TITLE: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

REEL NO: 11 Patents #4,780,911-4,788,721

VOLUME: 1096 Issues: 1-5

DATE: November 1 - 29, 1988

PUBLICATION NO: 10,426

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VOL
1096

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1

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Vol 1096 Number 1

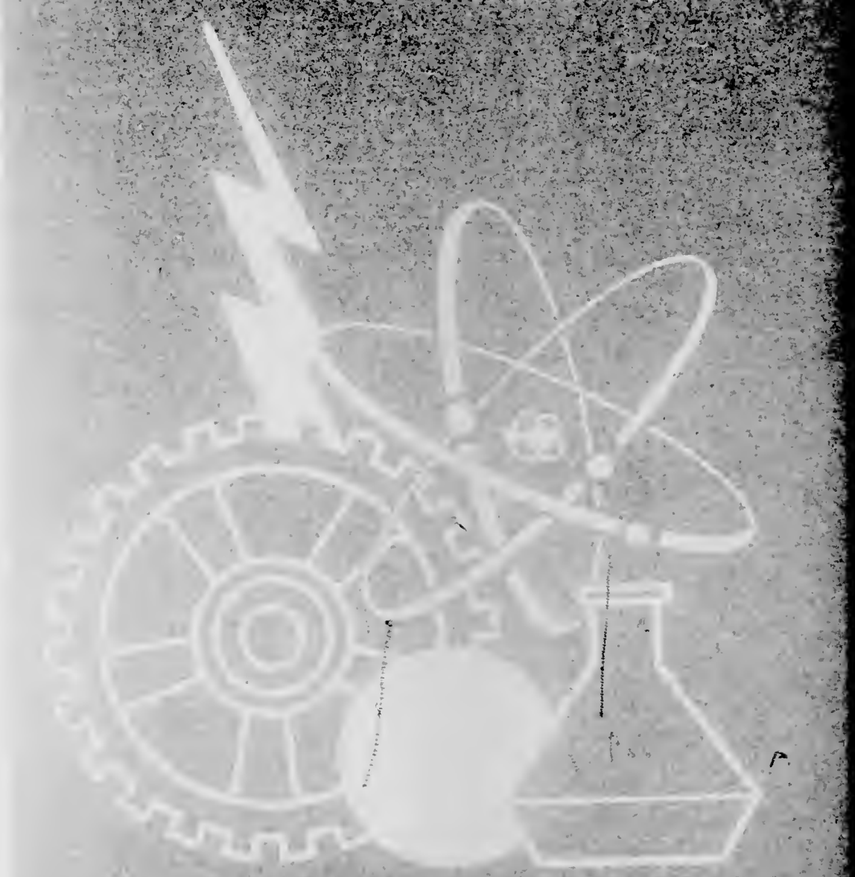
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 1, 1988



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

VOL
1096

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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
November 1, 1988 Volume 1096 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee –	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Aug. 11, 1988.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel for A Decision Without A Hearing as of Sept. 30, 1988

Chemical Discipline	–	November 4, 1987
Mechanical Discipline	–	February 2, 1987
Electrical Discipline	–	February 2, 1987

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Sept. 30, 1988

Chemical	–	May 1, 1986
Electrical	–	June 2, 1986
Mechanical	–	May 1, 1986

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of Sept. 1988

Affirmed	317
Affirmed-in-Part	48
Reversed	196
Total Decided	561

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on October 29, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,549,315 through 4,550,444
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 14, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,464,808	06/450,518	8/14/84
4,464,820	06/426,678	8/14/84
4,464,821	06/368,659	8/14/84
4,464,826	06/401,634	8/14/84
4,464,834	06/447,256	8/14/84
4,464,839	06/400,714	8/14/84
4,464,842	06/404,086	8/14/84
4,464,844	06/483,924	8/14/84
4,464,846	06/397,941	8/14/84
4,464,847	06/483,925	8/14/84
4,464,849	06/363,284	8/14/84
4,464,850	06/396,314	8/14/84
4,464,854	06/483,583	8/14/84
4,464,856	06/340,848	8/14/84
4,464,857	06/369,805	8/14/84
4,464,860	06/414,399	8/14/84
4,464,869	06/426,716	8/14/84
4,464,870	06/436,448	8/14/84
4,464,880	06/463,014	8/14/84
4,464,882	06/377,046	8/14/84
4,464,884	06/275,092	8/14/84
4,464,885	06/456,359	8/14/84
4,464,905	06/507,669	8/14/84
4,464,906	06/394,116	8/14/84
4,464,910	06/409,087	8/14/84
4,464,916	06/382,954	8/14/84
4,464,931	06/366,426	8/14/84
4,464,938	06/377,819	8/14/84
4,464,945	06/235,630	8/14/84
4,464,951	06/371,752	8/14/84
4,464,956	06/281,938	8/14/84
4,464,960	06/336,163	8/14/84
4,464,967	06/462,785	8/14/84
4,464,972	06/475,665	8/14/84
4,464,973	06/320,256	8/14/84
4,464,979	06/375,560	8/14/84
4,464,990	06/296,788	8/14/84
4,464,992	06/474,851	8/14/84
4,465,002	06/330,318	8/14/84
4,465,005	06/452,240	8/14/84
4,465,008	06/381,036	8/14/84
4,465,011	06/399,212	8/14/84
4,465,017	06/473,817	8/14/84
4,465,018	06/495,774	8/14/84
4,465,020	06/416,896	8/14/84
4,465,022	06/401,284	8/14/84
4,465,027	06/475,738	8/14/84

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Patent Number	Serial Number	Issue Date
4,465,052	06/400,418	8/14/84
4,465,054	06/377,865	8/14/84
4,465,055	06/335,590	8/14/84
4,465,058	06/396,672	8/14/84
4,465,059	06/303,468	8/14/84
4,465,061	06/369,740	8/14/84
4,465,062	06/378,065	8/14/84
4,465,064	06/350,983	8/14/84
4,465,066	06/347,190	8/14/84
4,465,070	06/348,457	8/14/84
4,465,073	06/326,397	8/14/84
4,465,087	06/519,462	8/14/84
4,465,089	06/426,698	8/14/84
4,465,095	06/348,700	8/14/84
4,465,099	06/323,845	8/14/84
4,465,104	06/536,794	8/14/84
4,465,110	06/339,084	8/14/84
4,465,116	06/512,835	8/14/84
4,465,127	06/257,601	8/14/84
4,465,132	06/444,188	8/14/84
4,465,155	06/274,658	8/14/84
4,465,156	06/378,845	8/14/84
4,465,164	06/351,423	8/14/84
4,465,166	06/351,754	8/14/84
4,465,167	06/322,252	8/14/84
4,465,168	06/325,013	8/14/84
4,465,170	06/314,990	8/14/84
4,465,171	06/366,195	8/14/84
4,465,174	06/427,445	8/14/84
4,465,179	06/483,945	8/14/84
4,465,187	06/348,819	8/14/84
4,465,193	06/406,171	8/14/84
4,465,197	06/370,165	8/14/84
4,465,202	06/422,031	8/14/84
4,465,205	06/552,853	8/14/84
4,465,208	06/445,361	8/14/84
4,465,209	06/404,138	8/14/84
4,465,216	06/425,945	8/14/84
4,465,222	06/433,637	8/14/84
4,465,227	06/568,955	8/14/84
4,465,231	06/362,815	8/14/84
4,465,238	06/299,468	8/14/84
4,465,245	06/474,034	8/14/84
4,465,247	06/298,510	8/14/84
4,465,248	06/327,769	8/14/84
4,465,250	06/465,230	8/14/84
4,465,253	06/486,598	8/14/84
4,465,254	06/387,276	8/14/84
4,465,265	06/510,322	8/14/84
4,465,266	06/355,447	8/14/84
4,465,274	06/424,320	8/14/84
4,465,276	06/373,701	8/14/84
4,465,278	06/462,306	8/14/84
4,465,292	06/386,287	8/14/84
4,465,304	06/358,869	8/14/84
4,465,307	06/394,131	8/14/84
4,465,310	06/433,058	8/14/84
4,465,313	06/325,423	8/14/84
4,465,314	06/334,302	8/14/84
4,465,315	06/342,504	8/14/84
4,465,316	06/363,050	8/14/84
4,465,320	06/288,037	8/14/84
4,465,323	06/352,142	8/14/84
4,465,327	06/353,982	8/14/84
4,465,348	06/324,403	8/14/84
4,465,363	06/442,468	8/14/84
4,465,366	06/312,122	8/14/84
4,465,367	06/317,927	8/14/84
4,465,374	06/448,820	8/14/84
4,465,384	06/470,218	8/14/84
4,465,387	06/429,161	8/14/84
4,465,403	06/334,547	8/14/84
4,465,409	06/343,024	8/14/84
4,465,410	06/388,975	8/14/84
4,465,421	06/398,142	8/14/84
4,465,424	06/391,397	8/14/84
4,465,426	06/395,993	8/14/84
4,465,431	06/391,645	8/14/84
4,465,435	06/371,553	8/14/84
4,465,437	06/345,569	8/14/84
4,465,443	06/434,179	8/14/84
4,465,450	06/482,982	8/14/84
4,465,453	06/443,998	8/14/84
4,465,456	06/295,574	8/14/84
4,465,460	06/537,179	8/14/84
4,465,461	06/407,427	8/14/84
4,465,467	06/380,670	8/14/84
4,465,468	06/434,477	8/14/84
4,465,469	06/380,682	8/14/84
4,465,472	06/443,647	8/14/84
4,465,477	06/520,143	8/14/84
4,465,493	06/334,536	8/14/84
4,465,495	06/360,523	8/14/84
4,465,510	06/505,766	8/14/84
4,465,515	06/286,654	8/14/84
4,465,519	06/507,672	8/14/84
4,465,520	06/468,691	8/14/84
4,465,534	06/555,450	8/14/84
4,465,538	06/350,107	8/14/84
4,465,555	06/385,316	8/14/84
4,465,558	06/525,493	8/14/84
4,465,564	06/507,763	8/14/84
4,465,568	06/322,000	8/14/84
4,465,569	06/512,726	8/14/84
4,465,593	06/566,606	8/14/84
4,465,600	06/458,760	8/14/84
4,465,607	06/421,080	8/14/84
4,465,617	06/541,495	8/14/84
4,465,627	06/290,912	8/14/84
4,465,631	06/482,544	8/14/84
4,465,654	06/518,858	8/14/84
4,465,669	06/357,814	8/14/84
4,465,678	06/444,419	8/14/84
4,465,680	06/438,061	8/14/84
4,465,681	06/403,664	8/14/84
4,465,682	06/388,300	8/14/84
4,465,686	06/372,174	8/14/84
4,465,693	06/386,295	8/14/84
4,465,695	06/511,918	8/14/84
4,465,719	06/392,489	8/14/84
4,465,770	06/287,907	8/14/84
4,465,781	06/399,242	8/14/84
4,465,785	06/444,364	8/14/84
4,465,799	06/448,182	8/14/84
4,465,826	06/379,808	8/14/84
4,465,831	06/332,326	8/14/84
4,465,836	06/456,901	8/14/84
4,465,843	06/441,234	8/14/84
4,465,844	06/526,051	8/14/84
4,465,846	06/488,902	8/14/84
4,465,847	06/420,314	8/14/84
4,465,855	06/368,721	8/14/84
4,465,863	06/441,375	8/14/84
4,465,892	06/538,085	8/14/84
4,465,899	06/376,050	8/14/84
4,465,903	06/487,223	8/14/84
4,465,904	06/271,227	8/14/84
4,465,908	06/408,326	8/14/84
4,465,912	06/397,582	8/14/84
4,465,916	06/381,038	8/14/84
4,465,917	06/393,154	8/14/84
4,465,925	06/376,035	8/14/84
4,465,927	06/347,044	8/14/84
4,465,934	06/348,154	8/14/84
4,465,937	06/313,794	8/14/84
4,465,940	06/368,787	8/14/84
4,465,946	06/525,137	8/14/84
4,465,948	06/395,035	8/14/84
4,465,949	06/525,058	8/14/84
4,465,953	06/418,867	8/14/84
4,465,956	06/469,957	8/14/84
4,465,965	06/310,879	8/14/84
4,465,978	06/507,879	8/14/84
4,465,979	06/433,524	8/14/84
4,465,981	06/424,533	8/14/84
4,465,985	06/353,983	8/14/84
4,466,070	06/362,248	8/14/84
4,466,074	06/303,599	8/14/84
4,466,090	06/364,689	8/14/84
4,466,104	06/339,106	8/14/84
4,466,105	06/285,515	8/14/84
4,466,108	06/309,136	8/14/84
4,466,114	06/385,291	8/14/84
4,466,118	06/444,929	8/14/84
4,466,121	06/319,803	8/14/84
4,466,124	06/404,041	8/14/84

Patent Number	Serial Number	Issue Date
4,465,988	06/441,816	8/14/84
4,465,989	06/435,446	8/14/84
4,466,015	06/428,591	8/14/84
4,466,024	06/435,038	8/14/84
4,466,028	06/345,904	8/14/84
4,466,046	06/482,567	8/14/84
4,466,048	06/359,240	8/14/84
4,466,069	06/286,556	8/14/84

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,402,202	06/279,335	9/6/83	7/1/81	9/29/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,377,024, Re. S.N. 220,914, Filed July 19, 1988, Cl. 029/157.30C, METHOD OF MAKING A HEAT EXCHANGER, Zalman Saperstein, Owner of Record: *Modine Manufacturing Co., Racine, Wis.,* Attorney or Agent: William A. Van Santen, Ex. Gp.: 326

4,402,770, Re. S.N. 248,217, Filed Sept. 23, 1988, Cl. 148/302, HARD MAGNETIC ALLOYS OF A TRANSITION METAL AND LANTHANIDE, Norman C. Koon, Owner of Record: *United States of America as Represented by the Secretary of the Navy, Arlington, Va.,* Attorney or Agent: Thomas E. McDonnell, Ex. Gp.: 111

4,442,701, Re. S.N. 214,906, Filed June 28, 1988, Cl. 073/32.00R, METHOD FOR MEASURING DENSITY OF A BULK MATERIAL IN A STOCKPILE, David C. Cowherd, et al., Owner of Record: *Bowser-Morner, Inc., Dayton, Ohio,* Attorney or Agent: Thomas A. Boshinski, Ex. Gp.: 265

4,584,033, Re. S.N. 186,115, Filed Apr. 22, 1988, Cl. 148/14, METHOD OF QUENCHING, Ronald H. Harding, et al., Owner of Record: *Union Carbide Corp., Danbury, Conn.,* Attorney or Agent: Steven H. Flynn, Ex. Gp.: 111

4,613,157, Re. S.N. 244,032, Filed Sept. 14, 1988, Cl. 283/1R, REUSABLE GREETING CARD, Steve Drabish, Owner of Record: *Steve Drabish & Rodger A. Johnson, both of Walton Hills, Ohio,* Attorney or Agent: Rodger A. Johnson, Ex. Gp.: 324

4,613,165, Re. S.N. 248,629, Filed Sept. 23, 1988, Cl. 285/045, INCREASED TENSILE STRENGTH VARIABLE DIAMETER PROTECTIVE JOINT, Karl F. Kuhne, Owner of Record: *Carbide Blast Joints Inc., Houston, Tex.,* Attorney or Agent: Theresa F. Camoriano, Ex. Gp.: 351

4,616,535, Re. S.N. 247,751, Filed Sept. 22, 1988, Cl. 81/121.1, TAMPER-PROOF THREADED FASTENING, Ezio R. Chiavon, Owner of Record: *Inventor,* Attorney or Agent: Guy D. Yale, Ex. Gp.: 323

4,627,994, Re. S.N. 245,514, Filed Sept. 19, 1988, Cl. 428/41, LABEL BEARING CONTINUOUS BUSINESS FORM, Bernard J. Welsch, Owner of Record: *Uarco Inc., Barrington, Ill.,* Attorney or Agent: William A. Van Santen, Ex. Gp.: 158

4,676,305, Re. S.N. 243,048, Filed Sept. 9, 1988, Cl. 165/158, MICROTUBE-STRIP HEAT EXCHANGER, E. David Doty, Owner of Record: *Inventor,* Attorney or Agent: Carl Oppendahl, Ex. Gp.: 345

4,684,295, Re. S.N. 247,171, Filed Sept. 21, 1988, Cl. 406/50, INTERMITTENTLY OPERATING PNEUMATIC DEVICE FOR PUMPING SOLID-CARRYING LIQUIDS AND SLURRIES, Jean-Francois Ranson, Owner of Record: *Inventor,* Attorney or Agent: Jordan B. Bierman, Ex. Gp.: 315

4,689,216, Re. S.N. 245,170, Filed Sept. 16, 1988, Cl. 424/58, SANGUINARINE DENTAL COMPOSITIONS WITH HYDRATED SILICA, James A. Greene, Owner of Record: *Vipont Laboratories Inc., Fort Collins, Colo.,* Attorney or Agent: Jerome J. Norris, Ex. Gp.: 125

4,713,131, Re. S.N. 245,202, Filed Sept. 16, 1988, Cl. 156/73.1, APPARATUS AND METHOD FOR ULTRASONICALLY JOINING SHEETS OF THERMOPLASTIC MATERIALS, Edward G. Obeda, Owner of Record: *Inventor,* Attorney or Agent: Haynes N. Johnson, Ex. Gp.: 131

4,724,719, Re. S.N. 246,622, Filed Sept. 20, 1988, Cl. 74/574, FLYWHEELS WITH VIBRATION DAMPING MEANS, Gunter Worner, et al., Owner of Record: *Daimler-Benz Aktiengesellschaft, Stuttgart, Germany,* Attorney or Agent: Donald D. Evenson, Ex. Gp.: 358

4,735,204, Re. S.N. 247,131, Filed Sept. 12, 1988, Cl. 128/419.0R, SYSTEM FOR CONTROLLING AN IMPLANTED NEURAL STIMULATOR, Marvin L. Sussman, et al., Owner of Record: *Inventor,* Attorney or Agent: Thomas R. Vigil, Ex. Gp.: 335

4,764,573, Re. S.N. 247,808, Filed Sept. 21, 1988, Cl. 526/90, ELECTRICALLY CONDUCTIVE PYRROLE POLYMERS, Ronald E. Myers, Owner of Record: *B. F. Goodrich Co., New York, N.Y.,* Attorney or Agent: Nestor W. Shust, Ex. Gp.: 155

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REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,693,983, Reexam. No. 90/001,606, Requested: Sept. 26, 1988, Cl. 360/93, TAPE CARTRIDGE DRIVE AND TRANSDUCING APPARATUS FOR THE TAPE THEREOF, Jerome Lemelson, Owner of Record: *Inventor, Princeton, N.J.,* Attorney or Agent: None, Ex. Gp.: 230, Requester: Sears Roebuck & Co., Chicago, Ill.

3,842,432, Reexam. No. 90/001,607, Requested: Sept. 26, 1988, Cl. 360/105, MAGNETIC TAPE TRANSDUCING SYSTEM, Jerome Lemelson, Owner of Record: *Inventor, Princeton, N.J.,* Attorney or Agent: None, Ex. Gp.: 230, Requester: Sears Roebuck & Co., Chicago, Ill.

3,842,433, Reexam. No. 90/001,608, Requested: Sept. 26, 1988, Cl. 360/105, MAGNETIC TAPE DRIVE AND TRANSDUCING METHOD, Jerome Lemelson, Owner of Record: *Inventor, Princeton, N.J.,* Attorney or Agent: None, Ex. Gp.: 230, Requester: Sears Roebuck & Co., Chicago, Ill.

4,067,698, Reexam. No. 90/001,604, Requested: Sept. 21, 1988, Cl. 44/66, HYDROCARBON INTERPOLYMER COMPOSITIONS, Arthur W. Anderson, et al., Owner of Record: *E. I. du Pont de Nemours & Co., Wilmington, Del.,* Attorney or Agent: Roger Hines, Ex. Gp.: 110, Requester: Phillips Petroleum Co., Bartlesville, Okla.

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,762,754, Reexam. No. 90/001,605, Requested: Oct. 4, 1988, Cl. 428/552, DYNAMIC HIGH PRESSURE PROCESS FOR FABRICATING SUPERCONDUCTING AND PERMANENT MAGNETIC MATERIALS, William J. Nellis, et al., Owner of Record: *Inventors, Berkeley, Calif.,* Attorney or Agent: R. E. Constant, Ex. Gp.: 220, Requester: Commissioner of Patents, Washington, D.C.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Webtek Corp., Los Angeles, Calif., Reg. No. 637,000, for the mark "KWIKY-DOT" and design, Canc. No. 16,542.

Frank A. Levato, Martinez, Calif., Reg. No. 1,244,877, for the mark "PIZZA-GRAM", Canc. No. 16,943.

Mr. Condotti, Ltd., New York, N.Y., Reg. No. 694,298, for the mark "CONDOTTI" and design, Canc. No. 16,593.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, judgment will be entered against registrant and said registration will be cancelled.

Human Engineered Software Corp., Calif., Reg. No. 1,314,417, for the mark "HES", Canc. No. 16,847.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 1, 1988

Re. 32,619	4,714,675	4,740,647	4,748,037
D. 292,318	4,715,776	4,740,741	4,748,119
D. 295,925	4,717,479	4,740,761	4,748,172
D. 296,219	4,718,738	4,740,794	4,748,251
4,477,276	4,722,714	4,741,003	4,748,255
4,534,948	4,722,931	4,741,215	4,748,421
4,570,830	4,722,997	4,741,289	4,748,939
4,588,882	4,723,138	4,741,789	4,749,114
4,590,928	4,723,404	4,741,804	4,749,306
4,594,579	4,723,422	4,742,036	4,749,359
4,600,732	4,723,715	4,742,537	4,749,440
4,628,486	4,724,013	4,742,550	4,749,461
4,631,316	4,724,186	4,742,888	4,749,792
4,646,697	4,725,257	4,743,271	4,749,865
4,659,734	4,725,705	4,743,290	4,749,880
4,661,644	4,727,019	4,743,451	4,749,916
4,672,823	4,727,947	4,743,829	4,750,115
4,674,341	4,728,205	4,743,881	4,750,276
4,683,467	4,728,363	4,743,975	4,750,285
4,688,252	4,729,799	4,743,995	4,750,370
4,692,366	4,729,838	4,744,266	4,750,382
4,694,255	4,730,107	4,744,297	4,750,497
4,694,855	4,730,370	4,744,417	4,750,687
4,696,019	4,730,481	4,744,548	4,750,937
4,696,117	4,730,892	4,744,701	4,750,989
4,696,326	4,731,240	4,744,884	4,750,998
4,697,247	4,732,885	4,745,072	4,751,435
4,698,466	4,733,250	4,745,197	4,751,562
4,699,022	4,734,211	4,745,365	4,751,604
4,700,822	4,734,441	4,745,520	4,751,661
4,702,105	4,734,685	4,745,914	4,752,136
4,704,390	4,735,569	4,746,507	4,752,297
4,705,366	4,736,359	4,746,631	4,752,315
4,705,519	4,736,436	4,746,803	4,752,443
4,706,156	4,736,462	4,747,020	4,752,486
4,707,483	4,737,593	4,747,028	4,752,538
4,708,581	4,737,921	4,747,173	4,752,918
4,709,065	4,738,013	4,747,291	4,752,998
4,709,115	4,739,339	4,747,338	4,753,072
4,709,360	4,739,764	4,747,353	4,754,164
4,709,658	4,739,899	4,747,405	4,754,313
4,709,978	4,739,982	4,747,517	4,755,175
4,710,227	4,740,182	4,747,630	4,755,325
4,710,299	4,740,218	4,747,694	4,755,402
4,712,045	4,740,333	4,747,944	4,756,473
4,712,209	4,740,447	4,747,953	
4,713,470	4,740,587	4,748,022	

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SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
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Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications. (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications.
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain data received and/or serial number for patent applications prior to the Office's standard notification (return post card or the official "Filing Receipt", "Notice to File Missing Parts," or " Notice of Incomplete Information Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8614
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada-Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, Free Library of	(215) 686-5330
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
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	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 24, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-3-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	10-24-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-1-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	11-5-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-8-87
DESIGN, GROUP 290—K. L. CAGE, Director	10-3-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-13-87
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	11-13-86
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	12-29-86
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-16-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-5-87

Expiration of patents: The patents within the range of numbers indicated below expire during September 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,602,913 to 3,609,762, inclusive
Plant Patents ..... None

STATUTORY INVENTION REGISTRATIONS

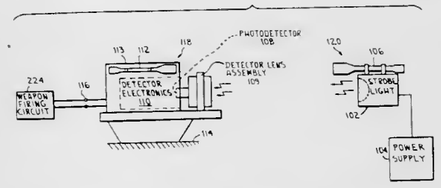
PUBLISHED NOVEMBER 1, 1988

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H538
WEAPON FIRING INHIBITOR METHOD AND APPARATUS

Victor A. Betzold, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1984, Ser. No. 684,393
Int. Cl.[4] F41J *1/20*
U.S. Cl. 89—134 **17 Claims**



1. A method for ensuring that a weapon is enabled to fire only when aimed at a predetermined zone around a target, which method comprises the steps of:

(a) transmitting from or near the target towards the weapon strobe light pulses of preselected pulse frequency, pulse duration and spectral content:

(b) at or near the weapon, optically focusing said stobe light pulses when the weapon is aimed at the predetermined zone;

(c) converting each of said optically focused strobe light pulses into a corresponding first electrical signal having an amplitude value as a function of intensity;

(d) generating an enable signal for a first preselected time period at least as long as a time period defined by said preselected pulse frequency only when one of said first electrical signals is detected within a second preselected time period after another one of said first electrical sigals is detected: and

(e) enabling the weapon only when said enable signal is provided.

H539
ARCUATE ROLLING BEARING

Steven A. Sievert, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1987, Ser. No. 32,670
Int. Cl.[4] F16C *33/46*
U.S. Cl. 384—614 **13 Claims**

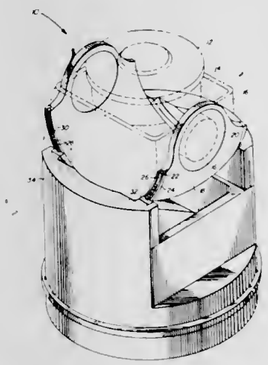
1. A rolling bearing comprising:

a first circularly arcuate race defining a first axially facing bearing track;

a plurality of rolling elements disposed in rollable engagement with said first track;

cage means for holding said rolling elements and for separating said rolling elements from each other; and

a second circularly arcuate race defining a second axially facing bearing track having the same radius as said first

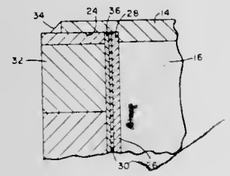


track and being axially opposed thereto so that said second track is rollably engaged with said elements.

H540
EXPLOSIVE SHOCK ATTENUATOR FOR HIGH FRAGMENT VELOCITY WARHEADS

Elso R. Caponi, Longwood, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 20, 1987, Ser. No. 87,856
Int. Cl.[4] F42B *13/18*
U.S. Cl. 102—495 **6 Claims**



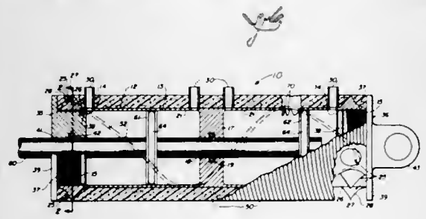
1. A warhead comprising a housing having a high energy main warhead charge with a booster charge at one end thereof for setting off the main warhead charge, a multiplicity of predetermined shaped metal fragments for being propelled for killing a target and said fragments being secured together in a cluster at an opposite end of said housing from said booster charge, and shock attenuator means mounted between an end surface of said clustered fragments and said high energy main warhead charge to attenuate shock transfer from said high energy main warhead charge to said fragments to prevent fragment breakup upon detonation of said high energy main warhead charge.

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H541
HOUSING FOR JAM RESISTANT ACTUATOR

James J. Childress, Federal Way, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1987, Ser. No. 89,117
Int. Cl.[4] F01B *11/02*
U.S. Cl. 92—151 2 Claims



1. In a housing for use with fluid at a predetermined pressure in a jam resistant actuator having a piston where the housing includes:

a cylindrically tubular liner having axially opposite and axially open ends and slidably receiving the piston, the liner being of such thickness and constructed of such material that the strength of the liner alone would be exceeded axially when the liner is subjected internally to fluid at such pressure and that petals formed from the liner by projectile penetration thereof are detachable therefrom by engagement with the piston when the piston is motivated by a fluid pressure substantially less than said predetermined pressure;

a pair of heads individually received in the ends of the liner;

attachment means individual to each head for detachably connecting the head to the corresponding end of the liner;

means individual to each head for sealing the head in fluid-tight relation to the liner;

passage means for introducing such fluid into the liner so that pressure therein urges each head from the liner in a direction away from the other head; and

a layer of resin impregnated filament wrapped peripherally about the liner to reinforce the liner against fluid pressure therein,

the improvement comprising:

each attachment means having a force transfer element which extends generally circumferentially about the interior of the liner at the corresponding such end thereof and which engages the corresponding head;

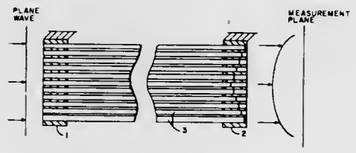
the linear having a plurality of projections unitarily constructed therewith and extended radially from the liner at each of said ends thereof, the projections at each of said ends being spaced circumferentially of the liner in circumscribing relation to the corresponding force transfer element, and each projection bearing a load transfer surface facing axially of the liner and oppositely of the other end thereof;

the layer having a plurality of strands which extend axially of the liner and engage the projections at said load transfer surfaces thereof, fluid pressure forces exerted axially of the liner on each head being transferred therefrom by the corresponding force transfer element to the liner at locations thereon adjacent to the corresponding end thereof, and such forces being transferred from the liner to the projections and from the projections to the strands engaged therewith, so that the strands are tensioned by such forces and axially reinforce the liner thereagainst.

H542
FIBER OPTIC VARIABLE FOCUS LENS

Arthur H. Werkheiser, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1988, Ser. No. 170,497
Int. Cl.[4] G02B *6/06, 6/04*
U.S. Cl. 350—96.25 3 Claims

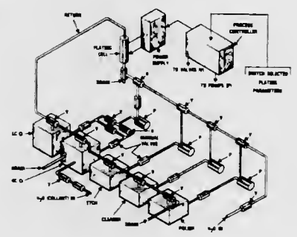


1. A fiber optic variable focus lens comprising a bundle of optical fibers of uniform length, rings mounted at opposite ends of the bundle, one of said rings being mounted at one of the ends of said optical fibers in a fixed relationship to the optical fibers to prevent movement of said one end of said optical fibers relative to said one of said rings, the other of said rings being mounted relative to the other end of said fibers for sliding longitudinal freedom of the other end of each fiber relative to said other of said rings to allow said fibers to be adjusted so as to be in different planes.

H543
LAMINATED CHROMIUM COMPOSITE

Edward S. Chen, Durham, N.C., and George P. Capsimalis, Ballston Lake, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 10, 1986, Ser. No. 919,957
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—635 7 Claims



1. An improved crack-free chromium composite comprising alternating ultra-thin layers of high concentration and low concentration chromium.

H544
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM EMPLOYING COBALT SPINEL STRUCTURED ANODE

Raul A. Castillo, Brazoria; Donald L. Caldwell, and Ralph W. Parham, Jr., both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

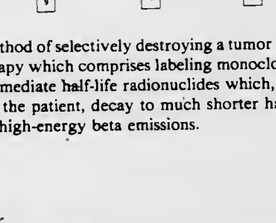
Continuation of Ser. No. 571,293, Jan. 16, 1984, abandoned, which is a continuation of Ser. No. 380,481, May 21, 1982. This application Apr. 13, 1987, Ser. No. 37,762
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—147 4 Claims

1. A method for the cathodic protection of a metal embedded in concrete which is subject to galvanic corrosion by its environment,

wherein the cathodic protection is provided by an impressed-current anode, using an amount of current which balances the natural requirement for electrons between the environment and the metal,

and wherein the said anode comprises an electroconductive titanium metal mesh substrate having coated thereon an adhering layer of an electroconductive cobalt oxide spinel having the formula

$$M_xZ_yCo_{(3-(x+y))}O_4$$



where M is a metal or a mixture of two or more metals selected from the group of metals contained in Groups IB, IIA, and IIB periodic table of the elements,

where Z is a metal or mixture of two or more metals selected from the group of metals contained in Group IA,

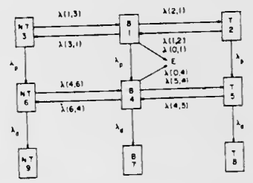
where x is equal to or greater than zero, and is less than or equal to one, and

where $(x+2y)$ is greater than or equal to zero and is less than or equal to one.

H545
IN VIVO GENERATOR FOR RADIOIMMUNOTHERAPY

Leonard F. Mausner, Stony Brook; Suresh G. Srivastava, Setauket, and Rita F. Straub, Brookhaven, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 30, 1987, Ser. No. 114,914
Int. Cl.[4] A61K *43/00, 39/395;* A61N *5/00*
U.S. Cl. 424—1.1 7 Claims

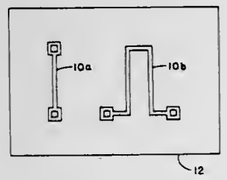


1. A method of selectively destroying a tumor using radioimmunotherapy which comprises labeling monoclonal antibodies with intermediate half-life radionuclides which, after administration to the patient, decay to much shorter half-like daughters with high-energy beta emissions.

H546
FORMATION OF THIN-FILM RESISTORS ON SILICON SUBSTRATES

George L. Schnable, Montgomery County, Pa., and Chung P. Wu, Hamilton Township, Mercer County, N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1988, Ser. No. 160,893
Int. Cl.[4] B22F *3/02*
U.S. Cl. 419—7 6 Claims



1. The method of forming thin-film resistors on silicon substrates comprising the steps of:

providing an oxide-covered silicon substrate;

implanting metallic conductor ions at a predetermined energy level into said oxide-covered silicon to form a conductive layer;

depositing a photo-resist layer upon said conductive layer;

placing a patterned mask upon said photo-resistor layer;

exposing said photo-resistor layer;

removing the unexposed photo-resist layer;

etching to remove undesired areas of said conductive layer;

dissolving remaining photo-resist;

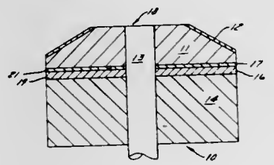
applying heat in the temperature range of 450° C. to 700° C. to anneal said conductive layer; and,

forming bonding pad on said conductive layers to form resistive elements.

H547
X-RAY TUBE TARGET

Andrew L. Lux, Bay Village, Ohio, and Robert M. Guezuraga, Roseville, Calif., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 13, 1986, Ser. No. 874,230
Int. Cl.[4] H01J *35/10*
U.S. Cl. 378—144 6 Claims



1. A composite target for an X-ray tube comprising a graphite substrate portion and a metal portion, the two portions being bonded together by successive interspersed layers of platinum and tantalum, wherein said platinum layer is disposed between said graphite substrate portion and said tantalum layer, said tantalum layer being relatively thin compared to said platinum layer and forming an isolator preventing formation of carbides in the metal portion, said platinum layer being between 1 and 3 mils in thickness and acting to hard said graphite layer to said metal portion.

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GROUP ORTHOGONAL ARRAYS FOR ELIMINATION OF MULTIPLE-TIME-AROUND ECHOS IN RADARS

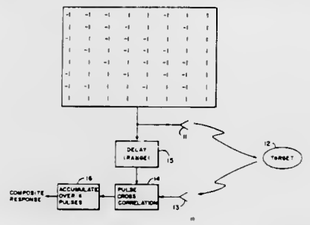
Edward Holliday, and Glenn D. Weathers, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 7, 1987, Ser. No. 633,091

Int. Cl.[4] G01S 7/44

U.S. Cl. 342—204 **2 Claims**

1. In a radar system for detecting a target in which a plurality of pulses with a carrier are transmitted and reflection of those pulses from the target are received, the improvement comprising the method of arranging the temporal distribution of carrier phase in each transmitted pulse by biphased binary coding; utilizing a set of at least two different group-orthogonal arrays for a series of at least eight transmitted pulses; and providing a corresponding reference set of arrays and combining them in a range gate manner with the reflection of the



transmitted pulses whereby crosscorrelation sidelobes of multiple time around reflections from the target are cancelled.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,774

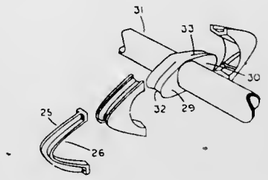
AXLE ALIGNMENT BUSHING

James M. Duff, P.O. Box 696, Sequim, Wash. 98382

Original No. 4,497,504, dated Feb. 5, 1985, Ser. No. 494,651, May 16, 1983. Application for reissue Jan. 20, 1987, Ser. No. 6,054

Int. Cl.[4] B60G 3/00, 25/00

U.S. Cl. 280—673 **15 Claims**



11. In a vehicle suspension structure including an axle twistable for adjusting the alignment of the suspension structure, a lug projecting generally radially from the axle and a coupling member leaving a concave interior surface for embracing the lug circumferentially of the axle, the improvement comprising an insert fittable over the lug and into registration with the concave interior surface of the coupling member for being clamped between the lug and the coupling member, said insert being shaped for applying force to said lug generally circumferentially of the axle as the coupling member is moved over said insert and said insert is moved over the lug to twist the axle and thereby adjust the vehicle suspension structure.

Re. 32,775

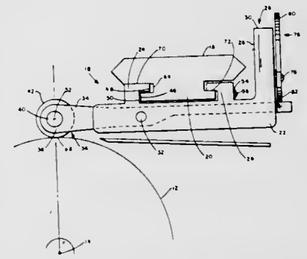
PINCH ROLLER ASSEMBLY

James Lawrence, Irvine, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Original No. 4,567,491, dated Jan. 28, 1986, Ser. No. 633,171, Jul. 23, 1984. Application for reissue Sep. 29, 1986, Ser. No. 912,093

Int. Cl.[4] G01D 15/28

U.S. Cl. 346—136 **9 Claims**



6. In a graphics plotter having a rotatable drum and a pinch roller for holding a writing medium against the surface of the drum for longitudinal movement thereby, the improvement comprising:

(a) a track having track surfaces extending generally parallel to the axis of the drum adapted to engage complementary track-engaging surfaces of a pinch-roller carriage;

(b) a pinch-roller carriage, which carriage includes track-engaging surfaces complementary to the track surfaces and slidably mounting the carriage on the track for sliding of the carriage longitudinally with respect to the track, the track-engaging surfaces being sized and shaped to mount the carriage loosely when the carriage is in a normal orientation with respect to the track but to be urged with force against the track surfaces to tend to bind the carriage to the track when the carriage is pivoted from the normal orientation with respect to the track;

(c) a pivot arm, carrying the pinch roller and being pivotably mounted on the carriage for pivoting about a pivot axis spaced from the axis of the pinch roller, for bringing the pinch roller into and out of engagement with the drum by the pivoting of the pivot arm;

(d) bias means acting between the carriage and the pivot arm to exert a torque about the pivot axis to tend to pivot the pivot arm to urge the pinch roller against the drum and, when the pinch roller has engaged the drum or a medium disposed thereon, to tend to pivot the carriage with respect to the pivot arm and thus with respect to the track and thereby exert a force urging the track-engaging surfaces against the engagement surfaces on the track so as to increase the static friction therebetween and prevent sliding of the carriage with respect to the track, whereby the carriage and pinch roller can be relatively easily slid along the track when the pivot arm has been pivoted against the torque exerted by the bias means but are held in place when the bias means is allowed to urge the pinch roller against the drum.

Re. 32,776

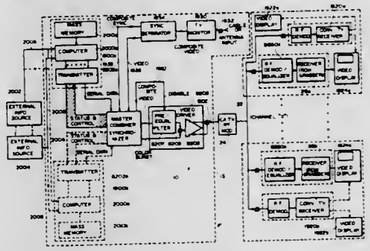
PIGGY BACK ROW GRABBING SYSTEM

Richard Saylor, Monsey, N.Y., assignor to IDR, Incorporated, Farmingdale, N.Y.

Original No. 4,032,972, dated Jun. 28, 1977, Ser. No. 699,088, Jun. 23, 1976. Application for reissue May 27, 1983, Ser. No. 498,971

Int. Cl.[4] H04N 7/087, 7/18

U.S. Cl. 358—142 **26 Claims**



1. a common channel video communication system for providing a television field comprising a plurality of television video scan lines over said common channel, said television field being comprised of both at least one video displayable row of video data characters contained in a pseudo video scan line occupying one of said plurality of television scan lines and normal televison video displayable information occupying the balance of said plurality of television video scan lines; said system comprising means for providing said television video scan lines comprising said normal television video information; means for providing said pseudo video scan line; and means operatively connected to said normal television video informa-

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tion providing means and said pseudo video scan line providing means for combining said normal television video information television video scan lines and said pseudo video scan line for providing said television field over said common channel, said pseudo video scan line providing means comprising means for providing said pseudo video scan line having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide said one row as an entire displayable row of video data characters, said displayable one row comprising a plurality of television video scan lines, said pseudo video scan line having an associated transmission time equivalent to said television video scan line, said packet of digital information comprising at least address information for said displayable one row and data information for said displayable characters in said displayable one row, said displayable one row being capable of providing a continuous video display of a selectable grabbed row of video information comprising said video data characters on a video display means from continuously transmittable video information [.] *said system further comprising television signal distribution means for distributing said provided television field over said common channel to said video display means for providing at least said grabbed row continuous video display and receiver means operatively connected between said common channel television signal distribution means and said video display means for processing said distributed television field and capable of providing a displayable video row signal corresponding to said displayable one row to said video display means from said one composite pseudo video scan line output signal for providing said continuous video display, said receiver means comprising means for updating said grabbed displayable row as said data portion of said displayable received distributed pseudo video scan line portion of said television field is updated.*

Re. 32,777

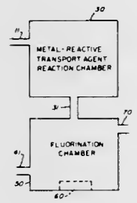
CHEMICAL VAPOR PURIFICATION OF FLUORIDES

Robert C. Folweiler, Bedford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Original No. 4,652,438, dated Mar. 24, 1987, Ser. No. 799,301, Nov. 18, 1985. Application for reissue Apr. 27, 1987, Ser. No. 41,960

Int. Cl.[4] C01B *9/08*

U.S. Cl. 423—489 **7 Claims**



1. A chemical vapor purification process for preparing metal fluorides comprising:

reacting at near-equilibrium conditions a metal selected from the group consisting of metals forming fluorides suitable for use in fluoride glass and thermodynamically partitionable from Fe, Cu, Co, OH and H_2O selected contaminants with a reactive transport agent selected from the group consisting of chlorine, bromine, and iodine [anions] in the presence of a stoichiometric excess of the metal to a generate gaseous, metal-containing compound;

isolating the gaseous, metal-containing compound from the starting materials; and

reacting the isolated gaseous, metal-containing oampound with a gaseous fluorinating agent to form a solid metal fluoride.

PLANT PATENTS

GRANTED NOVEMBER 1, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,361

APPLE TREE—FRANKAD CULTIVAR

Henry E. Franklin, Stanthorpe, Australia, assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed Oct. 27, 1986, Ser. No. 923,175

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as illustrated and described, characterized by (a) an unusually good heat tolerance, (b) a medium large upright and spreading growth habit, and (c) the consistent production of heavy crops of early ripening large round-oblate sprightly flavored fruit having a bright red skin coloration and firm flesh.

6,362

PEAR TREE OLD HOME×FARMINGDALE VARIETY NO. 87

Lyle A. Brooks, Forest Grove, Oreg., assignor to Gordon Bailey, Dayton, Oreg.

Filed Oct. 24, 1986, Ser. No. 923,028

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of pear tree, referred to by the cultivar designation Old Home×Farmingdale No. 87, substantially as herein shown and described, characterized particularly by its ability to serve as a rootstock for grafting of pear tree cultivars to produce "semi-dwarf" pear trees; further characterized by its excellent yield efficiency, its resistance to the Fireblight disease and its tolerance of the Pear Decline disease; further characterized by its hardiness, its excellent root anchorage, its compatibility with all major commercial pear varieties, its early bearing habit, and its ability to root easily and reproduce readily by vegetative means, particularly by hardwood cuttings.

6,363

NECTARINE TREE (AUGUST RED)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed May 7, 1987, Ser. No. 46,775

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct late ripening variety of clingstone nectarine tree, substantially as illustrated and described, which most nearly resembles the Autumn Grand (U.S. Plant Pat. No. 2,894) variety but is distinguished from and an improvement on that variety and other known late maturing varieties in having fruit which is firmer, has better red color in our area, and which first ripens 3 days before Autumn Grand but has an extended harvest period because of its extreme firmness, the fruit having average size, good flavor, and excellent shape for the commercial grower.

6,364

PEACH TREE ("PIX-ZEE")

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Dec. 29, 1986, Ser. No. 947,089

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree of dwarf size, dense spreading growth, and a regular and productive bearer of large size, firm, yellow flesh, freestone fruit, with good flavor, eating quality and attractive red skin color; the tree is further characterized by having a dwarf growth habit, close leaf nodes with heavy attractive foliage and large showy pink flowers.

6,365

CRAPE MYRTLE

Carl E. Whitcomb, Stillwater, Okla., assignor to Oklahoma State University, Stillwater, Okla.

Filed Sep. 23, 1985, Ser. No. 791,078

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of *Lagerstroemia indica* plant substantially as shown and described and particularly characterized by a compact, upright and semi-dwarf growth habit, a variegated flower having individual petals of pink, Rose madder #23, bordered by pure white on the outer margin, dark green leathery leaves and an exceptionally long bloom period.

6,366

GERANIUM NAMED DUSTER

Charles F. Heidgen, 821 Walnut St., Batavia, Ill. 60510

Filed Oct. 1, 1985, Ser. No. 782,739

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of geranium plant, substantially as shown and described, characterized by its cascading growth habit; its distinctive small, orange, fluffy looking flowers; its continuous blooming habit; its unique dark green, small, notched foliage; and its exceptional heat tolerance.

6,367

LILY PLANT NAMED 'LEMON PIXIE'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Nov. 10, 1986, Ser. No. 929,270

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Asiatic hybrid lily, substantially as herein shown and described, particularly distinguished by the unique color pattern of its flowers which are characterized by a ring of deep magenta spots surrounding the center of the flower, and the excellence of its flower form; the plant has a vigorous growth habit with rapid natural propagation; and its short stemmed, abundantly leaved and upright flowering silhouette as a pot plant specimen.

6,368

CARNATION NAMED 'LONSATO'

Nicole Barberet, and Yves Duclox, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France

Filed Sep. 15, 1986, Ser. No. 907,860

Claims priority, application Spain, Jun. 20, 1986, 861485

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinctive variety of carnation, substantially as herein shown and described, characterized by its intermittent flowering habit and profuse production of flowers having a generally fiery orange appearance; and the plant having a rapid and vigorous upright growth habit with medium long flower stems.

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6,369
CARNATION VARIETY 'LONGOTOM'
Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France
Filed Jul. 29, 1986, Ser. No. 890,374
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 1 Claim

1. A new and distinct carnation cultivar, substantially as herein shown and described, characterized by the very large size of its flowers which are generally of a light-Purple color with petals which are tinged at the inner body portion and outer end edges with a somewhat darker Mallow Purple color; the plant being further characterized by its recurrent and profuse production of flowers during its blooming seasons.

6,370
CARNATION NAMED 'LONSTIGA'
Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France
Filed Sep. 15, 1986, Ser. No. 907,861
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—73 1 Claim

1. The new and distinct variety of spray carnation, substantially as herein shown and described, characterized by its intermittent flowering habit with profuse production of flowers having a substantially solid cardinal red coloration, and having a rapid, vigorous and upright growth habit with a normal height of about 123 cm. at eight months with flower stems averaging about 69 cm. in length.

6,371
CHRYSANTHEMUM PLANT NAMED MALVERN'S DIGNITY
Richard W. Malvern, deceased, late of Manchester, Mo. (by Keith M. Malvern, administrator), assignor to Ball Pan Am Plant Company, Parrish, Fla.
Continuation of Ser. No. 815,170, Dec. 31, 1985, abandoned.
This application Feb. 20, 1987, Ser. No. 17,171
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of chrysanthemum plant named Malvern's Dignity, as described and illustrated, and particularly characterized by its standard form, white ray floret color, and a high degree of incurving of the ray florets.

6,372
ST. AUGUSTINE GRASS
Wayne C. Mixson, Apopka, Fla.; Terrance P. Riordan, Lincoln, Nebr., and Virgil D. Meier, Marysville, Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Aug. 7, 1986, Ser. No. 893,960
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A St. Augustine grass, substantially as herein illustrated and described.

PATENTS

GRANTED NOV. 1, 1988

ERRATA

For CLASS	See PATENT NO.
164-475	4,781,122
439-359	4,781,330
405-202	4,781,497
464-014	4,781,662
341-150	4,782,323
341-055	4,782,325
341-076	4,782,326
341-006	4,782,329

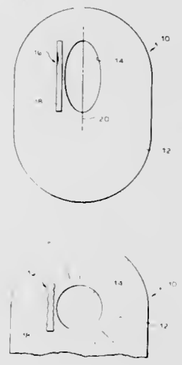
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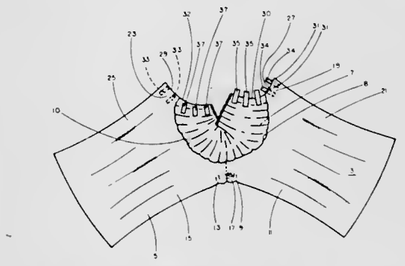
GENERAL AND MECHANICAL

4,780,911
DISPOSABLE BIB WITH ELASTICIZED HEAD OPENING
Robert J. Mack, Aberdeen, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Oct. 26, 1987, Ser. No. 113,085
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **3 Claims**



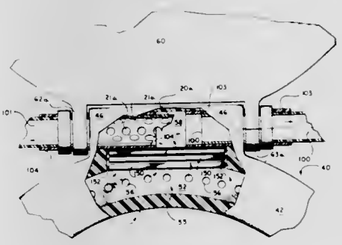
1. A disposable bib comprising a sheet of material for covering a portion of the torso of the wearer, said sheet having a head opening for passing the bib over the head of the wearer, and elastic means adjacent said head opening for reducing the head opening in size so that said bib fits substantially snugly about the neck of the wearer, said head opening being oval in shape, the longer axis of said oval head opening being the longitudinal axis of said opening and extending longitudinally of said bib, said elastic means comprising at least one elastic strip arranged parallel to said longitudinal axis of said head opening, said elastic strip causing a curvature of said bid to overlie the shoulders of the wearer.

4,780,912
DICKEY
Wayne A. Harmsen, Fond du Lac, Wis., assignor to Arm-Kor Marketing Corporation, Eden, Wis.
Filed Aug. 3, 1987, Ser. No. 80,971
Int. Cl.[4] A41D *23/00*
U.S. Cl. 2—91 **4 Claims**



1. An article of clothing comprising:
a. an imperforate and unitary front panel adapted to cover substantially all of a person's chest and having first and second sides, each side including an upper portion, the upper portion of the front panel second side terminating in a first seam;
b. (a) an imperforate and unitary back panel adapted to cover at least a portion of a person's back and having first and second sides, each side including an upper portion, the upper portion of the back panel first side being permanently joined to the upper portion of the front panel first side along a common fold line for draping over a first shoulder of the person, the upper portion of the back panel second side terminating in a second seam;
c. a collar joined to the front and back panels and permanently spanning the fold line between the upper portions of the respective first sides of the front and back panels, the collar terminating only in opposed first and second seams that correspond with and are continuous with the respective first and second seams of the front and back panels; and
d. a plurality of pairs of flexible fasteners secured to the front and back panels and to the collar adjacent the respective first and second seams thereof for cooperating to close the panel and collar seams along the neck and second shoulder of the person.

4,780,913
TOILET SEAT VENTING APPARATUS
T. J. Williams, Rt. 4, Box 920, Hazelhurst, Ga. 31539
Continuation-in-part of Ser. No. 611,823, May 18, 1984, abandoned. This application Jun. 21, 1985, Ser. No. 747,334
Int. Cl.[4] E03D *9/04*
U.S. Cl. 4—217 **2 Claims**



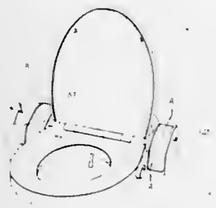
1. An improved toilet seat venting apparatus for use with a conventional toilet having a rim, the apparatus comprising:
a pipe fitting having two ends and being fixedly secured to the rim of a toilet, a portion of said pipe fitting being sectioned to provide a deflecting surface;
a toilet seat pivotally mounted upon said pipe fitting, said toilet seat including an inner channel disposed within said toilet seat so as to communicate with said sectioned portion of said pipe fitting regardless of the position of said toilet seat, a baffle disposed within said inner channel for selective obstruction thereof, and a groove defined in the bottom surface of said toilet seat that communicates with said inner channel;
an insert member dimensioned for receipt by said groove in the bottom surface of said toilet seat so as to form a passageway within said toilet seat that communicates with said inner channel, said insert member defining a plurality of intake ports that communicate with said passageway; and
a pair of receiving fittings that extend about and depend from the two ends of said pipe fitting respectively, said receiving fittings being telescopic with said pipe fitting for variable obstruction of said sectioned portion thereof; and

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means for suctioning operatively connected to said pipe fitting via said receiving fittings for drawing air from the area of said toilet seat through said pipe fitting,

whereby, upon activation of said means for suctioning said baffle is withdrawn from obstruction of said inner channel and gases are drawn through said intake ports, said passageway, said means regardless of the position of the toilet seat and the flow of gases therethrough may be varied by adjustment of said telescopic receiving fittings.

4,780,914
AUTOMATICALLY LIFTING DEVICE FOR TOILET SEAT
Hsien C. Lin, No. 6, Liang-Chow St., Taipei, Taiwan
Filed Feb. 9, 1988, Ser. No. 154,100
Int. Cl.[4] A47K *3/12*
U.S. Cl. 4—236 **3 Claims**



1. An automatic lifting device in combination with a toilet seat comprising, a housing containing at least a sleeve shaft, a sleeve, a main shaft, a torsional spring and a torsion adjusting assembly, and characterized in that;

said sleeve shaft being a cascade sleeve shape, of which a small diameter portion faces outwards and is mounted in a recess portion at one end of said housing, said sleeve shaft being fixedly positioned in said housing by a pin; the center portion of said small diameter portion being furnished with a shaft hole for receiving said main shaft;

said sleeve being mounted over the small diameter portion of said sleeve shaft and serving as a means for mounting a hinge portion of said toilet seat, said sleeve being longer in length than said small diameter portion, and projecting beyond said portion and having a slot in the area which projects beyond the small end portion

said main shaft, having one end inserted in the shaft hole of said small diameter portion, while the other end is mounted in a socket at one end of said assembly so as to have both its ends fixed in place for mounting said torsional spring;

said torsional spring being mounted on said main shaft and the first end of said torsional spring being inserted into a catch hole located in said toilet seat, while the second end thereof has a horizontal portion extending laterally of said spring;

said torsion adjusting assembly including a displacement shaft, a shaft seat, a worm gear and a worm, and having the features as follows:

one end of said displacement shaft, having a slot to receive said second end of said torsional spring, a mid-portion of said displacement shaft having threads;

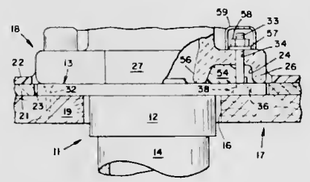
said shaft seat being mounted on said assembly, and having a center hole in the bottom center thereof for receiving the other end of said displacement shaft which can move axially in said center hole;

said worm gear being located on said shaft seat, and having a threaded hole for engaging with said threads of said displacement shaft, and said worm gear being retained in place by means of the upward force of said second end of said torsional spring,

said worm having one end engaged with said worm gear and a second end of said worm extending out of said assembly and having a knob mounted thereon, and said end of said worm being supported with a supporting plate which is integrally molded with said housing;

the aforesaid device being operated by rotating said knob to drive said worm gear which due to its threaded engagement with said displacement shaft will cause said shaft to move upwards or downwards for changing the space between the diametral pitch of said torsional spring and adjusting the torsion of said torsional spring.

4,780,915
TOILET FLOOR FLANGE
Casper Cuschera, 967 Industrial Parkway West, Hayward, Calif. 94544
Filed Nov. 27, 1987, Ser. No. 126,208
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—252 R **3 Claims**



1. In conjunction with a floor structure having a frame assembly, a sub-floor secured to the upper surface of the frame assembly, and a floor surface material secured to the upper surface of the sub-floor, a floor flange connecting the outlet of a toilet to a drainpipe which extends through the floor structure below the base of said toilet, said toilet base having front front and back wall portions and opposite side wall portions, comprising:

a cylindrical sleeve fitted onto the upper end of said drainpipe beneath said toilet in coaxial relationship with said drainpipe and having an annular lip which extends outward from the upper end of the sleeve,

a flange member having a central opening through which said upper end of said sleeve extends, said central opening having a diameter smaller than said lip of said sleeve, said flange member being rectangular and having edge regions which extend between said floor frame assembly and said back wall portion of said toilet base and between said floor frame assembly and at least the back part of said side wall portions of said toilet base, said flange member having a thickness dimension substantially equal to the thickness of said sub-foor and being adapted to be received in a rectangular recess in said sub-floor in flush relationship therewith, said flange member having means for enabling fastening of said toilet base thereto and fastening of said flange member to said floor frame assembly.

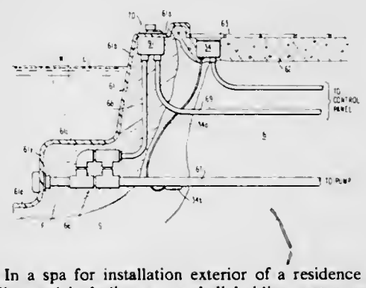
4,780,916
TUB SEAT MASSAGER
Bernard S. Sutton, 128 Lafayette Ave., Brooklyn, N.Y. 11238
Filed May 11, 1987, Ser. No. 47,490
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—543 **5 Claims**

1. A tub seat massager comprising a stiff contoured-shaped seat capable of supporting a person desiring a massage, including a back and detachable leg portion to provide comfort and support to the head, neck, back, arms, buttocks and legs of a person, said tub seat massager including a contoured top portion of stiff material and bottom portion of stiff material having the same contour as said top portion, said tub seat massager also including plural airtight sections internally and formed between said top and bottom portions, a seal mounted around the periphery of and sandwiched between said top and bottom portions to maintain said airtight sections airtight, and openings being disposed on the surface of said top portion, and certain of said openings communicating with certain of said plural airtight sections, a means for supplying pressurized air to each of said plural airtight sections, in a pre-selected manner, a



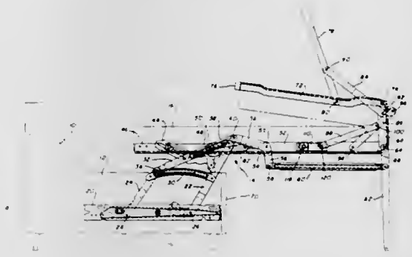
distribution means mounted centrally on the bottom of tub seat massager interconnecting the means for suppyling pressurized air to the plural airtight sections, in a pre-selected manner, whereby a person may rest on said tub seat massager and upon actuation of said means for supplying pressurized air, said pressurized air will flow into said airtight sections through said openings to massage said person.

4,780,917
SPA CONSTRUCTION WITH INTEGRATED SPA SIDE AND INSIDE CONTROL SYSTEM
James W. Hancock, R.D. #2, Cochranville, Pa. 19330
Filed Jan. 5, 1987, Ser. No. 623
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—544 **22 Claims**



1. In a spa for installation exterior of a residence or like building and including a spa shell holding water, an under water spa light, water piping opening to the interior of the shell and forming a water circulating loop, an electric heater within said loop for heating circulating water, electric motor-driven pump means within said loop for circulating said water through said circulating loop piping at low and high speed, an air manifold within said spa for injecting air into the water within said spa shell, an electric motor-operated blower connected to said air manifold for supplying compressed air thereto, said electric motor-driven pump means and said electric motor-operated blower being within an equipment area in the vicinity of said spa shell, a source of electrical power for said heater, said pump means and said blower, thermostat means for sensing the temperature of the water, and control means responsive to said thermostat means for controlling the connection of said electrical power source to said heater, said pump means and said blower, the improvement wherein; said control means comprises an in-house control panel within said residence, a spa side control unit mounted to said spa shell for access by an occupant of said spa and a main control panel at said equipment area, said electrical power source is a high voltage AC source, said main control panel comprises a lower voltage transformer for stepping down said high voltage AC to low voltage AC, a low voltage circuit means including said low voltage transformer, rectifier means for changing said low voltage AC to low voltage DC, said spa side control unit comprises a plurality of low voltage hermetically sealed switches for selectively energizing the circulating pump motor, said blower and said underwater spa light, and exterior, manual control means for manually operating said spa side control panel low voltage switches, said in-house control panel comprises a plurality of manually operated low voltage switches connected in parallel with the low voltage switches of said spa side control panel for operating said electric heater, said electric motor-driven pump means, said electric motor-operated blower, and said spa light independent of said spa side control panel low voltage switches; wherein, within said equipment area, said low voltage circuit means comprises at least one thermostat-operated relay for controlling the flow of high voltage AC current to said heater and a plurality of low voltage relays including relay coils, low voltage contacts and switchable high voltage AC contacts to operatively connect said high voltage AC power source to said heater, said electric motor-driven pump means, said blower and said spa light, respectively; wherein said in-house control panel manually operated switches are connected across respective relay coils of said low voltage DC relays for independently energizing said low voltage relays, said spa further comprises vacation switch means for selectively disabling at least said in-house switch means for operating said low voltage relays and wherein, said main control panel further comprises a series of manual, high voltage override switches in parallel with said spa side and said in-house low voltage switch means for connecting said high voltage AC directly across said electric motor-driven pump means, said blower and said spa light for overriding said low voltage DC switch means.

4,780,918
SOFA BED WITH FRICTION STOP
Michael F. Hartline, Saltillo, Miss., assignor to Super Sagless Corporation, Tupelo, Miss.
Filed May 7, 1987, Ser. No. 47,168
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—13 **13 Claims**



1. A sofa bed frame movable from a closed, sofa configuration to an open, bed configuration comprising

a main angle and a rear leg for supporting the front end of the main angle when the frame is in the bed configuration,

a center angle pivotally connected at one end to the front end of the main angle, said center angle being coplanar with the main angle when the frame is in the bed configuration and substantially perpendicular to the main angle when the frame is in the sofa configuration,

a front tube pivotally connected to the other end of the center angle and being generally coplanar with the main and center angles when the frame is in the bed configura-

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tion and lying in a plane substantially parallel to and spaced above the main angle when the frame is in the sofa configuration,

a front leg pivotally connected to the front tube for supporting the front tube when the frame is in the bed configuration,

a front leg lock link pivotally mounted intermediate its ends to the center angle and connected at one end to the front leg,

a lock link pivotally connected at one end to the other end of the front leg lock link and at its other end to the main angle,

a friction link in face to face relationship with the main angle,

fastening means including a friction generating device connecting the friction link to the main angle and permitting movement of the friction link on the main angle only under substantial friction,

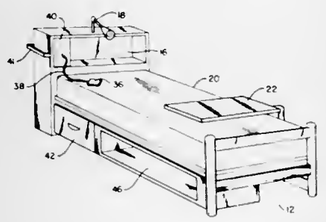
and a control link pivotally connected at one end to the lock link and at its other end to the friction link, said control link dragging the friction link on the face of the main angle when the frame is moved from the sofa to bed configuration.

4,780,919

HOSPITAL BED

Mildred B. Harrison, 198 Cedar Rd., East Northport, N.Y. 11731

Filed Oct. 20, 1987, Ser. No. 110,448
Int. Cl.[4] A61G *7/02*; A47B *23/00*
U.S. Cl. 5—60 **2 Claims**



1. A new and improved hospital bed, comprising:

a frame;

a mattress supported on said frame;

a head board having a storage shelf mounted on said frame;

a lamp mounted on said head board;

a longitudinally extending slide rail mounted at a lower side portion of said frame;

a rotatably mounted lead screw extending parallel to said slide rail;

a guide element having a lead nut engaging said lead screw and a portion engaging said slide rail for sliding movement thereon;

a bidirectional motor for rotating said lead screw;

a standard rigidly connected to said guide element;

a tray table pivotally connected to said standard for movement between an operative and a storage position;

a storage drawer mounted beneath said mattress on a side of said frame opposite said slide rail;

a rack bar secured to an exterior side wall of said storage drawer;

a pinion engaging said rack bar;

a bidirectional motor connected for rotating said pinion;

a sanitary unit including a toilet mounted beneath said mattress adjacent said storage drawer;

a rack bar secured to an exterior side wall of said sanitary unit;

a pinion engaging said sanitary unit rack bar;

a bidirectional motor connected for rotating said pinion; and

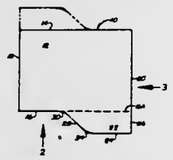
remote control means on said head board for selectively actuating said lamp, said tray table, said storage drawer and said sanitary unit.

4,780,920

ANGULAR SLEEPER'S PILLOW AND PILLOWCASE

Aaron L. White, 23300 Providence Dr., Suite 510, Southfield, Mich. 48075

Filed Aug. 28, 1987, Ser. No. 90,844
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—436 **6 Claims**



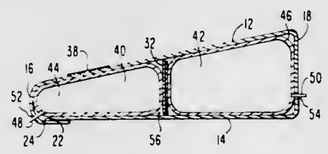
1. A side sleeper's pillow comprising: a larger, generally rectangular main pillow portion having an upper edge and a lower edge in parallel, transversely spaced apart relation, and generally parallel, transversely spaced part side edges, extending between the upper and lower edges of the main pillow portion, and an extension pillow portion extending from the lower edge of the main pillow portion adjacent one side edge of the main pillow portion having a lower edge, generally parallel to the upper edge of the main pillow portion, one side edge of which is a continuation of the one side edge of the main pillow portion and a transition side edge in spaced relation to the first side edge of the extension pillow portion having segment portions at each end thereof blending smoothly into the bottom edge of the main pillow portion and the bottom edge of the extension pillow portion, wherein the segment portion of the transition side edge of the extension pillow portion blending into the lower edge of the main pillow portion at an obtuse angle and has a radius in the range of one to ten inches, and wherein the segment portion of the transition side edge of the extension pillow portion blending into the lower edge of the extension pillow portion has a radius in the range of one to twelve inches.

4,780,921

COVER FOR THERAPEUTIC SUPPORT CUSHION

Karen R. Lahn, 323 Via Hidalgo, Greenbrae, Calif. 94904, and Russell G. Ward, 942 E. 18th St., Eugene, Oreg. 97403

Filed Apr. 8, 1987, Ser. No. 35,770
Int. Cl.[4] A47C *20/02*; A47G *9/02*
U.S. Cl. 5—437 **14 Claims**



1. A flexible, adjustable cover for a therapeutic support cushion comprising a top wall, a bottom wall, a front wall, a rear wall, a front end and a rear end, a pair of opposite side walls, a free end portion of said top walls extending under a free end portion of said bottom wall in overlapping relation, a detachable adhesive tape fastening means affixed transversely to the end portions of said bottom wall and of said top wall for closing and opening said cover and a generally vertical partition formed by a pair of detachably adherent overlapping

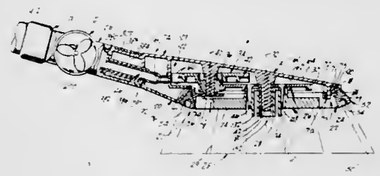
sections inside said cover between said top wall and said bottom wall providing a pair of separate hollow chambers, said sections comprising an upper section disposed downwardly and secured to inner surface of said top wall and a lower section disposed upwardly and secured to inner surface of said bottom wall, the overlapping portions of said sections being joined in a sealing engagement with each other.

4,780,922

HIGH POWER FLUID DRIVEN ROTARY BRUSH AND WATERWHEEL

George Sanchez, Chatsworth, Calif., assignor to Clyde Industries Limited, New South Wales, Australia

Filed Aug. 21, 1986, Ser. No. 899,303
Int. Cl.[4] A46B *13/06*
U.S. Cl. 15—29 **35 Claims**



1. A fluid drive assembly for a rotary brush, comprising:

a fluid inlet to the assembly and a nozzle for dispensing fluid from the inlet;

a waterwheel mounted for rotation about an axis; and

rotary brush rotating means rotatably driven by the waterwheel,

the waterwheel comprising a series of vanes peripherally disposed around the waterwheel,

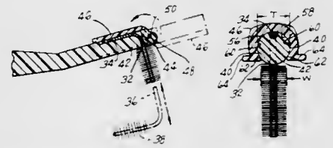
each vane comprising a wall for receiving the dispensed fluid having a pair of unrestricted ends spaced apart in a direction transverse to the direction of rotation and a fluid diverter separating the unrestricted ends, the diverter and wall on opposite sides of the diverter being adapted for diverting the fluid striking the wall for flow simultaneously in substantially opposite directions at the unrestricted ends.

4,780,923

INTERPROXIMAL BRUSH DEVICE HAVING HINGED BRUSH RETAINER CAP

Peter Schultheiss, North Liberty, Iowa, assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 125,727, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 012,186, Feb. 9, 1987, abandoned. This application Jan. 19, 1988, Ser. No. 140,780
Int. Cl.[4] A46B *3/08, 3/18*
U.S. Cl. 15—111 **25 Claims**



1. An interproximal brush handle comprising:

(a) an elongated handle having a grip portion and an end portion including opposed side surfaces, a bottom surface and a transverse hole;

(b) a cap pivotally mounted to the end portion and including a section adapted and arranged for communication with the end portion to cover at least part of the end portion surface;

(c) a longitudinal groove carried by the end portion or the cap and adapted and arranged for communication with the transverse hole; and
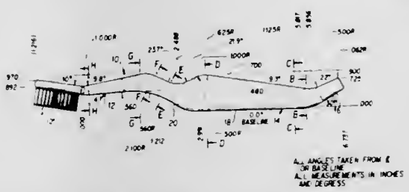
(d) means for releasably attaching the section to the end portion.

4,780,924

TOOTH BRUSH WITH REMOVABLE BRUSH HEAD

Paul D. Hansen, 307 Los Pinos Way, San Jose, Calif. 95119; Garrett B. DeCerce, 15003 SE. 143rd Pl., Renton, Wash. 98056, and William J. Schmidt, Jr., 2130 Half Rd., Morgan Hill, Calif. 95037

Filed Oct. 20, 1987, Ser. No. 110,685
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—176.1 **8 Claims**



1. A tooth brush comprising:

a handle portion in the shape of a bent trapezoid, said handle portion including:

a main body region substantially rectalinear in shape with a length that is several times longer than either its height or width, said main body region defining a top, a bottom and two side surfaces;

a tail region affixed to one end of the main body region angled upward through a selected angle with the top surface of the main body region; and

an "S" shaped region affixed to the other end of the main body region with an upper and a lower curved indentation to form the "S" being on the surfaces of the "S" shaped region that are extensions of the top and bottom surfaces of the main body region; and

a head portion affixed to the proximate end of the "S" shaped region, said head portion having bristles affixed thereto in a selected pattern.

4,780,925

DIPSTICK GUIDE WITH AUTOMATIC WIPER

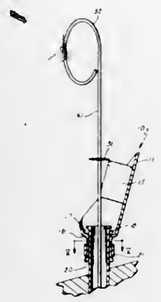
Jay F. Sherman, 7681 Walnut Ave., Jenison, Mich. 49428

Filed Feb. 17, 1987, Ser. No. 15,311
Int. Cl.[4] A47L *25/00*; F01M *11/12*; B60S *1/62*
U.S. Cl. 15—210 B **2 Claims**

1. Means for wiping liquid from the indicia bearing face of a ullage rod which enters the liquid containing chamber through a tube only when the rod is withdrawn while aligned with the axis of the tube, said means comprising: a body element having an upper portion and a generally circular base, said base being generally cylindrical and having a internal passage of a size to receive said tube therethrough, said upper portion of said body flaring upwardly and outwardly to form a hood open at the top, said hood having back and side portions, said back portion being rearwardly inclined, said side portions being curved to extend downwardly and forwardly to define a front opening which converges downwardly in a generally V-shape to a generally horizontal ledge portion that extends generally radially outwardly from the upper end of said base, said hood, ledge portion and base all being integral, the central portion of the upper part of the back portion being flat; a compressible wiper element secured to the inner face of said central portion, said element extending from said central portion at least to a position at which a portion of it intersects a plane assumed by

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the indicia bearing face of the ullage rod as it is withdrawn from said tube while straight and aligned with the central axis



of the tube; said base being vertically split at the front whereby its internal opening can be varied to fit tubes of different sizes, means for clamping said base around the tube.

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STRETCHABLE WIPER APPARATUS FOR VEHICLE

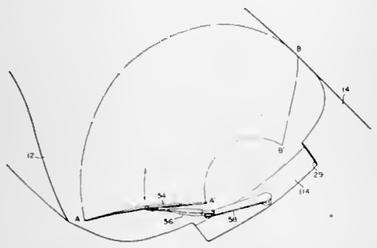
Osamu Kondo; Yasunori Hirosawa; Souichirou Okudaira, all of Aichi; Ikuo Souda, and Yukio Honda, both of Shizuoka, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 3, 1986, Ser. No. 903,327

Claims priority, application Japan, Oct. 18, 1985, 60-233056; Oct. 18, 1985, 60-233057; Oct. 18, 1985, 60-233058; Oct. 18, 1985, 60-233059; Oct. 18, 1985, 60-233060

Int. Cl.⁴ B60S *1/02, 1/26*

U.S. Cl. 15—250.21 **43 Claims**



1. A stretchable wiper apparatus for a vehicle, comprising:

(a) a first arm secured to a wiper arm pivoting shaft and pivoted within a predetermined angle about said shaft;

(b) a second arm secured at one end portion thereof to a wiper blade which is pressed against the surface of a window glass of the vehicle to wipe the window glass surface, the other end portion of said second arm being pivotally supported by said first arm;

(c) stretching means for expanding and contracting the overall length of said first and second arms, said stretching means having a stretching mechanism for bending and stretching said second arm relative to said first arm, and an arm stretching shaft means, and

(d) an actuator for activating said stretching mechanism including an arm stretching motor, said arm stretching shaft means and said arm stretching motor being connected through a worm wheel rigidly secured to the second end of said arm stretching shaft means and a worm which is rigidly secured to a rotating shaft of said arm stretching motor and meshed with said worm wheel,

whereby the overall length of said first and second arms reduced when the wiper is not used, so that an occupant of the vehicle is allowed to have an improved view of the outside from the inside of the vehicle.

4,780,927

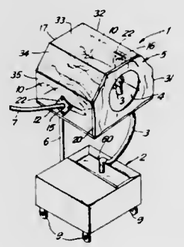
METHOD AND APPARATUS FOR REMOVING AND COLLECTING DUST

James E. Clayton, P.O. Box 589, 30 Southard Ave., Farmingdale, N.J. 07727

Continuation of Ser. No. 650,197, Sep. 13, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 894,386

Int. Cl.⁴ A47L *5/14, 9/14*

U.S. Cl. 15—345 **2 Claims**



1. A dust collection apparatus, comprising at least a first compartment, a second compartment and partition, having an aperture therethrough, that separates the two compartments so as to enable safe replacement or either a disposable bag or a pre-filter from said first compartment that is maintained at a negative pressure with respect to ambient during a replacement of either said disposable bag or said pre-filter, said apparatus comprising:

an elongated housing that comprises said first and second compartments, wherein said first compartment can be opened to ambient only through a removable cover substantially defining a first surface thereof;

a disposable bag filter within said first compartment;

a pre-filter within said first compartment;

a high efficiency particle air filter capable of capturing at least about 99.97% of all particulate having a size of greater than about 0.3 micron, within said housing; and

vacuum means within said second compartment;

wherein further, the disposable bag filter, the pre-filter, the high efficiency filter and said vacuum means are arranged in said housing so that said disposable bag filter is located in said first compartment upstream of said pre-filter, said high efficiency filter is located in a surrounding and sealing relation around the aperture through said partition and the pre-filter is mounted so as to be upstream of said high efficiency filter, wherein said pre-filter and high efficiency filter, that is in a surrounding and sealing relation to said aperture through the partition, are always upstream of said vacuum means, whereby the vacuum means located in said second compartment is both downstream of said first compartment and isolated therefrom by virtue of said high efficiency filter even when said first compartment is opened and said pre-filter is removed; wherein said first compartment is intended to be opened while said vacuum means are operating, thereby flushing said first compartment with air entering said first compartment by passing through said first surface to assist in the vacuum removal of any airborne dust particles proximate said first compartment into said second compartment and through at least said high efficiency filter while said first compartment cover is opened and either said disposable bag filter or pre-filter is being manipulated for replacement.

4,780,928

SPRING BIASED HINGE FOR SPECTACLE FRAMES

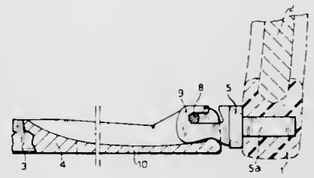
Mario De Lorenzo Poz, Candide, Italy, assignor to POZ S.n.c. di De Lorenzo Poz Mario ed Italo, Italy

Filed Sep. 30, 1986, Ser. No. 913,300

Claims priority, application Italy, Oct. 2, 1985, 53881/85[U]

Int. Cl.⁴ G02C *5/22*

U.S. Cl. 16—228 **7 Claims**



1. In a spectacle frame comprising a face-piece and two legs, a hinge for connecting the face-piece to a respective leg, wherein the hinge comprises:

a first hinge member connected to the leg and having two parallel spaced-apart plates between which a pin defining the hinge axis is mounted, and

a second hinge member joined to the face-piece of the frame and having a hook which receives the pin within its aperture,

and wherein:

the first hinge member also includes an elongate blade which is flexurally resiliently deformable, the blade extending between the two plates in a plane perpendicular thereto and having one end jointed to the first hinge member and its opposite end facing the pin of the hinge,

the hook of the second member has an outer surface which cooperates with the blade and includes a first cam portion for cooperating with the blade during folding of the leg against the face-piece so as to bias the leg into the folded position when the leg rotates about the hinge beyond the maximum point of curvature of the cam profile and to bias the pin into engagement with the hook to hold the pin and hook in assembled relation.

4,780,929

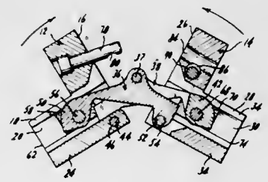
HINGE STRUCTURE

David B. Burns, Santa Barbara, and Joseph C. Mastroianni, Carpinteria, both of Calif., assignors to Gen-Fold Corporation, Santa Barbara, Calif.

Filed Apr. 15, 1987, Ser. No. 38,848

Int. Cl.⁴ E05D *11/10*

U.S. Cl. 16—349 **11 Claims**



11. A hinged structure comprising:

a lower member and an upper member, each said member having a surface face and a channel, said channels having a pair of guideways located at their distal ends, said channels and said guideways extending normal to said surface face for a distance substantially equal to the length of said members;

a first arm and a second arm, said first arm having a fixed end pivotally affixed to said lower member and a sliding end pivotally and slidably affixed to said upper member and said second arm having a fixed end pivotally affixed to said upper member and a sliding end pivotally and slidably affixed to said lower member, said first arm and said second arm pivotably affixed to one another at a location between said fixed ends and said sliding ends, said sliding ends of each of said arms pivotably and slidably affixed to their respective hinge member by a pin engaging an eccentrically fixed orifice of a pair of floating hinge slides fitted within said guideways of said channels of said upper and lower members.

4,780,930

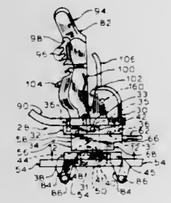
POULTRY CUTTER WITH A ROTATABLE ARBOR AND GUIDE MEANS

Leo Sparkia, South Bend, Ind., assignor to Fabricated Products, South Bend, Ind.

Filed Aug. 31, 1987, Ser. No. 90,902

Int. Cl.⁴ A22C *21/00*

U.S. Cl. 17—11 **7 Claims**



1. In a machine for cutting poultry into its various edible parts, said machine including a plurality of holder means each for supporting a dressed bird, a plurality of cutting means for selectively dismembering and cutting said bird into individual parts, said holder means connected to an endless conveyor means for transporting the holder means and said dressed birds to each cutting means, the improvement wherein each holder means includes an upright bird support member pivotally connected to said conveyor means for rotative movement of said support member and supported bird, each support member adapted to enter the eviscerated cavity of said bird, said support member being formed of two symmetrical parts which together define an outer peripheral configuration generally conforming with the inner shape of said cavity, said support member including protrusion means for engaging said bird, said support member being separated by a vertical slot means for accommodating a said cutting means as each holder means is transported to said last mentioned cutting means, each holder means including a table under said support member parts, said vertical slot means extending through said table.

4,780,931

FEEDING DEVICE FOR PATTY FORMING MACHINE

Richard G. Powers, Overland Park, and James E. Anderson, Shawnee Mission, both of Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Feb. 13, 1987, Ser. No. 14,597

Int. Cl.⁴ A22C *7/00*

U.S. Cl. 17—32 **13 Claims**

1. In a meat patty forming device having meat feeding mechanism, a patty-forming, and meat valve means operatively interposed between said mechanism and apparatus, said valve means including an elongated, slotted axially pivotal meat-conveying tube, the improvement which comprises structure for converting said patty-forming apparatus for use with a separate meat delivery assembly having a higher rated meat delivery

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capacity than said mechanism, said conversion structure comprising:

an elongated, stationary, apertured tube for use in said valve means in lieu of said pivotal tube, said apertured tube presenting an inlet end and being in constant communication with said patty-forming apparatus;

conduit means for operatively coupling said inlet end of said tube with said separate meat delivery assembly; and

accumulator means operatively connected with said elongated stationary apertured tube for accumulating meat fed



to said apertured tube, and for passing accumulated meat to the elongated stationary, apertured tube when meat is required to maintain the operation of the patty-forming apparatus,

said accumulator means being separate from said meat feeding mechanism and comprising structure defining an accumulator chamber, said accumulator chamber-defining structure being located in spaced relationship to and downstream from the inlet end of said elongated stationary apertured tube.

4,780,932

STUNNING OF ANIMALS

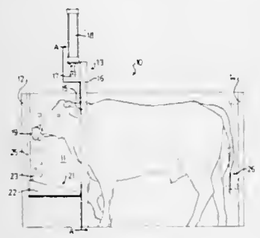
Derek W. Bowman, Hawera, and John C. Richardson, Auckland, both of New Zealand, assignors to T. H. Walker & Sons Limited, Hawera, New Zealand

Division of Ser. No. 934,454, Nov. 24, 1986, Pat. No. 4,748,719. This application Dec. 29, 1987, Ser. No. 139,256

Claims priority, application New Zealand, Nov. 25, 1985, 214348

Int. Cl.[4] A22B *3/00*

U.S. Cl. 17—45 **7 Claims**



1. A method for electrically stunning livestock such as beef cattle including the steps of:

(a) at least partially restraining the animal,

(b) applying an electric current across the head of the animal to stun it, and

(c) contacting the body of the animal with an electrode, and applying a heart-stopping current to kill the animal.

4,780,933

APPARATUS FOR REDUCING FIBER BALES OF SPINNING MATERIAL

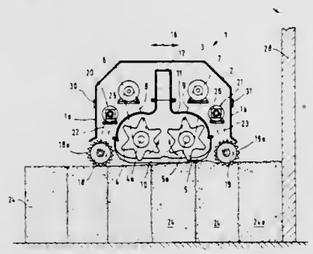
Akiva Pinto, Gastonia, N.C.; Gnenter Lucassen, Haltern, and Reinhard Schmidt, Gescher, both of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Filed Aug. 25, 1987, Ser. No. 89,115

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631902

Int. Cl.[4] D01G *7/06*

U.S. Cl. 19—80 R **12 Claims**



1. Apparatus for reducing pressed fiber bales of cotton, synthetic fibers and the like, by a reducing means reciprocating over the surface of the bales having a milling device carried within a housing, outer rollers carried by said housing adjacent opposing sides of said milling device said rollers having a toothed circumference to engage the bale surface, and means for carrying off removed material from said reducing means, wherein said apparatus comprises:

blocking means operatively connected to said outer rollers for preventing rotation of said outer rollers; and

said blocking means being operable to independently for stop rotation of said outer rollers.

4,780,934

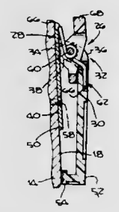
CLIP MECHANISM FOR PAGER

Michael W. Vickers, Lees' Summit, and David W. Stubbs, Kansas City, both of Mo., assignors to Maxcom Electronics, Inc., Kansas City, Mo.

Division of Ser. No. 933,118, Nov. 21, 1986. This application Nov. 2, 1987, Ser. No. 115,973

Int. Cl.[4] A44B *21/00*; **A45F** *5/00*

U.S. Cl. 24—3 J **3 Claims**



1. A clip mechanism for supporting a box-like personal paging device from a belt or pocket in a normally vertical position, and for permitting the device to be easily swung pivotally upward through about ninety degrees to a horizontal position such that the front face of the device may be viewed

in an upside-down relation by the person who is carrying the device, or else for permitting the device to be easily detached from the belt or pocket, said clip mechanism comprising, in combination:

a front plate having a central leg portion with an in-turned ear on each side of said leg portion, said ears being parallel and having aligned openings;

means for removably attaching said front plate to the rearward surface of the paging device so that its ears are near the upper extremity of the device;

a substantially rectangular back plate adapted to be vertically disposed, and having a pair of in-turned ears on its upper end, said ears being parallel and having aligned openings;

said two plates being normally disposed in generally parallel relation with said ears thereof being interengaged and all of said openings being aligned;

a hinge pin extending through all of said ear openings for supporting said two plates in pivotal relation to each other;

said back plate being adapted to be inserted downward along the back side of a belt or pocket and having on its lower end a forwardly extending flange for then retaining it in engagement with such belt or pocket;

a metal spring carried on said hinge pin and having projecting ends engaging respective ones of said plates for urging the lower ends of said plates together; and

an intermediate plate of a generally rectangular configuration, said intermediate plate being disposed between said ears of said front and back plates and having a transverse opening which receives said hinge pin for pivotally supporting said intermediate plate thereon;

said intermediate plate having an upper end which extends above both of said front and back plates and a lower end which extends a substantial distance below said hinge pin, so that when the paging device is swung pivotally upwardly its pivotal movement is limited by the upper end of said intermediate plate, and when said flange of said back plate is to be disengaged from a belt or pocket the upper end of said intermediate plate may be grasped and propelled toward the upper end of the paging device to thereby cause the lower end of said intermediate plate to open said back plate against the force of said spring.

4,780,935

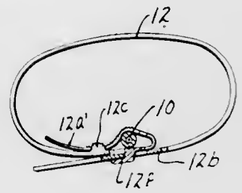
SECUREMENT STRAP

Leroy C. Palombit, 3608 Conlin Ave., Evansville, Ind. 47715

Filed Mar. 7, 1988, Ser. No. 165,005

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—16 PB **7 Claims**



1. A securement strap comprising a body in the form of an elongated flexible strip having a top surface and a bottom surface, one end of said strip being narrower than the remainder of said strip and including a roughened upper surface area, a bridge member extending downwardly from said bottom surface of said strip proximate said one end, said bridge member including a roughened inner surface area, said narrow end of said strip adapted to encircle a selected portion of a pre-bundled article in a retained relationship with said bridge member, a series of openings disposed along and through said strip, and a hooking member extending from said upper surface of said strip and adapted to be received in and secure one of said openings in an encircling and confining relationship with said article after bundling.

4,780,936

STAY-TIED SHOE LACES

Karen J. Brecher, 99 Creston Ave., Tenafly, N.J. 07670

Filed Mar. 10, 1987, Ser. No. 24,317

Int. Cl.[4] F16G *11/00*

U.S. Cl. 24—119 **14 Claims**



1. Footwear with a tongue and laces comprising:

(a) a shoe tongue having a front face and a rear face;

(b) a first flexible band member having first and second ends and first and second faces;

(c) a second flexible band member having first and second ends and first and second faces;

(d) securing means for securing the first end of said first flexible band member and the first end of said second flexible band member to the front face of said tongue in the vicinity of a knot tying together ends of a shoe lace;

(e) said first flexible band member having a first portion of an engaging means which extends over a region of the first face of said first band member from the second end thereof, said first face of said band member outwardly facing, from the front face of the shoe tongue and said second flexible band member having a second complementary portion of said engaging means for releasable engagement with said first portion which extends from the second end of the band member over a region of the second face thereof, which second face is facing the front face of the shoe tongue;

(f) said first and second band members being movable between an unfastened position and a fastened position;

(g) said first and second band members being adapted to extend about and cover a tied bow-knot of said laces to permit interengagement of said first and second portions of said engaging means in a fastened position.

4,780,937

FLUID-TIGHT SLIDE FASTENER

Masahiro Kusayama, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 46,431, May 6, 1987. This application Feb. 1, 1988, Ser. No. 150,506

Claims priority, application Japan, May 6, 1986, 61-68058[U]

Int. Cl.[4] A44B *19/32*

U.S. Cl. 24—389 **6 Claims**

1. A fluid-tight slide fastener comprising:

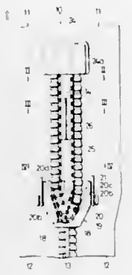
(a) a pair of stringers each having a water-proof support tape and a row of coupling elements mounted on and along a bent inner longitudinal edge of said support tape, said bent inner longitudinal edge having throughout the length thereof an intermediate portion folded around said row of coupling elements and a pair of upper and lower sealing abutments disposed on opposite sides of said intermediate folded portion;

(b) a slider slidably mounted on the two rows of coupling

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elements to take the latter into and out of coupling engagement with each other to close and open the slide fastener;

(c) a top end stop mounted on upper ends of said support tapes and having embedded therein a length of said folded edges, said upper sealing abutments on said support tapes being spaced from one another within said top end stop by a first distance which is substantially equal to the width of a diamond of said slider, said lower sealing abutments on said support tapes being spaced from one another within



said top end stop by a minimum second distance which is smaller than the width of said slider diamond; and

(d) a backing sheet attached to the underside of said upper ends of said support tapes and having a sealing projection extending longitudinally of said support tapes and projection extending longitudinally of said support tapes and projecting between said bent inner longitudinal edges, said sealing projection being spaced from said top end stop by a third distance which is slightly larger than the length of said slider diamond, said sealing projection having a width substantially equal to said distance.

4,780,938

SLIDE FASTENER SLIDER WITH DETACHABLE PULL TAB

Susumu Ishii, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,709

Claims priority, application Japan, Dec. 19, 1986, 61-195522[U]

Int. Cl.[4] A44B *19/26*

U.S. Cl. 24—429 **12 Claims**



1. A slider for a slide fastener having a pair of opposed rows of coupling elements, comprising:

(a) a slider body including upper and lower wings joined at their front ends by a neck so as to define therebetween a generally Y-shaped guide channel for the passage of the opposed coupling element rows;

(b) an arch-shaped lug projecting from the front end of said upper wing over a top surface of said upper wing and terminating in a rear free end directed toward said top surface and spaced therefrom by a first gap, said lug having on its underside an intermediate partition all directed toward said top surface of said upper wing and spaced therefrom by a second gap at least equal to said first gap, said lug further having first and second recesses defined respectively between said rear free end and said partition wall and between said partition wall and a front fixed end of said lug;

(c) a pull tab threaded onto said arch-shaped lug for pivotal movement relative to said slider body and having a spindle;

(d) a closure member slidably mounted in said upper wing and having a pair of spaced first and second closure portions, said closure member being movable longitudinally of said slider body between an open position in which said first and second closure portions are spaced respectively from said rear free end and said partition wall of said lug so as to allow said spindle of said pull tab to pass through said first and second gaps, and a closed position in which said first and second closure portions are disposed adjacent to said rear free end and said partition wall of said lug to prevent said spindle of said pull tab from passing through said first and second gaps; and

(e) a spring mounted in said upper wing to normally urge said closure member toward said closed position.

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FASTENER FOR BANDS OR THE LIKE

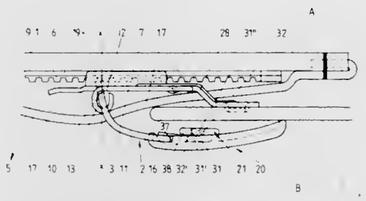
Lothar Belter; Gustav Christians, and Erich Klingenburg, all of Wuppertal, Fed. Rep. of Germany, assignors to Schaeffer Verbindungstechnik GmbH, Wuppertal, Fed. Rep. of Germany

Filed Aug. 5, 1987, Ser. No. 82,826

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1986, 3628771

Int. Cl.[4] A44B *11/00, 19/00*

U.S. Cl. 24—585 **7 Claims**



1. A fastener for a band or the like, particularly a waistband on trousers, skirts, pockets and the like, comprising

a rail provided with detents in the form of depressions, the rail being fastened to one end of the band;

a slide which travels on said rail, the slide being fastened to the other end of the band;

an angle-shaped flip lever having a shorter angle leg which, in a flipped position of the flip lever, engages into the detent depressions of the rail, the flip lever being carried by said slide, the flip lever having a window for the free passage of a cover strip lying on the outside in front of the rail, the flip lever including a longer angle leg with extends outward of the fastener in operating position;

a covering disposed on said longer leg;

a snap-detent connection for securing said covering to said longer leg, the snap-detent connection being formed by providing the covering with an opening into which a tongue of the longer leg extends; and wherein

said opening is developed as an insertion pocket, open towards the window, for receipt of the tongue, the wide surface of which enters into a detent connection with a wall of the pocket.

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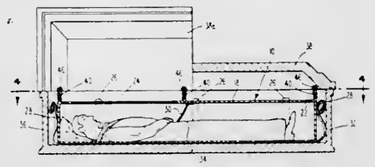
VIEWING POUCH PARTICULARLY FOR BODIES DEAD OF A COMMUNICABLE DISEASE

William G. Jay, 149 Circuit Ave., Waterbury, Conn. 06708

Filed Jul. 13, 1987, Ser. No. 72,676

Int. Cl.[4] A61G *17/06*

U.S. Cl. 27—28 **11 Claims**



1. A collapsible viewing pouch comprising an assembly of readily flexible sheet material defined by a bottom panel, side panels and top panel and adapted to fit into a box-shaped burial casket having a base and walls extending upward from the base, the top panel of the assembly having a zipper fastener extending around three sides, so that when the zipper is unzipped the part of the top panel defined by the zipper can be flapped open, said part being of flexible transparent sheet material at least in the area which would be over and align with head and upper torso of a deceased person within the pouch, the top panel having secured across it spaced parallel tubes of flexible sheet material, and a pair of removable rigid elongated elements disposed in the tubes respectively and adapted to have their ends extend beyond the tubes and rest on the tops of the adjacent walls of the casket respectively, whereby the top panel may be suspended from the elements in planar condition to make the pouch appear as a rigid, box-like structure.

4,780,941

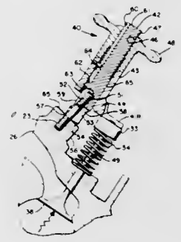
QUICK MOUNT HAND VALVE SPRING COMPRESSOR

Thomas L. Tucker, Rte. 1, Box 285, McKinney, Tex. 75069

Filed Jun. 3, 1987, Ser. No. 57,110

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—217 **7 Claims**



1. A quick mount manual engine valve spring compressor comprising: a mounting stud thread lock position engaging tool element with a rocker arm mounting stud threaded top receiving bottom opening having an internal thread section moveable into and out of engagement with threads on the top of said rocker arm mounting stud, an externally threaded top and a support base; sleeve means having a center opening slideable along said tool element and having a valve spring assembly top engaging side extension; key means rotationally keying said sleeve means and said tool element together through a range of sliding movement of said sleeve means on said tool element; manual handle means internally threaded to fit the top of said tool element turnable downward on said externally threaded top on the tool element; and bottom means on said manual handle means engageable with the top of said sleeve means to press the sleeve means downward to compress a valve spring for valve retainer lock removal; wherein said valve spring assembly top engaging side extension includes two arms as a bifurcated extension of said extension; said two arms are spaced to avoid contact with valve spring retainer lock structure while engaging the top of a valve spring assembly; said side extension is a side extension from the bottom of said sleeve means; said key means includes a groove keyway and pin interconnection between said sleeve means and said tool element; said groove keyway is a vertically extended groove extended from the top of said tool element through to below said externally threaded top of said tool element; and said pin is mounted in said sleeve means to extend into center opening in said sleeve means; said pin is mounted in said sleeve means body above the level of said side extension; said pin is mounted in the back side of said sleeve means body from said side extension; said internal thread section is a partial thread section with partial thread grooves cut through no more than half a circle to facilitate the partial thread grooves in said partial thread section being moved into and out of thread lock position engagement with threads of a rocker arm mounting stud threaded top.

4,780,942

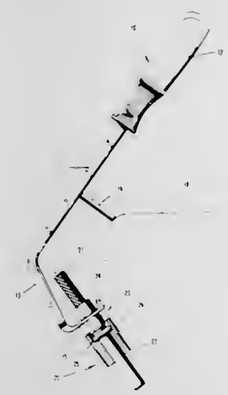
FUEL INJECTOR PULLER

Helmut R. Bernat, 7122 Sanford Ct., Annandale, Va. 22003

Filed Feb. 12, 1987, Ser. No. 14,231

Int. Cl.[4] B66F *15/00*

U.S. Cl. 29—219 **6 Claims**



1. A hand tool for pulling a part outwardly from a seated location, said tool comprising:

(a) an elongated shaft portion including a handle at one end thereof, a gripping section at the other end thereof and push support means at an intermediate location between the handle and the gripping section,

(b) the handle having the size and shape to facilitate the hand gripping thereof,

(c) the gripping section including a reaching portion extending outwardly from the end of the shaft portion and a part-engaging portion extending away from a distal end of the reaching portion,

(d) the push support means extending outwardly from the shaft portion to provide a fulcrum pivot point between the handle and the gripping section,

(e) the part-engaging portion is disposed at a grasping angle in the range of about 75° to about 85° with respect to the reaching portion and shaped to grasp the part to be pulled

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outwardly from the seated location when a force is applied to the handle in a direction to cause relative movement of the part-engaging portion with respect to the fulcrum,

(f) the reaching portion is disposed at a reaching angle with respect to the shaft portion,

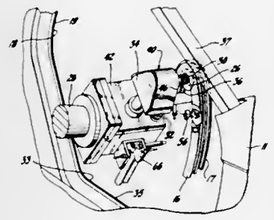
(g) the reaching angle is in the range of about 115° to about 120°.

4,780,943

APPARATUS AND METHOD OF A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

Stephen St. Angelo, Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 888,238, Jul. 18, 1986, Pat. No. 4,715,110, and a continuation-in-part of Ser. No. 944,649, Dec. 22, 1986.
This application Oct. 15, 1987, Ser. No. 91,198
Int. Cl.⁴ B23P *19/02*
U.S. Cl. 29—235 **4 Claims**



1. An EOAT for a robot used for installing a loop of weather stripping, stored in a loading station, into a body opening, said EOAT in combination comprising:

a frame;

a selectively operable gripper mounted to said frame to grab said loop from said loading station to load said robot;

a guide roller rotatably mounted to said frame having a first-position engaged with said loop to align said weather stripping and said guide roller having a second position out of engagement with said loop;

an idler roller mounted on said frame for supporting said loop generally opposite said guide roller in said first position of said guide roller; and

a powered pressure roller rotatively mounted on said frame having variable rotational velocity for receiving said loop from said guide roller and guiding said loop and tracing the opening of said body whereby said loop is affixed to the opening of said body.

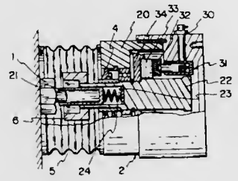
4,780,944

METHOD AND TOOL FOR THE FREEING OF PARTS HELD FAST TOGETHER

Juhani Niinivaara, Koria, and Hannu Makelainen, Rovaniemi, both of Finland, assignors to Oy Gas General Sea Safety Ltd., Helsinki, Finland

PCT No. PCT/FI85/00077, § 371 Date Jun. 30, 1986, § 102(e) Date Jun. 30, 1986, PCT Pub. No. WO86/01765, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 18, 1985, Ser. No. 865,729
Claims priority, application Finland, Sep. 18, 1984, 843634
Int. Cl.⁴ B23P *19/00, 19/02*
U.S. Cl. 29—426.3 **8 Claims**

1. A method for the freeing of fast-held parts, such as between the threaded shanks of bolts and nuts, or similar objects, with the aid of a tool comprising pressing an electrical conducting cup-like hollow endpiece of a tool against and around the part that is held fast, inducing an arc between the fast-held part and the endpiece to create thermal energy to heat and/or thermally cut the fast-held part, rotating the endpiece so that the arc is continuous and peripheral to the threaded shank of



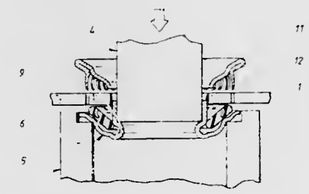
the fast-held part, removing molten material formed between the endpiece and the fast-held part by said rotational movement.

4,780,945

METHOD AND AN IMPLEMENT ARRANGEMENT FOR THE REMOVAL OF FASTENERS IN THE FORM OF RINGS

Göran Rutgersson, Ekebacken, S-440 30 Marstrand, Sweden

PCT No. PCT/SE85/00437, § 371 Date Jul. 2, 1987, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO87/02926, PCT Pub. Date May 21, 1987
PCT Filed Nov. 6, 1985, Ser. No. 74,540
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—426.5 **1 Claim**



1. A method for removal of rings from a flexible material such as canvas, a ring, which is attached to the material and to be removed from the same, including two annular flanges, each with an outer and an inner edge, and between portions adjacent to the inner edge of each flange a tubular portion, the tubular portion extending through a hole in the material and the flanges being pressed against opposite surfaces of the material, thereby anchoring the ring to the material; the method including

placing the ring, attached to the material and intended to be removed, on an annular support having a supporting surface extending around a hole and adapted to support one flange of the ring along a narrow portion at the outer edge of said one flange, the portion and inwardly being defined by an inner edge of the supporting surface;

positioning an end surface of a mandrel against the other flange, the end surface of the mandrel being placed in contact with a narrow portion along the inner edge of said other flange, the portion outwardly being defined by an outer edge of the mandrel, which outer edge of the mandrel, along its periphery, is at a distance from said inner edge of the supporting surface;

moving the mandrel towards the support and into the hole of the support;

performing the movement until an inner portion of the ring at its tubular portion is pressed down into the hole of the support and the flanges having become deformed to the shape of a frustrum of a cone; and

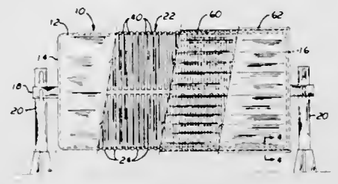
pulling the material away with its portion adjacent to its hole out from its position between the deformed flanges.

4,780,946

METHOD OF MAKING DOUBLE WALL STORAGE TANK WITH BEADED SPACER MEANS

David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Continuation-in-part of Ser. No. 43,634, Apr. 28, 1987, Pat. No. 4,744,137, which is a division of Ser. No. 884,481, Jul. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,140, Sep. 12, 1985, Pat. No. 4,640,439, which is a continuation-in-part of Ser. No. 818,258, Jan. 13, 1986, Pat. No. 4,644,627. This application Oct. 7, 1987, Ser. No. 105,881
Int. Cl.⁴ B23P *9/00*
U.S. Cl. 29—455.1 **10 Claims**



1. A method of manufacturing from a rigid single wall inner tank for storage of liquids, a double wall tank, said method comprising the steps of:

applying to at least a portion of the exterior surface of said rigid inner tank a plurality of spaced apart, generally parallel beads of a hardenable, viscous liquid synthetic resin spacer material to form, between adjacent said beads, channel means that provide for substantially free passage of liquids through said channel means;

stretching a substantially imperforate film over said synthetic resin beads and over said channel means to separate said inner tank and said spacer material from subsequently applied sheath material; and

applying over said film overlying said beads a substantially rigid outer sheath of a material that is substantially liquid-tight, said sheath being spaced from at least a portion of said inner tank exterior surface by said film and said beads, whereby is provided a rigid double wall tank.

4,780,947

METHOD OF MAKING DOUBLE WALL STORAGE TANK WITH CHANNELED SPACER MEANS

David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Continuation-in-part of Ser. No. 43,634, Apr. 28, 1987, Pat. No. 4,744,137, which is a division of Ser. No. 884,481, Jul. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 775,140, Sep. 12, 1985, Pat. No. 4,640,439, which is a continuation-in-part of Ser. No. 818,258, Jan. 13, 1986, Pat. No. 4,674,627. This application Oct. 7, 1987, Ser. No. 105,890
Int. Cl.⁴ B23P *9/00*
U.S. Cl. 29—455.1 **22 Claims**

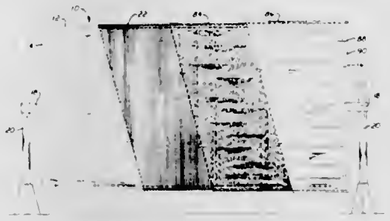
1. A method of manufacturing from a rigid single wall inner tank for storage of liquids, a double wall tank, said method comprising the steps of:

applying to at least a portion of the exterior surface of said rigid inner tank a hardenable synthetic resin spacer material

forming in said spacer material channel means that provides for substantially free passage of liquids through said channel means;

stretching a substantially imperforate film over said synthetic resin spacer material and over said channel means to separate said inner tank and said spacer material from subsequently applied sheath material; and

applying over said film overlying said spacer material a substantially rigid outer sheath of a material that is substantially liquid-tight, said sheath being spaced from at least a portion of said inner tank exterior surface by said



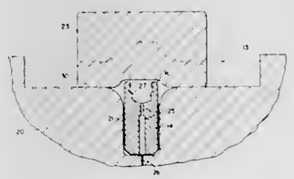
film and said spacer material, whereby is provided a rigid double wall tank.

4,780,948

FORGED DISSIMILAR METAL ASSEMBLY AND METHOD

John H. Ferguson, Sauquoit, and Dana P. Perkins, deceased, late of New Hartford, both of N.Y. (by Marjorie F. Perkins, executrix), assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 498,347, May 26, 1983, Pat. No. 4,608,742. This application Nov. 25, 1985, Ser. No. 801,187
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.⁴ B23P *25/00*
U.S. Cl. 29—458 **16 Claims**



1. Method of producing a component having a rigid joint between two dissimilar metals in a forging operation, comprising the steps of:

(a) providing a first metal part in a predetermined shape;

(b) determining an interface between the first part and a second metal part;

(c) machining the first part into a final form at the interface;

(d) plating the first part at the interface with a plating material having a property of inhibiting dissimilar metal corrosion;

(e) coating a billet, of the metal from which the second metal part is to be formed, with boron nitride where the billet is to contact the interface in the forging operation;

(f) heating the boron nitride coated billet in a nonoxidizing atmosphere at a temperature sufficient for the boron nitride to change from a white state to a black state, thereby heating the boron nitride and changing the boron nitride from a white state to a black state, prior to the forging operation;

(g) establishing the first part at a temperature below that required for plastic deformation during the forging operation;

(h) heating the billet to a forging temperature;

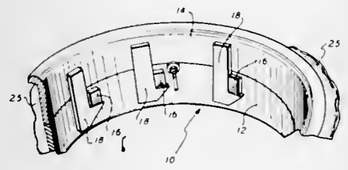
(i) placing the first part into a pre-determined position in a forging die;

(j) placing the billet into a second pre-determined position in the forging die;

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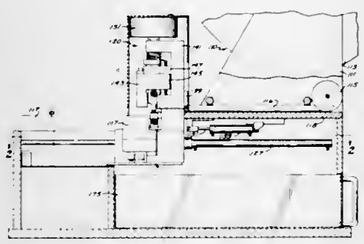
(k) applying forging pressure against the billet, thereby forming the billet into the second part, and thereby joining the second part to the first part at the interface; and
(l) machining the joined parts to produce said component.

4,780,949
TIRE RETREADING EQUIPMENT
Thad A. Perdue, and Bobby G. Johnson, both of Muscle Shoals, Ala., assignors to Robbins Tire & Rubber Co., Inc., Tuscumbia, Ala.
Filed Dec. 17, 1986, Ser. No. 942,878
Int. Cl.[4] B23P *19/00;* **B29C** *35/00*
U.S. Cl. 29—525.1 **3 Claims**



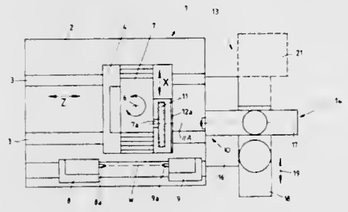
3. A method for securing a retreading tube to a retreading rim section, said tube having a radially-inwardly-extending threaded valve stem and a body with an integral radially-inwardly extending extension surrounding said stem at its base and said rim section having a slot for reception of said stem, which comprises inserting said stem in said slot, and tightening a nut on said stem against a washer whereby to draw said extension firmly into said slot and securely anchor said retreading tube to said retreading rim said sections being axially abutting and each sharing locking means engagable with a corresponding locking means on the other of said sections by rotation of said sections while said sections are substantially in mutual contact, said method including assembling said sections about said stem and a relatively rotating said sections while in mutual contact to lock said locking means.

4,780,950
AXIAL LEAD ELECTRICAL COMPONENT FEEDER
Gregory W. Holcomb, 13 Viento, Irvine, Calif. 92714
Filed Aug. 24, 1987, Ser. No. 88,828
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—566.3 **6 Claims**



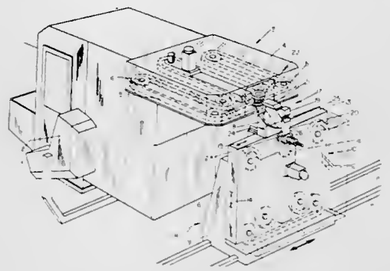
1. A component lead cutting and forming apparatus for axial lead electronic components respectively having first and second leads secured to tape, comprising:
means for supporting the first and second leads of an axial lead component being processed, said supporting means being translatable between first and second positions;
translatable means for (a) providing strain relief clamping of the leads of the component being processed against said supporting means, (b) cutting the leads of the component being processed, and (c) cooperating with said supporting means to bend the leads of the component being processed, when said supporting means is in said first position; and
means for translating said supporting means between a first position and a second position, wherein at said second position the axial lead component having cut and formed leads is presented for robotic pick-up.

4,780,951
APPARATUS FOR CHANGING TOOLS IN GRINDING MACHINES AND THE LIKE
Rudolf Beyer, Esslingen; Lutz-Peter Heerdt, Altbach, and Roland Schemel, Schorndorf, all of Fed. Rep. of Germany, assignors to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jun. 27, 1986, Ser. No. 879,267
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523376
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 24—568 **26 Claims**



1. In a grinding machine which operates with rotary tools, particularly in a circular grinding machine which operates with large grinding wheels, the combination of a tool support arranged to carry at least one rotary tool so that the axis of rotation of such tool is at least substantially horizontal; means for moving said support along a predetermined path toward and away from a tool changing station; a depository for tools disposed at said station and having a carrier means for carrying tools in such orientation that the axes of the tools are at least substantially vertical, said support being movable relative to and independently of said depository; and transfer means for transferring tools between said support and said carrier means at said station, including means for changing the orientation of the axes of tools from substantially horizontal to substantially vertical during transfer from said support to said carrier means and from substantially vertical to substantially horizontal during transfer from said carrier means to said support, said orientation changing means comprising a head mounted for angular movement about a predetermined axis and said transfer means further comprising two arms which are mounted on said head and are disposed substantially at right angles to each other, and discrete tool clamping means provided on each of said arms, each of said clamping means defining a discrete axis coinciding with the axis of the tool which is held by the respective clamping means, said predetermined axis being disposed at an angle of substantially 45° to the vertical and to each of said discrete axes.

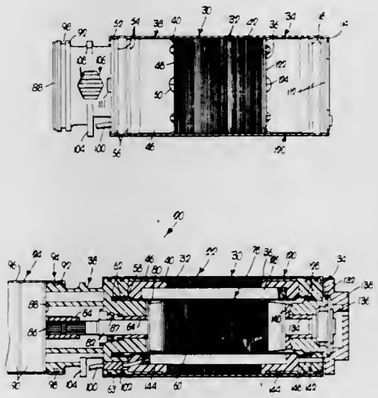
4,780,952
TOOL CARRIAGE FOR LOADING MACHINE TOOLS
Werner Babel, Achweg, and Walter Schwarz, Auf der Herze, both of Fed. Rep. of Germany, assignors to MAHO Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 2, 1987, Ser. No. 20,453
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607391
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**



1. A tool carriage for loading the tool magazines of numerically controlled machine tools, said tool carriage comprising:
a traveling mechanism having a supporting structure mounted to an undercarriage, said traveling mechanism being arranged with respect to the machine tools to travel to and have predetermined tool changing positions in close proximity thereto;
a slide member mounted to said supporting structure for two-dimensional movement with respect thereto;
a tool supply magazine mounted to said slide member, said tool supply magazine being adapted to removably receive a plurality of machine tools in a plurality of separate openings, said openings being movable in concert with respect to said slide members; and
a tool changing assembly comprising:
a saddle slidably mounted to said slide member for reciprocating movement with respect thereto in a direction transverse to the dimensions of movement of said slide member;
an angle carrier rotatably mounted to said saddle;
at least one gripping arm on said angle carrier, said gripping arm having a proximal end secured to said angle carrier and a distal end extending therefrom; and
a gripping member on said distal end of said gripping arm; said gripping member being adapted to grasp a tool in either said tool supply magazine or said tool magazine and, pursuant to the reciprocal movement of said saddle and rotational movement of said angle carrier, the tool is removed from one of said magazine is transported to the other said magazine.

4,780,953
METHOD OF ASSEMBLING A SUBMERSIBLE ELECTRIC MOTOR
Charles F. Wheeler, Olathe, and Darryl M. Nielsen, Lenexa, both of Kans., assignors to The Marley-Wylain Company, Mission Woods, Kans.
Continuation of Ser. No. 778,129, Sep. 19, 1985, abandoned. This application Apr. 29, 1987, Ser. No. 49,020
Int. Cl.[4] H02K *15/14*
U.S. Cl. 29—596 **11 Claims**

1. A method of assembling an electric motor comprising the steps of:
providing a generally cylindrical, tubular shell having an inner diameter of a certain value;
placing a base and an end member adjacent opposite end portions of a lamination stack in substantial axial alignment therewith,
each of said base, said end member and said lamination stack presenting a generally cylindrical surface of a diameter larger than said certain value before assembly of said motor;
applying sufficient axial pressure to said base, said lamination stack and said end member to forcibly insert under pressure said base, said stack and said end member in said shell,



said axial pressure being sufficient to overcome the interference fit relationship presented between said tubular shell and said base, said stack and said end member; and
roll-forming end portions of said shell to grippingly engage shoulder portions of said base and said end member to thereafter retain said base, said stack and said end member in assembled relationship.

4,780,954
FUEL CELL ELECTROLYTE MATRIX AND A METHOD FOR MANUFACTURING THE SAME
Hiroshi Kato, Wake, Japan, assignor to Japan Gore-Tex, Inc., Tokyo, Japan
Filed Aug. 19, 1987, Ser. No. 86,828
Claims priority, application Japan, Aug. 19, 1986, 61-192118
Int. Cl.[4] H07M *6/00, 4/86*
U.S. Cl. 29—623.5 **3 Claims**

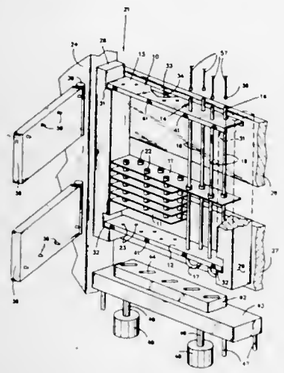
1. A method for manufacturing a fuel cell electrolyte matrix which comprises (a) mixing 6 to 60 parts by weight of polytetrafluoroethylene powder with 40 to 94 parts by weight of a mixed powder comprising (i) 10 to 70 weight percent inorganic powder capable of forming a metal phosphate and (ii) 30 to 90 weight percent phosphoric-acid-resistant inorganic powder to produce a mixture, (b) forming said mixture into a porous sheet, (c) impregnating the porous structure of said sheet with phosphoric acid, and (d) heating the sheet so that the aforementioned inorganic powder capable of forming a metal phosphate is converted in situ into a metal phosphate.

4,780,955
APPARATUS FOR MAKING A TUBE AND FIN HEAT EXCHANGER
Steven L. Stroup, Bluffton, Ind., assignor to Crown Unlimited Machine, Inc., Bluffton, Ind.
Filed May 20, 1987, Ser. No. 52,689
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—727 **11 Claims**

1. A tube expander for producing heat exchangers having first and second end sheets with fins therebetween and tubes

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extending through said end sheets and fins expanded into tight engagement therewith, comprising a frame, support means on said frame operable to support a loosely assembled heat exchanger unit having tubes extending loosely through said end sheets and fins, expander rods on said frame, and power means operable to move said heat exchanger unit and expander rods relative to each other and cause said expander rods to enter one end of said tubes and progressively expand said tubes into tight



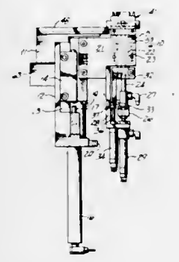
engagement with said sheets and fins, expansion of said tubes causing said tubes to progressively shorten, said support means operating to maintain a fixed distance between said end sheets as said expander rods progressively expand and shorten said tubes, said support means also operating to produce relative longitudinal movement between the other ends of said tubes and the adjacent end sheet so that the spacing between said end sheets remains fixed as said tubes are shortened.

4,780,956

FLOATING CROWN FOR INSERTION-EXTRACTION HEAD

Rune S. Pearson, Torrance, and Paul T. Duval, Lomita, both of Calif., assignors to Reliability Incorporated, Houston, Tex.

Filed May 5, 1987, Ser. No. 46,842
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—740 **21 Claims**



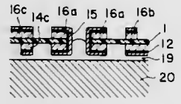
1. A head assembly comprising:
a main body having a generally vertical primary bore;
a floating crown positioned at the upper end of the main body having an upper surface including means for receiving an item, said crown having a generally vertical bore coaxial with the primary bore of the main body;
means for securing the crown to the main body whereby the crown is afforded lateral and rotational movement relative to the main body but wherein angular movement relative to the main body is substantially prevented, said securing means comprising a plurality of generally vertical mounting wires fixedly attached at their lower ends to the main body and fixedly attached at their upper ends to the crown.

4,780,957

METHOD FOR PRODUCING RIGID-TYPE MULTILAYER PRINTED WIRING BOARD

Shoji Shiga, Utsunomiya; Shinichi Konishi, Hiratsuka; Hideo Suda, Imaichi, and Yoshiaki Ogiwara, Nikko, all of Japan, assignors to Furukawa Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,703
Claims priority, application Japan, Mar. 19, 1987, 62-65124
Int. Cl.[4] H05K *3/36*
U.S. Cl. 29—830 **15 Claims**



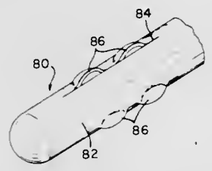
1. A method for producing a rigid-type multilayer printed wiring board of the type in which a multilayer printed wiring sheet substantially comprising a thin insulating resin layer, metal foil printed wiring layer and a plurality of conductive holes formed through the two layers is bonded onto a metal board through an insulation laminate, said method comprising the steps of:
preparing a multilayer printed wiring interlayer sheet comprising said multilayer printed wiring sheet in which a printed wiring pattern unprocessed metal foil is left on one surface thereof, the other surface being already subjected to a given printed wiring forming process;
bonding the other surface of said interlayer sheet to a surface of a metal board through an insulation laminate; and
forming a desired printed wiring pattern on said printed wiring pattern unprocessed metal foil on said one surface.

4,780,958

METHOD OF MAKING AN ELECTRICAL TERMINAL FOR A PRINTED CIRCUIT BOARD

Howard R. Shaffer, Millersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 915,931, Oct. 6, 1986, Pat. No. 4,735,575.
This application Feb. 4, 1988, Ser. No. 152,290
Int. Cl.[4] H01R *43/16*
U.S. Cl. 29—874 **2 Claims**



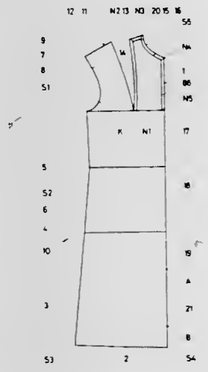
1. A method of making a contact terminal suitable for insertion into a socket means of a printed circuit board and mechanically self-retaining therein in electrical engagement therewith, comprising the steps of:
selecting a sheet of metal of uniform thickness;
stamping a terminal blank therein having end portions;
piercing a selected portion of said blank intermediate said blank end portions at a plurality of locations to form substantially parallel and generally axial slits therealong between respective pairs of slit end points spaced from ends of said selected blank portion;
deforming a selected side of each said slit to form projections outward from the plane of the blank at said slit which taper into the plane of said blank at points spaced laterally from said slit and from an adjacent said slit, such that the metal portion on said selected side has an effective axial length greater than the metal portion on the other side of said slit, and such that axially extending portions of said selected blank portion between adjacent ones of said slits are undeformed;
forming at least said selected portion into a tubular shape such that said projections extend outwardly from said tubular shape and generally tangentially to free ends of said projections on said selected sides of said slits, said projection free ends comprising spring members and being deflectable radially inwardly by a socket means of a printed circuit board upon insertion thereinto; and
forming at least one blank end portion into a contact section.

4,780,960

PATTERN, PROCESS AND APPARATUS FOR OBTAINING A CUTTING TEMPLATE

Wolf Merz, Industriestrasse 32, CH-9430 St. Margrethen, Switzerland

Continuation of Ser. No. 766,702, Aug. 19, 1988, abandoned.
This application Jan. 5, 1988, Ser. No. 143,269
Claims priority, application European Pat. Off., Sep. 18, 1984, 84810456.8
Int. Cl.[4] A41H *3/00*
U.S. Cl. 33—17 R **4 Claims**



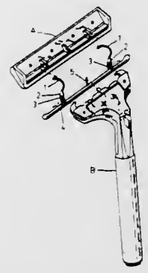
1. A process for storing, sensing and selecting a template for use in the production of a garment, comprising the steps of:
(a) providing each of a plurality of cutting templates with a reference line defined by first and second points and with a third reference point, the reference line and reference points being located in a constant relationship to one another and to the cutting template;
(b) storing the templates according to the position of said reference line and reference points;
(c) determining a selection criterion with respect to the position of the reference line and reference points of a template for use in the production of a particular garment; and
(d) sensing the stored cutting templates, to select from among the plurality of templates the one template which most closely satisfies the selection criterion.

4,780,959

RAZOR ADAPTOR

Laslo B. Sinka, 27 Santa Barbara Rd., Willowdale, ON. M2N 2C1, Canada

Filed Jan. 27, 1987, Ser. No. 7,140
Int. Cl.[4] B26B *21/14*
U.S. Cl. 30—83 **7 Claims**



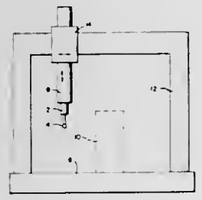
1. An adaptor for use with a shaving razor comprising a pair of mutually parallel springy arm means adapted to engage with a razor cartridge, said razor cartridge having mounting channel formed at the under-side therein, said arm means having a center portion being a continuation of said arm means provided with a plurality of openings for coupling with a razor handle, a bar means attached to the lower ends of said center portion and extending perpendicular to said center portion and said bar means extending outwards in a spaced manner below said razor cartridge when said razor cartridge and said handle are mounted to the adaptor, a leg means attached to said bar means at the center point between and parallel to said center portion and operative for actuating a latching device provided on said handle and to maintain the adaptor within a predetermined position relative to said handle.

4,780,961

PROBE ASSEMBLY AND CIRCUIT FOR MEASURING MACHINE

Russell S. Shelton, 9 Park Ave., and Michael J. Schaffer, 7 Main St., both of Flanders, N.J. 07836

Filed Nov. 10, 1986, Ser. No. 928,353
Int. Cl.[4] G01B *7/02*
U.S. Cl. 33—503 **40 Claims**



1. A probe assembly for connecting a stylus to the head of a

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coordinate measuring machine and for sensing a position where the stylus touches a workpiece, said probe assembly comprising,

a housing,

means for connecting the housing to the head of a coordinate measuring machine,

a carrier which is supported on said housing,

means for connecting a workpiece-contacting stylus to the carrier,

positioning means for retaining the carrier at a precise normal rest position relative to the housing, said carrier being movable from said rest position when it is subjected to external forces,

means for detecting contact between the stylus and a workpiece, said detecting means including a piezoelectric crystal means which is mounted on said carrier, said crystal means being operable to produce a signal when the carrier receives an impact from the stylus and before the carrier moves from said rest position,

electronic circuit means for receiving said signal and providing an output signal which is greater than and substantially simultaneous with said signal from the crystal means, said electronic circuit means including an absolute value circuit.

4,780,962

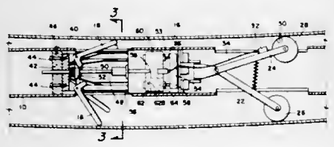
PIPELINE BEND VERIFICATION PIG

Dennis R. Smith, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Dec. 5, 1983, Ser. No. 558,105

Int. Cl.⁴ G01B *5/28*

U.S. Cl. 33—523 **9 Claims**



1. A bend verification pig for indicating curvature in a pipeline having a fluid medium flowing therethrough, comprising:

an elongated rigid housing of size to traverse within a pipeline and defining a longitudinal axis;

support members fixedly secured at spaced locations on said housing, each support member being of diameter so as to support said housing at each of the spaced locations centrally within the interior of a pipeline;

sensing means supported at an intermediate portion of said housing between and spaced from said support members and configured to follow the pipe wall and to indicate the relative position of said intermediate portion and the pipe wall; and

means affixed to said housing and responsive to the flow of fluid medium to cause the propulsion of said housing through a pipeline.

4,780,963

PROBE FOR SENSING CONTACT VIA ACCELERATION

David R. McMurtry, Wotton-Under-Edge, Great Britain, assignor to Renishaw plc, Great Britain

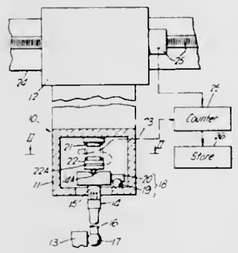
Continuation of Ser. No. 897,767, Jul. 28, 1986. This application Apr. 12, 1987, Ser. No. 84,142

Claims priority, application World Int. Prop. O., Dec. 17, 1984, PCT/GB85/00586

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.⁴ G01B *7/28*

U.S. Cl. 33—558 **8 Claims**



1. A contact-sensing probe for use in apparatus for measuring the dimensions of a workpiece, comprising:

a fixed part adapted to be mounted in the apparatus;

a first movable part, including a stylus for engaging said workpiece during a measuring operation;

support means for supporting the first movable part in a rest position on the fixed part;

bias means for urging the first movable part into said rest position, the first movable part being displaceable from the rest position by a displacing force in opposition to the bias means, the bias means acting to return the first movable part to the rest position upon cessation of the displacing force;

a second movable part movable with respect to the first movable part, the second movable part bearing against the first movable part so as to allow transmission from the first movable part to the second movable part of a pressure wave caused by engagement of the stylus with said workpiece during a measuring operation; and

sensing means on the second movable part for sensing said engagement, said sensing means being sensitive to said pressure wave.

4,780,964

PROCESS AND DEVICE FOR DETERMINING THE END OF A PRIMARY STAGE OF FREEZE DRYING

Taylor N. Thompson, Sr., Kingston, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,277

Int. Cl.⁴ F26B *5/06*

U.S. Cl. 34—5 **10 Claims**

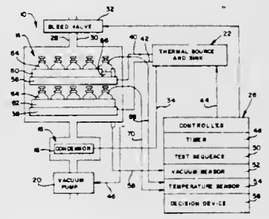
1. A method for determining the end of a primary stage of a freeze drying process that dries a product in a tray drying device, said freeze-drying process effecting said primary stage of drying by sublimation and effecting said secondary stage of drying by desorption, said method comprising:

A. effecting said primary stage by subjecting said product to a desired heat of sublimation and a pressure at a substantially constant first value so that said product remains at a substantially constant first temperature to effect said sublimation;

B. substantially reducing said pressure from said first value while maintaining constant the rate of application of said heat of sublimation;

C. measuring the temperature of said product during said reduction in said pressure from said first value:

D. increasing said pressure to said first value and repeating steps A through C upon the temperature of said product



falling below said first temperature during said reduction in said pressure; and

E. ending said primary stage and entering said secondary stage upon the temperature of said product remaining constant during said reduction in said pressure.

4,780,965

METHOD FOR THE THERMAL CLEANING OF EXHAUST GASES OF A HEAT TREATMENT APPARATUS

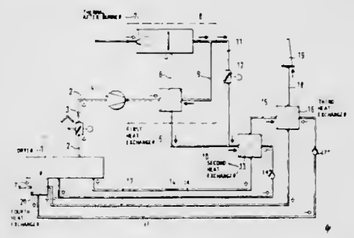
Karl Grafen, Wuerselen; Gerhard Golkowsky, Willich, and Helmut Paulus, Herzogenrath, all of Fed. Rep. of Germany, assignors to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed May 13, 1987, Ser. No. 49,610

Claims priority, application Fed. Rep. of Germany, May 15, 1986, 3616333

Int. Cl.⁴ F26B *3/04*

U.S. Cl. 34—35 **5 Claims**



1. A method for the thermal cleaning of exhaust gases coming from a heat treatment apparatus operated by a gaseous treatment medium, comprising the following steps:

(a) guiding said exhaust gases to be cleaned through a first heat exchanger (5) into an oxidizing device (7) for oxidizing combustible components of the exhaust gases in said oxidizing device (7),

(b) returning at least a portion of already cleaned exhaust gas from said oxidizing device (7) to said first heat exchanger (5) for preheating gases to be oxidized and thereby cleaned, in said first heat exchanger (5),

(c) guiding cleaned exhaust gas leaving the first heat exchanger (5) through a second heat exchanger (13) for heating a heat carrier medium in a first heat carrier circuit (14, 14') connecting said second heat exchanger (13) to heat exchanger means installed in said heat treatment apparatus (1),

(d) supplying gases leaving said second heat exchanger (13) to a third heat exchanger (16) for heating a heat carrier medium in a second heat carrier circuit (17, 17') connecting the third heat exchanger (16) with a fourth heat exchanger (20) located at an entrance of said heat treatment apparatus (1) and preheating in said fourth heat exchanger (20) fresh treatment medium to be freshly supplied into said heat treatment apparatus (1), whereby reusing of any exhaust gas for treatment purposes in said treatment apparatus is avoided.

4,780,966

SPARGE PIPE ASSEMBLY FOR FLUIDISED BED

Brian Harding, The Mynde, Lingen, Buckneil, Shropshire, England

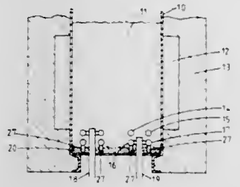
PCT No. PCT/GB86/00082, § 371 Date Oct. 2, 1986, § 102(e) Date Oct. 2, 1986, PCT Pub. No. WO86/04833, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 19, 1986, Ser. No. 928,209

Claims priority, application United Kingdom, Feb. 22, 1985, 8504557; Mar. 19, 1985, 8507078

Int. Cl.⁴ F26B *17/10*

U.S. Cl. 34—57 A **11 Claims**



1. A fluidised bed comprising a container, a mass of particulate material disposed within the container and an apertured tube or sparge pipe assembly for introducing fluidising gas into the said particulate material, which assembly is supported within the container adjacent to and spaced from the bottom thereof and connected to a supply of fluidising gas disposed externally of the container, characterised in that said sparge pipe assembly comprises at least one sparge pipe which is of continuous endless configuration that permits the fluidising gas to circulate freely in the sparge pipe when said gas is injected therein in a non-radial direction so as to impart a recirculating motion to the gas.

4,780,967

APPARATUS FOR THE RECOVERY OF WASTE HEAT CONTAINED IN THE EXHAUST FROM DRYERS OF PAPER MACHINES

Vinko Mučic, Walldorf, Fed. Rep. of Germany, assignor to TCH Thermo-Consulting-Heidelberg GmbH, Heidelberg, Fed. Rep. of Germany

PCT No. PCT/EP87/00179, § 371 Date Nov. 24, 1987, § 102(e) Date Nov. 24, 1987, PCT Pub. No. WO87/06284, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 2, 1987, Ser. No. 135,159

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612907

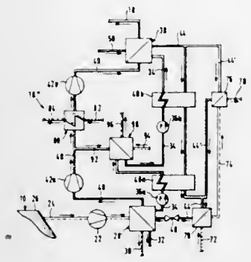
Int. Cl.⁴ D21F *5/20;* **F25B** *25/02*

U.S. Cl. 34—86 **9 Claims**

1. In combination with a dryer of a papermaking machine, an apparatus for recovery of waste heat in moist exhaust air from the dryer, said apparatus comprising: a compression heat pump having a low-pressure side to which the exhaust air is fed, and a high-pressure side to which feed water is fed from which process steam is produced for heating the dryer, said heat pump being a two-substance compression heat pump including a degasser, a resorber, and three conduits interconnecting said degasser and said resorber; a first and second one of said conduits carrying a poor solution from said degasser to said re-

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sorber; a third one of said conduits carrying a rich solution from said resorber to said degasser, a first heat exchanger inserted into high-pressure-side sections of said second and third conduits, respectively; said degasser being connected to a duct for feeding the moist exhaust air thereinto from the dryer; said resorber having a steam outlet connected to a process steam line to an inlet of the dryer; at least one second heat exchanger in a section of said third conduit between said first heat exchanger and throttling means, in said section the rich solution is cooled by ambient air which is heated and fed to



said dryer; means for supplying said ambient air to said first heat exchanger and means for feeding said heated air to said dryer; a first branch line for the rich solution extending from a section of the conduit between the resorber and said at least one second heat exchanger and back into said section of the conduit between the heat exchanger and the throttling means, and at least one third heat exchanger in said branch line and connected, as regards flow of the ambient air to said dryer, in series with the at least one second heat exchanger by means for feeding said heated air from said first heat exchanger to said second heat exchanger.

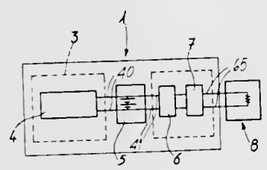
4,780,968

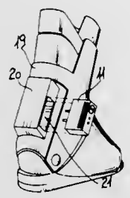
HEATER DEVICE, PARTICULARLY FOR SKI BOOTS

Silvano Bragagnolo, Castelfranco Veneto, Italy, assignor to Nordica S.p.A., Montebelluna TV, Italy

Filed Jun. 22, 1987, Ser. No. 64,733
Claims priority, application Italy, Jun. 30, 1986, 59390/86[U]
Int. Cl.⁴ A43B *7/02, 5/04*
U.S. Cl. 36—2.6 **28 Claims**

1. Heating device particularly for ski boots, comprising an electrical resistance heating circuit, said device comprising, in combination, at least one battery, a substantially watertight box-like structure, battery charging means, at least one first circuit adapted for preventing overcharging of said battery, at least one second circuit adapted for preventing excessive discharging of said battery, and at least one third circuit adapted for controlling power fed to said electrical resistance heating circuit, said substantially watertight box-like structure being removably associable with a ski boot, connectable to said electric resistance heating circuit, and adapted for containing





said battery, said first circuit, said second circuit, and said third circuit.

4,780,969

ARTICLE OF FOOTWEAR WITH IMPROVED TENSION DISTRIBUTION CLOSURE SYSTEM

Samuel G. White, Jr., 5707 Hartford Dr., Ft. Wayne, Ind. 46835

Filed Jul. 31, 1987, Ser. No. 80,109
Int. Cl.⁴ A43B *11/00*
U.S. Cl. 36—50 **3 Claims**



1. A tension distribution closure system for shoes comprising:

a shoe having medial and lateral adjacent closure faces along the tongue opening and lacing means comprising a plurality of eyelets in each of said closure faces adapted to permit a shoelace to pass freely therethrough; and

having a lacing means spacing consisting of the spacing between opposing pairs of eyelets and a lacing means adjacent row spacing consisting of the spacing between adjacent eyelets residing on either the medial or lateral closure face of the tongue opening; and said lacing means spacing increasing in width as said lacing means nears the toe of said shoe; and

said lacing means adjacent row spacing increasing near the tie point, providing greater tension at the toeward lacing means and greater tension distribution across the entire shoe when said shoelace is pulled and tied.

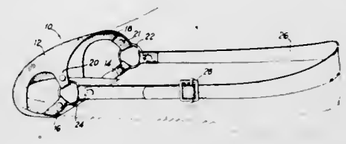
straight and allowing the ski boot to be used for walking upon the flat surface.

4,780,970

SHOE PROTECTOR

Douglas C. McArthur, Sr., 6195 Spout Springs Rd., Flowery Branch, Ga. 32504, and Willard R. McArthur, Sr., 2698 Camlot Ct., Duluth, Ga. 30136

Filed May 26, 1987, Ser. No. 54,755
Int. Cl.⁴ A43B *13/22*
U.S. Cl. 36—72 R **5 Claims**



1. A shoe protector comprising:

(a) an elastic protector cup for enclosing the toe of the shoe to be protected;

(b) a pair of superior stabilizers connected to the top of the protector cup for pulling the cup downward against the top of the shoe toe and rearward against the shoe toe;

(c) a pair of inferior stabilizers connected to the bottom of the protector cup for pulling the cup upward against the bottom of the shoe toe and rearward against the shoe toe;

(d) a pair of stabilizer rings, each connecting a superior and an inferior stabilizer; and

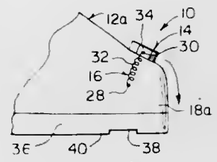
(e) a heel strap attached to both stabilizer rings for applying rearward force on the rings.

4,780,971

TOE LEVELER FOR A SKI BOOT

William A. Verdi, 149-04 115th St., South Ozone Park, N.Y. 11420

Filed Feb. 12, 1987, Ser. No. 14,006
Int. Cl.⁴ A43B *5/04;* **A43C** *15/09*
U.S. Cl. 36—132 **3 Claims**



1. A toe leveler for a ski boot having a toe portion with a top, comprising:

(a) a sole having an indent in underside thereof, said sole affixed to the ski boot so that said indent is below the toe portion of the ski boot;

(b) a body member mounted to the toe portion of the ski boot and being of a predetermined thickness and movable from a first position on the top of the toe portion of the ski boot; and

(c) spring means for attaching said body member to the toe portion of the ski boot in an infinite number of places so as to compensate for ski boots with different widths so that in said first position said body member is stored upon the top of the toe portion allowing the ski boot to be attached to a ski and in said second position said body member is placed under the toe portion and into said indent of said sole so that said body member is prevented from involuntary movement and the angular displacement of the ski boot is compensated for when the ski boot is placed on a flat surface without the ski and keeping leg of skier

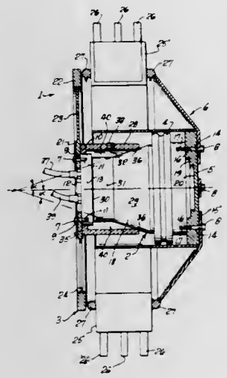
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4,780,972

WHEELMOTOR DRIVE FOR ROTARY CUTTERHEAD

Wayne G. Keene, 933 Corbin Ave., Northridge, Calif. 91324

Filed Mar. 21, 1988, Ser. No. 170,989
Int. Cl.⁴ E02F *3/18*
U.S. Cl. 37—70 **11 Claims**



1. In a cutterhead assembly for a dredge having on deck:

a hydraulic pump with inlet and outlet ports;

a hydraulic fluid reservoir tank with inlet port;

a four way control valve with four ports, for reversal of flow of hydraulic fluid with optional alternate dispositions thereof corresponding to clockwise and counterclockwise rotation, respectively, of the bucketwheel of said cutter head assembly;

a pair of high pressure hydraulic lines each connecting outlet and inlet ports, respectively, of said pump with corresponding inlet and return ports, respectively, in the inlet side of said four way control valve;

first and second outlet ports in the outlet side of said four way control valve connected to first and second hydraulic lines, respectively;

a hydraulic fluid return line connected to an inlet port of said reservoir tank; an articulated boom on said dredge, with a sling on the free end of said boom, said sling being provided at its lower terminus with a back plate which is adapted to support and maneuver on the inboard side of said back plate a bucketwheel, said cutterhead assembly consisting of said back plate as the first element and said bucketwheel as the ultimate element of a power train;

the improvement consisting of providing in said power train;

(a) a flat, circular hub surface on said inboard side of said back plate, coaxial with and facing said bucketwheel;

(b) a wheelmotor having a stationary shaft part and a rotating case, said stationary shaft part having a flat flange surface adapted to abut and to be coaxially secured to said flat circular hub surface on said back plate by a first plurality of bolts, said flat flange surface of said stationary shaft part occupying the center portion of said flat, circular hub surface on said back plate leaving unoccupied, a peripheral annular portion surrounding said occupied center portion;

(c) bucketwheel with hub adapted to be affixed coaxially to said rotating case of said wheelmotor by a second plurality of bolts;

(d) an array of three ports in said flat flange surface of said stationary shaft part, the first and second ports of said array of three ports being connected by said first and

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second hydraulic lines to said first and second outlet ports, respectively, in said inlet side of said four way control valve; and

(e) the third port of said array of three ports being adapted to receive said hydraulic fluid return line connecting to said inlet port of said hydraulic fluid reservoir tank;

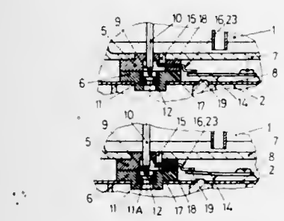
whereby said wheelmotor direct-drives said bucketwheel while wet under water, absent protection of dry chamber with gearbox, form the intrusion of water into bearings of said wheelmotor.

4,780,973

WATER BYPASS VALVE FOR STEAM IRONS WITH DISPLACEABLE BYPASS BLOCKING PLATE

Tomas B. Vildosola, Elbar, Spain, assignor to Oficina de Investigacion Agrupada, S.A., Spain

Filed Oct. 28, 1986, Ser. No. 923,969
Claims priority, application Spain, Oct. 30, 1985, 289,976
Int. Cl.[4] D06F *75/18*
U.S. Cl. 38—77.7 **3 Claims**



1. A water bypass valve in a steam iron that controls the passage of water between a water tank and a vaporizing chamber located in said steam iron comprising:

(a) a lower half-body, said lower half-body having an outlet port and a valve seat positioned in said outlet port;

(b) an upper half-body, said upper half-body having an inlet port, a lock pin passageway and a displaeement plate mortise, said lower half-body and said upper half-body being joined such that a through passageway is formed between said inlet port and said outlet port and said locking pin passageway is concentric with said outlet port;

(c) a bimetallic element connected to a surface on said vaporization chamber;

(d) a displacement plate positioned in said displacement plate mortise, said displacement plate having a first end resiliently held against said inlet port thereby closing said inlet port, said displacement plate having a second end spaced apart from said bimetallic element such that said bimetallic element can make contact with said second end of said displacement plate when said bimetallic element is in an excited state and thereby cause said first end of said displacement plate to move away from said inlet port thereby opening said inlet port;

(e) a locking pin movably positioned in said lock pin passageway and movable between a closed position in which said lock pin is in engagement with said valve seat thereby closing said outlet port, and an open position in which said lock pin is away from said valve seat thereby opening said outlet port; and

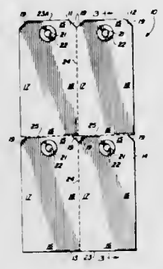
(f) control means connected to said locking pin to control the movement of said locking pin between said closed position and said open position.

4,780,974

OFFSET PRINTING TAG ASSEMBLY

Donald B. Mitchell, 515 West Highland, Phoenix, Ariz. 85013

Continuation of Ser. No. 534,759, Sep. 22, 1983. This application Jan. 9, 1987, Ser. No. 1,742
Int. Cl.[4] A44C *3/00*
U.S. Cl. 40—299 **10 Claims**



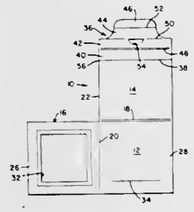
1. A tag assembly configured to be compatible with an offset printing press having a feed path and a feed assembly, comprising: a single substantially rectangular sheet having a top, a bottom and opposing sides defining a continuous sheet perimeter, said sheet including first and second linear perforation lines defining a longitudinal axis and a lateral axis bisecting said sheet into four equal tag sections each having a top, a bottom and two opposing sides, the tag sections lying above the lateral axis defining a first pair of tag sections and the tag sections lying below the lateral axis defining a second pair of tag sections, each tag section including a hole located in proximity to the top of each tag section and centered with respect to the sides of each tag section, the holes in each pair of tag sections being symmetrically disposed with respect to the longitudinal axis, the bottom and the adjacent surface of said rectangular sheet forming an unobstructed feed surface for insertion into the feed path of said printing press with the longitudinal axis of said sheet centered about and in alignment with the feed path, the area below the holes and above the bottom of the second pair of tag sections defining a clear zone for enabling the feed assembly of said printing press to grip said rectangular sheet.

4,780,975

SELF MAILER WITH EASEL

Arthur S. Friedman, 2144 Seneca Dr. West, Merrick, N.Y. 11566

Filed Feb. 26, 1987, Ser. No. 19,927
Int. Cl.[4] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—155 **26 Claims**



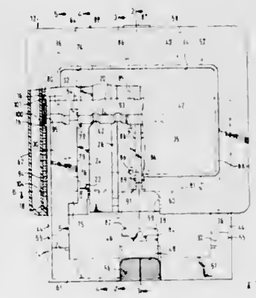
1. A one-piece picture mount formed from a planar blank for alternate assembly into a mailer and a display frame, said mount comprising a picture-receiving pocket defined by a backing panel and an overlying frame panel with a first fold line therebetween, said backing and frame panels having secured overlying edge portions remote from and parallel to said first fold line, said frame panel including at least one line of adhesive along said overlying edge portion whereby to secure said overlying edge portions together, a support panel immediately adjacent and integral with said backing panel along a second fold line transverse to said first fold line for a selective folding of said support panel between a forwardly folded mailer position overlying said frame panel and a rearwardly folded display position diverging from said backing panel, and a brace panel immediately adjacent and integral with said support panel along a third fold line parallel to said second fold line for a selective folding of said brace panel into overlying relation to the backing panel in the mailer position and into bracing orientation between the diverging support panel and backing panel in the display position, said brace panel including multiple fold line-defined sections parallel to said third fold line, at least the outermost one of said sections, relative to the backing panel, defining a tongue, said backing panel including a locking slot therethrough selectively receiving said tongue in each of said mailer and display positions.

4,780,976

CONTAINER FOR ACCOMMODATING A PILE OF PICTURES

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

PCT No. PCT/EP85/00611, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03025, PCT Pub. Date May 22, 1986
PCT Filed Nov. 12, 1985, Ser. No. 901,531
Int. Cl.[4] G09F *11/30*
U.S. Cl. 40—511 **44 Claims**



1. A container for a pile of substantially rectangular sheets of substantially identical format, comprising:

a housing having a window for display of substantially all of an uppermost sheet of the pile in the container, said window defining a plane, said housing having a plurality of narrow sides perpendicular to said plane and having an opening in one of said narrow sides;

a sheet supporting slider reciprocable through said housing opening in a direction parallel to said plane between an inner end position and an outer end position, said slider having a front wall which, in said inner end position, is substantially coextensive with said housing opening;

a pile hold-down member mounted on said slider adjacent the front wall thereof and being displaceable relative to said slider member substantially in a plane parallel to the plane of said window to engage, in said outer end position, over said at least one sheet conveyed out of the housing in the slider; and

spring means for biasing said hold-down member into said sheet engaging position; wherein:

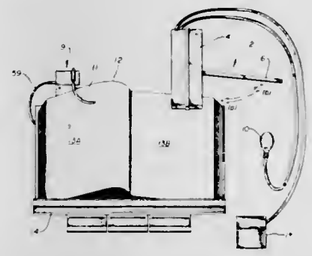
when the slider is moved into said inner end position, said hold-down member is displaced against bias of said spring means into a position out of registration with said window.

4,780,977

PAGE TURNING APPARATUS

James M. Howard, Dover, and Constantine Tsoucalas, Bergenfield, both of N.J., assignors to Maddak, Inc., Pequannock, N.J.

Filed Sep. 8, 1987, Ser. No. 93,720
Int. Cl.[4] G09F *19/00*
U.S. Cl. 40—531 **13 Claims**



1. For use with a member such as a book or the like disposed on a supporting surface and opened for reading, apparatus for turning a read page from one side of the member to the other side, comprising:

a clamp for clamping the apparatus to the supporting surface;

a stationary block mounted to the clamp;

a chassis;

means for supporting the chassis on the block so that said chassis is displaceable toward and away from the member;

an arm;

means mounted to the chassis for supporting the arm so that said arm is displaceable in a plane substantially normal to the plane of displacement of the chassis;

said apparatus being initially in a "start" position, whereby the chassis is spaced away from said member and the arm is in a substantially three o'clock orientation;

means connected to the apparatus and to a power source for operating said apparatus;

means mounted to the chassis and connected to the operating means and operable thereby for generating a vacuum;

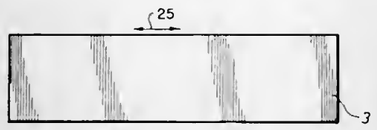
means mounted to the chassis and connected to the operating means and operable thereby for displacing the chassis toward the member, whereupon the generated vacuum pulls the read page away from the member when the chassis has been displaced a predetermined distance, and means for thereupon reversing the direction of displacement of the chassis so that said chassis is displaced away from said member;

means mounted to the arm and connected to the operating means and operable for displacing the arm from the substantially three o'clock orientation to a substantially eight o'clock orientation, whereupon the arm sweeps behind the pulled away page to turn said page as the chassis is displaced away from the member; and

means for reversing the direction of displacement of the chassis when the chassis has been displaced a predetermined distance away from the member, and means for reversing the direction of displacement of the arm, so that said apparatus returns to the "start" position, and is ready to turn another page from one side of the member to the other side.

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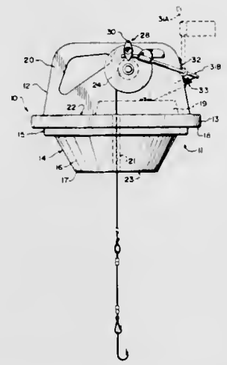
4,780,978
INFORMATION-CARRYING SIGN WITH HIDDEN SECUREMENT
Lauge Sonderb k, Fredensborg, Denmark, assignor to Dansign V/Lauge Sonderbaek, Copenhagen, Denmark
PCT No. PCT/DK86/00058, § 371 Date Jan. 29, 1987, § 102(e) Date Jan. 29, 1987, PCT Pub. No. WO86/07176, PCT Pub. Date Dec. 4, 1986
PCT Filed May 28, 1986, Ser. No. 15,135
Claims priority, application Denmark, May 30, 1985, 2429/85
Int. Cl.⁴ G09F *7/00*
U.S. Cl. 40—584 **5 Claims**



1. A sign device comprising a mounting part and an information-carrying part capable of being pushed onto said mounting part, wherein the mounting part and the information-carrying part comprise mutually cooperating profile portions having the effect that the pushing of the information-carrying part onto the mounting part can only be performed during mutual displacement of substantially planar, mutually abutting surface portions on the mounting part and the information-carrying part, respectively, characterised in that the sign device comprises a hidden magnetically releasable lock adapted to automatically lock the mutually displaceable surface portions together in the pushed-on state of the information-carrying part, wherein said lock comprises a tiltably mounted magnetic plate mounted in a first recess in one of the two mutually displaceable surface portions, said plate comprising a projection for locking cooperation with a similarly formed second recess in the second of the two mutually displaceable surface portions, said lock further comprising a spring influencing the magnetic plate in such a manner that the projection will then automatically be in engagement with the recess in the second of the two mutually displaceable surface portions in their assembled position.

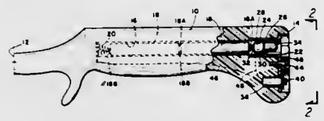
4,780,979
ICE FISHING DEVICE
Peter "M" Dyck, 367-2nd Street, Winkler, Manitoba, Canada R6W 2R5, and Elmer D. Wiebe, General Delivery, Morden, Manitoba, Canada R0G 1J0
Filed Oct. 26, 1987, Ser. No. 112,481
Int. Cl.⁴ A01K *97/12*
U.S. Cl. 43—17 **15 Claims**

13. An ice fishing rig comprising a rigid base plate member having transverse dimensions sufficient to cover a hole formed in the ice and to stably support the rig on the ice, a hole formed through the plate member from an upper surface above the ice to a lower surface adjacent the water, a support member attached to said plate member and upstanding therefrom at a position adjacent to one side of the hole, a reel mounted on the support member for rotation about a substantially horizontal axis, a line carried on the reel for dispensing therefrom and winding thereon, the reel being arranged on the support member so as to allow dispensing of said line directly through said hole from the reel and a manually graspable handle on the reel for actuation to wind in the line, said base plate member being integrally molded from a synthetic plastics material and including a plate portion and a plug portion extending downwardly from an underside of the plate portion which is circular in cross section and has a transverse dimension defining a first plug portion thereof which has an outer surface tapered from an uppermost largest diameter thereof to a lowermost smallest diameter thereof, and a second plug portion between said first plug portion and said plate portion which has an outer cylindrical surface of diameter larger than said largest diameter of said



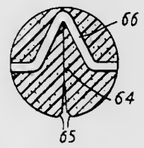
first plug portion such that the plug portion closes the hole and projects downwardly at least partly into the hole.

4,780,980
FISHING ROD HANDLE HAVING A LIGHT THEREIN
Billy B. McCullough, 11231 N. Memorial Dr., Owasso, Okla. 74055
Filed Feb. 19, 1988, Ser. No. 157,591
Int. Cl.⁴ A01K *87/00*
U.S. Cl. 43—17.5 **6 Claims**



1. A fishing rod handle having a light in the handle thereof comprising:
- a fishing rod handle having means at the forward end thereof for attachment of a fishing rod, having a rearward end, and having an elongated cylindrical opening therein communicating with said rearward end;
- a rigid insert member having an integral tubular portion, the insert member being attachable to said handle rearward end with said tubular portion received within said handle cylindrical opening;
- a bulb retained witin in said insert member tubular portion, the bulb having an electrical contact on the rearward end thereof and the forward end having a lens;
- at least one battery positioned within said handle cylindrical opening, the battery having electrical contacts on the opposed ends thereof;
- means within said handle cylindrical opening urging said battery and thereby one of said electrical contacts thereon into engagement with said bulb electrical contact;
- a switch means secured to said insert member having an "on" and an "off" position;
- circuit means connecting said battery, said switch and said bulb to energize said bulb when said switch is "on"; and
- means to removably retain said insert member to said handle rearward end.

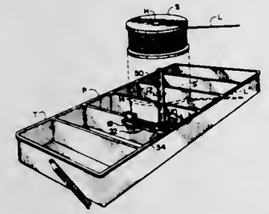
4,780,981
HIGH DENSITY MATERIALS AND PRODUCTS
Andrew C. Hayward, 34 Glenwood Rise, Stonnall, Staffordshire, and Melvyn E. Slater, 49 Walsall Rd., Cannock, Staffordshire, both of England
Continuation of Ser. No. 930,988, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 714,953, Mar. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 667,894, Nov. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 536,241, Sep. 27, 1983, abandoned. This application May 6, 1987, Ser. No. 45,714
Claims priority, application United Kingdom, Sep. 27, 1982, 82.27505. Aug. 12, 1983, 83.18830. European Pat. Off. 83305632.8; Japan, Sep. 26, 1983, 58-176530. United Kingdom, Nov. 4, 1983, 83.29526; Mar. 22, 1984, 84.07471
Int. Cl.⁴ A01K *95/00*
U.S. Cl. 43—44.89 **7 Claims**



1. A fishing weight comprising:
- at least two main body parts having faces adapted to be closed together on a fishing line;
- flexible hinge means linking said two main body parts whereby a gap between said faces may be varied by flexure of said hinge;
- each said main body part comprising a mass of metal particles embedded in a polymeric matrix formed from a settable or hardenable material;
- said hinge means being formed by a strip or wire of a deformable but relatively rigid metal different from the material of said main body parts; and
- said strip or wire extending from an interior portion of one of said main body parts to an interior portion of the other of said main body parts, end portions of said strip or wire being molded into the respective interior portions of the main body parts;
- the attachment of said main body parts by said strip or wire being such that when said faces are closed together in an orientation adapted for enclosing a fishing line therebetween, said strip or wire is in a transverse bent configuration around the location adapted to receive the fishing line whereby the line may be gripped between said faces by the relative rigidity of the wire or strip in that configuration.

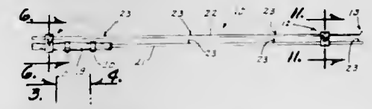
4,780,982
FISHING LINE DISPENSER
Wesley F. Black, 2402 15th Ave. W., and Ronald L. Black, 2114 8th Ave. E., both of Williston, N. Dak. 58801
Filed Mar. 6, 1987, Ser. No. 22,859
Int. Cl.⁴ A01K *97/00*
U.S. Cl. 43—54.1 **20 Claims**

15. Line dispenser apparatus for mounting and holding a cylindrical spool of line having a hole through its longitudinal axis on a fishing tackle box equipped with a vertical tray partition that has a top edge and a lateral surface in a manner that allows the spool to spin about its longitudinal axis as line is pulled off the spool, comprising:
- an elongated frame member having a first end and a second end;
- first clip means at the first end of said frame member and second clip means at the second end of said frame member, both said first and second clip means being adapted for mounting said frame member on said partition in a tight engaging manner;
- an elongated shaft having a proximal end and a distal end, said shaft being pivotally mounted at its proximal end to said frame member in such a manner that it can be pivoted in a pivotal path from a folded position with its distal end



positioned adjacent said partition to an extended use position with its distal end extending outwardly from said partition and adapted for insertion through the axial hole in the spool.

4,780,983
FISHING ROD STORAGE APPARATUS
Michael W. Smith, 2940 NE. 121st, Portland, Oreg. 97220
Filed Mar. 21, 1988, Ser. No. 170,940
Int. Cl.⁴ A01K *97/00*
U.S. Cl. 43—54.1 **1 Claim**

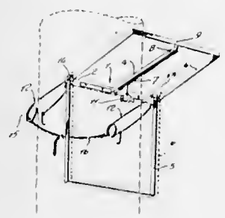


1. Apparatus comprising:
- a fishing rod including a handle for receiving a reel, a first bendable portion attached at one end thereof to and extending from said handle, said handle being larger in diameter than said first bendable portion, a second bendable portion, means on one end of said second bendable portion for selective attachment to said one end of the first bendable portion whereby said first and second portions can be effectively connected together for use as a fishing pole or disconnected for storage or for transportation from place to place;
- a first flexible strap means for connecting the handle to said second portion of the fishing pole when said first and second portions are in the unconnected, storage position, said first flexible strap means including hook and loop fastener means for attachment to said handle and to said second portion said hook and loop fastener means including:
- a first hook containing section attached to one side of one end of said first flexible strap means;
- a first loop containing section connected to said one side of the other end of said first flexible strap means;
- a second loop containing section connected to said one side of said first flexible strap means and being positioned closer to said first hook means than to said first loop means, said first flexible strap means extending around said second portion of said fishing rod and said first hook containing section being in engagement with said second loop containing section;
- a second hook containing section connected to the other side of said first flexible strap means at a position directly on the other side from said second loop containing section, said first flexible strap means extending around said handle and said first loop containing section being in engagement with said second hook containing section when said fishing rod is in the storage position thereof;
- a second flexible strap means for connecting the first portion of the fishing rod to the second portion thereof in the

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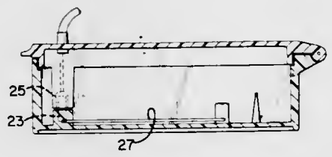
storage position thereof, said second flexible strap means including hook and loop fasteners including:
a third hook containing section attached to one end of one side of said second flexible strap means;
a fourth hook containing section attached to the other side of said one end of said second flexible strap means;
a third loop containing section attached to the other end of said one side of said second flexible strap means and attached to said fourth hook containing section when said second flexible strap means is disposed around said first portion of said fishing rod in the storage position of said fishing rod; and
a fourth loop containing section attached to said one side of said second flexible strap mans at a position between the third hook containing section and the third loop containing section, said fourth loop containing section being attached to said third hook containing section when said second flexible strap means is disposed around said second portion of said fishing rod in the storage position of said fishing rod.

4,780,984
ANIMAL TRAP
Paul Courty, 79 Blanchard Street, Causapscal, Province of Quebec, Canada G0J 1J0
Filed Jan. 6, 1987, Ser. No. 820
Int. Cl.[4] A01M *23/26*
U.S. Cl. 43—89 **4 Claims**



1. An animal trap comprising a fixed jaw, a movable jaw pivotable toward and away relative to the fixed jaw, spring means connected to the movable jaw and operatively biasing the latter pivotally toward the fixed jaw, a detent lever pivotaly secured relative to the fixed jaw, an abutment device fixedly secured relative to the fixed jaw constructed and arranged to intercept the detent lever in one angular direction around the pivotal axis thereof, and the detent lever including a catching portion operatively intercepting the movable jaw against the spring bias acting in opposite angular direction thereon relative to said one angular direction and relative to the pulling action by an animal on a bait attached to the detent lever, said spring means including two spring wires each having a pair of opposite ends fixedly secured to the fixed jaw and in biasing engagement with the movable jaw respectively, and an intermediate loop portion projecting from the fixed jaw on the opposite side thereof relative to the movable jaw in laterally spaced-apart relationship arranged for straddling of a support, and further including a link which has opposite ends attached to the intermediate loop portions of the two wires and which operatively extends around said support on the opposite side thereof relative to the fixed jaw to hold the fixed jaw vertically against said support.

4,780,985
ELECTRIC MOUSE EXTERMINATOR
Claude G. Coots, Rte. 1, Box 104, Mentone, Ala. 35984
Filed Jan. 12, 1987, Ser. No. 932,790
Int. Cl.[4] A01M *19/00*
U.S. Cl. 43—98 **8 Claims**



1. A rodent exterminator which comprises, in combination:
(a) a box having end and side walls,
(b) an opening in only one of said end walls extending into the interior of said box,
(c) a top pivotally to one of said walls
(d) a single pair of electrocution wires disposed within said box, each said wire being adjacent and extending along said side walls on opposite sides of said opening and extending therealong toward the interior of said box,
(e) means in said top for disconnectingly applying electrical power to said wires, each of said wires being coupled to said means when said top is closed; and
(f) means disposed at the interior of said box and between said wires to mount bait to attract said rodent into said opening and entice said rodent to move between said wires.

4,780,986
APPARATUS FOR THE COLLECTION AND DISPOSAL OF INSECTS
Jack M. Broomfield, and Douglas W. Broomfield, both of 940 Siskiyou Dr., Menlo Park, Calif. 94025
Filed Nov. 3, 1987, Ser. No. 116,464
Int. Cl.[4] A01M *5/02*
U.S. Cl. 43—139 **19 Claims**

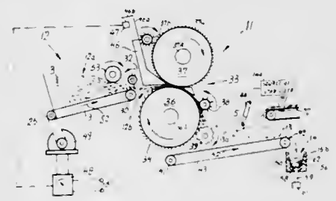


1. An attachment for modifying a hand-held electric vacuum cleaner so that it is suitable for the collection and disposal of insects, the vacuum cleaner being of the type which comprises
(1) a power unit comprising
(a) an electric motor,
(b) a fan which is driven by the motor, and
(c) a switch for operating the motor; and
(2) a collection unit which is separably connected to the power unit and which comprises a housing having a first open end and a second open end, the first open end being fitted to the power unit;
whereby operation of the motor causes air to be drawn through the collection unit so that solid matter adjacent the second open end is drawn through the second open end and collected in the collection unit;
said attachment being connectable to the power unit in place of the collection unit and comprising
(a) a housing having a rear open end and a front open end, the rear open end being connectable to the power unit,
(b) a carriage which is movable between a rear position and a front position, the rear position being within the housing and relatively close to the rear open end and a front position which is relatively close to the front open end, and
(c) a receptor which
(i) is mounted on the carriage and
(ii) is such that, when it is mounted on the carriage, insects entrained by air drawn through the housing from the front open end to the rear open end are retained by the receptor,
whereby, when the attachment is connected to the power unit of the vacuum cleaner, the resulting modified vacuum cleaner can be used to collect insects by operating the motor with the carriage in the rear position, and insects thus retained by the receptor can thereafter be disposed of by moving the carriage from the rear position to the front position so that the carriage comes to an abrupt stop in the front position, thus removing the insects from the carriage.

4,780,987
METHOD FOR THE PREPARATION OF HYDRATED, PREGERMINATED SEEDS IN GEL CAPSULES
Charles Nelsen; Steven Strickland, both of Davis; Roxanne Davis, Sacramento, and Keith Redenbaugh, Davis, all of Calif., assignors to Plant Genetics, Inc., Davis, Calif.
Continuation-in-part of Ser. No. 545,678, Oct. 25, 1983, Pat. No. 4,583,320. This application Sep. 9, 1985, Ser. No. 773,604
The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.
Int. Cl.[4] A01C *1/06*
U.S. Cl. 47—57.6 **47 Claims**

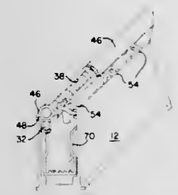
1. A method for preparation of singulated, hydrated, pregerminated seeds comprising the steps of:
encapsulating in a capsule at least one ungerminated seed, said capsule formed from a hydrated, polymer gel;
maintaining said seed capsules in a hydrated condition such that free water is available within the capsule to initiate seed germination;
maintaining said seed capsules in conditions which permit germination;
introducing osmotic growth inhibitor to said hydrated seed capsules; and,
delivering said hydrated, pregerminated seed capsules to an environment for growth and development.

4,780,988
METHOD OF PRODUCING ROD-SHAPED INCIPIENT PLANT CARRYING DEVICES
Johannes Mielke, Reinbek; Günter Böttcher, Hamburg, and Paul Evert, Aumühle, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 598,146, Apr. 9, 1984. This application Aug. 19, 1985, Ser. No. 767,183
Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318869; Aug. 20, 1984, 3430563
Int. Cl.[4] A01C *1/04*; A01G *9/10*
U.S. Cl. 47—58 **50 Claims**



1. A method of producing substantially cylindrical incipient plant carrying devices of finite length, comprising the steps of establishing a source of particulate material which contains a synthetic foam continuously withdrawing particulate material from he source and accumulating the withdrawn particulate material into a relatively thin layer; advancing the layer along a first path; conveying a continuous web of wrapping material along a second path substantially transversely of the first path; delivering successive increments at the leading end of the layer into the second path so that such increments together constitute an elongated narrow stream; draping the web around the stream so as to convert the web and the stream into a rod wherein the particulate material constitutes a filler and the web constitutes a tubular wrapper surrounding the filler; and severing the rod at predetermined intervals so that the rod yields a succession of discrete carrying devices.

4,780,989
HYDROPONIC ASSEMBLY
Stowell W. Mears, Tolland; Kris Johnson, Storrs, and Yves Kraus, Mansfield, all of Conn., assignors to Mears Structures, Inc., Storrs, Conn.
Filed Apr. 30, 1986, Ser. No. 857,259
Int. Cl.[4] A01G *31/02*
U.S. Cl. 47—65 **53 Claims**



1. A trough assembly for a hydroponic farming facility, comprising:
a plurality of continuous outer troughs, a plant supporting means engaging and translatable along one of said outer troughs, and a plurality of interior troughs of discrete lengths, contained and slidable within each of said outer troughs, said interior troughs being slidably removable from each of said outer troughs and said interior troughs being designed to contain plant roots supported by said supporting means.

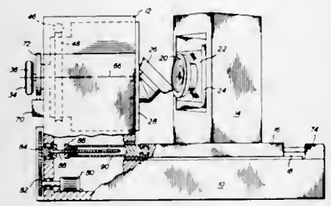
4,780,990
MACHINE AND PROCESS FOR FORMING LONGITUDINALLY CURVED TOOTH GEARS
George P. Cody, Jr., Victor, and Theodore J. Krenzer, West Rush, both of N.Y., assignors to The Gleason Works, Rochester, N.Y.
Filed Jun. 16, 1986, Ser. No. 874,981
Int. Cl.[4] B23F *9/02*
U.S. Cl. 51—52 R **17 Claims**

1. A machine for forming longitudinally curved tooth gears comprising:
a machine base;
a work support mounted on said base;
a tool support mounted on said base;
a cradle journaled in said tool support;
a cradle axis passing through said tool support about which said cradle is journaled for rotation;
a dish-shaped tool journaled for rotation in said cradle in a position offset from said cradle axis;
means for rotating said tool;
means for relatively oscillating said tool with respect to said work support about said cradle axis;
means for relatively reciprocating said work support with respect to said tool in a direction substantially along said

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cradle axis in a timed relationship with said oscillating means for defining a working path of said tool; and

said timed relationship being defined by a relative withdrawal of said work support along said cradle axis with



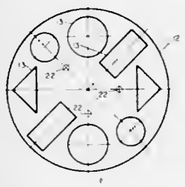
respect to the relative angular displacement of said tool about said cradle axis for reducing longitudinal mismatch between mating tooth surfaces of longitudinally curved tooth gears.

4,780,991

MASK AND PRESSURE BLOCK FOR ULTRA THIN WORK PIECES

Anatoly Gosis, Chicago, Ill., assignor to General Signal, Stamford, Conn.

Filed Aug. 22, 1986, Ser. No. 899,151
Int. Cl.⁴ B24B *37/04*
U.S. Cl. 51—131.3 **5 Claims**



1. A fixture for a lapping machine for finishing ultra thin workpieces, with the machine providing a circular rotatable platen, the exposed lapping surface of which supports a truing ring including,

(a) a mask positioned in facial contact upon the lapping surface of the platen and providing a plurality of work receiving openings within its periphery,

(b) a pressure pad of substantially the same configuration as said mask and overlying said mask when it is positioned upon the lapping surface of the platen,

(c) a pressure block carried by said pressure pad having the same configuration as said work receiving openings so as to be positioned therein, with said block having a thickness greater than said mask so as to space said pad from said mask when in overlying position with respect thereto,

(d) means connecting said pressure block to said pressure pad so as to be held within said work receiving openings provided by said mask when said pressure pad overlies said mask, and

(e) a spring plunger depending from said pressure pad and having one end in contact with the upper surface of said mask when said pressure pad overlies said mask for yieldably maintaining said mask upon the lapping surface of the platen during rotation thereof.

4,780,992

APPARATUS FOR CLEANING POOL TILE

Roy B. McKervey, 3029 W. Tuckey La., Phoenix, Ariz. 85017

Filed May 4, 1987, Ser. No. 45,320
Int. Cl.⁴ B24B *23/00*
U.S. Cl. 51—180 **24 Claims**



1. An apparatus for cleaning swimming pool tile, said apparatus comprising:

(a) an elongated pole handle, said pole handle including a substantially vertical lower portion for reaching downwardly into a swimming pool, and a slanted upper portion for extending rearwardly from said lower portion towards an operator standing near the edge of a swimming pool;

(b) a drive shaft mounted for rotation within said pole handle;

(c) a fuel-consuming motor for rotating said drive shaft;

(d) an abrasion member detachably mounted on the lower end of said drive shaft for rotation therewith; and

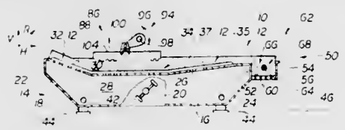
(e) a dispensing unit detachably mounted on the exterior surface of said pole handle for delivering cleaning fluid to said abrasion member.

4,780,993

METHOD AND APPARATUS FOR SURFACE TREATING A WORKPIECE

James R. DeSpain, Prospect, and Michael W. Burke, Louisville, both of Ky., assignors to Carrier Vibrating Equipment, Inc., Louisville, Ky.

Filed Apr. 5, 1985, Ser. No. 720,135
Int. Cl.⁴ B24B *1/00*
U.S. Cl. 51—317 **13 Claims**



1. A method of surface treating workpieces comprising the steps of:

a. passing a gas upwardly through a substantially stationarily positioned bed of surface treating media to fluidize the bed of surface treating media;

b. vibrating the fluidized bed of surface treating media to agitate the surface treating media;

c. submerging the workpiece in the fluidized, agitated bed of surface treating media;

d. holding the submerged workpiece stationary against all movement within the fluidized, agitated bed of surface treating media;

e. releasing the hold of the workpiece; and

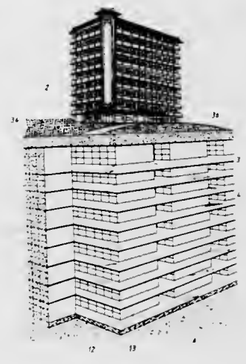
f. removing the workpiece from the bed of surface treating media.

4,780,994

HONEYCOMB TYPE OF STRUCTURE FOR INTERMENT OF HUMAN REMAINS

Pang T. Chen, 2F1., No. 2, Lane 30, Section 1, Fu-Hsing South Road, Taipei, Taiwan

Filed May 4, 1987, Ser. No. 46,236
Int. Cl.⁴ E04H *13/00*
U.S. Cl. 52—30 **7 Claims**



1. A cellular structure honeycomb-type building for human interment, comprising:

a plurality of floors, at least one of said floors being underground and at least one of said floors being above ground level;

each underground floor divided into a plurality of compartments, said compartments arranged in parallel rows and separated by a plurality of longitudinal and lateral corridors which allow access to each of said compartments;

each compartment being subdivided into a plurality of layers;

each layer defining a unit tomb space adapted to receive a single coffin;

each of said compartments communicating with at least one earthen wall;

whereby said coffin within said unit tomb space is in contact with said earthen wall allowing any corpse within said coffin to decompose and mix with the earthen walls, leaving behind in said unit space human remains which may be collected and relocated, so that said unit tomb space may be reused at some future date.

4,780,995

FACIA ROOF EDGE SYSTEM AND METHOD

Charles E. Gittins, 3099 Wheeler Rd., Bay City, Mich. 48706

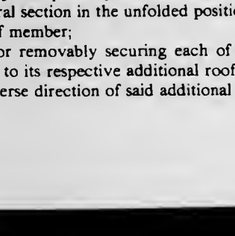
Filed Apr. 13, 1987, Ser. No. 37,936
Int. Cl.⁴ E04D *1/36*
U.S. Cl. 52—60 **4 Claims**

1. In a facia edge structure for a generally flat roof comprising a roof substance which includes a nailable edge strip and a waterproof covering rubber-like membrane of a length to extend beyond the edge strip:

a. a rigid clip plate having a flat nailing portion adapted to be secured to the upper face of said edge strip; the clip having an upwardly and angularly outwardly extending gravel stop portion, with upper and lower ends, leading substantially linearly from the nailing portion to a downwardly extending portion leading downwardly relative to said gravel stop portion along the side surface of said edge strip and roof substructure from an upper edge spaced vertically above said edge strip to a position downwardly spaced substantially from said edge strip, the gravel stop portion and downwardly extending portion forming a rigid downwardly open V-shaped portion, and the clip plate downwardly extending portion terminating in a downwardly and outwardly extending lock flange;

b. the membrane leading up over the gravel stop portion and down along the side of said substructure; and

c. a flexible facia plate having a vertically extending wall extending upwardly in juxtaposition to said downwardly extending portion of the clip plate from said flange to an upper edge spaced upwardly a substantial distance above the said upper edge of the downwardly extending portion of the clip plate, said facia plate having a downwardly and inwardly extending substantially linear gravel stop portion with upper and lower ends joined immediately to said upper edge of said vertically extending wall, forming a deformable resilient downwardly open V-shaped section with the vertically extending wall which is spaced vertically from said V-shaped portion of the clip and the membrane leading over it, and terminating in a reversely turned edge flange bearing directly on said membrane edge and the clip plate gravel stop surface beneath it interjacent the said ends of the gravel stop portion, the facia plate downwardly open V-shaped section providing an open space above said membrane extending upwardly from the reversely turned edge, there being a latch socket provided on the lower end of said facia plate to snap over said lock flange and retain said membrane edge without fastening it to said roof substructure, and the angle between said facia plate vertically extending wall and said facia plate membrane engaging portion being in the range of 20° to 30° to prevent windlift forces on the membrane from popping the facia strip out of installed position.



4,780,996

FOLDING HOUSE

Romeo Julien, Jr., Quebec, Canada, assignor to Les Maisons Quebeco Inc., Val d'Or, Canada

Filed Aug. 15, 1984, Ser. No. 640,863
Claims priority, application Canada, Sep. 2, 1983, 435977
Int. Cl.⁴ E04B *1/344. 7/16*
U.S. Cl. 52—68 **3 Claims**

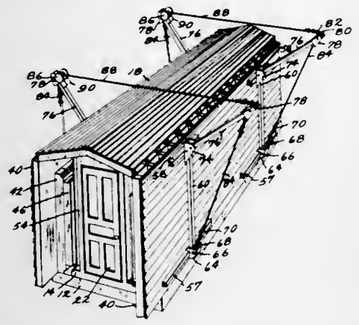
1. An apparatus to fold and/or unfold an portable building of the type in which additional roof, end wall and floor members being connected to a rigid central section by hinge means comprising:

(a) a pair of triangular structures each of which has an arm which projects upwardly and outwardly relative to said rigid central section in the unfolded position of said additional roof member;

(b) means for removably securing each of said triangular structures to its respective additional roof member along the transverse direction of said additional roof member,

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(c) a winch mounted on one of said arm at the end of the arm distal from the portable building, and



(d) a cable extending between said winch and said other arm, whereby when said winch is actuated to wind up said cable both said additional roof members unfold.

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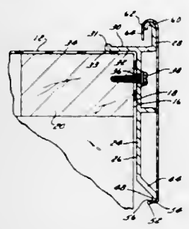
FASCIA INCLUDING MEANS FOR RIGIDLY SECURING A MEMBRANE IN PLACE

William T. Taylor, 4805 North Hollywood, Whitefish Bay, Wis. 53217, and Bennie L. Lane, W347 S7194 Sprague Rd., Eagle, Wis. 53119

Continuation-in-part of Ser. No. 862,463, May 12, 1986, Pat. No. 4,665,667 which is a continuation-in-part of Ser. No. 796,290, Nov. 8, 1985, abandoned. This application May 4, 1987, Ser. No. 46,573 The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] E04D *13/15*

U.S. Cl. 52—96 7 Claims



1. Apparatus for securing a membrane to a roof, the roof having an upper surface and the edge of the roof defining a generally vertical surface, the membrane being supported by the upper surface of the roof and a portion of the membrane extending downwardly adjacent the vertical surface of the edge of the roof, the apparatus comprising

a rigid fascia adapted to be secured to the vertical surface of the edge of the roof and to clamp the membrane against the upper surface of the roof and against the vertical surface of the edge of the roof, the rigid fascia including

means for clamping a portion of the membrane against the vertical surface of the edge of the roof, said means for clamping including a generally planar vertical portion engaging said portion of the membrane to secure it against the vertical surface, said generally planar vertical portion positioned in adjacent facing relation to the vertical surface of the edge of the roof, the generally planar vertical portion having a generally planar rearward surface adapted to be positioned in facing relation with respect to the vertical surface of the edge of the roof from the upper surface of the roof downwardly and to secure the edge of the membrane against that vertical surface, and

means for clamping a portion of the membrane down against the upper surface of the roof including a rearwardly extending flange projecting from the planar rearward surface, said flange being integrally and rigidly connected to said planar vertical portion, and the rearwardly extending flange including a lower surface engaging the portion of the membrane supported by the upper surface of the roof to hold the membrane down against the upper surface of the roof,

an upper portion of said planar vertical portion extending above the intersection of the rearwardly extending flange and the planar vertical portion, and said upper portion of said planar vertical portion including an upper flange having an edge and said planar vertical portion including a lower flange extending downwardly, said lower flange having a lower edge,

means for securing the planar vertical portion against the vertical surface of the edge of the roof to cause the portion of the membrane extending downwardly from the upper surface of the roof to be clamped against the vertical surface of the edge of the roof and,

cover plate means for covering said rigid fascia, said cover plate means including an upper edge portion having means for gripping said upper flange and including a lower edge having means for gripping said lower flange.

4,780,998

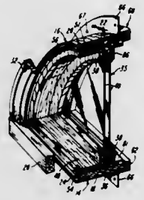
DECORATIVE WINDOW ASSEMBLY

Michael E. Knapp, Dayton, Ohio, assignor to American Woodwork Specialty Co., Inc., Dayton, Ohio

Continuation of Ser. No. 008,636, Jan. 29, 1987, Pat. No. 4,693,043, which is a continuation of Ser. No. 824,855, Jan. 31, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 92,444 The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[4] E06B *1/04;* E04F *19/02*

U.S. Cl. 52—211 4 Claims



1. A window assembly comprising at least one flat window panel of light transmitting material, a wood frame extending completely around said window panel and including portions projecting forwardly generally perpendicular to said window panel, said frame further including wood sash members defining a recess receiving a peripheral edge portion of said window panel, a heat and pressure formed sheet of plastics material having a uniform thickness less than the thickness of said window panel and forming a one-piece cap member mounted on said frame, said cap member including integrally connected cover portions extending completely around said window panel and mounted on said forwardly projecting portions of said frame, said sheet of plastics material forming an integral outer flange portion projecting outwardly around said cover portions generally parallel to said window panel, said sheet of plastics material also forming integrally connected and coplanar inner flange portions projecting inwardly from said cover portions and extending completely around said window panel forwardly of said sash members and said window panel in generally parallel spaced relation to said window panel, said coplanar inner flange portions covering said sash members and said peripheral edge portion of said window panel within said recess, said sheet of plastics material further forming an integral lip portion extending completely around said peripheral edge portion of said window panel and projecting rearwardly from said inner flange portions to said window panel, and means forming a fluid-tight seal between said lip portion and said peripheral edge portion of said window panel, whereby said one-piece cap member extends continuously from said outer flange portion to said window panel completely around said window panel and forms a continuous protective barrier from said outer flange portion to said window panel.

4,780,999

ROOF EDGE CONSTRUCTION WITH SNAP-ON ROOF BLOCK RESTRAINT

Russell Webb, Woodfin, and John B. Hickman, Biltmore Forest, both of N.C., assignors to W. P. Hickman Co., Inc., Asheville, N.C.

Continuation-in-part of Ser. No. 830,463, Feb. 18, 1986, Pat. No. 4,662,129. This application Apr. 6, 1987, Ser. No. 34,546

Int. Cl.[4] E04D *13/15*

U.S. Cl. 52—96 8 Claims



1. An assembly for forming a raised roof edge on a building structure having a generally horizontal roof surface and a plurality of roof paving blocks on the horizontal roof surface, said assembly comprising:

a dam member, and anchoring means for anchoring said dam member to the building structure generally adjacent an edge of the horizontal roof surface;

a fascia member installable on said dam member; and

said dam member further including a generally vertical lower dam portion, a generally vertical intermediate dam portion extending in a generally upward direction, a generally transverse dam portion interconnecting said generally vertical lower dam portion and said vertical intermediate dam portion, and a flange portion interlockingly engageable with the fascia member when said fascia member is installed on the building structure, said vertical intermediate dam portion engaging the roof paving blocks and forming a stop for horizontally retaining the roof paving blocks, said dam member further including clamping means and retention means as a one-piece member with said dam member for securing said fascia member relative to said dam member when said fascia member is installed on said dam member, said clamping and retention means urging said fascia member generally against said dam member, said clamping and retention means further overlapping and biasing the roof paving blocks against the horizontal roofing surface at least in an area generally adjacent the edge of the horizontal roof surface.

4,781,000

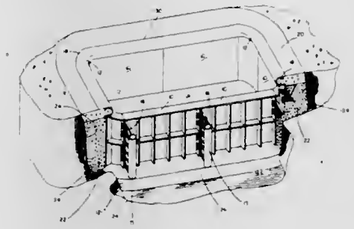
STRUCTURAL SUPPORT BRACE

Randall E. Bertsch, Bethel Rd.; Robin E. Bertsch, 10002 St. Clair's Retreat, and Richard K. Garton, 5630 Prophet's Pass, all of Fort Wayne, Ind. 46825

Filed Dec. 11, 1986, Ser. No. 940,744

Int. Cl.[4] E04H *3/16*

U.S. Cl. 52—169.8 12 Claims



1. A swimming pool brace and poured concrete pillar form comprising a brace body, said body having an upwardly facing support for a pool deck and a bottom footing anchor, means for connecting said body to a pool wall, a separate poured concrete pillar form, and means for fixing said form to said body, said form extending between said deck support and said anchor, said brace body and concrete pillar form being connected to each other and to said wall and prior to the pouring of concrete being a stable wall support and stable pillar concrete form facilitating the pouring of said pool footing, pillar and deck.

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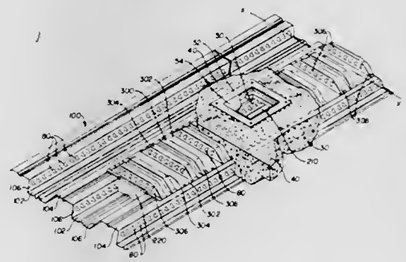
CONTINUOUS PRESET ACCESS HOUSING

Thomas G. Ryan, Bethel Park, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1986, Ser. No. 840,379

Int. Cl.[4] E04B *5/48*

U.S. Cl. 52—220 7 Claims



1. A continuous access housing for a cellular flooring system of the type having at least one corrugated metal decking sheet supported by an upper surface of supporting beams of a floor and an overlying layer of concrete having a top which defines an upper floor surface, said decking sheet provided on a first horizontal level and having spaced apart valley and crest portions extending longitudinally in the sheet and an inclined webbing connecting adjacent crest and valley portions, said decking sheet having at least one cell within at least one of the crest and valley portions thereof into which service lines and the like may be placed comprising:

(a) a corrugated metal housing member having at least two spaced apart crest portions and at least one intermediate valley portion with a webbing connecting adjacent crest

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and valley portions, at least one of insulating material and concrete filling at least a portion of said housing valley, said housing member supported by crest portions of the decking sheet on opposite sides of a valley of the decking sheet over which the housing member is positioned, said housing member extending longitudinally above and parallel to at least one cell on a second horizontal level vertically spaced above said first horizontal level, said housing member providing a separate enclosure for electrical receptacles and the like, said layer of concrete and said housing member also having at least one opening therein to allow for access into and through the housing member to the at least one cell from above the upper floor surface; and

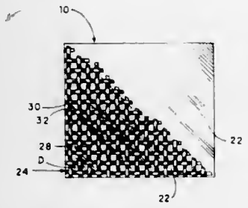
(b) a cover supported over said opening and positioned substantially coplanar with the upper floor surface whereby an enclosed cavity is created at least partially within at least one of said crest and valley portions of the housing member.

4,781,002

DAMAGE RESISTANT REFLECTIVE TEXTURED SURFACE SYSTEM

S. Tebbs Chichester, 1716 Aberdeen Cir., Crofton, Md. 21114

Filed Jan. 11, 1988, Ser. No. 142,821
Int. Cl.[4] B44F *1/02*
U.S. Cl. 52—311 **4 Claims**



1. A damage resistant reflective surface system, comprising:

(a) a sheet having a surface which is in a plane and at least partially reflective,

(b) a mesh screen adapted to be positioned over said reflective surface to protect said surface and camouflage any defacement thereof, said screen being comprised of a first series of spaced strands extending in one direction and a second series of spaced strands extending in a direction at an angle to said first direction, the spacing of said strands providing open areas through which projected and reflected light can pass to and from said reflective surface, said strands having a sufficient thickness to provide with said sheet a three dimensional structure whereby light reflecting from said reflective surface also reflects from said strands, and

(c) means for securing said mesh screen to said reflective surface,

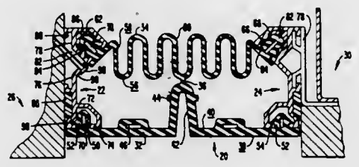
whereby maximum reflection occurs when viewing said surface from a direction substantially perpendicular thereto, with the amount of reflection viewed decreasing as the viewer moves toward the plane of said reflective surface due to the projection of said mesh screen outwardly of said surface and the reflection from said strands, such movement tending to camouflage any defacements appearing on said reflective surface, with continued movement in such direction entirely obscuring said openings.

4,781,003

EXPANSION JOINT SEAL, FRAME AND ASSEMBLY

Michael Rizza, 2863 Encina Camino, Walnut Creek, Calif. 94598

Filed Jan. 6, 1987, Ser. No. 786
Int. Cl.[4] E01C *11/02*
U.S. Cl. 52—396 **17 Claims**



1. An expansion joint seal, for protecting the areas between abutting building surfaces from moisture or foreign material, which allows independent movement of each building surface, comprising:

first and second seals of elastomeric composition for prevention of intrusion of moisture and foreign material into the area between abutting building surfaces, said first and second elastomeric seals having at least one accordian-like contour intergrally formed in their surface;

at least one tear strip located in an inner region between said first and second seals and affixed to each for maintaining close proximity between said first and second seals;

means for securely affixing a plurality of corner angles to said first seal to facilitate maintaining a continuous first seal surface as the expansion joint seal deviates from linerity at predetermined points along its length; and

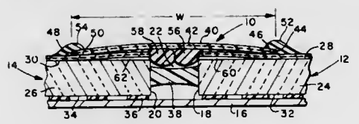
means for retaining the lateral edges of said first and second seals in proximate contact with abutting building surfaces such that intrusion of moisture and foreign material into an area between the abutting building surfaces is prevented.

4,781,004

JOINT SYSTEM FOR ROOFING PANELS

Richard E. Hartman, Akron, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Filed Sep. 28, 1982, Ser. No. 425,840
Int. Cl.[4] E04D *1/36*
U.S. Cl. 52—464 **9 Claims**



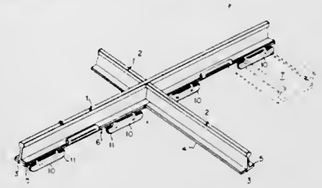
1. A joint system for connecting a first panel to a second panel in side-by-side relationship with a first side of said first panel being spaced from a second side of said second panel defining a gap therebetween, said joint system comprising a connecting sheet member extending across said gap and fastened to an outside surface of said first panel and to an outside surface of said second panel, said connecting sheet being formed of a reinforced elastomeric material, having a length and width substantially in excess of its thickness, being free of substantial projections, and terminating in an edge at a first position spaced from said first side with a solvent weld sealant being disposed along said edge to cover said edge and adhere said connecting sheet member to said first panel to provide space for a first bead of flowable material interposed between said connecting sheet member and the outside surface of said first panel adjacent said first side so that upon movement of said first side away from said second side said connecting sheet member will be straightened out and displace said flowable material of said bead into said gap to compensate for increases in gap width due to movement of said panels apart and irregular positioning of said first panel relative to said second panel.

4,781,005

CEILING PANEL CARRIER ADAPTER MEMBER

Willem Rijnders, Papendrecht, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Apr. 29, 1987, Ser. No. 43,911
Claims priority, application United Kingdom, Apr. 28, 1987, 8709964
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—489 **14 Claims**



1. An adapter member for attaching a ceiling panel element to a support member of a ceiling construction comprising:

(a) a ceiling support grid including main support members and cross-support members;

(b) a plurality of ceiling elements; and

(c) adapter members for connecting the elements to support members of the support grid, which support members have a bottom portion comprising a longitudinally extending lower surface and a sideways extending longitudinal free edge and, which adapter members include opposite elongated side edges and a central elongated body portion for parallel engagement with the lower surface of the support member, upwardly directed arm means bent over on top of the body portion to define clip means for attaching the adapter member to the longitudinal free edge of the support member and downwardly directed ceiling element attachment means for engaging with the ceiling elements to attach the elements to the ceiling support member, the improvement wherein:

(i) the arm means includes a plurality of first flange portions spaced along one side edge of the elongated adapter member, the spaces between the first flange portions being correlated with the pitch and dimension of the cross-support members that are connected to the main support member at the relevant side as not to interfere therewith;

(ii) the downwardly directed ceiling elements attaching means includes a plurality of second flange portions spaced along the one side edge of the elongated adapter member over the full length thereof at locations different from any of the first flange portions, each of said second flange portions having engaging means for holding at least one of the edges of a ceiling element.

4,781,006

BOLTED CHORD BAR CONNECTOR FOR CONCRETE CONSTRUCTION

Harvey H. Haynes, 3803 Randolph Ave., Oakland, Calif. 94602

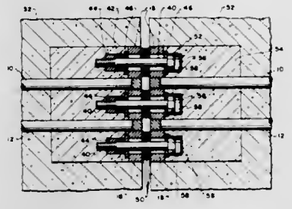
Continuation of Ser. No. 929,692, Nov. 10, 1986, abandoned. This application Dec. 4, 1986, Ser. No. 937,763
Int. Cl.[4] E04C *5/18*
U.S. Cl. 52—583 **4 Claims**

1. In a prefabricated tilt-up wall construction having chord bar connectors for joining adjacent walls, the improvement comprising:

flat rectangular steel face plate means, said face plate having at least four apertures; at least two of said apertures being substantially oversized bolt holes;

at least two elongate straight chord bars positioned perpendicular to said flat rectangular in two of said apertures, said at least two elongate chord bars being securely attached to said flat rectangular face plate;

said at least two elongate chord bars having a length selected to overlap with and be lap-spliced to reinforcing bars spanning substantially the entire width of said prefabricated concrete wall when said flat rectangular face plate is precast in said prefabricated concrete walls;



said elongate straight chord bar means with said face plate means being cast into prefabricated concrete wall panels with said face plate means flush with opposite end surfaces of said wall panel;

bolt means for bolting adjacent prefabricated concrete wall panels together by joining adjacent face plate means;

said bolt means including crushable washer means on said bolt shank between a nut threaded on said bolt shank and said bolt head for compensating for expansion and contraction of adjacent prefabricated wall panels when said adjacent panels are bolted together;

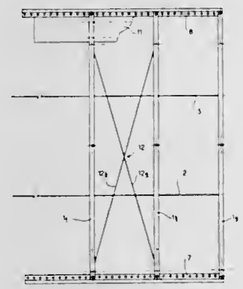
whereby prefabricated concrete wall panels may be safely and quickly erected and joined.

4,781,007

DEPLOYABLE WOODEN OSSATURE

Jean-Luc F. Bianchi, 40, rue des Canus, 78600 Maisons Laffitte, and Roland Y. Legrand, 4, Boulevard du Temple, 75011 Paris, both of France

Continuation of Ser. No. 795,849, Nov. 7, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 124,411
Int. Cl.[4] E04B *1/26*
U.S. Cl. 52—646 **9 Claims**



1. A deployable wooden ossature comprising,

truss means comprising a plurality of spaced apart mutually

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parallel vertical wooden elements having upper and lower ends;

said vertical elements being connected together by at least one strap which is sufficiently flexible to enable the vertical elements to be positioned in side by side adjacent relation to each other for storage and transportation;

said at least one strap being perpendicular to said plurality of vertical elements when the truss means is deployed;

lower rail means engaging the lower ends of said vertical elements when the truss means is deployed; and

upper rail means engaging the upper ends of said vertical elements when the truss means is deployed;

said at least one strap comprising means adapted to be tensioned between said vertical elements when said truss means is deployed, to strengthen the resulting structure.

4,781,008

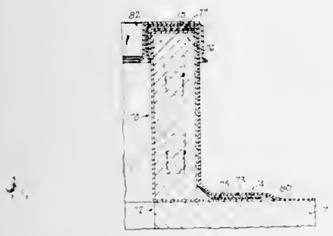
FRANE ASSEMBLY FOR BUILDING OPENING

George W. Lyons, Jr., Madison, Conn., assignor to The Bilco Company, New Haven, Conn.

Continuation of Ser. No. 884,413, Jul. 11, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 159,479

Int. Cl.[4] E04D *13/14*

U.S. Cl. 52—656 **17 Claims**



1. A frame assembly for surrounding an opening in a building surface and for adhering to a waterproof building surface membrane comprising:

a plurality of elongated curb elements,

each curb element having an upper edge, a lower edge and end surfaces,

each said lower edge being provided with a laterally projecting flashing strip,

each said end surface being provided with means for securement to an adjacent element, said means for securement comprising an aperture; and

a plurality of corner posts,

each corner post having at least two side surfaces, and

each side surface being provided with means for securement to an end surface of a curb element, said means for securement comprising an offset finger sized and located to engage in a curb end aperture;

said curb elements and corner posts being collapsible for shipment and assemblable to form the frame;

said curb elements being provided with a frame membrane material suitable for adhering to the waterproof building surface membrane.

4,781,009

STRUCTURAL COMPONENT AND A METHOD AND MACHINE FOR ITS MANUFACTURE

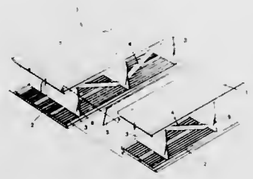
Erik A. Jonsson, Box 3411, Yckelsbo, S-82040 Järvsö , and Sven-Erik Fernaeus, Åkervägen 28 B, S-191 40 Sollentuna, both of Sweden

PCT No. PCT/SE85/00264, § 371 Date Feb. 26, 1987, § 102(e) Date Feb. 26, 1987, PCT Pub. No. WO87/00226, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 27, 1985, Ser. No. 30,960

Int. Cl.[4] E04C *2/50*

U.S. Cl. 52—793 **10 Claims**



8. An elongated, box-like structural component intended for use as a self-supporting floor component or the like comprising two mutually opposing side-members (1,2) which includes a top side member and a bottom side member and define a cavity therebetween and the mutually facing inner surfaces of which present longitudinally extending grooves, and between which side-members there are located distance pieces (3) having projections which engage respective grooves, said side-members (1,2) being intended to form the top and the bottom surfaces respectively of the floor structure, characterized in that each of said side-members (1,2) is provided with an upwardly facing groove along one longitudinal side edge of the structural component, and with a corresponding, downwardly depending tongue along the other longitudinal side edge of said component.

4,781,010

WRAPPING-PAPER FEEDING APPARATUS FOR USE IN COIN WRAPPER

Katusuke Furuya, Matsudo; Tomonari Sakurai, Urawa; Yoshio Oikawa, Warabi, and Katsuyuki Miyamoto, Urawa, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 832,998, Feb. 26, 1986, abandoned. This application Sep. 11, 1987, Ser. No. 97,340

Claims priority, application Japan, Mar. 20, 1985, 60-40420[U]

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—64 **9 Claims**

1. A wrapping-paper feeding apparatus for use in a coin wrapper, said feeding apparatus comprising:

paper feeding rollers for drawing wrapping paper out of a wrapping paper storage portion,

wrapping rollers for wrapping around accumulated coins the wrapping paper which is fed out of the paper feeding rollers,

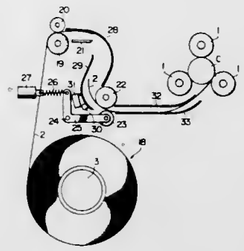
a cutter disposed downstream of the paper feeding rollers for cutting the wrapping paper,

paper cutting rollers disposed between the cutter and the wrapping rollers for selectively clamping the wrapping paper therebetween and for feeding the wrapping paper to the wrapping rollers only when the paper feeding rollers are stopped,

means for mounting said cutting rollers for relative movement toward and away from each other,

means for causing the paper feeding rollers to feed the wrapping paper a predetermined length in accordance with the kind of coins while the paper cutting rollers are stopped, and

means for causing the paper cutting rollers to feed the wrapping paper while at the same time the paper feeding rollers are stopped to thereby tension the wrapping paper between the paper cutting rollers and the stopped paper feeding rollers to engage the wrapping paper with the cutter to cut the wrapping paper a length suitable for wrapping the coins in accordance with the kind of coins,



tension detecting means for detecting tension on the wrapping paper as the wrapping paper is tensioned between the paper cutting rollers and the paper feeding rollers and for indicating when tension on the wrapping paper is released due to the cutting of the wrapping paper, means responsive to a release of tension on the wrapping paper due to the wrapping paper having been cut to separate the paper cutting rollers.

4,781,011

APPARATUS FOR PACKING FILLED BAGS IN BOXES

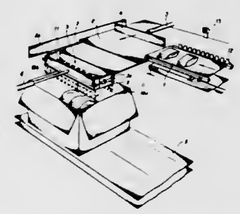
Bouwe Prakken, Spijkerlaan 9, 3471 Eg Kamerik, Netherlands

Filed Aug. 7, 1987, Ser. No. 82,556

Claims priority, application Netherlands, Aug. 13, 1986, 8602061

Int. Cl.[4] B65B *35/40, 35/32, 35/44*

U.S. Cl. 53—537 **10 Claims**



1. In an apparatus for packing filled bags into boxes which comprises a first receiving means, a first conveyor means for providing a row of overlapping filled bags on said first receiving means, a filled bag drip means, a second conveyor means for sequentially moving boxes beneath said filled bag drop means, and first pusher means for pushing a row of filled bags from said first receiving means to said filled bag drop means such that the row of filled bags will fall into a box positioned therebelow, the improvement wherein said drop means comprises a cassette means into which said row of filled bags can fall, a first bridging means extending from said cassette means to said first receiving means, and positioning means for moving said cassette means and said first bridging means towards and away from said first receiving means, thus determining where said row of filled bags falls into said box.

4,781,012

CLOSURE DEVICE FOR AN INJECTION MOULDING APPARATUS

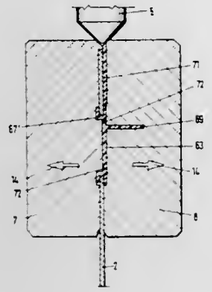
Wilhelm Reil, Bensheim, and Ulrich Deutschbein, Muhltal, both of Fed. Rep. of Germany, assignors to Tetra Pak Finance & Trading S.A., Pulley, Fed. Rep. of Germany

Division of Ser. No. 18,494, Feb. 25, 1987, Pat. No. 4,725,213. This application Oct. 15, 1987, Ser. No. 109,434

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606280

Int. Cl.[4] B65B *7/28;* **B29C** *65/02*

U.S. Cl. 53—452 **5 Claims**



1. A method for simultaneously producing a plurality of plastic endwalls having releasable, injection molded, closures thereon comprising the steps of:

a. moving a plurality of flat container endwalls, each defining an aperture therein, to a first predetermined point adjacent opened, closure mold parts with injection molding heads as portions thereof;

b. bringing a predetermined quantity of heated injection molding material to injection molding heads at said first point;

c. shutting said closure mold parts together over each of said aperatures to form a cavity thereon and flowing the material through said heads into the aperture within the closed molds;

d. opening said mold parts; and

e. moving said plurality of endwalls to a second predetermined point.

4,781,013

MAIL INSERTING AND COLLATING APPARATUS

John A. DePasquale, New York; Ivar R. Segalowitz, Great Neck, and Ceasar P. Andolfi, Bellerose, all of N.Y., assignors to J.A.D. Enterprises, Inc., New York, N.Y.

Division of Ser. No. 918,578, Oct. 14, 1986, Pat. No. 4,712,359. This application Oct. 9, 1987, Ser. No. 106,263

Int. Cl.[4] B65B *43/26*

U.S. Cl. 53—569 **4 Claims**

1. Mail inserting and collating apparatus comprising:

envelope conveyor means for continuously conveying a plurality of envelopes along a first path;

at least one envelope carrier means mounted on said envelope conveyor means and movable therewith, for holding said envelopes on said envelope conveyor means;

a plurality of insert hopper means for containing a plurality of stacks of inserts;

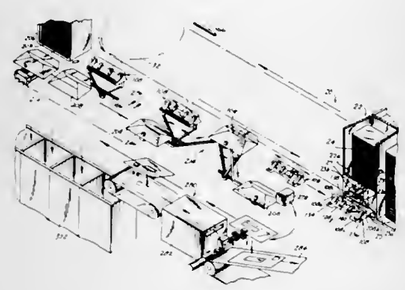
insert conveyor means for continuously conveying a plurality of inserts along a second path, at least a portion of said second path running substantially parallel and adjacent to said first path;

at least one pocket means mounted on said insert conveyor means and movable therewith, for holding said inserts on said insert conveyor means;

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removing means for selectively removing said inserts from said insert hopper means and supplying the same partially in said at least one pocket means;

pusher means for pushing said inserts further into said at least one pocket means; and

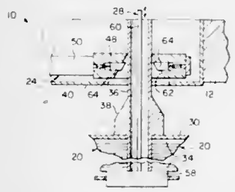


cam means for moving each envelope carrier means toward a respective pocket means at an insert and envelope merge station.

4,781,014
CORD LINE MOWER

Charles E. Conboy, Jr., R R 1 Box 455, Kula, Hi. 96790, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed May 18, 1987, Ser. No. 51,278
Int. Cl.[4] A01D *34/67, 34/73*
U.S. Cl. 56—12.7 **1 Claim**



1. A cord line mower which comprises:

(a) a support housing having a hollow open chamber extending downwardly therefrom;

(b) a plurality of wheels mounted to said housing to enable movement of said housing over a ground surface at a controlled height thereabove in a preferred direction;

(c) a spool assembly within said housing;

(d) a flexible non metallic cord line cutting element wound repeatedly within said spool assembly, said cutting element having two free unsupported lengths, each extending generally radially outward from an opposite side of said spool assembly during driven rotation thereof, the free unsupported lengths during cutting operations, define a plane substantially perpendicular to axis of rotation of said spool assembly to which the cutting element is wound thereto;

(e) a drive assembly for rotatably driving the spool assembly at a speed sufficient to extend and stiffen the lengthens of said cutting element to permit impact cutting of uncut grass particles thereby;

(f) a handle bar for manipulating said cord line mower; and

(g) means for lifting said spool assembly into said drive assembly for extending the unsupported lengths of said cutting element thus releasing extra lengths of said cutting element, wherein said spool assembly includes:

(a) a cord line housing having a pair of opposite side holes therein;

(b) a spool within said cord line housing for holding said cutting element; and

(c) a hollow shaft having an external bevel edge thereabout, said shaft extends upwardly from said cord line housing; wherein said drive assembly includes:

(a) a casing mounted into said support housing;

(b) a motor mounted on said support housing, said motor having a vertical shaft extending downwardly into said casing;

(c) a first pulley wheel connected to the vertical shaft in said casing;

(d) a second pulley wheel rotatably mounted in said casing around said hollow shaft of said spool assembly; and

(e) an endless belt placed around said first and second pulley wheels driven by said motor, wherein said lifting means includes:

(a) a plurality of rollers mounted to the top surface of said support housing;

(b) a plurality of eyelets mounted along said handle bar;

(c) a lever assembly mounted to upper portion of said handle bar;

(d) a spool lifter mounted to the underside of said cord line housing;

(e) an elongated cable affixed at one end to said spool lifter and extends upwardly through said hollow shaft over said rollers and through said eyelets with other end affixed to said lower assembly;

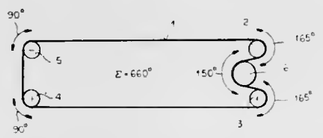
(f) said second pulley wheel having a cone shaped hole with a spring biased clutch mechanism therein so that when said lever assembly is manually activated said spool lifter will raise said cord line housing in which said bevel edge will engage with said clutch mechanism; and

(g) at least one cutter mounted within the hollow open chamber of said support housing to chop off the excess of the unsupported lengths of the cutting element.

4,781,015
TANGENTIAL BELT DRIVE

Friedrich Dinkelmann, Rechberghausen; Ernst Halder, Ebersbach/Fils, and Norbert Städele, Göppingen, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Fed. Rep. of Germany

PCT No. PCT/DE85/00401, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/07101, PCT Pub. Date Dec. 4, 1986
PCT Filed Oct. 16, 1985, Ser. No. 27,030
Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518998; May 31, 1985, 3519540
Int. Cl.[4] D01H *1/241;* **F16G** *1/14;* **F16H** *7/02*
U.S. Cl. 57—105 **21 Claims**



1. Tangential belt drive for a machine used in the production of twisted or twined yarns comprising:

a plurality of work units of the same kind arranged in at least one row next to each other, the work units being subdivided into sections with at least approximately the same number of units;

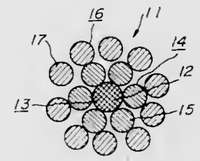
respective belt means including at least one endless tangential belt to drive said work units of each of said sections, said belt having a width between 7 and 15 mm and a thickness between 2 and 2.7 mm; and

at least one driving electromotor and guide means for said one of said tangential belts, the guide means for each tangential belt including a pair of guide rollers remote from said pulley and a pair of guide rollers engaged by the respective belt and proximal to the respective drive pulley, said guide rollers proximal to said drive pulley and said drive pulley being engaged by said belt means with respective contact angles and being positioned so that the sum of said angles is at least 360° for the belt means of each section, the guide rollers of at least some of said sections being common to and forming a guide means for the belt means of an adjacent section whereby the belt means of successive ones of said sections run substantially synchronously.

4,781,016
STEEL CORDS

Michitaka Sato, Kokubunji, and Toshio Sugawara, Higashiyamato, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 9, 1988, Ser. No. 154,170
Claims priority, application Japan, Feb. 16, 1987, 62-19997[U]
Int. Cl.[4] D02G *3/48;* **B60C** *9/00;* **D07B** *1/06*
U.S. Cl. 57—213 **6 Claims**



1. A steel cord comprising a core of a single steel filament, an inner sheath composed of six steel filaments spirally wound around the core, and an outer sheath composed of n steel filaments spirally wound around the inner sheath; filament number n of the outer sheath being within a range of 7~12, and a diameter of the steel filament constituting each of the core, inner sheath and outer sheath being within a range of 0.20 mm to 0.40 mm and satisfying the following relations:

(a)

$n = 7 \sim 11$

$d_c \geqq 0.04 + d_1$ and $d_1 \geqq d_2$

(b)

$n = 12$

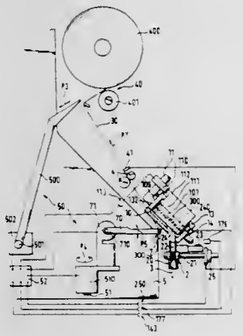
$d_c 0.04 + d_1$, and $d_2 \geqq 0.350\ (d_c + 2d_1) - 0.027$

wherein d_c is a diameter to the core (mm), d_1 is a diameter of the inner sheath (mm) and d_2 is a diameter of the outer sheath (mm).

4,781,017
PROCESS AND DEVICE TO PIECE TO AN OPEN-END FRICTION SPINNING DEVICE

W. Gerhard Hoeber, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE86/00318, § 371 Date May 8, 1987, § 102(e) Date May 8, 1987, PCT Pub. No. WO87/01742, PCT Pub. Date Mar. 26, 1987
PCT Filed Aug. 2, 1986, Ser. No. 55,627
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533587
Int. Cl.[4] D01H *15/00, 7/885*
U.S. Cl. 57—263 **51 Claims**



1. Process to piece to an open-end friction spinning device of the type having two spinning elements normally rotating in the same direction, and forming a nip therebetween in which fibers fed thereto are formed into yarn during such normal spinning rotation of the spinning elements, said process comprising the steps of: feeding fibers continuously to the nip; first removing the fibers from the nip without forming yarn therefrom; then driving the friction spinning elements in their normal spinning direction while terminating such fiber removal; subsequently back-feeding a free yarn end to the forming fiber accumulation in the nip from a piecing-readiness position of such free yarn end which position is located outside said nip; and then drawing continuous yarn off from the nip while continuously incorporating into such yarn the fibers being fed to the nip.

4,781,018
SOLAR THERMAL PROPULSION UNIT

James M. Shoji, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 26, 1986, Ser. No. 878,738
Int. Cl.[4] H05B *1/00*
U.S. Cl. 60—203.1 **3 Claims**

1. A space vehicle including a solar thermal propulsion unit for propelling the space vehicle comprising at least one controllable space vehicle regenerative engine including a rocket engine assembly, the rocket engine assembly further comprising in combination:

(a) a heating chamber communicating with a DeLaval nozzle and exhaust outlet wherein the heating chamber further includes,

(i) a solar window positioned at one end of the heating chamber;

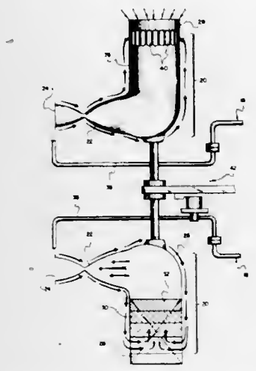
(ii) a solar radiation absorber assembly of graded porous material in stacked configuration retained within the heating chamber intermediate the solar window and the DeLaval nozzle, the graded porous material defined by a coated graphite matrix of increasing porosity from the solar window inwardly for the passage of solar radiation and the propellant to be heated therethrough, and

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the coated graphit matrix being coated with a composition which is selected from the group consisting of zirconium carbide, tantalum carbide, hafium carbide and combinations thereof;

(b) a propellant storage and delivery system for providing propellant to the rocket engine assembly;

(c) means for delivering propellant to the rocket engine heating chamber; and



(d) means for collecting, concentrating and delivering solar radiation to and through the solar window and into the solar radiation absorber assembly, the absorber assembly receiving concentrated solar radiation for heating a propellant passing through the absorber assembly and the DeLaval nozzle to impart thrust to the space vehicle.

4,781,019

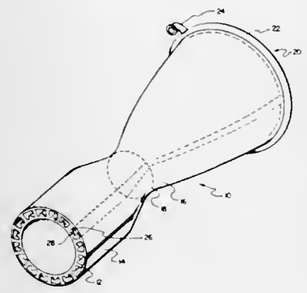
KEEL-RIB COOLANT CHANNELS FOR ROCKET COMBUSTORS

William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 481,550, Apr. 4, 1983, abandoned. This application Jul. 8, 1987, Ser. No. 70,638

Int. Cl.⁴ F02K *9/00*

U.S. Cl. 60—260 **4 Claims**



1. In a regeneratively cooled rocket combustor comprising a wall having a hot-side surface for defining the interior of said combustor, and a plurality of longitudinally extending, spaced apart coolant channels formed within said combustor wall, said coolant channels being substantially rectangular in cross-sectional shape with the long axis of the rectangle oriented radially with respect to the axis of said combustor, each of said coolant channels having interior surfaces and a roof, said roof being formed by the portion of said combustor wall situated between said hot-side surface and said coolant channel; wherein the improvement comprises at least one keel-rib formed within each coolant channel, each said keel-rib extending a minor fraction of the way into said coolant channel from said roof and being bounded by longitudinally extending arcuate flutes for providing smooth and continuous surface transition between said keel-rib and adjoining interior surfaces of said coolant channel, each said keel-rib extending said minor fraction for substantially the entire length of each said coolant channel.

4,781,020

STARTUP SLIP TEMPERATURE-RISE ALLEVIATING OUTLET VALVE FOR HYDROKINETIC COUPLING

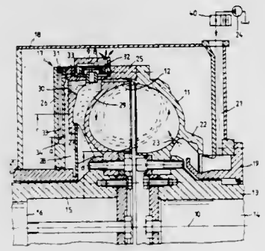
Bernhard Schust, Kressberg-Waldtann; Jürgen Liebe, Kirchberg/Jagst, and Heinz Höller, Crailsheim, all of Fed. Rep. of Germany, assignors to Voith Turbo GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 30,699

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610106

Int. Cl.⁴ F16D *33/10, 33/12*

U.S. Cl. 60—337 **11 Claims**



1. A hydrokinetic coupling, comprising:

a primary vane wheel and a secondary vane wheel mounted to rotate about a common axis of rotation, a toroidal working chamber fillable with a working fluid defined between the primary and secondary vane wheels;

a shell enveloping the primary and secondary vane wheels and coupled to the primary vane wheel to rotate therewith around the axis of rotation;

means for supplying working fluid that flows into the working chamber and from there into the shell;

an outlet port in the shell for continuously discharging working fluid outside the shell;

an outlet valve for selectively discharging working fluid outside the shell and an outlet valve body for controlling the outlet valve;

a control line for supplying control fluid to the outlet valve body, the control line having an inlet for control fluid;

a damping chamber in the shell, the inlet of the control line communicating into the damping chamber;

opening means in the damping chamber for entry of working fluid into the damping chamber in a manner such that the damping chamber is filled to a level determined by an instantaneous slip value that is established between the primary and secondary vane wheels; and

the inlet of the control line for the outlet valve being so positioned relative to the damping chamber that the outlet valve remains open above a predetermined slip value and closes below the predetermined slip value.

4,781,021

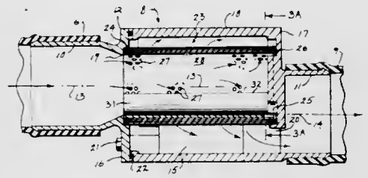
MARINE ENGINE EXHAUST MUFFLER ASSEMBLY

Arvid E. Winberg, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 29, 1987, Ser. No. 55,691

Int. Cl.⁴ F01N *3/02*

U.S. Cl. 60—309 **14 Claims**



1. For use in association with a marine engine (1) having means (6) for discharge of exhaust gases and spent engine cooling water, a muffler assembly (8) comprising, in combination:

(a) a gas-water inlet member (10) adapted to be connected to the discharge means of the engine,

(b) a gas-water outlet member (11) disposed downstream of said inlet member,

(c) a longitudinally extending muffler housing (12) disposed between said inlet and outlet members and with said housing forming a first chamber (15) in communication with said members,

(d) a muffler cartridge (23) disposed in said first chamber and with said cartridge forming a second chamber (28) therein,

(e) said cartridge including a body having perforation means (27) therein so that exhaust gases and spent engine cooling water are mixed and flow from said second chamber and outwardly through said perforation means into said first chamber,

(f) and means (31) for accumulating spent engine cooling water within said cartridge during engine operation.

4,781,022

SWASH PLATE TYPE HYDRAULIC SYSTEM

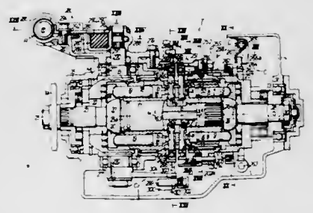
Tsutomu Hayashi, Tokyo; Nobuyuki Yagigaya, Chiba; Masaie Kato, Tokyo; Kazuhiko Nakamura, Kanagawa; Yoshihiro Yoshida, Tokyo; Yoshihiro Nakajima, Tokyo, and Mitsuru Saito, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,043

Claims priority, application Japan, Jan. 20, 1986, 61-9633; Mar. 24, 1986, 61-65485

Int. Cl.⁴ F16D *33/00*

U.S. Cl. 60—489 **45 Claims**



1. A swash plate type hydraulic system comprising a cylinder block having a number of cylinder bores annularly arranged therein, a group of plungers each slidably received in each of said cylinder bores, a swash plate engaging those ends of said plungers which protrude from said cylinder bores, and higher and lower pressure oil passages concentrically defined in said cylinder block in a manner distanced from each other, wherein the transfer of a working oil between said cylinder bores and said higher and lower pressure oil passages is conducted during relative rotation between said cylinder block and a member supporting said swash plate, and wherein a plurality of distributor valves are provided in said cylinder block in a radially arranged configuration for reciprocation between radially outer and inner positions to permit said respective cylinder bores to alternately communicate with said higher and lower pressure oil passages; an eccentric wheel is provided to abut against the outer ends of said distributor valves in such a manner to permit each of said distributor valves to reciprocate interlockingly with the relative rotation between the cylinder block and the swash plate supporting member when said eccentric wheel assumes a position eccentric with respect to a center of rotation of said cylinder block; and a shifting device is provided for shifting an eccentric relationship of said eccentric wheel with respect to the center of rotation of said cylinder block.

4,781,023

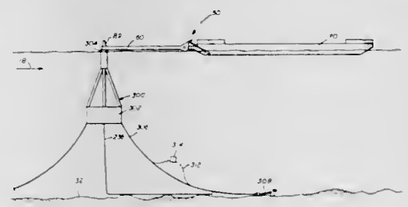
WAVE DRIVEN POWER GENERATION SYSTEM

Carroll K. Gordon, New Orleans, La., assignor to Sea Energy Corporation, New Orleans, La.

Filed Nov. 30, 1987, Ser. No. 126,969

Int. Cl.⁴ F03B *13/12*

U.S. Cl. 60—506 **68 Claims**



1. A power generation system for extracting energy from the motion of waves in a wave field and converting the energy into useful energy, comprising:

a floating structure rotatably connected to a mooring buoy by means of a yoke and allowed to move in heave and pitch in response to the motion of the waves in the wave field;

said mooring buoy acting as a stable reference platform to said floating structure;

energy extraction means extending between said floating structure and said yoke and responsive to said motion of said floating structure for extracting energy from the heave and pitch motion of the waves; and

energy conversion means disposed on said floating structure for converting said extracted energy into useful energy.

4,781,024

STATIC CUP SEAL ASSEMBLY FOR MASTER CYLINDER END

Kaoru Nakamura, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 21, 1986, Ser. No. 831,635

Claims priority, application Japan, Mar. 7, 1985, 60-033255[U]; Mar. 7, 1985, 60-033256[U]

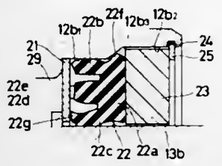
Int. Cl.⁴ F16J *15/18*

U.S. Cl. 60—533 **6 Claims**

2. In a master cylinder comprising; a cylinder body having a cylinder opened at one end; a piston having a large diameter

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portion slidably fitted in a small diameter portion of said cylinder and provided with a cup seal attached to one side of the large diameter portion for contact with an inner periphery of the small diameter portion of said cylinder, and a small diameter portion projected out of said cylinder; and a ring-shaped cup seal made of elastic material, arranged within a large diameter portion at one end of said cylinder in fixed relationship with respect to said cylinder body, and having an outer lip in contact with an inner periphery of the large diameter portion of said cylinder and an inner lip in slidable contact with an outer periphery of the small diameter portion of said piston, wherein a pressure liquid chamber is formed at one side of the larger diameter portion of said piston and a supply liquid chamber communicating with a reservoir is formed between the other side of the large diameter portion of said piston and said ring-shaped cup seal, the improvement comprising the inner lip of said ring-shaped cup seal being integrally formed at its distal end with an annular projection spaced from a first cup seal locking member, which is inserted in the large diameter portion of said cylinder and serves to prevent a movement of said



ring-shaped cup seal towards said supply liquid chamber, to thereby restrain deformation of said inner lip at least when said inner lip is deformed due to the negative pressure generated in said supply liquid chamber, said annular projection being formed to have a sharpened distal end in cross section, said ring-shaped cup seal being formed on an outer periphery of a base part with an annular convexity which comes into contact with a tapered region located between a small diameter region of the large diameter portion of said cylinder in which said ring-shaped cup seal is to be arranged and a large diameter region thereof in which is located a second cup seal locking member adapted to prevent said ring-shaped cup seal from moving out of said cylinder, at least when said outer lip is deformed radially inwardly due to the negative pressure generated in said supply liquid chamber, said annular convexity being pressed to the tapered portion of the cylinder so as to obtain a positive sealing effect when the outer lip is pulled by the negative pressure generated in the supply liquid chamber while also being unrestrained outwardly in the radial direction to avoid pressure contact between an inner periphery of the base part and the piston when the seal is expanded.

4,781,025

APPARATUS FOR THE HYDRAULIC TRANSMISSION OF MECHANICAL POWER AND FOR THE SIMULTANEOUS MULTIPLICATION OF THE SPEED OF ROTATION

Alfred Christ, Zürich, Switzerland, assignor to Sulzer-Escher Wyss AG, Zürich, Switzerland

Filed May 9, 1986, Ser. No. 861,442

Claims priority, application Switzerland, May 29, 1985, 02260/85

Int. Cl.⁴ F15B *11/00*

U.S. Cl. 60—536 **19 Claims**

1. An apparatus for hydraulically transmitting mechanical power and simultaneously multiplying rotary speed, comprising:

a hydraulic motor;

a hydraulic pump operatively connected to said hydraulic motor;

said hydraulic pump comprising a cam plate defining a cam profile, a power-input drive shaft for driving said cam plate and a predetermined number of plunger-and-cylinder units;

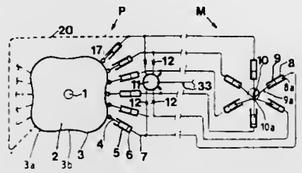
said cam profile comprising at least two cycles of substantially cyclical deviation from a base circle for multiplying the rotational speed between the hydraulic pump and the hydraulic motor in direct relationship to the number of said at least two cycles;

said predetermined number of plunger-and-cylinder units being substantially radially oriented relative to said power-input drive shaft for following said cam profile;

said hydraulic motor comprising a power-output drive shaft, a drive mechanism for driving said power-output drive shaft and a predetermined number of piston-and-cylinder units;

each plunger-and-cylinder unit comprising a plunger;

each piston-and-cylinder unit comprising a piston;



conduit means connecting each said plunger-and-cylinder unit to an associated piston-and-cylinder unit of said piston-and-cylinder units such that a mechanical motion imparted by said cam profile to said plunger is transmitted by a hydraulic medium to said associated piston-and-cylinder unit for imparting mechanical motion to said piston;

said pistons engaging said drive mechanism such that said mechanical motion conjointly imparts to said drive mechanism an eccentric motion;

said drive mechanism comprising eccentric drive means for converting said eccentric motion of said drive mechanism to a rotary motion of said power-output drive shaft;

each said plunger-and-cylinder unit and said therewith associated piston-and-cylinder unit defining conjointly with said conduit means connecting said plunger-and-cylinder unit to said associated piston-and-cylinder unit a respective hydraulic volume.

4,781,026

FLUID PRESSURE BRAKE BOOSTER FOR MOTOR VEHICLES

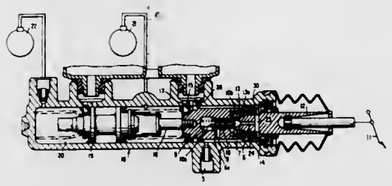
Hiromu Kuromitsu, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 680,565, Dec. 11, 1984, abandoned. This application Mar. 4, 1987, Ser. No. 22,602

Claims priority, application Japan, Mar. 22, 1984, 59-55657

Int. Cl.⁴ B60T *13/00*

U.S. Cl. 60—547.1 **6 Claims**



1. A fluid pressure brake booster for use in a motor vehicle, comprising:

(a) an accumulator for storing a working fluid under pressure supplied by a pump from a reservoir;

(b) a housing having an inlet port for introducing the working fluid stored in said accumulator and an outlet port for returning the working fluid into said reservoir;

(c) a piston slidably fitted in a cylinder bore in said housing;

(d) a pressure buildup chamber defined by said piston in said housing on one side of said piston and held in fluid communication with a wheel brake actuating cylinder;

(e) a power chamber defined by said piston in said housing on an opposite side of said piston;

(f) a manually operated control valve for normally keeping said power chamber out of communication with said inlet port and in communication with said outlet port, said manually operated control valve being responsive to a depression of a brake pedal operatively coupled therewith for bringing said power chamber out of communication with said outlet port and in communication with said inlet port;

(g) said housing having a compensating port held in communication with a reservoir for a master cylinder and positioned so that it will be out of communication with said pressure buildup chamber by a cup seal mounted on an end of said piston when the latter is actuated, and a supply port for introducing a brake fluid from said reservoir for said master cylinder into said pressure buildup chamber from behind said cup seal and around the cup seal;

(h) said piston having in an outer peripheral surface thereof a first axial slot communicating with said inlet port for guiding the working fluid from said inlet port to said control valve, a second axial slot communicating with said supply port, and a third axial slot communicating with said outlet port for guiding the working fluid from said control valve to said outlet port wherein said first, second and third axial slots are respectively located in a same predetermined axial plane on the axis of said piston; and

(i) a plurality of seals disposed respectively in said first and third axial slots for preventing the working fluid from leaking from said first and third axial slots to said second axial slot in between said piston and said housing.

4,781,027

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE WITH TWO EXHAUST GAS TURBOCHARGERS

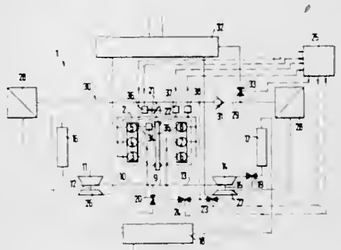
Axel Richter, Wimsheim; Jochen Lorenz, Ingersheim, and Ulrich Eger, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 72,755

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623540

Int. Cl.⁴ F02B *37/12*

U.S. Cl. 60—602 **41 Claims**



1. A multi-cylinder internal combustion engine, comprising at least two exhaust gas turbocharger means each including a turbine and a compressor driven by said turbine, a suction manifold, the compressors being operatively connected to said suction manifold by way of separate charging pressure lines, an exhaust gas manifold, separate exhaust gas line operatively connecting the turbines with said exhaust gas manifold, one of said exhaust gas turbocharger means being operable to be switched-in during the operation of the internal combustion engine to operate in addition to the other exhaust gas turbocharger means, a by-pass line from the exhaust gas manifold and by-passing the turbines of both exhaust gas turbocharger means, a controllable blow-off valve means in said by-pass line, a controllable switch-in valve means in the exhaust gas line of the turbine of the exhaust gas turbocharger means adapted to be switched-in, said check valve being operable to open after opening of the switch-in valve means by the pressure building up in the charging air line, electronic control means for controlling the blow-off valve means and the switch-in valve means in dependence on operating parameters of the internal combustion engine detected by sensor means, anticipatory control means for generating an anticipatory control signal in dependence on said operating parameters, regulating means for generating a regulation signal in dependence on at least a suction pipe operating parameter, and said electronic control means controls said blow-off valve means and said switching valve means as a function of both said anticipatory signal and said regulation signal.

4,781,028

TURBOCHARGED DIESEL ENGINE

Michael Zoche, Keferstrasse 13, D-8000 Munchen 40, Fed. Rep. of Germany

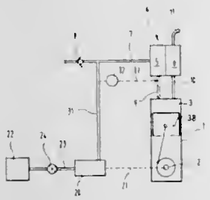
PCT No. PCT/DE86/00291, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/00576, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 16, 1986, Ser. No. 33,152

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526665

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 60—612 **4 Claims**



1. A diesel engine with an exhaust gas turbocharger and a compressed air starter, said turbocharger comprising a compressor and a turbine, the compressor communicating with a suction pipe (7) for sucking air into the compressor and with a pressure pipe (9) leading into a combustion chamber of the engine and the turbine communicating with an exhaust gas pipe (10) coming from the combustion chamber and with an exhaust outlet (11) leading into the open, and said compressed air starter being connected to mechanically drive a crankshaft (2) of the engine and having an exhaust air pipe (31) which is connected to drive the turbocharger (4) and to the combustion chamber of the engine, whereby during starting of the engine compressed air from the starter is fed to the combustion chamber and the turbocharger is driven by compressed air from the starter.

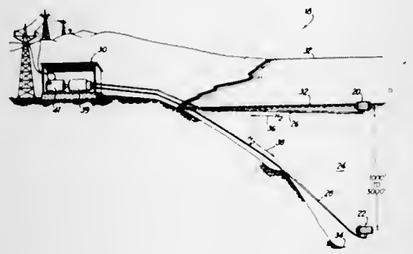
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,029

METHODS AND APPARATUS FOR OCEAN THERMAL ENERGY CONVERSION USING METAL HYDRIDE HEAT EXCHANGERS

Paul R. SerVaas, Indianapolis, Ind., assignor to Hydride Technologies Incorporated, Indianapolis, Ind.

Filed Jun. 5, 1987, Ser. No. 58,828
Int. Cl.[4] F03G 7/04
U.S. Cl. 60—641.7 18 Claims



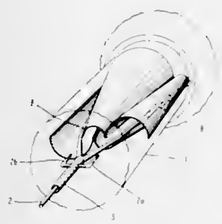
1. A thermal energy conversion system, comprising:
a. a means for converting the kinetic energy of pressurized hydrogen gas to another form of energy;
b. a metal hydride bed heat exchanger for supplying hydrogen gas to and receiving hydrogen gas from the energy conversion means; and
c. a means associated with the heat exchanger for changing the position of the exchanger in a body of water.

4,781,030

DUAL BURNER

Jean Hellat, Rütihof-Baden, and Jakob Keller, Dottikon, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jul. 21, 1986, Ser. No. 887,194
Claims priority, application Switzerland, Jul. 30, 1985, 3289/85
Int. Cl.[4] F02C 1/00
U.S. Cl. 60—743 5 Claims



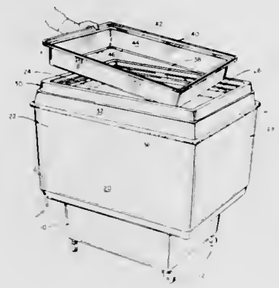
1. In a dual burner for generating hot gas of the type having supply systems for air and gaseous liquid fuels, and a swirler assembly, the improvement comprising:
a swirler assembly having an inlet end and an outlet end and including at least two doubly curved sheets folded along diagonal lines extending conically outward toward said outlet end, each of said doubly curved sheets having first and second curved fold faces, said first fold face forming an internal core which expands in the direction of said outlet end, and said second curved fold face forming an external core which contracts in the direction of said outlet end, said first curved fold having an edge extending in the direction of said outlet end,
fuel mains extending along said first curved fold face edges, said fuel mains being provided with fuel nozzles, and
a tangential air inlet extending along said inlet end.

4,781,031

FROST REDUCER FOR REFRIGERATED CABINET

Billy L. McElvany, 3540 W. Pioneer Pkwy., Arlington, Tex. 76013

Filed Jul. 8, 1987, Ser. No. 71,276
Int. Cl.[4] A47F 3/04
U.S. Cl. 62—255 6 Claims



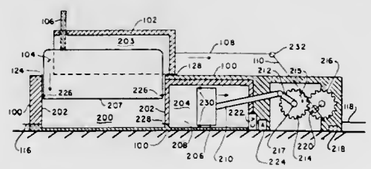
1. A cabinet for merchandising frozen foods comprising
vertical wall means defining a freezer compartment in said cabinet,
means defining an opening adjacent to portions of said wall means,
an open frame in said opening and having upper and lower opened portions in registry with said opening,
said frame including a wall extending between said upper and lower portions and a mounting ledge of said wall adjacent said upper opened portion,
said wall being spaced from said wall means whereby frost will accumulate on said wall and frost will be reduced on said wall means,
said ledge being supported on the adjacent top portions of said vertical wall means, and
said wall including a peripheral channel adjacent said lower opened portion.

4,781,032

ENERGY CONSERVING COMPRESSOR REFRIGERATION APPARATUS

Milburn E. Dupre, 2105 Chapel Dr., Fairborn, Ohio 45324

Division of Ser. No. 673,320, Nov. 20, 1984, Pat. No. 4,679,986.
This application Jun. 15, 1987, Ser. No. 38,262
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] F25B 1/00
U.S. Cl. 62—498 9 Claims



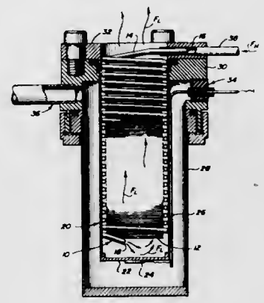
1. Refrigeration apparatus comprising:
a low-pressure to intermediate-pressure compressing apparatus including a movable free piston member fitted for reciprocal motion in a compressing cylinder and having a working side thereof exposed to a vaporizable liquid refrigerant medium and a worked-upon side thereof exposed alternately to atmospheric pressure and to pressure lower than atmospheric pressure;
means for compressing said refrigerant medium from said intermediate pressure to a higher pressure, said higher pressure including refrigerant medium temperatures above a predetermined coolant temperature;
condensing heat exchanger means for lowering the temperature of said higher-pressure refrigerant medium to said predetermined coolant temperature and condensing said refrigerant medium to the liquid state thereof; and
evaporating means located in communication with a heat-supplying closed atmosphere for converting said refrigerant medium from the liquid state to a gaseous state coincident with said low pressure and thereby cooling said closed atmosphere..

4,781,033

HEAT EXCHANGER FOR A FAST COOLDOWN CRYOSTAT

William A. Steyert, Center Valley, and Ralph C. Longsworth, Allentown, both of Pa., assignors to APD Cryogenics, Allentown, Pa.

Filed Jul. 16, 1987, Ser. No. 74,303
Int. Cl.[4] F25B 19/00
U.S. Cl. 62—514 JT 16 Claims



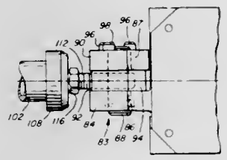
1. A heat exchanger for a fast cooldown cryostat having in at least one stage the combination of
a cold end located proximate to a Joule Thompson orifice,
a warm end located proximate to a source of high pressure fluid, said cold end and said warm end being separated by a distance dimension,
means for conducting expanded gas from said Joule Thompson orifice the length of said distance dimension to said warm end, said conducting means comprising a matrix defining a plurality of paths for said expanded gas from said Joule Thompson orifice to said warm end, and
means for conducting said high pressure fluid from said warm end to said Joule Thompson orifice at said cold end, said high pressure fluid conducting means being in heat exchange relation to said matrix throughout said distance dimension.

4,781,034

CRYOGENIC SUPPORT SYSTEM

Thomas H. Nicol, Aurora; Ralph C. Niemann, Downers Grove, and John D. Gonczy, Oak Lawn, all of Ill., assignors to Universities Research Association, Inc., Washington, D.C.

Filed Jun. 10, 1987, Ser. No. 60,682
Int. Cl.[4] F25B 19/00
U.S. Cl. 62—514 R 21 Claims



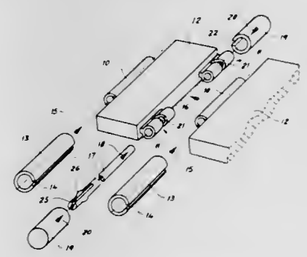
1. A cryogenic support system for restraining a cold mass assembly having a longitudinal axis, comprising:
an anchoring support member rigidly affixed at one end to a foundation and at the other end to the cold mass assembly;
a sliding support member spaced longitudinally from said anchoring support member, said sliding support member rigidly affixed at one end to a foundation and slidably supporting the cold mass assembly at the other end so as to permit longitudinal movement of the cold mass assembly but restrict lateral movement of the cold mass assembly;
a tie bar pivotally connected at one end to said anchoring support member and at the other end to said sliding support member, said tie bar disposed substantially parallel to the longitudinal axis of the cold mass assembly;
said tie bar comprising a rod having a negative coefficient of thermal expansion and a pair of end attachments affixed to opposite ends of said rod, each of said end attachments having a positive coefficient of thermal expansion;
whereby force directed along the longitudinal axis of the cold mass assembly is distributed by said tie bar between said anchoring support member and said sliding support member.

4,781,035

NON EXPANDING BRACELET WITH VISIBLE HINGES

Gaston Gagnebin, and Michel Cattin, both of Bienne, Switzerland, assignors to Omega S.A., Bienne, Switzerland

Filed Feb. 13, 1987, Ser. No. 15,187
Claims priority, application France, Feb. 14, 1986, 86 02128
Int. Cl.[4] A44C 5/10
U.S. Cl. 63—4 13 Claims



1. A non-expanding bracelet including a plurality of elements linked together in succession, each of said elements including a median knuckle on one side and two end knuckles on the opposite side, the median knuckle of one element fitting between the end knuckles of the neighbouring element so as to form in association with a connecting means a visible hinge, the

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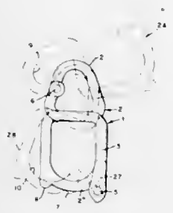
median and end knuckles being integral with the element of which they form a part and each being sheathed with a jacket for decorative purposes, the jacket covering the median knuckle comprising a tube which is longitudinally split and slid over said median knuckle prior to fitting in of the knuckles forming the hinge.

4,781,036
PIERCED-EAR EARRING WITH CHANGEABLE DECORATIVE EARRING ELEMENTS
Dolores Erickson, 16 Bel Aire Dr., Madison, Wis. 53713
Filed Oct. 16, 1986, Ser. No. 919,667
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 **4 Claims**



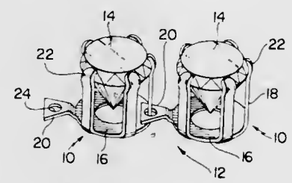
1. A pierced-ear earring assembly comprising: a post having a pointed end to be fired through an ear lobe of the wearer by a spring biased ear-piercing device; a generally cylindrically shaped front cap configured to be supported and guided within said ear piercing device removably attached to one end of said post; a rear cap constructed to be removably attached to the other end of the post after it has been fired through the ear lobe; and a decorative earring element constructed to be removably attached to said one end of said post after said front cap has been removed.

4,781,037
FASTENER UNIT FOR JEWELRY
Kopper Willibald, Worms-Horchheim, Fed. Rep. of Germany, assignor to Allgemeine Gold-und Silberscheideanstalt AG, Pforzheim, Fed. Rep. of Germany
Continuation-in-part of PCT DE85/00547, Dec. 20, 1985, published as WO86/04492, Aug. 14, 1986. This application Oct. 1, 1986, Ser. No. 916,722
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1985, 3503790
Int. Cl.[4] A44C *11/02, 7/00*
U.S. Cl. 63—13 **39 Claims**



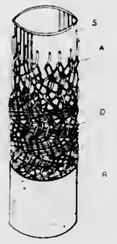
1. A fastener unit for jewelry comprising
a first fastening member forming a double hook, which is of inherently resilient construction with hook openings and where the hook openings are directed oppositely in about mirror image at both sides of a tension axis of the hook;
a second fastening member forming a generally double hook member;
a pivot mount means for the first fastening member and for the second fastening member wherein the pivot mount means is disposed near a respective end of the first fastening member and of the second fastening member, the first fastening member and the second fastening member being detachably connected at their other ends, such that the first fastening member can pivot to opposite sides of the tension axis in relation to the second fastening member around said pivot mount means forming a common axis; a counter detent disposed at a second end of the first fastening member;
a detent disposed at the second end of the second fastening member for releasably engaging the counter detent, whereby securing in position the first fastening member by its second end through the counter detent, wherein the first fastening member and the second fastening member hinged together are pivotable through 360 degrees crossing over the tension axis for the opening and closing of said hook opening and being so constructed that a pivotal movement in one direction opens one hook opening and closes the other and vice versa.

4,781,038
LINKABLE GEM SETTING
Robert G. Branca, No. Providence, R.I.; Robert H. Goretti, Attleboro, Mass., and Nicholas A. Cambio, Johnston, R.I., assignors to Hab Tool, Inc., Johnston, R.I.
Filed May 26, 1987, Ser. No. 54,878
Int. Cl.[4] A44C *5/10, 17/02, 27/00*
U.S. Cl. 63—26 **6 Claims**



1. In combination, a first gem setting comprising a first base element, at least three resilient upstanding first fingers on said first base element, said first fingers including inwardly facing recessed terminal mounting portions adjacent the terminal ends thereof and being adapted to be resiliently flexed to enable a gem to be snap received and retained in engagement in the mounting portions thereof without thereafter deforming the first fingers, and first engagement means extending outwardly from said first base element for engaging at least one finger of another gem setting of similar configuration in order to link said first gem setting thereto, a first gem snap received in engagement in the mounting portions of said first fingers so that it is supported in upwardly spaced relation to said first base portion, a second gem setting comprising a second base element, at least three resilient upstanding second fingers on said second base element, said second fingers including inwardly facing recessed terminal mounting portions adjacent the terminal ends thereof and being adapted to be resiliently flexed to enable a gem to be snap received and retained in engagement in the mounting portions thereof without thereafter deforming the second fingers, said first engagement means engaging at least one of said second fingers in order to link said first and second gem settings together, and a second gem snap received in engagement in the mounting portions of said second fingers to that it is supported in upwardly spaced relation to said second base portion, said first engagement means being engageable with said second gem and being thereby retained in engagement with said second fingers by said second gem.

4,781,039
CIRCULAR KNIT WITH WARP KNIT STRUCTURE AND METHOD OF MAKING SAME
Bojidar P. Ribarev; Savko T. Petrov; Veselin G. Mintchev; Kiril L. Kirilov; Yordanka P. Ribareva; Boryana B. Ribareva, and Hristo D. Popov, all of Sofia, Bulgaria, assignors to Institute Po Obleklo I Tekstil, Sofia, Bulgaria
Continuation of Ser. No. 820,933, Jan. 21, 1986. This application Aug. 17, 1987, Ser. No. 87,959
Claims priority, application Bulgaria, Jan. 22, 1985, 68484
Int. Cl.[4] D04B *9/12*
U.S. Cl. 66—9 A **3 Claims**



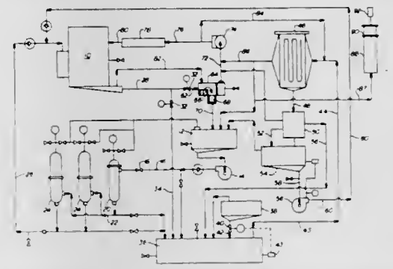
1. An article of manufacture comprising:
a flexible tubular core;
at least one knitted covering on said core, said covering consisting of a single system of seven warp yarns warp knitted in wales extending longitudinally along said core and courses extending around said core with each of said warp yarns having wale loops knitted into wales in successive courses and extending between said wale loops over and without looping and interlocking with at least one and less than all of said wales between said successive courses.

4,781,040
LATCH NEEDLE FOR KNITTING MACHINE
Fuji Koike, Nagoya, Japan, assignor to Loyal Kogyo Kabushiki Kaisha, Japan
Filed Jul. 6, 1987, Ser. No. 69,738
Claims priority, application Japan, Jul. 4, 1986, 61-103510[U]; Sep. 16, 1986, 61-141026[U]; Sep. 16, 1986, 61-141027[U]
Int. Cl.[4] D04B *35/04*
U.S. Cl. 66—121 **6 Claims**



1. Latch needle for knitting machines comprising an extended needle body plastically formed from a synthetic resin and consisting of a shank portion, a hook portion formed at one end thereof and a butt portion at the other end, said shank portion having a slot formed in the vicinity of said hook portion and defined by a pair of side walls, each having a hole, and a pair of oppositely slanted bottom walls; and a latch plastically formed from the synthetic resin and having a latch spoon at one end thereof and a pair of transversely protruded opposite pivots at the other end so that when said pivots are fitted in said holes the latch may be angularly moved alternately between the closed position where said latch lies on one of said slanted bottom wall near to the hook with the latch spoon resting on the free end of the hook and the open position where said latch lies on the other slanted bottom wall remote from the hook by an angle a little smaller than 180° which is defined by the inclination of said slanted bottom walls, in which rounded faces are formed on either of the pivots and the concerned portion of the side walls so that when the latch partly inserted in said slot is urged to move down the side walls are resiliently spreaded owing to wedge action to be caused by said rounded faces so that said pivots may engage with said holes and then the side walls may be brought into the initial positions by virtue of the flexibility of the synthetic resin.

4,781,041
APPARATUS FOR CLEANING GARMENTS AND SOFT GOODS CONTAMINATED WITH NUCLEAR, CHEMICAL AND/OR BIOLOGICAL CONTAMINANTS
David E. Fowler, Gainesville, Fla., assignor to Quadrex Hps, Inc., Gainesville, Fla.
Division of Ser. No. 679,641, Dec. 10, 1984. This application Oct. 27, 1986, Ser. No. 923,770
Int. Cl.[4] D06F *43/08*
U.S. Cl. 68—18 F **18 Claims**



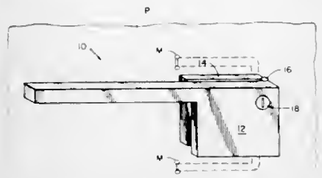
1. An apparatus for decontaminating garments contaminated with radioactive, toxin, biological and/or chemical contaminants comprising:
(a) a drum for supporting the contaminated garments;
(b) a pump for placing an initial charge of dry cleaning solvent in which the chemical contaminants are soluble within said drum during an initial wash cycle;
(c) means for draining said drum of the dry cleaning solvent with suspended particulate contaminants and dissolved chemical contaminants at the completion of the initial wash cycle;
(d) a primary solvent tank in fluid communication with said pump to supply said pump with dry cleaning solvent;
(e) a separate and distinct container into which said drum may be drained of contaminated solvent at the completion of the initial wash cycle;
(f) means for continuously circulating the dry cleaning solvent through said drum to remove additional contaminants during a secondary wash cycle;
(g) filtering means for continuously removing radioactive and/or biological particulate matter suspended in the solvent being continously circulated during the secondary wash cycle;
(h) adsorber means for continuously removing chemical contaminants dissolved in the solvent being continuously circulated during the secondary wash cycle.

4,781,042
AUTOMOBILE CHILD PREVENTION LOCKS
Rick J. Stephens, 1318 Oak Way, Glenwood Springs, Colo. 81601
Filed Oct. 2, 1987, Ser. No. 103,609
Int. Cl.[4] E05B *73/00*
U.S. Cl. 70—14 **1 Claim**

1. For use in a vehicle having an interior, at least one door, an interior door panel on the door, a U-shaped door actuating handle pivotally mounted on the door panel, a window operating lever rotatably mounted on the door panel;
a new and improved automobile child prevention lock system for preventing the operation of the door actuating handle and window operating lever of the vehicle from the interior, comprising:

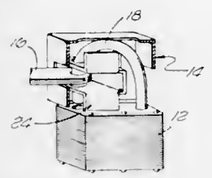
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first lock means for attachment to the U-shaped vehicle door actuating handle, for preventing operation of the handle;
said first lock means having first and second planar plate members connected by a hinge for movement between an open position and a closed position in which said first and second plate members extend in parallel overlying relation;
an elongated finger portion on said second plate member;,
means on said first and second plate members for locking said plate members in a closed parallel overlying position;



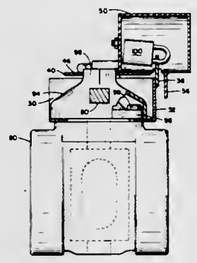
second lock means for attachment to the window operating lever, for preventing operation of said lever;
said second lock means having a hollow cylindrical barrel mounted within the door panel of the vehicle, adjacent the window operating lever, said barrel extending perpendicularly to the plane of the door panel;
a pair of recesses formed in said hollow cylindrical barrel;
a cylindrical plug dimensioned for reception within said hollow cylindrical barrel;
a radially extending L-shaped arm on said cylindrical plug adapted for receipt over the window operating lever;
a centrally disposed key operated lock cylinder in said cylindrical plug;
and
a pair of radially extendable projections actuated by said key operated lock cylinder and adapted for receipt in said recesses of said hollow cylindrical barrel.

4,781,043
SECURITY SHIELD FOR PROTECTION OF A PADLOCK
Charles P. Loeffler, 5573 Peacock La., Riverside, Calif. 92505
Filed Nov. 23, 1987, Ser. No. 124,166
Int. Cl.[4] E05B *67/38*
U.S. Cl. 70—54 **4 Claims**



1. A security shield for the protection of padlock of the type which has a body and a shackle, the shackle being of generally U-shaped configuration and having at least one free leg the security shield comprising:
a housing and a padlock positioned therein, said housing having a front and rear wall interconnected by a pair of side walls, a top wall interconnecting the ends of the front, rear and side walls to define an open ended box, said front wall having a locking port formed therein for enabling a hasp to pass therethrough, and an exit slot in said top wall for enabling said shackle outer end to pass therethrough;
a saddle secured to the interior said housing comprising a lower horizontal base and a upper horizontal base interconnected by an arm, said bases each having apertures therein for enabling the shackle free leg to pass therethrough and a shackle support element extending upwardly from said upper horizontal base for positioning said shackle with respect to said housing when said padlock is in a closed position, said housing enclosing said padlock shackle and the adjacent position of said padlock body when in a locked position.

4,781,044
SECURITY LOCK FOR VALVES
Dale R. Ortega, P.O. Box 54, Mutual, Okla. 73853
Filed Jan. 29, 1987, Ser. No. 8,563
Int. Cl.[4] F16K *35/10*
U.S. Cl. 70—177 **12 Claims**

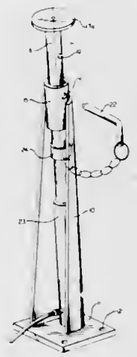


1. A security lock and cover for valves of the type having a rotatable valve stem extending through a valve bonnet which is attached to a valve body by a removable connector means, said cover comprising:
a bottom plate with means to attach said bottom plate to said valve, said bottom plate having upstanding vertical sidewall cover plates on at least two sides thereof, an upwardly extending lock lip means attached to one of said vertical sidewall cover plates;
a top cover plate means hingeably connected to one of said sidewall cover plates substantially covering the top of said valve, an opening in said top cover plate means of the same but slightly larger shape than said valve stem, through which the top of said valve stem is received.
a lock enclosure means attached to the top of said top cover plate means, a first opening means through said lock enclosure means to receive said lock lip means into said lock enclosure means, a second opening means into said lock enclosure means to accommodate the operation of a lock with said lock lip means to prevent the movement of said top cover plate means and said valve stem.

4,781,045
VEHICLE CHECKING AND STRAIGHTENING EQUIPMENT WITH INTERCHANGEABLE OPERATING HEADS
Germain Celette, Vienne, France, assignor to Celette S.A., France
Continuation of Ser. No. 846,861, Apr. 1, 1986, abandoned. This application Nov. 5, 1987, Ser. No. 119,232
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—31 **7 Claims**

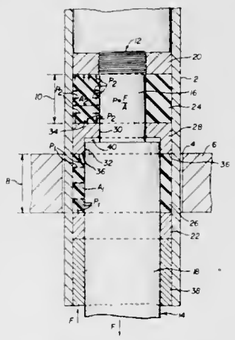
1. In a vehicle repair system for verifying the correct location of components of a damaged vehicle wherein the vehicle is secured to a checking bench having a plurality of spaced fastening holes formed therein for mounting locating devices for verifying the correct position of vehicle components during a repair process, the improvement comprising
a common base member having a mounting plate containing a plurality of spaced fastening holes by which said base member may be secured to fastening holes on the checking bench and a column member secured to the mounting plate and extending outwardly therefrom,
a sleeve member secured in said column member having an opening passing axially therethrough and an indexing bore passing radially therethrough,

a plurality of interchangeable heads for engaging a vehicle, each head having a common control rod that is receivable within the opening in said sleeve whereby the heads can be selectively changed in said column to carry out various functions,
each interchangeable head having a pin receiving bore extending through the control rod at a predetermined location for orientating the head relative to the sleeve so that upon the coaxial alignment of the indexing bore in the sleeve with the pin receiving bore, in a head, the head will be in a predetermined position relative to a vehicle secured to the checking bench,



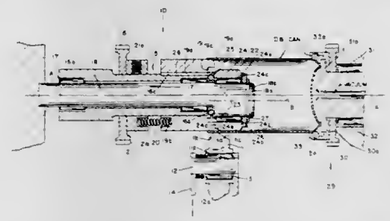
said column member being formed with a recess for receiving therein a removable force applying cylinder that is actuable to apply a correcting force to the vehicle through a selected one of said interchangeable heads, and
securing pin means for insertion through said coaxially aligned bores to fix said interchangeable heads in said base member relative to the checking bench.

4,781,046
TUBE EXPANDER
Jan S. Porowski, Pittsburgh, Pa., assignor to O'Donnell & Associates, Inc., Pittsburgh, Pa.
Filed Feb. 16, 1988, Ser. No. 156,530
Int. Cl.[4] B21D *39/20;* **B23P** *11/02, 15/26, 17/00*
U.S. Cl. 72—58 **2 Claims**



1. A tube expander capable of simultaneously applying a plurality of selected radial pressures at a plurality of sections of a tube interior which comprises a central road assembly having a plurality of diameters, a first rigid ring securedly attached around one end of said central rod assembly, a second rigid ring loosely mounted around said central rod assembly remote from said first rigid ring, at least one first elastomeric ring loosely mounted around at least one of said central rod assembly diameters, at least one second elastomeric ring loosely mounted around at least another of said central rod assembly diameters, a third rigid ring having portions thereof loosely mounted around each of said central rod assembly diameters disposed between said elastomeric rings and in axial contact therewith, the surface area of said third rigid ring in contact with said first elastomeric ring being different in size than the surface area of said third rigid ring in contact with said second elastomeric ring, said at least one first elastomeric ring being in axial contact with said first rigid ring, said at least one second elastomeric ring being in axial contact with said second rigid ring and means for moving said second rigid ring and said central rod assembly axially in directions relatively opposite to each other sufficient to compress said elastomeric rings.

4,781,047
CONTROLLED SPIN FLOW FORMING
Renato J. Bressan, Forked River, N.J.; Andrew Halasz, Crystal Lake, Ill.; Lawrence S. Maccherone, Severna Park, Md., and Eugen F. Ihly, Denver, Colo., assignors to Ball Corporation, Muncie, Ind.
Continuation-in-part of Ser. No. 758,394, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 542,309, Oct. 14, 1983, Pat. No. 4,563,887. This application May 2, 1986, Ser. No. 858,774
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] B21D *17/04*
U.S. Cl. 72—84 **14 Claims**



1. A method of spin rolling the open end of a cylindrical container body comprising the steps of
positioning inside the container body in axial inwardly spaced relation from the open end thereof an axially fixed sleeve engageable with the inside surface of the container body, said sleeve having a sloped end surface which faces the open end of the container body;
positioning inside the container body a holder which fits the inside diameter of the container body to support the same, said holder having an end facing the sloped end surface of said sleeve, and said holder being supported for axial displacement away from said sleeve, said holder end and said sloped end surface of said sleeve defining a gap therebetween;
positioning opposite said gap on the outside surface of the container body a roller supported for axial displacement away from said sleeve, said roller having a trailing end portion and a peripheral portion;
spinning the container body thus supported by said holder and advancing said roller radially inwardly relative to said gap so that said trailing end portion presented by the roller and said sloped end surface of said sleeve engage the container body between them while said trailing end portion of said roller moves inwardly along said sloped end surface of said sleeve to roll a neck into the container body; and
continuing to spin the container body while the roller moves inwardly and the holder retracts axially until the roller has spun an outwardly bent flange on to the end portion of the

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container body engaged between said holder end and said roller.

4,781,048

METHOD OF FORMING SPIRALLY WOUND GASKETS

Leslie Richardson, Ilkley, England, assignor to Flexitallic Limited, West Yorkshire, England

Filed May 6, 1986, Ser. No. 860,171
Claims priority, application United Kingdom, May 10, 1985, 8511923
Int. Cl.⁴ B21C *47/04, 47/08*
U.S. Cl. 72—146 **3 Claims**

1. A method of producing a spiral wound gasket formed by a plurality of superposed turns of strip material, said method comprising:

(a) progressively winding a metal strip between a pair of cooperating rollers;

(b) after winding at least one complete turn of said metal strip, introducing a strip of gasket filler material into the winding ahead of said pair of rollers to form superposed layers of said metal strip and said gasket filler material, wherein a discontinuity is formed in said winding when said gasket material is introduced; and, while continuing to wind said superposed layers of said metal strip and gasket filler material,

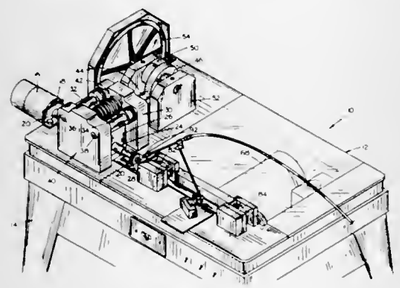
(c) positively separating said rollers at a predetermined rate to give a predetermined substantially constant rate of growth in diameter for a composite gasket section formed between said rollers, said rate being substantially without regard to any local variation in thickness of said layers.

4,781,049

APPARATUS FOR CREATING A FLORENTINE PATTERN ON A GOLD STRIP

William P. Farrar, and John L. Tomsik, both of Rapid City, S. Dak., assignors to Coleman-Frizzell, Inc., Rapid City, S. Dak.

Filed Jan. 20, 1987, Ser. No. 4,629
Int. Cl.⁴ B21D *73/00*
U.S. Cl. 72—220 **5 Claims**



1. An apparatus for creating a florentine finish on a flat metal strip for use in the manufacture of jewelry, comprising,

a support means adapted to have the flat metal strip positioned thereon,

means on said support means for longitudinally moving said strip with respect thereto,

a first power means on said support means, including a horizontally extending power shaft,

a movable florentining means operatively connected to said first power means which engages one side of said strip to create a uniform-depth florentine finish thereon as said strip is moved on said support means,

said movable florentining means including a rotatable cutting wheel means on said power shaft which is positioned above the strip and which is in contact therewith, the strip being moved parallel to the longitudinal axis of rotation of said power shaft, and

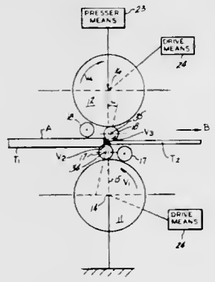
means for moving said cutting wheel means back and forth across the strip in a substantially transverse manner with respect to the direction of movement of the strip so as to impart a florentine finish thereon.

4,781,050

PROCESS AND APPARATUS FOR PRODUCING HIGH REDUCTION IN SOFT METAL MATERIALS

Joseph Winter, New Haven, and Michael J. Pry Woodbridge, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 21, 1982, Ser. No. 341,411
Int. Cl.⁴ B21B *13/14, 13/04, 35/08*
U.S. Cl. 72—241 **20 Claims**



1. A rolling mill for reducing the thickness of a strip material being rolled, said mill comprising:

at least two driven back-up rolls, each of said back-up rolls having an axis of rotation;

said axes of rotation defining a first plane;

at least two offset idler work rolls forming a roll bite through which said strip material passes in a desired rolling direction to effect a desired gage reduction in said strip material thickness, each of sid work rolls having an axis of rotation and being in contact with a respective one of said back-up rolls;

said work rolls being arranged so that said axes of rotation of said work rolls forming said roll bite are positioned on opposite sides of said first plane and define a second plane at an angle to said first plane;

means for applying a compressive force having a desired magnitude to said rolls to effect said desired gage reduction; and

means driving said work rolls forming said roll bite at a peripheral speed ratio less than the desired gage reduction but greater than zero for creating a first resultant frictional force acting in said rolling direction for at least partially driving said strip material through said roll bite, said work roll driving means comprising said work rolls being driven by respective ones of said driven back-up rolls.

4,781,051

ROLLING MILL STAND WITH AXIALLY SHIFTABLE ROLLS

Tilmann Schultes, Solingen, and Gerd Beisemann, Düsseldorf, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 16, 1986, Ser. No. 920,076
Int. Cl.⁴ B21B *27/02, 31/18, 29/00*
U.S. Cl. 72—247 **4 Claims**

1. A strip-rolling mill, comprising:

a mill stand;

a pair of upper and lower bottle-shaped working rolls in said

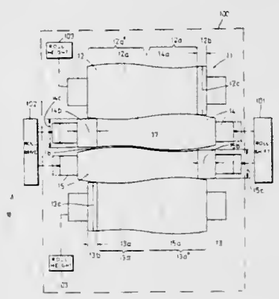
mill stand defining a rolling gap through which a strip workpiece is passed, said pair of working rolls being rotatable about respective axes of rotation, said working rolls each having:

a pair of journal pins at opposite ends of each working roll, and

a respective roll body between the respective pair of journal pins,

each of said bodies being continuously curved from one end of the working roll body over a respective curved portion to a location short of an opposite end of the respective working roll body, the curved portion of each of said working rolls being complementary to but inversely positioned with respect to the curved portion of the other working roll, each curved portion including

a convex portion increasing in diameter from the said one end of the respective roll body and then decreasing to



an intermediate location along the length of the respective roll body,

a concave portion continuously decreasing from said intermediate location and thereafter increasing to said location of the respective roll body short of said opposite end, the maximum diameter of said concave portion being less than the maximum diameter of said convex portion, and

a cylindrical portion of constant diameter beginning at said intermediate location of the respective roll body short of the opposite end and extending to said opposite end and lying immediately adjacent to the respective concave portion for reducing linear pressure peaks; and

means for shifting said rolls axially in opposite directions by a distance sufficient to effect change in shape of said gap and equal to the axial lengths of said cylindrical portions, each cylindrical portion of a respective roll body axially overlapping the convex portion of the other roll body.

4,781,052

ACTUATOR DEVICE FOR AXIALLY MOVING ROLLING MILL ROLLS

Günter Schiller, Kreuztal, Fed. Rep. of Germany, assignor to SMS Schliemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,552
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1985, 3544403
Int. Cl.⁴ B21B *31/18, 31/10, 35/14*
U.S. Cl. 72—247 **16 Claims**

1. In a rolling mill equipped with an actuator device for axially shifting driven rolls journaled by way of radial bearings in holding elements in a rolling mill frame, and equipped with means for imparting motive power to said actuator device, the improvement wherein:

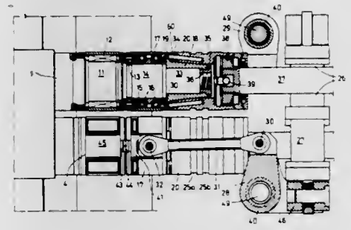
a drive-side roll journal portion of each roll is stepped to define a centering roll portion adjacent to a drive portion, and a journal portion adjacent to said centering roll portion;

a radial bearing engages each of said journal portions;

an axial bearing engages each centering roll portion and including a sleeve receiving the respective said centering roll portion

a bearing housing receives said axial bearing and is shiftable relative to said frame;

a hydraulic piston and cylinder is connected to each bearing



housing for axially displacing same and the respective roll at the respective centering portion;

at least one spindle head is axially couplable to said drive portion and axially positions said housing upon being shoved onto said drive portion, said centering roll portion and said drive portion being retractable through said sleeve for replacement of the respective roll by removing it axially from the frame; and

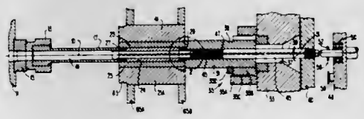
a driven spindle for imparting motive power is connected to said spindle head.

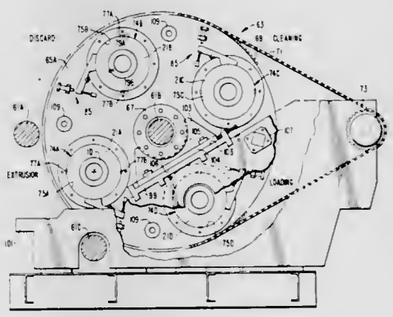
4,781,053

INDIRECT EXTRUSION PROCESS AND MACHINERY THEREFOR

Charles L. Stewart, 1733 Addison Rd., Palos Verdes Estates, Calif. 90274

Filed Mar. 5, 1986, Ser. No. 836,629
Int. Cl.⁴ B21C *23/02, 27/00, 33/00, 35/04*
U.S. Cl. 72—273.5 **19 Claims**





1. An indirect extrusion process for producing an extrusion

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product from a hot metal billet in a press having an extrusion axis, comprising:

providing a multiple container press turret having a plurality of press containers mounted about an axis of rotation of the press turret, and with the press containers each having an axial throughbore and being mounted on the press turret to be substantially axially stationary during extrusion of a billet;

mounting the pressure turret to be substantially axially stationary and rotatable about said axis of rotation for sequentially rotating the press containers, respectively, from a loading station off of the extrusion axis to an extrusion station in which the press container is coaxially aligned with the extrusion axis;

loading a die, a hot billet and a pressure disc into the axial throughbore of a container while such container is in the loading station so that the billet is sandwiched between the die and the pressure disc, with the die having an opening through which the billet is to be extruded to form an extrusion product and with the pressure disc having opposite radial faces and a maximum outer diameter between such faces which is slightly less than the diameter of the axial throughbore to define a diametrical clearance between the pressure disc and the press container;

rotating the turret to bring the loaded container into the extrusion station;

at the extrusion station, locating a bolster adjacent the radial face of the pressure disc which is remote from the billet and axially fixing the bolster to substantially prevent axial movement of the pressure disc in a direction toward the bolster during extrusion and so that the bolster exerts a relatively insignificant axial force against the container; and

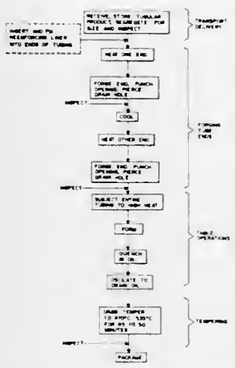
pressing an elongated stem having an axial passage into the throughbore of the container and against the die to press the die toward the bolster to cause the billet to be extruded through the die to create an extrusion product which exits the container through the axial passage in the stem, while extrusion of the billet through the diametrical clearance between the pressure disc and the container is substantially avoided.

4,781,054

APPARATUS FOR BENDING AND FORMING HEATED TUBULAR WORKPIECES

Peter A. Brown, Cambridge; Kenneth N. Jenkins, and Pouget, Paul A., both of Chatham, all of Canada, assignors to Rockwell International Suspension Systems Company, Canada

Filed Dec. 19, 1986, Ser. No. 943,468
Int. Cl.[4] B21D *11/04*
U.S. Cl. 72—306 **6 Claims**



1. Apparatus for bending and forming heated tubular workpieces including a straight central portion and double sigmoid curved opposed end portions, comprising:

a pair of central anvil elements that are radially closeable relative to an elongated tubular workpiece, one of said anvil elements being longitudinally extensible along the length of a workpiece to be secured by the anvil elements, the ends of said one anvil element having first sigmond curvatures;

a first pair of forming rollers adjacent the opposed ends of the one anvil element, and a first pair of actuators for moving the first forming rollers generally transversely of the axis of a workpiece past the ends of the one anvil element to first bend the workpiece into a generally trapezoidal shape between its center and its distal ends over the ends of the one anvil element and for retracting the first rollers after the first bending operation;

a second pair of forming rollers having second sigmoid curved peripheries for second bending the ends of the first bent workpiece completely around the first sigmoid curvatures on the one anvil element in close conformity therewith, and a second pair of actuators for moving said second rollers past the ends of the one anvil element and for withdrawing the second rollers after a third bending operation; and

a third pair of bending rollers adjacent the ends of the one anvil element for third bending a workpiece, and a third pair of actuators for moving the third pair of rollers adjacent and past the second pair of rollers for bending the distal end areas of a workpiece into second sigmoid curves conforming to the peripheries of the second pair of rollers and for withdrawing the third pair of rollers from the workpiece;

whereby, upon timed actuation of the anvil elements and the three pairs of linear actuators, a tubular workpiece may be clamped between the anvil elements, first bent to a trapezoidal shape, second bent to form a first sigmoid curve between its center and distal end areas, and third bent to form a reverse, second sigmoid curve at its distal end areas.

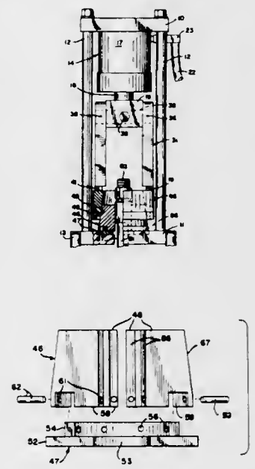
4,781,055

CRIMPING MACHINE

Wendle R. Phipps, Saginaw, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Continuation of Ser. No. 799,141, Nov. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 722,290, Apr. 11, 1985, abandoned. This application May 22, 1987, Ser. No. 53,580
Int. Cl.[4] B21D *39/04, 41/02*
U.S. Cl. 72—402 **11 Claims**

1. A machine for assembling a hose and fitting by crimping, comprising a base plate, a power unit connected to said base plate, said unit including a ram which is movable on a ram axis toward and away from said base plate, a die set movably positioned on said base plate during operation of the machine, the dies of said set being movable radially but immovably axially relative to said ram axis, a die bowl movably positioned on said die set, said die bowl and said die set having cooperating cam surfaces thereon, and two extensions attached to said ram, single point means pivotably connecting said extensions to said ram whereby said extensions are pivotable together relative to said ram on a single pivot axis which is perpendicular to said ram axis and said extensions are pivotable between an extended position where they are substantially parallel with said ram axis and a retracted position where they are at an angle with said ram axis, said extensions engaging said die bowl when said ram is moved toward said base plate, and said extensions being separate and spaced from said die bowl and said die set when said ram is moved away from said base plate, said die set further including a retainer plate and said dies being movably mounted on said retainer plate, means for interconnecting said dies with said retainer plate and limiting said movement of said dies to movement in the radial direction, said retainer plate being removably positioned on said base plate, and locating



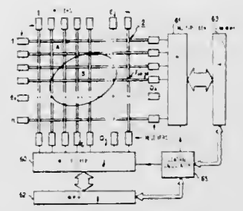
means for interconnecting said retainer plate with said base plate and locating said dies concentrically around said ram axis.

4,781,056

OPTICAL DEVICE FOR STRAIN DETECTION, METHOD FOR THE MEASUREMENT OF STRAIN BY MEANS OF THE SAID DEVICE AND THEIR APPLICATION TO SCALES

Jacques Noel, Saint-Cloud, and Jean-Claude Bocquet, L'Hay Les Roses, both of France, assignors to Sopha Praxis, Paris, France

PCT No. PCT/FR86/00071, § 371 Date Nov. 7, 1986, § 102(e) Date Nov. 7, 1986, PCT Pub. No. WO86/05273, PCT Pub. Date Sep. 12, 1986
PCT Filed Mar. 5, 1986, Ser. No. 934,614
Claims priority, application France, Mar. 7, 1985, 85 03356
Int. Cl.[4] G01L *1/24, 25/00;* **G01G** *3/12, 9/00*
U.S. Cl. 73—1 B **13 Claims**



1. An optical device for strain detection, which device comprises:

at least one optical fiber (1) disposed in such a manner as to form a network (2), said at least one fiber being disposed in such a manner as to form a regular meshed network, each mesh of the network being delimited by two weft lines (i) and two warp lines (j) which are successive and which are respectively constituted by said at least one fiber spaced according to a specified pitch, the spacing pitch of the warp and weft lines being equal to $k\lambda/2$ where k is an integer equal to or greater than 1 and where λ represents the critical period of the mechanical perturbation capable of coupling the groups of adjacent propagation modes, $\lambda=2\pi a/(2\Delta)^{\frac{1}{2}}$ where: a is the radius of the core of the fiber, $2\Delta=(1-n_g^2/n_c^2)$, n_g being the refractive index of the sheath of the optical fiber and n_c the refractive index of the core of the fiber respectively,

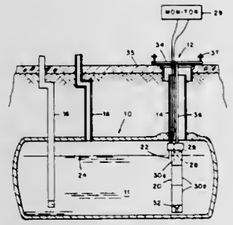
means for emitting light (E) which are disposed at one end, referred to as the entrance end of said at least one fiber and means for receiving light (R) which are disposed at the other end, referred to as the exit end, of said at a least one fiber, said receiving means (R) being capable of supplying information relating to the luminous intensity transmitted by said at least one fiber of the network and a corresponding measurement of the strain.

4,781,057

METHOD AND APPARATUS FOR DETECTING LEAKS IN A LIQUID-CONTAINING TANK

George J. Hyfantis, Jr., 346 Fallen Oak Clr., Seymour, Tenn. 37865; Richard A. Ellis, 1913 Red Fox La., Hixson, Tenn. 37343, and Reg W. McCulloch, 321 W. Heritage Dr., Farragut, Tenn. 37922

Filed Jan. 16, 1987, Ser. No. 4,117
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—49.2 **3 Claims**



1. Apparatus for detecting leaks in a liquid-containing tank comprising:

tank level sensing probe comprising heat transfer sensor means for sensing heat transfer along the probe for producing a signal corresponding to the level of liquid in the tank;

thermally-conductive reference cell means for being immersed in the liquid and for containing a volume of liquid isolated from flow communication with the liquid in the tank, said volume of liquid in said reference cell means having a surface being exposed to ambient conditions above the surface of the liquid in the tank;

support means for supporting the reference cell means in a fixed position immersed in the liquid in the tank with the surface level of the liquid in the reference cell being at approximately the same level as the level of the liquid in the tank;

reference level sensing probe comprising heat transfer sensor means for sensing heat transfer along the probe and producing a signal corresponding to the level of the fluid in the reference cell;

means for monitoring the signals produced by the tank level sensing probe and the reference level sensing probe over a period of time;

wherein said tank level sensing probe and said reference level sensing probe each comprise:

a main probe unit having first an second legs disposed in a side-by-side substantially parallel relationship;

a heater circuit having a heater segment for heating at least said first leg of said main probe unit and being disposed in an orientation extending along said first leg;

heated sensor means disposed proximate to said heater seg-

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ment for being heated by said heater segment and for sensing temperatures at a plurality of positions along said first leg;

non-heated sensor means for sensing temperatures at a plurality of positions along said second leg; and

circuit means connected to said heated sensor means and said non-heated sensor means for producing a signal proportional to the temperatures sensed by said heated sensors and said second sensors.

4,781,058

METHOD AND APPARATUS FOR MEASURING LOAD BEARING CAPACITY OF TRAFFIC-CARRYING SURFACES

Peter W. Arnberg, Odeng 75, 11322 Stockholm, Sweden, assignor to Peter W. Arnberg; Sten Engwall, both of Solna and Sture Tordhag, Vallingby, all of, Sweden, a part interest

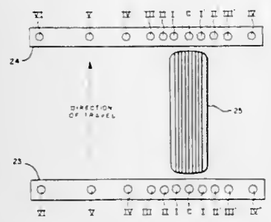
Continuation of Ser. No. 776,502, Sep. 16, 1985, Pat. No. 4,658,639. This application Jan. 22, 1987, Ser. No. 6,700

Claims priority, application Sweden, Sep. 17, 1984, 8404663

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.[4] G01N *3/40;* **G01B** *11/00*

U.S. Cl. 73—84 **16 Claims**



1. A method for measuring the load bearing capacity of a traffic-carrying surface, comprising the steps of:

(a) continuously transporting a load along said surface with at least one contact point between said load and said surface;

(b) measuring the elevation of the surface at a first plurality of points in front of said at least one contact point in a direction transverse to the direction of travel of the load and producing therefrom a plurality of first measured values;

(c) measuring the elevation of the surface at a second plurality of points corresponding to said first plurality of points behind said at least one contact point and producing therefrom a plurality of second measured values; and

d) determining the difference between each of said first plurality of measured values and each of said corresponding second plurality of measured values to generate a plurality of values defining a transverse profile of the surface.

4,781,059

METHOD AND APPARATUS FOR DETECTING COMBUSTION PRESSURE IN ENGINE

Seikoo Suzuki, Hitachiota; Masayuki Miki, Katsuta; Matsuo Amano, and Takao Sasayama, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

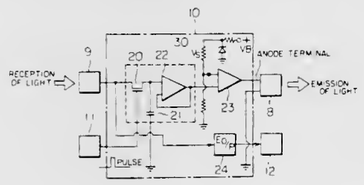
Filed Jul. 10, 1986, Ser. No. 884,037

Claims priority, application Japan, Jul. 10, 1985, 60-150240

Int. Cl.[4] G01L *19/04;* **G01M** *15/00*

U.S. Cl. 73—117.3 **10 Claims**

3. In an internal combustion engine, a chamber pressure detecting apparatus comprising a light sensor means, a portion of said light sensor means being positioned in the combustion chamber for detecting pressure in said chamber, a comparator having one input thereof connected to receive signals from the light sensor means and another input thereof connected to receive a reference signal value, and timing means for enabling an electrical signal from the light sensor means representative of a known combustion pressure produced at a predetermined angle of rotation of said engine to be applied to the comparator, whereby said electrical signal is compared with said reference signal value by said comparator to produce a difference value and an output of said comparator is connected to means for adjusting the light sensor means to bring said difference value toward zero so that error in said apparatus when detecting another electrical signal produced at pressures other than said known pressure is reduced.



4,781,060

SYSTEM FOR DETECTING WHEEL-DAMAGE

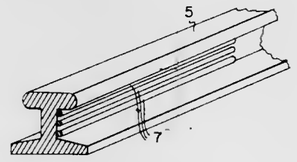
Dietmar Berndt, Koblenz, Fed. Rep. of Germany, assignor to Signaltechnik GmbH, Koblenz, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 100,305

Claims priority, application European Pat. Off., Mar. 17, 1987, 87103901.2

Int. Cl.[4] G01M *17/00*

U.S. Cl. 73—146 **8 Claims**



1. A system for detecting irregularities in the geometric shape of a railway wheel having a give circumference running on a rail having a head comprising a linearly expanding accelerometer (1) solidly joined to said rail and having a length equal to or longer than said circumference below said head of said rail (5) and in its longitudinal direction.

4,781,061

PROCESS FOR MONITORING THE GAS VOLUME IN AN HYDROPNEUMATIC ACCUMULATOR AND APPARATUS FOR CARRYING OUT THE PROCESS

Ulrich Baumgartl, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

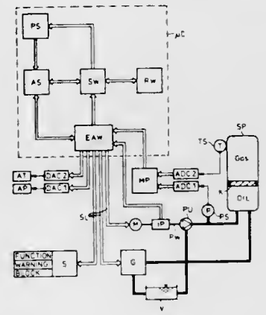
Filed Mar. 17, 1987, Ser. No. 26,823

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609701

Int. Cl.[4] G01F *17/00;* **G01M** *19/00*

U.S. Cl. 73—149 **10 Claims**

1. A process for monitoring the gas volume in an hydropneumatic accumulator comprising the steps of measuring the volume increase of the hydraulic fluid occurring at a given minimum hydraulic pressure, measuring the hydraulic pressure, and transmitting a signal depending upon the volume increase and the hydraulic pressure increase when there is insufficient gas volume in the accumulator, further comprising the steps of



detecting the temperature of the gas volume, determining a standard value for the volume increase proportional to the ratio of the gas temperature to the minimum hydraulic pressure, and comparing the volume increase causing the hydraulic pressure increase with this standard value.

4,781,062

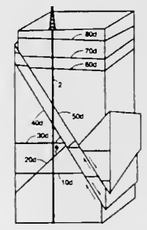
CONJUGATE FRACTURE SYSTEMS AND FORMATION STRESSES IN SUBTERRANEAN FORMATIONS

Thompson J. Taylor, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 23, 1987, Ser. No. 112,961

Int. Cl.[4] E21B *49/00*

U.S. Cl. 73—152 **11 Claims**



1. A method for identifying fault-related fracture systems in subterranean formation materials adjacent a borehole comprising:

scanning a record representative of depth, dip angle, and dip direction of generally planar subsurface features intersecting a borehole;

locating a set of fractures and deriving a measure of dip angle θ and dip direction ϕ for each fracture of the set producing a set of measures (θ,ϕ);

selecting a first subset and second subset of fractures each subset characterized by a different (θ,ϕ); and

determining an indicator of whether the selected first subset and second subset fractures are conjugate by deriving a measure of one of the included angle ψ opposite the borehole formed by intersection of a first subset fracture and a second subset fracture and the supplementary angle of ψ.

4,781,063

METHOD OF MEASURING ORIENTATION OF SHEET OR WEB LIKE MATERIAL

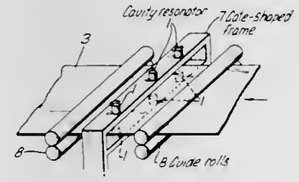
Shigeyoshi Osaki; Shinichi Nagata, and Yoshihiko Fujii, all of c/o Kanzaki Paper Manufacturing Co., Ltd., 1-11 Motomachi, Jyokoji, Amagasaki, Hyogo, Japan

Continuation of Ser. No. 781,649, Sep. 30, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 9,556

Claims priority, application Japan, Oct. 1, 1984, 59-205992

Int. Cl.[4] G01N *22/00*

U.S. Cl. 73—159 **3 Claims**



1. A method of measuring the orientation of the constituents of specimens of sheet or web like materials, the steps comprising:

preparing a cavity resonator in the form of a pair of waveguides forming a cavity, said waveguides having opposing openings with respect to one another to form a slit;

inserting a specimen sheet or web in said slit;

oscillating said cavity resonator by microwaves of fixed frequency while producing a rotation between said inserted specimen sheet or web and the plane of the microwaves of the cavity resonator;

measuring the amount of attenuation of the output signal or transmitted microwave intensity from said cavity resonator with respect to said exciting input signal, and measuring the orientation from the relation between said amount of attenuation or transmitted microwave intensity and the angle of said specimen sheet with respect to the cavity resonator;

slightly set shifting the oscillation frequency of said microwaves toward the higher side from the resonance frequency corresponding to an attenuation factor of about 0.3–5.5 dB in the output signal of the cavity resonator as measured when the specimen sheet or web is inserted in the slit and held therein at an angle relative to the cavity resonator.

4,781,064

PROTECTION FOR HYDRAULIC MACHINES

Maurice A. Yates, 4 Warren Park, Ottery-St-Mary, Devon EX11 1TN, United Kingdom

Continuation of Ser. No. 716,105, Mar. 26, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 946,126

Claims priority, application United Kingdom, Mar. 26, 1984, 8407740

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—168 **4 Claims**

1. A method for protecting a hydraulic machine comprising:

determining a design efficiency for the hydraulic machine;

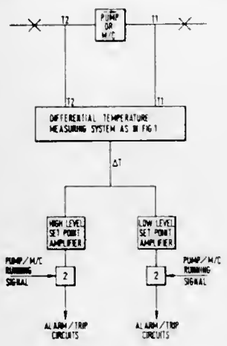
determining an unacceptable efficiency for the hydraulic machine;

calculating first and second values representative of said design efficiency and said unacceptable efficiency, respectively, said first and second values comprising temperature differences ΔT between a fluid inlet and a fluid outlet of the hydraulic machine when it is operating at said design efficiency and said unacceptable efficiency, respectively, ΔT being evaluated according to a predetermined formula which is premised upon an amplified relationship

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between efficiency and ΔT as efficiency varies from said design efficiency;

monitoring fluid temperatures at said fluid inlet and said fluid outlet during operation of the hydraulic machine;



calculating protection values comprising temperature differences ΔT between said monitored fluid inlet and fluid outlet; and

activating a signal when one of said protection values falls outside of a range between said first and second values.

4,781,065

SOLID-STATE ANEMOMETERS AND TEMPERATURE GAUGES

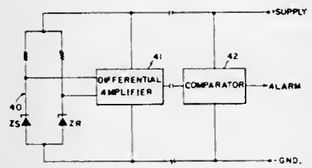
Martin T. Cole, 29 Stafford Street, Huntingdale, Victoria, Australia

Continuation of Ser. No. 731,674, May 7, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 40,592

Claims priority, application Australia, May 9, 1984, PG4919

Int. Cl.⁴ G01F *1/68*

U.S. Cl. 73—198 **6 Claims**



1. A solid state anemometer comprising:

(A) a differential temperature measurement circuit that includes:

i. a bridge circuit;

ii. a source of bias supply connected to opposite corners of said bridge circuit thereby to define two branches in shunt to said bias supply;

iii. each branch having in series a current limiting resistor and a Zener diode poled so that its P-N junction is back-biased by said supply; and

iv. means for connecting the conductor between said current limiting resistor and the associated Zener diode of each branch to respective output circuits whereat a differential output voltage can be sensed;

the values of said current limiting resistors and the breakdown voltage-current characteristics of said Zener diodes being substantially identical; the voltage of said bias source being sufficient to cause a reverse breakdown current of substantially equal value to flow through each of said Zener diodes, whereby when the temperature of said two Zener diodes is substantially the same over a considerable range of ambient temperatures the said differential output voltage is substantially negligible; and whereby, as the temperature difference between said Zener diodes increases over said considerable range of ambient temperatures, said differential output voltage varies substantially and correspondingly in linear relation to said temperature difference; wherein a first one of said Zener diodes is exposed to a fluid flow having a thermal influence, and a second one of said Zener diodes is isolated from said fluid flow and said thermal influence, such that heat developed by the reverse breakdown current through each of said Zener diodes is dissipated differently because of different exposures of said Zener diodes to said fluid flow; wherein said Zener diodes are not exposed to any heating influences other than self heating and said fluid flow, if any; and

(B) means for measuring the differential output voltage, if any, existing between said diodes caused by the cooling effect of said fluid flow, if any, said measured differential being an indication of fluid flow speed.

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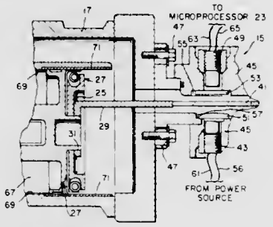
LINEAR SENSING APPARATUS FOR POSITIVE DISPLACEMENT METER

Kenneth L. Pope, Walkertown, and John S. McSpadden, Greensboro, both of N.C., assignors to Gilbarco Inc., Greensboro, N.C.

Filed Aug. 22, 1986, Ser. No. 899,324

Int. Cl.⁴ G01F *3/18*

U.S. Cl. 73—239 **19 Claims**



17. In a positive placement meter, including at least a first piston within a cylinder, a method for determining the volume of fluid passed through said meter over a given period of time, via monitoring of the linear movement of said piston(s) comprising relative to each piston of a said meter the steps of:

transmitting detectable energy perpendicularly across two parallel and opposing horizontal planes located within a space between two separate points, said space being in a volumetric area extending from and outside of said cylinder, the horizontal planes both intersecting a top face of said piston and being parallel to the central axis of said piston

permitting a predetermined portion of said energy to at all times pass from one of said points through a single aperture in one of said horizontal planes to the other horizontal plane;

alternately interrupting the flow of said detectable energy between the other of said planes and the other of said two separate points as a linear function of the movement of said piston;

detecting the alternately interrupted energy; and

producing electrical signals from said detected energy, the signals being analogous to the volume of fluid passed through said meter over the given period of time.

4,781,067

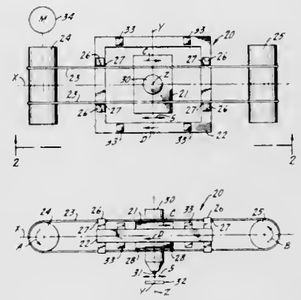
BALANCED SCANNING MECHANISM

Frank J. Cichanski, Elgin, Ill., assignor to Sonoscan, Inc., Bensenville, Ill.

Filed Apr. 30, 1987, Ser. No. 44,419

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—620 **18 Claims**



1. A balanced, null-inertia X axis scanning mechanism for an acoustic microscope or other instrument of the kind comprising a transducer and a scanning mechanism for moving the transducer back and forth relative to a specimen along an axis X and for shifting the specimen and transducer relative to each other along a transverse axis Y so that the specimen is scanned in a predetermined X-Y raster, the scanning mechanism comprising:

a first carriage and a second carriage;

guide means for guiding the carriages for movement along the X axis;

a transducer mounted on the first carriage;

the total mass of the second carriage being equal to the total mass of the transducer and the first carriage, and the distribution of each of those total masses being approximately balanced with respect to the X axis;

and drive means comprising two elongated linear drive elements located on opposite side of the X axis and each connected to both carriages, for driving the carriages reciprocally along the X axis, with accelerations and velocities which are equal in amplitude but opposite in direction;

the drive means being approximately symmetrical with respect to the X axis so that driving forces applied to the carriages are effectively balanced about the axis and so that a straight line between the centers of carriage mass and the line of carriage motion both correspond approximately to the X axis.

4,781,068

DIFFERENTIAL MASS FLOWMETER

Alessandro Pradelli, Finale Emilia, Italy, assignor to Bellco SpA, Mirandola, Italy

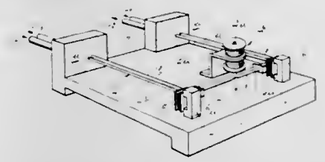
Filed Apr. 17, 1987, Ser. No. 39,397

Claims priority, application Italy, May 6, 1986, 20312 A/86

Int. Cl.⁴ G01F *1/84*

U.S. Cl. 73—861.38 **5 Claims**

1. A differential mass flowmeter including a pair of "U" shaped tube units mounted at the open end of the "U" to a support and extending therefrom in a cantilevered fashion and including means for oscillating the tube units relative to the support and signal generating means for generating a signal proportional to the angle of inclination assumed during oscillation by the portion of the tube units opposite to said support, wherein according to the improvement the tube units of said pair of "U" shaped tube units are arranged in a common plane and in side by side and coextensive relationship to each other and wherein the tube portions of said tube units opposite to said support comprise a cross-point in which said tube portions



cross each other and in which said tube portions are coupled to each other.

4,781,069

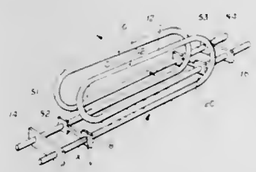
MODE SELECTION APPARATUS FOR MULTIPLE TUBE CORIOLIS TYPE MASS FLOW METERS

Erik L. Mitzner, Saratoga, Calif., assignor to Exac Corporation, Campbell, Calif.

Filed Jun. 5, 1986, Ser. No. 871,113

Int. Cl.⁴ G01F *1/84*

U.S. Cl. 73—861.38 **9 Claims**



1. A dual tube Coriolis mass flow sensor structure comprising:

a pair of tubular members which are spaced apart and extend generally in parallel, and which have corresponding longitudinal extremities joined together to provide parallel flow paths for flowing material;

drive means for applying oscillatory drive forces to both of said tubular members to cause portions between the extremities of said tubular members to oscillate relative to each other in a first mode of oscillation due to said drive forces, and to oscillate relative to each other in a second mode of oscillation due to Coriolis forces induced by the mass of material flowing through said tubular members;

motion detecting means disposed to detect Coriolis force induced motion of said tubular members as said material flows therethrough; and

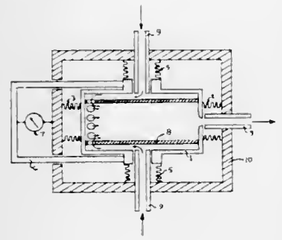
mode selection means including at least one elongated member

having distal ends rigidly affixed to respective ends of said tubular members so that said elongated member extends generally transverse to the longitudinal axes of said tubular members, and

having low stiffness about at least one axis passing through the intersection of said elongated member and the longitudinal axis of one of said tubular members, such that, for at least one of said modes of oscillation, said mode selection means does not provide a node said stiffness being selected to modify the vibrational stiffness of and shift the natural frequency of said sensor structure in one of said modes of oscillation relative to the natural frequency of said structure in the other of said modes of oscillation.

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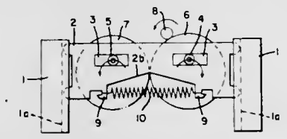
4,781,070
FLOW METER
Stephen Derin, 7224 Mardan Rd., Greenbelt, Md. 20770
Filed Aug. 6, 1986, Ser. No. 893,945
Int. Cl.[4] G01F *1/07*
U.S. Cl. 73—861.72 **15 Claims**



1. A flow meter for measuring the mass flow of a fluid comprising:
a chamber, having at least one inlet opening and at least one outlet opening, the inlet opening being essentially perpendicular to the outlet opening, the outlet opening being a curved funnel in shape, the chamber having a substantially larger cross-sectional inside area than the inlet opening, whereby a constant velocity profile of the fluid is formed at the outlet opening:
a meter housing;
a first conduit connected to the meter housing and aligned with and arranged axially with the inlet opening;
a second conduit connected to the meter housing and aligned with and arranged axially with the outlet opening;
a first expandible member connected at one end to the meter housing and at the opposite end to the inlet opening, the first conduit being arranged axially within the first expandible member, so that a closed fluid path is provided from the first conduit to the inlet opening of the chamber;
a second expandible member connected at one end to the meter housing and at the opposite end to the outlet opening, the second conduit being arranged axially within the second expandible member, so that a closed fluid path is provided from the outlet opening of the chamber to the second conduit;
a third expandible member connected at one end to the meter housing and at the opposite end to the chamber, the third expandible member being located directly opposite the outlet opening, whereby the third expandible member in cooperation with the second expandible member allows the chamber to move in an axial direction of the outlet opening;
means for balancing fluid pressures between the second and third expandible members;
an actuator connected to the chamber and actuated by and related to movement of the chamber in the axial direction of the outlet opening; and
means for determining the flow of the fluid through the chamber being responsive to the actuator.

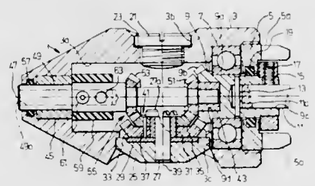
4,781,071
DEVICE FOR RECIPROCATING MOVEMENT
Arturo M. Gutierrez, Paseo del Pintor Rosales, 38, 28008 Madrid, Spain
Filed Dec. 23, 1986, Ser. No. 945,481
Claims priority, application Spain, Dec. 28, 1985, 291362
Int. Cl.[4] F16H *21/36*
U.S. Cl. 74—50 **4 Claims**

1. A device for providing reciprocating motion to obtain short length displacements, the device comprising: two gearwheels drivingly connected one to the other and having respective axes of rotation, drive means for rotating one of the gearwheels which acts as a driving wheel of the other gearwheel, each gearwheel having a frontal stud extending axially in displaced position in regard to its axis of rotation, a transverse member that can move vertically, the transverse member having opposite ends and including a pair of spaced slots to receive respective ones of the studs, vertical guide means arranged to receive respective opposite ends of the transverse member for reciprocating movement of the transverse member in the guide means, wherein one of the gearwheels includes an axially outwardly extending circular track that includes at least



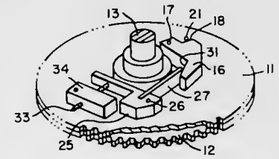
one opening, and wherein the track is concentric with the axis of rotation of the one gearwheel, and electrical contact means in contact with the track for controlling the operation of an electrical circuit by actuating the contact means when the contact means is opposite the opening of the track, and wherein one of the gearwheels drives a rotatable gear which has two outwardly extending concentric circular tracks, one of which tracks includes a gap at one point and the other track includes two diametrically opposed gaps, and electrical contact means in contact with each of the tracks for controlling the feeding of an electrical supply to the drive means.

4,781,072
MECHANISM FOR CONVERTING UNIDIRECTIONAL ROTATIVE MOVEMENT INTO ALTERNATING BIDIRECTIONAL ROTATIVE MOVEMENT
Oswald Tschudin, Basel, Switzerland, assignor to Institut Straumann AG, Switzerland
Filed May 26, 1983, Ser. No. 498,232
Claims priority, application Switzerland, Sep. 22, 1982, 5589/82
Int. Cl.[4] F16H *19/00, 55/17*
U.S. Cl. 74—318 **25 Claims**



1. A mechanism for converting unidirectional rotative movement into alternating bidirectional rotative movement comprising:
a drive shaft adapted for unidirectional rotative movement
a driven shaft adapted to be driven with alternating bidirectional rotative movement;
first gear means in continuous rotational connection with said drive shaft having gear teeth thereon;
second and third gear means on said driven shaft having gear teeth thereon;
said gear teeth of said first gear means being adapted to alternately engage said gear teeth on said second and third gear means in order to alternately drive said driven shaft in opposed rotative directions;
said gear teeth on said first, said second and said third gear means having a tooth pitch to with the gear teeth on said second and third gear means being offset relative to each other by an arc-length measured along pitch circles of said second and third gear means, which arc-length is not greater than one-fourth of said tooth pitch to.

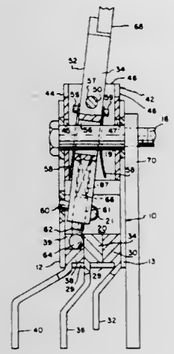
4,781,073
ADJUSTABLE ANTIBACKLASH GEAR SYSTEM
Bradley J. Bondhus, Laurel, and Wayne B. Lloyd, Catonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jun. 24, 1987, Ser. No. 70,840
Int. Cl.[4] F16H *55/24, 55/18*
U.S. Cl. 74—440 **4 Claims**



1. An antibacklash gear system, comprising:
a. a first gear having an aperture therein,
b. a second gear coaxial with the first gear, said second gear being mounted on the first gear for movement relative to the first gear about the axis of the gears,
c. a pin secured to the second gear and extending through the aperture in the first gear,
d. a first lever pivotally mounted on the first gear and having a surface positioned to engage the pin and move the second gear relative to the first gear,
e. a second lever pivotally mounted on the first gear,
f. a leaf spring secured to the second lever, said spring being positioned to engage the first lever to urge said surface against said pin, and
g. an adjustment screw mounted on the first gear for engaging the second lever to adjust the force applied to the first lever by the leaf spring.

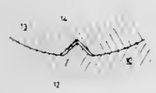
4,781,074
SHIFTER
Leonard C. Long, R.D. #2, Box 718A, Annville, Pa. 17003
Filed Apr. 13, 1987, Ser. No. 37,842
Int. Cl.[4] G05G *9/12*
U.S. Cl. 74—476 **20 Claims**

1. A shift control mechanism for an automotive transmission comprising
an outer housing,
at least two parallel shift rails arranged for sliding movement, each rail having a shift notch, said notches being aligned to form a single channel when the transmission is in neutral,
a shift lever pivotable in said housing, said shift lever having an extension extending toward said shift rails and spring



loaded there against, said extension having a distal end received in said channel.

4,781,075
CAMSHAFT AND METHOD OF MAKING THE SAME
Masaaki Yamaji, Misato, and Shunsuke Takeguchi, Yono, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 721,900, filed as PCT JP84/00123, Mar. 23, 1984, published as WO85/00863, Feb. 28, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 8,072
Claims priority, application Japan, Aug. 3, 1983, 58-140966
Int. Cl.[4] F16H *53/02*
U.S. Cl. 74—567 **5 Claims**



1. A camshaft comprising a steel shaft having at least one axial groove formed in the outer periphery thereof and a plurality of sintered alloy fitting members formed with a bore and loosely fitted on said shaft before being sintered, said bore containing at least one projection, said fitting member being mounted in position on said shaft through a fitting engagement between said projection and said groove and bonded to said shaft by liquid-phase sintering, wherein said projection is smaller, in cross-section, than said groove, and the clearance between said projection and said groove is larger than the clearance between said bore and said shaft before the fitting member is sintered while the clearance between the shaft and the bore is smaller than the radial sintering shrinkage of the bore, the inner periphery of said bore and the outer periphery of said shaft being metallurgically bonded to each other except at said projection and said groove, which are radially separated from each other after being sintered.

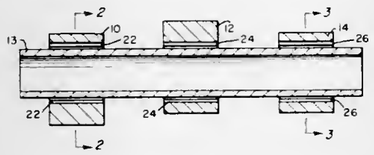
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CAMSHAFT FOR RECIPROCATING PISTON ENGINES

Michael J. Hartnett, Woodbury; Robert Lugosi, Canton; James Rollins, Winsted; John P. Cook, Simsbury, all of Conn., and Jeffrey A. Clark, Anderson, S.C., assignors to The Torrington Company, Torrington, Conn.

Filed Jan. 17, 1986, Ser. No. 819,837
Int. Cl.[4] F16H *53/00*; B21D *39/00*; B23P *11/02*
U.S. Cl. 74—567 **1 Claim**



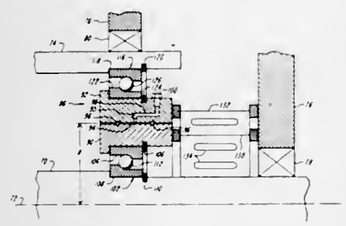
1. A camshaft for reciprocal piston engines comprising: a rotatable tube having an axis and an annular wall; axially spaced members including axially spaced cams and bearing rings mounted about the tube, the rotatable tube, cams, and bearings having the same axis; the rotatable tube having a plurality of circumferentially spaced projections extending axially through and from one longitudinally outermost member to and through the other longitudinally outermost member, said circumferentially spaced projections being spaced apart from each other, the projections being formed by expanding circumferentially spaced portions of the wall of the tube away from the axis of the tube, each cam and each bearing ring having circumferentially spaced axially extending grooves on their inner surfaces, said circumferentially spaced grooves being spaced apart from each other, each projection of the tube extending into a groove of each cam and a groove of each bearing ring to permanently secure the cams and bearing rings on the tube.

4,781,077

STABLE INTERSHAFT SQUEEZE FILM DAMPER

Aly El-Sahfei, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 19, 1986, Ser. No. 944,548
Int. Cl.[4] F16F *15/10*; G05G *1/00*
U.S. Cl. 74—573 F **16 Claims**



1. A dual shaft rotating assembly having a stable intershaft squeeze film damper for attenuating vibration, comprising:
a housing;
a first shaft rotatable about an axis of rotation;
a second shaft concentric with said first shaft and rotatable about said axis of rotation;
means for supporting each of said shafts from said housing while permitting each of said shafts to rotate independently;
squeeze film damper means positioned between said first shaft and said second shaft and defining an annular region containing a damping fluid for attenuating vibration of said first shaft and said second shaft; and
means for maintaining said damping fluid stationary relative to said housing.

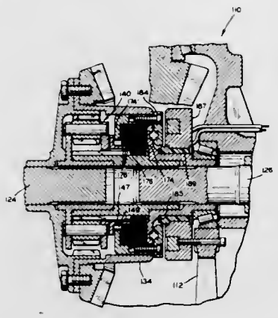
12. A dual shaft rotating assembly having a stable intershaft squeeze film damper for attenuating vibration, comprising:
a housing;
a first shaft for rotation at a first angular speed about an axis of rotation;
first bearing means for supporting said first shaft from said housing and for permitting rotation of said first shaft relative to said housing;
a second shaft concentric with said first shaft for rotation at a second angular speed about said axis of rotation;
second bearing means for supporting said second shaft from said housing and for permitting rotation of said second shaft relative to said housing;
squeeze film damper means positioned between said first shaft and said second shaft and defining an annular region containing a damping fluid;
a first intershaft bearing between said first shaft and said squeeze film damper means;
a second intershaft bearing between said second shaft and said squeeze film damper means; and
means for preventing rotation of said squeeze film damper means relative to said housing.

4,781,078

LOCKING DIFFERENTIAL WITH ELECTROMAGNETIC ACTUATED CLUTCH

Martin G. Blessing, Fort Wayne; Charles F. Heine, New Haven, and Richard L. Pifer, Fort Wayne, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 2, 1987, Ser. No. 9,831
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—711 **17 Claims**



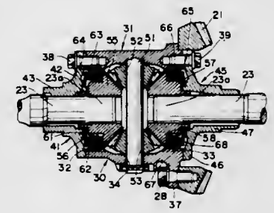
1. A limited slip differential gear assembly for driving each axle of a pair of coaxially aligned vehicle axles at the same relative speed and at relatively different speeds under various conditions, said assembly comprising: an outer housing, a differential gear mechanism rotatably mounted in said housing, means for connecting said axles to said differential gear mechanism, said differential gear mechanism having component parts operatively linking said axles to one another such that one axle can rotate relative to the other, said component parts having at least two members which rotate relative to each other during relative rotation between said axles, a clutch means capable of producing a variable resistance to differential rotation of said axles, said clutch means having a plurality of annular clutch disks with alternate disks being keyed to one of said two members and intermediate disks keyed to the other of said two members, said clutch disks being collectively designated as a clutch pack, said clutch means having a means for applying a remotely controllable first variable force laterally against the entire clutch pack to increase resistance to rotation between adjacent disks, and means for applying a supplemental force laterally against only some of said disks, said supplemental force applying means being responsive to continuing relative rotation of said axles after said first force has been applied.

4,781,079

DIFFERENTIAL CASE

Hirotake Takahashi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1986, Ser. No. 888,735
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—711 **4 Claims**



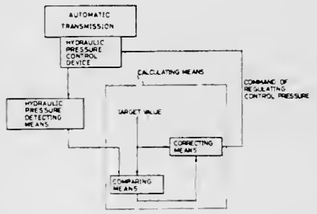
1. A differential case with a limited-slip mechanism, comprising:
a pair of axles held in coaxial relation to each other;
a pair of side gears mounted respectively on inner ends of said axles;
pinions interposed between and held in mesh with said side gears;
a case housing said side gears and said pinions therein and supported on said axles;
a clutch mechanism interposed between said case and each of said side gears and including a plurality of discs arranged for mutual frictional engagement;
said case comprising a one-piece central body having opposite open ends and caps attached to said opposite open ends, said central cylindrical body having grooves extending axially thereof and defined in an inner peripheral surface thereof on at least one of said opposite ends, said discs having portions engaging in said grooves for preventing rotation of said discs.

4,781,080

HYDRAULIC PRESSURE CONTROL DEVICE IN AUTOMATIC TRANSMISSION

Kunihiro Iwatsuki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 15, 1986, Ser. No. 942,071
Claims priority, application Japan, Jan. 7, 1986, 61-001165
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—867 **13 Claims**



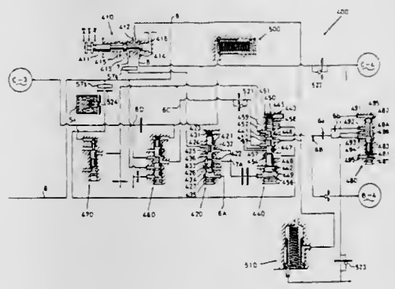
1. A hydraulic pressure control device in an automatic transmission, provided with a means for regulating control oil pressure in response to a command value from a calculating means, comprising:
means for detecting whether or not a defined period of time has passed since an affirmative shift judgment by said calculating means;
means for detecting whether or not engine load is substantially constant
means for detecting control oil pressure in said hydraulic pressure control device when said defined period of time has passed and said engine load is substantially constant and generating a detected oil pressure value;
means for comparing the detected oil pressure value with a target value and producing a comparison value; and
means for correcting the command value of said calculating means in accordance with the comparison value.

4,781,081

HYDRAULIC CONTROL FOR VEHICLE TRANSMISSION

Kazuhiko Shibata; Yoshinori Shibayama, both of Anjo; Kagenori Fukumura, Toyota, and Seiichi Nishikawa, Toyokawa, all of Japan, assignors to Aisin-Warner Limited, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 21, 1986, Ser. No. 820,361
Claims priority, application Japan, Jan. 19, 1985, 60-7784
Int. Cl.[4] B60K *41/04*
U.S. Cl. 74—868 **2 Claims**



1. A control device of a transmission for a vehicle comprising:
a shift mechanism connected between a first and a second hydraulic servo of the transmission to supply a line pressure to the first hydraulic servo and to discharge a line pressure to the second hydraulic servo,
an orifice control means provided between the shift mechanism and the first hydraulic servo for supplying a line pressure to the first hydraulic servo,
a first passage having an orifice provided between the shift mechanism and the orifice control means to supply a line pressure in the first passage to the first hydraulic servo through said orifice control means,
a second passage provided between the shift mechanism and the orifice control means to supply a line pressure thereto through the orifice control means, and
a third passage provided between the orifice control means and the first hydraulic servo to supply a line pressure thereto through the orifice control means, said orifice control means having
a spool,
a spring,
a first and a second port connected to the first passage,
a third port connected to the second passage, and
a fourth port connected to the third passage, whereby the first passage is connected to the third passage when an oil pressure between the orifice and the first port in the first

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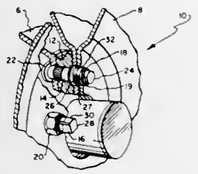
passage is lower than a set pressure and the second passage is connected to the third passage when the oil pressure between the orifice and the first port in the first passage is higher than the set pressure.

4,781,082

KIT FACILITATING REMOVAL OF WHEEL LUG STUD AND ASSOCIATED METHOD

Edward P. Swertz, 28 Williamstown Ct., Apt. 8, Cheektowaga, N.Y. 14227

Filed Mar. 16, 1987, Ser. No. 26,032
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—53.2 **9 Claims**



1. A kit facilitating the removal from a wheel of a damaged wheel lug stud having a shank-like portion defining a cylindrical periphery therearound, said kit comprising:

means defining a ribbed nut including an elongated body having a longitudinal axis and defining two opposite and parallel end faces, an exterior surface extending between said end faces and of such configuration to be operatively clasped by a conventional socket wrench, and a central through-aperture extending between said two end faces, said through-aperture providing said nut body with an interior surface adapted to grip the cylindrical periphery of the damaged stud so that the stud-gripping interior surface is defined by the nut body and thereby prevent relative rotation between the stud and said nut body when said nut is operatively driven upon the stud so that said through-aperture encircles the cylindrical periphery thereof; and

a drive-on tool defining an elongated rigid body having two opposite ends, one of said ends definng a recess adapted to loosely accept said nut body when said nut body is positioned endwise therein and including means for limiting the endwise movement of said nut body into said tool body so that said nut body can be positioned endwise within said recess and operatively driven upon the wheel lug stud as aforesaid as said drive-on tool acts as an intermediary member between said nut body and a driving tool so that once said nut body has been operatively driven upon the lug stud and said drive-on tool has been removed from said nut body, the lug stud can be unscrewed as said nut body is manipulated with a conventional socket wrench,

said interior surface of said nut body through-aperture defining a series of axially-extending grooves spaced circumferentially about said through-aperture and extending from one face of said nut body so as to form a series of radially inwardly-projecting edges extending axially along the nut body from said one end face, said inwardly-projecting edges collectively defining an opening extending into said nut body having a diameter which is slightly less than the diameter of the cylindrical periphery of the damaged wheel lug stud so that as said nut body is operatively driven upon said wheel lug stud, said inwardly-projecting edges cut axially-extending channels along the cylindrical periphery of the lug stud and the cooperation between said inwardly-projecting edges and the cut channels prevent relative rotation between the nut body and the lug stud,

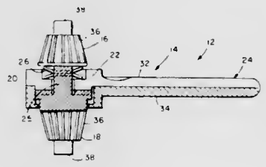
each groove in said interior surface of said aperture defining a beveled surface at said one end face so that the beveled surfaces of adjacent grooves collectively define a cutting edge which is sloped with respect to the longitudinal axis of said nut body so that when said nut is operatively driven said-one-end face first over the end of the lug stud, the sloped cutting edges of said nut body effectively funnel the lug stud toward said inwardly-projecting edges and thereby facilitate the driving of said through-aperture about the lug stud.

4,781,083

RATCHET KEY CHUCK TOOL

Henry G. Cummings, 208 Plymouth St., Holbrook, Mass. 02343

Filed Jul. 2, 1987, Ser. No. 69,298
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—63.1 **13 Claims**



1. A tool for tightening and loosening a chuck, said tool comprising:

(a) a one-way ratchet having a ratchet wheel, a pawl, tension means and a handle, said handle connected to said pawl, said tension means yieldably holding said pawl in driving engagement with said ratchet wheel when said handle is rotated in a first direction, said pawl being out of driving engagement with said ratchet wheel when said handle is rotated in a second direction;

(b) a shaft connected to said ratchet wheel, said handle rotatable about a longitudinal axis of said shaft; and

(c) a chuck key mounted on each end of said shaft;

(d) the chuck is tightened when engaged by one of said chuck keys and said handle is rotated in said first direction;

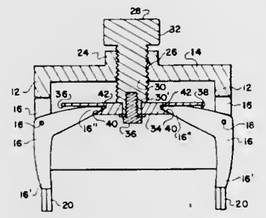
(e) the chuck is loosened when engaged by the other of said chuck keys and said handle is rotated in said first direction.

4,781,084

ADJUSTABLE SOCKET-TYPE WRENCH

Carson D. Steen, and Robby W. Steen, both of 402 Tillman Rd., Fort Mill, S.C. 29715

Filed Aug. 25, 1987, Ser. No. 89,314
Int. Cl.[4] B25B *13/28*
U.S. Cl. 81—111 **8 Claims**



8. An adjustable socket-type wrench particularly adapted for self-adjusted gripping engagement of automotive oil filter

cartridges of a range of peripheral sizes for applying removal torque thereto, said wrench comprising:

a socket member of a cup-like shape defining a generally cylindrical interior area for axially receiving one axial end of an oil filter cartridge,

at least three elongate gripping arms pivotably supported by said socket member in axial disposition at substantially equidistant circumferential spacings about said interior area of said socket member for radial movement of said arms inwardly and outwardly with respect thereto, each said gripping arm having a cam end disposed within said interior area,

operating means rotatably mounted threadedly to said socket member coaxially with its said interior area for axially reciprocal movement with respect thereto, said operating means including a head portion disposed exteriorly of said socket member for engagement by a conventional torque applying tool such as a wrench for actuating rotation of said operating means, and

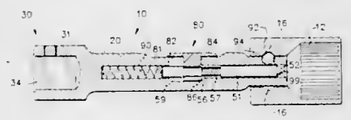
cam means disposed within said interior area of said socket member and fixed integrally with said operating means for rotational and axial movement integrally therewith, said cam means having a peripheral recessed channel which receives and retains said cam end of each said gripping arm and cam surfaces within said channel for engaging opposite sides of said cam ends of said gripping arms to cause coordinated radially inward pivoting of said gripping arms when said operating means and cam means are rotated counterclockwise relative to said socket member and said gripping arms to move in one axial direction relative thereto and coordinated radially outward pivoting of said gripping arms when said operating means and cam means are rotated clockwise relative to said socket member and said gripping arms to move in the other axial direction relative thereto, for selective gripping engagement of said gripping arms with and disengagement thereof from an oil filter cartridge received within said interior area of said socket member and for counterclockwise rotational movement of said socket member and gripping arms unitarily with said operating means and cam means upon gripping engagement of said gripping arms with an oil filter cartridge to rotationally apply removal torque thereto.

4,781,085

LOCKING SOCKET WRENCH EXTENSION

Leonard J. Fox, III, San Diego, Calif., assignor to Bayfront Investments, Inc., Encinitas, Calif.

Filed Dec. 30, 1987, Ser. No. 139,478
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—177.85 **4 Claims**



1. In an extension for use with the drive member of a socket wrench system comprising a shaft of predetermined length having a rear end and a front end, coupling means at said shaft rear end for coupling said rear end to a socket drive member, and receiving means at said shaft front end for torque transferring engagement with a socket; locking means for securing a socket onto said receiving means, said locking means being operable between a first position for positively locking a socket to the engagement means and a second position for releasing a socket; said locking means comprising:

a central bore within said shaft;

a radial cavity from said central bore thru said receiving means;

a thumb lever channel extending radially from said central bore;

a detent disposed in said radial cavity in said socket receiving means, said detent having a locking position wherein it protrudes out of said receiving means when the locking means is in its locking position so as to engage a socket and prevent its removal from said receiving means, and said detent having a releasing position wherein it resides substantially within said receiving means with a portion of said detent disposed within said central bore when said locking means is in its releasing position;

a locking bolt within said central bore including:

a front section;

a thumb lever receiving section; and

a thumb lever journal section;

said bolt being axially moveable such that as said bolt is moved from a release position to a locking position, its said front section contacts and moves said detent from its release position to its locking position;

biasing means for biasing said bolt in the locking position; and

a thumb lever disposed in said channel; said thumb lever having an inner end for engagement with said locking shaft and an outer end accessable by a person's thumb for axial movement for moving said bolt from its locking position to its release position; said thumb lever inner end including:

a bore for attachment around said journal section; and

an entry slot to said bore for passage therethru of said receiving section for attachment of said thumb lever to said locking bolt; and

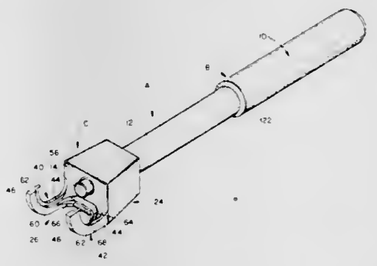
engaging means for engaging said bolt and thumb lever for axial movement of said bolt.

4,781,086

FLUID FITTING WRENCH

Lonnie E. Johnston, Bedford, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Filed Feb. 17, 1987, Ser. No. 15,352
Int. Cl.[4] B25B *23/14, 13/16*
U.S. Cl. 81—476 **7 Claims**



1. An adjustable wrench for particular use with tee and cross type fittings having first, second, and third branches, the third branch being orthogonally disposed relative to the first and second branches, said wrench adapted to retainingly grasp a fitting during operative adjustment of coupling members associated with the branches of the fitting, said wrench comprising:

a handle having a first actuating end and a second clamping end terminating in a generally smooth end face; and,

a body member adapted to receive an associated fitting therein, said body member having

(i) a base portion having an end wall and cooperatively receiving said handle second end, said handle being movable along a first axis relative to said base portion

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for selectively extending and retracting said handle second end from said base portion end wall,

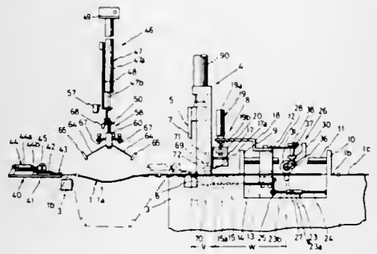
(ii) a clamping portion extending outwardly from said base portion end wall defining a generally open clamping cavity, said clamping portion including first and second generally parallel spaced sidewall members, each member being generally L-shaped with a first leg extending generally parallel to the first axis and having a recessed region adapted to receive a peripheral portion of the associated fitting, each member further including a second leg disposed generally perpendicular to the first leg, and generally parallel to said base portion end wall to define a second end wall, each second leg having a generally curvilinear surface adapted to facilitate abutting receipt of the first and second branches of the associated fluid fitting and each second leg extending outwardly from a respective first leg to an opposite side of the first axis from the first legs, said clamping portion further including an arcuate cutout region extending axially outward from said base portion end wall from between said sidewall members for abutting engagement with the third branch of the associated fluid fitting, said arcuate cutout region being disposed axially outward a predetermined dimension from said base portion to orient the third branch of the associated fluid fitting in substantially perpendicular relation to the first axis, said handle clamping end adapted to be selectively placed in clamping engagement with the associated fitting body by selectively extending said smooth end face from said base portion end wall to define four point contact with the associated fluid fitting that limits movement of the associated fluid fitting along the first axis and limits rotational movement of the associated fluid fitting relative to the body member.

4,781,087

APPARATUS AND METHOD FOR CUTTING TOWEL CLOTH

Yoshio Shibata, Aichi, Japan, assignor to Kabushikikiaisha Barudan, Aichi, Japan

Filed Apr. 14, 1987, Ser. No. 38,264
Claims priority, application Japan, Apr. 18, 1986, 61-89534
Int. Cl.[4] D06H *7/02*
U.S. Cl. 83—18 **3 Claims**



1. A method of cutting long towel cloth using a towel cutting apparatus which comprises:

(a) a pull-out device for pulling out towel cloth;

(b) a positioning device disposed along a conveyor path of the towel cloth pulled out by said pull-out device and adapted to, when the boundary of a flat fabric section and a subsequent piled fabric section of the towel cloth has arrived, stop the movement of said towel cloth while locking a leading end of the piled fabric section;

(c) a cutting device disposed along the conveyor path downstream relative to said positioning device in the direction of movement of the towel cloth and adapted to cut the towel cloth being positioned by said positioning device;

(d) a size measuring device disposed along the conveyor path upstream relative to said positioning device in the direction of movement of the towel cloth;

(e) an adjusting device adapted to, based on the measured value of said size measuring device, adjust the relative distance between said positioning device and said cutting device; and

(f) a correction device disposed above the conveyor path and downstream relative to said cutting device in the direction of movement of said towel cloth,

said positioning device comprising a pair of positioners disposed beneath and above said conveyor path of said towel cloth, respectively, for locking the leading end of the piled fabric section, each of said positioners having a width size larger than that of said towel cloth;

said size measuring device comprising means of discriminating the kind of cloth and means of measuring the length of cloth that has passed; and

said correction device comprising a support frame capable of moving up and down across the conveyor path, a movable frame coupled to said support frame to be movable up and down with respect thereto, a spring interposed between said support frame and said movable frame for normally urging said movable frame apart away from said support frame, a switch actuated to deliver an operation signal when said support frame and said movable frame are moved to approach against a resilient force of said urging spring, and a plurality of leaf springs arranged in the widthwise direction of the towel cloth, each of said leaf springs having the upper end attached to said movable frame and the lower end to which a pusher is attached,

said cutting method comprising the steps of:

pulling out the towel cloth by said pull-out device;

lowering said support frame of said correction device across the conveyor path of said towel cloth, causing said pushers to push down the towel cloth lying between said pull-out device and said positioning device to thereby further pull out said towel cloth;

measuring the length size of the flat fabric section of the pulled-out towel cloth by said size measuring device, during the process in which the towel cloth is additionally pulled out by said correction device;

adjusting the relative distance between said positioning device and said cutting device by said adjusting device based on the measured length of the flat fabric section, so that the spacing between said positioning device and said cutting device becomes equal to a half of said measured length, positioning the cutting device to sever said flat fabric sections along a line midway between piled fabric sections;

stopping the movement of said towel cloth with said positioners of said positioning device locking the boundary between the flat fabric section and the piled fabric section of the towel cloth, during the process in which the towel cloth is additionally pulled out by said correction device;

confirming the operation of said switch in said correction device;

confirming by said size measuring device that, after the boundary between the flat fabric section and the piled fabric section of the towel cloth past the location of said size measuring device, the towel cloth has moved by such a distance as allowing said boundary to reach the location of said positioners; and

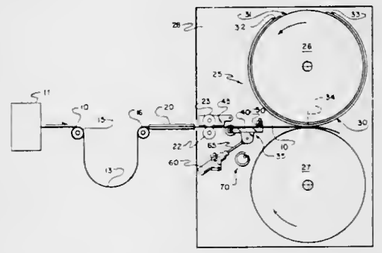
cutting said towel cloth by said cutting device after said two types of confirmation, whereby said towel cloth is secured in said flat section midway between ends of said piled fabric sections.

4,781,088

PNEUMATIC SCRAP REDUCTION SYSTEM FOR ROTARY DIE CUTTER

Barry J. O'Connor, Anderson, Ind., and Robert B. Vigder, Dayton, Ohio, assignors to Corfine Inc., Muncie, Ind.

Continuation-in-part of Ser. No. 51,262, May 5, 1987, Pat. No. 4,716,802, which is a continuation of Ser. No. 817,720, Jan. 20, 1986, abandoned. This application Dec. 23, 1987, Ser. No. 137,489
Int. Cl.[4] B26D *1/62, 5/00;* B65H *20/32*
U.S. Cl. 83—38 **5 Claims**



5. The method of minimizing the scrap web material between successive blanks cut from advancing web material in a die cutter system including a pair of die and anvil rolls which are mounted in a frame in nip-defining relation and cooperate to grip and pull the leading end portion of the web forward during each cutting cycle thereof and which release the cut leading end of the web during a portion of each complete revolution, said system also including means for feeding the web to said rolls, and means for maintaining a slack loop of web between said feeding means and said rolls whereby said rolls grip and pull the web from said slack loop, said method comprising the steps of

(a) holding the web against backward movement at a station in space between said loop and said rolls,

(b) creating a second loop in the portion of the web between said station and said rolls substantially immediately upon completion of said cutting cycle to retract the cut leading end of the web,

(c) controlling the size of said second loop to cause the retracted position of the cut leading end of the web to coincide with the angular position on said anvil roll where said die roll will engage said anvil roll at the start of the next cutting cycle, and

(d) releasing said second loop after the start of said next cutting cycle.

4,781,089

LONGITUDINAL CUTTING OF A FIBROUS TUBULAR PRODUCT

Gerard Gerber, and Andre Leblond, both of Choisy Au Bac, France, assignors to Isover Saint-Gobain, Aubervilliers, France

Filed Jul. 19, 1985, Ser. No. 757,091
Claims priority, application France, Jul. 20, 1984, 84 11512
Int. Cl.[4] B26D *1/04*
U.S. Cl. 83—51 **2 Claims**

1. A process for forming three longitudinal cuts in the shape of a step along a wall of a fibrous tubular product, comprising the steps of simultaneously:

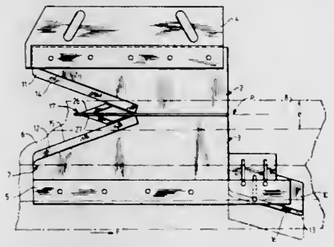
cutting from an inside surface of said wall of said fibrous tubular product radially outward to a depth within said wall to make a first cut,

cutting from an outside surface of said wall of said fibrous tubular product radially inward to a depth within said wall to make a second cut, said first cut and said second cut being approximately parallel and slightly displaced from each other,

cutting within said wall to make a third cut tangential to said wall and approximately perpendicular to said first cut and said second cut,

cutting from within said wall radially inward in the plane of said first cut to make a forth cut that joins said first cut, and

cutting from within said wall radially outward in the plane of said second cut to make a fifth cut that joins said second cut, said fourth and fifth cuts being made simultaneously with said first and second cuts, said third cut joining interior ends of said fourth and fifth cuts.

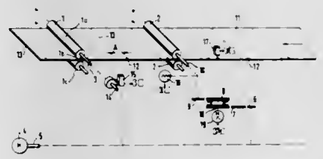


4,781,090

APPARATUS FOR SEVERING SECTIONS FROM A WEB BY TRANSVERSE SEVERING CUTS AT LOCATIONS RELATED TO PRINTED MARKS ON THE WEB

Richard Feldkamper, Lengerich; Herbert Fischer, Rheine, and Karl-Heinrich Feld, Lengerich, all of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Dec. 2, 1986, Ser. No. 936,692
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542923
Int. Cl.[4] B26D *5/34, 5/40*
U.S. Cl. 83—74 **3 Claims**



1. Apparatus for severing web sections from a moving web by transverse severing cuts at locations related to printed marks on the web, said apparatus comprising:

feed roll means for feeding a web in a web movement direction;

cutter means for cutting the web transverse to the web movement direction and spaced from said feed roll means in the web movement direction;

main drive means for driving said cutter means and said feed roll means;

differential transmission means for operatively connecting the feed roll means to said main drive means;

servomotor means for imparting a correcting rotation to the differential transmission means;

detector means for detecting printed marks on the web and for providing a mark signal;

sensor means for sensing the position of a cutter knife on said cutter means and for providing a knife position signal;

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controller means responsive to the mark signal and to the knife position signal for providing a control signal for controlling the servomotor means in dependence on a deviation of the spacing of successive printed marks for a theoretical web section length, wherein the servomotor means includes a stepping motor operative in response to said control signal, which represents the difference between the theoretical length of each web section corresponding to that distance which would be obtained between a cut and the next following cut if the servomotor was arrested, and the distance between the printed marks associated with said cuts, and shift register means having a plurality of register sections in a number corresponding to the number of printed marks disposed between said cutting means and said detector means for shifting in step with the movement of the printed marks past the mark detector and providing pulses in a number corresponding to said deviation detected for two consecutive printed marks, the pulses being stored in each register section, and wherein stepping pulses in the same number are delivered to the stepping motor when the preceding web section has been severed.

4,781,091

CONVEYOR SYSTEM FOR CONVEYING VENEER SHEETS WITH SPACINGS THEREBETWEEN

Takashi Nakaya, Onbu, Japan, assignor to Meinan Machinery Works, Inc., Japan

Division of Ser. No. 867,427, May 15, 1986, Pat. No. 4,681,002, which is a division of Ser. No. 703,542, Feb. 20, 1985, abandoned. This application Apr. 1, 1987, Ser. No. 41,069

Claims priority, application Japan, Feb. 22, 1984, 59-25147

Int. Cl.[4] B65H *35/08;* **B65G** *47/86*

U.S. Cl. 83—107 **1 Claim**

1. A conveyor system for conveying veneer sheets with spacings therebetween comprising:

supply conveyor means for supplying a one-piece veneer sheet in a predetermined direction;

rotary cutter means, operably mounted to said supply conveyor means and receivable of said one-piece veneer sheet, for cutting said one-piece veneer sheet into a plurality of veneer sheets of predetermined length measured in said predetermined direction, said plurality of veneer sheets each having a pair of sides transverse to said predetermined direction;

delivery conveyor means, operably connected to said rotary cutter means and receivable of said veneer sheets of predetermined length, for conveying said plurality of veneer sheets in said predetermined direction in side-by-side relation;

lower conveyor means, proximate to said delivery conveyor means and receivable of veneer sheets of predetermined length conveyed by said delivery conveyor means, for conveying said received sheets in said predetermined direction in spaced-apart relation, said delivery conveyor means and said lower conveyor means defining a lower veneer sheet path;

upper conveyor means for conveying veneer sheets of said predetermined length in said predetermined direction in spaced-apart relation, said upper conveyor means being disposed above said lower conveyor means and defining an upper veneer sheet path;

stick-and-carry conveyor means, disposed prior to said lower conveyor means and between said delivery conveyor means and said upper conveyor means, for picking up every other veneer sheet of said plurality of veneer sheets of predetermined length conveyed by said delivery conveyor means in said side-by-side relation and conveying said picked up veneer sheet to said upper conveyor means, said stick-and-carry conveyor means comprising a rotating roller having an axis of rotation and a circumferential length equal to an even number times said predetermined length of each veneer, said axis of rotation being disposed above said upper veneer sheet path, said roller having on the circumferential periphery thereof alternate sticking and non-sticking areas, each said area having a circumferential length substantially equal to said predetermined length of said veneer sheets, said sticking areas, upon rotaton of said roller, registering with and detachably engaging every other veneer sheet of predetermined length conveyed by said delivery conveyor means to pick up said detachably engaged veneer sheet from said delivery conveyor means and transport said picked up veneer sheet to said upper conveyor means; and

separation means, operably engaging picked up veneer sheets conveyed by said stick-and-carry conveyor means, for detaching said picked up veneer sheets from said stick-and-carry conveyor means and guiding said detached veneer sheets to said upper conveyor means.

4,781,092

APPARATUS FOR FEEDING BAR-LIKE WORKPIECE MATERIAL IN A SEVERING MACHINE

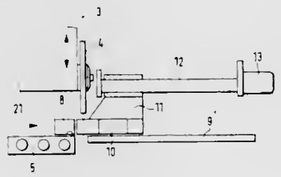
Ruprecht Gaiser, Baden-Baden, Fed. Rep. of Germany, assignor to Keuro Maschinenbau GmbH & Co., Achern-Gamshurst, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,193

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633691

Int. Cl.[4] B26D *7/06*

U.S. Cl. 83—153 **6 Claims**



1. An apparatus for feeding bar-like workpiece material in a severing machine, comprising a frame, said frame provided with a tool carriage mounted for vertical movement thereon, said tool carriage having a cutting means disposed thereon operable in a cutting plane, said frame further provided with a machine table for receipt of said bar-like workpieces from a magazine, means for loading said bar-like pieces and transmitting them in a material feed direction across said machine table, a pair of openable and closble chuck jaws disposed non-displaceably ahead of said cutting plane for holding said bar-like workpiece material on said machine table, a pair of openable and closable feed jaws disposed downstream of said cutting plane, said feed jaws adapted to grasp each piece of unworked workpiece material from a position astride said cutting plane and to advance same with said chuck jaws opened, a pair of openable and closable removal jaws disposed downstream of said cutting plane for displacement in said feed direction, said removal jaws adapted to grasp each said workpiece before completion of a severing operation and to remove said workpiece in said feed direction upon completion of said severing operation, said feed jaws adapted to be movable out of a displacement path of said removal jaws, said displacement path extending in the material feed direction.

4,781,093

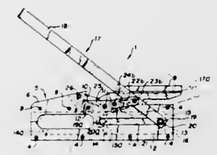
MULTI-POWER CUTTER

Edward F. Guenard, 1089 Kerwan Avenue, Coquitlam, British Columbia, Canada V3J 2J9

Filed Jul. 14, 1986, Ser. No. 885,076

Int. Cl.[4] B26D *3/16, 7/02*

U.S. Cl. 83—176 **7 Claims**



1. An apparatus adapted for cutting tubular objects comprising:

a main body;

cutting means movably positioned within said body;

first actuating means secured to said cutting means;

retaining means movable between an open position and a closed position and defining an area in which said objects are held before said cutting means;

second actuating means to permit opening and closing of said retaining means; and

lock means to prevent said cutting means from moving into the area defined by said retaining means when said retaining means is in the open position, whereupon moving said retaining means into the closed position to secure said objects within said retaining means, allows said first actuating means to be activated thereby allowing said cutting means to cut said object.

4,781,094

DEVICE FOR TRANSVERSELY CUTTING STRIPS OF DEFORMABLE MATERIAL

Massimo Moretti, Rome, Italy, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

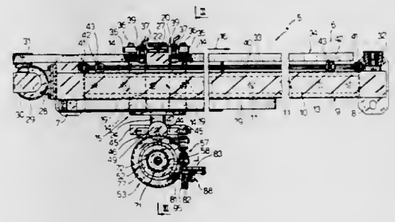
Filed Apr. 7, 1987, Ser. No. 35,423

Claims priority, application Italy, Apr. 8, 1986, 67281 A/86

Int. Cl.[4] B26D *3/02;* **B29H** *17/30;* **B65H** *35/04*

U.S. Cl. 83—488 **6 Claims**

1. A device for transversely cutting a strip of deformable material, said device comprising means for supporting a said uncut strip; a cutting blade positionable substantially tangent with the said supporting means and designed to move, in relation to the same, in a cutting direction transverse in relation to the said strip, said device further comprising pressure means located ahead of the said blade in the said cutting direction; the said pressure means being designed to move with the said blade in the said cutting direction and along a cutting line, and cooperating, in use, with the said strip for pressing down, onto the said supporting means and during the said cutting operation, an uncut portion of the said strip located immediately ahead of the said blade in the said cutting direction.



4,781,095

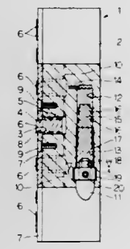
PUSHER

Minoru Yoshida, Nagoya, Japan, assignor to Kabushiki Kaisha Yoshida Shokai, Japan

Continuation of Ser. No. 696,093, Jan. 28, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,687

Int. Cl.[4] B26D *1/24;* **F15B** *7/00*

U.S. Cl. 83—502 **6 Claims**



1. A pusher comprising:

a body being formed in an annular shape and having an annular front surface and an outer circumferential surface;

a plurality of piston holes provided on said annular front surface of said body;

a first piston slidably fitted in each of said piston holes and a front end of each of said pistons extending outwardly of said annular front surfaces of said body;

an oil passage provided in said body in communication with a bottom portion of each of said piston holes;

a pressure chamber provided in said body and communicating with said oil passage;

a second piston slidably fitted in said pressure chamber;

a threaded hole provided on said outer circumferential surface of said body and communicating with said pressure chamber;

a threaded shaft threadably fitted to said threaded hole and having a top end abutting on said second piston and having a base end adapted to be engaged with advancing of said threaded shaft;

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oil provided in the bottom portion of each piston hole, the oil passage and the pressure chamber;

a pressure multiplying circuit in which the total cross-sectional area of all of said piston holes is set larger than the cross-sectional area of said pressure chamber;

said second piston is adapted to be pushed by said threaded shaft, and said first pistons are adapted to be pushed forwardly out of said annular front surface of said body through the oil by the threadable advancing of said threaded shaft with a force greater than the advancing force of the threaded shaft.

4,781,096

MUSICAL TONE GENERATING APPARATUS

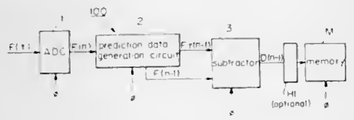
Hideo Suzuki, and Toshifumi Kunimoto, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 4, 1985, Ser. No. 784,842

Claims priority, application Japan, Oct. 9, 1984, 59-212381; Oct. 9, 1984, 59-212382; Oct. 9, 1984, 59-212383; Dec. 20, 1984, 59-269374; Dec. 20, 1984, 59-269375

Int. Cl.[4] G10H *1/06, 7/00*

U.S. Cl. 84—1.01 **20 Claims**



18. A data compression device for reducing the amount of memory space needed to store data representing sampled points of a musical tone, comprising:

prediction means for receiving a set of sample point values and calculating, from a subset of the received set of sample point values, a predicted value of one sample point whose actual value is a member of the sample set but not of the subset; and

difference generating means, coupled to the prediction means, for generating difference information representing the difference between the predicted value and the actual value of the one sample point.

4,781,097

ELECTRONIC DRUM INSTRUMENT

Shigeru Uchiyama, Sayama; Kazuhisa Nakamura, and Kenichi Tsutsumi, both of Tokyo, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 905,069

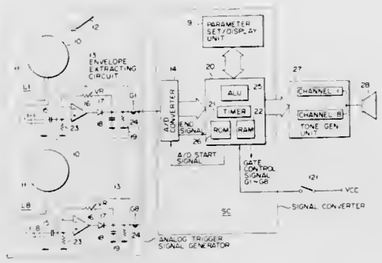
Claims priority, application Japan, Sep. 19, 1985, 60-207151; Sep. 27, 1985, 60-214123

Int. Cl.[4] G10H *1/057, 1/46, 7/00*

U.S. Cl. 84—1.13 **38 Claims**

33. An electronic musical instrument comprising means for generating an electric signal representing vibrations of a vibration member operative for musical performance, and tone generating means for generating a predetermined tone signal according to said electric signal from said signal generating means, said electronic musical instrument further comprising:

envelope-extracting means for extracting an envelope signal from said electric signal;



analog-to-digital conversion means for converting said envelope signal from said envelope-extracting means into a digital signal; and

control means for discontinuing the generation of tone from said tone generating means when the level of said digital signal from said analog-to-digital conversion means becomes a predetermined value or a value slightly lower than said predetermined value.

4,781,098

Patent Not Issued For This Number

4,781,099

MUSICAL QUIZ APPARATUS

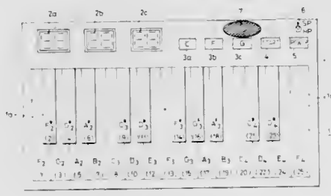
Tatsuhiro Koike, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 4, 1982, Ser. No. 439,290

Claims priority, application Japan, Nov. 10, 1981, 56-167210

Int. Cl.[4] G09B *15/00*

U.S. Cl. 84—470 R **4 Claims**



1. A musical quiz apparatus for presenting audible question chords and for answering such questions, comprising:

chord datum generating means capable of generating a plurality of kinds of different chord data respectively representing chords and generating a question chord datum one at a time as randomly selected from among said plural kinds of chord data, wherein said plural kinds of chords data contain data of a tonic chord, a subdominant chord and a dominant chord in each of a plurality of tonalities, and said chord datum generating means comprises:

tonality selecting means for selecting one of a plurality of tonalities;

tonality datum generating means connected to said tonality selecting means for generating a tonality datum indicative of the totality selected by said tonality selecting means;

root note designation datum generating means for randomly generating a numerical datum corresponding to either one of a tonic note, a subdominant not and a dominant note; and

root note datum generating means for receiving said tonality datum and said numerical datum for generating a root not datum indicative of a root note of either one of the tonic chord, subdominant chord and dominant chord in said selected tonality, whereby generating, based on said root note, said question chord data indicative of a root position of either one of the tonic chord, subdominant chord and dominant chord in said selected tonality;

musical tone forming means supplied with said question chord datum for forming audible musical tones constituting a chord designated by said question chord datum;

musical keyboard means including keys respectively representing musical notes and capable of being depressed;

depressed chord detecting means coupled with said keyboard means for producing a depressed chord datum indicative of a chord constituted by keys depressed after formation of said audible musical tones constituting a chord;

judging means supplied with said question chord datum and said depressed chord datum for producing a coincidence output when said question chord datum coincides with said depressed chord datum; and

control means connected to said judging means and to said chord datum generating means for controlling said chord datum generating means to generate a next question chord datum upon receipt of said coincidence output.

4,781,100

LINKLESS AMMUNITION GUN TRANSFER UNIT

William C. Baldwin, Irvine, Calif., assignor to Western Design Corporation, Irvine, Calif.

Filed Jun. 8, 1987, Ser. No. 59,538

Int. Cl.[4] F41D *10/04, 10/32*

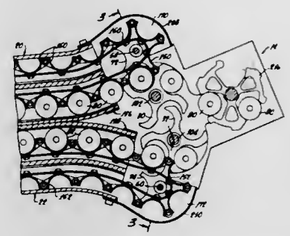
U.S. Cl. 89—33.04 **12 Claims**

1. A linkless ammunition gun transfer unit for the conversion of a linked-ammunition firing gun, having an ammunition feeder assembly, to a linkless-ammunition firing gun, said linkless-ammunition gun transfer unit comprising:

drive train means for engaging ammunition feed sprockets disposed in said ammunition feeder assembly;

plate means, configured for attachment to said ammunition feeder assembly, for supporting said drive train means; and

coupling means for removably attaching a linkless-ammunition feed chute to the ammunition feeder assembly and aligning the ammunition feed sprockets in the ammunition feeder assembly with ammunition transfer sprockets disposed in said linkless-ammunition feed chute to enable transfer of linkless-ammunition rounds therebetween, said coupling means engaging the drive train means when the feed chute is attached to the ammunition feeder assembly for transferring power from the ammunition feed sprockets to the transfer sprockets in order to move ammunition through said ammunition feed chute.



4,781,101

MOBILE MANEUVERABLE CROWD CONTROL SHIELD

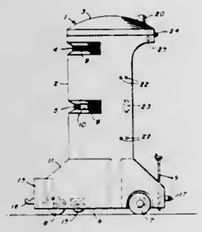
Daniel Zevuluni, 1 Zunz Street, and Michael Vinicky, 12 Merkaz Baley Melacha, both of Tel Aviv, Israel

Filed Jul. 20, 1987, Ser. No. 75,766

Claims priority, application Israel, Jul. 27, 1986, 79527

Int. Cl.[4] F41H *5/14*

U.S. Cl. 89—36.09 **7 Claims**



1. A mobile hand-maneuverable crowd control protective shield of a height to accommodate a standing person therein, said shield comprising continuous front and side wall portions and a roof, said side wall portions defining an open back for said shield rearward of said front wall portion, a platform mounting said shield, said platform including one pivotally

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mounted front steering wheel, two laterally spaced rear wheels rearward of said front wheel and defining a common support plane with said front wheel, and stabilizing wheel means slightly above the support plane for stabilizing said shield against excess lateral tipping and for facilitating forward movement of the shield over varying ground elevations through selective engagement therewith, said stabilizing wheel means being mounted on said platform between said front and rear wheels and closer to said front wheels than said rear wheels.

4,781,102

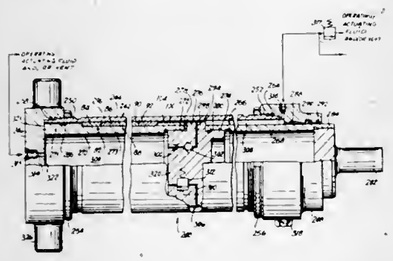
LOCKING, BEARING AND ACTUATING APPARATUS

Joseph E. Scerbo, and Roy B. Johnson, both of York, Pa., assignors to York Industries, Inc., York, Pa.

Continuation of Ser. No. 740,479, Jun. 3, 1985, abandoned, which is a division of Ser. No. 333,249, Nov. 3, 1981, Pat. No. 4,534,269. This application Apr. 20, 1987, Ser. No. 40,712

Int. Cl.[4] F15B *15/26*

U.S. Cl. 91—41 **4 Claims**



1. In locking, bearing and actuating apparatus which include actuating cylinder means, double acting actuating piston means operativley disposed within said actuating cylinder means and dividing the same into first and second cylinder spaces, pressure-responsive locking means operatively associated with said actuating cylinder and piston means and operable to lock the same together and prevent relative movement therebetween, and means to pressurize said locking means to a level sufficient to release said lock, the improvements comprising, said actuating piston means comprising piston faces of different effective areas with the larger of said piston faces being operatively associated with said first cylinder space, and the smaller of said piston facs being operativley associated with said second cylinder space, means to introduce pressurized fluid into said first and second cylinder spaces, respectively, said second cylinder space being in pressurized fluid flow communication with said pressure-responsive locking means, pressurized fluid transfer passage means independent of said pressurized fluid introduction means and operatively connecting said first and second cylinder spaces, means operatively associated with said pressurized fluid transfer passage means and permitting pressurized fluid flow therethrough only from said first cylinder space to said second cylinder space, and means preventing direct pressurized fluid flow communication between said first cylinder space and said pressure-responsive locking means whereby, the introduction to said first cylinder space of fluid pressurized to a level sufficient to effect initial movement of said piston into said second cylinder space but not sufficient to fully release said pressure-responsive locking means, and the concomitant flow of said pressurized fluid from said first cylinder space to said second cylinder space through said pressurized fluid transfer means, will be effective to further pressurize said fluid in said second cylinder space to a level sufficient to fully release said pressure-responsive locking means for continued movement of said piston into said second cylinder space.

4,781,103

FLUID SERVOMECHANISM

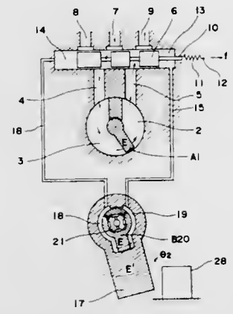
Teruo Maruyama, Hirakata, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jul. 16, 1986, Ser. No. 886,664

Claims priority, application Japan, Jul. 19, 1985, 160526

Int. Cl.[4] F01B *25/04*

U.S. Cl. 91—171 **2 Claims**



1. A fluid servomechanism comprising:
a first fluid driven actuator having an output shaft;
a second driven actuator having an output shaft, the output shaft of said first actuator being displaceable relative to the output shaft of said second actuator when driven;
pressure generating means for generating pressure that corresponds to the displacement of the output shaft of said first actuator relative to the output shaft of said second actuator to drive the second actuator in a direction which reduces the displacement of the output shaft of said first fluid driven actuator relative to the output shaft of said second actuator;
first and second fluid chambers on opposite sides of the output shaft of said first actuator;
a fluid supply source operatively hydraulically connected to said chambers for supplying fluid;
third and fourth fluid chambers each of which is disposed between the output shaft of said second actuator and a respective face of the output shaft of said first actuator and in which pressure is generated by said pressure generating means to drive said second actuator; and
control means for detecting the pressure generated by said pressure generating means and for controlling the displacement of the output shaft of said first actuator when the pressure detected reaches a predetermined value,
said control means comprising a spool disposed between said fluid supply source and said first and second fluid chambers for selectively allowing fluid to be supplied to said first and second chambers, said feedback lines each of which is in hydraulic communication with a respective end of said spool and one of said third and fourth chambers and through which pressure generated by said pressure generating means in said third and fourth chambers passes so as to control said spool.

4,781,104

ROTARY FLUID ENERGY TRANSLATION DEVICE

Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

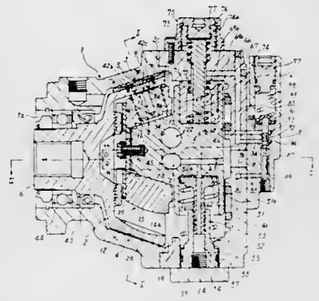
Filed Oct. 21, 1986, Ser. No. 921,081

Int. Cl.[4] F01B *13/06*

U.S. Cl. 91—497 **2 Claims**

1. A rotary piston fluid energy converter comprising:
first and second members which are rotated relative to one another;

a cylinder barrel having a plurality of substantially radially disposed cylinders, wherein each cylinder has a piston disposed therein;
a support element which supports said second member through said cylinder barrel and pistons, wherein said support element and said cylinder barrel are rotatable with respect to one another, and wherein said support element is displaceable perpendicularly with respect to an axis of rotation, in order to adjust the distance between centers of the first and second members and the center of the support element, and further wherein spaces are formed in said cylinders between said pistons and said support element, such that when said support element is displaced from said axis of rotation said spaces increase or decrease when rotated, so that said convertr acts as either a pump or a motor, and further wherein said support



element is displaceable in a first direction to form a pump, and in a second direction to form a motor;
a spring member for biasing the support element in said first direction;
a dydraulic actuator for displacing the support element in said second direction against the action of the spring member; and
a pressure compensating valve through which a high pressure fluid used in the converter is introduced into the actuator when said high pressure fluid exceeds a preset pressure valve to cause the converter to operate as a motor, when the converter is supplied with an input of high pressure fluid, and when said high pressure fluid does not exceed said preset pressure value, said high pressure fluid is prevented from communicating with said actuator by said pressure-compensating valve so that the converter acts as a pump.

4,781,105

SPRING BRAKE CYLINDER

Yasuhisa Hata, Akashi, and Osamu Akamatsu, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

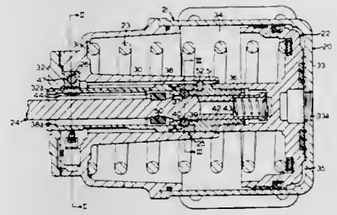
Filed Mar. 27, 1987, Ser. No. 32,105

Claims priority, application Japan, Mar. 28, 1986, 61-71602

Int. Cl.[4] F01B *9/00*

U.S. Cl. 92—29 **4 Claims**

1. A spring brake cylinder assembly, said assembly comprising:
(a) a body portion having a pair of axially-opposed end walls;
(b) a piston positioned for reciprocal axial movement within said body portion, said piston having a face portion adjacent a first end wall of said body portion and a stem portion extending in an axial direction from an inner surface of said face portion of said piston;
(c) a piston guide means engageable with said stem portion of said piston and a second end wall of said body portion for guiding said piston in an axial direction during reciprocal axial movement of said piston;
(d) a brake spring caged between said inner surface of said face portion of said piston and said second end wall of said body portion to supply a predetermined braking force to said assembly;
(e) a pushrod having a first end thereof extending coaxially into said body portion through a second end of said body portion;
(f) a clutch means threadedly engaged with said stem portion and engageable with said pushrod adjacent said first end for making a connection and disconnection of said push-



rod with said piston, thereby controlling their relative displacement in an axial direction;
(g) a clutch control means engageable with said clutch means and said piston guide means for controlling said clutch means between an engaged and disengaged state, said clutch control means including an elongated hollow portion surrounding said pushrod and extending out of said second end of said body portion; and
(h) a clutch operating means positioned adjacent said second end of said body portion and engageable with said clutch control means for manually releasing said assembly from a brake application.

4,781,106

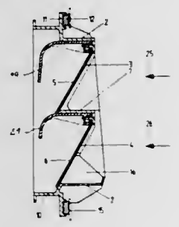
RETURN AIR BARRIER FOR MOTOR VEHICLES

Manfred Frien, Enkenbach-Alsenborn, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 26, 1988, Ser. No. 160,663

Int. Cl.[4] B60H *1/26*

U.S. Cl. 98—2.18 **3 Claims**

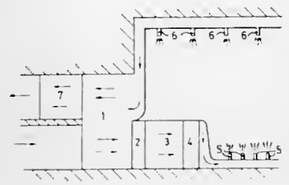


1. Return air barrier for a system for ventilation of the passenger compartment of a motor vehicle, whose closure flap made of a flexible low-density material is suspended, rests by its own weight against an inclined grid in the housing of the return air barrier, and during air flow moves against the direction of outflow into the closed position, characterized in that above the closure flap within the range of travel thereof, several hook-like webs are mounted in such a way that at the height at which flapping begins, the flap touches the free end of at least one web and, with increasing air velocity, buckles in

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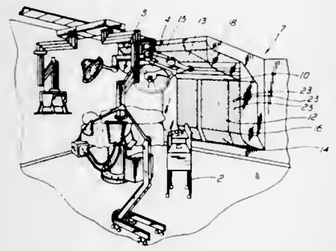
the lower edge region, adheres snugly to the webs and is held in an angular form.

4,781,107
METHOD AND APPARATUS FOR MAINTAINING A ZERO-PRESSURE TYPE PLANT
Nils-Johan Nilsson, Parkgatan 10, S-832 00 Frösön, Sweden
Filed Dec. 9, 1986, Ser. No. 940,155
Int. Cl.⁴ F24F *11/00*
U.S. Cl. 98—33.1 **6 Claims**



1. A method for preventing disturbances of the ventilation air flow in a ventilation plant of the zero-pressure type comprising an air supply blower and an air exhauster of the fan type, wherein the static pressure in the room to be ventilated by the plant is compared with the static pressure of the open air, the difference between said static pressures is used as a regulating variable for controlling the flow through one of the air supply blower and air exhauster in such a way that this difference is eliminated, whereby disturbances in the ventilation flow are compensated by the plant.

4,781,108
METHOD AND MEANS FOR SUPPLYING CLEAN AIR TO AN OPERATING ROOM
Lars A. H. Nillson, Oskarshamn, Sweden, assignor to MTD Medical Technology and Development Ltd., Nicosia, Cyprus
PCT No. PCT/SE86/00193, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06460, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 28, 1986, Ser. No. 10,191
Claims priority, application Sweden, Apr. 26, 1985, 8502043; Oct. 4, 1985, 8504594
Int. Cl.⁴ F24F *9/00*
U.S. Cl. 98—36 **11 Claims**



1. A method for supplying clean or sterile air to an area intended to be kept clean or sterile in an operating room, the method comprising the steps of

supplying a central primary narrow carry beam of clean air towards said area;

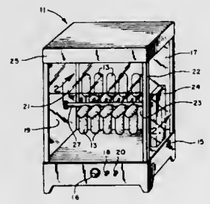
supplying flows of clean secondary air on either side of the carry beam;

the secondary air on either side of the carry beam initially being directed towards the carry beam and then deflected essentially parallel to the carry beam;

said carry beam essentially being directed along the intersection of the secondary air flows;

the air velocity of said carry beam being greater than the air velocity of said secondary air.

4,781,109
APPARATUS FOR HEATING AND DISPLAYING FOOD PRODUCTS ON A STICK
William R. Wiebe, Jr., Scottsdale, and G. Robert Pankey, Fountain Hills, both of Ariz., assignors to Conagra, Inc., Omaha, Nebr.
Filed Feb. 20, 1987, Ser. No. 17,774
Int. Cl.⁴ A47J *37/04, 39/00*
U.S. Cl. 99—483 **10 Claims**



1. An apparatus for simultaneously heating and displaying a plurality of corn dogs each on a disposable stick, said apparatus comprising:

cabinet means including top, bottom, and side wall means, at least a portion of said side wall means being transparent so as to allow operators and customers to see within the cabinet means;

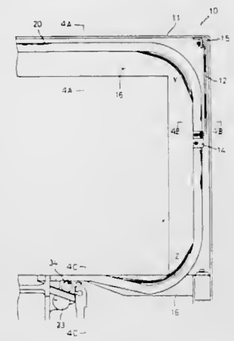
shaft means rotatably mounted within the cabinet means and including a plurality of stick retaining means on said shaft for releasably retaining the disposable sticks of the food products thereon;

rotating means for rotating the shaft means; and

heating means for maintaining said food products at a desired serving temperature.

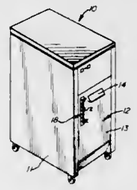
4,781,110
BAND GUIDING ARCH FOR STRAPPING MACHINE
Yasunori Sakaki, Tokyo; Kenji Fujii, Yamato; Seiichiro Koyama; Yosikatsu Aizawa, both of Tokyo, and Tsutomu Tagomori, Yokohama, all of Japan, assignors to Strapack Corporation, Tokyo, Japan
Filed Mar. 10, 1987, Ser. No. 27,217
Claims priority, application Japan, Mar. 13, 1986, 61-35350[U]; May 20, 1986, 61-113755
Int. Cl.⁴ B65B *13/06*
U.S. Cl. 100—26 **8 Claims**

1. A band guiding arch for a strapping machine, comprising a guide plate and an arch guide having corner sections interconnected by linear sections, said corner and linear sections including inner and outer peripheral portions disposed, respectively, closer to and farther from a center of said arch guide, said inner and outer peripheral portions forming therebetween a band passage for containing a band to be wrapped around an article to be strapped, said passage being open at a side thereof facing said guide plate, said arch guide being urged toward said guide plate in a yieldable manner to close said open side while permitting said arch guide to be moved away from said guide plate under the urgings of said band when the direction of travel of said band has been reversed, whereby said band may be withdrawn from said passage, said inner peripheral portions of said corner sections including band-engaging surfaces extending toward said guide plate at an inwardly directed inclination relative thereto such that said band-engaging surface forms an acute angle with said guide plate to facilitate move-



ment of said arch guide away from said guide plate as said band is being withdrawn from said passage.

4,781,111
APPARATUS FOR INDICATING LEVEL OF COMPACTED TRASH IN TRASH COMPACTOR
Paul B. Chesnut, Armstrong Township, Vanderburg County, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 24, 1986, Ser. No. 945,899
Int. Cl.⁴ B30B *15/06*
U.S. Cl. 100—99 **12 Claims**



1. In a trash compactor having a trash receiving container, a ram, and means for selectively forcibly urging the ram into the container for compacting trash placed therein, improved indicating means for indicating the upper level of compacted trash in said container relative to a preselected maximum level comprising means for indicating the amount of travel of the ram below said preselected level during a trash compacting operation including magnetic actuating means movable in correspondence with the travel of the ram, and means responsive to movement of the actuating means comprising a plurality of magnetically operated reed switches and display means selectively operated by said switches.

4,781,112
APPARATUS FOR PRINTING HOLLOW CONTAINERS
Alvin M. Cohan, Englewood, N.J., assignor to American Production Machine Company, Union City, N.J.
Filed May 4, 1987, Ser. No. 45,281
Int. Cl.⁴ B41F *17/26*
U.S. Cl. 101—38 A **9 Claims**

1. A printer for the sidewalls of a hollow container comprising the combination of:

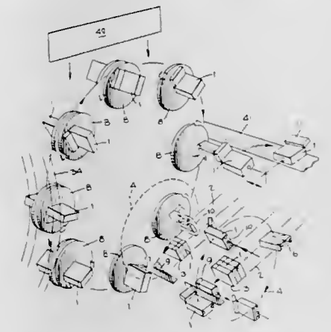
a container feed means for simultaneously presenting a plurality of containers to a transfer means;

a printing disc mounting a plurality of container holders on a circular array;

a resiliently mounted locking lever positioned on each of said container holders for holding said containers in their printing position;

transfer means for moving said plurality of containers from said feed means to said disc;

plurality of processinf stations positioned around the edge of said printing disc and adjacent to said holders;

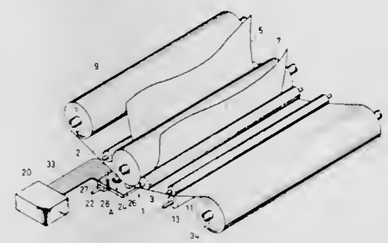


one of said plurality of stations comprising a printer for printing the container sidewalls;

another of said plurality of stations comprising means for removing containers from said printing disc; and

said locking levers comprising pivotally mounted levers with the levers on two back-to-back container holders on opposite faces of said printing disc being operatively coupled to a single spring loaded plunger.

4,781,113
ELECTRIC CONDUCTION PRINTER
Takemi Yamamoto, Nagoya; Masanari Kobayashi, and Yasuo Kimura, both of Ichinomiya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan
Filed Mar. 19, 1987, Ser. No. 28,090
Claims priority, application Japan, Mar. 19, 1986, 61-62502
Int. Cl.⁴ B41J *3/12, 3/20*
U.S. Cl. 101—93.04 **8 Claims**



1. An electric conduction printer, comprising:

an electrode carrier member having a surface on which are provided a plurality of pattern electrodes for forming printing patterns;

a sheet-shaped printing medium which moves relatively to said electrode member and forms pictures printed in accordance with the printing patterns by electric conduction;

an anisotropic electroconductive block member which is mounted on said electrode carrier member and includes a

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first surface contacting said surface of the carrier member without a substantial relative movement between the first surface and the surface of the carrier member to form an electroconductive state with said pattern electrodes, and a second surface contacting said printing medium to allow a relative movement between the second surface and the printing medium to form an electroconductive state with the printing medium; and

said anisotropic electroconductive block member having an electroconductivity in the direction of thickness of said block member passing through said first and second surfaces, whereby the printing patterns are transferred through said block member from said electrode carrier member to the printing medium.

4,781,114

SILK-SCREEN PRINTING MACHINE PROVIDED WITH A RECIPROCATINGLY MOVABLE SQUEEGEE ARRANGEMENT

Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Jun. 30, 1986, Ser. No. 880,019
Claims priority, application Sweden, Jul. 10, 1985, 8503432
Int. Cl.⁴ B05C *17/04*
U.S. Cl. 101—123 **8 Claims**



1. A silk-screen printing machine having a reciprocatingly movable squeegee arrangement including at least one squeegee for printing in both directions and arranged to be passed over a stencil positioned over material to receive print and resting on a printing table, said squeegee arrangement including means for moving said squeegee, said machine further including a frame assembly comprising inner and outer frame units and a stencil frame. a first means attached to said frame assembly at one end of said frame assembly for raising and lowering said frame assembly, and a second means attached to the inner unit adjacent an opposite end of said frame assembly for raising and lowering the inner unit, activation of the first and second means for raising and lowering being in response to the location of said squeegee to thereby compensate for stretch of said stencil.

4,781,115

TABLET PRINTING MACHINE WITH ROLL CLEANING SYSTEM

Yoshio Ueda, Kobe; Kenichi Nishimura, Takatsuki; Yoshiaki Mochizuki, Osaka; Atsuo Ohike, Nishinomiya; Takayoshi Honda, Takatsuki, and Eiji Shiba, Izumi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 938,467
Claims priority, application Japan, Dec. 6, 1985, 60-275825; Dec. 13, 1985, 60-281693
Int. Cl.⁴ B41F *17/36, 35/06*
U.S. Cl. 101—425 **5 Claims**

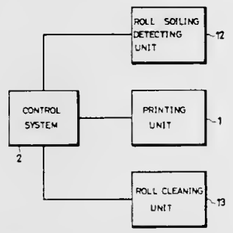
1. A tablet printing machine comprising:

a roll cleaning unit comprising a cleaner to be impregnated with a cleaning liquid and adapted for pressing contact with a transfer roll of the printing unit thereof during the rotation of the transfer roll,

a cleaning roll having a plurality of furrows formed in its outer periphery and dividing the outer periphery into a plurality of ridges circumferentially thereof,

drive means for intermittently rotating the cleaning roll by one or at least two ridge pitches at a time,

the cleaner being wound around the outer periphery of the cleaning roll along the ridges and the furrows, and



means for supplying the cleaning liquid to the cleaner at the portions thereof over the ridge surfaces along the outer periphery of the cleaning roll.

4,781,116

WASHING METHOD AND APPARATUS FOR GUIDE ROLLERS OF ROTARY PRESS

Matsuo Harada, Tokyo, Japan, assignor to Nikka Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1987, Ser. No. 43,351
Claims priority, application Japan, Apr. 28, 1986, 61-98695; Apr. 30, 1986, 61-100526
Int. Cl.⁴ B41F *35/00*
U.S. Cl. 101—425 **8 Claims**



1. A method of washing guide rollers of a rotary press comprising the steps of:

operating said rotary press slowly while printing paper is fed under an initial pulling force and at an initial back-tension to said rotary press,

applying a washing liquid to said printing paper, while said printing paper is travelling, across substantially an entire width of the printing paper to partly wet said printing paper,

guiding said travelling printing paper through the rotary press by guide rollers,

maintaining a plurality of guide rollers in contact with said travelling printing paper on a paper discharge side with respect to a printing portion of said rotary press, and

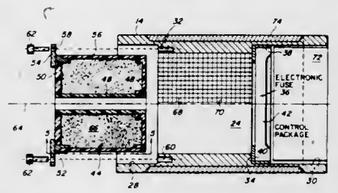
rotating said plurality of guide rollers at a peripheral speed different from a speed of said travelling printing paper so that contamination of said guide rollers is wiped off by said travelling printing paper.

4,781,117

FRAGMENTABLE WARHEAD OF MODULAR CONSTRUCTION

Charles R. Garnett, Dahlgren, and William M. Henderson, Ninde, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 20, 1987, Ser. No. 75,705
Int. Cl.⁴ F42B *13/18*
U.S. Cl. 102—493 **10 Claims**



1. An intermediate fragmentation warhead section for a missile comprising:

a tubular housing having an inner surface and an opening on at least one end thereof,

a removable cylindrical explosive cartridge of composite construction having an inner and outer end and an outer shell operatively sized to reside insertably within said tubular housing; and

means for retaining said cylindrical cartridge fixedly attached to said tubular housing in sized relationship to the inner end of said cylindrical cartridge whereby said cartridge is retained longitudinally in a preselected position within said tubular housing; and

an annular shoulder affixed to and extending radially within said tubular housing;

an outwardly extending radial flange fixedly attached to the outer end of said cylindrical cartridge sized to correspond to said annual shoulder; and

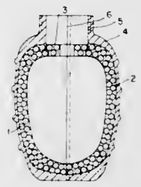
means for fastening said annular shoulder to said corresponding radial flange whereby said cartridge is abuttingly urged against said means for retaining thus fixedly positioning said cartridge within said tubular housing at a preselected position.

4,781,118

GRENADE BODY, IN PARTICULAR FOR HAND GRENADES

Hans Assmann, Schwanenstadt-Kaufing, Austria, assignor to Oregon Establissement fur Patentverwertung, Liechtenstein

Filed Feb. 27, 1986, Ser. No. 834,000
Claims priority, application Austria, Mar. 4, 1985, 630/85; Jun. 19, 1985, 1814/85
Int. Cl.⁴ F42B *27/00*
U.S. Cl. 102—496 **12 Claims**



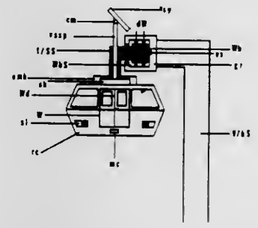
1. A grenade body comprising a multi-part fragmentation body which includes a hollow body and substantially spherical metal particles embedded in plastics material, and preferably an outer casing of plastics material which at least partially encloses the fragmentation body, wherein parts of the fragmentation body positively engage one into the other at connecting surfaces of the parts, characterised in that the substantially spherical metal particles, when the fragmentation body is assembled, have a distance beyond the connecting surface which is smaller than the particle diameter and that at least in the region of the connecting surfaces at least one inner layer of particles is displaced relative to at least one outer layer of particles by approximately a half particle diameter.

4,781,119

SOLAR-RAPID RAIL MASS TRANSIT SYSTEM

James G. Davis, 16246 Rancho Blanco Dr., Houston, Tex. 77083

Filed Sep. 10, 1984, Ser. No. 649,183
Int. Cl.⁴ B61B *3/02;* **B60L** *13/00*
U.S. Cl. 104—93 **5 Claims**



1. A solar-powered mass transportation rail system, comprising at least one overhead rail extending above the ground defining a wheel box slot therein;

at least two solar-powered rail cars suspended from said rail, each car having a plurality of hollow support poles extending from the top of the car,

photovoltaic solar panels supported by said support poles,

motorized, remote controlled canting means for allowing the solar panels to be tilted consistently toward the position of the sun,

each car having a self-contained solar power generation system including at least two electric motors, storage batteries for providing power when access to sunlight is less than optimal, the motors and batteries being located on the top of each car, the support poles providing a conduit for power generated in the solar panels to be transmitted to the batteries and in turn to the motors,

at least one power transmission wheel box system at each each of each car providing both propulsion and support of the car, each wheel box system fitting into said wheel box slot,

the rail cars providing seating for 25–50 passengers, retractable side doors for passenger loading and unloading at transit stops, end doors with collapsible, accordian-type fiberglass walkways to allow passengers to pass car to car while the train is in motion, and

the cars being connected by electromagnetic couplers.

4,781,120

MONORAIL TRAIN SET

David A. Farrow, 1060 SW. 19th St., Boca Raton, Fla. 33432; George M. Kinley, III, 4554 Sunrise Blvd., Delray Beach, Fla. 33445, and Michael A. Sandler, 836 NE. 76th St., Boca Raton, Fla. 33432

Filed Jan. 14, 1987, Ser. No. 3,270
Int. Cl.⁴ A63H *19/36, 19/28, 19/30*
U.S. Cl. 104—118 **9 Claims**

1. A track member having a rectangular cross section and a given length bounded by two ends, said member having a pair of relatively longer sides and a narrower top and bottom, said member forming a monorail track which can be attached to a similar monorail track, the improvement comprising:

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said member ends being formed in a semicircular shape with a diameter equal to the length between said top and bottom;

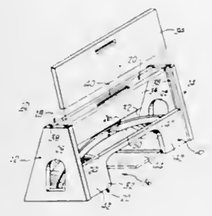
first and second recessed surfaces, each positioned on an opposite side and end of said member, each of said recessed surfaces extending from said top to said bottom of said member and back from the end of said member, each recessed surface terminating with a back in the shape of a circular arc of less than 180° and having a diameter equal to the length between said top and bottom, said back extending from said recessed surface to said side of said member; and

attachment means affixed to each of said recessed surfaces within the circle formed by said member ends and recessed surface back, said attachment means being of a type to be compressively attached to a corresponding attachment means affixed on another member to form an affixation therebetween.

8. A track vehicle set container building and component comprising:

a curved floor above the bottom of said building and having a permanently affixed vehicle track thereon;

an plurality of openings through said building, two of which are aligned with said permanently affixed track and a third of which is below said floor;



a plurality of fixed and removable panels forming a closed volume above said floor and below said floor on both sides of said third opening for storing assemblable parts to said set, said parts being attached from one side of said permanently affixed track to the other side of said permanently affixed track and including sufficient parts to provide a track path through said third opening;

a vehicle; and

engageable lock means, selectively affixing said vehicle to said permanently affixed track when engaged therebetween and allowing said vehicle to travel over a path defined by said assembled parts when disengaged;

wherein said track is a monorail track and has a rectangular cross section and a given length bounded by two ends, said track having a pair of relatively longer sides and a narrower top and bottom, said track forming a monorail track which can be attached to a similar monorail track, said track further including track ends formed in a semicircular shape with a diameter equal to the length between said top and bottom; first and second recessed surfaces, each positioned on an opposite side and end of said track, each of said recessed surfaces extending from said top to said bottom of said track and back from the end of said track, each recessed surface terminating with a back in the shape of a circular arc of less than 180° and having a diameter equal to the length between said top and bottom, said back extending from said recessed surface to said side of said track; and attachment means affixed to each of said recessed surfaces within the circle formed by said track ends and recessed surface back, said attachment means being of a type to be compressively attached to a corresponding attachment means affixed on another track to form an affixation therebetween.

4,781,121

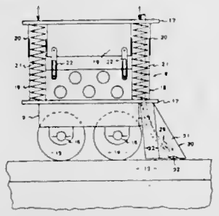
SYSTEM FOR ENHANCING TRACTION AND ENERGY EFFICIENCY IN TRAINS

Sudhir Kumar, and Shiv R. Kumar, both of 17 W. 434 Sutton Pl., Westmont, Ill. 60559

Filed Mar. 25, 1987, Ser. No. 30,719

Int. Cl.⁴ B61F *19/00;* **B08B** *1/02, 3/02*

U.S. Cl. 104—279 **16 Claims**



1. A device for increasing the adhesion capacity of a tractive vehicle's powered wheels on rails, comprising:

a frame attached to the tractive vehicle in advance of at least one of the powered wheels; and

at least one cleaning wheel mounted for rotation on the frame in engagement with the rail at a non-zero angle of attack with respect to the longitudinal axis of the rail such that the resulting lateral slip of the cleaning wheel on the rail due to lateral creepage cleans a continuous thin strip the rail crown surface for better adhesion of following powered wheels.

4,781,122

PROCESS OF CASTING STEEL INCLUDING RENDERING THE STEEL BATH INERT BY MEANS OF LIQUID ARGON OR CARBON DIOXIDE IN THE FORM OF DRY ICE

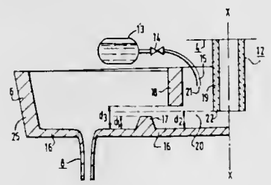
Jean Foulard, Ablon, and Raymond Borasci, Chatenay-Malabry, both of France, assignors to L'Air Liquide, Paris, France

Filed Nov. 25, 1987, Ser. No. 125,343

Claims priority, application France, Nov. 26, 1986, 86 16475

Int. Cl.⁴ B22D *11/10*

U.S. Cl. 164—475 **15 Claims**



1. Process of casting steel, by casting a jet of liquid steel from a first container into a second container, protecting the casting jet and/or the surface of the bath of liquid steel in the second container against oxidation and/or nitridation, wherein the protection of liquid steel against oxidation and/or nitridation is carried out by injecting dry ice or liquid argon in the second container in two consecutive steps:

a first step for flushing the second container, which takes place before the start of the casting of the liquid steel, during which dry ice or liquid argon is injected to provide a flushing flow such that said dry ice or said liquid argon at least partially reaches the bottom of the second container and is converted at least partially into a gas to progressively expel air present in said second container, said step being over when the concentration of oxygen in the vicinity of the base of the jet of liquid steel at the start of the casting is lower than 0.5%,

a second step for maintaining the atmosphere in the vicinity of the base of the jet which begins substantially when the liquid steel starts to be cast in the second container, during which dry ice or liquid argon is injected according to an upkeep flow, which is lower than the flushing flow, such that the presence of said dry ice, liquid argon or gas resulting from their transformation in the vicinity of the base of the jet maintains an atmosphere containing less than about 0.5% oxygen in said zone.

4,781,123

CONSTRUCTION OF ARTICULATING PORTION OF ARTICULATED RAILWAY CARS OR THE LIKE

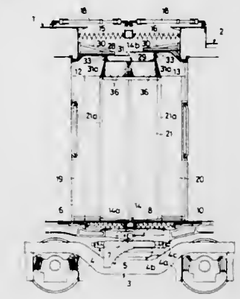
Muneaki Yoshihara, Osaka, Japan, assignor to Kinki Sharyo Kabushiki Kaisha, Higashi, Japan

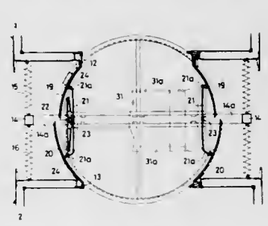
Filed Jan. 5, 1987, Ser. No. 1,626

Claims priority, application Japan, Sep. 5, 1986, 61-210067

Int. Cl.⁴ B61D *17/14*

U.S. Cl. 105—8.1 **7 Claims**





1. In articulated railway cars or the like provided with a truck in the center portion between serial front and rear bodies, which are coupled pivotably horizontally and vertically around the center portion of said truck, a construction of an articulating portion for the articulated cars, in which a pair of front and rear side wall panels and a pair of ceiling panels are respectively longitudinally disposed in the center portion between said two bodies around a passage opening on the opposing side of each said body to respectively form both side walls and ceiling walls;

said pair of front and rear side wall panels have circular arc-shaped sectional plans bending outwardly laterally, radii of curvature of said circular arcs are made concentrically and to differ from each other;

said pair of ceiling panels are in different heights;

flexible covers made of elastic plates are installed inside said side walls, elastic sealing members are provided on the longitudinal opposite sides of said flexible covers and biased to contact said pair of side wall panels by the elastic force of said flexible covers; and

ceiling covers are provided under said ceiling walls, the lateral opposite edges of said ceiling covers are coupled to the upper edges of said flexible covers, and elastic sealing members respectively contacting said pair of ceiling panels by biasing are provided on the longitudinal opposite edges of said ceiling covers.

4,781,124

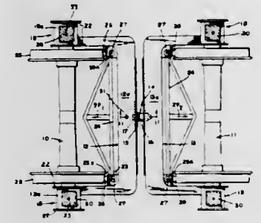
ARTICULATED TRUCKS

Harold A. List, Bethlehem, Pa., assignor to Railway Engineering Associates, Inc., Bethlehem, Pa.

Division of Ser. No. 623,189, Jun. 21, 1984, Pat. No. 4,655,143, which is a continuation-in-part of Ser. No. 948,878, Oct. 5, 1978, Pat. No. 4,455,946, which is a continuation-in-part of Ser. No. 608,596, Aug. 28, 1975, Pat. No. 4,131,069, which is a continuation-in-part of Ser. No. 438,334, Jan. 31, 1974, abandoned. This application Aug. 21, 1986, Ser. No. 898,578

Int. Cl.⁴ B61F *3/08, 5/38, 5/52*

U.S. Cl. 105—168 **3 Claims**



1. A truck assembly for use with a railway vehicle, comprising at least two axleborne wheelsets, load-bearing truck framing pivotally movable about a vertical axis with respect to the vehicle body, a steering arm for each wheelset having load-bearing portions with axle bearings movable with respect to the framing in the steering sense, and mechanism interconnecting the steering arms in the region between the axles independently of the load-bearing framing, said mechanism including joint parts respectively connected with the steering arms to provide for coordinated opposite steering motions of the wheelsets and having flexibility providing freedom for limited relative movement of the joint parts vertically of the vehicle and also laterally and longitudinally of the vehicle, said joint parts comprising a hollow generally cylindrical sleeve connected with the other steering arm and extending into the cylindrical sleeve and providing an annular space between the sleeve and pin, the axes of the sleeve and pin being extended fore-and-aft of the vehicle, said mechanism further including resilient means reacting between the joint parts and being deflectable to provide freedom for relative movement of the joint parts and thus of the steering arms and wheelsets vertically, as well as laterally and longitudinally, of the vehicle, and said resilient means being located in said annular space and yieldingly resisting relative movement of the joint parts and thus of the steering arms and the wheelsets vertically, as well as laterally and longitudinally, of the vehicle.

4,781,125

DROP BOTTOM TRUCKS OR HOPPERS

Reginald Friedenthal, Johannesburg, South Africa, assignor to Standcar (Proprietary) Limited, Johannesburg, South Africa

Filed Nov. 4, 1986, Ser. No. 926,726

Claims priority, application South Africa, Nov. 5, 1985, 85/8477

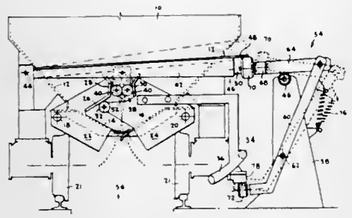
Int. Cl.⁴ B61D *7/02*

U.S. Cl. 105—250 **8 Claims**

1. A hopper including a hopper body which has a discharge opening in its underside, two doors which are pivotally connected to the body on opposite sides of its discharge opening with the pivot axes of the doors lying in the direction of travel of the hopper, the doors being movable between a first position in which they close the opening and a second position in which the opening is open, a door latch arrangement including an abutment formation on each door at one end of the hopper which, in the first position of the doors, are opposite and directed towards each other at a position above the pivot axes of

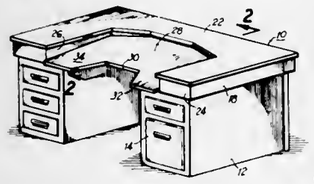
VOL 1096 ISS 1 NO 1 1988 UMI

the doors, a detent between the abutments for preventing movement of the doors from their first to second positions, and means on the hopper body movable independently of the doors



for moving the detent from between the abutments to enable the doors to move under gravity from their first to their second position.

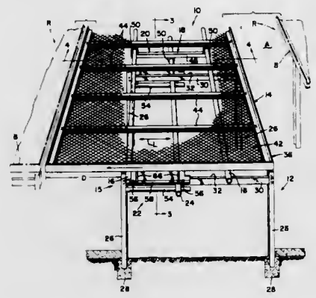
4,781,126
ADJUSTABLE DESK-TOP ASSEMBLY
Edwin P. Lochridge, 452 Ridgewood Rd., NE., Atlanta, Ga. 30307
Filed Aug. 24, 1987, Ser. No. 88,280
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—6 **9 Claims**



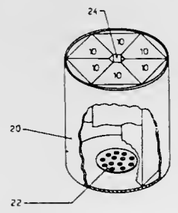
9. An adjustable desk-top assembly for installation over a pedestal, said assembly comprising spaced upper and lower panel members having a front side and a rear side with a user's station being located adjacent said front side, said panel members also being disposed generally paralell to one another and having side panel members disposed therebetween and secured respectively to said upper and lower panel members for defining storage compartments, said upper and lower panel members having a generally semicircular cut-out portion extending inwardly from the user's station of said assembly, a work surface disposed in said cut-out portion having front and rear edges with securing means connected near said front edge, said securing means being disposed within said lower panel member for maintaining said work surface in a defined area relative to said upper and lower panel, and adjustment means disposed near said rear edge of said work surface for raising and lowering said rear edge for imparting a slope to said work surface.

4,781,127
BENCH GLIDE SYSTEM
John L. Conley, 4344 Mission Blvd., Pomona, Calif. 91766
Filed May 5, 1986, Ser. No. 859,334
Int. Cl.[4] A47B *11/00*
U.S. Cl. 108—137 **21 Claims**

1. A rolling bench comprising:
a base,
a platform top over said base,
a roller assembly disposed between said base and top and supporting said top on said base for edgewise movement of the top along a given direction line relative to the base, and wherein
said roller assembly is movable along said direction line relative to both said top and base and comprises rollers spaced from one another along said direction line and disposed in peripheral rolling contact with both said top and base for rolling movement of said rollers along said direction line relative to both said top and base during movement of said top along said direction line relative to said base, and spacer means for retaining the rollers in spaced relation along said direction line.

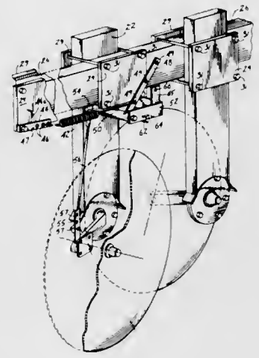


4,781,128
COMBUSTION APPARATUS HAVING A DEFINED GEOMETRIC CONFIGURATION
Samuel Salner, 8 Gluskin St., Rishon LeZion 75263, Israel
Filed Jan. 13, 1987, Ser. No. 2,851
Claims priority, application Israel, Jan. 31, 1986, 77753
Int. Cl.[4] F23K *3/00*
U.S. Cl. 110—102 **8 Claims**



1. Combustion apparatus having a defined geometrical configuration and comprising a plurality of combustion elements, each comprising:
fragmented non-consolidated combustible material; and
combustible enclosure means for said fragmented material, said combustion apparatus being characterized in that it defines a channel having a geometrically defined configuration, which channel provides a combustion region, passage for the air utilized in the combustion of the fragmented combustible material and for combustible gases evolved during combustion of the fragmented combustible material, and egress for gaseous combustion products, said plurality of combustion elements comprising a plurality of sectors which when joined in a particular configuration, define an axially symmetric body having a channel formed therein.

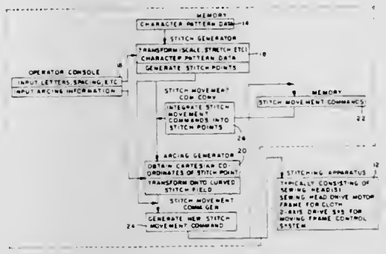
4,781,129
DEBRIS AND SOIL SHAVER
Morton C. Swanson, Palouse, and Guy J. Swanson, Spokane, both of Wash., assignors to Swanson Spray and Manufacturing, Inc., Palouse, Wash.
Filed Oct. 24, 1986, Ser. No. 922,897
Int. Cl.[4] A01C *5/06*; A01B *35/28*
U.S. Cl. 111—73 **25 Claims**



1. A debris and soil shaver for mounting to an agricultural apparatus adapted to travel across the ground surface in a predetermined direction, the agricultural apparatus including a frame member, the shaver comprising:
a disk-like member having a disk periphery defining a disk plane, and further having a central axis which is transverse with respect to the disk periphery;
a first support member, the disk being mounted to the first support member with the central transverse disk axis being arranged at an oblique angle relative to the predetermined direction of agricultural apparatus travel;
mounting means for vertically adjustably mounting the first support member to the agricultural apparatus frame member, the mounting means including an operative connection means between the frame member and first support member for allowing downwardly biased substantially free floating elevational movement, up and down, of the disk relative to the frame member as the agricultural apparatus travels across the ground surface, downward elevational movement of the disk relative to the frame member resulting in an increasingly greater angle of the disk plane from vertical; and
surface angle adjusting means for varying the angle with which the disk plane engages the ground surface relative to vertical, said surface angle adjusting means comprising the vertical adjustability of the mounting means.

4,781,130
SYSTEM FOR STITCHING ALONG A CURVE
Thaddeus A. Badowski, Strongsville, Ohio, assignor to Barudan America, Inc., Walton Hills, Ohio
Filed Sep. 12, 1986, Ser. No. 906,248
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **21 Claims**

1. Apparatus for transforming stitch points in a first orientation relative to one another into stitch points in a second orientation relative to one another comprising:
means for generating stitch points in said first orientation, said generating means comprising a stitch point generator which receives data for stitch points and transforms said data into stitch points in said first orientation; and
means for transforming said stitch points produced by said generating means into stitch points in said second orientation, said stitch point transforming means comprising means for determining the cartesian co-ordinates of said stitch points produced by said generating means, means for transforming said cartesian co-ordinates of said stitch



points into new positions in said second orientation, and means for determining the cartesian co-ordinates of said new positions of said stitch points in said second orientation.

4,781,131
SEWING MACHINE HAVING A SEWING-MATERIAL CUTTING DEVICE
Horst Fenzl, Oerlinghausen, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Fed. Rep. of Germany
Filed Feb. 19, 1987, Ser. No. 16,210
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621785
Int. Cl.[4] D05B *37/04*
U.S. Cl. 112—130 **11 Claims**



1. A sewing machine having a sewing-material cutting device, the cutting device comprising:
(a) a movable upper knife, the upper knife including a knife holder and a replaceable turnable cutting plate having a plurality of cutting edges;
(b) a stationary bottom knife cooperating with the upper knife to cut sewing material; and
(c) fastening means disposed substantially at an axis of symmetry of said cutting plate for replaceably and turnably fastening the turnable cutting plate to the knife holder with a selected one of said cutting edges in a cutting position;
wherein the fastening means comprises a polygonal member having a plurality of side surfaces, each of the side surfaces corresponding to a respective one of said plurality of cutting edges of said cutting plate, and each of said side surfaces selectively engaging a portion of said knife holder for maintaining the corresponding cutting edge in said cutting position.

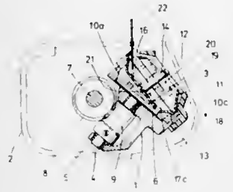
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4,781,132

FULL ROTARY LOOP TAKER ASSEMBLY FOR SEWING MACHINES

Kimikazu Matsuda, Kyoto, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan

Filed Oct. 29, 1987, Ser. No. 115,603
Int. Cl.[4] D05B *57/14*
U.S. Cl. 112—228 **5 Claims**



1. A full rotary loop taker assembly for sewing machines, comprising:

a loop taker (**11**) supported for rotation around a first rotative axis (**12**) and having a bottom surface wall (**16**) defining a bottom surface which forms a surface of rotation around the first rotative axis;

a loop taker support means (**1**) which supports said loop taker for rotation around said first rotative axis,

driver means (**3**) driven for rotation around a second rotative axis (**4**) which intersects said first rotative axis at a predetermined intersecting point (**21**), said driver means having at least three projections (**10***a*, **10***b*, **10***c*), said projections being disposed in a surface (**6**) perpendicular to said second rotative axis and being angular spaced with an angular distance of less than 180 degrees at positions equidistant from said second rotative axis;

said loop taker having at least three engaging holes (**17***a*, **17***b*, **17***c*) in its bottom surface wall for receiving said respective projections, said engaging holes being angularly spaced around the first rotative axis; and

said first and second rotative axes being in positional relationship such that in a predetermined angular range in the rotation of the driver means, the respective projections are ready to escape from the corresponding engaging holes and during the rotation of the driver means the projections are successively received in the corresponding engaging holes in such a manner as to ensure that there is always at least one projection which has been received in the corresponding engaging hole.

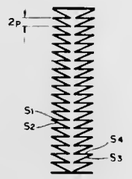
4,781,133

AUTOMATIC BUTTONHOLE STITCHING METHOD OF SEWING MACHINE

Susumu Hanyu, Hachioji; Toshiaki Kume, Tachikawa, and Hachiro Makabe, Fussa, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Oct. 15, 1979, Ser. No. 84,804
Claims priority, application Japan, Oct. 24, 1978, 54-130798
Int. Cl.[4] D05B *97/00*
U.S. Cl. 112—264.1 **2 Claims**

1. A method for automatically stitching a buttonhole by means of a zigzag sewing machine, having a needle, the buttonhole including at lesat two line-tack stitching parts which are to be sequentially stitched, the method comprising a step of applying a predetermined amount of fabric feeding to a first group of alternate stitches in said line-tack stitching parts, and a step of applying no fabric feeding to a second group of alternate stitches in the same line-tack stitching parts so that no movement is applied to the fabric relative to the needle in any direction during stitching of said second group of alternate



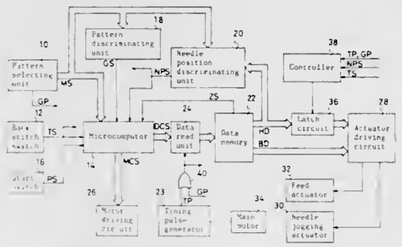
stitches, whereby inclined stitches and non-inclined stitches are formed alternatively in each line-tack stitching part.

4,781,134

ZIGZAG SEWING MACHINE WITH A BACK STITCH FORMING APPARATUS

Fujio Horie, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 2, 1987, Ser. No. 103,659
Claims priority, application Japan, Oct. 2, 1986, 61-235213
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—451 **3 Claims**



1. A zigzag sewing machine with a back stitch forming apparatus comprising:

a needle supported in a machine frame for endwise reciprocaton and lateral jogging motion;

pattern selecting means having a pattern selection control member, and for selecting a desired pattern among a plurality of patterns including specific patterns to perform over-casting;

a back stitch control member capable of being operated to form a plurality of back stitches before or after forming the pattern;

memory means for storing stitch data to form said plurality of patterns and said back stitches;

read means for reading desired stitch data from said memory means in response to the operation of said pattern selection control member and said back stitch control member;

pattern discriminating means for discriminating whether the pattern selected by said pattern selecting means is any one of said specific patterns;

needle position discriminating means for discriminating whether the present needle position coincides with the right end position, as viewed in the direction of feeding the work, of the selected pattern; and

control means for controlling said read means to read stitch data for jogging the needle to the left from said memory means in response to the operation of said back stitch control member, when a discrimination is made by said pattern discriminating means that said specific pattern is selected and a discrimination is made by said needle position discriminating means that said needle is jogged to a position corresponding to said right end position of the selected pattern;

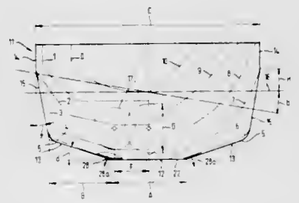
whereby back stitches are formed in a work when any one of specific patterns is selected.

4,781,135

SHIP HULL

Gustav Lindqvist, Esbo, Finland, assignor to Oy Wärtsilä Ab, Helsinki, Finland

Continuation of Ser. No. 707,870, Mar. 4, 1985, abandoned. This application Sep. 16, 1986, Ser. No. 909,005
Claims priority, application Finland, Mar. 12, 1984, 840995
Int. Cl.[4] B63B *1/04*
U.S. Cl. 114—56 **38 Claims**



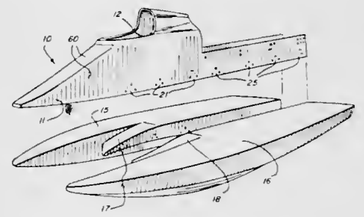
1. A ship having a hull defining a bow having a substantially V-shaped form in the design waterline plane of ship, and having a general frame form defining a bottom surface and two side surfaces, the bottom surface of the hull having a bottom section that is horizontal in a cross-section of the hull and extends longitudinally of the hull midway between the two side surfaces of the hull, and the bottom surface of the hull also having two inclined sections that are located entirely below said design waterline plane and are joined to the bottom section along respective sides thereof and to the side surfaces respectively, each such join being along a clearly defined longitudinal intersection edge, the width of said section and of each of the inclined sections being at least 20% of the maximum beam of the hull, and the inclined sections extending over a substantial part of the length of the hull.

4,781,136

SAFETY COCKPIT FOR POWERBOAT

Cornelius W. M. Van Der Velden, Halderheiweg 14, Boxtel, Netherlands

Filed May 1, 1986, Ser. No. 858,453
Int. Cl.[4] B63B *1/02*
U.S. Cl. 114—56 **27 Claims**



1. A powerboat comprising:

(A) a float section including means for supporting said boat on the surface of a body of water;

(B) a substantially nonnavigable nose section with (**1**) an outer shell, the bottom of which comes close to making contact with the water in which said boat is placed; (2) a cockpit for holding the driver of said boat; and (3) manipulatable controls within said cockpit for controlling the operation of said boat, said nose section being connectable to and removable from said float section; and

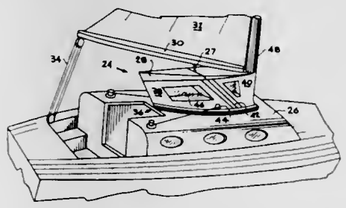
(C) affixing means, coupled to said nose and float sections, for removably and rigidly connecting said nose and float sections together.

4,781,137

BOOM-FOOTED SAIL EFFICIENCY ENHANCEMENT SYSTEM

John F. Clauser, 975 Murrieta Blvd. #22, Livermore, Calif. 94550

Continuation-in-part of Ser. No. 730,167, May 3, 1985. This application May 12, 1987, Ser. No. 48,795
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—102 **20 Claims**



1. Apparatus for increasing aerodynamic efficiency of a conventional thin sail extending from a mast and attached to a boom that is spaced above a deck of a sailboat when the boom is aligned approximately along the centerline of the boat, and while the boom moves through a normal and substantial range of vertical and horizontal positions about the centerline, comprising:

the sail, boom and mast being configured so that all sail attached to the boom is located above the boom and the sail is self-tacking, and including a seal between the sail and the boom;

a stationary vertical baffle rigidly mounted to the deck and extending from the mast aft along the centerline of the boat for sealing the space between the boom and the deck against air flow therethrough, the baffle including:

a lower portion mounted to the deck; and

an upper portion connected to the lower portion that contacts the boom when the boom is aligned approximately along the centerline of the boat, and automatically forms a flexible compliant sliding seal with the boom that is maintained over a range of substantial vertical and horizontal motion of the boom;

the baffle and boom being configured so that the baffle is not attached to the boom, thereby allowing the boom to swing freely above the baffle and be controlled by conventional position controls, the baffle automatically forming a seal with the boom when the boom is positioned approximately along the centerline of the boat and automatically maintaining the seal over a range of horizontal and vertical motion of the boom useful when the boat is sailing to weather, including vertical motion resulting from sailcloth stretch, rigging stretch, reefing, variations in sail twist, and the like, and automatically breaking the seal when the boom is positioned far from the centerline.

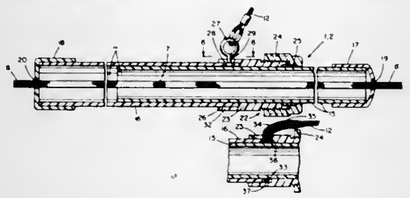
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,138

STANDOFF MOORING BAR FOR BOATS

Duff M. Hay, 1509 Lake Holiday Dr., Sandwich, Ill. 60548

Filed Jul. 20, 1987, Ser. No. 75,431
Int. Cl.[4] B63B *17/00, 21/00*
U.S. Cl. 114—221 R **11 Claims**



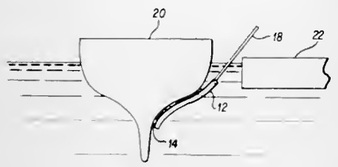
1. A standoff mooring bar for a boat comprising an adjustable mooring bar body having an elongated inner cylindrical tube telescoping within an elongated outer cylindrical tube; a mooring rope extending through the bore of the telescoping pair of cylindrical tubes; and a compression locking assembly fixing the adjustable length of the telescoping pair of tubes with the locking assembly including a generally cylindrical locking sleeve fixed to the outer tube adjacent its tube and which receives the inner tube, a locking cap through which the inner tube passes and which is formed to mate adjustably with the locking sleeve, and a compression ring seal enveloping the inner tube and captured between the locking sleeve and the locking cap which upon tightening of the locking cap relative the sleeve causes the ring seal to bind frictionally and thus lock the two telescoping tubes to a fixed length which is infinitely variable between the minimum and maximum telescoping lengths; and means for attaching a guy rope to the mooring bar.

4,781,139

ONE MAN MANUAL BOAT HULL CLEANING DEVICE

John Burgers, P.O. Box 2101, Santa Cruz, Calif. 95063

Filed Aug. 18, 1986, Ser. No. 897,270
The portion of the term of this patent subsequent to Mar. 10, 2004, has been disclaimed.
Int. Cl.[4] B63B *59/08*
U.S. Cl. 114—222 **9 Claims**



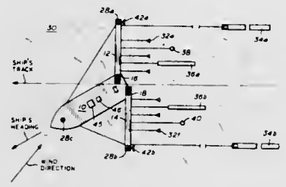
1. A one-man manually operable device for cleaning marine growth from submerged portions of a boat hull, comprising:
an elongated, flexible, buoyant base having a substantial length to width ratio, and having opposite surfaces thereon and opposite proximate and distal ends along the length thereof, wherein said base is of a length to extend a substantial distance downwardly along, and to substantially conform to the shape of, the side of a boat hull from a point at the upper edge thereof and of a selected material such that the dimensions of its shape remain substantially unchanged in tension and compression created by manually applied forces thereto;
scrubbing means affixable to a substantial portion of one surface of the base for cleaning marine growth from the hull of the boat; and
handle means affixable to the base for underwater extension and manual manipulation of said base in tension and compression to clean the hull of the boat, said handle means being a single elongated operator's handle affixed only to and extending from the proximate base end, with said distal end of the base being free of any operating handle means thereon;
said base having sufficient rigidity in a direction along its length so as to permit ready manual manipulation by said single handle of said base in the water proximate to a boat hull to position the said distal base end at a furthermost distance of said base from said handle at a desired location with respect to said hull notwithstanding inherent forces on said base to fold and buckle the base by the buoyancy thereof as said base is manually inserted and immersed downwardly in water;
said base having sufficient flexibility continuously over its entire length to permit limited bending thereof in a direction parallel to the base width in response to buoyant forces thereon when submerged, thereby to permit said base to substantially accommodate curvature of the boat hull;
whereby when said base is submerged into water adjacent a boat hull with said one base surface scrubbing material proximate the boat hull, said handle and said base rigidity permitting desired positioning of said base and distal base end for cleaning a hull area, and said base buoyancy effects limited flexing thereof under buoyant pressure so as to substantially conform said base along its length to curvature of said boat hull thereby to place said scrubbing material in contact with said hull, whereby manual manipulation of said handle to reciprocate said base in a direction along its length will effect cleaning of said hull.

4,781,140

APPARATUS FOR TOWING ARRAYS OF GEOPHYSICAL DEVICES

Robert R. Bell, and Louis I. Schneider, Jr., both of Houston, Tex., assignors to Teledyne Exploration Company, Houston, Tex.

Division of Ser. No. 39,152, Apr. 16, 1987, Pat. No. 4,726,315.
This application Jan. 14, 1988, Ser. No. 143,677
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[4] B63B *21/66;* **B63G** *8/42;* **G01V** *1/38*
U.S. Cl. 114—244 **6 Claims**



1. An arrangement for maintaining the integrity, with respect to a line of survey, of the geometric pattern of an array of geophysical devices that are distributed over at least two spatial dimensions and are towed through a body of water behind a ship, comprising:
a pivotally-mounted boom, having an outwardly-extending portion, mounted on each side of the ship;
means for distributing a plurality of towed geophysical devices along the outwardly-extending portion of each said boom at spaced-apart intervals; and
means for orienting each said boom perpendicular to the track of the ship over the water bottom along the line of survey, independently of the heading of the ship relative to the surface of the water.

4,781,141

PERSONAL WATER CRAFT WITH IMPROVED HULL DESIGN

Edward H. Webb, Paynesville, Minn.; Marley Duclo, Hotchkiss, Colo., and Lonn M. Peterson, Moorhead, Minn., assignors to Wetjet International, Ltd., Paynesville, Minn.

Filed Sep. 10, 1986, Ser. No. 905,863
Int. Cl.[4] B63B *1/32*
U.S. Cl. 114—288 **8 Claims**



1. An aquatic vessel comprising:
(a) a hull structure, the hull structure having a substantially rectangular planform, the hull having a length and width, the length being approximately twice the width, the hull having a bow, a stern, a top surface and a bottom surface;
(b) an operator support structure, the operator support structure being located on the top surface of the hull adjacent to the stern, the operator support structure being sufficiently large to accommodate two persons straddling the support structure in tandem;
(c) an operator control console, the control console being located approximately midway between the stern and bow of the hull and on the top surface of the hull, the control console accommodating a steering wheel which is accessible to persons seated on the operator support structure;
(d) an engine, the engine being located on the top surface of the hull adjacent to the bow so as to maintain longitudinal trim;
(e) an impeller assembly, the impeller assembly being located adjacent to the stern and the bottom of the hull, the impeller assembly being powered by the engine;
(f) a water inlet port, the water inlet port perforating the bottom surface of the hull near the stern and forward of the impeller assembly such that water may enter the impeller assembly and be ejected therefrom, thereby propelling the vessel;
(g) a center section, the center section being centrally, longitudinally aligned and integrally formed with the bottom surface of the hull, the center section defining a longitudinal axis and the center section beginning at the stern of the vessel and extending towards the bow for a distance varying from 10% to 90% of the length of the hull; and
(h) a water entrainment groove, the groove being centrally, longitudinally aligned with the center section, the groove extending from a point coincident with the forward most portion of the center section and extending toward the stern and terminating adjacent to the water inlet port, the groove having a length and the groove defining a longitudinal axis, the longitudinal axis of the groove being parallel to the longitudinal axis of the center section.

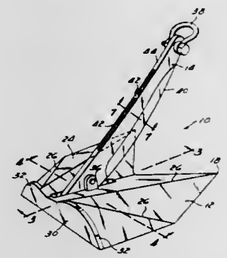
4,781,142

HIGH PERFORMANCE MARINE ANCHOR

Maxwell C. Cheung, 8 Sycamore Creek, Irvine, Calif. 92715

Continuation of Ser. No. 736,466, May 21, 1985, abandoned. This application Feb. 20, 1987, Ser. No. 16,450
Int. Cl.[4] B63B *21/32*
U.S. Cl. 114—304 **29 Claims**

26. A drag embedment marine anchor, comprising:
a fluke which is symmetrical about a central longitudinal axis;
an elongated shank extending upwardly from said fluke from a location along said axis, said shank having one end which is attached to said fluke and another end which is attached to a mooring line, the midsection of said shank being hollow, and reinforced by at least one rib which is oriented substantially normal to the longitudinal axis of the shank, said rib being substantially planar and abutting the entire periphery of the interior of said hollow midsection so as to form a plurality of separated, independent, hollow compartments, said rib stiffening the shank to withstand increased side bending loads on the shank, the remainder of said shank being solid.

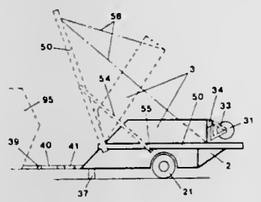


4,781,143

TRAILABLE VEHICLE PONTOON SYSTEM

Kenneth C. Logan, P.O. Box 48168 Bentall Center, Vancouver, B.C., Canada V7X 1N8

Filed Feb. 17, 1987, Ser. No. 15,778
Int. Cl.[4] B63B *7/00*
U.S. Cl. 114—353 **4 Claims**



1. A vehicle launching system comprising, in combination, hinged pontoons, retractable wheel modules attached to said pontoons, a rotating winch frame,with cable and hook,attached to said pontoon hinges, extendable beams attached front and rear to the vehicle to be launched by and onto said vehicle launching system, removable cross beams capable of being attached to said pontoons said vehicle having a drive train and braking system, said vehicle launching system being adaptable to a procedure in which said hinged pontoons are capable of unfolding on said hinges facilitated by said winch frame and said pontoons being capable of being separated laterally to permit said vehicle to be driven between said separated pontoons, said rotating winch frame being adaptable to rotate toward the front of said vehicle and by means of a winch cable disposed to said vehicle, to lift the front of said vehicle to a postion where said front extendable beam may be affixed to said separated pontoons, said rotating winch frame being in turn, adaptable to rotate toward the rear of said vehicle, as said vehicle advances toward the water utilizing said vehicles drive train or braking system and by means of a winch cable disposed to the rear of said vehicle, to lift said vehicle to a position where said rear extendable beam may be affixed to said separated pontoons, said vehicle thus mounted being capable of

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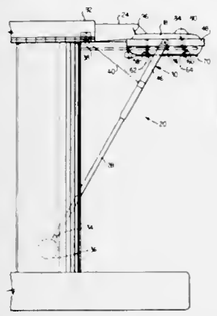
being launched into water conveyed by retractable wheels attached to said pontoons.

4,781,144

OFF-SHORE DRILLING INSTALLATION EVACUATION SYSTEM

Daniel P. O'Brien, 4 Jensen Camp Road, St. John's, Newfoundland, Canada A1E 3G3

Filed Nov. 7, 1986, Ser. No. 928,690
Claims priority, application Canada, Dec. 4, 1985, 494860
Int. Cl.⁴ B63B *23/04*
U.S. Cl. 114—365 **20 Claims**



17. In combination with a vessel such as a drilling rig or production platform comprising a deck and having a crew accommodation unit on said deck,

a survival craft,

supporting means for selectively supporting said survival craft outboard of said deck,

lowering means for lowering said supporting means and said survival craft from adjacent to said deck into the water at a safe distance form the rig or platform to thereby launch said survival craft and avoid collision with the rig or platform after the launching thereof, and

means comprising a longitudinally extending passageway for enabling personnel to move from said accommodation unit to said survival craft supported by said supporting means adjacent to said vessel and for containing life jackets, said passageway being substantially closed except for the ends thereof communicating with said survival craft and said deck and sealingly engaging said accommodation unit and survival craft for prevention entry of heat and/or matter into said passageway other than through said ends thereof.

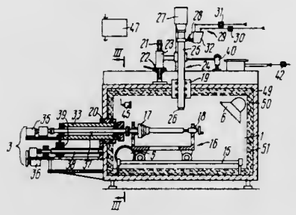
4,781,145

DETONATION DEPOSITION APPARATUS

Roman A. Amlinsky, Kievskaya ulitsa, 24, kv.126; Alexei A. Goncharov, I-y Zborovsky pereulok, 17, kv.14; Vladimir E. Nedelko, Orekhovy bulvar, 11, korpus 1, kv.256, and Jury P. Fedko, Krasnodarskaya ulitsa, 65/18, korpus 1, kv.5 all of, Moscow, U.S.S.R.

PCT No. PCT/SU86/00073, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/00453, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 25, 1986, Ser. No. 47,913
Claims priority, application U.S.S.R., Jul. 26, 1985, 3922680
Int. Cl.⁴ B05B *17/04*
U.S. Cl. 118—620 **2 Claims**

1. A detonation deposition apparatus comprising a sound insulated deposition chamber having a loading opening provided with a cover plate, a plenum ventilation port and an exhaust ventilation port which communicates with atmosphere through an exhaust ventilation system; a sound insulated ventilation chamber having an inlet port and communicating with the deposition chamber through the plenum ventilation port and with the atmosphere through the inlet port; deposition equipment comprising a barrel having an open end and communicating with a batcher for a pulverulent material being deposited, a gas supply system and a spark plug which are located outside the sound insulated deposition and ventilation chamber; and a means for moving a workpiece with respect to the end of the barrel and located in the deposition chamber and a drive mechanically coupled to said means; wherein the improvement comprises the barrel of the deposition equipment



being located outside the sound insulated deposition and ventilation chambers, the drive of the means for moving the workpiece being located outside the deposition chamber, and the deposition chamber being provided with first and second sealed inlets, the end portion of the barrel having the open end being movably received in the deposition chamber through said first sealed inlet, and a member of the mechanical coupling of the drive to the means for moving the workpiece being received in the deposition chamber through the second sealed inlet, a slide gate and a means for scavenging the deposition and ventilation chambers with compressed air being provided in the inlet port of the ventilation chamber.

4,781,146

AEROSOL TESTING CHAMBER FOR EXPERIMENTAL ANIMALS

Charles W. Spengler, 3310 Deforest Ave., Cincinnati, Ohio 45209

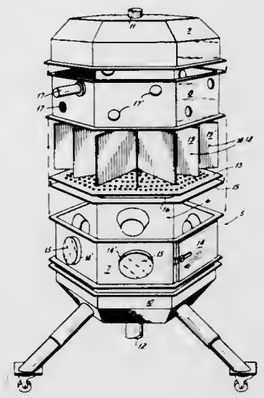
Filed Apr. 21, 1986, Ser. No. 854,028
Int. Cl.⁴ A01K *1/03*
U.S. Cl. 119—15 **24 Claims**

1. An aerosol testing chamber for experimental animals comprising:

a generally tubular chamber having a rectilinear interior surface and opposite ends,

means within said chamber for generating a fluidized bed of aerosol particles,

means for passing a gas through said chamber from one of said ends to another to carry said fluidized aerosol particles, and



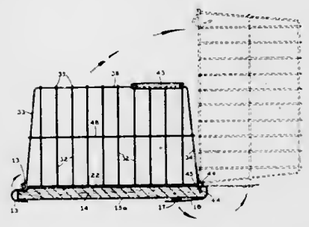
means for holding an experimental animal in said chamber and exposing said animal to said fluidized aerosol particles passing through said chamber.

4,781,147

PORTABLE SAFETY SEAT AND CARRIER FOR SMALL ANIMAL

Joseph V. Delino, Jr., 1481 NW. 7th St., Apt. 5, Miami, Fla. 33125

Filed Aug. 14, 1987, Ser. No. 85,337
Int. Cl.⁴ A01K *1/03*
U.S. Cl. 119—17 **8 Claims**



7. A portable carrier for a small animal comprising:

a substantially rigid flat base;

an inverted basket presenting a peripheral bottom rail resting on said base and a top spaced above said bottom rail;

hinge means hingedly attaching said bottom rail of the inverted basket at one end thereof to said base;

said top of the inverted basket having an opening at said one end thereof large enough to pass the animal's head and neck but not the animal's body below the neck;

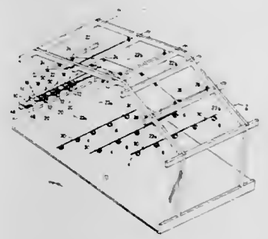
and manually releasable means for attaching said bottom rail to the base at the opposite end of said bottom rail from said hinge means.

4,781,148

LIFTING FEEDING TROUGHS FOR POULTRY COOPS

Joseph Gamliel, Ramat Yishai, Israel, assignor to G.I.R. Automatic Mechanization Co. Ltd., Ramat Yishai, Israel

Filed Nov. 24, 1986, Ser. No. 933,920
Int. Cl.⁴ A01K *1/02*
U.S. Cl. 119—19 **4 Claims**



1. A poultry coop comprising:

a plurality of feeding troughs;

a plurality of winding drums, one for each of said feeding troughs;

a plurality of cables each attached at one end to one of said winding drums, and at the opposite end to two-spaced points of its respective trough for lifting and lowering its respective trough;

a common drive including a motor and drive shaft for all said winding drums;

and a clutch for each of said winding drums, each clutch including a manually movable operator, a first clutch member fixed to its respective winding drum, and a second clutch member movable axially towards and away from said first clutch member;

said common drive shaft passing freely through all said winding drums and clutch members but being keyed to said second clutch members so as to rotate therewith;

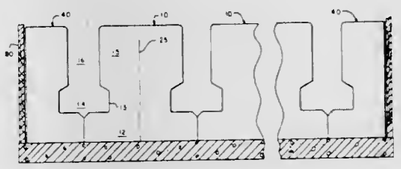
said clutch operator for each of said winding drums being manually movable to selectively engage or disengage its respective second clutch member with the respective first clutch member of the winding drum to selectively raise or lower its respective feeding trough.

4,781,149

PREFABRICATED CATTLE STALL

Charles F. Hinnenkamp, P.O. Box 135, Melrose, Minn. 56352

Filed Mar. 22, 1985, Ser. No. 715,576
Int. Cl.⁴ A01K *1/00*
U.S. Cl. 119—27 **14 Claims**

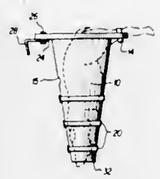


7. A cattle stall construction which comprises two panels in linear register side by side, each panel of which further comprises a broad lower portion, a large indentation at each side of the panel above the broad lower portion, and a top portion wider than the portion of panel between indentations and narrower than the bottom portion so that a vertical slot is formed between the top portions of the panels which is contin-

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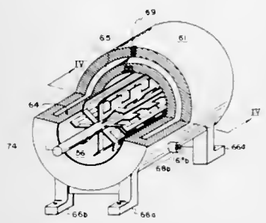
uous with a large opening formed between the adjacent indentations in the two panels.

4,781,150
ANIMAL RESTRAINING DEVICE
Roy L. Phillips, Rte. 1, Box 60, Milford, Tex. 76670
Filed Mar. 30, 1987, Ser. No. 31,667
Int. Cl.[4] A01D *3/00*
U.S. Cl. 119—98 **5 Claims**



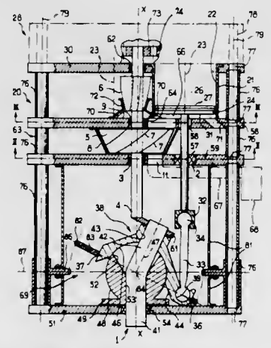
1. An animal restraining device comprising;
(a) a tapered cone-shaped cylinder having a split disposed centrally thereof and extending lengthwise of said cylinder;
(b) a plurality of securing means affixed to said cylinder adjacent to said split and spaced equidistantly from one another for adjusting the cone-shaped cylinder of said cylinder for accommodating various sized animals;
(c) a three-sided, rectangularly-shaped base affixed to the large opening of said cylinder having disposed along one side thereof a retaining means for maintaining the device in a stable position while it is in operation; and
(d) two securing means affixed to the base of the cylinder at opposed ends that and opposite said split which are adjustable to accommodate the rear legs of the animal.

4,781,151
FLAMELESS HEAT SOURCE
George H. Wolpert, Jr., 1044 Park Ave.; Kenneth R. Wolpert, 337 Poplar, and Kurt W. Wrede, Box 193AA Loop Rd., all of Columbia, Pa. 17512
Filed Nov. 24, 1986, Ser. No. 934,205
Int. Cl.[4] F22B *3/06;* **F24C** *9/00*
U.S. Cl. 122—26 **6 Claims**



1. An apparatus for producing heat comprising:
a. a cylindrically-shaped block having an annular cavity;
b. a rotatable shaft journalled through said block and a first source of heat-transfer fluid contained therein, and having a plurality of vanes of predetermined thickness, length and height fixed thereto at predetermined locations on the outer circumference thereof and wherein said plurality of vanes are fixed to said shaft such that each said vane has at least one edge thereof in parallel relation to the axis of said shaft;
c. a passageway of predetermined depth and width circumferentially extending around substantially all of said block for guiding movement of heat-transfer fluid from a second source past said block to a heat distribution point;
d. circulation means connected to said second source to control movement to fluid therefrom; and
e. power control means connected to said shaft.

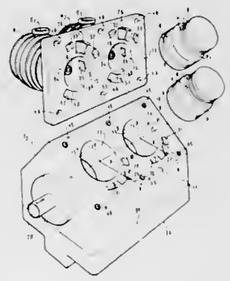
4,781,152
BARREL HEAT ENGINE WHOSE PISTONS AND LINERS ARE COOLED BY A DIRECTED FLUID FLOW PRODUCED BY TURBINES INSIDE THE ENGINE
Jacques Pellerin, 59 Bd de la République, 91450 Soisy-sur-Seine, France
Con' uation-in-part of Ser. No. 62,608, filed as PCT FR86/00434, Dec. 16, 1986, published as WO87/03929, Jul. 2, 1987. This application Jun. 19, 1987, Ser. No. 63,865
Claims priority, application France, Dec. 19, 1985, 85 18826
Int. Cl.[4] F01P *3/02, 3/08;* **F02B** *75/26*
U.S. Cl. 123—41.35 **16 Claims**



1. A machine comprising parallel cylinder bores disposed in barrel, pistons reciprocable in said cylinder bores and defining in said bores working chambers adjacent one face of said pistons, rods connecting said pistons with a movement converter connected to a rotatable shaft extending generally parallel to axes of the cylinder bores, said movement converter being adapted to provide movement transformation between reciprocations of said rods and rotation of said rotatable shaft, and valving means, wherein the machine is provided with internal means defining at least one path for a coolant fluid, said path including in said cylinder bores cooling chambers which are separated from the working chambers by said pistons, and with at least one coolant-fluid-propelling turbine driven by said shaft and mounted in a thermal separation compartment located between a movement conversion compartment and a cylinder assembly.

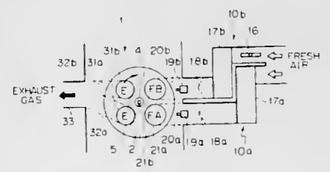
4,781,153
INTERNAL COMBUSTION ENGINE
Bernard Hooper, High Woodland Littlegain, Hilton, Nr Bridgenorth, Shropshire, United Kingdom
PCT No. PCT/GB86/00620, § 371 Date Jun. 9, 1987, § 102(e) Date Jun. 9, 1987, PCT Pub. No. WO87/02416, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 13, 1986, Ser. No. 80,538
Claims priority, application United Kingdom, Oct. 19, 1985, 8525854
Int. Cl.[4] F02B *75/20*
U.S. Cl. 123—59 BS **10 Claims**

1. An internal combustion engine comprising at least first and second cylinders each containing a stepped piston, each cylinder and piston having a pumping part of larger diameter and a working part of smaller diameter, the working part of each cylinder being charged by precompressed charge delivered from the pumping part of the other cylinder, a crank case and at least one cylinder block secured to the crank case at an interface, the crankcase and the at least one cylinder block together defining the first and second cylinders in which the stepped pistons are slidable, the pistons each being connected to a crank shaft mounted in the crankcase, a first transfer path along which the precompressed charge flows from the pumping part of the first cylinder to the working part of the second cylinder in which the charge is ignited, and a second transfer path along which the precompressed charge flows from the pumping part of the second cylinder to the working part of the first cylinder in which the charge is ignited, the first transfer path comprising first, second and third passage parts, the first passage part communicating with the pumping part of the first



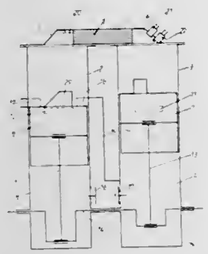
cylinder and the second passage part, and the third passage part comprising at least two branches each branch communicating with the second passage part and the working part of the second cylinder, the second transfer path comprising first, second and third passage parts, the first passage part communicating with the pumping part of the second cylinder and the second passage part, and the third passage part comprising at least two branches each branch communicating with the second passage part and the working part of the first cylinder, the first passage part and each of the branches of the third passage parts of each of the first and second transfer paths crossing the interface between the crankcase and the at least one cylinder block via aligned ports in the crankcase and the at least one cylinder block and each of the second passage parts being wholly contained within the crankcase.

4,781,154
TWO-CYCLE INTERNAL COMBUSTION ENGINE
Toshio Tanahashi, Susono; Norihiko Nakamura; Michiaki Ujihashi, both of Mishima; Hiroshi Noguchi, Gotenba; Toshio Ito, Susono; Toyokazu Baika, Susono; Katsuhiko Hirose, Susono, and Kingo Horii, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jun. 2, 1987, Ser. No. 56,687
Claims priority, application Japan, Jul. 2, 1986, 61-154228
Int. Cl.[4] F02B *75/02*
U.S. Cl. 123—65 VD **4 Claims**



1. A two-cycle internal combustion engine having three, or a multiple of three, cylinders comprising: a cylinder head having, for each cylinder, at least one intake port for introducing fresh air into a combustion chamber and at least one exhaust port for discharging exhaust gas; an air charging means for supplying compressed fresh air to said intake port; intake and exhaust valves for opening and closing said intake and exhaust ports, respectively; and a valve operating means operated in response to a crank angle; characterized in that said engine further comprises:
a one-way valve provided between said intake valve and said air charging means, in said intake port in each cylinder, so that air or gas is prevented from flowing back toward said air charging means;
said valve operating means including a means for opening said exhaust valve earlier than said intake valve when a speed of downward movement of the piston is relatively high; and,
an intake and exhaust system for effecting cross-scavenging and air charging due to exhaust gas pulsation between cylinders during at least a high load running condition of the engine.

4,781,155
REGENERATIVELY ACTING TWO-STROKE INTERNAL COMBUSTION ENGINE
Helmut G. Brücker, Teistlergutstrasse 9/1/6, A-4040 Linz (Oberosterreich), Austria
Filed Mar. 16, 1987, Ser. No. 26,439
Claims priority, application Austria, Mar. 17, 1986, 707/86
Int. Cl.[4] F02B *33/22*
U.S. Cl. 123—70 V **12 Claims**



1. In a regeneratively operating two-stroke reciprocating internal combustion engine with at least one combustion cylinder (3) containing a piston (7), a supercharger cylinder (2) containing a piston (6), and a connecting line connected between the combustion and supercharger cylinders, the connecting line contained a regenerator (1) between the cylinders and an ignition device and a fuel injection arrangement associated with the combustion cylinder (3), wherein the pistons of the combustion cylinder (3) and of the supercharger cylinder (2) operate with a mutual phase shift by an angle of between 30+ and 90°, the piston of the combustion cylinder (3) leading the piston of the supercharger cylinder (2); the improvement in which the supercharger cylinder (2) is connected, in every position of the pistons (6, 7), with the combustion cylinder (3) by way of the connecting line (4) wherein the regenerator (1) is arranged; that crankcases (8, 9) of supercharger cylinder (2) and combustion cylinder (3) can be filled with fresh air by way of intake slots (10, 11) controlled by the pistons (6, 7), while the pistons (6, 7) pass through their top dead center; both crankcases (8, 9) can be emptied into the supercharger cylinder (2) above the piston (6) within the supercharger cylinder; and there are provided in the supercharger cylinder (2) one of outlet slots (19) controlled therein by the piston (6) of the supercharger cylinder (2) and an outlet valve (20) for the

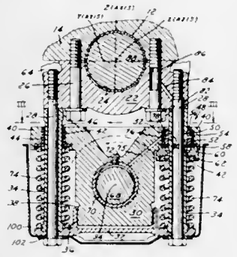
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discharging of the exhaust gases in the cylinder head (5) of the supercharger cylinder (2).

4,781,156
ENGINE VIBRATION BALANCER

Alvin H. Berger, Brownstown; Roy E. Diehl, Northville, and Gordon W. Ellis, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 9, 1987, Ser. No. 130,780
Int. Cl.[4] F02F *7/00*; F02B *75/06*
U.S. Cl. 123—192 R **17 Claims**

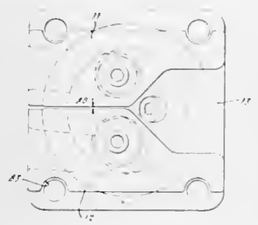


1. A crankshaft vibration balancing means for an automotive type internal combustion engine, comprising, in combination, an engine block having main bearing means, a crankshaft rotatably mounted in the bearing means, and at least one main bearing cap securing the bearing means and crankshaft to the block, a vibration balancing mass suspended from the cap and spaced radially therefrom, means for mounting the mass for a radial oscillatory movement with respect to the axis of the crankshaft, and cam means on the crankshaft engagable with and reciprocating the mass upon rotation of the crankshaft, the means for mounting including means restricting translational movement of the mass to the radial direction only during reciprocation by the cam means while permitting a limited rotational freedom of movement restricted to only sufficient movement to maintain the mass in alignment for movement in the radial direction.

4,781,157
MULTIPART CERAMIC CYLINDER HEAD

Wallace R. Wade, Farmington Hills, and Edwin J. Ounsted, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1987, Ser. No. 137,781
Int. Cl.[4] F02B *75/08*
U.S. Cl. 123—193 H **8 Claims**



1. A multipart ceramic cylinder head construction, comprising:

(a) a ceramic plate having (i) opposed faces, (ii) a central zone through which extends a transverse central axis, (iii) a peripheral zone about said central zone, said plate further having three or more gas or fluid transfer openings extending transversely through said central zone and spaced about said central axis, each in a different radial sector of the plate;

(b) a first ceramic intake port block having sufficient ceramic mass to define a gas passage and define integral compression receiving portion, said first block being adapted to mate with one of said radial sectors of said plate to align said first passage with the opening in said one radial sector;

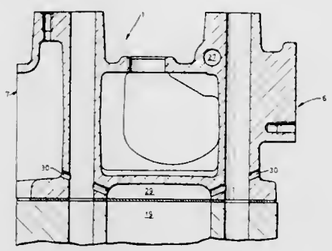
(c) a second ceramic exhaust port block having sufficient ceramic mass to define a second gas passage and define an integral compression receiving portion, said second block being adapted to mate with another of said radial sectors of said plate to align said second passage with the opening in said another radial sector; and

(d) means effective to (i) secure said blocks mated to said plate in compression, and (ii) provide an air gap spacing between said blocks.

4,781,158
CYLINDER HEAD

Lothar Bauer, Cologne, and Ernst-Siegfried Hartmann, Overath, both of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 942,358
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545333
Int. Cl.[4] F22B *5/00*
U.S. Cl. 123—193 CH **11 Claims**

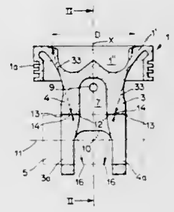


1. An internal combustion engine including a cylinder casing having a pair of in-line cylinders and an air-cooled cylinder head with a cooling air chamber and combustion chamber floors adapted to cover the ends of said cylinders, respectively, presenting an air intake valve port and an exhaust valve port for each of said cylinders, said floor having a flat combustion chamber side covering said ends of said cylinders and an opposite cooling chamber side, said cooling chamber side sloping in relation to said combustion chamber side presenting a smooth convex floor surface of spherical shape above each of said cylinders and sloping gradually in radial directions from the axis of the associated cylinder and a generally straight elongated slot in the said combustion chamber side of said head extending between and at a right angle to a plane through the axes of said cylinders.

4,781,159
COMPOSITE PISTON FOR USE IN THE CYLINDER OF A DIESEL ENGINE

Ludwig Elsbett; Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14-16, D-8543 Hilpoltstein, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,595
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626129
Int. Cl.[4] F02F *3/00, 3/22*; F16J *1/00*
U.S. Cl. 123—193 P **11 Claims**

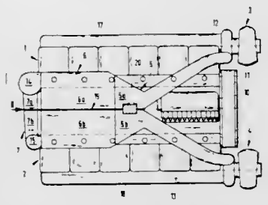


1. A composite piston for use in the cylinder of an engine, particularly a diesel engine, comprising a first section arranged to seal the interior of the cylinder from the fuel and gaseous combustion products and a section arranged to guide the piston in the cylinder, said first section including a head, two spaced-apart piston pin bosses having registering openings, connecting means for connecting said head with said bosses, and at least one reinforcing wall connecting said bosses to each other, and further comprising a piston pin disposed in said openings and pivotally coupling said bosses with said second section.

4,781,160
METHOD FOR OPERATING AN EXHAUST-GAS-TURBOCHARGED, LOW-COMPRESSION MULTI-CYLINDER DIESEL-CYCLE INTERNAL COMBUSTION ENGINE

Joachim Löhr; Volker Rasch, and Walter Gotre, all of Nuremberg, Fed. Rep. of Germany, assignors to Man Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 1, 1987, Ser. No. 103,494
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633405
Int. Cl.[4] F02D *17/00*
U.S. Cl. 123—198 F **5 Claims**



1. In a method of operating an exhaust-gas-turbocharged, low-compression, multi-cylinder Diesel-cycle internal combustion engine that has a first cylinder group which operates over the full load range, and a second cylinder group which is cut out during starting and in the idling and part load ranges, but is cut in in the remaining load range, with cutting out and cutting in of the second cylinder group being effected by respectively cutting off or cutting in the fuel supply, each cylinder group having associated with it an exhaust-gas-operated turbocharger with an associated charge air pipe, the latter communicating with one another via a so-called pressure equalization system, the improvement comprising the steps of:

in the cylinder cutout mode, i.e. during starting as well as in the lower load and speed ranges, interrupting pressure equalization between the two charge air pipes:

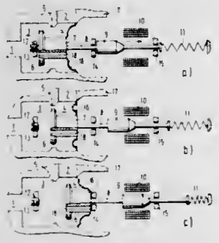
in the upper load range, restoring pressure equalization via a load-controlled device; and

during cylinder cutout, preheating the intake air for the firing cylinders.

4,781,161
SETTING MEMBER FOR CONTROLLING THE QUANTITATIVE FLOW OF A FLUID

Andreas Sausner, Frankfurt am Maio, and Wolfgang Göcking, Neu-Anspach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt/Main, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,618
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609438
Int. Cl.[4] F02D *41/16*
U.S. Cl. 123—339 **6 Claims**



1. In a setting device for controlling the quantitative flow of a fluid, in particular for regulating idling speed of an internal combustion engine, the setting device having an electromagnet and an armature which is movable by the electromagnet against the force of a spring, the improvement wherein the setting device further comprises:

an enclosure defining a first hollow space to which the fluid can be fed and a second hollow space from which the fluid can be extracted;

a constriction disposed within said enclosure for joining said first hollow space with said second hollow space;

a piston secured to said armature and movable through said constriction by said armature from a first position in one of said hollow spaces in which the armature is free of an electric current to a second position in another of said hollow spaces at maximum deflection of the armature wherein said armature is activated by the electric current; and

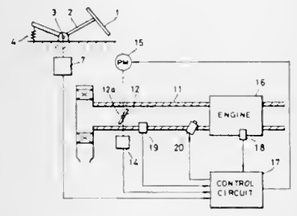
a stop defining said first position, said spring urging said piston against said stop in said first position to provide a larger volume of fluid flow at said first position than a volume of fluid flow occurring during passage of said piston in said constriction.

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4,781,162
THROTTLE VALVE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Yoshikazu Ishikawa, and Kouji Yamaguchi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 80,924
Claims priority, application Japan, Aug. 4, 1986, 61-183850; Aug. 4, 1986, 61-183852
Int. Cl.[4] F02D *9/08, 41/14*
U.S. Cl. 123—399 **8 Claims**



1. A throttle valve control system for controlling an opening angle of a throttle valve disposed in an intake system of an internal combustion engine which is mounted in a vehicle, the control being executed in accordance with engine operating parameters, comprising:

detecting means for detecting a first engine operating parameter;

setting means for setting a target value of said first engine operating parameter and;

drive means for driving said throttle valve such as to reduce a deviation between said detected value of said first engine operating parameter and said target value;

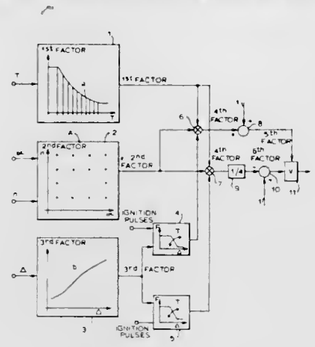
said drive means further acting to set an upper limit opening angle of said throttle valve in accordance with a second engine operating parameter which is different from said first engine operating parameter, and to limit said throttle valve opening angle to a value which is lower than said upper limit opening angle.

4,781,163
FUEL INJECTION SYSTEM

Rüdiger Jautelat, Tamm; Rolf Kohler, Schwieberdingen; Günther Plapp, Filderstadt; Botho Zichner, Schwieberdingen, all of Fed. Rep. of Germany, and Hans-Martin Muller, Framington Hills, Mich., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00380, § 371 Date Jul. 20, 1987, § 102(e) Date Jul. 20, 1987, PCT Pub. No. WO87/03337, PCT Pub. Date Jun. 4, 1987
PCT Filed Sep. 19, 1986, Ser. No. 90,246
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541731
Int. Cl.[4] F02M *51/02*
U.S. Cl. 123—492 **12 Claims**

1. In a fuel injection system which is able to operate with an acceleration enrichment to increase the fuel supply during an acceleration state and a deceleration leaning to reduce the fuel supply during a deceleration state, wherein a compensation of the fuel supply in dependence upon a throttle valve position and a throttle valve opening movement is obtained during a transient state from a normal operation for the acceleration enrichment or for the deceleration leaning, the improvement comprising means to determine a factor $F\ddot{U}K_{DEL}$ which affects said compensation at the transient state, said fuel supply being loaded with said factor $F\ddot{U}K_{DEL}$ which is derived from a three-dimensional characteristic diagram B as a function of a

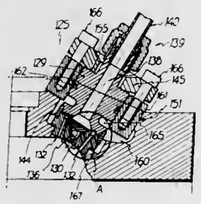


throttle valve position change speed $d\alpha/dt$ and a throttle valve change travel $d\alpha$.

4,781,164
FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Kenneth P. Seeber, Wanneroo; Wayne R. Gilbert, City Beach, and Christopher K. Schlunke, Kingsley, all of Australia, assignors to Orbital Engine Company Proprietary Limited, Balcatta, Australia

Filed Sep. 21, 1987, Ser. No. 99,017
Claims priority, application Australia, Sep. 23, 1986, PH 08154; Mar. 13, 1987, PI 0841
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—533 **30 Claims**

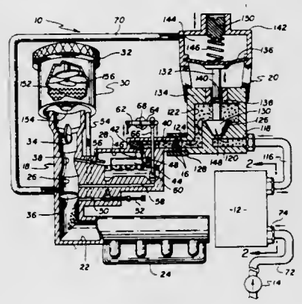


A method of fuel injection for an internal combustion engine having one or more combustion chambers and wherein a metered quantity of fuel entrained in a gas charge is injected directly into each combustion chamber each combustion cycle thereof by the pressure of the gas charge, the method including the steps of delivering gas from at least one combustion chamber of the engine to a gas reservoir, controlling said delivery of gas to said reservoir to substantially maintain the gas in said reservoir above a pressure sufficient to effect direct injection of the fuel into the combustion chambers, and supplying gas at a regulated pressure from said gas reservoir to effect the delivery of the fuel into the combustion chambers.

4,781,165
INTERNAL COMBUSTION ENGINE POLLUTANT CONTROL SYSTEM

Kelly R. Rawlings, Big Bear Lake, Calif., assignor to Anti-P, Inc., Los Angeles, Calif.

Continuation of Ser. No. 853,425, Apr. 23, 1986, Pat. No. 4,711,222, which is a continuation-in-part of Ser. No. 729,656, May 2, 1985, abandoned. This application Oct. 6, 1987, Ser. No. 106,715
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.
Int. Cl.[4] F02M *31/12*
U.S. Cl. 123—555 **23 Claims**



1. A device for improving combustion of the air/fuel mixture in an internal combustion engine including a fuel pump, an air intake means, and a carburetor having a fuel float chamber, an air/fuel mixing throat in communication with the air intake means, and passage means from the float chamber to the mixing throat, the device for improving combustion of the air/fuel mixture in an internal combustion engine comprising:

a fuel heating and vaporizing unit having a fuel inlet connected to the fuel pump, and an outlet for a mixture of liquid and vaporized fuel produced within the fuel heating and vaporizing unit; and

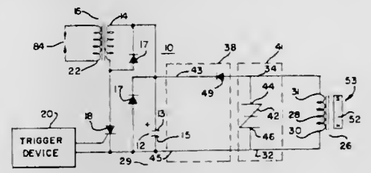
a flow control valve for controlling the flow of the mixture of liquid and vaporized fuel from the fuel heating and vaporizing unit outlet to the float chamber, the control valve being connected to a ported vacuum line extending from the carburetor and responsive to ported vacuum pressure to increase the flow of the mixture of liquid and vaporized fuel when the pressure decreases, and decrease the flow of the mixture of liquid and vaporized fuel when the pressure increases.

4,781,166
VOLTAGE REGULATED MAGNETO POWERED CAPACITIVE DISCHARGE IGNITION SYSTEM

Gregry M. Remmers, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 29, 1987, Ser. No. 67,702
Int. Cl.[4] F02P *3/09*
U.S. Cl. 123—597 **4 Claims**

1. A voltage regulated magneto powered capacitive discharge ignition system comprising a charge capacitor having opposite plates, a magneto including a charge coil having opposite end terminals, circuit means for respectively connecting said opposite plates of said charge capacitor to said end terminals of said charge coil and including rectifier means for insuring unidirectional current flow from said charge coil to said charge capacitor, said rectifier means having input terminals respectively connected to said end terminals of said charge coil and output terminals respectively connected to said plates of said charge capacitor, and voltage regulator means for operationally clamping the voltage of the charge coil including two terminal, bidirectional semiconductor voltage triggered switching means comprising a Sidac having first and second anode terminals, said first and second terminals being respectively connected to said end terminals of said charge coil and to said input terminals of said rectifier, said switching means



being self triggered and thereby rendered conductive between said first and second terminals in response to a voltage developed on said charge coil exceeding a predetermined value thereby shunting said charge coil so that further charging of said charge capacitor is prevented.

4,781,167
COMPOUND BOW WITH ADJUSTABLE TENSION CABLE ANCHOR

Dan J. Martin, Walla Walla, Wash., assignor to Martin Archery, Inc., Walla Walla, Wash.

Filed Mar. 3, 1987, Ser. No. 20,753
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R **30 Claims**



16. An anchor for securing a tension cable of a compound bow to the compound bow, comprising:

attachment means for securing the anchor to the compound bow;

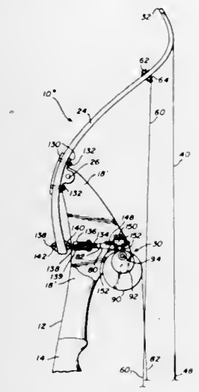
tension cable receiving means for receiving a tension cable for its securing to the anchor, the tension cable receiving means and attachment means being slidably, not threadably, received relative to one another; and

adjustment means for selectively varying the position of the attachment means and tension cable receiving means relative to one another for adjusting the tension in the tension cable, the adjustment means comprising a set screw which engages both the tension cable receiving means and the attachment means, threading of the set screw directly varying the relative positions of the tension cable receiving means and the attachment means.

28. A compound archery bow incorporating the anchor of claim 16.

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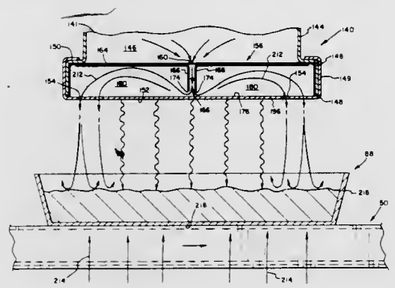
4,781,168
ARCHERY BOW
Wayne L. Lester, 3935 Willow Run, Flower Mound, Tex. 75028
Continuation-in-part of Ser. No. 880,203, Jun. 30, 1986, abandoned. This application Oct. 1, 1986, Ser. No. 913,987
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—24 R **9 Claims**



4. An archery bow, comprising:
(a) a handle;
(b) a resilient upper limb and a resilient lower limb, each pivotally connected to opposite ends of said handle and presenting spaced recurved tips;
(c) a bowstring connected at each end to said tips of said upper and lower limbs and defining a first plane with said handle;
(d) upper and lower pulley assemblies rotatively mounted on the archery bow in spaced relation intermediate the ends of said handle, each of said pulley assemblies including a large pulley and a small pulley connected to each other and eccentrically and rotatively mounted on said handle at a common point, said upper and said lower pulley assemblies with said handle defining a second plane parallel to said first plane;
(e) a first tension cable connected at one end to said upper limb between said tip thereof and said pivotal connection with said handle, said first tension cable being operatively engaged with said lower pulley means;
(f) a second tension cable connected at one end to said lower limb between said tip thereof and said pivotal connection with said handle, said second tension cable being operatively engaged with said upper pulley means; and wherein said upper and lower pulley assemblies each further comprises a third pulley rotatively mounted on one of said upper or lower limbs and one of said first or second tension cables extending from said large and small pulleys to said third pulley and operatively engaged therewith, with another end of said first or second tension cable being connected to said handle.

4,781,169
OVEN WITH RADIANT PANEL
Mitchell C. Henke; Carol S. Nealley; Effie J. Lee, and Daniel S. Kaminski, all of Fort Wayne, Ind., assignors to Lincoln Foodservice Products, Inc., Fort Wayne, Ind.
Filed Apr. 14, 1987, Ser. No. 38,021
Int. Cl.[4] A21B *1/00;* **A23L** *3/00*
U.S. Cl. 126—21 A **33 Claims**

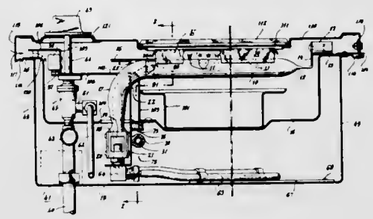
1. A food preparation oven comprising:
an enclosure defining a chamber for receiving a food product therein,
support means for supporting a food product in said chamber,
means for producing a moving mass of heated air, and
a duct connected to said means for producing, said duct having a thermally conductive wall with an outer radiant energy emissive surface means for radiating infrared energy toward said support means when said wall is heated,

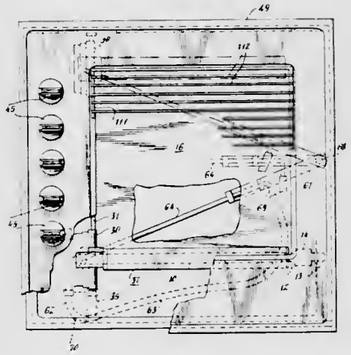


said wall having a plurality of apertures therein facing toward said support means,
said duct including means therein for conveying heated air from said means for producing over an inner surface of said wall to thereby heat the wall and then conveying the heated air towards and through said apertures toward said support means.

4,781,170
TRAVELING FLAME BURNER
Richard L. Perl, Mansfield, Ohio, assignor to The Tappan Company, Ohio
Filed Feb. 24, 1987, Ser. No. 17,921
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—39 E **22 Claims**

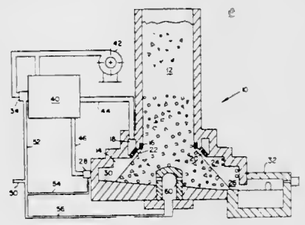
1. A cooking appliance comprising a substantially horizontal elongated heat source, means reciprocating said heat source in a horizontal plane in a direction substantially transverse to the lengthwise direction of said heat source, a source of energy for





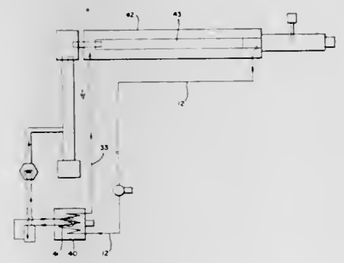
said heat source, and means for directing energy from said source of energy to said heat source.

4,781,171
GAS FIRED PARTICULATE MELTING APPARATUS AND METHOD
Klaus H. Hemsath, Toledo, Ohio, assignor to Indugas, Inc., Toledo, Ohio
Filed Jul. 6, 1987, Ser. No. 70,224
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—343.5 A **17 Claims**



1. A liquid fuel fired furnace apparatus for melting particulate material, said apparatus comprising: a vertically disposed hollow cylindrical shaft for preheating a foraminous column of flowable particulate feedstock, said shaft having an open bottom end, a concentrically aligned chamber for containing a freestanding pile of feedstock, said chamber being disposed directly below said open bottom end, said chamber having top, bottom and intermediate portions defined by refractory sidewalls and a refractory floor, said sidewalls having inner surfaces which extend downwardly and outwardly from said open bottom end to said floor, a plurality of high temperature burners firing into said intermediate and bottom portions of said chamber and a means for injecting relatively cooler gases from a remote source into said top portion of said chamber.
14. An improved method of melting particulate material comprising the steps of: introducing particulate material into the top of a vertically disposed preheater shaft, supporting said particulate material in said preheater shaft on a freestanding pile of preheated particulate material disposed on an inclined floor of a melting chamber, enveloping a top portion of said free standing pile with cooled combustion gases from a remote source, subjecting the intermediate and base portions of said pile to intense heat capable of melting the particulate material on the outside surface of said pile, allowing the melted material to gravitate to the lower end of said slope, and collecting said melted material in a reservoir at the bottom of the slope.

4,781,172
VARIABLE FLOW MULTIPLE PASS APPARATUS FOR HEATING LIQUIDS
James H. Byrd, 32 Westover, and Jimmy D. Ashley, Rte. 4, both of, Edenton, N.C. 27932
Filed Dec. 3, 1985, Ser. No. 804,047
Int. Cl.[4] A47J *27/06, 37/12;* **F28F** *13/08*
U.S. Cl. 126—378 **4 Claims**



1. In a cooking oil heat heater having a variable flow multiple pass heat exchanger for heating the cooking oil comprising a series of tubular members in a stacked configuration locted above a source of combustion gases wherein the cooking oil is directed through a supply line and into a manifold that further directs the cooking oil through a least one first layer of tubes, said tubes leading to a second manifold through which the cooking oil is directed upward and through a least one second layer of tubes having tubes of substantially the same diameter as the tubes in said first layer and having a greater number of tubes than said first layer, and wherein said layers of tubes are closely spaced and said tubes in each layer are staggered between said tubes of the next adjacent layer.

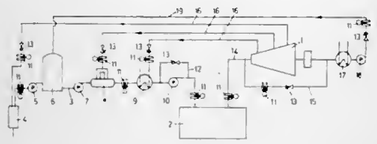
4,781,173
EVAPORATING DEVICE AND ELECTRIC SUPPLY STATION PROVIDED WITH SUCH AN EVAPORATING DEVICE
Juha Ven; Kari K. Ven; Petri A. G. Ven, and Timo R. Ven, all of Desguinlei 206, B - 2018 Antwerpen, Belgium
Filed Jun. 18, 1986, Ser. No. 875,542
Claims priority, application Belgium, Jun. 28, 1985, 2/60730(902768)
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—433 **11 Claims**

1. An evaporating device comprising at least one set of solar heating units of that type which has an insulated oblong room which is provided at the top with a slit, a mirror structure with at least one oblong mirror which is mounted on said room for collecting the sun radiation and reflecting same through the slit into said room, a pipe which extends through said set, said pipe

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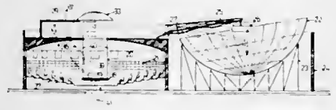
constituting a vapor pipe which extends in sequence through the various solar heating units, an automatically adjustable flow regulating valve at either end of said vapor pipe, a liquid supply pipe connected to the vapor pipe in at least two locations between said regulating valves and automatic means to control the operation of said valves, said means comprising a temperature meter at each end of said vapor pipe and a control device connected to said flow regulating valves and to said temperature meters, which control device closes the flow regulating valve at an end of the supply pipe and opens the flow regulating valve at the other end and so reverses the flow direction of the fluid inside said supply pipe each time that the temperature meter at the first mentioned end detects a temperature above a predetermined value.

11. An electric power station, comprising at least one vapor generator and at least one vapor turbine-generator set connected thereto, which vapor generator comprises at least one set of solar heating units of a type which has an insulated



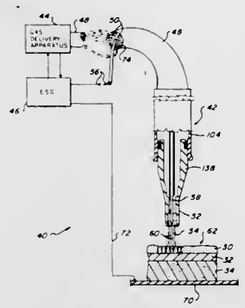
oblong room which is provided at the top with a slit, a mirror structure with at least one oblong mirror which is mounted on said room to collect the sun radiation and reflect same through said slit into the room, a pipe which extends through said set, said pipe constituting a vapor pipe which extends in sequence through the various solar heating units, an automatically adjustable flow regulating valve at either end of said vapor pipe, a liquid supply pipe connected to the vapor pipe in at least two locations between said regulating valves and automatic means to control the operation of said valves, said means comprising a temperature meter at each end of said vapor pipe and a control device connected to said flow regulating valves and to said temperature meters, which control device closes the flow regulating valve at an end of the supply pipe and opens the flow regulating valve at the other end and so reverses the flow direction of the fluid inside said supply pipe each time that the temperature meter at the first mentioned end detects a temperature above a predetermined value.

4,781,174
CREMATION APPARATUS AND METHOD
Kenneth H. Gardner, 408 Plantations Building, Bridgetown, Barbados,
Filed Nov. 25, 1983, Ser. No. 555,014
Claims priority, application United Kingdom, Dec. 8, 1982, 8234973
Int. Cl.[4] F24J *2/00*
U.S. Cl. 126—452 **29 Claims**



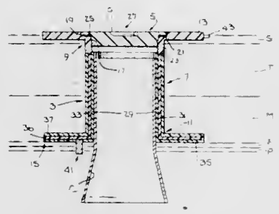
1. A method of cremating a corpse comprising elevating the corpse through an opening in the roof of an auditorium to simulate ascent of the corpse to Heaven, then focussing concentrated radiant solar heat on the corpse to provide at least partial incineration thereof.

4,781,175
ELECTROSURGICAL CONDUCTIVE GAS STREAM TECHNIQUE OF ACHIEVING IMPROVED ESCHAR FOR COAGULATION
Francis T. McGreevy, Aurora; Carol Bertrand, and Karl W. Hahn, both of Englewood, all of Colo., assignors to C. R. Bard, Inc., Murray Hills, N.J.
Filed Apr. 8, 1986, Ser. No. 849,950
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.17 **59 Claims**



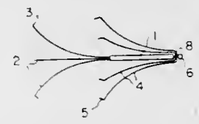
1. An electrosurgical unit for creating an improved eschar in the stroma of tissue, comprising:
means for conducting a predetermined gas not containing oxygen in a jet to the tissue at a predeterined flow rate sufficient to clear natural fluids from fluid-perfused tissue and to substantially expose the tissue stroma; and means for transferring electrical energy at a predetermined radio frequency range in ionized conductive pathways at a predetermined power level within the gas jet in an electrical circuit which includes the tissue to create the eschar.

4,781,176
IMPLANTABLE DEVICE
Biagio Ravo, Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017
Filed Feb. 20, 1987, Ser. No. 17,126
Int. Cl.[4] A61B *19/00*
U.S. Cl. 600—30 **13 Claims**



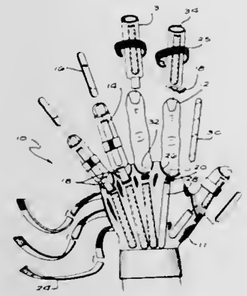
1. A device for providing access to the colon through the abdominal wall of a patient comprising:
a hollow tubular colon support member having a generally cylindrical body portion adapted to be received within an opening in the abdominal wall and defining a generally cylindrical interior space open at the first and second opposed ends of the body portion, said body portion being adapted to receive and secure the end of the colon within said interior space, wherein at least a segment of said cylindrical body portion of said support member comprises inner and outer layers of biocompatible polymeric material, with said outer layer being capable of receiving soft tissue ingrowth therein to enhance the anchoring of said support member in the abdominal wall of the patient and said inner layer being capable of receiving soft tissue ingrowth therein to bond the end of the patient's colon to the support member, and first and second substantially radially-extending flanges adjacent the first and second opposed ends of the body portion, respectively, the first flange being adapted to lie upon the dermis or subcutaneous tissue and the second flange being adapted to lie on the fascia or peritoneum;
a plug adapted to sealingly close the support member opening to said interior space which is located at said first end of the body portion;
means for engaging the plug with the support member adjacent said first end of the body portion to close and seal said support member opening;
means for releasing said engaging means to open said support member opening; and
means for generating and transmitting to the patient a signal when a predetermined pressure is attained inside the patient's colon in the vicinity of the support member.

4,781,177
BLOOD CLOTS FILTERING DEVICE
Jacques Lebigot, Saint-Barthelemy, Guadeloupe, assignor to Promed, Saint-Barthelemy, Guadeloupe
Filed Nov. 16, 1987, Ser. No. 120,995
Claims priority, application France, Nov. 17, 1986, 86 15962
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—897 **9 Claims**



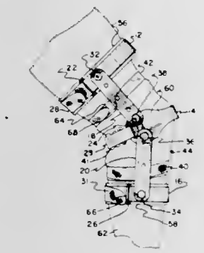
1. A filtering device useful for partly interrupting the interior vena cava and for creating an efficient barrier against embolic migration, wherein in as expanded operating condition, said device comprises:
a filiform body, extended at one of its ends by a first filter constituted by a plurality of flexible wires of identical length and configuration, starting from said end and diverging in extension from said body, said wires being regularly circumferentially spaced apart, one with respect to the other, so as to form a cone of revolution, widened and open at its base, the free end of each wire being bent outwardly to form a fastening tip;
a filter-stabilizer located at the other end of said body and constituted of a plurality of flexible wires of identical length and configuration, starting from said other end, and which are first bent over around said body and diverging with respect thereto, said wires being regularly circumferentially spaced apart, one from the other, and being, moreover, offset by a certain angle with respect to the wires constituting the first filter, in order to form a second cone of revolution widened and open at its base, the free end of each wire being slightly bent inwardly to prevent any fastening;
and an eyelet being also provided at said other end of the body for threading a thread therethrough for positioning the filtering device;
whereas in the collapsed state, the wires of the filter-stabilizer, in order to be housed in a catheter, are resiliently bent against said body and the wires of the first filter are resiliently bent over the axis extending from said body.

4,781,178
ORTHOPEDIC GLOVE
Kevin M. Gordon, 10421 Summer Holly Cir., Los Angeles, Calif. 90077
Filed Feb. 6, 1987, Ser. No. 11,642
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—77 **10 Claims**



1. An orthopedic glove comprising:
a hand covering having a main section adapted to cover a hand, including a hand palm side and a back side, said main section of said hand covering having a plurality of elongated pockets formed on both said back side and said palm side;
a plurality of separate detachable finger sleeve sections, each of said separate sleeve sections being formed with two sleeve pockets, said sleeve pockets being positioned on opposite sides of said finger sleeve section;
mounting means for selectively and removably mounting selected ones of said finger sleeve sections to said main section at one or more of five different locations, each of said five locations being selected to be adjacent to a respective one of said hand fingers; and
elongated splints adapted to be selectively and removably insertable into each of said main section pockets and said finger sleeve pockets.

4,781,179
ATHLETIC LEG BRACE APPARATUS
Michael A. Colbert, 10607 School St., Fairfax, Va. 22030
Filed Aug. 7, 1987, Ser. No. 82,581
Int. Cl.[4] A61F *3/00*
U.S. Cl. 128—80 C **1 Claim**

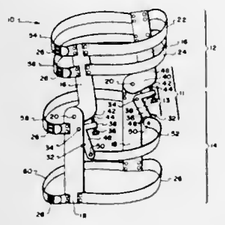


1. An athletic leg brace comprising;
a flexibie upper harness attachable about the leg above the knee;
said upper harness having a strap and buckle for securing said upper harness to said leg:
a pair of upper lateral suspension rods each having two

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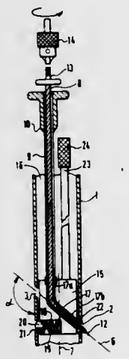
terminal ends and provided with holes spaced along the longitudinal axis thereof;
a knee protector strap positionable across the front of the knee and joined to a pair of contoured knee protection pads;
means pivotally securing said terminal ends of said upper lateral suspension rods respectively to said flexible upper harness strap and said protection pads;
a layer of padded material disposed internally of said upper lateral suspension rods and said upper harness strap;
a flexible lower harness attachable about the leg below the knee,
said lower harness having a strap and buckle for securing said lower harness to said leg;
a pair of lower lateral suspension rods each having two terminal ends and provided with holes spaced along the longitudinal axis thereof;
means pivotally securing said terminal ends of said lower lateral suspension rods respectively to said flexible lower harness strap and protection pads;
said layer of padded material disposed internally of said lower lateral suspension rods and said flexible lower harness strap;
said layer of padded material and suspension rods having hook and loop fasteners to affix said layer and rods, on said rods hook and loop fasteners affixed by fastening means comprising said holes;
means for securing said knee protection pads behind the leg; whereby said knee protector strap and upper and lower flexible harness straps enclose the leg above the knee as said upper suspension rods are maintained positioned above and laterally of the knee while said lower suspension rods are maintained positioned below and laterally of the knee;
said knee protection pad securing means comprising adjustable means maintaining said pads positioned across and laterally of the knee cap;
a band of elastic material separate from and cooperating with said knee protector strap means for softening the action of the securing means against the back of the leg; and
said band of elastic material being contiguous with said securing means.

4,781,180
ORTHOTIC KNEE BRACE SYSTEM AND METHOD
Moshe Solomonow, 3380 State St. Dr., New Orleans, La. 70125
Filed Sep. 22, 1986, Ser. No. 909,899
Int. Cl.[4] A61F 5/00
U.S. Cl. 128—80 C **14 Claims**



1. An anterior orthotic knee brace system for gradually providing and increasing a posteriorly directed retaining force to the upper anterior portion of the tibial bone as wearer's leg extends and wherein said system comprises in combination:
(a) a first framework, including means for attaching said framework to a human leg above the knee joint.
(b) a second framework, including means for attaching said framework to a human leg below the knee joint.
(c) hinge means for pivotally interconnecting said first and second framework, and
(d) a tibia stabilizing force-transfer assembly operatively interconnected between said first and second frameworks, said force-transfer assembly including means for gradually increasing the posteriorly directed retaining force at the upper anterior portion of the tibia as the leg extends thereby preventing anterior dislocation of the tibia from the knee joint.

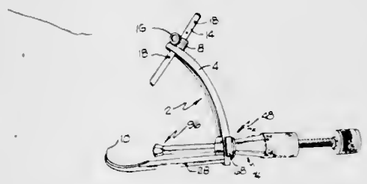
4,781,181
BORING SENSOR FOR INTRAMEDULLARY NAIL AND CORRESPONDING INTRAMEDULLARY NAIL
Christian Tanguy, Choisy-Le-Roi, France, assignor to Zimmer, S.A., Vitry-Sur-Seine, France
Filed Aug. 26, 1986, Ser. No. 900,459
Claims priority, application France, Aug. 27, 1985, 85 12777; Aug. 13, 1986, 86 11720
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YZ **19 Claims**



11. Apparatus for drilling a passage in the cortical wall of a bone, comprising: an intramedullary nail having a wall defining an internal cavity, said nail presenting a substantially constant transverse cross-section tubular form and having aligned inlet and outlet screw holes in said wall, said nail having a slightly pointed distal end and a proximal end provided with at least one screw passage in the wall thereof which is inclined with respect to a longitudinal axis of said nail, said nail further including, adjacent said slightly pointed distal end at least two pair of holes transversely aligned with respect to the longitudinal axis of the nail for permitting fixation screws to pass through the nail into the bone and to also define positioning means; and
a boring sensor intended to be housed within said intramedullary nail for drilling a passage in the cortical wall of a bone that bears the nail, said boring sensor comprising:
a guiding and positioning unit axially movable in said internal cavity of the nail, said unit including a passage extending therethrough, said passage including a first portion substantially parallel with the axis of the nail and a second portion forming an angle with the first portion, said second portion terminating in a distal orifice on the surface of the unit;
a sheath having a proximal end exiting the internal cavity of said nail substantially parallel to the axis of said unit and a distal end connected with said unit and in open communication with said passage, said sheath including a bore extending therethrough from said proximal end to said distal end thereof, and a portion of said sheath adjacent said guiding and positioning unit including a substantially rigid wall;

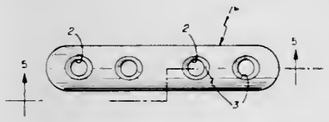
a flexible shaft rotatably positioned in said sheath and said passage, said flexible shaft having a distal end with a boring head thereat and a proximal end adapted to be coupled to a rotary motor; and
positioning means in said unit for engaging the positioning means of said nail to position said unit in said nail such that the distal orifice of said unit is positioned in line with the screw hole in the wall of said nail.

4,781,182
APPARATUS AND METHOD FOR USE IN PERFORMING A SURGICAL OPERATION
Mark L. Purnell, 323 Free Silver Dr.; Robert R. Odén, P. O. Box 660, both of Aspen, Colo. 81611; William L. McCune, 1739 W. 35th, Denver, Colo. 80211, and Michael E. Berkeley, 1695 Silver King Dr., Aspen, Colo. 81611
Filed Oct. 3, 1986, Ser. No. 915,122
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 VD **10 Claims**



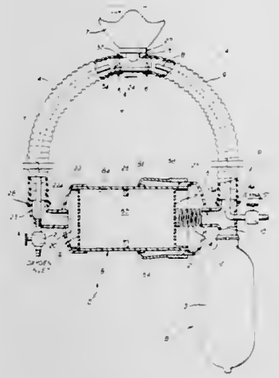
1. Apparatus for use in performing surgery on a portion of a body comprising:
an arcuate support means having a longitudinal axis comprising an arc of a circle having a center;
said arcuate support means having a first end portion and a second end portion;
guide means secured to said first end portion;
a passageway extending through said guide means and having a longitudinal axis coinciding with a ray from said center of said circle;
pin sleeve means mounted and secured in said guide means;
said pin sleeve means having a passageway extending therethrough and having a longitudinal axis coinciding with said longitudinal axis of said guide means so that drill means may be guided through said passageway and enter into said portion of said body;
targeting means having a non-linear configuration and having a target area portion at one end thereof so that said target area portion may be positioned at a desired location inside said portion of said body and attachment means at the other end of said targeting means;
releasable securing means for cooperating with said attachment means to secure said targeting means to said arcuate support means so that said target area portion is located at said center of said circle;
clamping means movably mounted on said securing means for movement into contact with the outside of said portion of the body and to apply pressure thereto so as to cooperate with said securing means to hold said target area portion at said desired location; and
said releasable securing means permitting movement of said arcuate support means and said guide means relative to said targeting means and said clamping means so that said pin sleeve means may be located so that said drill means will pass through said portion of said body at the proper angular relationship thereto and contact said target area portion.

4,781,183
SURGICAL PROSTHESIS
Donald J. Casey, Ridgefield; Peter K. Jarrett, Trumbull, both of Conn., and David W. Wang, Vestal, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Filed Aug. 27, 1986, Ser. No. 900,957
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YP **14 Claims**



1. A bone fixation device comprising an absorbable polymer matrix, said matrix obtained from the polymerization of l-lactide, and a reinforcement material being a filler in a particulate, non-fiber form being suspended throughout the matrix and being selected from the group consisting of tricalcium phosphate, hydroxyapatite, and a mixture thereof.

4,781,184
CLOSED CIRCUIT BREATHING APPARATUS AND METHOD OF USING SAME
William P. Fife, 2350 W. Briargate, Bryan, Tex. 77802
Continuation of Ser. No. 570,615, Jan. 13, 1984, abandoned. This application Aug. 15, 1986, Ser. No. 896,928
Int. Cl.[4] A62B 7/10
U.S. Cl. 128—205.12 **13 Claims**



1. A closed circuit breating apparatus adapted for connectionto an oxygen supply for providing oxygen to a subject for breathing, the subject introducing carbon dioxide and other fluids into the apparatus while breathing, said appaatus comprising:
a conection element having a first end and a second end adapted to be secured to the subject in fluid communication with the respiratory system of the subject;
a non-return valve comprising;
a housing in closed circuit fluid communication with said first end of said connection element;
a one-way inhalation valve means for allowing oxygen to enter said housing when the subject inhales;
a one-way exhalation valve means for allowing oxygen and other exhaled fluids to exit said housing when the subject exhales;

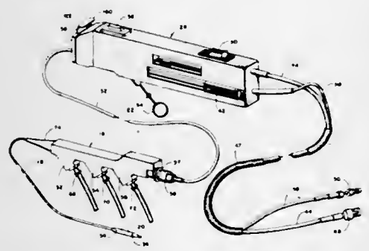
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an inhalation conduit in closed circuit fluid communication with said housing and connected to said housing adjacent said inhalation valve means to transport oxygen to said housing for the subject to inhale;
an exhalation conduit in closed circuit fluid communication with said housing and connected to said housing adjacent said exhalation valve means to transport oxygen and other exhaled fluids from said housing with the subject exhales;
carbon dioxide absorption means in closed circuit fluid communication between said inhalation and exhalation conduits for absorbing carbon dioxide exhaled by the subject;
means for connecting said carbon dioxide absorption means to receive fluids from said exhalation conduit and furnish purified fluids to said inhalation conduit;
an expansible breathing bag connected through said inhalation conduit in flow communication with said housing of said non-return valve assembly;
supply means including inlet tubing means mounted in said exhalation conduit for selectively introducing oxygen from the oxygen supply to a point adjacent said exhalation valve means for passage to said inhalation conduit through said carbon dioxide absorption means; and
purge means including outlet tubing means mounted in said inhalation conduit and extending in said inhalation conduit to a point adjacent said inhalation valve means for purging fluids from the apparatus.

4,781,185
CONNECTING APPARATUS FOR CATHETER ASSEMBLY

James V. Kauphusman, Champlin, and Bruce H. Neilson, Brooklyn Park, both of Minn., assignors to GV Medical, Inc., Minneapolis, Minn.

Filed Jul. 21, 1986, Ser. No. 887,196
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **18 Claims**

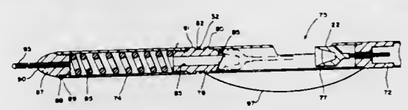


1. Apparatus for releasably connecting the proximal end of a transluminal catheter with respect to a housing, including:
a locking plate enclosure mounted at the distal end of a housing and including parallel, spaced apart first and second walls forming a slot therebetween open to a peripheral edge of the enclosure, and first and second longitudinally aligned openings formed in the first and second walls, respectively; a generally planar locking plate having a central aperture formed therethrough and supported in said slot to reciprocate between an open position wherein said central aperture is substantially longitudinally aligned with said first and second openings, and a locking position wherein a locking blade portion of said locking plate along said central aperture is located between said first and second openings; a biasing means in said enclosure for urging the locking plate in a locking direction; and a stop means for limiting movement of the locking plate in said locking direction; and
a transluminal catheter including a catheter connector integral with the proximal end of the catheter, and adapted for at least partial longitudinal insertion into said housing through said first and second openings and central aperture, said catheter connector having a central longitudinal bore therethrough for accommodating an optical fiber, and further having an annular groove formed in its exterior surface; said groove, during said insertion, positionable in said slot to receive said locking blade portion, thus to form an interlocking engagement between said locking plate and said catheter connector.

4,781,186
ATHERECTOMY DEVICE HAVING A FLEXIBLE HOUSING

John B. Simpson, Woodside; Hira Thapliyal, Mountain View; Hanson S. Gifford, III, Palo Alto, and Tommy G. Davis, Mountain View, all of Calif., assignors to Devices for Vascular Intervention, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 834,947, Feb. 28, 1986, abandoned, and a continuation-in-part of Ser. No. 732,641, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 615,298, May 30, 1984, abandoned. This application Jul. 31, 1987, Ser. No. 80,342
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **14 Claims**

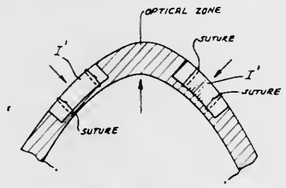


1. In an atherectomy device for use in a vessel, a flexible tubular member having proximal and distal ends and having at least one lumen extending therethrough, a housing secured to the distal end of the tubular member, the housing having a cutout in one side thereof extending longitudinally of the housing and facing outwardly in a direction which is generally perpendicular to the longitudinal axis of the housing, a collection chamber formed in the housing for retaining severed atheroma materials within the atherectomy device, a rotary cutter mounted in the housing for movement longitudinally of the housing through the cutout, at least a portion of the housing being flexible so as to permit bending of the housing between its distal and proximal extremities whereby the housing has the capability of following contours in a vessel in which the atherectomy device is to be utilized and, inflatable balloon means carried by the housing and mounted exterior of the housing on the side opposite the cutout so that when the balloon means is inflated the cutout will be moved towards the sidewall of the vessel.

4,781,187
METHOD AND IMPLANT FOR REFRACTIVE KERATOPLASTY

Robert S. Herrick, 4134 N. Rosemead Blvd., Rosemead, Calif. 90004

Filed Aug. 19, 1986, Ser. No. 897,865
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 **7 Claims**

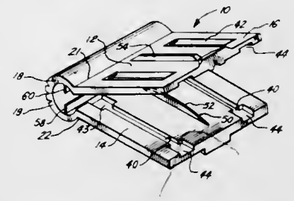


1. A method of radial keratotomy including the steps of producing a preselected number of radial keratotomy incisions in the cornea of a human eye for correcting impaired vision, providing a thin piece of donor corneal tissue of a preselected geometric configuration selected in accordance with the desired correction in refractive properties of the cornea to restore substantially normal vision and sized for insertion into said radial keratotomy incisions, inserting a thin piece of donor corneal tissue into a preselected number of said corneal incisions, in a preselected orientation in accordance with the desired correction in refractive properties, and fixing the thin pieces in position in said corneal incisions.

4,781,188
UMBILICAL CORD CLAMP APPARATUS

Jason H. Collins, 2986 Palm Dr., Slidell, La. 70458

Filed Sep. 22, 1986, Ser. No. 909,883
Int. Cl.[4] A61B *17/10*
U.S. Cl. 128—305 **6 Claims**



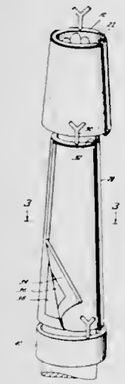
1. A composite umbilical cord cutter and clamp apparatus, comprising:
a. a base member having an upper and lower portion, the upper and lower portion joined by a loop integral therewith so that the opposite ends are normally spaced apart and may move between open and closed positions in relation to one another;
b. means contained on the base member for engaging and supporting at least a pair of clamp members in spaced relation, each of said clamp members further comprising a substantially V-shaped portion including a pair of arms joined together by a loop integral therewith forming a hinge between the arms at one end with the opposite ends being freely and normally spaced apart, the arms movable between a first unclamping open position and a second clamped position, and locking means on each of the members for maintaining each of the members in the locked position;
c. cutting means on the base member positioned intermediate the clamp members for severing the umbilical cord following the movement of the base member and clamp members to the second clamped position; and
d. upper and lower resilient retainer plates positioned in the loop of the base member for assisting in releasing the clamp members from the base member following the return of the base member to the open position.

4,781,189
PNEUMATIC EXSANGUINATOR AND METHOD FOR EXSANGUINATING A LIMB

Cesar A. Vijil-Rosales, 5642 Indigo, Houston, Tex. 77096

Filed Nov. 1, 1985, Ser. No. 794,242
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—327 **7 Claims**

1. A method for exsanguinating a limb comprising the steps of:
encircling the limb with multiple means for pneumatic compression, multiple means to release pressure, and multiple means to monitor the pressure, each of said multiple means operating independent of each other;
compressing the limb first with the compression means nearest the extremity of the limb and sequentially compressing the independent compression means to the proximal end of the limb while monitoring independently the pressure in each compression means; and



exsanguinating said limb with the exertion of the independently monitored pressure in each of the compression means.

4,781,190
METHOD OF ARTHROSCOPIC REPAIR OF A LIMB JOINT

Wilson K. C. Lee, 14 Thornber Street, Unley Park 5061 South Australia, Australia

Filed Apr. 11, 1986, Ser. No. 850,702
Claims priority, application Australia, Jun. 18, 1985, PH1081
Int. Cl.[4] A61B *17/04, 17/06*
U.S. Cl. 128—334 R **13 Claims**

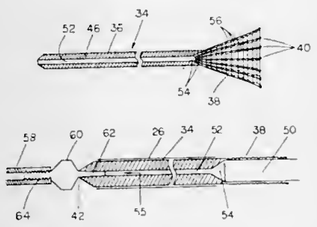


1. A method for surgical repair, under arthroscopic control, of a lesion in a tissue of a limb joint of a mammal comprising the steps of:
(a) inserting a straight needle, carrying a suture previously knotted at one end, via the end distal from an eccentrically placed eye aperture into the joint at the anterior medial aspect of the joint,
which needle has two tapered, sharpened ends and is 0.5 to 30 cm long;
(b) advancing the tip of the needle under arthroscopic con-

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trol using either direct vision or television monitor control, until it reaches the medial side of the tear;
(c) pushing the needle through the tissue and advancing it so that the trailing tip of the needle remains inside the joint capsule and the eye aperture of the needle is just outside the skin of the joint on the lateral side;
(d) pulling the free end of the suture through to the exterior of the joint;
(e) pushing the needle back through the tissue in the reverse direction until the eye aperture of the needle is just outside the skin and the tip of the longer arm of the needle is just adjacent to the tissue;
(f) pulling the suture through to the exterior of the joint as in step (d); and
(g) repeating the procedure as many times as required to repair the lesion.

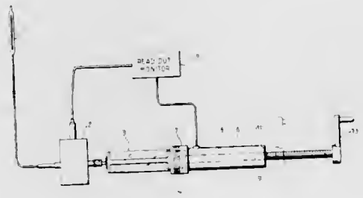
4,781,191
METHOD FOR ENABLING ATRAUMATIC PASSAGE OF A SEVERED TENDON THROUGH A TENDON SHEATH
James S. Thompson, 112 Upnor Rd., Baltimore, Md. 21202
Division of Ser. No. 4,662, Jan. 20, 1987, Pat. No. 4,733,850.
This application Jan. 7, 1988, Ser. No. 142,520
Int. Cl.⁴ A61B *17/04*
U.S. Cl. 128—334 R **6 Claims**



6. A method for placing a severed tendon in a position to be repaired, at least a portion of which having been removed from its normal position in an enclosed space, and utilizing an elongated hollow tube which is open at both ends, comprising the steps of:
inserting said tube into the enclosed space;
placing the end of the severed tendon in one end of said tube;
applying suction to the opening at the other end of said tube, thereby holding the tendon in contact with said tube;
pulling said tube and a portion of said tendon through the enclosed space.

4,781,192
BALLOON DILATION APPARATUS
Linda L. Demer, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.
Filed Dec. 22, 1986, Ser. No. 944,772
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.⁴ A61M *29/02*
U.S. Cl. 128—344 **3 Claims**

1. An apparatus for performing balloon dilation and indicating the pressure and volume of the balloon during dilation comprising:
a syringe for filling a balloon catheter with liquid,
the syringe including a cylinder and a piston moveable axially in the cylinder effective to displace liquid in the syringe,
liquid passage means adjacent an end of the cylinder for passage of the displaced liquid to the balloon catheter,
a linear variable differential transformer having an axial bore and a core moveable axially in the bore effective to generate an electrical signal proportional to the core's axial position in the transformer,
the syringe and the linear variable differential transformer being disposed together in end to end relationship,
a shaft moveable axially within the syringe cylinder and the axial bore of the transformer, one end connected to the piston in the syringe cylinder, and the shaft in the bore of the transformer being nonferrous and carrying the core,
whereby movement of the shaft causes simultaneous axial movement of the piston and the core and produces the electrical signal proportional to the core's axial position in



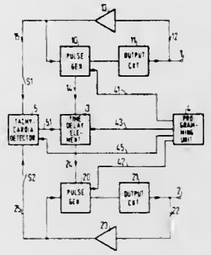
the transformer and thereby the volume of the liquid displaced from the syringe cylinder into the balloon catheter,
a pressure transducer in fluid communication with liquid in the liquid passage effective to produce an electrical signal proportional to the liquid pressure, and
means for displaying the electrical signals produced by the linear variable differential transformer and the pressure transducer thereby displaying present and past values of the liquid pressure and volume existing within said balloon catheter.

4,781,193
HEADACHE TREATMENT APPARATUS
Kenneth L. Pagden, P.O. Box 581, Leeton, Australia 2705
Filed Jun. 23, 1982, Ser. No. 391,187
Claims priority, application Australia, Mar. 7, 1982, 85508/82
Int. Cl.⁴ A61F *7/00*
U.S. Cl. 128—402 **4 Claims**



1. Headache treatment apparatus comprising:
a cap which covers the top of a patient's head,
a heating element contained in said cap,
means to energize said heating element thereby to heat the top of a patient's head above its normal temperature,
suspension means extending from said cap and supporting a head-band spaced below said cap, whereby when said cap is on top of the patient's head, said head-band encircles a zone of the patient's head which includes his brow and temples,
a cooling coil contained in said headband, and
means to circulate a cooling fluid through said coil thereby to cool said zone below its normal temperature.

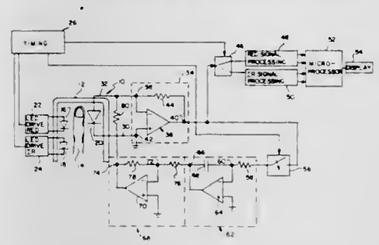
4,781,194
HEART PACEMAKER
Hakan Elmqvist, Bromma, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Feb. 15, 1983, Ser. No. 466,629
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3207006
Int. Cl.⁴ A61N *1/32*
U.S. Cl. 128—419 PG **14 Claims**



1. A heart pacemaker comprising:
atrial terminal means and ventricular terminal means for respective connection to the atrium and ventricle of a heart;
ventricular pulse generating means connected to said ventricular terminal means for delivering stimulating pulses to said ventricle;
atrial sensing means connected to said atrial terminal means for sensing contractions of said atrium;
a tachycardia detector having an input connected to said atrial sensing means for detecting tachycardia; and
a programmable delay element having an input connected to said atrial sensing means and having an output connected to said ventricular pulse generating means for normally triggering said ventricular pulse generating means after a first time delay following an atrial contraction (AV time), said programmable delay element having another input connected to the output of said tachycardia detector for triggering said ventricular pulse generator upon receipt of a signal from said tachycardia detector after a selected programmed second time delay for terminating said tachycardia, said programmable time delay including means for subsequently returning to said first delay time if said second delay time occurs.

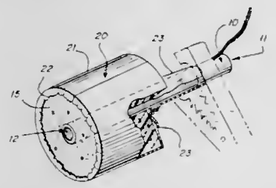
4,781,195
BLOOD MONITORING APPARATUS AND METHODS WITH AMPLIFIER INPUT DARK CURRENT CORRECTION
Alan D. Martin, Boulder, Colo., assignor to The BOC Group, Inc., Montvale, N.J.
Filed Dec. 2, 1987, Ser. No. 127,742
Int. Cl.⁴ A61B *5/00*; G01N *33/49*
U.S. Cl. 128—633 **14 Claims**

1. Apparatus for monitoring a parameter of the blood in a body structure comprising:
(a) photodetector means for producing a photodetector output signal related to the amount of light impinging upon said photodetector means;
(b) preamplification means having an input node for providing an amplified signal related to a signal supplied to said input node, said input node being connected to to said photodetector means for receipt of said photodetector output signal;
(c) illumination means for emitting light and directing the emitted light through the body structure so that emitted light transmitted through said body structure will impinge upon said photodetector means;
(d) means for periodically interrupting operation of said illumination means to provide dark intervals, whereby the photodetector output signal during each said dark interval will be a dark interval photodetector output indicative of ambient light impinging on said photodetector means;



(e) correction means for applying to said input node of said preamplification means a correction signal substantially equal in magnitude but opposite in sense to the dark interval photodetector output signal whereby said amplified signal will be substantially corrected for the effects of ambient light on said photodetector means; and
(f) interpretation means for determining said parameter of the blood from said corrected, amplified signal.

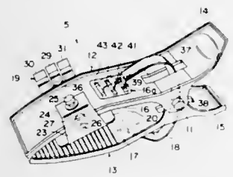
4,781,196
CONDUCTIVE EARTIP ASSEMBLY
Mead C. Killion, Elk Grove Village, Ill., assignor to Etymotic Research, Inc., Elk Grove Village, Ill.
Filed Feb. 20, 1987, Ser. No. 17,480
Int. Cl.⁴ A61B *5/04, 5/12*
U.S. Cl. 128—642 **9 Claims**



1. A conductive eartip assembly comprising:
a tubular central acoustical channel having one end adapted for coupling to an acoustic transducer and a distal open end for delivering sound to the ear;
a generally cylindrical tip portion laterally surrounding the distal end of said channel and extending outward therefrom to define a size and shape which fits snugly within the ear canal; and
a conductive film coupled to and surrounding said tip portion and having a portion extending therefrom to define an output conductor, said conductive film being adapted to engage and be electrically coupled to the skin of said ear canal and to thereby couple said output conductor to the skin of said ear canal,
wherein said central channel is vinyl and said cylindrical tip portion is a plastic foam and wherein said tip portion is cemented to said channel with a vinyl based adhesive.

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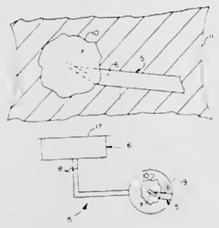
4,781,197
CLIP TYPE ELECTRODE FOR ELECTROCARDIOGRAPHS
Takashi Fukuda, Tokyo, Japan, assignor to Fukuda Denshi Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 644,908, Aug. 28, 1984, abandoned.
This application May 27, 1986, Ser. No. 867,593
Claims priority, application Japan, Apr. 12, 1984, 59-54010[U]
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—644 **2 Claims**



1. A clip-type electrode for an electrocardiograph comprising:
a pair of clamping plates each having a grasping section and a clamping section and being arranged for pivotal movement about a common shaft positioned between said grasping section and said clamping section;
said clamping sections being curved to have concave surfaces facing each other, and having an electrode member mounted on the clamping section of one of said clamping plates;
said grasping sections being formed as outwardly bent members such that movement of said grasping sections toward each other causes said clamping plates to pivot about said common shaft to cause said clamping sections thereof to spread apart;
said clamping plates each having a plurality of engagement grooves formed in the other surfaces of said clamping sections spaced at successively greater distances from said common shaft and having a slot formed through each said grasping section at a position adjacent to said common shaft; and
a leaf spring means bent into a substantially U-shaped configuration extending through said slots and around said clamping sections and having end portions fitting said engagement grooves, each end portion of said spring means being arranged to removably engage, respectively, a selected one of said engagement grooves on one of said clamping plates for biasing said clamping sections of said clamping plates toward each other;
said spring means being so arranged that said end portions may be removed from said selected engagement grooves and engaged with other engagement grooves at a different distance from said common shaft so as to adjust clamping force of said clamping plates.

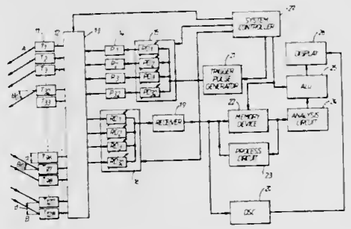
4,781,198
BIOPSY TRACER NEEDLE
Eugene L. Kanabrocki, 151 Braddock Dr., Melrose Park, Ill. 60160
Filed Sep. 8, 1986, Ser. No. 904,976
Int. Cl.⁴ A61B *6/00*
U.S. Cl. 128—654 **7 Claims**

1. A biopsy tracer needle comprising a stainless steel needle having an electrolessly plated layer of a gamma emitting radioactive material sufficient to be detected by gamma ray detecting equipment at a point remote from said needle only on the



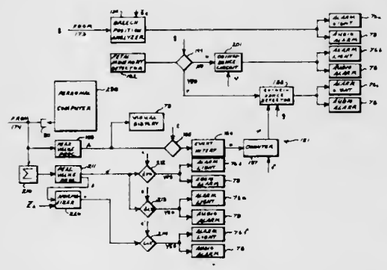
end of said needle and a non-radioactive material covering the radioactive material.

4,781,199
SYSTEM AND METHOD FOR MEASURING SOUND VELOCITY OF INTERNAL TISSUE IN AN OBJECT BEING INVESTIGATED
Makoto Hirama, Otawara, and Yoichi Sumino, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jan. 7, 1986, Ser. No. 816,902
Claims priority, application Japan, Jan. 7, 1985, 60-241; Aug. 22, 1985, 60-183053
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—660.01 **10 Claims**



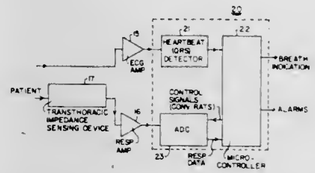
1. A system for measuring the sound velocity of an inner tissue body within an object to be investigated, the system comprising:
an integral array of transducer elements spaced at predetermined intervals for transmitting ultrasonic pulses from the surface of the object into the object and receiving echoes of said pulses reflected from within said object, said array including at least three subarrays of transducers that are separated from one another by predetermined distances;
transmitting means coupled with said array for exciting a first subarray of transducers to direct first and second ultrasonic pulses toward the object along a common transmitting beam;
receiving means coupled with said array for activating a second subarray and third subarray of transducers different from those activated by the transmitting means to receive echoes of said first and second pulses along a first receiving beam and a second receiving beam, respectively, said first and second receiving beams being parallel to each other;
beam steering means coupled with at least one of said at least three subarrays for activating transducers of that subarray at predetermined time delays to steer at least one of said transmitting beam and receiving beams so that the transmitting beam and the first receiving beam intersect at point Po within the inner tissue body and the transmitting and the second receiving beam intersect at different point P_1 within the inner tissue body;
time measuring means coupled with said subarrays for measuring the propagation time taken for a particular pulse to travel along the intersecting transmitting and receiving beams to and from the integral array and for thereby determining a first propagation time for the first pair of intersecting beams and a second propagation time for the second pair of intersecting beams;and
computing means coupled with said beam steering means and said time measuring means for determining the sound velocity of the inner body tissue from the time difference between the first and second propagation time, the predetermined distances, and the angles of the transmitting and receiving beams.

4,781,200
AMBULATORY NON-INVASIVE AUTOMATIC FETAL MONITORING SYSTEM
Donald A. Baker, Box 4414, Polson, Mont. 59860
Filed Oct. 4, 1985, Ser. No. 784,663
Int. Cl.⁴ D61B *5/04*
U.S. Cl. 128—670 **29 Claims**



1. An ambulatory, non-invasive, automatic fetal monitoring system for use on a mother to continuously measure and analyze information indicative of the well-being of a fetal living within the mother, comprising:
a sensor garment for wear by the mother about the mother's torso;
a plurality of fetal cardiac sensor means mounted on said sensor garment at spaced locations to continuously detect fetal heartbeats when the fetus is in a variety of positions within the mother and provide
electronic fetal cardiac sensor signals at least one of which is indicative of fetal heartbeats with time;
at least one fetal movement sensor means mounted on said sensor garment to continuously detect physical movement of the fetus within the mother and provide at least one electronic fetal movement sensor signal which is indicative of fetal movement;
a computing means connected to receive and analyze said cardiac and movement sensor signals to determine fetal heart rate and including means to perform at least one analysis relating fetal heart rate and detected movement by the fetus;
heart rate indicator means for indicating fetal heart rate; and
means for indicating results of the analysis relating fetal heart rate and detected movement by the fetus.

4,781,201
CARDIOVASCULAR ARTIFACT FILTER
John C. Wright, and Harry M. Triebel, both of New Haven, Conn., assignors to American Home Products Corporation (Del.), New York, N.Y.
Continuation of Ser. No. 686,575, Dec. 27, 1984, abandoned.
This application Jul. 22, 1986, Ser. No. 887,318
Int. Cl.⁴ A61B *5/08*
U.S. Cl. 128—671 **5 Claims**



1. For suppressing cardiovascular artifact from a respiration signal derived from a patient, a filtering device comprising:
heat beat detecting means for detecting heart beats of the patient;
processing means for determining the heart rate of the patient in response to the detected heart beats; and
filtering means operable for sampling the respiration signal in proportion to the heart rate and producing a filtered respiration signal as follows:

$$\text{Filtered Respiration Signal} = S_{(t)} + (K_1 + K_2)Z^{-1}{}_{(t-1)} + (K_3 + K_4)Z^{-2}{}_{(t-1)}$$

where:
$S_{(t)}$ is the respiration signal currently being sampled;

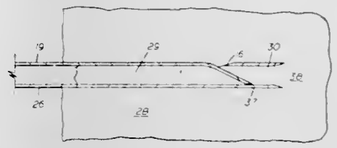
$$Z^{-1}{}_{(t)} = S_{(t)} + K_1 Z^{-1}{}_{(t-1)} + K_3 Z^{-2}{}_{(t-1)}$$

$$Z^{-2}{}_{(t)} = Z^{1}{}_{(t-1)};$$

and

K_1, K_2, K_3, and K_4 are constants.

4,781,202
BIOPSY CANNULA
Woodrow W. Janese, 2806 N. Navaro, Suite M, Victoria, Tex. 79901
Filed Aug. 31, 1987, Ser. No. 91,800
Int. Cl.⁴ A61B *17/34*
U.S. Cl. 128—754 **8 Claims**



1. A biopsy needle, comprising
a hollow cylindrical housing having a proximal end and a cylindrical distal end and a coaxially extending cylindrical opening therethrough,
the housing having an axial slot therein, adjacent, but spaced from, the distal end,

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support means on the housing for retaining a blade in position in the slot,

shoulder means near the cylindrical distal end of said housing adjacent to the distal end of said axial slot for holding the distal end of a flexible blade out of the opening but allowing the distal end of the blade to contract into said opening for cutting a specimen within the needle when the blade is disengaged relative to said shoulder, and

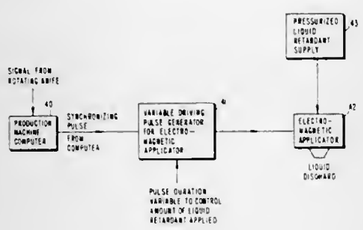
a flexible blade, having proximal and distal ends, movably positioned in said axial slot of said housing and slideably engageable with the support means, wherein said blade can slide in an axial direction to disengage from said shoulder means when slid towards the proximal end of said housing, the distal end of the blade being sharpened and spring actuated by being prebent to form a leaf spring means for contracting into the opening of the housing when disengaged from said shoulder means, the blade being curved in cross section and with the housing forming a cylindrical portion of said opening for receiving a cylindrical biopsy sample.

4,781,203

METHOD AND APPARATUS FOR MAKING SELF-EXTINGUISHING CIGARETTE

Paul D. La Hue, 1137 Linden Dr., Bloomington, Ind. 47401

Filed May 15, 1985, Ser. No. 734,118
Int. Cl.⁴ A24C *5/18*; A24D *1/10*
U.S. Cl. 131—79 **8 Claims**



2. An apparatus for making self-extinguishing cigarettes, comprising:

means for continuously gathering and arranging shredded tobacco particles into a substantially uniform moving stream of tobacco;

means for providing a continuous strip of cigarette wrapping paper;

means for continuously receiving said moving stream of tobacco and said continuous strip of cigarette wrapping paper and combining and shaping them into a continuous cigarette rod;

means for receiving said continuous cigarette rod and cutting said cigarette rod into individual cigarettes;

a supply of liquid fire retardant chemical;

means, including an electrically actuated nozzle in flow communication with said supply of liquid, for intermittently directing the flow of said liquid onto said moving stream of tobacco before said tobacco reaches the cigarette paper; and

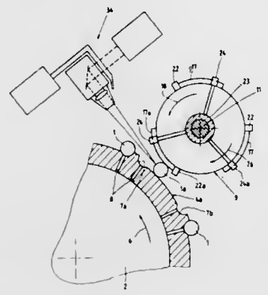
means for synchronizing said intermittent flow means with said cigarette cutting means such that said liquid is applied at intervals and for a selected duration so that the portion of the tobacco stream to which the liquid is applied ends up at a selected place along the length of each cut cigarette.

4,781,204

APPARATUS FOR MANIPULATING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

Karl-Heinz Barbe, Hamburg; Werner Hinz, Lauenburg, and Jörg Ziolkowski, Tespe, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,486
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610209
Int. Cl.⁴ A24C *5/60*
U.S. Cl. 131—282 **20 Claims**



1. Apparatus for manipulating rod-shaped articles of the tobacco processing industry, comprising a conveyor for moving the articles in a predetermined direction, said conveyor having a series of first rolling surfaces each including a front and a rear portion as seen in said direction; means for depositing articles on the front portions of successive surfaces so that the articles extend transversely of said direction; a rolling device including at least one rolling member having a series of second rolling surfaces: first drive means for moving said first surfaces at a predetermined speed; second drive means for moving said second surfaces at said speed counter to said direction, said rolling member being adjacent said conveyor so that the articles which advance with successive first surfaces are engaged by successive second surfaces and roll about their respective axes while the respective first surfaces move relative thereto; and means for terminating the rolling of articles when the articles are reached by the rear portions of the respective first surfaces, including a series of spaced-apart arresting members and means for moving said arresting members in said direction with and relative to said conveyor and at said speed so that successive arresting members engage successive articles on said conveyor and press the articles against the rear portions of the respective first surfaces.

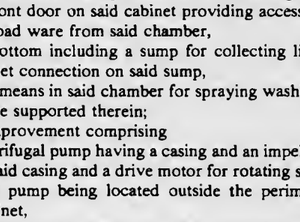
4,781,205

PRODUCT GUIDE FOR PROCESSING EQUIPMENT

Conrad D. Shakley, Spring Mills, Pa., assignor to Chemcut Corporation, State College, Pa.

Filed May 27, 1987, Ser. No. 54,510
Int. Cl.⁴ B08B *3/00*
U.S. Cl. 134—131 **7 Claims**

1. In processing equipment in which thin materials are being conveyed along a predetermined path of travel from one end of the equipment to the other, with the path being comprised of a plurality of rotatably drivable rods extending transverse of the equipment and serially arranged between ends of the equipment to provide conveyance of materials through the equipment, the improvement comprising a plurality of material guide elements adapted to be carried by said drive rods so as to be free of rotation therewith, with said guide elements each having an upper guide rail disposed substantially parallel with the path of travel, with said rails, when carried by said drive rods, being disposed for engaging thin materials being conveyed through the machine and guiding the materials along their path, and with the guide elements having mounting means for mounting of said elements on the drive rods, wherein said mounting means include opening means facilitating installation and removal of said guide elements transversely



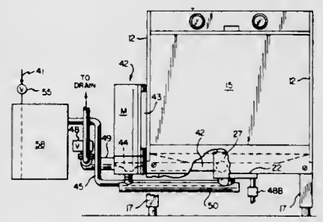
of the drive rods without requiring demounting of the drive rods, wherein the mounting means of each guide element includes at least one generally U-shaped opening facing in the general direction of travel of materials through the apparatus, and at least one snap-on, snap-off mounting of the guide element on a drive rod.

4,781,206

LOW ENERGY, LOW WATER CONSUMPTION WAREWASHER

Tore H. Noren, Petaluma, Calif., assignor to The Stero Company, Petaluma, Calif.

Filed Apr. 11, 1986, Ser. No. 850,635
Int. Cl.⁴ B08B *3/02*
U.S. Cl. 134—174 **4 Claims**



1. In a commercial warewasher for undercounter installation,

said warewasher having a cabinet including top, bottom, side and rear walls joined to form a washing chamber and a front door on said cabinet providing access to load and unload ware from said chamber,

said bottom including a sump for collecting liquid and an outlet connection on said sump,

spray means in said chamber for spraying washing liquid on ware supported therein;

the improvement comprising

a centrifugal pump having a casing and an impeller rotatable in said casing and a drive motor for rotating said impeller, said pump being located outside the perimeter of said cabinet,

said pump casing having an inlet connection and an outlet tube extending to said spray means,

said pump inlet connection being located substantially in a horizontal plane extending through said outlet connection of said sump,

an outlet pipe extending from said sump outlet connection to said pump inlet connection at an elevation at least partially below said pump inlet connection and the bottom of said sump;

whereby decrease in the liquid level in said chamber to said sump outlet connection will cause cavitation in said impeller to stop effective output from said pump while a quantity of liquid remains in said outlet pipe; and

a drain line extending from said pump outlet connection and a normally closed drain valve in said drain line, opening of said drain valve allowing the output of said pump to flow directly to a drain and to said spray means until cavitation of said impeller stops the pump output.

4,781,207

PROCESS FOR THE TRANSPORTATION OF VISCOUS OILS

Dieter Balzer, Haltern, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,633
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609641
Int. Cl.⁴ F17D *1/17*
U.S. Cl. 137—13 **17 Claims**

1. A process for transporting of a viscous heavy crude oil through a pipeline comprising forming an oil-in-water emulsion of said crude oil by mixing said oil with water and an emulsifier which is

(1) 10–90% by weight of a carboxymethylated oxalkylate of the formula

$$R—(O\text{-}13\ CH_2—CH_2)_n—O—CH_2COOM$$

wherein

R is ($C_{4\text{-}16}$ alkyl)phenyl,

n is 1 to 40, and

M is an alkali metal or alkaline earth metal ion or ammonium, and

(2) 90–10% by weight of an ether sulfate of the formula

$$R'—(O—CH_2—CH_2)_m—OSO_3M'$$

wherein R', M' and m are independently chosen from the groups defined for R, M and n, respectively, and

transporting said oil-in-water emulsion through said pipeline.

4,781,208

DEVICE FOR REGULATING THE CONCENTRATION OF CREAM IN A CENTRIFUGE FOR SEPARATING MILK

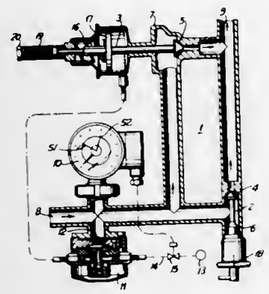
Karl-Heinz Zettier, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jul. 29, 1987, Ser. No. 79,310
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626782
Int. Cl.⁴ F16K *31/124*, *31/42*
U.S. Cl. 137—110 **2 Claims**

1. In a device for regulating the concentration of cream in a centrifuge for separating milk, having an inlet, an outlet, choke means between the inlet and outlet and including a manually activatable first valve body for setting the choke at a constant minimum cross-section, and a second valve body for expanding the cross section when a prescribed outflow pressure is exceeded, the improvement wherein the choke means includes one seat associated with the first valve body and another seat associated with the second valve body, wherein the valve bodies and the seats associated with them are accommodated in separate housings and further comprising a contact manometer with two switching contacts located at the inlet upstream of both valve housings and means for activating the second valve body only after the second switching contact is exceeded, wherein the activating means comprises a source of compressed air and a remotely controlled valve connecting the

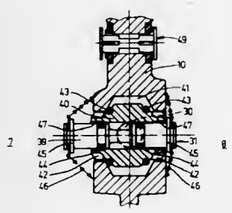
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second valve body housing and the source of compressed air and a pressure converter controlled by the pressure in the



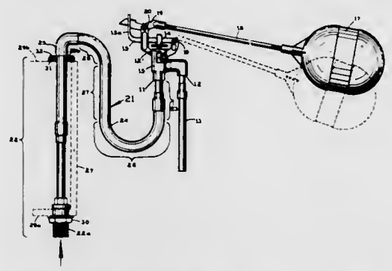
device and positioned between the remotely controlled valve and the second valve body.

4,781,209
SWITCH-OVER VALVE, PREFERABLY FOR AN AIR DRIER
Nils A. Nelander, Vintrie, and Lars A. Övall, Löddeköpinge, both of Sweden, assignors to Garphyttan Haldex AB, Landskrona, Sweden
Filed Nov. 2, 1987, Ser. No. 115,907
Claims priority, application Sweden, Nov. 3, 1986, 8604687
Int. Cl.[4] F16K *11/00*
U.S. Cl. 137—119 **14 Claims**



1. A switch-over valve for directing an air flow under pressure to either one of two compartments, the other compartment being vented to the atmosphere, wherein the valve is arranged in a partition wall separating the two compartments from each other and the air flow is directed to the valve through a conduit in the partition wall, said switch-over valve comprising: a cavity in the partition wall having an inlet and a pair of outlets; a valve body axially movable within the cavity between two positions sealing off either one of the outlets from the cavity to the compartments and keeping the other outlet open, the valve body including a bore extending therethrough between the compartments; a control piston positioned within the bore in the valve body and having an axial length greater than that of the valve body, the piston being axially movable in the bore in the valve body; and spring means for biasing the control piston towards a neutral position relative to the partition wall.

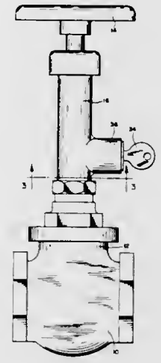
4,781,210
REPLACEMENT INLET VALVE ASSEMBLY FOR A TOILET TANK
James E. Leonard, 1521 Cathedral Dr., Margate, Fla. 33063
Filed Feb. 19, 1988, Ser. No. 157,696
Int. Cl.[4] F16K *43/00, 31/26*
U.S. Cl. 137—315 **3 Claims**



1. A unitary replacement inlet valve assembly for use with a toilet having a water tank including first and second compartments comprising the combination of:
a ballcock-operated inlet valve for said first compartment having a housing with a water inlet opening on the bottom and water outlet means spaced from said inlet opening;
and a ballcock mechanism for said first comparment operatively connected to said valve to control the flow of water from said inlet opening to said outlet means in accordance with the water level in said toilet tank;
and a generally S-shaped water inlet conduit having a first vertical leg for said second compartment being offset laterally from said valve and having its upper end at a higher level than said inlet opening in the valve, a second vertical leg for said first compartment extending down from said inlet opening in the valve, and a reversely bent serpentine segment for said first compartment connecting the upper end of said first vertical leg above the top of said second compartment when installed to the lower end of said second vertical leg, said connection above said second compartment having means for maintaining said first vertical leg in alignment with said second compartment;
said inlet valve houisng and said water inlet conduit being rigidly joined to each other to be handled as a single unit during installation.

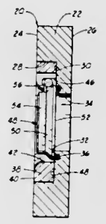
4,781,211
LOCK FOR A VALVE
George J. Cormier, 311 Madison St., Fitchburg, Mass. 01420
Filed Jun. 3, 1985, Ser. No. 740,496
Int. Cl.[4] F16K *35/00*
U.S. Cl. 137—383 **2 Claims**

1. A locking valve comprising a housing,
a valve stem, a valve stem actuator associated with the housing, means mounting the stem for rotary motion under influence of the actuator, and a coupling on the actuator and movable thereon for selective engagement or disengagement from the valve stem, whereby the actuator fails to turn the stem when disengaged therefrom,
the coupling being rotatively fixed relative to the actuator and being in the form of a sleeve thereon, means constantly tending to urge the coupling toward the stem and a smooth, uninterrupted edge on the coupling,
means to move selectively the coupling away from the stem, disconnecting the stem from the actuator against the action of the constantly urging means, key operated means to actuate the selectively movable means, p1 said key-operated means engaging only the smooth uninterrupted edge of the coupling so thede coupling and its actuator are freely rotatable when the coupling is disengaged from the stem,
means rotarily connecting the coupling and stem where engaged,



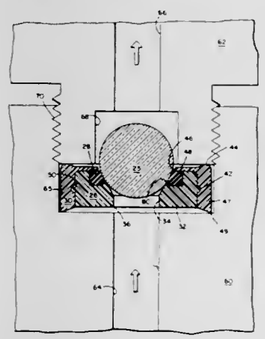
the key-operated means being located in out of alignment relation with the actuator so that blows on the actuator are not transferred to the key-operated means in any position of the coupling.

4,781,212
SWING CHECK VALVE WITH REMOVABLE CAGE AND DISC
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170
Continuation-in-part of Ser. No. 49,383, May 13, 1987. This application Aug. 24, 1987, Ser. No. 88,250
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—515.7 **13 Claims**



1. A valve, comprising:
a tubular valve body;
a valve seat in the body having an annular seating face thereon extending transversely with respect to the body;
a disc supported in the body for swinging movement to and from the seating face of the valve seat, said disc having a substantially flat, circular main body portion and a seating face thereon sized to mate with the seating face of the seat, said disc also having a hinge pin formed thereon extending in a plane parallel with the seating face of the disc; and
a generally ring-shaped cage in the valve body having one end face thereof abuting the valve seat, said cage surrounding at least one-half of the periphery of the disc, a section of the inner peripheral portion of the cage being removed to provide a generally rectangular opening communicating with the generally circular opening through the cage, said cage having a pair of aligned recesses in said one end face thereof communicating with the opposite ends of said rectangular opening receiving the opposite end portions of the hinge pin, and the inner peripheral surface of the cage extending from one end of said rectangular opening to the opposite end thereof being rounded radially outwardly from about the center thereof to the end face of the cage opposite said one end face;
wherein the disc further includes a generally rectangular transition between the main body portion of the disc and the central portion of the hinge pin having a width slightly less than the width of said rectangular opening, and wherein
the distance between the surface of the hinge pin nearest the main body portion of the disc and the adjacent outer periphery of the disc at each side of said transition is greater than the thickness of the cage at the intersection of each hinge pin recess and said rectangular opening.

4,781,213
BALL CHECK VALVE
Enrique L. Kilayko, 64 Arrowhead Rd., Weston, Mass. 02193
Filed Nov. 16, 1987, Ser. No. 120,853
Int. Cl.[4] F16K *15/04, 25/00*
U.S. Cl. 137—516.29 **5 Claims**



1. A ball check valve assembly for use in a valve body comprising a base and a housing securable together, comprising
a subassembly providing
a first surface,
an assembly fluid conduit terminating at said first surface in a port of circular cross section for communication with a base fluid conduit in the base,
within said assembly fluid conduit, an O ring seat aligned with said port,
an elastomeric O ring positioned in said seat,
spacer means radially outward of said O ring seat, extending generally away from said first surface and having a dimension adjacent said O ring seat greater than the cross sectional diameter of said O ring when unstressed, and
O ring capture means spaced from said O ring seat for limiting travel of said O ring away from said port, providing a central aperture, and
a rigid spherical valve closure element having a diameter greater than that of said port,
said O ring having an ID less than the diameter of said closure element and an OD greater than the diameter of said capture means aperture,
said spacer means ID being at least about ½% greater than the OD of said O ring,
whereby during closing travel of said closure element, said O ring is free to move transverse to the direction of such travel responsive to said closure element, for closure

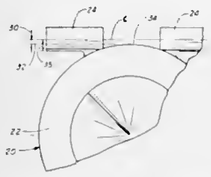
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element impact on said O ring distributed relatively equally over the contacted O ring surface.

4,781,214
SWING CHECK VALVE DISC

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Continuation-in-part of Ser. No. 23,786, Mar. 9, 1987, abandoned, and a continuation-in-part of Ser. No. 49,383, May 13, 1987. This application Jun. 9, 1987, Ser. No. 60,249
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—527 **7 Claims**

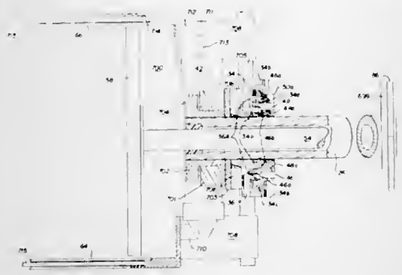


1. A disc for a swing check valve, comprising:
a plate-like, substantially round body having an annular sealing face on one side thereof; and
hinge pin means formed integrally with the body for journaling the disc in the swing check valve, said hinge pin means providing a pair of axially aligned cylindrical bearing pins having their axes parallel with said sealing face and a tangient to the adjacent outer periphery of the body, the positions of said bearing pins relative to said body being such that said axes are radially outward of said tangient and the spacing between said axes and said tangient is less than the radius of said bearing pins.

4,781,215
PACKAGE WRAPPING MACHINE SYSTEM

Riley H. Mayhall, Jr., P.O. Box 309, Burtonsville, Md. 20866, and Andrew Zudal, 4140 Mt. Olney La., Olney, Md. 20832

Division of Ser. No. 521,023, Aug. 9, 1983, abandoned, which is a continuation of Ser. No. 165,770, Jul. 3, 1980, abandoned. This application May 20, 1985, Ser. No. 735,640
Int. Cl.[4] F16L *39/04*
U.S. Cl. 137—580 **10 Claims**

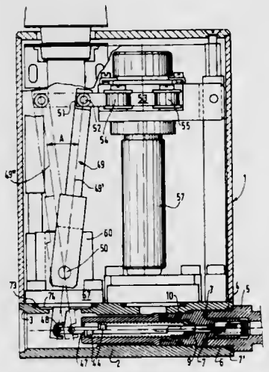


1. A rotary set on a shaft fluid power coupling comprising in combination:
a first member having central bore through which a rotary main shaft passes, a first member first face through which a fluid power connection is made, a first member second face which lies in a plane perpendicular to said main shaft having a cylindrical annular groove therein, and a passage within said first member which will permit fluid to flow from said fluid power connection to said annular groove;
a second member which rotates with respect to said first member having a second member first face which lies in a plane perpendicular to said main shaft axis of rotation, said second member first face having a cylindrical annular extension which extends into said first member cylindrical annular groove a distance less than the depth of said cylindrical annular groove thereby forming an annular space, and means for passing a fluid from the said annular space formed between said annular groove and said annular extension to a second member second face having a fluid passage way connecting means; and
wherein said second member cylindrical annular extension is engaged with said first member cylindrical annular groove by axially sliding said cylindrical extension into said cylindrical groove.

4,781,216
GAS REGULATING VALVE

Jean Arnoult, Saint-Nazaire-les-Eymes; Gérard Loiseau, Bois d'Arcy, and Maurice Molozay, Le Mesnil-Saint-Denis, all of France, assignors to L'Air Liquide, Paris, France

Filed Feb. 5, 1988, Ser. No. 152,835
Claims priority, application France, Feb. 9, 1987, 87 01515
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—614.19 **4 Claims**

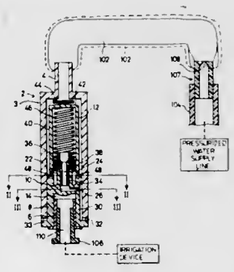


1. A gas regulating valve comprising a valve body defining a passage, a valve needle having an axis and axially movable in said passage, a control rod associated with the needle for shifting the needle, regulating means comprising a linkage having a first end connected to the needle, a forward-rearward rotating electric motor, means connected to the motor for delivering a differential electronic signal based on the difference between a reference pressure and a measure regulated pressure, the linkage having a second end drivenly connected to the motor and comprising an actuator mounted to be pivotable about a fixed axis, said actuator including a transverse flange having a periphery, a sealing bellows having a first axial end and a second axial end which is fixed in a sealed manner to said periphery, a fixed annular support member fixed in a sealed manner to said first axial end of the bellows and fixed relative to the valve body in a sealed manner, the actuator having a control end portion which extends through the annular support member and is substantially perpendicular to said rod of the needle, means for connecting the control end portion of the actuator to said rod, an annular sealing element of a metallic expanding type engaged in the passage and surrounding the needle, the needle having a variable recess extending axially of the needle and cooperative with the annular sealing element for defining with the annular sealing element a gas passage having a section which is variable with the axial position of the needle, a movable second rod, a valve member mounted on the second rod and movable by the second rod to a position for closing said passage, a return spring for biasing the valve member to said passage-closing position, said needle being operative to exert a thrust against and shift the second rod, in opposition to the action of the return spring, for opening the passage when the needle is shifted by the motor through the linkage in a direction for increasing said gas passage section.

4,781,217
PULSE-IRRIGATION METHOD AND APPARATUS

Peretz Rosenberg, Moshav Beit Shearim, Israel

Continuation of Ser. No. 826,749, Feb. 6, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 88,548
Claims priority, application Israel, Feb. 13, 1985, 74332
Int. Cl.[4] E03B *7/07*
U.S. Cl. 137—624.14 **16 Claims**

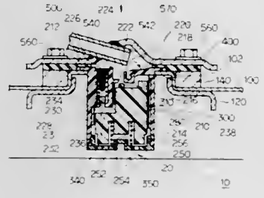


1. A pulse-irrigation system comprising a pressurized water supply line supplying water in a continuous, non-interrupted manner, a water irrigation device, and a pulsating device for converting the pressurized water of the line to a pulsating output when supplied to the irrigation device, comprising:
a valve which is normally closed, which automatically opens at a predetermined opening pressure lower than that of the supply line to connect its inlet to its outlet, and which automatically closes at a predetermined closing pressure which is lower than its opening pressure;
an inlet coupling between the inlet of said valve and said pressurized water supply line, said inlet coupling including a reservoir for the water, and an inlet orifice producing a continuous, non-interrupted flow of water at a low flow rate into said reservoir from said pressurized water supply line;
and an outlet coupling connected to the outlet of said valve and having an outlet orifice producing, when said valve is open, a flow out of said reservoir to said water irrigation device at a substantially higher flow rate than into said reservoir through said inlet orifice.

4,781,218
VALVE ASSEMBLY FOR USE IN A FUEL TANK OF A VEHICLE

Eiji Mori, Okazaki, and Hitoshi Ohkubo, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 932,500, Nov. 20, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 149,947
Claims priority, application Japan, Nov. 29, 1985, 60-184959[U]; Jun. 26, 1986, 61-97893[U]; Jul. 1, 1986, 61-100998[U]
Int. Cl.[4] F16K *17/196, 24/04;* **B01D** *45/08*
U.S. Cl. 137—202 **12 Claims**



5. A valve assembly for use in a fuel tank of a vehicle, the valve assembly comprising:
first and second valve means and a valve casing, said first valve means comprising bias means and a first valve body, said valve casing being mounted on the fuel tank, said valve casing having a cylinder portion and a first aperture, said first valve body being located within said cylinder portion, said first aperture being defined within said cylinder portion, said cylinder portion being defined within said valve casing, said first aperture allowing communication between the inside of said valve casing and the outside of said fuel tank, the first valve body closing selectively said first aperture of said cylinder portion, said bias means biasing said first valve body toward said first aperture of said cylinder portion, said first valve body and said first bias means being located at a first side of said valve casing, said first valve body being positioned selectively at one of a first position and second position, whereby when said first valve body is positioned at said first position, said first valve body covers said first aperture, such that said first valve means prevents communication through said first aperture, and when first valve body is positioned at said second position, said first valve body is located apart from said first aperture, such that the first valve means allows communication between the inside of said valve casing and the outside of said fuel tank through said first aperture said second valve means comprising a second valve body, a second aperture and a third aperture, said second aperture being opened at an upper portion of said valve casing, said third aperture being opened at a lower portion of said valve casing, said second valve body being movable between a first position and a second position, whereby when fuel within the tank is below the third aperture of the valve casing, the second valve body is in said first position and the inside of said fuel tank communicates with an inside of said valve casing through both of said second and third apertures of the valve casing, and when the second valve body is in said second position, the inside of said fuel tank communicates with the inside of said valve casing through said second aperture of the valve casing, such that regardless of the position of said valve body and the fuel, communication between the inside of said fuel tank and the inside of the valve casing is ensured, said valve casing further comprising a fourth aperture, said second valve body being located within said valve casing, said fourth aperture allowing, selectively, communication between the inside of said valve casing and the outside of said fuel tank, whereby when said second valve body is positioned at said first position, the second valve body is positioned apart from said fourth aperture, such that said second valve means allows communication between the inside of said fuel tank and the outside of said fuel tank through said fourth aperture of said valve casing, and when said second valve body is positioned at said second position, said second valve body covers said fourth aperture of said valve casing such that said second valve means prevents communication through said fourth aperture;
a first dust preventing means secured to an outer surface of said valve casing, said first dust preventing means having a wall member and a groove, said wall member being located proximate said fourth aperture, said groove being defined around said wall member, whereby when air flows from the outside of said fuel tank to the inside of said

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fuel tank, the air hits said wall member of said dust preventing means, thereby forcing the air to travel around the wall member, such that said first dust preventing means substantially prevents the introduction of minute dust particles into the inside of said fuel tank;

a lid member having a pipe member, said lid member mounted on the fuel tank, the lid member covering said first and second valve means, an end of said pipe member being located under said lid member, said lid member being located apart from said second valve means, a space being defined between said lid member and said second valve means, said pipe member allowing communication between the atmosphere and said space, said end of said pipe member being located apart from said fourth aperture of said valve casing, said dust preventing means being located between said end of said pipe member and said fourth aperture of the valve casing, whereby said dust preventing means prevents smooth communication between said pipe member and said first and fourth apertures of the valve casing, said groove collecting dust therewithin; and

a seal means located between said lid member and said valve casing and between said lid member and said fuel tank, the seal means having an opening, the opening allowing communication between said pipe member and said valve casing, the seal means including a thick portion and a thin portion, the thick portion of the seal means providing a seal between the fuel tank and said lid member, the thin portion of the seal means providing a seal between the valve casing and said lid member, whereby the seal means can prevent the introduction of minute dust between said fuel tank, said lid member and said valve casing.

4,781,219

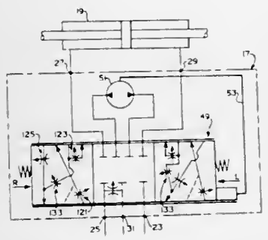
FLUID CONTROLLER AND DAMPENING FLUID PATH

Donald M. Haarstad, Chaska, Minn., and Douglas M. Gage, Dubuque, Iowa, assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 917,565, Oct. 10, 1986, abandoned. This application Apr. 13, 1987, Ser. No. 37,493

Int. Cl.[4] F15B *13/04*

U.S. Cl. 137—625.24 **25 Claims**



1. A controller operable to control the flow of fluid from a source of pressurized fluid to a fluid pressure operated device, said controller being of the type including housing means defining an inlet port for connection to the source of pressurized fluid, a return port for connection to a reservoir, and first and second control fluid ports for connection to the fluid pressure operated device; valve means disposed in said housing means and defining a neutral position and a first operating position; said housing means and said valve means cooperating to define a main fluid path communicating between said inlet port and said first control fluid port and between said second control fluid port and said return port when said valve means is in said first operating position; fluid actuated means for imparting follow-up movement to said valve means proportional to the volume of fluid flow through said main fluid path; said main fluid path including a first variable flow control orifice disposed between said inlet port and said first control fluid port, and having its minimum flow area when said valve means is in said neutral position, and an increasing flow area as said valve means is displaced from said neutral position toward said first operating position, said first variable flow control orifice having its maximum flow area when said valve means is moved to its maximum displacement from said neutral position; characterized by:

(a) said housing means and said valve means cooperating to define a dampening fluid path in parallel with said main fluid path, said dampening fluid path being in fluid communication with said main fluid path at a first location disposed between said first variable flow control orifice and said first control fluid port, and at a second location disposed downstream of said second control fluid port;

(b) said dampening fluid path including a variable dampening orifice operable to dampen the flow of pressurized fluid in said main fluid path to said first control fluid port to thereby cushion the operation of said controller; and

(c) said variable dampening orifice begins to open after said first variable flow control orifice begins to open, as said valve means moves from its neutral position to its maximum displacement position.

4,781,220

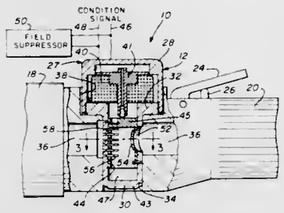
FAST RESPONSE SHUT-OFF VALVE

William S. Smith, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 4, 1987, Ser. No. 45,935

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—625.65 **2 Claims**



1. A fast response shutt-off valve for pneumatic tools and the like comprising:

a generally cylindrical, hollow body member having a closed end and having an inlet and an outlet;

a generally cylindrical, hollow valve member having an interior and located for reciprocating movement in said body member between open and closed positions, said valve member having an inlet port in fluid communication with the inlet in said body member and with the interior of said valve member in both said positions and an outlet aligned with and in fluid communication with the outlet in said body member in said open position of said valve member and misaligned with the outlet in said body member preventing fluid communication therebetween when said valve member in said closed position, said valve member having a closed end cooperating with the closed end of said body member to form a variable volume chamber in said valve, said valve member being biased by fluid in said body member toward the closed position for rapid movement of said valve member from the open to the closed position by said fluid, said valve member also including a vent passageway for connecting a portion of said outlet in said body member to atmosphere when said valve member is in the closed position;

releasable mean for releasably holding said valve member in the open position, said releasable means including an electrically-actuated solenoid mounted in fixed relationship to said body member and connected with said valve member for positioning said valve member;

field suppression means connected to said solenoid for decreasing the time required to flux breakdown when said solenoid is deenergized thereby permitting the valve member to move more rapidly from the open to the closed position; and,

alignment means for preventing relative rotation between said valve member and said body member while permitting relative reciprocating movement therebetween.

4,781,221

MISPICKED WEFT YARN REMOVING METHOD AND SYSTEM THEREFOR

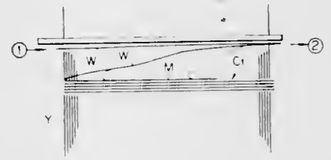
Kimimasa Onishi, Hachioji; Takatsugu Kato; Kenichi Iwatani, both of Tokyo; Miyuki Gotoh, Machida, and Eiji Ichimatsu, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

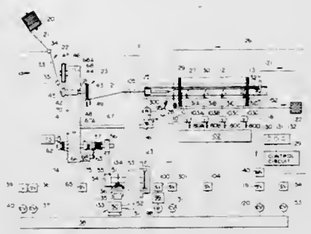
Filed Jun. 27, 1986, Ser. No. 879,319

Claims priority, application Japan, Jun. 29, 1985, 60-141570; Sep. 11, 1985, 60-201082; Sep. 11, 1985, 60-199487

Int. Cl.[4] D03D *51/00, 49/00, 47/30, 47/36*

U.S. Cl. 139—116 **54 Claims**





1. A method of removing a mispicked weft yarn in a loom, comprising the following steps in the order named:

stopping operation of the loom in a state where the mispicked weft yarn is connected to weft inserting means, after the mispicked weft yarn is beaten up by a reed;

exposing the mispicked weft yarn at cloth fell of a woven cloth;

inserting a weft yarn connected to the mispicked weft yarn from a weft picking side to a counter-weft picking side of the loom; and

drawing the inserted weft yarn together with the mispicked weft yarn to the counter-weft picking side.

28. A system of removing a mispicked weft yarn in a loom provided with a main shaft and weft inserting means, comprising:

means for stopping operation of the loom in a state wherein the mispicked weft yarn is connected to the weft inserting means after the mispicked weft yarn is beaten up by a reed, when operated;

means for exposing the mispicked weft yarn at cloth fell of a woven cloth, when operated;

means for inserting a weft yarn connected to the mispicked weft yarn from a weft picking side to a counter-weft picking side of the loom, when operated; and

means for drawing the inserted weft yarn together with the mispicked weft yarn to the counter-weft picking side, when operated.

4,781,222

FABRIC WINDING DEVICE FOR WEAVING LOOMS

Philippe van Bogaert, Schaerbeek, and Willy Dejonckheere, Ypres, both of Belgium, assignors to Picanol N.V., Belgium

Filed Feb. 24, 1987, Ser. No. 17,478

Claims priority, application Belgium, Feb. 24, 1986, 904266

Int. Cl.[4] D03D *49/20*

U.S. Cl. 139—307 **10 Claims**



1. A fabric take-up system for a weaving loom including a breast beam for woven fabric comprising:

a driven rotatable take-up roll extending parallel to the breast beam arranged to receive woven fabric from the breast beam, the take-up roll being mounted on the loom so that the take-up roll has freedom to move transversely of its rotary axis at least in the general direction of the breast beam and so that a fabric under tension extending from the breast beam wrapped over the take-up roll from an entry area on the periphery of the take-up roll moving away from the breast beam during driven movement of the take-up roll, beneath the rotary axis of the take-up roll, and then around the take-up roll back towards the breast beam tends to move the take-up roll in reaction to the tension force of the fabric transversely of the axis of the take-up roll at least generally in the direction of the breast beam;

a pressure roll disposed parallel and contiguous to the take-up roll to form a nip between the take-up and pressure rolls, said pressure roll disposed generally between the take-up roll and the breast beam, said nip disposed so that the path of a fabric take-up extends from the breast beam and around the side of the take-up roll disposed away from the breast beam and back towards said breast beam before encountering said nip;

support means for the pressure roll arranged to prevent displacement of the pressure roll away from the nip;

whereby tensioned fabric extending from the breast beam around the take-up roll, through said nip and around a portion of the pressure roll will produce a nip pressure between the take-up roll and the pressure roll by tending to move the take-up roll transversely of its axis towards the pressure roll.

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4,781,223

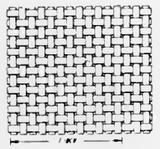
WEAVING PROCESS UTILIZING MULTIFILAMENTARY CARBONACEOUS YARN BUNDLES

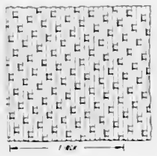
J. Eugene McAliley, Rock Hill, S.C.; Gene P. Daumit, Charlotte; Fredrick A. Ethridge, Waxhaw, both of N.C., and James R. Crozier, Jr., Rock Hill, S.C., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 748,781, Jun. 27, 1985, Pat. No. 4,714,642, which is a continuation-in-part of Ser. No. 647,739, Sep. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,728, Aug. 30, 1983, Pat. No. 4,534,919. This application Jun. 26, 1987, Ser. No. 66,551

Int. Cl.[4] D03D *23/00*

U.S. Cl. 139—420 R **22 Claims**





1. In a process for weaving a fabric suitable for use as fibrous reinforcement in a resinous matrix material wherein the fabric incorporates a plurality of multifilamentary yarn bundles comprising adjacent substantially continuous carbonaceous filaments containing at least 70 percent carbon by weight; the improvement comprising supplying said multifilamentary yarn bundles during said weaving in an unsized form wherein the individual filaments of said multifilamentary yarn bundles are randomly decollimated and commingled with numerous filament cross-over points throughout their lengths so as to create a multitude of interstices between adjacent filaments which are well adapted to receive and retain a matrix-formings resin as evidenced by an ability of the filaments of said yarn bundles when subjected to the flaring test described herein while in a substantially untwisted state to resist lateral expansion to a width which is as much as one and one-half times the original width as a result of said commingling of adjacent filaments.

4,781,224

LOOM EQUIPPED WITH WEFT PICKING CONTROL SYSTEM

Miyuki Gotoh, Tokyo; Mitugu Kawajiri, Iruma, and Hiroshi Kobayashi, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 18, 1985, Ser. No. 756,448

Claims priority, application Japan, Jul. 20, 1984, 59-149663; Nov. 9, 1984, 59-235226; Jan. 10, 1985, 60-1497; Jan. 10, 1985, 60-894[U]

Int. Cl.[4] D03D *47/30, 47/36*

U.S. Cl. 139—435 **23 Claims**

1. A loom comprising:

means for picking a weft yarn along a weft passage, said weft picking means including a weft inserting nozzle by which said weft yarn is picked under the influence of a jet of fluid supplied thereto;

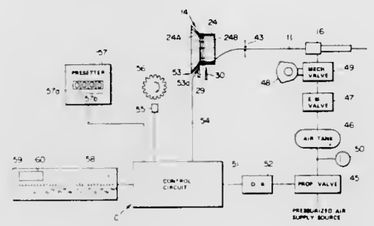
means for detecting force of said weft yarn at a time in the vicinity of termination of travel of said weft yarn in weft picking, said force detecting means comprising means for detecting tension of said weft yarn at aid time;

means for comparing said weft yarn force with a standard force of said weft yarn to obtain any difference therebetween, said force comparing means comprising means for comparing said weft yarn tension with a standard tension of said weft yarn to obtain a difference in tension therebetween; and

means for controlling said tension applied to said weft yarn, said tension controlling means comprising means for controlling said fluid to be supplied to said nozzle in accordance with said difference in tension.

23. A loom comprising:

means for picking a weft yarn along a weft passage, said weft picking means including a nozzle by which said weft yarn



is picked under the influence of a jet of fluid supplied thereto;

means for detecting force of said weft yarn at a time in the vicinity of termination of travel of said weft yarn in weft picking, said force detecting means comprising means for detecting tension of said weft yarn at said time;

means for comparing said weft yarn force with a standard force of said weft yarn to obtain any difference therebetween, said force comparing means comprising means for comparing said weft yarn tension with a standard tension of said weft yarn to obtain a difference in tension therebetween; and

means for controlling said tension applied to said weft yarn, said tension controlling means comprising means for controlling said fluid to be supplied to said weft inserting nozzle in accordance with said difference in tension.

4,781,225

WEFT YARN STORE FOR A LOOM

Cornelis Van Donk, Mortel, and Gerardus Cox, Geldrop, both of Netherlands, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

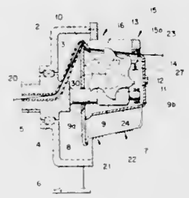
Filed Jun. 16, 1987, Ser. No. 62,591

Claims priority, application Switzerland, Jun. 16, 1986, 02428/86

Int. Cl.[4] D03D *47/36*

U.S. Cl. 139—452 **9 Claims**

7. A loom weft yarn store for receiving yarn from a weft yarn package and making lengths of such yarn available at intervals to the weft picking instrumentalities of the loom, said store comprising drum means for receiving windings of yarn on its periphery and means for periodically clamping the weft yarn adjacent the discharge end of the drum, said clamping means including a clamping element outside the drum means, a clamping member mounted inside the drum means for movement into and out of contact with said clamping element, and means inside said drum means connected to said clamping member for moving said clamping member in and out with respect to said drum means to clamp the yarn between said clamping element and said clamping member, said clamping element bearing yieldingly against said clamping member





when said clamping member and said clamping element clamp the weft yarn therebetween.

4,781,226

DRIVING AND CONTROL MECHANISM FOR CLAMPING, PRESENTATION AND FASTENING OF WEFT THREADS IN GRIPPER WEAVING LOOMS

Denis Moeneclaey, Roeselare; Remi Lagache, Zillebeke-Ieper; Johnny Victoor, Langemark, and Lucien Coopman, Zonnebeke, all of Belgium, assignors to Picanol N.V., Belgium

Filed Apr. 3, 1987, Ser. No. 33,740

Claims priority, application Netherlands, Apr. 3, 1986, 8600858

Int. Cl.[4] D03D *47/38*

U.S. Cl. 139—453 **13 Claims**



1. A driving and control mechanism for moving at least one clamping device on a gripper weaving loom between a plurality of positions for clamping, presenting and holding a weft thread comprising:

(a) at least first and second operating levers, each lever having a first end, a central portion and a second end;

(b) coupling means connecting the first ends of both levers to the clamping device;

(c) cam transmission means having separate cam elements acting on each lever;

(d) locking means to selectively engage the second end of either operating lever such that the lever so engaged controls the movement of the clamping device; and

(e) control means to control the activation of the locking means.

4,781,227

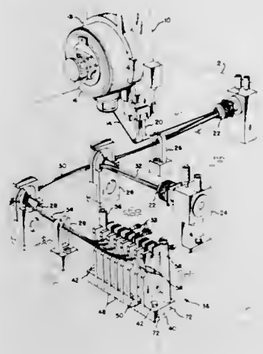
BREAKOUT DOCK FOR A WIRE HARNESS ASSEMBLY SYSTEM

Dan A. Cross, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 29, 1987, Ser. No. 67,834

Int. Cl.[4] B21F *27/00*

U.S. Cl. 140—92.1 **20 Claims**



1. A breakout dock for holding individual wire ends separated from a wire harness bundle, the dock being adapted for robotic assembly of the wire harness and comprising:

(a) a support allowing separation of the wire from the bundle, the support including a bearing surface having means for precisely positioning the wire at a predetermined location and predetermined height;

(b) a clamp positioned adjacent to and associated with the support for receiving and retaining the separated wire; and

(c) at least one position indicator for allowing a robot to determine the location and orientation of the support and the clamp.

4,781,228

TREE PRUNER

Dennis H. Vaders, State Road, N.C., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Aug. 17, 1987, Ser. No. 85,834

Int. Cl.[4] A01G *23/02;* **B27L** *1/00*

U.S. Cl. 144—2 Z **5 Claims**

1. A pruner for severing limbs from a tree, comprising:

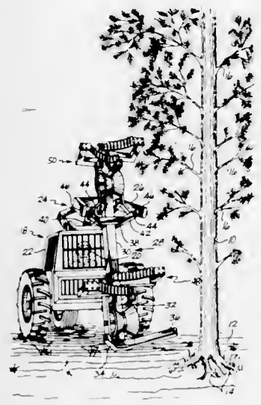
a frame,

at least two delimbing stations on the frame positioned substantially in an inline relationship,

each delimbing station having at least a pair of movable

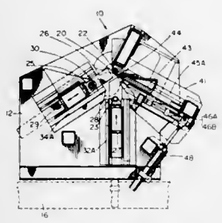
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grapple arms and flexible limb severing chains supported thereon, and



means for opening and closing the grapple arms about a tree whereby the flexible chains can be wrapped substantially about the entire circumference of the tree.

4,781,229
SPINDLELESS VENEER LATHE
Gary L. Wilson, Richmond, Canada, assignor to Durand-Raute Industries Ltd., British Columbia, Canada
Continuation-in-part of Ser. No. 947,400, Dec. 29, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 158,293
Claims priority, application Canada, Sep. 24, 1986, 519035
Int. Cl.[4] B27L *5/02*
U.S. Cl. 144—213 **21 Claims**



1. A veneer lathe, comprising:
(a) a fixed roller;
(b) a pressure roller;
(c) a following roller;
(d) a pressure roller support which slidably carries said pressure roller;
(e) means for moving said pressure roller along said pressure roller support relative to a block positioned between said rollers;
(f) a following roller support which slidably carries said following roller;
(g) means for moving said following roller along said following roller support relative to said block;
(h) following roller positioning means for selectively positioning said following roller with respect to said fixed and pressure rollers in response to a following roller position control signal; and,
(i) a knife;
whereby rotation of said rollers against said block rotates said block with respect to said knife, thereby peeling veneer from said block.

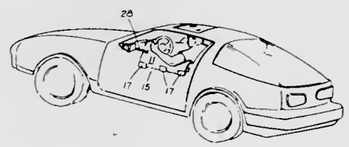
4,781,230
TEMPLATE FOR USE IN CARVING A THREE-DIMENSIONAL OBJECT
Thomas L. Haug, 6001 S. Irvington, Tulsa, Okla. 74135
Filed Jun. 15, 1987, Ser. No. 61,453
Int. Cl.[4] B27M *3/00*
U.S. Cl. 144—372 **3 Claims**



1. A template for use in carving a three dimensional object from a solid block comprising:
a template in the form of a stiff board of thin material having at least three spaced apart cut-out openings therethrough, the first opening conforming to a side elevational silhouette of the object, the second opening conforming to an end view silhouette of the object, and the third opening conforming to a top view silhouette of the object, whereby the block may be cut, or carved to permit it to be passed through each of said three openings in the template with minimal clearance to thereby enable the user to conform the object cut or carved from a block to the basic configuration of the desired object.

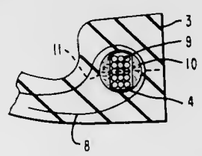
3. A method of carving a three dimensional object from a solid block comprising:
drawing an outline of three silhouettes of the object on a sheet, the first outline being a side elevational silhouette of the object, the second outline being an end view silhouette of the object, and the third outline being a top view silhouette of the object;
cutting out the outlines of the three silhouettes providing a template having three cut-out openings therein;
cutting or carving a solid block to permit its passage with minimal clearance through said three cut-out openings in said template to thereby obtain a model having the basic configuration of the desired object; and
rounding and smoothing the model having the basic configuration to achieve the desired three dimensional object.

4,781,231
PROTECTIVE HEATSHIELD KIT FOR VEHICLE DOORS
Kenneth M. Garcia, and Teresa L. Rill, both of 2000 E. Roger Rd., Apt. I–68, Tucson, Ariz. 85719
Filed Jul. 17, 1987, Ser. No. 74,964
Int. Cl.[4] B60J *11/00*
U.S. Cl. 150—52 K **7 Claims**



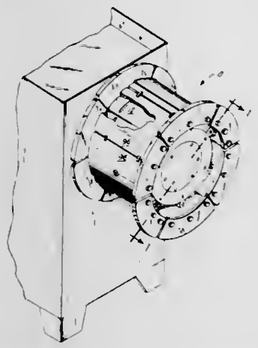
7. A heatshield apparatus designed to protect a user's arm from the heat that builds up on the upper surface of that portion of a vehicle door housing the window in the open position when a vehicle is parked and exposed to the sun, said heatshield apparatus comprising:
(a) a piece of heat absorbing material, formed in a rectangular shape to define an armrest cover to said vehicle door portion, said cover having, an exterior mounting portion, an interior mounting portion, an inside portion and an outside surface portion, said outside surface portion being provided with an area located on said exterior mounting portion to be used for advertisement,
said outside surface portion being further provided with a pocket for storing personal items and having a closing means comprising a set of mating VELCRO pads, said pocket being located on said interior mounting portion,
said interior mounting portion being further provided with a cutout arrangement for door panel accessories, such as door handles;
(b) a plurality of imbedded magnets in the periphery of said interior and exterior mounting portions of said armrest cover, said magnets being provided for detachable mounting onto the corresponding metallic interior and exterior surfaces of said portion of said vehicle door,
said magnets being covered with a protective pad and attached to said periphery by stitching within a hemmed portion of said interior and exterior mounting portions, said protective pads intended to protect from scratching said metallic interior and exterior surfaces of said vehicle door;
(c) a plurality of strips of material sold under the tradename VELCRO, attached to said interior mounting portion along the periphery of said inside surface portion for detachable attachment to a plurality of mating halves of the tradename VELCRO material, said plurality of strips and mating halves of the tradename VELCRO material being provided for vehicles which do not have metallic inside door panels;
(d) a plurality of eyelets suitably located on said armrest cover; and
(e) a string having one end detachably tied to one of said plurality of eyelets, and the other end loose for user securement to said vehicle such as to an outside rear view mirror or for use as a tie string of said armrest cover when stored as into a vehicle glove box.

4,781,232
PNEUMATIC VEHICLE TIRE BEAD STRUCTURE
Hans-Ulrich Klose, Wiedensahl, Fed. Rep. of Germany, assignor to Continental Aktiengesellschaft, Hannver, Fed. Rep. of Germany
Filed Jan. 29, 1987, Ser. No. 8,577
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602874
Int. Cl.[4] B60C *15/04*
U.S. Cl. 152—540 **4 Claims**



1. In a pneumatic vehicle tire made of rubber or rubber-like material and having a reinforcing carcass that is anchored in the beads of the tire by being looped around bead cores that are essentially inextensible and resistant to compression, with said bead cores having an essentially round overall cross-sectional shape, the improvement therewith wherein:
each of said bead cores has an inner region of high strength and rigidity, with said inner region having a cross-sectional shape that is characterized by a dimension as measured at points of greatest dimension radially and axially respectively, in the radial direction of said bead core, that differs and at maximum location thereof when in mounted position respectively is greater than dimension thereof in the axial direction; each of said bead cores also has an outer region, of lightweight material, that complements said inner region to provide said essentially round overall cross-sectional shape for said bead core,
said bead cores being embedded in said beads in a non-adhering manner, and for a vulcanization process, having laterally outwardly pivoted sidewalls and beads that are to be disposed on a radially inner periphery of a wheel rim; and being provided on each of said beads with a sealing surface that, in an operational position of said tire, is disposed in the interior of said tire for placement of the beads sealingly on the radially inner periphery of the wheel rim.

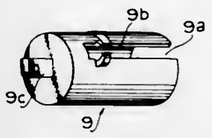
4,781,233
EXPANDABLE TIRE HUB APPARATUS
Roy L. Williams, 4716 Rye St., Metairie, La. 70002
Filed Mar. 22, 1984, Ser. No. 592,275
Int. Cl.[4] B60C *25/00*
U.S. Cl. 157—16 **4 Claims**



1. An expandable tire hub apparatus, comprising:
a. a hub assembly;
b. a plurality of shoe members radially expandable from said hub assembly;
c. a plurality of first piston means interconnecting said hub assembly and each of said shoe members, said plurality of first piston means responsive to fluid pressure;
d. a second piston member responsive to fluid pressure within said hub assembly so that movement of said second piston member imparts fluid pressure to each of said plurality of first piston means for radially expanding each of said shoe members into air tight engagement with a tire positioned on said hub assembly; and
e. guide means, interconnecting said shoe members and said hub assembly, so that when pressure is applied to said plurality of first piston means each of said shoe members are maintained equidistant apart from said hub assembly as said shoe members move into air tight engagement with said tire positioned thereupon.

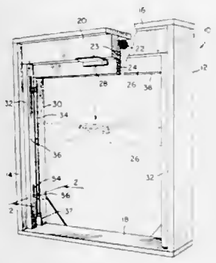
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4,781,234
SECURING DEVICE FOR A BAGGAGE COVER SHEET WINDER
Hitoshi Okumura, and Susumu Mizobuchi, both of Ohta, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan
Division of Ser. No. 551,608, Nov. 14, 1983, Pat. No. 4,668,001.
This application Apr. 16, 1987, Ser. No. 39,108
Claims priority, application Japan, Nov. 16, 1982, 57-173227; Dec. 7, 1982, 57-184251; Mar. 3, 1983, 58-29933
Int. Cl.⁴ E04F *10/02*
U.S. Cl. 160—23.1 **1 Claim**



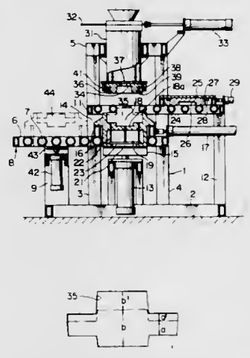
1. A baggage area cover sheet winder comprising:
a winding drum,
a rod disposed longitudinally within said winding drum,
a cover sheet fixed at one end to said winding drum,
a rigid core member fixed at an opposite end of said cover sheet from said one end, said rigid core member terminating with a locking pin at each of its ends,
a spring located between said winding drum and said rod, and
an end cap fixed at each end of said rod, each said end cap including (a) a pulling out opening for guiding passage of said cover sheet into and out of said end cap, (b) a boss portion projecting outwardly from said end cap for engagement with a device to secure the winder to the sides of an automobile, and (c) a housing portion having an upper detent and a lower detent for removably locking said locking pins therebetween to prevent pulling out of said cover sheet except by exertion of a predetermined amount of fore and to prevent loss of torsion in said spring due to free rolling of said winding drum.

4,781,235
COMBINED SUN SCREEN AND STORM WINDOW
Kurt B. Hedstrom, 1604 Meredith Pl., Plant City, Fla. 33566, and Iver H. Hedstrom, 5180 Elwood Rd., Springhill, Fla. 33512
Filed May 6, 1987, Ser. No. 46,429
Int. Cl.⁴ E06B *9/17*
U.S. Cl. 160—269 **6 Claims**



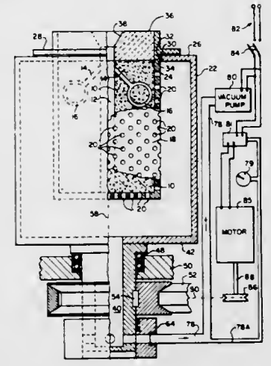
1. A combined sun screen and storm window comprising a generally rectangular frame having parallel side members, a top header and a bottom sill, each side member including a pair of guide strips with the strips being spaced from each other, a flexible panel supported on a spring biased roller at the upper end thereof and provided with a slide on the free end thereof for vertical movement between the strips with the strips forming guides for the slide and side edges of the panel, one of said strips in each pair being movably supported for clamping and sealing engagement with the opposed side edge surfaces of the panel and the opposed end surfaces of the slide, and means moving the movable strip and retaining it is adjusted position, said means for moving the movable strip including a strap attached fixedly to the movable strip and extending laterally into overlapping relation to the stationary strip, a movable strap mounted on the stationary strip in intersecting relation to the strap attached to the movable strip with a cam slot on the movable strap on the stationary strip with a pin on the strap on the movable strip received in the cam slot whereby movement of the strap with the cam slot therein will laterally move the strap attached to the movable strip, thereby moving the movable strip between clamped and unclamped positions.

4,781,236
METHOD OF AND DEVICE FOR PRODUCING MOLD CORE
Nagato Uzaki, Toyohashi; Isao Atsumi, Toyokawa; Kimikazu Kaneto, Toyohashi; Hisashi Harada, Aichi; Kunihiro Hashimoto, Toyokawa, and Osamu Motomatsu, Aichi, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan
Filed Jun. 25, 1987, Ser. No. 66,362
Claims priority, application Japan, Oct. 4, 1986, 61-236828; Oct. 18, 1986, 61-247968
Int. Cl.⁴ B22C *15/28*
U.S. Cl. 164—40 **6 Claims**



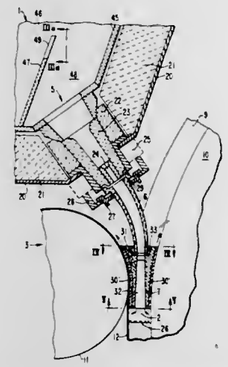
1. A method for molding a mold core having an outer peripheral surface, end surfaces, and thick and thin sections from green sand in a mold composed of core sections defined by dividing said core along a plane, said core sections having inner peripheral surfaces which are contiguous, when said mold sections are positioned end to end, providing therein space for producing a mold core,
said method including the steps of:
preparing a first die by closing the end of one of said core sections when said sections are positioned end to end and forming in said end of said one of said core sections an end wall surface by which the outer peripheral surface and an end surface of said mold core is to be formed;
preparing a second die by forming therein shallow and deep recesses which correspond to said thick and thin core sections to be formed, said shallow and deep recesses forming a mold sand receiving cavity, when said second die is mated with said first die and molding sand is charged into said cavity, such that said shallow and deep recesses in said cavity have depths which are greater than the thicknesses of said corresponding thick and thin core sections to be molded, with the ratios between said greater depths of said shallow and deep recesses and the thickness of the corresponding thick and thin core sections being constant;
preparing a third die by forming therein shallow and deep recesses which correspond to said thick and thin core sections to be formed and to said shallow and deep recesses in said second die, said shallow and deep recesses formed in said cavity between said third die and said first die having depths substantially equal to the thicknesses of said corresponding thick and thin core sections when said third die compresses the mold said therein;
mating said first and second dies with each other to form therebetween said mold sand receiving cavity;
charging mold sand into said mold sand receiving cavity under pressure effected by compressed air so that a preformed mold body having a bulk greater than that of the mold core to be produced is formed;
separating said second die from said first die and said preformed mold body leaving said preformed mold body on said first die;
mating said third die with said first die and said preformed mold body; and
compressing said preformed mold body between said first die and said third die to reduce the thickness of said preformed mold body and to form said mold core with said thick and thin section.

4,781,237
ROTARY VACUUM CASTING APPARATUS
Peter Sing, 168-10 84th Ave., Jamaica Hills, N.Y. 11432
Filed Jul. 25, 1986, Ser. No. 890,830
Int. Cl.⁴ B22D *13/00*
U.S. Cl. 164—255 **10 Claims**



1. A rotary investment casting apparatus for producing molded jewelry objects of improved quality from molten metal by eliminating incomplete filling of the mold and by removing gaseous material form both the mold and the molten metal to avoid gas pockets and porosity in the molded objects, comprising:
a gas-permeable investment mold having been formed in one piece of material porous to gases by encompassing wax impressions of the objects to be molded in said porous material and after the setting of said mold, melting and removing the wax, said mold being positioned for rotation about its central vertical axis and having a plurality of cavities in the shape of the objects to be molded, each of said cavities extending directly from a branch passage connecting each of said cavities to a centrally disposed vertical feed opening in said mold, said branch passages being oriented at a downwardly acute angle with respect to said central vertical axis of said investment mold and being distributed throughout said investment mold in tree-branch-like fashion, said cavities being exposed to pressure from above and outside said investment mold;
means for creating a region of partial vacuum peripherally surrounding the porous walls and porous bottom of said mold uniformly to withdraw gases from said gas-permeable mold, from said shaped cavities and from the molten metal poured therein before it solidifies; and
means for rotating said mold in erect vertical position about said central vertical axis thereof, whereby, when the casting apparatus is actuated and the molten metal poured into said investment mold, the combined centrifugal, gravitiational and pressure differential forces being multi-directionally exerted on said angularly disposed cavities and the molten metal therein to ensure both the complete filling of said cavities and the absence of gas pockets in the molded object, said pressure differential force resulting from the higher pressure from outside said mold combining and acting in concert with the lowered pressure created within said mold by said means for creating a region of partial vacuum.

4,781,238
REFRACTORY CHANNEL CONNECTION APPARATUS IN A METALLURGICAL VESSEL
Laurenz Keisers; Kurt Engelmann, both of Krefeld, and Johannes Steins, Erkrath, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden and Karf Engineering GmbH, Dusseldorf, both of, Fed. Rep. of Germany
Filed Jul. 8, 1987, Ser. No. 71,255
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623937
Int. Cl.⁴ B22D *11/10*
U.S. Cl. 164—415 **23 Claims**



12. In an assembly of continuous casting machine including a mold formed by a peripheral groove in a casting wheel and a band covering the open side of the groove, and a metallurgical vessel having a discharge nozzle for discharging molten metal into said mold, the improvement of a refractory channel connection apparatus for transferring the molten metal from said discharge nozzle to said mold while isolating the metal from the exterior air, said apparatus comprising:
a refractory pouring tube having an inlet end connected to said discharge nozzle of said metallurgical vessel, an outlet end and a molten metal passage extending from said inlet end to said outlet end;
a refractory nozzle extension at said outlet end of said pouring tube, said nozzle extension having therethrough a flow through passage communicating with said passage of said pouring tube, an outer profile extending tangentially into said mold and defining therewith a slot, and a lower end

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positioned within said mold to a level above the upper level of metal cast therein, said flow through passage having an inlet end with a cross-sectional shape matching that of the outlet end of said passage of said pouring tube and an outlet end with a cross-sectional shape proportional to but smaller than the cross section of said mold;

means for forming a pressurized gaseous atmosphere within a chamber including said flow through passage and a space above the upper level of metal in said mold and thereby for preventing exterior air from entering said chamber through said slot and contacting the metal in said mold; and

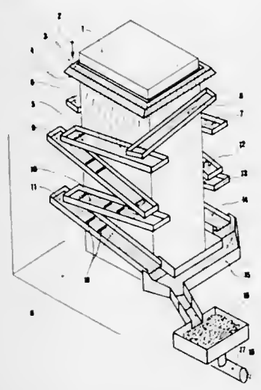
a ceramic fiber seal surrounding at least a portion of said outer profile of said nozzle extension and positioned within said slot for sealingly engaging said nozzle extension with said mold.

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PROCESS AND APPARATUS FOR CASTING IN A PIT, WITHOUT ANY EXPLOSIVE RISK, OF ALUMINUM AND ITS ALLOYS, PARTICULARLY WITH LITHIUM

Yves Cans, Saint Egréve; Jean-Marie Hicter, and Jacques Moriceau, both of Coublevie, all of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Filed Nov. 18, 1987, Ser. No. 122,180
Claims priority, application France, Dec. 3, 1986, 86 17770
Int. Cl.[4] B22D *11/124*
U.S. Cl. 164—486 **7 Claims**



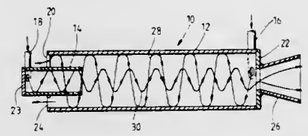
1. In a process for casting in a pit without any risk of explosion, aluminum and its alloys by casting in a cooled ingot mould with a mobile bottom, which is vertically axed and is supplied in its upper part with liquid metal and from which continuously flows through a lower part a partly solidified metal, comprising accelerating cooling by spraying the cast metal with water, and permitting the sprayed water to trickle on the surface of the metal to a level where it is separated from the metal surface by an elastic shield, the improvement comprising collecting at the level of the shield and over the entire periphery of the shield, the cooling water in the form of a film and any liquid metal outpouring from the shield, causing the water and metal to flow downwardly by gravity along an inclined plane, separating the metal from the water in portionwise manner and recovering the water outside the pit.

4,781,240

ENERGY EXCHANGE METHOD AND APPARATUS

John O. Cliff, 211 Deerfield La., Franklin, Tenn. 37064

Filed Mar. 10, 1988, Ser. No. 166,396
Int. Cl.[4] F28E *3/02*
U.S. Cl. 165—1 **16 Claims**



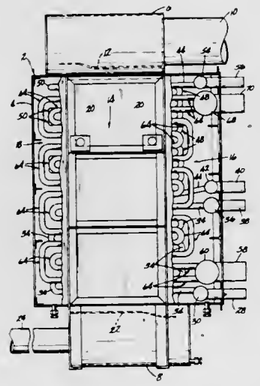
1. A process for heat and energy exchange which comprises introducing compressed fluid from a first source to be heated into a first tube tangentially to an inner surface thereof at one end of said tube, conducting it along said tube to an opposite end of said first tube in a spiral manner, conducting compressed fluid from a second source to be cooled tangentially into a second tube at said opposite end of said first tube, said second tube being of less diameter than said first, and conducting said compressed fluid to be cooled in a spiral manner from said opposite end to said one end with direct contact between the two fluids and with very little mixing, thereby while performing work transferring heat from said fluid to be cooled to said fluid from said first source to be heated and making said fluid to be cooled cooler than when conducted into said second tube.

4,781,241

HEAT EXCHANGER FOR FUEL CELL POWER PLANT REFORMER

Robert Misage, Manchester; Glenn W. Scheffler, Tolland; Herbert J. Setzer, Ellington; Paul R. Margiott, and Edmund K. Parenti, Jr., both of Manchester, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Aug. 27, 1987, Ser. No. 90,305
Int. Cl.[4] F28D *7/08;* **H01M** *8/04, 8/18*
U.S. Cl. 165—1 **7 Claims**



1. A method of operating a heat exchanger in a fuel cell power plant, said method comprising the steps of:

(a) providing a single heat exchanger housing having an inlet end, and outlet end and a medial portion between said inlet and outlet ends;

(b) flowing reformed fuel from a reformer through said housing from said inlet end to said outlet end;

(c) flowing raw hydrocarbon fuel through said housing from said outlet end to said inlet end in heat exchange relationship with said reformed fuel;

(d) flowing coolant water from a power section of the power plant through said housing from said outlet end to said medial portion in heat exchange relationship with said reformed fuel;

(e) flowing steam from the power plant through said housing from said medial portion to said inlet end in heat exchange relationship with said reformed fuel; and

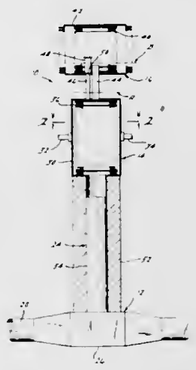
(f) said reformed fuel entering said inlet end at reformer temperatures and exiting said outlet end at power plant power section temperatures, said raw hydrocarbon fuel entering said outlet end at near ambient temperatures and exiting said inlet end at reformer temperatures, said coolant water entering said outlet end at power section temperatures and exiting said medial portion as two phase water-steam mixture, and said steam entering said medial portion at steam separator temperatures and exiting said inlet end at reformer temperatures.

4,781,242

EXHAUST HEAT RECOVERY SYSTEM FOR COMPARTMENT HEATING

Roelf J. Meijer, and Benjamin Ziph, both of Ann Arbor, Mich., assignors to Volvo Flygmotor A.B., Trollhatten, Sweden

Filed Mar. 9, 1987, Ser. No. 23,781
Int. Cl.[4] F28D *15/02;* **F02N** *17/06*
U.S. Cl. 165—32 **18 Claims**



1. An exhaust gas heat exchanger for transferring heat from the exhaust gases of an engine to its liquid coolant, thus increasing the rate of heating of the coolant, said heat exchanger providing a regulated rate of heat transfer despite changes in the temperature of said exhaust gases, comprising:

a heat pipe having an evaporator portion and a condenser portion, said evaporator portion exposed to said exhaust gases thereby heating a working fluid in said heat pipe, said condenser portion defining a coolant heater in thermal communication with said liquid coolant,

a thermal storage canister for storing said working fluid whereby the quantity of said working fluid transferring heat from said evaporator portion to said condenser portion can be varied,

conduit means for communicating said working fluid between said coolant heater and said thermal storage canister,

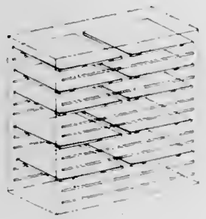
a thermally activated valve for controlling the flow of working fluid from said storage canister to said heat pipe wherein, when said exhaust gas is at a low temperature, substantially all of said working fluid is exchanged between said evaporator portion and said coolant heater, and when said exhaust gas is at a high temperature, a portion of said working fluid condenses in said storage canister and said thermally activated valve regulates the return flow of said condensed working fluid to said heat pipe whereby said storage canister and said thermally activated valve vary the proportion of the total amount of said working fluid in said heat pipe which transports heat between said evaporator portion and said coolant heater in accordance with the temperature of said exhaust gases.

4,781,243

THERMO CONTAINER WALL

Nicolaas DeVogel, and Frederick J. Gorges, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 11, 1986, Ser. No. 940,298
Int. Cl.[4] F28D *21/00*
U.S. Cl. 165—47 **13 Claims**



1. A food storage cart on wheels comprising two sidewalls, a top wall, a bottom wall and a rear wall, together defining a storage space having an access opening, and a door for closing said access opening movable between an open position and a closed position, and shelves within said cart for receiving and supporting food, and wherein at least one of said shelves is a removable thermo wall of a sandwich construction, and comprises a top surface member, a bottom surface member, a honeycomb core, means connecting said surface members to the opposite sides of the honeycomb core, said honeycomb core including cells having sidewalls which extend perpendicular to said surface members, said surface members closing the ends of said cells, and a phase change material within said cells which has a heat of fusion which is substantially higher than the heat of fusion of water.

4,781,244

LIQUID COOLING SYSTEM FOR INTEGRATED CIRCUIT CHIPS

Yuji Kuramitsu, and Yukio Yamaguchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 25, 1987, Ser. No. 18,408
Claims priority, application Japan, Feb. 25, 1986, 61-26175[U]; Nov. 7, 1986, 61-265195
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—80.4 **5 Claims**

1. A cooling system for an electronic system comprising:

a connector mounted on a panel;

an integrated circuit package having a substrate and being removably connectable to said connector;

a mounting frame for mounting said package into contact with said connector;

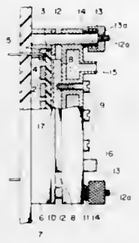
heat exchanger means provided with inlet and outlet means to permit liquid coolant to flow through said heat exchanger means, said heat exchanger means including a heat conductive member;

a layer of heat conductive bonding material for bonding said heat conductive member to said package to provide a low thermal resistance contact therebetween; and

a plurality of fastening means mounted on said panel for removably holding said heat exchanger means on said

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panel, wherein each of said fastening means comprises a guide post having a shaft portion and an externally threaded portion, a nut having an internally threaded portion engaged with said externally threaded portion, and a coil spring between said heat exchanger means and



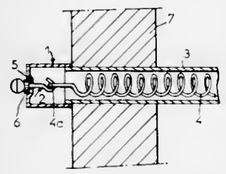
said nut, said coil spring exerting a predetermined amount of pressure on said heat exchanger means when said nut is tightened to contact said shaft portion to promote a reduction in stress on said integrated circuit package substrate and said heat conductive member.

4,781,245

DEVICE FOR POSITIONING A ROTATABLE ELEMENT WITHIN A TUBE

David Freychet, and Robeo Loutaty, both of Le Havre, France, assignors to Compagnie de Raffinage et de Distributioo Total France, Paris, France

Filed Jan. 12, 1987, Ser. No. 2,110
Claims priority, application France, Jan. 10, 1986, 86 000293
Int. Cl.⁴ F28G *1/12, 3/08*
U.S. Cl. 165—94 **13 Claims**



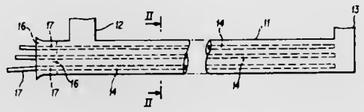
1. A device mountable at the end of a tube of predetermined size and having a circular cross-section for rotatably positioning in the tube a movable element shaped to be driven in rotation within the tube by the action of a fluid flowing through said tube, comprising an open frame member having a base portion in the shape of a longitudinally split circular cylinder and adapted to be secured to the outside of a protruding end of said tube and an upper open support portion shaped to extend across the axis of said tube when mounted thereon without substantially impeding the flow of fluid past said open frame member relative to said tube, and a spindle rotatably mounted on said support portion for rotation along the axis of the end of said tube and adapted to be fastened to one end of said movable element positioned in said tube.

4,781,246

THERMALLY REVERSIBLE HEAT EXCHANGE UNIT

Peter M. Golben, Wyckoff, N.J., assignor to Ergenics, Inc., Wyckoff, N.J.

Filed May 12, 1982, Ser. No. 377,556
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.⁴ F25B *17/08*
U.S. Cl. 165—104.12 **4 Claims**



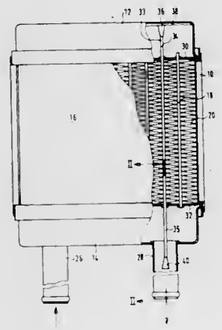
1. A thermally alternating heat exchange unit comprising an elongated tubular jacket having a width and a length much greater than the width, said jacket having an outlet at one end and an inlet at the other end, at least one elongated metal heat transfer surface therein positioned essentially parallel to the longitudinal axis of said jacket and being substantially equal in length to said jacket, there being a spacing between said transfer surface and a wall of said jacket configured to permit a heat exchange liquid to flow between the wall of said jacket and said heat transfer surface, and wherein the ratio of said jacket length to said jacket width is sufficiently large to permit a flow of successive portions of miscible heat exchange liquid of differing temperatures between said inlet and said outlet while retaining a difference in temperatures between two successive ones of said liquid portions.

4,781,247

HEAT EXCHANGER FOR THE COOLANT CIRCUIT OF INTERNAL COMBUSTION ENGINES

Joachim Schulz, Amorbach, Fed. Rep. of Germany, assignor to Aurora Konrad G. Schulz GmbH & Co., Mudau/Odenwald, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,531
Claims priority, application European Pat. Off., Aug. 14, 1986, 86111269.6
Int. Cl.⁴ F01P *11/02;* F28F *23/00*
U.S. Cl. 165—104.32 **11 Claims**



1. In a heat exchanger for the coolant circuit of an internal combustion engine, with said heat exchanger including an upper water tank, a lower water tank that is connected to a return line, heat exchanger tubes that extend between said upper and lower water tanks, and an air-withdrawal line that extends from said upper water tank into the region of said lower water tank, the improvement wherein:

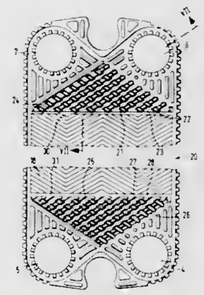
said heat exchanger is embodied as a radiator, and said air-withdrawal line extends through said lower water tank into said return line, said air-withdrawal line having an upper opening in said upper water tank, and a lower opening in said return line, with that region of said air-withdrawal line about said lower opening thereof being widened.

4,781,248

PLATE HEAT EXCHANGER

Johann Pfeiffer, Bretten, Fed. Rep. of Germany, assignor to W. Schmidt GmbH & Co., K.G., Bretten, Fed. Rep. of Germany

Filed May 18, 1987, Ser. No. 50,457
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622316
Int. Cl.⁴ F28F *3/08*
U.S. Cl. 165—167 **13 Claims**



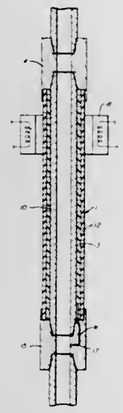
1. A heat exchanger, comprising substantially rectangular plates in alignment with one another and provided by embossing with a bead-like profile of uniform total depth, said plates being alternatingly rotated by 180° relative to one another and having a peripheral gasket disposed therebetween and further being fastened detachably into a stack with the facing profiles of adjacent plates resting on one another in opposed relation, wherein the plates alternatingly form flow spaces, encompassed by the peripheral gasket, for a first medium and a second medium guided substantially parallel to the first, the flow spaces being supplied with the respective medium via inlet and outlet openings in alignment with one another and formed by means defining openings disposed in the corner regions of the plates, the plates further having a middle rectangular heat exchange zone and two triangular heat exchange zones adjoining the middle zone on opposite sides, said triangular zones transfer the flow section of the middle zone to the vicinity of the inlet and outlet opening, to which end the profile of the triangular zones is embodied substantially as rays originating at the opening and having a pitch defining a mutual spacing, characterized in that said rays of one triangular zone (**21, 32**) comprise a profile having regular sections (**22, 23; 34, 35**) having the pitch of the ray spacing and adjoining one another in the direction of the rays and embossed alternatingly in opposite directions out of the plane of a plate, with the embossing depth originating at the plane of the plate (**20, 31, 36–39**), and further that the rays of the other triangular zone (**25**), along where they are covered by the rays, rotated by 180°, of the first triangular zone, have a profile having sections (**26, 27**) corresponding to that of the first triangular zone but embossed in the opposite direction.

4,781,249

PROGRESSIVELY INFLATED PACKERS

Edward T. Wood, Houston, Tex., assignor to Completion Tool Company, Houston, Tex.

Filed Apr. 4, 1984, Ser. No. 596,681
Int. Cl.⁴ E21B *33/127*
U.S. Cl. 166—187 **8 Claims**



1. An inflatable well packer for use in a well bore comprising:

a central tubular pipe member with a substantial length;

an elastomer inflatable member disposed along the length of said pipe member and means at each end of said elastomer member for attaching said elastomer member to said pipe member;

passage means including valve inflation means for admitting fluid from the interior of said pipe member to the interior of said elastomer inflatable member; and

said elastomer inflatable member having releasable expansion retarding means extending from one end of said inflatable member towards the center of said inflatable member whereby said elastomer member may be inflated progressively from one end of said inflatable member to the other end of said inflatable member.

4,781,250

PRESSURE ACTUATED CLEANING TOOL

William H. McCormick, Plano; Charles C. Cobb, Lewisville, and Malcolm N. Council, Richardson, all of Tex., assignors to Otis Engineering Corp., Dallas, Tex.

Filed Dec. 14, 1987, Ser. No. 132,777
Int. Cl.⁴ E21B *37/00*
U.S. Cl. 166—240 **6 Claims**

1. Apparatus for cleaning flow conductors comprising:

a. first mandrel means and second mandrel means with a longitudinal flow passageway extending through each;

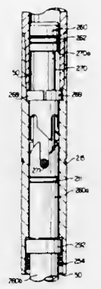
b. means for connecting one end of the first mandrel means to a source of cleaning fluid;

c. the second mandrel means slidably disposed within the first mandrel means and a portion of the second mandrel means extending from the other end of the first mandrel means;

d. means for rotating the second mandrel means relative to the first mandrel means in response to fluid pressure changes within the longitudinal flow passageway;

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e. the rotating means including a continuous J-slot and an indexing pin; and



f. means for attaching a cleaning tool to the portion of the second mandrel means extending from the first mandrel means.

4,781,251

RECOVERING HYDROCARBONS WITH WATER SOLUBLE ALKYLPHENOL LIGNIN SURFACTANTS

Douglas G. Naae, Houston, and Francis E. DeBons, Richmond, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,850
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **14 Claims**

1. A method of recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting through an injection well a surfactant slug comprising about 0.1% to about 10% by weight of an alkylphenol lignin surfactant,

said alkylphenol lignin surfactant produced by reacting in basic solution an alkylphenol having about six to about 15 carbon atoms in the alkyl chain with formaldehyde at a temperature of about 50° to about 120° C. for about 15 minutes to about 3 hours to form a first reaction product,

reacting the first reaction product with a kraft lignin in solution at a temperature of about 100° to about 160° C. for about 30 minutes to about 5 hours to form an alkylphenol lignin reaction product; and

increasing the water solubility of the alkylphenol lignin reaction product by a reaction selected from the group consisting of sulfonation, sulfation, alkoxysulfonation, alkoxysulfation, and alkoxylation to produce the alkylphenol lignin surfactant;

injecting through the injection well a drive fluid to push the surfactant slug towards a production well; and

recovering hydrocarbons at the production well.

4,781,252

STORAGE TANK FIRE EXTINGUISHING APPARATUS

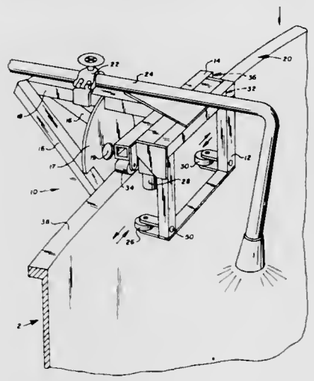
Thomas G. Wilburn, Orange, Tex.; William C. Gray, Lake Charles; William E. Myers, DeRidder, both of La., and Richard P. Bauer, Annandale, Va., assignors to Citgo Petroleum Corp., Tulsa, Okla.

Continuation of Ser. No. 073,838, Jul. 15, 1987, abandoned, which is a continuation of Ser. No. 862,796, May 13, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 142,248
Int. Cl.[4] A62C *35/54*
U.S. Cl. 169—68 **16 Claims**

1. An apparatus for mounting a fire a suppressant delivering nozzle to a circumferential lip of a tank comprising:

a mainframe member;

means for mounting said mainframe member to the circumferential lip so that said mainframe member is movable on said lip about a least a portion of the circumference of the tank, said means for mounting including a first roller adapted to engage and roll along an interior of the lip of the tank, a second roller adapted to engage and roll along



the top of said lip and a third roller adapted to engage and roll along an exterior of the lip; and

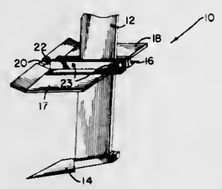
means for fixedly coupling a fire suppressant delivery nozzle to a portion of said mainframe member disposed vertically above the circumferential lip.

4,781,253

SHIELD FOR SOIL RIPPING IMPLEMENT

Keith J. Cosson, 416 N. Washington, Grand Island, Nebr. 68801

Filed Nov. 10, 1986, Ser. No. 929,189
Int. Cl.[4] A01B *39/26, 39/12*
U.S. Cl. 172—508 **10 Claims**



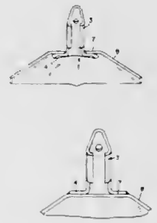
1. In an agricultural ripper tiller implement for deep tilling of soil between growing row crops, wherein said implement includes a downwardly depending shank and a shoe member carried by the lower end of said shank; wherein the improvement comprises a shield member which is adapted to be detachably secured to said shank in a generally horizontal plane; wherein the front edge of said shield member is sloped upwardly; wherein said shield member extends outwardly from opposite sides of said shank at least about 8 inches; wherein said shield member is positioned on said shank in a manner such that when said shank and shoe are pulled through the soil said shield member enables soil to move outwardly from said shank to said row crops while preventing soil from being thrown upwardly and covering said crops; wherein said shield member comprises first and second sections which are detachably connected to each other, with said shank being disposed between said sections; and further comprising a third section which extends between said first and second sections in front of said shank.

4,781,254

TWO-PIECE EARTH ENGAGING IMPLEMENT AND METHOD OF FORMING THE SAME

William M. Johnson, Melton South, Australia, assignor to Ralph McKay Limited, Maidstone, Australia

Continuation-in-part of Ser. No. 637,339, Aug. 3, 1984, abandoned, which is a continuation of Ser. No. 217,170, Dec. 16, 1980, abandoned. This application Dec. 30, 1986, Ser. No. 948,462
Claims priority, application Australia, Dec. 20, 1979, PE1794
Int. Cl.[4] A01B *15/04;* B21D *5/16;* B21H *7/06*
U.S. Cl. 172—730 **12 Claims**



1. A two-piece earth engaging deep tillage implement comprising an earth engaging portion formed from a metal blank and having a substantially planar central section and a blade portion extending from said central section at an angle thereto and facing in the forward direction of travel of said implement, said central section terminating in a rear edge extending transverse to the direction of travel of said implement, a socket portion formed from a rectangular metal blank and having a lower end secured to said central section of said earth engaging portion forwardly of said rear edge and sloping upwardly from said earth engaging portion and terminating in an upper end, said socket portion being generally triangular in cross section with the dimension from the apex to the base of the triangular cross-section being oriented front-to-rear with respect to and aligned with the forward direction of travel of the implement, said front-to-rear dimension of said generally triangular cross-section being relatively larger than the base thereof, said front-to-rear dimension decreasing in magnitude from said upper end toward said lower end of said socket portion, the lower end of said socket portion having outwardly extending flanges, said flanges being secured to said earth engaging portion to provide the securement of said socket portion to said earth engaging portion, said socket portion being of narrow width transverse to the direction of travel of said implement so as to present a narrow profile to earth through which it moves and to have reduced draft, said socket portion incorporating a recess beginning at said upper end and extending toward said lower end, said recess tapering in cross section from said upper end of the socket portion toward said lower end of said socket portion, said recess cross section being smaller at said lower end than at said upper end, said tapering terminating at the upper surface of said earth engaging portion, said recess being adapted to receive a complementary shaped foot of a tine of an agricultural machine for fastening said socket portion to said tine exclusively by friction.

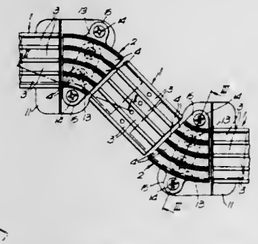
7. A method of forming an earth engaging deep tillage implement comprising the steps of blanking an earth engaging portion from metal plate, said earth engaging portion having a substantially planar central section and a blade portion extending from said central section at an angle thereto and facing in the forward direction of travel of said implement, said central section terminating in a rear edge extending transverse to the direction of travel of said implement, blanking a triangular socket portion from metal plate, forming said earth engaging portion into its three dimensional form, bending said rectangular portion about itself to form a hollow socket portion, shaping said socket portion to have a generally triangular cross section with the dimension from the apex to the base of the triangular cross section being oriented front-to-rear and aligned with the forward direction of travel of the implement, said front-to-rear dimension of said generally triangular cross section being relatively larger than the base thereof, said front-to-rear dimension decreasing in magnitude from said upper end toward said lower end of said socket portion, said socket portion having a narrow width transverse to the direction of travel of said implement so as to present a narrow profile to earth through which it travels and to have reduced draft, the lower end of said socket portion having outwardly extending flanges formed thereon, subsequently joining the lower end of said socket portion to said central section of said earth engaging portion forwardly of said rear edge by securing said flanges to said earth engaging portion.

4,781,255

CABLE CONDUIT SYSTEM FOR VEHICLES

Stanley A. Lock, Bristol, and Brian E. Mills, Surrey, both of England, assignors to British Aerospace Public Limited Company, London, England

Filed Dec. 6, 1985, Ser. No. 805,630
Claims priority, application United Kingdom, Dec. 8, 1984, 8431067
Int. Cl.[4] H02G *3/04*
U.S. Cl. 174—97 **3 Claims**



1. A conduit system, especially for mounting cables in a vehicle, said conduit system including at least three conduit elements, each having an equal multitude of channels for holding cables, positioned in end to end relationship such that the channels of each conduit element lie substantially in alignment with the channels of the adjacent conduit element and the end of each conduit element lies closely adjacent to but set apart from its adjoining conduit element, at least two of said conduit elements being straight and at least one being curved, and two or more straight conduit elements being interconnected by one or more curved conduit elements, the channels of the curved conduit elements being of slightly greater width than the channels of the straight conduit elements, and the ends of the straight conduit elements being slightly flared to effect a smooth transition between the channels of adjacent conduit elements.

4,781,256

CUTTING STRUCTURES FOR ROTARY DRILL BITS

Michael T. Wardley, Stroud, England, assignor to NL Petroleum Products Limited, England

Division of Ser. No. 808,328, Dec. 12, 1985, Pat. No. 4,699,227. This application Jun. 30, 1987, Ser. No. 68,632
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **20 Claims**

1. A cutting structure for a rotary drill bit comprising a pre-formed thermally stable polycrystalline diamond cutting element brazed to a separately pre-formed carrier, the carrier being formed of a material such that, at the brazing temperature, the difference in coefficient of thermal expansion between

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the said material and the polycrystalline diamond material is less than the difference in coefficient of thermal expansion



between tungsten carbide and the polycrystalline diamond material.

4,781,257

SUSPENSION STRUCTURE FOR A TRACKED VEHICLE

James E. Gee, Washington; Andrew J. Tonsor, East Peoria; David E. Nelson, Peoria, and Ronald L. Satzler, Princeville, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 28, 1987, Ser. No. 90,476
Int. Cl.[4] B62D *55/06*
U.S. Cl. 180—9.5 **24 Claims**

3. In a vehicle of the type including a main frame having first and second ends, first and second undercarriages individually having a track roller frame, first and second wheel assemblies and a ground-engaging track encircling the wheel assemblies, a suspension structure for connecting the main frame to the undercarriages, comprising:

pivot means for pivotally connecting each of the undercarriages to the first end of the main frame and permitting pivotal movement thereof about a generally horizontal and transversely oriented axis, the supporting pivot means being located elevationally below the main frame and adjacent the second wheel assemblies;

coupling means for centrally supporting the second end of the main frame on the undercarriages and preventing uncontrolled lateral spreading of the undercarriages, the coupling means including a stabilizing beam connected to each of the track roller frames, an equalizer bar centrally connected to the main frame and having opposite outer ends, and a coupling joint connecting each of the outer ends of the equalizer bar to the respective stabilizing beam, the coupling means being located adjacent the first wheel assemblies; and

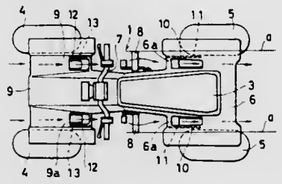
drive means for independently powerably rotating the first wheel assemblies including a motor mounted on each of the undercarriages away from the pivot means.

4,781,258

REAR FENDER APPARATUS IN SADDLE TYPE VEHICLE

Gen Tamura, Kokubunji, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1986, Ser. No. 886,475
Claims priority, application Japan, Jul. 17, 1985, 60-156148
Int. Cl.[4] B60K *11/04*; B62M *7/06*
U.S. Cl. 180—68.1 **2 Claims**



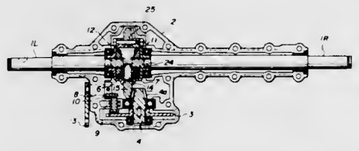
1. A fender apparatus for use with a saddle type vehicle having a vehicle body, an internal combustion engine mounted on the vehicle body at the mid portion thereof between front and rear wheels, a driver's seat mounted on the vehicle body at an upper portion thereof, a pair of rear wheels mounted on the vehicle body, and foot pedals adjacent said engine and disposed inside said rear wheels, each foot pedal having an outer end, the fender apparatus comprising a rear fender covering the two rear wheels, the rear fender having a downwardly bent front wall and a through opening in the bent front wall located laterally to the inside of the position of the rear wheel on each side of the vehicle body and laterally inside a plane parallel to a centerline of the vehicle body passing through the outer end of the respective foot pedal, and a longitudinally extending partition wall located between each through opening and the corresponding rear wheel on each side of the vehicle body wherein upon movement of the vehicle air flows rearward past the engine and through the through openings to dissipate heat generated by the engine and to cool the driver's feet and legs.

4,781,259

AXLE DRIVING APPARATUS

Kojiro Yamaoka, Nishinomiya, and Shusuke Nemoto, Yao, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

Filed Oct. 24, 1986, Ser. No. 923,118
Claims priority, application Japan, Oct. 25, 1985, 60-239757; Oct. 25, 1985, 60-164836[U]; Oct. 25, 1985, 60-164837[U]
Int. Cl.[4] B60B *35/16*; F16D *55/08*
U.S. Cl. 180—75 **10 Claims**



1. An axle driving apparatus, comprising a driving case, a differential gear unit and a vertically disposed differential pinion shaft located in said driving case, said driving case being divided into a first driving case and a second driving case wherein the intersection of said first driving case and said second driving case lies in a plane that passes through the longitudinal axis of an axle, wherein said differential gear unit and said differential pinion shaft are held between said first driving case and said second driving case, said first driving case being provided with an extension having a cavity, said extension having disposed at the outside surface thereof a stepless speed change device having an output shaft wherein said extension additionally provides means for interfacing said output shaft with a transmission mechanism for driving said differential pinion shaft in said cavity.

10. An axle driving apparatus, comprising:

an axle having a longitudinal axis;

a differential gear unit for driving said axle;

a speed change mechanism comprising an output shaft;

a transmission mechanism for transferring power from said output shaft of said speed change mechanism to said differential gear unit;

a first driving case comprising an extension with an interior cavity wherein said extension provides means for supporting said transmission mechanism within said cavity and said extension houses means for said output shaft of said speed change mechanism to interface with said transmission mechanism;

a second driving case wherein said second driving case and said first driving case meet along a plane parallel to the longitudinal axis of said axle;

said axle driving apparatus further comprising braking means, said braking means comprising:

a pinion shaft;

a gear attached to said pinion shaft for interfacing with said transmission;

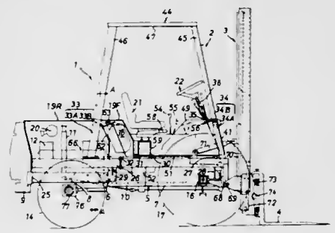
a friction pin, wherein said friction pin provides braking friction in contact with said gear attached to said pinion shaft.

4,781,260

FRAMEWORK STRUCTURE FOR VEHICLES

Shigeru Morita; Kenkichi Nozaka, and Yosihiro Kawahara, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Apr. 24, 1987, Ser. No. 42,214
Claims priority, application Japan, Jun. 30, 1986, 61-154836
Int. Cl.[4] B62D *33/06, 49/00*
U.S. Cl. 180—89.12 **12 Claims**



1. A framework structure for a vehicle having a vehicle body, the vehicle body including an engine, a clutch housing and a transmission case joined to form a monocoque body arranged longitudinally comprising:

a pair of front wheels provided at opposite sides of a front portion of the vehicle body and operatively connected to a front axle case, a rear axle frame attached to a rear portion of the vehicle body, a pair of rear wheels each attached to the rear axle frame and operatively connected to a rear axle case, a steering assembly disposed between opposite front wheel fenders provided at the front portion of the vehicle body, a bonnet covering the engine carried on the vehicle body in its rear portion, and a driver's seat mounted on the vehicle body and interposed between the bonnet and the steering assembly;

said framework structure being characterized in that a pair of elongated reinforcing frames are positioned longitudinally along the body at opposite sides thereof, respectively, to cover the longitudinal length from the front end to the rear end of the body, said pair of reinforcing frames are interconnected at a front, intermediate and rear portions thereof by connectors, the front connector, the rear connector and a bracket provided in a middle of the reinforcing frames are connected to the body at a front and intermediate portions longitudinally of the body;

a front gate frame and an intermediate gate frame are positioned astride and transversely arranged relative to said reinforcing frames and comprise a pair of side upright members and top members, the pair of side upright members are secured at open end to the reinforcing frames;

upright members of the front gate include top ends being adjustable heightwise almost equal to top of the fender;

upright members of the intermediate gate include top ends being adjustable heightwise almost equal to top of the bonnet and respective gates are attached to vehicular elements located above the body; and

a safety frame is formed by connecting top ends of front and rear posts with a pair of top frames, respectively, down ends of front posts in the safety frame are engaged removably with top ends of the members in the front gate and down ends of rear posts in the safety frame are engaged removably with top ends of the members in the rear gate.

4,781,261

FOUR-WHEEL STEERING SYSTEM FOR AUTOMOTIVE VEHICLES

Youichi Hyodo, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Oct. 27, 1986, Ser. No. 923,399
Claims priority, application Japan, Oct. 28, 1985, 60-240945
Int. Cl.[4] B62D *5/10*
U.S. Cl. 180—140 **3 Claims**

1. A four-wheel steering system for an automotive vehicle having a pair of dirigible front road wheels and a pair of dirigible rear road wheels, comprising a front wheel steering mechanism operable in response to a steering effort applied thereto to steer the front road wheels, a rear wheel steering mechanism including an axially displacable operation rod operatively connected at opposite ends thereof with the rear rod wheels to steer the rear road wheels, and a connecting mechanism assembled in combination with said rear wheel steering mechanism and being drivingly connected to said front wheel steering mechanism for effecting axial displacement of said operation rod in response to operation of said front wheel steering mechanism and for controlling the steering angle ratio and direction of the rear road wheels relative to the front road wheels, wherein said rear wheel steering mechanism comprises:

a power-assisted steering mechanism which includes a hydraulic power cylinder integrally provided with said operation rot to assist axial displacement of said operation rod, an intermediate rod arranged in parallel with said operation rod to be axially displaced in accordance with the mode of operation of said connecting mechanism, a control valve operatively connected to said intermediate rod and said operation rod to control fluid under pressure supplied into said power cylinder in accordance with the mode of operation of said connecting mechanism, and a

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tubular housing assembly to be mounted on a body structure of the vehicle, said housing assembly supporting thereon said operation rod and said intermediate rod in parallel and being provided therein with said power cylinder, and wherein said control valve is mounted on said housing assembly and includes an input element drivingly connected with said intermediate rod to be operated in accordance with the mode of operation of said connecting mechanism and an output element drivingly connected with said operation rod to effect axial displacement of said operation rod in response to operation of said input element, said connecting mechanism comprising a carrier rotatably mounted within said housing assembly and being arranged to rotate about a first axis perpendicular to the longitudinal axis of said operation rod, drive means mounted on said housing assembly to effect rotary motion of said carrier about said first axis, a bell crank rotatably mounted on said carrier and being arranged to rotate about a second axis in parallel with the longitudinal axis of said operation rod when said carrier is retained in a neutral position, said bell crank having a first arm extending therefrom at a predetermined angle to said first axis and a second arm extending therefrom along said first axis, a first link rod having one end pivotally connected with the first arm of said bell crank and the other end operatively connected to said front wheel steering mechanism to be moved along said first axis in response to operation of said front wheel steering mechanism, and a second link rod pivotally connected with the second arm of said bell crank and connected at one end thereof with said intermediate rod.

4,781,262

VEHICLE STEERING SYSTEM

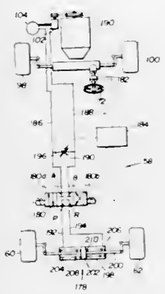
Kenji Nakamura; Yasuji Shibahata, both of Yokohama; Yukio Fukunaga, Zushi; Yasumasa Tsubota, Yokosuka; Namio Irie, and Junsuke Kuroki, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Continuation of Ser. No. 695,241, Jan. 28, 1985, abandoned. This application Dec. 10, 1986, Ser. No. 941,533

Claims priority, application Japan, Jan. 31, 1984, 59-15335

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—140 **7 Claims**



1. A steering wheel system in a motor vehicle having steerable front and rear road wheels, comprising:

a steering wheel for turning the front road wheels;

means for holding the rear road wheels fixed in a neutral position so long as the steering wheel is turned with a steering effort of a torque of no more than a predetermined value, and

means for turning the road wheels only in the direction opposite to the direction of turning of the front road wheels and only when said steering wheel is turned with a torque larger than the predetermined value.

4,781,263

STEERING FORCE CONTROLLER FOR POWER STEERING DEVICE

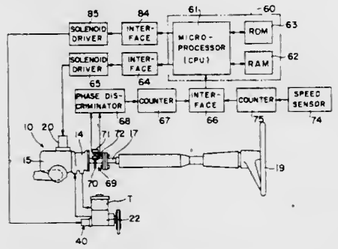
Kunihiko Eto, Toyota; Yutaka Mori, Toyokawa, and Akihiro Ohno, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 737,491, May 24, 1985, abandoned. This application Jan. 8, 1987, Ser. No. 4,314

Claims priority, application Japan, May 31, 1984, 59-112303

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—143 **8 Claims**



1. A steering force controller for a power steering device in an automobile having a servovalve actuatable by a manual torque applied to a steering wheel for supplying fluid under pressure from a pump selectively to a pair of chambers defined in a power cylinder operatively coupled to steerable wheels, said steering force controller comprising:

solenoid-operated valve means operable in response to current applied to solenoid means thereof for controlling fluid under pressure supplied to said power cylinder;

a steering angle sensor for detecting the steering angle of said steering wheel so as to output signals indicative of the detected steering angle;

signal reading means for reading said output signals from said steering angle sensor at a predetermined frequency;

calculation means for statistically calculating the variance of a plurality of said steering angle signals read by said signal reading means;

discrimination means for determining a running mode of said automobile based upon the variance calculated by said calculation means; and

control means connected to said solenoid means for controlling the current applied to said solenoid means based upon a control pattern corresponding to said running mode determined by said discrimination means.

4,781,264

MOTOR VEHICLE WITH RIDING SADDLE AND HORIZONTALLY DISPOSED CUSHIONING UNIT

Akio Matsuzaki; Mamoru Isomura; Kazutoshi Nakano, and Toshiya Katami, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1985, Ser. No. 787,265

Claims priority, application Japan, Oct. 12, 1984, 59-214708; Oct. 12, 1984, 59-214709; Oct. 12, 1984, 59-214710; Oct. 12, 1984, 59-214711; Oct. 12, 1984, 59-214712; Oct. 12, 1984, 59-214707

Int. Cl.[4] B60K *13/02, 3/14, 19/02, 25/26*

U.S. Cl. 180—219 **5 Claims**

1. A motor vehicle with a riding saddle, comprising:

a front wheel and a rear wheel;

a front wheel steering device for steering said front wheel;

a frame having an integral head pipe supporting said front wheel steering device for angular movement;

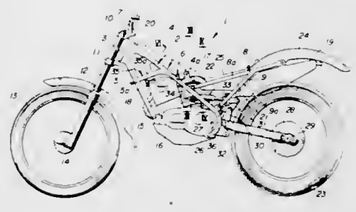
an engine fixed to said frame, said frame and said engine constituting a rigid structural body;

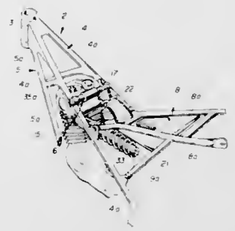
a rear fork having a front end pivotally mounted on said frame and a rear end supporting said rear wheel;

a cushioning unit having a front end pivotally coupled to said rigid structural body and a rear end coupled to said rear fork for relative angular movement, said cushioning unit extending substantially parallel to a longitudinal central axis of the motor vehicle and being displaced laterally from said longitudinal central axis, leaving a space on one side of said cushioning unit; and

accessory means disposed in said space;

said frame comprise a main tube extending downwardly and rearwardly from an upper portion of said head pipe, a down tube disposed below said main tube and extending downwardly and rearwardly from a lower portion of said head pipe, each of said main down tubes being composed of a pair of laterally spaced members, and a seat frame





extending rearwardly from an intermediate portion of said main tube;

said seat frame comprising a pair of laterally spaced members connected to said laterally spaced members, respectively, of said main tube in a V-shape when seen in side elevation; and

said accessory means including an air cleaner case disposed below said seat frame and having an upper surface slanted along said seat frame, a pre-chamber of an exhaust pipe disposed below said air cleaner case, a connecting tube extending from an upper front portion of said air cleaner case, and a carburetor disposed between said laterally spaced members of the main tube, said connecting tube being connected to said carburetor, said connecting tube and said carburetor being positioned above a junction of said laterally spaced members of the main tube and said laterally spaced members of the seat frame.

4,781,265

INTERMITTENT CHANGE-OVER CONTROL FROM TWO-WHEEL DRIVE TO FOUR-WHEEL DRIVE

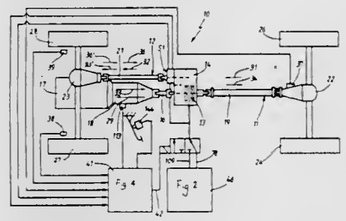
Werner Weiler, Lichtenwald, and Arno Röhringer, Ditzingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 64,079

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621225

Int. Cl.[4] B60K *23/08*

U.S. Cl. 180—233 **10 Claims**



1. Control device for the intermittent change-over of a vehicle drive from two-wheel drive vis a permanently driven vehicle axle to four-wheel drive by closing of an electrically or electrohydraulically controllable clutch in a power take-off gfear, in the closed state of hich the permanently active drive train is coupled to the connectable drive train acting on further vehicle wheels, and there being an electronic control means for a processing of electrical output signals froms peed sensors, characteristic of the circumferential speed of the wheels belonging to the respective vehicle axles, and generating control signals necessary for controlling the clutch, to change-over when the drive slip of at least one of the wheels of the permanently driven vehicle axle exceeds a predetermined threshold value, further comprising:

torque direction sensor means for generating output signals with an alternative logical signal level which are characteristics of the two possible alternative directions of the torque effective in the connectable drive train; and

driving-direction sensor means for generating output signals with an alternative logical signal level which are characteristics of the alternative forward and reverse driving directions; and

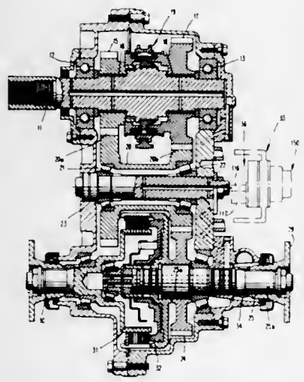
wherein said electronic control means includes (1) first means which receives further signals from said torque direction sensor means and said driving direction sensor means; (2) second means which generates a control signal for aminimum period of activation to control said clutch to assume its closed state when the slip threshold value is exceeded; (3) third means which maintains said control signal at a signal level necessary to maintain the clutch closed for an extended period of time when the output signals form the torque direction sensor indicates that the torque in the connectable drive train has a direction representing an acceleration of the vehicle in accordance with the driving direction of the vehicle as indicated by the signals from the driving-direction sesnor; and, (4) fourth means which changes said contorl signal to a signal level necessary for the release of the clutch when the output signals form the torque direction sensor indicates that the torque in the connectable drive train has a direction representing a deceleration of the vehicle in accordance with the driving direction of the vehicle as indicated by the signals from the driving-direction sensor.

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4,781,266
TWO-WHEEL/FOUR-WHEEL AUTOMATIC CHANGE-OVER DEVICE IN AUTOMOBILE TRANSFER APPARATUS

Junichi Hotta, Nagoya; Yuichi Fukuhara, Chiryu, and Kenji Takeuchi, Hoi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 30, 1987, Ser. No. 9,254
Claims priority, application Japan, Jan. 31, 1986, 61-19253
Int. Cl.[4] B60K *23/08*
U.S. Cl. 180—248 **4 Claims**

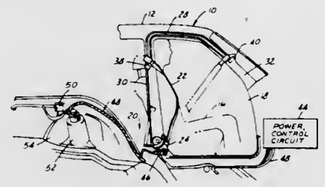


1. In a transfer device constructed such that driving forces are transmitted directly from a transmission to one of the front pair of wheels and the rear pair of wheels and are at the same time transmitted through a wet-type multiple disc clutch to another set of said two wheels, a two-wheel/four-wheel automatic change-over device in an automobile transfer apparatus of a four-wheel drive automobile, comprising:
- velocity sensing means for sensing the velocity of the automobile relative to a preset velocity;
- slope sensing means for sensing when the automobile is travelling on a slope;
- acceleration sensing means for sensing an acceleration of the automobile which is quick relative to a predetermined acceleration;
- slip sensing means for sensing a difference between the velocity of the automobile and the rotational velocity of the wheels;
- hydraulic valve means for causing a disengagement of the clutch during a two-wheel drive mode, a differential engagement of the disc clutch during a differential four-wheel drive mode of the automobile and for causing a direct engagement of the disc clutch during a direct four-wheel drive mode of the automobile;
- a change-over control unit for controlling change-over between two-wheel and four-wheel drive, said unit including;
  - speed-responsive control means for causing the hydraulic valve means to operate in the two-wheel drive mode in response to the speed sensing means sensing an automobile velocity higher than the preset velocity,
  - slip responsive control means for causing the hydraulic valve means to operate in one of the differential and direct four-wheel drive modes in response to the slip sensing means sensing a difference between the velocity of the automobile and the rotational velocity of the wheels,
  - acceleration and slope responsive control means for causing the hydraulic valve means to operate in the direct four-wheel drive mode in response to at least one of the acceleration sensing means and the slope sensing means.

4,781,267
PASSIVE RESTRAINT CONTROL SYSTEM

Keith R. Waineo, Farmington Hills; Kenneth A. Freeman, Plymouth, and Martin L. Bray, Rochester Hills, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 20, 1987, Ser. No. 123,434
Int. Cl.[4] B60D *21/00*
U.S. Cl. 180—268 **12 Claims**

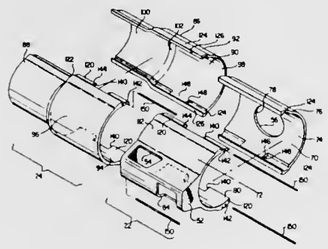


1. In an automobile passive seatbelt system of the type wherein a seatbelt retractor is mounted on the automobile body and a seatbelt extends from the retractor to an anchor mounted in a track mounted proximate a door opening of the body, the anchor being movable along the track between a position restraining an occupant of the automobile and an open position permitting ingress and egress of an occupant to and from the automobile, under the influence of an electric motor to which power is supplied by the automobile electrical system and to which the anchor is drivingly engaged, and having means for operating the motor to drive the anchor from the restraining position to the open position in response to the opening of the automobile door, an improvement comprising
- inertia responsive switch means for sensing the occurrence of a predetermined level of impact on the automobile, and
- means responsive to the switch means for preventing operation of the electric motor to effect movement of the anchor between the restraining and open positions.

4,781,268
STEERING COLUMN SHIELD

Winaford H. Richardson, Jr., 2511 Wedglea, #823, Dallas, Tex. 75211

Continuation of Ser. No. 028,217, Mar. 26, 1987, Pat. No. 4,719,986. This application Jan. 12, 1988, Ser. No. 142,924
Int. Cl.[4] B60R *25/02*
U.S. Cl. 180—287 **4 Claims**

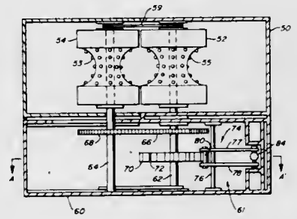


1. Apparatus for preventing the unauthorized use of a vehicle having an ignition lock and at least one control lever mounted in a steering column, comprising:
- a main column unit including first and second main column unit half shells;
- the first main column unit half shell having semi-cylindrical inner and outer surfaces extending substantially along the length thereof and walls defining an opening for the ignition lock of the vehicle;
- the second main column unit half shell having partial semi-cylindrical inner and outer surfaces and a lever pocket extending from the outer surface thereof, the lever pocket including walls defining at least one opening for the control lever of the vehicle;
- main column unit interlocking joint means disposed on side edges of the first and second main column unit half shells for fixing the main column unit about the steering column in the vicinity of the ignition lock and control lever; and
- main column unit locking means acting in cooperation with the main column unit interlocking joint means for preventing the removal of the main column unit once it is fixed about the steering column.

4,781,269
DESCENT REGULATOR AND ESCAPE SYSTEM

Richard B. Clay, 1134 Sonoma Ave., Santa Rosa, Calif. 95405

Filed Jun. 18, 1987, Ser. No. 64,172
Int. Cl.[4] A62B *1/20, 1/12*
U.S. Cl. 182—5 **6 Claims**

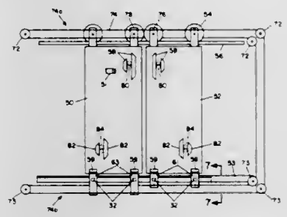


1. An apparatus for regulating the rate of descent of an object down a line, said apparatus comprising:
- attachment means for removably securing said object to said aparatus;
- drive roller means for non-slip engagement of said apparatus to said line, said drive roller having an axis, so that when said drive roller is moved along said line, said drive roller turns about said axis in rotational motion;
- linkage means connected to said drive roller axis for transmission of said drive roller rotational motion;
- escapement wheel means connected to said linkage means, said escapement wheel having a circumferential surface, and carrying a tooth means, said tooth means disposed radially outward from said circumferential surface;
- arbor means including at least a first arbor pin and a second arbor pin, said arbor pins supported by said arbor means proximate said escapement wheel surface and said tooth means;
- pivot means for enabling oscillating motion of said arbor means about an arbor pivot point;
- lever arm means connected to said pivot for transmission of said arbor means oscillating motion; and
- dampening means comprising a closed hydraulic dampening system for regulating said lever arm motion, wherein when said apparatus is attached to and is moved along said line, said escapement wheel rotates so that said tooth means contacts and displaces said arbor pins in alternate sequence to oscillate said arbor means about said pivot.

4,781,270
ELEVATOR DOOR ARRANGEMENT

Gordon A. Holland, Memphis, Tenn., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Mar. 2, 1987, Ser. No. 20,767
Int. Cl.[4] B66B *13/00*
U.S. Cl. 187—56 **12 Claims**

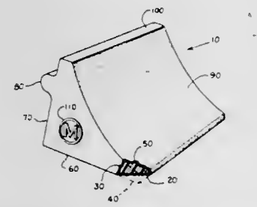


1. An elevator door arrangement having at least one door panel; door drive means for moving said panel along an axis between open and closed positions; first guide means coupled to an upper portion of said panel for guiding said panel for movement parallel to said axis; a sill, disposed below said panel, having an upper surface with an elongated slot therethrough, said slot extending parallel to said axis; a guide member coupled to a lower portion of said panel and projecting down through said slot; and second guide means disposed below said slot and engaging said guide member for movement parallel to said axis;
- wherein the means for guiding said guide member comprises a pair of opposed guide surfaces defining a guide channel disposed below said slot, said guide surfaces being spaced apart a distance wider than said slot, and wherein said guide member includes a guide element disposed below said slot and between, and in sliding engagement with, the guide surfaces.

4,781,271
WHEEL CHOCK BLOCKS

Arthur Wokeck, 204 Devon Dr., Mauldin, S.C. 29662

Filed Jul. 15, 1986, Ser. No. 885,925
Int. Cl.[4] B60J *3/00;* **G08J** *9/36*
U.S. Cl. 188—32 **1 Claim**



1. An ultra-lightweight chock block of predetermined shape for use with a vehicle wheel, comprising:
- a generally triangular-shaped solid body of expanded polystyrene having a density generally in a range of from about 1.5 pounds to about 2.0 pounds per cubic foot and with a corresponding compressive strength at 10% deflection of from about 21 lbs. per square inch up to about 44 lbs. per square inch, said body having as one said thereof a curved wheel-engaging surface of from about 42 square inches up to approximately 156 square inches in area, so that such curved surface provides up to about 7000 lbs. of compressive strength, and said body further having as a

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second side thereof a relatively planar bottom surface for resting on a surface shared by a vehicle wheel to be engaged by said curved surface;

a handle member, formed integrally with said body, and generally on an angled bracing side of said body opposite from said wheel-engaging surface thereof, for manipulation of said block; and

a hardened latex paint coating residing over the entire outer surface of said body and said handle member thereof, and at least slightly penetrating same; wherein

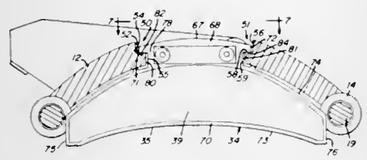
said coating provides an integral skin with respect to said body and said handle so as to distribute over the entire compressive strength of said body pressure applied to any part of said curved wheel-engaging surface thereof by a vehicle wheel to thereby maximize the effective wheel-engagement strength of said chock block, and so as to protect said expanded polystyrene body from moisture and/or petroleum-based products by providing a relatively sealed barrier therearound.

4,781,272

FRICTION PAD AND SUPPORT FOR A DISC BRAKE

David D. Sheill, Farmington Hills; Donald J. Davidson, Troy, and David J. Dettloff, Utica, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 528,330, Aug. 31, 1983, abandoned.
This application Jul. 8, 1985, Ser. No. 752,709
Int. Cl.⁴ F16D *65/02*
U.S. Cl. 188—73.1 **6 Claims**



1. A friction pad for a disc brake comprising a backing plate having a major portion defined by arcuate longitudinal edges joined by spaced lateral edges, friction material secured to one side of said major portion of said backing plate and a supporting portion of said backing plate comprising a single T-shaped tab having a head portion joined to said major portion of said backing plate by a neck portion of less circumferential length then said head portion, a surface joining said head portion to said neck portion and forming a shoulder at each end of said tab, said shoulders at each end of said tab being non-symmetrical relative to the major portion of said backing plate whereby each of said shoulders may be slidably received on only one of a pair of corresponding non-symmetrical edges of a supporting member.

4,781,273

DISC BRAKE CALIPER SUPPORT STRUCTURE

Hideyuki Fujinami, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1986, Ser. No. 938,242
Claims priority, application Japan, Dec. 5, 1985, 60-272583
Int. Cl.⁴ F16D *65/02*
U.S. Cl. 188—73.42 **3 Claims**

1. A disc brake caliper support structure for a bogie frame, comprising:

a. a support member fixed to the bogie frame and having first and second vertically spaced-apart support holes;

b. a disc brake caliper assembly having a pair of first lugs and a pair of second lugs, said first lugs being disposed on axially opposite sides of said first support hole in said support member and said second lugs being disposed on axially opposite sides of said second support hole in said support member;

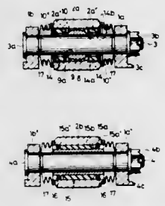
c. means for floatingly coupling said caliper assembly to said support member, said coupling means including:

a first guide pin passing through said first support hole and connecting said first lugs of said caliper assembly,

means for pivotally supporting said first guide pin in said first support hole, said first guide pin support means including a spherical bushing fixed to said support member in said first support hole and a complementary spherical member mounted on said first guide pin,

a second guide pin passing through said second support hole and connecting said second lugs of said caliper assembly, and

means for resiliently supporting said second guide pin in said second support hole, said second guide pin supporting means including (1) a cylindrical sleeve slidably mounted on said second guide pin and disposed in said second support hole, said sleeve having a length approximately equal to the thickness of said support member through



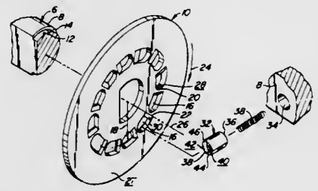
said second support hole and having a stop portion projection radially outwardly from said sleeve at each axial end thereof (2) a cylindrical rubber member disposed radially between said sleeve and said second support hole and axially between said stop portions of said sleeve, said rubber member having an inner peripheral surface in contact with said sleeve and an outer peripheral surface in contact with the inner peripheral surface of said second support hole, said outer peripheral surface of said rubber member having a sawtooth profile in axial cross-section, and (3) retaining means, mounted to said support member in said second support hole and axially spaced from said rubber member, for engaging said stop portions of said sleeve to limit axial movement of said sleeve relative to said support member and for retaining said sleeve and said rubber member in a position between said second guide pin and said inner peripheral surface of said support hole to prevent said second guide pin from contacting said support member.

4,781,274

ANTIBACKUP ASSEMBLY

Richard J. Hendrickson, Danville, Calif., assignor to f.m.e. Corporation, Hayward, Calif.

Filed Mar. 27, 1987, Ser. No. 31,479
Int. Cl.⁴ F16D *63/00, 11/04*
U.S. Cl. 188—82.1 **3 Claims**



1. An antibackup assembly for preventing the rotation of a member in a reverse direction while permitting substantially unhindered rotation in a forward direction, the forward and reverse directions being relative to a support, the assembly comprising:

the member having a plurality of openings positioned at a common distance from a center of rotation of the member, each opening having circumferentially spaced-apart ends defining an opening abutment surface and an opening exit surface, the abutment surface oriented generally perpendicular to a plane of rotation of the member;

a pin mounted within a hole in the support for movement towards and away from the disc, the pin being biased towards the disc, the pin being keyed to the hole in the support so to prevent rotary motion of the pin within the hole, while permitting axial movement of the pin within the hole;

the hole positioned so the pin is aligned with the openings as the member rotates, the pin having an outer end sized for engagement within the openings, the outer end of the pin having an abutment surface oriented generally perpendicular to the plane of rotation of the disc and shaped for complementary mating engagement with the abutment surface of the disc so to prevent attempted reverse rotary motion of the member;

the outer end of the pin having a ramped guide out surface configured to engage the opening exit surface so that rotation of the disc in the forward rotary direction causes the opening exit surface and the ramped guide out surface to engage and bias the pin away from the disc and back into the hole in the support so that forward rotary motion of the disc is substantially unimpeded and

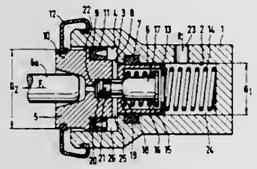
the pin including a shoulder for engagement with the member when a portion of the pin is housed within one of the openings to prevent further movement by the pin towards the member.

4,781,276

HYDRAULICALLY ACTUATED WHEEL BRAKE WITH A BUILT-IN PRESSURE CONTROL DEVICE

Volker Berisch, Hattersheim, and Karl Keiner, Schoeffengrund, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 264,893, May 18, 1981, abandoned.
This application Aug. 18, 1983, Ser. No. 524,113
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022642
Int. Cl.⁴ B60T *11/10*
U.S. Cl. 188—361 **9 Claims**



1. A hydraulically actuated wheel brake with a built-in pressure control device comprising, in combination:

a housing having a longitudinal cylindrical bore disposed longitudinally therein;

a brake piston disposed concentrically within the housing cylindrical bore and adapted to travel along the longitudinal axis of said bore to directly actuate an associated brake element, said brake piston having an outer periphery that is retained and guided by the cylindrical inner surface of said bore, said brake piston comprising interconnected spaced apart first and second concentric cylindrical sections, said second section forming a circumferential step in said brake piston which defines an annular pressure surface, said first section having a circular pressure surface, said pressure surfaces defining in combination with the inner cylindrical surfaces of said bore, a first working chamber and a second working chamber;

a pressure fluid inlet for communicating fluid under pressure with said first of said two working chambers; and

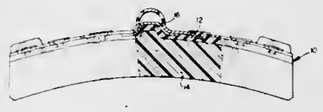
a valve operable between an initial and a second position connecting said first working chamber to said second working chamber, said valve being disposed within said piston and being actuated upon attainment of a predetermined value of inlet pressure to cause the rate of braking force produced by an inlet pressure above the predetermined value to increase at a rate lower than the rate of increase of braking force prior to said pressure fluid attaining said predetermined value.

4,781,275

COMPOSITION RAILWAY BRAKE SHOE

Alfred G. Olsen, Bloomingdale, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Apr. 30, 1984, Ser. No. 605,152
Int. Cl.⁴ F16D *69/02*
U.S. Cl. 188—251 A **4 Claims**



1. An improved composition railway brake shoe including a body of friction material including a binder having rubber and a thermosetting phenolic resin in which fillers and fibers are dispersed, a metal back plate for attaching said shoe to a railway car, and a backing strip interposed between said back plate and said body of friction material wherein the improvement comprises:

said backing strip comprising about 10–20 percent by weight of a curable rubber binder having dispersed therein a high strength and temperature resistant aramid fiber in pulp or short strand form ranging between about 0.3 to about 1.0 percent of the weight of said backing strip wherein said aramid fiber has tensile strength of 400,000 psi and temperature resistance between 420°–500° F.

4,781,277

NAPPY OR DIAPER CHANGING BAG

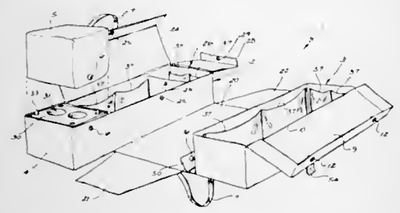
Hooi H. Lim, Post Office Box 408, Kogarah, New South Wales 2217, Australia

PCT No. PCT/AU86/00262, § 371 Date Jul. 15, 1987, § 102(e) Date Jul. 15, 1987, PCT Pub. No. WO87/02554, PCT Pub. Date May 7, 1987
PCT Filed Sep. 5, 1986, Ser. No. 86,150
Claims priority, application Australia, Oct. 25, 1985, PH03148
Int. Cl.⁴ A45C *9/00, 15/00*
U.S. Cl. 190—1 **5 Claims**

1. A nappy changing bag, comprising two spaced compartments, a flexible mat having one pair of opposed edges respectively attached to the lower portions of the two compartments,

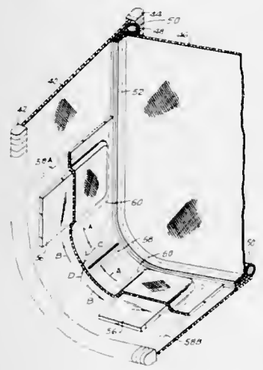
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means for holding the two compartments together with the mat folded between them and both compartments upright



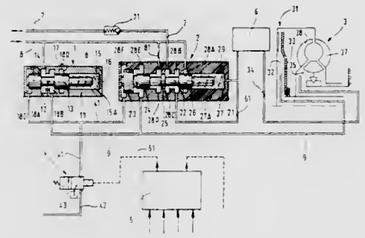
when the bag is being carried, and handles for carrying the bag.

4,781,278
SIMULATED HARD FRAME LUGGAGE
Brian D. Sadow, 21 Pondhill Rd., Chappaqua, N.Y. 10514
Filed Nov. 24, 1987, Ser. No. 124,662
Int. Cl.[4] A45C *7/00*
U.S. Cl. 190—107 **8 Claims**



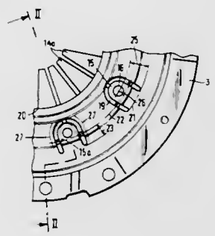
1. An article of soft luggage simulating an article of hard luggage, and comprising:
- at least one center section of soft luggage formed from a flexible and compliant material, and formable into a hollow rectangular cylinder having radiused corners;
- stiffening members arranged in spaced relationship and respectively positioned at opposite ends of each said radiused corner and extending substantially axially of said hollow cylinder;
- an interconnecting member extending axially of said center section at said radiused corner, said interconnecting member being formed from a stiff but compliant material and being conformable to said radiused corner; and,
- means securing said center section and said stiffening members and adjacent portions of said interconnecting member to each other in relative immoveable relationship solely in the vicinity of said stiffening members;
- whereby said interconnecting member is erectable to provide a stiffener for said corner, and is collapsible to permit flattening of said center section for storage.

4,781,279
CONTROL MECHANISM FOR A TORQUE CONVERTER WITH BRIDGE CLUTCH
Gierer Georg, Kressbronn, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshaften AG, Fed. Rep. of Germany
PCT No. PCT/EP85/00463, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/01870, PCT Pub. Date Mar. 27, 1986
PCT filed Sep. 13, 1985, Ser. No. 899,385
Claims priority, application European Pat. Off., Sep. 20, 1984, 84/00290
Int. Cl.[4] F16D *47/02*
U.S. Cl. 192—3.3 **3 Claims**



1. A control mechanism for a torque converter (3) with a converter direct clutch (31) and a lubrication circuit (7) for a hydrodynamic, mechanical transmission in which an operating pressure effects, via a control valve device, the charge of said torque converter (3) or engaging of said converter direct clutch (31), wherein a solenoid valve (4), actuated by an electronic unit (5), controls the operating pressure of the control valve device, characterized in that a converter pressure valve (1) and a converter clutch valve (2), each supplied with system pressure, are arranged between said solenoid valve (4) and said torque converter (3), both said valves being controlled via a common operating pressure pipe (41) coming from said solenoid valve (4) for charging said torque converter (3) and engaging said converter direct clutch (31), the switching on and off of said solenoid valve (4) occurring in a pulse-modulation process so that said operating pressure slowly builds up and slowly diminishes and said converter direct clutch (31) softly engages and disengages, said solenoid valve (4) is connected with said electronic unit (5) by a control line (51); wherein when said operating pressure pipe (41) is drained by a pressure relief pipe (43), said converter pressure valve (1) supplies the system pressure through a converter pressure pipe (9) and charges said torque converter (3) for disengaging and keeping disengaged said converter direct clutch (31), and fluid backflow from the torque converter enters into the lubrication circuit (7) of the mechanical transmission via a cooler (6) and said converter clutch valve (2), and when said operating pressure builds up in said operating pressure pipe (41) and depending thereon, said converter pressure valve (1) closes the supply of said system pressure and relieves pressure, via pressure relief channel 17, in said converter pressure pipe (9) and said torque converter (3), and said converter clutch valve (2) guides said system pressure via said cooler (6) into a working space (35) of said torque converter (3), engages said converter direct clutch (31), and produces a connection of said system pressure to said lubrication circuit (7) via a throttle.

4,781,280
FRICTION CLUTCH
Lothar Huber, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau, Bühl, Fed. Rep. of Germany
Continuation of Ser. No. 672,598, Nov. 16, 1984, abandoned. This application Jul. 24, 1987, Ser. No. 77,076
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343527; Jan. 13, 1984, 3420108
Int. Cl.[4] F16D *13/50*
U.S. Cl. 192—70.27 **41 Claims**

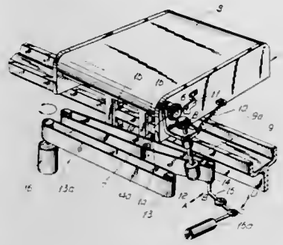


2. A friction clutch, particularly for use in motor vehicles, comprising a cover having integral cut out flexible elastic lugs including cantilever-like beams; a seat at one side of said cover; a diaphragm spring having a first side facing toward and a second side facing away form said seat, said lugs being stressed in the axial direction of said spring and said spring being tiltable relative to said seat; a pressure plate adjacent the second side of said spring and being arranged to be biased by said spring; and discrete fastener means each rigid with one of said lugs, each of said fastener means having a first portion extending substantially axially through said spring and a second portion disposed at said second side and at least indirectly bearing axially against said spring.

22. A friction clutch, particularly for use in motor vehicles, comprising a clutch cover defining an axis of rotation; a seat at one side of said cover; a diaphragm spring tiltable on said seat; and a plurality of fastener means for securing said spring to said cover, each of said fastener means including a lug which is cut out and bent out of said cover to define a cantilever-like beam portion contiguous with said cover, a second portion extending substantially axially of and through the spring, and a third portion which at least indirectly bears against said spring, said cantilver-like beam portion being elastically axially stressed so as to bias said third portion which at least indirectly bears against said spring axially toward said seat.

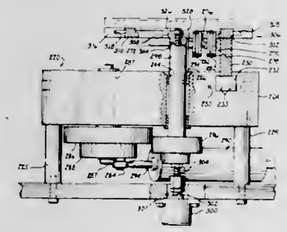
4,781,281
CONVEYOR AND DISCHARGE SYSTEM FOR SORTING ITEMS
Francesco Canziani, Via Contardo Ferrini, 21, 21010 San Macario (Varese), Italy
Filed Dec. 12, 1986, Ser. No. 940,930
Claims priority, application Italy, Dec. 20, 1985, 24227/85[U]
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—365 **8 Claims**

1. A conveyor and discharge system for a sorting system, comprising:
- a motor unit at a discharge station along a path; and
- a carriage movable along the path having a rotatable belt for conveying an item on the carriage as the carriage moves along the path and link means linking the rotatable belt to the motor unit when the carriage has moved along the path to the discharge station for revolving the rotatable belt with the motor unit, wherein:
- the motor unit comprises a motor and rotation means rotated by the motor; the carriage further comprises a roll on which the rotatable belt is mounted for revolving thereby; and the link means on the carriage comprises a rotatable shaft, gears respectively at one end of the shaft and roll rotatably engaging the shaft with the roll, a wheel on the other end of the shaft for frictionally engaging the rotation means for rotation thereby, whereby to revolve the belt,



and stop means for avoiding rotation of the shaft and, thereby, the belt when the wheel is not engaged with the rotation means.

4,781,282
AUTOMATIC CONTINUOUSLY CYCLEABLE MOLDING SYSTEM AND METHOD
Richardus H. J. Fierkens, Herwen, and Ireneus J. T. Maria Pas, Rozendaal, both of Netherlands, assignors to ASM Fico Tooling B.V., Herwen, Netherlands
Division of Ser. No. 586,855, Mar. 6, 1984, Pat. No. 4,575,328. This application Nov. 15, 1985, Ser. No. 798,568
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—414 **2 Claims**



1. A mechanism for receiving and arranging at least a pair of workpieces, comprising, in combination:
- (a) a turntable means for having a vertical rotational axis, said turntable means being configured to define first and second centrally open workpiece supporting areas on opposite sides of said vertical rotational axis thereof;
- (b) an elevating means coupled to said turntable means for reciprocally moving said turntable means between elevated and lowered positions thereof; and
- (c) a conveyor means positioned only on one of said sides of said vertical rotational axis of said turntable means in alignment with the fixed linear path of the workpieces for receiving a first one of at least a pair of said workpieces wherein said workpieces are serially moved along a linear path, said workpieces being received when said turntable means is in said lowered position, said workpieces being arranged in a side by side relationship by said mechanism, said conveyor means being disposed within said workpiece supporting area on said one of said side of said vertical rotational axis of said turntable means for moving said first one of said workpieces to a position above said first workpiece support area when said turntable means is lowered and in the first rotational position thereof so that

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when said turntable means is moved to the elevated position thereof by operation of said elevating means, said turntable means will lift said first workpiece off of said conveyor means and said first workpiece will become supported in said first workpiece support area of said turntable means.

4,781,283

ACCUMULATION CONVEYORS

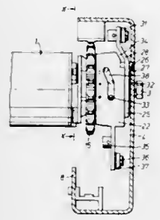
David P. Bentley, Gainsborough, and Victor E. Dolling, Laughterton, both of England, assignors to Dexion-Comino International Limited, Hempstead, England

Continuation of Ser. No. 711,937, Mar. 15, 1985, abandoned. This application Feb. 10, 1987, Ser. No. 13,156

Claims priority, application United Kingdom, Mar. 16, 1984, 8406923

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—460 **3 Claims**



1. An accumulation conveyor comprising:
a plurality of zones of load carrying rollers;
a common drive means which can be selectively applied to all of the load carrying rollers in each of said zones;
each of said zones including a single load sensor roller that is unique to said zone;
each of said load carrying rollers including a clutch which is unique to that load carrying roller for selectively applying drive from said drive means to said load carrying roller, each said clutch including a clutch actuating lever which is unique to said clutch, a priming lever which is unique to said clutch and which primes said clutch for operation, a first linkage which mechanically connects all of the priming levers in a given zone to the actuating levers of the clutches for the load carrying rollers in the next adjacent downstream zone, and a second linkage which mechanically connects all of the actuating levers in said given zone to the load sensor roller that is associated with the given zone in which said load carrying rollers are located;
the priming and actuating levers associated with each of said clutches being so arranged relative to one another and relative to said clutch that movement of both the priming lever and the actuating lever associated with said clutch is required to effect disengagement of said clutch to remove said drive from the load carrying roller associated with said clutch, each of said clutches having means for rendering movement of its associated clutch actuating lever ineffective unless the priming lever associated with said clutch has been moved into a predetermined priming position relative to the actuating lever associated with said clutch;
said drive means, clutches, actuating levers, priming levers, load sensor rollers and linkages in each of said zones and in adjacent ones of said zones cooperating with one another to cause all of the load carrying rollers in a particular one of said zones to be simultaneously positively driven by said drive means to transport a load through said particular zone or, alternatively, when the sensor roller in a zone downstream of said particular zone detects that said downstream zone is occupied by a load, to cause all of the load carrying rollers in said particular zone to be simultaneously disengaged from said drive means by the load itself in said particular zone acting upon the load sensor roller in said particular zone.

4,781,284

CLEANING OF A DRUM

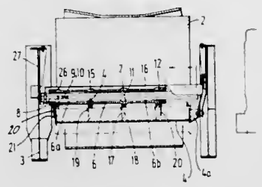
Horst Birkheuer; Rudolf Fauerbach, both of Hilden, and Dieter Hinrichsen, Duesseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 863,951

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517782

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—497 **8 Claims**



1. In a device for transporting pourable goods and including a conveyor belt looped around a drum establishing accordingly an upper and a lower stringer, a cleaning device for the drum comprising:
at least one stripper disposed between upper and lower stringer of the belt and abutting the rotating drum;
a pivotable trough for receiving stripped off dirt and arranged underneath said stripper or strippers;
a plurality of dirt pushing plates reachign into said trough, said trough being provided for downward pivoting while said dirt pushing plates remain in position; and
stripping means for engagement of the dirt pushing plates to strip dirt off said plates as the trough pivots down.

4,781,285

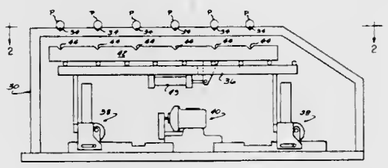
SOFT TOUCH DRIVE FOR ARTICLE HANDLING APPARATUS

Howard Schlatter, Rochester Hills, and Lawrence A. Wisne, Farmington Hills, both of Mich., assignors to Progressive Tool & Industries Company, Southfield, Mich.

Filed Sep. 21, 1987, Ser. No. 98,866

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—774 **15 Claims**



1. In an article handling apparatus including article transfer means mounted for movement along a first fixed path between a rest position at one end of said first fixed path and an extended position at the opposite end of said first fixed path, article support means for supporting an article at an intermediate position on said first fixed path, and drive means for driving said transfer means in a working stroke from said rest position to said extended position and to subsequently drive said transfer means in a return stroke back to said rest position, said transfer means being operable during said working stroke to engage an article at said intermediate position and carry the engaged article from said intermediate position to said opposite and of said first fixed path;
the improvement wherein said drive means comprises a rotary member mounted for rotation about a fixed axis, reversible motor means operable to drive said rotary member in rotation about said fixed axis in discrete single revolution cycles of 360° at a substantially constant rotary speed with the direction of rotation of said rotary member during each cycle being reversed from its direction of rotation during the preceding cycle, and motion transmitting means coupling said rotary member to said transfer means to drive said transfer member in a working stroke upon rotation of said rotary member through a first single revolution cycle and to drive said transfer member in a return stroke upon rotation of said rotary member through the next following single revolution cycle, said motion transmitting means including means for reducing the speed of movement of said transfer means momentarily to zero when said transfer means arrives at said intermediate position.

4,781,286

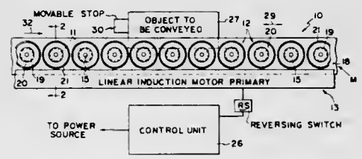
POWER AND FREE ROLLER CONVEYOR

Richard A. Weaver, Linden, Mich., assignor to Automated Manufacturing Systems, Inc., Fenton, Mich.

Filed Nov. 12, 1986, Ser. No. 929,615

Int. Cl.[4] B65G *13/06*

U.S. Cl. 198—789 **17 Claims**



1. A power and free roller conveyor comprising a linear induction motor having one primary and a secondary constituted by a plurality of freely rotatable rollers together forming a length of conveyor path; means mounting each of said rollers in spaced relation longitudinally of said path and for rotation about its own axis and closely adjacent but spaced from said primary by an air gap; and means for cyclically propagating magnetic flux in one direction along said primary longitudinally of said path, said air gap providing clearance between said primary and each of said plurality of rollers and being sufficiently small that the propagation of said magnetic flux results in an interaction of flux and current between said primary and said plurality of rollers sufficient to effect concurrent rotation in one direction of said plurality of rollers.

4,781,287

BOBBIN CONVEYING DEVICE

Kenji Fukushima, Kusatsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

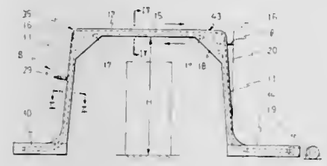
Filed Sep. 8, 1986, Ser. No. 905,252

Claims priority, application Japan, Sep. 9, 1985, 60-200115

Int. Cl.[4] B65G *29/00*

U.S. Cl. 198—803.01 **7 Claims**

1. A bobbin conveying device for conveying a bobbin on a transporting medium having a peg between a spinning preparation station and a winder, said device comprising:
an endless conveyor belt, said endless conveyor belt having a first substantially vertical conveying section, a substantially horizontal conveying section, and a second substantially vertical conveying section;
the conveyor belt being disposed between frames,
lower guide plates for supporting the conveyor belt which are fixed to the inner surfaces of the frames with a first gap at a central part thereof;
upper guide plates which are fixed to the inner surfaces of



the frames at a distance from the lower guide plates with a second gap for a passage of the peg of the transporting medium, and
a drive motor for the endless conveyor belt.

4,781,288

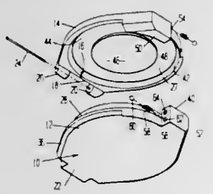
HERMETICALLY SEALED FLAT CASE

George S. Wing, 531 Esplanade, Apt. 515, Redondo Beach, Calif. 90277

Filed Oct. 13, 1987, Ser. No. 107,684

Int. Cl.[4] A45D *33/00*

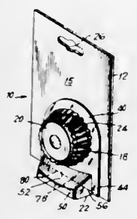
U.S. Cl. 206—37 **4 Claims**



1. A sealed case for flat objects which comprises:
a. a flat bottom having an upright circular wall with an inclined top edge, and a peripheral flat ledge with an annular groove extending about the exterior of said wall, above said ledge;
b. a flat cover having a recessed central well with an inside diameter to closely conform about said upright circular wall when said cover is closed on said bottom, said recess being surrounded by a peripheral edge with an inside wall inclined at an angle from 10 to 45 degrees;
c. hinge means comprising first and second hinge blocks on one end of said bottom and cover, respectively, with aligned through apertures and receiving a hinge pin for hinged interconnection of said bottom and cover at said one end thereof;
d. closure means comprising first and second closure abutments opposing each other on each of said bottom and cover at their ends opposite said one end, a plurality of ball detents and cooperating receptacles for said ball detents located in stacked array on said closure means; and
e. resilient seal means carried in said annular groove for compressive contact with the inclined inner wall of the recessed central well of said cover.

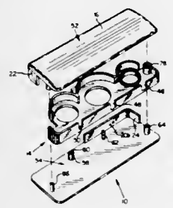
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4,781,289
SELF-SUPPORTING DISPLAY PACKAGE
William H. Perkins, Oxford, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Continuation of Ser. No. 31,621, Mar. 30, 1987, abandoned. This application Apr. 29, 1988, Ser. No. 188,754
Int. Cl.[4] B65D 5/52, 25/24
U.S. Cl. 206—45.24 12 Claims



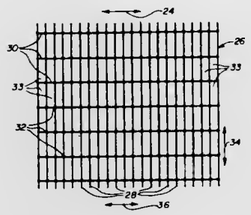
1. A self-supporting display package adapted to stand alone on a horizontal surface, said package comprising:
a cup-shaped product enclosure having an opening, the body of said enclosure extending in one generally horizontal direction therefrom;
means for covering the opening of said cup-shaped product enclosure to retain a product therein;
a hollow support structure integrally formed with said product enclosure, said hollow support structure having an open bottom within a three-sided, horizontal bottom edge, all three sides of said bottom edge being adapted to rest on said horizontal surface to support said package.

4,781,290
COIN HOLDING DEVICE
Norman D. Oliphant, 16820 SW. Allen Rd., Lake Oswego, Oreg. 97034
Filed Sep. 26, 1986, Ser. No. 912,389
Int. Cl.[4] A45C 11/28
U.S. Cl. 206—0.83 2 Claims



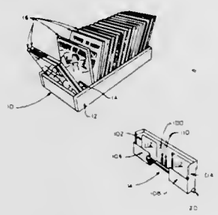
1. A coin holding apparatus comprising:
a casing including two identical halves secured together by a plurality of connecting posts for forming a body having a chamber and an opening to said chamber;
a coin tray including a set of coin holding depressions which is adapted to fit in and slide into and out of said body through said opening; and
a pivot means connected to said body and said coin tray for allowing said tray to pivot into and out of said body.

4,781,291
NETTING FOR WRAPPING ROUND BALES
Robert M. VanGinhoven, Lancaster, Pa., assignor to New Holland Inc., New Holland, Pa.
Filed Aug. 24, 1987, Ser. No. 88,456
Int. Cl.[4] B65D 71/00
US. Cl. 206—83.5 7 Claims



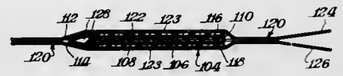
1. In combustion with a cylindrically shaped round bale of crop material, netting for wrapping the outer surface of said round bale in a circumferential direction, said netting comprising a plurality of longitudinal strands extending circumferentially of said round bale and a plurality of transverse strands extending longitudinaly of said round bale, said netting having sufficient elasticity in said circumferential direction to thereby prevent said netting from shrinking longitudinally of said round bale when the outer surface of said round bale is wrapped with said netting.

4,781,292
STORAGE RACK FOR COMPACT DISCS, CASSETTES AND THE LIKE
James E. Sacherman, 1550 California Ave., Palo Alto, Calif. 94306, and John W. Toor, 425 Alma St., #311, Palo Alto, Calif. 94301
Continuation-in-part of Ser. No. 848,452, Apr. 4, 1986, abandoned. This application Feb. 3, 1987, Ser. No. 10,217
Int. Cl.[4] B65D 85/57
U.S. Cl. 206—309 6 Claims



1. A storage and display apparatus for storing compact discs or the like comprising
a housing having a plurality of spaced holes therein,
a plurality of pivotable members pivotably positioned within the housing by means of pins capable of being received by the spaced holes in the housing,
each pivotable member having a rear wall, a displaceable means opposite the rear wall for fixedly positioning a compact disc or the like between the rear wall and the displaceable means, and a base plate extending between the bottom of the rear wall and the bottom of the displaceable means having a slot therein for adjusting the range of displacement of the displaceable means.

4,781,293
ONE STEP DRESSING DELIVERY SYSTEM
Owen L. Johns, Madeira Beach, Fla., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.
Filed Dec. 23, 1987, Ser. No. 137,218
Int. Cl.[4] A61F 15/00; B65D 85/67
U.S. Cl. 206—441 20 Claims



1. A dressing delivery system, which comprises:
(a) a thin, flexible dressing comprising a backing layer at least partially coated on one side with adhesive and having a pair of ends and a transverse fold such that at least a portion of the uncoated side of the backing layer is adjacent itself;
(b) a protective package enclosing the dressing comprising a pair of layers releasably sealed to each other outside the periphery of the dressing;
(c) a release layer between the adhesive coating of the folded backing layer and the package fixedly attached to the package and split along a line adjacent the fold, the release layer having a substantially greater stiffness and resistance to wrinkling than the dressing;
(d) opening means on the package adjacent the fold; and
(e) dressing release-retarding means at each end of the dressing, whereby opening of the package and placement of the dressing on a body portion can be accomplished in a single operation.

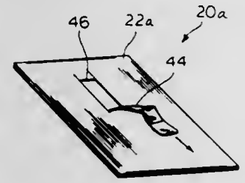
13. A method of preparing a dressing delivery system, which comprises:
(a) providing a dressing comprising a thin, flexible backing layer at least partially coated on one side with adhesive and having a pair of ends with a protective release layer on the adhesive-coated side of the backing layer, the release layer having a substantially greater stiffness and resistance to wrinkling than the dressing;
(b) folding the protected dressing such that at least a portion of the uncoated side of the backing layer is adjacent itself;
(c) cutting the release layer along a line adjacent the fold in the protected dressing to divide the release layer into two portions;
(d) fixedly attaching each portion of the free side of the release layer to a package layer larger than the folded dressing;
(e) providing each end of the protected dressing with release-retarding means;
(f) releasably sealing the package layers together outside the periphery of the folded dressing; and
(g) providing the sealed package layers with opening means at a side adjacent the fold.

4,781,294
TEAR ORIENTED PACKAGE
Carlo P. Croce, Leonia, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.
Division of Ser. No. 916,687, Oct. 8, 1986, Pat. No. 4,762,230. This application Dec. 18, 1987, Ser. No. 136,252
Int. Cl.[4] B65D 85/56, 75/62, 75/68
U.S. Cl. 206—469 12 Claims

1. A tear oriented package for items comprising:
a first wall member of foamed polypropylene material having a tear orientation and a die-cut thereon to facilitate the tearing of said first wall member in a predetermined direction; and
a second wall member sealed to said first wall member at their peripheral edges to form a sealed chamber therebetween for holding said items therein.

6. A package for holding items which comprises:
a first wall member;
a second wall member of foamed polypropylene material having a tear orientation and sealed to said first wall member at their respectively aligned peripheral edges to form a sealed chamber for holding said items therein, said second wall member being formed with a die-cut separable from said second wall member for tearing said second wall member in the direction of said tear orientation to open said package.

12. A tear oriented package for items comprising:
a first wall member of foamed polypropylene material having a tear orientation to facilitate the tearing of said first wall member in a predetermined direction;



a second wall member sealed to said first wall member at their peripheral edges to form a sealed chamber therebetween for holding said items therein, said second wall member being formed of a tear resistant polyester film lamination and a tear string insert between the members during formation of the package and access means formed in the package for exposure of a portion of the string whereby grasping of the exposed portion of the string and pulling thereof will tear the foamed polypropylene member thereby opening the package.

4,781,295
CONTAINER MADE FROM POLYSTYRENE FOAMS CONTAINING POLYETHYLENE
Binnur Z. Gunesin, Warren, and Viren P. Trivedi, Old Bridge, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 685,587, Dec. 24, 1984, abandoned. This application Feb. 10, 1988, Ser. No. 150,482
Int. Cl.[4] B65D 65/38
U.S. Cl. 206—524.6 5 Claims

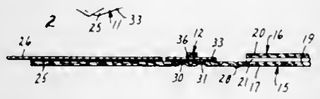
1. A method of using a generally rectangular tray of thermoplastic foamed material to package food by overwrapping the food and the tray with a plastic film on automatic packaging equipment; in which said thermoplastic foamed material comprises a foamed polymer blend of 75 to 98 weight percent polystyrene and 2 to 25 weight percent of low density polyethylene homopolymer or copolymer sufficient to reduce cracking of the tray during and after overwrapping, compared to a polystyrene tray without said low density polystyrene.

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4,781,296
METHOD AFFORDING AN EASY OPENING DEVICE FOR NONWOVEN THERMOPLASTIC FIBER ENVELOPES

Wayne K. Morris, Maplewood; Richard L. Sheehan, Jr., Grant Township, Washington County, and Donald L. Pochardt, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 26, 1987, Ser. No. 53,613
Int. Cl.[4] B65D *33/20, 3/26*
U.S. Cl. 206—610 **15 Claims**

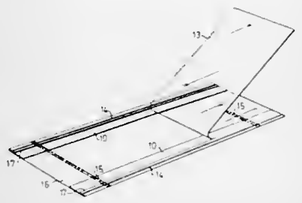


1. A method of forming an area of weakness in a web of nonwoven thermoplastic fibers comprising the step of applying sufficient energy at an ultrasonic frequency in a concentrated area of said web to change the fibers forming the web to a film.

4,781,297
READILY TEARABLE PACKAGE FOR STERILE ARTICLES

Rolf Abrahamsson, Mölndal, and Mats Berencreutz, Mölnlycke, both of Sweden, assignors to Molnlycke AB, Gothenburg, Sweden

PCT No. PCT/SE86/00277, § 371 Date Jan. 15, 1987, § 102(e) Date Jan. 15, 1987, PCT Pub. No. WO86/07334, PCT Pub. Date Dec. 18, 1986
PCT Filed Jun. 10, 1986, Ser. No. 26,366
Claims priority, application Sweden, Jun. 11, 1985, 8502888
Int. Cl.[4] B65D *75/58*
U.S. Cl. 206—610 **2 Claims**

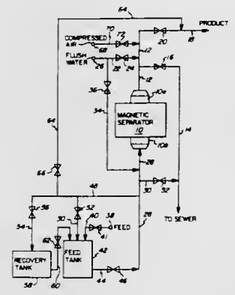


1. A package for a sterile article, comprising a paper part and a plastic part secured to said paper part along opposing longitudinal and opposing transverse lines in intersecting sealing relationship to define a package cavity adapted to accommodate said sterile article, said package having at least one end portion including a portion of said plastic part extending outwardly from one said transverse line, said plastic part comprising a linearly oriented plastic film material which can be torn in its direction of orientation, said direction of orientation being parallel to said longitudinal lines, said paper part having opposing free edge portions parallel to said longitudinal lines that are folded over toward each other and terminating within said package cavity, said longitudinal lines being disposed on said folded over free edge portions of said paper part, and tear indications on the portion of the plastic part in said outwardly extending end portion of the package parallel to and between but closely adjacent said longitudinal lines, said opposing free edge portions terminating between and spaced a substantial distance from said tear indications and said longitudinal lines.

4,781,298
PROCESS FOR BENEFICIATING CLAY AT HIGH SOLIDS

Glen A. Hemstock, Princeton, N.J., and Mitchell J. Willis, Macon, Ga., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation-in-part of Ser. No. 916,149, Oct. 7, 1986, and a continuation-in-part of Ser. No. 900,666, Aug. 27, 1986. This application Dec. 3, 1986, Ser. No. 938,205
Int. Cl.[4] B03C *1/02*
U.S. Cl. 209—3 **28 Claims**



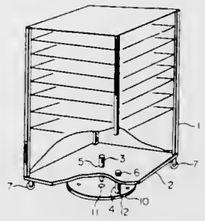
1. A method for processing impure crude kaolin clay including separating magnetically attractable impurities therefrom, which comprises: (a) blunging crude kaolin in water to form a slurry; (b) removing grit from said slurry; (c) fractionating said slurry to recover one or more fractions of fine clay having a desired particle size, at least step (c), being carried out in the presence of a clay dispersant and steps (a), (b) and (c), being carried out with a clay slurry having a solids content above 50%; (d) charging the dispersed slurry from step (c) to a high gradient wet magnetic separator being operated in a plurality of cycles, each cycle comprising;
(i) passing said slurry containing said impurities upwardly through the said separator while applying a magnetic field to the matrix;
(ii) discontinuing the passage of said slurry through said matrix and thereafter passing pressurized gas downwardly through the matrix to displace retained slurry therefrom, while continuing to apply the magnetic field to said matrix;
(iii) recovering the displaced slurry from step ii;
(iv) deenergizing the magnetic field and flushing said matrix with a flush liquid by at least initially passing the flush liquid upwardly through the matrix, to remove magnetically attractable impurities collected in the matrix;
(v) after flushing the matrix in step iv and prior to repeating the cycle, passing pressurized gas downwardly through the matrix to displace retained flush liquid therefrom, and
(e) recovering a slurry of magnetically purified clay at a clay solids level of at least 50%.

4,781,299
ROTARY SHELF

Nobuo Oyama, Chofu, Japan, assignor to Science and Technology Incorporated, Wilmington, Del.

Filed Sep. 9, 1987, Ser. No. 94,747
Claims priority, application Japan, Sep. 17, 1986, 61-219093
Int. Cl.[4] A47F *5/02*
U.S. Cl. 211—144 **4 Claims**

1. A rotary shelf comprising:
a shelf body having a lowermost shelf, caster means on said lowermost shelf for vertically supporting said lowermost shelf and permitting horizontal movement thereof;
a base under said lowermost shelf, means to form a rotary pivot connection between said lowermost shelf and said base comprising said base or said lowermost shelf having at least two stationary openings, one opening being approximately under the center of said shelf body and the other opening being spaced therefrom;

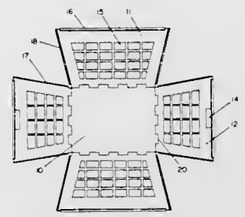


at least one shaft mounted for vertical up and down movement and projecting from the one of said lowermost shelf or said base not having said at least two openings so as to be releasably engageable in either of said two openings so that said shelf body may be rotated about either opening when a shaft is engaged in that opening.

4,781,300
FOLDING BASKET FOR LAUNDRY AND OTHER USES

Florence M. Long, 12506 W. Virginia Ave., Lakewood, Colo. 80228

Filed Apr. 16, 1987, Ser. No. 39,080
Int. Cl.[4] B65D *21/00*
U.S. Cl. 220—7 **5 Claims**



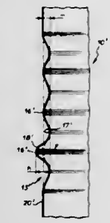
1. A collapsible laundry basket comprising a bottom portion having hinges attached to or molded with the bottom portion, two side wall members which fold under the bottom portion and two end wall members which fold on top of the bottom portion when the basket is in its collapsed position and snap locks on the vertical edges of said end and side wall members extending the entire length of said wall member edges for locking the wall members in an upright position when assembled for use.

4,781,301
PROCESS OF FABRICATION OF DRUM BODIES HAVING ROLLING HOOPS AND THE DRUM BODIES SO PRODUCED

Lucien F. Le Bret, Saint-Gratien, and Robert Saada, Maisons-Alfort, both of France, assignors to Gallay S.A., Gennevilliers, France

Filed Jul. 27, 1987, Ser. No. 77,847
Claims priority, application France, Aug. 5, 1986, 8611304
Int. Cl.[4] B65D *51/26*
U.S. Cl. 220—72 **13 Claims**

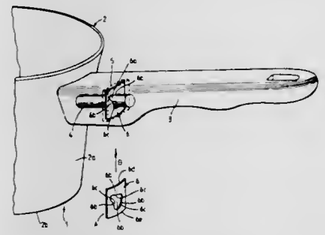
8. In a drum body having a smooth cylindrical surface for part of its height and at least two rolling hoops, the improvement comprising:
(a) at least one set of a plurality of corrugations comprising alternating peaks and troughs, the diameter of the troughs being less than that of the smooth surface and at least two peaks having a diameter equal to that of the smooth surface, the other peaks having a diameter equal to or greater than that of the smooth surface; and
(b) each rolling hoop being positioned between two immediately adjacent troughs and being defined by an expanded one of the at least two peaks, said rolling hoop protruding radially outwardly with respect to the other peaks.



4,781,302
ARTICLE WITH A HANDLE AND A METHOD OF ATTACHING A HANDLE TO AN ARTICLE

Arthur Pearson, Halesowen, England, assignor to George Salter & Co. Limited, West Bromwich, England

Continuation of Ser. No. 881,398, Jul. 2, 1986, abandoned. This application Oct. 14, 1987, Ser. No. 110,106
Claims priority, application United Kingdom, Jul. 3, 1985, 8516846; Jul. 31, 1985, 8519324
Int. Cl.[4] A47B *95/00*
U.S. Cl. 220—94 R **6 Claims**



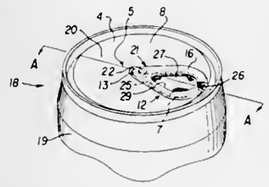
5. An article which is a cooking utensil, comprising:
a threadless metal shaft uniform in cross section and permanently fixed onto said article;
a separate elongate handle of molded material integrally formed with a longitudinal recess for receiving said shaft axially therein as well as including a slot opening therewith located generally at right angles and transversely with respect to the recess axially receiving said shaft therein and opening only in a direction toward the cooking utensil bottom, and
a single apertured retaining plate having integral projections received in a pre-stressed condition within the slot opening of said recess when said shaft is introduced as permanently fixed into the recess upon being introduced to project through said aperture retaining plate;
said retaining plate having a main plane which is flat both before and after assembly on said shaft subject to at least temporary deformation of said retaining plate during

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assembly so that said retaining plate then grips and bites into said shaft with said projections and thereby solely retains said handle on said article in an interference fit to prevent both axial and rotational movement of said handle relative to said shaft;

said retaining plate being located in said recess in an interfit relationship as well as handle cover means positioned relative to said recess to block any direct access to said recess so that said recess is closed off to make said shaft and said retaining plate generally inaccessible after assembly in order for said recess to be at least protected against any build up of any food product contamination therewith.

4,781,303
CONTAINER WITH A NON-REMOVABLE OPENING TAB APPARATUS
Robert A. Wells, 13 Fairway Dr., Kennesaw, Ga. 30144
Filed Mar. 25, 1988, Ser. No. 173,600
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—269 **40 Claims**



1. An easy-opening container comprising:

a container wall having an outer surface and an inner surface;

an openable panel at least partially defined in said wall by a selectively separable region of predetermined weakness for forming an opening in said wall;

a tab having a securement means, said securement means connecting said tab to the outer surface of said wall in substantially flat alignment with said outer surface;

said tab having a finger portion on one side of said securement means and a lift portion on the opposing side of said securement means;

said finger portion of said tab lying remote from said separable region and said openable panel;

said lift portion of said tab having a locking engagement means on at least a portion of the underside thereof for cooperative engagement with at least a portion of the periphery of the opening in said wall and with at least a portion of the inner surface of said wall upon separation of said openable panel from said wall;

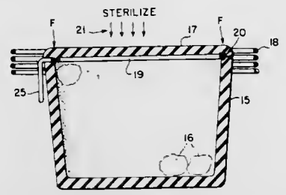
said lift portion overlying at least a portion of said wall outside of said separable region before and after said region has been separated from said wall;

said tab being operative for selective movement along at least a first and second path;

at least a portion of said separable region becoming separated from said wall when said tab moves along said first path;

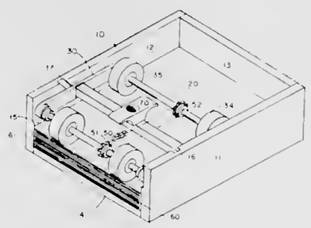
and substantially all of said separable region becoming separated when said tab moves on said second path.

4,781,304
MEANS AND METHODS OF SEALING LIDS ON CONTAINERS
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Filed Oct. 6, 1987, Ser. No. 105,025
Int. Cl.[4] B65D *17/48*
U.S. Cl. 220—280 **15 Claims**



1. A plastic container comprising in combination, a hollow body portion for receiving contents such as food being at least in part of a thermoplastic material, a mating lid portion adapted to close said body portion by contact with the thermoplastic material thereof to seal the contents inside the body being at least in part of a thermoplastic material that will mate with and fuse with the body thermoplastic material, a metallic wire body connected electrically to form a closed inductive coil circuit residing adjacent the body and lid portions in a position to heat and fuse the lid and body portions together in response to an externally applied induction field, and a pull tab formed by said wire body accessible from outside a closed container that in response to manual force will loosen a fused lid from the container.

4,781,305
SINGLE SHEET PAPER DISPENSER
Gerald O. Carberry, 113 Birch St., Schenectady, N.Y. 12303
Filed Apr. 27, 1987, Ser. No. 42,830
Int. Cl.[4] B65G *59/00*
U.S. Cl. 221—23 **3 Claims**



1. A single sheet paper dispenser comprising:

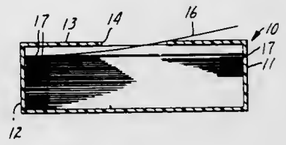
a tray adapted to hold a stack of paper, said tray having a bottom, an open dispensing side through which creaseless sheets of paper are manually withdrawn one at a time, two sidewalls each including a diagonal guide-slot formed therein, and a rear side opposite said open dispensing side;

means for retarding the forward motion of sheets in said stack so as to prevent feeding more than one sheet at a time, said retarding means including flanges fixed to the forward edge of each of the two sidewalls of said tray, said flanges each having a lip which extends into the open dispensing side of said tray;

a floating drive assembly including a first set of wheels mounted on a lead axle and a second set of wheels in tandem registry therewith mounted on a follower axle,

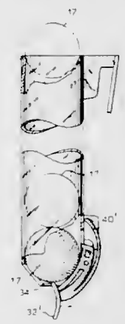
said floating drive assembly further comprising a roller chain entrained about said lead and follower axles for transferring rotary motion from said first set of wheels to said second set of wheels, said lead and follower axles being mounted on parallel carriage side rails and having a brace mounted orthogonally between said side rails, said brace being parallel to the lead and follower axles, said brace further having projections from the ends of said brace beyond said rails for slidable insertion into said diagonal slots, whereby the weight of said assembly is applied evenly to and directed toward the stack of paper by gravity as said projections slide in said diagonal guide-slots when said tray is positioned horizontally resting on said bottom or vertically resting on said rear side.

4,781,306
STACK OF SHEET MATERIAL
Daniel D. Smith, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 235,842, Feb. 19, 1981, Pat. No. 4,416,392. This application Sep. 7, 1983, Ser. No. 529,972
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.[4] B65H *1/00*
U.S. Cl. 221—33 **6 Claims**



1. A stack of flexible sheet material comprising a plurality of sheets disposed one on top of another, each sheet having a band of relatively releasable repositionable adhesive coated along one edge thereof and the sheets are stacked with the adhesive coated edge of each successive sheet disposed along alternate opposite edges to maintain the sheets in said stack.

4,781,307
COMBINATION GOLF BALL AND TEE DISPENSER
Ernest Ferro, Monsey, N.Y., assignor to Golf Cad-Eze Corporation, Central Islip, N.Y.
Continuation-in-part of Ser. No. 931,140, Nov. 17, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 88,017
Int. Cl.[4] B65G *59/00*
U.S. Cl. 221—131 **5 Claims**



1. A ball dispenser for dispensing balls, comprising in combination

a first elongated tube for stacking said balls, having a bottom opening being defined by a perimeter extending with a part thereof at right angles to the direction of elongation, and another part of said perimeter being slanted with respect to the direction of elongation,

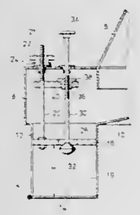
finger-operable dispenser means permitting positioning, touch and inspection of a lowermost ball, and release of said lowermost ball by the finger of one hand of the user, so as to leave the other hand free, said finger-operable dispenser means including

a holder mounted near one end of said first tube,

a two-position lever molded or stamped from a single solid member, being pivotably mounted at a pivot above said opening on said holder, and having a ball support portion normally supporting said lowermost ball, a finger-operable portion below said pivot and connected to said ball support portion, a transient ball resting portion having an inclined surface partially complementing a contour of the lowermost ball, being partially directed toward said opening and protruding with an extremity thereof into the first tube interior through a slot formed in said tube, and a resilient portion adjacent to, but separated by a gap from said transient ball resting portion,

said ball support portion normally abutting said lowermost ball, when said lever is in a rest position, but permitting release of said lowermost ball upon actuation of said fingeroperable portion so as to flex said resilient portion, said transient ball resting portion temporarily blocking release of a ball above said lowermost ball, when said lever is in an actuated position, but resuming an inoperative position when said finger-operable portion reverts to said rest position, whereby the ball previously positioned above the now released, and erstwhile lowermost ball, due to the action of gravity, becomes the new lowermost ball.

4,781,308
PRODUCT FEEDING DEVICE
Shoji Yamano, Akashi, Japan, assignor to Yamato Scale Company, Limited, Japan
Filed Sep. 12, 1986, Ser. No. 906,434
Claims priority, application Japan, Jan. 29, 1986, 61-19126
Int. Cl.[4] G01G *13/00*
U.S. Cl. 222—56 **10 Claims**



1. A product feeding device for a combination weighing machine, comprising a dispersion table for dispersing product fed to its central portion toward its peripheral portion, and a plurality of retaining hoppers disposed immediately adjacent said peripheral portion of the dispersion table for directly receiving product as it falls off the dispersion table, each retaining hopper being adapted for holding a specific volume of product and each having means for discharging said product into a weighing hopper therebelow, and each retaining hopper including means for automatically discharging a predetermined additional amount of product after said specific volume of product has been discharged from said hopper.

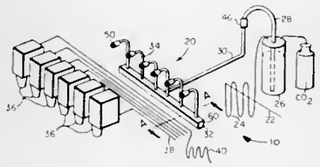
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4,781,309

DISPENSER WITH IMPROVED CARBONATED WATER MANIFOLD

James D. Vogel, Anoka, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Feb. 19, 1987, Ser. No. 16,604
Int. Cl.[4] B67D *5/56, 5/62*
U.S. Cl. 222—129.1 **11 Claims**



1. In a cold carbonated beverage dispenser having:
a carbonator with a carbonated water outlet and at least one inlet having means for being connected to sources of water and carbon dioxide, a plurality of post-mix carbonated beverage dispensing heads, each head having a syrup inlet for being connected to a respective discrete source of beverage syrup and a carbonated water inlet for being fluidly connected to the carbonator,
the improvement of:
a carbonated water distribution manifold fluidly connecting the carbonator water outlet to the carbonated water inlet of each dispensing head, said manifold comprising:
(1) a discrete tubular stainless steel outlet fitting for each dispensing head, each outlet fitting having a water outlet passageway therethrough and an outlet end fluidly connected to a respective dispensing head carbonated water inlet,
(2) a carbonated water distribution plenum fluidly in between said outlet fittings and the carbonator,
(3) a carbonated water inlet fitting having an inlet water passageway therethrough and its inlet end fluidly connected to the carbonator water outlet and its outlet end fluidly connected into the plenum;
(4) a generally planar stainless steel sheet metal outlet wall forming at least part of said plenum with an inlet end of each outlet fitting extending through the outlet wall and into the plenum and being welded from the inside of the plenum to an inner surface of the outlet wall, and
(5) a convex smoothly curved toroidal inlet nose surrounding the inlet end of each outlet fitting, each said inlet nose being in said plenum and having a minor diameter which is substantially the same as and which is co-axial with a inlet diameter of the outlet fitting water outlet passageway.

4,781,310

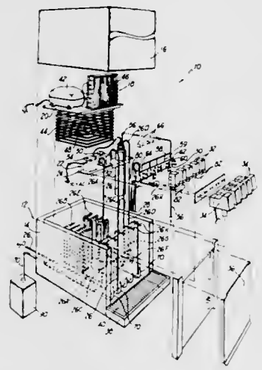
BEVERAGE DISPENSER

William S. Credle, Jr., Stone Mountian, Ga., and Alfred A. Schroeder, San Antonio, Tex., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 19, 1986, Ser. No. 944,637
Int. Cl.[4] B67D *5/56, 5/62*
U.S. Cl. 222—129.1 **7 Claims**

1. A beverage dispenser comprising:
(a) a tank with a removable bonnet mounted thereon;
(b) a refrigeration system including a refrigeration deck removably mounted on top of said tank;
(c) a carbonator system including a carbonator deck removably mounted on top of said tank and in front of said refrigeration deck, a carbonator pump and a control module mounted on top of said carbonator deck, and a carbonator tank extending down from said carbonator deck into said tank;
(d) a syrup pump mounting bracket mounted on top of said tank in front of said carbonator deck and extending vertically upwardly and adopted to mount a plurality of syrup pumps;
(e) a plurality of beverage dispensing valves mounted on the front of said dispenser;
(f) said refrigeration system including an evaporator coil depending down from said refrigeration deck into said tank;
(g) a water inlet conduit in said tank extending into said carbonator pump, then extending from said carbonator pump below said evaporator coil into an upwardly extending pre-cooling coil located inside of said evaporator coil, then extending back underneath said evaporator coil to said carbonator tank, then extending from said carbonator tank back underneath said evaporator coil to an upwardly extending cooling coil located inside of said evaporator coil, then extending back underneath said evaporator coil to a water manifold having a plurality of separate water inlet takes going to a respective one of said valves; and
(h) a plurality of separate, vertically oriented, syrup cooling coils located in said tank below said carbonator deck, each of said syrup cooling coils having an outlet end connected to a respective oneo f said valves.

7. A method for converting a beverage dispenser from use with a presureized syrup container to use with a bag-in-box syrup container, comprising the steps of:



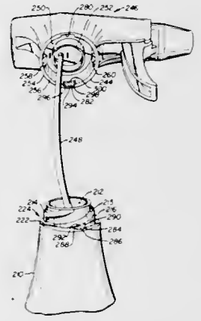
(a) providing a beverage dispenser comprising:
i. a tank with a removable bonnet mounted thereon;
ii. a refrigeration system including a refrigeration deck removably mounted on top of said tank;
iii. a carbonator system including a carbonator deck removably mounted on top of said tank and in front of said refrigeration deck, a carbonator pump and a control module mounted on top of said carbonator deck, and a carbonator tank extending down from said carbonator deck into said tank;
iv. a syrup pump mounting bracket mounted on top of said tank in front of said carbonator deck and extending vertically upwardly;
v. a plurality of beverage dispensing valves mounted on the front of said dispenser;
vi. said refrigeration system including an evaporator coil depending down from said refrigeration deck into said tank;
vii. a water inlet conduit in said tank extending into said carbonator pump, then extending from said carbonator tank below said evaporator coil into an upwardly extending pre-cooling coil located inside of said evaporator coil, then extending back underneath said evaporator coil to said carbonator tank, then extending from said carbonator tank back underneath said evaporator coil to an upwardly extending cooling coil located inside of said evaporator coil, then extending back underneath said evaporator coil to a respective one of said valves; and
viii. a plurality of separate, vertically oriented, syrup cooling coils located in said tank below said carbonator deck, each of said syrup cooling coils having an outlet end connected to a respective one of said valves;
said syrup cooling coils each having an inlet end connected to a syrup line connected to a pressurized syrup container;
(b) disconnecting said syrup line from said syrup cooling coil;
(c) connecting a plurality of syrup pumps to said bracket, each pump including a syrup inlet port and a syrup outlet port;
(d) connecting the inlet port of each syrup pump to a syrup tube from a bag-in-box; and
(e) connecting the outlet port of each syrup pump to a shock absorbing adapter tube connected in turn to an inlet end of a respective syrup cooling coil.

4,781,311

ANGULAR POSITIONED TRIGGER SPRAYER WITH SELECTIVE SNAP-SCREW CONTAINER CONNECTION

Walter B. Dunning; George E. Campbell, both of Pleasanton, and Julio Focaracci, Oakland, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 890,883, Jul. 28, 1986, abandoned, which is a continuation of Ser. No. 642,068, Aug. 17, 1984, abandoned. This application May 28, 1987, Ser. No. 55,247
Int. Cl.[4] B67B *5/00;* **B65D** *83/14*
U.S. Cl. 222—153 **10 Claims**



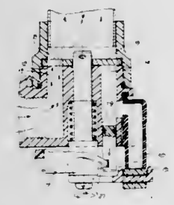
1. A container and cap closure therefor comprising:
(a) a container having a generally cylindrical neck including a bore therethrough for dispensing liquids;
(b) a cap closure for closing said bore including a closed end and an outer annular skirt depending therefrom and adapted to fit over said neck; and
(c) retaining means on said neck and skirt permitting said cap closure to be snapped on and off as well as rotated on and off said neck, said retaining means comprising:
(i) at least one thread on said neck; and
(ii) at least one retaining lug having a horizontal top surface on the interior of said skirt having a beveled area at the bottom tapering substantially to the innermost edge of said top surface adapted to ride over said thread when snapped onto said neck, said skirt and retaining lug being made of resilient material so that they may deform as they pass over said thread when said cap closure is snapped on or off said neck;
(iii) at least one retaining groove on said neck, said at least one retaining lug cooperating with said at least one retaining groove and said thread so as to axially retain said cap closure on said neck; and
(d) positioning means on said neck for positioning said cap closure with respect to said neck whereby said cap closure will be automatically positioned in the same orientation on said neck when said cap closure is fully engaged; and
(e) stabilizing means comprising at least one stabilizing recess in said cap closure, at least one mating stabilizing lug on said neck adapted to closely fit within said at least one stabilizing recess for stabilizing and orienting said cap closure with respect to said neck, said at least one stabilizing lug spaced about 90° around said neck from said at least one retaining groove so as to maximize the stabilizing effect, wherein said at least one stabilizing lug defines a generally curved radially outermost wall bounded laterally by a pair of generally vertical, lateral side walls.

4,781,312

LIQUID DISPENSER

Atis Strazdins, Unanderra, Australia, assignor to Strazdins (International) Pty. Limited, Sydney, Australia

Filed Nov. 12, 1986, Ser. No. 929,361
Claims priority, application Australia, Jul. 3, 1986, PH06728
Int. Cl.[4] B65D *85/54*
U.S. Cl. 222—309 **8 Claims**



1. A liquid dispenser comprising:
a substantially downwardly projecting nozzle having an outlet located at or adjacent one end thereof;
a first chamber communicating via said nozzle to said outlet;
a second chamber communicating with said first chamber;
sealing means for releasably sealing said first chamber from said second chamber, said sealing means comprising a rotatable plate;
suction means for producing a reduced pressure within said first chamber when said sealing means has sealed said first chamber from said second chamber, so as to draw material in said substantially downwardly projecting nozzle or suspended at said outlet back up said nozzle, said suction means comprising a plunger sealingly slidable in a cylinder; and
a spindle, the rotation of which rotates said rotatable plate, and which, after said rotatable plate is in its sealing position, causes said plunger to move down the cylinder to produce the reduced pressure within said first chamber.

4,781,313

CONTAINERS

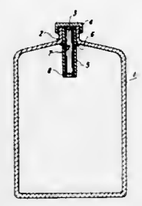
Willy Verheyen, Berchem, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 803,265, Nov. 29, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 88,322
Claims priority, application United Kingdom, Dec. 5, 1984, 8430754
Int. Cl.[4] B67D *5/60*
U.S. Cl. 222—464 **7 Claims**

1. A container for a liquid, having an opening through which liquid can be poured from the container, and comprising an outlet flow-regulating device comprising a tube extending

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from the vicinity of the opening into the interior of the container and open at both ends whereby, when liquid is poured from the container, the liquid and replacement air flow through the tube in opposite directions, the wall of the tube having therethrough a plurality of apertures arranged in two groups, one group being adjacent to the junction between the tube and the container wall and the other group being near the end of the tube remote from the container outlet opening for



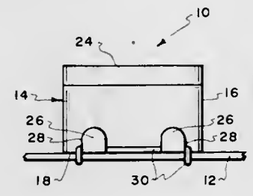
the passage of air from inside the tube to the interior of the container, wherein the total area of the apertures is from about 7% to about 20% of the total wall area of the tube, and the length of the tube within the container being from 1.2 to 5 times the major dimension of the cross section of the tube at its end remote from the outlet opening whereby said liquid is poured from the container and replacement air enters the container without substantial interruption of said poured liquid flow.

4,781,314
FLUID CONTAINER
Michael I. Schoonover, 1218 W. Atherton, Flint, Mich. 48507, and James A. McFadden, 504 Kingswood, Duband, Mich. 48429
Filed Mar. 30, 1987, Ser. No. 32,323
Int. Cl.[4] A47G *19/14*
U.S. Cl. 222—465.1 **11 Claims**



1. A container for fluids comprising, in combination:
two opposed sides, each of said sides having four edges, the edges of one of said sides corresponding to the edges of the other of said sides;
a first top extending between a first pair of corresponding edges of said two sides including a first portion defining a first opening through said first top, and a first neck;
a second top extending between a second pair of corresponding edges of said two sides including a second portion defining a second opening through said second top, and a second neck; said second pair of corresponding edges extending from ends of said first pair of corresponding edges so that said second top adjoins said first top at a first corner;
a first bottom extending between a third pair of corresponding edges of said two sides, said third pair of corresponding edges being adjacent said second pair of corresponding edges so that said first bottom adjoins said second top at a second corner;
a second bottom extending between a fourth pair of corresponding edges of the two sides, said fourth pair of corresponding edges extending from said third pair of corresponding edges and to said first pair of corresponding edges so that said second bottom adjoins said first bottom and said first top, respectively, at third and fourth corners; said two sides, two tops and two bottoms together defining a housing, each of said first and second bottoms being adapted to allow stable resting of said housing on either one of said bottoms; and
a spout and a pair of caps each securable to said first and second necks;
wherein said first and second necks are located on said first and second tops adjacent said fourth and second corners, respectively, near said second and first bottoms thereby allowing substantially complete drainage of said container when said container rests on either one of said bottoms.

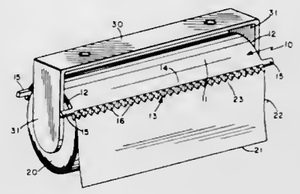
4,781,315
DETACHABLE WRISTBAND CARRIER
Erik R. Nordskog, 18653 Ventura Blvd., #300, Tarzana, Calif. 91356
Filed Sep. 12, 1986, Ser. No. 906,820
Int. Cl.[4] A44C *5/00*
U.S. Cl. 224—165 **4 Claims**



1. A portable minature container assembly adapted for releasable attachment to a closed band member, which assembly may be selectively opened for providing easy access to its contents, and which may be attached and released from the closed band member without having to open the band member, the assembly comprising:
a plastic container having at least two opposite side walls, a bottom wall, and a water-tight, integrally formed, hinged lid that, in its open position, permits access to the interior of said container;
at least one pair of separate finger members, each finger member of said pair being integrally formed on an opposite side wall of said container adjacent said bottom wall and protruding outward therefrom, each of said finger members being aligned with one another; and
said finger members having extending hooked portions, free ends of the hooked portions receive and releasably retain an elongated flexible member between said finger members and said side wall of said container, said elongated flexible member encircling a portion of the band member and releasably engaging said pair of finger members to retain said bottom wall of said container against said closed band member.

4,781,316
PAPER TOWEL CUTTER
John C. Freeberg, P.O. Box 1131, Rancho Sante Fe, Calif. 92140
Filed Oct. 1, 1986, Ser. No. 913,956
Int. Cl.[4] A47K *10/36;* B26D *1/02*
U.S. Cl. 225—71 **5 Claims**

1. A detachedly engaged paper cutting apparatus in combination with a paper roll holder for cutting paper and the like having substantial variation in thickness to any desired length comprising:
an elongated, arcuate-shaped plate disposed between said holder and a roll of paper, said plate having a longitudinal axis substantially identical to that of the paper roll and said plate comprising,



a notch positioned at opposite ends of the plate to receive sides of the paper roll holder, said notch defining a projection at each corner of said plate to loosely engage the apparatus between the paper roll and sides of the holder, said projections being coplanar with each other; and
an integrally-formed cutting edge at the front edge of the plate extending substantially along its entire length.

4,781,317
PHASING CONTROL SYSTEM FOR WEB HAVING VARIABLE REPEAT LENGTH PORTIONS
James W. Ditto, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.
Continuation-in-part of Ser. No. 902,192, Aug. 29, 1986. This application Oct. 27, 1986, Ser. No. 923,675
Int. Cl.[4] B65H *23/04;* B26D *5/34*
U.S. Cl. 226—27 **9 Claims**



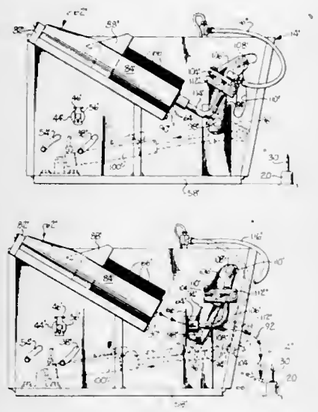
4. Apparatus for controlling the phasing of repeat length portions of a moving web to an operating machine at an operating station along the web wherein the operating machine has a repeating operating cycle and is designed to perform the same operation on each repeat length portion of the web pasing through the operating station and wherein the web is of the type which is subject to minor variations in the length of the repeat length portions thereof, comprising:
(a) register indicia means associated with each repeat length portion of the web positioned at a substantially identical location within each repeat length portion of the web for sensing by a register indicia sensing means for indicating the relative position of an associated repeat length portion;
(b) register indicia sensing means positioned at a sensing station along the web at a preselected distance of web travel upstream of the operating station for sensing the passage of said register indicia at said sensing station and for providing a register indicia sensing signal indicative of the occurrence of said machine reference position;
(c) web travel monitoring means operatively associated with the web for providing a web travel signal indicative of web travel distance;
(d) machine reference position sensing means for sensing the occurrence of a cyclically repeating preselected reference position of said operating machine, said reference position being selected to occur in a predetemined relationship with the occurrence of the coincidence of a web reference indicia and a preselected reference point in said machine operating station when the associated web repeat length portion is in phase with said operating machine, and for providing a machine position reference signal indicative thereof;
(e) operating machine movement sensing means for providing a machine movement signal indicative of the relative cyclical machine movement of said operating machine;
(f) data processing means for receiving and processing said web register indicia sensing signal, said web travel signal, said machine reference position signal, and said machine movement signal and for generating a control signal for controlling the relative rate of movement between said web and said operating machine based on said processing of signals for placing each repeat length portion of the web in proper registry with said operating machine
wherein said data processing means comprises;
web repeat length calculating means for calculating the length of each repeat length portion of the web prior to its passage through the operating station;
repeat length error determining means for comparing said calculated length of each repeat length portion to a predetermined, constant, design repeat length value for determining the relative repeat length error occurring in each repeat length portion;
register indicia reference signal generating means for generating a signal indicative of the passage of a register indicia past said preselected reference point in said operating station which is located at a predetermined distance of web travel downstream of said indicia sensing means;
phasing error determining means for comparing said register indicia reference signal to said machine position reference signal for measuring the phasing error between a web repeat length portion and the operating machine during each operating machine cycle;
error summing means for summing a determined phasing error associated with the repeat length portion located at the operating station with a determined repeat length error associated with the repeat length portion located at the operating station for determining an initial total error value for the repeat length portion immediately upstream of the operation station which is representative of the distance by which said immediately upstream repeat length portion is out of phase with said operating machine at a point in time when it is positioned approximately one repeat length upstream of said operating station;
wherein the control signal generated by said data processing means is based upon said determined total error value associated with the repeat length portion immediately upstream of the operating station.

4,781,318
TAGGING APPARATUS
Ronald L. Meyers, Rte. 2, Box 336, Sophia, N.C. 27350
Filed Apr. 17, 1987, Ser. No. 40,193
Int. Cl.[4] B65C *7/00;* B31F *7/00*
U.S. Cl. 227—67 **20 Claims**

1. In a tagging apparatus for securing tags by filamentary fasteners to an article, said apparatus including a tag supply hopper, a fastener dispensing device having a hollow needle-like member upon which tags are adapted to be impaled and through which fasteners are dispensed, and a suction-head member adapted to grasp a tag at said hopper and to impale said tag upon said needle-like member, the improvement comprising:
mounting means mounting said suction-head member for movement along a sinuous path of travel having an initial

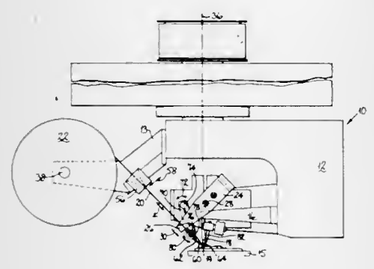
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arcuate section extending downwardly and forwardly from said hopper means and a terminal approximately



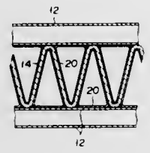
linear section extending generally parallel to said needle-like member.

4,781,319
BONDING HEAD
Werner Deubzer, and Farhad Farassat, both of Les Brenets, Switzerland, assignors to Dynapert Delvotec S.A., Switzerland
Filed May 30, 1986, Ser. No. 869,091
Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519594; United Kingdom, May 16, 1986, 8612001
Int. Cl.[4] B23K *37/00*
U.S. Cl. 228—4.5 **13 Claims**



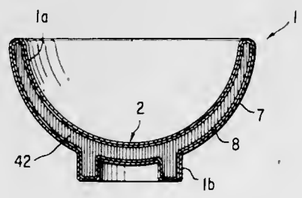
1. A bonding head, especially for ultrasonic bonding a wire (20) to a contact surface of an electronic or electrical component comprising a head support means, an ultrasonic transducer (16) secured to said head support means, a bonding tool (18) having a bonding tip and connected to said ultrasonic transducer (16), a wire supply support means for supporting a wire supply (22) from which wire (20) is unwound and a wire tail is located aligned with said bonding tool for completion of a bonding operation, said wire supply support means being mounted to a side of the head support means (12) opposite from the transducer (16), a wire guide means including a guide having an inlet end through which wire (20) passes and an outlet end adjacent said bonding tip (19) of said bonding tool, a guide mounting means including said head support means (12), a depending straight arm (70) extending vertically downwardly from said head support means, a pivot member (78) pivotally mounting said guide to the lower end of said arm (70) with a first adjustment axis for right angular movement about an axis at a right angle to movement of the wire through said guide, and a pivot support member (74) connecting said arm (70) to said head support means, said pivot support member supporting the upper end of said arm, having an axis for angular movement about a second adjustment axis at the upper end of said arm parallel with said first adjustment axis and being located in upwardly spaced relationship to said pivot member (78) whereby the angle of the guide (60) can be adjusted to a fixed operating position while maintaining said outlet end (64) in position adjacent the bonding tip (19).

4,781,320
METHOD FOR THE PRODUCTION OF A HEAT EXCHANGER
Tatsuya Fujiyoshi, Matsudo, Japan, assignor to Nihon Radiator Co., Ltd., Tokyo, Japan
Filed Apr. 27, 1987, Ser. No. 43,207
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—183 **7 Claims**



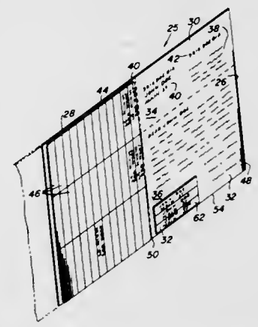
1. A method for the production of a heat exchanger having a core part thereof formed by joining a tube of aluminum material and heat-transfer fins of aluminum material with a brazing material, which method is characterized by effecting said brazing by the use of a flux obtained by suspending a potassium fluoroaluminate complex in an aqueous solution of a pigment-forming water-soluble compound, wherein said pigment-forming water-soluble compound is a mixture of nickel sulfate with potassium molybdate.

4,781,321
CONTAINER AND METHOD FOR PRODUCING SAME
Susumuu Koyata, 29,, Daisboji Sugo-machi Kaga-shi Ishikawken, and Hiroyoshi Uchimoto, 6-15, Iesa-machi 3-chome,, Kanazawa shi, Ishikawa-ken, both of Japan
Filed Aug. 18, 1987, Ser. No. 86,512
Claims priority, application Japan, Oct. 28, 1986, 61-257558; Mar. 7, 1987, 62-52576
Int. Cl.[4] B65D *3/00*
U.S. Cl. 229—1.5 B **2 Claims**



1. A container comprising:
(a) a base structure composed of coiled paper layers bonded to each other by an adhesive;
(b) an adhesive layer formed on the surface of said base structure;
(c) a moisture-proof coating layer laminated on the outer side of said adhesive layer, said moistureproof coating layer being composed of a paint, Japanese lacquer, or a ceramic material; and
(d) a cloth or a metal foil interposed between said coiled paper layers.

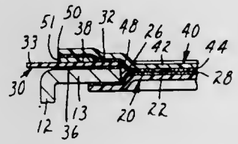
4,781,322
KIT FOR DIRECT MAIL SOLICITATION
Lawrence F. Humm, Philadelphia, Pa., assignor to Famous Artist Studios, Inc., Norristown, Pa.
Filed Sep. 11, 1987, Ser. No. 96,417
Int. Cl.[4] B65D *27/06*
U.S. Cl. 229—73 **12 Claims**



1. A kit for direct mail solicitation comprises:
(a) a first envelope having a window;
(b) a second envelope having a window, said second envelope being sized for insertion into said first envelope; and
(c) an insert being sized for insertion into said first envelope and having a first portion and a second portion which are integral,
(i) said first portion having first and second sections, said sections being detachable from one another, said first section being sized for insertion into said second envelope after detachment from said second section, said first section comprising a non-releasable label means having a first identification means and a second identification means thereon, said first identification means being located on said non-releasable label means of said first section such that when said first section is inserted into said second envelope, said first identification means is in registry with said window of said second envelope,
(ii) said second portion comprising a releasable label means having said second identification means thereon, said second identification means being located on said releasable label means such that when said insert is inserted into said first envelope said second identification means of said releasable label means is in registry with said window of the first envelope.

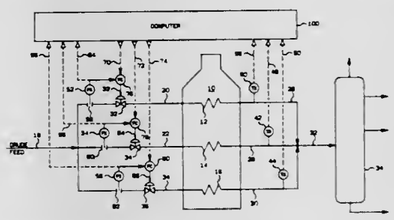
4,781,323
RECLOSABLE CLOSURE ASSEMBLY FOR CONTAINER
Terri A. Elias, and Stephen G. Szegda, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 769,698, Aug. 27, 1985. This application Jul. 7, 1986, Ser. No. 882,377
Int. Cl.[4] B65D *5/70*
U.S. Cl. 229—123.3 **13 Claims**

1. A reclosable closure assembly for a container, which container comprises at least one panel having an interior wall portion, an exterior wall portion, and an opening in said panel, said closure assembly comprising:
(a) an exterior tape having a backing and a pressure-sensitive adhesive layer, said exterior tape covering said opening, with said pressure-sensitive adhesive layer of said exterior tape attached to said exterior wall portion of said panel completely around said opening;
(b) a protective tape comprising a barrier layer and an adhesive layer firmly bonded to said barrier layer, said protective tape being firmly bonded by the adhesive layer of said protective tape to said interior wall portion of said panel and completely around said opening, said protective tape further being firmly bonded to said exterior tape in the area of said opening by means of said pressure-sensitive adhesive layer of said exterior tape and said adhesive layer of said protective tape, and



(c) a target tape including a backing, a layer of release coating material on one major surface of said backing, and an adhesive layer on the other major surface of said backing, said target tape having an opening coincident with said opening in said panel and being disposed between said exterior tape and said exterior wall portion of said panel with said layer of release coating material adjacent said exterior tape so that said exterior tape is releasably adhered to said target tape and may be easily removed and resealed to said exterior wall portion of said panel, said backing of said target tape being of a length so as to extend beyond the panel to which said target tape is attached.

4,781,324
PREHEAT TEMPERATURE BALANCING CONTROL
Bruce A. Jensen, Bartlesville, Okla., assignor to Applied Automation, Inc., Bartlesville, Okla.
Filed Oct. 29, 1987, Ser. No. 115,075
Int. Cl.[4] F23N *1/00*; **B60H** *1/00*
U.S. Cl. 236—15 BF **16 Claims**



1. Apparatus comprising:
a heating system having at least a first and a second heating coil extending in parallel relationship through said heating system;
means for supplying a first fluid stream to said heating system;
means for splitting said first stream into at least a second and a third stream, and for passing said second stream through said first heating coil to heat said second stream and for passing said third stream through said second heating coil to heat said third stream;
a first and a second flow control means for respectively controlling the flow rate of said second stream and said third stream, wherein a first automatic/manual selector switch is associated with said first flow control means and a second automatic/manual selector switch is associated

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with said second flow control means, and wherein the automatic position is selected for at least said first flow control means;

means for establishing first and second signals which are on-off type status signals respectively representative of the position of said first and second automatic/manual switches, and wherein a first status indicates automatic control in response to a computed set point and a second status indicates manual control in response to a manually entered set point;

means for establishing a third signal representative of the desired total flow rate of said at least second and third streams;

means for establishing a fourth signal representative of the actual flow rate of said second stream;

means for establishing a fifth signal representative of the actual flow rate of said third stream;

means for combining at least said second, and fifth signals to establish a sixth signal representative of the total flow rate controlled by at least said second controller if at least said second signal indicates said second status, so that said sixth signal indicates the total flow through said heating system that is manually controlled;

means, responsive to said first status of at least said first and second signals, for establishing a seventh signal which is equal to the number of streamns that are automatically controlled;

means, responsive to said third, sixth and seventh signals, for establishing an eighth signal which is representative of an adjusted flow rate for the number of streams represented by said seventh signal, required to maintain the actual total flow rate of said at least second and third fluid streams substantially equal to the desired total flow represented by said third signal;

means for establishing a ninth signal representative of the actual fluid temperature at the outlet of said first heating coil;

means for establishing a tenth signal representative of the actual fluid temperature at the outlet of said second heating coil;

means, responsive to said fourth, fifth, seventh, ninth and tenth signals, for establishing an eleventh signal representative of a weighted average outlet temperature for the number of streams represented by said seventh signal, so that said weighted average outlet temperature is responsive to the actual temperature and the actual flow rate of fluid heated in at least said first heating coil;

means for comparing said ninth signal and said eleventh signal and for establishing a twelfth signal which is responsive to the difference between said ninth signal and said eleventh signal, wherein said twelfth signal is scaled so as to be representatie of the change in flow rate of said second stream required to maintain the actual temperature at the outlet of said first heating coil substantially equal to the weighted average temperature represented by said eleventh signal;

means for combining said eighth signal and said twelfth signal to establish a thirteenth signal which is representative of the flow rate of said second fluid stream required to maintain the actual temperature at the outlet of said first heating coil substantially equal to said eleventh signal; and

means for manipulating the flow rate of said second stream in response to said thirteenth signal.

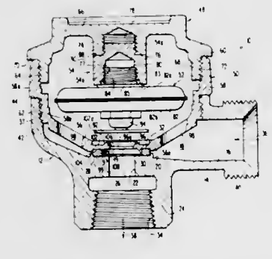
4,781,325

THERMOSTATIC VALVE WITH TRAP REPAIR CARTRIDGE

Gordon W. Finders, Jr., Marshalltown, Iowa, assignor to Dunhyam-Bush, Inc., West Hartford, Conn.

Filed Jan. 11, 1988, Ser. No. 142,597
Int. Cl.[4] F16T *1/02*; F16K *25/00*
U.S. Cl. 236—58 **5 Claims**

1. In a thermostatic valve comprising an upwardly open cup shaped valve casing having a horizontal bottom wall and an integral, annular side wall, an inlet passage within said annular side wall leading to an interior valve chamber defining a radial inlet passage, an axial hole within the bottom wall defining a fluid outlet passage, an inverted cup shaped cover adapted to threadably engage said valve casing annular wall to close off said valve chamber, a hollow sheet metal thermostatic actuator having a cylindrical axial projection fixed to one face and threadably engaging said cover and having a valve closure disc mounted to the other face of said thermostatic actuator for closing off said axial hole, the improvement comprising: a trap repair cartridge having an intermediate annular valve casing threaded at one axial end to said cover and being threaded at its opposite end to said valve casing annular wall, thereby axially enlarging said valve chamber, said trap repair cartridge further including a downwardly and radially inwardly conical bottom wall terminating in a integral, flat horizontal wall portion having an axial hole therein opening to said outlet passage and having a plurality of openings through said conical wall communicating the inlet passage within said valve casing to the



interior of said trap repair cartridge, and said thermostatic valve further comprising an adaptor post having an axial bore within one end thereof and a small diameter axial projection at said other end and being of a axial length equal to the axial length of said intermediate annular valve casing and wherein the periphery of said axial projection of said adaptor post has threads thereon such that, with the reduced diameter portion of said adaptor post threaded into the tapped axial hole within the bottom of said inverted cup shaped cover and said cylindrical projection of said hollow sheet metal thermostatic actuator threaded into the tapped axial hole within the bottom of adaptor post, said thermostatic actuator is positioned such that the valve closure disc mounted thereto faces a valve seat defined by the axial hole within the horizontal portion of the bottom wall of said trap repair cartridge thereby forming, a low cost, thermostatic valve assembly which retains the original orifice size while raising the valve seat height by a minimum amount but retaining the identical moving parts of the original thermostatic valve.

4,781,326

WARM FOG DISSIPATION USING LARGE VOLUME WATER SPRAYS

Vernon W. Keller, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 23, 1984, Ser. No. 633,180
Int. Cl.[4] E01H *13/00*
U.S. Cl. 239—2.1 **8 Claims**

1. A warm fog dissipation system using a large volume of water spray comprising:

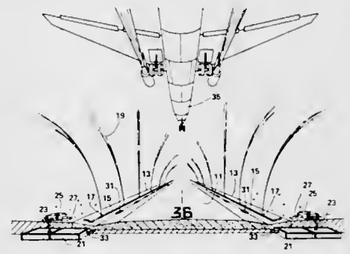
an area subject to warm fog,

means adjacent said area for spraying water in a line of overlapping spray patterns into the air to a height of at least twenty-five meters whereby said water breaks up forming a drop size distribution which falls through a fog,

overtaking, colliding, and coalescing with individual fog drops and thereby causes the fog drops to precipitate to the ground,

a first water reservoir for supplying large volumes of water to said means for spraying water,

a water collection system associated with said area for capturing a significant amount of water sprayed into the air and returning it to said first water reservoir,



said means for spraying water into the air having a first pipe line adjacent a side of said area,

said first pipe having outlet nozzles along its length for spraying water into the air,

a first pump means for pumping water from said first water reservoir into said first pipe line,

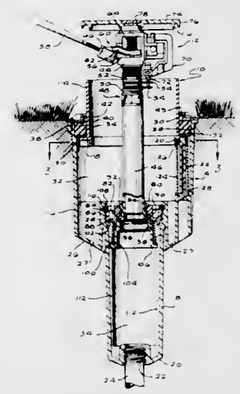
said spray nozzle and pump means being sized to produce to a maximum extent an approximate mean water drop diameter between 300 and 1000 microns.

4,781,327

DYNAMIC PROTECTIVE SHIELD FOR POP-UP SPRINKLERS

Kenneth L. Lawson, Ontario; Enric C. Mendoza, Walnut, and Edward M. Troup, deceased, late of Mount Baldy, all of Calif. by Cathryn H. Troup, legal representative, assignors to Anthony Manufacturing Corporation, Calif.

Filed Jun. 12, 1987, Ser. No. 61,159
Int. Cl.[4] B05B *15/10, 1/28*
U.S. Cl. 239—203 **13 Claims**



1. In a pop-up irrigation sprinkler of the type including a casing adapted to be buried in the ground having an open upper end and a generally closed bottom, a sprinkler coupled to a stem and mounted to said casing for relative movement between an extended, operative position with the sprinkler elevated above the casing and a retracted, inoperative position with the sprinkler housed within the casing below the open end, and a cover overlying the sprinkler and adapted to close the open end of the casing when the sprinkler is in the retracted, inoperative position, the improvement comprising:

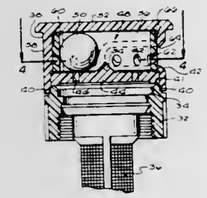
pop-up shield means coupled to said casing and movable with said sprinkler between a fully extended and a retracted position during a portion of said sprinkler extension and retraction, said cover engaging said shield means during movement of said shield means between said fully extended and retracted positions of said shield means thereby to effectively encase said sprinkler during said portion of said sprinkler extension and retraction.

4,781,328

ROTATING STREAM NOZZLE

David E. Robertson, Covina, Calif., assignor to Rain Bird Consumer Mfg. Corp., Glendora, Calif.

Filed Mar. 26, 1987, Ser. No. 30,082
Int. Cl.[4] B05B *3/06*
U.S. Cl. 239—230 **28 Claims**



24. A rotating stream nozzle for connection to a water supply conduit, said nozzle comprising:

a nozzle cap having an outwardly open window formed therein of predetermined width, said nozzle cap defining an internal drive chamber;

a generally cylindrical rotor supported for rotation substantially without axial displacement within said drive chamber and having a plurality of outwardly open discharge ports formed therein, said discharge ports being rotatable in sequence into alignment with said cap window upon rotation of said rotor within said drive chamber;

means forming at least one anvil within said rotor;

means for connecting said nozzle cap to the water supply conduit for flow of water under pressure into said drive chamber with a substantial annular swirling action; and

drive means within said drive chamber and driven by water flowing with swirling action into said drive chamber for impacting said anvil to rotate said rotor in a succession of rotational steps relative to said nozzle cap, said discharge ports upon alignment with said window permitting outward discharge of water from said drive chamber as outwardly projected water streams rotated in steps through a prescribed arcuate path defined by the width of said cap window.

4,781,329

COMBINED POWER DUSTER AND ULV AEROSOL GENERATOR

William L. Tenney, Crystal Bay; Larry D. Conner, Medicine Lake, and Edmund P. Meehan, Mound, all of Minn., assignors to London Fog, Inc., Long Lake, Minn.

Continuation of Ser. No. 735,113, May 17, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 948,389
Int. Cl.[4] B05B *7/14*
U.S. Cl. 239—305 **24 Claims**

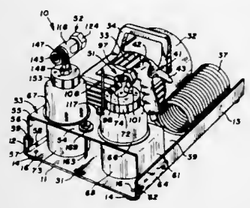
1. An apparatus for dispensing material comprising:

a base, having opposite sides and generally upright side flanges joined to the opposite sides thereof,

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an air compressor mounted on the base, a pressure relief valve connected to the air compressor to control the maximum air pressure,

a motor mounted on the base drivably connected to the air compressor, hose means connected to the air compressor to carry compressed air, manually operated valve assembly connected to the hose means selectively operable to block the flow of air and allow air to flow through the valve assembly, a table secured to the base, and material dispenser means removable associated with the table, said dispenser means having a container with a chamber for storing material, said container having an open top, cap means mounted on the container closing the open top, nozzle means having a first passage open to a material discharge opening, means for connecting the valve assembly to the nozzle means to supply air under pressure to the first passage, tube means extended into the chamber for carrying material stored therein, means mounted on the



cap means having a second passage open to the first passage and connected to the tube means for carrying material from the tube means when air flows through the first passage, said material in the chamber moves up the tube means, flows through the second passage into the first passage, and is discharged through the discharge opening to a desired location, valve means operatively associated with the means mounted on the cap means operable to selectively open and close the second passage to allow material to flow through the second passage into the first passage and stop the flow of material through the second passage, said table having downwardly directed side members secured to the side flanges, said side members being laterally spaced from the side flanges forming grooves, cover means for enclosing the air compressor, motor, air hose, valve assembly, table, and dispenser means, said cover means having side walls extended into said grooves, and latch means releasably connecting the cover means to the base.

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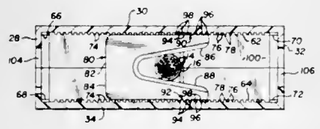
CONNECTOR HOOD

Jack F. Atkins, Garland, Tex., assignor to Custom Computer Cables, Inc., Plano, Tex.

Filed Sep. 9, 1986, Ser. No. 905,292

Int. Cl.⁴ H01R *13/627*

U.S. Cl. 439—359 **18 Claims**



1. A device to prevent connector pins attached to individual wires in a conductor from becoming removed from a computer connector, comprising: a body defining a chamber and including a top, a bottom and first, second, third and fourth sides joining the top and bottom, the top defining an opening of sufficient size to allow the conductor passage into the chamber, the bottom being open to receive the computer connector; connecting means provided on said body for securing the computer connector to the bottom of said body; a removably connected portion provided in the first side of said body, said removably connected portion being of a size sufficient to allow the conductor passage into the interior of said body; strain relief means for securing the conductor to said body; first supporting means provided on said body for supporting said strain relief means in close proximity to the opening in the top of said body; second supporting means provided on said body for supporting said strain relief means in close proximity to said removably connected portion in the first side, the connector pins being prevented from becoming removed from the computer connector when moving the conductor after said strain relief means has secured the conductor to said body and said connecting means has secured the computer connector to said body; a first row of teeth provided on said body extending from the second side in close proximity with a junction of the second side and top; a second row of teeth provided on said body extending from the fourth side in a facing relationship with the first row of teeth across the opening and disposed in close proximity with a junction of the fourth side and top; a third row of teeth provided on said body extending from the second side in close proximity with a junction of the first and second sides; a fourth row of teeth provided on said body extending from the fourth side in a facing relationship with the third row of teeth across said removably connected portion and disposed in close proximity with a junction of the first and fourth sides; and said strain relief means including a generally U-shaped member having a base and two arms connected to and extending away from the base, the two arms being displaced from one another by a distance sufficient to receive the conductor, a series of teeth disposed along each arm and facing in a direction away from the other arm; said first supporting means including a support wall connected to the second and fourth sides at a location interiorly of and in close proximity to said first and second rows of teeth; and said second supporting means including a support wall connected to the second and fourth sides at a location interiorly of and in close proximity to said third and fourth rows of teeth; a second removably connected portion provided in the third side of said body, said second removably connected portion being of a size sufficient to allow the conductor passage into the interior of said body; a fifth row of teeth provided on said body extending from the second side in close proximity with a junction of the second and third sides; a sixth row of teeth provided on said body extending from the fourth side in a facing relationship with the fifth row of teeth across said second removably connected portion and disposed in close proximity with a junction of the third and fourth sides; and a third support means for supporting the strain relief means in close proximity with said second removably connected portion provided in the third side of said body, said third support means including a wall connected to the second and fourth sides at a location interiorly of and in close proximity to said fifth and sixth rows of teeth.

4,781,331

MINERAL BREAKER

Alan Potts, Geneina, No. 1 Chapel Lane, Ravenshead, United Kingdom

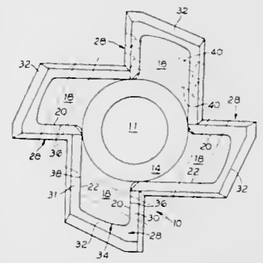
Continuation of Ser. No. 823,673, Jan. 29, 1986, abandoned. This application Oct. 15, 1987, Ser. No. 107,911

Claims priority, application United Kingdom, Feb. 6, 1985, 8502961; Aug. 2, 1985, 8519516

Int. Cl.⁴ B02C *18/18*

U.S. Cl. 241—236 **9 Claims**

1. In a mineral breaker having at least one breaker drum including a plurality of breaker teeth projecting radially from the drum and further including a plurality of opposed breaker teeth positioned so that, on rotation of the drum, mineral lumps to be broken are gripped between the leading faces of the teeth on the drum and said opposed teeth to thereby break the mineral lumps gripped therebetween by a snapping action, the improvement of each breaker tooth on said drum comprising a tooth core projecting radially outwardly of the drum and having flat leading and trailing faces, (b) an open sided tooth sheath seated on the core to cover said leading and trailing faces of that core, the tooth sheath comprising a leading wall and a trailing wall connected to one another only at one end by



a connecting wall which forms a terminal end of the tooth, the inner surfaces of the leading and trailing walls of the tooth sheath having flat faces which abut against the flat leading and trailing faces of the tooth core, respectively, and (c) fastening means for deflecting the leading and trailing walls of the tooth sheath inwardly to clamp the flat faces of the tooth sheath into abutment with the flat leading and trailing faces of the tooth core.

4,781,332

METHOD OF WINDING CONICAL OR TAPERED BOBBIN AND DEVICE TO PERFORM SAID METHOD

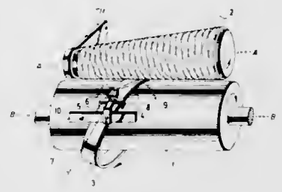
Petr Jirasco; Zdenek Koloc, both of Liberec; Vaclay Moc, Turnov, and Miroslav Vaclavik, Liberec, all of Czechoslovakia, assignors to Elitex, Koncern Textilniho Strojirenstvi, Liberec, Czechoslovakia

Filed Dec. 19, 1985, Ser. No. 810,977

Claims priority, application Czechoslovakia, Dec. 19, 1984, 9982-84

Int. Cl.⁴ B65H *54/42*

U.S. Cl. 242—18 DD **5 Claims**



1. In a method of winding conical or tapered bobbins, especially in textile machines with constant supply of the thread being wound, including the steps of biasing the surface of the bobbin against a rotating support element, forming the support element as a rotating body, directly driving the bobbin by a rotating transfer element, frictionally engaging the surface of the winding on the bobbin in the zone of the supply point of the thread on the bobbin, frictionally engaging the surface of the support element, and axially reciprocating the transfer element together with a thread distributor, the improvement comprising

supplying a part of thread leading from the thread distributor to a supply point on the bobbin onto a surface of the rotating transfer element while said transfer element is in contact with the winding on the bobbin, and

angularly positioning said transfer element on the rotating support element into the direction of said part of the thread.

4,781,333

ARRANGEMENT FOR HOLDING YARN PACKAGES

Walter Hefti, Ettenhausen; Urs Keller, Seuzach, and Robert Ammann, Ohringen, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

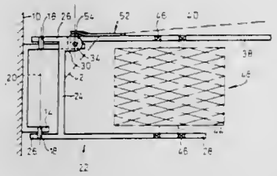
Continuation of Ser. No. 843,172, Mar. 24, 1986, Pat. No. 4,718,615. This application Jul. 27, 1987, Ser. No. 78,516

Claims priority, application United Kingdom, Apr. 22, 1985, 85101172

The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.

Int. Cl.⁴ B65H *54/42, 54/553*

U.S. Cl. 242—18 DD **10 Claims**



1. In an apparatus for winding yarn packages, an arrangement for holding bobbin tubes during the winding operation, comprising means for supporting a bobbin tube, said bobbin tube supporting means including at least one arm; first mounting means for mounting said at least one arm for pivoting about a first axis as a yarn package forms on the respective bobbin tube; second mounting means for mounting said at least one arm for pivoting about a second axis extending transversely to said first axis for installing the bobbin tubes on and removing the packages from the holding arrangement, a first member movable with said at least one arm during a pivoting thereof about said first axis and also about said second axis, and a second member engaging said first member during the pivoting thereof about said first axis as well as about said second axis with an engagement force at a contact zone which moves about said first axis concurrently with the pivoting of said at least one arm about said first axis and is situated at most so close to said second axis that said engagement force has only a negligible effect on the pivoting of said at least one arm about said second axis.

4,781,334

METHOD AND APPARATUS FOR INCREASING THE WINDING SPEED OF AN AUTOMATIC WINDING MACHINE

Josef Derichs, Bonhoefferstrasse 12, D-4050 Mönchengladbach 1, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,976

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637172

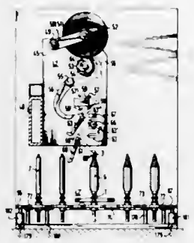
Int. Cl.⁴ B65H *54/22, 67/02, 67/06*

U.S. Cl. 242—35.5 A **43 Claims**

1. Method for increasing the winding speed of an automatic winding machine, which comprises successively supplying unwinding stations of the automatic winding machine with spindles each having one spindle bearing and one cop with a cop tube having a given winding direction and being ready for

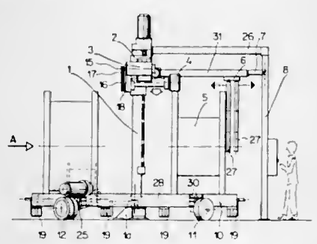
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unwinding, rotating the spindles opposite the given winding direction of the cops while unwinding and removing yarn from



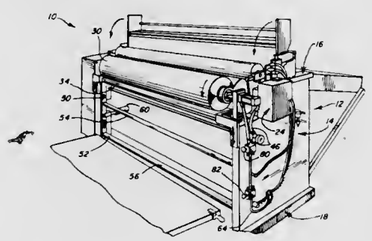
the cop from above, and removing the spindles from the unwinding station in common with the cop tubes mounted on the spindles after unwinding.

4,781,335
WINDING MACHINE
Michel F. Compagnon, La Tour-de-Peilz, Switzerland, assignor to Maillefer SA, Switzerland
Filed Aug. 31, 1987, Ser. No. 91,411
Claims priority, application Switzerland, Sep. 2, 1986, 3522/86
Int. Cl.[4] B65H *75/00*
U.S. Cl. 242—54 R **7 Claims**



1. A machine for winding cable on a large-diameter drum provided with two flanges, each having a circular periphery, comprising:
- a support frame disposed horizontally and including at least one pair of elongated, parallel rollers capable of supporting the drum by the circular peripheries of the flanges thereof;
- drive means;
- a drum-driving pulley driven by said drive means;
- means for supporting said pulley and for bringing said pulley into contact with a point on the circular periphery of a flange of the drum for causing the drum to rotate by friction;
- said frame including a plurality of pairs of said rollers for receiving a plurality of drums and displacement means for bringing the drums successively into a driving position in contact with said pulley, and
- a fixed column and a carriage slidable along said column, said frame being horizontally movable, and said drive means and said means for supporting said pulley being mounted on said carriage.

4,781,336
APPARATUS FOR UNWINDING AND FEEDING MATERIAL INTO A SHEETING MACHINE
Ben J. Rosenthal, Wilmette, and Gregory Starikovsky, Glenview, both of Ill., assignors to Rosenthal Manufacturing Co., Inc., Chicago, Ill.
Filed Dec. 3, 1986, Ser. No. 937,314
Int. Cl.[4] B65H *16/00*
U.S. Cl. 242—58.6 **2 Claims**



1. A sheeting machine having means for receiving material from a supply roll of sheet material, drive means connected to the receiving means for causing the receiving means to rotate, frame means connected to the receiving means, and a delivery means for feeding the material from the supply roll into the receiving means, the delivery means comprising:
- lateral support means for holding said supply roll of sheet material in position to be fed into said receiving means, said lateral support means including a tapered right lateral support member and a tapered left lateral support member; means for actuating at least one of said right and left lateral support members;
- vertical support means connected to said lateral support means and pivotally connected to said frame means for moving said lateral support means into proper position to feed said supply roll of sheet material into said receiving means and providing sufficient tension on said sheet supply roll to prevent jamming, said vertical support means including a right vertical support member attached to said frame means at a first pivot connection and said vertical support means including a left vertical support member attached to said frame means at a second pivot connection;
- said lateral support means including a plurality of horizontal support bars interposed between said right and left vertical support members;
- control means connected to said vertical support means for pivoting said vertical support means into and out of said proper position to feed said supply roll, said control means including means for positioning said supply roll directly against said receiving means and maintaining said supply roll directly against said receiving means as the diameter of the supply roll decreases during use; and
- braking means for slowing movement of said sheet material supply roll and maintaining the proper tension of said sheet material supply roll as the diameter of the supply roll decreases during use, said braking means connected around said lateral support means and between said vertical support means and said frame means.

4,781,337
LIGHT-TIGHT FILM ROLL CONTAINER
Kenneth D. Corby, and Robert R. Woodhams, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 31, 1986, Ser. No. 948,187
Int. Cl.[4] G03B *1/04*
U.S. Cl. 242—71.1 **3 Claims**

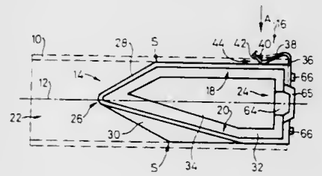
1. A film roll container of the type having a receptacle portion having a bottom wall and a peripheral upstanding wall and a mating cover portion having a top wall and a peripheral

depending wall overlapping the upstanding wall, the receptacle and cover portions having laterally extending central spindles for rotatably supporting opposite ends of a film roll when the cover portion is mounted on the receptacle portion, the film roll having an outer periphery, the combination comprising:
- a plurality of spaced first protuberances projecting upwardly from the bottom wall in the space between one of the upstanding and dependent walls and the outer periphery of the film roll, each first protuberance having an end portion having a blind bore therein;
- a plurality of spaced second protuberances depending downwardly from the top wall in the space between the other of the upstanding and dependent walls and the outer periphery of the film roll, each second protuberance being positioned in register with one of the first protuberances and having an end surface provided with a post, which post is insertable into a corresponding blind bore in the first protuberance for aligning and releasably holding the cover and receptacle portions together;



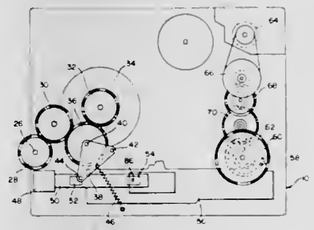
- a plurality of spaced first bosses projecting upwardly from the bottom wall in the space between one of the upstanding and dependent walls and the outer periphery of the film roll, each first boss having an end portion having an annular recess therein on one side thereof and a V-shaped bore on the opposite side of the end portion;
- a plurality of spaced second bosses depending downwardly from the top wall in the space between the other of the upstanding and dependent walls and the outer periphery of the film roll, each second boss being positioned in register with one of the first bosses and having an end surface having a cavity for defining an annular projection which is nestable in light-tight relation within the annular recess of the end portion of the first boss, each mating pair of the projections and end portions having centers through which registering openings extend; and
- means guided by the V-shaped bore through the openings for securing the first and second bosses and the receptacle and cover portions together in light-tight relation.

4,781,338
BOBBIN TUBE SUPPORT
Andre Lattion, Seuzach, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Jul. 15, 1987, Ser. No. 73,810
Claims priority, application United Kingdom, Jul. 18, 1986, 8617614
Int. Cl.[4] B65H *49/14, 49/04*
U.S. Cl. 242—131 **15 Claims**



1. A bobbin tube support comprising
- a tube supporting element having at least two longitudinally extending strip-like elements for contacting an interior of a bobbin tube at angularly spaced apart locations to prevent relative radial movement thereat, each said strip-like element having at least two longitudinally spaced sections for contacting the bobbin tube to maintain the tube on a predetermined axis, and a cross-piece connecting said strip-like elements at a proximal end of said supporting element; and
- a resilient retaining element extending over one of said strip-like elements and secured to said cross-piece to apply a clamping force on a bobbin tube located between said retaining element and said tube supporting element for releasably retaining the tube against axial movement from said supporting element.

4,781,339
TAPE CASSETTE LOADING AND REEL BRAKING MECHANISM
Ki H. Ahn, Choongchungnam, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 31, 1986, Ser. No. 948,157
Claims priority, application Rep. of Korea, Dec. 31, 1985, 18415/1985[U]
Int. Cl.[4] G11B *5/008*
U.S. Cl. 242—199 **1 Claim**

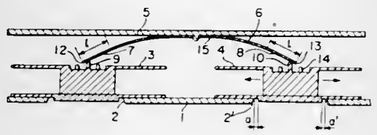


1. A cassette loading and reel braking assembly comprising in combination,
- a main chassis,
- a housing bracket supported by said main chassis,
- a L-shape guide groove disposed in said housing bracket,
- a cassette holder disposed in said housing bracket,
- a guide rod mounted on said cassette holder disposed in said L-shape guide groove,
- a worm wheel disposed in said housing bracket,
- an actuating arm fixed to said worm wheel having a longitudinal guide groove which slidably engages said guide rod,
- a connecting gear having an axle,
- a worm mounted to said connecting gear axle interlocked with said worm wheel,
- an intermediate gear interlocked with said connecting gear below the main chassis,
- a driving gear secured co-axially to a flywheel which is associated with said intermediate gear, supply and take-up reel tables and main brakes,
- a triangular movable plate pivotally fixed to said main chassis through an axis,
- a coil spring connected to a side of said movable plate at one end of said coil spring and to said main chassis at the other end of said coil spring,
- a movable gear rotatably mounted to said triangular movable plate through a pin and positioned between said intermediate gear and said driving gear operatively interlocked therewith, and
- an electric solenoid adapted to receive one end of an actuating plate which includes rectangular openings disposed in both end portions thereof for receiving an actuating pin of said movable plate and a contacting pin of one of said main brakes, respectively, such that said solenoid is used to both

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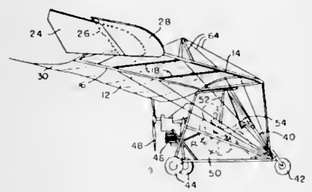
actuate the brake and engage or disengage the gears of the cassette loading device.

4,781,340
MAGNETIC TAPE CASSETTE
Haruo Shiba; Masatoshi Okamura, and Makoto Saito, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Mar. 14, 1984, Ser. No. 589,313
Claims priority, application Japan, Mar. 28, 1983, 58-43372[U]
Int. Cl.⁴ G03B *1/04*; G11B *23/08, 15/32*
U.S. Cl. 242—199 **1 Claim**



1. A magnetic tape cassette comprising an upper casing, a lower casing, a pair of tape reels contained in said lower casing in a rotatable manner and a leaf spring having two free ends, said leaf spring being fixed to said upper casing in a manner to press down central projections of said tape reels, wherein said leaf spring has a central portion, curved portions at both sides of said central portion, and linear free end portions at each of said free ends thereof under a nonloading condition, said free end portions being respectively in contact with the tops of said central projections, wherein the ratio of the total length of said leaf spring to the length of each said linear free end portions is about 1:0.08–0.25.

4,781,341
FLYING WING AIRCRAFT
Witold A. Kasper, 7747 — 115th Pl. NE., Kirkland, Wash. 98033
Filed Oct. 2, 1981, Ser. No. 307,861
Int. Cl.⁴ B64C *3/14, 39/10*
U.S. Cl. 244—13 **3 Claims**



1. A propeller driven wing-only aircraft having:
a. swept-back single surface wings with a reflex profile wherein the rearward part of the wings curve upwardly to assist in allowing said aircraft to safely descend with no forward speed and free of stalling;
b. said wings being positioned so that the center wings are at approximately the same location so that relatively small changes in position of the center of gravity pitch the aircraft up and down;
c. a load-carrying chassis operatively connecting with said wings and mounted below said wings;
d. an engine mounted on said chassis and operatively connecting in a driving relationship to a propeller;
e. said chassis having means on which the pilot is positioned and which means are movable forward and aft to assist in determining the pitch of the aircraft;
f. said aircraft including a rudder pivotally mounted at the tip of each wing in a manner that allows the front portion thereof to pivot inwardly to act as a spoiler and therfore to vary the magnitude and position of the lift generated by the wing on which the rudder is mounted;
g. said aircraft further including rudder actuating means having the ability to selectively move either of said rudders to control the roll and yaw of said aircraft and also having the ability to move simultaneously to act as spoilers and airbrakes;
h. said rudders project outwardly and upwardly from said wings in a dihedral configuration to provide roll stability for said aircraft; and,
i. wherein said rudders are pivotally secured to said wings about an axis that extends rearwardly above said wings so that the lower front edges of said panels remain substantially parallel to the upper surface of said wings as they pivot in order to effectively alter the magnitude and location of the center of lift of said wings for all positions of said rudders.

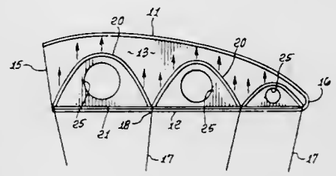
4,781,342
METHOD OF PROVIDING RAPID CONVERSION OF AN AIRCRAFT WEAPON CARRIAGE
Richard Hardy, 16816 2nd Ave. SW., Seattle, Wash. 98166, and Frank D. Neumann, 3003 109th Ave. SE., Bellevue, Wash. 98004
Continuation of Ser. No. 781,657, Sep. 30, 1985. This application Aug. 12, 1987, Ser. No. 84,987
Int. Cl.⁴ B64D *1/04*
U.S. Cl. 244—137.4 **11 Claims**



1. A method of providing rapid conversion of an internal weapon carriage to an external weapon carriage on an aircraft for folded fin or small fin and large fixed fin weapons, the steps comprising:
lowering a deployment mechanism attached to a folded or small fin weapon launch tube from a cruise position to a launch position on the aircraft, thereby removing said launch tube from a cavity of said aircraft;
removing the folded or small fin weapon if one is therein;
removing the launch tube from the deployment mechanism;
installing a launch rail on said deployment mechanism, said launch rail having a mounting mechanism;
installing a large fixed fin weapon on said launch rail, said large fixed fin weapon having a mounting mechanism mating with the mounting mechanism on said launch rail said large fixed fin weapon being approximately the same size as said launch tube; and
raising the deployment mechanism with said large fixed fin weapon to a cruise position on the aircraft in which said fixed fin weapon is at least partially positioned in said cavity.

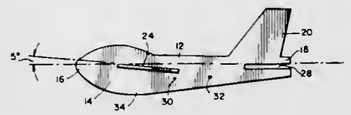
4,781,343
LOAD DISTRIBUTING CURVED TAPES ON PARAFOIL PANELS
Glen J. Brown, Santa Cruz, Calif., assignor to Vertigo, Inc., Lake Elsinore, Calif.
Filed Oct. 13, 1987, Ser. No. 107,790
Int. Cl.⁴ B64D *17/02*
U.S. Cl. 244—145 **11 Claims**

1. In a parafoil, the combination comprising
(a) an upper panel,
(b) a lower panel, spaced below said upper panel,
(c) upright connector panels joined to said upper and lower panels and laterally spaced apart, the connector panels extending generally forwardly and rearwardly and forming inflatable pockets having open forward ends and closed rearward ends, the pockets laterally spaced apart,
(d) load support strands connected to the parafoil at forwardly and rearwardly spaced locations proximate lower edges of the connector panels,
(e) and load distributing tapes attached to said connector



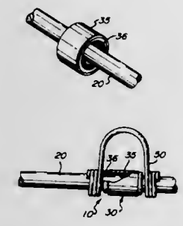
panels to extend along curved lines which are upwardly convex between said upper and lower panels, said tapes having lowermost terminations proximate said forwardly and rearwardly spaced locations,
(f) said panels consisting of lightweight easily foldable fabric materials, and said upper and lower panels defining forward and rearward edges of the parafoil.

4,781,344
AIRPLANE KITE
Ralph B. Thomas, 3645 Audrey Dr., Titusville, Fla. 32796
Filed Dec. 3, 1986, Ser. No. 937,364
Int. Cl.⁴ A63H *27/08*
U.S. Cl. 244—154 **10 Claims**



1. A tethered airplane kite in a form to resemble a jet powered airplane, comprising:
a body member, in-elevation defining a longitudinal fuselage with a nose and tail, and a vertical stabilizer;
a wing member, in plan, having swept back leading and trailing edges;
and, a horizontal stabilizer, in plan, having swept back leading and trailing edges;
said kite apparatus being characterized with its lateral axis through said wing member, having a pitch pivotal point located on said lateral axis and a center of gravity located rearwardly of said pitch pivotal point, creating a pitch-up orientation in the wind;
said body member having a first slot opening adapted to receive said wing member; said slot opening beginning at a point located approximately one-quarter the length of the fuselage aft of said nose and extending rearwardly therefrom;
said tethered airplane kite being further characterized by said vertical stabilizer projecting above the longitudinal axis of said body member a distance equal to at least three-quarters of the maximum vertical dimension of said fuselage of said body member; said vertical stabilizer having an area of at least one-quarter of the total area of said body member; and
said horizontal stabilizer having an area of at least one-third of the area of said wing member.

4,781,345
KITE STRUT
Robert J. Mileti, 21 Taylor St., Torrington, Conn. 06790
Filed Jun. 16, 1987, Ser. No. 62,873
Int. Cl.⁴ G64C *31/06*
U.S. Cl. 244—155 R **21 Claims**



1. A kite strut comprising an elongate rod having two end portions and further having at least one shrink fit stop ring disposed therebout, said stop ring comprising an annular segment of heat shrinkable material shrunk permanent into a shrink fit relationship with said elongate rod.

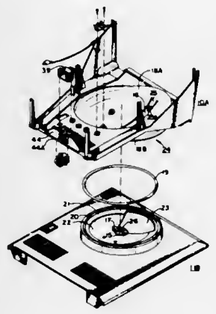
4,781,346
CLIMBING AIDS
Hugh I. Banner, Fron Hywel, Llanrug, Caernarfon, Gwynedd, LL55 3BD, Wales
Filed Aug. 13, 1987, Ser. No. 84,832
Claims priority, application United Kingdom, Aug. 13, 1986, 8619672; Sep. 26, 1986, 8623206
Int. Cl.⁴ A47G *29/00*
U.S. Cl. 248—1 R **7 Claims**



1. A climbing aid comprising at least two can members pivotally mounted on a spindle, one of the cam members pivoting in an opposite direction from the other, resilient means urging the cam members to a normal in use open position, a flexible member attached to the spindle and to which a rope may be attached and comprising a U-shaped loop of cable whose limbs are spaced by said spindle and at least one transverse bar spaced from said spindle, said limbs extending through spaced apertures in said transverse bar and secured therein, and means for pivoting the cam members against the action of the resilient means into a closed position comprising flexible wires extending from the cam members through aperture means in said transverse bar to connect with freely movable manually operable means for pulling said wires.

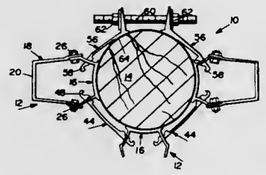
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4,781,347
VIDEO DISPLAY MONITOR
Robert G. Dickie, 15 Valley Trail, New Market, Ontario, Canada L3R 1H1
Filed Mar. 17, 1986, Ser. No. 840,392
Int. Cl.[4] F16M *11/12*
U.S. Cl. 248—183 **4 Claims**



1. An improved mounting device for a video display monitor of the type having a base containing a printed circuit board, a housing mounted to the base and containing a cathode ray tube, and electrical connections running between the base and the housing, wherein the improved mounting device comprises:
(a) a concave surface in the top of the base, said concave surface having:
(i) an annular slot circumscribing the outer perimeter thereof; and
(ii) a wedge shaped opening therein, said opening extending from just below said annular slot to just above the center of said concave surface, wherein said opening is larger in the perimital region than in the central region;
(b) a lubricated "o" ring contained within said annular slot;
(c) a ball portion in the bottom of the housing, said ball portion having:
(i) a convex outer surface substantially conforming to the concave surface in the top of the base;
(ii) a concave inner surface substantially parallel to said convex outer surface;
(iii) a rectangular slot in said ball portion, the long dimension of said slot being substantially perpendicular to the display surface of said CRT;
(d) a cylindrical member mounted to the base and extending from said concave surface in the top of the base through said rectangular slot into the housing, said cylindrical member having a coaxial channel forming a passageway running from the interior of said base to the interior of said housing such that the electrical connections can be passed therethrough;
(e) a pair of coplanar hold-down arms mounted to said cylindrical member and in slidable contact with said concave inner surface of said ball portion such that said convex outer surface of said ball portion is in slidable contact with said lubricated "o" ring; and
(f) a finger member resiliently mounted to said ball portion of the housing for movement between a limiting position in which it extends through said rectangular slot and into said wedge shaped opening such that said finger member limits the sliding movement of said housing with respect to said base, and a non-limiting position in which said finger member does not extend into said wedge shaped opening.

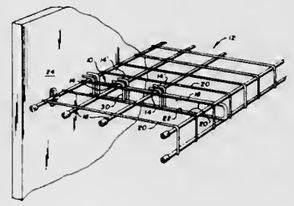
4,781,348
ADJUSTABLE BANDED ALUMINUM TRANSFORMER MOUNT
Steven R. Cutforth, Mexico; David P. Eppinger, Centralia; Daniel V. Hamilton, Centralia, and J. Thomas Odom, Centralia, all of Mo., assignors to A. B. Chance Company, Centralia, Mo.
Filed Jul. 31, 1987, Ser. No. 80,547
Int. Cl.[4] A47B *96/06*
U.S. Cl. 248—218.4 **7 Claims**



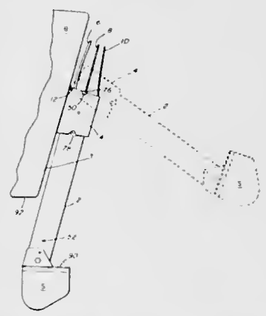
1. An assembly for mounting electrical apparatus for on a utility pole comprising:
at least one bracket having means adapted to be coupled to said electrical apparatus for supporting the latter in elevated disposition relative to the ground,
said at least one bracket including structure defining an aperture presenting a first portion having a first, certain width and a second portion open to a said first portion and having a second, certain width smaller than said first, certain width;
at least one elongated member extending partially around the periphery of said pole for securing said bracket and thereby any electrical apparatus coupled thereto to said pole,
said at least one member having an end region extending through said aperture,
said end region having walls defining at least one notch extending in a direction generally transverse to the longitudinal axis of said member,
said end region having an overall width complemental to said width of said first portion of said aperture for enabling insertion of said end region through said aperture,
said end region having a reduced width adjacent said at least one notch, said reduced width being complemental to said width of said second portion of said aperture, for enabling movement of said walls of said end region defining said notch from a position in said first portion of said aperture and toward a certain position at least partially within said second portion of said aperture; and
means for retaining said walls of said end region defining said notch in said certain position at least partially within said second portion of said aperture,
said overall width of said end region being larger than said certain width of said second portion of said aperture for substantially precluding unintentional withdrawal of said end region of said member from said aperture when said end region is in said certain position at least partially within said second portion of said aperture,
said means for retaining said walls in said certain position comprising a resilient spring element.

4,781,349
VENTILATED SHELF REINFORCING ELEMENT
Lee Remmers, Ocala, Fla., assignor to Clairson International, Ocala, Fla.
Filed May 26, 1987, Ser. No. 53,462
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—249 **14 Claims**

1. A reinforcing element for a shelf having a plurality of spaced, transverse parallel rods and at least two longitudinal rods extending between and coupling the parallel rods to one another, said reinforcing element comprising:
a main body portion having a first end and a second end;
means for coupling said main body portion to a first longitudinal rod of the shelf so as to extend downwardly therefrom, said main body portion having a length such that when said coupling means couples said main body portion to the first longitudinal rod, said main body portion extends at least from the first longitudinal rod to a point immediately below and adjacent to a second longitudinal rod of the shelf, said means for coupling said main body portion to the first longitudinal rod of the shelf including a hook element mounted to said main body portion for engaging the first longitudinal rod of the shelf; and
means for limiting the downward movement of said main body portion relative to the second longitudinal rod when said main body portion is coupled to the shelf, whereby the shelf is reinforced by the reinforcing element against widthwise deformation from vertical loading.

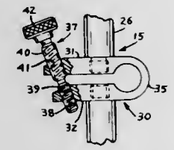


4,781,350
ADJUSTABLE MARINE INSTRUMENT MOUNTING MECHANISM
Stephen G. Boucher, Amherst, N.H., assignor to Airmar Technology Corporation, Amherst, N.H.
Filed Aug. 5, 1987, Ser. No. 81,875
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—286 **11 Claims**



1. An adjustable marine instrument mounting mechanism comprising:
a. a tube having means for mounting an instrument at one end,
b. guide blocks through which the tube slides,
c. a housing which mounts the guide blocks,
d. a base which is attachable to a boat with means for pivotably mounting the guide block housing, and
e. means for releasably latching the housing to the base in an operative, non-pivoting position,
f. the housing latching means being releasable by a predetermined force to permit the instrument to pivot away from the boat to prevent damage to the instrument in the event it strikes a foreign object or if the boat exceeds a predetermined speed, and
g. the means for releasably latching the housing to the base including a force loaded latching bar engageable with a cam on the base, the cam having a surface to produce resistance to the housing becoming engaged with the base to permit the housing and the mounted instrument mechanism to gradually latch to the base when the boat moves in reverse.

4,781,351
DEVICE FOR ADJUSTABLY SUPPORTING A DIAL INDICATOR
Nicholas Parapetti, 615 N. First St., Rockford, Ill. 61107
Filed Apr. 6, 1987, Ser. No. 34,654
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—291 **9 Claims**



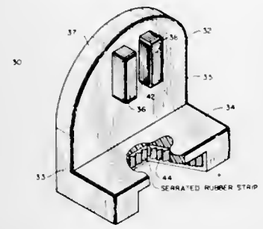
1. A device for holding a dial indicator and for permitting adjustment of the dial indicator relative to a supporting member, said device comprising first and second links adapted to be connected to the dial indicator and the supporting member, respectively, said first and second links being formed with first and second holes, respectively, resiliently yieldable leaf spring means connecting said first link to said second link and permitting said first link to pivot relative to said second link, and actuator means for effecting pivoting of said first link relative to said second link about a predetermined pivot axis, said actuator means comprising a differential screw having first and second threaded end portions of the same hand but of different pitch, and said first and second threaded portions extending into said first and second holes, respectively, and being threadably connected to said first and second links, respectively, whereby turning of said screw through one revolution effects pivoting of said first link relative to said second link through a distance which is a function of the difference in the pitch of said first and second threaded portions thereby to produce fine adjustment of the dial indicator relative to the supporting member.

4,781,352
SUPPORT RACK FOR TWEEZERS
Rosalie Youngman, 111 Superior, Dover, Ohio 44622
Filed Dec. 28, 1987, Ser. No. 138,049
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—309.4 **8 Claims**

1. A new and improved support rack for tweezers, comprising:
mounting plate means having front and back surfaces;
means on said back surface of said mounting plate means for securing said plate means to a wall;
a pair of spaced elongated bars extending outwardly in parallel relation from said front surface of said plate means;
a pair of tweezers retained between said bars;

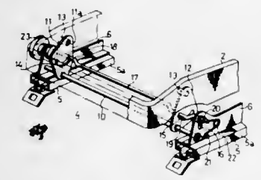
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cord means having one end secured to said plate means and an opposite end attached to said tweezers and extending



shelf having bottle opening means transversely connected to said mounting plate means.

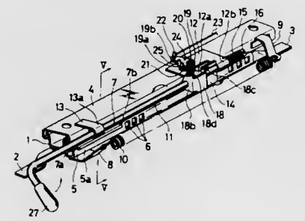
4,781,353
ADJUSTMENT DEVICE FOR A VEHICLE SEAT
Takaichi Nishino, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Jul. 23, 1986, Ser. No. 888,799
Int. Cl.[4] A47C *1/023;* **B60N** *1/08*
U.S. Cl. 248—395 **6 Claims**



3. An adjustment device for use in a vehicle seat comprising fixed-side means, a rod journaled by said fixed-side means, a pair of link members each having an arc-shaped slit and each being fixed to said rod, free ends of said link members being connected to a moveable side member, a crankshaft having a pair of bent portions on substantially 180° opposing sides thereof being provided on fixedside means, said bent portions of said crankshaft being respectively inserted through and engaged with said slits in said link members, wherein said fixed-side means comprises a pair of side brackets respectively fixed to a pair of right and left side rails, and said moveable-side member is a cushion frame, and wherein the rear ends of said side brackets are connected to said cushion frame by means of links, whereby said crankshaft is rotated to rotate said link members so as to move or adjust said moveable-side member relative to said fixed-side means.

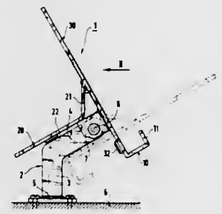
4,781,354
SEAT SLIDE DEVICE FOR CAR
Masao Nihei, Yokohama, and Fugio Takahashi, Ayase, both of Japan, assignors to Ohi Seisakusho Co., Ltd., Ayase, Japan
Filed Jul. 22, 1987, Ser. No. 76,337
Claims priority, application Japan, Jul. 23, 1986, 61-171853
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 **10 Claims**

1. A seat slide device for a car having a car seat with a seat section and a forwardly tiltable back support, comprising:
- a stationary rail means secured to the car body and having forward and rearward ends;
- a movable rail slidably mounted on said stationary rail means and being slidable so that said seat is movable between a rearward position and a forward position, and a standard position being set between said rearward and forward positions;
- said stationary rail means having a plurality of engagement holes arranged longitudinally along the rail means;
- a restraining section on the forward end of said stationary rail means and having a rearward end with a stopper thereon;
- an operating shaft pivotally mounted on said movable rail;
- a lock member pivotally mounted on said operating shaft and having at least one pawl adapted for selected engagement and disengagement with said engagement holes;
- means for normally biasing said pawl into engagement with one of said engagement holes; and



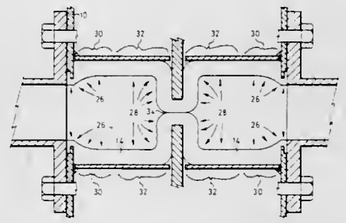
- a retaining member pivotally mounted on said operating shaft forwardly of said lock member and operatively connected to said back support, such that when said back support is titlted forwardly, said retaining member engages said lock member and pivots said lock member to disengage said pawl from said engagement hole, whereby said seat is movable to said forward position, and when said back support is returned to a normal upright position, said seat is movable to said standard position, and said retaining member contacts said stopper and is held between said stopper and said lock member whereby forward movement of the seat from the standard position to the forward position is prevented.

4,781,355
HOLDER FOR MANIPULATING FLAT OBJECTS
Philippe Jeantin, Valence, France, assignor to Companie Generale d'Automatisme CGA-HBS, Paris, France
Filed Jul. 29, 1987, Ser. No. 79,070
Claims priority, application France, Jul. 29, 1986, 86 10971
Int. Cl.[4] A47B *19/00*
U.S. Cl. 248—441.1 **6 Claims**



1. Holder for selectively manipulating flat objects having one of two formats referred to hereinafter as small format objects and large format objects, said holder comprising a support assembly adapted to pivot between two stable positions and formed by first and second members attached perpendicularly to respective opposite sides of a third member, said first and third members forming an L-shaped support for said large format objects in one of said two stable positions and said second and third members forming a T-shaped assembly, and a base which incoporates an inclined end portion on which said support assembly is pivotally mounted at a point between said second member and the point at which said first member and said second member are attached together, whereby said support assembly pivots about an axis substantially coincident with the intersection of said second and third members, the arrangement being such that a first of said two stable positions is defined by an abutting relationship between said inclined end portion of said base and said second member with said L-shaped support at the end of said base and facing the user and a second of said two stable positions is defined by an abutting relationship between said inclined end portion of said base and the part of said second member to which said first member is attached with the half of said T-shaped assembly to which said first member is not attached at the end of said base, facing the user and forming a support for said small format objects.

4,781,356
PINCH TYPE VALVES
Barrett M. M. Payne, Bulawayo, Zimbabwe, assignor to John Lawrence Sullivan, Bulawayo, Zimbabwe, a part interest
Filed Jun. 26, 1987, Ser. No. 67,780
Claims priority, application Zimbabwe, Jun. 30, 1986, 123/86
Int. Cl.[4] F16K *7/06*
U.S. Cl. 251—8 **5 Claims**



1. A valve comprising in working combination a housing; interposed between two opposite sides of said housing (**10**), in longitudinally spaced apart substantially coaxial alignment with one another, are a pair of generally cylindrical sleeve supports (**12**, **12***a*), said supports including outwardly belled or flared formations at their respective adjacent opposing ends (**18**, **18***a*) and further being adapted so as to receive, encompass and support in a sealed manner a resiliently deformable sleeve (**14**); means adapted to close the valve by inducing pinching formations into closed relationship about the flexible sleeve between the spaced sleeve supports; the housing further being adapted to be coupled to one or more corresponding flange faces at each opposite end.

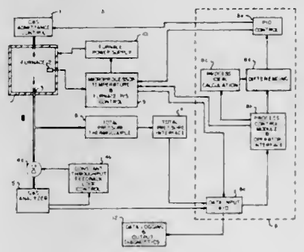
4,781,357
TAP PLUG APPARATUS
Charles F. Hartley, Pittsburgh, Pa., and Wesley G. Page, Owensboro, Ky., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Sep. 25, 1987, Ser. No. 100,878
Int. Cl.[4] C21B *7/12*
U.S. Cl. 266—45 **5 Claims**

1. Apparatus suitable for safely plugging and unplugging a furnace adapted to hold and transfer molten material, comprising:
- at least two linkage assemblies, with each assembly being comprised of bars pivotally connected together at locations adjacent their ends,
- a fluid operated cylinder mechanically connected to said linkage assemblies,
- an elongated bar supported by each linkage assembly, and
- plug means located at one end of each elongated bar for disposal against and removal from corresponding spout structures of the furnace by action of the cylinder translating through the linkage assembly, the linkage assembly being effective to move the elongated bars and plug means



to and from the spout structures, and to hold the plug means against the spout structures under a positive force provided by the cylinder without the plug means becoming wedged in the spout structures.

4,781,358
APPARATUS FOR MONITORING AN ARTICLE IN SINTERING FURNACE
John D. Langan, 6895 Sabado Tarde, Goleta, Calif. 93117
Division of Ser. No. 824,123, Jan. 6, 1986, Pat. No. 4,719,073.
This application Aug. 17, 1987, Ser. No. 86,391
Int. Cl.[4] C21D *11/00;* **F27B** *9/40*
U.S. Cl. 266—80 **9 Claims**



1. An apparatus for the monitoring and control of a batch process metallurgical sintering furnace comprising:
- a. means for continuously withdrawing a gas sample from the atmosphere of said furnace;
- b. means for measuring the percent composition of certain constituents of said gas sample;
- c. means for varying the conductance of said gas sample to said means for measuring the percent composition of certain gaseous constituents, whereby variations in furnace total pressure will not effect measurement of the percent composition of said constituents;
- d. means for measuring the temperature;
- e. means for measuring the total pressure in said furnace;
- f. means for comparing derived quantities which are functions of measured temperature, total pressure, and percent composition, with predetermined values;
- g. furnace temperature control means for controlling the furnace temperature rate with time in response to said measured values; and,
- h. input gas control means for controlling the input gases to said furnace in response to said derived quantities.

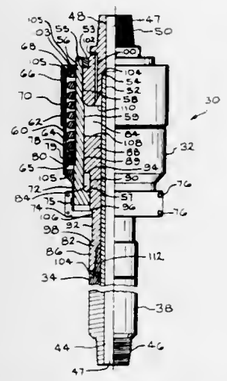
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,359

SUB ASSEMBLY FOR A SWIVEL

Wayne L. Matus, Gainesville, Tex., assignor to National-Oilwell, Houston, Tex.

Filed Sep. 23, 1987, Ser. No. 100,158
Int. Cl.[4] F16F *1/06*
U.S. Cl. 267—71 9 Claims



1. A sub assembly including a telescopic sub positioned between upper and lower threaded pins, the lower pin for threadable connection to a drill pipe, the upper pin for threadable connection to a swivel, the telescopic sub comprising:

an annular inner sleeve and an annular sleeve outwardly spaced from said inner sleeve, said inner and outer sleeves being connected to the upper pin,

said outer sleeve including a load bearing shoulder on its inner surface,

a first chamber formed between said sleeves and the upper pin,

an annular shiftable member disposed within said first chamber,

the outer surface of said shiftable member including an annular surface, a piston and a recess,

said annular surface having an outer diameter no greater than the inner diameter of said load bearing shoulder of said outer sleeve,

said piston including a shoulder whose outer diameter is greater than the inner diameter of said load bearing shoulder of said outer sleeve,

said piston being shiftably connected to said inner surface of said outer sleeve,

said shoulder of said piston for engaging said shoulder of said outer sleeve when the lower pin is threadably connected to the drill pipe,

said recess including an upper shoulder and an outer diameter less than said outer diameter of said annular surface,

an annular shiftable retainer outwardly spaced from said outer sleeve,

a second chamber formed between said retainer and said outer sleeve,

a preloaded spring disposed in said second chamber,

said spring preloaded with a force to support said shiftable member,

the lower end of said retainer having an inner diameter less than said outer diameter of said annular surface,

said lower end of said retainer for engaging said upper shoulder of said recess,

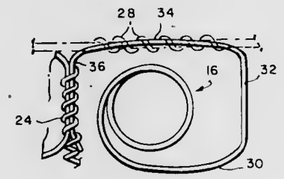
wherein said piston is shiftable between normal, extended and compressed positions to prevent thread damage to the lower pin and the drill pipe when making and breaking connections between the sub assembly and the drill pipe.

4,781,360

SPRING ASSEMBLY WITH HELICAL COILS OF SPRING WIRE WITH UNKNOTTED ENDS

Henry R. Ramsey, Dudley, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Dec. 7, 1987, Ser. No. 129,549
Int. Cl.[4] A47C *23/02;* F16F *3/04*
U.S. Cl. 267—91 1 Claim



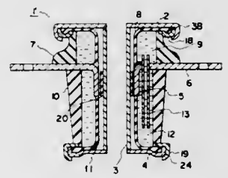
1. A spring assembly comprising a continuous border wire of rectangular configuration defining spaced, parallel sides and ends, a plurality of spaced, parallel rows of spring modules of helical coil springs disposed within the border wire, said springs in each row being disposed in rectilinear relationship to each other such as to form spaced, parallel rows of springs parallel to two of the spaced, parallel sides or ends, said springs having at their upper ends open-ended, unknotted terminal coils, said coils being so arranged within the border wire that the terminal coils of adjacent coils in each row of coils lap and that the terminal coils of the coils adjacent the sides and ends of the border wire lap the border wire and, further, that the terminal coils of one of two adjacent springs in a row of springs lap the terminal coils of the adjacent springs diametrically opposite the open ends of the terminal coils of the adjacent springs and wherein a helical length of wire extending transversely of the rows, the length of wire being of a length less than the distance between sides and/or ends of the border wire join the lapping portions of adjacent springs in each row of coils and wherein said helical lengths of wire connecting the terminal coils of the springs in adjacent rows of springs and wherein a continuous helical length of wire disposed about the sides and ends of the border wire connects the terminal coils of the coils adjacent the sides and ends to the border wire and wherein the coils at the sides and ends are so oriented that the open ends of the terminal coils of the coils at the sides and ends are disposed in alignment with the sides and ends such as to be lockingly confined within the helices of the helical length of wire disposed about the border wire, the ends of the helical lengths of wire adjacent the border wire being unknotted, and not connected to the border wire, wherein said open ends of said open-ended terminal coils embody terminal ends in the form of deviations disposed in the plane of the terminal coils which extend radially outward with respect to the centers of the terminal coils and wherein said deviations lap each other and said lapping portions are confined within the helices, the deviations being spaced from the terminal ends of the terminal coils, the springs having corresponding open-ended terminal coils at their lower ends correspondingly connected, the spring assembly eliminating knotting of coils to minimize the use of binding wire to thus reduce the cost of manufacture and weight of the spring assembly, the plurality of spaced, parallel rows of helical springs being disposed between vertically-spaced, rectangularly configured such border wires.

4,781,361

VIBRATION-PREVENTING RUBBER DEVICE

Katsunori Makibayashi, Toyota; Kenji Murase, Suzuka, and Motoo Kunihiro, Tsu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Toyo Tire & Rubber Co., Ltd., both of, Japan

Filed Jul. 3, 1986, Ser. No. 881,954
Claims priority, application Japan, Jul. 5, 1985, 60-146581
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—140.1 9 Claims



1. A vibration-preventing device comprising:

an inner cylinder;

an upper plate;

a partition wall having a hub portion extending substantially parallel to said inner cylinder;

a lower plate, said partition wall being positioned outside of said inner cylinder and being interposed between said upper plate and said lower plate, said upper plate and said lower plate being connected to the inner cylinder;

an upper vibration-preventing rubber member interposed between the partition wall and the upper plate;

an upper elastic film interposed between the partition wall and the upper plate, said upper vibration-preventing rubber member and said upper elastic film cooperating to define an upper damper liquid chamber;

a lower vibration-preventing rubber member interposed between the partition wall and the lower plate;

a lower elastic film interposed between the partition wall and the lower plate, said lower vibration-preventing rubber member and said lower elastic film cooperating to define a lower damper liquid chamber;

an orifice which fluidly communicates said upper damper liquid chamber with said lower damper liquid chamber; and

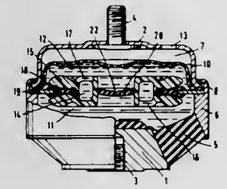
an elastic element outside of said damper liquid chambers and independent of said upper and lower elastic film, interposed between said inner cylinder and said hub of said partition wall, said elastic element being substantially axially coextensive with said hub, being in direct contact with one of said inner cylinder and said hub of said partition wall and, in the unloaded condition, being spaced from and out of direct contact with the other of said inner cylinder and said hub of said partition wall and cooperating to dampen low frequency vibrations, intermediate frequency vibrations and upper frequency vibrations with said vibration-preventing members.

4,781,362

HYDRAULICALLY DAMPING ELASTIC BEARING

Horst Reuter, Wachtberg-Oberbachem; Jörn-Rainer Quast, Sinzig-Bad Bodendorf; Heinz Brenner, Ahrweiler; Peter Maier, Wachtberg-Fritzdorf, and Heinrich Meyer, Königswinter, all of Fed. Rep. of Germany, assignors to BOGE GmbH, Eltorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 851,879, Apr. 11, 1986, Pat. No. 4,697,794, and Ser. No. 821,173, Jan. 19, 1986, Pat. No. 4,697,796. This application Jul. 17, 1987, Ser. No. 74,932
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632670
Int. Cl.[4] B60G *13/00;* F16F *15/04;* F16M *13/00;* B62D *21/00*
U.S. Cl. 267—219 18 Claims



1. A hydraulically damping elastic bearing for providing an axial damping action, comprising:

a housing;

a partition being at least partially elastic and being mounted within said housing so as to divide the interior of said housing into first and second chambers, and at least one slit provided in said partition;

said partition comprising:

an outer annular substantially rigid partition member; and

a central elastic partition member provided with said slit;

said central elastic partition member being asymmetrical in cross section, at least in the area of said slit, with respect to its central plane such that the opposing surfaces of said central elastic partition member are disposed at substantially unequal distances from said central plane in the area of said slit.

4,781,363

VIBRATION ISOLATOR PARTICULARLY OF THE ANTIRESONANCE FORCE TYPE

Dieter Braun, Oberpframmern, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschränkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 125,449, Feb. 28, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,641
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907926; Dec. 20, 1979, 2951526
Int. Cl.[4] F16F *7/10, 9/16, 13/00*
U.S. Cl. 267—225 17 Claims

1. A vibration isolator system adapted to be adjusted so that at a given antiresonance frequency vibration transmission is virtually completely suppressed between a vibrating member and a support member comprising:

first and second connecting members adapted to be connected respectively to said vibrating member and to said support member;

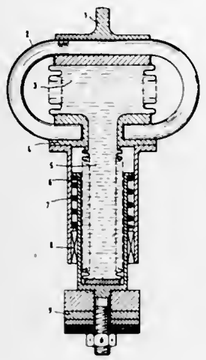
isolator spring means interposed between said first and second connecting members;

a closed hydraulic pressure system containing a liquid comprising operatively joined primary fluid chamber means and secondary fluid chamber means both deformable in the direction of movement of said vibrations, said secondary fluid chamber means having an effective cross-sectional area which is smaller than the effective cross-sectional area of said primary fluid chamber means, said secondary fluid chamber means being thereby deformed

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in the direction of movement of said vibrations to a greater extent than said primary fluid chamber means;

inertia mass means attached to said secondary fluid chamber means so as to be displaced upon deformation of said secondary fluid chamber means as a result of said vibrations, said inertia mass means being thereby accelerated to generate a resulting inertia force causing fluid pressure change in said fluid pressure system which compensates as



a dynamic force the dynamic portion of the forces transmitted between said first and second connection members; and

means for increasing the fluid pressure within said hydraulic pressure system in the static condition of said isolator system when no vibrations occur and for preventing said fluid pressure from decreasing below a predetermined limit during occurrence of said vibrations.

4,781,364

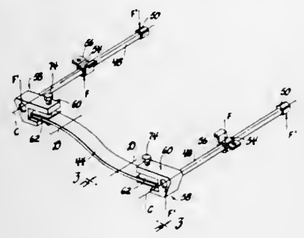
ELASTIC BEAM-TORSION ROD CONNECTION

Bernard J. Flan, Troy, and Ming-Chih Yew, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1983, Ser. No. 541,862

Int. Cl.⁴ F16F *1/18, 1/14*; B60G *19/00*

U.S. Cl. 267—260 **4 Claims**



1. A twist isolating connection between a distal end of a primary suspension elastic beam disposed transversely of a vehicle sprung mass and a torsion rod disposed longitudinally of said sprung mass between a control arm of the latter and said elastic beam distal end, comprising, means on one of said elastic beam distal end and an adjacent end of said torsion rod defining a yoke having a pair of spaced legs, means on the other of said elastic beam distal end and said torsion rod adjacent end defining a platform member between said legs having a first surface juxtaposed a first of said legs and a second surface juxtaposed a second of said legs, means on one of said first surface and said first leg defining a first protuberance contacting the other of said first surface and said first leg in a transverse plane of said sprung mass, and means on one of said second surface and said second leg defining a second protuberance contacting the other of said second surface and said second leg in said transverse plane, said first and said second protuberance being operative to clamp said platform member between said yoke legs only in said transverse plane while spanning a lateral section of said elastic beam so that said elastic beam is isolated from twisting forces resulting from beam bending of said torsion rod but is operative to resist torsional moments on said torsion rod in a beam bending mode.

4,781,365

HOLLOW ELASTOMERIC SPRING

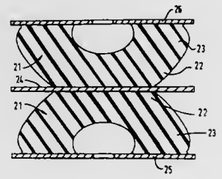
Reginald Harrison, Oadby Leicestershire, England, assignor to Dunlop Limited, United Kingdom

Continuation-in-part of Ser. No. 713,709, Mar. 19, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 9,531

Claims priority, application United Kingdom, Mar. 29, 1984, 8408167; Jan. 5, 1985, 8500274

Int. Cl.⁴ B60G *11/22*; F16F *1/40*

U.S. Cl. 267—294 **19 Claims**



1. A spring comprising:

first and second rigid end members arranged spaced apart and one opposed relative to the other,

a body of elastomeric material which extends between and is bonded to said opposed rigid end members whereby compression forces acting in a first direction on said rigid end members are resisted by compression of the elastomeric body, the maximum external dimension of the bonded area between the first rigid member and body being less than that of the bonded area between the second rigid member and body, the body of elastomeric material being of a substantially symmetrical shape as considered in any cross-section about a major axis of the spring extending in said first direction and said elastomeric material being of a low hardness not exceeding 60 Shore A,

the body of elastomeric material being substantially solid in the vicinity of the first of said rigid end members and of a substantially hollow tubular shape in the vicinity of the second of said rigid end members over between 10 and 80% of the length of the body between said opposed rigid end members,

said body of elastomeric material in the absence of applied force in the first direction being of progressively increasing external cross-sectional dimension over a first part of the length of the body extending from the first rigid end member and of progressively decreasing external cross-sectional dimension over a second part of the length of the body extending to said second rigid end member,

said second part extending over at least 10% of the length of the body and said first and second parts each being of a curved convex external profile as considered in a plane containing said major axis, the curved external profile of the first part of the length of the spring having at least one centre of curvature and said at least one centre of curvature lying further from the first rigid member in a direction towards the second rigid member than that transverse plane at which the external dimension of the body is a maximum,

any centre of curvature of the curved external profile of the second part of the length of the spring lying nearer to the first rigid member than any centre of curvature of the curved external profile of the first part of the length of the spring, and

said body of elastomeric material being of a substantially hollow tubular shape at said transverse plane at which the external dimension of the body is a maximum.

4,781,366

MACHINE FOR EXTENDING ROLLED CLOTH

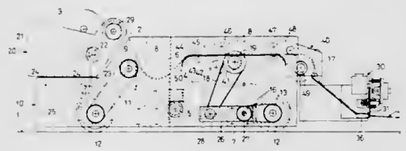
Keiko Tagawa, 14-1, Hon-mach 6-chome, Toyonaka-shi, Osaka, Japan

Filed Aug. 6, 1986, Ser. No. 893,929

Claims priority, application Japan, Aug. 9, 1985, 60-176008

Int. Cl.⁴ B65H *29/46*

U.S. Cl. 270—31 **2 Claims**



1. A cloth-extending machine comprising:

a machine body having running wheels, and a driving means for driving the machine body on the running wheels thereof;

a rolled cloth-holding stand for supporting a roll of cloth;

a cloth-supplying portion movably mounted to the machine body so as to be movable vertically relative to the machine body,

said cloth-supplying portion including a rotatable drawing-out roller for feeding the cloth in a feeding direction from the roll thereof, and a cloth-sliding guide means between the rolled cloth-holding stand and the drawing out roller for guiding the cloth extending therebetween as the cloth is fed from the roll by said drawing-out roller;

a cutting means disposed downstream of said drawing-out roller with respect to said feeding direction so as to receive the cloth fed by said drawing-out roller, said cutting means for cutting the received cloth into predetermined lengths; and

an ascending and descending means operatively connected to said cloth-supplying portion and said cutting means for moving the cloth-supplying portion and the cutting means in up and down vertical directions relative to said machine body and for moving the cloth-sliding guide means and the cloth-holding stand in said up and down vertical directions.

4,781,367

FOLDING DEVICE WITH PIVOTABLE BUCKLE CHUTE ROLL

Rudolf Stab, Frankenthal, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

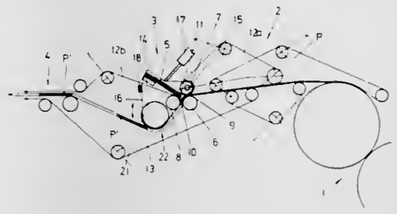
Filed May 22, 1987, Ser. No. 53,381

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1986, 3618921

Int. Cl.⁴ B42C *1/00*

U.S. Cl. 270—45 **12 Claims**

1. A folding device comprising at least one transverse folding unit in the form of a buckle folder, tape conveyors for the feed of printed products to the folding unit and for the delivery of such products therefrom, said folding unit being made up of two outer feed and delivery rolls on a delivery side thereof and of a center roll adapted to cooperate with such outer rolls with the formation of product-engaging and product-feeding nips, of means defining a buckle passage flanked by said outer rolls, and of a set of tapes in running engagement with said center roll, said outer roll on the feed side of such folding unit being able to be pivoted away from such center roll so as to render inoperative said feed nip defined therewith and said buckle



passage is able to be so moved that an inlet end thereof is moved clear of said tape set adapted to run over said center roll.

4,781,368

METHOD OF AND APPARATUS FOR CHANGING THE CONVEYING SPEED OF SHINGLED PAPER PRODUCTS

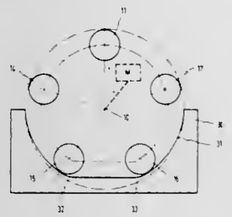
Gunter Gammerler, D-8021 Icking, Ichoring 44, Fed. Rep. of Germany

Continuation of Ser. No. 823,305, Jan. 28, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 120,208

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1985, 3502897

Int. Cl.⁴ B65H *5/34*

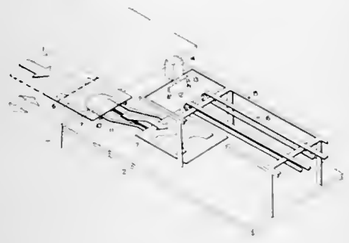
U.S. Cl. 271—270 **12 Claims**



8. A method of changing the conveying speed of shingled paper products and the like having partially overlapping surfaces, and being conveyed over a first moving belt conveyor or the like, comprising the steps of seizing a shingled first product by applying a substantially vertical contact pressure against the first product non-overlapped surfaces by a second moving belt, accelerating the first product in the direction of the first moving belt conveyor or the like while maintaining the substantially vertical contact pressure across said second moving belt for a predetermined time over a predetermined path in the conveying direction, releasing the substantially vertical contact pressure, and repeating the foregoing steps for the next and subsequent products.

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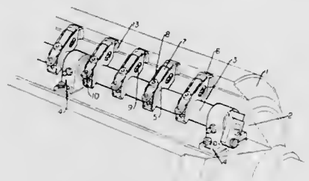
4,781,369
TRANSPORTING LIMP FABRIC
Anthony D. Mathias, Toorak, Australia, assignor to Pacific Dunlop Limited, Australia
PCT No. PCT/AU86/00073, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05466, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 21, 1986, Ser. No. 943,263
Claims priority, application Australia, Mar. 22, 1985, PG9867
Int. Cl.[4] B65H *29/46*
U.S. Cl. 271—267 **6 Claims**



1. Apparatus for transferring a limp fabric piece from a first station to a second station comprising in combination:
(a) a transfer member (7) having a flat low friction upper surface portion with a terminal edge to support thereon in a flat state a limp fabric piece (6),
(b) means supporting said transfer member (7) for movement in a direction normal or inclined to said terminal edge in each direction between said first and second stations,
(c) a receiving member (8) having a flat low friction upper surface portion located to underlie the transfer member (7) when the transfer member (7) is at said second station, and
(d) means (9) at said second station operable to frictionally engage the exposed surface of said limp fabric piece (6) supported on the low friction surface of said receiving member (8) when the transfer member (7) is at the second station so that the limp fabric piece (6) can subsequently be moved over said low friction upper surface portion of receiving member (8) to another work station, said frictional engaging means (9) being arranged to engage the fabric (6) along at least one marginal portion of the fabric piece (6) so that said marginal portions of said fabric piece (6) protrude beyond said frictional engaging means (9), and being selectively movable relative to the upper surface portion of the receiving member (8) to engage the fabric piece (6) when the transfer member (7) is at said second station, said frictional engaging means (9) and said low friction surface of the transfer member (7) being adapted so that when the fabric piece (6) is frictionally engaged and as the transfer member (7) moves from the second station back to the first station, the fabric piece (6) is withdrawn from the transfer member (7) over the terminal edge to be supported in a flat state on the upper surface portion of the receiving member (8).

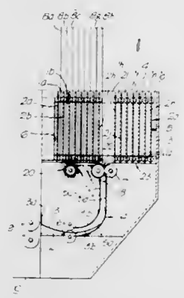
4,781,370
SHEET GRIPPING APPARATUS
Willi Weisgerber, Geisenheim-Johannisberg, Fed. Rep. of Germany, assignor to Miller-Johannisberg, Druckmaschinen GmbH, Weisbaden-Biebrich, Fed. Rep. of Germany
Filed Mar. 20, 1987, Ser. No. 28,675
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3623405
Int. Cl.[4] B65H *5/14*
U.S. Cl. 271—277 **7 Claims**

1. In a sheet gripper mountedd on an elongated gripper spindle in a sheet-processing machine, the combination comprising:
a sheet gripper means (5) including a gripper tip (6);
said sheet gripper means including an enclosing surface means (16) which encloses a partial peripheral portion of the circumferential periphery of the gripper spindle (3) and is firmly and radially centered on the gripper spindle (3) so as to extend transversely thereof in opposite directions;
a drive dog (7) fixedly, releasably connected to the gripper spindle (3) adjacent said partial peripheral portion and



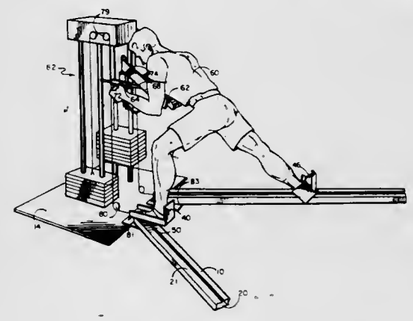
cooperable with said sheet gripper means (5) to retain the same with respect to the spindle (3);
a compression spring (9) located transversely to one side of the gripper spindle and engaged in compression between said sheet gripper means (5) and said drive dog (7), and an adjustment screw (10) located transversely to the other side of the gripper spindle; and
said sheet gripper means (5) and said drive dog (7) including cooperable contact surfaces formed to be effective for axially locating said sheet gripper means with respect to the spindle (3).

4,781,371
SHEET COLLECTOR
Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jul. 16, 1986, Ser. No. 886,583
Claims priority, application United Kingdom, Jul. 17, 1985, 8518086
Int. Cl.[4] B65H *39/115*
U.S. Cl. 271—293 **11 Claims**



1. A bottom-fed sheet collector comprising one or more upstanding sheet-receiving bins having sheet support surface(s) that include irregular sheet support surface portions adapted to hold the sheets while they are in said one or more upstanding sheet-receiving bins in a substantially curved configuration transverse to the direction of sheet feed, whereby the sheets are able to stand on edge and upright in the bins by virtue of the beam strength thus imparted to them, said collector including guide means for directing the sheets to said one or more bins, said guide means being adapted to bend the sheets into the substantially curved configuration before they enter said one or more bins, said guide means terminating below said one or more bins.

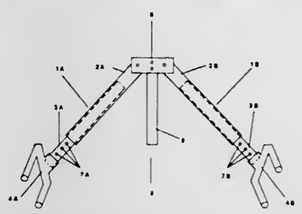
4,781,372
ICE-SKATING EXERCISE DEVICE
Patrick J. McCormack, 56 N. Truro St., Hull, Mass. 02045
Filed Apr. 15, 1987, Ser. No. 38,871
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—70 **10 Claims**



1. A leg movement exercise device comprising:
a base adapted to rest on the ground;
track attachment means affixed to said base;
a track rotatably attached to said track attachment means;
a guide member positioned on said track, said guide member adapted to be forwardly and rearwardly movable on said track by said leg movement;
a stirrup adapted to receive one of the user's feet;
stirrup attachment means extending from said guide member and affixed to said stirrup;
an adjustable weight resistance means affixed to said guide member and adapted to provide resistance to rearward movement of said guide member and attached stirrup on said track when pushed rearward by said leg movement;
track angle determination means to adjust the angle of said track from saio track attachment means; and
upper body support means attached to said base plate generally positioned above said track adapted to support the user's upper body.

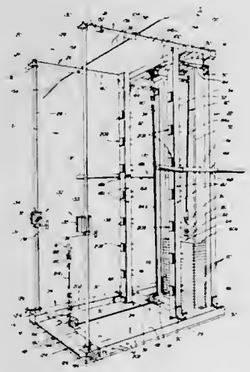
4,781,373
LEG STRETCHING APPARATUS
Charles F. Irwin, 1310 Fleming Ave., Lot A-1, Ormond Beach, Fla. 32074
Filed Aug. 21, 1986, Ser. No. 898,922
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—126 **1 Claim**

1. A leg stretching apparatus comprising:
a base consisting of two identical plates;
a handle rigidly connectedto and between said base plates;
a pair of extension assemblies one each pivotally mounted to and between said base plates and on opposite sides of said handle;
each said extension assembly comprising two tubes, a first tube mounted at one of its ends to said base and a second tube having one end telescopic with the other end of said first tube and a second end including a U-shaped stirrup for engaging a user's ankle; and said second tube including a means to adjust the length of said extension assembly by limiting telescopic movement of said second tube with



said first tube while allowing the second tube to rotate 360 degrees when in use.

4,781,374
BODY-BUILDING APPARATUS
Gilbert E. Lederman, 15 Wood Canyon St., Bisbee, Ariz. 85603
Filed Nov. 29, 1985, Ser. No. 802,671
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **9 Claims**



1. In body-building apparatus including an upstanding frame having a pair of spaced-apart front uprights, a pair of spaced-apart elongate arms extending forwardly from said frame adjacent to the top of the frame, and elongate support means extending forwardly from said frame adjacent to the bottom of the frame, the improvement comprising:
a chin bar;
means for mounting said chin bar on said arms adjustably in a selected one of a plurality of fixed positions along the length of the arms;
a pair of dip bars each including a rear portion, and a front portion extending angularly from the rear portion;
means for mounting said dip bars on said frame adjustably with said front portions each disposed in a selected one of at least two positions projected forwardly at different distances from said frame, said rear portions also projecting forwardly from said frame when said front portions are in at least one of their said positions, thereby to enable each bar to be manually gripped selectively on either of said portions;
a forward weight-cable pulley assembly;
means for mounting said pulley assembly on said support means adjustably in a selected one of a plurality of fixed positions along the length of the support means;
a plurality of equipment-supporting brackets disposed along each of said uprights, each of said brackets including a

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retainer and a pair of equipment-supporting legs extending laterally from the retainer and rearwardly with respect to the frame in vertically spaced-apart relation to each other, said legs of each bracket being reciprocally movable on an upright for corresponding movement of the bracket between a forwardly extending equipment-supporting position and a rearwardly retracted collapsed position, said retainer of each bracket including a first portion projecting upwardly from the uppermost one of the bracket legs for capturing a bar member seated on the uppermost leg between the retainer first portion and the front face of the upright on which the bracket is movable when the bracket is in said equipment-supporting position, and said retainer of each bracket including a second portion extending between the bracket legs for capturing a bar member seated on the lowermost leg between the retainer second portion and said front face of said upright and also between the bracket legs when the bracket is in said equipment-supporting position, and said retainer abutting on said front face of said upright when the bracket is in said collapsed position; and

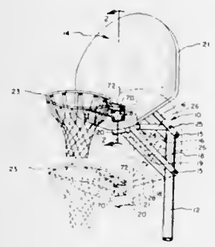
stop means associated with each of said leg pairs and its upright, for resisting said movement of the corresponding bracket either forwardly or rearwardly when in said equipment-supporting position.

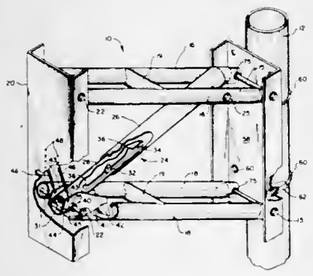
4,781,375

METHOD AND APPARATUS FOR ADJUSTING A BASKETBALL GOAL

Stephen F. Nye, Roy, Utah, assignor to Lifetime Products, Inc., Clearfield, Utah

Filed Oct. 21, 1986, Ser. No. 922,041
Int. Cl.[4] A63B *63/08*
U.S. Cl. 273—15 R **63 Claims**





1. An adjustable basketball goal system for adjustment of the height of a basketball goal above a playing surface, comprising:

a deformable parallelogrammatic structure;

means for securing the basketball goal to said parallelogrammatic structure;

means for securing said parallelogrammatic structure to a rigid vertical support such that said parallelogrammatic structure is suspended above the playing surface; and

a telescoping support, said telescoping support being slidable a maximum distance between a retracted configuration and an extended configuration and disposed substantially as a diagonal for said parallelogrammatic structure wherein said telescoping support has two ends, each of which is pivotally connected to said parallelogrammatic structure, comprising:

a first cylindrical member having a longitudinal slot with a plurality of notches, said first cylindrical member having one end pivotally connected to a pivot pin connected to said parallelogrammatic structure such that said first cylindrical member is capable of angular movement about said pivot pin within the plane of said parallelogrammatic structure, and said first cylindrical member also having two elongated bores through which said pivot pin is disposed such that said first cylindrical member is capable of limited rotational movement about its longitudinal axis;

a second cylindrical member slidably connected to said first cylindrical member and having a post disposed within said slot, wherein said post slides along the length of said slot as said first cylindrical member slides with respect to said second cylindrical member and said post may engage one of said notches to restrict further movement of said first and second cylindrical members with respect to each other, and wherein said first and second cylindrical members are concentric and said first cylindrical member is disposed, at least partially, within said second cylindrical member;

a rotator means for rotating one of said cylindrical members about its longitudinal axis whereby said post is disengaged from one of said notches and is disposed for slidable movement along the length of said slot thereby allowing said telescoping support to extend and contract its length; and

means for restricting the sliding movement of said first and second cylindrical members when one of the cylindrical members is rotated and released such that the inadvertent momentary actuation of said rotator means results in the cylindrical members sliding substantially less than said maximum distance.

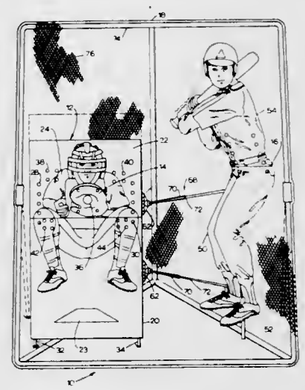
4,781,376

LIFE-LIKE BASEBALL PITCHER'S TRAINING DEVICE

Dave Barnes, Sr., 341 Frey La., Fairview Heights, Ill. 62208

Filed May 7, 1987, Ser. No. 47,688
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 A **12 Claims**

1. A training device for baseball pitchers comprising a life-size catcher figure, means for supporting said catcher figure upon a ground surface a catcher's mitt member having means for support upon said catcher figure, a life-size batter figure supported from said catcher figure in interchangeable left and right handed positions on opposite sides of said catcher figure, said catcher figure having means for adjusting the height to simulate different sized catchers, said batter figure having independent means for adjusting the height to simulate different sized batters, the batter figure having means for pivoting about a vertical axis to simulate different positions of adjustment in each of said right and left handed positions of the batter in a batter's box.

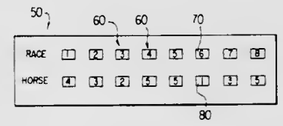


4,781,377

HYBRID SPORTING EVENT AND GAME SHOW

Charles D. McVean, and David R. Kime, both of McVean & Company, 850 Ridge Lake Blvd., Suite G01, Memphis, Tenn. 38119

Filed Oct. 24, 1986, Ser. No. 922,842
Int. Cl.[4] A63F *9/14*
U.S. Cl. 273—86 R **19 Claims**



1. A method of conducting a racing event comprising the steps of:

providing a racing facility;

providing a plurality of animals, each animal bearing a distinct animal-identifying indicium;

providing a controlling unit of a robotic jockey mounted on and controlling each animal;

providing remote control means of the robotic jockeys for controlling each of the controlling units;

providing a plurality of race cards, each race card bearing a plurality of race pairings, each race pairing including a race-identifying indicium and a corresponding indicium which is one of said animal-identifying indicia, no two of said race cards bearing identical race pairings for every race of the event;

distributing to each of a plurality of players at least one of said race cards;

using the remote control means and controlling units to conduct a racing event comprising a plurality of races of at least two of said animals from a start to a finish;

for each race of the event, declaring one of said animals to be the winner of the race;

for each race of the event, declaring every race card to be a winning race card for the race which bears a race pairing corresponding to the race that includes an animal-identifying indicium matching the animal-identifying indicium borne by the winning animal;

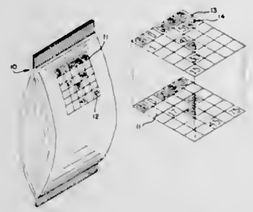
declaring an event-winning race card to be a card which has been declared to be a winning race card for every race of the event.

4,781,378

PROMOTIONAL GAME

John V. Clinnin, Nokomis, Fla., and Dale E. Dolence, Carbondale, Ill., assignors to Lustour Corp., Murphysboro, Ill.

Filed Jul. 22, 1987, Ser. No. 76,322
The portion of this patent subsequent to Oct. 4, 2005, has been disclaimed.
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—138 R **7 Claims**



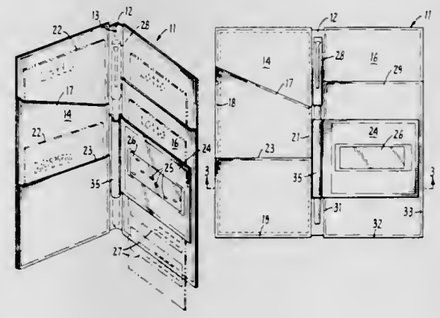
1. A promotional game including a game board on which is imprinted a first set of game indicia, and at least one grease and moisture resistant game card consisting of a transparent film laminate formed of a core layer of transparent biaxially oriented polymeric film printed with a second set of game indicia particularly adapted to correspond with said first set of game indicia printed on said game board, a layer of adhesive disposed over said core layer, a layer of transparent, grease and moisture resistant, polymeric film disposed over said layer of adhesive whereby said adhesive and film layers seal and protect said second set of game indicia from contamination or alteration, said game played by placing said game card in register with, and overlying said game board such that the combined game card and game board will immediately indicate whether such combination is a game winner.

4,781,379

DEVICE FOR STORING AND CHECKING WINNING NUMBERS ON LOTTO TICKETS

James H. Parks, 413 Agate Ct., Antioch, Calif. 94509

Filed Aug. 24, 1987, Ser. No. 88,565
Int. Cl.[4] A63F *3/06*
U.S. Cl. 273—148 R **4 Claims**



1. A device for storing lotto tickets and for readily identifying winning numbers on each ticket, comprising

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a single fold flexible wallet of opaque material having flat sides of approximately equal area and a central fold line between said sides,

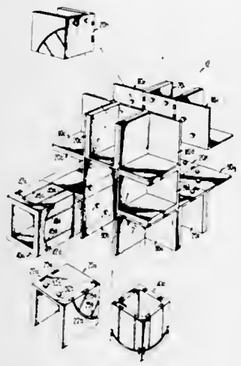
a transparent sheet member covering a major portion of one of said sides of said wallet and secured thereto around three of its sides to provide a transparent faced pocket adapted for storing a plurality of lottery tickets,

an opaque sheet member secured to said wallet at the single fold thereof and extending therefrom to overlie the other of said sides when said wallet is unfolded to lie flat,

a rectangular portion of said last named sheet member of commensurate size with a numbered unit area of a lotto ticket being transparent and formed for selective registration with successive rectangular numbered unit areas of lotto tickets,

said transparent rectangular portion being formed for removably receiving rings of colored indicator material at locations coinciding with the chosen numbers on a single unit area of said lotto ticket.

4,781,380
ARTICULATED RING PUZZLE
Thomas J. Irwin, P.O. Box 7710, Atlanta, Ga. 30357-0710
Filed Oct. 28, 1987, Ser. No. 114,645
Int. Cl.[4] A63F *9/08*
U.S. Cl. 273—153 S **12 Claims**



1. A puzzle comprising:

(a) a plurality of edge components wherein each such edge component has two orthogonal faces and two parallel faces, with each such parallel face being perpendicular to both of the orthogonal faces;

(b) a plurality of center components wherein each such center component has two pair of parallel faces, with each pair perpendicular to the other pair;

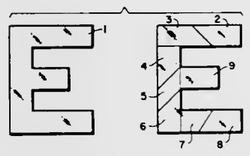
(c) a separate operation guiding track associated with each parallel face of each edge component, for guiding the movement of adjacent orthogonal faces of other edge components during operation of the puzzle;

(d) a separate operation guiding track associated with each parallel face of each center component, for guiding the movement of adjacent orthogonal faces of edge components during operation of the puzzle;

(e) a separate track engagement means associated with each orthogonal face of each edge component, for engaging and following the guiding tracks of adjacent parallel faces of center components and other edge components; and

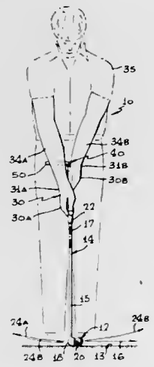
(f) a separate assembly guiding track associated with each face of each center component, each with locking means to selectively permit passage of the adjacent edge component track engagement means along the assembly guiding track only during assembly of the puzzle.

4,781,381
STACKED SHEETS WITH CODE BITS FORMING COMPOSITE IMAGE
Ferdinand Hein, Schulestrasse 9, Augsburg, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 665,788, Oct. 29, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 899,478
Int. Cl.[4] A63F *9/12*
U.S. Cl. 273—157 A **3 Claims**



1. A three-dimensional puzzle comprising: a plurality of transparent sheets; code bits of information distributed on said plurality of transparent sheets; wherein said plurality of transparent sheets are stacked together to define a three-dimensional puzzle, said transparent sheets having thicknesses on the order of the linear dimensions of said code bits in planes parallel to said transparent sheets, whereby a composite image is defined by said code bits when viewed from a single precise angle of view other than normal to the stacked sheets composite image is not apparent when the three-dimensional puzzle is viewed from other angles of view.

4,781,382
GOLFING AID
Lawrence J. Hargraves, 2271 E. Chevy Chase Dr., Glendale, Calif. 91206
Filed Mar. 17, 1987, Ser. No. 26,971
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 B **10 Claims**

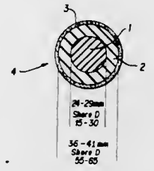


1. In combination with a golf putter that includes a head portion having a face for striking the ball and a shaft having first and second ends, said first end of said shaft secured to said head and a gripping portion that extends inwardly from said second end thereof, a device for aiding the golfer to properly strike the ball when putting, the device comprises:

a support member mounted at substantially said second end of said shaft; and

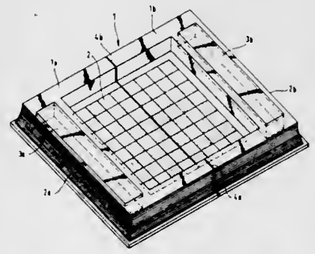
a generally linear arm mounted solely to and supported by said support member, and arm extending outwardly from said shaft in an opposite direction to said face and being of a length to support the arm of the golfer which is gripping the lower part of said gripping portion while the golfer's other arm is gripping the upper part of said gripping portion.

4,781,383
SOLID THREE-PIECE GOLF BALL
Toshihiko Kamada, Kagawa; Shunji Izumi, Tamano, and Shinichi Watanabe, Kagawa, all of Japan, assignors to Kamatari Co., Ltd., Kagawa, Japan
Filed Jun. 27, 1986, Ser. No. 879,783
Claims priority, application Japan, Feb. 4, 1986, 61-21231
Int. Cl.[4] A63B *37/06*
U.S. Cl. 273—228 **3 Claims**



1. A solid three-piece golf ball having a core consisting of inner and outer layers, and a shell covering said core, characterized in that said inner layer has a diameter of 24–29 mm and a hardness (Shore hardness D) of 15–30, said outer layer having a diameter of 36–41 mm and a hardness (Shore hardness D) of 55–65, and the area of the portion of the surface of said golf ball which contacts a club face when said golf is struck by the club being 27–35% said area being determined by dividing the area of the portion of the surface of a ball which contacted the face of a driver (wood club #1) when the ball was struck by the driver at a head speed of 40 m/sec by the area of a diametrical cross section of the ball and multiplying the quotient by 100.

4,781,384
STORAGE BOX
Rene Bois, "Bois du Roch" , St-Genest-De-Contest 81440, Lautrec, France
Filed Sep. 30, 1986, Ser. No. 913,847
Claims priority, application France, Sep. 30, 1986, 85 15045
Int. Cl.[4] A63F *3/00;* **A45C** *13/10;* **B65D** *85/20, 73/00*
U.S. Cl. 273—285 **17 Claims**



1. In a box for storing social games, said box having the form of a book and comprising two symmetrical parts forming the covers of the book which are articulatedly mounted on one another, said box being movable between a closed position and an open position, said symmetrical parts being positioned one adjacent the other on one plane onto which game pieces can be placed when the box is in the open position and each said symmetrical part being pressed against the other when the box is in the closed position, the improvement wherein:

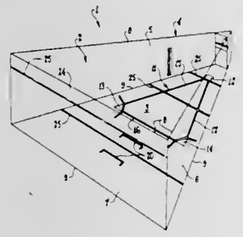
said box further comprises a male component forming the back of the book and having a salient portion;

the two symmetrical parts forming the covers of the book form a female component of the box which is further provided with an aperture where the salient portion can be inserted to secure the box in the closed position, said aperture being provided on the side of the female component where the symmetrical parts are articulatedly mounted on one another;

said box further comprises a gameboard which is asymmetrically pliable onto itself and when fully open can be positioned on the two symmetrical parts when said box is in the open position; and

said salient portion has an internal face which is provided with a longitudinal groove for insertion of said gameboard.

4,781,385
BALL GAME
Gary R. Harley, Mount Macedon, Australia, assignor to Pro Cricket Pty, Ltd., Port Melbourne, Australia
Filed Nov. 7, 1986, Ser. No. 928,195
Claims priority, application Australia, Nov. 11, 1985, PH3351
Int. Cl.[4] A63B *71/02, 59/06*
U.S. Cl. 273—411 **11 Claims**



1. An indoor ball game played between teams of oppsing players comprising:

a playing arena having a triangularly shaped playing area on which team players stand during game play;

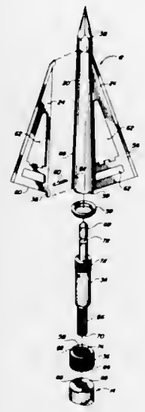
wall means providing upright boundary walls extending completely along boundary edges of the playing area, the walls being formed of netting material held taut;

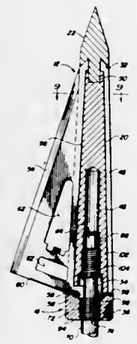
three bases located on the playing area in a triangular formation so as to define a triangularly shaped endless games track having straight track sections extending between adjacent bases, the games track arranged with the track sections extending parallel to respective boundary edges of the playing area and arranged offset the playing area so as to be closer to one apex of that area, that one of the bases closest to the one apex of the playing area being designated a batting base at which a game player is positioned for receiving and striking a ball pitched thereto from another game player on the playing area before progressively moving in one direction along the games track to successive bases in order to obtain a score during game play; and

a series of score zones having different score values spaced about the walls which, when hit by a ball struck by a game player at the batting base during game play, results in a respective score allocation according to game rules.

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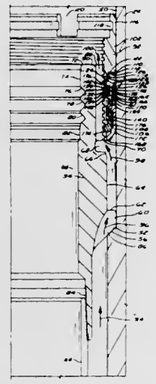
4,781,386
FLETCHING ALIGNMENT NUT
George E. Armitage, 620 Dedham Dr., Port Richey, Fla. 34668
Filed Jul. 31, 1987, Ser. No. 80,018
Int. Cl.[4] F41B *5/02*
U.S. Cl. 273—422 19 Claims





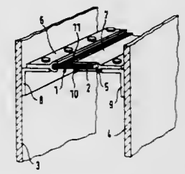
9. An arrow including, in combination:
a broadhead having a tapered body with a plurality of axial blade receiving slots symmetrically formed around the periphery thereof and an axial aperture formed in the rearward end thereof, a point coupled to the forward end of the body, and blades removably received in the slots with their forward ends removably secured in position by the point and with their rearward ends extending rearwardly of the body;
a shaft having a nock at the rearward end thereof, an axial aperture formed in the forward end thereof and fletching symmetrically secured around its periphery adjacent to the nock equal in number to the number of blades; and an assembly coupling the broadhead and shaft comprising a cylindrical stem having a cylindrical forward end coupled within the rearward end of the broadhead and having a cylindrical rearward end coupled within the forward end of the shaft and having intermediate external threads formed therebetween, the assembly also including a cylindrical cap having internal threads received on the intermediate threads of the stem whereby rotation of the cap with respect to the stem will move the cap along the length of the stem allowing for the varying the rotational position of the broadhead and shaft with respect to each other.

4,781,387
METAL TO METAL SUBSEA CASING HANGER SEAL
Benton F. Baugh, 11626 Oak Bend, Houston, Tex. 77079
Filed Jun. 15, 1987, Ser. No. 61,587
Int. Cl.[4] F16J *15/00*; E21B *43/013*; F16L *35/00*
U.S. Cl. 277—12 18 Claims



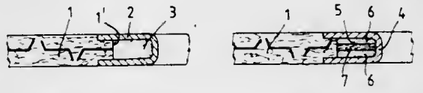
1. In a subsea wellhead providing a support shoulder and a generally cylindrical seal bore with a casing hanger supported on said support shoulder within said wellhead, said casing hanger providing an external seal diameter and a stop shoulder spaced below said external seal diameter, said cylindrical seal bore and said external seal diameter being concentric and spaced apart and providing an annular gap therebetween, a seal assembly comprising,
a seal element of a radial cross section to fit within said annular gap, comprising an upper section, a nose section, a seal section, a connection between said upper section and said seal section, and a connection between said seal section and said nose section,
said upper section being adapted to transmit a setting and retaining force to the seal section,
said nose section being adapted to land on said stop shoulder and having an upper shoulder,
said seal section comprising a continuous metal band centrally located within said annular gap, an external seal preparation located around said metal band, and an internal seal preparation within said metal band,
said metal band providing a metal connection between the top end of said seal section and the bottom of said seal section,
said internal seal preparation comprising at least one inner metal seal area adapted to be pressed against and to seal against said external seal diameter,
with said external seal preparation comprising at least one outer metal shoulder which slopes downwardly and outwardly and said at least one outer metal shoulder of said external seal preparation landing on said upper shoulder of said nose section upon downward movement of said seal section after said nose section has landed on said stop shoulder, such landing and contact between said at least one outer metal shoulder of said external seal preparation and said upper shoulder causing said at least one outer metal shoulder to be moved to a more horizontal position and thereby extending the radial component of said at least one outer metal shoulder causing the outer end of said at least one outer metal shoulder to contact said cylindrical seal bore of said subsea wellhead for sealing thereupon and for providing a reaction force in the direction opposite to the contact on the cylindrical seal bore of said wellhead to provide a compressive loading and constrict the diameter of said metal band and thereby press said at least one inner metal seal area against said external seal diameter on said casing hanger for sealing thereupon.

4,781,388
BRUSH SEAL
Bernhard Wöhrl, Gauting, and Klaus Hagemeister, Munich, both of Fed. Rep. of Germany, assignors to MTU -Motoren- und Turbinen Union München GmbH, Munich, Fed. Rep. of Germany
Filed Apr. 18, 1986, Ser. No. 853,679
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1985, 3514382
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] F16J *15/447*
U.S. Cl. 277—53 19 Claims



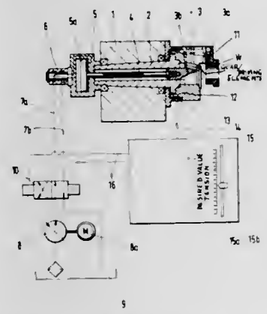
1. A brush seal for first and second spaced, adjoining members which are capable of undergoing universal relative displacement, said seal comprising a plurality of flexible bristles having opposite ends, means secured to the first member for securing one of the ends of the bristles to the first member in a state in which the bristles fan outwardly from said one end towards the other end and the thickness of the seal increases in a direction away from said one end, and fork means secured to the second member for embracing the other of the ends of the bristles to permit the relative universal displacement of the members while providing sealing between said members, said fork means comprising opposed spaced legs defining a space into which said other end of the bristles extends for relative free movement to accomodate said universal relative displacement of said members, said legs having free ends defining a throat at which the bristles enter said space, said legs being spaced apart by a distance less than the thickness of the fan of said plurality of bristles to apply resilient squeezing force to the bristles and provide sealing between said first and second members in their original positions and when displaced.

4,781,389
FLAT SEALING GASKET HAVING GRAPHITE-FILLED ARMOR
Horst Beyer, Burscheid; Karl-Heinz Maus, Wuppertal; Detlev Lachnit, Leverkusen; Klaus Lönne, Burscheid; Klaus-Peter Majewski, Burscheid, and Hans-Rainer Zerfass, Burscheid, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany
Filed Jul. 31, 1986, Ser. No. 890,947
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528614
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—235 B 16 Claims



1. In a flat sealing gasket made of a gasket material and including a generally circular opening defined by a peripheral gasket edge and a sheet metal armor of U-shaped cross section framing the peripheral gasket edge and having an open side oriented radially outwardly away from said generally circular opening and three closed sides; the improvement wherein said armor encloses on three sides a four-sided annular space situated radially inwardly of said gasket edge; said annular space extending generally concentrically with said opening; further comprising a graphite filling being separate from said gasket material and occupying said space; said graphite filling being bounded on three sides by said armor; and blocking means for circumferentially closing said open side for encapsulating said graphite filling in said four-sided space to prevent escape of the graphite filling from said space in a radially outward direction.

4,781,390
APPARATUS FOR THE ADJUSTMENT OF THE TENSION IN A ROTATING GRIPPING DEVICE OF A MACHINE TOOL
Josef Steinberger, Düsseldorf, and Bert Bongartz, deceased, late of Düsseldorf, both of Fed. Rep. of Germany by Sigrid Bongartz, heiress, assignors to Paul Forkardt GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany
Filed Aug. 27, 1986, Ser. No. 900,835
Claims priority, application European Pat. Off., Aug. 27, 1985, 85110723.5
Int. Cl.[4] B23B *31/24*
U.S. Cl. 279—4 2 Claims



1. An apparatus for the adjustment of the tension of a rotating gripping device of a machine tool having a plurality of gripping elements operated by a tension producing means, with said tension producing means having a correcting element that varies tension applied via drive elements, and whereby a build up and a withdrawal of tension applied can follow distinct prescribed characteristics, with at least one measuring element being disposed in said gripping device and acting to ascertain determined values of the tensions applied directly when actually exerted by said gripping elements on a workpiece which is gripped by said gripping device, and with said determined values being transferable through a signal controller from said gripping device to a regulator for continuous and correct controlled regulation of the tension applied so that at every time the actual value of tension corresponds objectively correct as to intended rated value with an internal tolerance within allowable variation thereof, which comprises:
means to provide a desired value for said tension applied which is presupposed in said regulator, with said regulator being electronic;
means to establish at least one upper regulating desired value;
further means to establish at least one lower regulating desired value;
means to define an internal tolerance allotment which is the

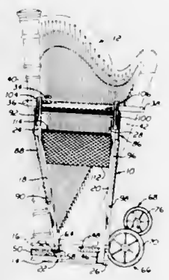
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amount by which said upper and said lower regulating values may differ from said desired value;

means for carrying out of a continual comparison between said desired value and said determined values; and

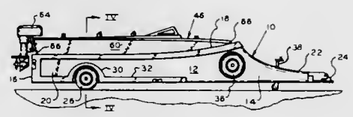
means to provide a leading controller output which is digitally produced in said regulator to change the tension applied by said tension producing means through the action of said correcting element, with said controller output being produced in intervals which are of greater amount when there is a larger difference between said determined value and said desired value and of smaller amount when there is a smaller difference between said determined value and said desired value, and with said controller output being reduced to a presupposed magnitude when said desired value of said tension applied is reached through said determined value, whereby said determined value of said tension applied correspondingly falls below said desired value through said reduction of said controller output and correspondingly increases from below said desired value to said desired value, and whereby with an increase of said determined value of said tension applied to a presupposed value from an upper tolerance allotment, said controller output is decreased to lower said tension applied so long as a lower allotment of said lower desired value is a new desired value until said determined value of said tension applied reaches a value between the respective said desired value and a lower desired value allotment, after which point, said controller output is increased again until it reaches said desired value through said determined value and is regularly lowered through said reduction of said controller output.

4,781,391
HARP CARRIER
Rudolph R.-Hartwig, 3455 Indiana Rd., Rotonda, Fla. 33947
Filed Mar. 9, 1987, Ser. No. 23,829
Int. Cl.[4] B62B *5/02*
U.S. Cl. 280—5.2 25 Claims



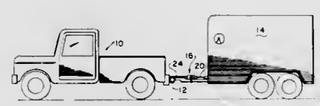
1. A carrier for transporting a harp, said carrier comprising: a base plate for receiving the base of the harp thereon, first and second side rails extending from said base plate, a first end of each of said side rails being fixed to said base plate, and a second end of each of said side rails extending therefrom; a harp support arm mounted in interconnecting relation between said second ends, said harp support arm comprising a first arm extending outwardly from said second end of said first side rail and a second arm extending outwardly from said second end of said second side rail, said first arm being adjustable relative to said second arm to releasably engage the column of a harp placed on said carrier; base restraining means comprising a harp base cradle mounted on said base plate and a harp base restraining element attached to said first end of said first side rail and being releasably engageable with the base of a harp placed on said carrier to selectively restrain the base of the harp on said base plate; and first wheel means attached to said base plate whereby said carrier may be rolled across a support surface.

4,781,392
MOLDED BOAT TRAILER
Gary J. Cooper, 105 Lakeside, Jackson, Mich. 49201
Filed Jul. 13, 1987, Ser. No. 72,771
Int. Cl.[4] B60P *3/10*
U.S. Cl. 280—414.1 21 Claims



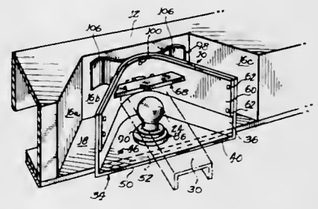
1. A boat trailer characterized by its ability to conform to the hull configuration of a trailered boat having an upper bow point comprising, in combination, a body having a front, a rear, lateral sides, an upper portion and a bottom portion, wheels mounted upon said body bottom portion, a tongue defined on said body front extending in a forward direction, a cavity defined in said body upper portion having lateral sides and located intermediate said body lateral sides and intersecting said body rear, said body lateral sides and said cavity lateral sides respectively intersecting at a front apex and enclosing a substantial portion of the sides of a boat located within said cavity and the boat upper bow point being substantially within said front apex whereby said trailer body and the boat produce a unitary appearance.

4,781,393
TRAILER LIGHT CONVERTOR
C. Duane Jeter, Rte. 5, Box 866 G, Midland, Tex. 79707
Filed Jun. 26, 1987, Ser. No. 67,617
Int. Cl.[4] B60D *7/04*
U.S. Cl. 280—422 5 Claims



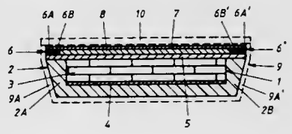
1. Structure for matching electrical connections of
a. a towing vehicle having
b. a trailer hitch with
c. a trailer hitched thereto;
d. hot wires on the towing vehicle for activating stop lights, turn lights, running lights, and the like on the trailer, and
e. light wires on the trailer connected to stop lights, turn ights, running lights, and the like on the trailer;
f. wherein the improvement comprises:
g. a box;
h. switch means in the box for changeably connecting any one of the hot wires to any of the light wires;
i. plug means extending from the box for electrically connecting each of said hot wires to said switch means;
j. socket means on the box for electrically connecting each of the light wires to said switch means;
k. a two-ended hot adapter jumper having
  i. a hot socket on one end mated with the plug means extending from the box,
  ii. a tow plug on the other end adapted to plug into a socket on the towing vehicle; and
l. a two-ended light adapter jumper having
  i. a light plug on one end mated with the socket means on the box, and
  ii. a light socket on the other end adapted to receive a plug on the trailer.

4,781,394
TRAILER HITCH GUIDE
Peter W. Schwarz, Idaho Falls, and Lance L. Hall, Shelley, both of Id., assignors to Universal Concepts, Inc., Idaho Falls, Id.
Filed May 29, 1987, Ser. No. 55,696
Int. Cl.[4] B60D *1/12*
U.S. Cl. 280—477 8 Claims



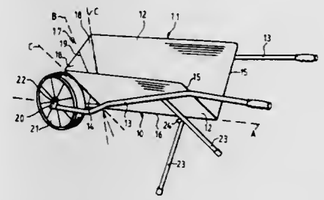
1. A trailer hitch for attachment to a bumper of a vehicle so as to provide releasable coupling with a trailer coupling member, said hitch comprising:
a coupling ball having a top and means for attachment to the bumper;
partial enclosure means partly surrounding said coupling ball having a wall portion extending above the top of said coupling ball and defining slot means for receiving a safety bar, said partial enclosure means further having means for attachment to the bumper; and
safety bar means receivable in said slot means so as to supported by said wall portion in overlying relationship with said coupling ball when said coupling ball is coupled to a trailer coupling member interposed between said coupling ball and said safety bar means, whereby unintentional uncoupling of said coupling ball and the trailer coupling member is prevented.

4,781,395
SKI
Josef Fischer, Ried im Innkreis, Austria, assignor to Fischer Gesellschaft m.b.H., Ried im Innkreis, Austria
Filed Oct. 27, 1986, Ser. No. 923,417
Claims priority, application Austria, Oct. 28, 1985, 3105/85
Int. Cl.[4] A63C *5/12*
U.S. Cl. 280—610 8 Claims



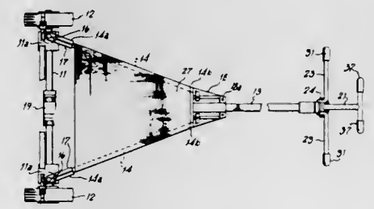
1. A ski having a core, a lower cover layer on a bottom surface of the core, the lower cover layer having edge portions extending beyond the core, a running surface coating and lateral running edges beneath the lower cover layer, the core being covered with a one-piece layer of plastics material, having a substantially U-shaped cross section, said one-piece layer having a web covering an upper surface of the core and limbs covering the sides of the core, said limbs having bottom surfaces covering said edge portions of the lower cover layer over their entire extent beyond the core and the limbs further having outer surfaces which taper inwardly over their entire extent from said bottom surfaces to an upper surface of the web.

4,781,396
COLLAPSIBLE WHEELBARROW
David H. King, 'Greenways', Brick Kiln Lane, Suffield, Norwich, Norfolk, England
Filed Jun. 9, 1987, Ser. No. 59,965
Int. Cl.[4] B62B *1/20*
U.S. Cl. 280—653 7 Claims



1. A collapsible wheelbarrow which comprises first and second sections each having a load-containing wall, a wheel support part extending from one end of each said load-containing wall, a handle part extending from the opposite end of each said load-containing wall, said load-containing wall of said side sections having lower edges which are directly hinged together for relative pivotal movement about a first axis extending substantially in the planes of said two load-containing walls, a generally triangular front wall pivoted to both said load-containing walls at or adjacent their respective said one ends, said front wall being foldable about a second axis passing through said first axis and dividing said front wall into two substantially similar triangular portions, and a rotatably-mounted wheel carried by said two wheel support parts, the wheelbarrow being arranged to permit collapsing movement from an opened-out position by relatively moving the two handle parts closer together so pivoting the two side sections about said first axis until the two load-containing walls lie side-by-side, the front wall simultaneously being folded about said second axis to lie generally in the same plane as the two load-containing walls.

4,781,397
COLLAPSIBLE TROLLEY
Michael Burn, Little Bealing, England, assignor to Cornucopia Products & Design Ltd., Suffolk, England
Filed Jul. 30, 1987, Ser. No. 79,493
Claims priority, application United Kingdom, May 28, 1987, 8712560
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—655 17 Claims



1. A collapsible trolley adapted for transporting and launching dinghies and like-sized boats, comprising
(a) a rear axle having endwise disposed wheels
(b) a Y-frame comprising a forward spine and trailing frame members pivotted thereto
(c) said frame members being deployed by pivotting be-

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tween a stowing position alongside and parallel to the spine and an operational Y shaped configuration in which the ends of the frame members remote from their spine pivot ends are releasably attachable to the axle near the ends thereof

(d) attachment of said remote ends of said frame members to the axle constituting the sole means of attachment of said Y-frame to said axle.

4,781,398

FRAME UNIT FOR VEHICLES

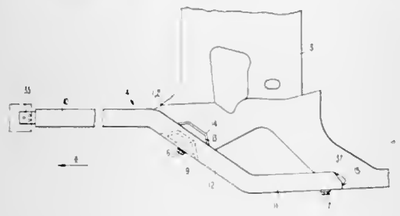
Manfred Uebelstadt; Peter Watzold, both of Wettstetten, and Roland Heidl, Lenting, all of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed Feb. 6, 1987, Ser. No. 11,632

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603706

Int. Cl.[4] B60R *21/00*

U.S. Cl. 280—784 **15 Claims**



1. A frame unit for a vehicle having a main frame unit comprising a pair of laterally spaced, longitudinally disposed structural side members and a transversely disposed structural cross-piece member defining an extension unit, said extension unit including means disposed at the intersections of said side members and said cross-piece member for rigidly securing said extension unit to said main frame unit sufficiently for transmitting impact loads from said extension unit to said main frame whereby sections of said side members extend forwardly of said main frame unit and are disposed in a crumple zone of said vehicle.

4,781,399

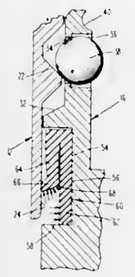
QUICK-CONNECT COUPLING HAVING IMPROVED SEAL

George D. Collon, Beacon Falls, Conn., assignor to WPM, Inc., Waterbury, Conn.

Filed Dec. 7, 1987, Ser. No. 129,250

Int. Cl.[4] F16L *21/08*

U.S. Cl. 285—8 **6 Claims**



1. In a quick-connect coupling including:

a. a tubular nipple having threads at its upper end adapted to screw on a kitchen faucet or the like, a downwardly facing stop surface beneath the threads and a lower portion comprising an outward retaining surface with an annular retaining enlargement therebelow, and

b. a coupler fitting having a tubular body received over said nipple lower portion, a portion of the body engaging the stop surface, the body having circumferentially spaced openings adjacent its upper end, a detent disposed in each opening, an annular skirt surrounding the body and having an inward annular projection, spring means urging the skirt upward on the tubular body so that the skirt normally tends to assume a position with the projection holding the detents inward firmly above the enlargement on the nipple to hold the coupler fitting on the nipple, and resilient seal means disposed in an annular recess in the inside of the body, the recess having a flat back wall, the seal means extending inward to engage the nipple below the retaining surface; the improvement wherein the seal means is an integral molded annulus including a band portion disposed sealingly against the back wall of the recess and a wing portion extending inward and downward from the upper end of the band, the wing portion tapering in thickness narrowing as its distal end is approached, its distal end being formed with an inward rib, the inward rib being in the form of an outwardly and upwardly convex curving surface, the curving surface sealingly engaging the nipple in a line of engagement about the periphery of the nipple, a portion of the distal end beyond said line of engagement angling outward and upward to provide a substantially flat surface adapted to resolve the force of fluid pressure thereagainst into a horizontal component urging the curving surface against the nipple more tightly at the line of engagement.

4,781,400

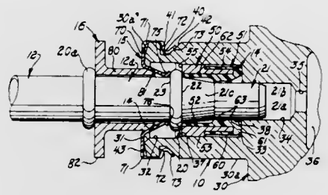
QUICK CONNECT TUBE COUPLING

Gail M. Cunningham, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1987, Ser. No. 68,457

Int. Cl.[4] F16L *37/12*

U.S. Cl. 285—39 **2 Claims**



1. A quick connect tube coupling comprising a socket member, a plug member, a tubular seal member and a spring member; said plug member being of tubular configuration with a pair of axially spaced apart upstanding annular inboard and outboard beads thereon and with a reduced diameter pilot tube portion extending from said inboard bead, said inboard bead defining on its inboard side a radial shoulder and on its opposite side an abutment shoulder; said socket member having a socket bore therein that extends from a hexagonal end thereof so as to define at least an annular first internal wall, a second wall and a pilot tube receiving wall, with a radial abutment shoulder interconnecting said second wall to said pilot tube receiving wall and an annular groove in the outer peripheral surface of said hexagonal end of said socket member; said tubular seal member including a tubular member adapted to be secured in said second wall and an elastomer fixed to said tubular member in a configuration so as to define an axially extending nib for

sealing engagement with said radial abutment shoulder and to define a pair of axially spaced apart beads sized so as to sealingly engage the outer peripheral surface of said pilot tube portion; and, spring retainer including a washer-like disk base having the outer peripheral edge thereof connected to circumferentially spaced apart spring fingers with each said spring flanges terminating at the free end thereof with lock leg means engageable in said annular groove to effect axial retention of said spring retainer to said socket member and, a plug retainer means interconnected to the inner peripheral edge of said disk base, said plug retainer means extending in the same axial direction as said spring fingers whereby said plug retainer means will abut against said abutment shoulder of said inboard bead is fully inserted into said socket member such that said radial shoulder of said inboard bead abuts against said tubular member of said seal member.

4,781,401

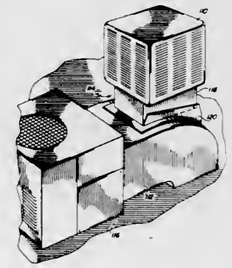
ADJUSTABLE JACK FOR MOUNTING ON A DUCT BEND

Donald W. Sharp, Phoenix, Ariz., assignor to Reynalda Clack, Phoenix, Ariz.

Filed May 15, 1987, Ser. No. 50,082

Int. Cl.[4] F24F *13/02*

U.S. Cl. 285—44 **4 Claims**



1. An improvement in an adjustable angle adaptive duct section for connecting an air handler to an upper curved side of an elbow portion of a distribution duct, the distribution duct having a rectangular cross section, the adjustable angle adaptive duct section having an inlet end and an outlet end, the inlet and the outlet ends of the adjustable angle adaptive duct section being joined by at least a bendable section, each of the inlet and outlets ends comprising a plurality of walls, the improvement comprising:

means for adapting the outlet end of the adjustable angle adaptive duct section to a portion of said upper curved side of said elbow portion of said rectangular cross section distribution duct, wherein said adaptive means comprises a mounting flange at said outlet end of said adjustable angle adaptive duct section, said flange being curved to fit said upper curved side of said elbow portion of said rectangular cross section distribution duct, said mounting flange being generally perpendicular to each of the plurality of walls of the outlet section and to one of the walls of the inlet section.

4,781,402

METAL CHIMNEY ASSEMBLY

John D. Ream, Wichita, Kans., and David M. Fetters, Holland, Mich., assignors to Metal-Fab, Inc., Wichita, Kans.

Filed Dec. 22, 1986, Ser. No. 945,355

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—47 **5 Claims**

1. A metal chimney assembly comprising:

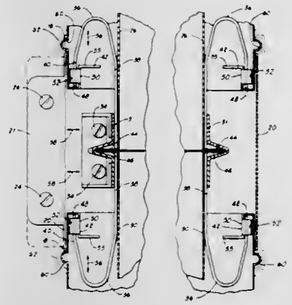
an upper double-wall section having a cylindrical inner flue wall and a cylindrical exterior casing wall;

a lower double-wall section having cylindrical inner flue wall and a cylindrical exterior casing wall;

an interior connecting band for securing together the ends of the flue walls of the upper and lower wall sections;

an exterior connecting band for securing together the ends of the casing walls of the upper and lower wall sections;

a plurality of "J"-shaped expansion clips, each of the clips having one end thereof attached to the flue walls such that



the clips are disposed around the circumference of the flue walls and extend outwardly therefrom; and

retainer means supported around the inner circumference of the exterior casing walls for slideably receiving a distal end of the clips, and maintaining the casing walls in a spaced relationship with the flue walls, the retainer means cooperating with the clips for providing longitudinal and radial movement between the inner flue walls and the exterior casing walls when the walls expand and contract at different rates creating relative movement.

4,781,403

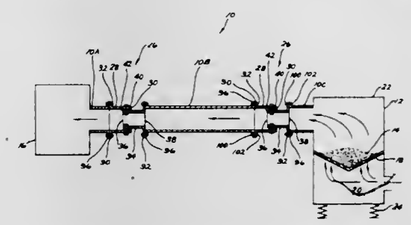
ARTICULATED CONDUIT COUPLING

Michael W. Durnil, Louisville, Ky., assignor to Carrier Vibrating Equipment, Inc., Louisville, Ky.

Filed Jan. 29, 1987, Ser. No. 8,634

Int. Cl.[4] A16L *7/00*

U.S. Cl. 285—94 **16 Claims**



1. An articulated conduit coupling comprising:

a first conduit section having a first and section cylindrical ends;

a second conduit section coaxially located with the first conduit section and having a first cylindrical end of a cross-sectional area sufficiently smaller than the cross-sectional area of the first conduit section such that the first cylindrical end of the second conduit section is concentrically received within the first cylindrical end of the first conduit section and such that a portion of the first cylindrical end of the first conduit section and such that a portion of the first cylindrical end of the first conduit

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section overlaps a portion of the first cylindrical end of the second conduit section with a clearance therebetween; and,

pivot means for pivotally diametrically interconnecting the overlapped portion of the second conduit section and overlapping portion of the first conduit section such that the diametric pivot axis is 90 degrees to the direction of relative pivotal motion between the first conduit section and second conduit section, the pivot means preventing any rotation of the first conduit section and second conduit section relative to each other about the concentric axis of the first and second conduit sections.

4,781,404

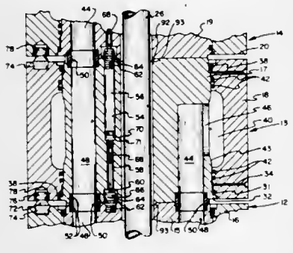
MULTI-PATH FLUID SWIVEL

Samuel P. Tharp, Houston; Edward H. Turner, Sugarland, and Joe W. Key, Magnolia, all of Tex., assignors to Key Ocean Services, Inc., Magnolia, Tex.

Continuation of Ser. No. 859,173, May 2, 1986, abandoned. This application Oct. 28, 1987, Ser. No. 117,362

Int. Cl.⁴ F16L *39/04*

U.S. Cl. 285—94 **16 Claims**



1. A multiple line fluid swivel for conducting fluids to and from a multiplicity of stationary lines and a multiplicity of corresponding rotating lines, at least some of which lines are adapted to conduct fluids at a pressure in excess of 1000 psi comprising:

a. a first lower core having a first integral fluid conduit formed therein open to the bottom of said first core and extending from said bottom and opening through the side of said first core and a second integral fluid conduit extending axially through said core,

b. a second upper core having an integral fluid conduit formed therein open to the bottom of said second core and extending from said bottom and opening through the side of said second core,

c. means securing said upper core to said first lower core including means to prevent rotation of said cores with respect to each other whereby said integral fluid conduit in said second core interfaces and is aligned with the second integral fluid conduit of said first core,

d. means forming a high pressure fluid seal to prevent leakage at said interface of fluid flowing from said second integral fluid conduit of said first core into said integral fluid conduit of said second core,

e. a housing closely surrounding each core, each housing independently rotatably supported on said corresponding core, said housings each cooperating with the corresponding core to form an annular chamber between said housing and core in alignment with the side opening of the core, and a side opening from said annular chamber to the exterior of said housing whereby fluid may flow from said side opening in said core into said annular chamber and out through said side opening, each housing being spaced from the adjacent housing to thereby permit relative motion of one housing with respect to the adjacent housing in the axial direction,

f. high pressure sealing means between each of said housings and its corresponding core located above and below said annular chamber to prevent leakage of fluid from said annular chamber said sealing means permitting rotation of said housings with respect to said cores, and

g. means extending between adjacent housings to prevent relative rotation between the two housings while permitting axial movement of one housing with respect to the adjacent housing.

4,781,405

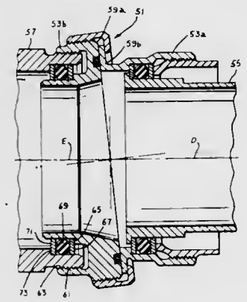
FLEXIBLE COUPLING FOR FLUID DUCTS

Bertram A. Peaster, Marietta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Division of Ser. No. 672,938, Nov. 19, 1984, Pat. No. 4,738,476. This application Apr. 30, 1987, Ser. No. 44,175

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—178 **6 Claims**



1. A flexible coupling for attaching a fluid duct having outwardly extending flanges to a threaded pipe having an internal stop abutment comprising:

(a) a pair of complementary coupling half assemblies each having a generally tubular configuration along a longitudinal centerline;

(b) one of said half assemblies for slidably mounting over one end of the fluid duct with sufficient clearance between the inside of said half assembly and the outside of the associated duct to permit conical movement therebetween;

(c) said other of said half assemblies having a generally tubular external portion with a threaded interior for mating with the threaded pipe to rigidly attach said half assembly to the pipe and a generally tubular interior portion for insertion into the pipe such that there is clearance between the interior of the pipe and the exterior of said interior portion, said interior portion having a stop abutment on is exterior;

(d) duct sealing means mounted in said one of said half assemblies for encircling the duct on which said one of said half assemblies is mounted to secure the duct to said half assembly and for sealing the clearance between the outside of the encircled duct and the inside of said one of said half assemblies while permitting conical and axial movement therebetween;

(e) pipe sealing means mounted in the threaded pipe for encircling said interior portion of said other of said half assemblies for sealing the clearance between the outside of the interior portion of said half assembly and the inside of the pipe when said exterior portion of said half assembly is threaded onto the pipe;

(f) adjacent end faces of each half assembly extending outwardly to form flanges abutting together in a plane disposed at an angle to the longitudinal center line of the associated half assembly;

(g) one of said flanges of said half assemblies having threads on the peripheral surface thereof; and

(h) a connector for securing one half assembly to the other, said connector being an annular collar having threads on the interior for mating with said threads of said one of said flanges and having an inwardly extending circular flange for engaging said flange without threads, the inside diameter of said collar providing sufficient clearance beween the external diameter of said flange without threads and said collar to permit radial and rotational movement between each half coupling assembly prior to the secure coupling of said assemblies one to the other.

4,781,406

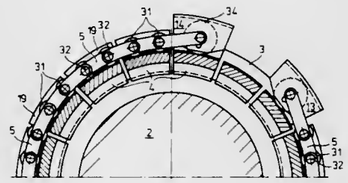
CLAMPING APPARATUS FOR JOINING TWO FLANGES

Jörg Hübener, Stutensee, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe G.m.b.H., Karlsruhe, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,907

Int. Cl.⁴ F16L *23/00*

U.S. Cl. 285—408 **3 Claims**



1. A clamping apparatus for joining two flanges including a plurality of clamping members spaced around two adjacent flanges, said clamping members being U-shaped and defining a cavity receiving therein portions of said flanges, a clamping chain extending around said clamping members for tightly engaging said clamping members and forcing them radially inwardly to provide clamping forces to said clamping members to cause firm engagement of said flanges with one another, said clamping chain and said clamping members being supported independently of one another, said clamping members being supported so as to be radially freely movable and said clamping chain being so associated with said clamping members as to provide only radially inwardly directed forces to said clamping members when said chain is tightened for engagement with said clamping members.

4,781,407

LATCH MECHANISM FOR THE GLOVE COMPARTMENT COVER OF A VEHICLE

Martin Rauchhaus, Dreieich-Sprendlingen, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 13, 1987, Ser. No. 37,579

Claims priority, application Fed. Rep. of Germany, May 13, 1986, 3616020

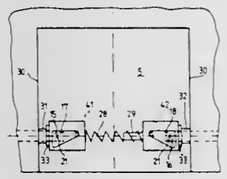
Int. Cl.⁴ E05C *9/14*

U.S. Cl. 292—37 **3 Claims**

1. A latch mechanism for the hingedly mounted glove compartment cover of a vehicle glove compartment comprising:

a pair of latching members reciprocably mounted in the glove compartment cover, each latching member having a locking rod at the outer end thereof adapted for introduction into a recess in the glove compartment to latch the door in the closed position, and each latching member having at the inner end thereof a cylindrical surface with a right-angled triangular shaped groove at the inner end thereof having walls which are perpendicular to each other respectively arranged parallel and perpendicular to the longitudinal axis of the locking rod and the wall perpendicular to the longitudinal axis of the locking rod located toward the outer end of the locking rod; and

a handle pivotable about a bearing axis disposed on the cover and in parallel relationship with the pivot axis of the cover, said handle having a pair of transmission elements which extend respectively into the triangular grooves of



the latching members whereby pivotal movement of the handle causes the transmission elements to be displaced in a path perpendicular to the axis of the locking members so that the transmission elements coact with the walls of the grooves to translate the latching members in and out of the recesses of the glove compartment.

4,781,408

COVER TOOL REMOVAL

Louis P. Hernandez, Central Islip, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 27, 1987, Ser. No. 125,977

Int. Cl.⁴ H05K *13/04*; A61B *17/04*

U.S. Cl. 294—99.2 **5 Claims**

1. A tool for removing a package cover, said cover and package when assembled having adjacent facing surfaces on opposite sides thereof and said tool comprising;

a pair of arms resiliently joined together at one end and which extend therefrom to respective opposite free-ends which, in a relaxed condition, are spaced apart from each other a distance sufficient for straddling the cover therebetween;

a jaw member provided at the opposite free-end of each arm, said jaw members having a lip operative to engage the cover facing surface adjacent thereto upon contraction of the arms towards each other and provide support for the cover as it is removed from the package.

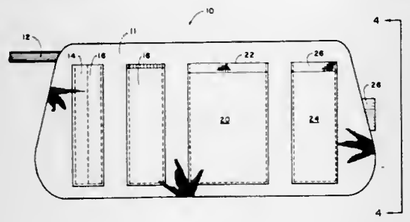
said jaw members having respective bottom surfaces that taper from the lip angularly downwardly away from each other to provide each jaw member with a wedge-shaped configuration operative to provide a wedging action between the cover and package facing surfaces effective to urge the cover and package apart upon contraction of the arms towards each other; and

resilient biasing means provided on each of the arms in facing relationship to each other, said biasing means operative to engage the side of the cover adjacent thereto and impart a resilient clamping force thereagainst in a compressed condition caused by contraction of the arms towards each other and to prevent the jaw lip from engaging the cover facing surface when the arms are in the

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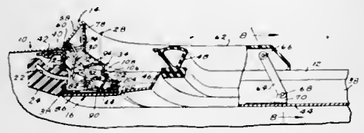
relaxed condition to facilitate removal of the cover from the tool.

4,781,409
AUTOMOBILE SUN VISOR ATTACHMENT
Peggy J. Harbison, 3938 S. Mission Oaks Dr., Chattanooga, Tenn. 37412
Filed Oct. 26, 1987, Ser. No. 112,115
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.6 **8 Claims**



1. A new and improved automobile sun visor attachment comprising:
cover means formed from an elastic stretchable fabric material;
storage compartment means on said cover means;
said cover means having a slot at one end thereof;
auxiliary sun visor means slidable in said slot;
and
a two channel strip for mounting around a periphery of an automobile sun visor and which forms a track for mounting said auxiliary sun visor means for sliding movement.

4,781,410
REMOVABLE ROOF ASSEMBLY WITH IMPROVED WIND DEFLECTOR
Bruce M. Gantner, Rochester, and Mark Gorentz, Milford, both of Mich., assignors to Webasto Sunroof, Inc., Rochester Hills, Mich.
Filed Jan. 5, 1987, Ser. No. 310
Int. Cl.[4] B60J *7/22*
U.S. Cl. 296—217 **19 Claims**

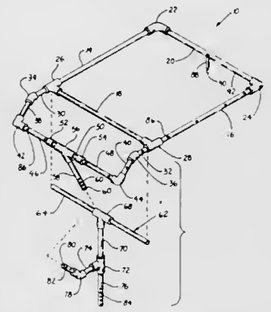


1. A removable roof assembly for an opening in a passenger vehicle roof, said vehicle roof opening including forward and rearward ends and sides extending therebetween comprising
housing means for mounting beneath the forward end and sides of the vehicle roof opening,
a removable roof structure of a size and shape to be mounted in a closed position with respect to the vehicle roof opening,
interengageable means between the forward end of said removable roof structure and the forward end of said housing means (1) movable relatively together into full operative interengagement when said removable roof structure is in said closed position to enable the forward end of said removable roof structure to be moved from a removed condition into said closed position in releasably secured condition and (2) movable relatively apart to enable said removable roof structure to be moved out of said closed position into a removed condition,
a wind deflector structure of a size and shape to be mounted with respect to said vehicle roof opening when said removable roof structure is in its removed condition in an operative position extending above and along the forward end of the vehicle roof opening and above and rearwardly along the sides thereof such that said wind deflector structure blocks the full operative interengagement of said interengageable means,
first means for retaining said wind deflector structure in said operative position and for enabling said wind deflector structure to be moved out of said operative position in response to a manual movement,
means mounting said wind deflector structure on said housing means (1) for movement out of said operative position into a storage position within said vehicle roof opening wherein the full operative interengagement of said interengageable means is no longer blocked thereby and (2) for movement from said storage position into said operative position which is prevented when said removable roof structure is in its closed position, and
second means for (1) retaining said wind deflector structure in said storage position when moved therein with said removable roof structure in a removed condition so as to enable said interengageable means to be fully operatively interengaged while said wind deflector structure is retained in said storage position and said removable roof structure to be moved into its closed position and (2) permitting said wind deflector structure to be moved into said operative position when said removable roof structure is removed from said closed position,
said first means comprising spring means for resiliently biasing said wind deflector out of said storage position and into said operative position so as to resiliently retain the same therein,
said second means comprising latch means operable in response to a manual movement of said wind deflector structure from its operative position into its storage position against the bias of said spring means to releasably retain the wind deflector structure in its storage position and cam means on said removable roof structure operable in response to the movement of said removable roof structure into its closed position for releasing said latch means and controlling the movement of said wind deflector structure under the bias of said spring means to move out of its storage position and into its operative position in response to the movement of said removable roof structure out of its closed position into its removed condition.

4,781,411
PORTABLE SUN SHIELD
James A. Kolb, 2535 McArthur St., Lakeland, Fla. 33801
Filed Apr. 23, 1987, Ser. No. 41,691
Int. Cl.[4] A47C *7/66*
U.S. Cl. 297—184 **6 Claims**

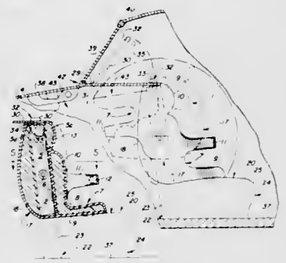
1. A new and improved portable sun shield selectively attachable to a separate structure, such shield comprising:
cover frame means having a cover selectively attachable thereto;
cover frame support means for supporting said cover frame means;
bracket assembly means fixedly securable to said separate structure;
and
connector means operably attachable to said bracket assembly means, said connector means serving to receive and retain said cover frame support means in a selected fixed position, and
said cover frame means comprising a first planar section including a forward link, a plurality of parallel side links, and a rear cylinderical pivot link of a first diameter; said cover frame means further including a second section

including a plurality of second side links angulated downwardly with respect to said side links, and a connecting link rearwardly and parallel said forward link and said rear cylindrical pivot link and underlying a plane defined by said first planar section; said connecting link having secured thereto a first locking means for securing said



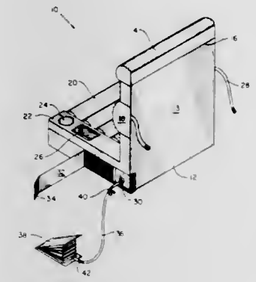
cover frame means in a selected angular position relative to said cover frame support means, and
said cover frame support means including a top hollow sylinderical support means of a second diameter arranged for accepting said rear cylinderical pivot link therein for rotatably securing said cover frame means to said cover frame support means.

4,781,412
ROTATING CHILD'S SEAT
Tommy E. Holman, 8974 Marlow St., Shreveport, La. 71118
Filed May 7, 1987, Ser. No. 46,784
Int. Cl.[4] B60N *1/12*
U.S. Cl. 297—238 **20 Claims**



1. A rotating child's seat for vehicles having a storage area and at least one bench seat with a cooperating backrest, said rotating child's seat comprising seat means adapted to support a child; an opening provided in the backrest for receiving said seat means in pivoting relationship; pivot means carried by the backrest, said pivot means engaging said seat means near the center of said seat means in transverse relationship; and seat angle adjusting means carried by the vehicle and adapted to engage the top of said seat means in adjustable relationship, whereby said seat means is selectively rotated on said pivot means through an arc of substantially 180 degrees into a first functional orientation over the bench seat in the vehicle at a selected angle with respect to the bench seat and into a second stored configuration in the storage area.

4,781,413
PORTABLE STADIUM SEAT
George J. Shumack, Jr., 517 N. Front St., Allentown, Pa. 18102
Filed Aug. 19, 1987, Ser. No. 86,774
Int. Cl.[4] A47C *1/08*
U.S. Cl. 297—252 **2 Claims**



1. A new and improved portable stadium seat for use on existing bleachers or stadium seats, comprising:
rigid seat frame means having a seat rest frame portion pivotally connected to a back rest frame portion by hinge means;
head rest frame means pivotally connected to said back rest frame portion by hinge means;
leg rest frame means pivotally connected to said seat rest frame portion;
generally "U" shaped seat hook means pivotally mounted on an underside of said leg rest frame means for attaching said seat frame means to said existing bleachers or stadium seats;
inflatable seat cushion means having a seat rest cushion portion and a back rest cushion portion;
means for attaching said seat cushion means to said seat frame means;
compartment means formed in said seat cushion means;
door means having latch means on said compartment means;
manually actuated pump means for inflating said seat cushion means removably received in said compartment means;
inflatable head rest means pivotally connected to said back cushion portion;
inflatable lumbar support means formed in said back cushion portion;
inflatable arm rest means on said seat cushion means having recesses for holding food and beverage containers;
manifold valve means for selectively connecting said manually actuated pump means to said seat cushion portion, said arm rest means, said head rest means, said lumbar support means and said back cushion portion; and
catch means on a back side of said head rest frame means for releasably retaining an end portion of said "U" shaped seat hook means whereby said seat rest frame portion and said back rest frame portion may be pivoted and retained in a closed position by inserting an end portion of said "U" shaped seat hook means in said catch means.

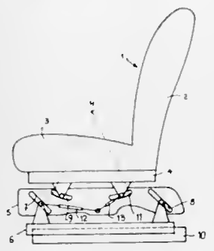
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,414

DEVICE FOR ADJUSTING THE HEIGHT AND THE ATTITUDE OF A SEAT STRUCTURE, IN PARTICULAR FOR A VEHICLE

Pierre Periou, Cergy Pontoise, France, assignor to Rockwell-CIM, France

Filed Oct. 26, 1987, Ser. No. 112,785
Claims priority, application France, Nov. 5, 1986, 86 15421
Int. Cl.⁴ A47C *1/02*
U.S. Cl. 297—313 **20 Claims**



1. A device for adjusting the height and the attitude of a seat structure in particular of a vehicle, said device comprising:
slides for mounting a seat on the floor of the vehicle;
a cushion and a backrest carried by the seat;
adjusting means for adjusting the seat in height and in attitude, located on each side of the seat structure;
said adjusting means comprising a cam interposed between the slide and the seat on each side of the seat;
at least one first bearing track for the bearing of each cam on the respective slide for the adjustment for the cam and each in height;
each said cam being formed by a plate in which are formed two elongated and inclined first openings having upper edges constituting said at least one first bearing track, said adjusting means further comprising supports mounted on the slide and rolling elements mounted on the supports for bearing against said first bearing tracks;
and at least one second bearing track for the bearing of the seat on each cam, the second bearing track having a shape which is a function of a desired attitude-adjusting movement of the seat relative to the cam; and
means for controlling the height of each cam and seat relative to the respective slide and for controlling the attitude of the seat relative to the respective cam.

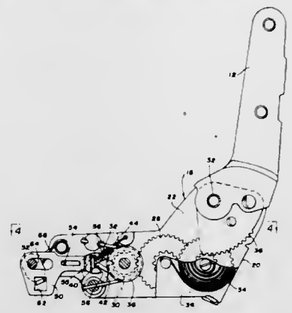
4,781,415

RECLINING INFINITELY VARIABLE SEAT LATCH WITH DUAL LOCKING MECHANISMS APPARATUS AND METHOD

Max O. Heesch, Brooklyn, and Allen D. Berg, Oxford, both of Mich., assignors to ITT Corporation, New York, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,143
Int. Cl.⁴ B60N *1/02*
U.S. Cl. 297—362 **7 Claims**

1. An improved infinitely variable recliner seat latch including in combination a base frame, a seat back frame pivotally mounted to said base frame, said seat back frame having a sector gear at an end of said seat back frame adjacent said base frame, at least one clutch gear rotatably mounted to said base frame, the angular position of said clutch gear being dependent upon the angular position of said seat back frame, means for infinitely restraining rotation of said clutch gear, wherein the improvement comprises:
a pawl engageable with said clutch gear to lock said clutch gear from rotation; and
means to release said pawl from engagement with said clutch gear and thereafter release said means of infinitely restraining rotation of said clutch gear allowing rotation of



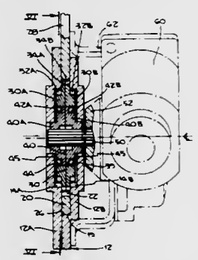
said clutch gear whereby the angular position of said seat back frame may be adjusted.

4,781,416

SEATBACK RECLINER

Richard F. Johnson, Bloomfield Hills; James D. Held, Utica, both of Mich.; Elaine S. Schultz, Troy, and Olivier Lecerf, Farmington Hills, all of Mich., assignors to Semec, Inc., Troy, Mich.

Filed Sep. 11, 1986, Ser. No. 906,732
Int. Cl.⁴ A47C *1/25*
U.S. Cl. 297—362 **6 Claims**



1. A power recliner for a seat having an adjustable backrest, comprising:
a pair of concentric internal gears, the first having an integer number N_1 of teeth and being fixed to said seat, the second having an integer number N_4 of teeth and being fixed to said backrest for rotation relative to said seat;
a pair of concentric external gears compounded back-to-back to form a satellite, the first of said external gears having an integer number N_2 of teeth conjugate with those of said first internal gear, where $N_1-N_2 \cong 1$, the second of said external gears having an integer number N_3 of teeth conjugate with those of said second internal gear, where $N_4-N_3 \cong b$ 1, and wherein the difference in pitch radii between said pairs of first and second internal and external gears, respectively, is about equal to a given, constant amount defined as the eccentricity of said satellite; and
driver means for driving said satellite at said eccentricity within said first internal gear with planetary motion, the profiles of said teeth of said gears being contoured for generally rolling, meshing contact without interference, whereby said second internal gear is driven with a velocity ratio of about $N_2N_4/(N_2N_4-N_1N_3)$;
said first internal gear further comprises a pair of substantially identical, coaxial internal gears spaced apart axially by about the width of said second internal gear, wherein one, the other, or both of said identical pair has a semicylindrical portion disposed radially thereon to form an upward-facing, semicylindrical bearing surface to support said second internal gear therein;
said second internal gear having a semicylindrical portion disposed radially thereon and journaled within said semicylindrical bearing surface to support said second internal gear for relative concentric rotation therebetween;
said first external gear further comprises a pair of substantially identical, coaxial internal gears spaced apart axially by about the width of said second external gear, with said second external gear being disposed intermediately therebetween, each said gear in said identical external pair engaging one of said gears in said identical internal pair;
said second internal gear further comprises a pair of substantially identical, coaxial internal gears spaced apart axially by about the width of said first internal gear, wherein one, the other, or both of said identical pair has a semicylindrical portion disposed radially thereon to form an downward-facing, semicylindrical bearing surface supported by said first internal gear,
said first internal gear having a semicylindrical portion disposed radially thereon and journaled within said semicylindrical bearing surface to support said second identical pair for concentric rotation thereabout;
said second external gear further comprises a pair of substantially identical, coaxial internal gears spaced apart axially by about the width of said first external gear, with said first external gear being disposed intermediately therebetween, each said gear in said identical external pair engaging one of said gears in said identical internal pair;
a cylindrical eccentric cam having a center coaxial with said satellite and a center of rotation coaxial with said internal gears, said satellite having a cylindrical opening therethrough forming an annular bearing surface to receive said cam for relative sliding rotation therein; and
means for selectively driving said cam bidirectionally about said center of rotation.

4,781,417

UPHOLSTERED SEAT CUSHION SUPPORT

Roger A. Shipman, West Bloomfield; Richard M. Kostin, Dearborn, and William J. Brezina, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1987, Ser. No. 130,043
Int. Cl.⁴ A47C *7/02*
U.S. Cl. 297—458 **15 Claims**



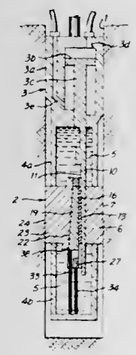
1. A seat cushion support for an upholstered seat, comprising:
a one-piece, form-retaining, resilient seat pan having a substantially curvilinear upper surface, substantially parallel lateral edges, a forward edge substantially perpendicular to said lateral edges, ishium accommodating means in a rearward portion of said seat pan, said rearward portion being concavely curved downwardly, and a forward portion which comprises a forwardmost portion curving downwardly to said forward edge; and
a pair of mounting tangs, each unitary with said seat pan and located proximate and inboard of a corresponding one of said lateral edges, each extending downwardly from connection with said seat pan.

4,781,418

FLUID ACTUATED APPARATUS FOR MECHANICALLY SPLITTING ROCK-LIKE MATERIAL

Silvano Pocci, Eric Dr., Kinnelon, N.J. 07405

Filed Jun. 1, 1987, Ser. No. 56,462
Int. Cl.⁴ E21C *37/02*
U.S. Cl. 299—23 **20 Claims**

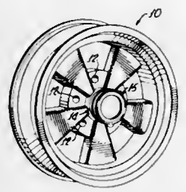


1. Apparatus to break rock and concrete slabs in situ when inserted into predrilled holes in said rock and concrete slabs comprising:
first and second members each having an outer surface engaging a wall of said predrilled holes and a longitudnal axis parallel to each other and said wall of said predrilled holes, said first member having a longitudnal groove therein, said groove including a flat bottom surface parallel to said longitudnal axes of said first and second members coextensive with said first member, a first pair of spaced vertical surfaces extending upward from and perpendicular to said bottom surface and coextensive therewith, a pair of spaced ledge-like surfaces disposed in a plane parallel to said bottom surface extending outward from said first pair of vertical surfaces and coextensive therewith, and a second pair of spaced vertical surfaces extending upward perpendicular to and from the outer edges of said pair of ledge-like surfaces and coextensive therewith;
a third member having a driven end, a free end, a first surface parallel to said longitunal axes of said first and second members slidably engaging said bottom surface and said first pair of vertical surfaces of said groove in said first member and a second surface opposite said first surface having a first predetermined slope along a given length from a point adjacent said driven end to said free end, said third member reciprocating in said groove a predetermined number of times greater than one during each cycle of operation and with a predetermined stroke length; and
means, disposed between said second surface of said third member and an inner surface of said second member at

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least a portion of which slidably engages said pair of ledge-like surfaces and said second pair of vertical surfaces, activated by each inward stroke of said third member to apply a powerful breaking force directly to said second member resulting in lateral movement thereof, to apply a reaction force equal to said breaking force to said first member and to retain said second member in its achieved position due to said lateral movement thereof at the end of each inward stroke of said third member during said cycle of operation.

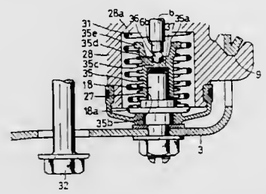
4,781,419
HUB CAP LOCKING ARRANGEMENT
Ralph T. Boothe, 2478 Lazy Brook La., Hacienda Heights, Calif. 91745
Filed May 14, 1987, Ser. No. 50,095
Int. Cl.[4] B60B *7/00, 7/06*
U.S. Cl. 301—108 A **18 Claims**



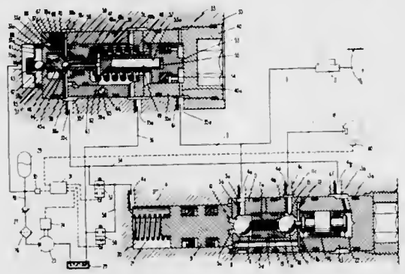
1. A hub cap locking arrangement for use with metal alloy vehicle wheels having a central wheel hub with an opening therethrough having an interior wall, a rear access to the opening, and an edge defining the front of the opening, the combination comprising:
hub cap means having a closed portion including shoulder means for abuttingly engaging said edge with said hub cap means assembled on said wheel;
substantially rigid tubularly configured means in fixed relation to said hub cap means configured for insertion into said opening for generally abutting coaction along the axial length thereof with the interior wall thereof with said shoulder means in abutting engagement with said edge, said tubularly configured means including a plurality of threaded apertures extending therethrough in a radial direction relative to said opening; and
threaded fastener means configured for engagement with said threaded aperture means of said tubularly configured means for further coaction with the interior wall of said opening upon tightening of said fastener means for urging ends thereof into tight frictional engagement with said wall for retaining said hub cap means on said wheel, said threaded fastener means being accessible only through the rear access to said opening for enabling tightening or loosening of said fastener means only with said wheel removed from the vehicle.

4,781,420
HYDRAULIC BRAKE LOAD-SENSING PROPORTION VALVE WITH NOISE PREVENTION MEANS
Mutsuro Yamakoshi, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co. Ltd., Japan
Filed Oct. 15, 1987, Ser. No. 109,462
Claims priority, application Japan, Oct. 27, 1986, 61-164494[U]
Int. Cl.[4] B60T *8/18*
U.S. Cl. 303—9.69 **5 Claims**

1. A load sensing proportion valve for use with a vehicle, comprising: a control valve disposed in line with a hydraulic fluid passage extending from a master brake cylinder to rear wheel brake cylinders; a plunger element connected to said control valve for operating said control valve in response to the output fluid pressure from said master brake cylinder; a load sensing lever means; a stem connected to said load sensing lever means, said stem adapted to urge said plunger to open said control valve in accordance with the position of said load sensing lever means, the position of said load sensing lever means being a function of a current load of the vehicle; a cap having at least a first recess and a second recess, said stem being positioned in one of said first and second recesses; resilient means positioned in one of said first and second recesses for damping forces applied thereto; a ball means positioned in the other of said first and second recesses, said stem and said plunger coming into and out of opposed engagement with each other through said resilient means; said cap means including bulkhead means surrounding said stem portion; and, spring means connected to said cap and said stem for urging said cap means toward said plunger.

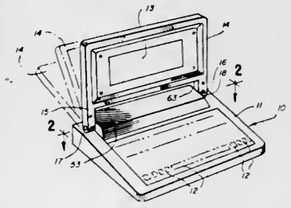


4,781,421
ACTUATOR FOR USE IN AN ANTI-SKID SYSTEM
Takumi Nishimura, Chiryu; Tadao Saito, Nagoya; Nobuyasu Nakanishi, and Noboru Noguchi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Mar. 11, 1986, Ser. No. 838,350
Claims priority, application Japan, Mar. 11, 1985, 60-34872[U]
Int. Cl.[4] B60T *8/04*
U.S. Cl. 303—115 **4 Claims**



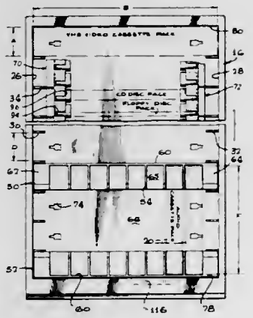
1. An actuator for use in an anti-skid system for wheels of a wheeled vehicle, comprising:
a first valve positioned in a pressure line to selectively divide said pressure line into two separate lines, one directed to a master cylinder and the other directed to a wheel cylinder, said pressure line connecting said master cylinder with said wheel cylinder;
an electric motor;
a pump driven by said electric motor;
an accumulator means for accumulating fluid pressure generated by said pump;
a control piston in said first valve and being movable from a non-operative position under fluid pressure in said pressure line directed to said wheel cylinder and returnable to the non-operative position to open and close said first valve whereby the volume of said pressure line directed to said wheel cylinder is increased when the first valve is open and decreased when the first valve is closed;
a second valve operable to supply said fluid pressure to said control piston upon normal rolling of the wheels so as to move said control piston to the non-operative position against said fluid pressure in said pressure line directed to said wheel cylinder and operable to exclude said fluid pressure from said control piston when the wheels are predisposed to lock up so that said control piston is moved from said non-operative position under the fluid pressure in said pressure line directed to said wheel cylinder;
a third valve having first valving means for controllably communicating a hydraulic chamber with said accumulator and stopping such communication, said hydraulic chamber supplying the fluid pressure to said control piston, and second valving means for controllably communicating said hydraulic chamber with a drain line and stopping such communication;
said third valve controlling said fluid pressure to be supplied to said hydraulic chamber in response to depression and release of a brake pedal; and
a relief valve provided in a seat member of said first valving means of said third valve so that when said fluid pressure from said accumulator exceeds a predetermined upper limit, the relief valve is opened to introduce hydraulic fluid to said drain line through said second valving means.

4,781,422
ADJUSTABLE CLUTCH MECHANISM
Thomas E. Kimble, Covington, Ky., assignor to Random Corporation, Cincinnati, Ohio
Filed Nov. 14, 1985, Ser. No. 798,861
Int. Cl.[4] A47B *81/06*
U.S. Cl. 312—72 **22 Claims**



1. A clutch mechanism for retaining first and second objects, coupled together to have rotational freedom relative to each other over a predefined arc about an axis, at any of a plurality of preselected positions about said axis, said mechanism comprising:
(A) a first set of a plurality of substantially flat surfaces, at least two of said flat surfaces of said first set being formed from separate pieces of material physically unattached to each other;
(B) first holding means, coupled to said first set of surfaces and to said first object, for retaining said surfaces of said first set substantially parallel to each other and at a substantially fixed spatial orientation relative to said first object, said first holding means permitting surfaces of said first set to move translationally toward and away from each other;
(C) a second set of a plurality of substantially flat surfaces, at least two surfaces of said second set being formed from separate pieces of material physically unattached to each other, said surfaces of said first and second sets being sufficiently large and having locations that at least one surface of said second set sits between any two surfaces of said first set that are free to move forward and away from each other and at least one surface of said first set sits between any two surfaces of said second set that are free to move toward and away from each other and said surfaces of said first set make contact with said surfaces of said second set at all orientations of said first and second objects within said arc about said axis;
(D) second holding means, coupled to said second set of surfaces and to said second object, for retaining said surfaces of said second set substantially parallel to each other and at a substantially fixed spatial orientation relative to said second object; said second holding means permitting surfaces of said second set to move translationally toward and away from each other;
(E) pressure means, coupled to said first and second sets of surfaces, for holding, with an adjustable, predetermined, substantially constant pressure, said first set of surfaces in contact with said second set of surfaces as said first and second objects rotate, relative to each other, about said axis through said arc.

4,781,423
ADAPTABLE CASSETTE AND DISC PACK STORAGE SYSTEM
Kimberlee K. Muenzer, La Crescenta, and Spencer L. Mackay, Agoura Hills, both of Calif., assignors to Certron Corporation, Anaheim, Calif.
Filed Apr. 28, 1987, Ser. No. 43,649
Int. Cl.[4] A47G *19/08*
U.S. Cl. 312—183 **7 Claims**



1. Apparatus for holding cassettes comprising:
a drawer which has a drawer length and which has opposite sides spaced apart by about the length of a first size cassette pack, said drawer having at least three tabs at each side that are spaced along said drawer length to leave a plurality of first spaces each of a width about the same as the width of said first size cassette pack;
an elongated cassette adaptor which extends between said opposite sides of said drawer and which has a pair of ends that each closely fit in said first spaces, said adaptor having a plurality of ribs spaced apart along its length to leave second spaces having widths about the same as the width of a second size cassette pack which has a predetermined width and length and which has pack ends spaced by its length, said adaptor forming bottom walls which lie between a power of said ribs and which lie adjacent to an end of a second size cassette pack that lies in one of said second spaces, each of said bottom walls being of smaller thickness than said adaptor ends which closely fit in said first spaces, whereby to store ends of the second size cassette packs.

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SINGLE MODE CHANNEL OPTICAL WAVEGUIDE WITH A STRESS-INDUCED BIREFRINGENCE CONTROL REGION

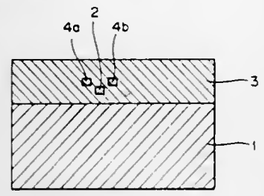
Masao Kawachi; Kaname Jinguji; Norio Takato, all of Mito; Mitsuho Yasu, Katsuta, and Katsunari Okamoto, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 13, 1987, Ser. No. 49,387

Claims priority, application Japan, Jul. 28, 1986, 61-177046; Aug. 11, 1986, 61-188158; Sep. 16, 1986, 61-217837; Dec. 11, 1986, 61-295226; Dec. 11, 1986, 61-295227

Int. Cl.[4] G02B *5/14*

U.S. Cl. 350—96.3 **32 Claims**



1. An optical device comprising:

a substrate;

a cladding layer formed on said substrate;

a silica glass core portion extending in a longitudinal direction formed in said cladding layer; and

stress adjusting means extending in said longitudinal direction provided locally in said cladding layer in at least one portion in the vicinity of said core portion for adjusting the stress applied to said core portion, whereby the stress-induced birefringence is adjusted in said core portion.

4,781,425

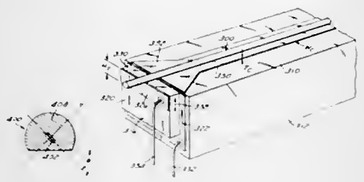
FIBER OPTIC APPARATUS AND METHOD FOR SPECTRUM ANALYSIS AND FILTERING

William P. Risk, Palo Alto, and Gordon S. Kino, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Feb. 18, 1966, Ser. No. 830,457

Int. Cl.[4] G02F *1/11*

U.S. Cl. 350—96.15 **23 Claims**



17. An apparatus, comprising:

a single mode birefringent optical fiber having first and second polarization modes and an optical beat length for said modes that varies in accordance with the wavelength of an optical signal in said fiber, said optical fiber having an input portion for receiving an input optical signal in said first polarization mode and having an output portion for transmitting an output optical signal in said second polarization mode;

a transducer for generating an acoustic wave;

means for varying the wavelength of said acoustic wave through a range of wavelengths which includes a wavelength equal to the beat length of said fiber for said input optical signal, said varying means comprises a source of electrical energy that has a selectively variable frequency;

an acoustic medium for propagating said acoustic wave longitudinally along said optical fiber between said input portion of said optical fiber and said output portion of said optical fiber, said acoustic medium having a surface positioned in acoustic contact with said optical fiber, said transducer being positioned on said acoustic medium to cause said surface of said acoustic medium to undulate with a surface acoustic wave, said surface acoustic wave causing at least a portion of the optical energy of said input optical signal in said first polarization mode to be coupled to said second polarization mode to form said output optical signal, said output signal shifted in frequency relative to said input signal and having an intensity that varies in accordance with the wavelength of said acoustic wave;

a polarizer having an input positioned to receive light from said output portion of said optical fiber and having an output for transmitting exclusively light in said second polarization mode such that said optical output signal passes through said polarizer; and

a photodetector for receiving said output signal from said polarizer and for generating an output electrical signal having a magnitude proportional to the intensity of said transmitted output optical signal.

4,781,426

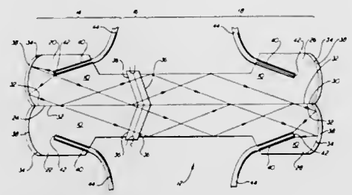
OPTICAL FIBER COLLIMATOR/SWITCH INCLUDING LIQUID CRYSTAL POLARIZING MATERIAL

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, a division of ITT Corporation, Nutley, N.J.

Filed Sep. 30, 1986, Ser. No. 913,874

Int. Cl.[4] G02B *6/28*; G02F *1/13*

U.S. Cl. 350—96.16 **15 Claims**



1. A collimator comprising:

a transparent member having a first surface which is planar;

means, integral with said transparent member, for collimating a light beam incident thereon, said collimating means including a planar reflecting surface directed substantially perpendicularly to said first surface, and a spherical reflecting surface directed substantially opposite said planar reflecting surface, said spherical reflecting surface directing said collimated incident light beam toward said first surface by reflecting said collimated beam off said planar reflecting surface at an angle at laast equal to the critical angle thereof; and

means for directly coupling an optical fiber to said transparent member adjacent said planar reflecting surface, said direct coupling means terminating in the focal plane of said spherical reflecting surface.

4,781,427

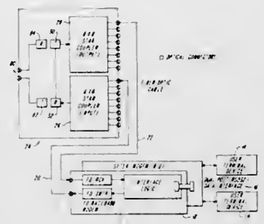
ACTIVE STAR CENTERED FIBER OPTIC LOCAL AREA NETWORK

Charles R. Husbands, Acton, and Bruce D. Metcalf, Carlisle, both of Mass., assignors to The MITRE Corporation, Bedford, Mass.

Filed Sep. 19, 1985, Ser. No. 777,934

Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.16 **10 Claims**



1. An active star centered optical node for interconnecting a plurality of user terminals comprising:

at least one passive star coupler including a plurality of first ports for interconnecting the user terminals located at a first side of the star coupler and a like plurality of second ports located at a second, head-end side of the star coupler;

an optical expansion part located at said second side of the star coupler;

at least two pairs of optical transmitters and receivers, and,

selection means movable between a first position which connects said at least two pairs of optical transmitters and receivers in a loop back mode in which an optical input from at least one of said second ports is directed to one of said receivers whose output is directed to one of said transmitters which in turn is directed back to at least one of said second ports and a second position which connects said at least two pairs of optical transmitters and receivers in a repeater mode where the output of at least one of said second ports is directed to the receiver of one of said receiver and transmitter pairs whose transmitter output is directed to said expansion port, and the other of said receiver and transmitter pairs receives an optical signal input to said optical node at said expansion port and transmits it into at least one of said second ports.

4,781,428

DEVICES AND METHODS FOR SELECTIVELY TAPPING OPTICAL ENERGY FROM AN OPTICAL FIBRE

Richard E. Epworth, Bishop Stortford; Stephen Wright, London; Roger J. Brambley, Great Dunmow, and David F. Smith, Harlow, all of Great Britain, assignors to STC PLC, London, England

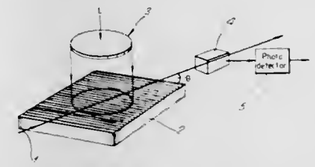
Filed Jun. 24, 1985, Ser. No. 748,296

Claims priority, application United Kingdom, Jul. 11, 1984, 8417663

Int. Cl.[4] G02B *6/34*

U.S. Cl. 350—96.19 **11 Claims**

1. A device for selectively tapping optical energy from a single mode optical fibre having a core and cladding thereon, the optical energy to be tapped being supported in a mode of propagation guided in the core of the optical fiber, the device including means for causing spatially periodic mechanical deformation of the fiber and coupling of optical energy between the guided mode in the core and at least one unguided mode in the cladding of the optical fiber at a predetermined optical frequency, said optical frequency being predetermined by the periodicity of the mechanical deformation of the fiber, the coupling between the said guided and unguided modes of



the single mode optical fiber being wavelength dependent and only taking place at that optical frequency at which the said periodicity corresponds to the beat length between said guided and unguided modes to be coupled, and means for removing from the cladding the optical energy at the predetermined optical frequency.

4,781,429

OPTICAL FIBER CONNECTION BASE FOR CONNECTING OPTICAL FIBERS OR AN OPTICAL FIBER AND AN OPTOELECTRONIC COMPONENT

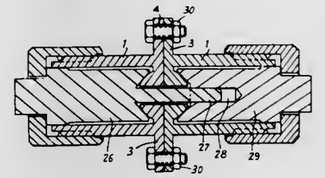
Jacques Cartier, Fontenay Sous Bois, France, assignor to Radiall Industrie, Rosny Sous/Bois, France

Filed Jul. 22, 1986, Ser. No. 887,952

Claims priority, application France, Jul. 22, 1985, 85 11170

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—96.20 **9 Claims**



1. An optical fiber connection base for receiving an optical fiber positioned and centered in a ferrule having a tubular axial extension with a passage into which the fiber can be introduced with clearance and immobilized so that its end coincides with a front end of the tubular extension, said connection base comprising, a unitary tubular body having a front support at one end, and a bore extending from the other end of the body toward said front support, said front support having a substantially planner front face and a rear face, an interior projection having at least one convex bearing surface and extending rearwardly into the bore from the rear face of the front support, said front support and projection having an axial opening therethrough adapted to receive the tubular extension of the ferrule inserted into the body from the rear of the bore, so that an annular conical wall of the ferrule seats on the convex bearing surface of the body along a circular line of contact at a predetermined position relative to the front face of the front support.

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4,781,430

OPTICAL FIBER MATERIAL HAVING OPTICAL FIBER TIGHTLY HELD BY WRAPPING MATERIAL

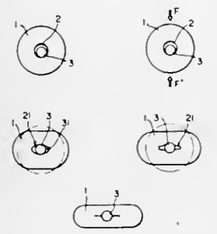
Toshiyasu Tanaka, Yokohama, Japan, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 18, 1985, Ser. No. 724,751

Claims priority, application Japan, Apr. 19, 1984, 59-77498; Nov. 22, 1984, 59-220489

Int. Cl.⁴ G02B *6/36*

U.S. Cl. 350—96.20 **16 Claims**



1. An optical fiber termination comprising an optical fiber and a termination member of predetermined length formed integrally of plastically deformable material in an initially substantially cylindrical shape, an end portion of said optical fiber being received within an axial passage of said termination member to thereby surround an outer peripheral surface of the end portion of the optical fiber for said predetermined length, said termination member being plastically deformed to partly contact the outer peripheral surface of said optical fiber in a manner that said termination member is in tight fitting contact with at least two separate peripheral outer surface portions of said optical fiber along at least a central portion of said member's predetermined length, said contacted peripheral outer surface portions of the optical fiber being disposed substantially symmetrical to each other with respect to the axis of the optical fiber and being separated from each other by spaces between the termination member and the optical fiber, said spaces being disposed substantially symmetrical to each other with respect to the fiber axis, thereby achieving tight fitting contact between said plastically deformed termination member and said peripheral outer surface portions of the optical fiber.

4,781,431

LENSED OPTICAL CONNECTOR

Laurence N. Wesson, Collegeville, Pa., and James F. Ryley, Haddonfield, N.J., assignors to Labinal Components and Systems, Inc., Elk Grove Village, Ill.

Filed Dec. 29, 1986, Ser. No. 947,233

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.21 **23 Claims**



1. An optical connector comprising a precision fiber alignment guide for locating the end of an optical fiber along a precise longitudinal axis; a ball lens formed of a material having a refractive index of less than 2, one end of said alignment guide having a flat face and being in spaced relation relative to the ball lens whereby the terminal end of an optical fiber disposed in the plane of said alignment guide one end is located at substantially the focal point of said ball lens at the flat face of the alignment guide; spacer plate means having at least one flat face and positioned between the ball lens and said alignment guide for engaging and maintaining the alignment guide one end and said ball lens in said spaced relation, the flat face of the alignment guide abutting the flat face of the spacer plate means, in which said spacer plate means has an opening formed therein for the unobstructed passage of light relative to a terminal end of an optical fiber located in said precision alignment guide.

4,781,432

OPTICAL FIBRE TRANSMISSION CABLE REINFORCEMENT

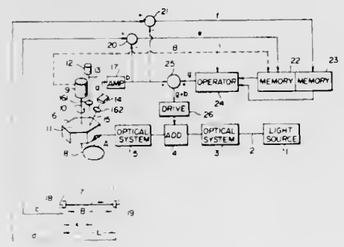
Zoltan Zongor, and Drago Santrach, both of Guelph, Canada, assignors to Fiberglas Canada Ltd., Canada

Continuation of Ser. No. 50,892, Jun. 21, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 286,991

Claims priority, application Canada, Jun. 1, 1979, 328888

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **36 Claims**



1. In a method of making an optical fibre transmission cable which includes providing an optical transmission fibre and a sheathing of synthetic resin material, the improvement comprising the steps of:

firstly prefabricating at least one individual reinforcement by saturating a glass fibre roving with a synthetic resin such that said resin occupies the interstices between and coats the glass fibres of said roving;

curing said synthetic resin; and

maintaining said roving under tensile stress during the curing of said synthetic resin to provide said individual reinforcement in a completely prefabricated condition, prior to the assembly thereof with any other component of said cable, as a separate cable component consisting of said roving and said cured synthetic resin, whereby said synthetic resin, when cured, maintains said roving in a pretensioned condition; and

subsequently combining said reinforcement with said optical transmission fibre and said sheathing.

4,781,433

OPTICAL FIBER PLENUM CABLE AND METHODS OF MAKING

Candido J. Arroyo, Lilburn; Jay T. Loadholt, III, Roswell, both of Ga.; Emanuele Scalco, Martinsville, N.J., and Palmer D. Thomas, Tucker, Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.

Continuation-in-part of Ser. No. 728,978, Apr. 30, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 946,646

Int. Cl.⁴ G02B *6/44*

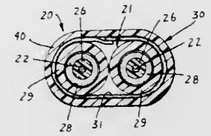
U.S. Cl. 350—96.23 **20 Claims**

1. An optical fiber plenum cable having relatively low flame and smoke evolution characteristics, said cable comprising:

a core which includes at least one optical fiber;

a core wrap comprising a layer of thermally protective non-metallic fibrous material which encloses said optical fiber and which provides said cable with predetermined strength characteristics; and

a jacket which encloses said core and said layer of fibrous material and which comprises a fire retardant plastic material which is decoupled sufficiently from said layer of



thermally protective fibrous material to avoid inducing microbending losses in the at least one optical fiber and to avoid compressing said core wrap and thereby facilitate the formation of char when said cable is subjected to heat such that said cable has a flame spread and peak optical density which do not exceed predetermined values.

4,781,435

METHOD FOR THE STEREOSCOPIC REPRESENTATION OF IMAGE SCENES WITH RELATIVE MOVEMENT BETWEEN IMAGING SENSOR AND RECORDED SCENE

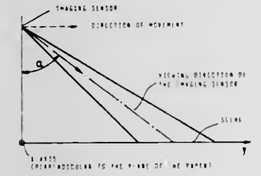
K. Reiner Lippmann, and K. Heinrich W. Dörgeloh, both of Braunschweig, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

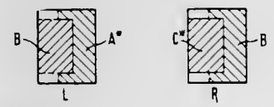
Filed Sep. 19, 1986, Ser. No. 909,502

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533379

Int. Cl.⁴ G02B *27/22*; G01C *11/12*

U.S. Cl. 350—130 **13 Claims**





1. Method for the stereoscopic moving image representation of image scenes, especially aerial scenes, sensed with relative movement between an imaging sensor and a sensed scene area, using for said representation respective sequences of two half-images sensed at consecutive imaging locations, said method including, for the continuous stereoscopic representation of almost the whole image area, the steps of combining each of the two-half images of the instantaneous stereoscopic image from parts of at least three respective consecutive sensed images of an image sequence which overlap each other in the direction of movement in pairs by at least 50%, with the locations of respective consecutive images in said two combined half-images being offset by one consecutive imaging location, and rectifying at least said parts of said at least three consecutive sensed images which are to be combined, under consideration of the geometric parameters of said at least three consecutive sensed images, such that the image scale for corresponding object points is equal.

4,781,434

SPACER OF OPTICAL FIBER CABLE AND METHOD FOR FORMING THE SAME

Ken Kitagawa; Shigehiro Matsuno, and Kazuaki Toda, all of Gifu, Japan, assignors to Ube-Nitto Kasei Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 889,341, Jul. 24, 1986, abandoned. This application Dec. 2, 1986, Ser. No. 937,007

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **5 Claims**



2. A spacer of an optical fiber cable, said spacer comprising:

a tension cable formed of fiber reinforced thermosetting resin and having a roughened outer surface;

an intermediate layer of thermoplastic resin and covering said tension cable, said intermediate layer having a roughened inner surface;

said roughened outer surface of said tension cable and said roughened inner surface of said intermediate layer cooperating together to achieve firm adherence therebetween due to an anchor effect resulting from contacting said thermosetting resin and said thermoplastic resin in a semi-fluid state under pressure; and

a spacer body formed of thermoplastic resin fusible with said thermoplastic resin of said intermediate layer, said spacer body having formed on an outer periphery thereof a plurality of helical grooves each for supporting an optical fiber therein;

the outer surface of said intermediate layer and the inner surface of said spacer body being fused together.

4,781,436

ILLUMINATED FEATHER-TOUCH SOLENOID ACTUATED VEHICLE DAY/NIGHT MIRROR

Joseph M. Armbruster, 2700 NE. 47th St., Lighthouse Point, Fla. 33064

Filed Mar. 14, 1986, Ser. No. 839,573

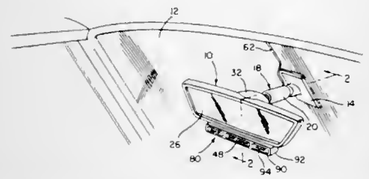
Int. Cl.⁴ G02B *7/18, 17/00*

U.S. Cl. 350—281 **8 Claims**

1. A rear view mirror for vehicles comprising a reflective mirror, means mounting the mirror in position for observation by a vehicle operator to enable areas rearwardly of the vehicle to be observed, said mounting means including means pivoting the mirror about a transverse axis generally perpendicular to the longitudinal axis of a vehicle in order to move the mirror from a day mode to a night mode so that vehicles approaching from the rear with illuminated headlights will not blind or distract the operator of the vehicle and means responsive to feather touch of a finger of a vehicle operator to pivot the

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mirror between day and night positions, said means for moving the mirror about a transverse axis including a solenoid, a feather-touch switch means electrically associated with the solenoid



and the electrical system of a vehicle to actuate the solenoid to move the mirror upon application of one finger of the vehicle operator to the switch means.

4,781,437

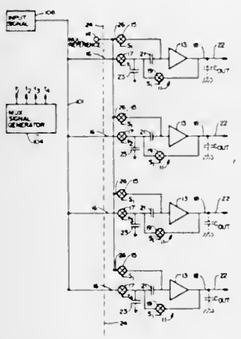
DISPLAY LINE DRIVER WITH AUTOMATIC UNIFORMITY COMPENSATION

Steven E. Shields, San Diego, and James E. Cooper, Jr., San Marcos, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 21, 1987, Ser. No. 136,239

Int. Cl.⁴ C02F *1/13;* **G09G** *3/18, 3/36;* **H03K** *5/159*

U.S. Cl. 350—332 **17 Claims**



1. In a driver circuit fabricated on a substrate for supplying a display signal to a liquid crystal display line, the circuitry comprising:

an amplifier means on said substrate having an input and an output;

compensation means on said substrate for compensating for offset in the output voltage of said amplifier means; said compensation means comprising:

first charge storage means having an input and having an output connected to the input of said amplifier means;

first switch means responsive to a first control signal for connecting said output of said amplifier means to said input of said first charge storage means;

second switch means responsive to said first control signal for connecting a reference voltage to said output of said first charge storage means;

second charge storage means for storing said sample, said second charge storage means being connected to the input of said first charge storage means; and

third switch means responsive to a second control signal for switching said display signal to said second charge storage means.

4,781,438

ACTIVE-MATRIX LIQUID CRYSTAL COLOR DISPLAY PANEL HAVING A TRIANGULAR PIXEL ARRANGEMENT

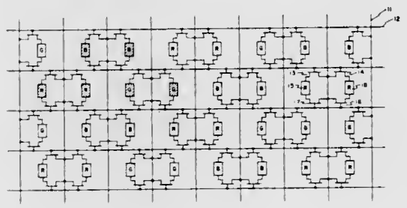
Kesao Noguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 28, 1988, Ser. No. 149,629

Claims priority, application Japan, Jan. 28, 1987, 62-19100

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 F **12 Claims**



1. An active-matrix liquid crystal color display panel comprising:

a transparent insulator substrate;

a plurality of access signal buses formed on said insulator substrate in parallel with one another;

a plurality of data signal buses formed on said insulator substrate to cross orthogonally said access signal buses;

a plurality of pixel elements formed on said insulator substrate, each pixel element including first and second display electrodes and first to fourth switching transistors, said first and second display electrodes being respectively disposed in neighbouring spaces surrounded by two access signal buses and two data signal buses, said neighbouring spaces being arranged in the same direction as said access signal buses, said first and second switching transistors having sources connected to said first display electrode, drains connected to the data signal bus running between said neighbouring spaces and gates respectively connected to said two access signal buses, said third and fourth switching transistors having sources connected to said second display electrode, drains connected to said data signal bus running between said neighbouring spaces and gates respectively connected to said access signal buses, said pixel elements being connected to every other data signal bus in stripe regions between adjacent two access signal buses, and said data signal buses to which said pixel elements are connected being different between adjacent stripe regions;

a filter having a plurality of filter elements disposed over said display electrodes, said filter elements permeating different color components and being repeatedly arranged in the same direction as said access signal buses to form filter element lines, the repetition of said filter elements being shifted between neighbouring filter element lines; and

liquid crystal interposed between said first and second display electrodes and said filter.

4,781,439

LIQUID CRYSTAL POLYIMIDE ALIGNMENT FREE OF SCATTERING DOMAINS

Hisao Yokokura, Hitachi; Tadao Nakata, Katsuta; Susumu Era, Hitachi; Yasuo Hanawa, Katsuta; Kishiro Iwasaki, Hitachi-oota; Teruo Kitamura, Katsuta; Akio Mukoh, Mito; Toshikazu Narahara, Naka; Yasuhiko Kando, Mobara; Shunichi Numata, Hitachi, and Kooji Fujisaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1987, Ser. No. 5,899

Claims priority, application Japan, Jan. 22, 1986, 61-10165; Jan. 29, 1986, 61-15901

Int. Cl.⁴ G02F *1/133*

U.S. Cl. 350—341 **6 Claims**

1. A liquid crystal display element comprising a pair of substrates, a pair of electrodes provided on said respective substrates, at least one of which is transparent and a liquid crystal layer disposed between said substrates, said liquid crystal layer comprising a nematic liquid crystal, which exhibits a positive dielectric constant anisotropy and contains an optically active substance, the liquid crystal molecule orientation direction in said liquid crystal layer being twisted in the range of 200° to 250° from the surface of one of said substrates toward the surface of the other said substrate so as to form a helical structure, characterized in that a polyimide orientation film is provided between said electrode and said liquid crystal layer, said polyimide orientation film being one made of a polyimide prepared by reacting one of diamine compounds selected from the group consisting of a diamine compound having a long-chain hydrocarbon group and a diamine compound having a trifluoromethyl group with a tetracarboxylic dianhydride and causing a pretilt angle of at least 3° relative to the nematic liquid crystal molecules.

4,781,440

STEREOSCOPIC OPTICAL INSTRUMENTS UTILIZING LIQUID CRYSTAL

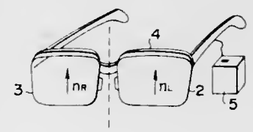
Akitoshi Toda, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Nov. 17, 1986, Ser. No. 931,427

Claims priority, application Japan, Nov. 29, 1985, 60-268904

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—347 V **8 Claims**



1. A stereoscopic optical instrument utilizing liquid crystals; comprising

left and right liquid crystal lenses which are incorporated into said optical instrument such that left and right liquid crystal molecular directors within said left and right lenses are in mirror symmetry with respect to a plane of symmetry which passes through the middle point of the center line connecting the centers of said left and right lenses and whose normal line is said center line.

4,781,441

METHOD OF CONTROLLING ORIENTATION OF LIQUID CRYSTAL, DEVICE USED THEREIN AND LIQUID CRYSTAL DEVICE PRODUCED THEREBY

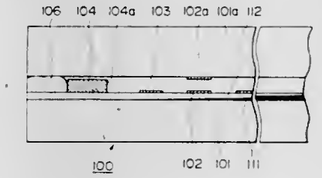
Junichiro Kanbe; Kazuharu Katagiri, both of Yokohama, and Shinjiro Okada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo

Filed Nov. 15, 1984, Ser. No. 671,916

Claims priority, application Japan, Nov. 25, 1983, 58-222620; Nov. 28, 1983, 58-223546; Nov. 30, 1983, 58-226279; Dec. 1, 1983, 58-227506

Int. Cl.⁴ G02F *1/135*

U.S. Cl. 350—350 S **87 Claims**



1. A device for controlling orientation of a liquid crystal comprising:

a cell structure comprising a pair of base plates and a nucleus-generating member disposed therebetween, and

a stripe-shaped film resistance heat-generating member disposed at a predetermined distance from the nucleus-generating member; said heat-generating member having a larger heat generating capacity near its ends then its central portion.

8. A device for controlling orientation of a liquid crystal comprising:

a cell structure comprising a pair of base plates and a nucleus-generating member disposed therebetween, and

a planar, wedge-shaped film resistance heat-generating member.

4,781,442

OPTOELECTRONIC SWITCH WITH A POWER THRESHOLD AND ITS CONTROL PROCESS

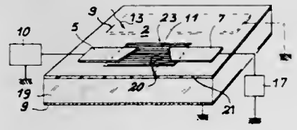
Alain G. Koster, Orsay, and Suzanne Laval, Bures-sur-Yvette, both of France, assignors to Commissariat a l'Energie Atomique and Centre National de la Recherche Scientifique, both of Paris, France

Filed Oct. 30, 1986, Ser. No. 924,829

Claims priority, application France, Oct. 31, 1985, 85 16210

Int. Cl.⁴ G02B *5/23;* **G01T** *1/24;* **H01L** *27/14;* **H01J** *40/14*

U.S. Cl. 350—354 **9 Claims**



1. A power threshold optoelectronic switch which establishes, under the effect of a monochromatic, pulse-type, parallel, incident light beam, an electric conduction between first and second normally insulated electrodes, which are aligned and spaced so as to form an interelectrode gap, incorporating means for applying a supply voltage to the first electrode, wherein the switch comprises:

a semiconductor guiding layer, placed on an insulating substrate and used for the transfer of incident light waves, the first and second electrodes being deposited on the upper

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surface of said guiding layer, an optical diffraction grating being etched in the guiding layer in the interelectrode gap;

a light source emitting said monochromatic, pulse-type parallel incident light beam at an incidental angle θ_i with respect to said diffraction grating;

said diffraction grating having a composition, a thickness and a spacing selected so that with light from said light source incident on said diffraction grating at an incidence angle θ_o, excitation of the guide layer takes place in a resonant manner under linear operating conditions, that is, with an incident light power below the power necessary for including a variation of the refractive index of said guide layer in the absence of resonant excitation; and

the light source emitting light beams at a wavelength so that the energy of photons in the light beam is close to the edge of the absorption band of the guide layer and arranged so that the incidence angle θ_i lies in a range between θ_o and $\theta_o \pm \Delta\theta$, where $\Delta\theta$ is defined as the angular width of incident light where resonant coupling under said linear operating conditions of said incident light takes place;

wherein when said incident light beam at an incidence angle of θ_i impinges on said diffraction grating, said incident light beam is resonantly coupled in said diffraction grating, thereby inducing a variation in the refractive index in the diffraction grating to produce an avalanche phenomenon as the incident light passes through a power threshold, at which point said diffraction grating becomes conductive between said first and second electrodes.

4,781,443

ELECTRICALLY CONDUCTING POLYMERS

Jeremy R. M. Giles, Worthing, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

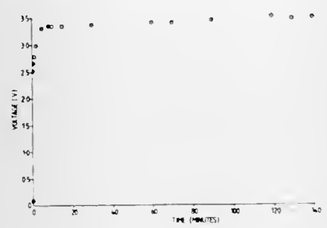
PCT No. PCT/GB86/00403, § 371 Date May 8, 1987, § 102(e) Date May 8, 1987, PCT Pub. No. WO87/00677, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 11, 1986, Ser. No. 26,696

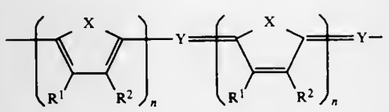
Claims priority, application United Kingdom, Jul. 12, 1985, 8517622

Int. Cl.⁴ H01B *1/12;* **H01M** *4/60;* **C08G** *61/12;* **C25B** *3/10*

U.S. Cl. 350—357 **16 Claims**



7. An electrode for use in a galvanic cell, a battery, an electrochromic display device or an optical storage device, which has thereon a film of an electrically conducting organic material which has a thickness of from 0.01 microns to 2 mm and which comprises a polymer containing along its backbone at least one linear unit of formula I:



(I)

wherein X is O, S or NR where R may be H, aryl, substituted substituted aryl, alkyl substituted alkyl,

R^1 and R^2, when taken separately, are the same or different and each is selected from the group consisting of H, alkyl, substituted alkyl, alkoxy, substituted alkoxyl, aryl, substituted aryl, amino, substituted amino, halo or cyano or, when taken together, are benzo or substituted benzo;

Y is $(CR^3)_{2x-1}$ in which R^3 is selected from the group consisting of H and substituted alkyl and x is an integer from 1 to 6; and

n is an integer from 1 to 4.

4,781,444

COLOR MEMBER HAVING ELECTRODEPOSITED COLOR LAYER COMPOSED OF POLYMER AND COLORING MATTER BONDED TO POLYMER AND METHOD FOR MANUFACTURING SAME

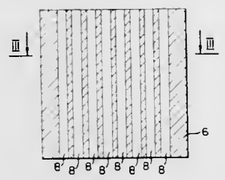
Mitsuru Saginoya; Koji Iwasa; Hitoshi Kamamori; Yutaka Sano; Yumiko Terada; Naoki Kato, all of Tokyo; Tameyuki Suzuki; Junichi Yasukawa, both of Kanagawa; Toyokazu Nomura, Chiba; Kazuo Tohda, Tokyo, and Shinji Itoh, Chiba, all of Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo and Shinto Paint Co., Ltd., Amagasaki, both of, Japan

Filed Feb. 28, 1985, Ser. No. 706,480

Claims priority, application Japan, Mar. 2, 1984, 59-40654; Mar. 2, 1984, 59-40655

Int. Cl.⁴ G02F *1/01;* **G02B** *5/22*

U.S. Cl. 350—357 **24 Claims**



1. A colored article comprising: a substrate; an electroconductive layer disposed on the substrate and configured in a desired pattern; and a colored layer electrodeposited on the electroconductive layer, the colored layer being comprised of a polymer and a coloring material chemically bonded to the polymer.

4,781,445

OPTICAL DEVICE HAVING POSITIONALLY CHANGEABLE OPTICAL SURFACES AND A METHOD OF VARYING AN IMAGE FORMING POSITION

Takeshi Baba; Takashi Serizawa; Masayuki Usui, all of Yokohama; Hiroyuki Imataki, Kawasaki, and Hiroyasu Nose, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,546

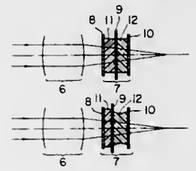
Claims priority, application Japan, Feb. 23, 1984, 59-32999

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.⁴ G02B *7/02, 1/06, 15/00, 5/04*

U.S. Cl. 350—409 **23 Claims**

1. An optical device comprising an elastomeric body, and a plurality of relatively rigid holding members each providing an optical surface and holding in cooperation with each other the elastomeric body, the relative positions of the plurality of



optical surfaces being changeable through deformation of the elastic body.

4,781,446

ZOOM LENS HAVING A CAPABILITY OF INTRODUCING SPECIAL FEATURES INTO IMAGE FORMATS

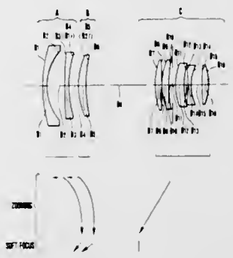
Tsunefumi Tanaka; Takashi Matsushita, both of Kanagawa; Nozomu Kitagishi; Sadatoshi Takahashi, both of Tokyo, and Keiji Ikemori, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,756

Claims priority, application Japan, Nov. 16, 1984, 59-242150; Nov. 16, 1984, 59-242151

Int. Cl.⁴ G02B *15/14, 15/177, 13/18*

U.S. Cl. 350—426 **11 Claims**



1. A zoom lens, comprising:

at least three lens units movable along the optical axis for zooming,

said three lens units including successively arranged first and second lens units, said first lens unit having a concave lens surface facing toward the second lens unit and said second lens unit having a convex lens surface facing toward the first lens unit, and said first and second lens units being arranged to move at different speeds along the optical axis for a soft-focus photography.

4,781,447

ULTRA COMPACT ZOOM LENS

Toshiro Ozawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,359

Claims priority, application Japan, Oct. 22, 1986, 61-249748

Int. Cl.⁴ G02B *15/16, 9/62*

U.S. Cl. 350—427 **6 Claims**

1. A zoom lens system, comprising:

a first lens unit having a positive refracting power, said first lens unit including a positive lens L_1, a negative lens L_2 and a cemented lens L_{34} comprised of a negative lens and a positive lens and having a positive resultant refracting power;

a second lens unit having a negative refracting power, said second lens unit including a positive lens L_5 and a negative lens L_6; and

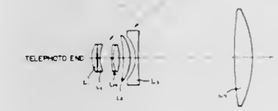
a third lens unit having a positive refracting power and including a positive lens L_7;

whereby, with the designation of following parameters,

f_1, f_2: resultant focal distances of said and second lens units, respectively;

n_6: refractive index of a lens material of said negative lens L_6;





v_1: dispersion of a lens material of said positive lens L_1;

n_+, n_-: refractive indexes of materials of the positive and negative lenses of said cemented lens L_{34}, respectively; and

v_+, v_-: dispersions of the materials of the positive and negative lenses of said cemented lens L_{34}, respectively;

the following conditions are satisfied:

(1) $1.0f_1 < f_2 < 1.2f_1$;

(2) $1.68 < n_+ < n_-$;

(3) $20 < v_+ - v_-$;

(4) $35 < v_1$; and

(5) $1.65 < n_6$.

4,781,448

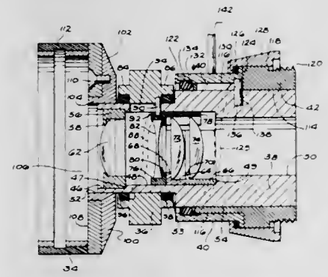
ZOOM LENS ADAPTER FOR ENDOSCOPIC CAMERA

David Chatenever, and Stephen M. Kurtzer, both of Santa Barbara, Calif., assignors to Medical Concepts Inc., Santa Barbara, Calif.

Filed Mar. 2, 1987, Ser. No. 20,775

Int. Cl.⁴ G02B *7/10, 23/26*

U.S. Cl. 350—429 **10 Claims**



1. An adapter, including a zoom lens, for coupling an image from the output of an endoscope to the input of a camera, comprising:

a cylindrical barrel having first and second ends;

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coupling means for coupling said first end of said barrel coaxially to said output of said endoscope;

mounting means for mounting said second end of said barrel coaxially to said input of said camera for axial movement relative thereto;

a sealed optical system comprising a plurality of lenses mounted coaxially within said barrel for receiving an image from said endoscope and transmitting said image through said input of said camera to an image plane therein, at least one of said lenses being axially moveable within said barrel and relative to others of said lenses for adjusting the magnification of said image on said plane, said barrel and said lenses being moveable together axially relative to said camera for focusing said image on said plane;

adjusting means for moving said one lens axially within said barrel and relative to said others; and

focusing means, operatively independent of said adjusting means, for moving said barrel and said lenses axially relative to said camera.

4,781,449

WIDE ANGLE READING LENS SYSTEM

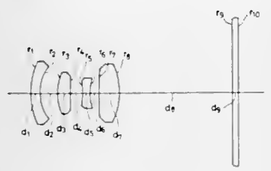
Jun Hirakawa, and Yasunori Arai, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,283

Claims priority, application Japan, Sep. 5, 1986, 61-210390

Int. Cl.⁴ G02B *9/36*

U.S. Cl. 350—469 **7 Claims**



1. A wide-angle reading lens system which comprises, in order from the object side, a first lens element which is a negative meniscus lens having its convex surface directed toward the object side, a second lens element which is a positive lens having a strong convex surface directed toward the object side, a third lens element which is a negative lens, and a fourth lens element which is a positive lens having a strong convex surface directed toward the image side, said lens system satisfying the following conditions:

$$-2.0f \leqq f_1 \leqq -0.75f \quad (1)$$

$$\frac{n_2 + n_4}{2} \geqq 1.72, \quad (2)$$

$$\nu_2, \nu_4 \geqq 35$$

$$d_{1\text{-}7} \leqq 0.85f \quad (3)$$

where f denotes the overall focal length of the system; f_1 is the focal length of the first lens element; n_i is the refractive index of an ith lens at the d-line; ν_i is the abbe number of the ith lens; and $d_{1\text{-}7}$ signifies the distance from the surface of the first lens element on the object side to the surface of the fourth lens element on the image side.

4,781,450

ELONGATE DEFORMABLE STRUCTURE AND APPLICATIONS TO EYEGLASS FRAMES

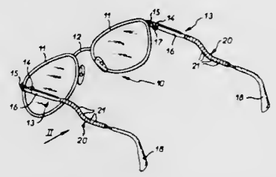
André Danloup, Saint Mihiel; Michel Erasell, Saint Maur, and Claude Romanet, La Varenne Saint Hilaire, all of France, assignors to Essilor International Cie Generale d'Optique, Creteil Cedex, France

Filed Feb. 10, 1987, Ser. No. 13,028

Claims priority, application France, Feb. 12, 1986, 86 01895

Int. Cl.⁴ G02C *5/16*

U.S. Cl. 351—114 **21 Claims**



1. Elongate deformable structure comprising a central core member made of a shape memory alloy and a plurality of annular members each having an axial bore and opposed surfaces transverse to the bore thereof, said core member extending through said bores of said annular members, said annular members being mounted for rotation about said core member, at least one of the transverse surfaces of at least one of said annular members being disposed obliquely to the axis of said bore thereof, said core member having an expanded configuration for permitting relative angular displacement of said annular members and a contracted configuration for maintaining said annular members together.

4,781,451

EYE PROTECTORS SUCH AS SPECTACLES, VISORS AND THE LIKE

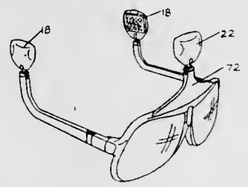
Terry McAllen, 253 Manor Farm Road, Bitterne Park, Southampton, England

Filed Sep. 26, 1986, Ser. No. 913,011

Claims priority, application South Africa, Oct. 7, 1985, 85/7704

Int. Cl.⁴ G02C *3/00*

U.S. Cl. 351—156 **7 Claims**



1. An eye protector for combination with an article of headgear, the eye protector comprising:

an eye protector for protecting at least one eye, the eye protector having a front side and, for juxtaposition with the eye, an opposite, rear side;

a pair of side elements connected on one end respectively to opposite ends of the eye protector for projecting rearwardly of the eye protector;

suspension means suspending the eye protector and side elements from an article of headgear, the suspension means comprising three members, two of the members respectively projecting upwardly from one, upward side of the side elements, and the third of the members projecting upwardly from a corresponding, upward side of the eye protector; and

the suspension means further comprising connecting means for movably connecting the members respectively to the side elements and eye protector for horizontal pivotal movement of the members about vertical axes, whereby to adapt the members for suspension from variable headgear without relying on direct contact between the eye protector and the head of the wearer for support of the eye protector.

4,781,452

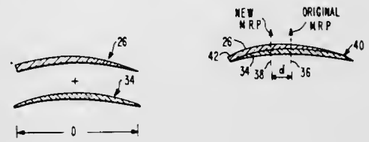
MODULAR OPTICAL MANUFACTURING SYSTEM

Ronald S. Ace, 5200 J. Philadelphia Way, Lanham, Md. 20706

Filed Nov. 7, 1984, Ser. No. 669,168

Int. Cl.⁴ G02C *7/02, 7/06;* **B24B** *1/00;* **G06F** *15/46*

U.S. Cl. 351—177 **16 Claims**



1. The method of manufacturing a modular lens for eyeglasses, comprising:

determining the prescription required for the finished modular lens;

measuring the pupillary distance of the patient who will wear the eyeglasses;

selecting a preground, prefinished, single vision lens having the spherical and cylindrical power required by said prescription and having an optical major reference point;

determining the decentration required to fit the selected single vision lens to the patient;

selecting a prism wedge lens having the prism power required to produce the required decentration of said major reference point of said single vision lens; and

assembling said single vision lens and said prism wedge lens to produce a surface finished modular lens having the required decentration.

4,781,453

OPHTHALMIC EXAMINATION APPARATUS

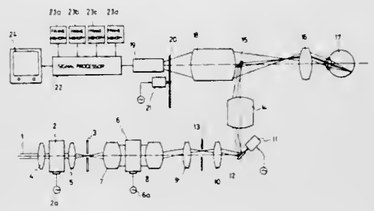
Koji Kobayashi, Hino, Japan, assignor to Kowa Company Ltd., Aichi, Japan

Filed May 12, 1987, Ser. No. 49,719

Claims priority, application Japan, May 12, 1986, 61-106688

Int. Cl.⁴ A61B *3/10*

U.S. Cl. 351—205 **5 Claims**



1. An ophthalmic examination apparatus which directs a laser beam from a laser light source at a subject eye fundus to scan the fundus two-dimensionally, picks up the light reflected back from the eye fundus and by means of a photoelectric transducer subjects the light to photoelectric conversion to obtain information about the eye fundus, said apparatus comprising:

a laser light source that generates laser beams of a plurality of wavelengths;

a first acousto-optical device which selects one wavelength from among the plurality of laser beam wavelengths;

a first optical deflector for scanning a laser beam in one direction at a predetermined frequency; and

a second optical deflector for scanning the laser beam in a direction that is at right-angles to the above said direction at a frequency that is lower than the above said frequency;

wherein said first optical deflector is the second acousto-optical device driven at an ultrasonic frequency, and by changing the range of variability of the ultrasonic frequency of the second acousto-optical device in accordance with the laser beam wavelength selected by the first acousto-optical device, the angle of deflection of the first optical deflector becomes the same irrespective of the wavelength of the laser beam.

4,781,454

OPTICAL TELEMETRY SYSTEM INCORPORATING A COLLIMATOR

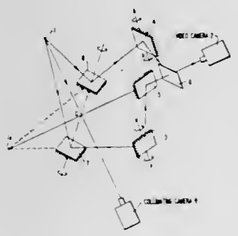
Alain Cazenave, Sevres, and Roland P. P. Tierrez, Montmagny, both of France, assignors to Hispano Suiza, St. Cloud, France

Filed Mar. 24, 1986, Ser. No. 843,393

Claims priority, application France, Apr. 3, 1985, 85 05031

Int. Cl.⁴ G01C *3/10;* **G01B** *11/00*

U.S. Cl. 356—1 **5 Claims**



1. In a collimating telemetry optical system for finding the distance of a viewed image comprising:

two first mirrors each rotatable about an axis lying parallel to the axis of the other, synchronized in rotation to each other, and each lying in a respective, different optical path from an object to superposed images of the object, the two optical paths being of the same length, the said image defining with a reference point a first optical axis, and

two second, co-planar, mirrors each located on a respective one of said optical paths and symmetrically with respect to the first optical axis,

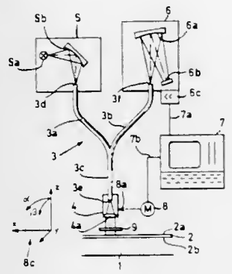
the arrangement being such that the telemetry is carried out on a virtual object, an image thus produced defining with the virtual object a second optical axis and wherein the plane constituted by said second mirrors is perpendicular to the plane constituted by said first and second optical axis.

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4,781,455
METHOD FOR MEASURING OPTICAL STRAIN AND APPARATUS THEREFOR

Meinrad Mächler, Ellwangen; Harry Schlemmer, and Ursula Rager, both of Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 861,160
Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516538
Int. Cl.⁴ G01B *11/18*
U.S. Cl. 356—34 **30 Claims**

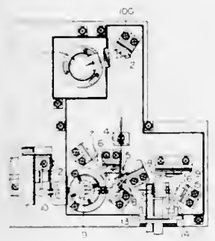


1. A method for optically measuring strain in transparent and opaque objects comprising the steps of:
placing a transparent film upon the object to define boundary layers and to adhere well to said object to ensure that the strains on the surface of the latter are transmitted to said film; said film having a thickness selected so as to be less than a predetermined value below which the formation of strain gradients in said film in the direction of the film thickness are precluded;
directing a bundle of optical rays onto said film so as to cause a portion of said rays to be reflected therefrom and define a component beam whereby a wavelength-dependent intensity course develops because of the interference of said component beam which is superposed and reflected at said boundary layers of said transparent film; and,
measuring and evaluating said intensity course.

4,781,456
ABSORPTION PHOTOMETER

Taro Nogami, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,212
Claims priority, application Japan, Jul. 26, 1986, 61-176467
Int. Cl.⁴ G01J *3/427*
U.S. Cl. 356—51 **11 Claims**

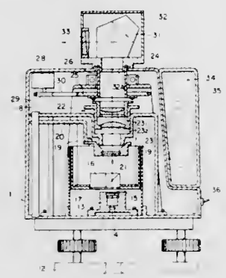


1. An absorption photometer comprising:
a light source for emitting light in one wavelength range;
a variable-wavelength spectrometer including dispersion means for dispersing the light depending on the wavelength;
light directing means located between said light source and said dispersion means for producing more than one light beam from the light emitted by said light source and making the light beams incident to said dispersion means at different angles;
means for taking out output light having different wavelengths from said dispersion means in one direction and for making the output light of different wavelength simultaneously incident to a sample in a sample cell;
detection means for simultaneously detecting each light of different wavelength transmitted through said sample; and
an arithmetic operation means for calculating the ratio of detection results at different wavelengths provided by said detection means.

4,781,457
LASER SURVEYING EQUIPMENT

Satoshi Hirano; Takuji Sato, and Hiroshi Nishikatsu, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,571
Claims priority, application Japan, Mar. 24, 1984, 59-55288; Mar. 29, 1984, 59-59356
Int. Cl.⁴ G01C *9/12*
U.S. Cl. 356—250 **11 Claims**

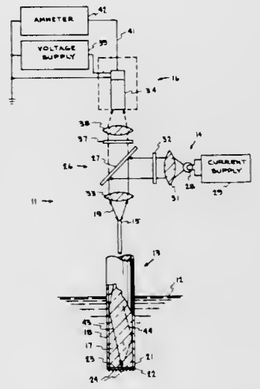


1. A laser surveying equipment comprising:
a laser beam luminous emitting section which is fixed relative to said laser surveying equipment;
a reflection member for producing an erected normal image, including means located above said laser beam luminous emitting section for upwardly reflecting the laser beam emitted from the laser beam luminous emitting section, and
a projection lens system which is substantially fixed relative to said laser beam luminous emitting section, and which receives the laser beam reflected from said reflection member and converts the thusly received laser beam to a parallel laser beam;
suspension means for suspending said reflection member relative to said laser beam luminous emitting section;
wherein said parallel laser beam from said projection lens is always directed vertically.

4,781,458
FIBER OPTIC APPARATUS FOR DETECTING MOLECULAR SPECIES BY SURFACE ENHANCED RAMAN SPECTROSCOPY

Stanley M. Angel, Livermore, Calif., and Shiv K. Sharma, Honolulu, Hi., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 30, 1987, Ser. No. 126,159
Int. Cl.⁴ G01N *21/65*
U.S. Cl. 356—301 **23 Claims**



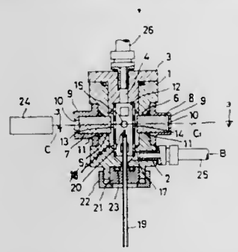
1. In apparatus for detecting one or more molecular species in a liquid medium by surface enhanced Raman spectroscopy, the combination comprising:
at least one optical fiber having a light transmissive core and having a coating of metal on at least a portion thereof, said coating being sufficiently thin to transmit light, said metal being one which enhances emission of Raman signals by substances adsorbed on the surface of the coating when probe light is scattered by said substances,
light source means for directing said probe light into said optical fiber, and
detector means for detecting Raman signals in light which is emitted from said optical fiber.

4,781,459
APPARATUS FOR MEASURING THE AMOUNT OF MINUTE PARTICLES CONTAINED IN LIQUID

Riichiro Suzuki, Kyoto, Japan, assignor to Horiba, Ltd., Tokyo, Japan

Filed Apr. 22, 1986, Ser. No. 854,760
Claims priority, application Japan, May 17, 1985, 60-74127[U]
Int. Cl.⁴ G01R *15/02*
U.S. Cl. 356—335 **4 Claims**

1. An apparatus for measuring particles contained in a sample liquid, comprising:
a cylindrical cell having an incident light transmitting portion, a passed through light transmitting portion diametrically aligned with said incident light transmitting portion, and a scattered light transmitting portion at an angle to the diameter between said incident light transmitting portion and said passed through light transmitting portion;
an inlet at one end of said cell for admitting sheath flow liquid having the same index of refraction as the sample liquid, and an outlet at the other end of said cell;
a rectifying cylinder within said cell and having the axis extending between said inlet and said outlet and perpendicular to the diameter between said incident light transmitting portion and said passed through light transmitting portion and having light passing holes therein aligned with said incident light transmitting portion, said passed through light transmitting portion and said scattered light transmitting portion, said rectifying cylinder being coated with an opaque material, said cylinder being for causing said sheath flow liquid to flow smoothly from said inlet to said outlet at a predetermined pressure;
a nozzle within said rectifying cylinder coaxial with the axis thereof and directed toward said outlet and upstream of said diameter and for discharging sample liquid into said cylinder at a pressure higher than said predetermined pressure;

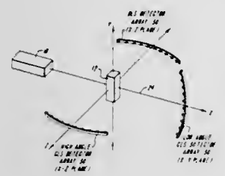


a plurality of partition walls on the outside of said cylinder between said incident light passing hole, said scattered light passing hole and said passed through light passing hole and extending parallel to the axis of said cylinder for guiding flow of sheath flow liquid along the outside of said cylinder; and
an optical detector optically connected to said scattered light transmitting portion for detecting light scattered from particles in the sample liquid.

4,781,460
SYSTEM FOR MEASURING THE SIZE DISTRIBUTION OF PARTICLES DISPERSED IN A FLUID

Steven E. Bott, Conway, Mass., assignor to Coulter Electronics of New England, Inc., Amherst, Mass.

Continuation-in-part of Ser. No. 817,048, Jan. 8, 1986, Pat. No. 4,676,641. This application Jun. 29, 1987, Ser. No. 68,139
Int. Cl.⁴ G01N *15/02, 21/49*
U.S. Cl. 356—336 **44 Claims**



1. A system for measuring the size distribution v(r) of particles dispersed in a fluid sample, where r is representative of particle size, comprising:
A. illumination means for illuminating said sample with a light beam directed along an input axis,
B. detector means for detecting the intensity of light scattered from said light beam by said sample for m measure-

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ments made under an associated one of a set of m measurement conditions, and for n measurements made under an associated one of a set of n measurement conditions, where m is an integer equal to or greater than one, and n is an integer equal to or greater than zero, and the sum of m and n is equal to or greater than two, and at least two of said m+n measurement conditions are different, said detector means further including:

i. means for generating m intensity signals, each of said intensity signals being representative of the detected intensity of said scattered light as a function of time under a corresponding one of the measurement conditions of said set of m measurement conditions,

ii. means for generating n average signals, each of said n average signals being representative of the average intensity of said scattered light detected under a corresponding one of the measurement conditions of said set of n measurement conditions,

C. autocorrelation means for generating m correlation signals, each of said correlation signals being representative of the autocorrelation function of a corresponding one of said intensity signals and being equal to an associated transformation of said distribution v(r),

D. size processing means responsive to said correlation signals and said average signals, including:

i. preprocessor means responsive to said m correlation signals for generating a composite correlation signal,

ii. means for generating a composite scattered light signal from said composite correlation signal and said n average signals

iii. means for determining a composite transformation operator J^{-1} related to said associated transformations and said n average signals,

iv. means for transforming said composite scattered light signal in accordance with said determined composite transformation operator J^{-1} to generate a size distribution signal representative of said distribution v(r), and

E. means for controlling said m+n measurement conditions whereby said intensity signals are mutually independent and said average signals are mutually independent.

4,781,461

RPM MEASURING DEVICE UTILIZING AN OPTICAL FIBER COIL AND WINDING METHOD FOR MAKING THE COIL

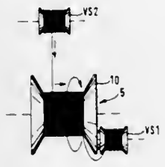
Klaus U. Baron, Heidelberg, and Eberhard Kiesel, Edingen, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,081

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533687

Int. Cl.[4] G01B *9/02;* **G01C** *19/64*

U.S. Cl. 356—350 **6 Claims**



1. In an rpm-measuring device including a closed light path comprising a coil formed of a plurality of winding layers of an optical fiber having first and second ends; a beam splitter connected to said first and second ends; means for passing two light beams in opposite directions through said coil by applying the two light beams to said first and second ends, respectively, and means for superposing the two light beams subsequent to their passage through said coil and for evaluating a phase-shift based on the Sagnac-effect; the improvement wherein the distance of the light path between the first end and any selected first location of said optical fiber is identical to the distance of the light path between the second end and a second location of said optical fiber; said selected first location and said second location being situated in immediately adjoining two windings belonging to two separate, immediately adjoining winding layers, whereby the two light beams propagate at all times in immediately adjoining two windings belonging to two separate, immediately adjoining winding layers.

4,781,462

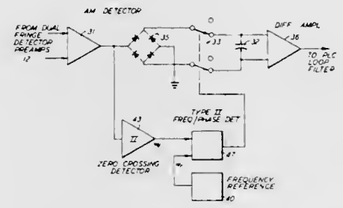
PATH LENGTH CONTROL SIGNAL DERIVATION CIRCUIT FOR A LASER ANGULAR RATE SENSOR

Lincoln S. Ferriss, Denville, and Mark A. Weitzner, Union, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Feb. 9, 1987, Ser. No. 13,080

Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 **4 Claims**



1. In electro-optical apparatus for the control of the optical path length at an integer number of wavelengths of a generated light beam having a steady state beam intensity, the electro-optical apparatus comprising an optical mirror/prism arrangement, a fringe detection circuit for detecting the fring operation of an optical output of the optical mirror/prism arrangement, and a path length control system deriving a signal from the steady state beam intensity of the optical output for controlling the optical path length in the optical mirror/prism arrangement to maximize the light beam intensity, the path length control system being coupled to the output of the fringe detection circuit and including a control signal derivation circuit connected to the output of the fringe detection circuit, the control signal derivation circuit comprising in combination an amplitude modulation detector, an electronic switch for switching the output of the amplitude modulation detector to a differential amplifier and a frequency/phase detector connected to the input to the amplitude modulation detector for controlling the operation of the electronic switch.

4,781,463

METHOD AND APPARATUS FOR USE IN MEASUREMENT OF THE POSITION OF A LINE OR EDGE OF AN OBJECT

Dennis Rosen, and John W. Lee, both of London, England, assignors to Birkbeck College, London, England

PCT No. PCT/GB85/00534, § 371 Date Jul. 16, 1986, § 102(e) Date Jul. 16, 1986, PCT Pub. No. WO86/03287, PCT Pub. Date Jun. 5, 1986

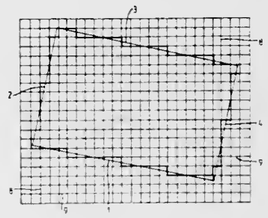
PCT Filed Nov. 20, 1985, Ser. No. 888,334

Claims priority, application United Kingdom, Nov. 20, 1984, 8429250

Int. Cl.[4] G01B *11/00;* **H04N** *7/18*

U.S. Cl. 356—394 **5 Claims**

1. A method of measuring the position of a line or an edge relative to a coordinate reference system, said method including the steps of arranging the line or edge, or an image thereof, and the coordinate system in relative overlapping positions with, in the case of a line, the line out of line with an axis of the coordinate system, and establishing the distance between each of a plurality of points on the line or edge and an adjacent



coordinate of the reference system, thereby to establish first information defining the position of the line or edge relative to the coordinate system.

4,781,464

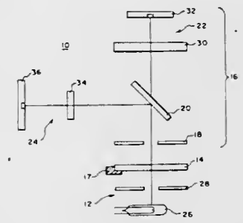
GEL SCANNER

Robert W. Allington; Wylee D. Brunken, both of Lincoln, and Lawrence L. Sedlak, Dwight, all of Nebr., assignors to Isco, Inc., Lincoln, Nebr.

Filed Apr. 14, 1986, Ser. No. 851,233

Int. Cl.[4] G01O *3/51;* **G01N** *21/86*

U.S. Cl. 356—419 **19 Claims**



1. A method of scanning dyed gel having bands resolved within it comprising the steps of:

moving the gel and an optical system with respect to each other;

transmitting light from a source of light through an aperture in an aperture plate having a dimension in the direction of motion of less than 0.5 millimeter and a dimension perpendicular to the direction of motion of less than 10 millimeters;

receiving light on the other side of the gel through an aperture plate and transmitting only frequencies of light within the visible range and within the absorption spectrum of the bands to a first photocell; and

transmitting other frequencies of the light passing through the gel to a reference photocell, which other frequencies of light include light only of frequencies not transmitted to the sensing photocell and having a bandwidth of frequencies at least 10 times wider than the bandwidth of frequencies reaching the said first photocell.

4,781,465

DEVICE FOR DETECTING ROAD SURFACE CONDITION

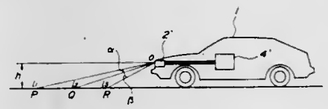
Atushi Demachi; Fumitaka Takahashi, both of Tokyo; Katsutoshi Tagami, Saitama, and Shigeto Nakayama, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 681,545, Dec. 14, 1984, abandoned. This application Jan. 9, 1987, Ser. No. 5,387

Claims priority, application Japan, Dec. 23, 1983, 58-248843; Dec. 28, 1983, 58-251741; Dec. 28, 1983, 58-251742

Int. Cl.[4] G01B *11/30*

U.S. Cl. 356—371 **3 Claims**



1. A device for detecting road surface condition in front of a car, comprising: distance measuring means including means for emitting directional beams from a beam source arranged at a predetermined height above a road surface, said directional beams being directed at predetermined different radiating angles relatively to a horizontal line, thereby irradiating at least three points on a line on the road surface in front of the car in its running direction and means for receiving the respective beams which have been reflected from the road surface for thereby measuring the respective distances between the respective irradiated points and the beam source; and means for effecting a predetermined arithmetic operation and for deciding from said arithmetic operation whether a flat condition of the road surface on said line is met or not on the basis of data concerning the distances of said at least three measured points, thereby determining uneven condition of the road surface in front of the car.

4,781,466

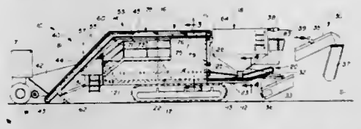
METHOD AND APPARATUS FOR PRODUCING CONCRETE

Harold M. Zimmerman, R.D. #1, Wabash Rd., Ephrata, Pa. 17522

Filed May 23, 1986, Ser. No. 866,273

Int. Cl.[4] B28C *5/14, 7/06;* **B65G** *65/06, 67/08*

U.S. Cl. 366—2 **9 Claims**



1. A method of continuously producing concrete and depositing said concrete along a desired path comprising the steps of:

moving a mobile concrete producing machine, having a loading conveyor, at least two aggregate supply bins, a cement supply bin, a water tank, delivery conveyors and a mixing auger, along a path of travel substantially corresponding to the desired path along which concrete is to be deposited;

simultaneously with said moving step, receiving supplies of at least two different aggregates delivered from an external ground supported supply vehicle at mutually exclusive intervals by said loading conveyor and conveying said aggregates to preselected respective aggregate supply bins to maintain an adequate supply of each said aggregate in the respective said aggregate supply bin; engaging the supply vehicle with the concrete producing machine to

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permit propelling the supply vehicle on the ground during said receiving step;

delivering supplies of water and cement to said water tank and said cement supply bin, respectively, simultaneously with said moving step as needed at appropriate intervals to maintain adequate supplies thereof within said mobile concrete producing machine;

withdrawing discernible quantities of each said aggregate and said cement from each said aggregate supply bin and said cement supply bin, respectively, in a substantially continuous manner by said delivery conveyors simultaneously with said moving step and discharging said aggregates and said cement from said delivery conveyors into said mixing auger with preselected quantities of water from said water tank;

mixing said aggregates, cement and water by said mixing auger to produce concrete simultaneously with said moving step; and

depositing said concrete from said mixing auger into the desired path of deposit by pivotally moving said mixing auger into a desired position simultaneously with said moving step.

4,781,467

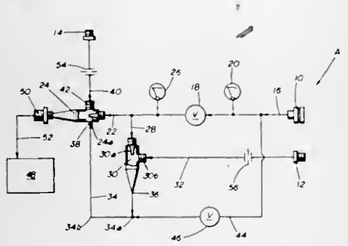
FOAM-GENERATING APPARATUS

Leslie P. Williams, Port Neches, Tex., assignor to CCA, Inc., Port Neches, Tex.

Continuation-in-part of Ser. No. 849,690, Apr. 9, 1986, Pat. No. 4,705,405. This application Oct. 15, 1987, Ser. No. 108,464

Int. Cl.[4] B01F *15/04*

U.S. Cl. 366—150 **8 Claims**



1. An apparatus for mixing chemicals comprising:

a motive liquid inlet;

a first chemical inlet;

a second chemical inlet;

a mixed chemicals outlet;

an eductor means having a first chemical inlet port and a second chemical inlet port;

said eductor means having an inlet in flow communication with said motive liquid inlet for flowing liquid under pressure through said eductor means to create a reduced pressure therein, and also having an outlet in flow communication with said mixed chemicals outlet;

conduit means connecting said second chemical inlet to said second chemical inlet port of said eductor means;

ejector means disposed in fluid communication with said motive liquid inlet and also with said first chemical inlet and said first chemical inlet port of said eductor means for causing a flow of a chemical from said first chemical inlet through the ejector means to said first chemical inlet port of said eductor means substantially independently of the flow rate of a chemical flowing into said eductor means from said second chemical inlet to facilitate control of the ratio of the chemicals entering said eductor means; and

said eductor means inducing flow of the chemical directly from said second chemical inlet into said second chemical inlet port and also the chemical from said ejector means for mixing the chemicals in said eductor means and discharging the mixed chemicals therefrom under pressure.

4,781,468

MIXING APPARATUS

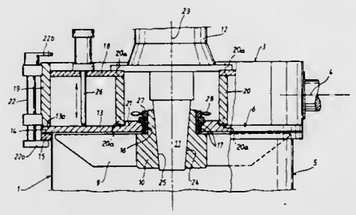
Friedrich W. Herfeld, Wall 1, 5982 Neuenrade, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 933,874

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543913

Int. Cl.[4] B01F *7/20, 9/12*

U.S. Cl. 366—213 **9 Claims**



1. Mixing apparatus comprising a support; rotary driving means having a rotatable drive shaft; means mounting said driving means on said support; a mixing vessel comprising an upright bowl having an open upper end; a cover for said bowl; means for securing said cover to said bowl at its upper end; mixer blade means; a rotatable hub secured to said mixer blade means; means journalling said hub on said cover for rotation; means reacting between said hub and said cover for locating said mixer blade means adjacent said cover and within said bowl at said upper end thereof; means for effecting relative movement of said bowl and said driving means toward and away from one another, said driving means and said hub being responsive to relative movement of said bowl and said driving means a predetermined distance toward one another to drivingly couple said shaft and said hub to one another; means for separably securing said vessel to said support with said shaft and said hub drivingly coupled; and means for rotating said support through substantially 180° while said vessel is secured thereto to invert said vessel and locate said cover at the bottom of said inverted vessel.

4,781,469

DETECTING PROXIMITY OR OCCURRENCE OF CHANGE OF PHASE WITHIN A FLUID

Gilbert Turon-Lagot, Rueli Malmaison, France, assignor to Electricite de France, Paris, France

Filed Nov. 25, 1985, Ser. No. 802,209

Claims priority, application France, Nov. 23, 1984, 84 17907

Int. Cl.[4] G01N *25/08*

U.S. Cl. 374—27 **9 Claims**

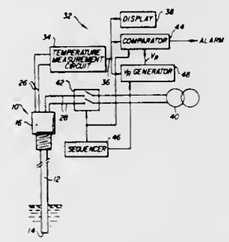
1. A method for detecting imminency of boiling in liquid body, comprising the steps of:

(a) delivering a predetermined quantity of heat by resistance electric heating, with an electrical resistor, to a portion of a thermally conducting means which is in contact with the liquid body for bringing said thermally conducting means to an increased temperature at said portion,

(b) sensing said increased temperature and providing, responsive thereto, an increased temperature signal representative of said increased temperature,

(c) comparing said increased temperature signal with a reference temperature signal having a value such that local boiling of said liquid body is indicated by a difference between said increased temperature signal and said reference temperature signal, and

(d) repeating steps a, b, and c.



4,781,470

FLEXIBLE CONTAINER WITH SEPARATE LIFTING AREA

Eirik Myklebust, and Bjarne Omdal, both of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

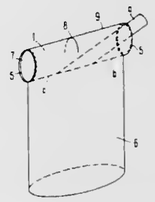
PCT No. PCT/NO85/00077, § 371 Date Aug. 11, 1986, § 102(e) Date Aug. 11, 1986, PCT Pub. No. WO86/03729, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 6, 1985, Ser. No. 897,005

Claims priority, application Norway, Dec. 21, 1984, 845158; Aug. 8, 1985, 853130

Int. Cl.[4] B65D *33/06*

U.S. Cl. 383—7 **16 Claims**



1. In a flexible container for transportation and storage of bulk material and including an interior having a lower cargo compartment to be filled with bulk material and defined by side walls, and an upper lifting area defined by integral lifting loops which are formed by direct extensions of the material of said side walls, and lifting openings through said material to said interior of said container for the receipt of lifting means, whereby bulk material may be filled into said cargo compartment via said lifting area through one of said lifting openings, the improvement of means for separating said cargo compartment from said lifting area and for closing said cargo compartment to prevent spillage therefrom of bulk material filled therein, said separating means comprising:

a separating member positioned within said lifting area of said container, said separating member being fastened to said container at positions adjacent edges of said lifting openings thereof; and

said separating member including at least one integral portion formed of a flexible material and defining a filling spout for being drawn out through one of said lifting openings during a filling operation, such that bulk material may be filled therethrough into said cargo compartment, and for being closed after completion of such filling operation and thereby closing the thus filled said cargo compartment.

4,781,471

METHOD AND ARRANGEMENT FOR PRODUCING BAGS, SACKS OR SIMILAR OBJECTS OF A THERMOPLASTIC SYNTHETIC PLASTIC FOIL WEB, AND OBJECTS PRODUCED THEREBY

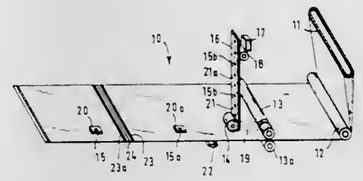
Karl-Heinz Sengewald, Kreisstrasse 16, 4802 Halle in Westfalen, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,374

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624311

Int. Cl.[4] B65D *30/02*

U.S. Cl. 383—7 **16 Claims**



1. A method of producing bags, sacks or similar objects from a thermoplastic synthetic plastic foil web, comprising the steps of providing on a synthetic plastic foil web a plurality of printing marks; electronically sensing the printing marks; and welding and separating the synthetic foil web in response to said sensing of the printing marks, said providing step including forming the printing marks so that they are electronically detectable and arranging the printing marks first on a supporting foil element and then attaching the supporting foil element with the electronically detectable printing marks thereon to the synthetic plastic foil web, said sensing being electronical detecting the printing marks.

4,781,472

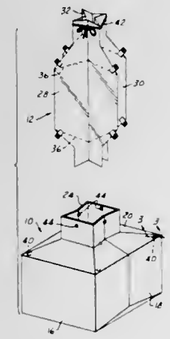
LARGE BAG WITH LINER

Arnie LaFleur, and Lee LaFleur, both of Manistee, Mich., assignors to Custom Packaging Systems, Inc., Manistee, Mich.

Filed Nov. 6, 1987, Ser. No. 118,304

Int. Cl.[4] B65D *33/06*

U.S. Cl. 383—16 **26 Claims**



1. In combination with a flexible and collapsible bulk bag having a side wall, ends and an opening adjacent one end to the exterior of the bag through which contents are discharged, and

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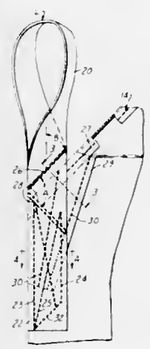
a flexible and collapsible liner received in said bag generally complimentary thereto and having a side wall, ends and an opening adjacent one end through which the contents are discharged; the improvement comprising, at least two connectors between said liner and bag and each connecting said liner to said bag, said connectors being spaced apart and each located adjacent a side wall portion of said bag and adjacent the one end of said bag and liner having the discharge openings therethrough, and all of said connectors being constructed, arranged, located and connected to said liner such that said liner is not withdrawn from said bag and can collapse upon itself during discharge of the contents thereof independently of and without being substantially restricted by said bag from collapsing, whereby the contents of said bag and liner are discharged through said openings without the liner being withdrawn from said bag by such discharge.

4,781,473

LARGE BAG WITH LIFT STRAPS

Arnie LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Inc., Manistee, Mich.

Filed Nov. 12, 1987, Ser. No. 120,123
Int. Cl.[4] B65D *33/06*
U.S. Cl. 383—16 **15 Claims**



1. A large bulk bag comprising:
a container having a flexible sidewall,
a strap of flexible material having opposed ends,
means fastening said ends in overlapping relation to adjacent overlapped sidewall portions of the container and forming a loop with a pair of runs extending above said sidewalls; and
a line of connection of said runs extending diagonally across said runs, located beyond said side wall portions and constructed and arranged to orient the lifting forces generally into a plane of the overlapped ends of said strap such that the separation of said strap from said connected adjacent sidewall portions is prevented upon lifting of the container by said strap.

4,781,474

POUCH WITH LOOP HANDLE ATTACHED BY OVAL SEAL

K. H. Sengewald, Postfach 1460, 4802 Halle in Westf. 1, Fed. Rep. of Germany

Continuation of Ser. No. 540,606, Oct. 7, 1983, abandoned. This application Mar. 11, 1987, Ser. No. 24,899
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3321808; Nov. 20, 1982, 3242510; Nov. 20, 1982, 3242976
Int. Cl.[4] B65D *33/06*
U.S. Cl. 383—29 **6 Claims**

1. A pouch made of thermoplastic foil and comprising a pair of side walls each having longitudinal edges, bottom portion, and a top portion, the longitudinal edges of one of the side walls being connected to the associated longitudinal edges of the other of the side walls so as to define an interior, the bottom portions having bottom folds, the top portions after connecting the side walls to each other defining a filling opening opposite to the bottom fold of each side wall; and only one one-piece handle of one strip thermoplastic foil and having a width which is considerably smaller than a width of the side walls, said one-piece one strip handle being arranged in the region of the bottom folds and only in a central region spaced from the



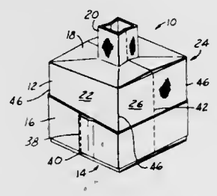
longitudinal edges and extending substantially parallel to the latter, said one-piece one strip handle having one end attached to the outside and only with the one of the side walls and another end attached to the outside and only with the other of the side walls so that a bridge between the one sidewall and the association bottom fold and between the other side wall and the associated bottom fold is prevented, the one and the other end of said one-piece one strip handle being welded to the associated side wall by a single welding seam which is of elongated oval shape and has an axis of elongation extending transversely of the longitudinal edges.

4,781,475

REINFORCED BULK BAG

Lee LaFleur, Manistee, Mich., assignor to Custom Packaging Systems, Inc., Manistee, Mich.

Filed Nov. 10, 1987, Ser. No. 119,109
Int. Cl.[4] B65D *33/02*
U.S. Cl. 383—119 **18 Claims**



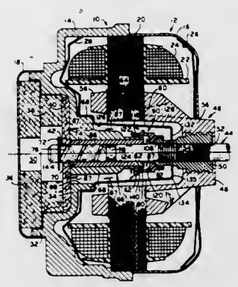
1. A reinforced bulk bag comprising a collapsible container having a bottom and a sidewall of a flexible material, a separate band of a flexible material, one of said band and sidewall encircling the other such that the sidewall is reinforced, said band having a minimum height equal to at least about one-fifth of the height of said sidewall of said container and a maximum height of about one half the height of said sidewall when said container is full, the lower edge of said band being located closely adjacent the bottom of the contair :r, and wherein said band and sidewall are tacked together in at least two circumferentially spaced apart locations.

4,781,476

METHOD OF CIRCULATING LUBRICANT FOR AN ELECTRIC MOTOR

Richard F. Uhen, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 796,827, Nov. 12, 1985, Pat. No. 4,635,352, which is a division of Ser. No. 584,622, Feb. 29, 1984, Pat. No. 4,565,937. This application Dec. 11, 1986, Ser. No. 940,663
Int. Cl.[4] F16C *17/00*
U.S. Cl. 384—136 **2 Claims**



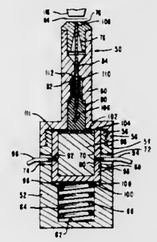
1. In a dynamoelectric machine including a stator, a rotor, a shaft connected to the rotor, a bearing supporting the shaft, and a lubricant reservoir, a method of circulating lubricant through the machine comprising: pumping lubricant from the reservoir axially in a forward direction through the bearing to lubricate the bearing, and pumping the lubricant out of one end of the bearing; throwing at least a portion of the lubricant that is pumped out of the bearing one end generally radially outwardly from the shaft against a surface disposed circumferentially around the shaft; impelling through space, with a rearward axial component of velocity, at least a portion of the lubricant that has been thrown radially against the circumferentially disposed surface; and returning the radially thrown and axially impelled lubricant back to the reservoir.

4,781,477

DOT MATRIX PRINT HEAD

Hideo Nagasawa, Oiso, Japan, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 13, 1987, Ser. No. 108,233
Claims priority, application Japan, Nov. 7, 1986, 61-263869
Int. Cl.[4] B41J *3/12;* **H01L** *41/04*
U.S. Cl. 400—124 **18 Claims**



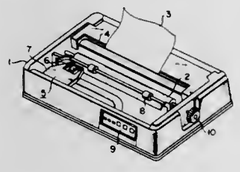
1. A dot matrix print head comprising a housing, an actuating means within the housing,
means supporting the actuating means, a plunger element operably associated with the actuating means and movable to and from a printing position, a print element secured to said plunger element and movable therewith, a
platen opposite said print element,
first resilient means for returning the plunger element and the print element from the printing position,
second resilient means for urging the supporting means and the actuating means to a home position, and
means for pulsing the actuating means for displacement thereof to move the plunger element against the first resilient means and to move the print element into impact with said platen, the impact causing said plunger element and said print element to rebound against said actuating means, said housing having shoulder means engageable by said actuating means upon rebound motion thereof to inhibit oscillation of the actuating means more rapidly than oscillation of the plunger element.

4,781,478

TECHNIQUE FOR AUTOMATIC CENTERING OF CARRIAGE IN A PRINTING APPARATUS TO ASSIST WITH INSERTION OF PAPER

Toru Eguchi, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1986, Ser. No. 904,686
Claims priority, application Japan, Sep. 17, 1985, 60-204824
Int. Cl.[4] B41J *19/30*
U.S. Cl. 400—279 **14 Claims**



1. A printing apparatus comprising:
a platen;
a carriage supporting a printing head for printing data on a sheet of paper set on the platen, and being movable in the axial direction of the platen;
a first guide member attached to the carriage and opposing the platen, for guiding a sheet of paper which is inserted in a first gap between the platen and the first guide member into a second gap between the platen and the printing head;
carriage drive means for moving the carriage to a predetermined position within a region opposing the central portion of the platen; and
first control means for sensing an occurrence of removal of said sheet of paper from said second gap, and for actuating said carriage drive means upon such an occurrence to move said carriage to the predetermined position.

4,781,479

TYPEFACE PRODUCT

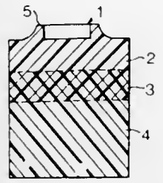
Tadashi Hirano, Tokyo, Japan, assignor to Data Card Japan Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,565
Claims priority, application Japan, Jan. 17, 1986, 61-6574
Int. Cl.[4] B41B *1/02*
U.S. Cl. 400—462 **9 Claims**

1. Type consisting of a heat-curable resin and comprising:
a typeface portion consisting of particles of a first size having a hardness capable of withstanding pressure applied at printing and a particle size affording smoothness;
an impact face portion consisting of particles of a second size larger than the first size and having a hardness capable of withstanding pressure applied at printing and an elasticity

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capable of withstanding and of absorbing impact sustained at printing; and



a joint portion located between said typeface portion and said impact face portion and consisting of a mixture of the particles of the first size and the particles of the second size.

4,781,480

PRINTER AND PAPER INSERTION DEVICE SUITABLE THEREFOR

Hiroshi Kikuchi; Shyoichi Watanabe; Yukio Ota; Yoshinori Koshida; Takashi Itaya, and Jiro Tanuma, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

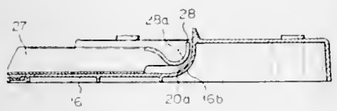
Continuation of Ser. No. 836,513, Mar. 5, 1986, Pat. No. 4,722,623. This application Jul. 23, 1987, Ser. No. 77,675

Claims priority, application Japan, Mar. 9, 1985, 60-32863; Mar. 9, 1985, 60-32864

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] B41J *29/02*

U.S. Cl. 400—691 **2 Claims**



1. A sheet insertion device for use with a printer for supplying thereto a sheet to be printed thereon by the printer, said device comprising:

a frame having a support surface for supporting a printer, said support surface having formed therein guide holes for receiving supporting legs of the printer to be supported by said support surface, and an opening formed in substantially a central area of said support surface for passage therethrough to the printer of a sheet to be printed;

a substantially horizontally flat member positioned below said support surface for supporting the sheet to be printed; and

means defining a curved passage for guiding the sheet from said flat member through said opening in said support surface, said curved passage defining means including a first curved member continuously curving upwardly from a rear portion of said flat member to said opening, and a second curved member spaced from said first curved member substantially at a predetermined interval.

4,781,481

THERMAL PRINTER AND ITS PRINTING METHOD

Yuji Nagahamaya, Takizawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 19, 1987, Ser. No. 86,958

Claims priority, application Japan, Oct. 28, 1986, 61-256694; Oct. 28, 1986, 61-256695

Int. Cl.[4] B41J *3/20*

U.S. Cl. 400—697.1 **4 Claims**



1. In a thermal printer having a thermal recording medium interposed between a recording paper and a thermal head, said thermal head being operated to apply thermal energy to said recording medium so as to thermally transfer a portion of an ink layer of said recording medium, said ink layer being made of a thremoplastic material and having a colorant, to the recording paper for printing and also being operating for lifting off a previously printed mark of the ink layer from the recording paper for erasing, said printed mark comprising a thermally transferred portion of said ink layer of said thermal recording medium,

an improved thermal recording medium comprising:

a base layer to which thermal energy from the thermal head is applied for printing and for erasing;

an ink layer having a predetermined melting temperature and melting viscosity; and

a separation layer joining said ink layer to said base layer and having a melting temperature higher than that of said ink layer and a melting viscosity lower than that of said ink layer,

wherein, when thermal energy is applied for printing and said separation and ink layers become melted, said melted ink layer has an affinity for the recording paper higher than for said melted separation layer and higher than the cohesion of said separation layer, and when thermal energy is applied for erasing a printed mark on the recording paper, said separation and ink layers become melted and said melted ink layer adheres to the printed mark, and when the thermal energy for erasing is subsequently removed, said separation layer of said thermal recording medium becomes hardened more quickly than said ink layer and said ink layer has an affinity for the recording paper lower than for said hardened separation layer and lower than the cohesion of said separation layer, to thereby lift off the printed mark from the recording paper.

4,781,482

GLUE GUN WITH RACK AND PINION FEEDER

Reinhard Ursprung, Eching, Fed. Rep. of Germany, assignor to Test-Rite Products Corp., Clifton, N.J.

Filed May 18, 1987, Ser. No. 51,847

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 8613376[U]

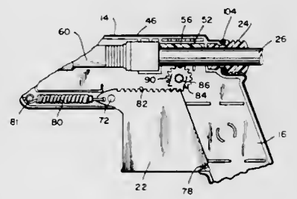
Int. Cl.[4] B05C *5/04*

U.S. Cl. 401—1 **13 Claims**

4. A glue gun adapted to receive thermoplastic sticks and extrude molten thermoplastic, the glue gun comprising a glue stick feed path, a heating assembly in the feed path and a glue stick feeding system for advancing a glue stick in the feed path toward the heating assembly, the feeding system including a trigger, a pinion having rim teeth, the rim teeth being engagable with the surface of a glue stick positioned in the feed path, gearing means including a rack drivingly engaging the pinion, means interconnecting the rack and the trigger for unitary displacement and means mounting the trigger for displacement

in a direction substantially parallel to the feed path axis while permitting tilting movement of the trigger toward the feed path axis.

13. A glue gun adapted to receive thermoplastic sticks and extrude molten thermoplastic, the glue gun comprising a glue stick feed path, the feed path including an upper fixed friction reducing bearing, a heating assembly in the feed path and a glue stick feeding system for advancing a glue stick in the feed path toward the heating assembly, the feeding system including a trigger, a pinion having two rows of rim teeth separated by a trough, a glue stick being positioned between the pinion and the bearing, a chordal segment of the glue stick positioned in the feed path extending into the trough, facing corners of the rim teeth defining the upper ends of the trough, the facing corners being engagable with the chordal surface of the glue stick, gearing means including a rack, the gearing means drivingly engaging the pinion and means interconnecting the rack and the trigger for unitary displacement.



4,781,483

DEVICE FOR EXPOSING A MASS STORED IN A CONTAINER

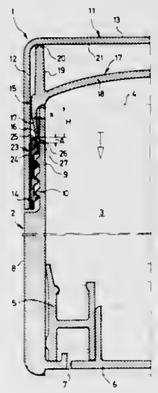
Willy Lorscheidt, Helenenstrasse 12, D-5024 Pulheim, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,117

Claims priority, applicatioo Fed. Rep. of Germany, Oct. 3, 1986, 3633754

Int. Cl.[4] B43K *21/02;* **B65D** *41/18*

U.S. Cl. 401—55 **11 Claims**



1. A device for exposing a mass stored in a container, comprising a follower piston slidably guided in said container and subjected to the action of the outer atmosphere, a closure cap removably disposed on the dispensing opening of said container, and a circumferential sealing gasket provided on said closure cap between the circumferential wall of said closure cap and the outer wall of said container and spaced from said outer container wall, for producing a vacuum acting to advance said means on removal of said closure cap, wherein, during removal movement of said closure cap, said circumferential sealing gasket is forced into sealing engagement with said outer wall of said container by a force produced by such removal and acting in the direction towards said outer wall.

4,781,484

APPLICATION UNIT REQUIRING AUTOMATIC ADDITION OF AT LEAST ONE ADDITIVE UPON FIRST USE

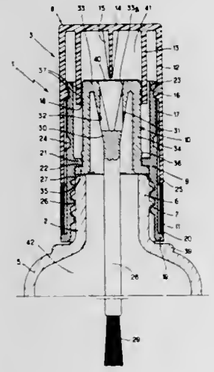
Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Feb. 13, 1987, Ser. No. 14,386

Claims priority, application France, Feb. 17, 1986, 86 02073

Int. Cl.[4] B05C *17/00*

U.S. Cl. 401—132 **7 Claims**



1. In a unit for storing and applying on a base a product with a consistency ranging from liquid to pasty such unit comprising:

(a) a reservoir for said product;

(b) detachable stoppering device adapted to be fitted on said reservoir;

(c) an applicator device integral with said detachable stoppering device, said applicator device comprising a stem, and an applicator element attached to the distal end of said stem for use in taking said product out of the reservoir and carrying it and spreading it on a said base, said stoppering device and said reservoir comprising co-operating means for effecting a stoppering seal of the reservoir;

the improvement wherein the stoppering device comprises:

(i) a first part which comprises means for fitting said stoppering device on said reservoir and with which the applicator device is integral;

(ii) a second part including means defining at least one compartment for at least one additional product intended to be admixed with a product to be contained in the reservoir, such admixture being intended to occur at the time of first use of the unit;

(iii) means mounting said second part displaceably in relation to said first part for displacement under the user's manual action upon the first use of the said unit between a first position which the second part adopts when said at least one compartment is obturated in a leakproof manner, and a second position wherein said at least one compartment has opened to communicate with the interior or said reservoir and to allow the contents of the said at lest one compartment to drop into said unit during the above-mentioned displacement from the first position to the second position; and

(iv) fixing means for fixing said first and second parts of the

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stoppering device to each other when said second part is in said second position with a view to withdrawing said stoppering device from said reservoir for use of a said product combined in said reservoir with said at least one additional product;

said first part of the stoppering device comprising a sleeve, a means fixing said applicator device to said sleeve, said sleeve comprising, at its lower portion, means for fitting said sleeve to the reservoir; said second part of said stoppering device comprising a closing cap comprising a top, a peripheral skirt joined to said top and means permitting said skirt to slide in relation to the upper region of said sleeve and comprising first fastening means on said closing cap and complementary second fastening means on said sleeve for the attachment of said cap on said sleeve alternately in the first position and in the second position;

said closing cap including an internal skirt coaxial with said peripheral skirt and joined to said top;

said unit including a single said compartment for an additional product, said single compartment being delimited by the top of said closing cap and by said internal skirt; said applicator device comprising in the transition zone between said stem and said sleeve a skirt capable of sliding in a leakproof manner in relation to said internal skirt of said cap, said zone having at lest one opening capable of communicating the interior of said at least one compartment for an additional product with said reservoir, said applicator device including an annular projection joined to the skirt of the applicator device, a foil being applied to said annular projection to close said compartment for the additional product;

said cap including a perforator carried on the top of said cap and capable of piercing said foil, said applicator device including a wall which joins said projection to said stem and which defines said at least one opening;

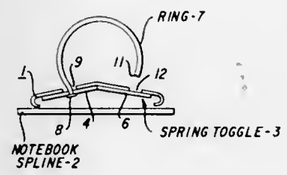
said sleeve having an upper portion which is spaced radially outwardly from said skirt of said applicator device to define an annular chamber for receiving said internal skirt of said closing cap, said chamber having a length dimension sufficient to allow said top of said closing cap to engage said projection upon said displacement from said first to said second position so that substantially all of the contents of said one compartment will be discharged therefrom.

4,781,485

CONTINUOUS RING LOOSE LEAF NOTEBOOK

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed May 29, 1987, Ser. No. 55,405
Int. Cl.⁴ B42F *13/20*
U.S. Cl. 402—45 **5 Claims**



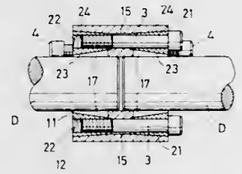
1. A toggle member sheet retainer comprising: an elongated housing: a plurality of toggle members contained within said housing; at least one continuous unitary sheet retainer ring member having first and second terminal portions; means for coupling a first terminal portion of said ring member to one of said toggle members; at least one pair of spaced openings in said housing, said toggle members, said at least one ring member, and said openings being arranged so that a portion of said ring member near said first terminal portion passes through one of said openings and the second terminal portion of said ring member is aligned with the second opening in said pair; means for causing said sheet retainer to selectively assume a first or second position; said first position having the second terminal portion of said ring member passing through said second opening and within said housing, and said second position having said second terminal portion spaced from said second opening and said housing to enable sheets to be coupled to said ring member.

4,781,486

SHAFT COUPLING

Masanori Mochizuki, 1-28, Yasunakacho 4-chome, Yao-shi, Osaka-fu, Japan

Filed Dec. 3, 1986, Ser. No. 937,617
Int. Cl.⁴ B25G *3/00*
U.S. Cl. 403—303 **8 Claims**



1. An apparatus for coupling a pair of shafts, comprising:

a pair of joint elements each having an internal cylindrical part with an inwardly tapered outer surface and an interior bore for receiving one of the shafts, each joint element further having an external cylindrical part which together with said internal parts defines an annular tapered recess;

a pair of ring members receivable in said tapered recesses, respectively, each said ring member having at least one tapped bore defined therein and constructed so that when said ring member is not tightened, its outer surface is not in contact with the inner surface of said external cylindrical part:

means for connecting each of said joint elements to the other; and

means insertable into said tapped bores for urging said ring members into said tapered recesses, whereby the inner surfaces of said ring members radially press said internal cylindrical parts to cause said internal cylindrical parts to press inwardly and frictionally engage each of the shafts and at the same time the diameters of said ring members expand because of their elasticity to cause the outer surfaces of said ring members to press against the inner surfaces of said external cylindrical parts so that torque is transmitted from one shaft to the other through a first and second torque transmission routes, said first torque transmission route being from said shaft to said internal cylindrical part of joint element to said connecting means and said second torque transmission route being from said shaft to said internal cylindrical part of joint element to said ring member to said external cylindrical part of said joint element to said connecting means.

4,781,487

QUICK DISCONNECT COUPLING

Stephen P. Greco, East Islip, N.Y., assignor to Scientific Industries, Inc., Bohemia, N.Y.

Continuation of Ser. No. 753,410, Jul. 10, 1985, abandoned. This application May 4, 1987, Ser. No. 52,112
Int. Cl.⁴ B25G *3/18;* **F16B** *21/00*
U.S. Cl. 403—326 **16 Claims**

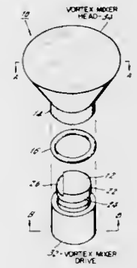
1. A coupling for connecting a rotatable driving member to a rotatable driven member, comprising:

a first coupling part for connecting to the rotatable driving member;

a second coupling part for connecting to the rotatable driven member, one of the first and second coupling parts having a recess defined therein for removably fitting over the other of the first and second coupling parts in a mounted position; the first and second coupling parts each having a respective wall which face each other when the first and second coupling parts are in the mounted position;

means for preventing relative rotation between the first and second coupling parts when in the mounted position so that the first and second coupling parts are rotatable together;

locking means for holding the first and second coupling parts in the mounted position and for permitting mounting and dismounting of the second coupling part from the first coupling part;



the locking means comprising an annular locking member on the respective wall of the first coupling part and an annular gliding groove defined in the respective wall of the second coupling part; the locking member being held in the gliding groove in the mounted position; the gliding groove being shaped for gliding over the locking member during mounting and dismounting;

the annular locking member and the annular gliding groove each have a respective radius of curvature, the radius of curvature of the gliding groove being greater than the radius of curvature of the annular locking member; and

the first coupling part being relatively hard and the second coupling part being relatively soft so that the second coupling part is undamaged by mounting and dismounting onto the first coupling part.

4,781,488

SECURING UNIT

Yoshitoki Hayashi, Aichi, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Division of Ser. No. 823,403, Jan. 28, 1986, Pat. No. 4,674,910, which is a continuation of Ser. No. 508,913, Jun. 29, 1983, Pat. No. 4,629,356. This application May 18, 1987, Ser. No. 50,568
Claims priority, application Japan, Jul. 14, 1982, 57-106564
Int. Cl.⁴ F16B *21/08*
U.S. Cl. 403—408.1 **6 Claims**

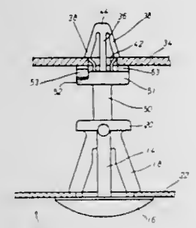
1. A securing unit for holding two substrates at a fixed interval, a first one of said substrates having a rectangular aperture therethrough and the second one of said substrates having a circular aperture therethrough in alignment with the rectangular aperture in the first substrate, said securing unit comprising:

(a) a resilient reverse detention member having a working surface which, in use, bears resiliently against a first side of the first substrate, said resilient reverse detention member being sized and shaped so as not to pass through the rectangular aperture in the first substrate;

(b) a support base that is sized and shaped to pass through the rectangular aperture in the first substrate;

(c) a first linkage member which extends between said resilient reverse detention member and said support base, said first linkage member being perpendicular to the working surface of said resilient reverse detention member and, in use, extending through the rectangular aperture in the first substrate;

(d) at least two first resilient detent leg members which extend from said first linkage member towards said resilient reverse detention member, each of said at least two first resilient detent leg members having an abutment surface which is sized, shaped, and positioned to make planar abutting contact with a second side, opposite to the first side, of the first substrate and an extension having a planar outer surface, said extension extending into the rectangular aperture in the first substrate and the planar outer surface of said extension being sized, shaped, and positioned to make planar abutting contact with a planar side surface of the rectangular aperture in the first substrate, said at least two first resiflent detent leg members being tapered inwardly in the first direction and being



resiliently inwardly deformable by camming contact with the periphery of the rectangular aperture in the first substrate as said at least two first resilient detent leg members pass through the rectangular aperture;

(e) a pedestal sized and shaped so as not to pass through the circular aperture in the second substrate;

(f) a support extension extending between said support base and said pedestal;

(g) a second linkage member which extends in the first direction from said pedestal and, in use, extends through the circular aperture in the second substrate;

(h) at least two second resilient detent leg members which extend from said second linkage member toward said pedestal, each of said at least two second resilient detent leg members having an abutment surface which is sized, shaped, and positioned to make planar abutting contact with the second substrate; and

(i) at least one resilient pushing piece which is integrally formed with said pedestal and sized, shaped, and positioned to make resilient contact with the second substrate.

4,781,489

ASSEMBLY FOR BRIDGING OVER EXPANSION JOINTS

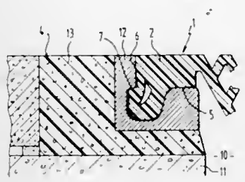
Guenter Buckenauer, Baldham, Fed. Rep. of Germany, assignor to Friedrih Maurer Sohne GmbH & Co., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 835,903, Mar. 4, 1986, abandoned. This application Jun. 11, 1987, Ser. No. 115,571
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3508010
Int. Cl.⁴ E01C *11/12*
U.S. Cl. 404—65 **5 Claims**

1. In an assembly for bridging over an expansion joint of a load receiving surface of bridges, roadways and the like, and which includes two spaced apart complementary joint edge profiles facing each other and a sealing band interconnected to said joint edge profiles and bridging therebetween and across the expansion joint, each said joint edge profiles having an

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upper surface substantially coextensive with the load receiving surface and comprising an upwardly opening cavity having the cross-section of a synclinal depression, an elongated horizontal marginal portion extending from one side of said cavity and toward the other of said joint profiles and being disposed at a given level below the load receiving surface, and an end marginal portion extending from said cavity at the opposite side thereof from said horizontal marginal portion, said end marginal portion including a vertical marginal portion extending from the load receiving surface and toward said cavity, and a lower edge portion, said lower edge portion adjoining and extending from said cavity and being inclined to face inwardly of said cavity and being coextensive therefrom and joining said vertical marginal portion at a level of said vertical marginal portion below the load receiving surface, a substantial reach of said lower edge portion extending inwardly toward said cavity below the level at which said horizontal marginal portion is disposed with respect thereto, said sealing band being comprised of elastic material and including a body portion having



an upper surface disposed to be positioned substantially flush to the load bearing surface, a medial portion, and opposite end portions which comprise lateral thickenings for interconnection of said sealing band to and between said joint edge profiles, each said lateral thickenings comprising a bulge for engaging within and substantially filling said cavity of one said joint edge profiles and having an inclined support surface disposed for mating abutment with said lower edge portion of said end marginal portion of such said one said joint edge profiles and which further comprises a seating surface for resting upon and in abutment with and along said horizontal marginal portion of such said one said joint edge profiles and a projecting nose portion adjoining said vertical marginal portion of such said one said joint edge profiles and extending therealong to the upper surface of said sealing band, said bulge being configured so that at least that portion of said nose portion adjacent the upper surface of said sealing band mates in compressed interfitting and sealing relationship with said vertical marginal portion of such said one said joint edge profiles.

4,781,490

METHOD OF POTHOLE REPAIR

Murray Jelling, 21 Spring Hill Rd., Roslyn Heights, N.Y. 11577

Continuation of Ser. No. 893,736, Aug. 6, 1986, Pat. No. 4,701,070. This application Oct. 8, 1987, Ser. No. 105,609
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.⁴ E01C *7/35*
U.S. Cl. 404—75 **10 Claims**

1. A repaired deteriorated paved area comprising:

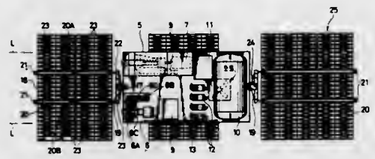
a pavement having a deteriorated area therein and an aqueous bonding solution of a water soluble acid salt of a fatty compound selected from an amine, amidoamine, polyamine or cyclic amine applied to and wetting the surfaces of the deteriorated area and the asphaltic patch material, which fills the deteriorated areas, thereby forming a strong bond in situ between the thus treated deteriorated paved area and the patch material.

4,781,491

ROAD SURFACE HEATING VEHICLE AND A GAS SUPPLY SYSTEM THEREFOR

Tatsuhiko Chiba, Kawaguchi, and Kenji Nakano, Kitamoto, both of Japan, assignors to Taisei Road Constructions Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,720
Claims priority, application Japan, Dec. 17, 1986, 61-300620
Int. Cl.⁴ E01C *23/14*
U.S. Cl. 404—95 **2 Claims**



1. A road surface heating vehicle having an automotive body and equipped, on the underside of that automotive body, with heating panels and, on said automotive body, with a gas tank, the vehicle comprising a plurality of vaporizers disposed on said automotive body, said plurality of vaporizers being connected in parallel to each other by means of a gas line and a liquid line both of which extend from said gas tank, said gas line branching into branch lines, said branch lines being connected to respective burners of said heating panels, a solenoid valve and a pressure adjusting valve mounted in line with each of said liquid and said gas line, a thermometer and a pressure adjusting valve operatively coupled to said gas tank, a heat directing fan mounted to said automotive body at one side of said tank and in facing relation thereto for selectively directing hot exhaust gases conveyed thereto from at least one of said heating panels toward said tank so as to promote vaporization of liquefied gas disposed in said tank, said automotive body having disposed thereon an operating board containing therein a microcomputer to which there are connected electric circuits for a control system for said vaporizers, said solenoid valves, said pressure adjusting valves, said thermometer, and a fan motor used to drive said fan, whereby, when the gaseous pressure in said gas tank has exceeded a specified level, said microcomputer automatically causes a closing of said solenoid valve in said liquid line and at the same time causes a stopping of the fan operation, whereas, when the gaseous pressure has decreased down to a specific level, said microcomputer automatically causes a starting of the fan operation and at the same time causes opening of said solenoid valve in said liquid line so as to cause operation of said vaporizers.

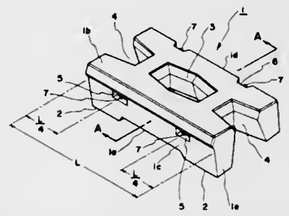
4,781,492

BLOCK FOR REVETMENT

Kunio Shindo, Sapporo, Japan, assignor to Kyowa Concrete Kogyo Co. Ltd., Sapporo, Japan

Filed Apr. 10, 1987, Ser. No. 37,586
Claims priority, application Japan, May 17, 1986, 61-74129
Int. Cl.⁴ E02B *3/12*
U.S. Cl. 405—16 **2 Claims**

1. A block for a revetment comprising a square-shaped block member having upper, lower, front, rear, left and right side surfaces, said lower surface being slanted from said front surface to said rear surface, leg members having the same height and provided at four corner portions of said slanted lower-surface of said block member, said block defining a centrally positioned through hole extending from a central portion of said upper-surface of said block member all the way down to a central portion of said lower-surface thereof, said block defining concave groove means having a generally half dimension as that of said through hole and formed on both left and right side surfaces of said block member, recess means formed on both front and rear surfaces at locations spaced apart by ¼ of the length of said block member from the left and right side



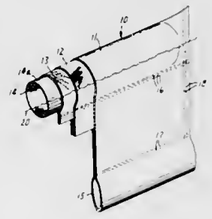
surfaces respectively and iron reinforcing bars buried in said block member and projecting within said recess means.

4,781,493

HIGH TEMPERATURE OIL CONTAINMENT BOOM

Edward M. Fischer, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 25, 1986, Ser. No. 899,636
Int. Cl.⁴ E02B *15/04*
U.S. Cl. 405—63 **9 Claims**



1. A high temperature oil containment boom comprising an outer layer of polymer coated fabric, a first underlayer of high temperature resistant and moisture resistant refractory fabric and a second underlayer of an intermediate or high temperature resistant refractory fabric surrounding a low density, high temperature resistant flotation core, said layers being secured together at least about their peripheral edges.

4,781,494

AIR-ASSIST ACCUMULATING AND TRANSFER UNIT FOR AN ELECTRONIC DEVICE TEST HANDLER

Nicholas J. Cedrone, Wellesley Hills, and Robert J. Grenzeback, Winchester, both of Mass., assignors to Daymarc Corporation, Waltham, Mass.

Filed May 16, 1986, Ser. No. 864,290
Int. Cl.⁴ B65G *53/08*
U.S. Cl. 406—52 **5 Claims**

1. Transport and storage means for a tester of electronic devices comprising:

a frame that rotates about a central axis and is inclined from the horizontal;

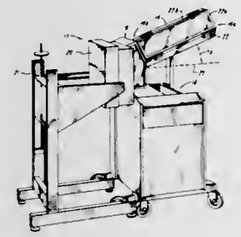
a plurality of elongated support members secured on said frame and extending generally parallel to the axis of rotation of the frame;

a plurality of elongated tracks located on said support members, said tracks each holding a plurality of electronic devices in a line;

locking means for replaceably securing said tracks onto said support members;

means for rotating said frame in a step-wise manner about said axis of rotation through a preselected number of angular positions that include a load position where the devices are loaded in line into one of said tracks and a feed position where the devices are discharged from said tracks; and

means for providing air levitating to the devices held in the track at said feed position to facilitate movement of the



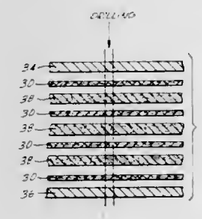
devices along the tracks in cooperation with the force of gravity, said air levitating means including spaced apart apertures formed in the floors of said tracks and a plurality of longitudinally extending passages located below said floors, wherein each said passage is in fluid communication with said apertures and a source of pressurized air.

4,781,495

DRY LUBRICANT DRILLING OF THRU-HOLES IN PRINTED CIRCUIT BOARDS

William R. Hatch, Diamond Bar, Calif., and John W. Foster, Edina, Minn., assignors to Lubra Sheet Corp., Eden Prairie, Minn.

Filed Oct. 14, 1986, Ser. No. 919,085
Int. Cl.⁴ B23B *51/06, 35/00*
U.S. Cl. 408—1 R **34 Claims**



1. In a process for drilling printed circuit boards in a dry state which includes drilling a thru-hole in a printed circuit board panel having a dielectric layer made from a material which can be smeared onto other portions of the circuit board panel by the drilling tool and thereby interfere with subsequent electrical performance of the finished circuit board, an improvement for reducing dielectric smear comprising the steps of:

placing a water soluble and substantially dry lubricating film in solid film form adjacent the circuit board panel; and

operating a rotary drilling tool for drilling in a dry state through the circuit board panel, including drilling through the lubricating film and at least through the dielectric layer of the panel to form a thru-hole in the panel, in which the lubricating film is formed in a film thickness sufficient to transfer lubricating properties to the rotary drilling tool during penetration of the lubricating film by the rotary drilling tool so that the thru-hole is drilled by the lubricated drilling tool.

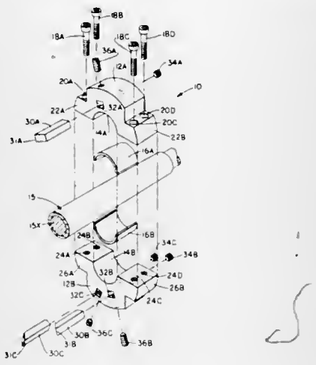
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4,781,496

TOOL AND METHOD FOR RESURFACING A HOUSING

Oscar R. Schuchman, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 23, 1986, Ser. No. 922,374
Int. Cl.[4] B23B *41/00*
U.S. Cl. 408—1 R **10 Claims**



1. A method of resurfacing a pump housing facing in situ to accept a seal for a rotatable shaft extending substantially perpendicularly from the housing, the method comprising the steps of:

(a) removably securing about the rotatable shaft a body having a first half and a second half and at least three selectively engageable cutting members being positioned in the body at different radial locations from the shaft;

(b) adjusting one of the cutting members to engage the facing at a desired depth;

(c) rotating the body and shaft so that the one of the cutting members produces a cutting path on the facing; and

(d) iterating steps (b) and (c) to cause the other cutting members to produce cutting paths on the facing, thereby producing a finished surface on the facing for accepting the seal.

4,781,497

TENSION-RESTRAINED ARTICULATED PLATFORM TOWER

Demir I. Karsan; Shaddy Y. Hanna, and Jimmy Y. Yeung, all of Ponca City, Okla., assignors to Conoco Inc., Ponka City, Okla.

Filed Feb. 2, 1987, Ser. No. 9,976
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—202 **19 Claims**

1. A tension-restrained articulated platform tower for supporting a deep water offshore drilling and production platform, said tower having a plurality of corners and comprising:

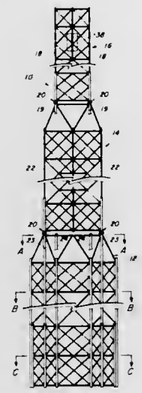
(a) a base tower section having horizontal and vertical structural members with angulated reinforcing elements;

(b) means for securing said base tower section to a particular portion of an ocean floor targeted for production of hydrocarbon fluids;

(c) at least one additional tower section;

(d) means for mounting said at least one additional tower section atop said base tower section in such a manner that each of said plurality of corners is pivotally articulated to permit compliant motion of said at least one additional tower section in response to wind, current and wave forces from a first at rest position, vertical loads from said at least one additional section being transmitted to the ocean floor through said vertical structural members of said base tower section when said at least one additional tower section is in said at rest position;

(e) a plurality of tension elements interconnected between said at least one additional tower section and said base tower section, said tension elements extending across said



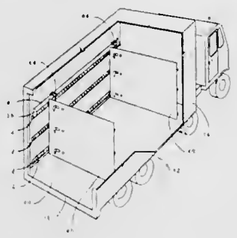
articulated mounting means and providing the primary position restoring force for said at least one additional tower section to return it to said at rest position following compliant motion induced by said wind, current and wave forces.

4,781,498

ADJUSTABLE LOAD RETAINER AND RETENTION MEANS FOR USE IN A TRANSPORT VEHICLE

Joseph W. Cox, 235 Wilson Street West, Ancaster, Ontario, Canada L9G 3N4

Filed Dec. 12, 1986, Ser. No. 940,865
Claims priority, application Canada, Jun. 23, 1986, 512249
Int. Cl.[4] B60P *7/00*
U.S. Cl. 410—118 **20 Claims**



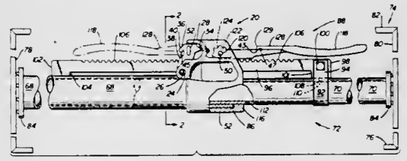
1. An adjustable load retention system for use in a load transport vehicle, said vheicle having two opposing interior walls, with at least two tracks affixed to and extending longitudinally along said two opposing walls, each track having a series of equally-spaced openings therein, each track on one opposing wall being aligned with a corresponding track on the other opposing wall, said system comprising a retainer and elongated retention means, the retainer having at least two flexible belts that are long enough to extend between the opposing walls, said belts being interconnected by suitable material, said belts having means at either end to removably attach the belts to the openings in said tracks, with means to tighten or slacken each belt, saids retention means being a filament extending between two supports along one wall only, said supports having nodules so that the supports can be releasably mounted in a spaced apart relationship on one of the tracks with each nodule extending into a separate opening, the tension of said filament being adjustable so that the filament can be tightened or slackened between the two supports, said retainer having a loop attached thereto that surrounds said filament so that said retainer can be moved longitudinally to various locations within said transportion vehicle between said supports by sliding said loop along said filament, said loop maintaining said retainer on said retention means, but said retainer being removable from said retention means by disconnecting said loop from said filament and said retention means being removable from said vehicle for installation in a second vehicle by slackening the filament tension.

4,781,499

LATCH ASSEMBLY FOR A CARGO BRACING DEVICE

Warren R. Wisecarver, Walnut Creek, Calif., assignor to Bishop-Wisecarver Corporation, Pittsburg, Calif.

Continuation-in-part of Ser. No. 666,094, Oct. 29, 1984, Pat. No. 4,669,934. This application May 26, 1987, Ser. No. 54,015
The portion of the term of this patent subsequent to Jun. 2, 2002, has been disclaimed.
Int. Cl.[4] B60P *7/06*
U.S. Cl. 410—151 **6 Claims**



1. A latch assembly for a cargo bracing device, said cargo bracing device having two relatively displaceable members, and an extension assembly coupled to said members for displacement thereof, said extension assembly including a drive assembly, a manually manipulatable handle coupled through said drive assembly to displace said members into engagement with opposing walls of a cargo container, and said latch assembly latching said handle in a latched position against displacement under the compression forces produced by said extension assembly to thereby retain said members in relatively fixed relation, wherein the improvement in said latch assembly comprises:

said latch assembly and said handle include interengaged surfaces oriented to extend in a direction transverse to the direction of movement of said latch assembly during unlatching to prevent unlatching of said latch assembly during dynamic loading and vibration of said cargo bracing bar.

4,781,500

METAL BLIND RIVET

Dieter Mauer, Lollar, Fed. Rep. of Germany, assignor to Emhart Enterprises, Corp., Farmingtoo, Conn.

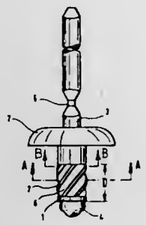
Filed Apr. 14, 1987, Ser. No. 38,092
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1986, 3612478
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—36 **8 Claims**

1. An assembly including a metal blind rivet and one or more structural members, said rivet comprises:

a rivet sleeve having a tubular barrel and a flange at one end thereof;

a mandrel penetrating the rivet sleeve and having a setting head positioned at the end of the rivet sleeve opposite the flange thereof, a breakneck and a stem; and

a plurality of helical ribs having flutes therebetween distributed evenly about the circumference of said tubular barrel and extending over a substantial length of said barrel, each of said ribs arranged in a helix at an angle of about 45° to the longitudinal axis of said tubular barrel so that during



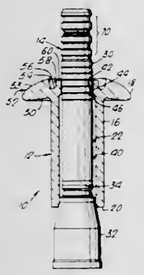
the setting operation, the ribs contact said structural member and carry out a twisting motion to scrape the structural member whereby contaminants such as dirt or varnish are removed to provide electrical contact.

4,781,501

SELF-PLUGGING BLIND FASTENER

Harvey P. Jeal, Stevenage, and Frederick A. Summerlin, Wheathampsted, both of England, assignors to Avdel Limited, Hertfordshire, England

Continuation of Ser. No. 883,816, Jul. 9, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,478
Claims priority, application United Kingdom, Jul. 12, 1985, 8517659
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—43 **6 Claims**



1. A self-plugging blind fastener comprising:

a tubular body having an axial bore, and

an elongate stem disposed in said bore;

said bore including a main region and a locking region adjacent an end of the body, said locking region being of reduced diameter as compared with said main region,

said stem comprising a plug and, integrally connected to said plug, an elongate stem-tail which projects from said one end of the body,

said plug having means for engaging and deforming another end of said body to form a blind head,

said stem-tail extending through said locking region and including a plurality of swageable annular flanges;

at least one of said flanges being located within said locking region and swaged into interference with the body, thereby retaining the stem within the body, and

at least one further one of said swageable flanges being disposed in the main region of said bore and capable of being swaged into interference with the body when pulled into said locking region.

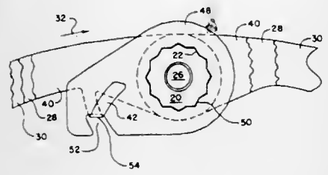
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ANTI-ROTATION LOCKING DEVICE FOR FASTENERS

Steven B. Kushnick, Jupiter, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 26, 1987, Ser. No. 112,162
Int. Cl.[4] F16B *39/10*
U.S. Cl. 411—87 5 Claims



1. Apparatus for locking the wrenching surface of a threaded fastener to prevent the loosening thereof in a joined part, said apparatus comprising:

a strap member having at least one circular hole therethrough for securing said strap member under the wrenching surface of an associated fastener, said strap member also having a bendable arcuate tang extending therefrom at a constant radius about the axle of said hole;

and a retainer member having an opening therethrough for engaging angular portions of said wrenching surface of said fastener, said retainer member also having an arcuate slot therein of substantially the same constant radius as that of said arcuate tang of said strap member, whereby a portion including the bottom of said arcuate slot lies along the length of said arcuate tang;

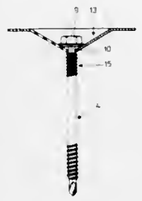
said tang having a width sufficiently narrow to pass through said slot, said tang being bent about the bottom of said slot and folded back upon said retainer member.

4,781,503

FASTENER ASSEMBLY FOR SECURING ROOFING ON A SOFT INSULATION MATERIAL TO A SOLID BASE

Gerhard Bögel, Balgach, Switzerland, assignor to SFS Stadler AG, Heerbrugg, Switzerland

Continuation of Ser. No. 622,537, Jun. 20, 1984, abandoned. This application Jan. 27, 1987, Ser. No. 8,077
Claims priority, application Australia, Jun. 22, 1983, A2296/83
Int. Cl.[4] F16B *33/00, 43/00*
U.S. Cl. 411—368 5 Claims



1. A fastener assembly for securing roofing material on soft insulating material to a solid base, comprising an axially elongated screw and a plate-like washer with a opening arranged centrally in and extending through said washer with said opening having a central axis, said screw includes an axially elongated shank having a leading end and a trailing end with a screw head symmetrically located on the trailing end of the shank and a threaded section on the shank extending from the leading end toward the trailing end with the threaded section spaced axially from said screw head and arranged to be threaded into the solid base so that the screw head is spaced outwardly from the solid base, said threaded section having a core diameter, said screw head having an outside dimension extending transversely of the axial direction of said screw and outwardly from the threaded section of said shank, said shank arranged to extend co-axially with and through the opening in said washer, said shank having an axially extending thread-free section extending from the screw head toward said threaded section and said thread-free section having a diameter approximately the same as said core diameter, said washer having a large surface extending transversely of the centeral axis and outwardly relative to said screw head so that said washer extends laterally outwardly from and completely around said screw head, said thread-free section having a diameter not greater than the opening in said washer, said washer has a generally planar first surface and an oppositely facing generally planar first surface and an oppositely facing generally planar second surface in generally parallel relation with the first surface and each extending transversely of the central axis of the opening with the second surface facing toward the leading end of the screw when the screw is inserted through the opening in said washer, said washer having an annular countersunk region projecting in the axial direction of said central axis outwardly from the second surface and laterally and symmetrically encircling the washer opening and flaring outwardly away from the central axis of the opening in the direction from the second surface toward the first surface so that the countersunk region projects in the axial direction of the washer opening from said generally planar second surface, said countersunk region is dimensioned in the axial direction of said opening considerably greater than the corresponding axial dimension of said screw head and has a maximum dimension transverse of the axial direction at the first surface of said washer considerably greater than the outside dimension of said screw head with said screw head contacting said countersunk region between and spaced from said opening and said first surface whereby when said screw is inserted through said washer into a solid base said screw head is recessed completely within said countersunk region inwardly of said first surface, and means located on said shank in at the end of said threaded section adjacent said thread free section for providing a support for said washer about the opening therethrouth when said screw and washer are connected to the base and said means being spaced from said screw head by an axial dimension so that said washer is prevented by said means from moving axially toward the base relative to said threaded section of said screw and can be tilted relative to the axis of said screw without displacing said screw transversely of the axial direction thereof.

4,781,504

TRIM CLIP

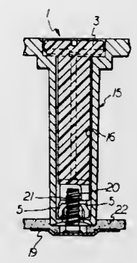
Kiyoteru Yuta, Toyohashi, Japan, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed May 21, 1987, Ser. No. 52,805
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—512 5 Claims

1. In a trim assembly for attachment to a threaded stud secured to a vehicle body which assembly comprises:

a trim molding having a multiplicity of holes positioned such that upon attachment to said vehicle body said threaded studs extend therethrough and having ridges extending radially outwardly from the periphery of said holes; and

a clip having a shank sized to fit through each said hole in said trim and having a hollow portion for receiving the shank of said stud, which hollow portion is provided with resilient pawls projecting into space of said hollow portion to be engaged with a groove of said stud, and an expanded head portion having a diameter larger than that of said hole in said trim, said expanded portion including at least one radially extended ridge formed on the surface facing said trim which upon attachment cooperates with



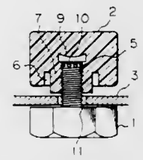
said ridges located on said trim to prevent rotation of the clip.

4,781,505

SCREW EQUIPPED WITH LOCKING MEANS

Hisaya Watanabe, Yokohama, Japan, assignor to Showa Denko Kabushiki Kaisha and Hiroaki Watanabe, Kanagawa, Japan

PCT No. PCT/JP85/00618, § 371 Date Sep. 3, 1986, § 102(e) Date Sep. 3, 1986, PCT Pub. No. WO86/02980, PCT Pub. Date May 22, 1986
PCT Filed Nov. 6, 1985, Ser. No. 888,651
Claims priority, application Japan, Nov. 6, 1984, 59-232497
Int. Cl.[4] F16B *39/22*
U.S. Cl. 411—301 2 Claims



1. A screw and nut assembly having locking means comprising a nut of synthetic resin material having an internally threaded cylindrical blind bore with a convex bottom portion the bottom portion comprised of said synthetic resin and a screw member of a material having a greater degree of rigidity than the material of said nut member, said screw member having cutting means on the end thereof whereby upon engagement of said cutting means on said screw with said convex bottom portion of said bore, said convex bottom portion will be deformed to prevent looseness of the screw and nut assembly.

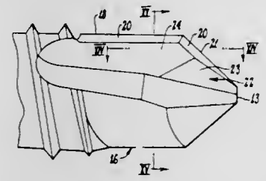
4,781,506

SELF-DRILLING SCREW

David J. A. Roberts, Mornington, and Brian Brindle, Glen Waverley, both of Australia, assignors to W. A. Deutsher Pty. Ltd., Moorabbin, Australia

Division of Ser. No. 658,107, Oct. 5, 1984, abandoned. This application Dec. 4, 1986, Ser. No. 938,358
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 7 Claims

1. A self-drilling screw including: a head at one end, a forged drilling portion at the opposite end, two longitudinally extending flutes formed in said drilling portion on respective opposite sides thereof, a land surface extending between each side of said flute and the adjacent side of the other said flute, each said flute being comprised of a plurality of flute surfaces, and one of said flute surfaces being a fillet, said fillet being adjacent to the tip of the drilling portion, each said land portion having a leading edge and a trailing edge relative to the intended direction of rotation of said screw, each said land surface is arranged to be progressively located closer to the axis of the screw in a direction away from the respective said leading edge, and the minimum width of said drilling portion is 60 to 80% of the maximum width thereof, each said fillet extending across the



base of the respective said flute and extending longitudinally from the chiselpoint of the screw towards the head and thereof for part only of the length of the respective said flute, each said fillet having a generally flat surface, said flat surface being angularly disposed relative to the longitudinal axis of the screw, and said fillet intersecting a substantial portion of said chiselpoint, and said fillet blending with said one of said flute surfaces.

4,781,507

QUICK ACTING THREADED FASTENER ASSEMBLY

Oswaldo A. Duenas, 13711 Olympic Ave., Costa Mesa, Calif. 92626

Filed Aug. 13, 1987, Ser. No. 85,460
Int. Cl.[4] F16B *37/08*
U.S. Cl. 411—433 4 Claims



1. A quick acting threaded fastener assembly, which is slidably adjustable to a desired tightening position and can be tightened or loosened with a minimum number of turns, comprising:

a quick acting nut;

a threaded rod having one or more threaded lands alternating with a like number of unthreaded lands, said threaded and unthreaded lands subtending substantially equal angles, and said unthreaded lands having all radial dimensions less than one half the minor diameter of the thread of said threaded lands;

a quick acting nut further comprising;

a cylindrical housing;

a first half-nut fixedly held within said housing;

a second half-nut rotatably held within said housing with external dimensions identical to corresponding external dimensions of said first half nut and having an inboard face

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adjacent the corresponding inboard face on said first half-nut;

said first and second half-nuts being threadedly engagable with said threaded rod and having one or more internally threaded sections alternating with a like number of unthreaded slots, said threaded sections and unthreaded slots subtending substantially equal angles, and said unthreaded slots having radial dimensions greater than one half the major diameter the threads of said threaded rod;

said first half-nut having at least one stop of axial length at least equal to one half the length of the pitch of said threads, said stops projecting from said inboard face toward said corresponding inboard face on said second half-nut and intermeshing with a similar stop projecting therefrom, whereby said stops limit the relative rotary motion of said first half-nut with respect to said second half-nut so that said slots are aligned at one extreme and said threaded sections are aligned for maximum threaded engagement with said threaded rod at the other extreme;

said housing further containing a first guide plate adjacent the outboard face of said first half-nut, said first guide plate being held rotatably parallel to said first half-nut by a first removable retaining means;

said housing further containing a second guide plate adjacent the outboard face of said second half-nut, said second guide plate, identical in external dimensions with said first guide plate and containing at least one detent depression adjacent said outboard face of said second half-nut, being held rotatably parallel to said second half-nut by a second removable retaining means;

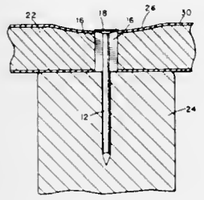
said first and second guide plates being disposed in slidable contact with said threaded rod thereby preventing undesirable angular motion between said threaded rod and said quick acting nut, and retained in said housing by said removable retaining means so as to contain all cooperating parts of said quick acting nut at correct axial spacings; and,

said second half-nut containing at least one spring actuated detent means in said outboard face cooperating with said detent depressions in said second guide plate, said detent means and said detent depression being indexed so as to indicate a state of slidable alignment of said quick acting nut with said threaded rod when said quick acting nut is rotated in the counterclockwise direction.

4,781,508
FLUTED NAIL

Norman Schroeder, 4017 Mt. Blackburn, San Diego, Calif. 92111; Irving Ahlbeck, III, 930 Carriage Dr., San Marcos, Calif. 92069; Bradley Schroeder, 6646 Thornwood St., San Diego, Calif. 92111, and Steven Stanwick, 180 Via La Paz, San Marcos, Calif. 92069

Filed Apr. 13, 1987, Ser. No. 37,627
Int. Cl.[4] F16B *15/00*
U.S. Cl. 411—452 **9 Claims**

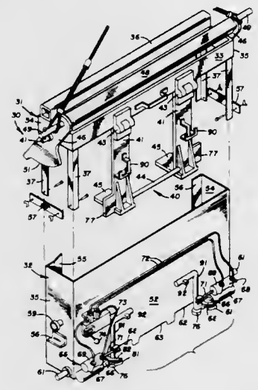


1. A nail for securing a soft material layer to a solid surface, comrising a shaft, a head extending radially around said shaft, and at least two flutes, each flute having an axially extending constant radius portion, said head having a substantially greater radial cross-sectional area that said flutes, and said flutes extending radially from the surface of said shaft for a distance no greater than the radius of said head, the bottom edge of said flute being substantially perpendicular to said shaft and spaced from said nail head a distance approximately equal to the thickness of said soft material layer.

4,781,509
STACK LOADER

Elferd L. Evans, 1235 W. I St., Oakdale, Calif. 95361

Filed Dec. 9, 1987, Ser. No. 130,625
Int. Cl.[4] B65H *1/30*
U.S. Cl. 414—52 **16 Claims**



1. A stack loader for moving a stack of metal sheets, said sheets being generally rectangular and said stack having vertical front, ends and back surfaces, said stack loader comprising:

a fork support frame,

a stack retainer telescopically received in said fork support frame and having an open bottom, a front wall, two end walls and relatively short-widthed back wall portions extending from said end walls towards each other but terminating at a substantial distance from each other, said stack retainer being shaped to fit down closely onto said stack of metal sheets,

fork means having a lifting surface and hinged to said fork support frame adjacent the front wall of said stack retainer, said fork means being pivotally movable between first and second positions wherein said lifting surface is under, and out from under, respectively, said open bottom of said stack retainer,

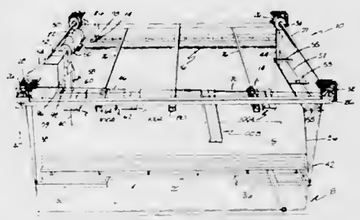
said stack retainer being movable relative to said fork support frame between first and second positions wherein the bottoms of said end walls of said stack retainer and of the front and back wall portions adjacent to said end walls are above, and substantially below, respectively, said lifting surface of said fork means,

lock means for locking said fork means from moving from its first position while allowing said stack retainer to move between its first and second positions relative to said fork support frame.

4,781,510
INSULATION BOARD FEEDER

Harvell M. Smith, Denver, and Robert R. Coleman, Westminster, both of Colo., assignors to Manville Service Corporation, Denver, Colo.

Filed Oct. 11, 1985, Ser. No. 786,784
Int. Cl.[4] B65G *59/02*
U.S. Cl. 414—119 **11 Claims**



1. In an apparatus for feeding insulation boards sequentially to a grooving machine, said apparatus having an elevator assembly for raising a stack of said insulation boards by means of a generally rectangular platform; a transfer assembly for transferring the top board in said stack to the grooving machine upon its reaching a normal positional plane, said assembly including transfer assembly drive means; and a guide assembly for maintaining the orientation of said board as it is fed into the grooving machine; the improvement comprising:

said transfer assembly including a reciprocating carriage having a plurality of space board-engaging fingers attached thereto, each of said fingers being pivotable about an axis extending transverse to the direction of transfer, an adjustable chain to permit said fingers to extend below said normal positional plane prior to engagement with the board, said fingers pivoting upwardly about said axis when engaged by said board as it is raised to said normal positional plane by said elevator assembly, said upward pivoting accommodating the configuration of the board being transferred, said board being laterally transferred from the top of said stack into said grooving machine upon activation of said transfer assembly drive means.

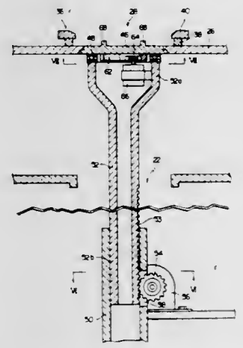
4,781,511
SEMICONDUCTOR PROCESSING SYSTEM

Hiroshi Harada; Yoshiyuki Iwasawa; Tsutomu Ishida, and Shintaro Kobayashi, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 932,182
Claims priority, application Japan, Mar. 25, 1986, 61-66761
Int. Cl.[4] C23C *15/00*
U.S. Cl. 414—217 **8 Claims**

1. In a semiconductor processing system which includes: a first semiconductor wafer cassette for housing semiconductor wafers; a first transfer pod for enclosing the first cassette airtightly, said first pod having a box-like pod body with an open bottom and a bottom plate detachably attached to the pod body and carrying the first cassette thereon; a wafer processing equipment including, a loading port for receiving the cassette so that the first cassette is retained in the loading port during the processing of the wafer cassette, and a canopy covering the loading port, said processing equipment including means for withdrawing the wafers from the first cassette to process the wafers when the cassette is set in the loading port; and first means for transferring the first cassette between the loading port of the processing equipment and the first pod without exposing the cassette and the wafers therein to outside contamination, the improvement wherein said first transferring means comprises:

an inlet port, including a first cassette opening on the canopy of the processing equipment at the position directly above the loading port, for placing the first pod thereon, said inlet port including, a port assembly for attaching and detaching the bottom plate of the first pod to and from the pod body when the first pod is placed on the inlet port, and a second cassette opening, formed in the canopy of the processing equipment, for allowing the bottom plate of the first pod to pass therethrough said first and second



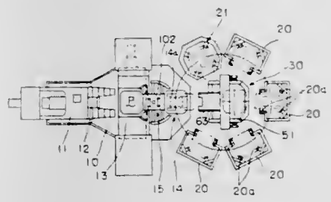
cassette openings being spaced from and in vertical alignment with each other; and

first lift means, arranged mainly between the openings in the loading and inlet ports, for conveying the bottom plate of the first pod between the loading and inlet ports when the bottom plate of the first pod is detached from the pod body.

4,781,512
PALLET CHANGING SYSTEM FOR A MACHINE TOOL

Takeshi Ohta, Nishio, and Tetsuro Yamakage, Anjoh, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 5, 1986, Ser. No. 938,466
Claims priority, application Japan, Dec. 6, 1985, 60-275589
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—222 **5 Claims**



1. In a pallet changing system for a machine tool for exchanging a pallet on a work table, the improvement which comprises:

a plurality of pallet storing shelves arranged in a plurality of concentric circular arrays and each having a plurality of pallet supporting racks located one above another, said arrays defining a central space surrounded by said racks;

a rotary table disposed rotatably in the center of said space;

a pair of guide posts upstanding from said rotary table;

a structure supported vertically movably on said posts;

a pallet handling fork provided on said structure horizontally movably to and away from a standby station;

a pair of guide rails along which said fork is horizontally movable;

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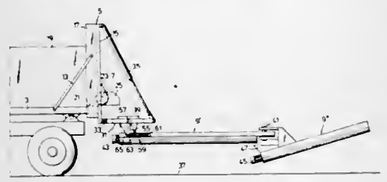
said fork having one end defining a pallet supporting portion;
means for rotating said rotary table in an indexed way;
means for moving said vertically movable structure vertically;
means for moving said fork horizontally;
a pallet changing device including a hook member which is rotatable about a vertical shaft between said work table and said standby station, and which has a pair of opposite ends each engageable with one of the pallets, and means for rotating said hook member;
said standby station forming a part of said circular arrays and having a pallet receiving means for supporting a pallet, said pallet receiving means vertically adjustably supporting said pallet at a standby position and a vertically different position for further transfer by said hook member; and pallet guide means provided between said work table of said machine tool and said standby station for guiding pallets along a circular track.

4,781,513

APPARATUS FOR UNLOADING BULK MATERIAL

Leif Sjögren, Rosenberg Fly, S-441 81 Alingsås, and Kjell A. Sjögren, Rensvist, S-447 00 Vårgårda, both of Sweden

PCT No. PCT/SE86/00172, § 371 Date Nov. 10, 1986, § 102(e) Date Nov. 10, 1986, PCT Pub. No. WO86/06119, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 14, 1986, Ser. No. 7,967
Claims priority, application Sweden, Apr. 15, 1985, 8501832
Int. Cl.[4] B05P *1/40*
U.S. Cl. 414—489 **7 Claims**



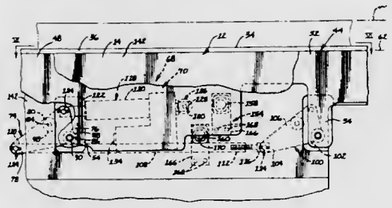
1. An apparatus for unloading bulk material from a load-carrying vehicle deck and spreading the material over ground contiguous to the vehicle, the apparatus comprising a spreader device, connectable to a rear end of the deck and carried thereby during unloading of the material,
said spreader device comprising
an adapter fixedly mounted on the rear end of said deck, and a spreader unit connectable to said adapter on said vehicle at a work site for unloading the material from the deck of said vehicle,
said spreader unit comprising
a connection part,
means for connecting the connection part to said adapter on the vehicle, said connection part including means for receiving the material from the deck and giving the material an agitated condition suitable for further conveyance, said means for receiving the material including a transverse conveyor connected to a rear edge of the deck when the spreader unit is connected to said adapter, for conveying bulk material to a material outlet of the connection part,
an extensible cantilever conveyor having a first material inlet end for receiving the bulk material discharged through said material outlet of the connection part and falling freely therefrom to the cantilever conveyor and a discharge end for discharging bulk material to be spread out, the cantilever conveyor being articulated and having an outer part separately pivotable relative to the cantilever conveyor, so that said outer part is movable over the ground relative to the cantilever conveyor,
a suspension part connected to the connection part and being pivotable around a transverse shaft such that the pivotable attitude between the suspension part and the connection part is controllably changeable for adjusting to different positions of the deck and to different positions of the connection part, whereby the suspension part is at least substantially parallel to the ground when the material is being spread,
means for swivelably suspending the cantilever conveyor at its said first end in said suspension part, said means including a ring means from which the cantilever conveyor is suspended, said ring means being rotatably mounted in said suspension part such that when said ring means are rotated, the cantilever conveyor moves over the ground, said ring means having a ring opening and said suspension part having a corresponding opening, such that when the material is passing the material outlet of the connection part, said openings and the material inlet of the cantilever conveyor are in alignment; and
means for adjusting the suspension of the cantilever conveyor such that an axis about which the conveyor swivels in its sweeping movement can be given various inclinations in a transverse plane relative to the vehicle.

4,781,514

MATERIAL HANDLING VEHICLE LOAD RETENTION APPARATUS

David A. Schneider, Mantua, Ohio, assignor to X Caterpillar Industrial Inc., Mentor, Ohio

Filed Apr. 27, 1987, Ser. No. 43,005
Int. Cl.[4] B60P *1/52*
U.S. Cl. 414—520 **12 Claims**



1. A material handling vehicle, comprising:
a frame having first and second spaced apart sides;
means for supporting a load on said frame at a location between said first and second spaced apart sides, said load supporting means defining a supporting surface plane;
first means for blocking movement of the load on said load supporting means in a first direction transverse and in passing relationship relative to said first side, said first blocking means having a gate member, said first blocking means gate member having upper and lower end portions and being movably connected to the frame adjacent the frame first side, said upper end portion of the first blocking means gate member extending above the supporting surface plane at a first position of said first blocking means and being disposed beneath the supporting surface plane at a second position of the first blocking means;
second means for blocking movement of the load on said load supporting means in a second direction transverse and in passing relationship relative to the second side, said second blocking means having a gate member, said second blocking means gate member having upper and lower end portions and being movably connected to the frame adjacent said frame second side, said upper end portion of the second blocking means gate member extending above the supporting surface plane at the first position of the second blocking means and being disposed beneath the supporting surface plane at the second position of the second blocking means;
a first power means for moving the first blocking means gate member between the first position at which said load is blocked from side passing movement in said first direction on said load supporting means and the second position at which said load is free to move in side passing relationship in said first direction on said load supporting means, said first power means having a first lever assembly, a second lever assembly, a tie rod and a linear actuator, said first lever assembly having first and second end portions and a middle portion, said first lever assembly being pivotally connected at the first lever assembly first end portion to the lower end portion of the first blocking means gate member and being pivotally connected at the middle portion to the frame, said second lever assembly having first and second end portions and a middle portion, said second lever assembly being pivotally connected at the second lever assembly first end portion to the lower end blocking means gate member spaced from the first lever assembly first end portion and said second lever assembly middle portion being pivotally connected to the frame, said tie rod having first and second spaced apart end portions and being pivotally connected at the tie rod first end portion to the second end portion of the first lever assembly and being pivotally connected at the tie rod second end portion to the second end portion of the second lever assembly, said linear actuator having a housing and a rod, said rod being slidably connected to the housing and extensibly movable relative to the housing, said rod being pivotally connected to the first lever assembly and said housing being connected to the frame; and
a second power means for moving the second blocking means gate member between a first position at which said load is blocked from side passing movement in said second direction on said load supporting means and a second position at which said load is free to move in side passing relationship in said second direction on said load supporting means.

4,781,515

ROLLER MOUNTING SYSTEM FOR BOAT TRAILER

Lawrence N. Johnson, W. 130 Highdrive, Spokane, Wash. 99203

Continuation-in-part of Ser. No. 727,721, Apr. 26, 1985, Pat. No. 4,611,748, which is a division of Ser. No. 65,118, Aug. 9, 1979, Pat. No. 4,530,634. This application Apr. 10, 1986, Ser. No. 850,050
Int. Cl.[4] B60P *3/10*
U.S. Cl. 414—534 **3 Claims**



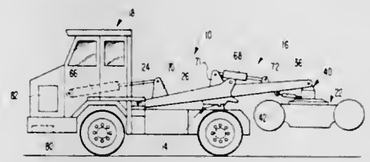
1. A roller assembly for supporting a boat on a boat trailer wherein the boat trailer includes at least one cross bar extending transversely to the longitudinal axis of the trailer and supported between spaced side frame members, said cross bar carrying thereupon at least one support tube which extends in a direction transverse to the longitudinal axis of the cross bar, said support tube carrying thereupon a support arm pivotal relative to the support tube at the point of connection therewith in a plane transverse to the longitudinal axis of the support tube, and boat hull engaging rollers carried upon the support arm, the improvement comprising
a cup-shaped portion formed at an end of said support arm and positioned to operatively engage the end of the support tube,
said cup-shaped portion surrounding a proximal end of the support tube for transmitting a loading force imposed on the support arm through the boat hull engaging rollers to the proximal end of said support tube, and
stop means carried on said support arm comprising an integral part formed within the cup-shaped portion of said support arm and positioned thereupon to engage the support tube for limiting the pivotal movement of the support arm relative to the support tube.

4,781,516

RAIL BOGIE HANDLING VEHICLE

Christopher A. Cripe, 1903 Escourt Dr., Coatesville, Pa. 19320, and Alan R. Cripe, 4511 Menokin Rd., Richmond, Va. 23225

Filed Feb. 18, 1987, Ser. No. 16,205
Int. Cl.[4] B60P *3/06*
U.S. Cl. 414—555 **19 Claims**



10. A vehicle comprising:
a tractor body including at least first and second axles each having at least first and second wheels;
a cab having a rearward face disposed on a forward end of said tractor body;
an elevating fifth wheel coupling device for coupling to a semitrailer mounted to a rearward portion of said tractor body;
a boom apparatus having a first end and a second end;
said boom apparatus pivotally mounted at said first end thereof to said tractor body at a point intermediate said rearward face of said cab and said fifth wheel coupling device;
said boom apparatus having a stowed position adjacent and parallel to said cab whereby said fifth wheel coupling device is free to be coupled to a semitrailer and a deployed position wherein said boom apparatus rests upon and extends across said fifth wheel coupling device;
means for pivotally moving said boom apparatus from said stowed position to said deployed position; and
means mounted to a second end of said boom apparatus for coupling said boom apparatus to a separable rail bogie,
whereby, when said boom apparatus is in said deployed position, said means for coupling can be coupled to a separable rail bogie and said fifth wheel coupling device can be elevated to elevate said boom apparatus and lift said rail bogie.

4,781,517

ROBOTIC AUTOMOBILE ASSEMBLY

Craig S. Pearce, and Clayton V. Pearce, both of Windsor, Canada, Carl Utz, Novi, Mich., assignors to Clay-Mill Technical Systems, Inc., Windsor, Canada

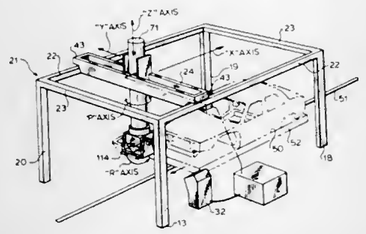
Filed Feb. 3, 1986, Ser. No. 825,752
Int. Cl.[4] B66F *1/00*
U.S. Cl. 414—590 **10 Claims**

1. For use in a robotic assembly system, means for moving a tool mount through five axes, said means comprising:
first motor means operably connected to said tool mount for rotating said mount about a first axis;
second motor means operably connected to said tool mount for rotating said mount about a second axis normal to said first axis;
third motor means for moving said tool mount along a third axis normal to said first axis;
a first movable carriage on which said first, and said second motor means and said tool mount are carried;
a second movable carriage, said first carriage being carried on said second carriage and movable relative thereto;

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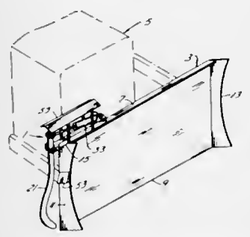
means for moving said first carriage relative to said second carriage along a fourth axis inclined to said first axis;

second carriage motor means operably connected to said second carriage for moving said second carriage along a fifth axis, said fifth axis being inclined to said first and said fourth axes; said first motor means being connected in driving relation with a first shaft, gear means connecting



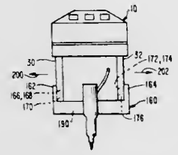
said first shaft to said tool mount, to drive said tool mount about an axis inclined to said first shaft; said second motor means being connected in driving relation with an elongate cylindrical member having a main axis, and surrounding said first shaft and connected in supporting relation with said tool mount, to rotate said tool mount about said cylindrical member main axis.

4,781,518
TREE GRIPPING DEVICE
Jack W. Paavila, Green Valley, Canada, assignor to Equipements Denis Inc., Ste. Hyacinthe, Canada
Filed Feb. 12, 1988, Ser. No. 155,278
Int. Cl.[4] B66C *3/00*
U.S. Cl. 414—724 **5 Claims**



1. A tree gripping device adapted to be mounted on the top of a bulldozer blade, comprising: an elongate base member for attachment in a generally horizontal position on the top of, and aligned with, the bulldozer blade with one end of the base member projecting past one side of the blade; a gripping arm pivotally attached near one of its ends to he base member adjacent its one end, the gripping arm extending generally transverse to the base member and located adjacent the one side of the blade with its other free end near the ground when the base member is mounted on the top of the bulldozer blade; and actuating means, generally overlying the base member and pivotally attached adjacent one end to the gripping arm adjacent its one end and adjacent its other end to one of the base member and the top of the bulldozer blade; the actuating means operable to move the gripping arm to grip a tree lying on the ground between the gripping arm, adjacent its free end, and the said one side of the bulldozer blade.

4,781,519
END EFFECTOR TOOLS
Mathew L. Monforte, Hamilton, N.J., assignor to Monfort Robotics, Inc., West Trenton, N.J.
Continuation of Ser. No. 830,677, Feb. 19, 1986, abandoned, which is a continuation of Ser. No. 591,265, Mar. 19, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 61,813
Int. Cl.[4] B25J *15/04*
U.S. Cl. 414—730 **17 Claims**



14. An exchangeable end effector tool, suitable for attachment upon a robotic end effector disposed on the distal end of a robotic arm, comprising in combination:

I. a robotic end effector having;

(A) at least two extending linear moving fingers for engaging an exchangeable tool when moving in a closing direction or a opening direction, said linear moving fingers including;

(a) finger indexing means disposing proximate the distal end of each said fingers, and

(b) a locking device disposed internally within each said fingers, said locking device having a first affixing position and a second releasing position; and

(c) remote means for moving said locking device from said first to said second position; and

II. an exchangeable tool having;

(A) tool engaging means accessible to the distal end of each said end effector extending fingers when said end effector fingers are moving outwardly or inwardly said extending fingers including;

(a) tool indexing means for mating and cooperating with said finger indexing means,

(b) means for cooperating with said finger locking device; and

(B) tool means having said engaging means affixing thereon, said tool means being selected to perform a prescribed function.

4,781,520
POLAR-COORDINATE MANIPULATOR FOR VACUUM APPLICATION
Valentin Balter, Cupertino, Calif., assignor to Huntington Mechanical Laboratories, Inc., Mountain View, Calif.
Filed Jan. 13, 1988, Ser. No. 143,635
Int. Cl.[4] B65G *54/00*
U.S. Cl. 414—751 **20 Claims**

1. A polar-coordinate manipulator for vacuum applications, comprising:

stationary support means for rigid attachment to a mounting flange of a vacuum chamber in sealing engagement with said chamber;

rotary support means installed in a rotatable manner on said stationary support means;

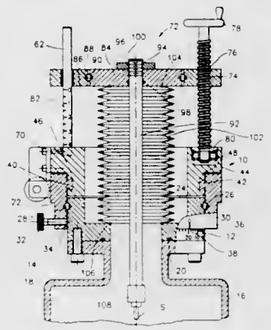
sliding means mounted on a pluality of first guides on said rotary support means and capable of sliding along said plurality of first guides in a radial direction with regard to the center of rotation of said rotary means;

second guide means mounted on said sliding means in a direction parallel to said axis of rotation;

moveable support means capable of moving along said second guide means in said direction parallel to said axis of rotation, said moveable support having an outer part which slides along said second guide means and an inner part which is mounted rotatingly with respect to said outer part;

axial drive means installed on said outer part and connected to said sliding means for driving said moveable support means in said direction parallel to said axis of rotation;

elongated means rigidly connected to said inner part and extending through said sliding means, said rotary support means, and said stationary support means and into said vacuum chamber;



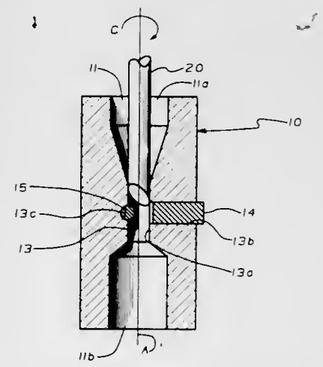
a sample holder on the end of said elongated means inside said vacuum chamber;

flexible, stretchable sealing means which surrounds said elongated means and forms a sealed chamber connected to said vacuum chamber;

means for measuring angular position of said rotary support means on said stationary support means; and

means for measuring said axial movement of said moveable support along said second guide means.

4,781,521
ORIENTING DEVICE AND METHOD
Reese H. Barker, Ogden, and Jack W. Crowther, Midvale, both of Utah, assignors to Deseret Medical, Inc., Franklin Lakes, N.J.
Continuation of Ser. No. 800,941, Nov. 22, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 73,376
Int. Cl.[4] B65G *47/24*
U.S. Cl. 414—754 **10 Claims**



1. An apparatus for rotatably orienting two members relative to one another during axial translation of same into engagement with one another comprising:

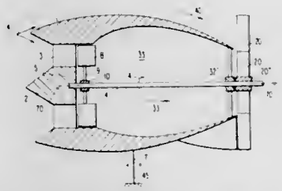
a first magnetic field responsive member having at least a cylindrical surface thereof and a slanted, oblique end for selected orientation,

a second member having a hollow cylindrical portion for sliding, mating engagement in bearing-like relation with said cylindrical surface to axially align said first and second members while permitting relative axial sliding and rotary motion therebetween,

orienting means located transverse to said hollow cylindrical portion of said second member at one side of said cylindrical portion and positioned to engage at least a part of said oblique end during relative axial sliding movement between said first and second members, and

a magnetic field emanating from a magnet located at the side opposite said one side of said cylindrical portion and imposed across said hollow portion of said second member for rotating said first member toward said one side of said cylindrical portion, said magnetic field acting on said first member to also influence its axial movement.

4,781,522
TURBOMILL APPARATUS AND METHOD
Norman E. Wolfram, 216 Millers Falls Rd., Turners Falls, Mass. 01376
Filed Jan. 30, 1987, Ser. No. 9,241
Int. Cl.[4] F03D *1/02*
U.S. Cl. 415—1 **23 Claims**



1. A method for producing mechanical rotation from a flowing medium comprising a first portion and a second portion, said first portion and said second portion being mutually exclusive, the method comprising the steps of

rotating a first rotor in response to said first portion of said medium to produce output medium from said first rotor,

rotating a second rotor in response to said second portion of said medium,

rotating a third rotor in response to rotation of said second rotor,

reducing the pressure of said output medium in response to rotation of said third rotor to effect augmentation of speed of said output medium by performing one of

increasing the speed of rotation of said third rotor with respect to the speed of rotation of the second rotor and rotating the second rotor in response to at least a portion of said output medium.

4,781,523
FLUID ENERGY TURBINE
Elmo E. Aylor, 498 Hwy. 208, Yerington, Nev. 89447
Filed Jun. 1, 1987, Ser. No. 56,120
Int. Cl.[4] F03D *1/06*
U.S. Cl. 415—2 A **18 Claims**

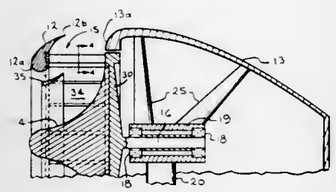
1. An air driven turbine comprising a rotor including a plurality of longitudinal blades distributed in spaced side-by-side relation about the axis of rotation of said rotor,

each of said blades being aligned with its major dimensional component parallel to said axis,

said blades being spaced in non-overlapping bounding relation about an interior of said rotor with the spaces be-

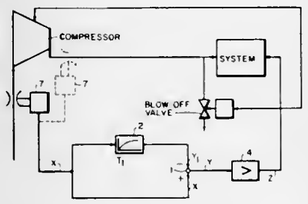
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tween said blades forming air slot outlets from said interior,
an air flow path for guiding flow of air into said interior and leading to said blades,
an air inlet comprising an inlet ring forming an entrance to said air flow path,
said blades across their width being shaped and angularly pitched to the flow of air therebetween to effect rotation of said rotor,



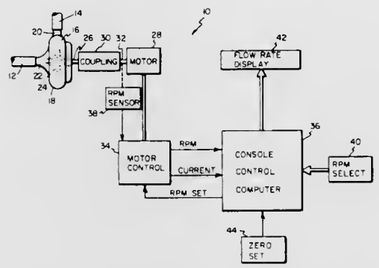
said blades being spaced relative to each other such that each of said slot outlets is formed between the leading edge of each of said blades and the trailing edge of the preceding adjacent blade,
the total cumulative area of said slot outlets being less than the minimum cross-sectional area long the air flow path of said inlet to slots.

4,781,524
METHOD AND APPARATUS FOR DETECTING PRESSURE SURGES IN A TURBO-COMPRESSOR
Wilfried Blotenberg, Dinslaken, Fed. Rep. of Germany, assignor to Man Gutehoffnungshuette GmbH, Oberhausen, Fed. Rep. of Germany
Filed Feb. 12, 1987, Ser. No. 13,659
Int. Cl.[4] F04D *27/02*
U.S. Cl. 415—27 **18 Claims**



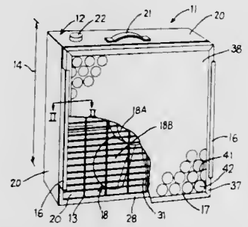
1. A method for detecting pressure surges in a turbo-compressor having intake and outlet ports, said method comprising the steps of:
(a) measuring one of the gas flow rate or gas velocity at one of said intake or outlet ports of said compressor, the measured quantity being represented by a signal X;
(b) determining the rate of change of said signal X, said rate of change being represented by a signal Y; and
(c) determining when said signal Y exceeds a prescribed first threshold value;
whereby the occurrence of surge is indicated when said signal Y exceeds said first threshold value.

4,781,525
FLOW MEASUREMENT SYSTEM
Lloyd C. Hubbard, Minnetonka, and Earl W. Clausen, Wayzata, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 17, 1987, Ser. No. 74,549
Int. Cl.[4] F01D *17/02*
U.S. Cl. 415—30 **7 Claims**



1. A method of indirectly and noninvasively measuring blood flow in an outlet line connected to a motor driven centrifugal blood pump of a type having an inlet, and outlet connected to the outlet line, a housing, and an impeller which is rotated by the motor to pump blood from the inlet to the outlet, the method comprising:
sensing a first parameter to provide a first signal representative of pump impeller RPM;
sensing a second parameter to provide a second signal representative of motor torque;
computing a blood flow rate in the outlet line as a function of the first and second signals; and
displaying a representation of the blood flow in the outlet line.

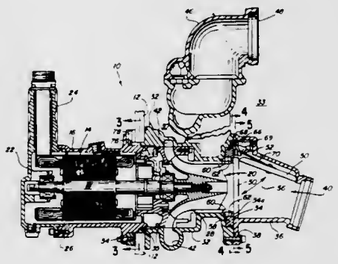
4,781,526
FAN AND FILTER COMBINATION
Clarence Mead, 3809 P Dr., North, Battle Creek, Mich. 49017
Filed Oct. 29, 1987, Ser. No. 114,675
Int. Cl.[4] F04D *29/70*; **B01D** *46/10*
U.S. Cl. 415—121 G **12 Claims**



6. A portable fan apparatus, comprising: a housing having an inlet opening, an outlet opening and an air passage extending from said inlet opening to said outlet opening; air movement means disposed in said air passage for causing air to flow into said inlet opening, through said air passage and out said outlet opening; a filter; filter support means for removably supporting said filter on said housing upstream of said air movement means in a manner so that all air flowing through said air passage passes through said filter, said filter being slidably inserted into and removed from said filter support means in directions transverse to a direction of air movement through said filter; a grille which is fixedly secured to said housing and

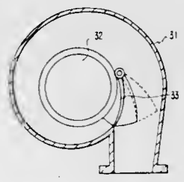
extends across said inlet opening in said housing on a side of said filter remote from said air movement means; said housing having therein a further opening through which said filter can be slidably inserted into and removed from said filter support means.

4,781,527
CARTRIDGE PUMP
E. Kent Miller, Rockford, Ill., assignor to Sundstand Corporation, Rockford, Ill.
Filed Mar. 19, 1986, Ser. No. 841,430
Int. Cl.[4] F01D *15/10*
U.S. Cl. 415—127 **25 Claims**



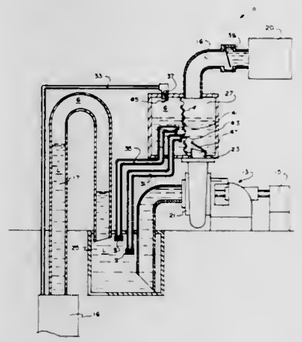
1. In a fluid holding receptacle, including in combination,
a pump housing on the fluid holding receptacle and having an inlet opening to allow passage of fluid from the receptacle into the pump housing,
pump means rotatably positionable in the pump housing on an axis,
pump inlet closure means mounted on the housing for movement in a path generally transversely of the pump axis between inlet open and closed positions, and
actuator means operatively associated between the pump means and the pump inlet closure means for moving the closure means generally transversely of the pump axis to its inlet closed position in response to rotational movement of the pump means about said axis.

4,781,528
VARIABLE CAPACITY RADIAL FLOW TURBINE
Atsushi Hagita; Nobuyasu Matsudaira; Michio Kyoya, and Yoichiro Okazaki, all of Sagamihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 9, 1987, Ser. No. 94,593
Int. Cl.[4] F01D *17/18*
U.S. Cl. 415—151 **2 Claims**



1. A variable capacity radial flow turbine comprising:
a housing having therein a turbine wheel, a scroll-shaped working gas passageway leading from an entrance to said turbine wheel in a direction of working gas flow, an intake from said passageway to said turbine wheel, and a partition dividing said passageway into two parallel parts; and
means for adjusting the cross-sectional area of said two-part passageway and thus for smoothly changing the flow rate of working gas supplied to said turbine wheel, said means comprising a pivotally mounted vane for opening and closing said intake, said vane including a plate-like member having a downstream end in said direction of gas flow pivotally mounted adjacent the inner circumference of said passageway and an upstream end, and a rib extending from said plate-like member in a direction perpendicular thereto toward said partition.

4,781,529
HYDRAULIC PUMPING SYSTEM
Loren J. Rose, 300 N. Highland, Memphis, Tenn.
Filed Oct. 5, 1981, Ser. No. 308,794
Int. Cl.[4] F01D *25/00*
U.S. Cl. 415—168 **6 Claims**



1. Hydraulic pump system for use with a pump means having an inlet port and an outlet port for pumping liquid from a first location to a second location through a liquid outlet means, said system comprising:
(a) a first chamber positioned below said pump means for communicating with said inlet port of said pump means and with said first location;
(b) a second chamber for communicating with said outlet port of said pump means and with said second location, said outlet port being located at the bottom of said second chamber;
(c) gas outlet means;
(d) gas passageway means for allowing gas to exit said first and second chambers through said gas outlet means, said gas passageway means extending between said first chamber and said gas outlet means bypassing said pump means for allowing gas to exit said first chamber without passing through said pump means;
(e) liquid passageway means for selectively allowing liquid to pass from said second chamber to said first chamber;
(f) gas passageway valve means for preventing liquid or gas from passing from said second chamber through said gas passageway means into said first chamber while allowing gas to pass from said first chamber through said gas passageway means into said second chamber;
(g) liquid passageway valve means for preventing liquid from passing from said second chamber through said liquid passageway means while said pump means is pumping liquid;
(h) pump valve means attached to said outlet port of said pump means within said second chamber and at the bottom of said second chamber for preventing liquid from

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passing from said chamber into said pump means when said pump means is not pumping liquid; and

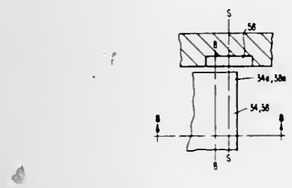
(i) said gas passageway valve means, said liquid passageway valve means and said pump valve means being operatively coupled to one another for causing said gas passageway valve means and said liquid passageway valve means to close when said pump valve means opens and for causing said gas passageway valve means and said liquid passageway valve means to open when said pump valve means closes.

4,781,530

COMPRESSOR RANGE IMPROVEMENT MEANS

Jerre F. Lauterbach; James D. Kahlenbeck, and Bruce W. Turner, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jul. 28, 1986, Ser. No. 889,633
Int. Cl.⁴ F04D *29/44*
U.S. Cl. 415—170 R **16 Claims**



1. A compressor comprising:

a compressor casing having an inner cylindrical casing wall defining a generally cylindrical bore and a central axis of rotation therethrough and including a circumferential row of slots formed in said inner casing wall;

a rotor having a compressor blade row comprising the leading row of blades on sid rotor, said leading blade row comprising a plurality of blades rotatable about said axis within said bore with the tips of said blades adjacent said row of slots;

each slot of said circumferential row of slots defined by an end wall and a pair of circumferentially spaced apart side walls, said side walls extending from said end wall toward said inner casing wall and defining therebetween at said inner casing wall an axially elongate opening into said bore, said side walls at said inner casing wall being generally parallel to the axis of said bore and forming at said inner casing wall an angle of 50°–70° with a radius of said bore extending from said axis, the inclination of said side walls causing said slots to be inclined relative to said inner casing wall at such an angle that the rotating blade tends to force air into said slots, and the axial length of each said slot being equal, within plus or minus 20%, to the maximum projected axial length of the blades of said leading row of blades on said rotor;

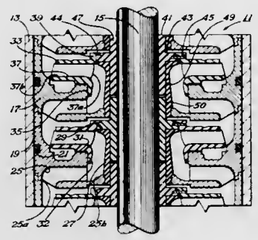
the axial centerline of said circumferential row of slots being positioned axially forward of the axial centerline of the blades of said leading blade row and a substantial portion of the axial slot length of each slot being forward of the leading edge of the blades of said leading blade row.

4,781,531

CENTRIFUGAL PUMP STAGE WITH ABRASION RESISTANT ELEMENTS

Mark C. James, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 13, 1987, Ser. No. 108,197
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.⁴ F04D *29/02*
U.S. Cl. 415—212 R **3 Claims**



1. In a submersible centrifugal pump of the type having a housing, a drive shaft extending through the housing, a plurality of diffusers mounted stationarily in the housing, each diffuser having a plurality of passages with a lower inlet and an upper outlet, a plurality of impellers, each mounted to the shaft for rotation therewith, each impeller having a plurality of passages with an inlet for receiving fluid from the outlets of an adjacent lower diffuser and an upper outlet for discharging fluid to the inlets of an adjacent upper diffuser, the improvement comprising:

the diffuser having a diffuser sleeve extending upward from the upper outlet of the diffuser, the diffuser sleeve being of a material harder than the remaining portions of the diffuser and having an upper edge; and

the impeller having an impeller hub carried by the shaft inside the diffuser hub for rotation with the shaft, the impeller hub having a flange that engages the upper edge of the diffuser sleeve in rotating sliding contact to transmit downward thrust on the impeller to the diffuser, the impeller hub being of a material harder than the remaining portions of the impeller.

4,781,532

BLADE RETENTION FEATURE FOR SADDLE FIR TREE ROOT BLADES OF TURBO MACHINES AND METHOD OF USING SAME

Peter Novacek, Gebenstorf; Paul Slepcevic, Nussbaumen, and Toni von Arx, Trimbach, all of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jun. 3, 1986, Ser. No. 869,920
Claims priority, application Switzerland, Jun. 28, 1985, 2767/85
Int. Cl.⁴ F01D *5/32*
U.S. Cl. 416—222 **6 Claims**

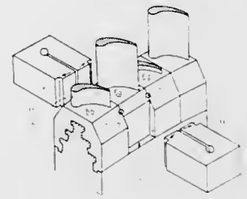
1. In a saddle-type rotor blade axial-flow turbomachine having a plurality of blades mounted on blade roots, said blade roots engaged with lugs on a rotor disk, and a locking blade mounted on a locking blade base, the improvement comprising:

said locking blade base being located between adjacent blade roots under a prestress;

means for fastening said locking blade base to the adjacent blade roots; and

said locking blade base being dimensioned axially more narrowly in the region of the lugs of the rotor disk than

that of the adjacent blade roots in such a way that a first removal recess is formed on one side of the locking blade



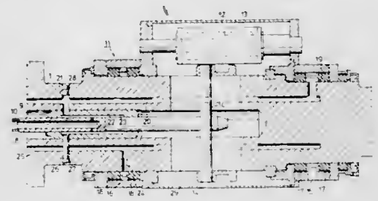
base exposing walls on the adjacent blade roots adapted to receive pressure from a prestress relieving tool.

4,781,533

CONTROL SYSTEM FOR PROPELLER WITH CONTROLLABLE PITCH

Sven-Ola Andersson, Kristinehamn, Sweden, assignor to Kamewa AB, Kristinehamn, Sweden

Filed Sep. 30, 1986, Ser. No. 913,595
Int. Cl.⁴ B63H *3/08*
U.S. Cl. 416—157 R **7 Claims**



1. An actuating system for variation and control of the pitch of a marine propeller having a propeller hub, propeller blades mounted in said hub for rotation about their mounting axes and a hollow rotatable propeller shaft connected to said propeller hub, the system comprising:

a hydraulic servomotor located within said propeller hub and mechanically coupled to said propeller blades for variation of their pitch angle;

a control valve located in said propeller hub for controlling supply of a high pressure fluid to said servomotor, a valve control rod extending axially and being axially displaceable in said hollow propeller shaft and having one end coupled to said control valve for actuating the same;

a high pressure fluid duct extending axially within said hollow propeller shaft and being connected to said control valve for supplying high pressure fluid thereto;

a first stationary high pressure fluid chamber embracing said propeller shaft and being sealed against the external surface of said shaft;

a second stationary high pressure fluid chamber embracing said propeller shaft and being sealed against the external surface of said shaft;

a first radial high pressure fluid channel extending within said shaft between said first high pressure fluid chamber and said axial high pressure fluid duct;

a second radial high pressure fluid channel extending within said shaft between said second high pressure fluid chamber and said axial high pressure fluid duct;

a first high pressure fluid source being alternatively and selectively connectable to either said first high pressure fluid chamber or said second high pressure fluid chamber; and

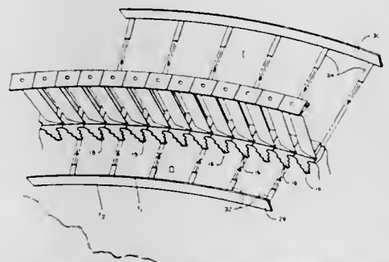
closure means in said first and second radial high pressure fluid channels for alternatively and selectively closing either said first or said second radial high pressure fluid channel to a flow of high pressure fluid therethrough.

4,781,534

APPARATUS AND METHOD FOR REDUCING WINDAGE AND LEAKAGE IN STEAM TURBINE INCORPORATING AXIAL ENTRY BLADE

Jurek Ferleger, Longwood, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1987, Ser. No. 20,045
Int. Cl.⁴ F01D *5/30*
U.S. Cl. 416—193 A **14 Claims**



1. In a turbomachine having a disc with an inlet side and an exit side, a plurality of generally axially extending grooves therearound, and a plurality of blades, each blade having a platform and a root in registration with one of the grooves, an apparatus for reducing windage loss and leakage comprising:

an annular plate juxtaposed one of the inlet or exit sides of the disc and overlaying the grooves and faces of the platforms, the annular plate having integral retaining means for maintaining the plate juxtaposed the disc, the internal retaining means extending into the disc, the annular plate having an outside radius approximate the radius of the disc plus the thickness of the platforms and an inside radius approximate the radius form the center of the disc to the bottom of the grooves, the annular plate covering the rough surfaces caused by imprecise alignment between faces of the roots and the disc and between adjacent platforms, and covering gaps between the roots and the disc and between and under adjacent platforms.

4,781,535

APPARATUS AND METHOD FOR SENSING DIAPHRAGM FAILURES IN RECIPROCATING PUMPS

James J. Frawley, Honeoye Falls, and Richard L. Mearns, Pittsford, both of N.Y., assignors to Pulsafeeder, Inc., Rochester, N.Y.

Filed Nov. 13, 1987, Ser. No. 119,934
Int. Cl.⁴ F04B *21/00, 43/06;* G08B *21/00*
U.S. Cl. 417—53 **15 Claims**

1. An apparatus for determining a pump diaphragm failure comprising:

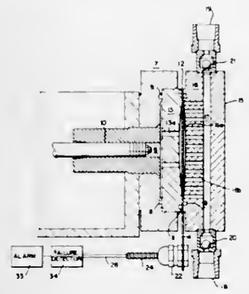
a single continuous circuit trace supported by said diaphragm, and insulated therefrom, and from a pumping medium, traversing substantially the entire surface area of said diaphragm;

an electrical circuit means connected to said continuous circuit trace for measuring both circuit trace continuity and a ground fault condition between said circuit trace and a pumping environment, whereby a diaphragm failure is detected when either said circuit trace electrical continuity is broken or said pumping environment comes into contact with said continuous circuit trace; and,

an alarm connected to said electrical circuit for indicating said diaphragm failure.

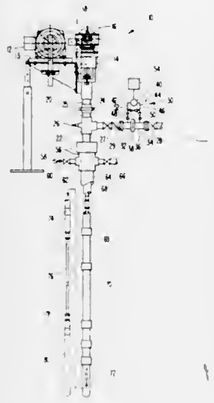
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13. A method for detecting a failure of a diaphragm separating two liquid mediums, comprising:
disposing a continuous circuit trace over a major portion of said diaphragm;
measuring the continuity of said circuit trace;



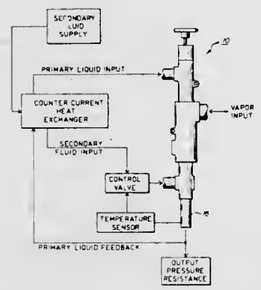
measuring a current flowing between said circuit trace and one of said liquid mediums; and
indicating a failure when either said continuity of said circuit trace changes or said current flowing between said circuit trace and said liquid medium changes.

4,781,536
LOW-FLOW PUMP-OFF CONTROL
Russell R. Hicks, 7034 S. Jamestown, Tulsa, Okla. 74136
Filed Sep. 10, 1986, Ser. No. 905,505
Int. Cl.[4] F04B *49/02;* **G01F** *1/42*
U.S. Cl. 417—12 **11 Claims**



1. A low-flow pump-off control device for deactivating a motor for a pump during conditions when a rate of supply of a source of fluid to be pumped by said pump is insufficient, said device comprising:
a pipe section having an inlet and an outlet, said inlet being connectable to said source of fluid to be pumped through said pipe section;
a plurality of plates disposed in said pipe section, each of said plates respectively defining at least one orifice through which said fluid is caused to pass;
a differential pressure switch for sensing a differential pressure between a pressure upstream of a first one of said plates and a pressure downstream of a last one of said plates that is at or below a set point indicative of a predetermined low flow rate of said liquid;
a first timer in communication with said switch for accumulating periods of time at which said switch senses said differential pressure;
a motor activation and deactivation means in communication with said timer for deactivating said motor when said accumulated periods of time total a predetermined amount; and
a second timer in communication with said first timer which is activated when said accumulated periods of time total said predetermined amount, wherein said motor activation and deactivation means is in communication with said second timer and activates said motor when said second timer times a second predetermined amount of time.

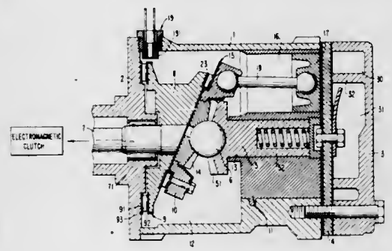
4,781,537
VARIABLE FLOW RATE SYSTEM FOR HYDROKINETIC AMPLIFIER
Carl D. Nicodemus, Mumford, and Blake T. Nicodemus, Perry, both of N.Y., assignors to Helios Research Corp., Mumford, N.Y.
Continuation-in-part of Ser. No. 24,589, Mar. 11, 1987, abandoned. This application Feb. 3, 1988, Ser. No. 151,821
Int. Cl.[4] F04F *5/00, 5/48;* **B05B** *7/00*
U.S. Cl. 417—54 **23 Claims**



1. In a hydrokinetic amplifier having a primary liquid input formed into a primary liquid jet surrounded by a motivating vapor that transfers vapor momentum to said primary liquid jet and accelerates said primary liquid jet through a minimum cross-sectional area upstream of a diffuser arranged beyond said minimum cross-sectional area, the improvement comprising:
a. a secondary liquid inlet arranged between said minimum cross-sectional area and said diffuser to merge a secondary liquid with said primary liquid jet in said diffuser;
b. said primary liquid input being drawn from downstream of said diffuser; and
c. said secondary liquid enroute to said secondary liquid inlet being arranged to cool said primary liquid input.

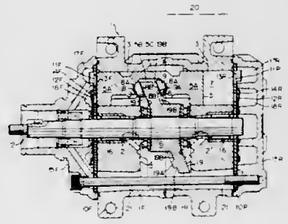
13. A method of operating a hydrokinetic amplifier to supply fluid to a load that varies its resistance to fluid flow, said hydrokinetic amplifier having a primary liquid input formed into a primary liquid jet surrounded by a motivating vapor that transfers vapor momentum to said primary liquid jet and accelerates said primary liquid jet through a minimum cross-sectional area upstream of a diffuser arranged beyond said minimum cross-sectional area, said method comprising:
a. admitting a secondary fluid to merge with said primary liquid jet in a region beyond said minimum cross-sectional area, so that said secondary fluid flow and said primary liquid jet combine and proceed into said diffuser; and
b. varying said fluid flow resistance of said load, without varying the flow rate of said primary liquid jet through said minimum cross-sectional area, so that change in said fluid flow resistance of said load inversely varies both the rate of inflow of said secondary fluid and also the rate of outflow from said diffuser to said load.

4,781,538
COMPRESSOR WITH ROTATION DETECTION DEVICE
Tamotsu Daikohara, Tano, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Sep. 4, 1987, Ser. No. 93,216
Claims priority, application Japan, Sep. 4, 1986, 61-134892[U]
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—223 **8 Claims**



1. In a rotation detecting device for a compressor including a housing, a drive shaft rotatably supported in said housing, a cam rotor drivingly coupled to said drive shaft and a wobble plate disposed adjacent a first surface of said cam rotor and nutating in response to the movement of said cam rotor, an improvement comprising:
a thrust race disposed on a second surface of said cam rotor and coupled thereto by a plurality of projections; and
detecting means disposed on said housing for detecting the magnetic flux density at a successive passes of said plurality of projections during rotation of the cam rotor.

4,781,539
SHOE AND SWASH PLATE LUBRICATOR FOR A SWASH PLATE TYPE COMPRESSOR
Hayato Ikeda, and Satoshi Kitahama, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jikoshokki Seisakusho, Aichi, Japan
Filed Jun. 11, 1987, Ser. No. 61,653
Claims priority, application Japan, Jun. 13, 1986, 61-091216[U]
Int. Cl.[4] F04B *1/16, 1/18;* **F01M** *1/00*
U.S. Cl. 417—269 **4 Claims**



1. A swash plate type compressor comprising:
a pair of axially combined front and rear cylinder blocks forming therein a plurality of cylinder bores and a swash plate chamber into which an oil-contained refrigerant is introduced from an air-conditioning circuit;
a pair of front and rear housings arranged at axial ends of the combined cylinder block, each housing having therein a suction chamber for the oil-contained refrigerant before compression, fluidly interconnected with the swash plate chamber of the combined cylinder block, and a discharge chamber for compressed refrigerant which is delivered to an outer air-conditioning circuit;
a drive shaft centrally rotatably mounted in the combined cylinder block;
a swash plate having sliding contact faces oblique to an axis of the drive shaft, and supported on the drive shaft so as to be rotated with said drive shaft, the swash plate being rotated in said swash plate chamber;
a plurality of reciprocatory double-headed pistons slidably fitted in the cylinder bores, each piston having two axially spaced piston heads alternatively carrying out compression and suction motions;
a plurality of pairs of shoes, each pair of shoes being held by one of said plurality of said double-headed pistons and arranged in sliding contact with said swash plate for causing a reciprocating motion of said one of said plurality of pistons in response to a rotation of said swash plate, each shoe having a circular flat face in sliding contact with a circularly extending flat contact path provided on one of said oblique faces of said swash plate, and a spherical face formed on an opposite side of said flat face and slidably socketed in one of said piston heads of said one of said pistons; and
lubricating means arranged in said swash plate chamber for capturing and retaining said oil-contained refrigerant within said swash plate chamber, thereby constantly supplying said captured oil-contained refrigerant to said swash plate and said plurality of pairs of shoes during rotation of said swash plate, said lubricating means including:
(a) at least one circularly extending recessed portion formed in a predetermined angularly extended region of each of said sliding contact faces of said swash plate, which region does not contribute to an application of a force for causing said compression motion of said each piston head of said each of said plurality of double-headed pistons, said circularly extending recessed portion capturing and retaining said oil-contained refrigerant within said swash plate chamber in response to rotation of said swash plate; and
(b) a narrow flat path circularly extending in parallel with and arranged adjacent to said circularly extending recessed portion in each of said sliding contact faces of said swash plate, said narrow flat path on each of said sliding contact faces of said swash plate being in sliding contact with said circular flat face of a respective one of each of said plurality of pairs of shoes during rotation of said swash plate.

4,781,540
PISTON TYPE COMPRESSOR FOR AIR CONDITIONING UNIT HAVING ASYMMETRIC VALVE MECHANISM
Hayato Ikeda; Mitsuhiro Oiwa; Satoshi Kitahama; Hiroshi Onomura, and Masahiro Sawada, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan
Filed Dec. 3, 1986, Ser. No. 937,340
Claims priority, application Japan, Dec. 5, 1985, 60-274108; Dec. 27, 1985, 60-299265
Int. Cl.[4] F04B *27/08, 39/10;* **F16K** *15/16*
U.S. Cl. 417—269 **11 Claims**

1. A piston type compressor comprising:
a cylinder block having therein a plurality of axial cylinder bores formed as compression chambers for permitting

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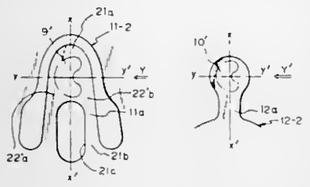
therein pistons to be reciprocated to compress a refrigerant gas;

at least a housing closing an axial end of the cylinder block for forming a suction chamer receiving therein a refrigerant gas to be compressed and a discharge chamber for receiving a compressed refrigerant gas;

a valve plate having an inlet port for introducing the refrigerant gas to be compressed from an outer air-conditioning circuit into the suction chamber, suction ports for fluidly communicating between the suction chamber and the compression chambers, an outlet port for discharging the compressed refrigerant gas from the discharging chamber toward the outer air-conditioning circuit, and discharge ports for fluidly communicating between the discharge chamber and the compression chambers;

suction valve means arranged on one end face of the valve plate and having a plurality of suction reed valves adapted to perform an oscillatory movement between a closing position being in contact with the valve plate for closing a corresponding one of said suction ports and an opening position apart from the valve plate for opening the corresponding suction port in response to a reciprocating motion of the pistons, each suction reed valve having a substantial length to define a first and second symmetrical planar portion on each side of a lengthwise central axis thereof;

discharge valve means arranged on the other end face of the valve plate and having a plurality of discharge reed valves adapted to perform an oscillatory movement between a closing position being in contact with the valve plate for



closing a corresponding one of said discharge ports and an opening position apart from the valve plate for opening the corresponding discharge port in response to a reciprocating motion of the pistons, each discharge reed valve having a substantial length to define a first and second symmetrical planar portion on each side of a lengthwise central axis thereof; and wherein each of the suction ports of the valve plate has a first portion to be closed by the first planar portion of a corresponding one of the suction reed valves and a second portion to be closed by the second planar portion of the corresponding one of the suction reed valves, the first and second portions of each suction port being arranged to be asymmetrical with one another with respect to the lengthwise central axis of the corresponding suction reed valves so as to cause a predetermined planar portion of each of the planar suction valves to achieve a larger displacement from a closed position in contact with the valve plate upon each movement toward the open position.

7. A piston type compressor comprising:

a cylinder block having therein a plurality of axial cylinder bores formed as compression chambers for permitting therein pistons to be reciprocated to compress a refrigerant gas;

at least a housing closing an axial end of the cylinder block for forming a suction chamber receiving therein a refrigerant gas to be compressed and a discharge chamber for receiving a compressed refrigerant gas;

a valve plate having an inlet port for introducing the refrigerant gas to be compressed from an outer air-conditioning circuit into the suction chamber, suction ports for fluidly communicating between the suction chamber and the compression chambers, an outlet port for discharging the compressed refrigerant gas from the discharging chamber toward the outer air-conditioning circuit, and discharge ports for fluidly communicating between the discharge chamber and the compression chambers;

suction valve means arranged on one end face of the valve plate and having a plurality of suction reed valves adapted to perform an oscillatory movement between a closing position being in contact with the valve plate for closing a corresponding one of said suction ports and an open position apart from the valve plate for opening the corresponding suction port in response to a reciprocating motion of the pistons, each suction reed valve having a substantial length to define a first and second planar portion on each side of a lengthwise central axis thereof;

discharge valve means arranged on the other end face of the valve plate and having a plurality of discharge reed valves adapted to perform an oscillatory movement between a closing position being in contact with the valve plate for closing a corresponding one of said discharge ports and an opening position apart from the valve plate for opening the corresponding discharge port in response to a reciprocating motion of the pistons, each discharge reed valve having a substantial length to define a first and second symmetrical planar portion of each side of a lengthwise central axis thereof; and wherein each of said suction reed valves of said suction valve means has a free end portion and a base portion apart from one another along said lengthwise central axis of said each suction reed valve, and wherein said base portion of said each suction reed valve is formed with a through-opening having a first portion located at said first planar portion of said each suction reed valve and a second portion located at said second planar portion of said each suction reed valve, said first and second portions of said through-opening being asymmetrical with one another with respect to said lengthwise central axis of said each suction reed valve, thereby forming a means for subjecting a predetermined one of said first and second planar portions of each of said plurality of suction reed valves to a larger displacement from said closing position in contact with said valve plate upon each movement toward said opening position.

4,781,541

EXTERNAL AXIAL ROTARY PISTON BLOWER WITH NOISE SUPPRESSING TRANSFER PORTS

Wolfgang Sohler, Wangen, and Werner Schubert, Lindau, both of Fed. Rep. of Germany, assignors to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 10, 1987, Ser. No. 60,743

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620792

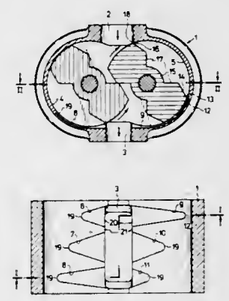
Int. Cl.[4] **F04B** *39/00;* **F04C** *18/18, 29/06*

U.S. Cl. 417—312 **4 Claims**

1. An external axial rotary piston blower having two pistons each with dual-vane configuration identical relative to each other respectively having cylinder surfaces with outer peripheral large radius of the pistons along inner peripheral surfacing of a blower housing formed by cylinders intersecting each other at location of inlet and outlet openings relative thereto and each having cylinder surfaces with centrally located small radius of the pistons running complementary into meshing engagement among each other, comprising:

transfer port means cut into the inner peripheral surfacing in circumferential direction on both sides of the outlet and opening therein, said transfer port means having a beginning and widening dimensionally as far as to a predetermined greatest length dimension toward said outlet and having different length and width among each other so that said transfer port means reach and grasp all possible

disturbing noise frequencies arising therewith so as to avoid strong exhaust noise discharging from the blower



even as noise development increases with increasing speed of the blower.

4,781,542

HERMETICALLY-SEALED COMPRESSOR WITH MOTOR

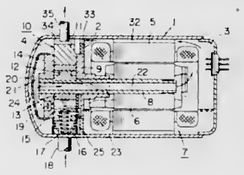
Masao Ozu, Fuji; Kanji Misawa, Fujimiya, and Takahiro Togawa, Numazu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1987, Ser. No. 55,598

Claims priority, application Japan, Jun. 2, 1986, 61-127771; Jun. 3, 1986, 61-128550; Jul. 11, 1986, 61-163462

Int. Cl.[4] **F04B** *39/02*

U.S. Cl. 417—369 **4 Claims**



1. In a hermetically-sealed compressor and motor, a lubricating system comprising: a sealed case containing in the bottom thereof accumulated lubricating oil, its interior divided into a motor chamber and a compressor chamber, an electric motor enclosed within the motor chamber and having a rotor, a compressor means enclosed within the compressor chamber and having an eccentric rotor, a common rotor shaft coupling the rotor of the electric motor and the eccentric rotor of the compressor means, and inner and outer bearings rotatably supporting the rotor shaft, the compressor means having a cylinder block interposed between the inner and outer bearings, and a delivery pipe connected to the compressor chamber; the improvement comprising a communication passage extending axially through the rotor shaft for conducting a gaseous refrigerant therethrough, one end of said communication passage being communicatively connected to the motor chamber, and a delivery cover secured to an outer surface of the outer bearing to define a delivery chamber between the delivery cover and the outer bearing, said delivery chamber being communicatively connected to the other end of said communication passage, whereby said gaseous refrigerant is supplied directly through the communication passage into the motor chamber, the surface level of lubricating oil in the compressor chamber being maintained at a higher level than that of the lubricating oil in the motor chamber as a result of this pressure.

4,781,543

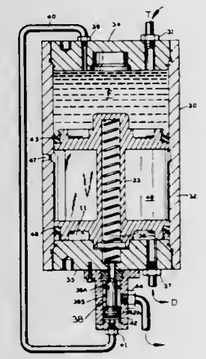
ARTIFICIAL LIFT SYSTEM FOR OIL WELLS

Gordon M. Sommer, Boca Raton, Fla., assignor to 501 Stripper Production Systems, Inc., Boca Raton, Fla.

Filed Jan. 27, 1987, Ser. No. 6,876

Int. Cl.[4] **F04B** *47/08*

U.S. Cl. 417—378 **19 Claims**



1. A subsurface production fluid lifting system for underground formations, comprising:

a subsurface pump affixed at the production fluid level of the underground formation;

said subsurface pump connected to a power piston having a top and underside by a sucker rod string;

wherein said power piston is of such diameter and displaced a distance above said pump so the weight of said sucker rod string is nearly balanced by fluid column pressure of the production fluid on the underside of said piston;

and said top of said power piston is vented to the annulus between the production tubing and well casing;

wherein said power piston is powered upward by pressure pulses of the production fluid being pumped to the underside of said power piston;

wherein said pulses are generated from a surface mounted actuator having a free-body piston; and

wherein said power piston will downstroke due to gravity between said pressure pulses;

and a check valve in the actuator having hydraulic connections to a storage area and to the production tubing and operative to direct production fluid to the storage area during each stroke of said free-body piston of said actuator in one direction, and operative to direct production fluid from said actuator down through the production tubing to said power piston for downhole powering the power piston during each stroke of the free-body piston in the opposite direction.

4,781,544

APPARATUS FOR TRANSMITTING PRESSURE FROM A HYDRAULIC FLUID TO A MATERIAL HAVING SOLID PARTICLES SUSPENDED IN A LIQUID MEDIUM

Gary L. Leonard, Clifton Park, and Francis P. Bundy, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 826,426, Feb. 5, 1987, abandoned. This application Aug. 4, 1987, Ser. No. 81,506

Int. Cl.[4] **F04B** *17/00*

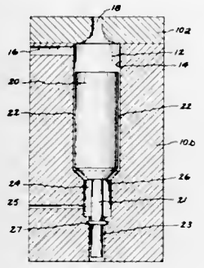
U.S. Cl. 417—392 **10 Claims**

1. Apparatus for transmitting pressure from a hydraulic fluid to a material having solid particles suspended in a liquid medium, while substantially isolating said hydraulic fluid from said material, said apparatus comprising:

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a housing including a piston chamber surrounded by a piston chamber wall, said piston chamber having an inlet port and an outlet port in flow communication with a first end of said piston chamber, for allowing material to enter and leave the first end of said chamber, respectively, said housing further including a hydraulic fluid channel for introducing hydraulic fluid at a second end of said piston chamber; and

a piston slidably disposed in said piston chamber so that sliding movement of said piston produces pressurization of the first end of said piston chamber for forcing material out said outlet port, said piston having a smaller diameter than said piston chamber creating a clearance gap be-



tween said piston and the corresponding surface of said piston chamber wall, said piston including an area-reducing portion disposed in said hydraulic fluid channel, the surface area of the portion of said piston in said hydraulic fluid channel being less than the surface area of the portion of said piston in the first end of said piston chamber so that said hydraulic fluid in the hydraulic fluid channel can be maintained at a higher pressure than the pressure in said slurry material, said hydraulic fluid channel being in flow communication with said clearance gap permitting at least a portion of the pressurized hydraulic fluid to pass through said clearance gap and flush solid particles from said material out of said gap.

4,781,545

ROTARY COMPRESSOR WITH SOUND SUPPRESSION TUBULAR CAVITY SECTION

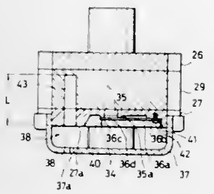
Yukio Yokomizo, Fujinomiya, and Masahiko Sasaki, Fuji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 904,294, Sep. 8, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 161,268

Claims priority, application Japan, Sep. 30, 1985, 60-148081[U]; Jan. 31, 1986, 61-11615[U]

Int. Cl.⁴ F04B *39/00;* **F04C** *29/06*

U.S. Cl. 417—312 **24 Claims**



1. A rotary compressor comprising:

a rotary shaft for a compression action;

a bearing which supports the rotary shaft and in which a discharge port and a discharge valve which discharges a compressed gas is positioned;

a sound suppression cover which covers the discharge port and the discharge valve, so that an annular discharge chamber is formed between the sound suppression cover and the bearing; and

at least one tubular cavity section with a bottom, said tubular cavity section opening into the discharge chamber at a location directly adjacent the discharge port such that the tubular cavity section is positioned to diverge from said location directly adjacent the discharge port, and having a length of approximately one fourth the average circumferential length of said discharge chamber, thereby producing a side branch muffler effect in that the pressure pulsations in the discharge gas produced in the discharge chamber are introduced into the cavity section and returned to the discharge chamber with the phase of the pulsations reversed.

4,781,546

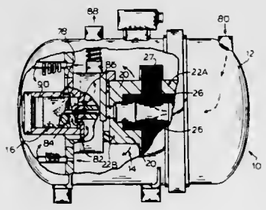
LINEAR RESONANT RECIPROCATING MACHINES

Peter W. Curwen, Ballston Spa, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Mar. 10, 1987, Ser. No. 24,258

Int. Cl.⁴ F04B *31/00*

U.S. Cl. 417—417 **4 Claims**



1. A free-piston reciprocating compressor, comprising:

a cylinder having suction and discharge valve means operatively associated therewith;

a piston means disposed for reciprocal movement within said cylinder and defining at one end a valved compression chamber and at the other end a closed volume balance chamber;

means for reciprocally driving said piston means in said cylinder for compressing a working fluid; and

porting means operatively associated with said piston-cylinder for balancing the time-average pressure forces on both sides of said piston means and providing a stabilizing force gradient wherein said piston means includes a hollow piston member having a port disposed in the wall thereof which during some portion of the reciprocation cycle communicates with a passage disposed in the wall of said cylinder, said passage during said some portion of the reciprocation cycle providing communication between said valved compression chamber and said closed volume balance chamber.

4,781,547

GAS EQUALIZER FOR DOWNHOLE PUMP

Raymond D. Madden, P.O. Box 389, Mansfield, Tex. 76063

Filed Nov. 13, 1986, Ser. No. 930,586

Int. Cl.⁴ F04B *7/00, 21/04*

U.S. Cl. 417—444 **12 Claims**

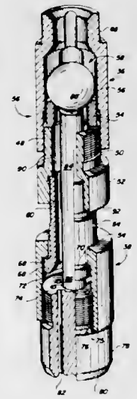
1. A gas release device for use in conjunction with a downhole pump of the reciprocatory type that includes a traveling valve assembly having a ball type valve element; said gas release device includes only an adaptor means; a cylindrical main body; a piston assembly; and, a pushrod;

said adaptor means enables said main body to be attached directly to the traveling valve assembly of the pump, a passageway formed through said main body and along the central longitudinal axis of the pump, said pushrod has a free end which extends into said passageway for engaging the ball of the traveling valve assembly, and an opposed end is directly and rigidly attached to and forms part of said piston assembly; said main body has an upper end opposed to an enlarged lower end formed thereon;

said piston assembly has an upper cylindrical skirt member which is rigidly attached to said port sub; passageways formed through said port sub through which production fluid flows each downstroke of the pump and thereby reciprocates the piston assembly towards the traveling valve; opposed faces formed by an inwardly directed boss of the cylindrical skirt member and the lower enlarged end of said main body abuttingly engage during each upstroke;

whereby; the free end of said pushrod lifts the ball of the traveling valve each downstroke of the well pump.

5. In a well pump for use in a wellbore, said pump having a pump plunger mounted for reciprocating motion respective to a cylindrical pump barrel, means imparting reciprocatory



motion between said plunger and barrel, there being a variable chamber formed between the plunger and barrel for producing fluid therethrough;

a traveling valve assembly having a caged ball element received against a seat located therein for controlling fluid flow from the variable chamber; and, a stationary valve assembly which is fixed respective to the wellbore for controlling flow into the variable chamber;

said stationary valve is operative on the downstroke to trap fluid in the variable chamber of the pump and said traveling valve is operative on the upstroke to lift fluid towards the surface; the combination with said traveling valve of a gas equalizing device;

said gas equalizing device includes a cylindrical housing having an upper end attached to the lower end of the traveling valve assembly, and a lower end spaced from said upper end, said cylindrical housing has an axial bore which extends longitudinally therethrough; an enlargement formed on the lower marginal end of said cylindrical housing; circumferentially extending opposed shoulders formed on said enlargement;

a piston having a cavity formed at an upper end thereof, confronting circumferentially extending faces formed within said cavity, and arranged for abuttingly engaging the opposed shoulders of said enlargement of said cylindrical housing; whereby said piston is loosely attached to said cylindrical housing and arranged to reciprocate longitudinally respective thereto between the limits provided by said confronting faces and said shoulders, a passageway formed longitudinally through said piston and into said cylindrical housing through which produced fluid can flow;

a pushrod having an upper marginal end portion telescopingly received within the axial bore of the cylindrical housing and a lower end portion rigidly attached to said piston; said piston reciprocates towards and away from the traveling valve on the downstroke and the upstroke; said upper end portion of said pushrod has a terminal end which engages and lifts the traveling ball element from its seat on the downstroke and which is moved free of the traveling ball on the upstroke;

whereby; said pushrod has a free end that lifts the ball of the traveling valve each downstroke of the well pump so that any compressible fluid accumulated within the variable chamber is free to flow from the variable chamber thereof.

4,781,548

INFUSION PUMP SYSTEM AND CONDUIT THEREFOR

Richard K. Alderson, 4525 E. Nancy La., Phoenix, Ariz. 85040; Ronald D. Sleater, 302 E. El Caminito Dr., Phoenix, Ariz. 85020, and James R. Talley, 102 Oak Cir., Monroe, La. 71203

Filed Apr. 10, 1987, Ser. No. 36,639

Int. Cl.⁴ A61M *5/00;* **F04B** *43/08*

U.S. Cl. 417—474 **19 Claims**

1. An infusion system operable on a resilient longitudinal tube for pumping fluid therethrough, comprising:

(a) a plurality of fixed spaced apart first comb means for receiving a tube and defining a pumping volume;

(b) means positioned adjacent to and cooperating with said first comb means for maintaining the tube in position;

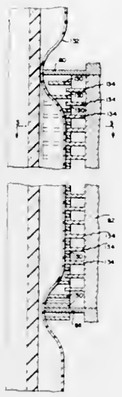
(c) a plurality of movable spaced apart second comb means interdigitated with said first comb means and engageable with the tube for reciprocatingly compressing the pumping volume;

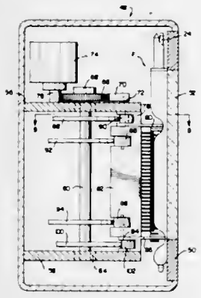
(d) first and second spaced apart cooperating valve means engageable with the tube for selectively compressing the tube and thereby permitting fluid to flow from or into the pumping volume;

(e) drive means operably associated with said second comb means and with said first and second valve means for simultaneously reciprocating said second comb means and

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operating for selectively said first and second valve means; and,





(f) brake means operably associated with said drive means for preventing unintended reciprocation of said second comb means.

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MODIFIED WRAP SCROLL-TYPE MACHINE

Jean-Luc Caillat, Dublin, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Division of Ser. No. 781,891, Sep. 30, 1985, abandoned. This application May 19, 1987, Ser. No. 52,107

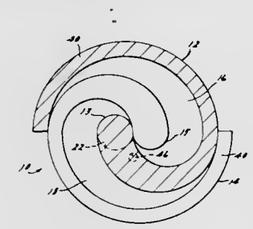
Int. Cl.⁴ F01C *1/04, 21/04, 21/08*

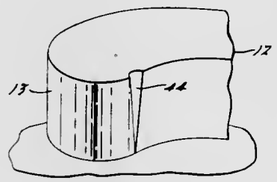
U.S. Cl. 418—55 **28 Claims**

1. A scroll-type apparatus comprising:

a fixed scroll member having a first spiral wrap; and

a second scroll member having a second spiral wrap, said first and second spiral wraps each having an inner end and an outer end, said second scroll member being mounted for movement along a predetermined cyclical path with respect to said first scroll member, said second wrap being intermeshed with said first wrap so that when said second scroll member is moved with respect to said first scroll member at least one fluid pocket is formed which carries fluid from a peripherally located inlet of said apparatus to a centrally located outlet of said apparatus, said first and second spiral wraps having a wrap length such that a minimum of two and a maximum of three line contacts between said wraps occur during a full cycle of said movement of said second scroll member, said first and second spiral wraps each having an inner end comprised of a concave arcuate shape and a convex arcuate shape, said arcuate shapes being configured to reduce the volume of said fluid pocket to a theoretical zero volume just prior to separation of said wraps, said wraps differing from said configuration by the provision of a cutout section in one of said wraps defining a relatively shallow recess in the flank





surface of said one of said spiral wraps adjacent the inner end thereof and formed substantially along the entire height of said wrap so as to insure provision of a flowpath of minimum volume communicating between said fluid pocket and said outlet as said fluid pocket is reduced in volume.

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SCROLL COMPRESSOR WITH DRIVING AND DRIVEN SCROLLS

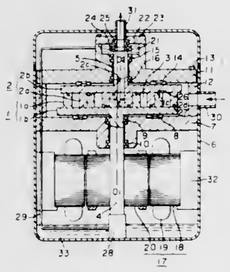
Etsuo Morishita; Masayuki Kakuda, both of Amagasaki; Masahiro Sugihara, Wakayama; Tsutomu Inaba, Wakayama; Toshiyuki Nakamura, Wakayama, and Tadashi Kimura, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,390

Claims priority, application Japan, Feb. 17, 1986, 61-32243; Mar. 7, 1986, 61-50815

Int. Cl.⁴ F04C *18/04, 29/02*

U.S. Cl. 418—55 **5 Claims**



1. A scroll compressor which comprises:

a sealing container,

a first fixed part placed inside said container,

a driving scroll comprising a circular plate portion, a wrap plate formed on a surface of said circular plate portion and a driving shaft extending from the other surface of said circular plate portion, said shaft being rotatably supported by said first fixed part,

a second fixed part placed inside said container so as to oppose said first fixed part with a certain space,

a driven scroll comprising a circular plate portion and a driven shaft extending from the other surface of said circular plate portion in the opposite direction to the shaft of said driving scroll,

wherein the driven shaft of said driven scroll is rotatably supported by said second fixed part so that the axis of rotation of said driven scroll shaft is deviated from the axis of rotation of said driving scroll; the wrap plates of said driving and driven scrolls are mutually combined with each other so that the parts of the side surfaces of the wrap plates come in contact to form a compression chamber and said driven scroll is directly driven by said driving scroll in synchronism therewith, and wherein a discharging conduit extends through said driven shaft from said compression chamber to an end of said driven shaft opposite said circular plate portion of said driven scroll, whereby the function of compression of a fluid is obtainable during the movement of said compression chamber toward the centers of said driving and driven scrolls,

a stationary discharge means communicating with said discharge conduit at said opposite end of said driven shaft,

seal means between said driven shaft and said stationary discharge means for sealing the rotary joint therebetween, for lubricating said seal means, wherein said lubricating means comprise an oil reservoir within which said seal means is positioned, whereby said seal means is immersed in a bath of oil within said oil reservoir.

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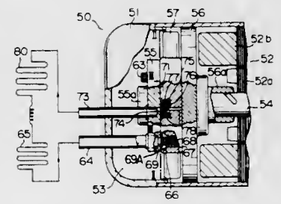
ROTARY COMPRESSOR WITH LOW-PRESSURE AND HIGH-PRESSURE GAS CUT-OFF VALVES

Yasuhiko Tanaka, Nara, Japan, assignor to Matsushita Refrigeration Company, Osaka, Japan

Filed Jun. 30, 1986, Ser. No. 879,888

Int. Cl.⁴ F04C *18/356, 25/00;* **F16K** *31/12;* **F25B** *49/00*

U.S. Cl. 418—63 **11 Claims**



1. A rotary compressor with low-pressure and high-pressure gas cut-off valves comprising: a closed vessel; a compression element; and a electrically driven element, said compression element and said electrically driven element being accommodated in said closed vessel,

said compression element comprising two side plaste each having a bearing portion for supporting a crankshaft; a cylinder plate for rotatably accommodating a rotor, said side plates and said cylinder plate being laminated to constitute a compression chamber; a vane and an oil seal for dividing said compression chamber into a low-pressure chamber and a high-pressure chamber, said vane having an end contacting an outer periphery of said rotor, said vane being accommodated in a vane groove of the cylinder plate and being biased toward said rotor by a spring; a low-pressure gas cut-off valve acting as a check valve which communicates with said low-pressure chamber and is disposed adjacent to said vane; a discharge valve for introducing a refrigerant gas into the closed vessel, which has been compressed in the compression chamber, directly or through an intermediary of a pre-cooler pipe; a high-pressure side inlet port in open communication with said closed vessel and a valve cylinder; a high-pressure side outlet port in open communication with a discharge pipe and said valve cylinder, said discharge pipe extending through said closed vessel; said high-pressure side inlet port and said high-pressure side outlet port being in juxtaposition with each other on the same surface of the side plate; a low-pressure side port in direct open communication with said valve cylinder and said low-pressure chamber of said compression chamber through a pressure passage; and a high-pressure gas cut-off valve in said valve cylinder, of which a flat surface thereof is capable of closing both said high-pressure side inlet and outlet ports simultaneously and of which the other end surface is capable of closing said low-pressure side port.

4,781,552

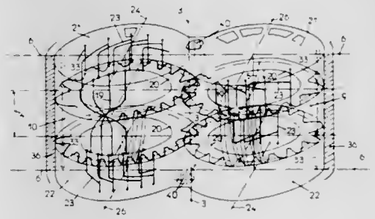
HIGH PRESSURE HYDRAULIC GENERATOR RECEIVER FOR POWER TRANSMISSION

Jean Malfit, Le Napoleon - 2 Avenue de Chapotte, Tournon, Ardeche, France

Filed Nov. 27, 1985, Ser. No. 803,102

Int. Cl.⁴ F03C *2/08;* **F04C** *2/18, 5/00, 15/00*

U.S. Cl. 418—72 **15 Claims**



1. A reversible generator-receiver for selectively generating torque from fluid pressure and receiving torque for generating fluid pressure, said generator-receiver comprising an assembly of:

(a) a plurality of free-floating interengaging helicoidal gear means, said gear means having teeth and two sides and being mounted without mechanical bearing means;

(b) a flexible casing having a generally 8-shaped cross section and surrounding said gear means;

(c) a plurality of side plates in abutment against the sides of said gear means;

(d) a rigid shell enclosing (a), (b) and (c);

(e) means for pressurizing the periphery of said flexible casing so as to force the latter against crests of said teeth so as to render spaces between said teeth fluid-tight; and

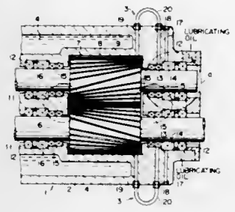
(f) means for applying equilibrated pressure to said support members so as to obtain fluid-tightness on both sides of said gear means.

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SCREW VACUUM PUMP WITH LUBRICATED BEARINGS AND A PLURALITY OF SHAFT SEALING MEANS

Ituro Nomura, Takarazuka; Kunihiko Nishitani, Akashi, and Noboru Tsuboi, Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 24, 1987, Ser. No. 77,219
Int. Cl.⁴ F04C *18/16, 27/00, 29/02;* **F16J** *15/16*
U.S. Cl. 418—104 **2 Claims**



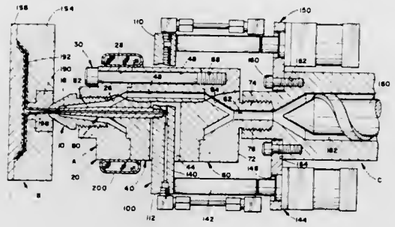
1. A screw vacuum pump comprising:
a casing having a rotor chamber opened at a first axial end thereof to a suction opening and opened at a second end thereof to a discharge opening;
a pair of male and female screw rotors rotatably received in said rotor chamber, each of said screw rotors having a pair of rotor shafts supported by forcibly lubricated bearings on both sides of said suction opening and said discharge opening;
at least one first sealing means provided between said bearing on at least said suction opening side and said rotor chamber and communicated with a space under a pressure less than atmospheric pressure, which space is out of communication with said suction opening such that a pressure differential between the suction opening and said first sealing means is reduced to thereby prevent air leakage from the first sealing means to said suction opening and for preventing lubricating oil from flowing into said suction opening; and
at least one second sealing means provided between said bearing on at least said suction opening side and said rotor chamber and communicated with atmosphere, said first and second sealing means being arranged in this order from said rotor chamber side.

4,781,554
APPARATUS FOR THE INJECTION MOLDING OF THERMOPLASTICS

James W. Hendry, Spring Hill, Fla., assignor to Michael Ladney, Sterling Heights, Mich.

Filed Jul. 9, 1987, Ser. No. 71,363
Int. Cl.⁴ B29C *45/16*
U.S. Cl. 425—4 R **20 Claims**

1. A nozzle used in an apparatus for the injection molding of thermoplastics, comprising:
a nozzle body including a first bore means for establishing a flow path for a molten thermoplastic, a first end of said nozzle body being adapted for fluid connection with an associated mold body, and a second end thereof being adapted for fluid connection with an end of an associated injection molding machine;
first valve means for controlling the flow of plastic through said nozzle body, said first valve means including a valve body adapted for reciprocating movement, said nozzle body including a second bore means for housing said valve body, said valve body including a tip portion and a fluid passage formed in said valve body and open at one end through said tip portion;
connection means adapted for communicating said valve body fluid passage with an associated source of pressurized fluid;
actuator means including an actuator bar having a fluid passage extending therethrough for selectively actuating said valve body to a closed position thereby preventing the flow of plastic through said nozzle body; and

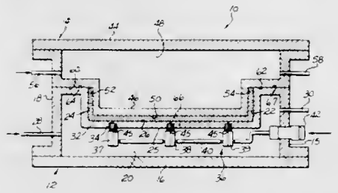


second valve means including a first means for preventing the flow of plastic through said actuator bar fluid passage and, a second means for permitting the flow of pressurized fluid in both directions through said valve body fluid passage.

4,781,555
APPARATUS FOR FORMING MOLDED PATTERNS

Charles A. Cook, White Pigeon, Mich., assignor to EFP Corp., Elkhart, Ind.

Filed Jan. 7, 1987, Ser. No. 991
Int. Cl.⁴ B29C *33/40, 35/04*
U.S. Cl. 425—4 R **8 Claims**

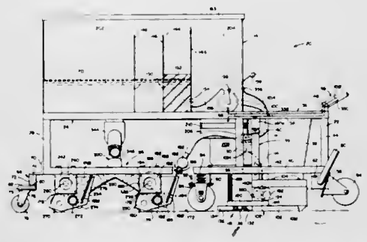


1. Apparatus for forming a molded pattern from expandable materials, said apparatus comprising:
a mold which has mold walls defining a cavity accurately defining the shape of said pattern and a plurality of heated fluid mold inlets therein communicating with said cavity;
an enclosed frame means positioned about said mold for storing a quantity of a heated fluid;
means for introducing said fluid into said enclosed frame means and thereby heat said mold walls;
valve means positioned completely within said enclosed frame means, said valve means having a valve means inlet within said enclosed frame means, and said valve means coupled with said heated fluid mold inlet for regulating the amount of said heated fluid delivered to said mold cavity from said enclosed frame means, and a single means extending through said enclosed frame means for selectively opening said valve means to deliver said heated fluid to said mold cavity.

4,781,556
GROUTING MACHINE

Jesse D. Paul, 501 Vassar St., SE., Albuquerque, N. Mex. 87106

Continuation-in-part of Ser. No. 751,966, Jul. 5, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 23,770
Int. Cl.⁴ B29C *39/00;* **E01C** *23/02*
U.S. Cl. 425—62 **70 Claims**

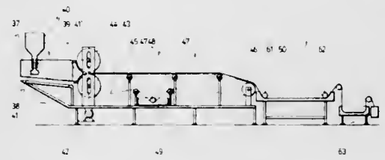


1. A grouting machine for applying grout to positioned floor tiles comprising:
a. support means,
b. grout dispensing means operatively connected to said support means and adapted for depositing grout into spaces between the tiles and on the tile upper surfaces,
c. slurry formation means operatively connected to said support means contiguously with respect to said dispensing means, said slurry formation means including a diluent addition means adapted for supplying a grout diluent to the grout remaining on the tile upper surfaces to form a slurry therewith,
d. slurry pick-up means operatively connected to said support means contiguously with respect to said formation means and adapted for removing slurry from the tile upper surfaces.

4,781,557
APPARATUS FOR MANUFACTURING RECONSTITUTED PEPPER AND OTHER FOODSTUFFS IN THE SHAPE OF A STRIP

Joaquin Gutierez Rubio; Manuel Varela Fuentes, and Engracia Gonzales Centeno, all of Seville, Spain, assignors to Sociedad Anonima de Racionalizacion (Sadrym), Dos Hermanas Sevilla, Spain

Division of Ser. No. 831,252, Feb. 19, 1986, abandoned. This application Jun. 23, 1987, Ser. No. 65,396
Int. Cl.⁴ A23P *1/10*
U.S. Cl. 425—71 **6 Claims**



1. An apparatus for manufacturing a foodstuff selected from the group consisting of reconstituted pepper, tomato, onion, orange, anchovies and the like in the shape of a strip comprising a feed hopper containing the foodstuff in the form of a dough, an upright vacuum tank mounted in said feed hopper and having a pouring tube positioned at the bottom of said vacuum tank and communicating therewith, a flow restricting means positioned at the exit to said pouring tube to maintain a substantially constant level of dough in said feed hopper by metering the flow rate of dough exiting said pouring tube, said feed hopper coupled to a laminating head by a plurality of rubber bands, said laminating head having an associated conveyor belt to move said strip of dough through a first tray comprising a gelification bath consisting of a calcium chloride solution and finally through a second tray comprising a bath of water for washing the gelified strip of dough.

4,781,558
APPARATUS FOR MAKING AN EMBOSSED GYPSUM PANEL

William E. Betzner, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Sep. 26, 1986, Ser. No. 911,932
Int. Cl.⁴ B28B *3/12, 11/14;* **B29C** *43/44, 47/00*
U.S. Cl. 425—115 **4 Claims**

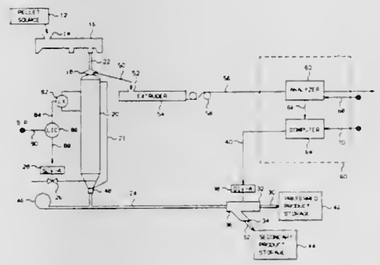


1. An apparatus for making an embossed gypsum panel having a predetermined pattern comprising: a mixer for making a settable gypsum slurry, a conveyor located below said mixer for receiving said gypsum slurry, a leveling means located downstream from said mixer to form a smooth surface on said gypsum slurry, means for determining the degree to which said gypsum slurry has set along said conveyor and thereby determining an optional location for embossing, an embossing means having an embossing surface for embossing a pattern into said smooth surface of said gypsum slurry, said embossing means being mounted on moveable support means for movement of said embossing means toward and away from said mixer, and means for moving said embossing means to said optimum location for embossing.

4,781,559
PLASTIC PELLET SORTING APPARATUS WITH EXTRUDED SIDE-STREAM MONITORING

Ronald D. Mathis; Gregory M. Swisher, both of Bartlesville, Okla., and Alejandro V. Santin, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 848,181, Apr. 4, 1986, Pat. No. 4,756,855. This application Dec. 24, 1987, Ser. No. 138,252
Int. Cl.⁴ B29B *7/72;* **B29C** *47/92*
U.S. Cl. 425—135 **6 Claims**



1. Apparatus comprising:
(a) a hold up tank having an inlet and an outlet;
(b) means for supplying a main stream of plastic pellets through a classifying screen to said inlet of said holdup tank wherein said classifying screen minimizes the number

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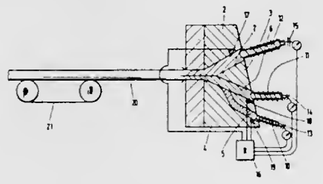
of agglomerated pellets that pass with the individual pellets to said holdup tank;
(c) a diverter valve having an inlet and first and second outlets;
(d) means for supplying said main stream of plastic pellets from said outlet of said holdup tank to said inlet of said diverter valve;
(e) an extruder for converting plastic pellets to plastic film;
(f) means for withdrawing a side stream of plastic pellets from said main stream at a sampling point at said inlet of said holdup tank and for providing said side stream to said extruder;
(g) analyzer means for analyzing for at least one type of flaw in a moving plastic film;
(h) means for passing a plastic film from said extruder to said analyzer means, wherein said analyzer means generates a measurement signal representative of the number of said at least one type of law;
(i) computer means operatively connected to said analyzer means for receiving said measurement signal and for automatically calculating a control signal in response to said measurement signal, wherein said control signal has a first magnitude when said measurement signal is greater than a predefined number of said at least one type of flaw, and has a second magnitude when said measurement signal is less than said predefined number;
(j) means for manipulating said diverter valve in response to said control signal to thereby establish plastic pellet flow from said inlet of said diverter valve to said first outlet of said diverter valve when said control signal has said first magnitude, and to establish plastic pellet flow from said inlet of said diverter valve to said second outlet of said diverter valve when said control signal has said second magnitude;
(k) level detector means for establishing a first signal representative of the level of pellets in said holdup tank;
(l) means for establishing a second signal representative of a desired level of pellets in said hold up tank such that said second signal is a function of the feed rate to the hold up tank and the time involved in calculating said control signal in paragraph (i);
(m) a control valve operably located in said outlet of said hold up tank;
(n) a level controller means for comparing said first signal and said second signal and for establishing a third signal responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the position of said control valve required to maintain the actual level of the pellets in said hold up tank substantially equal to the desired level represented by said second signal; and
(o) means for manipulating said control valve in response to said third signal so that the plastic pellets from which a side stream is withdrawn in (f) are delivered from said hold up tank to said diverter valve at substantially the same time that said diverter valve is being manipulated in response to the manipulating means in paragraph (j).

4,781,560
APPARATUS FOR REDUCING WASTAGE IN A MULTIPLE-HEAD EXTRUSION DEVICE

Adolf Herbert, Hannover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover, Fed. Rep. of Germany

Division of Ser. No. 906,289, Sep. 11, 1986, Pat. No. 4,693,855. This application Apr. 17, 1987, Ser. No. 39,169
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534770
Int. Cl.⁴ B29C *47/92*
U.S. Cl. 425—133.5 **1 Claim**

1. An apparatus for reducing the wastage of extruder material during the start-up phase of an extrusion device used to produce an extruded profile comprised of a plurality of separately extruded mixtures, comprising:
(a) a plurality of extruders, each of which has inlet and outlet ends and extrudes through said outlet end a different one of said mixtures,
(b) a separate drive means for driving each of said extruders,
(c) a separate pressure sensor means positioned relatively adjacent to the outlet end of each of said extruders for measuring the pressure of said mixture emerging from said extruder,
(d) a multiple extrusion head formed with separate flow channels aligned with the outlet ends of said extruders so as to receive extruded mixture from each of said extruders, said multiple extrusion head having an extrusion port through which said profile comprised of said mixtures is extruded, and

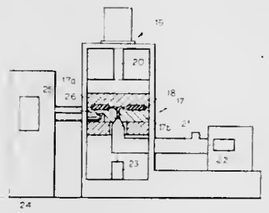


(e) a control means operatively connected to each of said pressure sensor means and to said drive means, and including a comparator means for comparing pressures measured by said sensor means with predetermined desired pressures, said control means functioning to independently deactivate each separate drive means when the pressure in the associated extruder has reached said predetermined desired pressure, while permitting other of said extruders to continue to operate, and subsequently simultaneously operate all of said drive means when the predetermined desired pressures have been reached in all of said extruders, as sensed by said pressure sensor means.

4,781,561
APPARATUS FOR CONTROLLING THE CROSS-LINKING OF ELASTOMERS IN A MOULD

Fausto Casa, Bresso; Raniero Mendichi, and Angelo C. Bassi, both of Milan, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Feb. 24, 1987, Ser. No. 17,898
Int. Cl.⁴ B29C *45/77*
U.S. Cl. 425—135 **10 Claims**

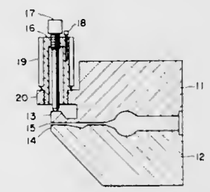


8. An apparatus for monitoring the cross-linking of a cross-linkable elastomer material, comprising:
a pair of mold parts together defining a fixed-volume mold cavity adapted to receive said material;
clamping means for relatively displacing said mold parts between a position in which said cavity is open to allow removal of a molded article and a position in which said cavity is closed to receive said material, said clamping means being constructed and arranged to maintain the volume of said cavity constant in the closed position of said mold parts when said cavity contains said material;
means for controlling the temperature of said mold parts to maintain the temperature of said material in said cavity in said closed position substantially constant and at a level permitting cross linking of said material;
at least one pressure sensor mounted in at least one of said mold parts and having a sensitive surface in contact with said material in said cavity in said closed position for sensing the pressure of said material during the cross-linking thereof; and
means for recording and processing information as to cross-linking provided by said sensor for monitoring said pressure during said cross-linking.

4,781,562
HEAT DISPLACING TYPE DIES

Takayoshi Sano; Hidemi Wada; Satoru Nitta; Katsuhiko Iguchi; Kenji Nozawa, and Hiroshi Serizawa, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 83,812
Claims priority, application Japan, Aug. 12, 1986, 61-189378; Aug. 12, 1986, 61-123513
Int. Cl.⁴ B29C *47/16, 47/92*
U.S. Cl. 425—141 **7 Claims**



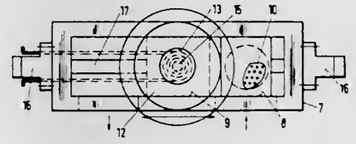
1. In a heat displacing type die adapted to extrude a sheet of a molten resin wherein a plurality of heat displacing units juxtaposed in the transverse direction of said sheet are heat controlled so as to transmit thermal expansion or contraction of said units to flexible lips defining lip gaps through bolt means thereby adjusting said lip gaps, the improvement comprising:
means for securing one end of each heat displacing unit to a die block;
means for flexing each flexible lip in response to thermal expansion or contraction of each heat displacing unit; and
means for securely connecting one end of said bolt means to the other end of said heat displacing unit so that said bolt means is moved in response to said thermal expansion or contraction of said heat displacing unit,
said heat displacing units having thermal expansion coefficients either equal to or greater than the thermal expansion coefficients of said bolt means,
whereby said lip gaps are widened or narrowed when said heat displacing units respectively expand or contract.

4,781,563
FILTER CHANGING MECHANISM INCLUDING MEANS FOR DISCHARGING RESIDUES OF RUBBER OR THERMOPLASTICS MATERIAL FROM EXTRUSION PRESSES

Gerd Capelle, Langenhagen, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,475
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3623935
Int. Cl.⁴ B29C *47/68*
U.S. Cl. 425—185 **2 Claims**

1. A filter changing apparatus for use in an extrusion press having a discharge station and a flow channel through which the extruded material passes in a flow direction to said discharge station, comprising:
(a) a frame,
(b) a pair of filter support members disposed in said frame, with at least one of said support members being detachably mounted in said frame,
(c) filter means adapted to be disposed in each support member in a position generally perpendicular to the direction of material flow,
(d) first hydraulic means for displacing said filter support members in a direction which is substantially at right angles to the direction of material flow, and

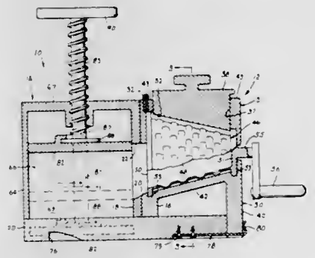


(e) means for discharging residual material in said flow channel to said discharge station, including a separate support member detachably mounted in said frame and replacing said at least one support member, a telescopic hydraulic cylinder mounted in said separate support member and adapted to telescopically move in a direction parallel to the flow direction of said material, and a discharge plate mounted on said telescopic hydraulic cylinder, actuation of said hydraulic cylinder functioning to move said discharge plate and displace residual material in said flow channel to said discharge station for removal therethrough.

4,781,564
APPARATUS FOR REFORMING SOAP BARS

Carmen J. Cerrone, 1811 W. Palm Dr., Mt. Prospect, Ill. 60056

Filed Jun. 11, 1987, Ser. No. 60,486
Int. Cl.⁴ B28B *3/00, 11/14*
U.S. Cl. 425—289 **9 Claims**



5. Apparatus for allowing a consumer to form a single bar of soap from smaller soap bars and scrap end pieces, comprising the combination of
a grinding component and a press component operatively associated to form a single unit sufficiently small to be portable and hand-held by the consumer;
the grinding component having means associated therewith, including having an inlet, operable to receive and hold said smaller soap bars and scrap end pieces;
the grinding component further having means to grind said smaller soap bars and scrap end pieces into fine shavings, and to have such shavings freely blended together at an outlet from the grinding component;
the press component having a tubular cavity with an open bottom end, and lower shaping form means moveable

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between a closed position disposed across and closing the open cavity end and an opened position laterally offset from and exposing the open cavity end;

an upper shaping form sized to fit closely within the tubular cavity, and means for moving the upper shaping form between a raised position spaced above the open cavity end, and a lowered position near the open cavity end;

means including an opening into the tubular cavity, at a location between the raised and lowered positions of the upper shaping form, and said opening being in direct communication with the outlet from the grinding component;

said fine shavings at the outlet of the grinding component thereby being operable to pass via said opening into the press component tubular cavity, at a location between the upper and lower shaping forms;

said upper shaping form being adapted to be moved then from said raised position toward the lowered position and against such fine soap shavings, to reform such soap shavings into said single bar between the upper and lower shaping forms; and

the formed bar being adapted to be removed from the open end of the tubular cavity, upon the lower shaping form means being moved to the opened position and the upper shaping form being moved against such formed bar.

4,781,565

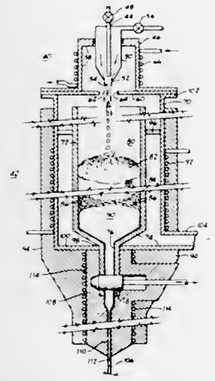
APPARATUS FOR OBTAINING SILICON FROM FLUOSILICIC ACID

Angel Sanjurjo, San Jose, Calif., assignor to SRI International, Menlo Park, Calif.

Division of Ser. No. 569,439, Jan. 9, 1984, Pat. No. 4,597,948. This application Mar. 3, 1986, Ser. No. 835,398

Int. Cl.⁴ B29C *39/14, 47/00*

U.S. Cl. 425—378.1 **7 Claims**



1. A casting member for casting molten silicon flowing therethrough comprising: said casting member defining a central aperture which necks down in one dimension to form an elongated rectangular discharge passage therethrough and a cushioning salt coating layer **112** disposed between said molten silicon and said casting member whereby the silicon flowing through said passage is in sheet form, and means to establish a temperature gradient of from above about 1412° C. to above about 993° C. along said casting member whereby said silicon temperature is reduced so as to solidify said silicon as it expands upon solidification and passes through said casting member in sheet form, and means for supplying said central aperture of said casting member with molten silicon and molten salt a reaction container, said reaction container having a bottom non-porous solid drain pipe in communication with said central aperture, said drain pipe having a movable closure plug for controlling the flow of molten silicon and molten salt from the reaction container drain pipe into said central aperture of said casting member.

4,781,566

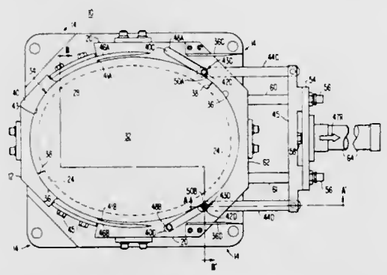
APPARATUS AND RELATED METHOD FOR ALIGNING IRREGULAR BLANKS RELATIVE TO A DIE HALF

Alfred F. Rossi, Weston, Conn.; Albert D. Johns, Roselle Park, N.J., and Ronald P. Marx, Appleton, Wis., assignors to James River Corporation, Richmond, Va.

Filed Nov. 9, 1987, Ser. No. 117,826

Int. Cl.⁴ B29C *51/00*

U.S. Cl. 425—400 **14 Claims**



1. A device for aligning an irregular blank relative to a die half, said device comprising:

a base for supporting a die half;

a drawpad mounted on said base for supporting an irregular blank in position relative to the female die half, said drawpad having an opening with a major axis and a minor axis for supporting said blank having a configuration corresponding to the opening and dimensioned to overlap the periphery of said opening, said blank having an outer edge defining a predetermined uniform annular width surrounding the opening at times when said blank is in an aligned positioned relative to the die half, said drawpad opening being defined by forward and rearward end portions on opposite sides of the minor axis thereof, said end portions each having a corresponding pair of quadrants defined by the intersection of the major and minor axes of the drawpad opening;

initial alignment means mounted on the drawpad adjacent the periphery of said opening for positioning the blank in said supported position;

a pair of guide means with the guide means disposed on opposite sides of the major diameter of the opening adjacent each of the rearward quadrants, each of said guide means including a portion movable along a path extending inwardly toward the other guide means at an acute angle to the respective radii of the major and minor axes defining said rearward quadrants, from a first position outside of the outer edge of said overlap, to a second position corresponding to the outer edge of said overlap for contacting a portion of the perimeter of said blank and moving a supported blank into said aligned position relative to said die half; and

means for moving said guide means between said first and second positions along said path.

4,781,567

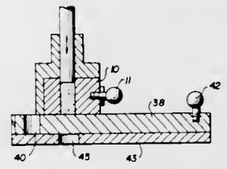
COMPACTION EVALUATION APPARATUS

Henry A. Miller, Jr., Lake Hopatcong, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 28, 1987, Ser. No. 113,301

Int. Cl.⁴ B28B *1/04*

U.S. Cl. 425—406 **4 Claims**



1. Compaction evaluation apparatus for determining desirable powder and compaction force parameters to produce a required plug for encapsulation, comprising,

a tamping pin,

a hollow body for accepting powder for forming a plug,

pneumatic cylinder means connected to said tamping pin for causing a downward motion thereof into said hollow body for compressing said powder into a plug,

means for supplying fluid under pressure to said pneumatic cylinder means for causing said downward motion,

pressure regulator means for controlling the pressure of the fluid which is supplied to said pneumatic cylinder means,

means for measuring the height of said powder plug,

automatic cycling means for causing said pneumatic cylinder means to move said tamping pin upwardly away from said powder plug after tamping thereof,

means for controlling the dwell of said tamping pin on said powder plug, which means comprises adjustable inlet and outlet valve means for said pneumatic cylinder,

said hollow body for accepting said powder comprising a die having a cylindrical cavity therein, and

an anvil disposed beneath said die, said anvil having an opening therein, and being movable between an operating position wherein said opening is not coaxial with the cylindrical cavity of said die and a plug removal position wherein said opening is coaxial with said cylindrical cavity of said die.

4,781,568

MOLD CLAMPING UNIT OF INJECTION MOLDING MACHINE

Yoshiharu Inaba, Kawasaki, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

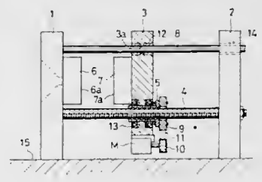
PCT No. PCT/JP86/00084, § 371 Date Oct. 21, 1986, § 102(e) Date Oct. 21, 1986, PCT Pub. No. WO86/04857, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 21, 1986, Ser. No. 933,638

Claims priority, application Japan, Feb. 22, 1985, 60-32846

Int. Cl.⁴ B29C *45/06;* **B22D** *17/26*

U.S. Cl. 425—451 **8 Claims**



1. A mold clamping unit of an injection molding machine comprising:

a fixed rigid front platen;

a fixed rigid rear platen;

a plurality of guide rods mounted between said front and rear platens;

a plurality of ball screws mounted between said front and rear platens so as to uniformly distribute a received stress as a clamping force;

a movable platen mounted on said guide rods and said ball screws;

first and second molds mounted on facing surfaces of said front platen and said movable platen, respectively, said ball screws and said guide rods being mounted between said front and rear platens at equal distances from centers of said molds at predetermined angular intervals;

a plurality of ball nuts, one corresponding to each of said ball screws, pivotally mounted on said movable platen and threadedly engaged with said ball screws;

a servo motor mounted on said movable platen at a location away from said molds so as to provide the received stress; and

coupling means for operatively connecting said servomotor to said ball nuts so that said servo motor moves said movable platen axially with respect to said ball screws, through said ball nuts, for opening and closing said molds, said coupling means being spaced apart from said movable platen.

4,781,569

APPARATUS FOR MANUFACTURING EMBOSSED ARTICLES OF SYNTHETIC RESIN

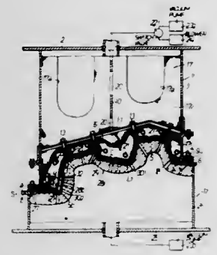
Toshiyuki Kinugasa; Tamio Furuya, both of Hidaka; Yoshiki Ishige, Tokorozawa; Nobuo Kikuchi, Sakado, and Shoji Takahashi, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 787,773, Oct. 15, 1985. This application Oct. 16, 1986, Ser. No. 920,077

Claims priority, application Japan, Oct. 18, 1984, 59-219174; May 27, 1985, 60-11383

Int. Cl.⁴ B29C *51/10*

U.S. Cl. 425—504 **11 Claims**



1. An apparatus for manufacturing an embossed article of synthetic resin from a synthetic resin sheet, the embossed article having an end wall, side walls connected to the end wall, an undercut portion connected to one of said side walls, and an embossed pattern on at least one said end and side walls, said apparatus comprising:

an embossing die including a molding or shaping portion having an embossing pattern and a multitude of fine vacuum pores distributed uniformly over the entire extent of said embossing pattern to shape or mold the end wall and side walls of the article while concurrently embossing said walls, said die further including a blowing-pressure supply portion having blow holes in a region corresponding to the undercut portion of the article; and

a press die including a clamping portion for clamping the synthetic resin sheet in cooperation with said molding or shaping portion and an undercut shaping portion con-

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nected to said clamping portion for coming into opposition to said blowing-pressure supply portion when the embossing die and press die clamp the sheet, said undercut shaping portion having a plurality of vacuum holes therein.

4,781,570

APPARATUS FOR THE MANUFACTURE OF PLASTIC PARTS BY INJECTION MOLDING OR REACTION INJECTION MOLDING

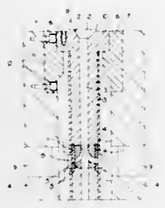
Hans-Heinrich Kaaden, Friedrich-Herschel-Strasse 5, 8000 Munich 80, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 865,197, Apr. 1, 1986. This application Sep. 19, 1986, Ser. No. 909,836

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1985, 3534254

Int. Cl.⁴ A23P *1/00*

U.S. Cl. 425—547 **26 Claims**



1. In an apparatus for the manufacture of plastic parts from thermoplastic, thermoset and/or elastomer material by injection molding or reaction injection molding, said apparatus having a multi-station locking unit of horizontal or vertical configuration adapted to hold a number of molds, an injection unit associated therewith for the simultaneous injection of the molds, two outer mold clamping plates, one of which is mounted on guide elements and movable thereon in the locking direction, a center mold-receiving part movably mounted on guide elements between the two mold clamping plates and having a heatable melt conduction system with sprue nozzles and one half of a mold attached to each of its sides, the center mold-receiving part being adapted as a mold clamping plate sectioned lengthwise relative to the locking direction for receiving larger halves of a mold, the two parts of the plate being kept together by a high-speed clamping device and having a melt conduction system mounted between the parts, and separate driving cylinders attached to the center mold clamping plate, the improvement comprising:

said melt conduction system having at least one melt conduction rail, each said at least one melt conduction rail being rigidly clamped at its face side lengthwise relative to the direction of flow between the sectioned mold clamping plate.

4,781,571

INJECTION MOLDING MACHINE WITH APPARATUS FOR REMOVING INJECTION MOLDED ARTICLES

Friedrich Heindl, Baden, Austria, and Wolf D. Hellmann, Beilngries, Fed. Rep. of Germany, assignors to Battenfeld Kunststoffmaschinen Ges.m.b.H., Kottingbrunn, Austria

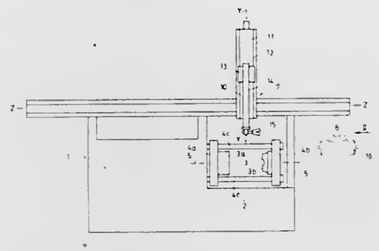
Filed Sep. 4, 1986, Ser. No. 903,675

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, 3532299

Int. Cl.⁴ B29C *45/42*

U.S. Cl. 425—556 **5 Claims**

1. Injection molding machine with an apparatus for the linear removal of injection molded articles from the opened injection mold, the injection molding machine having two injection mold halves and a frame or housing and a closing unit wherein a two-way support or carriage with a support member carried by the two-way support or carriage is movably mounted on a guide bed aligned above the closing unit for the injection mold, wherein the support member carries at its lower end a gripping member for the injection molded articles with gripping member is adjustable in an upward direction, wherein the gripping member in turn is adjustable relative to the support member about at least two joints extending at a right angle relative to each other, wherein the longitudinal axis of the guide bed for the two-way support or carriage is aligned parallel to the actuating device of the closing unit or to the longitudinal axis of the injection mold, characterized in that the two-way support (**10** to **13**) or carriage (**19**) supports or forms a carrier or cantilever (**13**) on whose free end is mounted the support member (**14**) so as to be vertically movable exclu-



sively along a vertical plane extending through the longitudinal axis (**5—5**) of the closing unit (**2**), that the guide bed (**8**) is rigidly fastened independently of the mold halves via support arms (**9**) directly to or on the frame or housing of the injection molding machine (**1**), and that the guide bed (**8**) projects at least with its one end over the front end face of the injection molding machine or over its closing unit (**2**) for the injection mold (**3**) wherein the movement of the two-way support or carriage on the guide bed, the movement of the support member relative to the two-way support or carriage and the adjustment of the gripping member about the at least two joints are independent of the opening and closing movement of the injection mold, so that the apparatus for the removal of injection molded articles is operated independently of the closing unit.

4,781,572

SELF-REGULATING GATE VALVE ASSEMBLY FOR INJECTION MOLDING APPARATUS

David E. Boring, New Oxford, Pa., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Oct. 9, 1987, Ser. No. 107,667

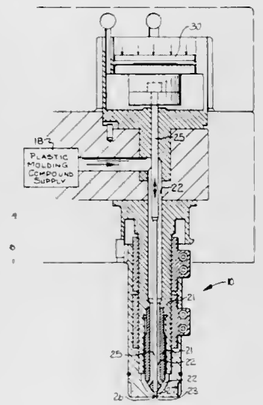
Int. Cl.⁴ B29C *45/20*

U.S. Cl. 425—564 **4 Claims**

1. A self-regulating gate valve assembly, adapted for use in a plastic product injection molding apparatus having a mold cavity and a mold core therein for molding a hollow product of predetermined design, said gate valve assembly having construction substantially eliminating mold core deflection during plastic molding compound flow in the injection molding apparatus and thus uneven wall thicknesses and weld lines in the molded plastic product, said gate valve assembly comprising:

a valve housing having passageways therein for receiving plastic molding compound under pressure from a source and including a generally cylindrical gate of restricted dimensions adapted to communicate with the mold cavity for injecting a jet of the plastic molding compound under a predetermined pressure into the mold cavity to impinge upon an end of the mold core and flow around the mold core therein to fill the cavity;

a generally cylindrical valve pin having a cross-sectional diameter approximately as great as the dimensions of said gate, an end and a reduced diameter section adjacent said end, said valve pin being movably positioned within said valve housing for movement of said end into seating position with said gate for closing said gate and shutting-off the flow of the plastic molding compound through said gate into the mold cavity and out of seating position with said gate toward the mold cavity with said reduced diameter section positioned within said gate for allowing the low of the plastic molding compound though said gate into the mold cavity, said reduced diameter section of said valve pin comprises a longitudinally-extending cut-out section around the circumference thereof having a reduced cross-sectional diameter at the center thereof and progressively increasing in cross-sectional diameter from the center thereof in both longitudinal directions to form a generally concave outside surface around said valve pin resulting in a uniform balanced flow around said valve pin by the plastic molding compound flowing therearound and into the mold cavity; and



means connected to said valve pin for being actuated to move said valve pin longitudinally toward the mold cavity to open said gate and hold said pin in the position of said gate under predetermined forces;

whereby, said reduced diameter section and said end of said valve pin cooperate when said valve pin is in the open position of said gate so that the plastic molding compound will flow through said gate and around said reduced diameter section and said end of said valve pin and into the mold cavity and around the mold core in a sheath-like flow configuration to produce balanced forces on the mold core to prevent deflection, and, wherein, the predetermined pressure of the plastic molding compound will produce forces on the end of said valve pin after filling the mold cavity greater than the predetermined forces holding said valve pin open to cause said valve pin to move longitudinally and close said gate in a self-regulating manner.

4,781,573

DEVICE FOR INJECTION MOULDING TUBULAR PREFORMS MADE OF A THERMOPLASTIC

Michel Depreter, Waterloo, Belgium, assignor to Solvay & Cie (Société Anonyme), Brussels, Belgium

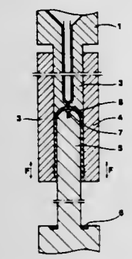
Filed Feb. 20, 1987, Ser. No. 17,210

Claims priority, application France, Feb. 24, 1986, 86.02619

Int. Cl.⁴ B29B *11/06*

U.S. Cl. 425—577 **5 Claims**

1. In a device for injection molding a tubular perform of a thermoplastic, the perform having a longitudinal axis, a small wall thickness and a great length parallel to the longitudinal axis, which device is composed or an injection-molding press equipped with an injection nozzle, and at least one injection mold, the injection mold including an external die and an internal core, the injection nozzle extending into the die, the internal core being insertable into the die in the direction of the longitudinal axis for causing the die and the core to define a cavity in which the preform is formed, the press including means to fill the cavity with injected thermoplastic from the nozzle, the die being composed of two die-halves which are movable relative to one another transverse to the longitudinal axis, the improvement wherein when said core is moveable into said die to define said cavity, said core and said die are



supported by supporting means to provide for progressive movement of said core and said die relative to one another parallel to the longitudinal axis to expand said cavity axially by said progressive movement during an injection by said nozzle of a preform from a staring position in which the length of the cavity is less than the length of the tubular preform to a final position in which the cavity corresponds in length, shape and volume to the tubular preform, during filling of the cavity with injected thermoplastic via said nozzle, with the ratio of the volume of the cavity in the starting position to the volume of the cavity in the final position being 1:1.5 to 1:100.

4,781,574

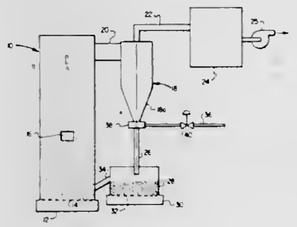
METHOD AND SYSTEM FOR CONTROLLING CYCLONE COLLECTION EFFICIENCY AND RECYCLE RATE IN FLUIDIZED BED REACTORS

Thomas E. Taylor, Bergenfield, N.J., assignor to Foster Wheeler Development Corporation, Livingston, N.J.

Filed May 8, 1987, Ser. No. 47,943

Int. Cl.⁴ F23D *19/00*

U.S. Cl. 431—7 **7 Claims**



5. A method of operating a fluidized been combustion system comprising the steps of establishing a bed of particulate material, including air to said bed of particulate material at a velocity sufficient to fluidize said particulate material, discharging a mixture of flue gases and entrained particulate material from said fluidized bed into one end portion of a cyclone separator, separating said entrained particulate material from the flue gases of said mixture, passing the separated

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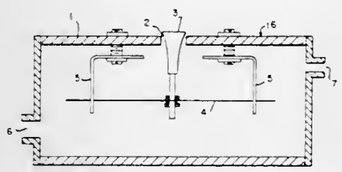
flue gases to a heat recovery unit for further treatment, passing said separated particulate material from an opposite end portion of said cyclone separator back into said fluidized bed, reducing the amount of separated particulate material passed back into said fluidized bed by introducing additional gas to said separator in a direction opposite the flow of separated particulate material from said separator to entrain a portion of said particulate material in said separator and pass it to said heat recovery unit, providing an induced draft to cause said flue gases and entrained particles to pass through said heat recovery unit.

4,781,575

TEMPERATURE COMPENSATOR FOR PRESSURE OPERATED FUEL REGULATOR

John L. Ferri; William C. Fulkerson; Ray L. Newman, and Jeffrey M. Gonzalez, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 1, 1983, Ser. No. 556,766
Int. Cl.⁴ F23N *5/04*
U.S. Cl. 431—90 **6 Claims**



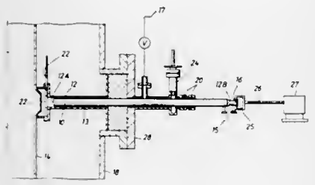
6. The combination of a pressure operated fuel regulator and a compensator for the pressure operated fuel regulator, the compensator comprising a housing having an opening for bleeding air therethrough, a tapered plug in the opening fastened to a thermostatic metal within the housing, there being clearance around the plug within the opening, said clearance being a free flow area, the free flow area increasing in area when the thermostatic metal is heated, the thermostatic metal comprising an elongated metal strip which is not attached to any support but the ends of which extend through slots of supports within the housing, the metal strip merely resting on the supports.

4,781,576

RETRACTABLE BURNER FOR COAL GASIFICATION PLANTS

Thomas S. Dewitz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 901,118, Aug. 28, 1986, abandoned. This application Dec. 4, 1987, Ser. No. 129,877
Int. Cl.⁴ F23C *5/06*
U.S. Cl. 431—186 **4 Claims**



1. An apparatus for retracting and inserting a burner shaft through a high pressure gasification vessel while in operation, said apparatus comprising:

a sleeve extending through a wall of said vessel in a fluid-tight manner and operative to guide a shaft into said vessel;

a retractable burner shaft extending through said sleeve in radially-spaced relationship therewith;

a prime mover associated with an end of said shaft which is outside said vessel wall, the prime mover being operative to move said shaft through said vessel wall;

sealing means operatively engaging said sleeve and the wall of said shaft at a first location to prevent materials from escaping from said vessel between said shaft and said sleeve;

a fluid adapted to be forced under pressure at a second location, in the wall of the sleeve nearer to the reactor than the sealing means, to occupy the space in said sleeve or between said sleeve and said shaft to prevent materials within said vessel from escaping through said sleeve upon retraction of said shaft;

movable blocking means located between said first and second locations to block said sleeve; whenever said shaft is retracted from said vessel and

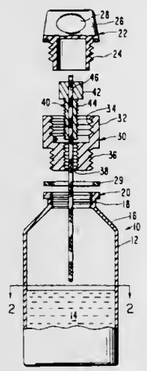
a shield operatively positioned to at least partially close said sleeve and located between said second location and a position occupied by the end of said shaft when fully inserted into said vessel.

4,781,577

FUEL BOTTLE WITH CANDLE-LIKE ATTACHMENT

Jeff Stewart, 13335 Wildcrest Dr., Los Altos, Calif. 94022

Filed Mar. 26, 1987, Ser. No. 30,182
Int. Cl.⁴ F23D *3/24*
U.S. Cl. 431—320 **16 Claims**



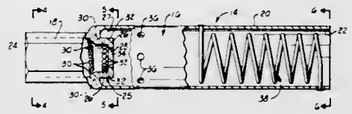
1. In a fuel bottle having a neck and a top threadably mounted on the neck: a candle-like attachment for the neck of the bottle, said attachment having a body provided with a lower part and a hollow upper part, the lower part having a central bore there through, the lower part of the body being threaded and coupled to the neck of the bottle, the upper part of the body being threaded to receive the lower end of the top to close the bottle when the attachment is coupled to the neck thereof, there being a threaded member extending through and coupled to the body, and a wick carried by the member, and said wick extend into the bottle and into the fuel carried thereby when the attachment is coupled to the neck of the bottle.

4,781,578

PILOT BURNER APPARATUS

Samuel O. Napier, Sapulpa, Okla., assignor to John Zink Company, Tulsa, Okla.

Continuation of Ser. No. 573,499, Jan. 24, 1984, abandoned. This application Jul. 18, 1985, Ser. No. 756,916
Int. Cl.⁴ F23D *14/12*
U.S. Cl. 431—347 **5 Claims**



1. A pilot burner comprising:

a hollow body member having a combustible gas inlet nozzle portion at one end connected to a sleeve portion which forms an outlet at the other end;

said nozzle portion of said body member including an internal wall which extends radially inwardly a short distance, then longitudinally towards the discharge end of said body member a short distance and then radially inwardly again whereby a cylindrical nozzle is formed interiorly of said sleeve portion having a central discharge orifice therein and forming an annular space between the interior of said sleeve portion and said cylindrical nozzle, said internal wall including first and second pluralities of spaced apart discharge apertures disposed therein positioned around said central discharge orifice, extending from the interior of said cylindrical nozzle to said annular space and having axes, respectively, which coverage and intersect the interior of said sleeve portion; and

a heat retaining member disposed within said sleeve portion of said body member adjacent the outlet end thereof whereby during the combustion of a combustible gas at said burner said heat retaining member is heated and upon short duration combustion disturbances, flame stability is maintained by said burner.

4,781,579

PROCESS FOR CHANGING THE COLOR OF PARTIAL AREAS OF THE SURFACE OF PIGMENTED HYDRAULICALLY BONDED CONSTRUCTION ELEMENTS

Walter Kneldinger, 4121 Altenfelden, Doppl 10, Austria

Continuation of Ser. No. 813,636, Dec. 24, 1985, abandoned. This application Jul. 7, 1987, Ser. No. 71,545
Claims priority, application Austria, Dec. 27, 1984, 4113/84
Int. Cl.⁴ F27D *5/00*
U.S. Cl. 432—10 **5 Claims**

1. A process for changing the color of partial surface areas as hydraulically bonded constructions elements comprising:

forming a concrete matrix including a pigment incorporated in said matrix;

hydraulically bonding said concrete matrix; and

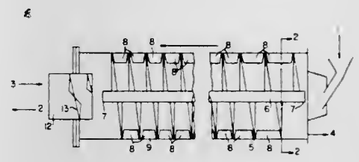
applying heat of at least 1000° C. to the surface of said bonded matrix to develop color in the surface areas of the matrix where the heat has been applied.

4,781,580

INDIRECTLY HEATED ROTARY TUBULAR KILN

Helmut Janz, Viersen; Fritz Rodi, Moers; Alfred Soppe, Issum, and Jakob Rademachers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 890,996, Jul. 25, 1986, abandoned, which is a division of Ser. No. 637,469, Aug. 3, 1984, Pat. No. 4,629,500. This application May 14, 1987, Ser. No. 51,191
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328709
Int. Cl.⁴ F27B *7/08*
U.S. Cl. 432—107 **4 Claims**



1. A rotary tubular kiln for carrying out gas-solids reactions, comprising

an indirectly heated outer reaction tube, said outer reaction tube being rotatable, said outer tube having an interior surface,

a charging hopper in communication with said outer reaction tube, and disposed at one end of said outer reaction tube,

a gas inlet in communication with said outer reaction tube, said gas inlet disposed at an end of said outer reaction tube which is opposite to the end wherein the charging hopper is disposed,

a gas outlet in communication with said outer reaction tube, said gas outlet disposed at the same end of the outer reaction as the charging hopper,

a product outlet in communication with said outer reaction tube, said product outlet disposed at the same end of the outer reaction tube as the gas inlet,

a central tube disposed within said outer reaction tube, said central tube running along almost the total length of the kiln, each end of the central tube covered with a sealing top,

said gas inlet and product outlet being disposed in a hollow chamber disposed at a distance from a sealed top end of the central tube that is opposite said hopper, said chamber containing a spiral baffle,

a spiral having a plurality of turnings, said spiral being tightly fixed between the central tube and the interior surface of the outer reaction tube, said spiral forming a plurality of channels between said turnings,

and a plurality of longitudinal lifing blades extending from the interior surface of the outer reaction tube and being between adjacent turnings, the height of the lifting blades being such that solids which fall from the lifting blades do not come into contact with the central tube, the lifting blades having an angle of respose with respect to the interior surface of the outer reaction tube.

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4,781,581

MELTING AND HOLDING FURNACE

Gerhard Bleickert, Sinsheim-Weiler, and Stefan Fruh, Neckarbischofsheim, both of Fed. Rep. of Germany, assignors to Bleiwenz GmbH, Sinsheim-Weiler, Fed. Rep. of Germany

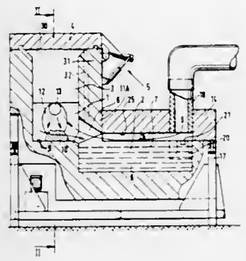
PCT No. PCT/EP86/00557, § 371 Date May 21, 1987, § 102(e) Date May 21, 1987, PCT Pub. No. WO87/02124, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 23, 1986, Ser. No. 59,992

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534484; European Pat. Off., Sep. 23, 1986, 86/00557

Int. Cl.[4] F27B *14/00*

U.S. Cl. 432—156 **4 Claims**



1. A melting and holding furnace, especially for non-ferrous metals, comprising a melting chamber and a holding chamber, which are separated from each other by a wall part and which are connected to each other by at least one passage and of which the holding chamber is situated lower than the melting chamber for receiving the molten metal discharging from the melting chamber after melting, said melting chamber being provided with an upwardly directed shaft and further including pressure-equalization channels provided in a wall of said melting chamber and/or its upwardly directed shaft facing said holding chamber, said pressure-equalization channels forming a connection between said melting chamber or shaft and said holding chamber and further comprising a burner pointed at the melting chamber from which burner the combustion gases formed during heating are guided through passages in the wall part to an outlet, wherein the inner surface of a cover of the holding chamber is situated at the level of the lower upper edge of at least one passage which is inclined between the melting chamber and the holding chamber and wherein the outlet is formed as a stack at the opposite end of the holding chamber in the holding chamber's cover, by which means the combustion gases are directed directly over the molten metal discharging from the melting chamber into the holding chamber through the at least one inclined passage into the holding chamber and from there along the surface of the molten metal bath to the outlet.

4,781,582

CONVERTIBLE BUCCAL TUBE ASSEMBLY

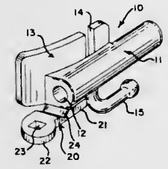
Peter C. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.

Filed Apr. 27, 1987, Ser. No. 43,038

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—17 **12 Claims**

1. A buccal tube assembly including a base, a tube having a round opening, and at least one torquing flap having a non-round opening and attached to said tube, said flap being mounted to normally extend substantially parallel to said tube and being bendable to align the non-round opening with the



round opening thereby converting the assembly to receive a torquing force from a non-round archwire.

4,781,583

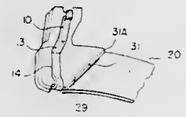
ADJUSTABLE PLASTIC FILM MATRIX

Harry J. Lazarus, 36 Knox La., Englishtown, N.J. 07726

Filed May 4, 1987, Ser. No. 46,527

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—39 **26 Claims**



1. A dental matrix band for engaging around a tooth, comprising: A plastic sheet member having a windable portion carrying a first end of said sheet member, a curved intermediate tooth engaging portion carrying a second end of said sheet member, said second end of said sheet member defining a receiving area, said tooth engaging portion being wrapped to form a matrix band with a part of said tooth engaging portion which is adjacent to said windable portion overlying said receiving area, said windable portion being wound to form a winding coil, and a lock loop engaged over said receiving area and said part of said tooth engaging portion, said lock loop permitting a sliding withdrawal of said tooth engaging portion with a winding of said winding coil by a dentist's matrix coil winding tool to tighten said band around a tooth by winding said coil against said lock loop which locks the matrix on the tooth, said lock loop having an outer leg engaged against an exterior of said part of said tooth engaging portion, said outer leg having an occlusal inwardly extending crimp bend area for bending an occlusal edge of said band inwardly, said lock loop having an inner leg engaged against an inner surface of said receiving area, said inner leg having a gingival tooth contacting point extending inwardly of said band and an occlusal crimp bend positioned adjacent to said crimp bend of said outer leg.

4,781,584

PROXIMAL RELEASE IMPRESSION TRAY

Vincent Chiaramonte, 75 Farmers Ave., Lindenhurst, N.Y. 11757, and Richard Bernstein, 4 Dogwood Hill, Brookville, N.Y. 11545

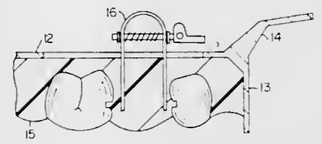
Filed Apr. 1, 1987, Ser. No. 32,530

Int. Cl.[4] A01C *9/00*

U.S. Cl. 433—48 **1 Claim**

1. Releasable dental impression tray comprising:
a dental tray having a top member having a slot, side member and a handle connected to said members, the tray being adapted to hold resilient dental impression material, and means mounted on the tray for compressing the impression material after it has set,

wherein the means for compression is a U shaped spring mounted on the top member and extending through the slot and in the slot into the resilient impression material, and



a screw means connected to move together the open ends of the U shaped spring member.

4,781,585

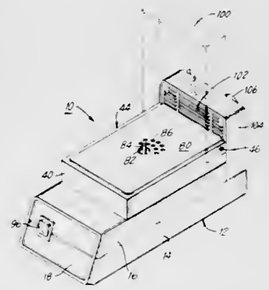
DENTAL ROUTER

Bernard Weissman, New York, N.Y., assignor to Ipco Corporation, White Plains, N.Y.

Filed Feb. 13, 1987, Ser. No. 14,719

Int. Cl.[4] A61C *3/06*

U.S. Cl. 433—51 **20 Claims**



1. A router for performing finishing operations on a dental model, comprising: a housing having a base portion, a motor with a rotating vertical drive shaft secured in said base portion, a storage compartment mounted onto said base portion, a pivotal cover member closing onto said compartment having a hole aligned with said drive shaft, the exterior top surface of said cover member forming a horizontal work platform on which the dental model can be supported during finishing operations, a chuck portion extending from the motor shaft and projecting into said storage compartment and in which an operating tool is secured for vertical projection above the work platform through said hole in said cover for rotation about a vertical axis, a plurality of apertures in said platform peripheral to said hole through which dust resulting from finishing operations can fall into the storage compartment, and a vacuum outlet from said storage compartment through which the dust can be extracted.

4,781,586

ARTICULATOR FOR SIMULATING MOVEMENTS OF THE MANDIBLE

Bernhard Lisec, Kupferzeile 25, A-4810 Gmunden, Austria

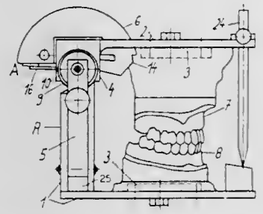
Filed Feb. 2, 1987, Ser. No. 9,466

Claims priority, application Austria, Feb. 10, 1986, 312/86

Int. Cl.[4] A61C *11/00*

U.S. Cl. 433—57 **11 Claims**

1. In a dental articulator for simulating movements of a mandible relative to an upper jaw, comprising an upper part (2, 4) adapted to carry an upper jaw model (7), a lower part (1) adapted to carry a lower jaw model (8), and a hinge (13, 13) connecting said upper and lower parts, the hinge defining an axis (A-B) extending substantially horizontally in a plane extending substantially perpendicularly to the upper and lower parts for articulating said upper part with respect to the lower part about the hinge axis: the improvement comprising
(a) two pins (18) displaceably mounted in a first laterally extending slot (22) in the upper part (4), the pins extending downwardly from the upper part and being adapted to be fixed in said first slot,
(b) a constraining bar (19) fixed to said lower part (1), the



constraining bar having a constraining edge in front of said plane and facing rearwardly towards said hinge axis, and the constraining edge being engageable with said pins (18) and spaced from the axis a distance corresponding to the radius of said pins, and
(c) two stops (2) displaceably mounted in a second laterally extending slot (21) in said lower part (1), the stops being adapted to be fixed in said second slot and extending upwardly from the lower part for engagement with said pins (18) to cooperate therewith for controlling horizontal components of a simulated chewing movement of said upper and lower articulator parts relative to each other.

4,781,587

DENTAL TREATMENT DEVICE

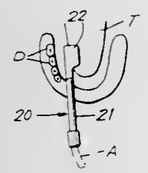
Takeo Kubo, 1091 Konakadai-cho, Chiba-shi, Chiba-ken, Japan

Filed Jun. 10, 1986, Ser. No. 872,727

Claims priority, application Japan, Jun. 17, 1985, 60-90185[U]; Jan. 25, 1986, 61-13023

Int. Cl.[4] A61C *17/04*

U.S. Cl. 433—93 **13 Claims**

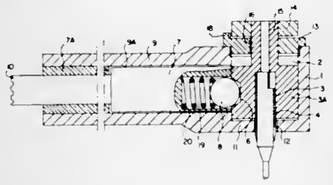


1. A dental treatment device adapted for protecting a tongue and removing liquid in a mouth, comprising:
an elongated member extending substantially linearly and having a hole extending throughout the entire length of the elongated member, a connecting portion formed at one end of the elongated member, said connecting portion communicating said hole and adapted to be connected to a vacuum source for inhaling fluid through the hole, and an end portion formed at the other end of the elongated member for communicating said hole, and
a protecting member connected to the end portion of the elongated member to incline diagonally relative to the elongated member, said protecting member including a

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body member having upper, lower, tongue side and tooth side portions, a space formed inside the body member for communicating the hole of the elongated member and at least one opening at a lower portion of the body member for communicating between said space and outside, and a first protecting plate in the rectangular form, said first protecting plate being connected to the body member to extend substantially laterally outwardly from the upper portion of the body member in the direction away from the tongue side portion of the body member so that when the body member is, in use, disposed between teeth and a tongue, a part of an upper portion of the tongue is covered by the first protecting plate to thereby protect and hold the tongue, liquid in the mouth being removed through the opening and space of the body member and the hole of the elongated member.

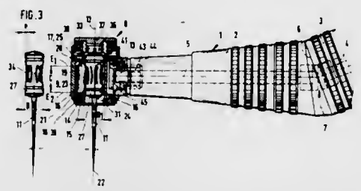
4,781,588
COUNTER-ANGLE HEAD FOR ENDODONTIC INSTRUMENT
Daniel Granier, quartier Petite Ile, 30150 Roquemaure, France
Filed Dec. 8, 1986, Ser. No. 939,405
Claims priority, application France, Dec. 18, 1985, 85 18904
Int. Cl.[4] A61C *1/07*
U.S. Cl. 433—123 **9 Claims**



1. In a counter-angle head for endodontic instruments, comprising a body having a bore, a cover covering said bore, a cylindrical slide slidably mounted in said bore, said slide having a clamp carrier adapted to clamp a tool therein, said slide further comprising at least one peripheral slot, said body having a cylindrical housing extending radially from said bore and communicating therewith, said cylindrical housing having rotatably mounted therein a shaft carrying a bearing mounted eccentrically relative to said shaft, said bearing adapted to enter into said at least one peripheral slot; the improvement comprising means for retracting said bearing to disengage said bearing from each said at least one peripheral slot.

4,781,589
CLAMPING ARRANGEMENT, ESPECIALLY FOR DENTAL INSTRUMENTS
Erich Bareth, Ummendorf, Fed. Rep. of Germany, assignor to Kaltenbach & Voight GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany
Filed Jun. 30, 1986, Ser. No. 879,916
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526684
Int. Cl.[4] A61C *1/14*
U.S. Cl. 433—127 **16 Claims**

1. Clamping arrangement, especially for the gripping engagement of dental implements, comprising a handpiece; a receiving sleeve for a dental implement rotatably supported in said handpiece; a rotary drive connected with said receiving sleeve for imparting rotation thereto, said receiving sleeve including a cylindrical adapter having an inclined annular track surface at an end thereof remote from the tip of said dental implement, said adapter being axial displaceable; an annular shoulder supported by said receiving sleeve adjacent the opposite end of said adapter proximate the tip of said dental implement, said shoulder having an inclined annular track surface facing said track surface on said adapter; and a plurality of circumferentially spaced clamping elements oriented transversely of the longitudinal of said clamping arrangement such as to, upon contacting said inclined tracks, exert a radially inwardly acting pressure on a shaft of said implement which is inserted into said receiving sleeve, the improvement in that each of said clamping elements comprises a cylindrical rod-



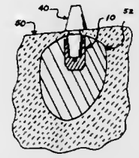
shaped member having rounded ends at the opposite ends thereof, said member extending in the direction of said clamping arrangement and having each rounded end contacting against respectively one of said inclined track surfaces; and spring means exerting an axial force on the adapter in a direction towards the tip of said dental implement for biasing said inclined track surface on said adapter in a direction towards the inclined track surface on said annular shoulder.

4,781,590
DENTAL INSTRUMENT
Naomi J. Weinstein, Long Beach, Calif., assignor to Anthony Horowitz, a part interest and Robert F. Senescu, both of Van Nuys, Calif., a part interest
Filed Oct. 3, 1986, Ser. No. 915,993
Int. Cl.[4] A61C *3/06*
U.S. Cl. 433—142 **3 Claims**



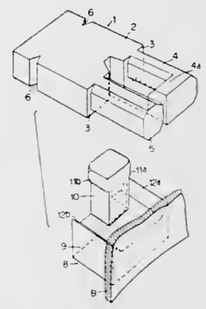
1. A dental instrument adapted to be used manually comprising:
- a handle adapted to be grasped for usage by the user, said handle being elongated defining an aft end and a fore end, said handle having a longitudinal center axis, said aft end being free;
- a head attached to said fore end, said head having an operating surface, said operating surface being substantially located within a single plane said operating surface being planar, and the overall configuration being triangular, said single plane being inclined to said longitudinal center axis; and
- a sheet material pad having a front surface and a rear surface, an abrasive layer attached to said front surface, an adhesive layer attached to said rear surface, said adhesive layer to connect with said operating surface to temporarily secure said pad onto said operating surface, said pad being removable and replaceable from said operating surface.

4,781,591
ENDOSTEAL IMPLANT AND METHOD FOR PERFORMING IMPLANTATION THEREOF
James P. Allen, 490 Thomas Cove, Rochester, N.Y. 14625
Filed Apr. 6, 1987, Ser. No. 34,661
Int. Cl.[4] A61C *8/00*; **A61F** *5/04, 2/28*
U.S. Cl. 433—174 **4 Claims**



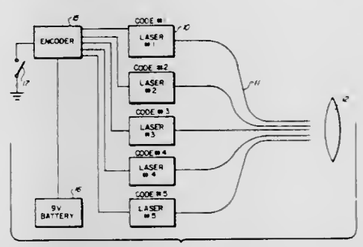
1. An endosteal implant capable of substantially reducing the time for securing said implant to the bone, said implant comprising:
- an implant housing adapted to be placed at an endosteal site and covered with soft tissue, said housing defining a bore extending from one end of said housing interiorly thereof;
- a removable electrical power source selectively insertable into said bore of said housing and retainable therein to establish an electrical current flow through soft tissue and bone completely surrounding said housing when implanted at a desired endosteal site, whereby such current flow promotes cellular adhesion activity thereby substantially reducing the time for securing said implant to the bone, and
- an abutment selectively insertable in said bore of said housing for affixing a desired prosthesis to said housing when said power source is removed therefrom.

4,781,592
DEVICE FOR SUPPORTING PARTIAL DENTURE
Satoshi Fukutsuji, 7-21, 1-Chome Higashi, Doutonbori, Minami-ku, Osaka, Japan
Filed Mar. 10, 1987, Ser. No. 24,155
Claims priority, application Japan, Mar. 18, 1986, 61-40336[U]; Jun. 27, 1986, 61-151227
Int. Cl.[4] A61C *13/225*
U.S. Cl. 433—181 **3 Claims**



1. A device for supporting a denture comprising:
- a fixture member for being fixedly mounted on a supporting tooth;
- supporting means attached to said fixture member for detachably supporting a movable member;
- a movable member for being fixedly mounted to a denture and for being detachably supported by said fixture member; and
- said movable member including a base portion and a movable portion, said base portion being fixedly attachable to the denture, said movable portion having means for detachably rigidly engaging said supporting means of said fixture member, said movable portion including temperature-responsive means for moving said means for detachably rigidly engaging for disengaging said detachably rigidly engaging means for said supporting means responsive to a temperature lower than the temperature of the mouth, and said temperature-responsive means moving said detachably rigidly engaging means for engaging said detachably rigidly engaging means with said supporting means responsive to a temperature higher than the temperature of the mouth.

4,781,593
LEAD ANGLE CORRECTION FOR WEAPON SIMULATOR APPARATUS AND METHOD
Warren A. Birge, Orlando, and Richard J. Wangler, Maitland, both of Fla., assignors to International Laser Systems, Inc., Orlando, Fla.
Filed Jun. 14, 1982, Ser. No. 387,933
Int. Cl.[4] F41F *27/00*
U.S. Cl. 434—22 **8 Claims**



1. A laser weapon simulator apparatus comprising in combination:
- laser means for firing a plurality of radiation beams along a weapon bore sight and on at least one side thereof;
- encoding means coupled to said laser means for assigning a code to each laser means beam;
- a movable target;
- a radiation detector means attached to said movable target for detecting said laser means radiation beam;
- decoding means coupled to said radiation detection means for decoding the detected laser beam; and
- comparing means for comparing the lead angle of said laser means radiation beam with the correct value of lead angle for the target velocity, whereby a determination is made of whether the laser weapon simulator was fired with the correct lead at the moving target.

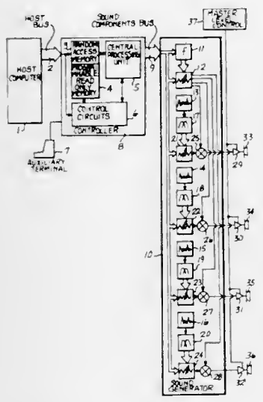
4,781,594
SOUND SIMULATION SYSTEM
Wilbur B. Metcalf, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Jan. 12, 1987, Ser. No. 2,821
Int. Cl.[4] G09B *9/00*
U.S. Cl. 434—48 **14 Claims**

1. A system for producing composite sounds, comprising:
- a plurality of electroacoustic devices;
- a plurality of frequency programmable tone generators;
- a plurality of programmable tone attenuators;
- at least one random noise spectrum generator means for generating noise bands with predetermined center frequencies spaced to cover an audio spectrum;
- a controller means for processing and distributing digital data to establish frequencies to be produced by said fre-

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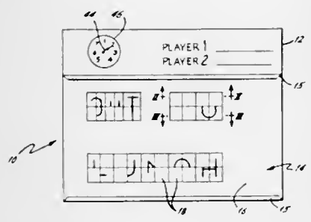
quency programmable tone generators and to establish levels of attenuation to be applied by said programmable tone attenuators and said programmable random noise attenuators;

a connecting means to interconnect said plurality of electro-



acoustic devices, said plurality of frequency programmable tone generators, said plurality of programmable tone attenuators, said at least one random noise spectrum generator means, said plurality of programmable random noise attenuators, and said plurality of amplifiers to produce multiple channel composite sounds.

4,781,595
VISUAL DESIGN AND CHARACTER FORMATION COMPOSITE
James A. Cox, 116 Rue du Bois, Cherry Hill, N.J. 08003
Filed Dec. 31, 1987, Ser. No. 140,034
Int. Cl.[4] G09B *11/00*
U.S. Cl. 434—81 **16 Claims**



1. A composite sheet for forming visually observable designs comprising:

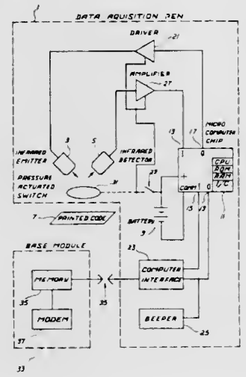
a transparent deformable upper layer having a plurality of pockets formed therein:

a transparent intermediate layer sealed to said upper layer along edges of said pockets to form a plurality of containers;

a lower layer connected to said intermediate layer, said lower layer having a plurality of fluid activatable invisible designs formed thereon; and

invisible design activation fluid contained within said containers to transform said invisible designs into visually observable designs upon breaking of said intermediate layer adjacent said containers by pressure exerted against said upper layer and subsequent contact of said fluid with said lower layer.

4,781,596
SURVEY TECHNIQUE FOR READERSHIP OF PUBLICATIONS
Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666
Filed Jun. 16, 1986, Ser. No. 874,483
Int. Cl.[4] G09B *5/00*
U.S. Cl. 434—236 **23 Claims**



1. An electronic apparatus for monitoring a selected magazine as to its readership by individuals acting as test subjects involving a survey issue having a first unique code affixed to its front cover and a second unique code affixed to its back cover, comprising:

sensing means manipulable by the test subjects for detecting said first and second codes;

first memory means for storing a reference code related to said first and second codes;

means for comparing the detected first and second codes with said reference code to generate a control signal when a correspondence is found therebetween, respectively;

second memory means for storing a data signal in response to generation of the control signal by said comparing means,

time determining means coupled to the comparing means to determine the time difference between a time when a control signal is generated, respectively, for the first and second unique codes; and

time threshold means for preventing the retention in the second memory means of said data signal when said determined time difference does not exceed a preset time threshold.

4,781,597
ARTIFICIAL BIRD BODIES FOR TAXIDERMY
David M. Cowley, 341 S. Franklin, Ponca City, Okla. 74601
Filed Jan. 11, 1988, Ser. No. 142,567
Int. Cl.[4] G09B *23/36;* **A41G** *9/00*
U.S. Cl. 434—296 **3 Claims**

1. The method of manufacturing an artificial bird body for covering with skin and feathers comprising:

(a) plucking all the feathers from a bird carcass;

(b) filling one-half (½) of a box with granular material;

(c) positioning one-half (½) of said bird in said granular material in a selected pose for mounting;

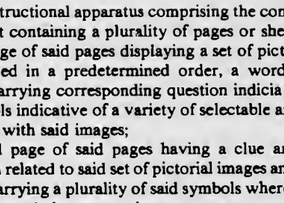
(d) filling a portion of the remaining one-half (½) of said box with molding materials to form a first half of a mold; said mold formed on a plane taken substantially horizontally through said plucked carcass;

(e) removing said granular material and filling a portion of said box which contained said granular material with said molding material to form a second half of said mold;

(f) removing said carcass from said first and second halves of said mold;

(g) filling the space occupied by said bird carcass with molding material to form a first cast carcass then removing said first cast carcass material, when solidified, from said first and second half molds;

(h) adjusting the shape of said first cast carcass to properly fit a skin with feathers;

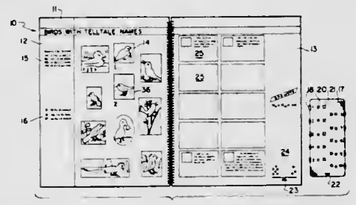


(i) forming a pair of slots to receive a pair of tibia bones and a third slot to receive a tail portion; and,

(j) forming a second casting using steps (b) through (g), using said first cast carcass, said first and second halves of said second casting parting along a vertical plane through said first cast carcass, including the insertion of support wire means,

whereby a bird body in any normal pose can be cast which includes all of the bones, muscles and connecting tissues in its proper location for the placement of skin and feathers thereover.

4,781,598
INSTRUCTIONAL APPARATUS
Burton Cutler, 19560 S. Rancho Way, Dominguez Hills, Calif. 90220
Filed Jun. 25, 1987, Ser. No. 66,316
Int. Cl.[4] G09B *3/00*
U.S. Cl. 434—327 **5 Claims**



1. An instructional apparatus comprising the combination of:

a booklet containing a plurality of pages or sheets;

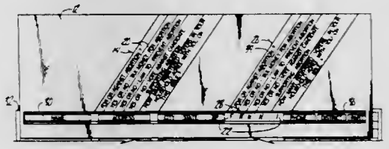
a first page of said pages displaying a set of pictorial images arranged in a predetermined order, a worded question area carrying corresponding question indicia and a set of symbols indicative of a variety of selectable answers associated with said images;

a second page of said pages having a clue area carrying indicia related to said set of pictorial images and an answer area carrying a plurality of said symbols wherein a first set of said symbols representing correct responses are located in a predetermined manner and the remaining of said plurality of symbols are randomly crowded aout said first set thereby obscuring said first set;

a decoding device having a plurality of open windows for displaying only said first set of said symbols carried on said answer area when said decoder is located in a predetermined location on said answer area; and

said decoder further having movable means carrying said set of symbols for seleceted display via openings adjacent to each of said open windows whereby symbols on said movable means can be comparied with symbols present at said windows.

4,781,599
METHOD OF COLLECTING AND RECORDING ANSWERS TO SURVEY QUESTIONS ON A CENSUS DIRECTORY
Brian J. Dowd, 3305 52nd Street, Des Moines, Iowa 50310
Filed Dec. 4, 1986, Ser. No. 937,891
Int. Cl.[4] G09B *3/00*
U.S. Cl. 434—364 **4 Claims**



1. Method of collecting and recording answers to survey questions on a census directory comprising the steps of,

positioning a block of questions in separate lines on an overlay frame having a window and aligning the block of questions along the length of the overlay next to the window frame with lines of questions extending at an angle to the the longitudinal axis of the window frame and the end of the block of questions being adjacent a substantially blank space between section entries of information on the census directory,

positioning the overlay frame on the census directory with the line of information about a particular person selected for the survey being centered in the window frame,

asking the person selected the questions in the block of questions, and

recording the answers to the questions in the blank space on the census directory of the line in the window frame.

4,781,600
JUNCTION BOX AND A PROCESS OF ASSEMBLING THE SAME
Masaaki Sugiyama; Mitsugu Watanabe; Hideharu Hayashi; Yukio Nishio, and Masaki Yamamoto, all of Kosai, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,639
Claims priority, application Japan, Jun. 25, 1986, 61-146845; Jun. 25, 1986, 61-146846; Jun. 25, 1986, 61-095938[U]; Jun. 25, 1986, 61-095939[U]
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—45 **10 Claims**

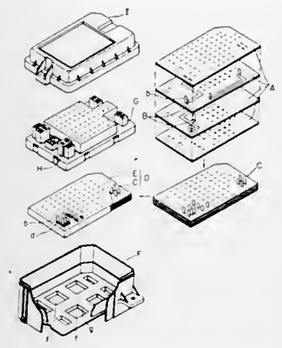
1. A junction box comprising:

a wiring board assembly including a multiple-layered wiring plate pile embedded in insulating resin and having insulating plates and conductor strips one over the other and electrical contacts outwardly projecting from the outer most insulating plates;

at least one insulating connector body having through holes for receiving the electrical contacts in said wiring board assembly, and joined to said assembly so as to receive the

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contacts projecting from the outer surface of said assembly in the through holes of the connector body; and



a box housing receiving an assemblage of said wiring board assembly and said connector body.

4,781,601

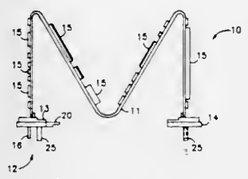
HEADER FOR AN ELECTRONIC CIRCUIT

Virgil F. Kuhl, Lauderhill; Jose A. Ruiz, Tamarac; Richard D. Lipinski, Coral Springs, and Guenter Noll, Ft. Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1987, Ser. No. 69,922

Int. Cl.⁴ H01R *9/07*

U.S. Cl. 439—77 **4 Claims**



1. A header and electronic circuit assembly comprising:

a flexible circuit carrying a plurality of electronic components and having opposed sides;

a plurality of leads affixed to each of the opposed sides of the flexible circuit,

a header means including first and second header portions, each being formed with mating means for interconnection of the header portions,

the first header portion receiving leads affixed to one of the sides of the flexible circuit and the second header portion receiving leads affixed to the other of the sides of the flexible circuit, and

the flexible circuit being foldable for permitting interlocking of the first and second header portions, and

the mating means including alignment means having complementary tongues and slots on the header portions, the tongue of one header portion being received in the slot of the other header portion for maintaining alignment of the header portions when interconnected, and

the mating means including latching having pairs of upper and lower clips on each header portion, the upper clips of each header portion selectively mating with lower clips of the other header portion for maintaining interconnection of the header portions.

4,781,602

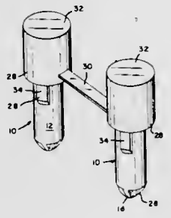
ELASTOMERIC SUPPLEMENT FOR CANTILEVER BEAMS

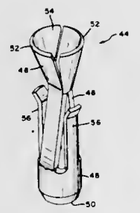
Robert F. Cobaugh, Elizabethtown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 843,344, Mar. 24, 1986, abandoned, which is a continuation of Ser. No. 237,334, Feb. 23, 1981, abandoned. This application May 27, 1987, Ser. No. 54,652

Int. Cl.⁴ H01R *13/52*

U.S. Cl. 439—82 **5 Claims**





1. Spring sockets for insertion into holes in a circuit board and for receiving thereinto conductive pins extending outwardly from electronic components, each of said sockets comprising conductive, elongated hollow body means having concave-convex shaped spring arms attached to one end and extending axially therefrom with free ends thereon forming, in cooperation with each other, an opening and further, with the convex surfaces of said spring arms defining contact areas for engaging conductive pins inserted into said opening, said sockets further including cap means of elastomeric material encapsulating one end of said body means.

4,781,603

GROUNDING SYSTEM FOR A CABINET

Rolf T. Olsson, Tullinge, and Hans O. W. Andersson, Sollentuna, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE86/00231, § 371 Date Jan. 30, 1987, § 102(e) Date Jan. 30, 1987, PCT Pub. No. WO86/07497, PCT Pub. Date Dec. 18, 1986

PCT Filed May 16, 1986, Ser. No. 30,863

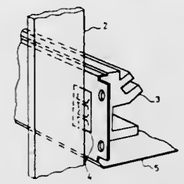
Claims priority, application Sweden, Jun. 14, 1985, 8502976

Int. Cl.⁴ H01R *13/648*

U.S. Cl. 439—95 **10 Claims**

1. A grounding system for cabinets containing electrical equipment comprising first and second bars of a yielding, soft metal for leading off ground currents, said bars being attachable to a cabinet adapted for containing electrical equipment in an arrangement in which the first and second bars overlap one another and a contact-making, spring-biased contact plate between the bars at the location where the bars overlap one another, said contact plate having a plurality of spaced contact points at which contact is made between the contact plate and

said bars, the contact plate being inserted in an opening in a second plate disposed between the bars to maintain the contact



between the contact plate and said bars at discrete locations constituted by said spaced contact points.

4,781,604

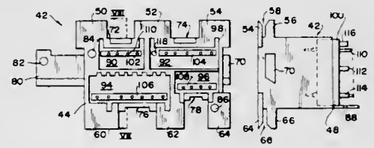
ELECTRICAL CONNECTOR INCLUDING A METALLIC HOUSING AND INTEGRAL GROUND CONTACT

Amir-Akbar Sadigh-Behzadi, and Gary C. Bethurum, both of Los Angeles, Calif., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Mar. 23, 1987, Ser. No. 28,923

Int. Cl.⁴ H01R *13/53, 13/652*

U.S. Cl. 439—101 **7 Claims**



1. An electrical connection assembly for accommodating in electrical interconnection fashion, distinct plural electrical cable terminations, said assembly comprising;

a plurality of substantially identical electrical contacts;

an electrically conductive housing having an electrically conductive part defining at least a preselected one of said contacts; and

an electrically insulative insert supported by said housing and supporting the other ones of said contacts;

said housing further including an open front face, an open rear face, plural compartments extending interiorly from said front face for receipt of said distinct plural cable terminations and a passage disposed interiorly of said rear face and being in communication with said compartment for accommodating said insert and permitting entry of said other contacts into said compartments.

4,781,605

SHAPE MEMORY ELEMENT FOR CONNECTING BRAID ONTO A CONNECTOR

Guy Herubel, Marly Le Roi, and Jean-Jacques Négre, Nanterre, both of France, assignors to Souriau & Cie, Boulogne Billancourt, France

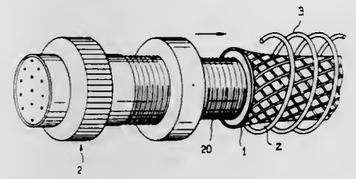
Filed Jan. 21, 1987, Ser. No. 5,883

Claims priority, application France, Jan. 30, 1986, 86 01297

Int. Cl.⁴ H01R *13/20*

U.S. Cl. 439—161 **16 Claims**

1. A shape memory element for connecting braid to a connector, comprising a rolled element formed of a homogeneous material at least a portion of which having two reversible physical shape memory states, passage from each one of said two reversible physical shape memory states to the other being obtained only by modification of temperature and independent of any associated structure of at least a portion of said element, below and/or above a transition temperature Ms of constituent material of said element, a first memorized shape state permitting assuring of electric contact and mechanical holding of said braid on a corresponding rear zone of said connector and a



second memorized shape state permitting engagement and/or disengagement of said braid and said rear zone.

4,781,606

WIRE STRIPPING ARRANGEMENT

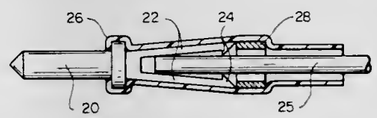
Robin J. T. Clabburn, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 329,977, Dec. 11, 1981, abandoned. This application Mar. 16, 1988, Ser. No. 169,080

Claims priority, application United Kingdom, Dec. 12, 1980, 8039951

Int. Cl.⁴ H01R *4/24*

U.S. Cl. 439—161 **15 Claims**



1. An arrangement for penetrating the insulation of an insulated wire, comprising an independently recoverable penetration member at least partly made of memory metal, said member having an original undeformed shape and a deformed shape wherein thermally recoverable plastic deformation is imparted to the member and wherein the original undeformed shape is thermally recoverable alone from the deformed shape, said member in the deformed shape arranged to be capable, upon recovery in use, of penetrating the insulation of an insulated wire positioned in the arrangement in use.

4,781,607

ELECTRICAL CONNECTOR ASSEMBLY

William D. Rumbaugh, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 737,825, May 24, 1985, Pat. No. 4,667,736. This application May 14, 1987, Ser. No. 50,315

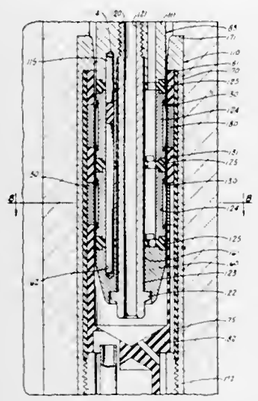
Int. Cl.⁴ H01R *3/00*

U.S. Cl. 439—191 **4 Claims**

1. An electrical connector assembly for electrical contact with a removable well tool in a well tubing comprising: housing means adapted for mounting in said well tubing: a plurality of longitudinally spaced insulated electrical contact rings mounted in said housing means; an insulator ring mounted in said housing means between each adjacent pair of said contact rings, each said insulator ring having longitudinal slots for electrical wires to said contact rings in said housing means; an electrical wire in said housing means to each said contact ring; a tubular member adapted to be connected on said well tool and defining a flow passage through said electrical connector assembly; a tubular insulator on said tubular member; a plurality of longitudinally spaced annular contact bodies on said tubular insulator each provided with longitudinal slots for electrical wires to each said contact body; an insulator ring on said tubular insulator between each adjacent pair of said

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contact bodies, said insulator rings on said tubular insulator being provided with slots for electrical wires; and electrical contact ring on each contact body sized and spaced to electrically contact each said contact ring in said housing means,



each contact ring on each said contact body being a ring-shaped spring member formed of a plurality of interconnected circumferentially spaced longitudinal outwardly bowed spring-like contacts; and an electrical wire to each said contact ring on said tubular insulator.

4,781,608

BUSBAR HOLDER OF PLASTIC

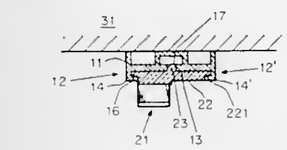
Willi Hillmann, Kamen, Fed. Rep. of Germany, assignor to Paul Vahle GmbH & Co. KG, Kamen, Fed. Rep. of Germany

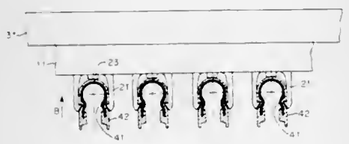
Continuation of Ser. No. 836,390, Mar. 5, 1986, abandoned. This application Feb. 5, 1988, Ser. No. 154,429

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512161

Int. Cl.[4] A47F *5/08*

U.S. Cl. 439—212 6 Claims





1. An arrangement for installation of a plurality of busbars extending next to each other and spaced from one another, comprising: a mounting plate with a substantially rectangular shape and marginal portions that are inwardly recessed and project beyond sides of said plate along longitudinal edges of said plate to form a receptacle; said plate having a backside fastenable to a mounting surface; a plurality of clips, each clip comprising a busbar holder extending out of a web that fits under said marginal portions and can be snapped into position, said busbar holder being formed on said web; said web being twice as long as the clip and having extensions that fit under said marginal portions of said mounting plate; said clip being arranged at one end of the web at a said extension; said mounting plate being bendable against spring resistance transverse to a longitudinal axis of said mounting plate, said web being snappable into position when said mountable plate is bent against said spring resistance.

4,781,609

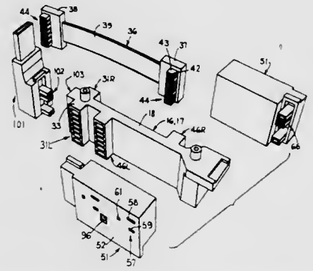
WALL SYSTEM WITH MULTICIRCUIT ELECTRICAL SYSTEM

Harold R. Wilson, Holland, and David E. Nestell, Grand Rapids, both of Mich., assignors to Haworth, Inc., Holland, Mich.

Continuation of Ser. No. 639,970, Aug. 10, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 906,556

Int. Cl.[4] H01R *29/00*

U.S. Cl. 439—215 12 Claims



5. A small portable electrical power-tap unit adapted to be releasably coupled both physically and electrically to an electrical terminal by means of a pluglike connection, the terminal having multiple conductors associated therewith defining at least first and second electrical circuits each having separate live and neutral conductors, said power-tap unit comprising:

a blocklike housing of electrically insulative material defining a hollow interior therein;

first, second and third conductive members mounted within said hollow interior in electrically spaced relationship and having conductor parts which define three individual pronglike receptacles associated with a three-hole electrical socket, said housing having three openings formed in one wall thereof in alignment with said conductor parts for defining said three-hole socket for permitting supply of electrical energy to a circuit or device disposed externally of the unit;

a pluglike connector portion associated with a further wall of said housing for permitting said unit to be physically and electrically coupled to the terminal by means of a pluglike connection;

said connector portion including first, second and third electrical contacts which are adapted to create releasable electrical engagement with the terminal, said first and second electrical contacts being movably supported on said housing within the hollow interior thereof and projecting outwardly therefrom, said third electrical contact being fixedly supported within said housing and projecting outwardly therefrom;

carrier means of an electrically insulative material slidably supported on said housing and having said first and second electrical contacts stationarily mounted thereof for permitting said first and second contacts to be synchronously moved relative to said third electrical contact between at

least first and second positions which permit the power-tap unit to be coupled to the terminal for connection to different electrical circuits;

electrically conductive means connecting said first and second electrical contacts to said first and second conductive members, respectively, for permitting relative movement therebetween as said first and second electrical contacts more between said first and second positions, said third electrical contact being electrically connected to said third conductive member;

said carrier means being movably supported on said housing for slidable displacement in a direction which is substantially perpendicular to the outwardly projecting direction of the electrical contacts;

said further wall or said housing having elongated slot means formed therein through which project said first and second electrical contacts for permitting said contacts to be displaced along said slot means between said first and second positions; and

said carrier means having fixedly associated therewith first and second shroudlike parts which are also of electrically insulative material and are disposed in surrounding relationship to the first and second electrical contacts respectively, said first and second shroudlike parts projecting outwardly through said slot means and being transversely slidably displaceable therealong between said first and second positions.

4,781,610

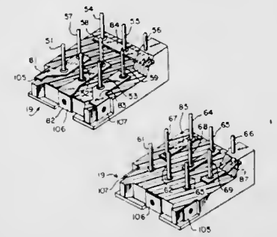
VOLTAGE SELECTOR FOR A THREE PHASE ELECTRICAL MOTOR

John L. Mercer, c/o B. & M. Electric Company, 615 East Main St., Springfield, Ohio 45503

Filed Jul. 27, 1987, Ser. No. 78,143

Int. Cl.[4] H01R *27/00;* H02K *11/00*

U.S. Cl. 439—217 20 Claims



1. For an electric motor having six field windings connected to nine terminal wires for selective application of three phase electrical power at either of two different voltage levels, improved voltage selection means comprising:

a terminal block mounted on said motor and having an array of nine female terminals connected to said terminal wires, and

a reversible connector comprising:

an insulating base having oppositely disposed first and second faces interconnected by an edge surface,

a first set of nine contact pins partially encapsulated within said base and projecting from said first face for selective engagement with said array of female terminals,

a second set of nine contact pins partially encapsulated within said base and projecting from said second face for selective engagement with said array of female terminals, and

three power connectors mounted on said base for reception of said power at either of said voltage levels;

said power connectors each being connected to at least one pin in each of said first and second sets of contact pins; other pins in said first and second sets being setwise interconnected for applying said two different voltage levels to said motor.

4,781,611

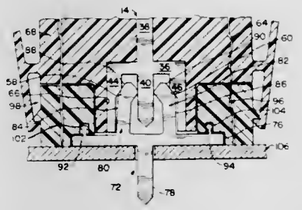
ZERO INSERTION FORCE ELECTRICAL CONTACT ASSEMBLY

Russell J. Leonard, Downers Grove, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Jun. 1, 1987, Ser. No. 56,562

Int. Cl.[4] H01R *13/15*

U.S. Cl. 439—259 17 Claims



1. A zero insertion force mating electrical contact structure comprising:

a bifurcate female terminal comprising a base and a pair of contact beams cantilevered from said base, said contact beams including generally inwardly facing contact surfaces and generally outwardly facing cam surfaces converging toward one another at greater distances from said base; and

a trifurcate male terminal comprising a base, a central contact post extending from said base, said central contact post having a width less than or equal to the distance between said contact surfaces of said contact beams, said trifurcate male terminal further comprising a pair of cam arms extending from said base and on opposite sides of said contact post, said cam arms comprising generally inwardly facing cam surfaces converging toward one another at closer distances to said base, said cam surfaces of said trifurcate male terminal being disposed to engage the cam surfaces of said bifurcate female terminal upon sufficient movement of the male and female terminals toward one another, and to urge the contact surfaces of said bifurcate female terminal into engagement with the central contact post of said trifurcate male terminal.

4,781,612

SOCKET FOR SINGLE IN-LINE MEMORY MODULE

Roger L. Thrush, Clemmons, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 800,181, Nov. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 670,857, Nov. 13, 1984, Pat. No. 4,557,548, which is a continuation-in-part of Ser. No. 561,392, Dec. 14, 1983, Pat. No. 4,558,912. This application Apr. 2, 1987, Ser. No. 35,273

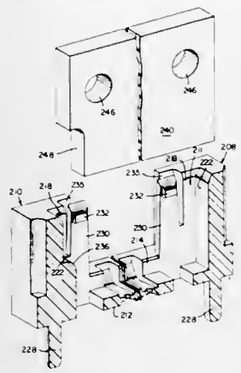
Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—328 9 Claims

1. A low profile, high density socket for positioning a single in-line memory module upright on a printed circuit board, the module comprising a plurality of microelectronic packages mounted on a low profile substrate, the substrate having edge traces leading from module contacts to edge contacts along a lower substrate edge, the socket comprising: a plurality of terminals each comprising means for interconnection between the substrate edge contacts and the printed circuit board; and an elongate dielectric housing further comprising a central body and upright support brackets extending above the central body at either end thereof, the central body having an elongate channel opening along an upper module receiving face, the

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terminals being positioned side by side along the channel, each support bracket having an inwardly facing guide slot extending from the top of the bracket, aligned with and merging with the channel, the guide slots comprising means for aligning and supporting a module upon insertion of the module substrate lower edge into the channel with the edge contacts in engagement with the terminals, and a resilient latch integral with the dielectric housing and extending from the central body toward the top of each support bracket adjacent each guide slot, and



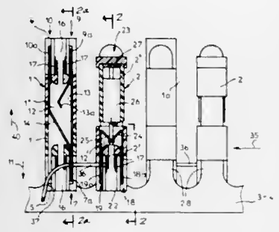
comprising means for engaging the module adjacent an upper edge of the module, each guide slot being defined by an outer enclosed end, and first and second opposed sides extending inwardly therefrom, the latch being on the second side facing the first side, the first and second sides comprising respectively the sides of first and second laterally extending walls of the brackets, the first laterally extending wall extending further inward than the second laterally extending wall, the second laterally extending wall having a recess therein, the latch being positioned within the recess.

4,781,613

CONNECTION UNIT FOR TELEPHONE LINE

Yves Saligny, Thyez, France, assignor to Etablissements Carpano & Pons, France

Continuation of Ser. No. 492,412, May 6, 1983, abandoned. This application Mar. 18, 1987, Ser. No. 28,035
Claims priority, application France, May 7, 1982, 82 08389
Int. Cl.⁴ H01R *11/20*
U.S. Cl. 439—391 **6 Claims**



1. A connection unit for telecommunications lines, which comprises:

at least one common support; and

at least one insulating connection box, and at least one insulating protection box, the connection box and the protection box being removably mounted on the common support and extending transversely thereto, the connection box and the protection box being arranged in a side by side manner with respect to each other and being in spaced apart relationship so as to allow the connection box and the protection box to be interchanged with respect to their relative mounting positions on the common support;

the connection box having a plurality of telecommunication line connection terminals mounted thereon and arranged in at least two rows, and internal connection means mounted therein for interconnecting connection terminals of one row with corresponding connection terminals of the other row so that telecommunication lines connected to terminals of one row may be electrically coupled to telecommunication lines connected to corresponding terminals of the other row;

the protection box having a plurality of telecommunication line connection terminals mounted thereon and arranged in at least one row, and further including a plurality of individual line protecting means mounted therein for electrically protecting the telecommunications lines, each individual line protecting means being electrically coupled to a corresponding protection box connection terminal;

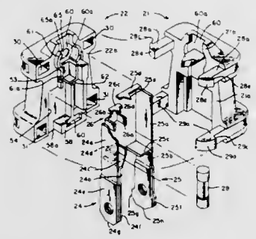
the common support including a plurality of parallel upstanding extensions formed integrally thereon, the connection box and the protection box being removably mounted on respective upstanding extensions, wherein each of the connection box and the protection box is adapted to be removed from one upstanding extension and remounted on another extension to interchange the mounting positions of the connection box and the protection box on the common support.

4,781,614

ELECTRIC PLUG WITH SNAP-FITTED HOUSING COMPONENTS

Joseph M. Ahroni, 2701 W. Manor Pl., #204, Seattle, Wash. 98199

Division of Ser. No. 755,230, Jul. 17, 1985, Pat. No. 4,679,877. This application Apr. 24, 1987, Ser. No. 42,292
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.⁴ H01R *4/24, 19/04*
U.S. Cl. 439—391 **11 Claims**



1. An electrical plug comprising:

a housing having two interfitting housing shells providing a wireway open at one end for entry of two insulated conductors;

two pairs of flexible legs projecting integrally from one of said shells near opposite ends thereof, each leg having an integral locking foot at its free end extending laterally outward, said legs extending through bores formed in the other shell and having their locking feet engaging retaining shoulders at the outer ends of the bores to prevent withdrawal of the legs from the bores;

each of said bores having a widened mouth portion at its inner end aligned with the respective retaining shoulder for introduction of the locking foot of the respective leg at the start of assembly of the housing, and then tapering inwardly from said mouth portion such as to spring the leg laterally inward during assembly until its locking foot reaches the outer end of the bore and springs back outwardly to fit over the respective retaining shoulder, said legs being hidden in said bores and said shoulders being substantially covered by said locking feet; and

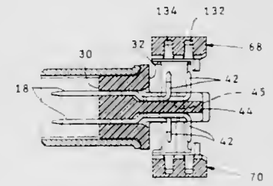
two conductive members located in the housing and having insulation-piercing elements projecting into said wireway and arranged to pierce the insulation surrounding said conductors and engage respective ones of said conductors when the housing shells are pressed together with said legs in said bores.

4,781,615

CABLE TERMINATING COVER RETENTION SYSTEM

Wayne S. Davis, Harrisburg; Jon A. Fortuna; Earl W. McCleerey, both of Mechanicsburg, and Robert N. Whiteman, Jr., Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1987, Ser. No. 90,296
Int. Cl.⁴ H01R *4/24*
U.S. Cl. 439—395 **18 Claims**



1. An electrical connector assembly for terminating a cable having a plurality of insulated conductors disposed in a planar array, the assembly capable of being preassembled into a pretermination position to permit insertion and alignment of said cable for termination thence terminated to the cable defining a termination position, comprising:

a dielectric housing having a mating face and an opposed rear face with a plurality of contact receiving passages disposed in two rows extending therebetween with contacts secured therein, said contacts having an axis, a mating portion proximate said mating face and a terminating portion extending beyond said rear face, said terminating portion formed to be an insulation displacing plate having a slot therein extending normal to the axis of said contact,

a terminal support block extending from the rear face of said housing between the rows of contacts, said block having a pair of apertures therethrough defining aperture walls;

a first cable terminating cover having spaced first leg means extending normally thereof with first aperture means adjacent thereto, said first aperture means defining first wall means, said first leg means adapted to be received in said pair of apertures at a pretermination position in an interference fit between a first portion of said first leg means and a first portion of said aperture walls;

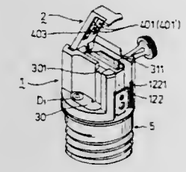
a second cable terminating cover having spaced second leg means extending normally thereof with second aperture means adjacent thereto, said second aperture means defining second wall means, said second leg means adapted to be received in said pair of apertures from an opposed direction from said first leg means, said second leg means adapted to be received in said pair of apertures at a pretermination position in an interference fit between a first portion of said second leg means and a second portion of said aperture walls, said second leg means adapted to be secured in said apertures at a termination position with said second leg means extending into said first aperture means in an interference fit between a second portion of said second leg means and said first wall means, said first leg means adapted to be secured simultaneously with said second leg means, said first leg means adapted to be secured in said apertures at a termination position with said first leg means extending into said second aperture means in an interference fit between a second portion of said first leg means and said second wall means, whereby the interference fit that secures the cable terminating covers in the cable terminated position is between a wall means and an area of the leg means not previously deformed by the interference fit that retains the cable terminating covers in the pretermination position.

4,781,616

SOCKET ASSEMBLY

Alexander K. Yu, 10th Fl., 546, Min Chuan E. Rd., Taipei, Taiwan

Filed Sep. 15, 1987, Ser. No. 97,511
Int. Cl.⁴ H01R *4/24*
U.S. Cl. 439—409 **5 Claims**



1. A socket assembly having a screwshell provided for holding an electric lamp bulb, an isolating plate for being positioned on top of the screwshell, and a positive terminal member disposed in the screwshell with one end extending through the top thereof, comprising:

a non-conductive body with an L-shaped recess in a middle portion fixedly connected to the screwshell at a lower end through a plurality of riveting pins;

conducting means disposed on said non-conductive body in connection with the screwshell and the positive terminal member for effecting electrical connections therewith;

a coupling means, formed in an L shape with a horizontal portion and a vertical portion in conjunction with said L-shape recess, pivotally connected to said non-conductive body for being closely engaged withh said L-shaped recess; and

piercing terminal means separately disposed on a reverse surface of the horizontal portion of said coupling means in conjunction with said conducting means for being respectively inserted into the insulation of an electrical cord and making electrical connections with said conducting means; so that, by pressing said coupling means against said non-conductive body along said L-shaped recess, an electrical connection can be quickly and conveniently made through the close engagement of said coupling means and said non-conductive body without requiring any screws.

4,781,617

CABLE CONNECTOR ARRANGEMENT TO ACCOMMODATE MULTIPLE CABLE SIZES

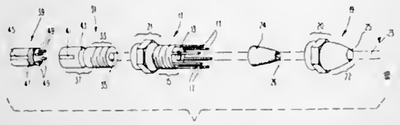
Vernon F. Alibert, Misty Hollow RD #3, Glens Mills, Pa. 19342

Filed Apr. 2, 1987, Ser. No. 34,008
Int. Cl.⁴ H01R *13/59*
U.S. Cl. 439—461 **8 Claims**

1. Means to secure a connector assembly to a cable, comprising in combination: support means having an externally threaded section; a plurality of finger like structure means, each having a secured end formed integral with said support

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means and disposed so that when viewed together said secured ends define an endless configuration, each of said finger like structure means having a free end and disposed so that a space is formed between each of said finger like structure means and any adjacent ones of said finger like structure means said finger like structure means being formed of a bendable brass alloy; clamping insert means having first and second ends and fabricated of material having a resilient, compressible and stretchable nature, said clamping insert means formed to have an aperture therethrough of such dimension that a cable passing therethrough will be firmly secured to said clamping insert means, said clamping insert means further formed and disposed so that when a cable is passed through said aperture said clamping insert means is fittable at least partially within said plurality of finger like structure means and with its first end



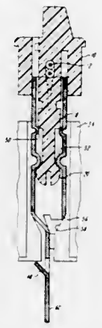
located approximately opposite the free ends of said finger like structure means; compression nut means having first and second sections and formed to be internally threaded within said first section and formed to have an internally concave surface in said second section, said compression nut means further formed to have a sufficiently large aperture at the end of said second section whereby in the course of said compression nut means having its first section threaded onto said externally threaded section of said support means said first end of said clamping insert means passes through said aperture and whereby said finger like structure means are bent inwardly to follow said internally concave surface toward said clamping insert means and pass through said aperture of said compression nut toward the center thereof to effect a clamping action on said clamping insert means to in turn clamp said support means to said cable.

4,781,618

PUSHBUTTON ELECTRICAL TERMINAL

Lawrence E. Geib, Carol Stream, and Herbert C. Naylor, West Dundee, both of Ill., assignors to Reed Devices, Inc., Carol Stream, Ill.

Filed Jun. 25, 1987, Ser. No. 66,868
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—392 **11 Claims**



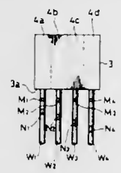
1. A pushbutton electrical terminal comprising:
a terminal body of electrically conductive material, having a tubular section adapted for mounting within a mounting opening of a mounting member;
said tubular section having an open end with an insulation displacement contact provided thereon, and an electrical terminal lead outwardly extending from the other end of the tubular section;
a plunger of electrically insulative material, having a head portion adapted to fit over the open end of the tubular section, a coaxial post portion adapted to fit within the tubular section, a transverse opening in the post portion for receiving an insulated wire therethrough;
the plunger being movable with respect to the terminal body and along a longitudinal axis of the tubular section to force the wire disposed in the transverse opening into the insulation displacement contact of the tubular section to cause contact of the wire and terminal body; and
means on the tubular body and the plunger cooperative to latch the plunger in a lower position.

4,781,619

CONNECTOR AND METHOD OF CONNECTING WIRES THERETO

Tomohiro Ikeda, Kosai, Japan, assignor to Yazaki Corporation, Japan

Filed Sep. 18, 1987, Ser. No. 98,309
Int. Cl.[4] H01R *3/00*
U.S. Cl. 439—488 **5 Claims**



1. A connector comprising:
(a) a connector housing formed with a plurality of cavities;
(b) a plurality of connector terminals each inserted into one of the cavities formed in said connector housing; and
(c) a plurality of wires each connected to one of the connector terminals, each of said wires being provided with a single marking formed at a position on each of said wires a same distance away from a predetermined position of said connector terminal, to check imperfect insertion of said connector terminal into said connector housing on the basis of misalignment of markings of said wires along a parallel line relative to said connector housing.

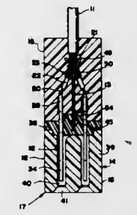
4,781,620

FLAT RIBBON COAXIAL CABLE CONNECTOR SYSTEM

John N. Tengler; Roy A. Gobets; Chris A. Shmatovich, all of Chico, and Ross A. Tessien, Grass Valley, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 18, 1987, Ser. No. 15,977
Int. Cl.[4] H01R *9/05, 9/07, 13/652, 23/66*
U.S. Cl. 439—497 **21 Claims**

1. A cable termination assembly comprising a single flat ribbon insulated coaxial multiconductor cable including multiple conductors and respective coaxial shields therefor; plural contacts having a plurality thereof electrically connected to respective ones of said conductors; bus means for electrically connecting a plurality of said coaxial shields; and body means for holding together said single cable, plural contacts and bus means; and wherein relatively adjacent ones of said conductors of said single cable have end portions extending beyond their respective coaxial shields for electrical connection to respective contacts, and said bus means includes a main portion extending across the width of said single cable and interposed



between said end portions of said relatively adjacent ones of said conductors of said single cable.

4,781,621

SEALING MATERIAL RECEIVING STRUCTURE IN A JUNCTION BLOCK

Masaaki Sugiyama, and Hideharu Hayashi, both of Washizu Kosai, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 20, 1987, Ser. No. 28,659
Claims priority, application Japan, Mar. 24, 1986, 61-041925[U]
Int. Cl.[4] H05K *5/06*
U.S. Cl. 439—559 **2 Claims**

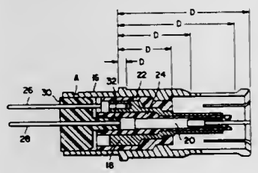
1. A junction block structure to be filled with sealing material, comprising:
a first cover provided with connector means for connecting to associated circuitry;
a second cover provided with connector means for connecting to associated circuitry, said first and second covers each having an inner and outer surface;
at least one insulating plate provided with bus bars having tab terminals, said at least one insulating plate being placed between said first and second covers;
at least one plate-shaped packing formed of an elastic material having tab-receiving holes for receiving said tab terminals therethrough, said plate-shaped packing being placed between said at least one insulating plate and one of said first and second covers; and
elastic enclosure means formed integrally with said plate-shaped packing and surrounding said tab-receiving holes for preventing said sealing material from leaking through gaps between said tab terminals and tab-receiving holes, said enclosure means having walls with end surfaces and having interior and exterior surfaces, said interior and exterior surfaces defining interior and exterior corners, said interior surfaces and interior corners defining first apertures aligned with said tab-receiving holes, said enclosure means projecting from said plate-shaped packing towards one of said first and second covers and being receivable by second apertures in at least one of said first and second covers, said second apertures each having inner surfaces, each said enclosure means satisfying the inequality $c-2a<d$ and $c>b$, where a is a thickness of said walls of said enclosure means, b is an outer major axial length of each said enclosure means, c is a major axial length of each said aperture in said at least one of said first and second covers, and d is a major axial width of each said tab terminal, said enclosure means being readily insertable into said second apertures in said at least one of said first and second covers, said outer surfaces of said enclosure means and said inner surfaces of said second apertures being initially spaced and contacting each other only when a said tab terminal is inserted into a tab-receiving hole and respective first aperture, said end surfaces of said walls being coplanar with said outer surface of said cover into which said enclosure means has been inserted, thereby preventing the formation of gaps between said tab terminal and said respective enclosure means.

4,781,622

TRIAXIAL CONTACT ASSEMBLY FOR TERMINATION TO PRINTED CIRCUIT BOARDS AND THE LIKE

Lloyd G. Ratchford, Oneonta; Valentine J. Hemmer, and Alan L. Davis, both of Unadilla, all of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Oct. 20, 1987, Ser. No. 110,270
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—585 **9 Claims**



1. A triaxial contact assembly for termination to printed circuit boards comprising:
an outer contact;
an intermediate contact concentrically disposed within the outer contact;
an inner contact concentrically disposed within the intermediate contact;
an outer dielectric insulator concentrically disposed between the outer and intermediate contacts;
an inner dielectric insulator concentrically disposed between the intermediate and inner contacts;
the intermediate and inner contacts each carrying printed circuit board tails;
a cap concentrically disposed within the outer contact abutting a surface on the inner contact for holding the intermediate and inner contacts and the inner and outer insulators projecting forwardly within the outer contact; and
means for holding the cap in place near the rear of the outer contact.

4,781,623

SHIELDED PLUG AND JACK CONNECTOR

Walter M. Philippson, Woodside; Robert J. Brennan, Ossining, and Terrence Meighen, Stormville, all of N.Y., assignors to Stewart Stamping Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 655,696, Sep. 28, 1984, Pat. No. 4,653,837, which is a continuation-in-part of Ser. No. 612,722, May 21, 1984, Pat. No. 4,641,901, which is a continuation-in-part of Ser. No. 570,806, Jan. 16, 1984, Pat. No. 4,537,459. This application Nov. 22, 1985, Ser. No. 800,679
Int. Cl.[4] H01R *23/02, 13/648*
U.S. Cl. 439—610 **17 Claims**

1. A plug for terminating a cable having a plurality of conductors enclosed within an outer jacket, comprising:

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a housing assembly including a front housing part and a rear housing part separate from said front housing part; said front housing part having top, bottom and side walls defining a front interior cavity portion for receiving the cable conductors from which the outer jacket has been removed, and a plurality of contact-receiving slots formed in said bottom wall communicating with said conductor-receiving slots formed in said bottom wall communicating with said conductor-receiving cavity for receiving flat contact terminals adapted to electrically engage respective cable conductors; said rear housing part defining a rear interior cavity portion for receiving a terminal end region of the cable including the outer jacket thereof; and



interference shielding means extending around the transverse circumference of at least said front housing part over the exterior of said top, bottom and side walls thereof for attenuating interference radiation into and out from said plug, said interference shielding means including a forward shield sleeve extending around the transverse circumference of said front housing part over the exterior of said top, bottom and side walls thereof, and a rear shield separate from said forward shield sleeve situated within said rear housing part and extending around said rear interior cavity portion, said rear shield electrically coupled to said forward shield sleeve.

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FILTER ARRANGEMENTS AND CONNECTORS

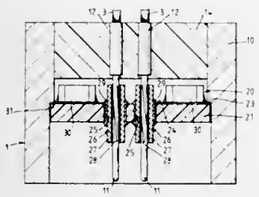
Brian Shepherd, Wendover, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Feb. 11, 1988, Ser. No. 154,747

Claims priority, application United Kingdom, Feb. 11, 1987, 8703048

Int. Cl.[4] H01R *13/66*

U.S. Cl. 439—620 **11 Claims**



1. An electrical connector comprising: a housing; one or more conductive pin elements supported in said housing; and a filter assembly located in said housing, said filter assembly including a plate member, said plate member having a conductive region thereon that is, in use, connected to ground, and at least one aperture therethrough, at least one electrically conductive socket element inserted into and extending through a respective one of said apertures, at least one filtering element initially seperate from said plate member, and means connecting the or each said filtering element electrically between said conductive region and the or each respective socket element, wherein the or each socket element is open at both ends and has a size and shape such that the or each said socket element receives a respective pin element therein with the pin element projecting from the socket element such that electrical connection can be established by the projecting end of the pin element with a cooperating mating contact, and wherein the or each socket element includes a resilient contact element therein which provides a sliding contact with the said respective pin element extending through the socket element such that the or each said filtering element thereby provides filtering of signals of undesired frequencies on the respective pin element.

4,781,625

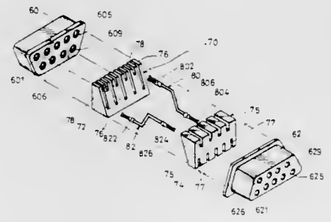
TRANSFERRING DEVICE FOR ELECTRICAL CONNECTORS

Yuan-Wei Yang, Taipei, Taiwan, assignor to Ming Fortune Industry Co., Ltd., Taipei, Taiwan

Filed Dec. 29, 1987, Ser. No. 138,954

Int. Cl.[4] H01R *13/50*

U.S. Cl. 439—654 **4 Claims**



1. An electrical connector transferring device, comprising:
- a first plastic member having at least one row of first upper throughholes and at least one row of first lower through holes;
- a second plastic member having at least one row of second upper through holes corresponding with said one row of first lower through holes, and at least one row of second lower through holes corresponding with said one row of first upper through holes;
- a first intermediate block having a set of first grooves corresponding with said one row of first upper through holes, and a set of second grooves corresponding with said one row of first lower through holes, said first intermediate block being assembled to said first plastic member;
- a second intermediate block having a set of third grooves corresponding with said one row of second lower through holes, and a set of fourth grooves corresponding with said one row of second upper through holes, said second intermediate block being assembled between said first intermediate block and said second plastic member;
- a first set of terminals each of which having two free ends inserted, respectively, into said one row of first upper through holes and said one row of second lower through holes, and a central portion engaged into said first and said third grooves;
- a second set of terminals each of which having two free ends inserted, respectively, into said one row of first lower through holes and said one row of second upper through holes, and a central portion engaged into said second and said fourth grooves.

4,781,626

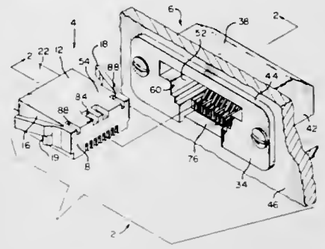
KEYING SYSTEM FOR CONNECTOR FAMILIES

Daniel B. Lazarchik, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 24, 1982, Ser. No. 423,486

Int. Cl.[4] H01R *13/64*

U.S. Cl. 439—680 **3 Claims**



1. A series of electrical connector assemblies, each assembly comprising a plug and a receptacle, each plug and each receptacle comprising a molded insulating housing having a mating end and a rearward end and having oppositely facing external housing endwalls extending from the mating end to the rearward end, each of the receptacles having a trough-like plug-receiving opening extending into its mating end, the plug-receiving opening in each receptacle having opposed first and second plug opening sidewalls which are proximate to the external housing sidewalls and opposed plug opening endwalls which are proximate to the external housing endwalls, the plug of each connector assembly having a forward portion which extends from its mating end partially towards its rearward end and which is dimensioned to be received in the plug-receiving opening of the receptacle of the same assembly, a plurality of plug contacts in the plug of each assembly and a like plurality of receptacle contacts in the receptacle of the same assembly, the receptacle contacts being within the plug receiving opening and being arranged in a row which extends between the plug opening endwalls, the plug contacts of each plug being approximate to the mating end of the plug and being arranged in a row which extends between the plug housing endwalls, the receptacle contacts in each receptacle of the series extending from the first plug opening sidewall at a location adjacent to the mating end of the receptacle, the receptacle contacts being spring contacts which extend obliquely into the plug-receiving opening, the plug-receiving openings of the receptacles of the series being of increasing width, as measured between the plug opening endwalls, with increasing numbers of receptacle contacts in the receptacles, the plugs of the series similarly being of increasing width, as measured between the plug housing endwalls, with increasing numbers of plug contacts in the plugs, the height of the plug openings, as measured between the plug opening sidewalls, being uniform for all receptacles in the series, the series of electrical connectors being characterized in that:

a primary keying system is provided on the connector assemblies of the series, the primary keying system comprising, on each assembly of the series, at least one primary key on the receptacle of each assembly and at least one primary keyway in the plug of the same assembly, each primary key of the receptacle being aligned with a corresponding primary keys of each receptacle being molded integrally on the second opening sidewall which is opposite to the first plug opening sidewall from which the receptacle contacts extend, the primary keys and primary keyways of the connector assemblies having greater numbers of contacts and greater widths being selectively located, relative to the locations of the primary keys and primary keyways of assemblies having lesser numbers of contacts and lesser widths to prevent insertion of a plug having a lesser width and a lesser number of contacts into a receptacle having a greater width and a greater number of contacts, and

a secondary keying system is provided on the connector assemblies of the series for keying specifically a specific plug of the series to a specific receptacle, the secondary keying system comprising secondary keys in the receptacles and secondary keyways in the plugs, the secondary keyways being dimensioned to preclude entry of a primary key therein.

4,781,627

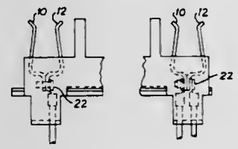
BUS BAR STAB AND INSULATOR ASSEMBLY

Samir F. Farag; John D. Kleinecke, and Thomas R. Little, all of Wichita Falls, Tex., assignors to Siemens-Allis, Atlanta, Ga.

Filed Jan. 23, 1986, Ser. No. 821,617

Int. Cl.[4] H01R *4/48*

U.S. Cl. 439—687 **18 Claims**



1. A bus bar stab and insulator assembly, comprising:
- a stab housing having a base with a group of first, second and third upstanding partitions formed on the base, the first partition having a shoulder thereon opposite the base and extending from the first partition toward the third partition, the third partition having a shoulder thereon opposite the base and extending from the third partition toward the first partition, the second partition being positioned between the first and third partitions and defining pathways between the first and second partitions and between the second and third partitions;
- a first stab finger positioned in the pathway between the first and second partitions, extending from the housing a preselected distance, and having first and second end portions, the first end portion having an opening therein and a first tab extending from the first end portion in a first direction;
- a second stab finger having first and second end portions, the first end portion having an opening therein and a second tab extending therefrom in a second direction, opposite the first direction;
- a screw extending through the openings, with the first and second tabs in interlocking engagement; and
- a stab housing cover having a group of first and second spaced apart channels formed on the cover, the first channel defined by a first portion connected to, and extending from the cover and a second portion extending from the first portion towards the shoulder of the first partition of the housing, the shoulder of the first partition slidingly engaging the first channel for relative sliding motion between the stab housing base and cover, the second channel defined by a first portion connected to and extending from the cover and a second portion extending from the first portion towards the shoulder of the first partition of the housing, the shoulder of the third partition slidingly engaging the second channel for relative sliding motion between the stab housing base and the cover.

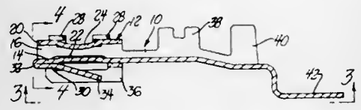
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,628

FEMALE ELECTRICAL TERMINAL

Gary C. Detter, Berlin Center; Duane L. Brantingham, Cortland, and Richard A. Petrosky, Warren, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 22, 1987, Ser. No. 111,353
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—748 **4 Claims**



1. In an electrical terminal of unitary sheet metal construction having a floor and a resilient latch tang which slants away from a side of the floor in an outward direction, the improvement comprising;

an appendage which is attached to the floor at an end of the terminal by a bight so that the appendage is juxtaposed to the said side of the floor,

said appendage having spaced side walls which project away from the said side of the floor for protecting the resilient latch tang,

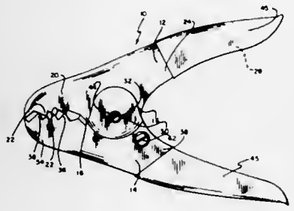
said side rails extending away from the said side of the floor by a distance which is substantially at least as great as the distance which the latch tang extends away from the same side of the floor.

4,781,629

JUMPER CABLE ASSEMBLY

Max D. Mize, 402 E. Copeland, Kingman, Kans. 67068

Continuation-in-part of Ser. No. 831,836, Feb. 24, 1986, Pat. No. 4,685,760. This application Aug. 5, 1987, Ser. No. 82,059
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] H01R *4/40*
U.S. Cl. 439—822 **9 Claims**



1. A jumper cable assembly comprising a pair of battery contact clamps, each battery contact clamp comprising

a lower member having a pair of lower parallel ears with aligned lower apertures and having one end terminating into a lower jaw portion having a structure defining a plurality of teeth;

an upper member having a pair of upper parallel ears with aligned upper apertures that register with the lower apertures of said lower parallel ears of said lower member when said upper parallel ears and said lower parallel ears mate, said upper member additionally having an end terminating into an upper jaw portion having a structure defining a plurality of teeth;

a rivet means passing through said lower and upper apertures pivotally securing said lower member to said upper member such that the jaw portions of the lower and upper member cooperate with each other respectively;

torsion spring means for urging said jaw portions together in a touching relationship about said rivet means and maintaining said jaw portions in a touching relationship when said clamp is in a closed posture, said torsion spring means having convolutions that are positioned around the rivet means and an upper end and a lower end that respectively engage the upper and lower members, said upper end and said lower end of said torsion spring means extend away from said rivet means in the same direction and in an opposed relationship with respect to each other;

a lug terminal means pivotally secured to said lower member, said lug terminal means being contacted biasingly by said lower end of said torsion spring means to retain and urge said lug terminal means against said lower member and assist in retaining any cable engaged to the lug terminal means against the lower member;

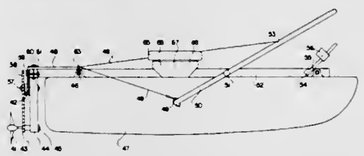
a pair of cables with one cable secured to the lug terminal means of one of the battery contact clamps and the other cable secured to the lug terminal means of the other battery contact clamp; and a connector secured to the ends of the pair of cables opposed to the ends secured to the lug terminal means of the pair of battery contact clamps.

4,781,630

MUSCULAR FORCE ACTUATED VEHICLE

Ulrich Gertsch, Steffisburg, Switzerland, assignor to Gertsch Product Innovation AG, Steffisburg, Switzerland

PCT No. PCT/CH86/00074, § 371 Date Mar. 24, 1987, § 102(e) Date Mar. 24, 1987, PCT Pub. No. WO86/07028, PCT Pub. Date Dec. 4, 1986
PCT Filed May 30, 1986, Ser. No. 44,430
Claims priority, application Switzerland, May 31, 1985, 4066/84; Jul. 8, 1985, 2041/86
Int. Cl.[4] B63H *16/16*
U.S. Cl. 440—24 **5 Claims**



1. A vehicle actuable by muscular force comprising:

(a) a body;

(b) a seat mounted on said body;

(c) first and second levers mounted on said body adjacent said seat, each said lever including an upper end, a lower end and a pivot point between said lower end and said upper end, said pivot points being substantially coaxial;

(d) a propulsion system mounted on said body and including:

(1) a first force transmitting unit comprising an endless chain coupled with guide gears;

(2) a propulsion element coupled to said first force transmitting unit via a free wheeling connection allowing force transmission in a first direction of motion of said first force transmitting unit and allowing free wheeling of said connection in a second opposite direction of motion of said first force transmitting unit;

(e) a second force transmitting unit mounted on said body and including:

(1) an elongated member connected at one end to the lower end of said first lever and at another end thereof to said second lever between the pivot point and upper end thereof;

(2) said elongated member being affixed to said first force transmitting unit between said ends thereof;

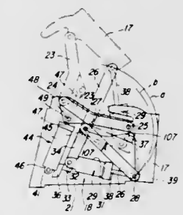
(f) whereby pivoting of said levers simultaneously in a first direction causes movement of said first force transmitting unit in said first direction of motion thereof, and pivoting of said levers simultaneously in a second direction causes movement of said first force transmitting unit in said second direction of motion thereof.

4,781,631

SUPPORTING DEVICE FOR MARINE PROPULSION APPARATUS

Tatsuki Uchida, and Ryoji Nakahama, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 23, 1987, Ser. No. 28,896
Claims priority, application Japan, Mar. 24, 1986, 61-65187
Int. Cl.[4] F16M *1/02*
U.S. Cl. 440—63 **9 Claims**



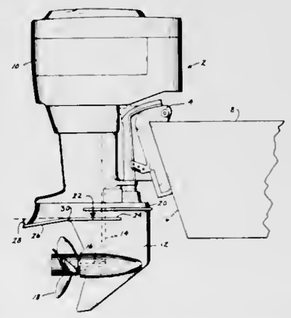
1. In a marine outboard drive carrying propulsion means, supporting means for supporting said outboard drive for movement relative to the transom of an associated watercraft through a plurality of trim adjusted positions, the improvement comprising said supporting means comprising linkage means including at least one link having pivotal connections to said outboard drive and said transom, the location of one of said pivotal connections being adjustable for varying the path of movement of said outboard drive in response to adjustment of the location of said pivotal connection.

4,781,632

ANTI-VENTILATION PLATE

John J. Litjens, Oshkosh; Michael E. Frazzell, Neenah; Michael A. Karls, Hilbert; Ronald M. Steiner, and William P. Lang, both of Oshkosh, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Oct. 8, 1987, Ser. No. 106,148
Int. Cl.[4] B63H *1/18*
U.S. Cl. 440—66 **11 Claims**



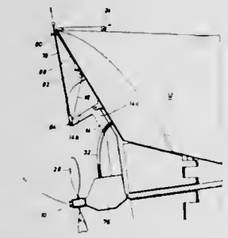
2. A marine drive comprising a lower housing spaced rearwardly of the transom of a boat and defining an air space therebetween and having a generally vertical drive shaft driving a generally horizontal propeller shaft having a propeller mounted thereto, said housing including a fixed horizontal anti-ventilation plate having a horizontal forward portion on said housing and having a horizontal aft portion extending coplanarly rearwardly from said forward portion and over said propeller, and comprising a second anti-ventilation plate mounted to said housing and extending rearwardly and downwardly at an angle relative to horizontal, said second plate and said first mentioned plate meeting at a junction spaced above and forward of the outermost tips of the blades of the propeller.

4,781,633

RETRACTABLE DRIVE MECHANISM FOR MARINE VESSELS

Milby N. Hunt, 19 Manor Way, Galveston, Tex. 77550

Continuation of Ser. No. 918,839, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 677,236, Dec. 3, 1984, abandoned. This application Jul. 30, 1987, Ser. No. 81,617
Int. Cl.[4] B63H *5/12*
U.S. Cl. 440—64 **54 Claims**



1. Apparatus for driving marine vessles having a drive linkage to power means, comprising:

a. a drive assembly for interacting with the water in which such a vessel is positioned for moving the vessel relative to the water;

b. means for connecting said drive assembly to said drive linkage to power means for linking said drive assembly to said power means whereby said power means may operate said drive assembly; and

c. mounting means whereby said drive assembly may be carried by said vessel, movable between a first configuration and a second configuration, said mounting means comprising a lever, including a first lever arm and a second lever arm carrying said drive assembly, and a pivot mounting of said lever at a location between said first and second lever arms where said lever arms meet, whereby said drive assembly may be rotated about said pivot mounting on said lever between said first and second configurations, and whereby external force may be applied to said first lever arm to move said drive assembly from said second configuration to said first configuration;

d. wherein, with said mounting means in said first configuration, said drive assembly is at least partially withdrawn from said water and, with said mounting means in said second configuration, said drive assembly in connected to said drive linkage by said connecting means for selective operation by said power means and is positioned to so move said vessel relative to said water.

4,781,634

WATER DEFLECTOR FOR OUTBOARD MOTOR

Cheryl A. Harris, Pickett, and James C. Dutcher, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 26, 1987, Ser. No. 89,584
Int. Cl.[4] B63H *1/18*
U.S. Cl. 440—66 **13 Claims**

1. In a marine drive having a propulsion assembly including an upper unit housing an engine, a lower unit carrying a pro-

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peller and housing a drive shaft for drivingly interconnecting the engine and propeller, and a transom bracket assembly having an upper end and a lower end and positioned forwardly of said propulsion assembly for supporting the propulsion assembly from a transom of a boat for steering, tilting and trimming movement of said propulsion assembly relative to the boat transom, a splash guard for diverting water away from the



propulsion and bracket assemblies during operation of the boat, comprising:

a body member having a pair of rearwardly extending spaced fin members defining a central opening for receiving the lower unit of said propulsion assembly; and

mounting means for fixedly mounting said body member on the lower end of said transom bracket assembly.

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MARINE OUTBOARD ENGINE UNIT

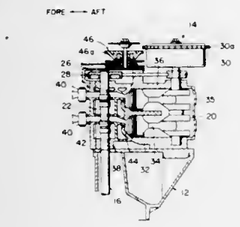
Sosuke Kinouchi, Kakogawa, and Hideto Yoshitake, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Oct. 9, 1987, Ser. No. 106,654

Claims priority, application Japan, Oct. 9, 1986, 61-155101[U]

Int. Cl.⁴ B63H *21/28*

U.S. Cl. 440—75 **3 Claims**



1. A marine outboard engine unit of the type having an aft part and a forward part for attachment to the stern of a boat hull and comprising a lower unit, a vertical extension drive shaft housed within the lower unit, a propeller coupled to the lower end of the drive shaft to be driven thereby, and an engine secured to the upper part of the lower unit and having an output shaft coupled to the upper end of the drive shaft to drive the same, the engine being a four-stroke-cycle engine having at least one cylinder, a vertical crankshaft disposed at said aft part, at least one vertical camshaft which is disposed at said forward part, is coupled to the crankshaft via transmission means to be driven by power from the crankshaft via the transmission means, and is coupled to the upper end of the drive shaft to drive the same, and a carburetor provided for each cylinder and disposed at said forward part to face forwardly.

4,781,636

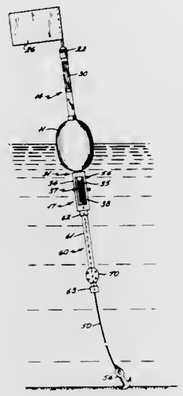
PORTABLE MARKER BUOY

Thomas Schurr, 3135 Hattan St., Sarasota, Fla. 33577

Filed Apr. 7, 1987, Ser. No. 35,455

Int. Cl.⁴ B63H *21/52*

U.S. Cl. 441—6 **9 Claims**



1. A portable marker buoy apparatus comprising a float means having upper and lower ends and a generally central vertical axis, an anchor line dispensing means including a frame member having upper and lower connector portions, said upper connector portion being removably mounted to said lower end of said buoy so that said anchor line dispensing means is in substantial axial alignment therewith, said anchor line dispensing means including a reel assembly rotatably carried by said frame member, an anchor line normally wound around said reel assembly, control means carried by said frame member for restricting the rotation of said reel assembly with respect to said frame member to control the deployment of said anchor line therefrom, said reel assembly including a central spool having at least one annular flange extending perpendicular thereto, said annular flange having a plurality of notches formed in generally equally spaced relationship around the outer periphery thereof, said control means including generally flexible latch means having an outer end, means for mounting said latch means to said frame member so that said outer end thereof extends downwardly into said notches in said one of said annular flanges, said outer end of said latch means being flexible to permit controlled rotation of said reel assembly, an elongated tubular weight assembly removably mounted to said lower connector portion of said frame member of said anchor line dispensing means so as to be generally axially aligned with and spaced from said float means, said anchor line extending through said weight assembly, at least one elongated vertically extending pole means mounted to said upper end of said float means and extending generally axially thereto, a signal means carried by said pole means.

4,781,637

SWIMMING APPARATUS

Kenneth J. Caires, 681 Kaumakani St., Honolulu, Hi. 96825

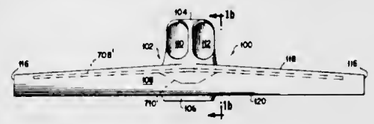
Continuation of Ser. No. 762,029, Aug. 2, 1985, abandoned, which is a continuation of Ser. No. 481,251, Apr. 1, 1983, abandoned. This application Mar. 30, 1987, Ser. No. 31,680

Int. Cl.⁴ A63B *31/10*

U.S. Cl. 441—61 **16 Claims**

14. A swim fin, comprising a foot receiving portion that is molded of a plastic material, and a hydrofoil portion that is molded of a plastic material, said hydrofoil portion being molded integrally with said foot receiving portion so as to extend transversely from either side thereof, said hydrofoil

portion having a cross-sectional shape having a generally rounded leading edge and a generally sharpened trailing edge, said hydrofoil comprising a skin, internal transverse stiffener



means and internal motion-controlling means, wherein said motion-controlling means allows said skin to take differing asymmetrical cross-sectional configurations responsive to water pressure on upper and lower surfaces thereof.

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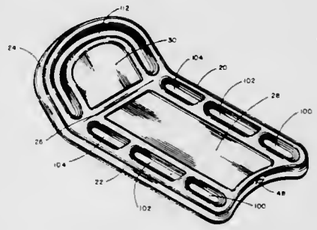
KICKBOARD FOR SWIMMERS

Arthur A. Winters, Jr., Orlando, Fla., assignor to Winters' Innovations, Inc., Orlando, Fla.

Filed Jun. 19, 1986, Ser. No. 876,103

Int. Cl.⁴ B63C *9/08*

U.S. Cl. 441—129 **13 Claims**



1. A swimmer's kickboard comprising:

first and second planar portions rigidly secured to one another and forming an obtuse angle; and

a plurality of drag indicating indicia disposed on at least one of said first and said second planar portions; and means for grasping the kickboard at locations adjacent said indicia for selectively invoking one of a plurality of different drag characteristics of said kickboard while swimming.

4,781,639

CULLETLESS MAIN SEALING METHOD OF CATHODE-RAY TUBE

Masayoshi Misono, Chiba, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,536

Claims priority, application Japan, Sep. 20, 1985, 60-206412

Int. Cl.⁴ H01J *9/26*

U.S. Cl. 445—43 **2 Claims**

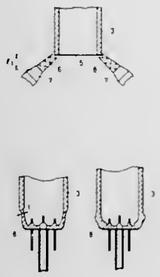
2. A culletless main sealing method of a cathode-ray tube comprising the steps of:

(i) measuring a distance l_2 between a reference line of a culletless cathode-ray tube and an end surface of a neck tube of said cathode-ray tube;

(ii) disposing burners at a predetermined constant distance from a plane containing said end surface of said neck tube by adjusting the positions of said burners in accordance with the measured distance l_2;

(iii) heating said end surface of said neck tube by said burners;

(iv) pushing a stem to said end surface of said neck tube for glass welding said stem thereto by moving said stem to the side of said neck tube for a distance X represented by a formula $X=S-l_2+l_4$ where a distance from the position, at which said stem is initially set to said reference line is a predetermined constant value S, and a pushing distance by which said stem is pushed after said stem is brought into contact with said end surface of said neck tube is a predetermined constant value l_4; and



(v) pulling said stem, pushing to said end surface of said neck tube, to shape the welded portion for a distance Y represented by a formula $Y=X-l_5$, where l_5 is a predetermined constant value.

4,781,640

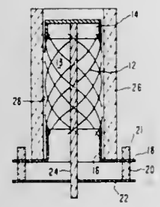
BASKET ELECTRODE SHAPING

Robert N. Tornoe, Fremont, and Semler D. Jackson, Sunnyvale, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 694,539, Jan. 24, 1985, abandoned. This application Jun. 18, 1986, Ser. No. 876,657

Int. Cl.⁴ H01J *9/02*

U.S. Cl. 445—50 **13 Claims**



1. A method of shaping an electrode structure comprising: a plurality of helical wire filaments, said method comprising:

forming a cylindrical array of helical filaments, each filament being bonded at a first end to a first common metallic cylinder and at a second end to a second common metallic cylinder, said metallic cylinders being mechanically fixed to a common support means and mutually insulated,

the invention wherein comprising the additional steps of placing around said cylindrical array a form of temperature resistant dielectric material having a cylindrical opening sized to contain said array,

placing said array and form in an inert environment,

heating said filaments in said inert environment by passing electric current between said metallic cylinders, so that at least some of said filaments expand to be restrained by the surface of said opening, and

cooling said electrode structure, such that said filament array contracts away from said form, and

removing said form.

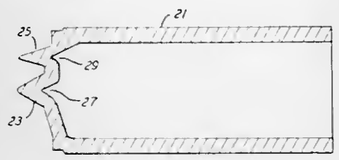
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4,781,641

TOOL FOR MAKING THREE-WAY LAMP BASES

Phillip A. Livera, Cedar Grove, and Paul P. Bracaglia, Fairfield, both of N.J., assignors to North American Philips Lighting Corp., New York, N.Y.

Filed Dec. 4, 1986, Ser. No. 937,760
Int. Cl.[4] H01J *9/30*
U.S. Cl. 445—60 **5 Claims**



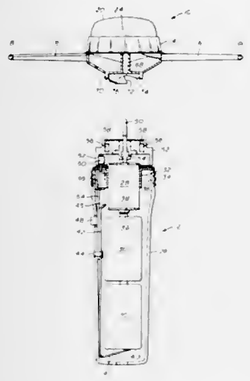
1. A round tubular metal glass plunger for manufacturing bases for three way lamps, said plunger having a longitudinal axis and a base with a first projection in the middle of said base, said first projection having a round cross-section of a given diameter in a predetermined plane perpendicular to the longitudinal axis of said plunger, which plane passes through that half of said first projection closer to said base, said base also having a second projection off centered on it, said second projection having a circumferential dimension about said longitudinal axis in said predetermined plane which is at least as large as the given diameter of said first projection, and which decreases smoothly in the direction away from the base from said predetermined plane to the end of said projection.

4,781,642

ROTARY FLYING TOY

Victor Stanzel, P.O. Box 28, Schulenburg, Tex. 78956

Filed Jul. 29, 1987, Ser. No. 79,009
Int. Cl.[4] A63H *27/00, 27/12*
U.S. Cl. 446—38 **12 Claims**



1. A rotary flying toy comprising:
a rotor having a vertical axis and a plurality of blades adapted to rotate about said vertical axis of said rotor to provide vertical lift to said rotor;
a hand-held launcher for powering said rotor, said launcher comprising,
an electric motor for powering said rotor,
a source of electric power,
switch means for selectively connecting said power source to said electric motor for operating said electric motor,
drive means for selectively engaging said electric motor with said rotor, whereby said electric motor may be operated to spin said rotor about said vertical axis of said rotor at a rotational velocity sufficient for said rotor to fly,
means for selectively retaining said rotor on said launcher as the rotational speed of said rotor is increased beyond that necessary for said rotor to fly,
brake means for selectively rapidly decelerating said drive means, and
resilient means for biasing said switch means into a position where said electric motor is not connected to said source of electric power and for biasing said brake means into a position for decelerating said drive means.

4,781,643

TODDLER TREE

Donna L. Holloway, and Teryl L. Olson, both of 4993 August Dr., Carson City, Nev. 89701

Filed Dec. 30, 1987, Ser. No. 139,821
Int. Cl.[4] A63H *3/52*
U.S. Cl. 446—75 **16 Claims**





1. A new and improved toy tree, for use as a toy box, comprising:
base means;
a hollow trunk means, having a top opening, connected to said base means;
a removable lid means covering said top opening;
at least one side opening means formed in said trunk means;
enclosed chute means in said hollow trunk means communicating with said side opening means; and
bell means in said enclosed chute means, whereby toys inserted through said side openings means will fall into said chute means, ring said bell means and fall out onto a floor.

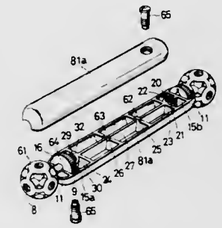
4,781,644

ASSEMBLY KIT FOR TOY OR THE LIKE

Takaharu Yoshida, Hyogo, Japan, assignor to Abero Laboratory Inc., Osaka, Japan

Filed Aug. 21, 1986, Ser. No. 898,586
Claims priority, application Japan, Oct. 12, 1985, 60-227504
Int. Cl.[4] A63H *33/12;* **F16B** *7/00*
U.S. Cl. 446—123 **20 Claims**

1. An assembly kit for toy use or the like comprising:
a plurality of rod elements, each of which comprises a pair of identically shaped half portions extending in an axial direction and fasteners for fixing together the pair of half portions with an axially extending planar surface of one of the half portions abutting an axially extending planar surface of the other one of the half portions, each of the half portions having opposite ends in the axial direction and a first recessed portion and a second recessed portion inwardly of each of the ends, the first recessed portion being larger than the second recessed portion with the second recessed portion being located between the first recessed portion and a respective one of the ends of the half portion;
a plurality of bolts, each of the bolts having a head portion and a shank portion extending from one side of the head



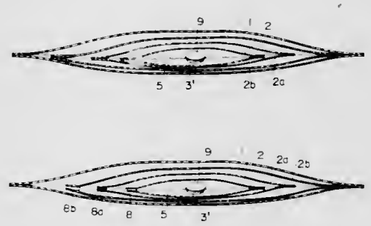
portion, the head portion being sized to fit into the first recessed portion and the shank portion having external threads at a free end thereof, the shank portion being sized to fit in the second recessed portion, the bolts being removable from each of the rod elements by removing the fasteners holding the pair of half portions together to thereby allow separation of the half portions in a direction perpendicular to the axial direction; and
a plurality of connecting elements, each of which includes a plurality of holes having internal threads in which the threaded shanks of the bolts are engaged.

4,781,645

INFLATABLE BAG WITH INNER AND INTERMEDIATE CONTAINERS AND GAS GENERATION SUBSTANCES WITHIN INNER CONTAINER

Kenichi Kato, Tokyo, Japan, assignor to Tadashi Sakuma, Tokyo, Japan

Filed May 23, 1986, Ser. No. 866,346
Claims priority, application Japan, May 24, 1985, 60-077135 [U]; Aug. 12, 1985, 60-123785[U]
Int. Cl.[4] A63H *5/00, 33/00*
U.S. Cl. 446—188 **15 Claims**



11. An inflatable bag, comprising:
a quantity of a first substance which when mixed with a quantity of a selected second substance will generate a quantity of inflating gas;
a quantity of a selected second substance which when mixed with said quantity of said first substance will generate said quantity of inflating gas;
an inner container being constituted by first wall means having an internal volume containing both said quantity of said first substance and said quantity of said selected second substance together with a breakable second wall means, which, while it remains unbroken, maintains said quantity of said first substance separated from said quantity of said selected second substance; and
an outer container containing said inner container and being constituted by flexible third wall means defining a bag capable of having, when inflated, a substantially larger internal volume than said internal volume of said inner container;
said internal volume of said inner container being insufficient to contain all of said quantity of inflating gas and said first wall means of said inner container being constructed and arranged to permit said inflating gas to escape from said inner container into said internal volume of said outer container only after said breakable second wall means has been broken and said quantity of said first substance and said quantity of said selected second substance have substantially fully contacted one another within said inner container while said inner container has remained substantially intact but for breakage of said breakable second wall means;
said first and third wall means of said inner and outer containers being constructed and arranged to permit said breakable second wall means to be manually broken from externally of said outer container without rupturing said outer container and without rupturing said inner container and said first wall means of said inner container being relatively non-stretchable, so that as said quantity of inflating gas is generated in said inner container upon breakage of said breakable second wall means, at least some of said inflating gas, sufficient to inflate said internal volume of said outer container, must escape through said first wall means of said inner container into said internal volume of said outer container; and
said internal volume of said outer container being sufficient to contain all of said quantity of inflating gas so as to dispose said outer container in an inflated condition;
a first intermediate container being constituted by fourth wall means having an internal volume containing said inner container and being contained within said internal volume of said outer container;
said internal volume of said first intermediate container being insufficient to contain all of said inflating gas which escapes through said first wall means of said inner container upon contacting of said quantity of said first substance and said quantity of said selected second substance;
said fourth wall means of said first intermediate container being constructed and arranged to permit said inflating gas to escape from said first intermediate container into said internal volume of said outer container only after said inflating gas has escaped from said inner container into said first intermediate container and fully inflated said internal volume of said first intermediate container; and
said fourth wall means of said first intermediate container being relatively non-stretchable, so that afler said inflating gas begins to escape from said inner container into said first intermediate container so as to inflate said internal volume of said first intermediate container, at least some of said inflating gas must escape through said fourth wall means of said first intermediate container into said internal volume of said outer container.

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TOY TOASTER OVEN

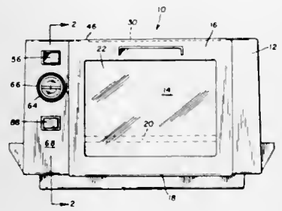
Joseph L. Dibley, New York, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jul. 8, 1987, Ser. No. 70,947
Int. Cl.[4] A63H *3/52, 33/22*
U.S. Cl. 446—219 **19 Claims**

1. A toy toaster oven comprising:
an oven compartment at least partially covered by a light-reflecting material;

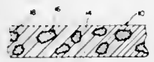
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a sky-light for the oven compartment,
a window through which said oven compartment is visible;
a shade member for the sky-light movable between an open position for uncovering the sky-light and illuminating the light-reflecting material with ambient light to simulate



initiation of a heating cycle as viewed through said window, and a closed position for covering the sky-light to simulate termination of the heating cycle; and
control means for moving the shade member between open and closed position.

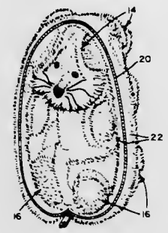
4,781,647
TOY DOLL CONSTRUCTION WITH PHOSPHORESCENT HAIR FIBERS
Linwood E. Doane, Jr., Cumberland, R.I., assignor to Hasbro, Inc., Pawtucket, R.I.
Filed May 4, 1987, Ser. No. 46,180
Int. Cl.⁴ A63H *33/22, 3/36;* **A41G** *3/00;* **B32B** *9/00*
U.S. Cl. 446—219 **8 Claims**

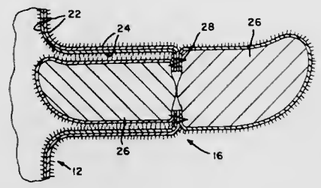




1. In a doll construction of a type including a doll body having a head and a plurality of flexible stranded artificial hair fibers on said head, the improvement comprising at least a portion of said hair fibers being phosphorescent and being extruded from a material comprising a flexible polymeric material which is at least partially translucent and a plurality of phosphorescent particles in said polymeric material, said translucent hair fibers having cross sectional dimensions of less than approximately 0.015 in., said phosphorescent particles having a maximum particle size which is between 0.0075 in. and 0.0005 in. and which is less than one half of said cross sectional dimension.

4,781,648
REVERSIBLE PLUSH TOY
Henry Garfinkel, 31 Dogwood Rd., Searingtown, N.Y. 11507
Filed Mar. 3, 1987, Ser. No. 21,350
Int. Cl.⁴ A63H *3/12, 3/02*
U.S. Cl. 446—321 **7 Claims**

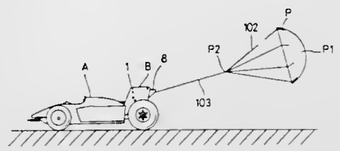




1. A reversible toy comprising a body with opposed first and second body surfaces each selectively exposable to constitute an outer body surface which both defines an outer body appearance and encloses the other body surface, means defining a closeable opening through said body and the opposed surfaces thereof for a reversing of the toy by passing the bulk of the body through the opening to selectively interchange the outer body surface and the stored body surface, at least one projecting appendage secured to each of the opposed body surfaces in substantial alignment with a paired appendage on the opposed body surface, the paired appendages being selectively extensible and retractable, one relative to the other, to define an exposed appendage projecting from the outer body surface and a stored enclosed appendage enclosed with the stored body surface, and means for automatically effecting inversion of said at least one projecting appendage upon extension of said paired appendage.

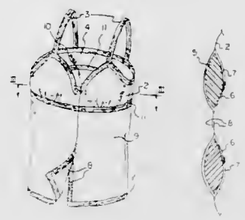
4,781,649
TOY CAR WITH A PARACHUTE
Toshiaki Nagano, Mibu, Japan, assignor to Shinsei Kogyo Co., Ltd., Tokyo, Japan
Filed Oct. 7, 1986, Ser. No. 916,202
Claims priority, application Japan, Apr. 14, 1986, 61-85641
Int. Cl.⁴ A63H *17/00, 33/20*
U.S. Cl. 446—435 **8 Claims**

1. A toy vehicle comprising:
a vehicle body;
wheels rotatably mounted to said vehicle body;
a parachute;
housing means mounted to said vehicle body for accommodating said parachute in a storage state;
discharge means for ejecting said parachute from said housing means during motion of said vehicle body, said discharge means including a spring-loaded pusher element;
locking means operatively engageable with said discharge means for selectively preventing operation thereof; and
releasing means including a camming mechanism operatively engageable with said locking means for releasing said locking means and thereby enabling said discharge means to eject said parachute from said housing means,



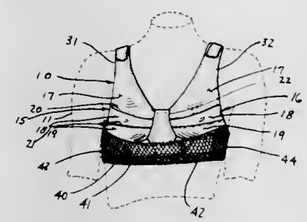
said releasing means including a remote-controllable motor operatively connected at an output to said camming mechanism.

4,781,650
PROSTHETIC GARMENT FOR BILATERAL MASTECTOMY
Isabelle A. Budd, 2832 Innis Road, Gloucester, Ontario, Canada K1B 4K4
Filed Nov. 9, 1987, Ser. No. 117,966
Claims priority, application Canada, Nov. 13, 1986, 522939
Int. Cl.⁴ A41C *3/10*
U.S. Cl. 450—55 **6 Claims**



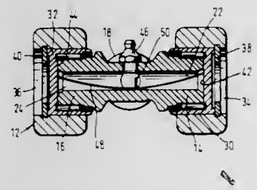
1. A prosthetic garment comprising a generally cylindrical member defined by front and rear lightweight yieldable panel members stitched together to form a unitary garment adapted to generally encircle the upper torso of a wearer, said front panel member having an upper front member in the form of a pair of breast flaps adapted to correspond in location to the breasts of said wearer, said front panel member having a lower front member, said rear panel member having upper and lower rear members, the first of said breast flaps being connected to said upper member of said rear panel by a first strap member, the second of said breast flaps being connected to said upper member of said rear panel by a second strap member, each of said breast flaps having an internal panel generally corresponding in shape to the shape of said breast flaps and being secured thereto so as to define a pocket, an opening formed in said internal panel, said pocket being adapted to receive a breast insert inserted through said opening, said upper and lower front panel members being formed of opposing upper and lower panels adapted to be connected together generally at the center of said front panel by securing means.

4,781,651
ATHLETIC SUPPORT BRASSIERE
Christina L. Ekins, 21227 De La Guerra St., Woodland Hills, Calif. 91364
Filed Jul. 15, 1987, Ser. No. 73,524
Int. Cl.⁴ A41C *3/00*
U.S. Cl. 450—79 **8 Claims**



1. A support brassiere for athletic activities comprising:
a pair of flexible breast-receiving cups, made of non-stretchable material inelastically joined to each other at the front center of the brassiere;
an encircling band stretched to the bottom margins of said cups, providing sufficient elasticity to enable the brassiere to pass over the shoulders and fit over the breasts, and enabling free breathing of the wearer;
a stabilizer strip comprising a pair of stabilizer strip parts each stitched to said encircling band at locations spaced from said front center, and having free ends adapted to be fastened to one another, said stabilizer strip being flexible, inelastic and non-stretchable, so disposed and arranged as to fit flat against the rib cage immediately beneath the breasts; and
a pair of shoulder straps each attached to the back of said encircling band and to a respective cup to support said cups from above.

4,781,652
LUBRICATION ARRANGEMENT FOR HOOKES JOINT
Hubert Geisthoff, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Fed. Rep. of Germany
Filed Apr. 21, 1987, Ser. No. 41,677
Claims priority, application Fed. Rep. of Germany, May 17, 1986, 3616810
Int. Cl.⁴ F16D *3/41*
U.S. Cl. 464—14 **11 Claims**



1. A lubrication arrangement for a Hookes joint comprising a cross member and two yokes, the cross member having four radially extending journals arranged in two pairs, the journals in each one of said two pairs thereof being coaxial with one another and the axes of the two pairs of journals being perpendicular to one another, the journals of one said pair thereof being rotatably mounted in bearing assemblies in corresponding ends of one said yoke and the journals of the other said pair thereof being rotatably mounted in bearing assemblies in corresponding ends of the other said yoke; the cross member having

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a lubricant bore extending axially of each journal and having an open end at the associated said bearing assembly for distributing lubricant to the associated bearing assembly; and displacement means within and extending axially through each said bore rotatable with the bearing assemblies and yokes relative to the cross member for providing uniform unimpeded flow of the lubricant through the bore whereby, upon relative rotation between a yoke and the cross member, the displacement means is rotated relative to the bore within which it is located.

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POWER TRANSMISSION DEVICE FOR MOTOR VEHICLE

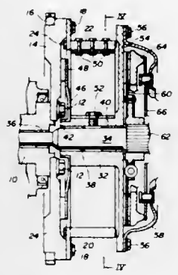
Koyo Nakamura, Yokosuka; Yukihiro Etoh, Yokohama; Kenji Okamura, Yokosuka, and Yoshiji Shimaoka, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 23, 1985, Ser. No. 812,405

Claims priority, application Japan, Dec. 27, 1984, 59-281342; May 10, 1985, 60-69230[U]; May 31, 1985, 60-118575

Int. Cl.[4] F16D *3/12*

U.S. Cl. 464—58 **3 Claims**



1. A power transmission device for a motor vehicle having an engine with a crank shaft and flywheel and a transmission with a transmission input shaft, comprising:

means for providing a torque transmission connection between the crankshaft and the transmission input shaft, said torque transmission connection providing means including a spring spring assembly operably disposed between the crankshaft and the transmission input shaft to allow relative angular displacement between the crankshaft and the transmission input shaft;

vibration damping means separate from said spiral spring assembly for providing resistance to said relative angular displacement between the crankshaft and the transmission input shaft;

said spiral spring assembly including an outer ring and an inner sleeve, a plurality of spiral springs having inner ends thereof fastened to said inner sleeve and having outer ends thereof fastened to said outer ring at locations substantially equi-angularly distant from each other;

said outer ring being connected to a flywheel of said crankshaft; and

said vibration damping means includes a friction plate and a belleville spring fastened to said inner sleeve and having a radially outward end portion fixed to said friction plate such that bias force of said belleville spring biases said friction plate into frictional engagement with the flywheel, said spiral springs being spirally wound about the longitudinal axis of said inner sleeve.

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RESILIENT SHAFT COUPLING

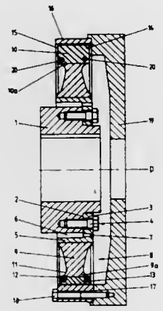
Jürgen Walter, Haltern; Manfred Lunke, and Ulrich Falz, both of Dortmund, all of Fed. Rep. of Germany, assignors to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Dec. 17, 1986, Ser. No. 943,648

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545027

Int. Cl.[4] F16D *3/77*

U.S. Cl. 464—89 **4 Claims**



1. In a resilient shaft coupling having radially inner rigid hub-like coupling part, an outer rigid coupling part, and a unitary, annular intermediate member that is made of an elastomeric material and is operative to transmit torque between said rigid parts, with said intermediate member being secured to said inner coupling part by vulcanization, and with the radially outer periphery of said intermediate member being provided with pinion-like first toothing means for meshing engagement, with provision for axial movement relative to a companion inner second toothing means also for meshing engagement of said onter coupling part during a positive connection effected by meshing engagement of said first and second toothing means, whereby said intermediate member comprises: a radially inner zone as a member of uniform torsional strength, said zone having an axial thickness that decreases radially outwardly; a short transition zone; and an outer zone which has said pinion-like first toothing means for meshing engagement on its radially outer periphery, with a radially inner interface being provided between said outer zone and said transition zone, the improvement in combination therewith which comprises:

closed metal rings embedded as provided in axially projecting annular regions of said outer zone of said intermediate member located near said radially inner interface between said outer zone and said transition zone, with at least one of said closed metal rings being disposed near each of the two axially outer surfaces of said outer zone, said metal rings being embedded in the material of said outer zone in a manner disposed concentric to the rotational axis of said coupling so that said metal rings serve to attain a radial support of the axially projecting annular regions via radially directed support forces to protect against bending and premature destruction of the annular regions of said intermediate member especially endangered relative to said radially inner zone during loading of the shaft coupling as well as to resist radial-pressure tensioning forces taken up by said closed metal rings in the shaft coupling to provide a resilient shaft coupling having a relatively high torsional resilience yet able reliably to transmit higher torques than comparable shaft couplings of substantially the same size.

4,781,655

SYSTEM FOR CONTROLLING THE PRESSURE OF OIL IN A SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

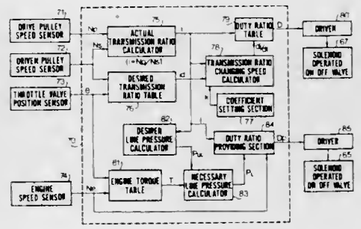
Kazunari Tezuka, Asaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

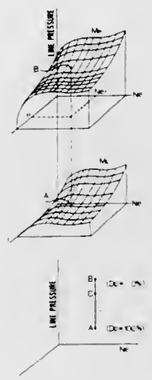
Filed Mar. 27, 1987, Ser. No. 31,986

Claims priority, application Japan, Mar. 13, 1986, 61-73690

Int. Cl.[4] F16H *11/02;* **B60K** *41/12*

U.S. Cl. 474—28 **12 Claims**





1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine, the transmission comprising a drive pulley including a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable disc and a second hydraulic cylinder for shifting the disc of the driven pulley, and a belt engaged with both pulleys, the control system including a line pressure control valve providing line pressure and having ports and a spool, a transmission ratio control valve having ports and a spool, and a first hydraulic circuit having a pump for supplying oil to the first hydraulic cylinder through the line pressure control valve and transmission ratio control valve, the latter controlling the transmission ratio of the transmission by controlling the amount of the oil supplied to the first hydraulic cylinder, the improvement in the control system comprising:

a second hydraulic circuit for supplying control oil to the line pressure control valve for shifting the spool of the line pressure control valve;

a solenoid operated control valve controllable by control pulses and provided in the second hydraulic circuit for controlling amount of the control oil supplied to the line pressure control valve so as to shift the spool of the line pressure control valve dependent thereon;

an engine speed sensor for producing an engine speed signal corresponding to engine speed;

a drive pulley speed sensor for producing a drive pulley speed signal corresponding to speed of the drive pulley;

a driven pulley speed sensor for producing a driven pulley speed signal corresponding to speed of the driven pulley;

a first calculator for producing an actual transmission ratio signal in accordance with said drive and driven pulley speed signals;

a second calculator for determining a necessary line pressure in accordance with operating conditions of the engine and said actual transmission ratio signal; and

first means including:

a first three-dimensional table storing values, representing high line pressures obtained by a minimum duty ratio of said control pulses, as a function of engine speed and actual transmission ratio; and

a second three-dimensional table storing values, representing low line pressures obtained by a maximum duty ratio of said control pulses, as a function of engine speed and actual transmission ratio;

said first means for determining a value of a high line pressure and a value of a low line pressure from said first and second tables, respectively, in accordance with said actual transmission ratio signal and said engine speed signal;

said first means being further responsive to said necessary line pressure and said determined values of said high and low line pressures for producing in accordance with said necessary line pressure and said determined values of said high and low line pressures a necessary duty ratio of said control pulses for operating said solenoid operated control valve to control the line pressure to a corrected necessary line pressure.

4,781,656

VARIABLE SPEED POWER TRANSMISSION PULLEY AND SYSTEM

George E. Brackett, Bonita Springs, and Thomas A. Murphy, Marco Island, both of Fla., assignors to Maxaxam Corporation, Dover, Del.

Filed Jun. 18, 1987, Ser. No. 64,087

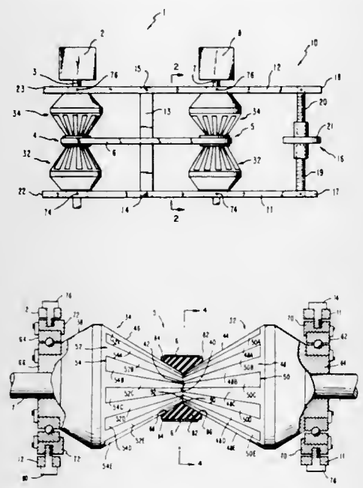
Int. Cl.[4] F16H *9/20*

U.S. Cl. 474—29 **20 Claims**

1. An adjustable power transmission pulley, comprising a pair of generally conical pulley sections, each of said sections having a base portion, an apex portion and a generally conical outer surface thereon formed by a plurality of generally axially extending, circumferentially spaced, segments which project from said base portion toward said apex portion, the segments of one of said sections inter-engaging with the segments of the other of said sections to form a support surface therebetween, the minimum diameter of said support surface being variable by axially relatively moving said sections toward or away from one another, between positions of maximum approach and maximum separation; and, an annular elastomeric member mounted on said support surface, said elastomeric member having generally conical internal surfaces thereon which correspond to the conical outer surfaces of said sections and having a generally cylindrical outer surface thereon, said conical internal surfaces of said elastomeric member having a mini-

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mum internal diameter, when unstretched, that is no greater than the minimum external diameter of said support surface



when said pulley sections are at their positions of maximum separation from one another.

4,781,657

FRONT DERAILLEUR FOR A BICYCLE

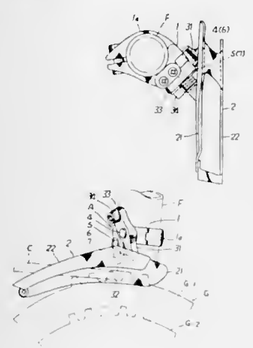
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 23, 1987, Ser. No. 41,524

Claims priority, application Japan, Apr. 28, 1986, 61-64938[U]

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—78 **2 Claims**



1. A front derailleur for a bicycle, said derailleur comprising:

(a) a linkage mechanism comprising a fixing member, a chain guide having an inner guide plate and an outer guide plate, and linkage members supporting said chain guide to said fixing member, said linkage members being oriented substantially vertically when said derailleur is mounted on said bicycle; and

(b) pivot shafts for pivotally supporting said linkage members to said fixing member and said chain guide, each of said pivot shafts having a longitudinal axis which is (i) oriented within respective horizontal planes substantially normal to said central vertical plane of said bicycle and (ii) slanted forwardly relative to a longitudinal direction of the bicycle when said front derailleur is mounted on said bicycle, with each of said pivot shafts having a fore end which is positioned closer to said fixing member than to said chain guide and a rear end which is positioned closer to said chain guide than to said fixing member, said chain guide, responsive to actuation of said derailleur, moving substantially within a vertical plane oriented substantially perpendicular to a horizontal plane normal to said central vertical plane of said bicycle in a direction oblique with respect to an axis of a front gear assembly of said bicycle forwardly of said bicycle from a rest position of said derailleur.

4,781,658

POWER TRANSMISSION MECHANISM

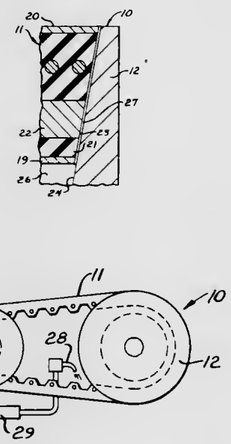
Hiroshi Takano, Miki; Shinichi Takagi, Hyogo, and Akihiro Fujita, Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Jan. 12, 1983, Ser. No. 457,466

Claims priority, application Japan, Feb. 12, 1982, 57-21482

Int. Cl.⁴ F16H *57/04*

U.S. Cl. 474—91 **19 Claims**



1. In a V-belt power transmission mechanism having power transmitting pulleys provided with belt receiving peripheral grooves defining opposed sidewalls, and a V-belt entrained about said pulleys and having exposed side edge surfaces comprising at least in part rubber surfaces facially engaging said groove sidewalls to have functional drive relationship therewith, the improvement comprising:

means for providing a thin film of lubricant fluid between said belt side edge surfaces and said groove sidewalls for reducing the coefficient of friction therebetween are reducing noise and heating of the V-belt.

4,781,659

TORSIONAL VIBRATION DAMPER WITH A V-BELT PULLEY CONNECTED THERETO

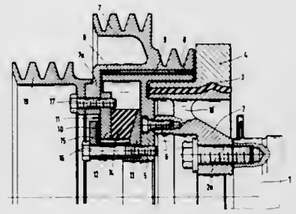
Hans Gebhardt, Langenzenn, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 111,444

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635702

Int. Cl.⁴ F16H *55/14*

U.S. Cl. 474—94 **3 Claims**



1. A vibration damper, for damping rotating masses, including a primary part that is adapted to be mounted on a shaft, especially a crankshaft of a multi-cylinder reciprocating-piston internal combustion engine, and a secondary part that is disposed in the radial direction relative to said primary part and is connected to the latter via an elastic damping means, preferably of rubber, with a support element for a V-belt pulley furthermore being secured to said primary part, said vibration damper further comprising:

a coupling element disposed between said V-belt pulley and said support element, with said coupling element comprising an inner part, an outer part, and a vulcanized elastomeric block that is disposed between said inner and outer parts, with said elastomeric block being made of a soft rubber mixture that has a high degree of torsional elasticity; and

respective radial bearing means and axial bearing means for said V-belt pulley, with said support element providing a bearing support for said radial bearing means, and said outer part of said coupling element providing a bearing support for said axial bearing means.

4,781,660

V-PULLEY FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Atsushi Amataka, Tokyo; Mikio Kubo, and Yoshitoshi Hagiwara, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

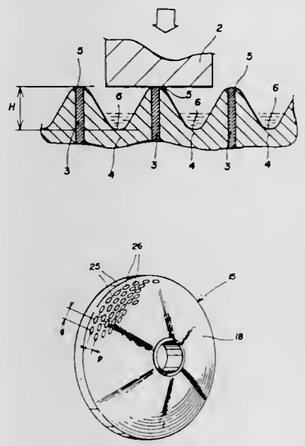
Filed Jul. 6, 1987, Ser. No. 69,982

Int. Cl.⁴ F16H *55/36*

U.S. Cl. 474—174 **7 Claims**

1. A V-pulley apparatus adapted for a continuously variable transmission which uses a chain belt composed of a plurality of chain block connected in its longitudinal direction, and a pair of V-pulleys operatively connecting each other through the chain belt, comprising:

a pair of conical pulley faces that the chain belt contacts, each face of which being provided with a rough surface and a combination pattern of abrasion-prone and abrasion-resistant sections alternately arranged at intervals shorter



than the length and width of contact of each chain block with the respective pulley faces.

4,781,661

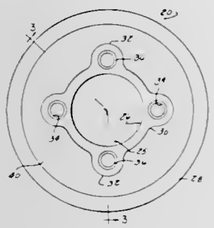
BOSS MOUNTED, NON-METALLIC PULLEY

John E. Emmett, 30159 Old Bedford, Farmington Hills, Mich. 48018

Filed Jun. 19, 1987, Ser. No. 63,661

Int. Cl.⁴ F16H *55/48*

U.S. Cl. 474—190 **20 Claims**

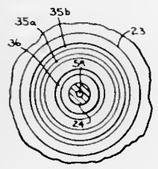


1. A boss mounted, non-metallic pulley comprising:

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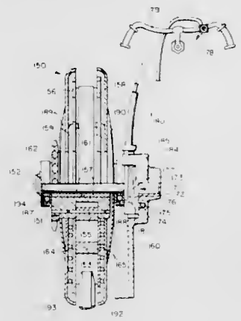
a base member having a radially extending hub and an axially projecting sidewall formed on a surface of the hub;
an annular pulley track, formed on an outer periphery of the base member, axially off-set with respect to and perpendicular to the hub; and
a boss carrier formed on a surface of the base member and integral therewith, said boss carrier including a plurality of radially extending bosses and a mounting bore formed in each boss extending axially from the annular pulley track through the base member.

4,781,662
UNIVERSAL JOINT WITH IMPROVED LUBRICATION
Roger D. Mayhew, Fredonia, and Irwin F. Whitty, Campbellsport, both of Wis., assignors to Weasler Engineering, Inc., West Bend, Wis.
Continuation-in-part of Ser. No. 797,790, Nov. 14, 1985, Pat. No. 4,650,439, which is a continuatioo of Ser. No. 679,814, Dec. 10, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 887,484
Int. Cl.[4] F16D *3/26*
U.S. Cl. 464—14 **3 Claims**



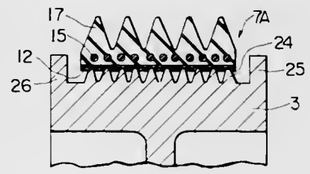
1. A universal joint, comprising:
a first member with a first axis of rotation;
a second member pivotally connected to the first member; and
a lubrication passageway comprising:
an arcuate groove in said first member, said groove being in a first plane which is spaced apart from the first axis of rotation and is perpendicular to an imaginary line which is normal to the first axis of rotation, said arcuate groove having an entry portion on one side of a second plane which is normal to the first axis of rotation and which intersects the groove where the groove is farthest from the first axis of rotation and said groove having an exit portion on the other side of said second plane;
a first passageway in communication with one of said portions for providing lubricant to the groove, said portion being the entry portion; and
a second passageway in communication with and extending radially inward from the other one of said portions for directing lubricant from the groove to a sliding surface radially inward from the groove, said portion being the exit portion;
wherein the centrifugal force gradient increases from any point in the groove where the second passageway is in communication with the groove to any point in the groove where the groove is farthest from the first axis of rotation; and
wherein lubricant is admitted to the universal joint through the groove from the entry portion to the exit portion and then to the second passageway such that backflow through the second passageway due to centrifugal force is impeded by the groove; and
wherein the first member includes a bearing press fitted in a recess and the groove is defined between the bearing and the recess.

4,781,663
TORQUE RESPONSIVE AUTOMATIC BICYCLE TRANSMISSION WITH HOLD SYSTEM
James B. Reswick, 1003 Dead Run Dr., McLean, Va. 22101
Continuation-in-part of Ser. No. 6,155, Jan. 23, 1987, Pat. No. 4,741,546, which is a continuation-in-part of Ser. No. 823,463, Jan. 28, 1986, Pat. No. 4,652,250, which is a division of Ser. No. 593,928, Mar. 27, 1984, Pat. No. 4,608,034. This application Apr. 27, 1987, Ser. No. 42,808
Int. Cl.[4] F16H *9/10*
U.S. Cl. 474—49 **15 Claims**



1. A variable speed ratio transmission system comprising:
a drive pulley having means to mount said drive pulley for rotation on a shaft and a driven pulley having means to mount said driven pulley for rotation on a second shaft;
said pulleys each having annular drive surface means for receiving an endless flexible transmission belt passed over said pulleys and for transmitting torque between said drive pulley and said driven pulley through said belt;
means for varying the diameter of said driven pulley annular drive surface means between an expanded position and a plurality of contracted positions including means for constantly biasing said drive pulley toward said expanded position and means for contracting said drive pulley to said plurality of contracted positions from said expanded positions against said biasing means in response to a torque exceeding a predetermined torque applied to said driven pulley and transmitted to said drive pulley through the belt;
means for varying the diameter of said driven pulley annular drive surface means between a contracted position and a plurality of expanded positions and means for expanding said driven pulley to said plurality of expanded positions in response to a decrease in diameter of said drive pulley;
said drive and said driven pulley annular drive surface means including a plurality of belt engaging segments having axially opposed surfaces;
said drive pulley having plate means mounted on said shaft for free relative rotation with respect to said shaft adjacent each of said opposite surfaces of said belt engaging segments; and
said drive pulley having means for holding said drive pulley annular drive surface in one of said contracted positions including means for applying an axial force to each of said belt engaging segments through said plate means.

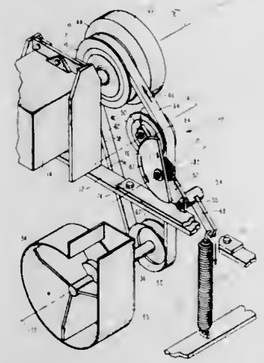
4,781,664
DRIVE POWER TRANSMISSION SYSTEM
Junji Imamura, Hyogo, Japan, assignor to Mitsuboshi Belting Ltd., Kobe, Japan
Continuation of Ser. No. 215,585, Dec. 11, 1980, abandoned, which is a continuation of Ser. No. 35,661, May 3, 1979, abandoned. This application Jun. 2, 1983, Ser. No. 499,673
Claims priority, application Japan, Nov. 27, 1978, 53-163633
Int. Cl.[4] F16H *7/00*; F16G *1/28*
U.S. Cl. 474—87 **9 Claims**



1. In a device of a power transmission system having a driving pulley, a plurality of driven pulleys, and a power transmission belt having outer and inner surfaces laid in a serpentine manner over said pulleys, the improvement comprising: said driving pulley and at least one driven pulley contacting the inner surface of said power transmission belt, said pulleys in contact with the inner surface having a plurality of circumferentially arranged V-grooves, each of said V-grooves being fitted to ribs formed on the inner surface of said belt, and the remaining pulley or pulleys engaging the outer surface of said power transmission belt and having a plurality of semicircular protrusions extending circumferentially outwardly therefrom arranged in parallel and axially spaced at equal intervals, said protrusions having a height in a range of 0.5 mm to 3.0 mm, said protrusions being relatively small with respect to said ribs, said protrusions engaging the outer surface of said belt such that transverse shifting of said belt is prevented while torque is transmitted from said belt to said remaining pulley or pulleys, and said power transmission belt being an endless belt having a plurality of said ribs arranged longitudinally thereof, said ribs being substantially equal in section along the widthwise direction of said belt, and said outer surface of said belt being at least initially substantially flat.

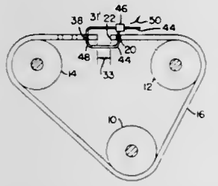
4,781,665
POWER-DELIVERY BELT-TENSIONING SYSTEM
Dean M. Walker, Fort Collins, Colo., assignor to Walker Manufacturing Company, Fort Collins, Colo.
Filed Aug. 31, 1987, Ser. No. 91,412
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—133 **6 Claims**

1. A power-delivery belt-tensioning system comprising:
a source of rotary motive power;
a first pulley mounted for rotation about a predetermined axis;
means for coupling said power from said source to said pulley;
a second pulley mounted for rotation about a given axis spaced from and parallel to said predetermined axis;
a driven device responsive to rotary power;
means for coupling rotary power from said second pulley to said driven device;
a flexible endless belt seated on and circling around said first and second pulleys to deliver power from said first pulley to said second pulley;
an idler pulley mounted for rotation about another axis parallel to said given axis and displaceable to move said idler pulley toward and away from said belt with said idler pulley being aligned with said first and second pulleys to seat against a portion of said belt and, during operation, normally said belt in a preselected degree of tension;
means associated with said power delivery system for changing the level of power available to be delivered to said driven device;
means for resiliently urging said idler pulley against said belt to create tension in said belt;



and means responsive to a surge in power delivered from said source to said driven device, with consequent incremental increase of tension in said belt, for maintaining said preselected degree of tension in said belt upon cessation of said surge in power.

4,781,666
EMERGENCY DRIVE BELT AND METHOD FIELD OF THE INVENTION
Acee M. Acee, Sr., Box 241, R.R. 1, Whiteboro, N.Y. 13492
Filed Oct. 8, 1987, Ser. No. 106,130
Int. Cl.[4] F16G *3/00*; B65D *63/00*
U.S. Cl. 474—253 **7 Claims**



1. An emergency drive belt device comprising a belt-shaped flexible and stretchable member of polymeric material, said belt-shaped polymeric member having an aperture spaced closely adjacent to a first end thereof and a plurality of spaced apart apertures extending along the longitudinal axis of the belt-shaped polymeric member away from the other end thereof such that said belt-shaped polymeric member can be shortened by cutting between spaced apart apertures to provide a belt-shaped member length which is slightly less than that which is required to provide a complete loop around a drive pulley and preselected driven pulleys; coupling means comprising a flexible and deformable tie member of substantially lesser length than said belt-shaped polymeric member, said tie member having an integral ratchet means and said tie member being threadable serially through the two apertures which are adjacent respective ends of the belt-shaped polymeric member and through said ratchet means and being en-

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gageable therewith to form an adjustable loop coupling the respective ends of said belt-shaped polymeric member, said loop being adjustable to increasingly smaller size by pulling said tie member to increase the portion thereof which passes through said ratchet means and thus increase the tension in the belt-shaped polymeric member when said belt-shaped polymeric member is in-place and looped around, said drive pulley and one or more preselected driven pulleys.

4,781,667

SECOND-FOLD ROLLERS FOR A FOLDING DEVICE

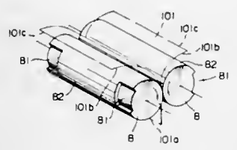
Mitsuo Kitai, Kanagawa, Japan, assignor to Kabushikigaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,876

Claims priority, application Japan, Mar. 28, 1986, 61-45871[U]

Int. Cl.⁴ B65H *45/16*

U.S. Cl. 493—359 **5 Claims**



1. In a folding apparatus for forming folded sheets from an advancing paper web, comprising means for longitudinally folding the web to a given width, a pair of parallel second fold rollers forming a nip and having a length greater than said given width, and means for cutting the longitudinally folded web into sheets and inserting said sheets into the nip of said second fold rollers for forming a transverse fold in said sheets in such a manner that rear corners on said sheets pass between said second fold rollers, wherein each of the pair of said second fold rollers has a first cylindrical surface with at least one of the pair being provided with at least one non-contact section so formed in an end of the roller and extending coaxially with the longitudinal axis of the roller as to prevent contacting the rear corners of the sheets passing between the second-fold rollers, the non-contact section being a recess in the first cylindrical surface, said recess having a second cylindrical surface concentric with said first cylindrical surface and having sidewalls extending radially and coaxially with the longitudinal axis for interconnecting said first and second cylindrical surfaces.

4,781,668

CUTTING DEVICE FOR A CORRUGATED BOX MACHINE

Donald E. Mowry, Norwalk, Ohio, assignor to Don Mowry Flexo, Inc., Norwalk, Ohio

Filed Oct. 30, 1986, Ser. No. 925,062

Int. Cl.⁴ B26D *1/24*

U.S. Cl. 493—365 **18 Claims**

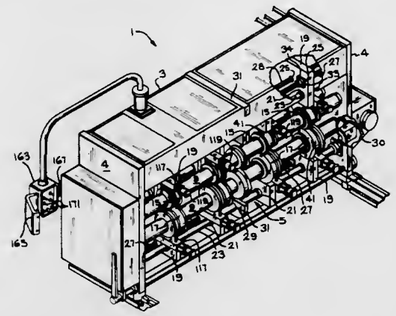
1. A cutting device comprising:

opposed rotatable shafts;

cutting and cooperating heads positioned on said shafts, said heads being disposed for cutting or scoring material passed through said heads;

a hub assembly connected to at least one of said heads, said hub assembly positioned on said rotatable shaft and releasably securing said head to said shaft; said hub assembly locking said head on said shaft;

said hub assembly including at least one wedge member, a rotatable member positioned adjacent said hub assembly, said rotatable member being rotatable to engage said hub assembly, said hub assembly including a sleeve positioned on said shaft, said sleeve mounting said wedge member, and means adjacent said wedge member and operatively connected to said rotatable member for engaging sand



disengaging said wedge member wherein said heads can be repositioned along said shafts.

4,781,669

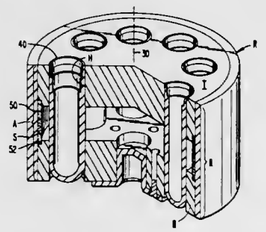
COMPOSITE MATERIAL CENTRIFUGE ROTOR

Alireza M. Piramoon, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 58,435, Jun. 5, 1987. This application Oct. 9, 1987, Ser. No. 107,187

Int. Cl.⁴ B04B *1/00, 7/08*

U.S. Cl. 494—16 **10 Claims**



1. A composite rotor construction comprising in combination a top disk and a bottom disk, each said disk fabricated from laminated layers with longitudinally extending fibers for reinforcing, said fibers bound together with resins;

said laminated layers having a sequentially repeating pattern of radial directions having different angular orientations with respect to a selected radii extending normal to the spin axis of said rotor, each said laminated layer being normal to the spin axis of said rotor;

a spacer ring comprising a wound fiber hoop sandwiched between said top disk and said bottom disk to form a rotor assembly; a radial fiber hoop cured to shrink under tension over the periphery of said rotor assembly and overlie the outside surface of said top disk, said bottom disk and said spacer ring therebetween whereby said rotor assembly at said top disk, bottom disk and spacer ring are radially compressed with respect to the spin axis of said rotor equal and opposite to the dynamic forces of radial tension on said rotor; and

said bottom disk defining a hub aperture;

a hub placed within said hub aperture in said bottom disk, said hub adapted for fitting into said aperture under a shrink fit.

4,781,670

CENTRIFUGE DRUM

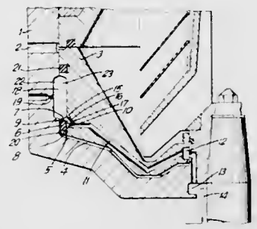
Werner Kohlstette, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 62,282

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1986, 3621074

Int. Cl.⁴ B04B *1/14, 11/00*

U.S. Cl. 494—27 **7 Claims**



1. In a self-emptying centrifuge drum, with at least one chamber that accommodates a control fluid and that is demarcated by a concentric component inserted into the drum and has an annular groove located at an outer diameter thereof and a sealing ring in the annular groove and configured to rest against a cylindrical surface in the drum to seal off the chamber, the improvement wherein the sealing ring is elastic and wherein the annular groove has an annular base and wherein the groove is configured to permit radial movement of the sealing ring to radially move towards and away from the annular base, at least one channel extending radially inwardly from the base and in fluid communication with the annular groove, means for supplying control medium to the channel to radially move the sealing ring away from the annular groove and seal off the chamber and means for effecting the outlet of the control medium from the channel to radially move the sealing ring towrads the annular groove and open the seal of said chamber.

4,781,671

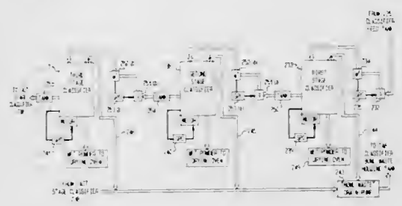
SYSTEM FOR CLASSIFICATION OF PARTICULATE MATERIALS

Richard L. Pober, Waban, and Bruce E. Novich, Lexington, both of Mass., assignors to Ceramics Process Systems Corporation, Cambridge, Mass.

Filed Mar. 28, 1987, Ser. No. 28,891

Int. Cl.⁴ B04B *5/00*

U.S. Cl. 494—31 **13 Claims**



1. A multi-component semi-continuous system for the classification of colloids in a liquid suspension, comprising:

(i) an array of units, including a first unit and a second unit for classifying suspended colloids, each unit including a centrifuge device having a colloids input and a fines output and also including a static fluid layer in the bowl of each centrifuge device adjacent the bowl wall and rotating along with the bowl;

(ii) transport means for transporting the fines output of the centrifuge device in the first unit to the colloid input of the centrifuge device in the second unit, so that colloids can be transported therebetween;

(iii) dispersion means for subjecting a mixture of colloids and liquid to mechanical energy to provide a well-dispersed suspension of the colloids in the liquid;

(iv) first control means for regulating a mass flow rate through the colloidal input of each unit; and

(v) second control means for regulating a rotation rate of each centrifuge device, the first control means and the second control means effective to provide a sub-micron classification fraction of the colloids in at least one of the units.

4,781,672

THREE STAGE IMPLANTABLE FLOW CONTROL VALVE WITH IMPROVED VALVE CLOSURE MEMBER

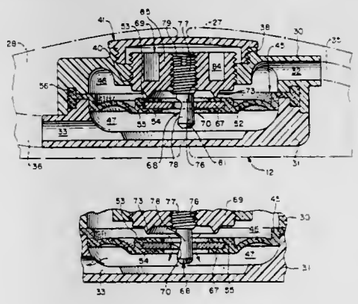
Michael D. Hooven, Valencia, Calif., assignor to Cordis Corporation, Miami, Fla.

Filed Oct. 21, 1986, Ser. No. 922,079

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.⁴ A61M *27/00*

U.S. Cl. 604—9 **13 Claims**



1. A valve for controlling the passage of body fluids from one location in the body to another location, comprising:

a housing having first and second interior chambers;

inlet port means for establishing fluid communication between said first chamber and the one location;

outlet port means for establishing fluid communication between said second chamber and the other location;

partition means in said housing separating said first and second chambers and being movable in response to fluid pressure differential therebetween;

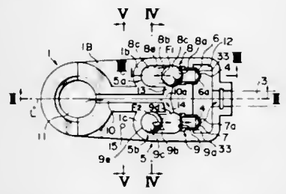
a valve seat forming part of said partition means and defining a fluid flow orifice to permit flow of fluid between said chambers;

a valve closure member including an annular valving surface in said first chamber for engaging said partition means in registry with and surrounding said orifice to prevent flow through said orifice when said pressure differential falls below a predetermined minimum level; and

a valve stem extending from said valve closure member and through said orifice into said second chamber, said valve stem including a flow metering surface which coacts with said valve seat to meter said fluid flow through said orifice as a function of the position of said partition means when said pressure differential exceeds said predetermined minimum level.

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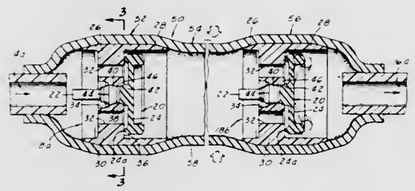
4,781,673
BRAIN VENTRICLE SHUNT SYSTEM WITH FLOW-RATE SWITCHING MECHANISM
Yasuo Watanabe, Komae, Japan, assignor to Kabushiki Kaisha Nihon M.D.M., Tokyo, Japan
Filed Dec. 8, 1986, Ser. No. 938,926
Claims priority, application Japan, Dec. 20, 1985, 60-286950; Oct. 22, 1986, 61-25138
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—9 **20 Claims**



1. In a brain ventricle shunt system with a flowrate switching means, said system comprising a brain ventricle catheter adapted to be inserted at a tip portion thereof into the brain ventricle so as to drain cerebro-spinal fluid from the brain ventricle, a peritoneum or auricle catheter adapted to be inserted at a tip portion thereof into the peritoneum or the auricle so as to feed said cerebro-spinal fluid into said peritoneum or auricle, and a shunt main body connected at one end thereof to a base portion of said brain ventricle catheter and at another end thereof to a base portion of said peritoneum or auricle catheter so as to fluidically communicate said brain ventricle catheter and said peritoneum or auricle catheter with each other, the improvement comprising:
check valve means disposed within said shunt main body for preventing said cerebro-spinal fluid from flowing back from said peritoneum or auricle catheter to said brain ventricle catheter; and
flow rate switching means provided within said shunt main body for altering the flow rate of said cerebro-spinal fluid from said brain ventricle catheter to said peritoneum or auricle catheter;
said flow-rate switching means comprising a predetermined plurality of flow passages connecting said brain ventricle catheter and said peritoneum or auricle catheter, a predetermined plurality of flow rate regulators interposed respectively within said flow passages for controlling the flow rates through said respective flow passages to predetermined flow rates, and a predetermined plurality of ON-OFF valves interposed respectively within said plurality of flow passages so as to individually close said flow passages upon the application of external drive forces thereto.

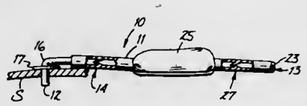
4,781,674
FLUID FLOW CONTROL VALVE
Russell Redmond, Goleta, and Claude Vidal, Santa Barbara, both of Calif., assignors to VIR Engineering, Goleta, Calif.
Filed Jan. 30, 1987, Ser. No. 9,516
Int. Cl.⁴ A61M *5/00*
U.S. Cl. 604—9 **10 Claims**

1. A fluid control device for controlling the flow of fluid from one region of the body to be drained to another region, said device comprising a housing having a fluid inlet and a fluid outlet and a valve assembly carried within said housing intermediate said fluid inlet and said fluid outlet, said valve assembly comprising:
(a) an elastomeric valve member comprising:
(i) a valve element; and
(ii) an integrally formed, substantially cylindrically shaped elongated stem extending from said valve element, said stem being yieldably deformable along its length and including an enlarged diameter portion of predetermined length having longitudinally spaced first and second shoulders;
(b) a valve body comprising a rim portion closely receivable within said housing and a transversely extending web portion, said web portion having a fluid passageway therethrough and including:
(i) a valve seat for engagement by said valve element to control the flow of fluid through said fluid passageway; and
(ii) a central bore defining a cylindrical section of predetermined length and diameter for closely receiving said



enlarged diameter portion of said valve member to position said valve member within said valve body, said cylindrical section including a circumferentially extending edge having a diameter less than that of said second shoulder of said enlarged diameter portion of said stem, said respective lengths of said cylindrical section of said bore and of said enlarged diameter portion of said stem being such that upon exerting a pulling force on said stem, said stem will be yieldably deformed along its length and said second shoulder will engage said second edge of said cylindrical section to maintain said stem in a deformed state, whereby said valve element will exert a predetermined closing pressure upon said valve seat.

4,781,675
INFUSION CANNULA
Thomas C. White, 1701 S. Minnesota Ave., Sioux Falls, S. Dak. 57105-1765
Continuation of Ser. No. 802,517, Nov. 27, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 93,067
Int. Cl.⁴ A61M *27/00*
U.S. Cl. 604—10 **14 Claims**

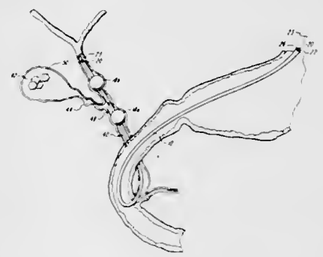


1. An implantable infusion cannula for infusing fluids into an eye, comprising a tube having first and second ends and having a flexible portion therebetween capable of conforming to the curvature of the eye; check valve means positioned between the first and second ends for allowing fulid flow only toward the first end; means adjacent to the first end for securing the tube to an eye wall; and means at said second end for attaching the cannula to a fluid source.

4,781,676
INTERSTITIAL ADMINISTRATION OF PERFLUOROCHEMICAL EMULSIONS FOR REOXYGENATION OF HYPOXIC TUMOR CELLS
Frank K. Schweighardt, Allentown, and David V. Woo, Downingtown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Feb. 20, 1987, Ser. No. 16,812
Int. Cl.⁴ A61N *1/30*
U.S. Cl. 604—21 **17 Claims**

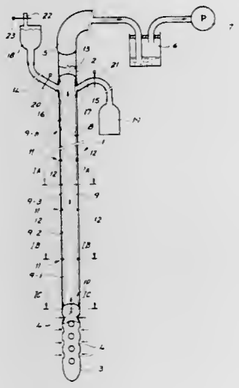
1. A method of treating hypoxic mammalian tumor cells in vivo in a mammal comprising administering an oxygenated fluorochemical emulsion interstitially directly into the hypoxic zones within said tumor and thereafter subjecting the administered cells to an amount of radiation effective to initiate destruction of said cells.

4,781,677
METHOD OF TREATMENT UTILIZING A DOUBLE BALLOON NASOBILIARY OCCLUSION CATHETER
Gilbert M. Wilcox, 95 West St., Portland, Me. 04102
Continuation-in-part of Ser. No. 756,065, Jul. 19, 1985, Pat. No. 4,696,668. This application Sep. 29, 1987, Ser. No. 102,100
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.⁴ A61M *25/00*
U.S. Cl. 604—28 **4 Claims**



1. A method of performing air contrast cholecystrography in the gallbladder of a human body, comprising the steps of:
inserting a double balloon nasobiliary occlusion catheter into a human body so that the catheter extends into the common bile duct on each side of the entrance to the cystic duct; said catheter having passages running therethrough for venting bile, for inflating and deflating balloons, and for infusing and extracting contrast and/or air;
inflating said balloons by forcing a fluid through said inflating and deflating passage, said balloons being inflated to a diameter greater than the diameter of the bile duct so as to isolate the portion of the bile duct between said balloons;
injecting said contrast and/or air through said infusing and extracting passage of said catheter into said isolated portion of the bile duct and into the cystic duct and gallbladder;
extracting said contrast and/or air from said gallbladder and cystic duct through said infusing and extracting passage of said catheter;
while said balloons are inflated, venting bile from the common hepatic duct through a distal end of said catheter through said bile venting passage of said catheter to the proximal end of said catheter;
once said air contrast cholecystography has been completed, deflating said balloons by allowing the inflating fluid to be discharged through said inflating and deflating passage, and
withdrawing the catheter from the body.

4,781,678
SURGICAL DRAIN
Alexandre de Couët, Zürich, Switzerland, and Mohamed Hamid, Schiltigheim, France, assignors to Imtec S.A., Zurich, Switzerland
Filed Mar. 4, 1987, Ser. No. 21,833
Claims priority, application France, Mar. 6, 1986, 86 03321
Int. Cl.⁴ A61M *3/00*
U.S. Cl. 604—45 **13 Claims**



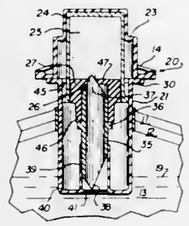
1. A surgical drain for the evacuation in a post-operational phase of harmful secretions appearing at a surgical site, said surgical drain comprising:
a tube having a sustantially closed distal end, at least one lateral orifice provided in close proximity of said distal end, and an open proximal end,
said open proximal end being adapted for having suction applied thereto,
an elastically deformable, substantially sleeve-shaped member, extending substantially coaxially through said tube and defining therein a central passage way communicating with said open proximal end and said lateral orifice, said sleeve-shaped member being fastened in a fluid tight manner to the inner wall of said tube, at least at locations which are respectively close to said proximal end and to said orifice whereby said sleeve shaped member defines with said inner wall of said tube at least one inflatable pocket sealed off with respect to said passage way, and means for selectively supplying pressure medium to said at least one pocket to selectively inflate the same, thereby modifying the overall volume of said central passage way defined by said sleeve shaped member.

4,781,679
CONTAINER SYSTEM WITH INTEGRAL SECOND SUBSTANCE STORING AND DISPENSING MEANS
Mark E. Larkin, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jun. 12, 1986, Ser. No. 873,665
Int. Cl.⁴ A61M *37/00*
U.S. Cl. 604—88 **22 Claims**

1. A container system for separately storing a liquid and a second substance and subsequently dispensing a mixture of the two substances comprising:
container means for containing and delivering a liquid, said container means having walls defining an internal cavity;
sleeve means mounted in a wall of said container, said sleeve means having a pierceable member closing one end thereof;
cup means for containing the second substance, said cup

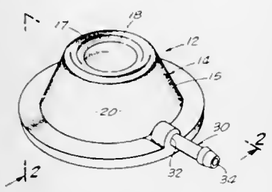
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means being slideably positioned in said sleeve means, said cup means having an open end;
pierceable plunger means slideably positioned within said open end of said cup means;
collapsible cap means positioned over the other end of said sleeve means, and over said cup means; and
hollow piercing means disposed between said pierceable



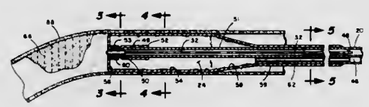
plunger and said pierceable member; whereby as said cup means is urged toward said pierceable member by collapsing said cap means, said piercing means will pierce both said plunger means and said pierceable member, and said plunger means will be forced inwardly of said cup means so as to force said second material from said cup means through said hollow piercing means into said container means.

4,781,680
RESEALABLE INJECTION SITE
Russell Redmond, Goleta, and Claude Vidal, Santa Barbara, both of Calif., assignors to VIR Engineering, Goleta, Calif.
Filed Mar. 2, 1987, Ser. No. 20,725
Int. Cl.[4] A61M *11/00*
U.S. Cl. 604—93 **14 Claims**



14. A subcutaneous injection site for use with a hypodermic needle for delivery of fluids to the body, comprising:
(a) a housing, including:
(i) a base;
(ii) a generally disc shaped elastomeric septum spaced apart from said base said septum being penetrable by the hypodermic needle;
(iii) continuous side walls constructed of a relatively soft elastomeric material interconnected with said base and with said septum to define an internal chamber disposed intermediate said base and said septum said side walls including a dome shaped portion;
(iv) a rigid ring surrounding said generally disc shaped elastomeric septum and disposed interiorly of said continuous side walls and beneath said dome shaped portion; said rigid ring being so constructed and arranged as to continuously exert a radially inwardly directed, uniform compressive force on said elastomeric septum whereby resealing is enhanced following penetration of said elastomeric septum by the hypodermic needle;
(b) connector means associated with said housing for providing a fluid flow path between said internal chamber and the exterior of said housing, and
(c) closure means carried by said base and surrounding said compression means and at least the periphery of said membrane for sealing said internal chamber relative to atmosphere.

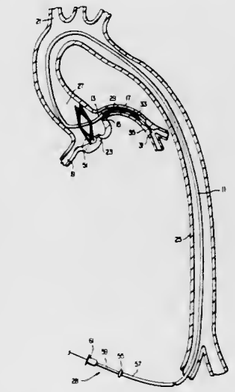
4,781,681
INFLATABLE TIP FOR LASER CATHETERIZATION
James S. Sharrow, and Leonard A. Nordstrom, both of Bloomington, Minn., assignors to GV Medical, Inc., Minneapolis, Minn.
Filed Sep. 15, 1987, Ser. No. 96,926
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—96 **19 Claims**



1. A laser enhanced transluminal balloon catheter, including:
a length of catheter tubing insertable by a distal end thereof into an artery, means forming an optical fiber lumen and a balloon inflation lumen in said catheter tubing, and an optical fiber mounted in said optical fiber lumen, substantially confined axially and slidable longitudinally relative to said catheter tubing, for transmitting laser energy from the proximal end of the catheter tubing to said distal end; and
a pliable balloon member mounted to said catheter tubing along a tubing distal end portion of the said balloon member and said tubing distal end portion forming a fluid tight enclosure in fluid communication with said balloon inflation lumen, said balloon member including a radially inward first section, a radially outward second section parallel to the tubing distal end portion, and an annular distal face section joining said first and second sections, at least a portion of said first section being contiguous with and sealed to said tubing at least proximate said distal end; and
wherein said balloon member is inflatable, responsive to a fluid supplied under pressure through said balloon inflation lumen, to an operating configuration wherein said second section is contiguous with a segment of said artery to positively position said enclosure within and relative to said artery, at least a portion of said distal face section is located distally with respect to said distal end, and wherein said distal face section aligns said first section substantially coaxially with said second section.

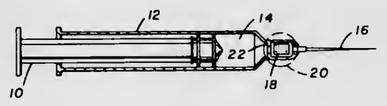
4,781,682
CATHETER HAVING SUPPORT FLAPS AND METHOD OF INSERTING CATHETER
Piyush V. Patel, 2103 W. Michigan, Midland, Tex. 79701
Filed Aug. 13, 1987, Ser. No. 84,827
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—96 **2 Claims**

1. A method of inserting a catheter assembly for use in performing coronary angioplasty, wherein the catheter assembly comprises a dilating catheter having a balloon, an elongated inner tube coaxial with the dilating catheter having a proximate end and a distal end, an elongated outer tube coaxial with the inner tube having a proximate end and a distal end, the distal end of the outer tube being connected to the distal end of the inner tube, wherein the connection between the distal end of the inner tube and the distal end of the outer tube has a plurality of passages for blood flow between the inner tube and the outer tube, a plurality of support flaps formed on the outer tube by a plurality of longitudinal slits capable of radial movement when the outer tube is moved longitudinally relatively to the inner tube, the method comprising the steps of:
introducing the catheter assembly into a femoral artery until the distal ends of the inner and outer tubes of the catheter assembly are located within the patient's aorta;
maneuvering the proximate ends of the inner and outer tubes to insert the distal end of the inner and outer tubes into a selected artery;
moving the proximate end of the outer tube longitudinally



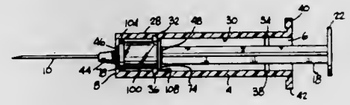
relative to the inner tube, in order to cause a plurality of support flaps to move radially outward from the inner tube and to support the distal ends of the inner and outer tubes in the selected coronary artery;
inserting a dilating catheter having a balloon into the selected artery; and
inflating the balloon with a fluid to enlarge the lumen of the selected artery for allowing the dilating catheter to pass through the selected artery and to perform the necessary angioplasty.

4,781,683
SINGLE-USE, SELF-ANNULLING INJECTION SYRINGE
John J. Wozniak, Columbia, and Kam Leong, Perry Hall, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.
Filed Apr. 22, 1987, Ser. No. 41,036
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 **16 Claims**



1. A single use injection device, comprising:
a variable volume chamber adapted to receive a drug containing water;
an injection needle having an internal lumen, said injection needle connected to said variable volume chamber forming a flow channel between said variable volume chamber and said internal lumen of said injection needle; and
a hydrophilic expansion means composed essentially of a hydrogel, positioned within said flow channel, for expanding and blocking said flow channel after being exposed to said drug containing water, thereby preventing reuse of the injection device, wherein said hydrophilic expansion means comprises a delay means for providing a preset time window greater than thirty seconds from the time of exposure of said hydrophilic expansion means to said drug containing water for injection of the drug before the hydrophilic expansion means blocks said flow channel.

4,781,684
SINGLE USE DISPOSABLE HYPODERMIC SYRINGE
Lewis E. Tremner, 3046 S. Gaylord St., Denver, Colo. 80210
Continuation-in-part of Ser. No. 92,652, Sep. 3, 1987. This application Apr. 15, 1988, Ser. No. 182,235
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 **19 Claims**



1. A single use disposable hypodermic syringe comprising:
a hollow elongated barrel means having an inner surface, at least one open end and another end for use in providing a container for a fluid;
said hollow elongated barrel means having a longitudinal axis;
piston means mounted in said hollow elongated barrel means for reciprocation therein along said longitudinal axis;
plug means on said piston means and in sealing engagement with said inner surface and used to aspirate fluid into said hollow elongated barrel means and to eject said fluid from said hollow elongated barrel means and having at least a portion thereof formed from a resilient but slightly compressible material;
piston rod means secured to said piston means and projecting outwardly from said hollow elongated barrel means through said at least one open end for use in reciprocating said piston means;
said another end having a radially inwardly extending wall portion having a central opening, said radially inwardly extending wall portion providing an annular shoulder for providing a stop for said plug means;
cannula means connected to said central opening;
movement preventing means comprising a first portion movable with said plug means and a second portion in a fixed position on said inner surface of said hollow elongated barrel means; and
said plug means and said first portion having a longitudinal extent greater than the longitudinal extent between said annular shoulder and said second portion so that, when said plug means contacts said annular shoulder and is uncompressed, said second portion will be located between said first portion and said annular shoulder to permit movement of said plug means away from and toward said annular shoulder, but, when said plug contacts said annular shoulder and is compressed, said first portion is located between said second portion and said annular shoulder and in contact with said second portion to prevent movement of said plug means in a direction away from said annular shoulder.

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IMPLANTABLE DRUG-DISPENSING CAPSULE AND SYSTEM FACILITATING ITS USE

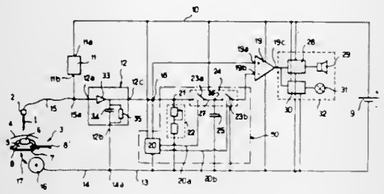
Gérard Lehmann, Neuville de Poitou; Joël Metais, Monts Sur Guesnes; Jean-Francois Meunier, Noisy le Grand, and Jean-Philippe Gautier, Ozoir la Ferriere, all of France, assignors to Celsa Composants Electriques, Monts Sur Guesnes and R. D. M. Medical, Brie Comte Robert, both of, France

Filed Apr. 9, 1987, Ser. No. 36,228

Claims priority, application France, Apr. 16, 1986, 86 05462; European Pat. Off., Apr. 6, 1987, 87 400759.4

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—117 **8 Claims**



1. A system for registering proper introduction of an injection syringe needle into the body of a drug-dispensing capsule implantable under the skin of a patient, said capsule, placed in contact by its outer wall with the patient's body, including an electrically conducting inner wall forming a mechanism for detecting the proximity of the tip of said needle, and said system being equipped with an external signaling device connected to said inner wall and responding to the state of closure through the patient's body of an electrical circuit including said inner conducting wall of the capsule and said needle, the improvement comprising:

an AC generator the input of which is connected to the positive pole of a DC source,

an assembly including a rectifier and filter, said assembly being connected

by a first input terminal to the output of said generator,

by a second terminal to the negative pole of said source,

at least one comparator connected

by lead-out to said signaling device,

by lead-in to a third output terminal of the rectifier/filter assembly and to a comparison unit intended to provide a reference voltage, said comparator being subjected to the difference in voltage between that delivered by said rectifier/filter assembly and that delivered by said comparison unit and being fed, with said signaling device, by said DC source,

a surface electrode placed on a patient's skin, said electrode being connected to the negative pole of the source and, in the circuit's closed state, in series with said needle, the patient's body, and/or said inner wall of the capsule, towards the input terminal of said rectifier/filter assembly.

4,781,686

AUTOMATIC SAFETY VALVES FOR CARDIOTOMY RESERVOIRS

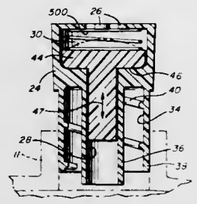
Oscar A. Erickson, 2051 Ridgeview Ave., Los Angeles, Calif. 90041

Continuation of Ser. No. 367,908, Apr. 18, 1982, abandoned. This application Jun. 15, 1987, Ser. No. 62,396

Int. Cl.[4] A61M 1/00

U.S. Cl. 604—118 **11 Claims**

1. In combination with an internally pressurized reservoir having at least one port opening and a cap closing said port opening, said cap including an outer cylindrical portion inserted into the reservoir through said port opening with a sealing fit having an internal helical thread, a body portion connected to said outer cylindrical portion in axially spaced relation to the reservoir and an inner hollow portion projecting axially from the body portion in radially spaced relation to the outer cylindrical portion forming an annular chamber therein pressurized by fluid from the reservoir to maintain said sealing fit, said inner portion having an axial end projecting beyond the outer cylindrical portion into the reservoir, said body portion enclosing a vent chamber therein, said inner portion being fully opened at said axial end thereof and having a vent passage of uniform flow area extending between said fully



opened axial end and the vent chamber, positive pressure opening valve means rendered operative for automatically relieving excessive pressure within the reservoir and valve seat means mounting the valve means on the body portion in fluid communication with the vent passage for rendering the valve means operative in response to said excessive pressure developed at said fully opened axial end of the inner portion within the reservoir axially spaced from the annular chamber without affecting said pressurization thereof.

4,781,687

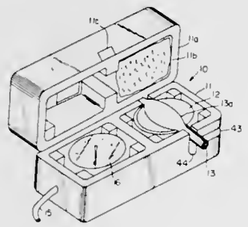
IRRIGATION SYSTEM UTILIZING AIR BLADDER PRESSURE REGULATOR AND METHOD OF USE

R. E. Wall, Laguna Hills, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 16, 1986, Ser. No. 920,043

Int. Cl.[4] A61M 1/00

U.S. Cl. 604—118 **16 Claims**



1. A pressure regulation apparatus for irrigation system comprising:

a housing defining a cavity,

a fitting in said cavity for allowing the passage therethrough of an egress line from an irrigation site for carrying irrigation fluid,

an egress bladder formed in said egress line in said cavity, said egress bladder having a greater cross-sectional area than said egress line,

an air bladder in contact with said egress bladder in said cavity,

means to inflate air bladder whereby an operator may increase the air pressure in said air bladder to restrict the flow in said egress bladder to increase the pressure at the irrigation site,

further whereby an operator may decrease the air pressure in said inflated air bladder for increasing the flow in said egress bladder.

4,781,688

DISPENSING DEVICE FOR A LIQUID MEDICAMENT

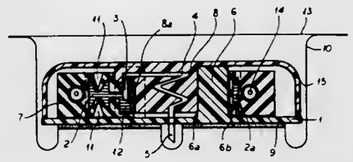
Herwig Thoma, Wiesengasse 3, A-1140 Wien, and Michael Krötlinger, Traisen, both of Austria, assignors to Herwig Thoma, Vienna, Austria

Filed Apr. 6, 1987, Ser. No. 34,884

Claims priority, application Austria, Apr. 4, 1986, 891/86

Int. Cl.[4] A61M 5/00

U.S. Cl. 604—132 **19 Claims**



1. A device for administering a liquid medicament to a patient at a substantially constant rate, said device comprising:

a housing formed with a generally cylindrical support;

a flexible collapsible annular reservoir containing said medicament and surrounding said support and braced thereagainst, said reservoir having an inwardly contractible wall which is distended when said reservoir is filled with said medicament;

an annular resilient body surrounding said reservoir and in contact therewith in an unstressed state of said body, said body being distended upon filling of said reservoir with said medicament to apply an inward radial force to said wall for pressurizing said medicament in said reservoir; and

a passage formed in said housing and connected to said reservoir while having an outlet adapted to communicate with an internal part of said patient, said passage having a cross section and length and structure controlling outflow of said medicament in relation to the annular force applied to said wall and the contraction of said wall under said force during discharge of said medicament that said discharge is effected with a substantially constant pressure over substantially the entire discharge period.

4,781,689

SPRING-OPERATED LIQUID-DISPENSING DEVICE

Andrew Sealfon, 713 North St., Middletown, N.Y. 10940, and Carl Yurdin, 2 Harbor View Rd., Port Washington, N.Y. 11050

Filed Nov. 13, 1986, Ser. No. 930,657

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[4] A61M 7/00

U.S. Cl. 604—134 **2 Claims**

1. A spring operated device for dispensing a liquid at a controlled rate comprising a rectangular housing formed of a pair of parallel and opposed side walls and two parallel and opposed end walls forming a rectangular shaped internal compartment therebetween, one of said side walls having a longitudinal slot opening into said compartment, an internal wall in said compartment spaced inwardly of and substantially parallel to said one of said side walls forming therebetween a guide track that is essentially parallel to said one of said side walls, said track having an upper end adjacent one of said end walls and a lower end adjacent the other one of said end walls, a collapsible bag disposed in said compartment, said bag adapted to store and dispense a liquid, a slide member disposed in said compartment, a constant torque, coiled spring disposed in said compartment, one end of said spring connected to said slide member, the other end of the spring connected to said housing so as to urge said slide member into pushing contact with said bag, said slide member adapted to move in said compartment between said end walls and thereby place a controlled pressure on said bag, and a boss rigidly connected to said slide member



and extending from one side thereof through said longitudinal slot of said one of said side walls, said boss adapted to slide in and be constrained by said track so that as said slide member moves between said end walls, said slide member is caused to traverse a path at a maintained orientation relative to said side walls.

4,781,690

GUIDING TUBE FOR MEDICAL INSTRUMENTS

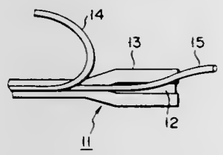
Toshinobu Ishida; Yousuke Moriuchi, and Tadashi Kousai, all of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,625

Claims priority, application Japan, Mar. 20, 1986, 61-63249

Int. Cl.[4] A61M 5/00, 25/00

U.S. Cl. 604—164 **12 Claims**



1. A tube for guiding rod-like medical instruments into a living body, comprising:

a main body provided with a longitudinal slit and formed of a mixture of first and second materials; and

a stripe embedded liquid-tight in the slit of the main body and formed of a third material;

said first material being substantially incapable of bonding to the third material, and said second material exhibiting a high bonding to the third material such that the stripe can be readily detached from the slit by application of a predetermined force to allow the guiding tube to be removed from the medical instrument after introduction of the medical instrument through the guiding tube.

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4,781,691
STEPPED NEEDLE
James R. Gross, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Jul. 17, 1987, Ser. No. 74,609
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—164 **15 Claims**



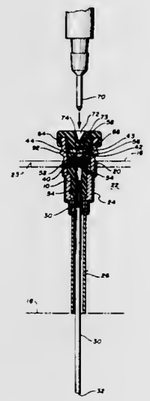
1. A stepped needle, comprising:
a proximal hollow hub;
a first elongated tubular portion extending from the hub of a first larger diameter; and
a second elongated tubular end portion located distal the first tubular portion of a second smaller diameter, with the outer diameter of the seciond tubular portion being in the range of 0.018 to 0.025 inches, and the respective inner diameter of the second tubular portion being in the range of 0.010 to 0.017 inches.

4,781,692
RETRACTABLE SAFETY NEEDLES
Janine C. Jagger; Richard D. Pearson, and Patrice G. Guyenet, all of Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.
Continuation-in-part of Ser. No. 771,640, Sep. 3, 1985, Pat. No. 4,676,783. This application Mar. 27, 1987, Ser. No. 30,986
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—164 **13 Claims**



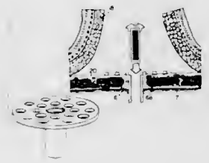
1. An intravenous catheter with retractable stylet comprising,
a stylet having a body-insertable distal end and a proximal end connected to a length of flexible plastic tubing,
a rigid plastic housing encases the entire stylet when the stylet in a retracted position,
a flexible plastic catheter, connected to a distal end of the housing, of length sufficient to substantially cover and be supported by the stylet in a non-retracted position,
sealing means, positioned within the distal end of the housing, for sealing the housing by engaging the stylet when the stylet is in extended or retracted position, and
abutment means for limiting travel of the stylet.

4,781,693
INSULIN DISPENSER FOR PERITONEAL CAVITY
Felix J. Martinez, Plymouth; Larry E. Fuller, Minnetonka, and Louis C. Cosentino, Wayzata, all of Minn., assignors to Minntech Corporation, Minneapolis, Minn.
Filed Sep. 2, 1983, Ser. No. 529,048
Int. Cl.[4] A61F *1/00*
U.S. Cl. 604—175 **2 Claims**



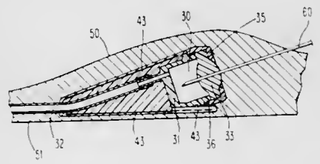
1. A percutaneous implant device for providing access to the peritoneal cavity comprising:
a substantially rigid, tubular percutaneous body of biologically compatible material which extends through the skin and peritoneum when implanted so as to provide means for accessing the peritoneal cavity through the interior of said device;
flexible, subcutaneous catheter means associated with said tubular percutaneous body for providing fluid communication between the body exterior and the peritoneal cavity;
porous tissue ingrowth means for anchoring the device to a patient's body said porous tissue ingrowth means including a porus collar of polytetrafluoroethylene overlaying said tubular percutaneous body on the portion of said tubular body to be embedded within the epidermis and a porous collar of polyethylene terephthalate overlaying said tubular percutaneous body between said polytetrafluoroethylene collar and said catheter;
an elastomeric septum member occupying a portion of the tubular portion of said body, and means for holding said septum member in a sealed relationship within the interior of said tubular percutaneous body, said septum and said body defining an excutaneous cavity within the device;
sponge means within said excutaneous cavity for maintaining sterility when saturated with an antiseptic solution; and
a penetrable cap member adapted to be joined to said body for sealing said sponge means within said tubular percutaneous body of said device.

4,781,694
ABDOMINAL WALL PATHWAY
Per-Ingvar Branemark, Ändergatan 3, S-431 39 Mölndal; Jarl Almén, Fornborgsvägen 13, S-436 00 Askim; Lars-Magnus Bjursten, Linnégatan 9, S-413 09 Göteborg; Peter Thomsen, Ättehögsgatan 10B, S-416 74 Göteborg, and Lars E. Ericsson, Brunörtevägen 7, S-438 00 Landvetter, all of Sweden
Filed Feb. 26, 1986, Ser. No. 832,787
Claims priority, application Sweden, Feb. 27, 1985, 8500946
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—175 **10 Claims**



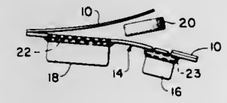
1. A device for providing a permanent pathway between the abdominal cavity and the exterior of the body comprising:
a first anchoring means for implantation in the connective tissue of the abdomen during a first operation, and retained for a healing phase to allow ingrowth of said connective tissue, said first anchoring means including at least one plate member forming a healing surface against surrounding connective tissue and a tube extending downwardly from said plate member and in communication with a central through opening in said plate member for forming a pathway through the connective tissue and peritoneum wall into the abdominal cavity, said first anchoring means being capable of receiving a removable covering means for retention during said healing phase;
a second skin penetration means for providing a pathway between said first means and the exterior of the body, said second means connectable to said first means during a subsequent second operation after said healing phase;
said first and second means together forming said permanent pathway between said exterior of the body and the abdominal cavity for admitting medical devices into said cavity;
wherein said first and second means are at least coated with titanium on surfaces coming into direct contact with the connective tissue.

4,781,695
IMPLANTABLE FLUID DISPENSER
Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203
Filed Jul. 11, 1986, Ser. No. 884,432
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—175 **4 Claims**



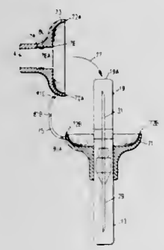
1. An implantable drug delivery depot for transcutaneous access by a conduit directed substantially parallel to the skin which comprises
a rigid-walled drug reservoir,
a flattened, penetrable drug reservoir inlet septum which defines a first plane,
a substantially flat reservoir anchoring flange which defines a second plane, said first and second planes being substantially perpendicular, together with
a tubular drug reservoir outlet adapted to avoid inadvertent penetration by the conduit, said outlet being bent or directed at an angle away from said flange to enter said reservoir remote from the conduit tip.

4,781,696
METHOD OF DISPENSING MEDICINE
Thomas S. Moulding, Jr., 1954 Glencoe St., Denver, Colo. 80220, and Donald G. Ellis, Geneva Park, Boulder, Colo. 80302
Division of Ser. No. 872,482, Jun. 10, 1986, Pat. No. 4,690,676, which is a division of Ser. No. 532,038, Sep. 14, 1983, Pat. No. 4,604,847. This application Aug. 27, 1987, Ser. No. 89,852
Int. Cl.[4] G09F *30/00*
U.S. Cl. 604—189 **23 Claims**



1. A method of dispensing medicine to a person comprising the steps of:
(a) providing a medicine package having a first sealed reservoir containing the medicine and a second reservoir, the region of the package surrounding the second reservoir provided with a code indicating information concerning the characteristics of the medicine;
(b) reading the code;
(c) severing the package in the region of the code and the second reservoir;
(d) applying a force to the package in the region of the second reservoir such that the first reservoir is opposed to expose the medicine; and
(e) delivering the medicine to the person.

4,781,697
REMOVABLE PROTECTIVE SHIELD FOR NEEDLE SHEATH
Robert Slaughter, P.O. Box 6272, Carmel, Calif. 93921
Filed Dec. 4, 1987, Ser. No. 128,596
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **14 Claims**



1. A protective shield for use with a two-piece tubular housing having an aperture in the opposing ends of said two-piece tubular housing for receiving and storing a double-ended hypodermic needle, said protective shield comprising:
a pair of shield means, each of said shield means having a centrally disposed bore for sliding said shield means over one piece of said two-piece tubular housing, each of said shield means having an upper side and a lower side, each

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of said shield means being needle puncture resistant, each of said shield means being removable and cooperatively retained in place with said upper side proximate said aperture, each of said shield means extending radially outward for protecting the hand and fingers from needle puncture; and

strap means flexibly attaching each of said shield means to the other shield means such that each of said shield means may move freely relative to the other without becoming disconnected from the other.

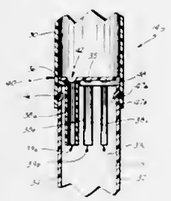
4,781,698

SELECTABLE DROP SIZE INFUSION METERING DEVICE

Mark L. Parren, 712 Broad St., St. Joseph, Mich. 49085

Filed Apr. 9, 1987, Ser. No. 34,540
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—246 **15 Claims**





1. An infusion system for intravenous administration of fluid to patient from a fluid reservoir comprising:

a drop chamber;

first connecting means for connecting said drop chamber to a fluid reservoir;

adjustable drop forming means in said drop chamber for splitting a stream of a fluid into sequentially discharged droplets;

metering means connected to said drop chamber for metering the rate the droplets are discharged from said drop forming means;

second connecting means for connecting said metering means to a patient;

flow control means located in one of said connecting means for varying the flow rate of fluid to a patient; and

selection means associated with said drop chamber for selectively adjusting said drop forming means to selectively produce droplets of different size and fluid volume for a given fluid, said selection means operable to adjust said drop forming means without disconnecting any portion of said system;

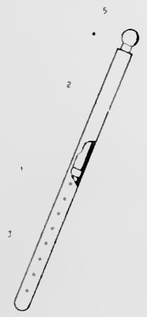
whereby the selection means may be operated to produce droplets of a size and volume appropriate for the viscosity of the fluid being administered and the desired rate of fluid infusion without disassembling the system or disconnecting the system from a patient.

4,781,699

MUCUS-REMOVING DEVICE

Tatsuyuki Suzuki, Fukushima, and Shoji Kawamoto, Takatsuki, both of Japan, assignors to Nissho Corportion, Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 938,487
Claims priority, application Japan, Feb. 8, 1986, 61-17354[U]
Int. Cl.[4] A61M *5/315*
U.S. Cl. 604—218 **5 Claims**



1. A device for removing a mucus from a uterocervical canal of an animal which comprises a hollow tubular catheter having an inner cavity and made of a soft synthetic resin and a column-like rod suction means having an outer diameter slightly smaller than the diameter of said inner cavity of said tubular catheter for producing a sucking force in the inner cavity of the catheter and which is inserted in the catheter and movable lengthwise therein, said catheter being provided with 5 to 24 holes communicating with the inner cavity thereof, each of said holes having a diameter not substantially less than 1 mm and not substantially more than 3 mm, said holes being distributed substantially uniformly in a portion between the tip of the catheter and a position at about 10 to 15 cm's distance from the tip of the catheter, said column-like rod suction means, when inserted into said inner cavity adjacent the inner end of said tubular catheter and inserted substantially the length of said catheter, forming a hermetic seal between said outer diameter of said suction means and said inner cavity when said device is inserted into a mucus in a uterocervical canal and said suction means is moved lengthwise from the inner end of said tubular catheter, said hermetic seal forming a suction in said inner cavity of said hollow catheter and drawing portions of said mucus into said holes and attaching said mucus to the outer wall of said device for removal with said device from said uterocervical canal.

4,781,700

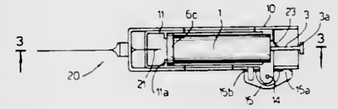
DEVICE FOR TAKING FROM A VEIN SAMPLES OF BLOOD TO BE TESTED

Guido F. Vicario, Milan, Italy, assignor to Finbiomedica S.R.L., Milan, Italy

Filed Jun. 16, 1987, Ser. No. 62,586
Claims priority, application Italy, Jun. 17, 1986, 20818 A/86
Int. Cl.[4] A61M *5/245; A61B 5/00*
U.S. Cl. 604—234 **5 Claims**

1. A device for collecting a series of blood specimens for laboratory testing by a single venipuncture, comprising a support, means on the support for carrying a double pointed needle, and an elongated cradle mounted for lengthwise sliding movement on the support toward and away from the needle in the lengthwise direction of the needle, the cradle being open

on one side to receive therein only by sideways insertion a disposable vial containing a plunger connected to an operating means for sliding the plunger in the vial toward and away from



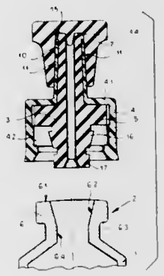
a pierceable membrane closing an end of the vial adjacent the needle, and the cradle being open at opposite ends thereof to receive at one end thereof said operating means and at the other end the needle.

4,781,701

SYRINGE FOR MEDICAL PURPOSES

Peter Geprägs, Weingarten, Fed. Rep. of Germany, assignor to Arzneimittel GmbH Apotheker Vetter & Co. Ravensburg, Ravensburg, Fed. Rep. of Germany

PCT No. PCT/DE86/00285, § 371 Date Jun. 16, 1987, § 102(e) Date Jun. 16, 1987, PCT Pub. No. WO88/00479, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 11, 1986, Ser. No. 71,344
Int. Cl.[4] A61M *5/325*
U.S. Cl. 604—240 **2 Claims**



1. A syringe for medical purposes, comprising:

a syringe body adapted to receive a plunger and provided at an outlet end with an outlet tip;

a needle attachment abutting said tip and communicating with said syringe body therethrough, said needle attachment being provided with an elongated connection neck extending away from said tip, said needle attachment and said connection neck being composed of an elastomeric material; and

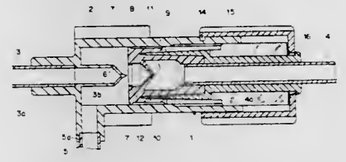
a tubular connection piece surrounding said needle attachment and engaging over said tip to secure said needle attachment to said syringe body, said connection piece having a collar extending along said connection neck toward a free end of said connection neck remote from said tip, said connection piece being composed of a synthetic material more rigid than said elastomeric material, said connection neck being formed at said free end with an annular shoulder abutting an end surface of said collar and extending radially outwardly to an outer surface of said collar to lie flush therewith and form an annular seal for a tip cap or a needle-carrying sleeve adapted to be slid onto said neck and said collar.

4,781,702

THREE-WAY CONNECTOR FOR LIQUID EXCHANGE

Peter Herrli, Biel, Switzerland, assignor to Contempo Products, P. Herrli, Biel, Switzerland

Filed Jun. 16, 1987, Ser. No. 63,180
Claims priority, application Switzerland, Jun. 20, 1986, 2506/86
Int. Cl.[4] A61M *5/245*
U.S. Cl. 604—244 **10 Claims**



1. A three-way connector for the exchange of fluids, of the type having a valve body, a connection tube, a supply tube, a drain tube, and means for holding one end of each of the tubes in the valve body, wherein the improvement comprises:

a chamber defined by said valve body, said one end of said connection tube and of said drain tube opening out into said chamber;

a tubular duct extending from said correction tube having an end projecting into said chamber and axially aligned with said one end of said supply tube;

a diaphragm closing said one end of said supply tube; and

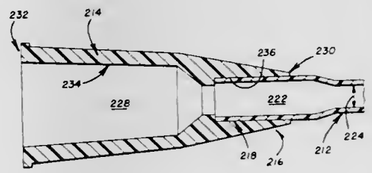
means for axially displacing said one end of said supply tube between a first position wherein said end of said supply tube is remote from said end of said tubular duct and said connection tube communicates with said drain tube for fluid exchange, and a second position wherein said one end of said supply tube is in proximity to said end of said tubular duct and said diaphragm is pierced by said end of said tubular duct, thereby establishing communication between said supply tube and said connection tube.

4,781,703

CATHETER ASSEMBLY

Jack M. Walker, Portola Valley, and Dwayne E. Hardy, San Mateo, both of Calif., assignors to Menlo Care, Inc., Menlo Park, Calif.

Filed Oct. 17, 1985, Ser. No. 788,461
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—264 **32 Claims**



1. A catheter assembly, comprising:

a unitary cannula having a proximal end portion, a distal end portion, and a longitudinal duct therethrough from the proximal end portion to the distal end portion, the cannula being of a polymeric material selected such and having the intrinsic property that an inner cross-section of the duct increases to form an enlarged duct cross-section when at least a part of the distal end portion of the cannula is inserted into a body of a living subject and maintained in said body, and/or when the duct is contacted by an aque-

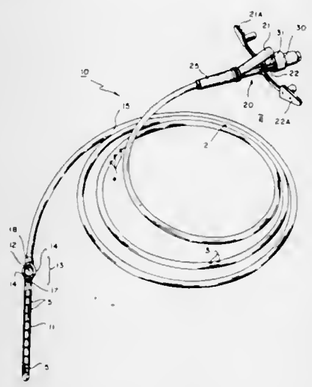
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ous liquid, for a period of time sufficient for the enlarged duct cross-section to form;

a hub having a passageway therethrough from a first to a second end thereof, said passageway having a cross-sectional area throughout at least substantially equal to the enlarged duct cross-section; and

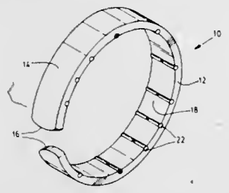
attaching means for attaching said proximal end portion of said cannula to said first end of said hub with said passageway through said hub in flow communications with said duct in said proximal end portion of said cannula, said attaching being in a manner such that the cross-sectional area of the duct adjacent the proximal end portion, following formation of the enlarged duct cross-section, is throughout at least substantially equal to the enlarged duct cross-section along the remainder of the cannula.

4,781,704
FEEDING TUBE ASSEMBLY WITH COLLAPSIBLE OUTLET CONNECTOR
Laurence A. Potter, Whitehouse Station, N.J., assignor to Entech, Inc., Lebanon, N.J.
Filed Feb. 24, 1987, Ser. No. 18,157
Int. Cl.⁴ A61M *31/00*
U.S. Cl. 604—270 **15 Claims**



1. An enteral feeding tube of predetermined diameter for administration and aspiration of fluids within a gastrointestinal tract, said tube having a proximal end for fluid communication with a fluid nutrient source and a distal end comprising a bolus positioned at the distal end of said tube, said bolus being enlarged in a first dimension and having resilient sides defining an opening, said bolus being intersected by a first longitudinally extending plane and a second plane substantially transverse to said first plane, said first dimension being defined by said first plane, whereby said bolus is normally enlarged in said first plane and not in said second plane, said bolus having a first end in fluid communication with said tube and a terminal end, said bolus having a diameter greater than the diameter of said tube thereby increasing the flow of fluid from said fluid nutrient source during administration, said sides being collapsible upon contact with a restriction and being capable of resuming their original shape upon passing said restriction, thereby temporarily reducing the diameter of said bolus.

4,781,705
MINERAL APPLICATOR
Charles G. Shepherd, Oakville, and Margaux A. Greenhouse, Toronto, both of Canada, assignors to Zyton Inc., Toronto, Canada
Filed Jun. 16, 1987, Ser. No. 62,618
Int. Cl.⁴ A61M *35/00*; A61F *13/00*
U.S. Cl. 604—289 **5 Claims**



1. A mineral applicator adapted to be worn on the person comprising:

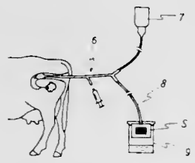
a holder body with a contact surface adapted to be placed against the skin;

engagement means on said holder body adjacent said contact surface;

retaining means for retaining said holder body on the skin; and,

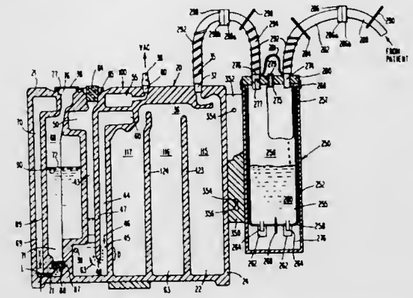
a plurality of mineral objects engageable with said engagement means, said mineral objects being supported adjacent said contact surface of said holder body, for contacting the skin.

4,781,706
DEVICE FOR COLLECTING AND SELECTING EMBRYOS
Tatsuyuki Suzuki, 1, Aza-Odakurahara, Oaza-Odakura, Nishigo-mura, Nishishirakawa-gun, Fukushima-ken, and Kazuhiko Masuda, Takatsuki, both of Japan, assignors to Nissho Corporation, Osaka, Japan and Tatsuyuki Suzuki, Fukushima, Japan
Filed Feb. 6, 1987, Ser. No. 11,946
Claims priority, application Japan, May 14, 1986, 61-72127[U]
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—317 **6 Claims**



1. A device for collecting embryos from an embryo-containing perfusate, which is drawn from the uterus of an animal, and selecting the collected embryos, comprising: an open vessel comprising a side wall and a bottom wall and made of a substantially transparent material, said side wall being provided with at least one opening, said opening being at a distance from the bottom wall; a filter means attached to said opening, said filter means permitting the passage of liquid while retaining embryos; and a detachable cover member capable of being tightly fastened to said vessel, said cover member being provided with an inlet for introducing said embryo-containing perfusate into said vessel.

4,781,707
PROCESS AND APPARATUS FOR COLLECTING BLOOD FROM A BODY CAVITY FOR AUTOTRANSFUSION
John R. Boehringer, Wynnewood, and John Karpowicz, Glenmoore, both of Pa., assignors to Boehringer Laboratories, Wynnewood, Pa.
Continuation-in-part of Ser. No. 830,577, Feb. 18, 1986. This application Sep. 12, 1986, Ser. No. 906,750
Int. Cl.⁴ A61M *1/00*
U.S. Cl. 604—317 **46 Claims**



4. Apparatus for the collection of blood for reuse thereof comprising:

(a) a receptacle for receiving blood in an interior thereof;

(b) support means for said receptacle;

(c) a zone defined between said receptacle and said support means;

(d) means maintaining said zone

(i) hermetically sealed from the atmosphere and from the source of vacuum and

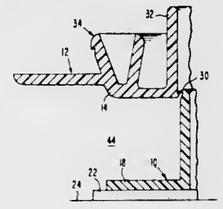
(ii) hermetically sealed from the interior of said receptacle;

(e) an inlet to said receptacle for the delivery of blood therethrough;

(f) means for applying a source of vacuum to the apparatus to draw blood through a said filter and into said receptacle; and

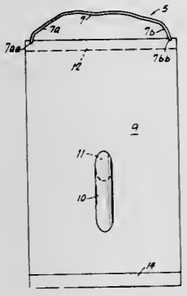
(g) a filter as part of the apparatus for filtering blood drawn therethrough.

4,781,708
TELESCOPING COUPLING FOR AN OSTOMY APPLIANCE
Peter L. Steer, Reigate, England, assignor to Craig Medical Products Limited, Sussex, England
Continuation of Ser. No. 849,605, Apr. 8, 1986, abandoned. This application Apr. 13, 1987, Ser. No. 38,464
Claims priority, application United Kingdom, Apr. 10, 1985, 85098168
Int. Cl.⁴ A61F *5/44*
U.S. Cl. 604—338 **8 Claims**



1. A body side ostomy member which includes a medical grade adhesive pad and a coupling ring means, said coupling ring means consisting of inner and outer concentric member means which are captive and slide telescopically with respect to another forming an integral coupling means, said inner concentric member means having a flange means with a resilient, flexible sealing strip means distal to said pad, said outer member means having a resilient flexible sealing strip means on a proximal end of said outer member means such that when the inner and outer member means are longitudinally extended apart with respect to each other, said sealing strip means limits the telescopic sliding movement of said outer and inner concentric member means and provides a space between said member means to enable a user's thumb or fingers to be placed therebetween.

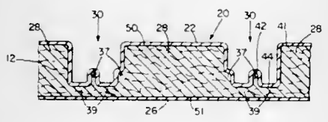
4,781,709
AIDS-PREVENTING CONDOM SHIELD ARTICLE
Mark Grabman, 99-32/ 66 Rd., Rego Park, N.Y. 11374
Filed Apr. 27, 1987, Ser. No. 43,050
Int. Cl.⁴ A61F *5/44*
U.S. Cl. 604—349 **16 Claims**



1. A disease-prophylactic sex-device comprising in combination: an elongated water-impervious sheet having a substantially flat face and an opposite side face, having a top-end and an opposite bottom-end forming a height therebetween, having a right-edge and an opposite left-edge forming a width therebetween, and having a hole formed therein on said substantially flat face of the sheet at a location intermediate between said top end and said opposite bottom end of said height and between said left edge and said right edge of said width; a water-impervious closed-end sleeve extending from and integral and continuous with said opposite-side face of the sheet forming said hole on said flat face, said water-impervious sheet and said elongated water-impervious sleeve jointly comprising a unified single composition commonly-formed as a continuing unbroken-structure thereby water-impervious such that it is sealed against any potential leaking therethrough, said closed-end sleeve having opposite interior and exterior surfaces and being shaped as and functioning as a condom and forming free-space therein in communication with said hole, such that when a mans's sex organ is inserted and positioned therein, the sex organs of the man and of a female during copulation are segregated by the closed-end sleeve and said sheet is avoided; and at-least one cup-like means formed at a position spaced-below said closed-end sleeve and said hole formed thereby, each said cup-like means being positioned and adapted to collect and retain any liquid that has moved or been forced from said exterior or interior surface of said closed-end sleeve or from said hole and said free-space, toward said bottom into said cup-like means.

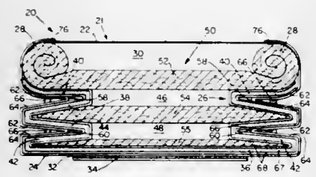
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4,781,710
ABSORBENT PAD HAVING IMPROVED LIQUID DISTRIBUTION
Donald R. Megison, and Richard A. Vonderhaar, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 15, 1987, Ser. No. 50,815
Int. Cl.[4] A61K *13/16*
U.S. Cl. 604—378 **9 Claims**



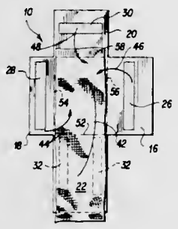
1. An absorbent pad, comprising:
tuft regions; and
channels, said channels separating and surrounding said tuft regions; said channels further comprising storage regions and transport regions, said storage regions having a density greater than the density of said tuft regions, said transport regions having a density greater than the density of said storage regions, and said transport regions being separated and surrounded by said storage regions.

4,781,711
ABSORBENT ARTICLE HAVING MOISTURE INSENSITIVE RESILIENT SHAPING MEMBERS
Dawn I. Houghton, Fairfield, and Nicholas A. Ahr, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 794,820, Nov. 4, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 93,075
Int. Cl.[4] A61F *13/16, 13/18, 13/20*
U.S. Cl. 604—378 **28 Claims**



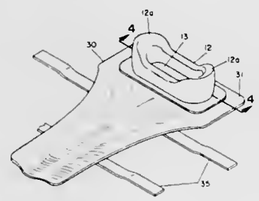
1. An absorbent article comprising:
a liquid pervious topsheet;
a liquid impervious backsheet joined with said topsheet;
an absorbent core positioned between said topsheet and said backsheet;
at least two resilient shaping members disposed one in each longitudinal side of the absorbent article in a longitudinally spaced relation to each other between said absorbent core and said topsheet, said resilient shaping members being moisture insensitive;
an acquisition channel positioned between said topsheet and said absorbent core, and longitudinally bounded by and coplanar with at least said resilient shaping members; and
a liquid acquisition zone having a volume of at least 30 cm^3, said liquid acquisition zone comprising at least said resilient shaping members and said acquisition channel.

4,781,712
FEMININE PAD WITH ATTACHED DISPOSAL WRAP
William A. Barabino, North Reading, and Raymond S. Dean, Lynn, both of Mass., assignors to Personal Hygiene Research Associates, North Reading, Mass.
Filed Apr. 10, 1987, Ser. No. 37,198
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 **11 Claims**



1. A feminine napkin comprising;
an elongated absorbent pad provided with a body surface and an outer surface and having opposite free ends,
an elongated cover sheet having an inner face juxtaposed said pad outer surface and provided with an opposite outer face, said cover sheet including opposite end portions substantially underlying said pad free ends,
adhesive means in said cover sheet outer face intermediate said opposite end portions,
a disposal wrap sheet extending from one said cover sheet end portion, and
said wrap sheet including a plurality of laterally adjacent panels foldable to a before-use position opposed to and underlying said pad outer surface, whereby
following use, said pad is half-foldable upon itself with portions of said body surface juxtaposed one another and said wrap sheet is displaceable from said before-use position with said panels then unfoldable and movable to a position wherein subsequent re-folding of said panels substantially fully envelopes said pad outer surface within said wrap sheet with said adhesive means engaging and retaining said panels in an after-use position.

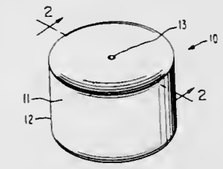
4,781,713
INCONTINENCE PAD FOR FEMALES
Kathleen Welch, Cranston, R.I., and Terese Campion, Springfield, Mass., assignors to Sherwood Medical Company, St. Louis, Mo.
Filed Jun. 10, 1987, Ser. No. 61,182
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 **9 Claims**



1. A disposable incontinence pad to be worn by a female comprising a highly moisture-absorbent multi-layered pad encased in a moisture-resistant hydrophobic layer which in turn is surrounded by a moisture absorbent-hydrophilic layer,

said pad having an essentially ovoid opening therein and having securely attached thereto on a surface of the pad contacting a user an essentially ovoid resilient contoured rim portion defining an essentially ovoid opening which is continuous with said opening in said pad, said rim portion surrounding and conforming itself to the entire vulvar region of the user and surrounding and being in contact with said opening in said pad, the rim portion being contoured so as to direct urine flow into the absorbent pad with minimal splash-back while at the same time preventing urine from contacting the vulvar tissue.

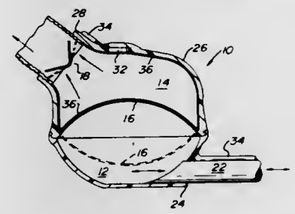
4,781,714
DISPENSER FOR DELIVERING THERMO-RESPONSIVE COMPOSITION
J. Benjamin Eckenhoff; Felix Theeuwes, both of Los Altos, and Deters, Joseph C., Mountain View, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Continuation of Ser. No. 547,885, Nov. 2, 1983, abandoned. This application Oct. 8, 1986, Ser. No. 916,581
Int. Cl.[4] A61K *9/00*
U.S. Cl. 604—890.1 **14 Claims**



1. A dispenser for delivering a beneficial agent formulation to an environment of use, wherein the dispenser comprises:
(a) a compartment;
(b) a beneficial agent formulation in the compartment, which formulation comprises:
(i) a beneficial agent; and,
(ii) a thermoplastic, lipophilic means for delivering the beneficial agent from the compartment, said means stable up to 33° C. and absorbing heat from the environment of use above 33° C. thereby forming a deliverable formulation comprising the beneficial agent;
(c) a first wall that surrounds at least in part the compartment, said wall comprising hydrophilic means for absorbing fluid from the environment of use for expanding the wall into the compartment;
(d) a second wall that surrounds the first wall, which second wall comprises at least in part semipermeable means for permitting the passage of fluid through the second wall; and,
(e) at least one passageway in the second wall communicating with the compartment for delivering the beneficial agent from the dispenser.

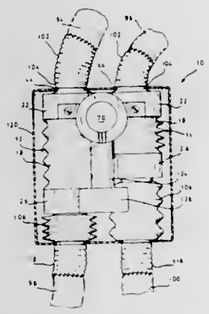
4,781,715
CARDIAC PROSTHESIS HAVING INTEGRAL BLOOD PRESSURE SENSOR
David Wurzel, Center Square, Pa., assignor to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.
Filed Apr. 30, 1986, Ser. No. 857,896
Int. Cl.[4] A61F *2/22*
U.S. Cl. 623—3 **10 Claims**

1. A cardiac prosthesis having a fluid chamber and a blood chamber separated by a flexible diaphragm, the diaphragm being actuated by a drive fluid pulsatingly supplied to the fluid chamber for pumping blood from the blood chamber, means for noninvasively sensing the pressure of the blood in the blood chamber comprising at least one pressure transducer means located between the endocardial and epicardial surfaces of a wall of the blood chamber for substantially maintaining the



characteristics of the endocardial surface of said wall blood and in pressure-sensing relation to the interior of the chamber.

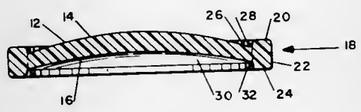
4,781,716
ARTIFICIAL HEART
Marc Richelsoph, Box 489-B, Nashville, Tenn. 37235
Filed Feb. 13, 1987, Ser. No. 14,362
Int. Cl.[4] A61F *2/22*
U.S. Cl. 623—3 **24 Claims**



1. An improved artificial heart for pumping blood, said heart comprising:
first and second pump units, each said first and second pump unit including a pump body defining an axially collapsible bellows of substantially cylindrical shape and having a coaxial fluid passageway therethrough, said pump body having a first end portion defining an outlet opening and an oppositely disposed second end portion defining an inlet opening, whereby substantially linear flow of said blood through said fluid passageway from said inlet opening to said outlet opening is achieved, said first and second pump units each having a first valve unit secured to said first end portion of said pump body in fluid communication with said outlet opening, said first valve unit including a first one-way valve for allowing said blood to flow out of said pump body and restricting the flow of said blood into said pump body, each said first and second pump unit also having a second valve unit secured to said second end portion of said pump body in fluid communication with said inlet opening, said second valve unit including a second one-way valve for allowing said blood to flow into said pump body and restricting the flow of said blood out of said pump body; and
drive means for selectively collapsing and expanding said bellows of said first and second pump units.

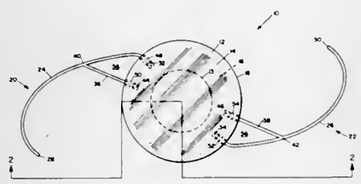
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4,781,717
INTRAOCULAR LENS
Dennis T. Grendahl, Excelsior Bay Gables, Excelsior, Minn. 55331
Continuation of Ser. No. 758,320, Jul. 24, 1985, abandoned. This application Jun. 11, 1987, Ser. No. 60,528
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **6 Claims**



1. A unitary, monolithic, self-positioning intraocular lens for implantation in the capsular bag of the human eye, the lens comprising:
a. a lens optic element; and,
b. a continuous, unbroken rim element immediately surrounding said optic element, said rim element, in cross section, extending over and below the edge of said optic element said rim element having a width and height of a geometric cross section provided with rounded edges so as to secure the rim within the capsular bag and prevent cutting or wearing through the equator of the capsular bag, and said rim being of a different color than said lens optic whereby edge effect and glare are minimized or eliminated.

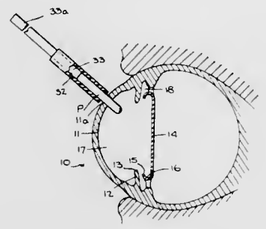
4,781,718
INTRAOCULAR LENS
Richard L. Lindstrom, 20050 Lakeview Ave., Excelsior, Minn.
Filed Oct. 9, 1987, Ser. No. 106,272
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **7 Claims**



1. An intraocular lens comprising:
a. an optic; and,
b. at least one main loop haptic member and at least one supporting loop haptic member, the loop member and the supporting member being joined intermediate their ends, and their proximate ends being immovably secured to the optic by conical barbs on the ends being in tight frictional engagement with the sides of cylindrical bores in the optic.

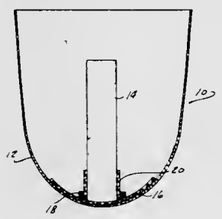
4,781,719
METHOD OF INSERTING AN INTRAOCULAR LENS INTO AN EYE
Charles D. Kelman, 269 Grand Central Pkwy., Floral Park, N.Y. 11005
Filed Jul. 28, 1987, Ser. No. 78,563
Int. Cl.⁴ A61F *2/16*
U.S. Cl. 623—6 **19 Claims**

1. Method of inserting an intraocular lens, having an optic and haptics of flexible material, through an incision into an eye, which comprises compressing the lens into a generally cylindrical shape, immersing the compressed lens in an eye compatible liquid, freezing the liquid in situ to form a generally cylindrical frozen plug, and



inserting the frozen plug, containing the compressed lens therein, through the incision into the interior of the eye.

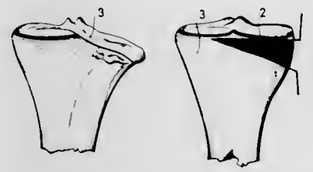
4,781,720
AMPUTATION APPARATUS
Carole J. Sherva-Parker, Rt. 1, Box 152, Thief River Falls, Minn. 56701
Filed Feb. 5, 1987, Ser. No. 11,160
Int. Cl.⁴ A61F *2/28*
U.S. Cl. 623—16 **28 Claims**



1. An internal prosthesis for use with a prosthesis attachable externally to a residual limb having a bone with a free end therein, the internal prosthesis comprising:
bone end pressure distributing means disposed completely within the residual limb;
open-bottomed bone end containing means attached to the bone end pressure distributing means; means for reinforcing the bone end pressure distributing means; and
wherein the bone end pressure distributing means comprises a large, flexible, tubular sock/sleeve sized to fit over the muscle tissue of the residual limb and underneath the skin thereof, having a smooth, continuous, reinforced, closed end portion to receive the full force of pressure generated by the free end of the bone.

4,781,721
BONE-GRAFT MATERIAL AND METHOD OF MANUFACTURE
Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants, Lubeck, Fed. Rep. of Germany
Continuation of Ser. No. 558,693, Dec. 6, 1983, abandoned, which is a division of Ser. No. 313,652, Oct. 22, 1981, abandoned. This application May 19, 1986, Ser. No. 864,571
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3106917
Int. Cl.⁴ A61F *2/30*; B29H *7/20*
U.S. Cl. 623—16 **2 Claims**

1. A method for manufacturing a morphologically stable implant for replacement of animal or human bone, which implant comprises an open-pored or open-celled porous sponge-like structure of metal having pores or cells of a mean width in the range of 0.5–1.5 mm, method comprising using an open-pored or open-celled sponge as a positive molding pattern for the implant, the sponge pores or cells having a mean width in the range of 0.5–1.5 mm, filling the pores or cells of the sponge with a heat resistant orthodonically embedding material, applying heat to the sponge filled with said embedding material so as to remove the sponge by vaporizing thereof, and wherein said embedding material remains to form a core having cavities or openings corresponding to the sponge, filling the cavities or openings of said core with a metal



by casting, and removing said core so as to obtain a metal implant having a sponge-like structure provided with pores or cells corresponding to the pores or cells of the sponge, and having a mean width of 0.5–1.5 mm.

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NOVEL ALKANEPHOSPHONIC MONOESTER SALTS, PREPARATION THEREOF AND USE THEREOF AS SPIN FINISHES FOR TEXTILE FIBERS

Hans-Jerg Kleiner, Kronberg/Taunus; Rolf Kleber, Nue-Isenburg, and Lothar Jaeckel, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

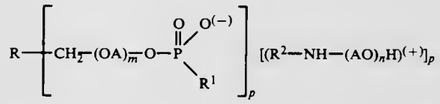
Filed Mar. 1, 1988, Ser. No. 162,417

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706784

Int. Cl.[4] D06M *1/02, 13/26;* C07F *9/40*

U.S. Cl. 8—127.1 8 Claims

1. An alkylphosphonic monoester salt of the formula



where R, if p = 1, is straight-chain or branched C_1–C_7-alkyl, and, if p = 4, a carbon atom, R^1 denotes C_1–C_4-alkyl, A denotes C_2H_4 and/or C_3H_6, m denotes a number from 15 to 35, R^2 denotes straight-chain or branched C_6–C_{24}-alkyl, n denotes a number from 0 to 15, and p denotes 1 or 4.

4,781,723

COMPOSITIONS FOR THE GROOMING OF HAIR

Paul Gross, Darmstadt, and Udo Wiegand, Weiterstadt, both of Fed. Rep. of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00364, § 371 Date Jan. 27, 1987, § 102(e) Date Jan. 27, 1987, PCT Pub. No. WO87/00041, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 21, 1986, Ser. No. 12,666

Int. Cl.[4] A61K *7/06, 7/11, 7/13*

U.S. Cl. 8—405 7 Claims

1. A synergistically effective hair-grooming composition, which once applied, need not be removed from the hair by rinsing, which comprises:

(a) 0.01 to 0.09% by weight of a quaternized copolymer of vinylpyrrolidone and dimethylaminoethylmethacrylate in a molar ratio of 80 to 20;

(b) 0.01 to 0.5% by weight of tetraoxyethylene lauryl ether; and

(c) water, an alcohol selected from the group consisting of ethanol, isopropanol, and mixtures thereof, or a mixture of water and the alcohol.

4,781,724

PROCESS FOR THE SIMULTANEOUS DYEING AND PERMANENT SHAPING OF HAIR

Theodor Wajaroff; Peter Hartmann, both of Darmstadt, Fed. Rep. of Germany, and Kohei Kubo, Tokyo, Japan, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00682, § 371 Date Jul. 22, 1987, § 102(e) Date Jul. 22, 1987, PCT Pub. No. WO87/03474, PCT Pub. Date Jun. 18, 1987

PCT Filed Nov. 26, 1986, Ser. No. 93,748

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1985, 3543453

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—426 11 Claims

1. In a process for permanently shaping and dyeing white or gray hair, in which the hair is washed, towel-dried, wound on curlers, treated with a shaping composition, rinsed, treated with a fixing composition, rinsed, and the curlers removed, the improvement which comprises including in the shaping composition 0.00001 to 0.005% by weight of at least one red-violet dyeing xanthene dyestuff, and in the fixing composition 0.0001 to 0.01% by weight of at least one blue dyeing anthraquinone dyestuff, thereby eliminating any unwanted yellow shade of the hair.

4,781,725

ENHANCED TRANSFER PRINTABILITY TREATMENT METHOD AND COMPOSITION

Larson B. Dunn, Jr.; Kenneth B. Moser, both of Decatur, Ill., and Panemangalore S. Pai, Charlotte, N.C., assignors to Staley Continental, Inc., Rolling Meadows, Ill.

Filed Sep. 17, 1986, Ser. No. 908,495

Int. Cl.[4] D06P *1/00, 1/16, 3/14, 3/62*

U.S. Cl. 8—471 12 Claims

1. A method of transfer printing a textile fabric which is composed at least in part of cellulosic or natural proteinaceous fibers, said method comprising the steps of:

(a) saturating said textile fabric with an aqueous solution comprising a glycoside reagent of the formula:

$$RO(R'O)_y(Z)_x \qquad A$$

wherein R is monovalent organic radical containing from 2 to about 8 carbon atoms; O is an oxygen atom; R′ is a divalent hydrocarbon radical containing from 2 to about 4 carbon atoms; y is a number having an average value of from 0 to about 12; Z represents a moiety derived from a reducing saccharide containing 5 or 6 carbon atoms; and x is a number having an average value of from 1 to about 5;

(b) drying the resulting saturated textile fabric thereby providing a substantially dry, impregnated textile fabric; and

(c) transfer printing onto the dried, impregnated textile fabric by contacting said fabric with a transfer printing paper containing a coating of a disperse dye composition thereon at an elevated temperature for a time sufficient to cause at least a portion of the disperse dye composition to vaporize and to migrate from the surface of the printing paper to the textile fabric.

4,781,726

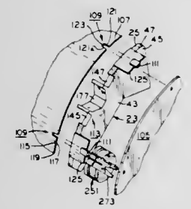
METHOD OF ASSEMBLING A DYNAMOELECTRIC MACHINE

Lynn E. Fisher, Ft. Wayne, Ind.; Richard A. Wandler, Clinton, Iowa, and James P. Frank, Rock Falls, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Apr. 3, 1987, Ser. No. 33,975

Int. Cl.[4] H02K *15/14*

U.S. Cl. 29—596 37 Claims



1. A method of assembling a dynamoelectric machine with the dynamoelectric machine having a housing, at least one end frame, and a terminal board assembly, the housing including inner and outer circumferential surfaces with at least one end surface interposed therebetween, a set of spaced apart slots in the housing intersecting with the inner and outer circumferential surfaces and the at least one end surface thereof, respectively, and each slot having a pair of opposed side edges with a cross-edge therebetween spaced from the at least one end surface, and the terminal board assembly including a switch means supporting face, another face generally opposite the switch means supporting face, a peripheral portion interposed

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between the switch means supporting face and the another face, a set of flanges extending from at least adjacent a part of the peripheral portion beyond the switch means supporting face, a set of spaced apart pads on the flanges extending beyond the peripheral edge, respectively, and each pad and flange defining a pair of opposite side grooves with a cross-groove therebetween, the method comprising the steps of:

disposing the pads of the terminal board assembly at least adjacent the at least one end surface of the housing with the switch means supporting face of the terminal board assembly facing generally toward the housing and aligning generally the pads with the slots in the housing, respectively;

moving the terminal board assembly toward the housing;

entering the opposite side grooves of the terminal board assembly into registry with the opposed side edges of the slots in the housing and sliding the opposite side grooves along the opposite side edges to enter the cross-edges on the housing into registry with the cross-grooves of the terminal board assembly, respectively;

overlaying both the flanges and the pads at least in part with the inner and outer circumferential surface of the housing generally about the slots therein, respectively, and disposing the peripheral portion part of the terminal board assembly at least generally adjacent the inner circumferential surface of the housing during the entering and sliding step; and

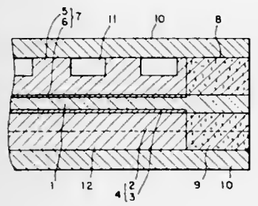
associating the at least one end frame in an assembly position on the housing in engagement with the at least one end surface thereof and retaining thereby the pads against displacement from the slots in the housing past the at least one end surface thereof, respectively.

4,781,727

METHOD FOR GAS SEALING OF PHOSPHORIC ACID-TYPE FUEL CELL

Kenro Mitsuda; Hisashi Shiota; Kenzo Takahashi; Kozo Shimamoto; Toshiaki Murahashi, and Ikuyuki Hirata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,027
Claims priority, application Japan, Jan. 21, 1987, 62-12820
Int. Cl.⁴ H01M *2/08*
U.S. Cl. 29—623.2 **3 Claims**



1. A method for sealing the gas of a phosphoric acid-type fuel cell which comprises filling the pores in the porous material periphery of the cell constituents with fine particles of at least one of silicon carbide and silicon nitride which have undergone surface oxidation treatment, and causing particles to expand in volume through the reaction of the surface oxide of the particles with hot phosphoric acid that yields phosphate compounds, thereby clogging the pores.

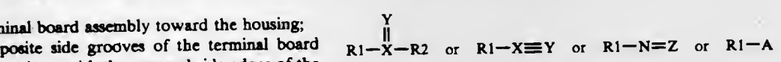
4,781,728

OCTANE ENHANCERS FOR FUEL COMPOSITIONS

Peter J. Jessup, Santa Ana; Stephen G. Brass, Fullerton, and Michael C. Croudace, Huntington Beach, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 728,245, Apr. 29, 1985, Pat. No. 4,647,292. This application Aug. 27, 1986, Ser. No. 900,726
Int. Cl.⁴ C10L *1/02, 1/18, 1/22, 1/24*
U.S. Cl. 44—56 **70 Claims**

1. A composition comprising a base fuel comprising gasoline and an octane-enhancing proportion of a compound of chemical formula:



(I) (II) (III) (IV)

wherein X=Y is C=O, C=N—R3, C=C=W,



or C=S; X≡Y is C≡N or C≡C—R8; N=Z is N=O, N=C=W, or



W is oxygen or sulfur; and A is an aryl-containing group with R1 bonded to the carbon atom of an aromatic ring, provided that A is not phenyl; R1 is either a substituted or unsubstituted trimethyl silyl group, or an organic radical containing a substituted or unsubstituted trimethyl silyl group; and R2, R3, R4, R5, R6, R7, and R8 are the same or different organic or inorganic species, provided that R4 is not hydrogen or a methyl group.

4,781,729

METHOD AND APPARATUS FOR IMPROVING THE EFFICIENCY OF INTERNAL COMBUSTION ENGINES

Howard Bidwell, Granby, Mass., assignor to Stephen Masiuk, Granby, Mass.

Continuation-in-part of Ser. No. 25,071, Mar. 12, 1987, which is a continuation-in-part of Ser. No. 15,853, Feb. 17, 1987, which is a continuation-in-part of Ser. No. 5,023, Jan. 20, 1987, which is a continuation-in-part of Ser. No. 874,491, Jun. 16, 1986, which is a continuation-in-part of Ser. No. 821,342, Jan. 22, 1986, which is a continuation-in-part of Ser. No. 623,499, Jun. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 402,970, Jul. 29, 1982, Pat. No. 4,484,444. This application Apr. 23, 1987, Ser. No. 41,536
Int. Cl.⁴ C10L *1/10*
U.S. Cl. 44—57 **1 Claim**

1. A combustion process involving the burning of a diesel fuel in an internal combustion engine comprising: separately introducing into the combustion zone to the top of the dead center of the engine the fuel charge blend of fuel oil and of a finely powdered magnesium, to which combustion zone a charge of steam is flowed in the environment of compression of approximately 500 p.s.i. and of temperature approximating 800° F. with the fuel/magnesium mixture taking fire on contact with the steam.

4,781,730

FUEL ADDITIVE COMPRISING A HYDROCARBON SOLUBLE ALKALI OR ALKALINE EARTH METAL COMPOUND AND A DEMULSIFIER

Stephen H. Stoldt, Concord Township; Scott T. Jolley, and Reed H. Walsh, both of Mentor, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Jun. 5, 1987, Ser. No. 58,456
Int. Cl.⁴ C10L *1/22, 1/30*
U.S. Cl. 44—71 **32 Claims**

1. A composition comprising:

(a) a hydrocarbon soluble or dispersible alkali metal or alkaline earth metal containing composition, and

(b) the reaction product of

(i) a polybasic acid, and

(ii) a polyhydroxyalkanolamine of the formula:

$$RN[(AO)_xH][(DO)_yH]$$

wherein R is a hydrocarbyl radical, A and D are the same or different alkylene groups and x and y are each at least 1.

21. A process for reducing valve seat recession in a vehicle requiring such protection comprising introducing to the fuel tank of the vehicle a composition comprising:

(a) a hydrocarbon soluble or dispersible alkali metal or alkaline earth metal containing composition, and

(b) the reaction product of

(i) a polybasic acid, and

(ii) a polyhydroxyalkanolamine of the formula:

$$RN[(AO)_xH][(DO)_yH]$$

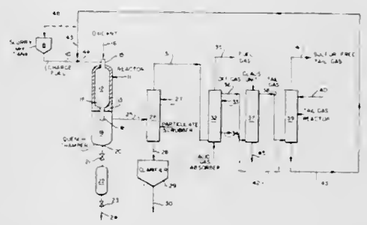
wherein R is a hydrocarbyl radical, A and D are the same or different alkylene groups and x and y are each at least 1 wherein the composition is mixed with a fuel and the fuel is combusted.

4,781,731

INTEGRATED METHOD OF CHARGE FUEL PRETREATMENT AND TAIL GAS SULFUR REMOVAL IN A PARTIAL OXIDATION PROCESS

Warren G. Schlinger, Pasadena, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1987, Ser. No. 140,280
Int. Cl.⁴ C10S *3/46*
U.S. Cl. 48—197 R **15 Claims**



1. A method for producing a synthesis gas comprising:

(a) partially oxidizing a sulfur- and metal-containing carbonaceous charge fuel in the presence of a temperature moderator and an oxygen-containing gas to produce a sulfur-containing hot synthesis gas and a metal-containing molten slag;

(b) partially cooling the sulfur-containing synthesis gas via direct or indirect means or a combination thereof;

(c) scrubbing the partially cooled sulfur-containing synthesis gas with aqueous scrubbing liquor to remove particulates and further cool the synthesis gas;

(d) further scrubbing the partially cooled sulfur-containing synthesis gas with a scrubbing liquor to produce:

(i) a fuel gas stream with a substantially reduced sulfur content; and

(ii) an off-gas stream comprising sulfur-containing compounds;

(e) directing the off-gas stream comprising sulfur-containing compounds to a Claus process unit to produce elemental sulfur and a tail gas stream comprising residual amounts of sulfur-containing compounds;

(f) contacting the tail gas stream with particles comprising iron-containing compounds, thereby:

(i) forming iron sulfide-containing particles; and

(ii) producing an essentially sulfur-free tail gas stream; and

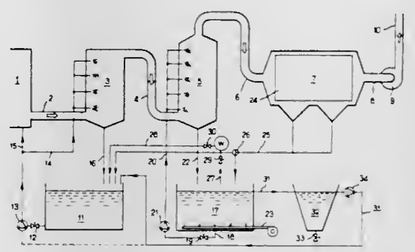
(g) recycling at least a portion of the iron sulfide-containing particles of step (f) by mixing the particles with the carbonaceous charge fuel of step (a) prior to the partial oxidation of the charge fuel.

4,781,732

METHOD FOR CLEANING CRUDE GAS AND APPARATUS THEREFORE

Otmar Wondrasch, Vienna; Jorg Schrittwieser, and Robert Koch, both of Stockerau, all of Austria, assignors to Isover Saint-Gobain, Aubervilliers, France

Filed Oct. 24, 1986, Ser. No. 922,841
Claims priority, application Austria, Oct. 24, 1985, 3078/85
Int. Cl.⁴ B03C *1/00*
U.S. Cl. 55—10 **3 Claims**



1. A method of cleaning crude gas, contaminated by phenol and/or formaldehyde and/or the products of condensation thereof, comprising spraying the crude gas with a circulated washing liquid enriched with micro-organisms, some of the impurities contained in the crude gas being thereby agglutinated, the washing liquid being collected and the impurities contained therein being at least partly degraded by the micro-organisms, the micro-organisms being subjected to an activation process, thereafter passing the crude gas sprayed with washing liquid through an electric high-voltage field thereby collecting micro-organisms and aerosol particles entrapped in said crude gas, sprayed with washing liquid on electrodes producing said high-voltage field.

4,781,733

SEMIPERMEABLE THIN-FILM MEMBRANES COMPRISING SILOXANE, ALKCXYSILYL AND ARYLOXYSILYL OLIGOMERS AND COPOLYMERS

Walter C. Babcock, and Dwayne T. Friesen, both of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Continuation-in-part of Ser. No. 888,229, Jul. 23, 1986, abandoned. This application Jul. 16, 1987, Ser. No. 74,247
Int. Cl.⁴ B01D *53/22*
U.S. Cl. 55—16 **32 Claims**

11. A thin-film composite separation membrane comprising a microporous polymeric support having a thin polymeric semipermeable film formed on the surface of said support, said

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film comprising the polycondensation reaction product of two complementary polyfunctional compounds, at least one of which is selected from a group consisting essentially of siloxanes, alkoxysilanes, and aryloxysilanes, each of said complelemtary polyfunctional compounds having at least two functional groups selected from a member of Group A or Group B:

Group A	Group B
—COX	—NHR_h
—SO_2X	—OH
—NCO	—SH
—$POXR_o$	
—NR_hCOX	

where X is halide; R_o is selected from alkyloxy and substituted alkyloxy containing 1 to 18 carbons in the carbon chain, alkyl and substituted alkyl containing from 1 to 18 carbons in the carbon chain, cycloakyl, substituted cycloalkyl, and substituted heterocycloalkyl, aryl and substituted aryl; R_h is selected from hydrogen and R_o; provided that when said at least two functional groups are selected from group A for one of said complementary polyfunctional compounds, said at least two functional groups are selected from group B for the other of said complementary polyfunctional compounds, and vice-versa; and further provided that when at least one of said complementary polyfunctional compounds is a siloxane and the functional group from group A is —NCO, the functional group from group B is not —NHR_h.

22. A method for the separation of oxygen and nitrogen comprising splitting a feed stream containing oxygen and nitrogen with the thin-film composite separation membrane of claims **11**, **15**, **20**, or **21** into an oxygen-rich permeate stream and a nitrogen-rich residue

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4,781,734

NON-POROUS HYDROGEN DIFFUSION MEMBRANE AND UTILIZATION THEREOF

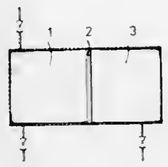
Friedrich Behr, Essen; Bernd Kugler, Aachen; Michael Pietsch, Kall, and Walter Weirich, Aachen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,217

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211193

Int. Cl.⁴ B01D *53/22*

U.S. Cl. 55—16 **3 Claims**



1. A method for the separation of hydrogen from gas mixtures containing hydrogen comprising contacting the primary side of a non-porous hydrogen diffusion membrane with said gas mixture, said membrane being formed of TiAg and having a titanium component of from about 45 to 55% of atoms, said separation being conducted at about 600° C. in a hydrogen partial pressure range of about 10 torr.

2. Apparatus for the separation of hydrogen from a gas mixture containing hydrogen comprising a first chamber and a second chamber, said first chamber and said second chamber being separated by a membrane, said membrane being formed of TiAg and having a titanium component of from about 45 to about 55% of atoms.

4,781,735

ENRICHMENT IN OXYGEN GAS

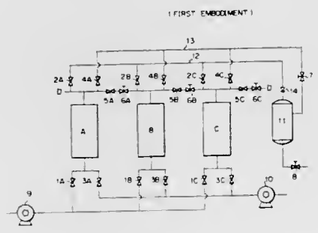
Taichi Tagawa, Takatsuki; Yasuto Suzu, Omihachiman; Shigeki Hayashi, Sakai, and Yasumitsu Mizuguchi, Takaishi, all of Japan, assignors to Osaka Sanso Kogyo Ltd., Osaka, Japan

Filed Dec. 15, 1987, Ser. No. 132,288

Claims priority, application Japan, Dec. 26, 1986, 61-313151

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—26 **6 Claims**



1. A process for separating oxygen from a feed gas containing at least oxygen, nitrogen and argon through pressure swing adsorption utilizing three adsorption columns containing an adsorbent capable of selective adsorption of nitrogen comprising:

(i) introducing said feed gas into a first adsorption column, in which step (viii) was previously completed, from its feed end to pressurize the column, thereby absorbing the nitrogen in the feed gas and obtaining a product gas;

(ii) introducing a portion of the product gas obtained in step (i) into a second column, in which step (vi) was previously completed, while continuing introduction of the feed gas to the first column;

(iii) connecting the feed end of the first column, in which step (ii) was previously completed, to the feed end of the second column, in which step (vii) was previously completed, and introducing the gas from the first column to the second column until approximate pressure equalization of the two columns is achieved;

(iv) connecting the effluent end of the first column, in which step (iii) was previously completed, to the effluent end of a third column, in which step (v) was previously completed, and introducing an amount of the gas from the first column to the third column sufficient to depressurize the first column;

(v) evacuating the first column, in which step (iv) was previously completed;

(vi) purging the first column undergoing evacuation with a definite amount of gas coming from the effluent end of the second column, in which step (iii) was previously completed, during which purge the effluent end of the first column is open, said step (vi) being effected for all or part of the period of step (v);

(vii) introducing product gas into the effluent end of the first column, in which steps (v) or (vi) were previously completed, to pressurize the first column;

(viii) introducing into the first column, in which step (vii) was previously completed, the feed gas, and at the same time connecting the feed end of said first column to the feed end of the third column, in which step (ii) was previously completed, and introducing the gas from the third column to the first column, until appropriate pressure equalization of the two columns is achieved; and

periodically switching the flow among said adsorption columns so as to repeat the above steps.

4,781,736

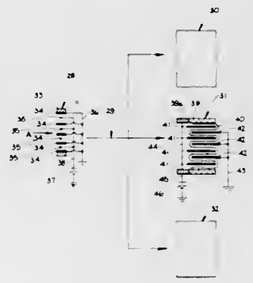
ELECTROSTATICALLY ENHANCED HEPA FILTER

William A. Cheney, Cincinnati, and Wendell P. Spurgin, Montgomery, both of Ohio, assignors to United Air Specialists, Inc., Cincinnati, Ohio

Filed Nov. 20, 1986, Ser. No. 933,106

Int. Cl.⁴ B03C *3/12, 3/14*

U.S. Cl. 55—132 **8 Claims**



1. In combination a HEPA filter and an ionizer, said HEPA filter comprising a frame, a non-conductive fibrous filter medium within said frame folded in zig-zag fashion, a conductive spacer located in each filter medium fold supporting said folds in substantially even parallel spaced relationship throughout said filter, said spacers and filter medium being sealed along their edges to said frame, said HEPA filter having an air inlet face and an air discharge face, alternate ones of said spacers comprising a first set thereof each having a first longitudinal edge exposed at said air inlet face of said HEPA filter and a second longitudinal edge covered by said filter medium at said HEPA filter air discharge face, the remainder of said spacers comprising a second set thereof each having a first longitudinal edge exposed at said filter air discharge face and a second longitudinal edge covered by said filter medium at said filter air inlet face, said ionizer comprising a frame and a plurality of alternate wire-like electrodes and plate-like electrodes supported in parallel spaced relationship by said frame, said wire-like electrodes being connected to a d.c. high voltage low current source, said plate-like electrodes being connected to ground, said ionizer being located upstream of said HEPA filter, remote from said air inlet face of said HEPA filter, said spacers of said first set being electrically isolated one from the other, means connecting said spacers of said second set together and to ground, and means to electrostatically induce a charge on said spacers of said first set comprising at least one corona-producing wire-like electrode arranged adjacent to the air inlet face of the HEPA filter, perpendicular to the planes of the spacers of the first set and within charging range of said first set of spacers, whereby said spacers of said first set become charged by ion flow from the corona of said at least one wire-like electrode.

5. In combination a HEPA and an ionizer, said HEPA filter comprising a frame, a non-conductive fibrous filter medium within said frame folded in zig-zag fashion, a conductive spacer located in each filter medium fold suporting said folds in substantially even parallel spaced relationship throughout said filter, said spacers and filter medium being sealed along their edges to said frame, said HEPA filter having an air inlet face and an air discharge face, alternate ones of said spacers comprising a first set thereof each having a first longitudinal edge exposed at said air inlet face of said HEPA filter and a second longitudinal edge covered by said filter medium at said HEPA filter air discharge face, the remainder of said spacers comprising a second set thereof each having a first longitudinal edge exposed at said filter air discharge face and a second longitudinal edge covered by said filter medium at said filter ait inlet face, said ionizer comprising a frame and a plurality of alternate wire-like electrodes and plate-like electrodes supported in parallel spaced relationship by said frame, said wire-like electrodes being connected to a d.c. high voltage low current source, said plate-like electrodes being connected to ground, said ionizer being located upstream of said HEPA filter, remote from said air inlet face of said HEPA filter, said spacers of said second set being electrically isolated one from the other, means connecting said spacers of said second set together and to ground, and means to electrostatically induce a charge on said spacers of said second set comprising at least one corona-producing wire-like electrode located adjacent to the air discharge face of the HEPA filter, perpendicular to the planes of the spacers of the second set and within charging range of said second set of spacers, whereby said sapcers of said second set become charged by ion flow from the corona of said at least one wire-like electrode.

4,781,737

APPARATUS FOR THE INJECTION OF FLUE GASES INTO A COOLING TOWER

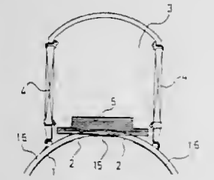
Heinz J. Pflaumbaum, Brunsbergweg, 6A, D-5810 Witten-Heven, Fed. Rep. of Germany, and Pierre L. Lemmens, Rue Pieter, 56, B-1190 Brussels, Belgium

Continuation-in-part of Ser. No. 848,301, Apr. 4, 1986, Pat. No. 4,673,421. This application May 6, 1987, Ser. No. 46,720

Claims priority, application Belgium, May 14, 1986, 0/216658

Int. Cl.⁴ B01D *45/08*

U.S. Cl. 55—238 **26 Claims**



1. An apparatus for receiving flue gases from a flue gas source and for discharging said flue gases into a cooling tower, said flue gases having a velocity, said apparatus comprising, in combination:

a horizontal conduit including an inlet for receiving the flue gases from the source, said conduit further including an uppermost portion having a longitudinal slot formed therein;

at least one tank positioned on the conduit, overlying the longitudinal slot, and being in communication therewith for receiving the gases from the conduit through the longitudinal slot, each said tank having at least one side surface being in communication with the cooling tower;

at least one drop separator panel disposed in each respective side surface of each tank, whereby gases in each tank may pass therethrough and into the tower; and

at least one deflector disposed in each tank above the longitudinal slot, each said deflector being positioned on a respective plane which is substantially perpendicular to the slot, thereby controlling the velocity of the gases received in each tank from the conduit, and thereby maintaining the gases on the side surface of each tank at a uniform velocity.

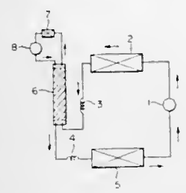
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,738

LIQUID-GAS CONTACTOR FOR NON-AZEOTROPIC MIXTURE REFRIGERANT

Katsuhiko Fujiwara; Masahiko Kagami; Takumi Imoto, all of Kusatsu, and Naoki Shimokawa, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1987, Ser. No. 113,960
Claims priority, application Japan, Oct. 30, 1986, 61/258810
Int. Cl.⁴ F25J *3/00*
U.S. Cl. 62—18 **5 Claims**



1. A gas-liquid contactor for use in a refrigeration cycle having a compressor, a condenser, an orifice means and an evaporator which are connected through pipes in the form of a loop through which a non-azeotropic refrigerant composed of two or more refrigerants of different boiling temperatures is circulated, said gas-liquid contactor comprising:

a container;

a first pipe connected to a lower portion of said container upstream of said gas-liquid contactor;

a second pipe connected to a lower portion of said container downstream of said gas-liquid contactor;

a gaseous refrigerant outlet pipe connected to an upper portion of said container;

a liquid refrigerant returning pipe connected to an upper portion of said container;

upper and lower filler holders disposed in an upper portion and a lower portion of said container and each having a multiplicity of through-holes; and

a bed of a filler defined between said upper and lower filler holders and charged with a multiplicity of pieces of filler each having a substantially cylindrical shape and a peripheral surfaces formed therein with convexities and concavities.

4,781,739

LOW ENERGY HIGH PURITY OXYGEN INCREASED DELIVERY PRESSURE

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Continuation-in-part of Ser. No. 642,103, Aug. 20, 1984, Pat. No. 4,578,095. This application Feb. 26, 1987, Ser. No. 19,042
Int. Cl.⁴ F25J *3/04*
U.S. Cl. 62—22 **18 Claims**

1. A process for fractional distillation of a supply of cleaned and compressed air to oxygen product of at least 98% purity plus optional coproduct crude argon comprising:

(a) evaporating product oxygen by exchanging latent heat with a major fraction of said supply air, which is partially condensed thereby;

(b) rectifying the condensed remainder of said major fraction to overhead N_2 and kettle liquid bottoms in a high pressure (HP) rectifier;

(c) totally condensing a minor fraction of the supply air in a reboiler for a nitrogen (N_2) removal column, thereby providing bottoms reboil to said column

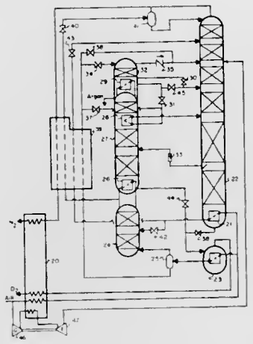
(d) splitting the liquid air into two streams and feeding one each to said HP rectifier and said N_2 removal column as respective intermediate refluxes therefor;

(e) feeding at least one fluid from the kettle liquid to said N_2 removal column;

(f) withdrawing a sidestream liquid oxygen-argon mixture substantially free of nitrogen from an intermediate height of said N_2 removal column below the feed height;

(g) distilling said liquid sidestream in an argon distillation column to crude argon overhead product and liquid oxygen bottom product;

(h) withdrawing liquid oxygen bottom product from both the N_2 removal column and the argon distillation column;



(i) increasing the liquid oxygen pressure to the evaporation pressure of step (a);

(j) supplying said pressurized liquid oxygen to said evaporation step; and

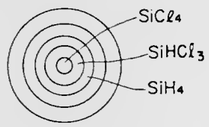
(k) withdrawing said crude argon and said evaporated oxygen.

4,781,740

METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Toshio Danzuka; Hiroshi Yokota, and Yoichi Ishiguro, all of Yokohama, Japan, assignors to Sumimoto Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 716,136, Mar. 26, 1985, abandoned. This application Feb. 19, 1987, Ser. No. 16,354
Claims priority, application Japan, Mar. 27, 1984, 59-57273
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.⁴ C03B *37/018*
U.S. Cl. 65—3.12 **8 Claims**



1. A method for producing a glass preform for an optical fiber comprising steps of:

jetting $SiCl_4$ as a glass-forming raw material and an inert gas from a first nozzle of a multi-nozzle burner and, as another glass-forming raw material, at least one hydrogen-containing silicon compound with larger oxidation or hydrolysis reaction heat than that of $SiCl_4$ selected from the group consisting of $SiHCl_3$, SiH_2Cl_2, SiH_3Cl and SiH_4 from a second nozzle surrounding the first nozzle,

flame hydrolyzing and/or oxidizing the glass-forming raw materials to synthesize glass soot particles,

depositing the glass soot particles on a starting member to form a porous soot preform with a controlled bulk density distribution and

heating and sintering the soot preform to obtain a transparent glass preform.

4,781,741

PROCESS FOR PRODUCING SPHERICAL GLASS PARTICLES

Walter A. Johnson, Towanda; Nelson E. Kopatz, and Lori S. Pruyne, both of Sayre, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 871,039, Jun. 5, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 103,617
Int. Cl.⁴ C03B *19/10*
U.S. Cl. 65—21.2 **5 Claims**

1. A process for producing spherical glass particles, said process comprising:

(a) entraining particles of glass in a non-reducing carrier gas;

(b) forming a high velocity stream of molten droplets of said glass by feeding the entrained particles into a plasma;

(c) passing said droplets through a gaseous atmosphere to cool and decrease the velocity of said droplets;

(d) directing said stream toward a repellent surface;

(e) impacting said molten droplets against said surface to form fragmented portions; and

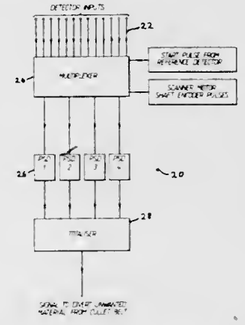
(f) cooling said fragmented portions to form a glass powder consisting essentially of particles the major portion of which are glass spheres having a particle size of less than about 25 micrometers in diameter.

4,781,742

METHOD AND APPARATUS FOR DETECTING UNWANTED MATERIALS AMONG CULLET

Barry R. Hill, St. Helens, and David M. Ring, Southport, both of England, assignors to Pilkington PLC, St. Helens, England

Filed Sep. 15, 1987, Ser. No. 96,523
Claims priority, application United Kingdom, Sep. 26, 1986, 8623213
Int. Cl.⁴ C03B *3/00*
U.S. Cl. 65—29 **19 Claims**



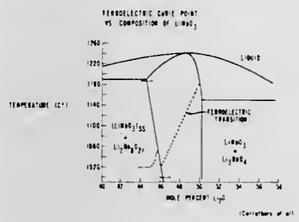
1. An apparatus for inspecting glass cullet for the presence of unwanted materials among the pieces of glass, the apparatus comprising frame means disposed adjacent the cullet, a light source mounted on the frame means for directing light onto the cullet to simultaneously illuminate glass particles and unwanted particles which may be present, at least one array of a plurality of light detectors mounted on the frame means and positioned to differentiate between light which is scattered from the cullet with sufficient lack of uniformity to be indicative of reflections off the cullet itself, and light which is scattered with sufficient uniformity to be indicative of reflections off unwanted material among the cullet, and signaling means operably connected to said detectors to provide an indication of the presence of unwanted material among the cullet.

4,781,743

METHOD OF IMPROVING WAVEGUIDE UNIFORMITY IN OPTICAL SUBSTRATE AND PRODUCT

Ronald J. Holmes, Lowhill Township, Lehigh County, and William J. Minford, Lehigh Township, Northampton County, both of Pa., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 16, 1987, Ser. No. 4,014
Int. Cl.⁴ C03B *25/00;* **G02B** *5/14;* **C03C** *21/00*
U.S. Cl. 65—30.13 **9 Claims**



1. A method of forming optical waveguides in an optical substrate for providing improv ed diffusion uniformity of said optical waveguides , said method comprising the steps of:

(a) providing an optical substrate consisting of $LiNbO_3$;

(b) pre-annealing said optical substrate provided in step (a) to form a surface layer with a predetermined congruent composition, said surface layer formed to comprise a depth at least equal to the depth of the optical waveguides; and

(c) forming said optical waveguides in said congruent composition surface layer formed in step (b).

4,781,744

MOLDING METHOD

Shigeyoshi Kobayashi, Kawasaki; Tsuneo Manabe; Masazumi Shigematsu, both of Yokohama; Yasuko Osaki, Kawasaki; Shoji Watanabe, Tokyo, and Tohoru Sema, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd. and Lion Corporation, both of Tokyo, Japan

Continuation of Ser. No. 914,361, Oct. 2, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 102,310
Claims priority, application Japan, Oct. 11, 1985, 60-224880
Int. Cl.⁴ C03B *19/02;* **C03C** *1/04*
U.S. Cl. 65—33 **6 Claims**

1. A method of shaping and crystallizing calcium phosphate glass, comprising:

preparing a mold, the shaping surface of which is comprised of crystals of β- or δ-calcium metaphosphate in an amount sufficient to provide uniform crystallization of said glass in said mold;

feeding a molten calcium phosphate glass melt to said mold; and

shaping the molten calcium phosphate glass melt which is in contact with the shaping surface of said mold to provide a shaped product, and crystallizing said shaped product while it is hot to thereby provide a crystallized calcium phosphate article.

4,781,745

REGISTERING DEVICE FOR GLASS ARTICLE HANDLING COMPONENTS

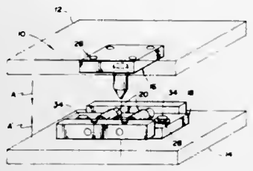
Eustace H. Mumford, Ottawa Lake, Mich., assignor to Glasstech International L.P., Scarsdale, N.Y.

Filed May 19, 1987, Ser. No. 52,025
Int. Cl.⁴ C03B *11/06*
U.S. Cl. 65—323 **10 Claims**

1. A device for registering together two cooperable glass article handling components, said device comprising: a first

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registering member defined by a pin on one of said handling components; and a second registering member defined by at least a pair of fixedly spaced rollers having an opening therebetween on the other component; said registering members being movable toward one another in a direction of registration; said



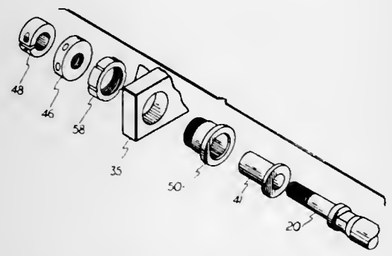
roller spacing being such that said pin is in rolling contact with said rollers as said pin is inserted into said opening for engaging the other registering member to thereby provide accurate registration between the handling components during glass article handling.

4,781,746

DRIVE APPARATUS FOR STRAIGHT LINE SHEAR MECHANISM

Robert L. Doughty, West Hartford, and Robert J. Duga, Enfield, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 17, 1987, Ser. No. 134,277
Int. Cl.[4] C03B 7/10
U.S. Cl. 65—332 **19 Claims**



1. An improved drive assembly for a reciprocally mounted mechanism of a glassware forming machine, of the type including an arm secured to the mechanism, at least one slidingly mounted drive rod having an axis essentially parallel to an axis of reciprocation of the mechanism, said drive rod being joined to said arm so that the arm and mechanism move in parallel with said drive rod, and drive means for reciprocating said drive rod along its axis; wherein the improvement comprises an improved joint between the arm and the drive rod, comprising:

first and second annular members projecting from a circumferential member fitted to or integral with said drive rod, said annular members having radial surfaces facing each other; and

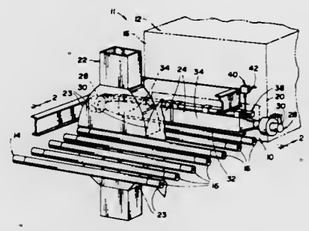
a bushing member secured to or integral with said arm and fitted around said drive rod intermediate the radial surfaces of said annular members, with a radial clearance region between said circumferential member and said bushing member and an axial clearance region between the bushing member and the radial surfaces to permit limited repositioning and reorientation of the arm relative to the drive rod.

4,781,747

BLOW BACK CONTROL DEVICE IN GLASS TEMPERING SYSTEM

Sven E. F. Soedervall, Edane, Sweden, assignor to Glasstech International L.P., Scarsdale, N.Y.

Filed Aug. 17, 1987, Ser. No. 86,971
Int. Cl.[4] C03B 27/04
U.S. Cl. 65—348 **16 Claims**



1. In a glass tempering system having a roller conveyor including rolls for receiving a sheet of glass that has been heated in a glass heating furnace, the furnace including an exit end having an exit opening through which the heated glass sheet is discharged from the furnace along the rolls, the glass tempering system also having a quenching station for applying cooling gas to the heated glass sheet, a blow back control device comprising: a housing defining a suction chamber located near the exit opening of the furnace; and suction means connected to the housing for drawing spent cooling gas through the suction chamber and for discharging the gas away from the furnace exit opening to avoid temperature swings in the furnace caused by cooling gas entering the furnace.

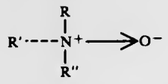
4,781,748

AQUEOUS NITROGENOUS FERTILIZER SOLUTIONS HAVING REDUCED CORROSIVITY

Richard F. Miller, Humble, and Marilyn W. Blaschke, Pearland, both of Tex., assignors to Pony Industries, Inc., New York, N.Y.

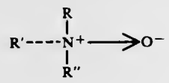
Filed Oct. 17, 1986, Ser. No. 919,955
Int. Cl.[4] C05G 3/00, 1/02, 5/02
U.S. Cl. 71—28 **14 Claims**

1. An aqueous fertilizer composition comprised of at least one nitrogenous compound which is useful as a plant fertilizer and a corrosion inhibiting amount of at least one amine oxide having the structural formula



wherein R, R′ and R″ are identical or different hydrocarbon radicals selected from straight- or branched-chain alkyl groups each having 1 to 24 carbon atoms, unsubstituted or alkyl-substituted aromatic radicals having 6 to 24 carbon atoms or mixtures of these.

8. A method of reducing the corrosivity of aqueous nitrogenous fertilizer compositions on metals comprising adding to said fertilizer composition at least one amine oxide having the structural formula



wherein R, R′ and R″ are identical or different hydrocarbon radicals selected from straight- or branched-chain alkyl groups each having 1 to 24 carbon atoms, unsubstituted or alkyl-substituted aromatic radicals having 6 to 24 carbon atoms or mixtures of these in an amount sufficient to substantially inhibit corrosion of metal surfaces which come in contact with said fertilizer compositions.

4,781,749

POLYMETHYLENE UREA FERTILIZER SOLUTION

William P. Moore, Hopewell, Va., assignor to Coron Corporation, Souderton, Pa.

Filed Sep. 29, 1987, Ser. No. 103,039
Int. Cl.[4] C05C 9/00
U.S. Cl. 71—28 **19 Claims**

1. A two stage method for preparing clear, storage stable, controlled release polymethylene urea fertilizer solution, comprising:

(a) a first stage reaction of urea with a molar excess of aqueous formaldehyde, amounting to between 1.5 and 2.5 mols formaldehyde per mol of urea, at near-boiling temperatures between 75° and 105° C. in the presence of buffering agents to maintain near-neutral reaction conditions, and ammonium compounds, until the formaldehyde is substantially converted to methylene moeities; and

(b) a second stage reaction of the methylene moeities with sufficient added urea to provide a molar excess of urea to formaldehyde at near-boiling temperatures in the presence of buffering agents sufficient to maintain near-neutral reaction conditions, and ammonium stabilizing compounds, until the methylene, urea, and ammonia moeities are substantially converted to a water soluble polymethylene ureas solution containing minor amounts of methylolurea, methylene diurea and free ammonia.

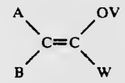
4,781,750

HERBICIDALLY ACTIVE ENOLS

John W. Ashmore, Souderton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 27, 1985, Ser. No. 770,033
Int. Cl.[4] A01N 33/12, 37/43
U.S. Cl. 71—85 **26 Claims**

1. A compound having the formula:



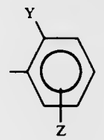
wherein

A is COR^1, CO_2R^1 or $CONR^4R^5$;

B is cyano; COR; CO_2R; or $S(O)_nR^2$;

V is hydrogen, (C_1-C_6)alkyl, COR^3 or phenalkyl having one to four carbons in the alkyl group;

W is unsubstituted or substituted furan, unsubstituted or substituted thiophene wherein the substituent is halo or nitro; or substituted phenyl having the formula



wherein

Y is halo, nitro, (C_1-C_4)alkoxy or (C_1-C_4)haloalkyl;

Z is from one to two of the same or different hydrogen, halo, cyano, (C_1-C_6)haloalkyl, nitro, (C_1-C_6)alkyl, (C_1-C_6)alkoxy or (C_1-C_6)haloalkoxy;

R is (C_1-C_4)alkyl;

R^1 is (C_1-C_4)alkyl;

R^3 is (C_1-C_6)alkyl or unsubstituted or substituted phenyl having one to three of the same or different halo, nitro, (C_1-C_4)alkyl, (C_1-C_4)alkoxy, (C_1-C_4)haloalkyl, or dialkylamino having independently up to six carbons in each alkyl moiety;

R^4 and R^5 are independently, (C_1-C_3)alkyl or R^4 and R^5 joined together with the nitrogen to which they are attached form a heteroalkyl ring selected from the group consisting of morpholine, piperidine and pyrrolidine;

n is from 0 to 2; geometric isomers, tautomers, halogen addition products and agronomically acceptable salts thereof.

17. A method of controlling weeds which comprises applying to the locus to be controlled a herbicidally effective amount of a compound according to claim 1.

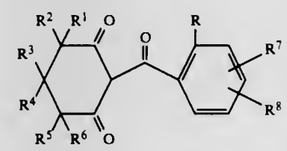
4,781,751

CERTAIN 2-(2-SUBSTITUTED BENZOYL)-4-(SUBSTITUTED)-1,3-CYCLOHEXANEDIONES

Hsiao-Ling M. Chin, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 86,266, Aug. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 919,277, Oct. 16, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 102,046
Int. Cl.[4] A01N 41/00
U.S. Cl. 71—103 **16 Claims**

1. Compounds of the formula



wherein

R is halogen; C_1-C_2 alkyl; C_1-C_2 alkoxy; trifluoromethoxy; difluoromethoxy; nitro; cyano; C_1-C_2 haloalkyl; R^aSO_n— wherein n is 0 or 2 and R^a is C_1-C_2 alkyl; trifluoromethyl or difluoromethyl;

R^1 is hydrogen, C_1-C_4 alkyl, halogen, or phenyl;

R^2 is hydrogen or C_1-C_4 alkyl; or

R^1 and R^2 together are C_2-C_5 alkylene;

R^3 is hydrogen, C_1-C_4 alkyl, or phenyl, with the proviso that R^1 and R^3 are not both phenyl;

R^4 is hydrogen or C_1-C_4 alkyl;

R^5 is hydrogen, halogen or C_1-C_4 alkyl;

R^6 is halogen, cyano, nitro, trifluoromethyl, —C(O)—OR^f wherein R^f is C_1-C_4 alkyl, or —$C(O)NR_2^b$ wherein R^b is hydrogen or C_1-C_2 alkyl;

R^7 and R^8 independently are (1) hydrogen; (2) halogen; (3) C_1-C_4 alkyl; (4) C_1-C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1-C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1-C_4 alkyl; (b) C_1-C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1-C_4 alkyl; (11) R^eC-(O)— wherein R^e is C_1-C_4 alkyl or C_1-C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined; and their salts.

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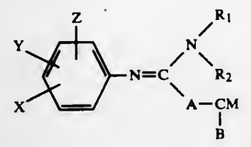
4,781,752

HALOACETAMIDINES COMPOSITIONS AND THE HERBICIDAL USE THEREOF

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 272,860, Jun. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 091,854, Nov. 6, 1979, abandoned. This application Jul. 11, 1983, Ser. No. 512,941
Int. Cl.[4] A01N *33/02*
U.S. Cl. 71—121 28 Claims

1. The herbicidal composition in which the herbicidal compound has the formula



in which
R_1 is hydrogen;
R_2 is alkyl having 1–6 carbon atoms, inclusive;
—CMAB is $—CHCl_2$;
X and Y are independently selected from the group consisting of lower alkyl having 1 to 6 carbon atoms, inclusive, and chloro; and
Z is hydrogen with a herbicidally suitable carrier or diluent.

4,781,753

PROCESS FOR PRODUCING FINE SPHERICAL PARTICLES FROM NON-FLOWING POWDERS

Nelson E. Kopatz, and Lori S. Pruyne, both of Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 29, 1987, Ser. No. 8,495
The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—0.5 B 1 Claim

1. A process for producing fine spherical powder particles, said process comprising:
(a) forming a relatively uniform admixture of a starting powder material having a particle size of no greater than about 20 micrometers in diameter and a flowability aid, said flowability aid being non-reactive with and coarser than said starting material;
(b) entraining said admixture in a carrier gas and passing said admixture through a high temperature zone at a temperature above the melting point of said starting material, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet, to melt at least about 50% by weight of said starting material;
(c) rapidly and directly resolidifying the resulting high temperature treated material, while in flight to form fine spherical particles having a particle size of less than about 20 micrometers in diameter; and
(d) separating said flowability aid from the balance of said high temperature treated material.

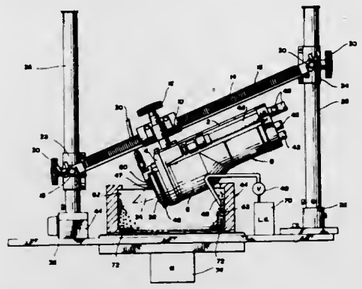
4,781,754

RAPID SOLIDIFICATION OF PLASMA SPRAYED MAGNETIC ALLOYS

Vito W. Soranno, Sterling Heights; Frank G. Pirrallo, Troy, and Thomas H. Van Steenkiste, Washington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1987, Ser. No. 100,429
Int. Cl.[4] B22F *9/10*
U.S. Cl. 75—0.5 B 7 Claims

1. A method of making rapidly solidified metal powder comprising the steps of introducing a said metal into the flame of a plasma torch; directing the torch flame onto the inside surface of a rotating quench cylinder to solidify the metal carried in the flame against said surface and continuously introducing a gas adjacent the inside surface of the rotating quench cylinder such that the metal carried in the torch flame is solidified against the inside surface of the cylinder at a rate



such that a powder having a substantially amorphous to very finely crystalline microstructure is obtained and such that the solidified metal does not adhere to said inside surface of the quench cylinder.

4,781,755

METHOD OF RECOVERING COPPER AND FURNACE FOR CARRYING OUT THE METHOD

Erwin Koch, Leoading; Gerhard Glöckler, Ohsdorf, and Heinz Müller, Neuhofen, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Austria

Filed Jul. 10, 1987, Ser. No. 72,247
Claims priority, application Austria, Jul. 22, 1986, 1977/86
Int. Cl.[4] C22B *4/00*; C21C *5/52*
U.S. Cl. 75—10.19 7 Claims

1. A method of recovering copper from a burden comprising at least one of oxidic and silicate copper compounds by way of pyrometallurgy, wherein a reaction zone is provided and heated by at least one plasma jet emitted from plasma burner means, and said copper compounds are melted in said reaction zone and are heated to a temperature of at least 1,500° C., and reaction zone maintaining an oxygen partial pressure sufficiently low so as to cause the thermal decomposition of said copper compounds without thermal decomposition of oxides of other metals present in said copper compounds, wherein said reaction is carried out in a scalable furnace, and wherein said reaction is carried out without adding a reducing agent to said burden.

4,781,756

REMOVAL OF LITHIUM NITRIDE FROM LITHIUM METAL

Teresita C. Frianeza-Kullberg, and Dennis J. Salmon, both of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Filed Jul. 2, 1987, Ser. No. 68,871
Int. Cl.[4] C22B *26/12*; C22C *24/00, 3/00*
U.S. Cl. 75—66 8 Claims

1. A process for the removal of lithium nitride from a liquid lithium metal consisting essentially of adding to liquid lithium metal containing lithium nitride, in an inert, nitrogen free atmosphere at a temperature between the melting point of lithium and 300° C., a stoichiometric quantity of aluminum to react with the lithium nitride, with agitation performed by introducing an inert nitrogen free gas beneath the surface of the lithium, continuing the agitation for a period of time sufficient to form aluminum nitride and separating the aluminum nitride from the liquid lithium metal.

4,781,757

COATING COMPOSITION

Werner Lamb, Emden, Fed. Rep. of Germany, assignor to Desert Tool and Supply, Inc., Las Vegas, Nev.

Filed Feb. 13, 1987, Ser. No. 14,849
Int. Cl.[4] C09G *1/06*
U.S. Cl. 106—11 9 Claims

1. A coating composition consisting essentially of a major amount of mineral oil and between about 0.01 and about 1.0% eucalyptus oil, by volume.

4,781,758

INK COMPOSITION FOR DROP-ON-DEMAND INK JET

Paul L. Gendler; Alfred H. Sporer, both of San Jose, Calif., and Donald A. Stremel, Northglenn, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1987, Ser. No. 111,225
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 9 Claims

1. A substantially aqueous composition for drop on demand ink jet printing comprising:
a fluid vehicle with greater than 50% by weight water,
a water soluble dye in the range of 1–10% by weight,
a lower alkylene glycol plasticizer in the range of concentration of 1–20% by weight, and
in the range of 1–10% by weight, a water soluble additive which is a low molecular weight heterocyclic, bifunctional monomer or dimer in which the two functional groups are either two imide groups, or a hydantoin bearing a carboxylic acid group, with both the imide groups and the amide groups being capped with hydroxyalkylene units.

4,781,759

LIMESTONE AND CLAY TRACTION AID

George N. Smith, 3833-N. Lake Orlando Pkwy., Orlando, Fla. 32808

Filed Aug. 8, 1985, Ser. No. 763,946
Int. Cl.[4] C09K *3/18*
U.S. Cl. 106—36 11 Claims

1. A process for providing traction on ice or snow comprising the steps of:
(a) providing a composition comprising 75 to 95 percent by weight crushed limestone having a particle size between about ¼ inch and about 30 mesh and 5 to 25 percent ground clay and
(b) spreading the composition on ice or snow covered surfaces.

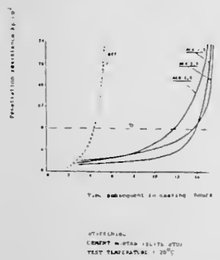
4,781,760

METHOD FOR IMPROVING THE PROPERTIES OF CEMENT MORTAR AND CONCRETE

Kjell Svensson, and Sepp Zechner, both of Helsingborg, Sweden, assignors to Aluflour Aktiebolag, Helsingborg, Sweden

Filed Aug. 11, 1987, Ser. No. 84,081
Claims priority, application Sweden, Sep. 9, 1986, 8603780
Int. Cl.[4] C04B *7/13*
U.S. Cl. 106—89 9 Claims

1. A method for improving the properties of cement mortar or concrete comprising adding to the cement mortar or concrete, waste sludge as pozzolan, said waste sludge obtained by neutralizing with an alkali to a pH greater than 7 at least one of mother liquor and gaswashing liquor derived from the manufacture of aluminum fluoride from aluminum hydroxide and hexafluorosilicic acid, said waste sludge being added in an



amount of 0.5–10% by weight of the prescribed amount of cement calculated on a dry weight basis.

4,781,761

TITANIUM DIOXIDE PIGMENT COATED WITH BORIA-MODIFIED SILICA

Howard W. Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1986, Ser. No. 857,324
Int. Cl.[4] C09C *1/36*
U.S. Cl. 106—446 13 Claims

1. A pigment consisting essentially of rutile TiO_2 particles bearing coatings consisting essentially of SiO_2 and B_2O_3, wherein the coatings constitute 2–10% of the total pigment weight.

7. A process for preparing TiO_2 particles bearing coatings of boria-modified silica, comprising:
(a) forming an aqueous slurry of rutile TiO_2 at a temperature from about 65° C. to about 90° C.;
(b) adjusting pH of the slurry to the range 7–10.5;
(c) adding a predetermined quantity of a solution comprising Na_2SiO_3 and B_2O_3, under conditions which maintain silicate and boria ions in solution;
(d) gradually lowering pH of the slurry to about 7.5–8.5 by addition of acid, thereby depositing a coating of silica and boria; and
(e) curing the resulting coated pigment at a temperature from about 65° C. to about 90° C. for a period of at least 15 minutes.

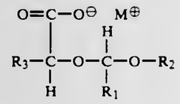
4,781,762

FLAVORING METHOD AND COMPOSITION

Brian Byrne, Mahwah, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 776,300, Sep. 16, 1985, Pat. No. 4,697,025.
This application May 20, 1987, Ser. No. 52,105
Int. Cl.[4] A24B *3/12*; B29C *49/00*
U.S. Cl. 131—276 10 Claims

1. A method of releasing flavorful aldehydes from foodstuffs and tobacco containing carboxylates comprising:
(a) providing a compound of the general formula:



where R_1 is an alkyl having from 1 to 14 carbons, alkenyl having from 2 to 14 carbons, cycloalkyl, cycoalkenyl, aryl, or furyl having from 4 to 14 carbons; R_2 is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, or cycloalkynyl of from 1 to 7 carbons, aryl or oxyaryl of from 5 to 18

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carbons, or a cycloaliphatic ether of from 5 to 6 carbons; and R_3 is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, or cycloalkynyl of from 1 to 7 carbons, aryl, or oxyaryl of from 5 to 18 carbons, or a cycloaliphatic ether of from 5 to 6 carbons, or a radical of the general formula:



where R_4 and R_5 independently are hydrogen or alkyl of from 1 to 6 carbons; and R_6 is aryl, alkylaryl, aryloxy, alkoxy, cyclic acetal of from 3 to 7 carbons, dioxyalkenyl ether of from 4 to 8 carbons; and M is cation other than hydrogen ion;

(b) adding a liquid comprising water to said mixture to form an aqueous mixture.

4,781,763

METHOD FOR CLEANING THE NET BAG OF BREEDING ENCLOSURES

Einar B. Vaagland, Vågland, Norway, assignor to Vaagland Mek. Verksted A/S, Vagland, Norway

Filed Apr. 7, 1987, Ser. No. 35,320

Int. Cl.[4] B08B *30/00*

U.S. Cl. 134—26 **2 Claims**



1. The method of cleaning accumulations of algae, seaweed, mussels and other growth from the mesh threads of a large, wet and heavy net bag that has been used as a breeding enclosure moored in an immersed state in a body of water forming a portion of a fish breeding plant, comprising the steps of releasing the net bag from the net bag mooring, removing the net bag with the accumulated growth thereon from said body of water and placing the entire bag within a rotatable drum, the drum being mounted for rotation about a horizontal axis and having a plurality of spaced outlet openings therein for the egress of said accumulations from the interior of said drum, and the interior of the drum also being provided with a plurality of spaced ridges that extend substantially radially toward the center of said drum with each such ridge having a radial length that is at least 10% of the internal diameter of the drum, continually rotating said drum in a single direction to cause said ridges to regularly lift said net bag from the bottom to the top of the drum whereafter said net bag drops under the influence of gravity back to the bottom of the drum, continually spraying wash water under pressure, through water inlet openings in the drum, into the interior of said drum as the drum is rotated and as said net bag is lifted and dropped therein to cause portions of said accumulated growth to be knocked off of the mesh threads of the net bag by the combined action of the wash water spray and the impact of said net bag against the spaced ridges and interior walls of the drum, said wash water being sprayed under pressure into the interior of said drum from a side wall of the drum in a plurality of spaced water jets each of which is directed generally parallel to the axis of rotation of the drum, continually draining the wash water and said portions of said accumulated growth for the interior of said drum via said openings during the continued spraying of said wash water and the continued rotation of said drum until said net bag is substantially free of all said accumulated growth, and so correlating the pressure of said sprayed water and the size of said water inlet openings to the area of said outlet openings that the interior of said drum remains substantially free of water build-up during the cleaning of said net bag.

4,781,764

METHOD OF REMOVING UNDESIRED PARTICLES FROM A SURFACE OF A SUBSTRATE

Adriaan F. M. Leenaars, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 21, 1987, Ser. No. 76,101

Claims priority, application Netherlands, Jul. 28, 1986, 8601939

Int. Cl.[4] B08B *3/04*

U.S. Cl. 134—34 **7 Claims**

1. A method of removing undesired particles up to 0.3 micrometers in size from a surface of a substrate, the method comprising moving an interface of the liquid over the surface of the substrate, characterized in that the interface of the liquid is moved over the surface of the substrate at a speed of at most 10 cm/sec.

4,781,765

PHOTOVOLTAIC DEVICE

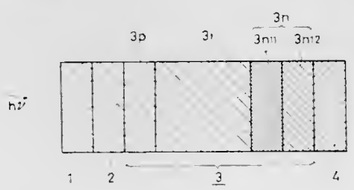
Kaneo Watanabe, Kyoto, and Yukio Nakashima, Osaka, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 14, 1987, Ser. No. 96,944

Claims priority, application Japan, Sep. 26, 1986, 61-228798

Int. Cl.[4] H01L *31/06*

U.S. Cl. 136—249 **18 Claims**



1. A photovoltaic device comprising:

a semiconductor film made mainly of amorphous silicon, said semiconductor film including a plurality of semiconductor layers which comprise at least one semiconductor-to-semiconductor junction,

a transparent front electrode on one side of said semiconductor film, and

a back electrode on the other side of said semiconductor film;

wherein one end layer of said semiconductor layers which neighbors on said back electrode includes,

at least one first type sub-layer of an alloyed amorphous silicon which contains not only hydrogen and a dopant for one conductivity type but also at least one element selected from the group of nitrogen and oxygen so as to provide a conversion efficiency which is improved in resistance to thermal degradation, and

at least one second type sub-layer of an amorphous silicon which contains hydrogen and a dopant for said one conductivity type, but which is substantially free of said at least one element selected from the group consisting of nitrogen and oxygen.

4,781,766

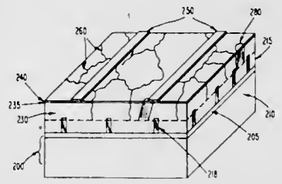
FAULT TOLERANT THIN-FILM PHOTOVOLTAIC CELL AND METHOD

Allen M. Barnett; Robert B. Hall, both of Newark, Del.; Jeff W. Edington, Westmoant, Canada; Alexander P. Davidson, Whichford, United Kingdom, and William A. Tiller, Portola Valley, Calif., assignors to Astrosystems, Inc., Newark, Del.

Division of Ser. No. 792,976, Oct. 30, 1985, Pat. No. 4,677,250. This application May 29, 1987, Ser. No. 55,436

Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 136—258 **34 Claims**



20. In a thin-film photovoltaic solar cell having as its components a substrate functioning as a first electrical contact, at least one semiconductor layer, including at least one photovoltaic junction, and a second electrical contact, the improvement being an aluminum substrate containing silicon in the amount of 5 to 25 weight percent, and an insulator interposed between the substrate and said at least one semiconductor layer, said insulator comprising a mixture of aluminum oxide and silicon oxide, and said insulator containing electrically conductive silicon nucleation sites dispersed therein, whereby microscopic and macroscopic defects terminate on the insulator and the sites provide for electrical communication between the first electrical contact and the semiconductor layer.

4,781,767

PHOTOELECTRIC CONVERSION DEVICE

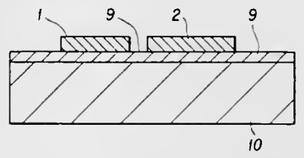
Kohji Toda, Yokosuka; Kohji Takahashi, and Yasuo Niwa, both of Tokyo, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 873,881, Jun. 13, 1986, Pat. No. 4,724,157. This application Oct. 14, 1987, Ser. No. 108,180

Claims priority, application Japan, Dec. 14, 1985, 60-281671; Dec. 14, 1985, 60-281672; Dec. 14, 1985, 60-281673; Dec. 14, 1985, 60-281674; Dec. 14, 1985, 60-281675; Dec. 14, 1985, 60-281676; Dec. 14, 1985, 60-281677; Dec. 14, 1985, 60-281678; Jan. 31, 1986, 61-020771; Jan. 31, 1986, 61-020772; Jan. 31, 1986, 61-020773; Jan. 31, 1986, 61-020774; Jan. 31, 1986, 61-020775; Jan. 31, 1986, 61-020776; Jan. 31, 1986, 61-020777; Jan. 31, 1986, 61-020778; Jan. 31, 1986, 61-020779; Jan. 31, 1986, 61-020780

Int. Cl.[4] H01L *31/04*

U.S. Cl. 136—265 **1 Claim**



1. A photoelectric conversion device comprising a substrate; a thin crystalline Pb—Cr oxide film on a surface of the substrate and which is obtained by forming said thin film on the surface of the substrate by a vacuum evaporation process using a sintered body prepared from compounds comprising PbO and Cr_2O_3 as a target and heat treating the thin film in an atmosphere containing Pb; and a pair of spaced apart conductive film electrodes formed on the surface of the thin film.

4,781,768

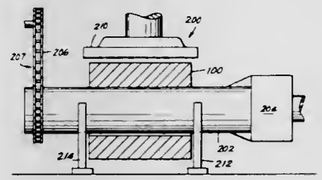
FULL LENGTH FORGING METHOD FOR PRODUCING LARGE SECTION, LARGE MASS CYLINDRICAL SLEEVES OF ALLOY 625

Ashok K. Khare, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Continuation-in-part of Ser. No. 913,939, Oct. 1, 1986, Pat. No. 4,714,499. This application Nov. 23, 1987, Ser. No. 123,806

Int. Cl.[4] C22F *1/10*

U.S. Cl. 48—11.5 N **11 Claims**



1. A process for producing a large section, large mass sleeve of alloy 625 consisting essentially of a limiting composition by weight percentage of 58.0 min. nickel, 20.0–23.0 chromium, 5.0 max. iron, 8.0–10.0 molybdenum, 3.15–4.15 columbium (plus tantalium), 0.10 max. carbon, 0.50 max. manganese, 0.50 max. silicon, 0.015 max. phosphorus, 0.015 max. sulphur, 0.40 max. aluminum, 0.40 titanium, and 1.0 max. cobalt (if determined), comprising the steps of:

(a) forming a workpiece by hot isostatically pressing alloy 625 powder into a preform having a length slightly longer than the predetermined full length of the finished large section, large mass cylindrical sleeve and a bore of a predetermined diameter along the longitudinal axis;

(b) saddle forging the workpiece which further comprises the substeps of,

(1) heating the workpiece to a temperature of 2000° F.,

(2) placing the workpiece on a preheated saddle forging mandrel,

(3) placing the saddle mandrel with the workpiece disposed thereon on a pair of saddles, with the saddles being positioned such that a first saddle supports a first end of the saddle forging mandrel and a second saddle supports a second end of the saddle forging mandrel with a small gap being formed between a first end of the workpiece disposed on the saddle forging mandrel and the first saddle and a small gap being formed between a second end of the workpiece disposed on the saddle forging mandrel and the second saddle,

(4) engaging a first end of the saddle forging mandrel with a manipulator means and engaging the saddle forging mandrel near the second end with a chain drive assembly,

(5) working the workpiece by rotating the workpiece in steps with the manipulator means and the chain drive assembly and at each step applying a saddle forging die having a length longer than the full length of the workpiece, with the saddle forging die applying a pressure of 3000 tons to the workpiece at each step until the workpiece stops moving, with each successive step being an amount which allows an overlap of a new step's press location with the previous step's press location,

(6) reheating the workpiece to a temperature of 2000° F. and repeating substeps, (b)(2), (3), (4) and (5) a predetermined number of times,

(7) reheating the workpiece to a temperature of 2000° F. for the final heat, repeating steps (b)(2), (3) and (4) and then repeating substep (b)(5) after the workpiece cools to a temperature below 1950° F., and

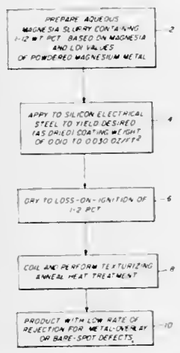
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(8) air cooling the workpiece to room temperature;
(c) thermal treating the workpiece followed by annealing the workpiece; and
(d) finish machining the workpiece to form the finished large section, large mass cylindrical sleeve.

4,781,769
SEPARATING-AGENT COMPOSITION AND METHOD USING SAME

Nazmi Toker, Monroeville, and Leroy R. Price, Allison Park, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Filed Dec. 29, 1986, Ser. No. 947,002
Int. Cl.[4] C04B *9/04*
U.S. Cl. 148—29 **8 Claims**



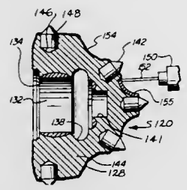
1. In a composition of matter which is a slurry for application to silicon-steel strip as an agent to prevent adjacent laps from becoming adhered to each other during subsequent annealing of a coil of such strip, said slurry consisting principally of magnesium oxide and water, the improvement which comprises adding to said slurry an amount up to 1 weight percent magnesium sulfate heptahydrate and about 1 to 12 weight percent, based on the magnesium oxide present and typical Loss on Ignition values obtained after drying, of magnesium metal powder effective to prevent the development of coating defects on the surface of said steel during said annealing wherein said magnesium metal powder is defined within a size range of minus 50 to minus 320 mesh.

4,781,770
PROCESS FOR LASER HARDFACING DRILL BIT CONES HAVING HARD CUTTER INSERTS

Naresh J. Kar, Westminster, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 843,048, Mar. 24, 1986, Pat. No. 4,708,752. This application Aug. 10, 1987, Ser. No. 83,404
Claims priority, application Ireland, Mar. 12, 1987, 646/87; European Pat. Off., Mar. 13, 1987, 87 3021794; Mexico, Mar. 18, 1987, 5613; Japan, Mar. 23, 1987, 62-65897
Int. Cl.[4] C21D *9/22*
U.S. Cl. 148—16.5 **14 Claims**

1. A process for hardfacing a hard cutter insert bearing cone for a rock bit comprising the steps of:
machining a cone blank surface;
carburizing the bearing surfaces formed within the cone blank;
heat-treating the cone blank to temper the cone blank to an exterior cone blank hardness of about 40 Rockwell C hardness units;
forming holes in said cone blank surface for one or more insert cutters;
pressing the inserts in the insert holes formed in the cone blank;
finish machining the inner bore of the cone;
applying a cladding material to the exterior surface of the finished cone blank;
bombarding the cladding material to the exterior surface of the cone with a laser beam of sufficient intensity and for a sufficient time so as to melt the cladding material into the

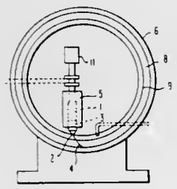


surface of the cone blank, light reflective means adjacent an exposed surface of said inserts, the exposed light reflective means ajacent the cutter inserts not being heated substantially in the step of subjecting the cladding material to the laser beam on to the exterior surface of the cone, the cladding material being immediately adjacent to said light reflective means adjacent said inserts; and
cooling the cladding material sufficiently rapidly to form a hard external layer on said cone blank.

4,781,771
AMORPHOUS CO-BASED METAL FILAMENTS AND PROCESS FOR PRODUCTION OF THE SAME

Tsuyoshi Masumoto, No. 8-22, Uesugi 3-chome, Sendai-shi, Miyagi; Akihisa Inoue, Miyagi; Michiaki Hagiwara, and Kiyomi Yasuhara, both of Kyoto, all of Japan, assignors to Unitika Ltd., Hyogo and Tsuyoshi Masumoto, Miyagi, both of, Japan

Continuation of Ser. No. 720,325, Apr. 5, 1985, abandoned, which is a division of Ser. No. 597,569, Apr. 9, 1984, Pat. No. 4,527,614, which is a continuation of Ser. No. 311,207, Oct. 14, 1981, abandoned. This application Dec. 30, 1986, Ser. No. 947,711
Claims priority, application Japan, Oct. 16, 1980, 55-144860
Int. Cl.[4] C22C *19/07*
U.S. Cl. 148—403 **4 Claims**



1. An amorphous Co-based metal filament having a circular cross-section and made of an alloy comprising 5 to 20 atomic percent of Si and 7 to 35 atomic percent of B, the total of Si and B being 13 to 40 atomic percent and the remainder being composed substantially of Co, and which has a wire diameter satisfying the following equation (I):

$$D_F \leqq 190 - 8|Si - 11| - 8|B + 0.8Si - 25| \quad (I)$$

wherein D_F is the wire diameter, in μm, of the filament, Si is the atomic percent of Si in the alloy, and B is the atomic percent of B in the alloy, said filament having a size unevenness in the longitudinal direction of 13% or less.

2. An amorphous Co-based metal filament having a circular cross-section and made of an alloy comprising 5 to 20 atomic percent of Si, 7 to 35 atomic percent of B, and 30 atomic percent or less of at least one metal selected from the group consisting of Fe, Ni, Cr, Ta, Nb, V, Mo, Mn, W and Zr, the remainder being composed substantially of Co, provided that the total of Si and B is 13 to 40 atomic percent, Fe is 30 atomic percent or less, Ni is 20 atomic percent or less, Cr is 10 atomic percent or less, Ta is 10 atomic percent or less, Nb is 10 atomic percent or less, V is 10 atomic percent or less, Mo is 5 atomic percent or less, Mn is 5 atomic percent or less, W is 5 atomic percent or less, and Zr is 5 atomic percent or less, and which has a wire diameter satisfying the equation (II):

$$D_F \leqq K - 8|Si - 11| - 8|B + 0.8Si - 25| \quad (II)$$

where D_F is the wire diameter, in μm, of a filament, K is a constant as determined depending on an additional metal element with which a part of the Co metal element is replaced:
when Fe, Ni, Mo, Mn, W or Zr is added, K=190,
when Nb, Cr or V is added, K=300, and
when Ta is added, K=400,
provided that when two or more metal elements are added, the K value is the maximum value, Si is the atomic percent of Si in the alloy, and B is the atomic percent of B in the alloy, said filament having a size unevenness in the longitudinal direction of 13% or less.

4,781,772
ODS ALLOY HAVING INTERMEDIATE HIGH TEMPERATURE STRENGTH

Raymond C. Benn, and Andrew Zozom, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Feb. 22, 1988, Ser. No. 158,874
Int. Cl.[4] C22C *19/05*
U.S. Cl. 148—404 **5 Claims**

1. An oxide dispersion strengthened alloy consisting in percent by weight essentially of about 5–9% chromium, 5–7% aluminum, 5–9% tungsten, 1–3% molybdenum, 1–5% tantalum, 0–1.5% titanium, 0–10% cobalt, 1–4% rhenium, 0.6–2% of an oxidic form of yttrium, 0.005–0.1% boron, 0.03–0.5% zirconium, 0–2% iron, 0–0.3% nitrogen, 0–1% niobium, 0–2% hafnium with the balance being essentially nickel, said alloy containing at least about 0.6% of an oxidic form of yttrium when in polycrystalline form and containing near the minimum amount, if any, of grain boundary segregating elements when in single crystal form.

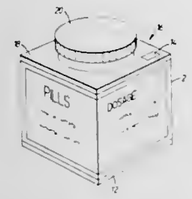
3. An alloy as in claim 1 in the form of a monocrystalline mass having a crystal aspect ratio of at least 7.

4,781,773
MANUFACTURING CONTAINERS FROM MULTILAYERED MATERIAL

David J. Instance, Guinea Hall, Sellindge, Kent, United Kingdom

Filed Aug. 11, 1987, Ser. No. 84,634
Claims priority, application United Kingdom, Dec. 22, 1986, 8630546
Int. Cl.[4] B29C *47/06*; B32B *1/08, 1/10*
U.S. Cl. 156—69 **14 Claims**

1. A method of manufacturing containers, the method comprising the steps of:
(a) extruding an elongate tube of plastics material, the tube having a rectangular outer cross-section and an elongate central cylindrical cavity;
(b) cutting the tube transversely into a plurality of container body portions;

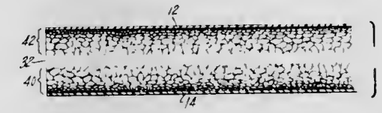


(c) sealing a base to one end of each body portion; and
(d) sealing a top to the other end of each body portion.

4,781,774
METHOD OF MANUFACTURING FOAM CORE PANELS FOR SOUND ABSORPTION

Raymond G. Steward, Port Huron, and Stuart G. Boyd, North Street, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Apr. 6, 1987, Ser. No. 34,457
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—79 **5 Claims**



1. A method of manufacturing a pair of foam core panels having improved sound absorption characteristics which comprises the steps of:
forming a foam panel between a top and a bottom means which dimensionally limit the thickness of the panel, said panel having a nonuniform cellular structure such that the panel has a large cell structure at a center portion and smaller cell structure at the top and bottom portions of the panel; and
skiving the foam panel through the center portion having the large cell structure to make two panels each having an exterior surface that has a large cell structure and has open cells to thereby improve the panels sound absorption characteristics.

4,781,775
COPLANAR DIE TO SUBSTRATE BOND METHOD

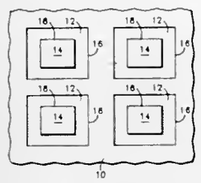
David J. Reed, Mesa, and Robert K. Fairbanks, Phoenix, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 1, 1987, Ser. No. 56,497
Int. Cl.[4] B32B *31/06*
U.S. Cl. 156—89 **14 Claims**

1. A coplanar die to substrate bond method for multichip modules and the like comprising the steps of:
providing a silicon wafer substrate having die openings incorporated therein, each of said die openings having a plurality of sidewalls;
providing a plurality of die to be disposed in said die openings of said silicon wafer substrate, each of said plurality of die having a plurality of edges;
placing said plurality of die on a plate in a predetermined relationship to each other;
disposing and aligning said silicon wafer substrate on said plate with said die so that said plurality of die are disposed in said die openings of said silicon wafer substrate;

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applying a slurry of glass between said plurality of sidewalls of said die openings of said silicon wafer substrate and said edges of said plurality of die while still on said plate, said slurry of glass being at least partially dried to hold said plurality of die and said silicon wafer substrate together;
placing said silicon wafer substrate including said plurality of die held thereto by said glass on a grooved plate having



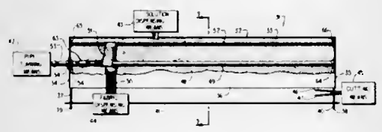
a plurality of grooves, said grooves being aligned with said sidewalls of said die openings of said silicon wafer substrate, said edges of said plurality of die and said glass therebetween; and
firing said silicon wafer substrate, said plurality of die and said glass while on said grooved plate until said glass becomes fused.

4,781,776

METHOD AND DEVICE FOR COATING A PIPE

Harry P. Sullins, Columbia, S.C., assignors to Richland Industrial, Inc., Columbia, S.C.

Continuation of Ser. No. 386,638, Jun. 9, 1982, abandoned. This application Sep. 30, 1986, Ser. No. 913,582
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—187 **17 Claims**



1. A method for coating an elongated pipe comprising the steps of:
dispensing a liquid coating composition into a stationary trough so as to maintain at least a predetermined level of said liquid in said trough;
mounting said pipe for axial rotation over said stationary trough;
dispensing an elongated web of insulating material from a web dispensing means, said web having a free end;
passing said free end of the web around a drag member and then around an elongated bar positioned above the bottom of said stationary trough and securing said free end to said pipe;
turning said pipe with said free end of the web secured thereto such that said web is dispensed from said web dispensing means, pulled around said drag member, pulled around said bar, and wound on said pipe; and,
moving said web dispensing means relative to said stationary trough in a direction transverse to the direction in which said web is being dispensed from said web dispensing means and substantially parallel to the rotational axis of said pipe such that said web is spirally wound on said pipe;
said elongated bar having a web contacting surface below said predetermined level of liquid being maintained in said stationary trough such that said web is pulled through and coated with said liquid coating composition when said pipe is turned by said turning means,
said drag member being positioned between the path of movement of said web dispensing means and said predetermined liquid level in said trough such that the turning of said pipe by said turning means causes uncoated web to be pulled around said drag member before being pulled around said bar and coated with said liquid coating composition;
said drag member having a stationary web contacting surface around which said web is pulled to provide frictional engagement for tensioning said web and causing said spiral windings of coated web to be drawn tightly around said pipe;
and the web contacting surfaces of both said drag member and said bar extending substantially parallel to the rotational axis of said pipe such that said movement of said web dispensing means relative to said stationary trough causes said uncoated web to travel along said drag member and said coated web to travel along said bar in directions transverse to the direction in which said web is being dispensed.

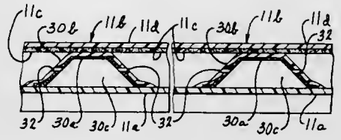
10. An apparatus for coating an elongated pipe comprising:
a stationary trough for holding a liquid coating composition;
securing means for rotatably mounting said pipe for axial rotation over said stationary trough;
turning means for turning said rotatably mounted pipe about its axis of rotation;
liquid dispensing means for dispensing said liquid coating composition into said trough to maintain at least a predetermined level of said liquid in said trough;
web dispensing means for dispensing an elongated web of insulating material toward said pipe when said pipe is turned by said turning means with one end of said web secured to said pipe;
movement means for moving said web dispensing means relative to said trough in a direction transverse to the direction in which said web is dispensed and substantially parallel to the rotational axis of said pipe such that said web is spirally wound on said pipe when said pipe is turned by said turning means;
bar means comprising an elongated bar for engaging said web and means for mounting said bar within said stationary trough, said bar being positioned above the bottom of said trough and having a web contacting surface below said predetermined liquid level such that said web is pulled through and coated with said liquid coating composition when said dispensed web passes around said bar before it is wound on said pipe and while said predetermined level of liquid is maintained in said trough; and,
a drag member having a stationary web contacting surface around which said web is pulled to provide frictional engagement for tensioning said web and causing said spiral windings of coated web to be drawn tightly around said pipe, said drag member being positioned between the path of movement of said web dispensing means and said predetermined liquid level in said trough such that the turning of said pipe by said turning means causes uncoated web to be pulled around said drag member before being pulled around said bar and coated with said liquid coating composition;
the web contacting surfaces of both said drag member and said bar extending substantially parallel to the rotational axis of said pipe such that said uncoated web travels along said drag member and said coated web travels along said bar in directions transverse to the direction in which said web is dispensed when said web dispensing means is moved relative to said trough by said movement means.

4,781,777

DOUBLE-WALL UNDERGROUND TANK AND METHOD OF MAKING

Peter J. Pugnale, The Woodlands, Tex., and Andrew A. Mance, Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 737,857, May 28, 1985, Pat. No. 4,676,093. This application Mar. 9, 1987, Ser. No. 23,755
Int. Cl.⁴ B31C *13/00;* **B65H** *81/00*
U.S. Cl. 156—187 **2 Claims**



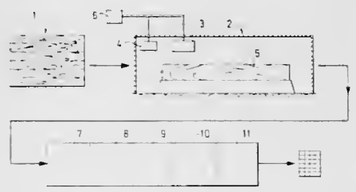
1. A method of making a double-wall tank particularly adapted for use underground, said method comprising forming a generally cylindrical inner wall and an inner end cap of a first tank half, forming a plurality of axially spaced hollow annular ribs on said inner wall, forming arcuately spaced holes in opposite sides of each of the hollow ribs, applying base sheet material over the ribs in straddling relationship to spaces between pairs of adjacent ribs, applying an outer end cap preform in telescoping relationship over a corresponding end one of the ribs, forming a generally cylindrical outer wall over the base sheet material, forming an outer end cap over the outer end cap preform, cutting off one rib adjacent an open end of the tank half to provide an overhang on the outer wall and complete a first tank half, repeating the above-mentioned steps to complete a second tank half, providing a manway in one of the two tank halves, and securing the tank halves together with open ends thereof adjacent each other.

4,781,778

METHOD FOR MANUFACTURING IN WOOD CASES USED WITHIN THE TELECOMMUNICATIONS INDUSTRY

Stig Olofsson, Televerkets Industridivision, Box 1001, S-149 ol Nynsähamn, Sweden

Continuation-in-part of Ser. No. 670,725, Nov. 13, 1984, abandoned. This application Jan. 8, 1987, Ser. No. 1,479
Claims priority, application Sweden, Nov. 16, 1983, 8306317
Int. Cl.⁴ B27K *3/12, 3/34, 5/04*
U.S. Cl. 156—196 **7 Claims**



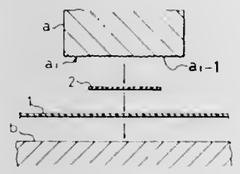
1. A method of manufacturing casing from wood comprising low-temperature heat treatment steps and subsequent casing forming step,
said low temperature heat treatment steps including:
drying a wooden member at a first temperature of about 50° C. by a series of drying periods and alternating vacuum periods, to obtain a moisture content from about 4 to about 5%, sufficient moisture being retained to prevent cell collapse of wood in said wooden member;
heating said dried wooden member at a second temperature of about 65° C. so as to seal pith fibers of the resin released from said wood during said heating to prevent re-absorption of moisture; and
forming step including forming a casing from said wood member.

4,781,779

METHOD OF MANUFACTURING TRIM COVER ASSEMBLY FOR VEHICLE SEATS

Akira Nemoto, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Sep. 29, 1987, Ser. No. 102,337
Int. Cl.⁴ B32B *31/20, 31/22*
U.S. Cl. 156—219 **4 Claims**



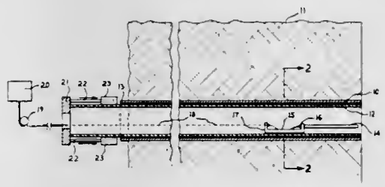
1. A method of manufacturing a trim cover assembly for vehicle seats, comprising the steps of:
placing a thermoplastic substrate on a lower die of a high frequency wave welding apparatus;
placing a thermoplastic decorative strip preformed in a predetermrined shape, upon said substrate placed on said lower die;
thereafter, lowering an upper die of said high frequency wave welding apparatus, said upper die having a working surface larger than said decorative strip and formed with a fine crimped irregularity, so as to reach said laminated decorative strip and substrate; and
applying pressure and heat via said upper die to said decorative strip and substrate while a high frequency wave is applied thereto via said upper die,
whereby said decorative strip is integrally welded to said substrate in a configuration wherein upper surfaces of said decorative strip and said substrate lie in the same plane.

4,781,780

METHOD OF PRODUCING A THERMOPLASTIC POLYMER-LINED PIPE

Finn Hannover, Wilmington, Del., assignor to Du Pont (U.K.) Limited, Wedgwood Way, United Kingdom

Filed Apr. 3, 1987, Ser. No. 34,038
Claims priority, application United Kingdom, Apr. 11, 1986, 8608805
Int. Cl.⁴ B29C *17/00*
U.S. Cl. 156—287 **8 Claims**



1. A process for lining a pipe with a thermoplastic polymer which comprises:
(a) selecting a substantially non-crosslinked, thermoplastic tubular polymer liner, the liner being heat shrinkable along its length and heat expandable in its diameter to

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provide a diametric expansion on heating about from 8 to 15%, the liner having an outside diameter less than the internal diameter of the pipe and which, when fully expanded, would have an outside diameter greater than the internal diameter of the pipe;

(b) inserting the tubular polymer liner into the pipe; and

(c) heating the polymer liner sequentially from one point toward at least one free end of the pipe and uniformly about its circumference to a temperature sufficient to cause the liner to expand while applying a compressive axial force sufficient to overcome the drag forces of the liner, the compressive axial force being applied to the end of the liner toward which the liner is being heated.

4,781,781

FORMATION OF SOLID POLYMERIC MATERIAL

Gerald Hallworth, 27 Nuttall Hall Rd., Ramsbottom, Lancashire, England

Division of Ser. No. 828,529, Feb. 12, 1986, Pat. No. 4,722,954. This application Aug. 27, 1987, Ser. No. 89,855

Claims priority, application United Kingdom, Feb. 14, 1985, 8503859; Apr. 9, 1985, 8509051; Dec. 30, 1985, 8531895

Int. Cl.⁴ C08J *3/20, 9/00;* **C08K** *3/36;* **C08C** *1/06*

U.S. Cl. 156—328 **8 Claims**

1. A method of making a solid flexible polymeric material comprising the steps of:

mixing a water-based latex comprising an aqueous dispersion of one or more polymeric materials selected from natural rubber, styrene-butadiene rubber, carboxylated styrene-butadiene rubber, polyvinylchloride, ethylene vinylacetate copolymer, polychloroprene, acrylic copolymers, butadiene-acrylonitrile copolymer; with

an inorganic filler comprising natural quartz sand having a graded particle size in the range 75 microns to 300 microns; and with

xanthan gum in an amount of 0.1 to 8.0 parts per 100 parts polymer by weight;

whereby a fluent mixture is obtained containing the said inorganic filler as a stable dispersion therein; and

solidifying the said mixture by setting the said latex.

4,781,782

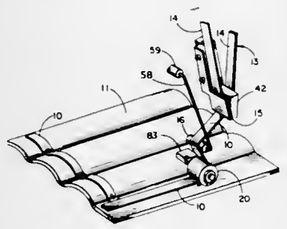
WEB APPLICATOR

Robert A. Luhman, Deer Park, Wis.; Kent S. Tarbutton, Lake Elmo, Minn.; Rudolf I. Shvartsman, Ballston Lake, N.Y.; Donald J. Geisel, Clifton Park, N.Y., and Richard J. Pilarski, Saratoga, N.Y., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 6, 1987, Ser. No. 34,759

Int. Cl.⁴ B65H *16/00, 77/00*

U.S. Cl. 156—361 **13 Claims**



1. A web applicator for applying to a surface a length of web material carried releasably on a liner, said applicator comprising:

a frame,

guide means directing a supply of web material to the frame,

a stripping plate supported on said frame and having an edge about which the liner of a said web material is drawn to separate the liner from the web,

drive means for driving said liner including a drive roller having positive engagement only with said

an applicator roller supported on said frame in spaced relationship to said edge,

a dancing roller disposed between said edge and said applicating roller and positioned transversely to and engageable only with said web,

means for positioning said dancing roller to define the normal path of said web, and

means responsive to movement of said dancing roller for controlling the rate of rotation of said drive roller.

4,781,783

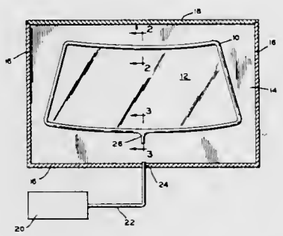
VACUUM RING FOR PRODUCING LAMINATED GLASS

Charles E. Ash, Perrysburg, and Scott W. Chambers, Millbury, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Oct. 26, 1987, Ser. No. 112,414

Int. Cl.⁴ B32B *31/24*

U.S. Cl. 156—382 **6 Claims**



1. A vacuum ring for use in removing air spaces between the facing surfaces of at least two laminae of a laminated assembly, said ring being adapted to be coupled to a vacuum source and to be mounted about the entire peripheral edge of the laminated assembly, said ring being formed of a flexible material and having a channel formed therein for receiving the peripheral edge of the laminated assembly, said channel defining an inner surface having a cross-sectional configuration which generally conforms to the cross-sectional configuration defined by the outer edge surface of the laminated assembly, said inner surface defining first and second facing wall portions and an interconnecting floor portion, each said facing wall portion having a longitudinally extending continuous groove formed therein, each said groove being spaced between an outer edge and an intersection of said wall portion and said floor portion, and said grooves in said first and second wall portions being coupled to a source of vacuum when the ring is mounted on a laminated assembly and coupled to a vacuum source.

4,781,784

APPARATUS FOR MAKING TIRE FABRIC IMPREGNATED WITH RUBBER

Anthony J. M. Sumner, Stratford-on-Avon, England, assignor to Apsley Metals Limited, United Kingdom

Division of Ser. No. 625,817, Jun. 28, 1984, Pat. No. 4,689,101. This application Jun. 10, 1987, Ser. No. 60,308

Claims priority, application United Kingdom, Jul. 5, 1983, 8318119

Int. Cl.⁴ B29B *15/10*

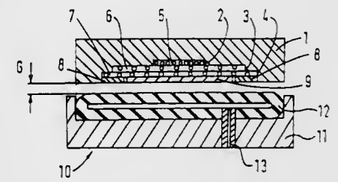
U.S. Cl. 156—394.1 **6 Claims**

1. An apparatus for use in the manufacture of a cord reinforced elastomeric tire breaker comprising at least two plies, and which is for consolidation of an annular breaker,

said apparatus comprising a rigid mold in the form of a ring having an open annular mold cavity on its radially inner

side to accommodate an annular precoated rubberized breaker and which is in the form of a plurality of shallow stepped grooves each groove being dimensioned to receive a respective breaker ply, a wall of the cavity contacting one side of said breaker fabric sheet;

a pressurizing member supported on a rigid carrier and



having means to position it to contact the other surface of the sheet and close the mold cavity, said pressurizing member comprising a bag inflatable by fluid pressure, with a pressure transmitting ring located between the bag and the breaker, and control means in the mold to control the mold temperature so that vulcanization does not occur in the mold.

4,781,785

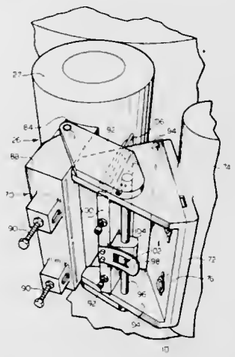
APPARATUS FOR APPLYING FLEXIBLE PLASTIC LABELS TO ROUND CONTAINERS

Walter Szeremeta, Bardstown, Ky., assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Nov. 13, 1987, Ser. No. 119,942

Int. Cl.⁴ B65C *9/04, 9/22*

U.S. Cl. 156—448 **8 Claims**



1. Apparatus for sequentially wrapping flexible thermoplastic labels around containers, each of said containers having one of each of said flexible thermoplastic labels wrapped thereabout by said apparatus, each of said containers having a generally cylindrical body portion, each of said flexible thermoplastic labels being wrapped around the cylindrical body portion of one of said containers by said apparatus, said apparatus comprising:

a rotatable vacuum drum;

means for rotating said rotatable vacuum drum;

means for sequentially providing said labels to said rotatable vacuum drum to successively apply a leading edge of each of said labels against said rotating vacuum drum to be temporarily retained against said rotatable vacuum drum;

rotatable gravure roll means forming a nip with said rotatable vacuum drum for applying a solvent to predetermined portions of each of said flexible thermoplastic labels as said each of said flexible thermoplastic labels passes through said nip, said solvent forming an adhesive with said predetermined portions of said each of said flexible thermoplastic labels;

fountain assembly means for applying a solvent to said rotatable gravure roll means;

means for sequentially transferring said labels from said rotatable vacuum drum to said body portions of said containers at a wrapping station to effect sequential adhesion of said labels to said body portions of said containers; and

means for mounting said fountain assembly means, said means for mounting including:

first support plate means, said fountain assembly means being pivotally attached to said first support plate means about a first axis;

second support plate means said first support plate means being pivotally attached to said second support plate means about a second axis, said second axis being spaced from said first axis and extending generally parallel thereto; and

releasable latch means for releasably preventing said first support plate means from pivoting with respect to said second support plate means to maintain said fountain assembly means in an unreleased position to apply the solvent to said rotatable gravure roll means, and upon the release of said releasable latch means to permit said first support plate means with said fountain assembly means to be pivoted away from said rotatable gravure roll means to permit servicing of said fountain assembly means.

4,781,786

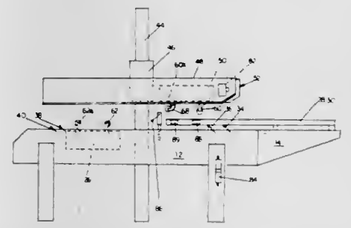
TAPE SEALING RANDOM HEIGHT CARTONS

Joseph S. Lerner, and David Krukas, both of Kings Park, N.Y., assignors to The Loveshaw Corporation, Ronkonkoma, N.Y.

Continuation-in-part of Ser. No. 378,827, May 17, 1982, abandoned. This application May 1, 1987, Ser. No. 44,884

Int. Cl.⁴ B31B *1/72*

U.S. Cl. 156—468 **16 Claims**



1. Machine for tape sealing cartons of random heights which is any one in a first range of shorter heights and a second range of taller heights while the cartons are advanced without stop along a forward travel course, the tape sealing of a shorter height carton being in a continuous wrap around tape run longitudinally of the carton from the top side to the bottom side of both the front and rear of said shorter height carton, the tap sealing of a taller height carton being in two separate continous tape runs extending longitudinally of the carton one on the top side and down a distance on the front and rear ends thereof and the other on the bottom side and up a distance on the front and rear ends thereof, the machine comprising

upper and lower taping cartridges supported along the carton travel course, each cartridge including a pair of movably mounted tape applying arms having a normally extended position lying in the carton travel course, a first arm of each pair in extended position presenting the adhesive face side of pressure sensitive tape from a stock thereof in confrontation to the front end of an advancing

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carton so that the advancing carton can engage the tape to apply it to the carton front end and with its advance draw out tape run from the stock while additionally moving the first arm to a retracted position, the second arm of each pair being connected to its associated first arm to retract in tandem therewith, the first and second arms of the upper cartridge when retracted being in tape pressing contact with the top and those of the lower cartridge when retracted being in tape pressing contact with the bottom of the advancing carton, the upper and lower cartridge second arms when extending from their retracted positions pressing tape onto the carton rear end on forward pass by of the said rear end of the points where the retracted second arm of the respective pairs is in tape pressing contact with the carton to and bottom,

means at the entrance to the carton travel course for detecting the height of a carton,

means operable whenever the detected carton height is one to vertically adjust the spacing between the upper and lower taping cartridges in correspondence to the height of the carton,

means operable whenver the detected carton height is one within said first height range to retract the arms of said lower taping cartridge to a position beyond that which is caused by carton engagement with said arms whereby the arms of said lower cartridge locate in and maintain a carton non-engaging, non-taping mode during the pasasge of a first height range carton through the machine, and

the second arm of the upper taping cartridge including a tape pressing member articulated thereto and under bias force applied thereto locating nested closely adjacent the forward side of said second arm when that arm is retracted but being opened away therefrom against said bias force by its pressing contact with the carton as it passes down onto the carton rear end as said second arm extends from retracted position, engagement of said pressing member with said carton rear end restraining return of said second arm to fully extended position until said pressing member moves down below the rear end of a first height range carton and such restraint is released whereby the second arm in moving to fully extended position propels said pressing member forwardly along the carton bottom at a speed greater than that of carton travel, said bias force urging said pressing member into tape pressing engagement with the carton bottom as said pressing member is being propelled forwardly.

4,781,787

WELDING EQUIPMENT

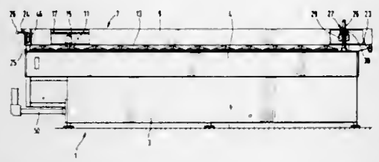
Reinhard Weissfloch, Stolberg, and Christian Rech, Herzogenrath, both of Fed. Rep. of Germany, assignors to Wegener GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Filed Nov. 3, 1986, Ser. No. 926,106

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1985, 8531749[U]

Int. Cl.⁴ B30B *15/04, 15/34*

U.S. Cl. 156—507 **16 Claims**



10. Plastic member welding equipment, comprising:

(a) a generally horizontal support;

(b) first and second horizontally disposed clamping tables movably mounted to said support for movement toward and away from each other;

(c) first and second clamping beams, each clamping beam overlying one of said tables and having a first end portion pivotally connected to the associated table and each beam movable with the associated table;

(d) first and second lock means associated with said support, each of said first and second lock means adjacent a second end portion of one of said beams;

(e) third and fourth lock means, each of said third and fourth lock means carried by one of said beams and cooperating with the associated one of said first and second lock means for positioning the associated beam at a selected angle to the associated table, each of said third and fourth lock means including adjustment means for regulating the angle between a beam and its associated table;

(f) said first, second, third and fourth lock means serving to position said clamping beams relative to said tables;

(g) clamping means being associated with said clamping beams and movable relative to said clamping beams; and

(h) means for welding together adjacent edges of first and second plastic members, each of the members being clamped between a beam and its associated table.

4,781,788

PROCESS FOR PREPARING PRINTED CIRCUIT BOARDS

Robert B. Forsterling, Kokomo, Ind., and Crystal M. Frailey, Union, Mo., assignors to Delco Electronics Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 947,195, Dec. 29, 1986, abandoned. This application Apr. 29, 1987, Ser. No. 44,042

Int. Cl.⁴ C23C *18/00;* **C23F** *1/00*

U.S. Cl. 156—630 **15 Claims**



1. A process of preparing a copper-plated insulating board suitable for patterning for forming a printed-circuit board comprising the steps of baring the cladding from a board of glass fiber laminations in an epoxy binder to whose surfaces copper foil had previously been clad by a pressing operation, said surfaces being essentially free of any noble metal catalytic activating agents, immersing the bare board in a non-complexed tetravalent cerium solution for a time and at a temperature to prepare the surfaces for copper plating, and electroless plating of copper to the surfaces of the board to a thickness suitable for use.

4,781,789

METHOD OF MAKING MEMORY DEVICES

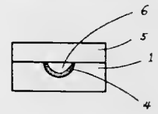
Jiun-Tsong Wu, 446 Manzanita Ave., Sierra Madre, Calif. 91024

Division of Ser. No. 750,733, Jul. 1, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 64,752

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 156—633 **1 Claim**

1. The method of making an optical memory device comprising a light-transparent substrate having a plurality of void cells and a preselected amount of ablative material in each void cell only partly filling each cell such that the ablative material can be redeposited at a plurality of locations in each cell, said method comprising the steps of applying a masking layer of coating on the surface of a base plate; ablating the masking layer and portions of the base plate underneath by a light beam having sufficient intensity and width to form individual pits at preselected areas in the base plate; depositing ablative material as a coating on the surface of the masking layer and on the base plate in the pits such that said ablative material fills only a portion of the volume of each of said pits; removing the mask-



ing layer and ablative layer outside of the pits by dissolving the masking coating and carrying with it the overlaying ablative material; and then laminating the base plate with a cover plate to form void memory cells at the pitted areas with the ablative material sealed in the void cells to thereby form said optical memory device wherein the cover plate and base plate together function as said substrate, wherein said ablative material is opague to radiant energy and is vaporizable in response to a high intensity radiant energy beam, and the amount of ablative material supplied to each pit is limited such that the ablative material can be redeposited at a plurality of locations in said cells.

4,781,790

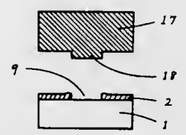
METHOD OF MAKING MEMORY DEVICES

Jiun-Tsong Wu, 446 Manzanita Ave., Sierra Madre, Calif. 91024

Division of Ser. No. 750,733, Jul. 1, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 64,758

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 156—633 **2 Claims**



1. The method of making an optical memory device comprising a light-transparent substrate having a plurality of void cells and a preselected amount of ablative material in each void cell only partly filling each cell such that the ablative material can be redeposited at a plurality of locations in each cell, said method comprising the steps of applying a masking layer of coating on the surface of a base plate; mechancially stamping the coated base plate surface with a punch to cause the punch to penetrate and displace the masking layer to partially uncover the base plate at preselected areas; etching the uncovered portions of the base plate to form pits at preselected areas in the base plate; depositing ablative material as a coating on the surface of the masking layer and on the base plate in the pits such that said ablative material fills only a portion of the volume of each of said pits; removing the masking layer and ablative layer outside of the pits by dissolving the masking coating and carrying with it the overlaying ablative material; and then laminating the base plate with a cover plate to form void memory cells at the pitted areas with the ablative material sealed in the void cells to thereby form said optical memory device wherein the cover plate and base plate together function as said substrate, wherein said ablative material is opaque to radiant energy and is vaporizable in response to a high intensity radiant energy beam, and the amount of ablative material supplied to each pit is limited such that the ablative material can be redeposited at a plurality of locations in said cells.

4,781,791

PROCESS FOR PRODUCING STRUCTURED RETAINING AREAS ON SHEET GRIPPERS AND SHEET GRIPPER SUPPORTS FOR SHEET HANDLING MACHINES

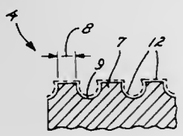
Claus Simeth, and Werner Sondergeld, both of Offenbach am Main, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed May 28, 1987, Ser. No. 55,607

Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618444

Int. Cl.⁴ B44C *1/22;* **C23F** *1/02*

U.S. Cl. 156—659.1 **8 Claims**



1. A process for the production of structured retaining areas on sheet grippers, sheet gripper supports and similar gripper facilities for machines for handling and processing sheets by the formation of a non-etchable dot structure on a hard base member, preferably of hardened steel, and subsequent etching-out of unmasked areas with acid or alkaline etching agents, characterized in that the dot structure is produced by screen printing and after the etching-out of unprinted areas a hard smoothing coating is applied to the structured retaining area.

4,781,792

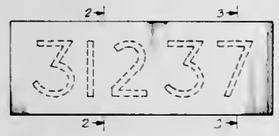
METHOD FOR PERMANENTLY MARKING GLASS

James V. Hogan, 323 Sapphire, Balboa Island, Calif. 92662

Filed May 7, 1985, Ser. No. 731,662

Int. Cl.⁴ B44C *1/22;* **C03C** *15/00*

U.S. Cl. 156—663 **18 Claims**



1. A process for permanently marking a glass surface comprising the steps of:

(a) wiping a glass surface with a basic aqueous cleaning solution;

(b) wiping the backside of a mask having a face and a back side with the basic aqueous cleaning solution, said mask comprising a porous support layer permeable to a glass etchant composition and a resist material impervious to said glass etchant composition, said mask having resist areas impervious to a glass etchant composition where said porous support layer is impregnated with said resist material, and non-resist areas pervious to said glass etchant composition where said porous support layer is substantially free of said resist material, said resist areas and

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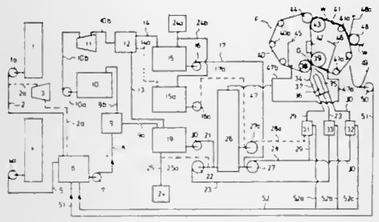
non-resist areas in combination delineating a marking pattern on the mask to be etched into the glass surfce;
(c) applying the back side of said mask to the wiped glass surface to bind the mask to said glass surface;
(d) applying a glass etchant composition operative to etch glass to the face of the mask to cover all of the non-resist areas of the mask with the glass etchant composition for a time operative for the glass etchant composition to etch the marking pattern into the surface of the glass; and
(e) removing the mask from the glass surface.

4,781,793

METHOD FOR IMPROVING PAPER PROPERTIES IN MULTIPLY PAPER USING LONG AND SHORT FIBER LAYERS

Matti Halme, Helsinki, Finland, assignor to Valmet Oy, Finland

Filed Jul. 6, 1987, Ser. No. 69,859
Claims priority, application Finland, Jul. 4, 1986, 862847
Int. Cl.[4] D21F *11/04;* D21H *5/12*
U.S. Cl. 162—55 **22 Claims**



1. Method for use in manufacturing paper having improved properties, comprising the steps of
supplying a first pulp grade containing mainly long fibers into a mixing chest,
supplying a second pulp grade containing mainly short fibers into said mixing chest,
mixing said pulp grades in said mixing chest into a basic stock mixture containing substantially all fibers to be used for producing the particular paper,
forming two different stock components from said basic stock mixture,
a first of said components principally containing fibers longer than average fiber length distribution in the basic stock mixture, and
a second of said components principally containing fibers shorter than the average fiber length distribution in the basic stock mixture, and also fines,
feeding the first component through lateral channels of a multi-channel headbox into direct contact with a pair of wires and between the same, and
feeding the second component through a middle channel of the multi-channel headbox, into the middle of a layer structure formed by the first component in contact with the pair of wires.

4,781,794

DETACKIFICATION OF ADHESIVE MATERIALS CONTAINED IN SECONDARY FIBER

Robert D. Moreland, Jacksonville, Fla., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 856,733, Apr. 28, 1986, Pat. No. 4,698,133.
This application Jul. 20, 1987, Ser. No. 75,370
Int. Cl.[4] D21F *1/32*
U.S. Cl. 162—199 **9 Claims**

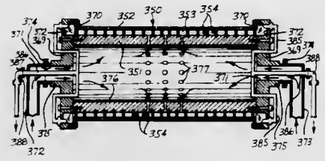
1. A method of detackifying hot melt and/or pressure sensitive adhesive material contained in a pulp produced from waste paper and reducing the deposition of the adhesive material on the paper web forming screen or wire by subjecting the forming screen or wire to water sprays and showers on its return run after the paper web has been separated from the forming screen or wire at the couch roll which comprises adding to the water sprays or showers a sufficient amount of a non-ionic water soluble polymer comprised of unsubstituted methyl ether cellulose derivatives which is effective to carry out said detackifying.

4,781,795

HEATED DRUM HAVING HIGH THERMAL FLUX AND BELT PRESS USING SAME

Ray R. Miller, 8816 Warren Dr. NW., Gig Harbor, Wash. 98335, assignor to Ray R. Miller and Weyerhaeuser Co., both of Tacoma, Wash., a part interest

Division of Ser. No. 849,931, Apr. 8, 1986, Pat. No. 4,710,271.
This application Sep. 8, 1987, Ser. No. 94,155
Int. Cl.[4] D21F *3/00, 5/02;* F26B *13/18*
U.S. Cl. 162—359 **17 Claims**



1. A drum comprising:
an inner cylindrical load bearing drum;
an outer cylindrical shell, said shell coaxially surrounding and spaced radially outward and apart from the inner drum to create an annulus between the shell and inner drum, the annulus being closed at each end;
radial connections within the annulus extending between said shell and said inner drum to secure the shell to the inner drum and transmit any load bearing against the shell to the inner drum, the radial connections being spaced both axially and circumferentially of the inner drum,
said radial connections and said shell and said inner drum defining axial fluid flow passages,
at least a part of said axial fluid flow passages being within a defined radial distance of the outer perimeter of said shell wherein said radial distance is equal to $1/5\sqrt{k}$ inches and k is the thermal conductivity of the material of construction of the outer shell expressed in Btu/hr/ft^2/unit temperature gradient in °F./ft,
said fluid flow passages within said defined said radial distance having a total surface area greater than the shell outer perimeter total surface area.

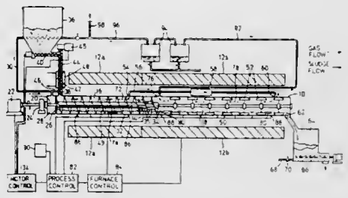
17. A press comprising a rotatable drum, an endless flexible belt reeved about said drum, and means for guiding and tensioning the belt about the drum to compress a web moving between the belt and drum, said drum further comprising;
an inner cylindrical load bearing drum;
an outer cylindrical shell, said shell coaxially surrounding and spaced radially outward and apart from the inner drum to create an annulus between the shell and said inner drum the annulus being closed at each end;
radial connections within said annulus, extending between said shell and said inner drum to secure the shell to the inner drum and transmit any load bearing against the shell to the inner drum, the radial connections being spaced both axially and circumferentially of the inner drum,
said radial connections and said shell and said inner drum defining axial fluid flow passages,
at least a part of said axial fluid flow passages being within a defined radial distance of the outer perimeter of said shell wherein said radial distance is equal to $1/5\sqrt{k}$ inches and k is the thermal conductivity of the material of construction of the outer shell expressed in Btu/hour/ft^2/unit temperature gradient in °F./ft,
said fluid flow passages within said defined said radial distance having a total surface area greater than the shell outer perimeter total surface area.

4,781,796

APPARATUS FOR THE CONVERSION OF SLUDGES

Trevor R. Bridle, Burlington, Ontario, and Herbert W. Campbell, Dundas, Ontario, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation of Ser. No. 787,339, Oct. 15, 1985, abandoned, which is a division of Ser. No. 645,149, Aug. 29, 1984, Pat. No. 4,618,735. This application May 7, 1987, Ser. No. 47,497
Claims priority, application Canada, Sep. 13, 1983, 436601
Int. Cl.[4] C10B *1/02*
U.S. Cl. 202—117 **5 Claims**



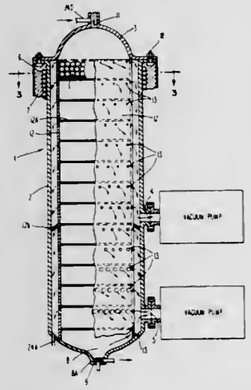
1. Apparatus for the conversion of dried sludge comprising:
a continuous tubular enclosure member providing along its length in succession a heating zone enclosure portion, a connecting zone enclosure portion, and a reaction zone enclosure portion, and the member having a single continuous conveyor extending through the interior thereof;
the heating zone enclosure portion establishing in the interior of the respective tubular member portion a controlled heated heating zone having an inlet thereto for dried sludge and separate outlets therefrom for heating zone gaseous products produced from the dried sludge and residual heating zone solid products of the dried sludge, the inlet and the solid products outlet being spaced from one another along the length of the tubular member for the solid products to traverse at least part of the heating zone portion enclosure interior while being heated therein;
the respective part of the conveyor within the heating zone enclosure portion being a screw type conveyor conveying the heated dried sludge from its dried sludge inlet to its solid products outlet;
first controlled heating means surrounding the heating zone enclosure portion of the tubular member for heating the respective enclosure portion interior to establish a controlled temperature therein of at least about 250° C.;
the reaction zone enclosure portion establishing in the interior of the respective tubular member portion a controlled heated reaction zone having separate inlets thereto for gaseous and solid products and separate outlets therefrom for gaseous and solid products, the solid products inlet and outlet being spaced from one another along the length of the tubular member for the solid products to traverse at least part of the reaction zone enclosure interior, and the gaseous products inlet and outlet being spaced from one another along the length of the tubular member for the gaseous products to traverse at least part of the reaction zone enclosure interior and contact the solid products therein;
second controlled heating means separate from said first controlled heating means surrounding the reaction zone enclosure portion of the tubular member for heating the respective enclosure portion interior to establish a controlled temperature therein of from about 280° C. to about 600° C.;
the respective part of the conveyor within the reaction zone enclosure portion being a lifting conveyor that lifts the solid products therein and permits it to fall under gravity through the gaseous atmosphere in the enclosure portion to effect gas/solid contact between the solid and gaseous products in the enclosure portion, and conveying the solid products from the solid products inlet to the solid products outlet;
the part of the conveyor within the connecting zone enclosure portion conveying the solid products from the solid products outlet of the heating zone enclosure portion to the solid products inlet of the reaction zone enclosure portion without substantial passage of gaseous material therethrough; and
duct means separate from the said continuous tubular member connecting the heating zone enclosure portion gaseous products outlet to the reaction zone enclosure portion gaseous products inlet for the passage of gaseous products from the heated dried sludge in the heating zone enclosure interior portion to the reaction zone enclosure portion interior for reaction therein catalysed by the solid products therein.

4,781,797

APPARATUS FOR THE RECOVERY OF GAS DISSOLVED IN FLUE CONDENSATE

Arthur F. Johnson, Boulder, Colo., assignor to Energy Conservation Partnership, Ltd., Boulder, Colo.

Filed Sep. 11, 1987, Ser. No. 96,770
Int. Cl.[4] B01D *3/10, 19/00*
U.S. Cl. 202—173 **14 Claims**



1. An apparatus for separating a more volatile substnce from a liquid in which it is dissolved, comprising:
(a) a substantially gas tight outer shell defining the outer wall of an evacuating space;
(b) an inner shell disposed within said outer shell and defining the inner wall of said evacuatiing space, said inner shell further defining an inner space;
(c) refrigeration conduit means comprising a tube for containing a refrigerant disposed outside of and in thermally conducting relation with said outer shell and means for supplying refrigerant to said conduit at a temperature and a rate such that said outer shell is maintained at a temperature suitable for condensing gas withdrawn from within said inner shell;
(d) sized packing material disposed within said inner shell providing a tortuous path of interstices;
(e) means to introduce a more volatile substance and a liquid

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in which it is dissolved into the uppermost portion of said inner shell from outside said outer shell;

(f) vacuum means communicating with said evacuating space for withdrawing gas from said space at a rate such that the gas pressure over the liquid in said inner space is controllted to be below atmospheric pressure, to separate the more volatile substance from the liquid by vacuum distillation

(g) means for simultaneously removing the more volatile substance from within said evacuating space, and the liquid from the lowermost portion of the inner space; and

(h) perforated dividing plates disposed within and sealed to the inner shell, positioned transversely to the axis of the outer shell and spaced from one another to divide the inner space into a plurality of vertically spaced successive substages, said packing material disposed on said plates;

a plurality of openings being formed in said inner shell extending between the substages defined by the dividing plates and the evacuating space, the size and number of said openings varying successively from one substage to the next, the rate of withdrawal of gas from said evacuating space, and the size and number of said openings in each substage being such that the gas pressure in each of the substages varies progressively from a maximum value at the uppermost of the substages to a minimum value in the lowermost of the substages, and whereby substantially equal volumes of the volatile substance are withdrawn from each substage.

4,781,798

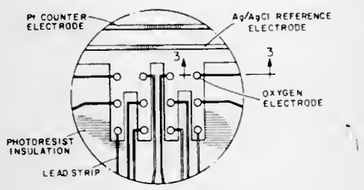
TRANSPARENT MULTI-OXYGEN SENSOR ARRAY AND METHOD OF USING SAME

David A. Gough, Cardiff by the Sea, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 725,214, Apr. 19, 1985, abandoned. This application May 8, 1987, Ser. No. 47,655

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—1 T **30 Claims**



16. A method of meauring the concentration of a gas on biological surfaces comprising:

providing a transparent electrochemical sensor having a transparent support base, a connecting strip on said base with a plurality of respective leads attached to an edge of said base, a plurality of sensing electrodes each of 20μ to 100μ diameter on a surface of said base at a spacing of 40μ to 200μ, each of said sensing electrodes being independently connected to a respective one of said leads and electrically insulated from all of the others of said sensing electrodes, said electrodes including a reference electrode and a counter electrode, and an electrolyte solution on said base and contacting said electrodes;

contacting said biological surface with said transparent support base; and

detecting said gas at different regions of said biological surface contacted by said transparent support base.

4,781,799

ELECTROFORMING APPARATUS AND PROCESS

William G. Herbert, Jr., Williamson, N.Y.; Toru Nozaki, Minami-ashigara, and Akio Onishi, Ebina, both of Japan, assignors to Xerox Corporation, Stamford, Conn. and Fuji Xerox Co. Ltd., Ebina, Japan

Filed Dec. 8, 1986, Ser. No. 939,503

Int. Cl.[4] C25D *1/02*

U.S. Cl. 204—9 **9 Claims**

1. An electroforming process comprising providing an elongated electroforming mandrel, said mandrel comprising a first segment having at least one mating end and at least a second segment having at least one mating end, said mating end of said first segment being adapted to mate with said mating end of said second segment, means to temporarily maintain said mating end of said first segment mated with said mating end of said second segment during an electroforming process, each of said segments having a circumferential, electrically conductive electroforming surface located at at least said mating end, temporarily mating said mating end of said first segment with said mating end of said second segment in substantially perfect alignment to form a junction free of any groove discernible by passage of the edge of an adult human fingernail, electroforming a metal layer on said electroforming surface of said first segment, said metal layer adjacent said mating end of the underlying first segment having a smooth rounded outer edge and electroforming a metal layer on said electroforming surface of said second segment, said metal layer adjacent said mating end of the underlying second segment having a smooth rounded outer edge, establishing a parting gap between said metal layer and said underlying first segment, establishing a parting gap between said metal layer and said underlying second segment, and removing said metal layers from said underlying segments by sliding said metal layers axially along said underlying segments, the end of said metal layers adjacent said mating ends of said underlying segments having a smooth rounded outer edge.

4,781,800

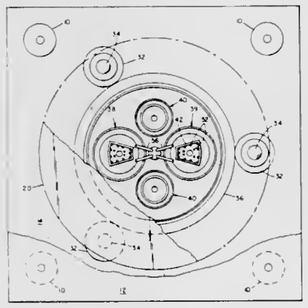
DEPOSITION OF METAL OR ALLOY FILM

Lee M. Goldman, Arlington; Wataru Ohashi, and Frans A. Spaepen, both of Lexington, all of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Sep. 29, 1987, Ser. No. 102,106

Int. Cl.[4] C25D *5/02, 17/00*

U.S. Cl. 204—15 **12 Claims**



1. Method of plating with metal or alloy a surface of an article which comprises

providing a liquid bath containing in solution said metal or alloy or a compound thereof,

continuously supplying fresh solution within said liquid bath and continuously withdrawing solution from beneath the surface of said bath,

confining the lateral margins of the surface of said bath within a horizontal rim of solid material, said confined surface extending above said rim and being held therewithin solely by surface tension forces,

bringing only the lower surface of the article to be plated into contact with the surface of said liquid bath without bringing the article surface into contact with said rim, said article surface extending laterally beyond the margins of said liquid bath on every side, and

maintaining said contact for a time sufficient for a plating deposit of the desired thickness to be built up on said article surface.

4,781,801

METHOD OF COPPER PLATING GRAVURE ROLLS

C. Richard Frisby, Strongsville, Ohio, assignor to McGean-Rohco, Inc., Cleveland, Ohio

Filed Feb. 3, 1987, Ser. No. 10,212

Int. Cl.[4] C25D *7/00*

U.S. Cl. 204—25 **8 Claims**

1. A method of depositing on a gravure roll a layer of copper which does not significantly anneal upon aging and is especially adapted to receive electronic engraving, said method comprising the steps of submerging a gravure roll in an electroplating bath including from about 150 to about 225 g/l of copper sulfate as pentahydrate, from about 35 to about 90 g/l of sulfuric acid, from about 0.01 to about 1.0 g/l of a polyether surfactant having a molecular weight from about 400 to about 10,000, from about 1 to about 100 mg/l of a sulfonated, sulfurized benzene brightener compound and about 0.5 to about 5.0 mg/l of a grain refining compound having the nucleus



in a heterocyclic ring structure, and a molecular weight between about 100 and about 180; and passing electrical current through the bath to deposit copper on the gravure roll.

4,781,802

SOLID TANTALUM CAPACITOR PROCESS

E. James Fresia, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 27, 1987, Ser. No. 42,765

Int. Cl.[4] C25D *5/50, 11/02*

U.S. Cl. 204—37.1 **4 Claims**

1. A process for improving the stability of the dielectric oxide in a solid electrolyte tantalum capacitor, said process comprising:

anodizing a tantalum pellet at a voltage of at least 150V in an electrolyte containing in excess of 0.03% phosphoric acid, 30% to 60% ethylene glycol and water;

interrupting said anodizing and heating said pellet without bias at a temperature in excess of any temperature in any other step in said process;

completing said anodizing in said electrolyte;

pyrolyzing a semiconductor precursor within said pellet; and

heating said pellet under a bias with said tantalum pellet as the anode, said bias being less than employed in said anodizing.

4,781,803

ELECTROLYTIC PROCESSES EMPLOYING PLATINUM BASED AMORPHOUS METAL ALLOY OXYGEN ANODES

Jonathan H. Harris, Shaker Heights; Michael A. Tenhover, Solon; Robert K. Grasselli, Aurora, all of Ohio, and Michael D. Ward, Newark, Del., assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 705,688, Feb. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 606,275, May 2, 1984, abandoned. This application Jun. 16, 1986, Ser. No. 874,617

Int. Cl.[4] C25B *1/02*

U.S. Cl. 204—129 **27 Claims**

1. Improved electrolytic processes where oxygen is generated at the anodes, the improvement comprising the step of:

conducting said electrolysis process in an electrolytic cell having a platinum based amorphous metal alloy oxygen anode having the formula

$$Pt_pA_aD_d$$

where

A is one or more elements selected from the group consisting of Cr, Mo, W, Fe, Os, Ir, Cu, Ni, Rh, Pd, Ag, Ti, Ru, Nb, V, Ta and Au;

D is one or more elements selected from the group consisting of B, C, Si, Al, Ge, P, As, Sb and Sn;

p ranges from about 40 to 92;

a ranges from about 0 to 40; and

d ranges from about 8 to 60, with the provisos that p+a+d=100 and when D is Si or P, and A does not include Ir, Rh, Pd, Ti, Ru, Nb or Ta.

4,781,804

ELECTROLYTIC ORGANIC MOLD FLASH REMOVAL

George C. Wolf, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Mar. 2, 1988, Ser. No. 163,006

Int. Cl.[4] C25F *1/00*

U.S. Cl. 204—141.5 **14 Claims**

1. An electrolytic method for removing organic plastic material from a metal surface comprising the steps of:

(A) immersing the metal surface in a solution comprising:

(a) about 25–150 grams of an alkali metal hydroxide;

(b) about 15–100 milliliters of a detergent;

(c) about 30–200 milliliters of a glycol compound;

(d) about 15–100 grams of an alkali metal bicarbonate;

(e) about 25–200 milliliters of ethoxylated furfuryl alcohol;

(f) about 15–1000 milliliters of tetrahydrofurfuryl alcohol;

(g) about 50–300 parts per million fluorinated surfactant; and

(h) a sufficient amount of deionized water to yield about 0.75 to about 3.0 liters of solution, said amount being at least enough to create hydrogen generation within said solution when an appropriate voltage is applied to said solution;

(B) applying a voltage to said metal surface so that said metal surface is made cathodic, said voltage being sufficient to create hydrogen generation within said solution; and

(C) for a duration sufficient to remove the organic plastic material from said metal surface.

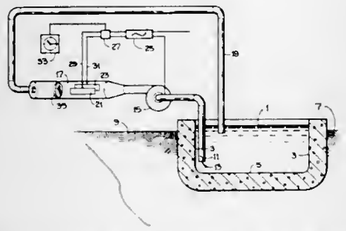
VOL 1096 ISS 1 NO 1 1988 UMI

4,781,805

METHOD FOR CONTROLLING POLLUTION AND REDUCING CALCIUM CONCENTRATION IN AQUEOUS BODIES

Vincent Dahlgren, 320 Osborne St., Vista, Calif. 92083

Filed Feb. 16, 1988, Ser. No. 156,334
Int. Cl.[4] C02F *1/46*
U.S. Cl. 204—149 8 Claims



1. An improved of controlling algal and bacterial pollution, as well as reducing the concentration of dissolved calcium, in an aqueous body of water, without the necessity of adding electrolytic thereto, comprising the steps of:

(a) immersing a pair of spaced-apart electrodes in the aqueous body, said electrodes being chemically active, being substantially free of copper ions and made from mixtures of silver and aluminum alloy containing from about 0.5 to about 5.0 percent by weight silver and the balance being aluminum alloy; and

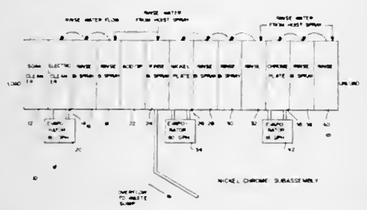
(b) impressing between said electrodes an alternating electrolytic potential wherein the rms voltage ranges from about 1 to about 100 volts and the frequency of alternation of the potential ranges from about 50 to about 70 cycles per second to provide silver ions to enter the water and destroy the algal and bacterial pollution and to prevent said electrodes from becoming coated with free calcium.

4,781,806

ELECTROPLATING SYSTEM

Dominic Tenace, 15980 Grand Ave., #M-9, Lake Elsinore, Calif. 92330, and Donald M. Hutchison, Moreno Valley, Calif., assignors to Dominic Tenace, Lake Elsinore, Calif.

Continuation of Ser. No. 786,472, Oct. 11, 1985, abandoned.
This application Jun. 8, 1987, Ser. No. 59,213
Int. Cl.[4] C02F *1/46;* C25D *21/08*
U.S. Cl. 204—149 5 Claims



5. An improved method for electroplating, the method comprising the following steps:

(a) providing at least one electroplating tank for plating parts;

(b) providing at least one water rinse tank in the vicinity of said electroplating tank;

(c) transferring plated parts from said electroplating tank to said rinse tank;

(d) providing a source of uncontaminated water positioned adjacent said rinse tank;

(e) rinsing said plated parts while removing said plated parts from said rinse tank;

(f) inserting substantially uncontaminated water into said rinse tank for reducing the contamination level of said rinse tank;

(g) transferring overflow water from said rinse tank to a spray above said electroplating tank for decreasing the contamination level of said rinse tank while removing dragout from said plated parts;

(h) providing an evaporator in fluid communication with said electroplating tank; and

(i) transferring contaminated effluent from said electroplating tank to said evaporator for disposal of said electroplating tank effluent without access to public sewers.

4,781,807

EFFICIENT CIS-TO-TRANS ISOMERIZATION OF 1,4-DIHALOBUTENE-2

Clarence E. Clark, Jr., Cincinnati, and Richard G. Fayter, Jr., Fairfield, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 28, 1986, Ser. No. 936,002
Int. Cl.[4] C07C *21/04, 17/00*
U.S. Cl. 204—157.98 3 Claims

1. A process for isomerizing 1,4-dichlor-butene-2 to provide a high ratio of trans-to-cis-1,4-dichlorobutene-2 which comprises contacting a mixture of trans-1,4-dichlorobutene-2 and cis-1,4-dichlorobutene-2 with anhydrous hydrogen bromide catalyst and an initiator, selected from the group consisting of 2,2'-azobisisobutyronitrile and ultraviolet light, for the reaction at a temperature of from about 25° C. to about 80° C. and for a sufficient time wherein the final mixture contains at least 90% trans-1,4-dichlorobutene-2.

4,781,808

AQUEOUS CATHODIC ELECTROCOATING MATERIAL AND A PROCESS FOR COATING AN ELECTRICALLY CONDUCTIVE SUBSTRATE

Michael Geist, Münster; Georg Schön, Everswinkel; Arnold Dobbelstein, and Güther Ott, both of Münster, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben Aktiengeselischaft, Münster, Fed. Rep. of Germany

PCT No. PCT/DE85/00261, § 371 Date Apr. 30, 1986, § 102(e) Date Apr. 30, 1986, PCT Pub. No. WO86/01526, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 2, 1985, Ser. No. 878,835
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1984, 3432233
Int. Cl.[4] C25D *13/20*
U.S. Cl. 204—181.7 2 Claims

2. A process for coating an electrically conductive substrate, which comprises:

immersing the substrate in an acidic aqueous bath comprising a cationic synthetic resin binder having amino groups or a mixture of amino groups and hydroxyl groups, a crosslinker mixture of two crosslinking agents, pigments, and additive agents selected from the group consisting of a filler, a corrosion inhibitor, a surface coating additive, a catalyst, and an organic solvent in an amount of up to 15% by weight, based on the total weight of the electrocoating material;

making the substrate the cathode for electrodeposition,

depositing a film on the substrate by means of direct current,

removing the substrate from the bath, and

curing the film;

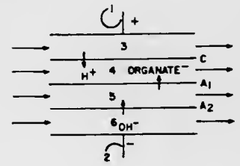
said pair of crosslinking agents of the crosslinker mixture being an aliphatic polyisocyanate blocked with an aliphatic cycloaliphatic or aromatic alkyl monoalochol or an aliphatic amine, and an aromatic polyisocyanate blocked with an aliphatic, cycloaliphatic or aromaticalkyl monoalcohol or an aliphatic amine the pair of crosslinking agents having different reactivities so that the crosslinking reaction of the blocked aliphatic polyisocyanates is initiated at a temperature which is at least 10° C. apart from that of the blocked aromatic polyisocyanate, and the crosslinking agent which reacts first is present in an amount of from 15 to 60 mol %, based on the mixture of the crosslinking agents.

4,781,809

RECOVERING FREE ORGANIC ACIDS FROM SOLUTIONS IN WHICH THEY OCCUR WITH OTHER ORGANIC MATTER

John L. Falcone, Jr., Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Jul. 21, 1986, Ser. No. 887,668
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 4 Claims



1. A method for recovering organic acid in substantially free acid form from an aqueous solution in which, together with other organic matter, said organic acid occurs at least in part as free acid, comprising:

(a) passing said solution through at least one de-acidifying compartment, each deacidifying compartment bounded on each face thereof by membrane surfaces substantially permeable to anions, each deacidifying compartment also having juxtaposed on one face thereof a free organic acid receiving compartment, each of said receiving compartment bounded on the face juxtaposed to said de-acidifying compartment by a membrane surface having a lower transport selectively for hydrogen ions than the membrane surface bounding said receiving compartment on the opposite face thereof, said opposite face also juxtaposed to a hydrogen ion source;

(b) passing a substantially direct electric current in series through each of said de-acidifying compartment and each of said juxtaposed free organic acid receiving compartment in a direction to cause transfer to said free organic acid receiving compartment of anions of said organic acid from said de-acidifying compartment and hydrogen ions from said hydrogen ion source.

4,781,810

ADVANCED CHLORINE GENERATING SYSTEM

Daniel M. Tucker, 1054 E. Shary Cir., Concord, Calif. 94518

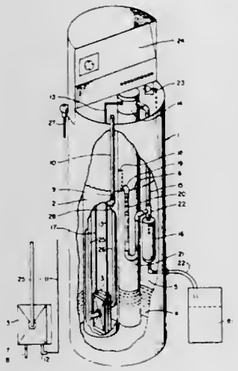
Filed Sep. 16, 1987, Ser. No. 97,049
Int. Cl.[4] C25B *15/00*
U.S. Cl. 204—228 8 Claims

8. A water sterilization and alkalinity control system according to claim 7 wherein:

a second storage contaner is provided into which the portion of the sodium hydroxide not used to generate sodium hypochlorite is allowed to accumulate, said container having an overflow to waste;

two venturi fittings, the pressure side of each connected through two solenoid valves to the pressure side of the filter in the circulation system of the water to be treated, the output of each venturi fitting connected through a check valve to the lower pressure return line of said circulation system;

the suction input of the first venturi connected to draw sodium hypochlorite from the first storage container when the solenoid valve on its pressure side is caused to open, the second venturi having its suction input connected to a line so arranged to draw sodium hydroxide from the second storage container when the solenoid valve connected to its pressure side is caused to open;



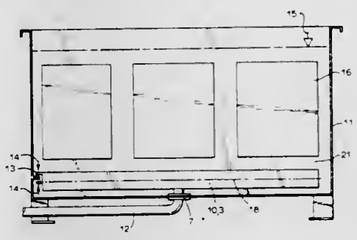
a chlorine and alkalinity sensing means connected to sense the chlorine and alkalinity levels of the water to be treated as it flows through its filter system, said sensing means connected to a control unit whereby the appropriate solenoid valve is caused to open to adjust the water's chlorine and alkalinity to predetermined levels.

4,781,811

DEVICE FOR FEEDING GAS INTO A LIQUID

Ludwig Mankut, Altdorf, and Peter Kuhn, Berlin, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

Filed Apr. 24, 1987, Ser. No. 43,199
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3614067
Int. Cl.[4] C25D *17/00;* B01D *47/02;* C10J *1/08*
U.S. Cl. 204—273 14 Claims



1. A device for feeding a gas into a liquid contained in an open receptacle, comprising a housing having a top wall formed with a first array of gas outlet openings communicating with the liquid to determined a desired side of bubles fed therein; an inner partition arranged at a distance below said top wall to divide the interior of said housing into a lower chamber and an upper chamber, said inner partition being formed with a second array of gas outlet openings exceeding in number the openings in said first array and having sectional areas which are smaller than the areas of openings in said first array to produce gas pressure in said upper chamber which is substantially equal to a pressure exerted against said top wall by the liquid in the open receptacle; a gas inlet opening formed in a

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lower part of said housing and communicating with said lower chamber; and combined sectional areas of the openings in said second array being substantially smaller than the sectional area of said gas inlet opening to dam up gas in said lower chamber.

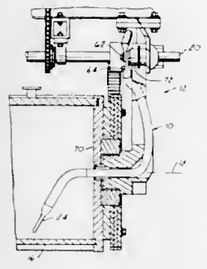
7. A device as defined in claim 1, wherein said housing is installed in a receptacle for a galvanizing bath.

4,781,812

DANGLER CABLE AND METHOD OF SECURING AN ELECTICAL CABLE TO A CATHODE MEMBER

Wendell G. Lewellen, III, Ann Arbor, Mich., assignor to Imperial Industries Inc., Belleville, Mich.

Filed Oct. 8, 1987, Ser. No. 107,004
Int. Cl.[4] C25D *17/00*; H01R *5/08*
U.S. Cl. 204—279 **9 Claims**



1. A dangler cable for use in an electroplating process, comprising:

an electrical cable having an insulating sheath and a plurality of spirally wound groups of wire strands extending axially therein, said electrical cable having a pair of ends including one end which is stripped, whereby said wound groups of wire strands protrude axially pass said insulating sheath;

a connector member secured to the other end of said electrical cable; and

a cathode member including an elongated tubular metal sleeve having leading and trailing end portions; said leading end portion having an inside diameter larger than the outside diameter of the electrical cable;

said tubular metal sleeve extending over and completely surrounding the stripped wire strands of said electrical cable, with said leading end portion extending over the insulating sheath;

said cathode member being secured to said insulating sheath adjacent said strip end by at least one crimp formed along the leading end portion of said metal sleeve extending coaxially of said electrical cable;

said trailing end portion of said metal sleeve being provided with a pair of opposed and generally parallel flats throughout its length which reduces the thicknes of said groups of wire strands therein.

4,781,813

METHOD AND APPARATUS FOR ASSURING PLATING UNIFORMITY
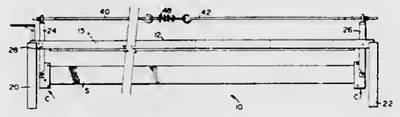
Timothy H. V. Archer, and Richard Sutera, both of Centerville, Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 2, 1987, Ser. No. 69,189
Int. Cl.[4] C25D *17/06*
U.S. Cl. 204—297 W **23 Claims**

1. Apparatus for tensioning an elongated substrate for maintaining planarity thereof during an electroplating process to ensure substantially uniform plating, comprising:

a pair of means for gripping opposite end portions of the substrate;

means connected to one of said gripping means for applying tension to the substrate; and



means for electrically isolating said tension applying means from the substrate.

4,781,814

MOLECULAR SIEVE COMPOSITIONS AND THEIR USE IN CRACKING/HYDROCRACKING

Edith M. Flanigen, White Plains; Brent M. Lok, New City; Robert L. Patton, Katonah, and Stephen T. Wilson, Shrub Oak, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 600,171, Apr. 13, 1984, Pat. No. 4,686,093. This application May 6, 1987, Ser. No. 46,396
Int. Cl.[4] C10G *11/04, 11/05, 45/12, 47/04*
U.S. Cl. 208—112 **6 Claims**

1. Process for cracking a hydrocarbon, which process comprises contacting said hydrocarbon under cracking conditions with a crystalline molecular sieve having three-dimensional microporous framework structures of MO_2, AlO_2 and PO_2 tetrahedral units and having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(M_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(M_xAl_yP_z)O_2$ and has a value of zero to about 0.3; "M" represents at least two elements, M_1 and M_2, selected from the group consisting of arsenic, beryllium, boron, chromium, gallium, germanium, lithium and vanadium; and "x", "y" and "z" represent the mole fractions of M ($=M_1+M_2$ etc.), aluminum and phosphorus, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the pentagonal compositional area defined by points A, B, C, D and E of FIG. 1 and each mole fraction for M_1, M_2, aluminum and phosphorus has a value of at least 0.01.

4,781,815

CATALYTIC CRACKING PROCESS

Regis J. Pellet, Croton-On-Hudson; Donald F. Best, Mahopac; Gary N. Long, Putnam Valley; Jule A. Rabo, Armonk, and Edward T. Wolynic, Scarsdale, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 657,417, Oct. 3, 1984, Pat. No. 4,687,754, which is a continuation-in-part of Ser. No. 490,965, May 2, 1983, abandoned. This application Apr. 27, 1987, Ser. No. 42,801
Int. Cl.[4] C10G *11/02, 11/04*
U.S. Cl. 208—120 **24 Claims**

1. The process for cracking a hydrocarbon feedstock to produce lower boiling hydrocarbons which comprise contacting said hydrocarbon feedstock with a zeolitic aluminosilicate which has a mole ratio of oxides in the dehydrated state of

$$(0.85\text{-}1.1)M_{2/n}O:Al_2O_3:xSiO_2$$

wherein M is a cation having a valence of "n", "x" has a value greater than 6.0, has a X-ray powder diffraction pattern having at least the d-spacings of Table A, has extraneous silicon atoms in the crystal lattice in the form of framework SiO_4 tetrahedra

and wherein said zeolite has been treated by employing at least one of the following steps comprising: (i) treating the aluminosilicate at an effective temperature for an effective time; (ii) ion-exchanging the aluminosilicate with at least one multivalent cation; and (iii) treatment with both steps (i) and (ii); with the proviso that steps (i) and (ii) be carried out one or more times in any order.

4,781,816

CRACKING PROCESS

Fu Ming Lee, and Clifford M. Shiblom, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1987, Ser. No. 110,319
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **20 Claims**

1. A catalytic cracking process comprising the step of contacting a hydrocarbon containing feed stream having an initial boiling point of at least 400° F., measured at about 0 psig, and containing at least about 5 ppmw vanadium with a catalyst composition comprising a physical mixture of

(a) zeolite embedded in an inorganic refractory matrix material, and

(b) at least one oxide of a metal selected from the group consisting of Be, Mg, Ca, Sr, and Ba on a support material comprising silica,

under such cracking conditions as to obtain at least one liquid hydrocarbon containing product stream having a lower initial boiling point and a higher API^{60} gravity than said feed stream.

4,781,817

HYDROGEN BRONZE CATALYST AND IMPROVED RESID UPGRADING PROCESSES USING IT

Philip J. Angevine, West Deptford; Arthur W. Chester, Cherry Hill, both of N.J.; Thomas F. Degnan, Yardley, Pa., and Garry W. Kirker, Washington Twp., N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 4, 1986, Ser. No. 938,084
Int. Cl.[4] C10G *45/04*
U.S. Cl. 208—216 R **16 Claims**

1. An improved petroleum resid upgrading process comprising hydrotreatment of resid with a hydrogen bronze, which comprises a layered metal oxide and/or sulfide of a metal selected from the group consisting of Group VB and Group VIB metals, containing inserted atomic hydrogen's wherein there is no formal chemical bond between the $O^=$ or $S^=$ anion of said layered metal oxide and/or sulfide, and said atomic hydrogen; said hydrotreatment being carried out at a hydrogen partial pressure greater than about 400 psig, temperature ranging between about 675° F. to about 850° F. and liquid hourly space velocity between about 0.1 and about 10 hr^{-1}.

4,781,818

NON CATALYTIC SOLID MULLITE/CRYSTALLINE SILICA MATERIAL AND USE THEREOF

William J. Reagan, Englishtown; David W. White, Middletown; William R. Schnitz, Highland Park, and L. Alan Jarnagin, Millington, all of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 945,221, Dec. 19, 1986, abandoned, which is a continuation of Ser. No. 682,962, Dec. 18, 1984, abandoned. This application Jan. 21, 1988, Ser. No. 147,108
Int. Cl.[4] C10G *25/00*
U.S. Cl. 208—251 R **17 Claims**

1. In a process for preparing premium products from a charge of petroleum hydrocarbon feedstock having a substantial Conradson Carbon residue number and metals content including vanadium and nickel which comprises contacting said feedstock in a decarbonizing and demetallizing zone with fluidizable microspheres of solid contact material having a low microactivity for catalytic cracking at low severity, including a temperature of at least 482° C., for a period of time less than that which induces substantial thermal cracking of said feedstock, at the end of said period of time separating from said microspheres of solid contact material a decarbonized volatilized hydrocarbon fraction of reduced Conradson Carbon residue number and metals content as compared with said feedstock; reducing temperature of said separated fraction to a level below that at which substantial thermal cracking takes place; subjecting said microspheres of solid contact material to contact with air at elevated temperature in a separate burning zone to remove combustible deposit from said solid and heat the solid; recycling at least a portion of said microspheres of solid contact material from the burning zone to the decarbonizing and demetallizing zone for further decarbonizing and demetallizing of said feedstock; the improvement which comprises employing in said process dense attrition resistant, acid insoluble microspheres consisting essentially of mullite crystals and crystals of a material selected from the group consisting of cristobalite, tridymite and mixture thereof, said microspheres having a mullite index of at least 45, an EAI below 1%/sec., a surface area below 5 m^2/g, a total porosity in the range of 0.01 to 0.09 cc/g and a pore structure such that the majority of the pores are larger than 1000 Angstrom units in diameter, said microspheres having been obtained by calcining microspheres consisting essentially of a material selected from the group consisting of kaolin clay, a mixture of kaolin clay and alumina, and kyanite at a temperature in excess of 1260° C.

4,781,819

TREATMENT OF VISCOUS CRUDE OILS

Maria L. Chirinos, Caracas; Jorge L. Grosso; Ignacio Layrisse, both of Miranda, all of Venezuela, and Alan Stockwell, Knaphill, United Kingdom, assignors to The British Petroleum Company p.l.c., London, England and Intevep SA, Caracas, Venezuela

Continuation of Ser. No. 628,523, Jul. 6, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 888,109
Claims priority, application United Kingdom, Jul. 6, 1983, 8318313
Int. Cl.[4] C10C *3/00*
U.S. Cl. 208—309 **13 Claims**

1. A method for the treatment and transportation of a viscous crude oil produced in the form of an emulsion of fine droplets of formation water in oil, comprising the stages of dehydration, solvent deasphalting, solvent removal and transportation through a pipeline, said dehydration and solvent deasphalting capable of being carried out in a single zone or separate zones, said method comprising:

(a) adding a deasphalting/dewatering solvent to the emulsion of water in oil upstream of the dehydration and deasphalting stages,

(b) separating water from oil in a dehydration stage,

(c) withdrawing water from the dehydration stage,

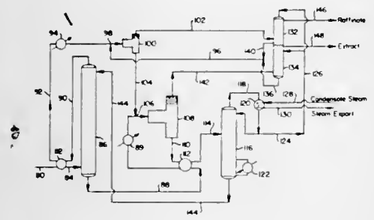
(d) precipitating asphalt in a deasphalting stage by contacting the oil with the solvent at a temperature in the range of 40° C. to 60° C. and removing asphaltenes from the deasphalting stage,

(e) passing oil and solvent from the deasphalting stage to the solvent removal stage, and

(f) withdrawing the oil of reduced water and asphaltene content from the solvent removal stage and transporting said oil through a pipeline.

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AROMATIC EXTRACTION PROCESS USING MIXED POLYALKYLENE GLYCOLS/GLYCOL ETHER SOLVENTS
Paulino Forte, Yonkers, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.
Continuation of Ser. No. 752,025, Jul. 5, 1985, abandoned. This application Jul. 9, 1986, Ser. No. 883,754
The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.
Int. Cl.⁴ C10G *21/16*; C07C *7/10*
U.S. Cl. 208—333 **28 Claims**



1. A process for the dearomatization of a mixed hydrocarbon feed which comprises the following steps:
(a) contacting said feed in an extraction zone at a temperature of at least about 150° C. with an aromatic extraction solvent to provide a solvent phase containing aromatic hydrocarbons and a raffinate phase containing nonaromatic hydrocarbons, wherein the aromatic extraction solvent comprises a polyalkylene glycol of the formula

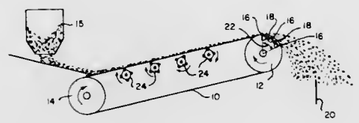
$$HO—[CHR_1—(CR_2R_3)_n—O—]_mH$$

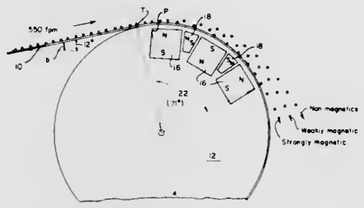
wherein n is an integer from 1 to 5, m is an integer having a value of 1 or greater and R_1, R_2 and R_3 may each be hydrogen, alkyl, aryl, araalkyl, alkylaryl and mixtures thereof and a glycol ether of the formula

$$R_4O—[CHR_5—(CHR_6)_x—O]_y—R_7$$

wherein R_4, R_5, R_6 and R_7 may each be hydrogen, alkyl, aryl, araalkyl, alkylaryl and mixtures thereof with the proviso that R_4 and R_7 are not both hydrogen; x is an integer from 1 to 5, and y may be an integer from 2 to 10;
(b) cooling said solvent and raffinate phases;
(c) introducing said cooled solvent phase to a separation zone and introducing therewith an effective amount of an anti-solvent for said aromatic hydrocarbons in said mixed extraction solvent to provide an extract phase containing aromatic hydrocarbons and a solvent phase containing mixed extraction solvent and anti-solvent;
(d) introducing said cooled raffinate phase to a separation zone and introducing therewith an effective amount of an anti-solvent for such aromatic selective solvent in said raffinate phase to provide a raffinate phase and a solvent-/anti-solvent phase;
(e) adjusting the anti-solvent in said solvent phase and recycling said solvent phase to the extraction zone of step (a); and
(f) recovering the extract phase of step (c) and the raffinate phase of step (d).

4,781,821
PROCESS FOR OPERATING A SHORT-BELT TYPE MAGNETIC SEPARATOR
Robert W. Salmi, Arbo Township, Minn., assignor to USX Corporation, Pittsburgh, Pa.
Filed Jan. 30, 1987, Ser. No. 9,309
Int. Cl.⁴ B03C *1/22*
U.S. Cl. 209—214 **9 Claims**



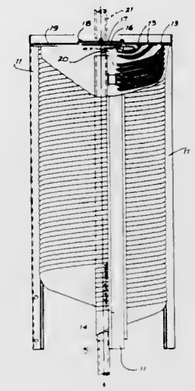


1. A process for separating magnetic ore particles from non-magnetic particles using a short belt magnetic separator having a pulley head with axial pole permanent magnets located within said pulley head, said magnets being mounted in a fixed position within said pulley head during operation of said separator and generating a magnetic field said process comprising:
feeding a mixture of magnetic and non-magnetic particulate materials onto a feed end portion of an endless belt of said short belt magnetic separator,
positioning said axial pole magnets within the pulley head so that said magnets extend along an arc beginning at a location spaced at least one degree beyond the point of tangency T of an upper surface of the belt with the pulley head
projecting both the magnetic and non-magnetic particles off the belt at the point of tangency T by operating the belt at a speed and angle of inclination sufficient therefor, and
drawing the magnetic particulates by said magnetic field back toward the belt after they have been projected therefrom so as to obtain a more effective separation of said magnetic and non-magnetic particles than when said magnetic particles are not projected from the belt at said point of tangency.

4,781,822
SPIRAL SEPARATOR
Murray H. Pryor, Roseville, Australia, assignor to Minpro Pty. Limited, New South Wales, Australia
Filed Aug. 6, 1986, Ser. No. 893,649
Claims priority, application Australia, Aug. 8, 1985, PH01858
Int. Cl.⁴ B03B *5/52*
U.S. Cl. 209—459 **17 Claims**

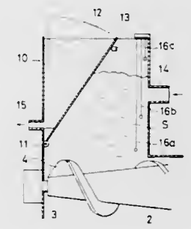
1. A multi-start spiral separator for fluid materials comprising:
a plurality of stationary substantially helical troughs arrayed around a common substantially vertical axis and having upper and lower ends;
an upwardly facing open fluid material-receiving portion at the upper end of each trough, said receiving portions being arranged around said axis;

a substantially planar deflector disposed substantially normal to said axis and adapted to deflect fluid material fed onto the surface thereof substantially uniformly into said fluid material-receiving portions; and



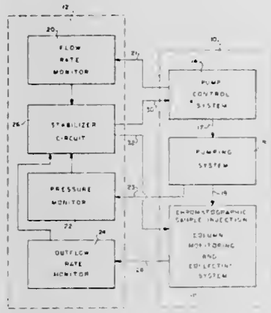
a fluid material delivery means having an elongate delivery end portion coaxial with said axis for feeding fluid material onto the surface of said planar deflector.

4,781,823
PRE-FILTERING APPARATUS FOR USE IN CONTINUOUS PRESS
Mitsuo Shinozaki, Tokyo, Japan, assignor to Fukoku Kogyo Company Limited, Tokyo, Japan
Filed Apr. 13, 1987, Ser. No. 37,940
Int. Cl.⁴ B01D *33/00*; B30B *15/30*
U.S. Cl. 210—86 **7 Claims**



1. A pre-filtering apparatus for use in a continuous press, comprising:
a hopper through which raw material to be pressed is supplied to the continuous press;
a plate-like filtering screen arranged within said hopper for dividing a space in the hopper into two portions, said filtering screen having means defining a number of filtering holes therein;
a shaft means for journalling one end of the filtering screen thereto in a freely rotatable manner so that the raw material is pressed by the weight of the filtering screen;
a stopper arranged in the hopper to limit the rotation of the filtering screen;
an inlet means for communicating with one of the space portions which is communicated with the continuous press; and
an outlet means for communicating with the other space portion of the hopper, said outlet means being provided above said shaft means.

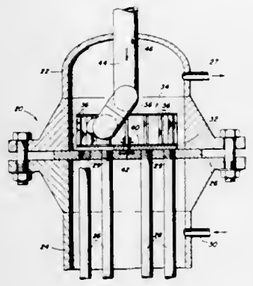
4,781,824
APPARATUS FOR LIQUID CHROMATOGRAPHY
Robert W. Allington, Lincoln, Nebr., assignor to Isco, Inc., Lincoln, Nebr.
Division of Ser. No. 415,471, Sep. 7, 1982, which is a division of Ser. No. 300,567, Sep. 9, 1981, Pat. No. 4,422,942. This application Sep. 2, 1986, Ser. No. 902,921
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.⁴ B01D *15/08*
U.S. Cl. 210—101 **41 Claims**



1. Apparatus for rapidly bringing a chromatographic column to equilibrium pressure comprising:
means for setting a pumping speed for pumping fluid from a pumping system into said column at a predetermined rate of flow;
means for measuring, at a time of a low value of pressure, a characteristic of fluid being transferred from the pumping system to the chromatographic column related to the pressure of the fluid;
means for estimating the equilibrium value of pressure from said measurements of said characteristic made at said low value of pressure;
means for increasing the pumping rate of flow until said estimated equilibrium value of pressure is reached; and
said means for estimating including means for taking the time derivative of the pressure; means for measuring the pressure at a predetermined fraction of the difference between the maximum time derivative of the pressure and zero; and means for multiplying the pressure at that point by a factor which is the reciprocal of the predetermined fraction; and reducing said rate of flow from the pumping system to said predetermined rate of flow.
40. Apparatus for operating a chromatograph comprising:
means for applying fluid from a pumping system into a chromatographic column system;
means for detecting chromatographic peaks in the effluent as the fluid passes through the chromatographic column system;
means for recording said chromatographic peaks;
means for measuring the rate of flow of said fluid from said chromatographic column system and generating a signal related thereto; and
means for controlling the rate of recording said peaks in response to said signal so that the rate of recording is directly proportional to the rate of flow of fluid between the pumping system and the chromatographic column system.

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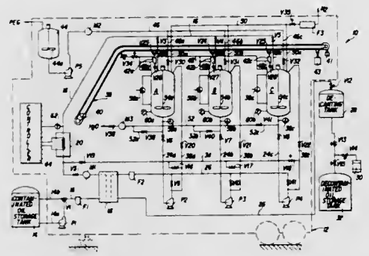
4,781,825
FILTER WITH SELF-ACTUATING ROTATING BACKWASH SELECTOR
Steven D. Grimes, LaPlace, La., and Sidney H. DePriest, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.
Filed Dec. 14, 1987, Ser. No. 133,095
Int. Cl.[4] B01D *29/24, 29/38*
U.S. Cl. 210—107 **7 Claims**



1. A filter for removing solids from a fluid comprising a housing having a partition which divides said housing into an upper chamber and a lower chamber, a plurality of tubular filter means secured to the bottom of said partition, said tubular filter means being open at the top and closed at the bottom, means defining openings in the partition which allow for fluid to flow from the open end of each said filter means into said upper chamber, means for supplying fluid to be filtered to the lower chamber, means for recovering filtered fluid from the upper chamber, a blockoff plate positioned above said partition, said blockoff plate having at least one open area so that said plate is capable of covering and uncovering each of said openings at least once as said plate is rotated about an axis, blockoff plate mounting means located in said upper chamber which allow said plate to rotate and to move axially so that in the backwash mode said plate rests on said partition and in the filter mode said plate is lifted above said partition to allow filtrate to flow from all the filter means into the upper chamber, a turbine means secured to the upper surface of the blockoff plate, and a backwash inlet means for directing fluid to said turbine means in such a fashion as to cause said blockoff plate to rotate.

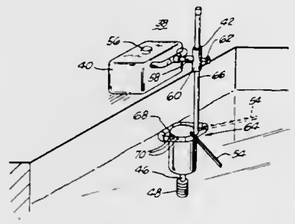
4,781,826
APPARATUS FOR DECONTAMINATING PCB-CONTAMINATED DIELECTRIC FLUIDS
Ashok K. Mendiratta, Niskayuna; Wayne F. Morgan, Mechanicville; Craig W. Horneck, Scotia, all of N.Y., and Nie-Jiann Wen, Weston, Mass., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 3, 1987, Ser. No. 128,314
Int. Cl.[4] B01D *21/30*
U.S. Cl. 210—139 **26 Claims**

1. Apparatus for reducing the quantity of polychlorinated aromxtic hydrocarbons in an inert organic solvent, said apparatus comprising in combination:
A. at least three reactors;
B. a main inlet line;
C. a separate, valved branch inlet line connecting said main inlet line to each of said reactors;
D. a first pump for pumping the solvent through said main and branch inlet lines into said reactors;
E. a heater included in said main inlet line for heating the solvent pumped therethrough;
F. means for separately introducing metered quantities of reagents to each of said reactors;
G. a main outlet line;
H. a separate valve branch outlet line connecting each said reactor to said main outlet conduit;
I. a separate second pump included in each said branch outlet line for pumping the solvent from said reactors through said branch outlet and main outlet lines; and
J. a controller for controlling the operations of said pumps, heater, reagents introducing means, and said valved inlet
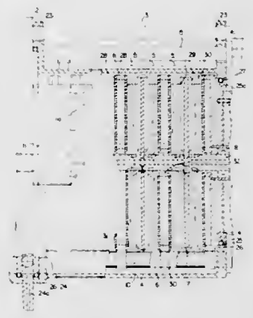


and outlet branch lines in repeating, timed phased batch sequence such that while solvent is being pumped through said main inlet line to fill one of said reactors during a batch charging cycle, solvent is being pumped through said main outlet line to empty a second one of said reactors during a batch discharging cycle and the polychlorinated aromatic hydrocarbons in the solvent in the third one of said reactors is undergoing reaction with said reagents during a batch reaction cycle.

4,781,827
PORTABLE SWIMMING POOL SKIMMER
Edward J. Shields, Boca Raton, Fla., assignor to Marlene L. Shields, Boca Raton, Fla.
Filed Jan. 2, 1987, Ser. No. 52
Int. Cl.[4] E04H *3/20*
U.S. Cl. 210—169 **18 Claims**



1. A portable skimmer for a swimming pool for skimming off floating debris from the pool water surface, said pool including pump means having a water suction line attached thereto, said skimmer comprising:
a weighted base member for being selectively positioned at any desired location around the periphery of said pool;
a basket having an open top and an outlet fitting; and
tubular basket holding means for holding said basket, said basket holding means having openings therein to allow water from said pool within said tubular means;
means, extending downward from said base member, for supporting said basket holding means in a position so that said open top is slightly below said water surface; and
means for connecting said outlet fitting to said water suction line.

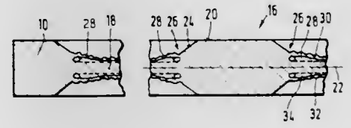
4,781,828
FILTER PRESS WITH ROTOR DISKS
Dieter Kupka, Neu-Ulm, Fed. Rep. of Germany, assignor to Bauko Baukooperation GmbH, Salzburg, Austria
Filed Dec. 18, 1986, Ser. No. 943,617
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 8560084[U]
Int. Cl.[4] B01D *25/12, 25/38*
U.S. Cl. 210—225 **24 Claims**



1. A filter press comprising a housing provided with a feed liquid inlet and consisting of two support walls and a casing defining an interior cavity of substantially circular cross section, one of said support walls forming an end closure of said cavity and the other support wall supporting an end wall forming another end closure of said cavity, said casing being in sealing engagement with said first named support wall and said end wall, further comprising a plurality of filter units coaxially aligned within said housing and composed each of a filter frame mounted in a mounting structure supported by said support walls independently of said casing, each of said filter frames defining a filtrate chamber covered in a radial plane by a filter medium, a feed liquid chamber being formed between said filter medium and a rotor disk disposed opposite thereto, said rotor disk being fixedly mounted on a hollow shaft which is rotatably supported by said support walls and extends centrally through said housing, and including means for moving the surface of said rotor disk towards said filter medium, and further comprising means for axially displacing said casing with respect to said support walls and said end wall to thereby expose said filter units wherein all position of said casing an annular clearance is existant between said filter units and said casing, said clearance being in continuous communication with all of said feed liquid chambers, said filtrate chambers being in communication with a discharge pipe extending through the interior of the filter press in parallel to said hollow shaft.

11. A rotor for a filter press, said rotor comprising a hollow shaft to extend through said filter press and having a central bore and a plurality of rotor disks fixedly mounted in said shaft at axial spacings, each rotor disk comprising a hub fixedly mounted on said shaft and two symmetrically disposed rigid pressure plates forming axially displaceable surface elements arranged on said shaft on opposite sides of said hub disk for axial displacement and being biased towards on another by means engaging said pressure plates, means defining at least one variable-volume cavity communicating with the bore of said hollow shaft and being disposed between said pressure plates to urge them from one another upon supply of a pressurized fluid to said cavity so as to force said pressure plates into engagement with filter cakes accumulating on filter media of adjacent filter units disposed adjacent to said rotor disks within said filter press, and further comprising sealing means being provided for defining said cavity in cooperation with said two pressure plates.

4,781,829
MEMBRANE FILTER PLATE FOR A FILTER PRESS OR THE LIKE WITH SUPPORT BOSE BOSSES
Reimund Stanik, Bischof-Ketteler-Strasse, 10,8952 Marktoberdorf, Fed. Rep. of Germany
Filed May 27, 1986, Ser. No. 866,964
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 8605058; European Pat. Off., Apr. 29, 1986, 86105922.8
Int. Cl.[4] B01D *25/12*
U.S. Cl. 210—231 **11 Claims**



1. In a membrane filter plate for a filter press with a one-piece, plastic carrier plate, at least one membrane arranged on one side of the carrier plate and provided with at least one spacing boss having an end face for the engagement of a filter cloth and a sealing rim having a sealing surface surrounding the carrier plate and the membrane and connecting the same in substantially fluid-tight manner, the sealing surface of the sealing rim parallel to the carrier plate median plane being arranged on the side having the membrane or on either side of the carrier plate at a distance from the plane of the membrane in a normal unloaded position, at least one support boss constructed at least partly in one piece with the carrier plate is provided in the central region of the latter and which is rotationally symmetrical to a normal to the carrier plate median plane, the end face of the support boss parallel to the carrier plate median plane being substantially aligned with the sealing surface of the sealing rim parallel to said median plane and provided laterally with a rotationally symmetrical transition surface facing the membrane and which slopes in the direction of the carrier plate median plane, the improvement comprising the support boss **16** being constructed in one piece with the carrier plate **18** in its area adjacent to the carrier plate median plane **22** and the transition surface **30** of the support boss **16** running from a connecting line **26** of membrane **28** to the support boss **16** for producing in each case one desired bending line **32, 34** for filtration phase initially substantially parallel to the carrier plate median plane **22**, then sloping towards the same under an angle of 3° to 15°, and then again extending parallel to the carrier plate median plane **22**, and the support boss **16** being provided with a central bore **28** passing through the complete carrier plate **18** and communicating via openings **46** in lateral face **24** with the particular filter chamber.

4,781,830
CROSS FLOW FILTRATION APPARATUS AND CLOSURE ASSEMBLY THEREFOR
Douglas L. Olsen, Eden Prairie, Minn., assignor to Osmonics, Inc., Minnetonka, Minn.
Filed Apr. 19, 1988, Ser. No. 183,587
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—232 **17 Claims**

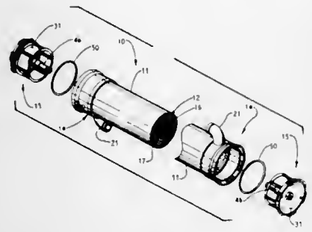
1. A cross flow filtration apparatus comprising, in combination:
an elongated filtration element housing having first and second ends;
a cross flow filtration element disposed within said filtration element housing, said filtration element comprising a cross flow filtration medium and a central filtrate tube; and
a closure assembly connected with at least one of said first and second ends of said filtration element housing, said closure assembly including:
a generally annular adaptor having a first end connected with said one end of said housing, a second end pro-

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vided with first connection means, a generally annular side wall connecting said first and second ends of said adaptor and an inlet/outlet port provided in said side wall;

an end cap for sealing cooperation with said adaptor, said end cap including an end wall having an outer peripheral edge provided with second connection means and a filtrate access port centrally positioned in said end wall for providing sealed access to said filtrate tube;

said first and second connection means cooperating with



one another to selectively secure said end cap to said adaptor, one of said first and second connection means having a plurality of protruding lugs and the other of said first and second connection means having a plurality of recessed portions positioned to receive said lugs upon selective limited rotation of said end cap relative to said adaptor to thereby secure said end cap to said adaptor; and

a seal member disposed between a portion of said end cap and a portion of said adaptor to form a seal therebetween when said end cap is secured to said adaptor.

4,781,831

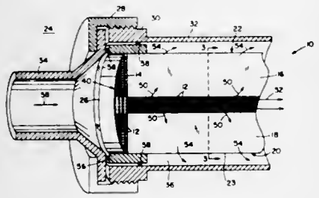
CROSS-FLOW FILTRATION DEVICE WITH FILTRATE FLOW CONDUITS AND METHOD OF FORMING SAME

Robert L. Goldsmith, 323 Waverly St., Belmont, Mass. 02178

Continuation-in-part of Ser. No. 944,663, Dec. 19, 1986, abandoned. This application Apr. 2, 1987, Ser. No. 33,572

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—247 **37 Claims**



1. A cross-flow filtration device for receiving a feed stock at a feed end and for separating the feed stock into filtrate and retentate, comprising:

a structure of porous material defining a plurality of passageways extending longitudinally from the feed end to a retentate end of the structure through which the feed stock flows to pass retentate from the device, the surface area of the passageways being at least 100 square feet per cubic foot of the structure;

a filtrate collection zone disposed along at least one side of the structure;

a plurality of filtrate conduits within the structure for carrying filtrate from within the structure toward the filtrate collection zone, the filtrate conduits providing paths of lower flow resistance than that of alternative flow paths through the porous material;

the filtrate conduits being distributed among the passageways to provide low pressure drop flow paths for filtrate flow through the porous material from the passageways to nearby filtrate conduits; and

means for isolating the filtrate collection zone from the feed and retentate ends of the structure.

4,781,832

HOLLOW-FIBER FILTER MODULE

Tohru Takemura, Hiroshima; Haruhiko Yoshida, Yamaguchi; Hiroshi Takahashi, Hiroshima; Yoshikazu Fujinaga, Aichi, and Masashi Okamoto, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

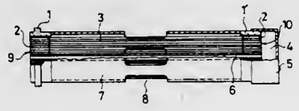
Continuation of Ser. No. 736,240, May 21, 1985, Pat. No. 4,720,342. This application Jun. 5, 1987, Ser. No. 58,877

Claims priority, application Japan, May 21, 1984, 59-100572; Oct. 29, 1984, 59-225982

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.⁴ B01D *31/00*

U.S. Cl. 210—321.8 **8 Claims**



1. A hollow fiber filter module comprising:

a bundle of parallel hollow fibers having two open ends;

means for forming a filtrate collection chamber at one of said open ends;

filtrate conduit means comprising a conduit extending through said bundle for conducting filtrate from said one of said open ends to the other of said open ends; and

a reinforcing ring comprising means for holding the position of said filtrate conduit means in said bundle.

4,781,833

HOLLOW FIBER FLUID SEPARATOR

Shoji Mizutani, and Nobuo Taneda, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 12, 1985, Ser. No. 796,865

Claims priority, application Japan, Nov. 16, 1984, 59-240589; Nov. 16, 1984, 59-240590; Nov. 16, 1984, 59-240591; May 30, 1985, 60-115270; Jun. 19, 1985, 60-131990

Int. Cl.⁴ B01D *13/01*

U.S. Cl. 210—321.81 **14 Claims**



1. A fluid separator having a fluid inlet and fluid outlet comprising a shell filled with a bundle of hollow fibers having a selective permeability, wherein a majority of the hollow fibers each has on the periphery thereof 1 to 10 fins extending in the longitudinal direction, and the occupancy ratio y of the sections, defined by the peripheries, of all the hollow fibers exclusive of the fin portions in the hollow fiber bundle to the section, vertical to the axial direction of the hollow fiber bundle, of the inner wall of the shell is within a range defined by the following formula (I):

$$41 - 3.1\sqrt{\alpha x} \leqq y \leqq 61 - 3.1\sqrt{\alpha x} \quad \text{(I)}$$

wherein x stands for the average fin number per hollow fiber in the hollow fiber bundle, and α indicates the ratio H/d of the average fin height H (μ) in the hollow fiber bundle to the average outer diameter d (μ) of the hollow fibers exclusive of the fin portions and wherein the shell has a cylindrical shape and said occupancy ratio y is expressed by the following formula (II):

$$y = (Nd^2/D^2) \times 100(\%) \quad \text{(II)}$$

wherein D stands for the inner diameter (μ) of the shell in which the hollow fiber bundle is filled, d stands for the average outer diameter (μ) of the hollow fibers exclusive of the fin portions in the hollow fiber bundle, and N stands for the hollow fibers contained in the shell.

4,781,834

MEMBRANE SEPARATION APPARATUS

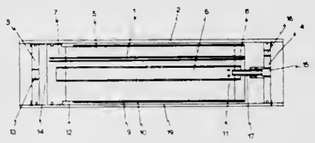
Masaaki Sekino; Katsuhisa Numata, and Tetsuo Ukai, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Jun. 19, 1987, Ser. No. 63,917

Claims priority, application Japan, Jun. 20, 1986, 61-145570

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.88 **15 Claims**



1. A membrane separation apparatus of hollow fiber type which comprises a hollow fiber package body in a cylindrical shape having a core pipe or tube available as a passage for a fluid and a hollow fiber layer surrounding said core pipe or tube, wherein said hollow fiber layer being formed by arranging hollow fibers having a selective permeability around and on the outer surface of said core pipe or tube, comprising in that (1) at least two perforated holes are provided on the wall of said core pipe or tube at the position near either one of the entrance or exit of said passage so as to flow the fluid into the hollow fiber layer therethrough; and (2) are outer surface of the hollow fiber package body covered by a film which is non-permeable to the fluid but leaving uncovered the edge portion of the outer surface opposite to the edge portion where said hole is present on the wall of said core pipe or tube.

4,781,835

DISK CONCENTRATORS

Theodor Bahr, Heidenheim; Rolf Laible, Giengen, and Ference Bilics, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Aug. 7, 1986, Ser. No. 894,208

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1985, 3528429

Int. Cl.⁴ B01D *33/26*

U.S. Cl. 210—331 **2 Claims**

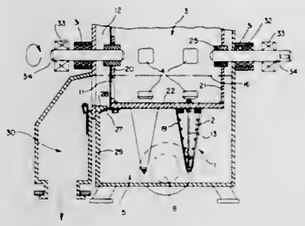
1. A disk concentrator comprising:

a trough defining a cavity for receiving a suspension;

an essentially drum-like structure with a peripheral wall at least one end wall which cooperate to define a filtrate collection chamber,

said peripheral wall defining at least one filtrate inlet orifice, said at least one end wall defining at least one filtrate outlet orifice;

a filter disk having a screen surface, said filter disk mounted on and rotatable with said filtrate collection chamber peripheral wall, said filter disk including a plurality of said segments circumferentially arranged around said peripheral wall and radially extending therefrom, said filter disk screen surface and said peripheral wall cooperating to define a filter chamber, which filter chamber communicates with said collection chamber through said filtrate inlet orifice,



radial reinforcing ribs positioned between said segments, which ribs of adjacent filter segments define facing grooves, which reinforcing ribs include a tongue positioned in said facing grooves and operable as a sealing element;

a means for rotating said filtrate collection chamber and filter disk; and,

a rotating seal mounted on said collection chamber drum-like structure radially outward from said outlet orifice, which seal is operable to seal communication between said outlet orifice and said trough cavity.

4,781,836

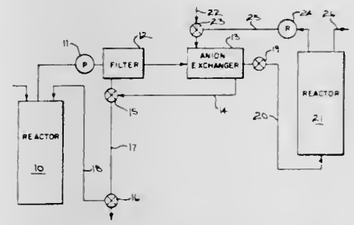
METHOD FOR BIOMETHANATION

Jurgen Thiele, East Lansing, and Joseph G. Zeikus, Okemos, both of Mich., assignors to Michigan Biotechnology Institute, East Lansing, Mich.

Filed May 16, 1986, Ser. No. 863,977

Int. Cl.⁴ C02F *3/28, 11/04;* **C12P** *5/02*

U.S. Cl. 210—603 **11 Claims**



1. A process for the biomethanation of an organic substrate to methane which comprises: treating the substrate in a first reactor to form a liquid containing dissolved organic acid anions; adsorbing said anions on an anion exchange material; removing the organic acid anion-free residual liquid; desorbing the organic acid anions from the anion exchanger to obtain an aqueous organic acid anion containing preparation; and transporting said preparation to a second reactor containing methanogenic bacteria which consume the organic acid anions and produce methane.

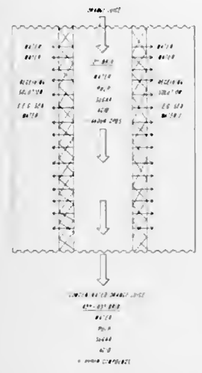
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4,781,837

METHOD OF PERFORMING OSMETIC DISTILLATION

Michel S. M. Lefebvre, Point Piper, Australia, assignor to Limitinstant Limited, London, England

PCT No. PCT/AU85/00287, § 371 Date Jul. 21, 1986, § 102(e) Date Jul. 21, 1986, PCT Pub. No. WO86/03135, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 21, 1985, Ser. No. 900,156
Claims priority, application Australia, Nov. 21, 1984, PG8224
Int. Cl.⁴ B01D *13/01*
U.S. Cl. 210—640 **8 Claims**



1. A method of osmotic distillation for the concentration of a first fluid of relatively low osmotic pressure comprising: circulating said fluid on one side of a hydrophobic porous barrier; simultaneously circulating a second fluid of a relatively high osmotic pressure on the opposite side of the porous barrier; solvent from said first fluid being transferred across the porous barrier in the vapor state substantially solely under the influence of an osmotic pressure gradient to the second fluid resulting in concentration of the first fluid.

8. An osmotic distillation apparatus for concentrating a first fluid of relatively low osmotic pressure comprising:

a hydrophobic porous barrier and means for circulating said first fluid on one side of said hydrophobic porous barrier;

means for simultaneously circulating a second fluid of a relatively high osmotic pressure on the side of said porous barrier opposite the side on which the first fluid circulates including means for causing solvent from said first fluid to be transferred across said porous barrier in a vapor state substantially solely under the influence of an osmotic pressure gradient to the second fluid resulting in concentration of the first fluid.

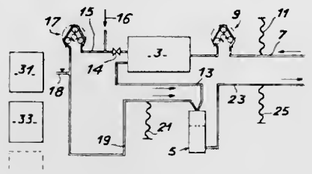
4,781,838

SOLID POLYVINYL ALCOHOL-BASED SUPPORT ABLE TO ADSORB LIPOPROTEINS AND ITS USE FOR THE SEPARATION OF LOW DENSITY LIPOPROTEINS PRESENT IN A LIQUID, SUCH AS BLOOD PLASMA

Geneviève Crassous, Paris; Gilbert Gaussens, Meudon; Dominique Duval, Courbevoie; Maryvonne Nicaise, Saint Remy Les Chevreuse; Gérard Vergne, Antony, and Sylvaine Hours, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 18, 1986, Ser. No. 897,751
Claims priority, application France, Aug. 23, 1985, 85 12666
Int. Cl.⁴ B01D *15/00*; C08G *18/10*
U.S. Cl. 210—692 **14 Claims**

1. A process for the separation of lipoproteins present in a liquid comprising contacting said liquid with a solid support comprising a polyvinyl alcohol hydrogel crosslinked by irradiation with at least one crosslinking monomer having at least two reactive ethylene functions under ionizing radiation, said crosslinked polyvinyl alcohol hydrogel having 70 to 95% by weight of chains derived from polyvinyl alcohol and 5 to 30% by weight of chains derived from crosslinking monomers and at least part of the —OH groups of the polyvinyl alcohol



hydrogel are replaced by $—OSO_3H$ groups directly fixed onto carbon atoms of the hydrogel and then separating the liquid from the support on which the lipoproteins have been adsorbed.

4,781,839

METHOD FOR FLOCCULATING AND REMOVING SOLIDS SUSPENDED IN WATER

David W. Kelly, Toronto; Stewart N. Paul, and John E. Waller, both of Mississauga, all of Canada, assignors to Dearborn Chemical Company, Limited, Mississauga, Canada

Division of Ser. No. 897,905, Aug. 19, 1986, Pat. No. 4,734,216. This application Oct. 8, 1987, Ser. No. 106,474
Claims priority, application Canada, Jan. 28, 1986, 500477
Int. Cl.⁴ C02F *1/54*
U.S. Cl. 210—725 **20 Claims**

1. A method of treating water containing suspended solids to remove from the water solids suspended therein comprising the steps of:

(a) adding to the water a metal salt selected from the group consisting of inorganic flocculants comprising aluminum, iron, or mixtures thereof;

(b) adding to the water tannin-based flocculant with a modified tannin produced by reacting a condensed tannin with an amino compound and an aldehyde; said additives from steps (a) and (b) being added in effective amounts to work together to flocculate solids suspended in the water and substantially improve solids flocculation efficiency; and

(c) removing flocculated solids from the water.

4,781,840

CATIONIC AND ANIONIC LIGNIN AMINES AS FLOCCULANTS

Peter Schilling, Charleston, and Patti E. Brown, Goose Creek, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 76,948, Jul. 23, 1987. This application Mar. 28, 1988, Ser. No. 173,871
Int. Cl.⁴ B01D *21/01*; C02F *1/54*
U.S. Cl. 210—730 **24 Claims**

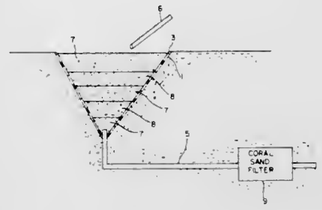
1. In a method for dewatering secondary papermill sludge, the improvement of accelerating the filtration rate and producing a lighter color filtrate comprising adding to the sludge a lignin derivative which is water soluble at alkaline and acidic pH values and is prepared by reacting lignin with an aldehyde, or an aldehyde-producing substance, and a polyamine.

4,781,841

HEAVY METAL ADSORBING AGENT AND METHOD OF USING SAME

Nobuo Someya, Tokyo, Japan, assignor to Nissho Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 909,825, Sep. 19, 1986, abandoned. This application Apr. 6, 1987, Ser. No. 34,743
Claims priority, application Japan, Dec. 20, 1985, 60-287220
Int. Cl.⁴ C02F *1/28*
U.S. Cl. 210—747 **5 Claims**



1. A method of adsorbing and preventing leakage of heavy metals in a waste material comprising:

providing a hole in the ground, wherein a drain pipe is provided at the lowest portion of the hole for draining water out of said hole;

lining said hole with a water impervious sheeting material; heat treating said waste material to form an ash containing said heavy metals

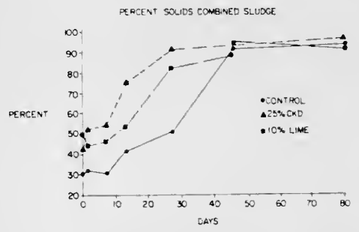
alternately layering coral sand and said ash in said hole, wherein at least a first layer of coral sand is provided on said sheeting material, at least a layer of said ash is provided on said first layer, and at least a second layer of coral sand is provided on said layer of said ash, wherein sufficient coral sand is provided in said first and second layer to adsorb said heavy metals in said ash; introducing water into said hole; adsorbing said heavy metals with said coral sand to prevent leakage of said heavy metals into said water; and draining water out of said hole through said drain pipe.

4,781,842

METHOD OF TREATING WASTEWATER SLUDGE

John P. Nicholson, Toledo, Ohio, assignor to N-Viro Energy Systems Ltd., Toledo, Ohio

Filed Feb. 27, 1987, Ser. No. 19,888
Int. Cl.⁴ C02F *11/14*
U.S. Cl. 210—751 **9 Claims**



1. A method of treating biological sludge containing odor, animal viruses, pathogenic bacteria, and parasites to provide a fertilizer for agricultural lands which can be applied directly to the lands which consists essentially of the following steps:

mixing said sludge with at least one material selected from the group consisting of lime, cement kiln dust and lime kiln dust to form a mixture;

wherein the amount of added material mixed with said sludge being sufficient to raise the pH of said mixture to 12 and above for at least one day;

and drying said mixture to produce a granular material,

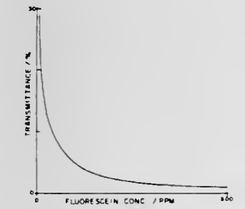
the amount of added material mixed with said sludge and the length of time of drying being sufficient to reduce significantly offensive odor of the sludge to a level that is tolerable; to reduce animal viruses therein to less than one plaque forming unit per 100 ml of said sludge; to reduce pathogenic bacteria therein no less than three colony forming units per 100 ml of said sludge; to reduce parasites therein to less than one viable egg per 100 ml of said sludge; to reduce vecto₁ attraction to said sludge; and to prevent significant regrowth of the pathogenic microorganisms.

4,781,843

CHEMICAL TREATMENT FOR ALGAE CONTROL IN OPEN WATER SYSTEMS

Gary L. Baker, Alexandria, Ky., and Ronald J. Christensen, Montgomery, Ohio, assignors to DuBois Chemicals, Inc., Cincinnati, Ohio

Filed Dec. 11, 1987, Ser. No. 131,902
Int. Cl.⁴ C02F *1/50*
U.S. Cl. 210—764 **11 Claims**



1. A method of retarding algae growth in water in an open water system, comprising:

establishing a concentration of a dye in said water;

wherein said dye is a water soluble dye which absorbs light at a wave length required by said algae to photosynthesize;

wherein said concentration is established at an amount effective to substantially retard photosynthesis by algae.

4,781,844

FLUORINE CONTAINING SILICONE TEXTILE-FINISHING AGENT: SILICONE SUSPENSION AND PERFLUOROALKYL POLYMER

Wilfried Kortmann, Hagen; Helmut Steinberger; Josef Pfeiffer, both of Leverkusen, and Ulrich Koemm, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 904,071, Sep. 4, 1986, abandoned, which is a continuation of Ser. No. 801,722, Nov. 26, 1985, abandoned, which is a continuation of Ser. No. 580,311, Feb. 15, 1984, abandoned. This application May 21, 1987, Ser. No. 53,168
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307420
Int. Cl.⁴ D06M *15/66*; C08L *83/04*
U.S. Cl. 252—8.6 **10 Claims**

1. A textile finishing agent comprising:

(a) 50 to 80 parts by weight of an aqueous colloidal suspension containing hydrolysates of

(i) trialkoxysilane $(RSi(OR')_3$ or

(ii) a mixture of trialkoxysilane $RSi(OR')_3$ and tetra-alkoxysilane $Si(OR')_4$,

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where R is C_{1-7} alkyl or an aryl and where R' is C_{1-4} alkyl and

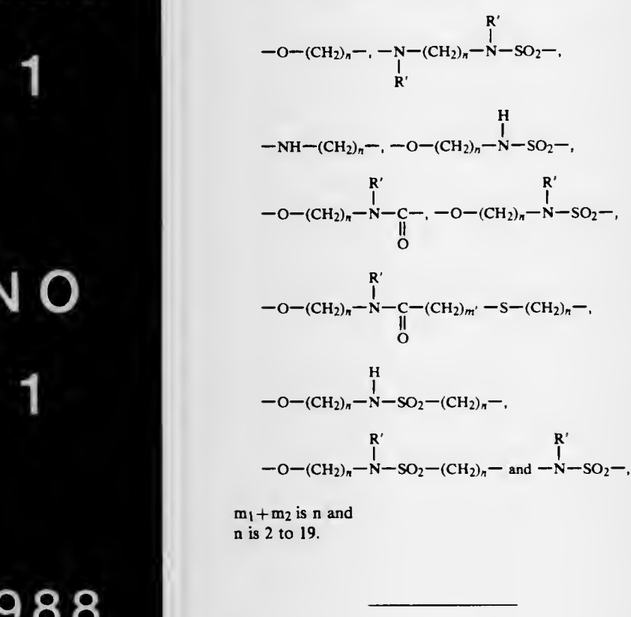
(b) 20 to 50 parts by weight of an aqueus dispersion comprising 5 to 50 weight % of a perfluoroalkyl group-containing resin, the resin having a fluorine content of 0.2–40% by weight, the resin being selected from the group consisting of a polyacrylate, a polyurethane and a polyester, the perfluoralky groups being of the formula

$$-Y-(CFx)_n-CF_{2x},$$

wherein
n is 2 to 19,
x is F, Cl, H, or

$$-Y-(CF_2)_{m1}-O-(CF_2)_{m1}-CF_3,$$

where Y is selected from the group consisting of



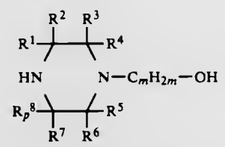
m_1+m_2 is n and
n is 2 to 19.

4,781,845
HYDROCARBON GELLANT
Allen R. Syrinek, Richmond, and David A. Huddleston, Sugar Land, both of Tex., assignors to Nalco Chemical Company, Naperville, Ill.
Filed Aug. 17, 1987, Ser. No. 85,735
Int. Cl.[4] E21B *43/26*; F17D *1/16*
U.S. Cl. 252—8.551 **2 Claims**

1. A liquid which may be used to gel a hydrocarbon oil employed in fracturing a subterranean hydrocarbon producing formation, or to reduce friction when pumping a liquid through a pipeline comprising at least about 10% by weight of (A) an ionic association polymer which is the reaction product of (1) sodium aluminate and (2) an alkyl phosphate ester; and the balance being (B) a polar solvent selected from the group consisting of (1) high boiling point aromatic naphtha combined with ispropanol, (2) the distillation residue of C_{10} fatty alcohol and (3) the distillation residue of C_{10} fatty alcohol combined with isopropanol.

4,781,846
ADDITIVES FOR AQUEOUS LUBRICANT
Hideo Kanamori, Ichihara, Japan, assignor to Idemitsu Kosan Limited, Tokyo, Japan
Filed Jun. 1, 1987, Ser. No. 61,013
Claims priority, application Japan, Jun. 12, 1986, 61-136726
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.3 **13 Claims**

1. An aqueous lubricant comprising a bactericidal amount of an additive selected from the group consisting of a piperazine compound of formula I:



[I]

wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 each represents hydrogen atom or an alkyl group of 1–18 carbon atoms and m is an integer of 2–5 and a reaction product of said compound of formula I with a carboxylic acid of 2–55 carbon atoms; and a lubricating amount of a lubricating oil distinct from said piperazine compound.

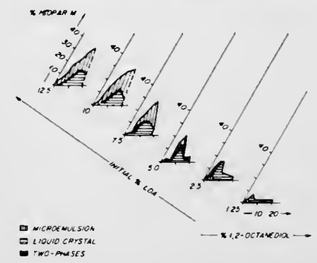
4,781,847
AQUEOUS LUBRICANT
Gene C. Weitz, Stillwater, Minn., assignor to American Polywater Corporation, Stillwater, Minn.
Filed May 8, 1986, Ser. No. 859,320
Int. Cl.[4] C10M *173/02*
U.S. Cl. 252—49.3 **25 Claims**

1. A fatty-acid-free lubricant consisting essentially of:
(a) about 0.5 to 25 wt-% polyalkylene glycol having a molecular weight of about 1,000 to 15,000;
(b) an effective gelling amount of a viscosity modifier consisting essentially of a mixture of at least two components selected from the group consisting of polymeric polyelectrolyte acrylate compounds, polyalkylene oxide compounds, polyacrylamide compounds and cellulosic compounds; and
(c) water.

4,781,848
METALWORKING LUBRICANT COMPRISING AN OIL-IN-WATER MICROEMULSION
Girma Biresaw, Lower Burrell; Ronald A. Reich, Shaler; John Bohaychick, and Ronald P. Festa, both of New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed May 21, 1987, Ser. No. 52,385
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.5 **20 Claims**

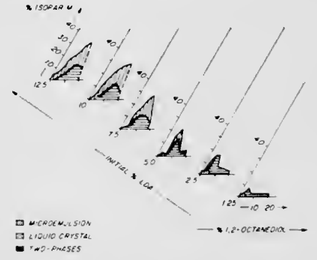
1. A lubricant composition suitable for use in metalworking and having the following ingredients:
(a) about 1–30 wt % of a natural or synthetic oil,
(b) about 0.5–30 wt % of a water-soluble surfactant,
(c) about 1–20 wt % of an organic cosurfactant comprising a C_4–C_{12} 1,2-alkanediol, and

(d) about 45–97.5 wt % water containing less than about 1 wt % dissolved inorganic salts; and wherein the relative



proportions of (a), (b), (c), and (d) are such that the composition comprises an oil-in-water microemulsion.

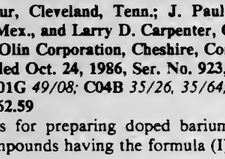
4,781,849
LYOTROPIC LIQUID CRYSTAL METALWORKING LUBRICANT COMPOSITION
Girma Biresaw, Lower Burrell, and Ronald P. Festa, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed May 21, 1987, Ser. No. 52,384
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.5 **20 Claims**



1. A lubricant composition suitable for use as a metalworking lubricant and having the following ingredients:
(a) about 1–20 wt % of a natural or synthetic oil,
(b) about 0.5–30 wt % of a water-soluble surfactant,
(c) about 1–20 wt % of an organic consurfactant comprising a C_4–C_{12} 1,2-alkanediol, and
(d) about 50–97.5 wt % water containing less than about 1 wt % dissolved inorganic salts; with the proviso that relative proportions of (a), (b), (c), and (d) are such that the composition comprises a lyotropic liquid crystal.

4,781,850
GREASE COMPOSITIONS CONTAINING BORATED CATECHOL COMPOUNDS AND HYDROXY-CONTAINING SOAP THICKENERS
John P. Doner, Sewell; Andrew G. Horodysky, Cherry Hill, and John A. Keller, Jr., Pitman, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 769,837, Aug. 27, 1985, Pat. No. 4,655,948. This application Mar. 10, 1987, Ser. No. 24,235
Int. Cl.[4] C10M *125/26*
U.S. Cl. 252—49.6 **13 Claims**

1. A grease composition comprising a lubricating component, between about 3 and about 20 percent by weight of a hydroxy-containing thickener and between about 0.5 and about 10 percent by weight of a borated catechol compound having the structure:



where R^1 and R^2 are each hydrogen or a C_1–C_{40} hydrocarbon radical and R^6 is hydrogen or a hydroxyl.

4,781,851
PREPARATION OF FERROMAGNETIC CHROMIUM DIOXIDE
Werner Steck, Ludwigshafen; Herbert Haberkorn, Gruenstadt; Laszlo Marosi, Ludwigshafen; Werner Huebner, and Helmut Jakusch, both of Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Continuation of Ser. No. 915,049, Oct. 3, 1986, abandoned. This application Aug. 28, 1987, Ser. No. 91,306
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535465
Int. Cl.[4] C01G *37/027*
U.S. Cl. 252—62.56 **1 Claim**

1. A process for preparing ferromagnetic chromium dioxide, which ferromagnetic chromium dioxide has improved residual magnetization and a better orientation ratio when incorporated into magnetic recording media, which process comprises:
reacting oxides of 3-valent and 6-valent chromium under a pressure of from 100 to 700 bar at a temperature of from 200° to 600° C. in the presence of water and in the presence of antimony(III) oxide and iron oxide as modifiers to form chromium dioxide, and thereafter
(1) treating the so formed chromium dioxide in an aqueous suspension with sodium sulfite;
(2) filtering, washing and drying the so treated chromium dioxide; and
(3) heating the treated chromium dioxide at from 210° to 280° C. for from 30 minutes to 6 hours in an inert gas atmosphere, with the proviso that the resulting heated material consists only of the crystalline phases of chromium dioxide and of orthorhombic CrOOH.

4,781,852
PROCESS FOR MAKING SELECTED DOPED BARIUM AND STRONTIUM HEXAFERRITE PARTICLES
Jerry J. Kaczur, Cleveland, Tenn.; J. Paul Deininger, Los Alamos, N. Mex., and Larry D. Carpenter, Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.
Filed Oct. 24, 1986, Ser. No. 923,063
Int. Cl.[4] C01G *49/08*; C04B *35/26, 35/64*; H01F *1/00*
U.S. Cl. 252—62.59 **34 Claims**

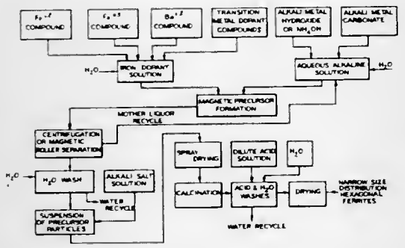
1. A process for preparing doped barium and strontium hexaferrite compounds having the formula (I):

$$AFe_{12-r-s}M_rN_sO_{19} \quad (I)$$

wherein A is barium or strontium; M is cobalt, zinc, nickel or a mixture thereof; N is titanium or ruthenium or a mixture thereof; and r and s are individually selected from about 0.1 to about 1.2, said process comprising:
(a) forming particles of a doped Fe_3O_4/ACO_3 co-precipitate wherein A is defined above from (i) a ferric compound, (ii) a ferrous compound, (iii) a barium or strontium compound, (iv) a cobalt, zinc or nickel compound or a mixture thereof, (v) a titanium or ruthenium compound or a mixture thereof and (vi) alkali metal carbonate, said relative amounts of (i) and (ii) sufficient to form Fe_3O_4;

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(b) suspending the doped Fe_3O_4/ACO_3 particles in a concentrated aqueous solution of an alkali halide;
(c) spray drying said suspension to form a dried powder comprising said doped Fe_3O_4/ACO_3 particles distributed onto the surfaces of said alkali halide crystals;
(d) calcining said dried powder at a temperature from about 700° C. to about 900° C. and below the melting point of said alkali halide to convert said Fe_3O_4/ACO_3 solids into doped hexaferrite particles having formula (I) and an average particle size from about 0.01 to about 0.3 microns; and



(e) recovering said doped hexaferrite particles from said alkali halide.

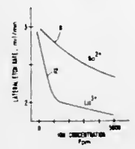
27. A dry powder comprising an admixture of double-doped Fe_3O_4/ACO_3 particles with alkali halide salt crystals, wherein A is barium or strontium and one dopant is cobalt, zinc or nickel or a mixture thereof and the second dopant is titanium orruthenium or a mixture thereof and wherein said doped Fe_3O_4/ACO_3 particles are distributed in clusters on the surfaces of said alkali halide crystals.

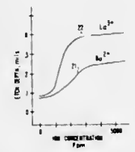
4,781,853

METHOD OF ENHANCING SILICON ETCHING CAPABILITY OF ALKALI HYDROXIDE THROUGH THE ADDITION OF POSITIVE VALENCE IMPURITY IONS

Robert K. Lowry, Melbourne Beach, and Edward U. Adams, Melbourne, both of Fla., assignors to Harris Corp., Melbourne, Fla.

Filed Dec. 1, 1986, Ser. No. 936,609
Int. Cl.⁴ C09K *13/02*
U.S. Cl. 252—79.5 **6 Claims**





1. An etchant for silicon comprising an alkali hydroxide solution containing a dissolved metallic salt, the cation of which has a positive valence of at least +2, that readily dissociates in a strong base solution and thereby supplies an added quantity of positive valence ions therein, which dissolved salt effectively increases the electronegativity of the alkali hydroxide solution such that the ability of the solution to attract electrons from the atoms of the silicon being etched and dissolved is enhanced, and wherein said alkali hydroxide solution comprises an alcoholic solution of potassium hydroxide.

4,781,854

LIQUID BLEACHING COMPOSITIONS

Colin Overton, Bromborough, Wirral, Great Britain, and Phillip E. Figdore, Franklin Lakes, N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 843,966, Mar. 25, 1986, abandoned. This application Apr. 2, 1987, Ser. No. 33,888
Claims priority, application United Kingdom, Mar. 27, 1985, 8508010
Int. Cl.⁴ C11D *7/54*
U.S. Cl. 252—100 **7 Claims**

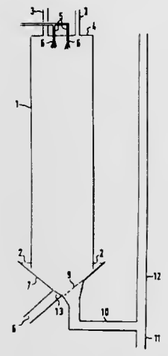
1. Aqueous stable thickened low-pH bleacing composition with a viscosity ranging from 10 to 250 mPa.s, consisting essentially of:
(a) from 1 to 7.5% by weight of a thickening synthetic anionic surfactant selected from the group consisting of alkyl-, alkenyl- and alkylaryl sulphonic acids, -polyglycolether sulphonic acids, and the salts thereof;
(b) from 0.5 to 10% by weight, calculated on the basis of the acid form, of a cold-water-soluble inorganic peroxy compound;
(c) from 0.5 to 20% by weight of an acidic compound which is selected from the group of strong mineral acids and the partial salts thereof, capable of providing the composition with a pH value of below 4; and
(d) an effective amount of co-surfactant not to exceed 5%.

4,781,855

SODIUM PHOSPHATE COMPOSITION AND PROCESS

Brian Shaw, West Bromwich, and Raymond A. Smith, Walsall, both of England, assignors to Albright & Wilson Limited, Oldbury Warley, England

Continuation of Ser. No. 041,303, Apr. 22, 1987, abandoned, which is a continuation of Ser. No. 876,808, Jun. 20, 1986, abandoned, which is a continuation of Ser. No. 767,163, Aug. 19, 1985, abandoned. This application Jan. 13, 1988, Ser. No. 143,568
Int. Cl.⁴ C11D *17/06*
U.S. Cl. 252—135 **21 Claims**



1. A particulate solid hydrated phosphate composition comprising trisodium phosphate and sodium hydroxide with the atomic ratio of Na:P:OH being 3.1–3.2:1:0.1–0.2, and the overall $P:H_2O$ ratio of 1:8–11, the solid composition having an outer layer comprising trisodium phosphate hexahydrate and a core containing trisodium phosphate dodecahydrate and sodium hydroxide.

4,781,856

LOW PHOSPHATE OR PHOSPHATE FREE NONAQUEOUS LIQUID NONIONIC LAUNDRY DETERGENT COMPOSITION AND METHOD OF USE

Trazollah Ouhadi, Liège, and Louis Dehan, Seraing, both of Belgium, assignors to Colagate-Palmolive Company, New York, N.Y.

Filed Aug. 5, 1985, Ser. No. 762,167
Int. Cl.⁴ C11D *1/66, 1/72, 3/16, 3/20*
U.S. Cl. 252—174.19 **16 Claims**

1. A phosphate detergent builder free heavy duty nonaqueous liquid nonionic laundry detergent composition which consists essentially of
10 to 60 percent of at least one liquid nonionic surfactant detergent,
25 to 35 percent of a carboxymethyloxy succinate builder salt, and an effective amount of at least one of
5 to 25 percent of a polycarboxylic acid terminated nonionic surfactant anti-gel agent which is an esterification reaction product between a nonionic surfactant which is a poly (C_2 to C_3 alkoxylated) fatty alcohol having a terminal hydroxyl group with a polycarboxylic acid or polycarboxylic acid anhydride and
5 to 15 percent of a C_2 to C_3 alkylene glycol mono C_1 to C_5 alkyl ether.

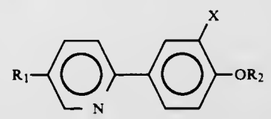
4,781,857

HALOGEN-CONTAINING PYRIDINE COMPOUND AND LIQUID CRYSTAL COMPOSITION

Hiromichi Inoue; Takashi Inukai; Kouji Ohno; Shinichi Saito, and Kazutoshi Miyazawa, all of Kanagawa, Japan, assignors to Chisso Corporation, Ohsaka, Japan

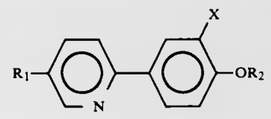
Filed Mar. 20, 1987, Ser. No. 28,691
Claims priority, application Japan, Mar. 26, 1986, 61-67960
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.⁴ G02F *1/13;* **C09K** *19/34;* **C07D** *211/7, 211/82*
U.S. Cl. 252—299.61 **5 Claims**

1. A halogen-containing pyridine compound expressed by the formula



wherein X represents F or Cl, R_1 represents a straight chain alkyl group of 6 to 12 carbon atoms, and R^2 represents a straight claim alkyl group of 5 to 12 carbon atoms.

3. A chiral smectic C (SC*) liquid crystal composition comprising at least one compound expressed by the formula



wherein X represents F or Cl and R_1 and R_2 each represent a straight chain alkyl group of 1 to 18 carbon atoms, and at least one optically active compound.

4,781,858

CYCLODEXTRIN-SILICA COMPOSITE AND A METHOD FOR THE PREPARATION THEREOF

Fujio Mizukami, Ushiku; Makoto Toba, Sakura; Shuichi Niwa, and Sumi Imai, both of Yatabe, all of Japan, assignors to Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,766
Claims priority, application Japan, Jul. 22, 1986, 61-172155
Int. Cl.⁴ A01N *25/10;* **A61K** *9/26;* **B01J** *13/00, 13/02*
U.S. Cl. 252—315.2 **13 Claims**

1. A cyclodextrin-silica composite having a structure composed of amorphous silica and a cyclodextrin incorporated into the matrix of the amorphous silica, being further characterized by the fact that the cyclodextrin is principally bonded to the silica by Si-O-C linkages.

2. A method for the preparation of a cyclodextrin-silica composite having a structure composed of amorphous silica and a cyclodextrin incorporated into the matrix of the amorphous silica being further characterized by the fact that the cyclodextrin is principally bonded to the silica by Si-O-C bonds which comprises the steps of:
(a) mixing a cyclodextrin and an alkoxy silane compound to give a mixture;
(b) adding water to the mixture to cause hydrolysis of the alkoxy silane compound and gelation of the hydrolyzate to give a gelled mass; and
(c) drying the gelled mass.

4,781,859

VOLTAGE-DEPENDENT NON-LINEAR RESISTANCE CERAMIC COMPOSITION

Keiichi Noi, Tsuzuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 715,945, Mar. 25, 1985, abandoned. This application Nov. 14, 1986, Ser. No. 930,995
Claims priority, application Japan, Mar. 30, 1984, 59-64014; May 31, 1984, 59-111171; May 31, 1984, 59-111172; Aug. 18, 1984, 59-171987; Aug. 18, 1984, 59-171988; Aug. 18, 1984, 59-171989; Aug. 18, 1984, 59-171990; Aug. 18, 1984, 59-171991
Int. Cl.⁴ H01B *1/08;* **C04B** *35/46*
U.S. Cl. 252—520 **12 Claims**

2. A voltage-dependent non-linear resistance ceramic composition consisting essentially of:
92.000–99.996 mol % of $SrTiO_3$, $Sr_{1-x}Ba_xTiO_3$ ($0.001 \leqq x \leqq 0.300$) or $Sr_{1-x}Ca_xTiO_3$ ($0.001 \leqq x \leqq 0.300$) as host material wherein the ratio of Sr/Ti is 1.05–0.95,
0.001–2.000 mol % of Y_2O_3,
0.001–2.000 mol % of Co_2O_3,
0.001–1.000 mol % of CuO, and
0.001–3.000 mol % of at least one metal oxide selected from the group consisting of Ag_2O and Al_2O_3.

9. A voltage-dependent non-linear resistance ceramic composition consisting essentially of:
93.000–99.995 mol % of $SrTiO_3$ having Sr/Ti ratio of 1.050–0.950,
0.001–2.000 mol % of Y_2O_3,
0.001–2.000 mol % of Co_2O_3,
0.001–1.000 mol % of CuO, and
0.001–1.000 mol % of one oxide selected from the group consisting of BaO, SiO_2, MgO and MnO_2.

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4,781,860

DISPOSABLE HAZARDOUS AND RADIOACTIVE LIQUID AQUEOUS WASTE COMPOSITION AND METHOD

Darryl J. Doan, Laurel, Mont., assignor to James W. Ayres and Farrell D. Rowsell, both of Las Vegas, Nev.

Continuation of Ser. No. 821,906, Jan. 23, 1986, abandoned, and a continuation-in-part of Ser. No. 818,323, Jan. 13, 1986, abandoned. This application May 11, 1987, Ser. No. 54,139

Int. Cl.⁴ G21F *9/16, 9/08;* **C02F** *1/42, 1/68*

U.S. Cl. 252—628 **14 Claims**

1. A method of disposing of radioactive or hazardous liquid wastes comprising a water soluble or miscible organic liquid, an aqueous solution having a dissolved solids content of about 5,000 parts per million or more, and mixtures thereof comprising adding thereto between about 2.2 and about 5.0 pounds of a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof per gallon of said liquid and stirring the mixture under high mechanical shear until it is substantially solidified.

4,781,861

AZIDE-TERMINATED AZIDO COMPOUND

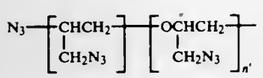
Edgar R. Wilson, Simi Valley, and Milton B. Frankel, Tarzana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 56,026, Jun. 1, 1987, abandoned. This application Dec. 15, 1987, Ser. No. 134,537

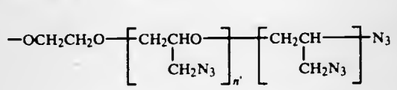
Int. Cl.⁴ C07C *77/02, 117/00*

U.S. Cl. 260—349 **4 Claims**

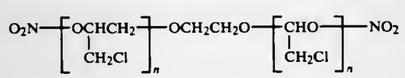
1. A glycidyl azide polymer azide of the general formula:



(1)



wherein n' is 0 to 9 and said glycidyl azide polymer azide is produced by the process of reacting polyepichlorohydrin-nitrate of the general formula:



(2)

wherein n is 1 to 10, with sodium azide in a polar solvent.

4,781,862

PROCESS FOR THE PREPARATION OF ANTHRAQUINONE

Alan E. Goliaszewski, Palmyra, N.J., assignor to Montvale Process Company, Inc., Westport, Conn.

Filed Jul. 8, 1986, Ser. No. 883,232

Int. Cl.⁴ C07C *50/18;* **B01J** *21/02, 21/14, 27/02*

U.S. Cl. 260—369 **13 Claims**

1. A process for the production of anthraquinone comprising: reacting two molecules of phthalic anhydride in the vapor phase, in the substantial absence of benzene, to form anthraquinone and carbon dioxide in the presence of a catalyst consisting of oxides of at least one member of the group of Group 4b metals zirconium, hafnium, and titanium, the Group 5b metals niobium, tantalum, and vanadium, or the rare earths cerium and thorium at a temperature in the range of 350°-550° C. and a pressure in the range of 0.01-200 bar, said temperature and pressure being selected to maintain the phthalic anhydride in the vapor phase.

4,781,863

AMINOCARNITINES

Owen W. Griffith, New York, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 596,180, Apr. 2, 1984. This application Sep. 21, 1987, Ser. No. 98,934

Int. Cl.⁴ C09F *5/00;* **C07C** *103/18*

U.S. Cl. 260—404.5 **8 Claims**

1. A process for producing D,L-3-acetamido-4-trimethylaminobutyric acid or salt form or zwitterionic form thereof comprising the steps of reacting 6-(chloromethyl)uracil with dimethylamine, reducing to the dihydrouracil, hydrolyzing to open the ring, acetylating, and then methylating.

4,781,864

PROCESS FOR THE REMOVAL OF CHLOROPHYLL, COLOR BODIES AND PHOSPHOLIPIDS FROM GLYCERIDE OILS USING ACID-TREATED SILICA ADSORBENTS

James N. Pryor, West Friendship; James M. Bogdanor, Columbia, and William A. Welsh, Fulton, all of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 15, 1987, Ser. No. 50,594

Int. Cl.⁴ C11B *3/10*

U.S. Cl. 260—420 **19 Claims**

1. A process for the removal of chlorophyll, or phospholipids and chlorophyll, from glyceride oils by treating with an acid-treated amorphous silica adsorbent to yield glyceride oils having commercially acceptable levels of phospholipid and chlorophyll, comprising:

(a) selecting a glyceride oil comprising chlorophyll, or phospholipids and chlorophyll,

(b) selecting an adsorbent comprising a high surface area amorphous silica which has been treated with an inorganic acid, an acid salt or a strong organic acid having a pK_a of about 3.5 or lower in such a manner that at least a portion of said acid is retained in the pores of the silica and the acid-treated adsorbent has an acidity factor of at least about 2.0×10^{-8} and a pH of about 3.0 or lower,

(c) contacting the glyceride oil of step (a) and the acid-treated adsorbent of step (b),

(d) allowing chlorophyll, or phospholipids and chlorophyll, to be adsorbed onto said acid-treated adsorbent, and

(e) separating the treated glyceride oil from the adsorbent.

4,781,865

PHOSPHINATED AND PHOSPHONATED SULFONIC ACIDS

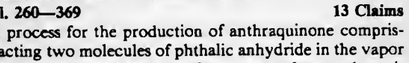
Chung-Tsing Liu, Bloomington, Minn., assignor to Ecolab, Inc., St. Paul, Minn.

Filed Sep. 29, 1986, Ser. No. 913,023

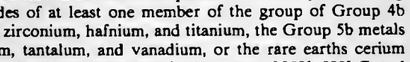
Int. Cl.⁴ C07F *9/02*

U.S. Cl. 260—502.5 D **15 Claims**

1. A compound of the formula:



or



wherein R is H or (C_1-C_7)alkyl, M^+ is H^+, NR_4^+ or one equivalent of a metal cation, and Z is a divalent (C_1-C_{18})hydrocarbyl group.

4,781,866

PROCESS FOR PRODUCING AMIDINE SULFONIC ACID INTERMEDIATES FOR GUANIDINES

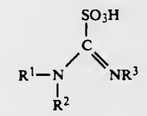
Cynthia A. Maryanoff, Solebury Township, Bucks County; James N. Plampin, Roslyn, and Robin C. Stanzione, Wayne, all of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Division of Ser. No. 868,231, May 28, 1986, Pat. No. 4,656,291, which is a continuation-in-part of Ser. No. 711,948, Mar. 15, 1985, Pat. No. 4,656,270. This application Nov. 24, 1986, Ser. No. 934,376

Int. Cl.⁴ C07C *139/00;* **C07D** *239/10*

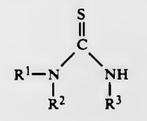
U.S. Cl. 260—506 **7 Claims**

1. A method for the synthesis of an amidine sulfonic acid of the following formula (I)



(I)

wherein R^1, R^2 and R^3 are independently hydrogen, NH_2, perhaloalkyl, perhaloaryl, NO_2, an organic group or are joined to form an organic group, which comprises oxidizing a thiourea of the following formula (II):



(II)

with hydrogen peroxide by the addition of a molybdenum catalyst of the formula $(NH_4)_2MoO_4$

4,781,867

PROCESS FOR MAKING PHOSPHINIC OR PHOSPHONIC ACID CHLORIDES

Norbert Weferling, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

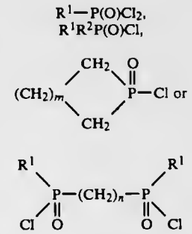
Filed Nov. 19, 1987, Ser. No. 122,924

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640357

Int. Cl.⁴ C07F *9/52*

U.S. Cl. 260—543 P **5 Claims**

1. A process for making phosphinic or phosphonic acid chlorides of the general formulae



(I)
(II)
(III)
(IV)

in which

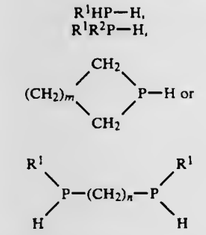
R^1 and R^2 each stand for a linear or branched alkyl group, a substituted or unsubstituted aryl or cycloalkyl group having 1 to 16 carbon atoms,

m stands for 2 or 3,

n stands for a whole number of 1 to 6,

and one of the hydrogen atoms in formula III may be a methyl or ethyl group,

which comprises: reacting sulfuryl chloride with a primary or secondary phosphine of the general formulae



(V)
(VI)
(VII)

in which R^1, R^2, m and n have the meanings given above, and one of the hydrogen atoms of the CH_2-groups in formula VII may be a methyl or ethyl group.

4,781,868

METHOD FOR MAKING UNSATURATED ALIPHATIC CARBOXYLIC ACID ANHYDRIDES

Klaus Langerbeins, Langen, Fed. Rep. of Germany, assignor to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

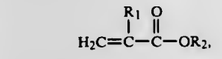
Filed Dec. 2, 1986, Ser. No. 937,195

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 3544765

Int. Cl.⁴ C07C *51/12, 57/04*

U.S. Cl. 260—549 **12 Claims**

1. A method for making an unsaturated aliphatic carboxylic anhydride, which method comprises reacting carbon monoxide, at a temperature from 70° C. to 350° C. and at a pressure from 1 to 500 bars, with an unsaturated carboxylic acid ester of the formula



wherein

R_1 is H or CH_3, and

R_2 is alkyl having from 1 to 10 carbon atoms, in the presence of a catalyst system consisting essentially of at least one noble metal from group VIII of the periodic table and a promoter selected from the group consisting of halogens and halogen compounds.

4,781,869

MULTI-LEVEL FILM FILL ASSEMBLY COOLING TOWER

Vincent Wiltz, P.O. Box 88, Krotz Springs, La. 70750

Filed Jul. 10, 1987, Ser. No. 71,781

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—109 **9 Claims**

1. A multi-level counterflow cooling tower assembly, comprising:

(a) at least one upright side wall portion having a first, upper air inlet opening;

(b) a first, upper water inlet for introducing water at a point above the first air inlet opening;

(c) a first upper layer of fill positioned intermediate the first air inlet opening and the first water inlet for receiving water flow therethrough as water is introduced into the first water inlet;

(d) a second, lower air inlet opening located below the first air inlet opening;

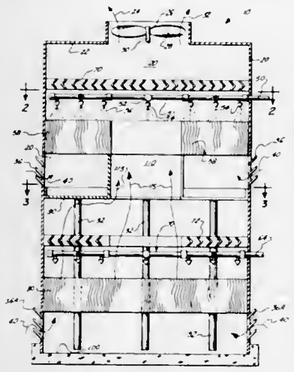
(e) a second, lower water inlet above the second air inlet opening;

inlet opening and the second water inlet means for receiving water flow flowing from the second water inlet, the

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lower layer of fill being vertically aligned with the upper layer of fill;

(g) means for preventing water which has flowed through the upper layer of fill from contacting the lower layer of fill; and



(h) channel means, for allowing air which has flowed through the lower layer of fill to flow from below the upper layer of fill to above the upper layer of fill without contacting the upper layer of fill.

4,781,870

LARGE MIRROR REPLICATION PROCESS

John W. Talbert, 442 Alcatraz Ave., Oakland, Calif. 94609

Division of Ser. No. 213,292, Dec. 5, 1980, abandoned, which is a division of Ser. No. 860,015, Dec. 12, 1977, Pat. No. 4,255,364.
This application Mar. 18, 1983, Ser. No. 476,746
The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.
Int. Cl.⁴ B29D *11/00*
U.S. Cl. 264—1.9 **16 Claims**

1. A process of replicating a large scale optical surface comprising the steps of:

preparing first and second substantially similar optical masters, each of said masters formed by the process of machining and grinding a rigid steel supporting surface, vacuum drawing and annealing a relatively flexible acrylic liner to said steel surface, and optically polishing said acrylic liner,

forming on said first optical master a castable resin layer to form thereon said replicated optical surface;

laying and fabricating on said second optical master a rigid substrate for the support of said replicated optical surface;

flexing the acrylic liner of said second optical master to release said supporting substrate;

placing said supporting substrate over said replicated optical surface on said first optical master at a preselected distance from the back of said replicated optical surface to form an interstice between the back surface of said replicated optical surface and the front surface of said supporting substrate;

introducing into said interstice a rubber for bonding said replicated optical surface to said substrate so as to form a single assembly;

continuously maintaining a vacuum between the acrylic liner and steel supporting surface of said first optical master during said pouring, placing, and introducing steps;

releasing said vacuum to allow removal of the acrylic liner from the steel supporting surface of said first optical master; and

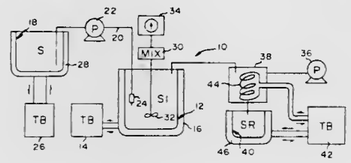
separating said single assembly from said first optical master by flexing the acrylic liner of said first optical master.

4,781,871

HIGH-CONCENTRATION LIPOSOME PROCESSING METHOD

Glenn West, III, San Carlos, and Francis J. Martin, San Francisco, both of Calif., assignors to Liposome Technology, Inc., Dover, Del.

Filed Sep. 18, 1986, Ser. No. 909,122
The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.
Int. Cl.⁴ A61K *9/52, 9/66, 37/22;* **B01J** *13/02*
U.S. Cl. 264—4.3 **14 Claims**



1. A method of preparing a suspension of liposomes having a lipid concentration of greater than about 300 μm/ml, and liposomes sizes no greater than about 0.4 microns, said method comprising

dissolving liposomes-forming lipids in a chlorofluorocarbon solvent, to form a lipid-in-solvent solution,

injecting the lipid solution, in liquid form, into an aqueous medium, under pressure and temperature conditions at which lipid frothing is largely prevented, and at an injection rate that produces predominantly oligolamellar liposomes,

during said injecting, removing injected chlorofluorocarbon solvent from the aqueous medium at substantially the same rate that it is introduced into the medium,

also during said injecting, extruding liposomes formed in the aqueous medium to reduce the sizes of the largest liposomes to less than about 0.4 microns, and

continuing said injecting, removing and extruding until the lipid concentration in the aqueous medium is at least about 300 μm/ml.

14. The method of claim 1, which further includes sterilizing the liposome injection by filtration through a sterilization filter.

4,781,872

METHOD OF MOLD OPENING/CLOSING SPEED CONTROL

Yoshiharu Inaba, Kawasaki, Japan, assignor to Fanuc LTD., Minamitsuru, Japan

Division of Ser. No. 752,621, Jul. 8, 1985, Pat. No. 4,696,632.
This application Jul. 31, 1987, Ser. No. 80,569
Claims priority, application Japan, Dec. 28, 1983, 58-245421; World Int. Prop. O., Dec. 26, 1984, PCT/JP84/00618
Int. Cl.⁴ B29C *45/80*
U.S. Cl. 264—40.5 **14 Claims**

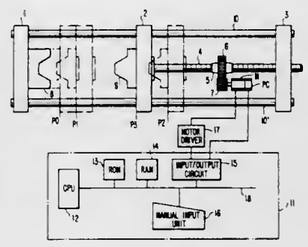
1. A method of controlling a mold opening/closing speed in an injection apparatus in which molds are moved into and out of contact, comprising the steps of:

(a) moving at least one of the molds at a first speed and storing at least one acceleration/deceleration position along the path of movement of the mold as the mold is moved during a teaching mode of operation;

(b) opening/closing the molds during an operation mode, said opening/closing step comprising the steps of:

(b1) detecting the position of the at least one of the molds along its path of travel;

(b2) controlling the opening/closing speed of the at least one mold in accordance with the detected position of the at least one mold, by accelerating/decelerating the opening/closing speed of the mold to accelerate or decelerate the mold when it is detected that the mold is



passing the at least one acceleration/deceleration position.

4,781,873

REVERSED PHASE MEMBRANES

Douglas L. Ford, Eastwood, Australia, assignor to Memtec Limited, New South Wales, Australia

PCT No. PCT/AU86/00054, § 371 Date Nov. 17, 1986, § 102(e) Date Nov. 17, 1986, PCT Pub. No. WO86/05707, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 6, 1986, Ser. No. 945,957
Claims priority, application Australia, Mar. 28, 1985, PG9949
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 264—44 **12 Claims**

1. A method of forming a porous membrane which is a reversed phase analogue of at least part of a first membrane the pores of which are substantially interconnected, said method comprising the steps of:

(i) filling at least some of the pores of the first membrane with a fluid that will form the analogue membrane;

(ii) forming the analogue membrane in the pores of the first membrane; and

(iii) removing the first membrane from the analogue membrane;

wherein said first membrane is a polypropylene or polyamide membrane and the analogue-forming liquid is at least one member selected from the group consisting of epoxy resins, silicic acid esters, phenolic resins, zirconium salts and silicon slats.

4,781,874

PROCESS FOR MAKING SILICON NITRIDE ARTICLES

James P. Edler, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 23, 1987, Ser. No. 111,839
Int. Cl.⁴ C04B *35/58*
U.S. Cl. 264—65 **5 Claims**

1. A process for making a silicon nitride article, said process including the steps of:

(a) providing powdered alpha-silicon nitride particles;

(b) coating the articles of step (a) with metallic silicon by means of a vapor phase reaction;

(c) forming the coated particles of step (b) into the article; and



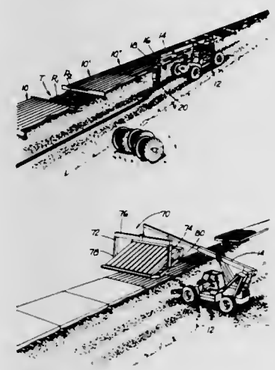
(d) nitriding the article of step (c) at a temperature and for a time effective to convert the metallic silicon to silicon nitride.

4,781,875

MANUFACTURE OF PRE-STRESSED CONCRETE RAILROAD TIES

Steven L. Jantzen, 101 Riverbluff Dr., Apt. G-103, St. Charles, Mo. 63301

Continuation-in-part of Ser. No. 779,804, Sep. 24, 1985, abandoned, which is a continuation of Ser. No. 550,370, Nov. 10, 1983, abandoned. This application Nov. 14, 1986, Ser. No. 930,514
Int. Cl.⁴ B28B *1/29, 11/14*
U.S. Cl. 264—157 **2 Claims**



1. A method of making concrete pieces comprising: supporting tie molds with an existing railroad track at a site near the area where the ties are to be installed;

providing each mold with components to form a plurality of ties;

locating reinforcing strands within the respective components in a plurality of longitudinally spaced molds;

pouring concrete into the molds to form ties;

severing the strands from adjacent ties in each adjacent mold;

clamping the reinforcing strands extending outwardly from a given mold with said extractor frame such that the center of the gravity of said extractor frame, when loaded with ties, is above a rotational axis of said extractor frame;

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lifting the ties as a group from the mold with said extractor frame;

using gravity to rotate the extractor frame approximately 180 degrees to locate the ties in an upright position; and

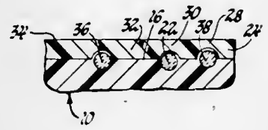
repeating the foregoing steps with the same apparatus at a second track site different from said first track site.

4,781,876

METHOD OF PRODUCING GLASS FIBER MAT REINFORCED PLASTIC PANELS

Hamid G. Kia, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1987, Ser. No. 74,772
Int. Cl.⁴ B29C *43/30*
U.S. Cl. 264—261 **2 Claims**



1. A method of producing a smooth surface layer on the surface of a premolded glass fiber mat reinforced panel situated in a matched mold were protruding fibers produce a rough surface, said method comprising:

positioning said premolded panel in the cavity of the lower mold piece of said matched mold,

coating the rough surface of said premolded panel with a thermoset polymeric material such that the thickness of said coating is adequate, said premolded panel being maintained at a temperature of no less than 67° C. during said coating operation,

applying sufficient pressure on said coated surface through an upper mold piece positioned on said panel to cause said coating to fill the valleys between the protruding fibers and to flow evenly to cover the entire surface of said panel, and

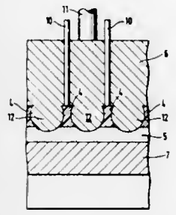
relieving said pressure while said coating is still in its fluid state and allowing said coating composition to sufficiently harden under the dead weight of said upper mold piece, whereby the cured coating provides a smooth surface layer on said panel that masks said protruding fibers.

4,781,877

CAGE PRODUCTION

Jurgen Rabe, Aurachtal, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 110,229
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 363708501
Int. Cl.⁴ B29C *45/14;* **B32B** *3/26;* **B21D** *53/12*
U.S. Cl. 264—266 **2 Claims**



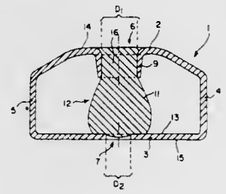
1. A method for the production of a cage made of castable or injection moldable polymeric material for rolling elements of a rolling contact bearing, said cage having pockets for receiving the rolling elements and containing a porous lubricant carrier, the pockets having perforated walls to provide a direct contact between the porous lubricant carrier and the rolling elements and the cage being made in an injection mold or casting mold provided with cores for forming the pockets, comprising initially inserting the porous lubricant carrier (**5,24**) into the mold (**1,19**), then closing the mold (**1,19**) whereby the porous lubricant carrier is elastically deformed by the cores (**12,35,36**), then casting or injection molding the polymeric material into the mold to fill the mold, thereby surrounding the porous lubricant carrier (**5,24**) with the polymeric material except at its supporting surface (**14,38**) and its surfaces engaging the cores (**12,35,36**), and removing the cage from the mold, whereby deformation of the porous lubricant carrier recedes and the porous lubricant carrier slightly projects into said pockets.

4,781,878

METHOD FOR PRODUCING AND SEALING AN OPENING IN A HOLLOW MOLDING

Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Jun. 23, 1987, Ser. No. 65,579
Claims priority, application Austria, Mar. 9, 1987, 550/87
Int. Cl.⁴ E06B *3/24*
U.S. Cl. 264—267 **6 Claims**



1. A method for production and subsequent sealing of an opening in a hollow molding of closed cross-sectional configuration having a pair of opposite side walls, comprising forming in one of said opposite side walls said opening surrounded by a substantially cylindrical shoulder that extends toward but terminates short of the other of said pair of side walls, and introducing through said opening a sealing compound which is in a plastic condition at a time of introduction, until the sealing compound contacts said other side wall and spreads out to form, between said other side wall and said cylindrical shoulder, a plug whose diameter is greater than an internal diameter of said cylindrical shoulder, said plug being out of contact with side walls of said hollow molding other than said pair of opposite side walls.

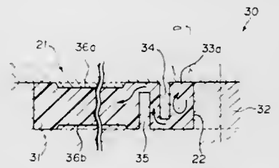
4,781,879

METHOD OF MAKING A MAGNETIC RECORDING DISK

Kengo Oishi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Nov. 18, 1986, Ser. No. 931,937
Claims priority, application Japan, Nov. 19, 1985, 60-259564
Int. Cl.⁴ B29C *45/00*
U.S. Cl. 264—328.12 **2 Claims**

1. A method of manufacturing a disk base for a magnetic recording disk, the disk base having a central opening surrounded by an inner peripheral edge portion, an outer peripheral edge portion along an outer periphery of the disk base, and a pair of annular grooved formed on opposite sides of the disk base coaxially with the central opening and between the inner peripheral edge portion and the outer peripheral edge portion, the magnetic recording disk having a flexible magnetic sheet which has a shape conforming to the shape of the disk base and is bonded to the disk base over an annular recess defined between the inner peripheral edge portion and the outer peripheral edge portion, said method comprising the steps of providing a mold defining a cavity around a center core which defines the central opening of the disk base, the mold including a first annular protrusion coaxial with the central core and projecting from one side of the mold into the cavity to define a first of the annular grooves; and including a second annular protrusion coaxial with the first annular protrusion and the



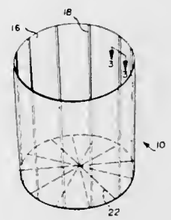
central core and projecting from the other side of the mold into the cavity to define a second of the annular grooves; and injecting a plastic material into the mold cavity through at least one pingate located between the central core and the first annular protrusion and causing the plastic to fill the cavity, the plastic material first filling a portion of the cavity defined between the first annular protrusion and the central core, subsequently flowing radially outwardly through a narrowed path defined between the annular protrusion, and then filling the remainder of the mold cavity by flowing radially outwardly in substantially all directions, thereby preventing formation of a weldline.

4,781,880

METHOD OF FORMING PLASTIC RIBBED ENCLOSURE

Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630

Continuation-in-part of Ser. No. 13,627, Feb. 11, 1987. This application Apr. 20, 1987, Ser. No. 39,950
Int. Cl.⁴ B29C *49/04*
U.S. Cl. 264—541 **13 Claims**



1. A method of forming a plastic enclosure having a flexible ribbed side wall portion and a substantially rigid closure therefor comprising the steps of:

extruding a plastic material from a die head having an endless extrusion opening to form a parison including

(a) extruding the plastic material to form the flexible ribbed side wall portion of the plastic enclosure and, during extruding according to step (a), forming ribs spaced one from the other about the entire circumference of the parison to form the side wall portion of the enclosure; and

(b) sequentially with the formation of said ribs, forming the closure for the enclosure by, as part of the step of extruding the plastic material from the die head and as a continuous part of and integral with said parison forming such enclosure, extruding the substantially rigid portion of the closure as a part of the entire circumference of the parison, the steps (a) and (b) being accomplished with either step preceding the other step.

8. A method of forming a plastic enclosure having a ribbed side wall body portion and an integral closure therefor comprising the steps of:

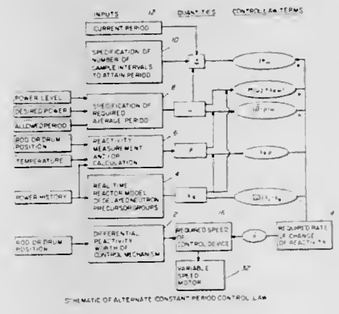
sequentially extruding during a continuous extrusion of plastic material from a die head, a side wall body portion having ribs and webs therebetween both extending longitudinally in the direction of the flow of plastic material from the die head and spaced laterally one from the other about the entire periphery of the enclosure and a substantially rigid closure portion of a thickness greater than the thickness of the webs and extending about the entire periphery of said enclosure.

4,781,881

APPARATUS AND METHOD FOR CLOSED-LOOP CONTROL OF REACTOR POWER IN MINIMUM TIME

John A. Bernard, Jr., 72 Paul Revere Rd., Needham Heights, Mass. 02194

Filed Jan. 5, 1987, Ser. No. 472
Int. Cl.⁴ G21C *7/30*
U.S. Cl. 376—216 **36 Claims**



1. Apparatus for closed-loop control of reactor power in a nuclear reactor in which power level is altered by adjustments in the rate of change of reactivity comprising:

means for adjusting said rate of change of reactivity; and

computing apparatus for computing repeatedly at intervals the function $\rho(t)=(\beta-\rho(t))\omega(t)-\lambda_e'(t)\rho(t)-\Sigma\beta_i(\lambda_i-\lambda_e'(t))+l^*\omega(t)+l^*[(\omega(t))^2+\lambda_e'(t)\omega(t)]$; whereby the reactor period is maintained at a specified constant value by adjusting said rate of change of reactivity to equal the value of the function.

4,781,882

GUIDE ROLLER ASSEMBLY FOR NUCLEAR REACTOR REFUELING APPARATUS

Robert B. Salton, Plum Boro, and Leonard P. Hornak, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 14, 1987, Ser. No. 49,494
Int. Cl.⁴ G21C *19/20*
U.S. Cl. 376—271 **14 Claims**

1. An apparatus for loading or unloading a fuel assembly in a nuclear reactor comprising:

means for positioning a fuel assembly above the reactor;

a housing on said positioning means;

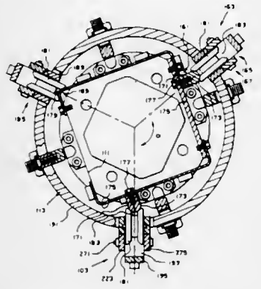
a pair of concentric inner and outer masts carried by said housing;

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said inner mast having means thereon for gripping a fuel assembly;

means for vertically axially moving said inner mast relative to said outer mast; and

guide means on said inner and outer masts to align the inner mast centrally within the outer mast during vertical axially moving the inner mast relative to the outer mast, said



guide means including a plurality of inner members disposed on the inner mast and complementary shaped outer members vertically spaced on the outer mast which cooperate with said inner members, means for supporting said outer members on said outer mast, means for pivoting said outer members relative to said support means towards and away from said inner members, and means for vertically aligning the position of said outer member.

4,781,883
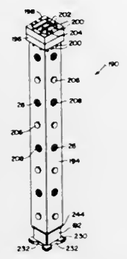
SPENT FUEL STORAGE CASK HAVING CONTINUOUS GRID BASKET ASSEMBLY

David A. Daugherty; Nicholas J. Georges; Harry E. Flanders, Jr., and Octavio J. Machado, all of Pensacola, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 646,722, Sep. 4, 1984, abandoned. This application Jul. 17, 1987, Ser. No. 75,191

Int. Cl.⁴ G21F *5/00*

U.S. Cl. 376—272 **27 Claims**



1. A cask for long-term storage of spent nuclear fuel, comprising:

a container having a cavity therein, the cavity including a top portion, a bottom portion defining a floor, and metal side walls extending between the top and bottom portions;

a grid basket assembly within the cavity, said grid basket assembly including a plurality of metal plates joined together to provide a matrix of storage slots for accommodating the spent fuel, said plates having lower ends adjacent said floor;

container means disposed in said storage slots for enclosing spent nuclear fuel assemblies, said container means including elongated cells, each cell having four walls defining a generally rectangular cross section; and

support elements disposed between the floor and the plates to support said plates above said floor, said support elements having flanges, and wherein at least one cell has a bottom that rests on said flanges.

4,781,884

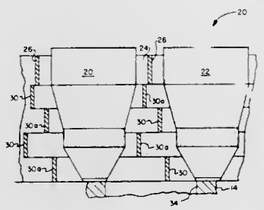
DEBRIS CATCHING STRAINER GRID

Andrew J. Anthony, Tariffville, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 2, 1987, Ser. No. 20,816

Int. Cl.⁴ G21C *1/01, 3/04*

U.S. Cl. 376—352 **4 Claims**



1. In a nuclear reactor having fuel assemblies including an upper end fitting and a lower end fitting and spaced nuclear fuel rod spacer grids therebetween for supporting and spacing elongated nuclear fuel rods which includes a hollow active portion of nuclear fuel filled cladding intermediate the rod-'ends and a tapering end cap of solid material on the rod end which first encounters reactor coolant flow, a debris catching strainer grid for capturing and retaining deleterious debris carried by reactor coolant before it enters the active region of a fuel assembly and creates fuel rod cladding damage, comprising in combination:

a polygonal perimeter,

a plurality of fuel end cap compartments defined by pairs of first and second intersecting and slottedly interlocked grid-forming strips attached to said perimeter and to each other, each said fuel rod end cap extending into a respective one of said end cap compartments,

at least some of said end cap compartments defined by two pairs of intersecting and slottedly interlocked strips including vertical rows of integral leaves intermediate their intersections,

each of said leaves of a row presenting an edge to the coolant flow, being radially adjacent and radially spaced from said fuel rod end caps and having a distance of projection out of the plane of its respective strip different from the others in its row, and means for attaching said debris catching strainer grid to the lower portion of said fuel assembly.

4,781,885

NUCLEAR REACTOR FUEL ASSEMBLY

Gunther Lill, Herzogenaurach; Rolf Holzer, Erlangen, and Hans Lettau, Effeltrich, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Nov. 4, 1986, Ser. No. 926,970

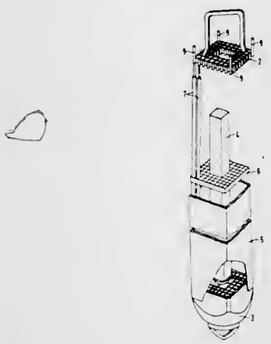
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1985, 3540466

Int. Cl.⁴ G21C *3/32*

U.S. Cl. 376—444 **6 Claims**

1. Nuclear reactor fuel assembly, comprising a fuel assembly top fitting having a square cross section, a fuel assembly base having a square cross section, an elongated fuel channel with a square cross section and channel walls, fuel rods containing nuclear fuel and an elongated prismatic water channel box

both being disposed in said fuel channel in a spacing configuration defined by a lattice having mesh openings with sides parallel to said channel walls, said fuel rods being mutually spaced apart in said mesh openings, said water channel box



having a cross section spanning more than one of said mesh openings, and said water channel box being spaced apart from said fuel channel by an interspace being completely filled with said mesh openings and said fuel rods disposed therein.

4,781,886

METHOD FOR PRODUCING REFRACTORY METAL PARTS OF HIGH HARDNESS

Thomas J. Patrician, Monroeton, and Vito P. Sylvester, Athens, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,809

Int. Cl.⁴ G22F *1/00*

U.S. Cl. 419—49 **5 Claims**

1. A method for producing a high hardness refractory metal part, said method comprising:

(a) hot isostatic pressing a refractory metal part having a density of at least about 90% of the theoretical density in the presence of a pressurizing gas having an atomic size great enough to strain the lattice of said refractory metal at a pressure to exceed the yield strength of said metal to result in the densification of said part to a density of greater than about 98% of the theoretical density; and

(b) rapidly cooling the resulting hot isostatically pressed part to produce said part having a hardness approaching the hardness of mechanically worked material.

4,781,887

PRODUCTION OF STEELS CONTAINING LOW MELTING POINT METALS

Akira Takahashi, Muroran, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 117,092

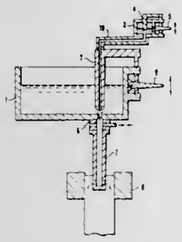
Claims priority, application Japan, Nov. 14, 1986, 61-269587

Int. Cl.⁴ C22C *33/00*

U.S. Cl. 420—129 **4 Claims**

1. A method for producing a steel containing a low melting point metal selected from the group consisting of Pb and Bi, comprising:

maintaining the low melting point metal in a molten state in a vessel; and allowing a controlled amount of the molten low melting point metal to flow down through a hollowed stopper rod positioned above a nozzle opening in the



bottom of a second vessel containing molten steel, into the molten steel contained in the second vessel.

4,781,888

ALUMINUM BRAZING MATERIAL FOR USE IN ALUMINUM HEAT EXCHANGER

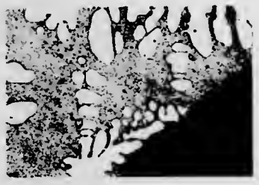
Michiki Hagiwara; Keizo Nanba, both of Nagoya; Shosuke Iwasaki, Kobe, and Tetsuo Abiko, Osaka, all of Japan, assignors to Sumitomo Precision Products Co., Ltd., Amagasaki, Japan

Filed Apr. 5, 1985, Ser. No. 720,217

Claims priority, application Japan, Jul. 31, 1984, 59-158678

Int. Cl.⁴ C22C *21/10*

U.S. Cl. 420—531 **10 Claims**



10. An aluminum brazing material used for assembling an aluminum heat exchanger by brazing, said aluminum brazing material consisting essentially of 4.5 to 10% of Si, 0.05 to 0.5% of Ca, 2.3 to 4.7% of Cu and 9.3 to 10.7% of Zn and the balance essentially aluminum.

4,781,889

HOLLOW FIBER MEMBRANE TYPE ARTIFICIAL LUNG

Hiromichi Fukasawa, Funabashi; Yoshiro Katsura, Narashino, and Kazuhiko Hagiwara, Tokyo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 597,440, Apr. 6, 1984, abandoned. This application Aug. 3, 1987, Ser. No. 81,536

Claims priority, application Japan, May 27, 1983, 58-92325

Int. Cl.⁴ A61M *1/14*

U.S. Cl. 422—48 **15 Claims**

1. A hollow fiber membrane type artificial lung comprising:

a housing;

a hollow fiber bundle positioned in said housing and comprising a multiplicity of gas-exchange hollow fiber membranes;

a first fluid chamber defined by the external surfaces of said hollow fiber membranes and the internal surface of said housing;

a first fluid inlet and a first fluid outlet both communicating with said first fluid chamber;

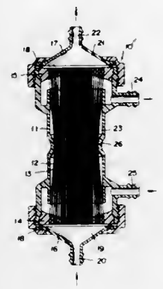
partitions supporting in place opposite ends of said hollow

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fiber membranes and provided at an inner face of said housing; and

a second fluid inlet and a second fluid outlet communicating with empty spaces inside said hollow fiber membranes;

said hollow fiber membranes comprising porous hollow fiber substrates which have been impregnated with silicone oil and have through micropores distributed in the walls thereof;



said porous hollow fiber substrates being hollow fiber membranes having an inside diameter in the range of 100 to 1000 μm, a wall thickness in the range of 5 to 100 μm, a porosity in the range of 40 to 80% and containing in the walls thereof said micropores of a diameter in the range of 100 Å to 5 μm; and

said silicone oil having a viscosity in the range of 50 to 3000 mPa.s, said silicone oil blocking said micropores and said hollow fiber substrates being free of a silicone oil layer on the internal and external surfaces of the walls thereof.

4,781,890

MULTILAYER CHEMICAL ANALYTICAL ELEMENT

Fuminori Arai; Kenichiro Yazawa, and Harumi Katsuyama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 851,286, Apr. 10, 1986, abandoned, which is a continuation of Ser. No. 672,804, Nov. 19, 1984, abandoned. This application Feb. 5, 1987, Ser. No. 11,386

Claims priority, application Japan, Nov. 18, 1983, 58-217428

Int. Cl.⁴ G01N *31/22;* **C12Q** *1/54*

U.S. Cl. 422—56 **6 Claims**

1. In a multilayer chemical analytical element which includes a porous spreading layer, a light-blocking layer and a reagent layer on a water-impermeable light-transmissive support in order, wherein the improvement comprises having said light-blocking layer contain a titanium dioxide fine powder having neither an aluminum oxide compound nor silicon oxide, the element containing a compound having a cation which is capable of forming a sparingly water soluble salt with flourine anion.

4,781,891

AUTOMATIC ANALYZING APPARATUS

Kevin Galle, New City, N.Y.; Ryoichi Orimo, Ohme, Japan; Masahiko Sakurada, Machida, Japan; Taiichi Banno, Hachioji, Japan, and Sugio Manabe, Kodaira, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

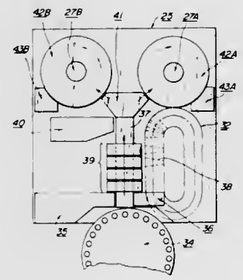
Continuation of Ser. No. 139,469, Apr. 11, 1980. This application Dec. 1, 1983, Ser. No. 557,386

Claims priority, application Japan, Apr. 14, 1979, 54-44912

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.⁴ G01N *35/04*

U.S. Cl. 422—64 **6 Claims**



1. An apparatus for effecting automatic analysis for sample liquids comprising:

a turntable arranged rotatably abouts its center axis and having a plurality of receptacles formed along a peripheral portion of the turntable for holding a plurality of reaction vessels;

means for rotating the turntable about its center axis intermittently, rotation of said turntable resulting in the indexing of reaction vessels in said receptables along a path of travel;

means for successively feeding reaction vessels into successive receptacles of the turntable;

means for delivering given amounts of samples into reaction vessels;

means for delivering given amounts of at least one reagent, corresponding to a given test item to be measured, into reaction vessels held by said receptacles of the turntable to form test liquids in respective reaction vessels;

means comprising a light source fixed at a center of the turntable for emitting light beams having a plurality of wavelengths in all radial directions of said turntable;

rotatable light beam directing means arranged about the center axis of the turntable for directing a light beam emitted from the light source toward successive reaction vessels held in said receptacles of the turntable, said light beam directing means comprising a cylinder having a longitudinal axis and having a slit formed therein positioned about said light source and being rotatable about said longtudinal axis distally around the light source and arranged proximally with respect to the path of travel of reaction vessels in said receptacles of the turntable during intermittent rotation thereof;

photometering means, fixed relative to said light source, having a plurality of light receiving ports fixedly arranged adjacent a plurality of photometric positions along said path of travel to receive light beams from said light source transmitted through reaction vessels in said receptacles of the turntable when reaction vessels are positioned at said photometric positions, said photometering means comprising a plurality of optical fibers arranged in a radial manner distally with respect to the path of travel of reaction vessels in said receptacles of the turntable, each fiber having a first and a second end, the first end of each fiber being placed opposite the distal side of the respective vessel positioned in a respective one of said receptacles at a respective photometric position, and the second ends of all fibers being collected together, a photodetector placed opposite the collected second ends of the fibers, and a filter unit fixed relative to said photometering means and said light source said filter unit including a plurality of optical filters rotatably arranged between the collected second ends of fibers and the photodetector, said filters each having a different transmission wavelength;

means for driving said turntable, filter unit and light beam directing means in such a manner that during each cycle of the intermittent rotation of the turntable, the light beam directing means and said filter unit are each rotated at least one full revolution, so that each of the light beams are made incident upon reaction vessels in each of said receptacles of the turntable at least once to produce successively from said photometering means a plurality of photometered values, corresponding to each of said different transmission wavelengths, for test liquid contained in each of such reaction vessels;

means for removing a reaction vessel from a receptacle of the turntable after photometry has been completed for a test liquid contained in that reaction vessel; and

means for receiving said plurality of photometered values and for selecting therefrom given quantitative analysis data for a given test item for a respective test liquid in each of a plurality of reaction vessels.

4,781,892

APPARATUS AND METHOD FOR DETERMINING FOULING TENDENCY OF LIQUID HYDROCARBONS

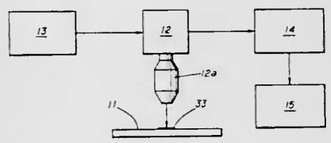
Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemicals Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 830,386, Feb. 18, 1986, which is a continuation-in-part of Ser. No. 723,598, Apr. 15, 1985. This application Sep. 24, 1986, Ser. No. 910,910

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.⁴ G01N *21/17, 30/90, 33/26*

U.S. Cl. 422—69 **7 Claims**



1. An apparatus for measuring the tendency of a hydrocarbon liquid to foul equipment which comprises:

(a) a thin layer chromatographic plate for receiving a sample of a hydrocarbon liquid on an internal portion thereof, said plate being capable of separating incompatible asphaltenes from compatible components of a sample of a hydrocarbon liquid to form an incompatible asphaltene ring region and a matrix region of compatible sample components on or in the internal portion of said plate;

(b) a light source adapted to scan the internal portion of the plate;

(c) means for measuring light from the light source which has been affected by the internal portion of the plate;

(d) means for comparing measured light corresponding to an asphaltene ring region of the internal portion of the plate with measured light corresponding to a matrix region of the internal portion of the plate and generating a corresponding comparison signal; and

(e) means for receiving a comparison signal from the comparing means and converting such a comparison signal into an electric signal indicative of the tendency of a liquid hydrocarbon to foul equipment.

4,781,893

APPARATUS FOR DETERMINING FOULING TENDENCY OF LIQUID HYDROCARBONS USING POLAR POLYMERIC MEMBRANES

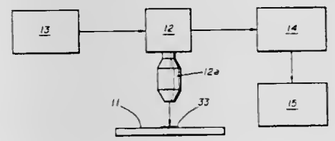
Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemicals Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 910,910, Sep. 24, 1986, which is a continuation-in-part of Ser. No. 830,386, Feb. 18, 1986, which is a continuation-in-part of Ser. No. 723,598, Apr. 15, 1985. This application Mar. 11, 1987, Ser. No. 24,730

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.⁴ G01N *21/17, 30/90, 33/26*

U.S. Cl. 422—69 **9 Claims**



1. An apparatus for measuring the tendency of a hydrocarbon liquid to foul equipment which comprises:

(a) a polymeric membrane for receiving a sample of a hydrocarbon liquid on an internal portion thereof, said membrane being capable of separating incompatible asphaltenes from compatible components of a sample of a hydrocarbon liquid to form an incompatible asphaltene ring region and a matrix region of compatible sample components on or in the internal portion of said membrane;

(b) a light source adapted to scan the internal portion of the membrane;

(c) means for measuring light from the light source which has been affected by the internal portion of the polymeric membrane;

(d) means for comparing measured light corresponding to an asphaltene ring region of the internal portion of the membrane with measured light corresponding to a matrix region of the internal portion of the membrane and generating a corresponding comparison signal; and

(e) means for receiving a comparison signal from the comparing means and converting such a comparison signal into an electric signal indicative of the tendency of a liquid hydrocarbon to foul equipment.

4,781,894

CONTROL MECHANISM FOR DELIVERY OF GAS PRODUCT AT CONSTANT PRESSURE

Jeffrey C. Wheaton, P.O. Box 2362, Binghamton, N.Y. 13910

Filed Mar. 9, 1987, Ser. No. 23,153

Int. Cl.⁴ G05D *9/00, 16/12*

U.S. Cl. 422—106 **5 Claims**

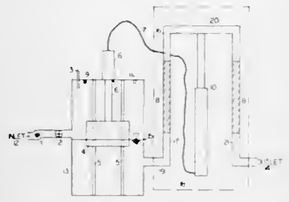
1. A float controlled system for delivery of a gaseous product at a controlled constant pressure, comprising:

a. a sealed reaction vessel for producing a gaseous product from a gas producing liquid having a liquid inlet provided with inlet control means for introducing a gas producing liquid under pressure into the vessel, a liquid outlet, a gas outlet for a gaseous product located above the liquid inlet, and a pressure sensor means located in the vessel above the liquid inlet for sensing gas pressure therein and controlling the inlet control means so that the gas producing liquid is introduced when a sensed gas pressure is below a predetermined desired pressure;

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b. a variable height liquid outlet means comprising a vertically mounted extendable tube having an upper end and a lower end connected to the liquid outlet of the reaction vessel, and a means for vertically moving the upper end of the extendable tube for varying the height of said extendable tube;

c. a float located in the reaction vessel for floating on the liquid therein and having a sensing means for sensing vertical movement of the float; and



d. a control means responsive to a sensed vertical movement of the float for translating the sensed movement of the float to the means for vertically moving the upper end of the extendable tube in an amount equal to and in the same direction as the sensed vertical movement of the float so that a liquid head created between a liquid level in the extendable tube and the liquid in the reaction vessel remains constant and thereby controlling the gas pressure in the reaction vessel at a constant pressure for delivery therefrom.

4,781,895

CANDLE-POWERED AROMA GENERATOR

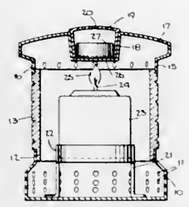
Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Continuation-in-part of Ser. No. 477,353, Mar. 21, 1983, Pat. No. 4,556,539, which is a continuation-in-part of Ser. No. 412,080, Aug. 27, 1982, Pat. No. 4,695,434. This application Jun. 18, 1984, Ser. No. 621,566

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] A61L *9/02*

U.S. Cl. 422—125 **4 Claims**



1. A candle-powered aroma generator in a lantern format comprising:

(a) a container housing a candle holder and provided with a removable metal cover having a depressed well therein which is positioned above the flame of a candle supported in said holder whereby the bottom of the well functions as a miniature hot plate; and

(b) a replaceable aroma cartridge receivable in said well, said cartridge being formed with a metal base of good heat conductivity and a vented top wall, said cartridge having a cavity therein partitioned by a porous pad into a vented upper chamber and in an unvented lower air chamber, the metal base of the lower air chamber resting on said bottom of the well which functions as a hot plate and being in heat exchange relation with said hot plate, said pad being impregnated with a volatile liquid fragrance whereby air heated and expanded in the lower chamber produces a positive pressure which forces the hot air through the pad to volatilize the fragrance to produce a vapor in the upper chamber which is discharged into the atmosphere through the vent in the top wall of the upper chamber.

4,781,896

REMOVAL OF OLEFIN MONOMER FROM OLEFIN POLYMER

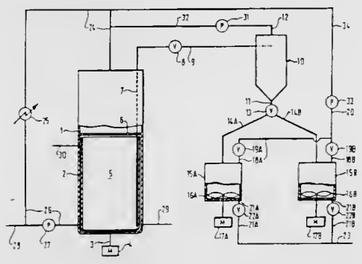
Bruce A. E. Willmore, Luton, and Jeffrey C. Greaves, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 228,201, Jan. 26, 1982, abandoned, which is a continuation of Ser. No. 86,147, Oct. 18, 1979, abandoned, which is a division of Ser. No. 40,313, May 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 936,194, Aug. 24, 1978, abandoned. This application Dec. 16, 1982, Ser. No. 450,433

Claims priority, application United Kingdom, Jun. 13, 1978, 7826767

Int. Cl.[4] B01J *8/08*

U.S. Cl. 422—134 **1 Claim**



1. Apparatus for removing olefin monomer from olefin polymers comprising, in combination,

a polymerization system including at least one olefin polymerization reactor having an exit means adapted to withdraw a reaction mixture containing a particulate olefin polymer from said polymerization reactor having at least one inlet means for liquid or gaseous olefin monomers and means to maintain the olefin monomer in the gas phase,

a vessel containing mechanical means to vigorously agitate a particulate solid,

inlet means to pass into said vessel a particulate solid,

outlet means in said vessel, transfer means from the exit means of said polymerization reactor to the inlet means of said vessel wherein said transfer means includes means for separating the solid particulate polymer from unabsorbed monomer mixed with the polymer, and

a purification system which is a distillation column wherein the gas outlet means of the vessel is connected to a line which leads to the said purification system from which at least one line is communicated to at least one of the two polymerization reactors within the polymerization system.

4,781,897

DISPENSERS

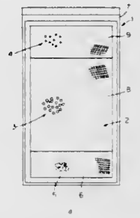
Stanley J. Geron, 75A Selwyn Ave., and Owen E. Hayward, 75 Selwyn Ave., both of Mission Bay Auckland, New Zealand

Filed Oct. 24, 1986, Ser. No. 923,096

Claims priority, application New Zealand, Nov. 29, 1985, 214380

Int. Cl.[4] B01D *11/00*

U.S. Cl. 422—265 **4 Claims**



1. A dispenser for releasing a bleach into an aqueous solution, said dispenser comprising:

a sachet, said sachet being formed from a sheet material and divided by a seam into at least a first compartment and a second compartment,

(1) said first compartment having a liquid permeable wall and containing a water soluble bleach material,

(2) said second compartment containing a weighting material, and

(3) said sachet containing a bouyant material, wherein the overall weight of said dispenser is such that it is immersed when initially deposited in said aqueous solution and said dispenser is buoyant when said water soluble bleach material has been dissolved.

4,781,898

AUTOCLAVE VENT

Arthur L. Jones, Charlotte, N.C., assignor to Pelton and Crane Company, Charlotte, N.C.

Filed May 1, 1987, Ser. No. 45,969

Int. Cl.[4] A61L *2/06*

U.S. Cl. 422—295 **9 Claims**



1. An autoclave, comprising:

a supply tank for holding therein a supply of a liquid;

a pressure chamber;

dosing means coupled between said supply tank and said chamber for allowing the entry into said chamber of a predetermined amount of the liquid at the beginning of a sterilization cycle of said autoclave;

a heater coupled to said pressure chamber for generating within said chamber a vapor phase of at least a portion of the predetermined amount of liquid which is allowed to enter said chamber during said sterilization cycle;

a first vent path means for venting the vapor phase of the liquid from said chamber into said supply tank at a first flow rate when open;

a second vent path means for venting the vapor phase of the liquid from said chamber into said supply tank at a second flow rate which is greater than said first rate, when open;

a microprocessor controller for controlling a plurality of time/temperature/pressure cycles for sterilizing items placed in said chamber;

a pressure sensor arrangement for developing a signal representative of the pressure of the vapor phase of the liquid within said chamber; and

wherein said microprocessor controller controls the opening of said first and second vent paths, said microprocessor controller being responsive to said pressure representative signal for controlling the opening of said second vent path at the end of said sterilize cycle.

4,781,899

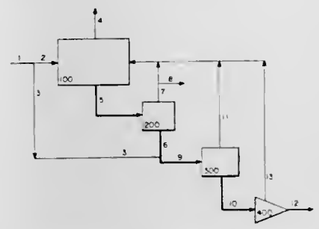
PURIFICATION OF CRYSTALLIZED SOLIDS MADE VIA CONTINUOUS CRYSTALLIZATION

Francis Raub, Plainsboro, and Henry A. Pfeffer, III, Mercerville, both of N.J., assignors to Intermountain Research & Development Corporation, Green River, Wyo.

Filed Jul. 27, 1984, Ser. No. 634,939

Int. Cl.[4] C22B *25/10;* **C01D** *15/08, 17/00*

U.S. Cl. 423—206 T **19 Claims**



2. In the production of soda ash via the continuous crystallization of sodium carbonate from a crude, concentrated sodium carbonate feed solution, containing dissolved impurities the improvement for reducing the level of impurities in the recovered soda ash product which comprises

(a) removing crystal slurry from a crystallizer circuit and separating the crystallized sodium carbonate from the aqueous solution of the crystal slurry by the steps of

(i) concentrating the removed slurry in a first hydroclone;

(ii) diluting the concentrated slurry with aqueous sodium carbonate solution used as crystallizer feed;

(iii) concentrating the diluted slurry in a second hydroclone; and

(iv) dewatering the concentrated slurry in a centrifuge to separate the crystal solids from the aqueous liquor; and

(b) drying the centrifuged sodium carbonate crystal solids.

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4,781,900

PROCESS AND COMPOSITION FOR PURIFYING ARSINE, PHOSPHINE, AMMONIA, AND INERT GASES TO REMOVE LEWIS ACID AND OXIDANT IMPURITIES THEREFROM

Glenn M. Tom, New Milford, and Duncan W. Brown, Wilton, both of Conn., assignors to Advanced Technology Materials, Inc., New Milford, Conn.

Division of Ser. No. 29,632, Mar. 24, 1987, Pat. No. 4,761,395.
This application Feb. 11, 1988, Ser. No. 154,917
Int. Cl.[4] B01D *53/04*
U.S. Cl. 423—210 15 Claims

1. A process for purifying a gaseous mixture comprising (i) a primary component selected from one or more members of the group consisting of arsine, phosphine, ammonia, and inert gases, and (ii) impurities selected from one or more members of the group consisting of Lewis acids and oxidants, to remove said impurities therefrom, comprising:

Contacting the mixture with a scavenger including a support having a surface area in the range of from about 50 to about 1,000 square meters per gram of support, with said support having associated therewith, but not covalently bonded thereto, an anion which is reactive to effect the removal of said impurities, said anion being selected from one or more members of the group consisting of:

(i) carbanions whose corresponding protonated compounds have a pK_a value of from about 22 to about 36; and

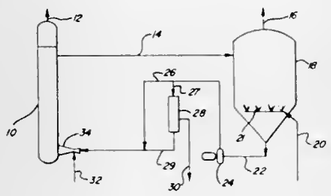
(ii) anions formed by reaction of said carbanions with the primary component of said mixture, when said primary component of said mixture comprises one or more members of the group consisting of arsine, phosphine, and ammonia.

4,781,901

METHOD AND COMPOSITION FOR THE REMOVAL OF HYDROGEN SULFIDE AND CARBON DIOXIDE FROM GASEOUS STREAMS

Gaines C. Jeffrey, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 857,863, May 1, 1986. This application Feb. 19, 1987, Ser. No. 16,167
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] C01B *17/02, 17/16, 31/20*
U.S. Cl. 423—226 12 Claims



1. A process for the removal of H_2S and CO_2 from a sour gaseous stream comprising:

(A) in a contact zone, contacting said stream with an aqueous alkaline solution comprising a lean CO_2 selective absorbent, an alkali and at least one polyvalent metal chelate to produce hydrosulfide and/or sulfide,

(1) all of said polyvalent metal in said chelate being present in a lower valence state, or

(2) said polyvalent metal in said chelate being present in a mixture of lower valence state and higher valence state polyvalent metal chelates, said mixture containing said lower valence state polyvalent metal chelate in an amount which is greater than about five times the amount of said higher valence state polyvalent metal chelate, and thereafter

(B) removing absorbed carbon dioxide from said aqueous alkaline solution and

(C) in an oxidation zone contacting said aqueous alkaline solution with an amount of said higher valence state polyvalent metal chelate comprising at least an amount effective to oxidize said hydrosulfide and/or sulfide present to sulfur without substantial oxidative degradation of said higher valence state polyvalent metal chelate.

4,781,902

PROCESS FOR THE REMOVAL OF NITROGEN OXIDES AND SULPHUR OXIDES FROM FLUE GASES

Peter C. S. Schoubye, Horsholm, Denmark, assignor to Haldor Topsoe A/S, Denmark

Filed Oct. 29, 1986, Ser. No. 924,621
Int. Cl.[4] B01J *8/00;* C01B *17/00, 21/00, 17/74*
U.S. Cl. 423—239 7 Claims

1. A process for eliminating nitrogen oxides and sulphur oxides from a stream of flue gas containing nitrogen oxides and sulphur oxides comprising the steps of

(a) adding ammonia to the stream of flue gas and contacting the resulting stream, at a temperature of 250°–450° C., with a reduction catalyst for selective reduction of nitrogen oxides into nitrogen and water, the molar ratio of ammonia to nitrogen oxides being in the range of 0.6–1.8,

(b) contacting the stream from step (a), at a temperature of 300°–470° C., with an oxidation catalyst for oxidation of unreacted ammonia into nitrogen, nitrogen oxide and water and simultaneous oxidation of sulphur dioxide into sulphur trioxide, and

(c) cooling the steam from step (b) to condense sulphur trioxide in the form of sulphuric acid

wherein the reduction catalyst employed in step (a) comprises 3–20% (w/w) of active catalyst, said active catalyst consisting of vanadium pentoxide, on a carrier of titanium dioxide, silica, alumina, or mixtures thereof, and the oxidation catalyst employed in step (b) comprises 2–7% (w/w) of vanadium and at least one alkali metal in an atomic ratio of alkali metal to vanadium in the range of 2–5.

4,781,903

PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS BY MEANS OF AN ABSORPTION MASS REGENERABLE BY REACTION WITH ELEMENTAL SULFUR

André Deschamps, Noisy le Roi; Sigismond Franckowiak, Rueil-Malmaison, and Serge Leporq, Mantes la Ville, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 12, 1986, Ser. No. 906,480
Claims priority, application France, Sep. 13, 1985, 85 13728
Int. Cl.[4] C01B *13/14, 17/00;* C01F *5/02;* B01J *8/00*
U.S. Cl. 423—244 12 Claims

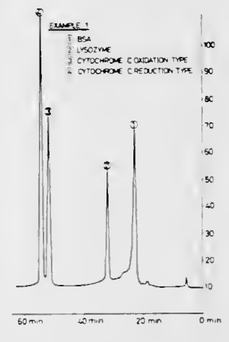
1. A process for removing sulfur dioxide from a gas containing the same, consisting essentially of a first step of contacting the gas with a solid absorbent containing magnesium oxide, in the presence of oxygen and a second step conducted at 350°–750° C. of contacting the absorbent containing magnesium sulfate with a reducing gas consisting essentially of sulfur vapor, so as to regenerate magnesium oxide in the absorbent.

4,781,904

CALCIUM-PHOSPHATE TYPE HYDROXYAPATITE FOR CHROMATOGRAPHIC SEPARATION AND PROCESS FOR PRODUCING SAME

Nobuaki Tagaya, Kawagoe; Hideyuki Kuwahara, Oi; Takao Hashimoto, Oi; Noriko Komatsu, Oi; Keiko Fukamachi, Mitaka; Tsugio Maeshima, Saitama; Toshihiro Ishikawa, and Tetsuro Ogawa, both of Tokyo, all of Japan, assignors to Tao Nenryo Kogyo Kabushiki Kaisha and Asahi Kogaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 909,978
Claims priority, application Japan, Sep. 23, 1985, 60-209562
Int. Cl.[4] C01B *25/32*
U.S. Cl. 423—308 6 Claims



1. A calcium-phosphate type hydroxyapatite for chromatographic separation in the form of spherulites having a mean particle diameter of 0.5 to 50 μm, each said spherulite being formed by aggregating mainly acicular crystallites, said crystallites characterized by a hexagonal unit lattice having unit lattice constants of 9.58+0.08A for the a axis and 7.00+0.05A for the c axis.

4,781,905

PROCESS FOR PRODUCING PHOSPHORIC ACID AND/OR PHOSPHATES FROM WET-PROCESS PHOSPHORIC ACID AND AN EXTRACTANT THEREIN

Jiang Yu-Ming, and Su Yuan-Fu, both of East China Institute of Chemical Technology, 130 Meilong Road, Shanghai, China

Filed May 30, 1986, Ser. No. 869,192
Int. Cl.[4] C01B *25/16*
U.S. Cl. 423—321 S 13 Claims

1. A process for producing pure phosphoric acid by extracting wet-process phosphoric acid chracterised in that the wet-process phosphoric acid is extracted at a temperature ranging from 5° to 35° C. by contacting with a water-immiscible solvent mixture consisting of a mixture of trialkyl phosphine oxides as extractant and a suitable water-immiscible diluent, adjusting the volume ratio of the solvent mixture to the said acid in the range of 1:1 to 4:1, and the ratio of extractant to diluent in the range from 5:1 to 1:5, contacting the solvent mixture with the said acid for from about 1 to 10 minutes to form a loaded solvent mixture phase and a raffinate phase, and stripping the loaded solvent to produce the pure phosphoric acid.

4,781,906

CRYSTALLINE SILICAS

Raymond M. Cahen, Brussels; Guy L. G. Debras, Belgrade, and Georges E. M. J. DeClippeleir, Sint Pieters Leeuw, all of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Dec. 19, 1983, Ser. No. 562,651
Int. Cl.[4] C01B *33/26*
U.S. Cl. 423—328 5 Claims

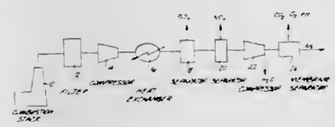
1. Crystalline silicas characterized in that they have a silica to alumina atomic ratio of at least 80 and an X-ray diffraction pattern as set forth in Table 1, after calcination in air for at least 3 hours at a temperature of at least about 500° C.

4,781,907

PRODUCTION OF MEMBRANE-DERIVED NITROGEN FROM COMBUSTION GASES

John M. McNeill, 14021 Marquesas Way, Marina Del Rey, Calif. 90292

Filed Dec. 4, 1985, Ser. No. 804,809
Int. Cl.[4] B01D *53/22;* F23N *1/02*
U.S. Cl. 423—351 12 Claims



1. A process for the production of nitrogen, which comprises:

(a) combusting a carbonaceous fuel to form a combustion gas comprising nitrogen, carbon dioxide, and oxygen;

(b) treating the combustion gas to remove to the extent present particulates, the oxides of sulfur, and the oxides of nitrogen and compressing the treated gas stream with or without water condensation in one or more stages of compression to a pressure sufficient to enable membrane separation of molecular nitrogen from carbon dioxide and oxygen; and

(c) contacting the compressed, treated gas stream at a temperature of from about 70° to about 160° F. with at least one membrane preferentially selective to reject nitrogen to yield a permeate comprising carbon dioxide and oxygen and a residue concentrated in nitrogen, said membrane having an oxygen and/or carbon dioxide-to-nitrogen ratio of permeability of from about 2.0 to about 20.0 and there is formed a nitrogen enriched gas stream containing at least 90% by volume nitrogen and no more than about 1 to about 5% by volume oxygen.

4,781,908

PROCESS FOR THE INFUSIBILIZING TREATMENT OF PITCH FIBER

Yojiro Hara, and Atsuki Kodama, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima and Kawasaki Steel Corporation, Kobe, both of, Japan

Filed Oct. 28, 1986, Ser. No. 923,866
Claims priority, application Japan, Nov. 7, 1985, 60-249833
Int. Cl.[4] D01F *9/12, 9/14*
U.S. Cl. 423—447.4 6 Claims

1. A process for the infusibilizing treatment of pitch fiber which comprises, in the production of pitch type carbon fiber, applying a dispersion consisting essentially of a powder of solid lubricant dispersed in organic solvent or aqueous nonionic surfactant-containing solution to a pitch fiber and then subjecting the fiber to an infusibilizing treatment by heating the fiber in an oxidative gas, wherein the organic solvent is hexane, heptane, methanol, acetone or ethanol.

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4,781,909

PROCESS FOR REMOVING BORON FROM SULFURIC ACID

Francis E. Evans, and Joel P. Guptill, both of Hamburg, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 653,162, Sep. 24, 1984, abandoned. This application May 19, 1986, Ser. No. 865,216

Int. Cl.[4] C01B *17/90, 35/06*

U.S. Cl. 423—531 **6 Claims**

1. In a process of the type in which sulfuric acid contaminated with non-volatile boron values is purified through conversion of the relatively non-volatile boron values to boron trifluoride by adding fluorosulfuric acid to the contaminated sulfuric acid, in an amount such that the molar ratio of contained fluoride to boron is at least 3 and thereafter contacting the resulting mixtures of said contaminated sulfuric acid and said fluorosulfuric acid with one or more inert gases, which desorb and sweep out the voltatile boron trifluoride from the contaminated sulfuric acid, the improvement comprising maintaining a molar ratio of contained fluoride to boron greater than 3.1/1 to 4/1 and adjusting the water content of the sulfuric acid such that the mole ratio of excess fluoride above the stoichiometric value of 3 to water in the acid is greater than about 0.25/1 and up to about 1/1 prior to contacting said acid with the said inert gas.

4,781,910

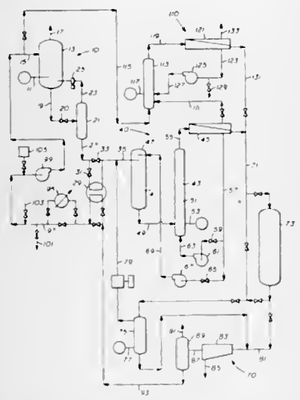
HYDROGEN SULFIDE REMOVAL AND SULFUR RECOVERY

Christiaan P. Van Dijk, Houston, Tex., assignor to W. Bruce Smith and Butler & Binion, Houston, Tex.

Filed Apr. 17, 1986, Ser. No. 853,277

Int. Cl.[4] B01D *53/34;* **C01B** *17/05*

U.S. Cl. 423—573 R **33 Claims**



1. A process for recovering elemental sulfur from a gaseous stream containing H_2S which comprises:

contacting said gaseous stream with a buffered aqueous stream containing thiosulfate ions to form a buffered aqueous H_2S stream containing thiosulfate ions and a product gas stream substantially free of H_2S which is not further contacted with thiosulfate ions;

introducing said buffered aqueous H_2S stream into a reduction sectionunder conditions whereby elemental sulfur is produced, and removing the aqueous effluent stream from said reduction section;

contacting said reduction section aqueous effluent in an oxidation section with oxygen to react H_2S in said effluent to thiosulfate ions; and

recovering elemental sulfur from the resulting stream from the oxidation section.

4,781,911

TiO_2 FOR CERAMIC FRITS AND GLAZES

Earl R. Lawborne, Savannah, Ga., assignor to Kemira, Inc., Savannah, Ga.

Filed Apr. 10, 1987, Ser. No. 37,205

Int. Cl.[4] C01G *23/053*

U.S. Cl. 423—616 **7 Claims**

1. A method for manufacturing titanium dioxide particles suitable for use in preparation of ceramic frit, comprising the steps of:

(a) preparing a clarified sulfuric acid solution containing soluble titanium sulfates;

(b) adjusting the temperature of said solution to between about 50° C. and about 95° C.;

(c) nucleating said solution with between about 0.1 and about 1.0% by weight titanium dioxide based on the titanium dioxide content of the solution;

(d) heating said solution at a rate of from about 0.1° C. to about 1.0° C. per minute up to the boiling point of said solution;

(e) simultaneously during said heating step, adding to said solution a quantity of water at a temperature substantially equal to the instantaneous temperature of said solution and constituting from about 10% to about 100% of the original solution volume, thereby forming a precipitated titanium dioxide hydrolysate;

(f) filtering and washing said precipitated hydrolysate to remove soluble impurities; and

(g) calcining said washed and filtered hydrolysate at a temperature sufficient to vaporize bound sulfates.

4,781,912

CATIONIC COMPLEX OF TECHNETIUM-99M.

Giuseppe D. Zanelli; Frank Brady; Niranjan M. Patel, and Avijit Lahiri, all of Harrow, United Kingdom, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Dec. 15, 1986, Ser. No. 941,917

Claims priority, application United Kingdom, Dec. 19, 1985, 8531296

Int. Cl.[4] A61K *49/02;* **C07F** *13/00*

U.S. Cl. 424—1.1 **7 Claims**

1. A cationic complex of technetium-99m with

(a) at least one bidendate ligand X having the formula

$$R_1R_2ZQZR_3R_4$$

where

each Z is phosphorus or arsenic,

Q is a $(CH_2)_n$ linking group where n is 2 to 8 or a 1,2-phenylene linking group,

each of R_1, R_2, R_3 and R_4 is hydrogen, C_1 to C_5 alkyl or phenyl; and

(b) at least one monodentate isonitrile ligand Y.

4,781,913

PHARMACEUTICAL COMPOSITION FOR USE IN DESENSITIZING HYPERSENSITIVE DENTIN

Eiichi Masuhara, 2-5-10 Honkomagome, Bunkyo-ku, and Hiroyasu Hosoda, both of Tokyo, Japan, assignors to Eiichi Masuhara, Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,242

Claims priority, application Japan, Apr. 10, 1986, 61-82839

Int. Cl.[4] A61K *7/22, 31/615*

U.S. Cl. 424—54 **4 Claims**

1. A dental compositon comprising an effective amount for use in desensitizing hypersensitive dentin or eliminating odontalgia in a patient in need thereof of N-methacryloyl aminosalicylic acid and a pharmaceutically acceptable carrier or diluent therefor.

4,781,914

SUNSCREEN AND MOISTURIZER

George E. Deckner, Westfield, N.J., assignor to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Dec. 4, 1985, Ser. No. 804,564

Int. Cl.[4] A61K *7/42, 7/44, 7/48, 9/10*

U.S. Cl. 424—59 **11 Claims**

1. A moisture-resistant skin treatment composition in the form of a sprayable oil-in-water emulsion, comprising water, at least one emollient, polyglyceryl-8 oleate as an emulsifier in an amount within the range of from about 0.5 to about 10% by weight based on the total composition to impart moisture-resistance to said composition, which upon being applied to the skin and rubbed thereon inverts to a water-in-oil creamy, non-greasy film having excellent substantivity.

4,781,915

COSMETIC

Yoshiji Maruya, Tokyo, and Tosbio Taki, Kanagawa, both of Japan, assignors to Sogo Pharmaceutical Company Limited, Sagamihara, Japan

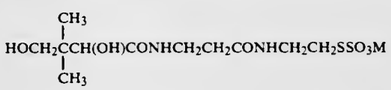
Continuation of Ser. No. 522,457, Aug. 9, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,822

Claims priority, application Japan, Aug. 26, 1982, 57-146898

Int. Cl.[4] A61K *7/40, 7/42, 7/48*

U.S. Cl. 424—59 **2 Claims**

1. A cosmetic preventing pigmentation on the skin, said cosmetic being prepared by blending 0.1–50% of pantetheine-S-sulfonic acid salt represented by the following formula:



where M is alkali metal or ½ alkaline earth metal, with a cosmetically acceptable base comprising a member selected from the group consisting of animal fat, vegetable fat, higher alcohols, glycols and mixtures thereof and a member selected from the group consisting of surfactants, pigments, stabilizers and mixtures thereof.

4,781,916

COSMETIC PREPARATION

Alexander P. Papaphilippou, Amanzimtoti, South Africa, assignor to Karl Heinrich Pegel

Continuation of Ser. No. 734,374, May 15, 1985, abandoned. This application Aug. 12, 1987, Ser. No. 85,237

Claims priority, application South Africa, May 24, 1984, 84/3939

Int. Cl.[4] A61K *7/047*

U.S. Cl. 424—61 **15 Claims**

1. A cosmetic cleansing cream for nail varnish removal and skin cleansing comprising between about 40 and 60 percent by weight of diethyl succinate, between about 3 and 10 percent by weight of a lipid, between about 5 and 29 percent by weight of an emulsifier, and the balance water.

4,781,917

ANTIPERSPIRANT GEL STICK

John P. Luebbe, Lawrenceburg, Ind.; Paul R. Tanner, Cincinnati, and Richard D. Farris, West Chester, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jun. 26, 1987, Ser. No. 67,573

Int. Cl.[4] A61K *7/32*

U.S. Cl. 424—65 **16 Claims**

1. An antiperspirant gel stick composition which is substantially free of unbound water comprising:

(a) from about 5% to about 50% of a solubilized antiperspirant active;

(b) from about 7% to about 35% of intermediate polarity emollients;

(c) from about 1% to about 5% of a benzylidene sorbitol;

(d) from about 15% to about 75% of a polar solvent;

(e) from about 1% to about 20% of dimethyl isosorbide; and

(f) from about 0.5% to about 10% of a buffering agent.

4,781,918

COSMETIC AGENTS FOR HAIR AND SKIN TREATMENT

Manfred Hofinger, Burgkirchen; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

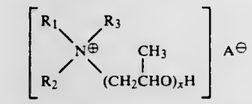
Filed Oct. 7, 1987, Ser. No. 106,058

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634417

Int. Cl.[4] A61K *7/06, 7/09*

U.S. Cl. 424—70 **8 Claims**

1. An agent for treatment of hair and skin, containing a quarternary ammonium compound of the formula



in which R_1 and R_2 may be identical or different and denote C_8–C_{22}-alkyl or C_8–C_{22}-alkenyl, R_3 denotes C_1–C_3-alkyl, x denotes a number from 1 to 3 and $A^{\ominus}$ denotes the anion of a C_2–C_6-carboxylic acid which may contain 1 to 3 hydroxyl groups, or the hydrogen phosphate anion.

4,781,919

SUSTAINED RELEASE DOSAGE FORM

Stephen M. Liebowitz, Somerville, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 621,580, Jun. 18, 1984, Pat. No. 4,713,237. This application Nov. 14, 1987, Ser. No. 132,530

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/78*

U.S. Cl. 424—78 **3 Claims**

1. A sustained release injectable dosage form comprising an effective amount of an active ingredient, and an effective amount of a water insoluble, water swellable, saponified starch acrylonitrile graft copolymer to provide sustained release of said active ingredient upon injection into a patient in need of such treatment.

4,781,920

ANTHELMINTIC PASTE COMPOSITIONS CONTAINING RESINATES OF D1-6-PHENYL-2,3,5,6-TETRAHYDROIMIDAZO[2,1-B]THIAZOLE

James M. Quinlan, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 670,839, Nov. 13, 1984, abandoned. This application Sep. 3, 1985, Ser. No. 772,097

Int. Cl.[4] A61K *31/74*

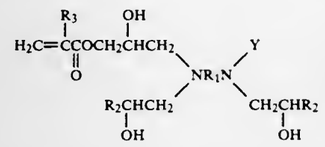
U.S. Cl. 424—79 **10 Claims**

1. A physically stable anthelmintic paste composition comprising 2% to 24% on a weight basis of resinated l-tetramisole or resinated dl-tetramisole, 40% to 75% on a weight basis of heavy mineral oil, 0..0% to 2.5% on a weight basis of a non-ionic surfactant, 0.5% to 31.0% on a weight basis of an organo-phosphate compound, 0% to 5% on a weight basis of an agent to increase the density of the composition, and 2% to 10% on a weight basis of a fumed or precipitated silica.

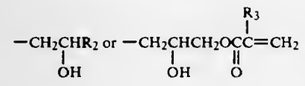
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4,781,921
HYDROGELS OF QUADROL METHACRYLATE POLYMERS
Daniel J. Smith, Stow, and Sanjay R. Patel, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio
Filed Oct. 6, 1986, Ser. No. 915,545
Int. Cl.[4] A61K *31/78*; C08L *39/00*
U.S. Cl. 424—81 **7 Claims**

1. A hydrogel comprising:
(A) a crosslinked polymer of a major amount of compound of the formula (I)



wherein R_1 is a divalent hydrocarbon radical containing from 2 to about 6 carbon atoms; R_2 is hydrogen, methyl or ethyl; R_3 is hydrogen or methyl; and Y is



and
(B) water.

4,781,922
CONTROL OF PARASITIC NEMATODE OVA WITH *BACILLUS SPHAERICUS*
Leon W. Bone, Auburn, Ala., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Jul. 20, 1987, Ser. No. 75,168
Int. Cl.[4] A61K *39/07*; A01N *63/00*
U.S. Cl. 424—92 **12 Claims**

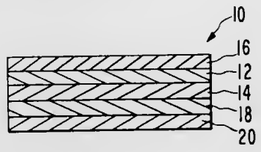
1. A method of controlling nematodes in a host animal's environment comprising
contacting nematode eggs with an effective amount of a toxin from the bacterium *Bacillus sphaericus*, which toxin is capable of inhibiting the egg hatching ability of said nematode.

4,781,923
ANTISEPTIC GELS
Michael A. Pellico, 3024 Military Ave., Los Angeles, Calif. 90272
Filed Jul. 20, 1987, Ser. No. 75,440
Int. Cl.[4] A61K *33/40*
U.S. Cl. 424—130 **20 Claims**

1. An antiseptic gel composition comprising polyglyceryl-methacrylate hydrate gel and hydrogen peroxide.

4,781,924
TRANSDERMAL DRUG DELIVERY DEVICE
Eun S. Lee, Redwood City, and Su I. Yum, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.
Filed Nov. 9, 1987, Ser. No. 118,577
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—449 **22 Claims**

1. A controlled release medical device for delivery of at least one therapeutic agent in a pre-determined delivery rate pattern to a biological environment comprising, in combination:
reservoir means containing a therapeutic agent which in a first form as a salt is suitable for storage and in a second form is a member selected from the group consisting of a free acid, a free base, an ester, is suitable for absorption through the skin or mucosa, and said reservoir means having a surface substantially impermeable to said therapeutic agent in said first form and permeable to said therapeutic agent in said second form and through which the second form of said therapeutic agent is released to the biological environment; and



activating means containing an activating agent wherein said activating agent in a first state is anhydrous, and in a second state is hydrated and in solution wherein said means is in the only anhydrous form;
whereby the therapeutic agent is changed from its first to its second form by the activating means in its second state and whereby the passage of therapeutic agent to the biological environment by diffusion is impeded until the therapeutic agent changes form.

4,781,925
CALCIUM SUPPLEMENT COMPRESSED TABLETS
John J. Michelucci; Deborah M. Sherman, both of Plattsburgh, N.Y., and Ronald N. Warner, Grand Isle, Vt., assignors to American Home Products Corporation, New York, N.Y.
Filed Mar. 6, 1986, Ser. No. 836,886
Int. Cl.[4] A61K *9/22, 33/42*
U.S. Cl. 424—465 **3 Claims**

1. A calcium supplement compressed tablet having improved disintegration characteristics comprising at least about 80% by weight of compacted calcium phosphate, and as a disintegrant about 0.5 to less than 1% croscarmellose sodium and about 0.5 to about 1% by weight of sodium lauryl sulfate, the amount of sodium lauryl sulfate being about 50% to about 100% by weight based upon the weight of croscarmellose sodium.

4,781,926
TRANSDERMAL THERAPEUTIC COMPOSITION
Suong-Hyu Hyon, and Yoshito Ikada, both of Uji, Japan, assignors to Biomaterials Universe, Inc., Osaka, Japan
Filed Mar. 21, 1986, Ser. No. 842,187
Claims priority, application Japan, Mar. 25, 1985, 60-60220
Int. Cl.[4] A61L *15/00*
U.S. Cl. 424—486 **7 Claims**

1. A transdermal therapuetic article in the form of a film or sheet prepared by freezing an aqueous solution of polyvinyl alcohol containing pharmacologically active substances and pharmacologically acceptable additives at a temperature below −5° C., and then defreezing the frozen solution at a temperature of 0° to 10° C. for at least 10 hours.

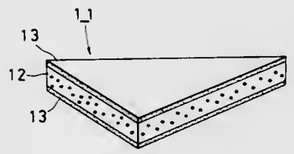
4,781,927
SWEETENING WITH L-AMINODICARBOXYLIC ACID ESTERS
Paul R. Zanno, Nanuet, N.Y.; Ronald E. Barnett, Barrington, and Glenn M. Roy, Streamwood, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.
Continuation-in-part of Ser. No. 898,063, Aug. 19, 1986, which is a continuation-in-part of Ser. No. 723,603, Apr. 15, 1985, abandoned. This application Aug. 5, 1987, Ser. No. 82,246
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—003 **29 Claims**

1. A composition comprising an edible composition and sweetening effective amount of a compound selected from the group consisting of N-L-Aspartyl-D-alanine[β(+)fenchyl]-ester, N-L aspartyl-2-methylalanine [β(+)fenchyl]ester, a food acceptable salt of N-L-aspartyl-D-alanine [β(+)fenchyl]ester, and a food acceptable salt of N-L-aspartyl-2-methylalanine [β(+)fenchyl]ester.

4,781,928
STABILIZED MOLASSES DISTILLERS CONDENSED SOLUBLES
Jerome L. Shen, St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
Filed Apr. 23, 1987, Ser. No. 41,491
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—69 **11 Claims**

1. A process for preventing substantially irreversible sedimentation of animal nutrients from liquid molasses distillers condensed solubles (MDCS) consisting essentially of mixing the MDCS "with a stabilizing amount of a water-soluble hydrocolloid, said MDCS containing an amount of nutrients sufficient for direct administration which nitrients are substantially soluble in the liquid, and which liquid has a solids level of between about 60 weight percent and about 83 weight percent, but which nutrient solids can precipitate out of the liquid at about 30° C. with a stabilizing amount of a water-soluble hydrocolloid.

4,781,929
COMPOSITE FOOD PRODUCT
Chikako Hoashi, Tokyo, Japan, assignor to Yugenkaisha Matsurei, Tokyo, Japan
Filed Apr. 7, 1986, Ser. No. 848,655
Claims priority, application Japan, Jan. 31, 1986, 61-19260
Int. Cl.[4] A23L *1/325*
U.S. Cl. 426—92 **12 Claims**



1. A composite food product which consists of a hanpen-like food material with a high cell content and a kamaboko-like food material with a cell content lower than that of the hanpen-like food material such that the difference in specific gravity between the hanpen-like and kamaboko-like food material is at least 0.1, the kamaboko-like food material being bonded to the hanpen-like food material so that the hanpen-like food material is put between or wrapped with the kamaboko-like food material, the thickness of the kamaboko-like material being such that a breakdown of the cell content structure of the hanpen-like material is prevented as a result of inhibition of excessive expansion upon heating or cooking of the composite food product.

4,781,930
METHOD OF PREPARING A FISH PRODUCT
Alfred T. Fraser, Medway, and Paul J. Fraser, Millis, both of Mass., assignors to Fraser Fish Ltd., Boston, Mass.
Filed May 30, 1986, Ser. No. 868,566
Int. Cl.[4] A23L *1/176*; A23B *4/10*
U.S. Cl. 426—96 **1 Claim**

1. A method of preparing a fish product comprising filleting a fish to appropriate thickness, immediately immersing the filleted fish in a vegetable oil for a period of 5 to 10 minutes at room temperature to effect absorption of the oil to a depth such as to inhibit excretion of the natural fluids from the fillet and prevent incursion of air and moisture, draining the excess oil from the surface, covering the surface with crumbs and then freezing the fillet.

4,781,931
CARAMEL-CONTAINING CELLULOSIC ARTICLE
Shiu-Chung Jon, Westmont, and Myron D. Nicholson, Lemont, both of Ill., assignors to Viskase Corporation, Chicago, Ill.
Division of Ser. No. 920,381, Oct. 20, 1986. This application Jan. 19, 1988, Ser. No. 144,984
Int. Cl.[4] A22C *13/00*
U.S. Cl. 426—132 **4 Claims**

1. A caramel-containing, wood-derived liquid smoke impregnated, cellulosic article wherein the caramel is uniformly distributed through the article mass and across the article surface in immobilized relation with the cellulose, without being in the chemical bonded state, so as to be substantially nonextractable in water and steam and impart a uniform non-granular dark brown appearance to said article, the liquid smoke being impregnated in at least one surface of said article and transferable through the caramel-containing cellulosic article mass to color and flavor absorbable material contiguously associated with a second surface of said article, without simultaneous transfer of said caramel to said absorbable material.

4,781,932
FOOD SHELL AND METHOD OF MANUFACTURE
Leslie L. Skarra, Tonka Bay; James R. Evans, Burnsville, and Annavarapu S. Murty, Minneapolis, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.
Continuation of Ser. No. 791,255, Oct. 25, 1985, abandoned. This application Aug. 6, 1987, Ser. No. 82,968
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—138 **24 Claims**

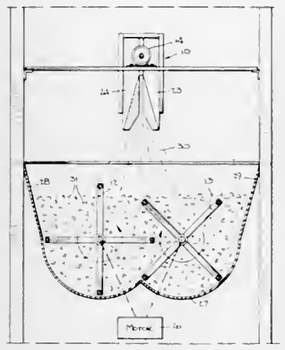
1. A cooked dough food piece which is relatively thin and flexible and has been partially fried, said piece is adapted for further cooking to make same friable, said piece contains:
at least about 25% starch by weight and plasticizer and softening agent in amounts sufficient to make said piece flexible, said plasticizer includes nonvolatilizable plasticizer in the range of between about 20% and about 38% by weight of said piece, said food piece having at least one delaminated portion, said delaminated portion being in an amount of at least about 60% of the food piece surface area with said delaminated portion having an average size exceeding about 5 mm^2.

4,781,933
INFRARED DEHYDRATOR UNIT FOR MINCED FISH
Joseph Fraioli, 8 Seymour Pl., White Plains, N.Y. 10605
Continuation-in-part of Ser. No. 937,220, Dec. 3, 1986, Pat. No. 4,702,693. This application Sep. 10, 1987, Ser. No. 95,027
Int. Cl.[4] A23L *3/40*; F26B *3/28*
U.S. Cl. 426—242 **9 Claims**

7. The method of producing an edible fish product comprising the steps of:
A. mincing raw fish to produce small pieces thereof;
B. placing a load of the fish pieces in an open tank having side walls;

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C. projecting into the tank a beam of infrared rays having a pattern which is directed mainly on the load and substantially avoids the side walls; and



D. agitating the pieces in the tank to pick up the pieces in the load thereof and exposing them to the incident beam until such time as the pieces are dehydrated.

4,781,934

PROCESS AND COMPOSITION FOR CURING MEAT

Lawrence A. Shimp, Golden, Colo., and Raimond Pals, Howell, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 19, 1986, Ser. No. 864,235

Int. Cl.[4] A23B *4/02*

U.S. Cl. 426—264 **16 Claims**

1. A meat curing process comprising contacting a meat product with an aqueous pickling solution containing an alkali metal chloride, nitrite ion and an amount of a glassy phosphate effective to buffer the solution at a pH in the range of 5.5 to 6.0, said phosphate having an M/P mole ratio of 1.188/1 to 1.250/1 wherein M is an alkali metal.

4,781,935

PROCESS FOR KEEPING COOKED POULTRY SKIN UNWRINKLED DURING LOW TEMPERATURE STORAGE

Soliman Y. K. Shenouda, Tarrytown; Erna Krueger, Hawthorne, both of N.Y.; Bitte C. Andreasson, Greenwich, Conn.; Nabil A. El-Hag, Putnam Valley, and Mary W. Yuan, No. Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 12, 1986, Ser. No. 862,071

Int. Cl.[4] A23L *1/315*

U.S. Cl. 426—290 **6 Claims**

1. A process for keeping the skin of a cooked, skin-covered meat product unwrinkled during low temperature storage comprising the steps:

(a) basting the skin-covered meat product with a glaze;

(b) placing the glazed, skin-covered meat product into a preheated oven until cooked;

(c) cooling the cooked, skin-covered meat product for a first time to a temperature ranging from 40° to 100° F.;

(d) exposing the cooled, skin-covered meat product to temperatures ranging from 400° F. to 600° F. to sear and stretch the skin;

(e) basting the stretched, seared skincovered meat product with a glaze; and

(f) cooling the twice-glazed, skin-covered meat product for a second time to a temperature ranging from 32° F. to 40° F. for storage.

4,781,936

COLORING COMPOSITIONS

Karim Nafisi-Movaghar, Walnut Creek, Calif., assignor to Del Monte Corporation, San Francisco, Calif.

Filed Jul. 9, 1986, Ser. No. 883,607

Int. Cl.[4] A23L *1/28, 1/27*

U.S. Cl. 426—429 **10 Claims**

1. A process for isolating a yellow coloring component from tomato peel which comprises exposing tomato peel to a nontoxic polar extraction solvent having at 25° C. a dielectric constant ranging from about 20 to about 30 effective to provide a yellow colored extract in said solvent.

4,781,937

PRODUCTION OF REHYDRATABLE FOOD PRODUCTS

Wilfred R. Knowles, R.R. #1, Acton, Ontario, Canada L7J 2L7, and John T. Thatcher, R.R. 1, Chatham, Ontario, Canada N7M 5J7

Filed Oct. 31, 1986, Ser. No. 926,018

Int. Cl.[4] A23L *1/212, 1/311*

U.S. Cl. 426—457 **9 Claims**

1. A method for preparing a nutritious, rehydratable food product containing about 10 to 35 weight % fat and about 15 to 60 weight % protein on a dry basis, comprising:

(a) comminuting a mixture of uncooked edible animal matter and vegetable matter;

(b) contacting the heated surface of a drum dryer with a thin layer of said comminuted mixture; and

(c) cooking and dehydrating said mixture on the heated surface of said drum dryer to a moisture content of below about 11% to produce said rehydratable food product containing from about 10 to 35 weight % fat and about 15 to 60 weight % protein on a dry basis, wherein said rehydratable food product retains at least 10% of the original color of the uncooked edible animal matter and vegetable matter.

4,781,938

SHELF-STABLE SNACK PRODUCT

Phillip F. Pflaumer, Hamilton, and James P. Smith, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 945,744, Dec. 23, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 94,952

Int. Cl.[4] A21D *10/00, 10/04*

U.S. Cl. 426—549 **28 Claims**

1. A crumb structured, ready-to eat baked batter-derived snack product with a water activity of from about 0.40 to about 0.75, said snack product having extended storage stability and resistance to staling, comprising:

(a) from about 20 to about 60% of a saccharide mixture, which comprises, by weight of said saccharide mixture:

(1) from about 25 to about 45% monosaccharides selected from the group consisting of glucose, fructose, and mixtures thereof;

(2) from about 10 to about 50% glucose-based di- and trisaccharides selected from the group consisting of maltose, isomaltose, maltotriose and other isomers of glucose-based trisaccharides, and mixtures thereof;

(3) from about 4 to about 9% glucose-based tetra- and higher saccharides; and

(4) from about 15 to about 60% sucrose; and

(b) from about 15 to about 35% of a starch component wherein the saccharide to starch ratio is from about 1:1 to about 4.5:1.

4,781,939

LAYERED MEAT EMULSION PRODUCT AND METHOD OF PRODUCING SAME

R. Craig Martin, Moorpark, and William Wu, Granada Hills, both of Calif., assignors to Nestec, S.A., Vevey, Switzerland

Continuation-in-part of Ser. No. 923,943, Oct. 28, 1986. This application Aug. 11, 1987, Ser. No. 82,767

Int. Cl.[4] A23L *1/31*

U.S. Cl. 426—646 **21 Claims**

1. A method of producing a meat emulsion product having a layered, meat-like appearance and texture resembling a chunk of natural meat, which comprises

forming a meat emulsion containing a mix of meat materials with the emulsion having a protein to fat ratio of at least about 1.5:1 and a moisture content of between about 45% to 80% by weight,

deaerating said meat emulsion,

comminuting and heating the meat emulsion to a temperature above the boiling point of water,

introducing the heated emulsion by centrifugal force into a confined processing zone while maintaining the emulsion under a pressure greater than the vapor pressure of the emulsion water,

maintaining the heated emulsion under such pressure in the confined zone until the protein is coagulated to form a firm emulsion mass,

reducing the pressure on the emulsion in the confined zone to below the vapor pressure of the emulsion water to vaporize emulsion water, and intermittently injecting pressurized steam into the emulsion in the confined zone whereby the firm emulsion mass is disrupted to form discrete pieces of set emulsion having a plurality of distinct layers bonded together, and

discharging the layered meat emulsion pieces from said confined processing zone.

4,781,940

METHOD FOR PRODUCING FILLER FOR MICROFILLED DENTAL COMPOSITE MATERIAL

Robert K. Denton, Jr., Allentown, N.J., assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Filed Jun. 26, 1987, Ser. No. 66,445

Int. Cl.[4] C08K *3/36, 9/04;* **C08F** *2/28*

U.S. Cl. 427—2 **3 Claims**

1. A process for the production of a filler for use in a microfilled dental composite formulation, which process comprises the steps of:

(a) coating colloidal silica with a polymerizable monomer by mixing said silica with an organic solvent solution of said monomer and an effective amount of a polymerization catalyst, and then evaporating said solvent;

(b) individualizing the coated silica by screening to product particles having a maximum size of about 90 microns;

(c) polymerizing said monomer; and

(d) individualizing the coated silica particles comprising the product of step (c) by screening.

4,781,941

METHOD OF MATTING PRE-SENSITIZED PLATES

Yuzo Inukai, and Tsuneyasu Matsuhisa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 465,387, Feb. 10, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 718,415

Claims priority, application Japan, Feb. 19, 1982, 57-20050

Int. Cl.[4] B05D *1/04*

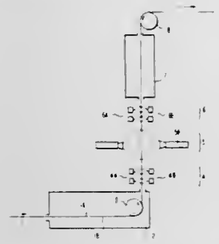
U.S. Cl. 427—27 **19 Claims**

1. A method for matting a pre-sensitized printing plate, comprising the steps of:

providing a pre-sensitized printing plate;

electrostatically attaching fine droplets of an aqueous liquid with a resin dissolved or dispersed therein on the surface of the pre-sensitized printing plate;

wet extending the fine droplets on the surface either by steaming or ultrasonic spraying; and



drying the fine droplets on the surface in order to form a matted surface, wherein the matted surface comprises protuberances having a diameter of from about 1 to 200 microns.

4,781,942

PROCESS FOR THE PHOTOCHEMICAL VAPOR DEPOSITION OF SILOXANE POLYMERS

Richard N. Leyden, Topanga, and James T. Hall, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1985, Ser. No. 810,810

Int. Cl.[4] B05D *3/06;* **C08G** *77/12*

U.S. Cl. 427—54.1 **12 Claims**

1. A low-temperature, charge-free process for forming on the surface of a substrate a layer of a siloxane polymer comprising exposing the substrate at 30° C. to 200° C. to a first vapor reactant comprising the monomer precursor having the formula SiR_xH_{4-x} where x is 1 to 4 and R is selected from the group consisting of alkyl and phenyl, and a second vapor phase reactant comprising a chosen oxygen-containing precursor in the presence of radiation of a predetermined wavelength to bring about the formation of neutral atomic oxygen from said second vapor phase reactant and the reaction of said atomic oxygen with said first vapor phase reactant to form said siloxane polymer which deposits on said surface of said substrate in a manner which avoids damage to said substrate due to bombardment by charged particles or radiation or exposure to elevated temperature.

4,781,943

PROCESS FOR PRETREATMENT BEFORE PLATING THROUGH-HOLES OF PRINTED CIRCUIT BOARDS

Ritsuji Toba, and Tsunehumi Mutoo, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,266

Claims priority, application Japan, Apr. 2, 1986, 61-74209; Jun. 14, 1986, 61-137291

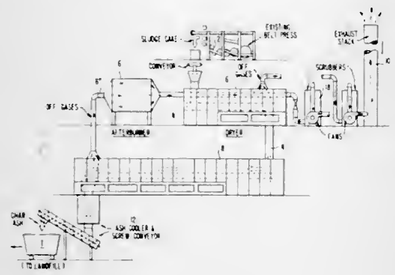
Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 **27 Claims**

1. A process for pretreatment before plating holes of printed circuit boards, which comprises dipping said printed circuit boards into a boiling water-soluble liquid to purge air within the holes with a saturated vapor of said liquid, and then dipping said printed circuit boards into water, thereby dissolving said saturated vapor within said holes in the water.

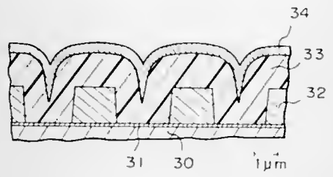
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4,781,944
PROCESS AND APPARATUS FOR FIXING, ENCAPSULATING, STABILIZING AND DETOXIFYING HEAVY METALS AND THE LIKE IN METAL-CONTAINING SLUDGES, SOILS, ASH AND SIMILAR MATERIALS
Bradford H. Jones, 85 Portsmouth Ave., P.O. Box 219, Stratham, N.H. 03885
Filed Feb. 20, 1986, Ser. No. 831,409
Int. Cl.[4] B05D *3/02;* **C01G** *37/02, 37/14*
U.S. Cl. 427—228 **15 Claims**



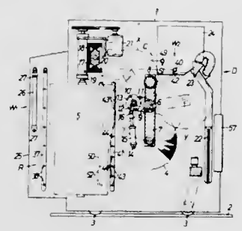
1. A process for fixing and stabilizing heavy metals in a metal-containing sludge, soil, or ash feed material that comprises, heating the metal containing material with intimately contacting carbon-containing material to a temperature sufficient to drive off volatile organics and solvents, but below the temperatures for complete volatilization of most heavy metals and while inhibiting the formation of oxides of nitrogen and sulfur, and in a substantially oxygen-free environment; continuing the heating for a period of time sufficient to produce a char residue with carbon bonded to the metal, the heating being continued until the weight of the residue expressed as a percentage of the weight of the metal containing material is a minimum and until substantially all volatile organics and solvents are driven off; cooling the char residue in the absence of air to a temperature of about 250° F. to ensure that the residue will no longer combust if exposed to air; and thereafter cooling the residue further to ambient temperature to provide a non-leachable residue.

4,781,945
PROCESS FOR THE FORMATION OF PHOSPHOSILICATE GLASS COATING
Masahide Nishimura, Kawasaki; Kanetake Takasaki, Tokyo; Kenji Koyama, Yokohama, and Atsuhiro Tsukune, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jun. 23, 1987, Ser. No. 65,505
Claims priority, application Japan, Jun. 23, 1986, 61-144919
Int. Cl.[4] C23C *16/30*
U.S. Cl. 427—255.3 **12 Claims**



1. A process for formation of a coating of phosphosilicate glass on a substrate by a chemical vapor deposition method, in which a reaction gas consisting of monosilane, phosphine and oxygen is introduced into a reaction chamber in admixture with ammonia gas, said ammonia gas being present in the reaction gas in an amount sufficient to inhibit formation of particulate by-products but insufficient to interfere with the desired CVD reaction.

4,781,946
VEHICLE POLISHING METHOD AND APPARATUS
Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Aichi, Japan
Filed Jan. 15, 1988, Ser. No. 144,136
Claims priority, application Japan, Apr. 25, 1987, 62-104477
Int. Cl.[4] B05D *3/00, 3/12*
U.S. Cl. 427—327 **2 Claims**



1. A vehicle polishing method comprising at least: a first polishing step of moving a portal travel frame travellable forwardly and backwardly in one of opposite travelling directions over a vehicle held in a stationary state to polish a body surface of said vehicle by rotary brush means mounted on said travel frame during such movement while applying a primary treating agent containing an anionic surfactant in a foamy form onto the body surface of said vehicle by a primary treating agent applicator mounted on said travel frame; and a second polishing and rinsing step of moving said travel frame in the other travelling direction and polishing said body surface by said rotary brush means while applying an aqueous wax containing a cationic surfactant onto said body surface by an aqueous wax applicator, and further ejecting fresh water onto said body surface by a rinsing unit mounted on said travel frame to wash away excessive wax from said body surface, wherein after termination of said first polishing step and before starting of said second polishing and rinsing step, said cationic surfactant-containing aqueous wax is applied to said rotary brush means for a predetermined period of time.

4,781,947
SIZING AGENT FOR CARBON FIBERS
Makoto Saito, Iruma; Hiroshi Toki, Namekawa; Makoto Miyazaki, Sakado, and Hiroshi Inoue, Miyoshi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 12, 1987, Ser. No. 84,677
Claims priority, application Japan, Aug. 12, 1986, 61-188854
Int. Cl.[4] C08G *18/04*
U.S. Cl. 427—385.5 **13 Claims**

1. A composite material comprising carbon fibers embedded in a matrix comprising an unsaturated polyester resin or a vinyl ester resin wherein said carbon fibers are pre-coated with a sizing agent comprising an unsaturated urethane compound consisting of the reaction products of an isocyanate compound with at least one unsaturated alcohol selected from the group consisting of alkene alcohols having at least one unsaturated group and the unsaturated alcohols prepared by the reaction of unsaturated carboxylic acids with at least one alkylene oxide.

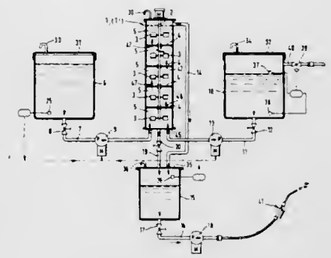
4,781,948
WATER-BASED FILM-FORMING COATING COMPOSITIONS AND THE USE THEREOF
David Caldwell, Sale, England, assignor to Imperial Chemical Industries PLC, London, England
Filed Jun. 5, 1986, Ser. No. 870,864
Claims priority, application United Kingdom, Jun. 10, 1985, 8514570
Int. Cl.[4] B05D *3/02;* **C08K** *5/09*
U.S. Cl. 427—388.1 **11 Claims**

1. A method of protecting a ferrous substrate which method comprises (a) applying to said substrate an acidic water-based film-forming coating composition which comprises an aqueous latex or dispersion of a film-forming polymer, and also contains at least one crboxylic acid of formula $R-(X)_n-CO_2H$ where R is carboxyl, H or lower alkyl (1 to 5 carbon atoms), X is —CH(OH)—, and n is 0, 1, 2, or 3, and (b) allowing the applied aqueous coating composition to dry at ambient temperature thereby to form by such drying a protective coating on the substrate.

4,781,949
METALLIC COATING METHOD
Akira Kasari, Hiratsuka, Japan, assignor to Kansai Paint Company, Limited, Hyogo, Japan
Continuation of Ser. No. 750,359, Jul. 1, 1985, abandoned. This application Feb. 27, 1987, Ser. No. 20,183
Claims priority, application Japan, Jul. 11, 1984, 59-144875
Int. Cl.[4] B05D *1/36*
U.S. Cl. 427—407.1 **12 Claims**

1. A metallic coating method comprising the steps of: (i) applying a thermosetting polymer coating composition containing no metallic flake pigment to an article to be coated to form a first layer, said polymer coating composition being a non-aqueous dispersion or solution, (ii) applying a high solids thermosetting polymer metallic coating composition to the first layer to form a second layer while the viscosity of the first layer is about 3 to about 5 poises at 20° C., (iii) applying a clear thermosetting polymer coating composition to the second layer to form a third layer, and (v) heating the coated article to cure the three layers at the same time.

4,781,950
METHOD FOR IMPREGNATING MINERAL BUILDING MATERIALS
Herbert Giesing; Götz Koerner; Eckehard Schamberg; Jakob Wassermeyer, and Christian Weitemeyer, all of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany
Filed Jul. 30, 1987, Ser. No. 79,652
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1986, 3627060
Int. Cl.[4] B05D *1/02*
U.S. Cl. 427—421 **11 Claims**

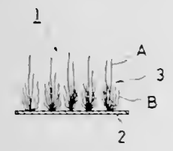


1. A method of impregnating mineral building material, such as masonry, at a predetermined site with aqueous solution of silanol and/or siloxanol which comprises
(a) continuously hydrolyzing at said site alkoxysilane and/or alkoxysiloxane compounds of the general formula

$$R_a^1Si(OR^2)_b \quad O_{\frac{4-(a+b)}{2}}$$

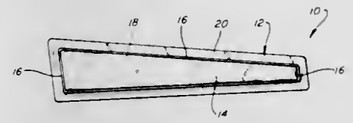
wherein
R^1 is alkyl with 1 to 8 carbon atoms, at least 90% of the R^1 groups in the average molecule being alkyl with 1 to 4 carbon atoms,
R^2 is methyl or ethyl,
a=0 to 1.5,
b=1.0 to 4.0 and
a+b=2.0 to 4.0,
by mixing water with said compounds, said hydrolysis being carried out with amounts of water and said compounds so as to obtain an amount of hydrolysate solution, which is used for impregnating purpose within a period not exceeding about 30 minutes, and
(b) applying the solution of (a) to building material at said site within a time span of 3–30 minutes after the water and said compounds have been mixed.

4,781,951
ARTIFICIAL FUR
Hiroshi Kitamura, Kusatsu, and Seiichi Yamagata, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Continuation of Ser. No. 911,934, Sep. 26, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 142,336
Claims priority, application Japan, Oct. 11, 1985, 60-224867
Int. Cl.[4] H01N *1/00*
U.S. Cl. 428—17 **18 Claims**



1. An artificial fur having an at least double layer structure comprising an erect pile layer of long fibers and an erect pile layer of short fibers, wherein the lightness of said short fibers is lower by at least 0.5 than that of said long fibers.

4,781,952
DECORATIVE ARTICLE AND PROCESS FOR MAKING
Charles M. Coscia, Upper Arlington, and William H. Goodburn, Columbus, both of Ohio, assignors to The D. L. Auld Company, Columbus, Ohio
Filed Mar. 13, 1987, Ser. No. 25,349
Int. Cl.[4] B60R *13/04*
U.S. Cl. 428—31 **19 Claims**



1. A process for making decorative articles, comprising:
(a) providing a substrate having an effective edge in a close

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pattern on the surface thereof formed by a coating of an essentially non-wettable material in a pattern which is peripherally contiguous with and circumscribes an elongated area on said surface,

(b) casting a fluent plastic composition from a casting head onto said substrate within said elongated area by providing relative movement between said casting head and said substrate in a direction generally parallel to the direction of elongation of said area while casting amounts of said fluent plastic composition on portions of said area in relation to the widths of such portions, said substrate being held substantially flat such that said fluent plastic flows to said effective edge and forms a positive meniscus, and

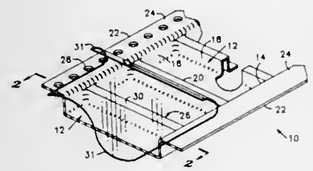
(c) curing said plastic composition to form a clear plastic cap which provides a lens effect over said area and thereby optically enhances the appearance of said substrate as viewed through said clear plastic cap.

4,781,953

PLASTIC CARRIER TAPE HAVING LOWERED CROSS RAILS

John F. Ball, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 27, 1987, Ser. No. 30,792
Int. Cl.[4] B65D *85/30*
U.S. Cl. 428—35 **8 Claims**



1. A carrier tape comprised solely of plastic comprising:

a plurality of component pockets, each of said component pockets having a first side, a second side, a third side and a fourth side;

a plurality of taping rails each having an upper surface in a first common plane, said taping rails being disposed along said first and said second sides of said component pockets; and

a plurality of cross rails, said cross rails defining said third and said fourth sides of said component pockets, said cross rails including top surfaces disposed in a second common plane, a predetermined distance below said first common plane.

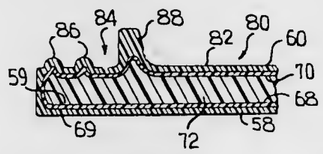
4,781,954

PREFORM WITH INTERNAL BARRIER AND PRODUCTS MADE FROM THE SAME

Suppayan M. Krishnakumar, Nashua, and Thomas E. Nahill, Salem, both of N.H., assignors to Continental PET Technologies, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 581,409, Feb. 17, 1984, Pat. No. 4,609,576. This application May 12, 1986, Ser. No. 861,855
Int. Cl.[4] B65D *1/40*; B29C *49/06*
U.S. Cl. 428—35 **23 Claims**

1. A laminated preform for forming blow mold articles, said preform being of the type formed by solely injection molding in a single conventional injection mold unit and including a tubular wall having inner and outer surfaces, said tubular wall in radial cross section comprising inner and outer first layers of an identical coinjected thermoplastic resin, very thin inner and outer layers of an identical coinjected gas barrier material next to and between said inner and outer first layers, and a second



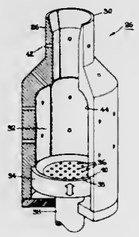
layer of thermoplastic resin between said barrier material layers.

4,781,955

RIBBON BLOWN GLASS ARTICLE

Raymond J. Noe, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 739,487, May 30, 1985, abandoned, which is a continuation of Ser. No. 519,436, Aug. 1, 1983, abandoned. This application Feb. 6, 1987, Ser. No. 12,107
Int. Cl.[4] H01K *1/00*
U.S. Cl. 428—35 **14 Claims**



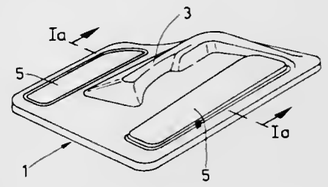
1. A ribbon blown glass article of a unitary, integral construction with a wall thickness less than about 90 mils which is less than that found in conventional blown and pressed glass articles, said ribbon blown glass article having a cylindrical neck portion terminating at one end in a bulb portion of larger cross-sectional dimensions and which includes a self-supporting closed end, wherein all structural features in said blown glass article are fully formed in a single metal mold of multi-part construction by having a pair of mold halves which rotate to provide curved sides in said glass article but which do not rotate when providing planar sides in said glass article, and which multi-part mold further includes a non-rotating base part that provides a self supporting closed end of either convex or flat contour in both curved sides and planar sides types of said glass article by moving upwardly in place while said glass article is being blown in said mold halves, but which then moves downwardly and releases said glass article before the mold halves are opened.

4,781,956

INTERIOR TRIM COMPONENT FOR A MOTOR VEHICLE

Willibald Zimmermann, Cologne; Klaus Hartmann, and Heinz Wessel, both of Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1985, Ser. No. 813,304
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1985, 3501354
Int. Cl.[4] B32B *7/06*
U.S. Cl. 428—43 **5 Claims**



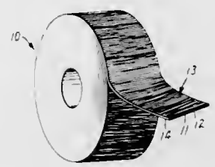
1. An interior trim component for a motor vehicle comprising a compressed fiber base having a decorative surface, a plastic sheet adhered to at least selected portions of said decorative surface of said base, wherein said base is formed by compression molding a fibrous mat of substantially uniform thickness, selected areas of said fibrous mat being subjected to a lesser degree of compression than remaining areas of said fibrous mat, areas of said base corresponding to said selected areas of said mat being thicker than areas of said base corresponding to said remaining areas of said mat, and wherein a covering material other than said plastic sheet is adhered to said base and overlies said thicker areas of said base and portions of said base peripheral thereto, said plastic sheet and said covering material overlapping one another at said peripheral surface portions, and wherein said plastic sheet has impressed separation seams adapted to enable the removal of portions of said plastic sheet overlapping said covering material.

4,781,957

EASY TEAR MASKING TAPE

Josephine S. Brown, and Alan J. Sipinen, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 27, 1987, Ser. No. 78,371
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—43 **5 Claims**



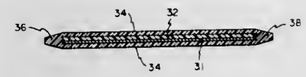
1. An elongate strip of normally tacky and pressure-sensitive adhesive tape wound convolutely upon itself about a core to form a roll, said tape having particular utility for use as a finger-tearable masking tape, comprsing in combination an approximately 55–65% crystalline isotatic polypropylene film backing having a 4-ply impact strength of about 1.8–3 kg-cm, said backing having an overall thickness on the order of 75–115 micrometers with one smooth side and one rough side, a layer of normally tacky and pressure-sensitive adhesive firmly adherently bonded to said smooth side, said rough side having closely spaced randomly disposed valleys extending substantially at right angles to the lateral edges of said tape, said valleys being separated by ridges and having a depth of greater than 50% to about 70% of the overall thickness, so that the tape has the general appearance of creped paper masking tape but differs in that it has an Elmendorf tear strength of about 30–50 grams and is consistently readily finger-tearable in a straight line along one of the valleys at right angles to its lateral edges, said tape, when subjected to a stretching force parallel to its length in excess of the yield strength of the film backing, differing from masking tape having a smooth-surfaced polypropylene film backing in that it elongates throughout its length without reducing significantly in width.

4,781,958

SEALED EDGE DETECTABLE TAPE

Ronald E. Gilbert, Katy, Tex., assignor to Reef Industries, Inc., Houston, Tex.

Continuation of Ser. No. 804,309, Dec. 3, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 98,715
Int. Cl.[4] B32B *1/04, 3/02, 15/08*
U.S. Cl. 428—76 **16 Claims**



1. A detectable tape comprising

a layer of ductile metal foil having two surfaces, a first surface and a second surface, and two sides, each side culminating in an edge,

a first film of thermoplastic material coating the first surface of the foil and extending beyond the foil's edges to form two strips, a first strip and a second strip, adjacent to and along the foil's edges,

a second film of thermoplastic material coating the secodn surface of the foil and extending beyond the foil's edges to form two strips, a third strip and a fourth strip, adjacent to and along the foil's edges, and

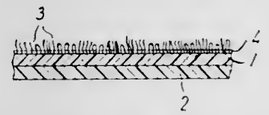
the first and third strips overlapping and sealed together to form a protective barrier along the foil edge to which they are adjacent, and the second and fourth strips overlapping and sealed together to form a protective barrier along the foil edge to which they are adjacent.

4,781,959

PROTECTIVE AND/OR CAMOUFLAGE MATERIAL

Willi Gottlieb, No. 110 A St. Kongensgade, DK-1264 Copenhagen K, Denmark

PCT No. PCT/DK86/00084, § 371 Date Mar. 20, 1987, § 102(e) Date Mar. 20, 1987, PCT Pub. No. WO87/00913, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 1, 1986, Ser. No. 46,042
Claims priority, application Denmark, Aug. 2, 1985, 3532/85
Int. Cl.[4] F41H *3/00*
U.S. Cl. 428—95 **6 Claims**



1. A protective and camouflage material for protecting persons and objects against observation and against chemical warfare agents and biological agents including toxins comprising a pile layer secured to a support layer wherein at least said pile layer is impregnated with a substance capable of decom-

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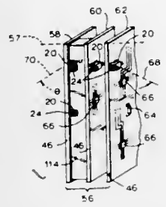
posing and decontaminating chemical and biological warfare agents.

4,781,960

STRUCTURE FOR MOUNTING INDICATOR LIGHTS ON A PRINTED CIRCUIT BOARD, AND MANUFACTURING METHOD

James M. Wittes, Linden, N.J., assignor to Industrial Devices, Inc., Edgewater, N.J.

Filed Feb. 27, 1987, Ser. No. 20,075
Int. Cl.[4] B32B *3/12*; H05K *7/02, 7/10*; H01R *9/00*
U.S. Cl. 428—119 **20 Claims**



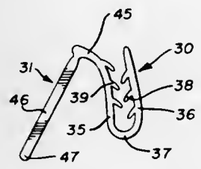
1. A mounting structure for securing an indicator lamp to a printed circuit board at a position elevated above the surface os said board, said structure comprising, in combination a pair of electrically conductive support legs, each of said legs having a relatively broad foot at one end, said foot being adapted to be secured to said board in electrically conductive contact with an electrically conductivbe area on said board, a lamp holding body secured to said legs, said lamp having a holding structure, a light-emitting element mounted in said holding structure, and a pair of electrical leads, said lamp being mounted in said body, and each of said leads being electricvally conductively connected to one of said legs.

4,781,961

SEALING STRIP FOR DAMPER SYSTEM

Milo Weaver, Box 26, U.S. Rte. 62, Winesburg, Ohio 44690, and Dean Miller, 1900 U.S. 62, Wilmot, Ohio 44689

Filed May 1, 1987, Ser. No. 44,659
Int. Cl.[4] B32B *3/04*; E06B *7/16*
U.S. Cl. 428—122 **10 Claims**



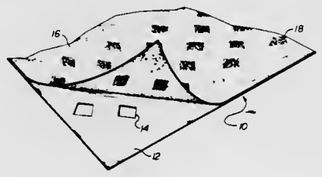
1. A sealing strip of S-shaped cross sectional configuration for a vertically disposed damper for the selective passage of air from a source to an output having a plurality of pivotal generally planar vanes with a groove at one periphery of the width thereof and a projecting flange at the other periphery of the width thereof, each flange interfitting with a groove of an adjacent vane when the damper is closed comprising, attachment means of generally U-shaped configuration for engaging the flange of a vane, said generally U-shaped configuration having a pair of spaced legs joined by a connector, having said spaced legs converging in a direction displaced from said connector and having gripping means positioned interiorly of said spaced legs for engaging the flange of a vane, and sealing means having an arm projecting from one of said legs and diverging from the other of said legs at an extremity displaced from said connector and having a flexible sealing lip normally extending linearly from and at an angle to said arm for contacting a planar engaging portion of an adjacent vane during closure of the damper, said sealing lip assuming a bowed configuration displaced away from said legs upon closure of the damper.

4,781,962

COMPOSITE COVER MATERIAL FOR ABSORBENT ARTICLES AND THE LIKE

Isidro B. Zamarripa, and Juna D. M. Tomas, both of Naucalpan, Mexico, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 9, 1986, Ser. No. 905,230
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—138 **7 Claims**



1. A composite cover material comprising:
a layer of thermoplastic film material having a plurality of fluid transmitting perforations extending therethrough, and
a layer of fluid pervious nonwoven web material adjacent and bonded to one side of said perforated film, said nonwoven material further having discrete areas of densified and fused material in vertical alignment with said perforations in said thermoplastic film, whereby said area of densified and fused material act as a mask with respect to said film perforations and further act to restrict fluid flow through said perforations when said film and said nonwoven are compressed.

4,781,963

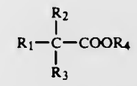
MAGNETIC RECORDING MEDIUM

Shigeo Utsumi, Yokohama, and Shigeyuki Watanabe, Kawasaki, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 38,898
Claims priority, application Japan, Apr. 16, 1986, 61-87683
Int. Cl.[4] G11B *5/704*
U.S. Cl. 428—141 **12 Claims**

1. A magnetic recording medium comprising a biaxially oriented polyester film showing the average surface roughness Ra of 0.005 to 0.013 μm, the static coefficient (μ_s) of film-film friction of not more than 0.28, the dynamic coefficient (μ_d) of film-film friction of not more than 0.28, and the maximum coefficient of friction of not more than 0.30 during 50-time repeated travelling, said biaxially oriented polyester film containing, with respect to 100 parts by weight of polyester,
(A) 0.001 to 1.0 part by weight of inner particles having an average diameter of 0.1 to 1.5 μm, or inactive additional particles having an average diameter of 0.1 to 1.0 μm, or a mixture of said inner articles and said inactive additional particles, and
(B) 0.005 to 2 parts by weight of an organic lubricant which comprises a mxiture of higher aliphatic monocarboxylic acids haing respectively different carbon numbers of not less than 18, or derivatives thereof having respectively different carbon numbers of not less than 18, or a mixture

of said higher aliphatic monocarboxylic acids and said derivatives thereof, said organic lubricant containing not less than 10 wt % of higher alphatic monocarboxylic acid(s) having not less than 34 Carbon atoms, or derivative (s) thereof in which the acid moiety has not less than 34 carbon atoms, or mixtures of said higher alphatic monocarboxylic acid (s) having not less than 34 carbon atoms and said derivative(s) thereof in which the acid moiety has not less than 34 carbon atoms, and has a melting point of 80° to 200° C., said higher aliphatic monocarboxylic acids and derivatives thereof being represented by formula (1):



(1)

wherein R_1 represents an alakyl group or an unsaturated hydrocarbon group having not less than 10 carbon atoms, R_2 represents an alkyl group or an unsaturated hydrocarbon group having not less than 2 carbon atoms, R_3 represents a hydrogen atom, an alkyl group, or an unsaturated hydrocarbon group having not less than 2 carbon atoms, and R_4 represents a hydrogen atom, a metal, an alkyl group or an unsaturated hydrocarbon group having not less than two carbon atoms, the total number of carbon atoms in R_1, R_2, R_3 and R_4 being not less than 16; and a magnetic layer provided on one side of said polyester film.

4,781,964

MAGNETIC RECORDING MEDIUM

Chiaki Mizuno; Yasuo Tamai; Hiroshi Ogawa, and Shinji Saito, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 20, 1986, Ser. No. 898,350
Claims priority, application Japan, Aug. 20, 1985, 60-182630
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—141 **6 Claims**

1. A magnetic recording medium comprising a flexible support and a magnetic recording layer provided on a surface of said support, wherein Young's modulus of said magnetic recording layer in its longitudinal direction is in the range of 720–2,000 kg/mm^2, a Young's modulus of said support in its longitudinal direction is in the range of 450–650 kg/mm^2, a ratio of Young's modulus of said magnetic recording layer in the longitudinal direction to Young's modulus of said support in the longitudinal direction is in the range of 1.20–3.20, a heat shrinkage ratio of said magnetic recording medium in its longitudinal direction after being allowed to stand at 110° C. for four hours is not higher than 0.008, and said support has a center line average height in the range of 0.02–0.1 μm on its back surface.

4,781,965

MAGNETIC RECORDING MEDIUM

Hiroshi Hashimoto; Noburo Hibino, and Tsutomu Okita, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1984, Ser. No. 657,991
Claims priority, application Japan, Oct. 5, 1983, 58-187519
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—143 **8 Claims**

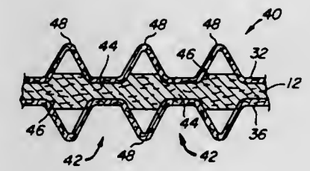
1. A magnetic recording medium comprising a non-magnetic support having coated thereon a non-magnetic layer and a magnetic layer in that order, with the surface roughness of the surface of the support on the side opposite from the magnetic layer being 0.007 μm or more, cut off of 0.25 mm, where the nonmagnetic layer is provided by coating and radiation-exposing a compound that is polymerizable by radiation exposure, wherein the non-magnetic layer has a surface roughness adjusted by utilizing a leveling effect to a value of 0.005 μm or less on the surface coated with the magnetic layer, and wherein the non-magnetic layer is formed by coating a layer of a composition containing the compound that is polymerizable by radiation exposure which has a viscosity of 300 cP or less, followed by exposiing the coated layer to radiation.

4,781,966

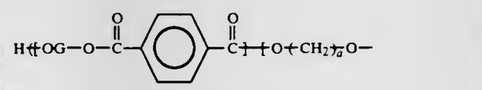
SPUNLACED POLYESTER-MELTBLOWN POLYETHERESTER LAMINATE

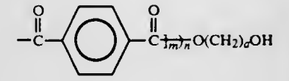
Jack D. Taylor, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 15, 1986, Ser. No. 919,273
Int. Cl.[4] A47G *9/02*; B32B *5/04, 5/26, 27/12, 27/36*
U.S. Cl. 428—152 **24 Claims**



1. A laminate which is elastic in at least one direction, said laminate comprising:
an elastic sheet comprising a polyetherester material having the following formula;





where
"G" is selected from the group including: poly(oxyethylene)-alpha,omega-diol poly(oxypropylene)-alpha,omega-diol poly(oxytetramethylene)-alpha,omega-diol and
"a", "m" and "n" are positive integers; and
at least one nonelastic nonwoven web comprising spunlaced hydraulically entangled polyester fibers joined to said elastic sheet at least at two areas, said nonelastic web being gathered between said two areas.

4,781,967

PAPERMAKER PRESS FELT

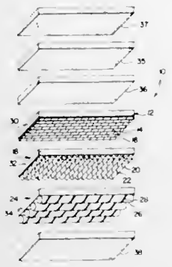
Robert W. Legge, Bridgewater, and William O. Hocking, Jr., Foxboro, both of Mass., assignors to The Draper Felt Company, Inc., Canton, Mass.

Filed Oct. 7, 1987, Ser. No. 106,065
Int. Cl.[4] B32B *5/12*
U.S. Cl. 428—109 **20 Claims**

1. An endless, unwoven press felt comprising a plurality of unwoven yarn assemblies that are located in overlying adjacent parallel relation with respect to one another, each of said yarn assemblies being composed of a plurality of layers of textile material in which is included at least one layer of fibrous batt material and a layer of an array of yarns that is defined by a plurality of yarns that are disposed substantially parallel to one another, said layer of fibrous batt material supporting the

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layer of array of yarns in each yarn assembly, the layer of array of yarns in one yarn assembly being disposed in nonparallel or transverse relation with respect to the layer of array of yarns in



an adjacent assembly, and said overlying adjacent yarn assemblies being united together without the interconnection of a separate yarn binding means extending therebetween.

4,781,968

MICRO-ELECTRONICS DEVICES AND METHODS OF MANUFACTURING SAME

David Kellerman, Littleton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 28, 1986, Ser. No. 834,912
Int. Cl.[4] B32B *3/00, 5/16, 9/00;* **H05K** *1/00*
U.S. Cl. 428—209 **22 Claims**

1. A low dielectric constant material for use in the formation of thick film devices comprising a substantially homogenous blend of a thick film insulation matrix material comprising ceramic or glass ceramic composite said material having a dielectric constant less than about 4.5, a thick film organic vehicle and a plurality of hollow glass microspheres.

4,781,969

FLEXIBLE PRINTED CIRCUIT BOARD

Satoru Kobayashi; Tetsuya Hirose, both of Hitaka, and Masahiro Suzuki, Kotesashi, all of Japan, assignors to Junkosha Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,033
Claims priority, application Japan, Oct. 3, 1986, 61-235839
Int. Cl.[4] B32B *9/00;* **B22F** *3/00;* **B22C** *23/22*
U.S. Cl. 428—209 **2 Claims**

1. A flexible printed circuit board comprising a composite metal circuit affixed to at least one surface of a flexible dielectric substrate, said composite circuit comprising an inner aluminum layer adjacent said flexible dielectric substrate and an outer copper layer adjacent said aluminum layer.

4,781,970

STRENGTHENING A CERAMIC BY POST SINTER COATING WITH A COMPRESSIVE SURFACE LAYER

Steven G. Barbee, Dover Plains, N.Y.; Hung-Chang Huang, San Jose, Calif.; Donald J. Hunt, Middletown, N.Y.; Jungihl Kim, Peekskill, N.Y.; Jae M. Park, Mahopac, N.Y.; Charles H. Perry, and Da-Yuan Shih, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 15, 1987, Ser. No. 73,620
Int. Cl.[4] B32B *3/00, 15/00, 9/00;* **C03B** *29/00*
U.S. Cl. 428—210 **47 Claims**

1. An article strengthened by a compressive surface layer comprising:

a fully sintered ceramic; and

a coating of material disposed over at least a part of the surface of said article after said ceramic has been fully sintered, said material being selected from the group consisting of amorphous silicon dioxide and refractory metal nitrides, said coating forming a compressive layer on said part of said article, said coating being at least as thick as the surface roughness of said part.

4,781,971

ELECTRICALLY CONDUCTIVE THERMALLY STABILIZED ACRYLIC FIBROUS MATERIAL AND PROCESS FOR PREPARING SAME

Yusuf M. F. Marikar, Scotch Plains, and Michael M. Besso, West Orange, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 809,654, Dec. 16, 1985. This application Aug. 7, 1987, Ser. No. 82,637
Int. Cl.[4] D01F *9/22;* **H01B** *1/04, 1/10*
U.S. Cl. 428—212 **20 Claims**

1. A sheetlike article comprising thermally stabilized acrylic fibrous material associated with from about 5 to about 60 percent by weight of electrically conductive covellite copper sulfide, present in at least one layer comprising a multiplicity of said fibers and having a thickness of approximately 1 mil to 1 inch, said article having a sheet resistivity in the range of from about 0.1 to about 1000 ohms/square.

2. A monolithic electrically conductive composite article comprising electrically conductive thermally stabilized acrylic fibrous material in association with approximately 5 to 60 percent by weight of covellite copper sulfide based upon the total weight of the conductive fibrous product, surrounded with a substantially continuous resinous matrix.

4,781,972

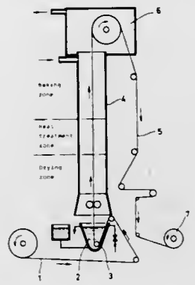
COMPOSITE MATERIAL AND PROCESS FOR MAKING SAME

Isamu Sakane, Ohtsu; Satsuki Kawauchi, Yasu, and Tadao Sato, Uji, all of Japan, assignors to I.S.T. Corporation, Shiga, Japan

Continuation of Ser. No. 835,876, Mar. 4, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,492
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—265 **5 Claims**

1. A composite material prepared by the process comprising the steps of coating or impregnating a heat-resistant fabric with

tetrafluoroethylene, drying said tetrafluoroethylene and baking said tetrafluoroethylene at such a temperature for such a time that the following equation will be satisfied:



$$-0.147X+170 \geqq t \geqq -0.042X+45$$

wherein t is the baking time in minutes and X is the baking temperature, and $X \geqq 400°$ C.

4,781,973

FABRIC COATING

Anthony A. Zotto, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 22, 1987, Ser. No. 112,209
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—266 **26 Claims**

1. Fabric of natural or synthetic fibers treated by application with sufficient silicone composition for water repellency, said silicone composition comprising:

(a) organopolysiloxane resin selected from the group consisting of resins having $R_3SiO_{0.5}$ units and SiO_2 units, the ratio of $R_3SiO_{0.5}$ to SiO_2 ranging from about 0.2 to about 0.9:1 and resins having $R_3SiO_{0.5}$ units, R_2SiO units, and SiO_2 units, the ratio of $R_3SiO_{0.5}$ units to SiO_2 ranging from about 0.2 to about 0.9:1 and the ratio of R_2SiO units being up to about 0.1:1 where each R is a substituted or unsubstituted monovalent hydrocarbon radicals from 1 to about 8 carbon atoms;

(b) 5 to 500 parts by weight an alkylalkoxypolysiloxane resin for each 100 parts by weight organopolysiloxane resin said alkyl-alkoxypolysiloxane having greater than 50% by number units of the formula:

$$RSi(OR^1)_nO_{(3-n)/2}$$

wherein n is 0.1 or 2 and R^1 is a substituted or unsubstituted hydrocarbon radical of from 1 to 6 carbon atoms and R is a substituted or unsubstituted hydrocarbon radical of from 1 to 8 carbon atoms; and

(c) an effective amount of condensation catalyst.

4,781,974

ANTIMICROBIALLY ACTIVE WET WIPER

Michael P. Bouchette, and Joseph H. Miller, both of Appleton, Wis., assignors to James River Corporation, Richmond, Va.

Continuation of Ser. No. 854,811, Apr. 23, 1986. This application Mar. 9, 1987, Ser. No. 23,228
Int. Cl.[4] A61H *9/70*
U.S. Cl. 428—288 **32 Claims**

1. An antimicrobially active wet wiper comprising:

(a) an antimicrobially active non-woven web comprising:

(i) bonded fibers;

(ii) a binder in an amount effective to bind the fibers;

(iii) a first antimicrobial agent being substantive to the fibers and to the binder when the web is either wet or dry; and

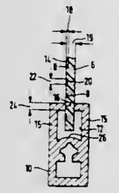
(b) a liquid containing a second antimicrobial agent, the web being maintained in a wet condition in the liquid until use.

4,781,975

DECORATIVE THERMOPLASTIC SHEET AND FRAME ASSEMBLY THEREFOR

Heinz G. Baus, 35, Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Division of Ser. No. 707,686, Mar. 4, 1985, Pat. No. 4,615,090. This application Sep. 30, 1986, Ser. No. 894,911
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408419; Mar. 8, 1984, 3408420
Int. Cl.[4] B32B *3/30*
U.S. Cl. 428—156 **12 Claims**



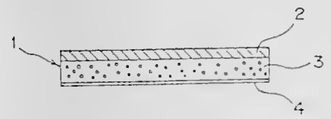
1. A decorative sheet comprising a single, homogenous layer of thermoplastic material having a defined thickness and a generally flat outer surface with a plurality of spaced depressions formed in the outer surface of said sheet; each depression having side and bottom portions and a depth equal to at most 40% of said defined thickness of said sheet; said bottom portion of each depression comprising a single, outwardly projecting, integral, decorative protrusion of said thermoplastic material having a height not greater than the depth of the depression in which it is located; whereby said sheet is free of protrusions projecting outwardly beyond said flat outer surface, and whereby flush mounting of said sheet in receiving grooves of a surrounding frame is facilitated.

4,781,976

SKIN COVERING FOR TRIMS OF AUTOMOBILES

Akihito Fujita; Tamotu Nagao, both of Takatsuki; Chikaaki Okamura, Uji, and Fumihiko Yoshida, Ibaraki, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

Filed Nov. 27, 1987, Ser. No. 127,041
Claims priority, application Japan, Nov. 28, 1986, 61-285573
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—318.6 **7 Claims**



1. A skin covering for trims of automobiles which comprises

(a) a surface layer comprising a high polymerization polyvinyl chloride having a mean degree of polymerization of 2,000 or more,

(b) a foam layer comprising a blend of a crosslinking polyvinyl chloride and a low polymerization polyvinyl chloride having a mean degree of polymerization of less than 1,500 and a foaming agent, and

(c) a back layer comprising a low polymerization polyvinyl chloride having a mean degree of polymerization of less than 1,500.

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4,781,977

CYCLODEXTRIN ADSORBING-MATERIAL

Yoshiaki Yagi; Kenichi Yamamoto, both of Fujisawa; Yukio Tsuchiyama, Yokohama; Michikatsu Sato, Fujisawa; Kouki Fujii, Yokohama, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Sanraku Incorporated, Tokyo, Japan

Filed Oct. 31, 1986, Ser. No. 925,264
Claims priority, application Japan, Oct. 31, 1985, 60-242956
Int. Cl.⁴ C08B *37/16;* **B01J** *20/32*
U.S. Cl. 428—332 **9 Claims**

1. A cyclodextrin adsorbing material composed of a water-insoluble resin substrate to which a ligand having such a size as to be included by cyclodextrin is chemically bonded via a spacer radical, said size of the ligand being such that when the shape of the ligand is taken as an ellipse just surrounding the entire atomic grouping of the ligand, the short diameter of the ellipse is within the range of about 4 to about 10 angstroms.

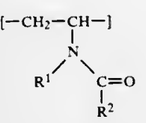
4,781,978

ARTICLES HAVING A COATING FORMED FROM A POLYMERIC BLEND

Daniel C. Duan, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 2, 1987, Ser. No. 22,323
Int. Cl.⁴ B32B *27/00;* **G02B** *1/04*
U.S. Cl. 428—383 **29 Claims**

1. Article comprising a substrate having an optically clear, non-crosslinked coating comprising at least one polymer comprising carbonylamido functional groups, at least one of said carbonylamido functional groups represented by the structure



where

R^1 and R^2 independently represent alkyl groups, or R^1 and R^2 together can be represented by $(-CH_2-)_x$ where x represents an integer, or R^2 can be hydrogen,

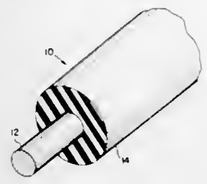
and at least one hydrophobic polymer substantially free of acidic functional groups, said hydrophobic polymer being selected from the group consisting of polyesters having aromatic groups therein and bisphenol A-based polysulfone resins.

4,781,979

CABLES FORMED WITH INTER-DISPERSED POLYMER INSULATION COMPOSITIONS AND METHOD OF MAKING

Edward V. Wilkus, and Alexander Fu Wu, both of Trumbull, Conn., assignors to Vulkor Incorporated, Lowell, Mass.

Continuation of Ser. No. 582,204, Feb. 15, 1984, abandoned, which is a division of Ser. No. 427,386, Sep. 29, 1982, abandoned. This application Aug. 14, 1986, Ser. No. 908,966
Int. Cl.⁴ B32B *15/00;* **H01B** *7/00*
U.S. Cl. 428—390 **4 Claims**



1. A cable article comprising a conductor, said conductor being at least partially insulated by a flexible homogenous and smooth composition comprising an interdispersion of low density polyethylene and polychloroprene polymer ingredients and at least an amount of fibrous polytrafluoroethylene interdispersing agent effective to homogenously bend said ingredients.

4,781,980

COPPER POWDER FOR USE IN CONDUCTIVE PASTE

Masayoshi Yoshitake, Ohtsu; Shigeru Kito, Kyoto, and Jiro Yamamoto, Kasatsu, all of Japan, assignors to Fukuda Metal Foil & Powder Co., Ltd., Kyoto, Japan

Filed Mar. 23, 1987, Ser. No. 29,232
Claims priority, application Japan, Mar. 28, 1986, 61-69898
Int. Cl.⁴ B32B *5/16;* **H01B** *1/06;* **C22B** *15/00*
U.S. Cl. 428—403 **6 Claims**

1. A copper powder for use in a conductive paste, which comprises a raw material copper powder; an anti-oxidization film formed on the surface of the copper powder, comprising an organic acid salt of a higher aliphatic amine in an amount of 0.005 to 10 parts by weight relative to 100 parts by weight of the copper powder, the organic acid salt of a higher aliphatic amine being a salt of an aliphatic mono- or di-amine having aliphatic hydrocarbon having 12 to 22 carbon atoms and a mono- or di-carboxylic acid having either aliphatic hydrocarbon having 2 to 23 carbon atoms or aromatic hydrocarbon groups having 7 to 8 carbon atoms; and a surface film which comprises 0.2 to 10 parts by weight of a dispersing agent selected from the group consisting of a combination of a boron-containing surfactant and a nitrogen-containing surfactant wherein the boron-containing surfactant has in the molecule thereof a boronic acid ester bond with polyhydric alcohol and has one or more groups of hydrocarbons having 7 to 25 carbon atoms, and the nitrogen-containing surfactant has one or more groups of hydrocarbons having 7 to 25 carbon atoms, and has non-covalent electron pairs; and 0.1 to 10 parts by weight of at least one coupling agent of the group consisting of isopropyl-triisostearoyl-titanate and acetoalkoxy-aluminum-diisopropy-late, relative to 100 parts by weight of the copper powder, and which is formed on the anti-oxidization film.

4,781,981

PLATE-LIKE MAGNETOPLUMBITE FERRITE PARTICLES FOR MAGNETIC RECORDING AND PROCESS FOR PRODUCING THE SAME

Tsutomu Katamoto; Norimichi Nagai, both of Hiroshima; Yasutaka Ota, Saeki; Katsunori Fujimoto, Hiroshima; Akihiko Hirayama, Onoda, and Masao Kiyama, Kyoto, all of Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Dec. 7, 1987, Ser. No. 129,628
Claims priority, application Japan, Dec. 19, 1986, 61-305006; Nov. 6, 1987, 62-281586
Int. Cl.⁴ C04B *35/26*
U.S. Cl. 428—403 **3 Claims**

3. Ba- and/or Sr-containing plate-like magnetoplumbite ferrite particles for magnetic recording containing ions of one metal (II) selected from Ni and Zn and ions of one metal (IV) selected from Ti, Sn and Zr, the metal (II) being present in an amount of from 4.0 to 14.0 atom % based on Fe (III) ions contained in the ferrite and the metal (IV) being present in an amount of from 2.0 to 14.0 atom % based upon the Fe (III) ions contained in the ferrite, said metal (II) and said metal (IV) substituting for part of the Fe (III), and having zinc incorporated as a solid solution close to the particle surface, said particles having an average diameter of 0.05 to 0.25 μm, a coercive force of 500 to 1,000 Oe, a magnetization of not less than 50 emu/g, an erasing characteristic value of not less than 25 dB, and a change of coercive force at a temperature of −20° to 120° C. in the range of −0.5 to +0.5 Oe/°C., said particles prepared by a process which comprises the steps of:

(a) subjecting an alkaline iron hydroxide (III) suspension containing ions of one metal (II) selected from Ni and Zn

in an amount of 4.0 to 14.0 atom % based upon Fe (III) ions,

ions of one metal (IV) selected from Ti, Sn and Zr in an amount of 2.0 to 14.0 atom % based upon Fe (III) ions, and Ba and/or Sr ions to an autoclaving treatment at a temperature in the range of 150° to 333° C. to produce Ba- and/or Sr containing plate-like magnetoplumbite ferrite particles containing the metals (ii) and (IV);

(b) suspending said particles in a zinc-containing aqueous solution of pH 4.0–12.0 to obtain the plate-like magneto-plumbite-type ferrite particles containing the metals (II) and (IV) and having a hydroxide of zinc deposited on the particle surface;

(c) filtering said particles, and

(d) heating and calcining said particles at a temperature in the range of 600° to 900° C. so that from 0.2 to 6% by weight zinc is incorporated as a solid solution close to the particle surface.

4,781,982

SURFACE TREATING MINERAL PARTICLES TO REDUCE HALIDE ADSORPTION

Lawrence L. Musselman, and Larry F. Wieserman, both of Apollo, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 27, 1987, Ser. No. 126,244
Int. Cl.⁴ A61K *7/18;* **B05D** *7/00;* **B32B** *5/16*
U.S. Cl. 428—403 **20 Claims**

1. A method for surface treating particles of a mineral to reduce adsorption of halide ions and halide free radicals onto surface portions of the particles, said method comprising:

(a) surface treating mineral particles with an alkali metal silicate surface treating agent in an aqueous solution having an initial pH of at least 8.5;

(b) neutralizing the aqueous solution to a pH of about 5–7, thereby to precipitate a silica coating onto surface portions of the particles;

(c) separating the surface-treated mineral particles from the solution; and

(d) drying the surface-treated particles.

9. Alumina trihydrate particles surface-treated by the method of claim **1** and having reduced affinity for halide ions and free radicals.

4,781,983

METHOD FOR PREPARING ANTISTATIC EXPANDABLE POLYSTYRENE

Susan G. Stickley, West Chester, Pa., assignor to Arco Chemical Company, Newtown Square, Pa.

Continuation-in-part of Ser. No. 44,862, Apr. 30, 1987. This application Jan. 19, 1988, Ser. No. 144,906
Int. Cl.⁴ B32B *5/16;* **B05D** *7/00;* **C08J** *9/22*
U.S. Cl. 428—407 **9 Claims**

1. A method for preparing expandable styrene polymer particles with an adherent coating of quaternary ammonium salts comprising:

(a) introducing said expandable styrene polymer particles into a closed mixing vessel;

(b) preparing organosols of said quaternary ammonium salts and glyceryl esters of long chain fatty acids in normal or cyclic aliphatic hydrocarbons or blends thereof, with or without an aromatic component;

(c) adding said organosols to said expandable styrene polymer particles with mixing;

(d) removing said aliphatic hydrocarbons by reducing the pressure in said mixing vessel; and

(e) separating said expandable styrene polymer particles coated with said quaternary ammonium salts.

4,781,984

AROMATIC POLYETHER RESINS HAVING IMPROVED ADHESION

Michael B. Cavitt, Lake Jackson; David A. Wilson, Richwood, and Marvin L. Dettloff, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 28, 1987, Ser. No. 43,505
Int. Cl.⁴ B32B *15/08, 27/38*
U.S. Cl. 428—418 **18 Claims**

1. A composition comprising a mixture of (1) at least one aromatic polyether resin having a weight average molecular weight of at least about 3,400; and (2) at least one aminophosphonic acid; wherein said aminophosphonic acid is present in an amount of from about 0.5 to about 20 parts per 100 parts by weight of aromatic polyether resin.

10. A steel, galvanized steel or aluminum substrate coated with a composition of claim **1**.

4,781,985

INK JET TRANSPARENCY WITH IMPROVED ABILITY TO MAINTAIN EDGE ACUITY

Robert C. Desjarlais, So. Hadley, Mass., assignor to James River Graphics, Inc., South Hadley, Mass.

Continuation-in-part of Ser. No. 876,448, Jun. 20, 1986, abandoned. This application Jan. 20, 1988, Ser. No. 146,087
Int. Cl.⁴ B32B *27/08, 27/36*
U.S. Cl. 428—421 **28 Claims**

1. An ink jet reoording transparency exhibiting an improved ability to maintain the edge acuity of ink blocks on the transparency, comprising:

(i) a substantially transparent resinous support, and

(ii) a substantially clear coating thereon which includes a fluorosurfactant of the formula

$$R_fCH_2CH_2SCH_2CH_2N^+(R)_3X^-$$

or

$$(R_fCH_2CH_2O)_{1,2}P(O)(ONR_4)_{2,1}$$

wherein

$R_f = F(CF_2CF_2)_{3-8}$ in each instance;

R is hydrogen, alkyl, aralkyl, alkenyl, or alkoxy; and

X is halogen, methosulfate ($CH_3SO_4^-$) or ethosulfate ($CH_3CH_2SO_4^-$).

4,781,986

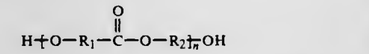
ADHESIVE, BONDING METHOD EMPLOYING SAME, AND PRODUCT PRODUCED THEREBY

William M. Alvino, Indiana Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1987, Ser. No. 79,075
Int. Cl.⁴ B32B *27/00;* **C09J** *3/14*
U.S. Cl. 428—423.7 **20 Claims**

1. A method of making an adhesive comprising:

(1) preparing a first composition which comprises a solution in an organic solvent of a polyesterether glycol having the general formula



where R_1 and R_2 are each independently selected from alkylidene from C_1 to C_{10} and n is about 1 to about 5, and where said polyesterether glycol has a molecular weight of about 100 to about 700 and a hydroxyl number of about 200 to about 255,

(2) preparing a second composition which comprises,

(A) about 0.85 to about 0.95 mole % of a diisocyanate soluble in said solvent; and

(B) about 0.15 to about 0.05 mole % of a polyisocyanate having at least three isocyanate groups; and

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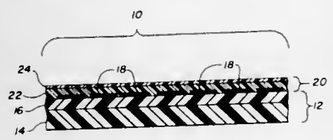
(3) mixing together approximately stoichiometric proportions of said first and second compositions to form said adhesive.

4,781,987

STAIN AND SCRATCH RESISTANT RESILIENT SURFACE COVERINGS

Nicholas C. Bolgiano, Lancaster; Mary B. Grubb, Landisville; Raymond S. Hudson, Lancaster, and William T. Sigman, Quarryville, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Mar. 6, 1987, Ser. No. 22,952
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—424.6 **10 Claims**



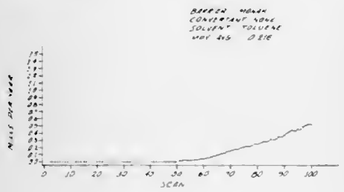
1. A resilient surface covering, said covering comprising
a resilient support surface; and
a resilient wear layer bonded to said support surface, said wear layer comprising a top first layer material and a crosslinked underlying second layer material selected from the group consisting of a moisture cured polyurethane, a moisture and UV-cured polyurethane, a UV-cured polyurethane and a cured unsaturated polyester adhered to said support surface, said first layer material being obtained from the thermal curing of a composition comprising a polyol component, an aminoplast component, and an acid catalyst component wherein said first layer material conforms to physical deformations of said crosslinked second layer material and having improved scratch and stain resistance properties relative to said crosslinked second layer material.

4,781,988

CORROSION-RESISTANT COATING

John J. Rusek, and Dick L. Tomlinson, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 29, 1986, Ser. No. 912,862
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—450 **11 Claims**



1. A coating on a ferrous surface, comprising:
(a) from about 1% to about 15% by weight of a convertant selected from the group consisting of morpholine and spherically symmetric alkyl esters of phosphorus, silicon or boron;
(b) the balance is a matrix adherent to the ferrous surface and compatible with the convertant, and
(c) the convertant, as determined by ESCA analysis, remains on the ferrous surface after mechanical and solvent removal of the coating.

4,781,989

SURFACE-COATED CUTTING MEMBER

Hironori Yoshimura, Yokohama, and Munenori Kato, Tokyo, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,278
Claims priority, application Japan, Mar. 7, 1986, 61-50000; Mar. 12, 1986, 61-53968; Mar. 12, 1986, 61-53969
Int. Cl.[4] B22F *7/02*
U.S. Cl. 428—552 **5 Claims**

1. A surface-coated cutting member comprising:
(a) a substrate of hard material selected from the group consisting of tungsten carbide-based cemented carbide, titanium carbo-nitride based cermet and high speed steel;
(b) a metal layer of zirconium vapor-deposited on a surface of the substrate and having an average thickness of 0.1 to 1 μm; said
(c) a hard coating vapor-deposited on the zirconium layer and having an average thickness of 1 to 9 μm, said coating consisting of an inner layer of an average thickness of 0.2 to 4 μm vapor-deposited on the zirconium layer, an intermediate layer of an average thickness of 0.2 to 4 μm vapor-deposited on the inner layer and an outer layer of an average thickness of 0.2 to 3 μm vapor-deposited on the intermediate layer, said inner layer being made of carbide of metal selected form Group IVa of the Periodic Table, said intermediate layer being made of carbon-nitride of metal selected from Group IVa of the Periodic Table, said outer layer being made of nitride of metal selected from Group IVa of the Periodic Table, wherein each layer is vapor-deposited through a physical vapor deposition process.

4,781,990

CONDITIONING AGENT FOR THE TREATMENT OF BASE MATERIALS

Hans-Joachim Grapentin, Wundtstr, 17, 1000 Berlin 19; Hubert-Matthias Seidenspinner, Mescheder Weg 36, 1000 Berlin 27, and Detlef Tessmann, Fuggerstrasse 21, 1000 Berlin 30, all of Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 899,922
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1985, 3530617
Int. Cl.[4] B05D *5/12, 1/18;* B32B *15/04*
U.S. Cl. 428—457 **5 Claims**

1. Process for the conditioning of base material for subsequent complete and uniform chemical metallization comprising in order the steps of thoroughly contacting the base material with an effective amount of a quaternary organic nitrogen compound as conditioning agent, at a temperature between 15° and 30° C., and chemically metallizing the base material.

4. Conductor plates produced according to the process of claim 1.

4,781,991

PRODUCTION OF DIELECTRIC BOARDS

John E. Thorpe, North Shields, and Gursharan S. Sarang, Ponteland, both of England, assignors to Microclad Laminates Limited, West Midlands, England

Division of Ser. No. 770,290, Oct. 21, 1985, Pat. No. 4,715,116. This application Oct. 9, 1987, Ser. No. 107,044
Claims priority, application United Kingdom, Dec. 19, 1983, 8333753
Int. Cl.[4] B32B *15/20*
U.S. Cl. 428—626 **5 Claims**

1. A flat metallic press plate having a polished surface on which a layer of copper substantially free of micro-pores has been deposited directly, the copper layer having a matte surface of copper of dendritic structure capable of being bonded to a dielectric material under heat and pressure in a laminating press, the adhesion of the copper layer to the polished surface of the press plate being sufficiently low that the forces generated at the interface of the press plate and the copper layer, owing to the penetration of the dielectric material into the dendritic structure under pressure and the subsequent cooling of the dielectric material, will cause the copper layer to be detached from the press plate.

4,781,992

CORROSION INHIBITION OF IRON AND ITS ALLOYS

Henry J. Gysling, and Joseph S. Yudelson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 58,306, Jun. 5, 1987, Pat. No. 4,743,466. This application Feb. 22, 1988, Ser. No. 158,808
Iot. Cl.[4] B05D *5/12*
U.S. Cl. 428—694 **5 Claims**

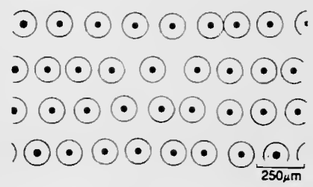
1. A method for protecting metallic iron and iron alloys against oxidative corrosion which comprises blinding finely divided magnetic particles of iron or iron alloys with a mixture of a binder resin and an organic liquid solution of a salt of the bis (triphenyl phosphoranylidene) ammonium cation and a non-corrosive passwaiting anion, coating the blend as a layer on a support and removing the solvent from the coated layer.

4,781,993

FIBER REINFORCED CERAMIC MATERIAL

Ramakrishna T. Bhatt, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 886,149, Jul. 16, 1986, Pat. No. 4,689,188. This application Apr. 15, 1987, Ser. No. 38,560
Int. Cl.[4] B32B *9/00, 19/00;* C04B *35/02*
U.S. Cl. 428—698 **5 Claims**



1. An improved composite material for use at elevated temperatures up to at least 1400° C. comprising
a plurality of mats of silicon carbide fibers, each of said fibers comprising
a pyrolitic graphite coated carbon core,
a silicon carbide sheath covering said coated carbon core,
an amorphous carbon layer covering said silicon carbide sheath and an overlayer having a high silicon/carbon ratio covering said amorphous carbon layer, and
a silicon nitride matrix reaction bonded to said fibers.

4,781,994

FIBER-REINFORCED CEMENT MATERIAL AND MOLDED ARTICLE COMPRISING HARDENED PRODUCT THEREOF

Toshio Enoki, and Yasuo Sakaguchi, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 98,555
Claims priority, application Japan, Sep. 25, 1986, 61-226915
Int. Cl.[4] C04B *7/35*
U.S. Cl. 428—703 **6 Claims**

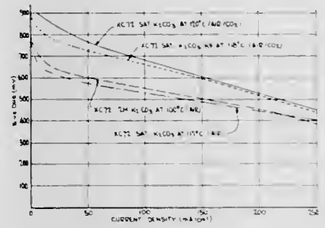
1. A fiber-reinforced cement material comprising
(A) 100 parts by volume of a cement component,
(B) 0.5 to 20 parts by volume of polyarylene thioether fibers and
(C) 0.5 to 20 parts by volume of carbon fibers.

4,781,995

AQUEOUS CARBONATE ELECTROLYTE FUEL CELL

Jose D. Giner, Brookline, Mass., assignor to Giner, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 866,763, May 27, 1986, abandoned. This application Apr. 16, 1987, Ser. No. 39,023
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—13 **14 Claims**



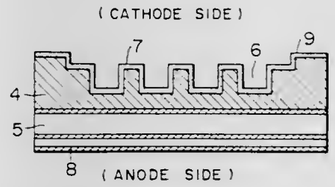
1. The method of operating a fuel cell comprising oxygen and fuel electrodes and an aqueous carbonate electrolyte comprising the step of adding carbon dioxide to at least one of said fuel oxygen electrodes during operation of the cell in an amount sufficient to maintain the concentration of free hydroxyl ions in the immediate vicinity of the oxygen electrode at most mildly alkaline and the concentration of free hydrogen ions in the vicinity of the anode slightly alkaline or at most slightly acidic and so as to provide an improvement in the electrical performance of the cell in comparison to the same cell operated under the same conditions but without the addition of CO_2.

4,781,996

FUEL CELL

Hajime Toriya; Akio Sohma, both of Hitachi, and Keizou Ohtsuka, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 61,219
Claims priority, application Japan, Jun. 13, 1986, 61-135926
Int. Cl.[4] H01M *2/08*
U.S. Cl. 429—36 **8 Claims**



1. A fuel cell comprising a stack of cell units, each of which comprises an anode, a cathode provided opposite to said anode, an electrolyte plate made of ceramic interposed between said anode and said cathode and a separator plate laminated on the back surface of each of said anode and said cathode, said separator plate being made of a material consisting essentially of 25 to 60% by weight of nickel and the balance of iron, wherein an expansion coefficient of the separator plate is substantially equal to that of the electrolyte plate.

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4,781,997

STORAGE BATTERY THAT IS PROTECTED AGAINST THE DISCHARGE OF ACID

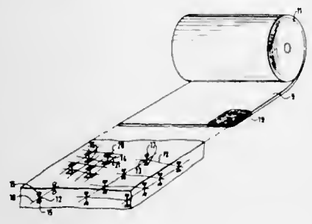
Christian Böhle, Soest; Eberhard Nann, Deiringsen, and Ulrich Römling, Meckingsen, all of Fed. Rep. of Germany, assignors to Hagen Batterie AG, Fed. Rep. of Germany

Filed Dec. 5, 1986, Ser. No. 940,029

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543617

Int. Cl.⁴ H01M *2/14*

U.S. Cl. 429—144 **7 Claims**



1. In a storage battery of a type including a liquid electrolyte, a pair of spaced electrode plates in said electrolyte, a microporous capillary separator member between said electrode plates, said electrolyte being absorbed in said separator member so that said separator member operates to prevent the discharge of electrolyte from said battery, the improvement comprising said separator member comprising a single flexible sheet of separator material which substantially fills the area between said electrode plates, a plurality of spaced individual spacer elements embedded in said sheet of separator material and a thin flexible net embedded in said sheet of separator material maintaining said spacer elements in predetermined longitudinally and transversely spaced positions therein.

4,781,998

Patent Not Issued For This Number

4,781,999

METHOD OF STABILIZING ELECTROCHEMICAL PRIMARY CELLS HAVING REACTIVE ANODES OF ZINC, ALUMINUM, OR MAGNESIUM; A STABILIZED ANODE OBTAINED BY SAID METHOD; AND A CELL INCLUDING SUCH AN ANODE

René Vignaud, Aulnay sous Bois, France, assignor to Societe les Piles Wonder, Saint Ouen, France

Filed Jun. 10, 1986, Ser. No. 872,535

Claims priority, application France, Jun. 18, 1985, 85 09230

Int. Cl.⁴ H01M *4/60*

U.S. Cl. 429—214 **13 Claims**

1. A method of stabilizing a primary electrochemical cell which includes at least one reactive anode made of a metal selected from the group consisting of zinc, aluminum, magnesium, and amalgams thereof, the method comprising:

adding a stabilizer to said electrode, the stabilizer concentration lying in the range from 0.001% to 1% by weight of electrode metal, and the stabilizer comprising at least one alkyl and polyethoxylalcohol sulfide satisfying the following formula:

$$R—S—(CH_2)_2—(O—CH_2—CH_2—)_n—OH \quad (1)$$

in which:

R is selected from the group consisting of an alkyl radical, an aryl radical, and an alkylaryl radical; and

n lies in the range from 2 to 100.

4,782,000

ELECTROPHOTOGRAPHIC RECORDING ELEMENTS WITH HYDROLYZED SILANE LAYER

Harald Lanke, Mannheim; Reinhold J. Leyrer; Bernhard Nick, both of Ludwigshafen, and Thomas Loerzer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 22, 1987, Ser. No. 64,538

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1986, 3627758

Int. Cl.⁴ G03G *5/14, 13/28*

U.S. Cl. 430—60 **1 Claim**

1. An electrophotographic recording element for electrophotographic offset printing plates which comprises:

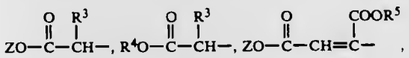
an anodically oxidized and mechanically, chemically and/or electrochemically pretreated aluminum base;

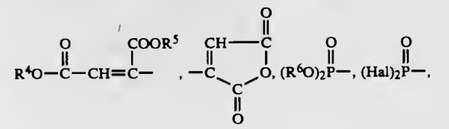
a photoconductive layer on the aluminum base, and

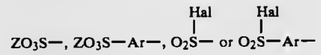
a thin layer formed of a hydrolyzed or hydrolzyed and condensed silane compound or compounds and having hydrophilic properties between the aluminum base and the photoconductive layer, wherein the silane compound has the formula (1)

$$X\text{-}(CH_2)_y\text{-}Si(R^1)_n(OR_2)_{3-n} \quad (1)$$

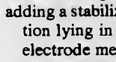
where R^1 and R^2 are identical or different and are each alkyl of 1 to 9 carbon atoms or aryl of 6 to 12 carbon atoms, X is one of the radicals







R^3 is hydrogen, alkyl of 1 to 9 carbon atoms, a carboxylic acid radical of 1 to 9 carbon atoms or a carboxylic anhydride ring formed from this carboxylic acid radical and the



radical bonded to R^3, and R^4 and R^5 are identical or different and are each alkyl of 1 to 9 carbon atoms or aryl of 6 to 12 carbon atoms, R^6 is hydrogen, alkyl of 1 to 9 carbon atoms or aryl of 6 to 12 carbon atoms, Ar is arylene of 6 to 12 carbon atoms, Hal is chlorine or bromine, Z is hydrogen or an alkali metal, y is an integer from 1 to 4 and n is 0, 1 or 2.

4,782,001

PROCESS FOR PRODUCING TONER FOR DEVELOPING ELECTROSTATIC IMAGES AND APPARATUS THEREFOR

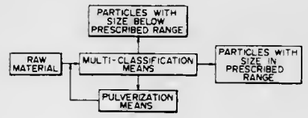
Hitoshi Kanda, Yokohama, and Takeo Meguro, Toride, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 850,179, Apr. 10, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 173,046

Claims priority, application Japan, Apr. 18, 1985, 60-81266; Feb. 14, 1986, 61-31398

Int. Cl.⁴ B02C *19/06;* G03G *9/00*

U.S. Cl. 430—137 **13 Claims**



1. A process for producing toner particles for developing electrostatic latent images, comprising the steps of: introducing colored solid particles containing a binder resin into a multi-division classifying zone divided into at least three sections by partitioning means, so that the particles are distributed by the Coanda effect; collecting (1) a coarse powder consisting primarily of coarse particles in a first divided section, (2) a medium powder consisting primarily of particles having a particle size within a defined range in a second divided section and (3) a fine powder consisting primarily of particles having a particle size smaller than the defined range in a third divided section; discharging each of the coarse powder, the medium powder and the fine powder, respectively, out of the multi-division classifying zone; feeding the classified coarse powder to a pulverizing step; and introducing the pulverized powder into the multi-division classifying zone, wherein said discharged fine powder (3) is not reintroduced into the multi-division classifying zone.

4,782,002

PHOTO AND PRESSURE SENSITIVE RECORDING MEDIA

Kuniyasu Makino, and Jun Sakai, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 30, 1987, Ser. No. 79,713

Claims priority, application Japan, Jul. 31, 1986, 61-181271

Int. Cl.⁴ G03C *1/72, 1/495, 1/68*

U.S. Cl. 430—138 **11 Claims**

1. A photo and pressure sensitive recording medium comprising:

a sheet shaped supporting member;

microcapsules and grains mixedly distributed and coated on one surface of said supporting member;

said microcapsules enveloping therein at least image developing materials and photo-sensitive materials;

said grains being of a larger size than that of said microcapsules whereby said grains extend further outwardly from said supporting surface than said microcapsules so as to protect said microcapsules from inadvertent subjection to



rupture forces and said grains being formed of a plastic material which is softenable when exposed to external energy, to permit exposure of said microcapsules to rupture forces.

4,782,003

PHOTO- AND PRESSURE-SENSITIVE RECORDING PAPER COMPRISING TWO TYPES OF MICROCAPSULES

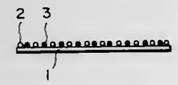
Hideo Yoshihara, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 9, 1987, Ser. No. 36,070

Claims priority, application Japan, Apr. 10, 1986, 61-80982

Int. Cl.⁴ G03C *1/40, 1/00*

U.S. Cl. 430—138 **2 Claims**



1. A photo- and pressure-sensitive recording paper comprising:

a support;

first microcapsules applied on said support each enclosing a dye precursor and including a substance which has a hardness changeable corresponding to a quantity of light irradiation thereon; and

second microcapsules applied on said support each enclosing a developer which is a thermoplastic substance whereby said dye precursor and developer can only react when said first microcapsules are subjected to a sufficient force to rupture and thereby release said dye precursor and said second microcapsules are subjected to sufficient heat to release said developer.

4,782,004

METHOD FOR DEVELOPING A HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL COMPRISING A DYE PROVIDING COMPOUNDS AND AN AUXILIARY DEVELOPING AGENT

Masashi Takeuchi; Kozo Sato, and Hiroyuki Hirai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 17, 1986, Ser. No. 931,092

Claims priority, application Japan, Nov. 16, 1985, 60-258398; Apr. 18, 1986, 61-89808; Jul. 2, 1986, 61-155594

Int. Cl.⁴ G03C *5/54*

U.S. Cl. 430—203 **3 Claims**

1. A method for forming an image comprising the steps of:

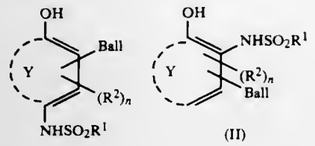
imagewise exposing a heat-developable photosensitive material comprising, on a support, at least: (1) a photosensitive silver halide, (2) a binder, (3) a dye-providing substance, and (4) an auxiliary developing agent selected from the group consisting of compounds of formula (I), compounds of formula (II) and compounds of formula (III);

heating the photosensitive material in the presence of water

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and a base and/or a base precursor during or after the imagewise exposing, thereby forming or releasing a diffusible dye; and

transferring the dye to a dye-fixing layer to form an image;



(I)

(II)

wherein

Ball represents an organic ballast radical capable of rendering the compounds of these formulas non-diffusible, with the proviso that Ball may be absent when R^1 is a non-diffusible radical;

Y represents a group of carbon atoms necessary to complete a benzene or naphthalene nucleus;

R^1 is a member having no photographic influence and selected from the group consisting of a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, amino, and heterocyclic radical;

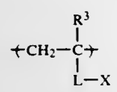
R^2 is selected from the group consisting of hydrogen, a halogen atom, a cyano radical, a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, heterocyclic, alkoxy, aryloxy, acyl, acyloxy, alkyloxycarbonyl, aryloxycarbonyl, carbamoyl, sulfamoyl, alkylsulfonyl, arylsulfonyl, acylamino, alkylthio, and arylthio radical; and

n is an integer having a value of 0 to 5;

wherein when n is 2 to 5, a corresponding plurality of R^2 may be the same or different and may be combined together to form a ring, and

when Y represents a group of carbon atoms necessary to complete a naphthalene nucleus, Ball and R^2 may be attached to either of the thus formed rings;

or high molecular weight compounds comprising monomer units represented by the general formula (III):



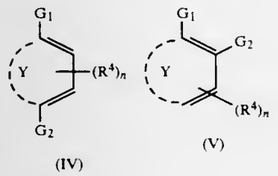
(III)

wherein

R^3 is selected from the group consisting of hydrogen, halogen, and a lower alkyl radical;

L represents a single bond or a divalent linkage; and

X is a residue of compounds having the general formulas (IV) and (V):



(IV)

(V)

wherein

Y represents a group of carbon atoms necessary to complete a benzene or naphthalene nucleus;

G1 and G2 are indepenently selected from a hydroxyl radical and a sulfonylamino radical having the general formula (VI):

$$-NHSO_2R^5 \quad \text{(VI)}$$

wherein R^5 is a monovalent radical selected from the group consisting of a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, amino, and heterocyclic radical, and R^5 is a divalent radical selected from the same radicals when R^5 is further attached to L; G1 and G2 may be the same of different;

R^4 is a monovalent radical selected from the group consisting of hydrogen, a halogen atom, a hydroxyl radical, a cyano radical, a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, heterocyclic, alkoxy, aryloxy, acyl, acyloxy, alkyloxycarbonyl, aryloxycarbonyl, carbamoyl, sulfamoyl, alkylsulfonyl, arylsulfonyl, acylamino, alkylthio, arylthio, and amino radical, and a sulfonylamino radical having general formula (VI), and R^4 is a divalent radical selected from the same radicals except the former four radicals or a single bond when R^4 is further attached to L; and

n is an integer having a value of 0 to 5;

wherein when n is 2 to 5, a corresponding plurality of R^4 may be the same or different and may be combined together to form a ring; and

when Y represents a group of carbon atoms necessary to complete a naphthalene nucleus, R^4 may be attached to either of the thus formed rings;

L being attached to the X residue at either R^4 or R^5.

4,782,005

N,N'-DIORGANO DICARBOXAMIDES AS OXYGEN INHIBITORS IN RADIATION SENSITIVE ACRYLATE COMPOSITIONS

Nils Eklund, Croton, N.Y., and William Rowe, Califon, N.J., assignors to Polychrome Corp., Yonkers, N.Y.

Continuation of Ser. No. 865,702, May 22, 1986. This application Feb. 18, 1988, Ser. No. 157,001

Int. Cl.⁴ G03C *1/68, 1/70*

U.S. Cl. 430—284 **13 Claims**

1. A radiation sensitive composition comprising an acrylic or methacrylic acid ester, a photoinitiator, and an anti-oxygen inhibitory amount of a N,N'-diorgano dicarboxamide selected from the group consisting of

N,N'-diallyl tartardiamide

N,N'-dibutyl tartardiamide

N,N'-dioctyl tartardiamide

N,N'-dihexyl tartardiamide

N,N'-diisoamyl tartardiamide

N,N'-dibutyl succindiamide

N,N'-dihexyl malondiamide

N,N'-dicyclopropyl tartaramide

N,N'-dibenzyl tartardiamide.

3. The radiation sensitive composition of claim **1** wherein the acrylic or methacrylic acid ester is acrylated urethane.

4,782,006

OPTICAL RECORDING EMPLOYING DIACETYLENE COMPOUND AND DYE TO FORM AND VISUALIZE A LATENT IMAGE

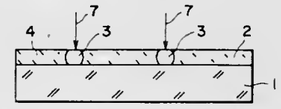
Yukuo Nishimura, Sagamihara; Ken Eguchi, Atsugi; Kunihiro Sakai, Yamato; Haruki Kawada; Hiroshi Matsuda, both of Atsugi; Takashi Nakagiri, Tokyo; Toshihiko Miyazaki; Yoshinori Tomida, both of Atsugi; Toshiaki Kimura, Sagamihara, and Kenji Saito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,532

Claims priority, application Japan, Dec. 16, 1985, 60-282214; Dec. 16, 1985, 60-282215; Jan. 28, 1986, 61-14708; Jan. 28, 1986, 61-14711; Jan. 29, 1986, 61-15855; Jan. 29, 1986, 61-15856; Jan. 30, 1986, 61-16877; Jan. 30, 1986, 61-16878; Jan. 31, 1986, 61-17993; Jan. 31, 1986, 61-17994

Int. Cl.⁴ G03C *5/00, 5/16*

U.S. Cl. 430—292 **26 Claims**



1. An optical recording method comprising the steps of:

(A) irradiating with an optical signal to impart recorded information to an optical recording medium having a recording layer containing a diacetylene compound and at least one selected from the group B consisting of azulenium salt compounds, pyrylium dyes, diene compounds, croconic methine dyes and polymethine compounds, thereby forming a latent image; and

(B) irradiating the recording medium having said latent image formed thereon to thereby visualize said latent image.

13. An optical recording method comprising the steps of:

(A) irradiating with an optical signal to impart recorded information to an optical recording medium having a recording layer containing a diacetylene compound and at least one selected from the group B consisting of azulenium salt compound, pyrylium dyes, diene compounds, croconic methine dyes and polymethine compounds, thereby forming a latent image;

(B) irradiating the recording medium having said latent image formed thereon to thereby visualize said latent image; and

(C) heating said recording medium to thereby further visualize said latent image.

4,782,007

ADDITIVE METHOD FOR MANUFACTURING PRINTED CIRCUIT BOARDS USING AQUEOUS ALKALINE DEVELOPABLE AND STRIPPABLE PHOTORESISTS

Donald R. Ferrier, Thomaston, Conn., assignor to MacDermid, Incorporated, Waterbury, Conn.

Filed Apr. 28, 1987, Ser. No. 43,325

Int. Cl.⁴ B05D *5/12, 3/04, 3/10*

U.S. Cl. 430—313 **5 Claims**

1. A process for manufacturing a pattern-metallized printed circuit by additive processing, comprising the steps of:

(a) providing an insulating substrate;

(b) providing on the surfaces of said substrate an alkaline strippable plating resist in a pattern which defines those areas on the surfaces of said substrate where metallization is not desired;

(c) depositing on the resist-patterned substrate species or precursors thereof catalytic to electroless metallization;

(d) removing said resist, and any catalytic species or precursors thereon, from said substrate by contact thereof with an aqueous alkaline solution containing a reducing agent; and

(e) electrolessly depositing metal on the remaining catalyzed areas of said substrate.

4,782,008

PLASMA-RESISTANT POLYMERIC MATERIAL, PREPARATION THEREOF, AND USE THEREOF

Edward D. Babich, Ridgefield, Conn.; Michael Hatzakis, Chappaqua, N.Y.; Scott L. Jacobs, Fishkill, N.Y.; Juri R. Parasczcak, Pleasantville, N.Y.; Jane M. Shaw, Ridgefield, Conn., and David F. Witman, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1985, Ser. No. 713,509

Int. Cl.⁴ G03C *5/00;* **C08F** *8/00;* **C08L** *83/00*

U.S. Cl. 430—313 **25 Claims**

1. A process which comprises:

a. providing a layer of polymeric material wherein said polymeric material contains at least reactive hydrogen functional groups or reactive hydrogen functional precursor groups and when said polymeric material contains said precursor groups, converting said precursor groups to reactive hydrogen functional groups;

b. then reacting at least a portion of said layer of polymeric material with a multifunctional organometallic material containing at least two functional groups which are reactive with the reactive groups of said polymeric material to thereby render the said at least portion of said layer resistant to oxygen plasma which is at least about 20 times greater than is the polymeric material before it is reacted with said organometallic material and;

c. then subjecting said layer to a gas plasma atmosphere.

4,782,009

METHOD OF COATING AND IMAGING PHOTOPATTERNABLE SILICONE POLYAMIC ACID

Donald A. Bolon, Scotia; Victoria J. Eddy, Schenectady, and John E. Hallgren, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1987, Ser. No. 33,938

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—326 **4 Claims**

1. A method for patterning adherent silicone polyamic acid on the surface of at least a portion of a substrate, where the silicone polyamic acid is patterned by

(1) spin coating a silicone polyamic acid onto the surface of the substrate,

(2) drying the silicone polyamic acid at a temperature of at least 100° C.,

(3) spin coating a positive photoresist onto the surface of the silicone polyamic acid to produce a silicone polyamic acid-photoresist composite,

(4) exposing the applied positive photoresist to patterned UV light, and

(5) developing the resulting patterned silicone polyamic acid-photoresist composite,

where the silicone polyamic acid is the intercondensation product of reaction of about 2% less than stoichiometric, to about stoichiometric, of aryldiamine and organic dianhydride, comprising a mixture of from about 20 to 80 mole percent of norbornane organosiloxane bisanhydride and from about 80 mole percent to about 20 mole percent of aromatic organic bisanhydride, based on the total moles of organic dianhydride.

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4,782,010

PHOTOTHERMOGRAPHIC EMULSIONS HAVING STABLE COLOR FORMING DEVELOPERS

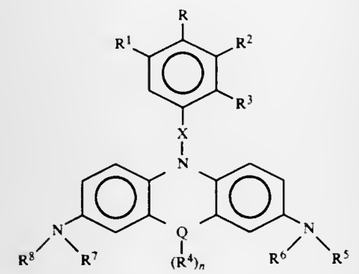
Roger A. Mader; David C. Weigel; Louis M. Leichter, and Kristen A. Hoff, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 29, 1986, Ser. No. 946,969

Int. Cl.[4] G03C *1/40, 1/26*

U.S. Cl. 430—538 **30 Claims**

1. A photothermographic emulsion capable of producing an image having visible color therein upon exposure to actinic radiation and thermal development comprising a binder, an organic silver salt, silver halide in catalytic proximity to said organic silver salt, and a dye forming developer in reactive association with said organic silver salt, said emulsion being characterized by the fact that said developer comprises a compound of the formula:



wherein

R=OH, or when R^3 is OH, R is H or combined with R^1 or R^2 to form a fused benzene ring;

R^1 and R^2 are selected from H, or a substituent having a diameter at least equal to that of —Br and equal to or less than 1,1,3,3,5,5-hexamethyl hexyl, with no more than one of R^1 and R^2 being H, and R^1 or R^2 may form with R a fused benzene ring, and R^2 may form with R^3 a fused benzene ring;

R^3 is H, OH or may form with R^2 a fused benzene ring;

R^4 is H, alkyl (substituted or not), aryl (substituted or not), aralkyl or alkaryl;

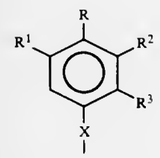
R^5, R^6, R^7 and R^8 are independently selected from H, alkyl (substituted or not), aryl (substituted or not), and one of R^5 and R^6, and one of R^7 and R^8 may represent W;

X is carbonyl, sulfonyl, carboxyl, amido or phosphonyl;

Q is N, S, O or C;

n is zero for Q equals S or O, n is 1 for Q equals N, and 2 for Q equals C;

and W is a group of the formula



wherein R, R^1, R^2, R^3 and X are as defined above.

4,782,011

BISPHENOL DERIVATIVE STABILIZERS

John D. Goddard; Nigel E. Milner, and Llewellyn J. Leyshon, all of Harrow, United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

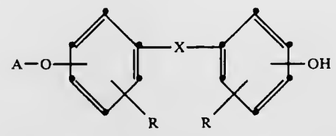
Filed Apr. 8, 1987, Ser. No. 35,970

Claims priority, application United Kingdom, Apr. 30, 1986, 8610610

Int. Cl.[4] G03C *1/34, 7/26*

U.S. Cl. 430—551 **7 Claims**

1. A photographic element comprising a support having thereon at least one silver halide emulsion layer having associated therewith a dye-forming coupler and a dye stabilizer comprising a bisphenol derivative having the following formula:



wherein

A is a substituted or unsubstituted alkyl, cycloalkyl, alkenyl, aryl, acyl, alkylsulfonyl or arylsulfonyl group;

X is a single bond or a linking group selected from alkylidene, a heteroatom or sulfonyl; and,

each R independently represents one or more substituents, each substituent independently being a substituted or unsubstituted alkyl, alkenyl, cycloalkyl or aryl group; or each R in combination with the benzene ring to which it is attached independently represents the atoms necessary to complete a fused ring system.

4,782,012

PHOTOGRAPHIC MATERIAL CONTAINING A NOVEL DIR-COMPOUND

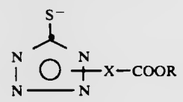
Roy C. DeSelms, and Jon A. Kapecki, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1987, Ser. No. 74,582

Int. Cl.[4] G03C *1/06, 7/16, 7/26, 7/32*

U.S. Cl. 430—544 **11 Claims**

1. A photographic element comprising a support bearing a silver halide emulsion layer and a photographic compound which, as a function of silver halide development, provides a development inhibitor having the structure:



wherein

X is alkylene of 1 to 3 carbon atoms;

R is alkyl of 1 to 4 carbon atoms; and

the sum of the carbon atoms in X and R is 5 or less.

4,782,013

PHOTOGRAPHIC ELEMENT CONTAINING A MACROCYCLIC ETHER COMPOUND

Arthur H. Herz, and Roger L. Klaus, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 23, 1987, Ser. No. 77,131

Int. Cl.[4] C07D *285/00;* **G03C** *5/24, 1/02, 1/06*

U.S. Cl. 430—564 **10 Claims**

1. A photographic element comprising a radiation sensitive silver halide emulsion layer and a macrocyclic ether compound wherein the ring structure comprises more than 12 but less than 30 total ring atoms, which ring atoms comprise (a) more than 2 and less than 10 oxygen atoms and at least one of (b) from 1 to 4 selenium atoms and (c) 1 or 2 sulfur atoms, with the proviso that when the macrocyclic ring contains no selenium atoms the sulfur atoms present in the ring are separated one from another by a divalent alkylene chain comprising less than 6 carbon atoms.

4,782,014

ASSAY AND PURIFICATION OF AMYLOID COMPONENTS, APPLICATIONS, AND KITS THEREFOR

Dan Serban, Binningen, and Christiane Rordorf, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,771

Claims priority, application United Kingdom, Jun. 25, 1985, 8516081

Int. Cl.[4] G01N *33/53, 33/577*

U.S. Cl. 435—7 **24 Claims**

1. A method of immunological analysis for serum amyloid A protein (SAA), comprising

(a) binding said SAA to an organic or inorganic carrier bearing nitrated phenyl groups, and

(b) detecting or detecting and quantifying said bound SAA, said step b being accomplished by incubating said bound SAA with an antiserum or a first monoclonal antibody specific for SAA, said antiserum containing a second antibody for said SAA, said first and second antibodies being labelled or when not labelled, further incubating said bound SAA with said first or second antibody attached thereto with a second antiserum or third labelled monoclonal antibody specific for said first or second antibody and which further antiserum contains a labelled fourth antibody which is specific for said first or second antibody, and detecting or detecting and measuring the amount of labelled antibody bound to said carrier.

4,782,015

METHOD FOR DETERMINING THE PRESENCE OF MALIGNANT CELLS

Anthony C. Allison, Belmont; Vera Morhenn, Palo Alto, and Alain B. Schreiber, Mountain View, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 30, 1984, Ser. No. 595,073

Int. Cl.[4] G01N *33/577*

U.S. Cl. 435—7 **10 Claims**

1. A method for determining the presence of a malignant condition in an exfoliative cell specimen obtained from a locus of interest, which method comprises

(a) contacting an exfoliative cell specimen with a monoclonal antibody that binds to a protein antigenic site of a normal or malignant cell from a locus other than a locus of interest, said antibody being specific for an antigenic site characteristic of normal basal cells and said protein having a molecular weight of about 120,000 by one dimensional gel electrophoresis, said antigenic site being found in said specimen only when a malignant condition is present, said antibody being capable of distinguishing said antigenic site from other antigenic sites which are found in said specimen, under conditions for binding of said antibody to said antigenic site to form immune complexes, and

(b) observing the presence of said immune complexes, the presence of said immune complexes being related to the presence of a malignant condition at said locus of interest.

4,782,016

ANALYTICAL ELEMENT AND METHOD FOR DETERMINATION OF THEOPHYLLINE BY ENZYME INHIBITION

Gary E. Norton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 18, 1985, Ser. No. 692,473

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] C12Q *1/42;* **C12N** *9/99*

U.S. Cl. 435—21 **15 Claims**

1. A dry analytical element for the determination of theophylline in a human biological fluid, said element comprising an absorbent carrier material, a buffer which maintains the pH at 9 or less during the determination and, in fluid contact, first and second zones, said first zone containing an isoenzyme of alkaline phosphatase which is capable of acting on a substrate for said isoenzyme at a pH of 9 or less, and said second zone containing a substrate for said isoenzyme.

4,782,017

ANALYTICAL ELEMENT AND METHOD FOR DETERMINATION OF THEOPHYLLINE BY ENZYME INHIBITION

Paul H. Frickey, and Gary E. Norton, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,069

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] C12Q *1/42;* **C12N** *9/99*

U.S. Cl. 435—21 **18 Claims**

1. A dry analytical element for the determination of theophylline comprising, in fluid contact, a porous spreading zone and at least one additional zone,

said element containing an isoenzyme of alkaline phosphatase which is capable of acting on a substrate for said isoenzyme at a pH of 9 or less, and a substrate for said isoenzyme, provided said phosphatase and substrate are in different zones of said element,

said element further containing a buffer which is capable of maintaining the pH at 9 or less during said determination, provided that substantially all of said buffer is in said porous spreading zone.

4,782,018

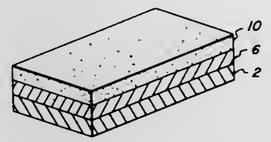
DETECTION OF HYDROLYZING ENZYMES

Jon N. Eikenberry, Rochester; Karen L. Warren, Rush; Brooke P. Schlegel, Canandaigua, and Dolores L. Humbert, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1986, Ser. No. 819,667

Int. Cl.[4] C12Q *1/40, 1/34, 1/00;* **G01N** *21/77*

U.S. Cl. 435—22 **19 Claims**



8. A test element for analysis of a hydrolyzing enzyme in a liquid, comprising a support having thereon:

a reagent zone including a non-diffusible polysaccharide having a detectable material appended thereto and a 1,3-dione having a methylene group between the two carbonyls of said 1,3-dione, which methylene group comprises at least one ionizable hydrogen, said non-diffusible polysaccharide being interactive in the presence of said hydrolyz-

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ing enzyme to provide a diffusible material comprising said detectable material, and

a registration zone adapted to receive said diffusible material.

4,782,019

ENZYMATIC PRODUCTION OF SPHINGOPHOSPHOLIPID DERIVATIVES

Yoshitaka Kokusho, Kunitachi; Shigeaki Kato, and Haruo Machida, both of Hino; all of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Aichi, Japan

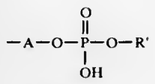
Filed Apr. 10, 1984, Ser. No. 598,696

Claims priority, application Japan, Apr. 11, 1983, 58-63307

Int. Cl.[4] C12P *19/30, 19/32, 9/00, 17/00*

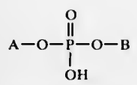
U.S. Cl. 435—89 **3 Claims**

1. A process for producing a sphingophospholipid derivative reprsented by the following formula (I)



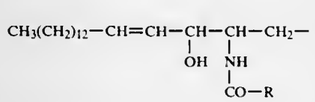
(I)

wherein A and R′ are as defined below, which comprises reacting a sphingophospholipid represented by the following formula (II)



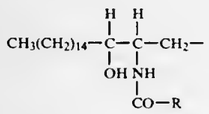
(II)

wherein A is a moiety represented by the following formula (i)



(i)

or the following formula (ii)



(ii)

in which R represents a saturated or unsaturated aliphatic hydrocarbon group having 16 to 24 carbon atoms, and B represents $-(CH_2)_2N^+(CH_3)_3$, $-(CH_2)_2NH_2$ or $-CH_2CH(OH)CH_2(OH)$,

with a compound having an alcoholic hydroxyl group selected from the group consisting of

(1) alcohol compounds having a primary alcoholic hydroxyl group and a C_1–C_{20} saturated or unsaturated aliphatic or aromatic hydrocarbon group R′ which may be substituted by a substituent selected from the group consisting of halogen, amino, carboxyl and hydroxyl; alcohol compounds having a primary alcoholic hydroxyl group and a residue R′ of a C_1–C_{20} saturated or unsaturated aliphatic or aromatic hydrocarbon containing in the molecule a linkage selected from the group consisting of ether, ester and amide linkages; and heterocyclic alcohol compounds having a primary alcoholic hydroxyl group and a heterocyclic residue R′ selected from the group consisting of pyridoxine, cytidine, arabinocytidine and adenosine;

(2) alcohol compounds having a secondary alcoholic hydroxyl group and a C_3–C_8 aliphatic hydrocarbon group R′ which may be substituted by a substituent selected from the group consisting of halogen, amino, mono- or dialkylamino of not more than 3 carbon atoms, and phenyl; and alcohol compounds having a secondary alcoholic hydroxyl group and C_4–C_6 alicyclic hydrocarbon group R′; and

(3) saccharides selected form the group consisting of pentoses having a pentose residue R′ and a primary alcoholic hydroxyl group and hexoses having a hexose residue R′ and primary alcoholic hydroxyl group, in which the pentose residue R′ or the hexose residue R′ may be substituted by amino or acetylamino; and phenol glycosides of said saccharides,

in the presence of phospholipase DM, said phospholipase DM having the ability to catalyze the formation of a sphingophoispholipid-primary alcohol derivative from a sphingophospholipid and geraniol and the formation of a sphingosphospholipid-secondary alcohol derivative from a sphingopospholipid and 2-butanol,

and recovering the reaction product formed.

4,782,020

PROCESS FOR THE CONTINUOUS ENZYMATIC CONVERSION OF ALPHA-HYDROCARBOXYLIC ACIDS INTO THE CORRESPONDING OPTICALLY ACTIVE ALPHA-AMINOCARBOXYLIC ACIDS

Wolfgang Leuchtenberger, Bruchköbel; Christian Wandrey, Jülich, and Maria-Regina Kula, Wolfenbüttel, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 583,857, Feb. 27, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 83,882

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307094

Int. Cl.[4] C12Q *1/32;* **C12P** *13/04, 13/12, 13/06*

U.S. Cl. 435—106 **15 Claims**

1. In a process for the continuous enzymatic conversion of an α-hydroxycarboxylic acid into the corresponding optically active α-aminocarboxylic acid in an enzyme reactor in the presence of nicotinamide-adenine-dinucleotide (NAD^+/NADH) of increased molecular weight through binding to a water soluble high molecular weight material, a dehydrogenase specific for the α-hydroxycarboxylic acid employed, a dehydrogenase specific for the α-aminocarboxylic acid to be formed, and ammonium ions the improvement comprising employing a membrane reactor equipped with an ultrafiltration membrane having a nominal exclusion limit of 2,000 to 50,000 which contains an aqueous solution of 0.1 to 10 mmole/l of NAD^+/NADH bound to a polyethylene glycol having an average molecular weight between 500 and 50,000, the dehydrogenase specific for the α-hydroxycarboxylic acid employed and the dehydrogenase specific for the α-aminocarboxylic acid to be formed, continuously supplying an aqueous solution of the α-hydroxycarboxylic acid to be reacted in a concentration of 25 to 100% of the maximum amount soluble and of the α-ketocarboxylic acid corresponding to that α-hydroxycarboxylic acid in a concentration between 1 and 10 k_m, based on the aminocarboxylic acid-dehydrogenase employed and an amount of ammonium ion at least equimolar to the amount of α-hydroxycarboxylic acid to be reacted, maintaining a difference in pressure over the membrane between 0.1 and 15 bar and continuously drawing off behind the membrane a filtrate stream containing the α-aminocarboxylic acid formed.

4,782,021

METHOD OF PRODUCING L-SERINE

Kenichi Ishiwata; Nobuyoshi Makiguichi; Hideki Kawashima; Tadashi Suzuki, and Masami Imadegawa, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,533

Claims priority, application Japan, Feb. 17, 1984, 59-26933; Jun. 26, 1984, 59-129980

Int. Cl.[4] C12P *13/06, 13/04;* **C12N** *9/10, 15/00*

U.S. Cl. 435—116 **4 Claims**

1. A method of producing L-serine by reacting glycine with formaldehyde in the presence of serine hydroxymethyltransferase, which comprises the step of: culturing, in a first culture medium containing glycine, tetrahydrofolic acid and formaldehyde, said formaldehyde being present at a concentration of no more than 20 mM, a microorganism belonging to the genus Escherichia and selected from the group consisting of *Escherichia coli* MT-10350, FERM BP-793 (FERM P-7437) or *Escherichia coli* MT-10351, FERM BP-794 (FERM P-7438), said microorganism having the ability to produce serine hydroxymethyltransferase and essentially lacking the ability to produce L-serine from glycine in the absence of formaldehyde, while maintaining the formaldehyde concentration in said culture medium at 20 mM or below.

4,782,022

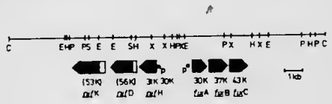
NITROGEN FIXATION REGULATOR GENES

Alfred Puhler; Helmut Reilaender, both of Bielefeld, and Gerhard Weber, Werther, all of Fed. Rep. of Germany, assignors to Lubrizol Genetics, Inc., Wickliffe, Ohio

Continuation-in-part of Ser. No. 616,586, Jun. 4, 1984, abandoned. This application May 22, 1985, Ser. No. 737,029

Int. Cl.[4] C12N *15/00, 1/20;* **C07H** *15/12*

U.S. Cl. 435—172.3 **25 Claims**



1. A recombinant DNA molecule capable of functioning as a vector comprising,

(a) a promoter of a *Rhizobium meliloti* fixD gene, and

(b) a foreign structural gene under control of said promoter.

4,782,023

STABILIZED HORSERADISH PEROXIDASE CONJUGATE COMPOSITION

Mark A. Anawis, Gurnee, and Roger E. Lindberg, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 576,824, Feb. 3, 1984, abandoned. This application Sep. 13, 1985, Ser. No. 775,882

Int. Cl.[4] C12N *9/96, 9/08;* **G01N** *13/00*

U.S. Cl. 435—188 **12 Claims**

1. A stabilized enzyme conjugate composition, comprising a horseradish peroxidase conjugate, and a stabilizing effective amount of a calcium salt and a polyethylene glycol.

4,782,024

FERMENTATION PROCESS AND FERMENTER

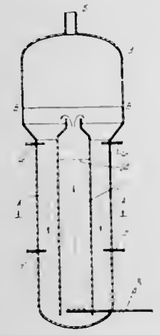
Roger H. Scott, Hurworth-On-Tees, Nr. Darlington, and Peter W. Dodd, Middlesbrough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 31, 1986, Ser. No. 925,556

Claims priority, application United Kingdom, Nov. 6, 1985, 8527335

Int. Cl.[4] C12N *1/32*

U.S. Cl. 435—247 **8 Claims**



1. A process for the aerobic fermentation of a culture containing microorganisms in which the culture is continuously circulated around a system having a riser and a downcomer communicating with each other at their upper and lower ends, oxygen-containing gas being supplied to culture in the lower part of the riser and in the downcomer in amounts sufficient for the culture and to circulate it around the system and nutrients including a carbon source being supplied to culture in the riser wherein the oxygen-containing gas supplied to the downcomer contains at least 30% by volume of oxygen and is supplied in an amount within the range 0.2% to 20% by volume of the amount of oxygen-containing gas which is supplied to the riser and sufficient nutrients including the carbon source are supplied to culture in the downcomer or are carried by the circulating culture into the downcomer to permit growth of culture to occur in the downcomer.

8. A fermenter which comprises a riser and a downcomer communicating with each other at their upper and lower ends, riser-gas supplying means for supplying oxygen-containing gas to the lower part of the riser sufficient to aerate and circulate a culture contained in the fermenter, downcomer-gas supplying means for supplying gas to the downcomer, and nutrient-supplying means for supplying nutrients including a carbon source to culture in the riser characterised in that the downcomer-gas supplying means is such that it can supply a gas containing at least 30% by volume of oxygen in an amount within the range 0.2% to 20% by volume of the gas supplied to the riser by the riser-gas supplying means and the nutrient-supplying means is such that it can supply nutrients including the carbon source to culture in the riser or in the riser and the downcomer in a manner such that nutrients are available to culture in the downcomer in an amount sufficient to permit growth of the culture to occur in the downcomer.

4,782,025

NOVEL MICROORGANISM

Shigeo Inoue, and Yoshiharu Kimura, both of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,092

Claims priority, application Japan, Jul. 25, 1984, 59-154437

Int. Cl.[4] C12N *1/16*

U.S. Cl. 435—255 **1 Claim**

1. A biologically pure culture of *Torulopsis bombicola* KSM-36 (FRI Deposition FERM BP-799) having the following mycological properties:

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(a) state of growth on various culture media: grows into elliptical to elongated elliptical Yeasts having a size of (0.75 to 3.0)×(1.5 to 5.5) μm on malt culture medium, malt agar, potato dextrose agar, and corn meal agar, and no formation of euhyphae or pseudohyphae is observed by the multipolar budding type;
(b) formation of ascospores: using malt extract agar, no formation of ascosporres is observed;
(c) formation of ballistosxpores: culturing on malt agar, no formation of ballistospores is observed;

(d) various physiological properties:

(1) growth conditions:	
pH:	3 to 8 (optimum pH: 5 to 6)
temperature:	7 to 38° C. (optimum temperature: 25 to 34° C.)
(2) assimilation of salts of nitric acid:	(−)
(3) decomposition of fat:	(+)
(4) liquefaction of gelatin:	(−)
(6) resistance to sodium chloride:	6-8% (w/v)
(7) formation of carotenoid pigments:	(−)
(8) formation of organic acids in Caster's culture medium:	(+)
(9) formation of starch-like substances:	(−)
(10) vitamin requirement:	(+)

(e) assimilating capacity and fermenting capacity:

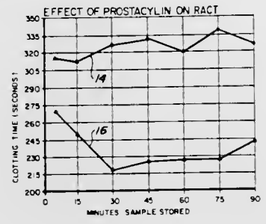
	assimilating capacity	fermenting capacity
(1) D-glucose	(+)	(+)
(2) trehalose	(−)	(−)
(3) D-galactose	(−)	(−)
(4) lactose	(−)	(−)
(5) sucrose	(+)	(+)
(6) raffinose	(−)	(+½)
(7) D-mannose	(−)	(−)
(8) D-xylose	(−)	
(9) α-methyl-D-glucoside	(−)	
(10) melibiose	(−)	
(11) D-arabinose	(−)	
(12) esculin	(−)	
(13) ethanol	(+)	
(14) inositol	(−)	
(15) maltose	(−)	(−)
(16) melezitose	(−)	
(17) glycerin	(+)	
(18) cellobiose	(−)	
(19) inulin	(−)	
(20) D-mannitol	(+)	
(21) soluble starch	(−)	
(22) D-sorbitol	(+)	

and,

(f) productivity of sophorose:
high sophorose producing activity.

4,782,026
COLLECTION MEDIUM FOR WHOLE BLOOD
Robert F. Baugh, Aurora, and Cynthia A. Taylor, Denver, both of Colo., assignors to Hemotec, Inc., Englewood, Colo.
Filed Feb. 25, 1985, Ser. No. 705,507
Int. Cl.⁴ G01N *33/86, 33/00*; C12Q *1/56*
U.S. Cl. 436—69 **16 Claims**

1. A method of preventing an initial drop in the activated clotting time measured in a recalcified activated clotting time test performed on citrated whole blood collected from a patient, the initial drop otherwise normally occurring and substantially concluding within approximately thirty minutes after drawing the blood from the patient as a result of a platelet-related procoagulant activity initiated by drawing the blood, the method comprising:
collecting a sample of the whole blood in citrate, and approximately simultaneously



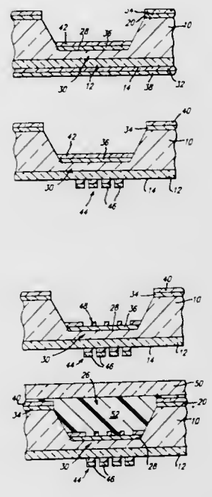
mixing an inhibitor of the initial drop with the blood sample, the inhibitor comprising one of a group consisting of a prostacyclin or imidazole.

4,782,027
PROTEIN DETECTION BY NEGATIVE STAINING
Christopher Lee, and Andrew Levin, both of Cambridge, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.
Filed Jan. 22, 1987, Ser. No. 7,136
Int. Cl.⁴ G01N *33/00*
U.S. Cl. 436—86 **18 Claims**

1. A method for detecting a polypeptide in a gel matrix, comprising treating said matrix with a staining agent that stains said gel more intensely in regions devoid of polypeptide than in regions containing polypeptide, regions of said gel exhibiting reduced intensity being indicative of the presence of polypeptide, wherein said staining agent comprises a water soluble copper or cobalt salt and a detergent and subsequently detecting a region of said matrix comprising said polypeptide as a region exhibiting reduced staining intensity.
2. A method of purifying a polypeptide, comprising:
(a) applying said polypeptide to a gel matrix;
(b) causing said polypeptide to run into said matrix;
(c) treating said matrix with a staining agent that stains said gel more intensely in regions devoid of polypeptide than in regions containing polypeptide, regions of said gel exhibiting reduced intensity being indicative of the presence of polypeptide, wherein said staining agent comprises a water soluble copper or cobalt salt and a detergent;
(d) and detecting a region of said matrix comprising said polypeptide as a region exhibiting reduced staining intensity; and thereafter
(e) eluting said polypeptide from said area of said gel exhibiting reduced staining intensity.

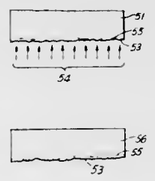
4,782,028
PROCESS METHODOLOGY FOR TWO-SIDED FABRICATION OF DEVICES ON THINNED SILICON
Michael G. Farrier, and James M. Myroszny, both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Filed Aug. 27, 1987, Ser. No. 89,786
Int. Cl.⁴ H01L *21/306*
U.S. Cl. 437—3 **15 Claims**

1. A method of forming a detector device having a thinned region from a semiconductor substrate of larger thickness defined by first and second major surfaces, said method comprising the steps of:
(a) forming a cavity in the substrate substrate to provide a thinned region therein having a third surface generally parallel to the first surface;
(b) implanting ions to form implanted layers of a given dopant concentration on the first, second and third surfaces;
(c) annealing the substrate and implanted layers;
(d) depositing metal onto the implanted layers of the first, second and third surfaces;
(e) selectively removing metal and portions of the implanted layer to form a plurality of contacts on the first surface;



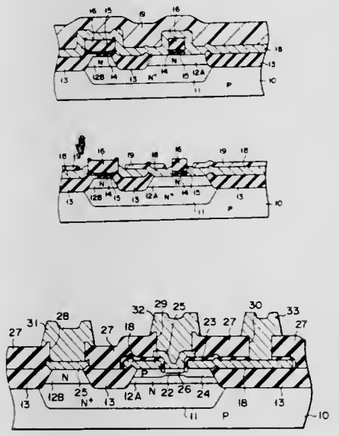
(f) selectively removing metal from the third surface in areas opposite the contacts to form a light shield in the areas between the contacts; and
(g) separating the thinned region from the substrate whereby the processing of the thinned region can easily be performed on two sides prior to mounting it to a readout device.

4,782,029
METHOD OF GETTERING SEMICONDUCTOR WAFERS WITH AN EXCIMER LASER BEAM
Kazumi Takemura; Fumitoshi Toyokawa, and Masao Mikami, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Jun. 30, 1987, Ser. No. 68,125
Claims priority, application Japan, Jun. 30, 1986, 61-154372; Oct. 24, 1986, 61-254309; Nov. 11, 1986, 61-269191; Nov. 11, 1986, 61-269192; Apr. 20, 1987, 62-97769
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—011 **6 Claims**



1. A gettering method comprising the steps of:
irradiating the back surface of a semicondutor wafer with an excimer laser beam having a wavelength of 150 to 400 nm and an energy density of 0.5 to 10 J/cm² by scanning said back surface with a belt-like spot of said laser beam with an irradiation pitch of 40 to 1500 um; and
thereafter performing a heat treatment of said semiconductor wafer for trapping contaminants of heavy metals in said semiconductor wafer at the back surface.

4,782,030
METHOD OF MANUFACTURING BIPOLAR SEMICONDUCTOR DEVICE
Yasuhiro Katsumata, Fujisawa, Japan, and Takao Ito, Ithaca, N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 7, 1987, Ser. No. 70,830
Claims priority, application Japan, Jul. 9, 1986, 61-161618; Nov. 14, 1986, 61-271208
Int. Cl.⁴ H01L *21/306*
U.S. Cl. 437—33 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:
forming on a first conductivity type semiconductor substrate, a first insulating layer comprising a first oxidation resistant insulating film, a second insulating film formed on said first oxidation resistant insulating film and having a selectivity of an etching condition to said first insulating film, and a third oxidation resistant insulating film formed on said second insulating layer,
forming a fourth oxidation resistant insulating film on the structure having said first insulating layer,
selectively etching said fourth insulating film so that part of the fourth insulating film remains on the side wall of said first insulating layer,
selectively oxidizing the surface of the semiconductor substrate using the remaining fourth insulating film as a mask to form an oxide layer on the semiconductor substrate,
removing the remaining fourth and third insulating films,
exposing the surface of said semiconductor region between said first insulating layer and said buried oxide layer,
forming a first non-single crystal semiconductor film on the structure having said first insulating layer,
selectively removing said first non-single crystal semiconductor film on said second insulating film,
doping a second conductivity type impurity to said first non-single crystal semiconductor film,
removing said second insulating film,
thermally heating the surface of said first non-single crystal

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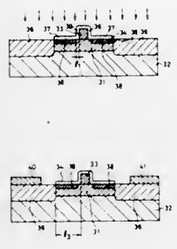
semiconductor film to form a thermal oxide film and to diffuse the impurity in said first non-single crystal semiconductor film into said semiconductor region to form a second conductivity type first semiconductor layer,
removing said first insulating film,
doping the second conductivity type impurity into the surface of said semiconductor region adjacent to the first semiconductor layer, using said thermal oxide film as a mask, to form a second semiconductor layer, and
forming a first conductivity type third semiconductor layer on the surface of said second semiconductor layer.

4,782,031

METHOD OF MAKING GAAS MOSFET WITH LOW SOURCE RESISTANCE YET HAVING SATISFACTORY LEAKAGE CURRENT BY ION-IMPLANTATION

Masahiro Hagio, Kyoto; Shinichi Katsu, Takatsuki; Kazuhide Gobda, Nagaokakyo; Shutaro Nambu, Uji, and Hiroshi Tsukada, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Division of Ser. No. 662,042, Oct. 18, 1984, abandoned. This application Mar. 4, 1987, Ser. No. 22,597
Claims priority, application Japan, Oct. 19, 1983, 58-194090
Int. Cl.⁴ H01L *21/265, 29/48*
U.S. Cl. 437—039 **17 Claims**



1. A method of making a field effect transistor comprising the steps of:
forming a gate electrode on a surface of a first semiconductor region located on a semi-insulating surface;
forming a thin film on said first semiconductor region, and on top and side surface of said gate electrode;
selectively exposing said surface of said first semiconductor region by selectively removing said thin film disposed away from said side surfaces of said gate electrode at a fixed distance;
ion-implanting an impurity of one conductivity type through said exposed surface of said first semiconductor region and through the unremoved thin film, thereby forming:
(a) a pair of second semiconductor regions of said one conductivity type deeper than said first semiconductor region at a portion beneath said exposed surface of said first semiconductor region; and
(b) a pair of third semiconductor regions of said one conductivity type thinner than said first semiconductor region at portions beneath said thin film except for the portion of said first semiconductor surface occupied by said gate electrode and said thin film formed on said side surfaces of said gate electrode; and
forming a source electrode and drain electrode on said surface of said second semiconductor regions, respectively.

4,782,032

METHOD OF MAKING SELF-ALIGNED GAAS DEVICES HAVING TIWN$_x$ GATE/INTERCONNECT

Arthur E. Geissberger; Robert A. Sadler, and Matthew L. Balzan, all of Roanoke, Va., assignors to ITT Gallium Arsenide Technology Center, a division of ITT Corporation, Roanoke, Va.

Filed Jan. 12, 1987, Ser. No. 2,083
Int. Cl.⁴ H01L *21/283*
U.S. Cl. 437—41 **5 Claims**



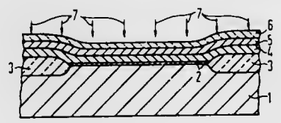
1. In a process for making a field-effect transistor including the heating of a gallium arsenide substrate having ions implanted therein, the improvement comprising the steps of:
forming a Schottky gate metallization layer directed on said substrate which layer consists of titanium-tungsten nitride (TiWN$_X$) and forms a diffusion barrier for said transistor,
wherein said gate metallization layer is formed by reactively sputtering a TiW (30 atomic percent Ti) target in a nitrogen/argon plasma having an adjustable flow ratio within the range of 1/10 to 1/1 of nitrogen (N) to nitrogen plus argon (N+Ar) N:(N+Ar) during formation of said layer by reactive sputtering to control the atomic percent of nitrogen in said layer, said process further including the steps of:
applying a dielectric encapsulant layer of silicon oxy-nitride (SiON) on said substrate and gate metalization layer and then annealing, and
forming contacts on the implanted substrate by removing said encapsulant layer in predetermined areas on the substrate and depositing conductive material in said areas employing a first level conductive interconnect layer of titanium-tungsten nitride (TiWN$_x$).

4,782,033

PROCESS FOR PRODUCING CMOS HAVING DOPED POLYSILICON GATE BY OUTDIFFUSION OF BORON FROM IMPLANTED SILICIDE GATE

Heike Glerisch, Unterschleissheim, and Franz Neppl, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 10, 1986, Ser. No. 928,893
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541940
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—56 **7 Claims**



1. A process for the production of highly integrated circuits which p- and n-channel MOS transistors and gate electrodes consisting of double layers of a refractory metal silicide and polycrystalline silicon which comprises:
providing a silicon substrate,
forming gate oxide and field oxide layers on said substrate,
depositing an undoped polycrystalline silicon layer over said gate oxide layer,

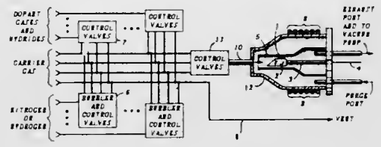
applying a refractory metal silicide layer over said undoped polycrystalline silicon layer,
applying a masking layer over the double layer of undoped polycrystalline silicon and refractory metal silicide, to thereby mask the source/drain implantation to be forme in the n-channel MOS transistors,
introducing boron ions into said refractory metal silicide layer by ion implantation over the entire surface,
subjecting the boron infiltrated material to a sufficiently high temperature and time to cause boron ions to diffuse out of the refractory metal silicide layer into said polycrystalline layer while causing crystalline of said double layer, and
forming gate electrodes in said double layer through the use of said masking layer.

4,782,034

SEMI-INSULATING GROUP III-V BASED COMPOSITIONS DOPED USING BIS ARENE TITANIUM SOURCES

Andrew G. Dentai, Atlantic Highlands; Charles H. Joyner, Jr., Middletown; Timothy W. Weidman, Westfield, and John L. Zilko, Fanwood, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 4, 1987, Ser. No. 58,099
Int. Cl.⁴ H01L *21/285, 21/205, 7/36*
U.S. Cl. 437—94 **14 Claims**



1. A process for producing a semiconductor body comprising the steps of (1) forming a region of semi-insulating Group III-V based material by contacting a substrate with a deposition gas stream and (2) forming a conductive region for said semiconductor body, the process CHARACTERIZED IN THAT
said region of semi-insulating material is further formed by introducing into said deposition gas stream a dopant precursor comprising a composition chosen from the group consisting of bis(benzene)titanium and cyclopentadienyl cycloheptatrienyl titanium, wherein said deposition gas stream is produced by combining entity compositions chosen from the group consisting of an organic indium-based compound together with a source of phosphorus and an organic gallium-based compound together with a source of antimony.

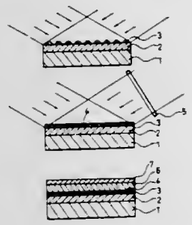
4,782,035

METHOD OF FORMING A WAVEGUIDE FOR A DFB LASER USING PHOTO-ASSISTED EPITAXY

Masatoshi Fujiwara, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 12, 1987, Ser. No. 119,724
Claims priority, application Japan, Sep. 8, 1987, 62-224477
Int. Cl.⁴ H01S *3/19;* **H01L** *21/208*
U.S. Cl. 437—129 **1 Claim**

1. A method of producing a semiconductor laser comprising:
a process of producing a first semiconductor layer comprising n type InP on an n type InP substrate;
a process of producing a diffraction grating of InGaAsP into which impurities are doped or undoped on said first semiconductor layer with irradiating interference fringes by a light exitation crystalline growth method; and
a process of burying a portion of said diffraction grating by InGaAsP into which impurities are undoped or doped



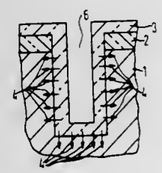
with irradiating interference fringes reverse to said interference fringes in light and darkness.

4,782,036

PROCESS FOR PRODUCING A PREDETERMINED DOPING IN SIDE WALLS AND BASES OF TRENCHES ETCHED INTO SEMICONDUCTOR SUBSTRATES

Frank Becker, Munich, and Erwin Hopf, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 16, 1987, Ser. No. 74,332
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629393
Int. Cl.⁴ H01L *21/385*
U.S. Cl. 437—164 **3 Claims**



1. A process for producing a predetermined doping level in the side walls and base of a trench etched into a semiconductor substrate which comprises:
treating said substrate with a gaseous atmosphere containing tetraethylorthosilicate and trimethylborate in amounts sufficient to form a boron silicate glass,
thermally decomposing said organic compounds at a temperature in the range from 600° to 700° C. and a pressure of 0.1 to 2 mbar to form said boron silicate glass as a layer deposit along said side walls and said bottom,
diffusing said layer dopant into said side walls and said bottom, and
removing the layer deposit remaining after the predetermined amount of diffusion has taken place.

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4,782,037

PROCESS OF FABRICATING A SEMICONDUCTOR INSULATED CIRCUIT DEVICE HAVING A PHOSPHOSILICATE GLASS INSULATING FILM

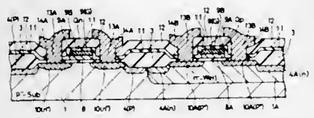
Akihiro Tomozawa, Hinode; Yoku Kaino, Sayama; Shigeru Shimada, Houya; Nozomi Horino, Higashiyamato; Yoshiaki Yoshiura, Tanashi; Osamu Tauchiya, Koganei, and Shozo Hosoda, Tachikawa, all of Japan, assignors to Hatachi, Ltd and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Continuation of Ser. No. 640,516, Aug. 13, 1984, abandoned. This application Oct. 30, 1986, Ser. No. 925,458

Claims priority, application Japan, Nov. 18, 1983, 58-216319; Nov. 18, 1983, 58-216320

Int. Cl.[4] H01L *21/441, 21/473*

U.S. Cl. 437—192 **49 Claims**



1. A process of fabricating a semiconductor integrated circuit device, comprising:

(a) the step of forming over a semiconductor substrate a first conductive layer which comprises a polycrystalline silicon layer and a layer of a silicide of a refractory metal formed on said polycrystalline silicon layer:

(b) the step of forming a first insulating film, by chemical vapor deposition, covering said first conductive layer, said first insulating film having an initial thickness;

(c) the step of forming a second insulating film on said first insulating film;

(d) the step of heating said second insulating film so as to cause glass flow of said second insulating film, said first insulating film having such an initial thickness that, after said step of heating said second insulating film, the thickness of said first insulating film that has not been subjected to glass flow is at least 600 Å, whereby peeling of the layer of a silicide of a refractory metal from the polycrystalline silicon layer is substantially avoided; and

(e) the step of forming a second conductive layer, which comprises an aluminum film, over the second insulating film.

4,782,038

PLATINUM GROUP ALUMINA-SUPPORTED, METAL OXIDATION CATALYSTS AND METHOD OF MAKING SAME

Haren S. Gandhi, Farmington Hills, Mich., and William L. H. Watkins, Toledo, Ohio, assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 26, 1987, Ser. No. 112,642

Int. Cl.[4] B01J *21/04, 23/10, 23/40*

U.S. Cl. 502—304 **20 Claims**

1. A method of making a catalyst system, having an alumina-containing coated substrate, for treating automotive exhaust gases, comprising:

impregnating or depositing onto said substrate a two-phase coating in which a first phase comprises CeO_2 and precious metal of the platinum group in microscale intimacy, and a second phase comprising precious metal of the platinum group substantially devoid of CeO_2 and separated from said CeO_2 in said first phase on a macroscale.

4,782,039

SELECTIVE CATALYTIC REDUCTION CATALYST AND A PROCESS FOR PREPARING THE CATALYST

Keck Lindsey, Boyertown, Pa., assignor to Johnson Matthey, Inc., Valley Forge, Pa.

Filed May 19, 1986, Ser. No. 864,489

Int. Cl.[4] B01J *21/04, 23/10, 23/22*

U.S. Cl. 502—304 **8 Claims**

1. A catalyst consisting essentially of vanadium oxide carried by a mixture of ceria and alumina wherein ceria comprises at least 2% by weight of said mixture on a ceramic or metallic support, said mixture having been calcined at 500° C., the vanadium oxide being incorporated into the catalyst separately from the ceria and alumina.

4,782,040

POROUS MATERIALS HAVING A DUAL SURFACE

Anthony Revis, Ames, Iowa, and Dwight E. Williams, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 9, 1984, Ser. No. 598,120

Int. Cl.[4] B01J *20/32, 20/22;* **B01D** *15/08;* **B32B** *5/14*

U.S. Cl. 502—401 **109 Claims**

1. A method of preparing a dual surface, porous material which comprises

(I) contacting a porous material with a reactive silane intermediate capable of forming covalent bonds with hydroxyl groups on the exterior surface of the porous material wherein said reactive silane intermediate is selected from a group consisting essentially of (i) silenes; (ii) silylenes and (iii) silanones;

(II) allowing the mixture from (I) to react thereby treating the porous material exterior surface;

(III) thereafter, contacting and mixing the treated porous material from (II) with a reactive silane, or its hydrolysis product, for a period of time to allow the reactive silane, or its hydrolysis product, to diffuse into the interior of the porous material and covalently bond with hydroxyl groups on the interior surface of the porous material, and

(IV) subsequently isolating the dual surface porous material from the mixture of (III).

4,782,041

SLIPPING LAYER CONTAINING AMINO-MODIFIED SILOXANE AND ANOTHER POLYSILOXANE FOR DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

Noel R. Vanier, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1988, Ser. No. 173,326

Int. Cl.[4] B41M *5/035, 5/26*

U.S. Cl. 503—227 **20 Claims**

1. In a dye-donor element for thermal dye transfer comprising a support having on one side thereof a dye layer and on the other side a slipping layer comprising a lubricating material in a polymeric binder, said lubricating material comprising a linear or branched aminoalkyl-terminated poly(dialkyl, diaryl or alkylaryl siloxane), the improvement wherein said slipping layer also comprises another polysiloxane, other than said aminoalkyl-terminated polysiloxane, comprising a copolymer of a polyalkylene oxide and a methyl alkylsiloxane wherein said alkyl group has more than one carbon atom.

4,782,042

ANTIBIOTIC A 40926 MANNOSYL AGLYCON

Enrico Selva, Gropello Cairoli; Beth P. Goldstein, Milan; Pietro Ferrari, Ferriere; Giovanni Cassani, Pavia, and Francesco Parenti, Lainate, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Dec. 23, 1986, Ser. No. 945,732

Claims priority, application United Kingdom, Dec. 30, 1985, 8531846

Int. Cl.[4] A61K *37/02;* **C07K** *5/12*

U.S. Cl. 514—9 **4 Claims**

1. Antibiotic A 40926 mannosyl aglycon and the addition salts thereof which has the following characteristics, in the non-addition salt form:

(A) ultraviolet absorption spectrum which exhibits the following absorption maxima:

		λ max (nm)
(a)	0.1 N HCl	280
(b)	phosphate buffer pH 7.38	280 300 (shoulder)
(c)	0.1 N potassium hydroxide	298
(d)	phosphate buffer pH 9.0	282 300 (shoulder)

(B) infrared absorption spectrum which exhibits the following absorption maxima (cm^-): 3700–3100; 3000–2800 (nujol); 1655; 1620–1540; 1505; 1460 (nujol); 1375 (nujol) 1350–1250; 1210; 1150; 1020; 970; 850, 810

(C) ^{1}H-NMR spectrum which exhibits the following groups of signals (in ppm) at 270 MHz recorded in DMSO d_6 (hexadeuterodimethylsulfoxide) plus CF_3COOH using TMS as the internal standard (0.00 ppm), (δ=ppm, multiplicity, attributions): 2.51, s ($DMSOd_5$); 2.50, s (NCH_3); 2.88, m (Z2); 3.30, m (Z'2); 4.08, m (X6); 4.44, d (X5); 4.49, d (X7); 4.83, m (X2); 5.02, s (4F); 5.08, s (Z6); 5.31, s (anomeric proton of mannose); 5.53, d (X4); 5.78, s (4B); 6.08, d (X3); 7.70, s (6B); 6.44–8.52 (aromatic and peptidic NH's)

(D) retention-time (R_t) of 1.18 relative to antibiotic L 17054 (TA3-1) (R_t=8.78 min), when analyzed by reverse phase HPLC under the following conditions:

column: Ultraspere ODS (5 μm) Altex (Beckman) 4.6 mm (i.d.)×250 mm

pre-column : Brownlee Labs. RP 18 (5 μm)

eluent A:	CH_3CN	10%	adjusted at pH 6.0
	(2.5 g/l) $NaH_2PO_4.H_2O$	90%	
eluent B:	CH_3CN	70%	adjusted at pH 6.0
	(2.5 g/l) $NaH_2PO_4.H_2O$	30%	

elution: linear gradient from 5% to 60% of eluent B in eluent A, in 40 min

flow rate: 1.6 ml/min

U.V. detector: 254 nm

internal standard: antibiotic L 17054 (TA3-1) (Gruppo Lepetit S.p.A.)

(E) Rf value of 0.39 in the following chromatographic system:

1 M NaCl containing 5 g/l of $NaH_2PO_4.H_2O$	70
acetonitrile	30
adjusted to pH 6.0, using silanized silica gel	60
F_{254} Merck plates (layer thickness 0.25 mm)	

Visualization:

U.V. light

Yellow color with Pauly Reagent, i.e. diazotized sulfanilic acid (J. Chromatog. 20, 171 (1965), Z. Physiol. Chem. 292, 99, (1953))

Bioautography using *B. subtilis* ATCC 6633 on minimal Davis medium.

(F) A fast atom bombardment (FAB) mass spectrum with $M+H^{\oplus}$ at about 1374.

4,782,043

RENIN INHIBITORS CONTAINING A C-TERMINAL AMIDE CYCLE

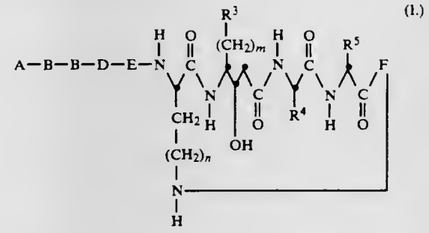
Joshua S. Boger, Bryn Mawr, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 607,081, May 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 504,768, Jun. 15, 1983, Pat. No. 4,485,099. This application Oct. 31, 1985, Ser. No. 793,364

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—11 **1 Claim**

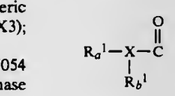
1. A pharmaceutical composition for treating hypertension comprising a peptide of the formula:



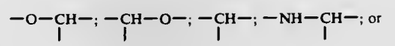
(1.)

wherein:

A is hydrogen; or



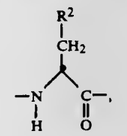
where X is —O—;





and R_a^1 and R_b^1 may be the same or different and are hydrogen; $Y-(CH_2)_p-$ or $Y-(CH_2)_{p'}-CH=CH-(CH_2)_{p''}$, where Y is C_{1-4}alkyl; hydrogen; aryl; C_{3-7}cycloalkyl; or C_{3-7}cycloalkyl or aryl substituted with up to five members independently selected from the group consisting of C_{1-8}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; p is 0 to 5; and p' and p'' are independently 0 to 2; except that where X is —O—, only one of R_a^1 or R_b^1 is present;

B is absent; glycyl; sarcosyl; or

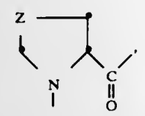


where R^2 is hydrogen; C_{1-4} alkyl; hydroxy C_{1-4} alkyl; aryl; aryl substituted with up to three members selected

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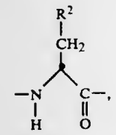
from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and; halo; indolyl; 4-imidazolyl; amino C_{2-4} alkyl; guanidyl C_{2-3} alkyl; or methylthiomethyl;

D is absent; or



where Z is $-(CH_2)_1-$ and l is 1 or 2; or —S—;

E is absent; or

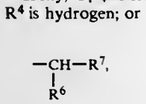


where R^6 is hydrogen; C_{1-4}alkyl; aryl; aryl; C_{1-4}alkyl; or aryl C_{1-4}alkyl or aryl where the aryl portion is substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo; or indolyl;

F is absent; or glycyl;

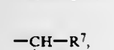
R^3 is C_{3-6} alkyl; C_{3-7} cycloalkyl; aryl; or C_{3-7}cycloalkyl or aryl substituted with up to three members selected from the group consisting of C_{1-4}alkyl, trifluoromethyl, hydroxy, C_{1-4}alkoxy, and halo;

R^4 is hydrogen; or



where R^7 is hydrogen; C_{1-4}alkyl; hydroxy; or C_{3-7}cycloalkyl; and R^6 is as defined above;

R^5 is hydrogen;



where R^6 and R^7 are as defined above; or $-(CH_2)_q-R^8$, where q is 0 or 1–4; and R^8 is heterocyclic; heterocyclic substituted with up to five members independently selected from the group consisting of C_{1-6}alkyl, hydroxy, trifluoromethyl, C_{1-4}alkoxy, halo, aryl, aryl C_{1-4}alkyl, amino, and mono- or di-C_{1-4}alkylamino; guanidyl C_{2-3}alkyl; or amino C_{1-4}alkyl;

m is 1 to 4;

n is 0 to 4; and

wherein all of the asymmetric carbon atoms have and S configuration, except for those in the A, B and D substituents, which may have an S or R configuration; and a pharmaceutically acceptable salt thereof; and one or more antihypertensive agents selected from the group consisting essentially of:

Diuretics: acetazolamide; amiloride; bendroflumethiazide; benzthiazide; bumetanide; chlorothiazide; chlorthalidone; cyclothiazide; ethacrynic acid; furosemide; hydrochlorothiazide; hydroflumethiazide; indacrinone (racemic mixture, or as either the (+) or (−) enantiomer alone, or a manipulated ratio, e.g., 9:1 of said enantiomers, respectively); metolazone; methyclothiazide; muzolimine; polythiazide; quinethazone; sodium ethacrynate; sodium nitroprusside; spironolactone; ticrynafen; triamterene; trichlormethiazide;

α-Adrenergic Block Agents: dibenamine; phentolamine; phenoxybenzamine; prazosin; tolazoline;

β-Adrenergic Blocking Agents: atenolol; metoprolol; nadolol; propranolol; timolol;

((±)-2-[3-(tert-butylamino)-2-hydroxypropoxy]-2-furananilide) (ancarolol);

(2-acetyl-7-(2-hydroxy-3-isopropylaminopropoxy)benzofuran HCl) (befunolol);

((±)-1-(isopropylamino)-3-(p-(2-cyclopropylmethoxyethyl)-phenoxy)-2-propranol HCl) (betaxolol);

(1-[(3,4-dimethoxyphenethyl)amino]-3-(m-tolyloxy)-2-propanol HCl) (bevantolol);

(((±)-1-(4-((2-isopropoxyethoxy)methyl)phenoxy)-3-isopropylamino-2-propanol)fumarate) (bisoprolol);

(4-(2-hydroxy-3-[4-(phenoxymethyl)-piperidino]propoxy)-indole);

(carbazolyl-4-oxy-5,2-(2-methoxyphenoxy)-ethylamino-2-propanol);

(1-((1,1-dimethylethyl)amino)-3-((2-methyl-1H-indol-4-yl)oxy)-2-propanol benzoate) (bopindolol);

(1-(2-exobicyclo[2.2.1]-hept-2-ylphenoxy)-3-[(1-methylethyl)-amino]-2-propanol HCl) (bornaprolol);

(o-[2-hydroxy-3-[(2-indol-3-yl-1,1-dimethylethyl)amino]-propoxy]benzonitrile HCl) (bucindolol);

(α-[(tert.butylamino)methyl]-7-ethyl-2-benzofuranmethanol) (bufuralol);

(3-[3-acetyl-4-[3-(tert.butylamino)-2-hydroxypropyl]-phenyl]-1,1-diethylurea HCl) (celiprolol);

((±)-2-[2-[3-[(1,1-dimethylethyl)amino]-2-hydroxypropoxy]phenoxy]-N-methylacetamide HCl) (cetamolol);

(2-benzimidazolyl-phenyl(2-isopropylaminopropanol));

((±)-3′-acetyl-4′-(2-hydroxy-3-isopropylaminopropoxy)acetanilide HCl) (diacetolol);

(methyl-4-[2-hydroxy-3-[(1-methylethyl)aminopropoxy]]-benzenepropanoate HCl) (esmolol);

(erythro-DL-1-(7-methylindan-4-yloxy)-3-isopropylaminobutan-2-ol);

(1-(tert.butylamino)-3-[0-(2-propynyloxy)phenoxy]-2-propanol (pargolol);

(1-(tert.butylamino)-3-[o-(6-hydrazino-3-pyridazinyl)-phenoxy]-2-propanol diHCl) (prizidilol);

((−)-2-hydroxy-5-[(R)-1-hydroxy-2-[(R)-(1-methyl-3-phenylpropyl)amino]ethyl]benzamide);

(4-hydroxy-9-[2-hydroxy-3-(isopropylamino)-propoxy]-7-methyl-5H-furo[3,2-g][1]-benzopyran-5-one) (iprocrolol);

((−)-5-(tert.butylamino)-2-hydroxypropoxy]-3,4-dihydro-1-(2H)-naphthalenone HCl) (levobunolol);

(4-(2-hydroxy-3-isopropylamino-propoxy)-1,2-benziso-thiazole HCl);

(4-[3-(tert.butylamino)-2-hydroxypropoxy]-N-methylisocarbostyril HCl);

((±)-N-2-[4-(2-hydroxy-3-isopropyl aminopropoxy)-phenyl]ethyl-N′-isopropylurea) (pafenolol);

(3-[[(2-trifluoroacetamido)ethyl]amino]-1-phenoxypropan-2-ol);

(N-(3-(o-chlorophenoxy)-2-hydroxypropyl)-N′-(4′-chloro-2,3-dihydro-3-oxo-5-pyridazinyl)ethylenediamine);

((±)-N-[3-acetyl-4-[2-hydroxy-3-[(1-methylethyl)amino]-propoxy]phenyl]butanamide) (acebutolol);

((±) -4′-[3-(tert-butylamino)-2-hydroxypropoxy]spiro[cyclohexane-1,2′-indan]-1′-one) (spirendolol);

(7-[3-[[2-hydroxy-3-[(2-methylindol-4-yl)oxy]propyl-]amino]butyl]thiophylline) (teoprolol);

((±)-1-tert.butylamino-3-(thiochroman-8-yloxy)-2-propanol) (tertatolol);

((±)-1-tert.butylamino-3-(2,3-xylyloxy)-2-propanol HCl) (xibenolol);

(8-[3-(tert.butylamino)-2-hydroxypropoxy]-5-methyl-coumarin) (bucumolol);

(2-(3-(tert.butylamino)-2-hydroxy-propoxy)benzonitrile HCl) (bunitrolol);

((±)-2′-[3-(tert-butylamino)-2-hydroxypropoxy-5′-fluorobutyrophenone) (butofilolol);

(1-(carbazol-4-yloxy)-3-(isopropylamino)-2-propanol) (carazolol);

(5-(3-tert.butylamino-2-hydroxy)propoxy-3,4-dihydrocarbostyril HCl) (carteolol);

(1-(tert.butylamino)-3-(2,5-dichlorophenoxy)-2-propanol) (cloranolol);

(1-(inden-4(or 7)-yloxy)-3-(isopropylamino)-2-propanol HCl) (indenolol);

(1-isopropylamino-3-[(2-methylindol-4-yl)oxy]-2-propanol) (mepindolol);

(1-(4-acetoxy-2,3,5-trimethylphenoxy)-3-isopropylamino-propan-2-ol) (metipranolol);

(1-(isopropylamino)-3-(o-methoxyphenoxy)-3-[(1-methylethyl)amino]-2-propanol) (moprolol);

((1-tert.butylamino)-3-[(5,6,7,8-tetrahydro-cis-6,7-dihydroxy-1-naphthyl)oxy]-2-propanol) (nadolol);

((S)-1-(2-cyclopentylphenoxy)-3-[(1,1-dimethylethyl-)amino]-2-propanol sulfate (2:1)) (penbutolol);

(4′-[1-hydroxy-2-(amino)ethyl]methanesulfonanilide) (sotalol);

(2-methyl-3-[4-(2-hydroxy-3-tert.butylaminopropoxy)-phenyl]-7-methoxy-isoquinolin-1-(2H)-one);

(1-(4-(2-(4-fluorophenyloxy)ethoxy)phenoxy)-3-isopropylamino-2-propanol HCl);

((−)-p-[3-[(3,4-dimethoxyphenethyl)amino]-2-hydroxypropoxy]-β-methylcinnamonitrile) (pacrinolol);

((±)-2-(3′-tert.butylamino-2′-hydroxypropylthio)-4-(5′-carbamoyl-2′-thienyl)thiazole HCl) (arotinolol);

((±)-1-[p-[2-(cyclopropylmethoxy)ethoxy]phenoxy]-3-(isopropylamino)-2-propanol) (cicloprolol);

((±)-1-[(3-chloro-2-methylindol-4-yl)oxy]-3-[(2-phenoxyethyl)amino]-2-propanol) (indopanolol);

((±)-6-[[2-[[3-(p-butoxyphenoxy)-2-hydroxypropyl-]amino]ethyl]amino]-1,3-dimethyluracil) (pirepolol);

(4-(cyclohexylamino)-1-(1-naphtholenyloxy)-2-butanol);

(1-phenyl-3-[2-[3-(2-cyanophenoxy)-2-hydroxypropyl-]aminoethyl]hydantoin HCl);

(3,4-dihydro-8-(2-hydroxy-3-isopropylaminopropoxy)-3-nitroxy-2H-1-benzopyran) (nipradolol);

α- and β-Adrenergic Blocking Agents:

((±)-1-tert-butylamino)-3-[o-[2-(3-methyl-5-isoxazolyl)-vinyl]phenoxy]-2-propanol) (isoxaprolol);

(1-isopropylamino-3-(4-(2-nitroxyethoxy)phenoxy)-2-propanol HCl);

(4-hydroxy-α-[[3-(4-methoxyphenyl)-1-methylpropyl-]aminomethyl]-3-(methylsulfinyl)-benzmethanol HCl) (sulfinalol);

(5-[1-hydroxy-2-[[2-(o-methoxyphenoxy)ethyl]amino]ethyl]-2-methylbenzenesulfonamide HCl);

(5-[1-hydroxy-2-[(1-methyl-3-phenylpropyl)amino]ethyl]-salicylamide HCl) (labetalol);

(1-((3-chloro-2-methyl-1H-indol-4-yl)oxy)-3-((2-phenoxyethyl)amino)-2-propanol-hydrogenmalonate) (ifendolol);

(4-(2-hydroxy-3-[(1-methyl-3-phenylpropyl)amino]-propoxy)benzeneacetamide);

(1-[3-[[3-(1-naphthoxy)-2-hydroxypropyl]-amino]-3,3-dimethyl-propyl]-2-benzimidazolinone);

(3-(1-(2-hydroxy-2-(4-chlorophenylethyl)-4-piperidyl)-3,4-dihydroxy)quinoxolin-2(1H)-one);

CNS-Acting Agents: clonidine; methyldopa;

Adrenergic Neuron Blocking Agents: guanethidine; reserpine and other rauwolfia alkaloids such as rescinnamine;

Vasodilators: diazoxide; hydralazine; minoxidil;

Angiotensin I Converting Enzyme Inhibitors:

1-(3-mercapto-2-methyl-1-oxopropyl)-L-proline (captopril);

(1-(4-ethoxycarbonyl-2,4(R,R,)-dimethylbutanoyl)indoline-2(S)-carboxylic acid);

(2-[2-[[1-(ethoxycarbonyl)-3-phenyl-propyl]amino]-1-oxopropyl]-1,2,3,4-tetrahydro-3-isoquinoline carboxylic acid);

((S)-1-[2-[[1-(ethoxycarbonyl)-3-phenylpropyl]amino]-1-oxopropyl]octahydro-1H-indole-2-carboxylic acid HCl);

(N-cyclopentyl-N-(3-(2,2-dimethyl-1-oxopropyl)thiol-2-methyl-1-oxopropyl)glycine) (pivalopril);

((2R,4R)-2-(2-hydroxyphenyl)-3-(3-mercaptopropionyl)-4-thiazolidinecarboxylic acid);

(1-(N-[1(S)-ethoxycarbonyl-3-phenylpropyl]-(S)-alanyl)-cis,syn-octahydroindol-2(S)-carboxylic acid HCl);

((−)-(S)-1-[(S)-3-mercapto-2-methyl-1-oxopropyl]indoline-2-carboxylic acid);

([1(S),4S]-1-[3-(benzoylthio)-2-methyl-1-oxopropyl]-4-phenylthio-L-proline;

(3-([1-ethoxycarbonyl-3-phenyl-(1S)-propyl]amino)-2,3,4,5-tetrahydro-2-oxo-1-(3S)-benzazepine-1-acetic acid HCl);

(N-(2-benzyl-3-mercaptopropanoyl)-S-ethyl-L-cysteine) and the S-methyl analogue;

(N-(1(S)-ethoxycarbonyl-3-phenylpropyl)-L-alanyl-L-proline maleate) (enalapril);

N-[1-(S)-carboxy-3-phenylpropyl]-L-alanyl-1-proline;

N^2-[1-(S)-carboxy-3-phenylpropyl]-L-lysyl-L-proline (lysinopril);

Calcium Channel Blockers:

α-[3-[[2-(3,4-dimethoxyphenyl)ethyl]methylamino]-propyl]-3,4-dimethoxy-α-(1-methylethyl)benzeneacetonitrile (verapamil);

1,4-dihydro-2,6-dimethyl-4-(2-nitrophenyl)-3,5-pyridinedicarboxylic acid dimethyl ester (nifedipine);

2-(2,2-dicyclohexylethyl)piperidine (perhexiline);

N-(1-methyl-2-phenylethyl)-γ-phenylbenzenepropanamine (prenylamine);

3-(aminosulfonyl)-4-chloro-N-(2,3-dihydro-2-methyl-1H-indol-1-yl)benzamide (indapamide);

(2′-(2-diethylaminoethoxy)-3-phenylpropiophenone (etafenone);

(4-[4,4-bis-(4-fluorophenyl)butyl]-N-(2,6-dimethylphenyl)-1-piperazineacetamide) (lidoflazine);

(2-(N-benzyl-N-methylamino)ethylmethyl-2,6-dimethyl-4-(m-nitrophenyl)-1,4-dihydro-3,5-pyridinedicarboxylate HCl) (nicardipine);

(N-(3,4-dimethoxyphenethyl)-2-(3,4-dimethoxyphenyl)-N-methyl-m-dithiane-2-propylamine-1,1,3,3-tetraoxide) (tiapamil);

(5,6-dimethoxy-2-(3-[(α-(3,4-dimethoxy)phenylethyl)methylamino]propyl)phthalimidine) (falipamil);

(β-[(2-methylpropoxy)methyl]-N-phenyl-N-phenylmethyl-1-pyrrolidineethanamine HCl monohydrate) (bepridil);

((+)-cis-3-(acetyloxy)-5-[2-(dimethylamino)ethyl]-2,3-dihydro-2-(4-methoxyphenyl)-1,5-benzothiazepin-4-(5H)-one) (diltiazem);

((E)-1-[bis-(p-fluorophenyl)methyl]-4-cinnamylpiperazine di HCl) (flunarizine);

(5-[(3,4-dimethoxyphenethyl)methylamino]-2-isopropyl-2-(3,4,5-trimethoxyphenyl)valeronitrile (gallopamil);

(ethylmethyl(2,3-dichlorophenyl)-1,4-dihydro-2,6-dimethyl-3,5-pyridinedicarboxylate (felodipine);

(isopropyl-2-methoxyethyl-1,4-dihydro-2,6-dimethyl-4-(3-nitrophenyl)-3,5-pyridinecarboxylate) (nimodipine);

(3-ethyl-5-methyl-1,4-dihydro-2,6-dimethyl-4-(3-nitrophenyl)-3,5-pyridine-dicarboxylate) (nitrendipine);

Other Antihypertensive Agents: aminophylline; cryptenamine acetates and tannates; deserpidine; meremethoxylline procaine, pargyline; trimethaphan camsylate; including pharmaceutical salt and ester forms thereof.

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COMPOSITION CONTAINING CORDIODILATIN OR FRAGMENTS THEREOF AND METHODS OF OBTAINING CARDIODILATIN

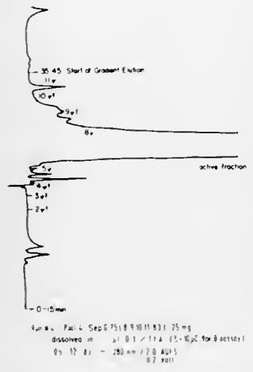
Wolf-Georg Forssmann, Heidelberg, Fed. Rep. of Germany, assignor to ORGANON-Medizinisch-Molekularbiologische Forschungsgellschaft m.b.H, Heidelberg, Fed. Rep. of Germany

Division of Ser. No. 769,627, Aug. 20, 1985, Pat. No. 4,751,284. This application Jan. 4, 1988, Ser. No. 140,736

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346953

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—12 **15 Claims**



1. Composition useful in treating a disease characterized by irregularities in tension or dilation of blood vessels, comprising an ionatropic effective amount of substantially pure peptide hormone cardiodilatin or a fragment thereof, said cardiodilatin characterized by having an isoelectric point of from 6 to 6.5, 126 amino acid residues, and an amino acid composition of Asp/Asn 14, Thr 3, Ser 15, Glu/Gln 12, Pro 10, Gly 12, Ala 10, Val 7, Met 4, Ile 1, Leu 15, Tyr 2, Phe 3, Lys 4, His 2, Arg 10, and Trp 2, and a pharmaceutically acceptable carrier.

4,782,045

PROMOTING THE PROLIFERATION OF INTESTINAL BIFIDOBACTERIA

Yoshiaki Machida, Tokyo; Fumio Fukui, Naritashi, and Takanobu Komoto, Funabashi, all of Japan, assignors to Showa Sangyo Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1986, Ser. No. 853,976

Int. Cl.[4] A61K *35/74, 31/70, 31/715;* **A23C** *9/152*

U.S. Cl. 514—23 **16 Claims**

1. A method for promoting the proliferation of microorganisms of the genus Bifidobacterium, comprising contacting said microorganisms with a growth promoting effective amount of an isomalto-oligosaccharide.

4,782,046

ULTRAPURE HYALURONIC ACID AND METHOD OF MAKING IT

Karen K. Brown, Kansas City, Mo.; Linda L. C. Ruiz, Lenexa, Kans., and Ivo Van De Rijn, Winston-Salem, N.C., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 801,973, Nov. 26, 1985, which is a division of Ser. No. 555,224, Nov. 25, 1983, abandoned. This application Sep. 18, 1986, Ser. No. 910,246

Int. Cl.[4] C08B *37/08;* **A61K** *31/725*

U.S. Cl. 514—54 **4 Claims**

1. A sterile preparation comprising hyaluronic acid or a salt thereof, the preparation having a protein content of less than about 1.25 mg/ml and a nucleic acid content of less than about 45 μg/ml and having a molecular weight range such that at least 98% of the preparation is within a molecular weight range of from about 2.0 million to about 4.0 million as determined by High Performance Liquid Chromatography.

4,782,047

AQUEOUS STEROID FORMULATIONS FOR NASAL ADMINISTRATION

Eric Benjamin, Sunnyvale; Shabbir Anik, Mountain View, and Ya-Yun T. Lin, Cupertino, all of Calif., assignors to Syntex Pharmaceuticals International Ltd., Hamilton, Bermuda

Filed May 22, 1986, Ser. No. 866,171

Int. Cl.[4] A61K *31/58, 31/56*

U.S. Cl. 514—174 **15 Claims**

1. A stable, effectively preservable, substantially non-stinging aqueous anti-inflammatory steroid formulation suitable for intranasal administration, which formulation comprises:

an anti-inflammatory steroid in an amount between about 0.01% and about 0.05% (w/v);

propylene glycol in an amount between about 2% and about 10% (w/v);

PEG 400 in an amount between about 10% and about 25% (w/v);

polysorbate 20 in an amount between about 1% and about 4% (w/v);

an effective amount of preservative;

an effective amount of antioxidant;

an effective amount of stabilizer;

water; and

pH buffering agent sufficient to adjust the pH of the resulting solution to between about 3.5 and about 7.

9. A method of treating inflammation of the nasal mucosa without inducing stinging, which method comprises intranasally administering to a subject in need thereof a substantially non-stinging aqueous anti-inflammatory steroid formulation comprising

an anti-inflammatory steroid in an amount between about 0.01% and about 0.05% (w/v);

propylene glycol in an amount between about 2% and about 10% (w/v);

PEG 400 in an amount between about 10% and about 25% (w/v);

polysorbate 20 in an amount between about 1% and about 4% (w/v);

an effective amount of preservative;

an effective amount of antioxidant;

an effective amount of stabilizer;

water; and

pH buffering agent sufficient to adjust the pH of the resulting solution to between about 3.5 and about 7.

4,782,048

METHOD FOR TREATING OR PREVENTING BOVINE MASTITIS

Peter Upton, Corona Del Mar, Calif., assignor to Nelson Research & Development Co., Irvine, Calif.

Filed Sep. 9, 1986, Ser. No. 905,621

Int. Cl.[4] A61K *31/555, 31/30*

U.S. Cl. 514—184 **10 Claims**

1. A method of treating an animal for mastitis which comprises administering to said animal an effective amount of copper ion, in combination with an organic compound having at least two hydroxyl radicals and at least one unsaturated carbon-carbon bond, to treat or prevent bovine mastitis.

4,782,049

TIN PROTOPORPHYRIN AND TIN MESOPORPHYRIN IN THE TREATMENT OF PSORIASIS

Attallah Kappas; George S. Drummond, both of New York, N.Y., and Lennart Emtestam, Huddinge, Sweden, assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 938,822, Dec. 8, 1986, abandoned. This application Dec. 2, 1987, Ser. No. 125,011

Int. Cl.[4] A61K *31/555*

U.S. Cl. 514—185 **4 Claims**

1. A method for treating psoriasis in a human patient in need of such treatment which comprises administering to the patient an antipsoriatic amount of tin protoporphyrin or tin mesoporphyrin followed by exposure to ultraviolet light.

4,782,050

6-BETA(SUBSTITUTED)-(S)-HYDROXYMETHYL-PENICILLANIC ACIDS AND DERIVATIVES THEREOF

Yuhpyng L. Chen, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 7,319, Jan. 27, 1987, abandoned. This application Dec. 4, 1987, Ser. No. 128,665

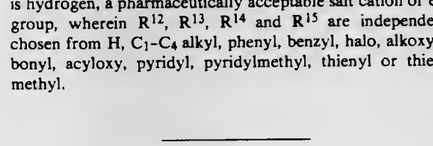
Int. Cl.[4] C07D *499/00;* **A61K** *31/425*

U.S. Cl. 514—192 **27 Claims**

1. A compound of the formula

and a pharmaceutically acceptable salt thereof wherein R^1 is selected from the group consisting of

where R^2 is selected from the group consisting of propargyl, phenyl, vinyl, allyl, cyclopropyl, fluoromethyl, 2-fluoroethyl, 2-hydroxyethyl, methoxy, methoxymethyl, 2-methoxyethyl, methylthiomethyl and 2-thienylmethyl; R^4 is selected from the group consisting of vinyl, allyl and alkyl of one to three carbon atoms; X is selected from the group consisting of hydrogen, methyl, methoxy and fluoro; and R is selected from the group consisting of hydrogen, benzyl, allyl and the residue of an ester group readily hydrolyzable in vivo selected from 3-phthalidyl, 4-crotonolactonyl, gamma-butyrolacton-4-yl,



where R^5 and R^6 are each hydrogen, methyl or ethyl, n is 1 to 5 and R^7 is alkyl having one to six carbon atoms.

4,782,051

2-AZA-SUBSTITUTED 1-CARBADETHIAPEN-2-EM-3 CARBOXYLIC ACIDS

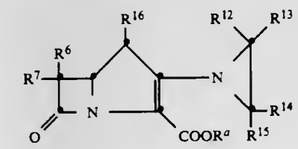
Burton G. Christensen, Cliffside Park; John C. Chabala, Westfield, and Ronald W. Ratcliffe, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 743,118, Jun. 10, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 87,978

Int. Cl.[4] C07D *487/04;* **A61K** *31/495*

U.S. Cl. 514—210 **7 Claims**

1. A compound of the formula:



wherein R^{16} is H or methyl; R^6 is hydrogen and R^7 is selected from hydrogen, linear, branched or cyclic C_1–C_5 alkyl, which can be substituted with fluoro, hydroxy, protected hydroxy; sulfoxy, wherein R^6 and R^7 taken together can also be C_2–C_4 alkylidene, optionally substituted by the above substituents, R^a is hydrogen, a pharmaceutically acceptable salt cation or ester group, wherein R^{12}, R^{13}, R^{14} and R^{15} are independently chosen from H, C_1–C_4 alkyl, phenyl, benzyl, halo, alkoxycarbonyl, acyloxy, pyridyl, pyridylmethyl, thienyl or thienylmethyl.

4,782,052

OCTAHYDROINDOLO[2,3-A]QUINOLIZIN-1-YL-ALKANECARBOXYLIC ACID AMINES AND THEIR THERAPEUTICALLY USEFUL ACID ADDITION SALTS, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM AND PROCESS FOR PREPARING SAME

Ferenc Sóti; Csaba Szántay; Mária Incze; Zsuzsanna Balogh née Kardos; Elemér Ezer; Judit Matuz; László Szporny; György Hajós, and Csaba Kuthi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Oct. 3, 1985, Ser. No. 783,911

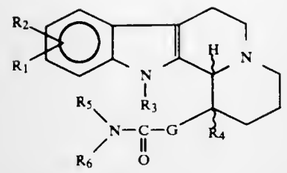
Claims priority, application Hungary, Oct. 5, 1984, 3776/84

Int. Cl.[4] A61K *31/55, 31/535;* **C07D** *471/04*

U.S. Cl. 514—212 **4 Claims**

1. A compound of the Formula (I)

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wherein

R_1 and R_2 stand independently for a hydrogen or halogen atom, or a hydroxyl, nitro or C_1 to C_4 alkoxy group;

R_3 and R_4 stand independently for a hydrogen atom or a C_1 to C_4 alkyl group; and

R_5 and R_6 are each independently selected from the group consisting of C_1 to C_8 alkyl, C_1 to C_8 alkyl substituted by hydroxy or C_1 to C_4 alkoxy, C_3 to C_8 alkenyl, C_3 to C_8 cycloalkyl, phenyl, phenyl substituted by halo, acetyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, phenyl or hydroxy, pyridyl, furyl, thienyl, pyrrolyl, imidazolyl, pyrimidinyl, thiezolyl, naphthyl, quinolinyl, indolyl, quinazolinyl, benzyl, benzyl substituted by one or two C_1 to C_4 alkyl, C_1 to C_4 alkoxy, halo or hydroxy, 1-phenyl-ethyl, 2-phenyl-ethyl, 4-phenyl-butyl, 1-naphthyl-methyl, furfuryl, 2-pyridyl-methyl, thiphen-2-yl-methyl, and 2-(3-indolyl)-ethyl; or

R_5 and R_6 together with the adjacent nitrogen to which they are attached form a C_2 to C_8 α,ω-alkylene group; or

R_5 and R_6 together with the adjacent nitrogen atom to which they are attached form a morpholinyl or N-methyl-piperazinyl group; and

G is a C_1 to C_4 straight alkylene chain; or a pharmaceutically acceptable acid addition salt thereof.

4,782,053

FUNGICIDAL COMPOSITIONS

Roger B. Pettman, Wychling, and Paul J. Kuhn, Faversham, both of England, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

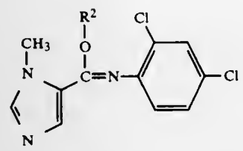
Filed Aug. 28, 1987, Ser. No. 90,275

Claims priority, application United Kingdom, Sep. 23, 1986, 8622900

Int. Cl.[4] A01N *43/56, 43/64, 43/84*

U.S. Cl. 514—231.2 **8 Claims**

1. A composition comprising a morpholine-type fungicide selected from the group consisting of 2,6-dimethyl-4-tridecyl-morpholine and 2,6-dimethyl-4-(2-methyl-3-(4-tert-butylphenyl))-propylmorpholine and a imidazole derivative of formula (I):



(I)

where R^2 represents an alkyl group having 4 or 5 carbon atoms, in which the ratio of morpholine-type fungicide to imidazole derivative is from 1:2 to 3:1 based on parts by weight of active ingredients.

4,782,054

TETRAHYDROQUINOLINE MORPHOLINE COMPOUNDS, COMPOSITIONS AND USE

Gilbert Régnier, Chatenay Malabry; Claude Guillonneau, Clamart, and Jean Lepagnol, Chatou, all of France, assignors to ADIR et Compagnie, Neuilly-sur-Seine, France

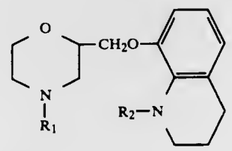
Filed Mar. 4, 1988, Ser. No. 164,103

Claims priority, application France, Mar. 24, 1987, 87 04047

Int. Cl.[4] A61K *31/535;* **C07D** *413/12*

U.S. Cl. 514—235.2 **13 Claims**

1. A compound selected from the group consisting of: morpholine compounds of the general formula I:



(I)

in which

R_1 is selected from the group consisting of: hydrogen

straight-chain and branched (C_1–C_6) alkyl, and those alkyl containing a double bond;

aralkyl of the formula Ar—$(CH_2)_m$— in which Ar is selected from the group consisting of unsubstituted aryl and aryl mono- and poly-substituted by a substituent selected from the group consisting of halogen, (C_1–C_5) alkyl, (C_1–C_5) alkoxy, and —O—$(CH_2)_n$—O— in which n is selected from 1 and 2;

and m is an integer from 1 to 3;

(C_5–C_6) cycloalkyl, and

acyl of the formula R′—CO— in which R′ is (C_1–C_2) alkyl; and

R_2 is selected from the group consisting of;

hydrogen,

straight-chain and branched (C_1–C_6) alkyl, and those alkyl containing a double bond;

aralkyl of the formula Ar—$(CH_2)_m$—, in which Ar and m are as defined above, and

acyl of the formula R′—CO— in which R′ has the meaning given above;

their enantiomers, and

physiologically tolerable acid addition salts thereof.

12. Pharmaceutical compositions containing as active ingredient a compound of claim 1 together with a suitable pharmaceutical carrier.

4,782,055

IMIDAZOPYRIDINE COMPOUNDS USEFUL IN THE TREATMENT OF ULCERS

Ikuo Ueda, Toyonaka; Youichi Shiokawa, Ibaraki; Kazuhiko Take, Osaka, and Hiromichi Itani, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

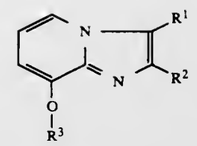
Continuation-in-part of Ser. No. 865,331, May 21, 1986. This application Dec. 16, 1986, Ser. No. 942,379

Claims priority, application United Kingdom, Dec. 16, 1985, 8530878; Nov. 20, 1986, 8627736

Int. Cl.[4] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—241 **14 Claims**

1. An imidazopyridine compound of the formula:



wherein

R^1 is lower alkynyl or lower alkynyloxy(lower)alkyl,

R^2 is lower alkyl, and

R^3 is mono(or di or tri)phenyl(lower)alkyl substituted by lower alkoxy, lower alkylthio, nitro or lower alkanesulfonyl, mono(or di or tri)phenyl(lower)alkyl substituted by nitro and one or two additional substituent(s) selected from nitro and lower alkyl, heterocyclic(lower)alkyl in which the heterocyclic moiety is selected from thienyl, furyl, pyrrolyl, pyrazolyl, thiazolyl, thiadiazolyl, triazolyl, pyridyl, pyridazinyl or triazinyl, or said heterocyclic(lower)alkyl substituted by at least one substituent selected from the group consisting of lower alkyl, lower alkoxy, and lower alkanamido, and a pharmaceutically acceptable salt thereof.

4,782,056

2-PHENYLHEXAHYDRO-1,2,4-TRIAZINE-3-,5-DIONES

Manfred Rösner, Eppstein, and Wolfgang Raether, Dreieich, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 903,752

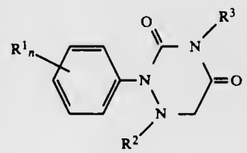
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531919

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.[4] A61K *31/53;* **C07D** *253/06*

U.S. Cl. 514—242 **6 Claims**

1. A compund of the formula I



(I)

in which:

n is one, two or three and the individual substituents

R^1, independently of one another, each is

(a) hydrogen, F, Cl, Br, I, trifluoromethyl, alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl, each having 1 to 6 carbon atoms in the alkyl radical, benzylthio, benzylsulfinyl or benzylsulfonyl, nitro, cyano, amino, alkylamino or dialkylamino, each having 1 to 12 carbon atoms in the alkyl radical, acylamino having 1 to 6 carbon atoms in the acyl radical, or

(b) a phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl, benzoyl, benzoylamino or anilino radical, each of which is substituted once, twice or three times by one of the substituents mentioned under (a);

R^2 is hydrogen, straight-chain or branched alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, benzyl which is unsubstituted or substituted by F, Cl, Br or (C_1–C_4)-alkyl, straight-chain or branched alkanoyl which has 1 to 12 carbon atoms and is unsubstituted or substituted once, twice or three times by F, Cl, Br, or benzoyl which is unsubstituted or substituted once or twice by F, Cl, Br or (C_1–C_4)-alkyl;

R^3 is hydrogen, straight-chain or branched alkyl having 1 to 12 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, or benzyl which is unsubstituted or substituted by F, Cl, Br or (C_1–C_4)-alkyl,

with the proviso that at least one of the radicals R^2 and R^3 is not hydrogen, and their salts.

6. A method for combatting coccidiosis in animals which comprises administering to said animals an effective amount of a compound of formula I as claimed in claim 1.

4,782,057

BENZO[H]CINNOLINE COMPOUND, A METHOD OF PREPARING SAID COMPOUND AND A PHARMACEUTICAL COMPOSITION

Tetsuya Tahara, Nakatsu; Minoru Kawakami, Chikujo; Shuzo Takehara, Nakatsu, and Masamitsu Sakamori, Chikujo, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP85/00471, § 371 Date Mar. 25, 1986, § 102(e) Date Mar. 25, 1986, PCT Pub. No. WO86/01506, PCT Pub. Date Mar. 13, 1986

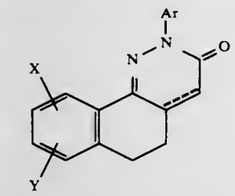
PCT Filed Aug. 26, 1985, Ser. No. 848,371

Claims priority, application Japan, Aug. 28, 1984, 59-178789

Int. Cl.[4] C07D *237/36;* **A61K** *31/50*

U.S. Cl. 514—248 **9 Claims**

1. A benzo[h]cinnoline compound of the formula



wherein

X is hydrogen, halogen, trifluoromethyl, hydroxy, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro, cyano or alkanoyl having 2 to 4 carbon atoms, and

Y is hydrogen, halogen, hydroxy or alkoxy having 1 to 4 carbon atoms, with the provisos that

when Y is hydrogen, X is hydrogen, halogen, trifluoromethyl, hydroxy, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro, cyano or alkanoyl having 2 to 4 carbon atoms,

when Y is halogen, X is hydrogen or hydroxy, and

when Y is alkoxy having 1 to 4 carbon atoms, X is hydrogen or alkoxy having 1 to 4 carbon atoms, and

Ar is phenyl or 2-pyridyl which may be optionally substituted by a substituent selected from the group consisting of halogen, trifluoromethyl, hydroxy, alkyl having 1 to 4 carbon atoms, amino, alkanoylamido having 2 to 4 carbon atoms, nitro and cyano; and the bond position indicated by the dotted line is a single bond or double bond.

4,782,058

1,3,4,6,7,11B-HEXAHYDRO-6-PHENYL-2H-PYRAZINO-(2,1-A)ISOQUINOLINES, FOR ANTI-HISTAMINE OR ANTI-DEPRESSION TREATMENT

Ronald C. Griffith, Pittsford, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 727,698, Apr. 26, 1985, abandoned. This application Dec. 3, 1987, Ser. No. 129,918

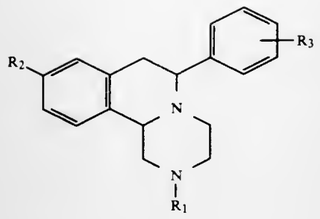
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] C07D *217/24, 217/22, 471/04;* **A61K** *31/495*

U.S. Cl. 514—250 **10 Claims**

1. A compound of the formula

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wherein

R_1 is hydrogen, C_1-C_7 alkyl, C_3-C_7 cycloalkyl, or C_4-C_8 cycloalkylmethyl;

R_2 is hydrogen, hydroxy, or C_1-C_7 alkoxy; and

R_3 is a single or multiple substitution by hydrogen, hydroxy, halogen, C_1-C_7 alkoxy, C_1-C_7 alkyl or trifluoromethyl; all stereoisomeric forms thereof, and pharmaceutically acceptable addition salts thereof.

9. A method of treating an allergy comprising the administration of an effective amount of a compound of claim **1** to a mammal in need of such treatment.

10. A method of treating depression comprising the administration of an effective amount of a compound of claim **1** to a mammal in need of such treatment.

4,782,059

METHOD OF CONTROLLING MYCOTIC INFECTIONS AND COMPOSITIONS THEREFOR

Hans H. Gadebusch, Yardley, Pa., and Mary E. Valiant, Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 29, 1986, Ser. No. 913,044

Int. Cl.⁴ A61K *31/50, 31/495, 31/135*

U.S. Cl. 514—252 **7 Claims**

1. A method for treating subjects with mycotic infecions comprising directing to the site where control is desired by administering a fungicidally effective amount of:

(1) a compound having 14α-methyldemethylase inhibitor activity and named cis-1-acetyl-4-[4-[[2-(2,4-dichlorophenyl)-2-(1H-imidazol-1-ylmethyl)-1,3-dioxolan-4-yl]-methoxy]phenyl]piperazine(ketoconazole); and

(2) a compound having squalene epoxidase inhibitor activity and named N-methyl-N-(3-phenylpropenyl)-1-naphthalenemethamine hydrochloride (naftifine);

wherein the compound having 14α-methyldemethylase inhibitor activity is employed in an amount of from about 2.85 to 4.75 mg/kg of body weight, and wherein the compound having squalene epoxidase inhibitor activity is employed in an amount of from about 2.85 to 4.75 mg/kg of body weight.

4,782,060

GEPIRONE FOR ALLEVIATION OF PANIC DISORDERS

Neil Kurtz, Weston, Conn.; Roger E. Newton, Evansville, Ind., and Davis L. Temple, Jr., Wallingford, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 29, 1987, Ser. No. 79,190

Int. Cl.⁴ A61K *31/50, 31/495*

U.S. Cl. 514—252 **8 Claims**

1. A method for alleviation of panic disorders which comprises administering a non-toxic therapeutically effective dose of gepirone or a pharmaceutically acceptable acid addition salt thereof to a patient in need of such treatment.

4,782,061

METHOD OF TREATING PSYCHOTROPIC CONDITIONS EMPLOYING SUBSTITUTED PIPERAZINE COMPOUNDS

Cornelis G. Kruse; Johannes A. M. van der Heyden; Ineke van Wijngaarden; Jan Hartog, and Berend Olivier, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

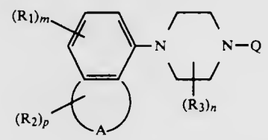
Filed Dec. 18, 1985, Ser. No. 810,207

Claims priority, application Netherlands, Dec. 21, 1985, 8403918

Int. Cl.⁴ A61K *31/495*

U.S. Cl. 514—254 **2 Claims**

1. A method of treating affections and diseases which are the result of disturbances in the central nervous system, characterized in that it comprises as active substance, a compound of the formula (1) is used;



(1)

wherein:

A together with the two carbon atoms of the phenyl group forms a 5-membered unsaturated ring having one or two hetero atoms of the group O, N and S;

Q is a straight, branched or cyclic, saturated or unsaturated chain of 1-10 carbon atoms and 0-3 N and/or O atoms, which chain may be substituted with a keto group, 1-6 halogen atoms, 1-3 phenyl groups which may be substituted with 1-2 substituents selected from alkyl with 1-5 carbon atoms, halogen, trifluoromethyl, nitro, cyano, dimethylamino and methylsulfonyl, or the chain may be substituted with one mono- or bicyclic heterocyclic group with 5-10 ring atoms of which 1-4 are hetero atoms of the group N, O or S, which heterocyclic group may be substituted with 1-3 alkyl or alkoxy groups with 1-5 carbon atoms, keto groups, or with a phenyl group which may be substituted with 1-3 halogen atoms, with the proviso that chain nitrogen atoms are substituted with 1 or 2 alkyl or hydroxyalkyl groups with 3-7 carbon atoms, or with a phenyl group;

R_1 and R_2 may be alkyl or alkoxy with 1-5 carbon atoms, hydroxyl, nitro, cyano, halogen, trifluoromethyl;

m has the value 0-1;

p has the value 0-1;

R_3 is an alkyl group having 1-5 carbon atoms; and n has the value 0-2,

or a pharmaceutically acceptable acid addition salt thereof.

4,782,062

9-(2-HYDROXYMETHYL)CYCLOALKYLMETHYL) GUANINES

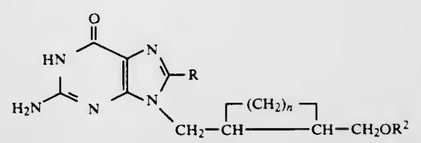
Richard L. Tolman, Warren, N.J.; John D. Karkas, New York, N.Y., and Wallace T. Ashton, Clark, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 11, 1987, Ser. No. 48,289

Int. Cl.⁴ C07D *473/18;* **A61K** *31/52*

U.S. Cl. 514—262 **6 Claims**

1. A 9-[2-(hydroxymethyl)cycloalkylmethyl]-8-substituted-guanine of the formula:



wherein R is H, halogen, C_1-C_4-straight or branched-chain alkyl; n is 2 to 6; and

R^2 is H or



wherein R^1 is C_1-C_{12}-straight or branched-chain alkyl, phenyl or naphthyl, or a pharmaceutically-acceptable salt thereof.

4,782,063

ERGOLINE ESTERS USEFUL AS SEROTONIN ANTAGONISTS

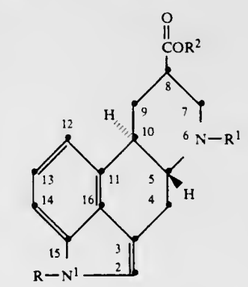
William L. Garbrecht; Gifford P. Marzoni, both of Indianapolis, and Pawel Fludzinski, Zionsville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 11, 1987, Ser. No. 48,166

Int. Cl.⁴ A61K *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **3 Claims**

1. A compound of the formula

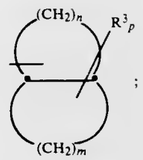


wherein:

R is a primary or secondary C_1-C_8 alkyl group, $—CH_2—C_2—C_4$ alkenyl, C_3-C_8 cycloalkyl, or C_3-C_6 cycloalkyl substituted with one or more primary or secondary C_1-C_5 alkyl groups, with the proviso that the total number of carbon atoms in R does not exceed 8;

R^1 is C_1-C_4 alkyl;

R^2 is



R^3 is hydroxy, C_1-C_4 alkoxy, halo, C_1-C_4 alkyl or



R^4 is hydroxy, C_1-C_4 alkoxy or amino;

m is 3 or 4;

n is 3 or 4;

p is 0, 1, or 2; and

the pharmaceutically acceptable salts thereof.

3. A pharmaceutical formulation for treating hypertension comprising an anti-hypertensive effective amount of a compound of claim **1** and a suitable carrier diluent, or excipient therefor.

4,782,064

2-HETEROARYL-ALKYL-1H-BENZ[DE]-ISOQUINOLINE-1,3(2H)-DIONES

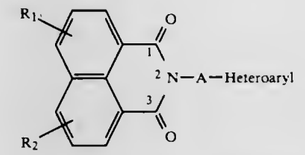
William B. Wright, Jr., Woodcliff Lake; Andrew S. Tomcufcik, Old Tappan, both of N.J., and Nancy H. Eudy, Cornwall-On-Hudson, N.Y., assignors to American Cyanamid Co., Stamford, Conn.

Filed Jul. 21, 1986, Ser. No. 887,688

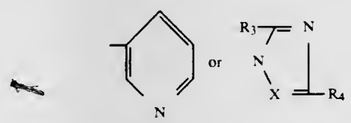
Int. Cl.⁴ A61K *31/47;* **C07D** *401/06, 249/08, 233/61*

U.S. Cl. 514—296 **17 Claims**

1. A method of treating diseases characterized by an imbalance of thromboxane A2 and prostacycline in a mammal which comprises administering internally to said mammal a pharmacologically effective amount of a compound selected from those of the formula:



wherein A is a divalent moiety of the formula: $—C_nH_{2n}—$ or $—CH_2CH=CHCH_2—$ where n is an integer from 3 to 8, inclusive; R_1 and R_2 may be the same or different and may be selected from the group consisting of hydrogen, halogen, alkoxy having from one to four carbon atoms, alkyl having from one to four carbon atoms, nitro and amino; and where Heteroaryl is



wherein R_3 and R_4 may be hydrogen, alkyl having from one to four carbon atoms or phenyl; and X is CH or N; together with the pharmaceutically acceptable acid-addition salts thereof.

2. The compound 2-[3-(1H-imidazol-1-yl)propyl]-1H-benz-[de]isoquinoline-1,3(2H)-dione.

15. A composition of matter in dosage unit form comprising from about 10 mg to about 700 mg of a compound

2[3-(1H-imidazol-1-yl)propyl]-1H-benz[de]isoquinoline-1,3-4-(1H-imidazol-1-yl)butyl-1H-benz[de]isoquinoline-1,3-(2H-dione;

2[4-(1H-imidazol-1-yl)pentyl-1H-benz -2H)-dione;

2[5-(1H-imidazol-1-yl)octyl-1H-benz isoquinoline-1,3-(2H)-dione;

2-[8-(1H-imidazol-1-yl)octyl]-1-benz[de]isoquinoline-1,3-(2H)-dione;

2[4-(3-pyridinyl)butyl-1H-benz isoquinoline-1,3(2H)-dione;

2[3-(1H-imidazol-1-yl)butyl-1H-benz isoquinoline-1,3-(2H)-dione;

6-amino-2-[4-(1H-imidazol-1-yl)butyl-1H-benz[de]isoquinoline-1,3(2H)-dione, dihydrochloride;

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2-[3-(1H-imidazol-1-yl)propyl-5-nitro-1H-benz isoquino-line-1,3(2H)-dione;
2-[4-(1H-imidazol-1-yl)butyl-5-nitro-1H-benz[de]-isoquino-line-1,3(2H)-dione;
5-nitro-2-[3-(1H-1,2,4-triazol-1-yl)propyl-1H-benz isoquino-line-1, 3(2H)-dione;
2-3-(1H-imidazol-1-yl)butyl-5-nitro-1H-benz[de]isoquinoline-line-1,3(2H)-dione; or
6-chloro-2-[4-(1H-imidazolyl-1-yl)butyl 1H-benze isoquinoline -1,3(2H)-dione, monohydrochloride or the pharmaceutically acceptable acid-addition salts thereof and a pharmaceutically acceptable excipient.

17. The method according to claim 1 wherein the diease is ischemic heart disease, transient ischemic attack, thrombosis or migrane.

4,782,065

METHODS AND COMPOSITIONS FOR TREATING VIRAL INFECTIONS

Thomas Albrecht, and Odd S. Steinsland, both of Galveston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Division of Ser. No. 601,471, Apr. 18, 1984, Pat. No. 4,663,317. This application Jan. 13, 1987, Ser. No. 2,981
Int. Cl.[4] A61K *31/44, 31/47*
U.S. Cl. 514—299 **6 Claims**

1. A method for treating cytomegalovirus infections in an infected human host comprising administering an effective amount of papaverine or dioxyline to the infected human host.

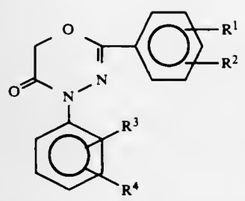
4,782,066

SUBSTITUTED OXADIAZINONE MITICIDAL COMPOSITIONS AND USE

Mark A. Dekeyser, Waterloo; Anupama Mishra, Guelph, both of Canada, and Richard C. Moore, Wallingford, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd., Don Mills, Canada

Division of Ser. No. 725,029, Apr. 19, 1985, Pat. No. 4,670,555. This application Feb. 24, 1987, Ser. No. 18,252
Int. Cl.[4] A01N *43/88*
U.S. Cl. 514—229.2 **7 Claims**

1. A miticidal composition comprising a compound having the structural formula



wherein R^1 and R^2 are the same or different and are hydrogen, fluorine, chlorine, iodine, C_1–C_2 fluoroalkyl, C_1–C_2 chloroalkyl, C_1–C_2 bromoalkyl, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_7–C_9 aralkyl, phenyl, C_1–C_6alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylsulfinyl, C_7–C_9 aralkoxy, phenoxy, phenylthio, phenylsulfinyl, alkali metal carboxylate, C_2–C_5 alkoxycarbonyl, phenoxycarbonyl or $—NR^5R^6$; with the proviso that R^1 and R^2 cannot both be hydrogen if R^3 and R^4 are both hydrogen or if one of R^3 and R^4 is hydrogen and the other is nitro;

R^3 and R^4 are the same or different and are C_1–C_4 alkoxysulfonyl, nitro, $—OCX_nH_3$, hydrogen, fluorine, chlorine, bromine, iodine, C_1–C_2 fluoroalkyl, C_1–C_2 chloroalkyl, C_1–C_2 bromoalkyl, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_7–C_9 aralkyl, phenyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylsulfinyl, C_7–C_9 aralkoxy, phenoxy, phenylthio, phenylsulfinyl, alkali metal carboxylate, C_2–C_5 alkoxycarbonyl or $—NR^5R^6$;

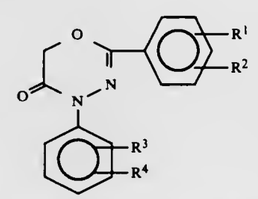
R^5 and R^6 are the same or different and are hydrogen or C_1–C_2 alkyl with the proviso that when R^5 and R^6 are both hydrogen the R^2, R^3 and R^4 cannot all be hydrogen;

X is fluorine, chlorine or bromine and

n is 1, 2 or 3 and

a carrier therefor.

5. A process for controlling mites comprising applying a miticidally effective amount of a compound having the structural formula



where R^1 and R^2 are the same or different and are hydrogen, fluorine, chlorine, bromine, iodine, C_1–C_2 fluoroalkyl, chloroalkyl, bromoalkyl, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_7–C_9 aralkyl, phenyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylsulfinyl, C_7–C_9 aralkoxy, phenoxy, phenylthio, phenylsulfinyl, alkali metal carboxylate, C_2–C_5 alkoxycarbonyl or $—NR^5R^6$;

R^3 and R^4 are the same or different and are C_1–C_4 alkoxysulfonyl, nitro, $—OCX_nH_{3-n}$ or one of the meanings given for R^1 and R^2;

R^5 and R^6 are the same or different and are hydrogen or C_1–C_2 alkyl;

X is fluorine, chlorine or bromine; and

n is 1, 2 or 3.

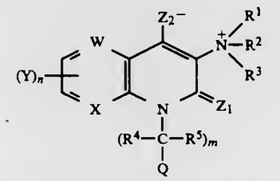
4,782,067

ANTI-ALLERGIC COMPOSITION CONTAINING ZWITTERIONIC BICYCLIC COMPOUNDS

David J. Blythin, North Caldwell, and Ho-Jane Shue, Pine Brook, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 760,196, Jul. 29, 1985, Pat. No. 4,684,727. This application Jul. 22, 1987, Ser. No. 76,469
Int. Cl.[4] A61K *31/435*
U.S. Cl. 514—300 **40 Claims**

1. A pharmaceutical composition useful for treating allergic reactions, inflammation, peptic ulcers and/or hyperproliferative skin disease comprising an antiallergic, antiinflammatory, cytoprotective and/or anti-hyperproliferative effective amount of a compound having the structural formula I



(I)

or a pharmaceutically acceptable salt or solvate thereof, in combination with a pharmaceutically acceptable carrier wherein:

W and X may be the same or different and each independently represents —CH= or —N=;

Z_1 and Z_2 are the same or different and each independently represents O or S;

R^1, R^2, R^3, R^4 and R^5 are the same or different and each may

be independently selected from the group consisting of H, alkyl having from 1 to 12 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, alkoxyalkyl having from 1 to 6 carbon atoms in the alkoxy portion and from 2 to 6 atoms in the alkyl portion thereof, hydroxyalkyl having from 2 to 8 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, acyloxyalkyl having from 1 to 6 carbon atoms in the acyloxy portion and from 2 to 8 carbon atoms in the alkyl portion thereof, and $—R^6—CO_2R^O$ wherein R^6 represents an alyklene group having from 1 to 6 carbon atoms and R^O represents hydrogen or an alkyl group having from 1 to 6 carbon atoms, with the provisos that the OH of the hydroxyalkyl group and the acyloxy of the acyloxyalkyl group are not joined to the same carbon atom as another heteroatom, that at least one of R^1, R^2 and R^3 is not hydrogen and that, when R^1, R^2 and/or R^3 are alkenyl or alkynyl, there is at least one carbon-carbon single bond between the nitrogen atom and the carbon-carbon double or triple bond;

in addition, one of R^1, R^2 or R^3 can be an aryl group containing 6 to 15 carbon atoms or an aromatic heterocyclic group containing 3 to 14 carbon atoms, either of which can be substituted with one to three substituents Y as defined below;

in further addition, two of R^1, R^2 adn R^3 can be joined together to represent an imidazolyl ring or to represent a ring which can contain from 2 to 8 carbon atoms, said ring optionally containing a —O—, —S— and/or $—NR^4—$ heteroatomic group (wherein R^4 is as defined above) and/or optionally containing a carbon-carbon double bond, and said ring optionally being substituted with one to three additional substituents R^7 which substituents may be the same or different and are each independently selected from OH with the proviso that OH is not on a carbon already joined to a hetero atom, —O—acyl having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 8 carbon atoms, alkoxyalkyl having from 1 to 6 carbon atoms in each alkyl portion thereof, alkyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carobn atoms, $—COOR^{10}$ wherein R^{10} is H, alkyl or aryl containing from 6–15 carbon atoms, or any two R^7 substituent groups may represent a hydrocarbon ring having from 4 to 8 total carbon atoms;

in still further addition, all three of R^1, R^2, and R^3 can be joined together to represent a polycyclic ring, which polycyclic ring can optionally be substituted by one to three substituents groups R^7 as defined above;

m is an integer of from 0 ot 3;

n is an integer of from 0 to 3;

Q represents an aryl group containing 6 to 15 carbon atoms or an aromatic heterocyclic group containing 3 to 14 carbon atoms, either of which group can optionally be substituted with 1 to 3 substituents Y as define below;

each Y substituent is independently selected from the group consisting of hydroxy, alkyl having from 1 to 6 carbon atoms, halogen, NO_2, alkoxy having from 1 to 6 carbon atoms, trifluoromethyl, cyano, cycloalkyl having from 3 to 7 carbon atoms, alkenyloxy having from 3 to 6 carbon atoms, alkynyloxy having 3 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, $—S(O)_n—R^8$ (wherein R^8 represents aklyl having from 1 to 6 carbon atoms and n is as defined above), $—SO_2NH_2$, $—CO—R^9$ (wherein R^9 represents OH, $—NH—R^8$ or $—O—R^8$, where R^8 is as defined above), $—O—B—COR^9$ (wherein B represents an alkylene group having from 1 to 4 carbon atoms and R^9 is as defined above), $—NH_2$, —NHCHO, $—NH—CO—R^9$ (wherein R^9 is as defined above, with the proviso that it is not hydroxy), $—NH—COCF_3$, $—NH—SO_2R^8$ (wherein R^8 is as defined above), and $—NH-SO_2CF_3$.

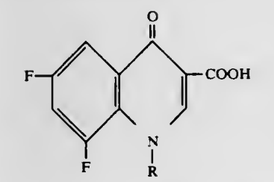
4,782,068

NEW QUINOLINE DERIVATIVES, THEIR PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING THE SAME

André Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques, France

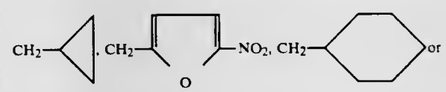
Continuation of Ser. No. 730,788, May 3, 1985, abandoned. This application Mar. 4, 1987, Ser. No. 22,620
Claims priority, application United Kingdom, May 11, 1984, 8412094
Int. Cl.[4] A61K *31/47;* **C07D** *215/18*
U.S. Cl. 514—312 **2 Claims**

1. Quinoline compounds of the formula:

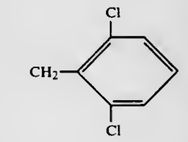


I

wherein R stands for C_2H_4F, $CH_2—O—CH_2—CH_2OH$,



or



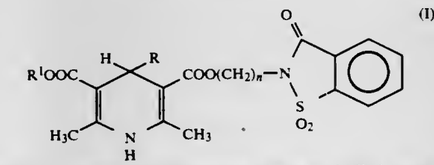
4,782,069

1,4-DIHYDROPIRIDINES AND THEIR USE AS ANTITHROMBOTIC DRUGS

Carlos Sunkel; Miguel Fau de Casa-Juana; Fernando Dorrego; Jaime Priego; Pilar Ortega, and Javier Cillero, all of Madrid, Spain, assignors to Alter, S.A., Madrid, Spain

Filed May 18, 1987, Ser. No. 51,852
Claims priority, application Fed. Rep. of Germany, May 28, 1986, 3617976
Int. Cl.[4] C07D *417/12;* **A61K** *31/38*
U.S. Cl. 514—338 **11 Claims**

1. A 1,4-dihydropyridine of formula I



(I)

wherein, R represents hydrogen or a saturated alkyl group with a linear or branched chain of 1 to 8 carbon atoms, R^1 represents an alkyl group with a linear, or branched, saturated chain of 1 to 12 carbon atoms, or cyclic chain of 3–12 carbon atoms, or

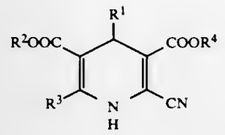
a 2-(N-salicylamido) ethyl group, and

n is a number equal to 1 or 2.

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4,782,070
CEREBRAL DYSFUNCTION THERAPEUTIC AGENT, WHICH COMPRISES A DIHYDROPYRIDINE COMPOUND
Takaharu Ono, Osaka; Toshiharu Kamitani, Yamatokooriyama, and Minoru Obtsuka, Kobe, all of Japan, assignors to Fujisawa Pharmacentical Co., Ltd., Osaka, Japan
Filed Jun. 19, 1987, Ser. No. 63,911
Claims priority, application Japan, Jul. 1, 1986, 61-154739
Int. Cl.⁴ A61K *31/44*
U.S. Cl. 514—344 **2 Claims**

1. A method for the treatment of cerebral dysfunction in a mammalian subject which comprises administering to said subject an effective amount of a dihydropryidine compound of the formula:

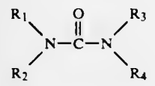


(I)

wherein
R^1 is 3-nitrophenyl, and
R^2, R^3 and R^4 are each lower alkyl,
or a pharmaceutically acceptable salt thereof.

4,782,071
TETRASUBSTITUTED UREA CHOLINERGIC AGENTS
Donald E. Butler, Holland; David M. Lustgarten, Ann Arbor; Walter H. Moos, Ann Arbor, and Anthony J. Thomas, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Nov. 3, 1986, Ser. No. 926,163
Int. Cl.⁴ A01N *43/40;* **C07D** *239/02*
U.S. Cl. 514—353 **25 Claims**

1. A compound having the formula



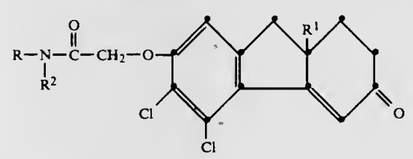
wherein R_1 and R_2 are each independently
phenyl;
phenyl substituted with
alkyl of from one to four carbon atoms,
alkyloxy of from one to four carbon atoms,
halogen,
hydroxyl,
nitro,
trifluoromethyl, or
—NR_5R_6 where R_5 and R_6 are independently hydrogen or alkyl of from one to four carbon atoms;
wherein R_3 is 2-, 3-, or 4-pyridinyl and R_4 is
phenyl; or
phenyl substituted with
alkyl of from one to four carbon atoms,
alkyloxy of from one to four carbon atoms,
alkoxycarboyl of from two or five carbon atoms,
halogen,
hydroxy,
nitro,
trifluoromethyl, or
—NR_5R_6 where R_5 and R_6 are as defined above;
or a pharmaceutically acceptable salt thereof.

4,782,072
THIADIAZOLE DERIVATIVE
Michael R. Stillings, Hull, Great Britain, assignor to Reckitt & Colman Products Limited, London, Great Britain
Filed Oct. 27, 1987, Ser. No. 113,076
Claims priority, application United Kingdom, Oct. 28, 1986, 8625774
Int. Cl.⁴ C07D *285/12;* **A61K** *31/41*
U.S. Cl. 514—363 **6 Claims**

1. 2-Aminomethyl-5-(2-biphenylyl)-1,3,4-thiadiazole and its non-toxic salts.

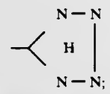
4,782,073
AMIDES OF [(5,6-DICHLORO-3-OXO-9-ALPHA-SUBSTITUTED-2,3,9,9-ALPHA-TETRAHYDROFLUOREN-7-YL-OXYL]ACETIC ACIDS, AND PHARMACEUTICAL COMPOSITIONS THEREOF
Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
Filed Dec. 24, 1986, Ser. No. 946,544
Int. Cl.⁴ C07D *257/06, 143/72, 125/08;* **A61K** *31/41*
U.S. Cl. 514—381 **7 Claims**

1. A compound of the formula:



(I)

wherein:
R is —CN,SO_2—C_1—C_6 alkyl,

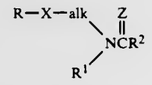


R^1 is lower alkyl, branched or unbranched, containing from 1 to 3 carbon atoms or hydroxy-lower alkyl containing 1 to 3 carbon atoms;
R^2 is H.

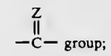
7. A pharmaceutical composition comprising a pharmaceutical carrier and an effective amount of a compound of claim 1.

4,782,074
FUNGICIDAL N,N-DISUBSTITUTED-HETEROCYCLIC CARBOXAMIDES
David M. Spatz, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Division of Ser. No. 690,784, Jan. 11, 1985, Pat. No. 4,654,346, which is a division of Ser. No. 439,243, Nov. 4, 1982, Pat. No. 4,504,484. This application Mar. 30, 1987, Ser. No. 32,207
Int. Cl.⁴ A61K *31/41, 31/40;* **C07D** *233/88*
U.S. Cl. 514—400 **43 Claims**

1. A compound of the formula:



wherein R is phenyl, or phenyl substituted with 1 to 3 subtituents independently selected from fluoro, chloro, bromo, iodo, nitro, lower alkyl, lower alkoxy, lower alkyl or lower alkoxy subtituted with 1 to 3 of the same or different halogens; R^1 is lower alkyl, or —CH_2Y wherein Y is lower alkenyl, lower alkenyl substituted with 1 to 3 of the same or different halogens, lower alkynyl, lower alkylnyl substituted with 1 to 3 of the same or different halogens, lower alkoxyalkyl, lower alkoxy, lower alkylthioalkyl, lower thioalkyl, lower hydroxyalkyl, lower haloalkyl, or halogen; R^2 is a 5-member heterocyclic ring containing 1 to 2 nitrogen atoms and the remainder carbon atoms, or a 5-member heterocyclic ring containing 1 to 2 nitrogen atoms and the remainder carbon atoms with the ring substituted with 1 to 2 independent lower alkyl groups, with the proviso that a nitrogen of the 5-member heterocyclic ring is not bonded to the



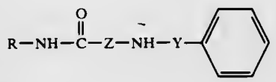
group;

Z is sulfur, or oxygen; X is sulfur, oxygen, or represents a direct linkage between R and alk; and alk is a branched- or straight-chain alkylene group of 1 to 10 carbons with the proviso that the chain length is no longer than 5 carbons.

36. A method for controlling fungi comprising contacting said fungi or their growth environment with a fungicidally effective amount of a compound of the formula defined in claim 1.

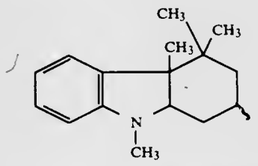
4,782,075
HEXAHYDROCARBAZOLE CONTAINING ALKYLAMINOAMIDE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND USE
David P. Kay, Purton Swindon, and Peter D. Kennewell, Okus Swindon, both of Great Britain, assignors to Roussel Uclaf, Paris, France
Filed Jul. 10, 1986, Ser. No. 883,914
Claims priority, application United Kingdom, Jul. 15, 1985, 8517854
Int. Cl.⁴ A61K *31/40;* **C07D** *209/88*
U.S. Cl. 514—411 **12 Claims**

1. A compound selected from the group consisting of alkylaminoamides of the formula

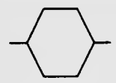


I

wherein R is



Z is —$(CH_2)_n$— optionally substituted by an alkyl of 1 to 6 carbon atoms, n is an integer from 1 to 6, Y is —$(CH_2)_n$— or

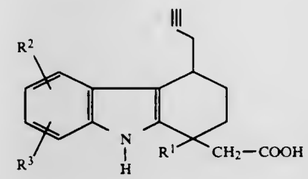


and their non-toxic, pharmaceutically acceptable acid addition salts.

5. An antiedematous and anti-inflammatory composition comprising an antiedematously and anti-inflammatorily effective amount of at least one compound of claim 1 and an excipient.

4,782,076
SUBSTITUTED 2,3,4,9-TETRAHYDRO-1H-CARBAZOLE-1-ACETIC ACID DERIVATIVES, COMPOSITION AND USE
Dominick Mobilio, Franklin Park, and Leslie G. Humber, North Brunswick, both of N.J., assignors to American Home Products Corporation, New York, N.Y.
Filed Mar. 1, 1988, Ser. No. 162,443
Int. Cl.⁴ A61K *31/40;* **C07D** *209/86*
U.S. Cl. 514—411 **7 Claims**

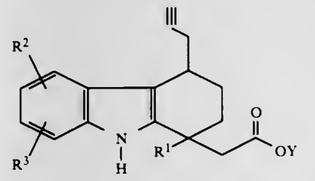
1. A compound of the formula (I)



(I)

wherein R^1 is hydrogen or lower alkyl containing 1 to 6 carbon atoms; R^2 and R^3 are independently hydrogen, halogen or lower alkyl containing 1 to 6 carbon atoms and the pharmaceutically acceptable salts thereof.

7. A compound of formula (XII)



(XII)

wherein R^1 is hydrogen or lower alkyl containing 1 to 6 carbon atoms; R^2 and R^3 are independently hydrogen, halogen or lower alkyl containing 1 to 6 carbon atoms; and Y is lower alkyl containing 1 to 6 carbon atoms.

4,782,077
TALISCANIN AND OTHER ARISTOLACTAMS FOR TREATING NEUROLOGICAL DISORDERS, PARKINSON'S DISEASE, ALZHEIMER DISEASE AND IMPOTENCE
Jacinto J. de la Parra, Mexico City, Mexico, assignor to Monoclonetics International, Inc., Houston, Tex.
Filed Aug. 20, 1987, Ser. No. 87,432
Int. Cl.⁴ A61K *31/40*
U.S. Cl. 514—423 **14 Claims**

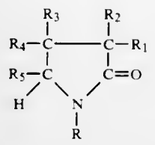
1. A method of treating neurological disorders or impotence comprising administering an effective amount of an aristolactam to an afflicted patient.

4,782,078
HALOPHOR BIOCIDAL COMPOSITIONS
Roger A. Crawford, Wadsworth; Robert H. Juda, Akron, both of Ohio, and Paritosh M. Chakrabarti, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Jan. 16, 1986, Ser. No. 819,453
Int. Cl.⁴ A01N *43/36*
U.S. Cl. 514—424 **7 Claims**

1. A halophor consisting essentially of a substantially water-

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free complex of (a) elemental halogen selected from the group consisting of bromine and iodine, (b) added halide represented by the formula, MX, wherein M is an alkali metal selected from sodium, lithium and potassium, or alkaline earth metal selected from calcium and magnesium, and X is bromine or iodine, and (c) N-alkyl substituted-2-pyrrolidone represented by the graphic formula:



wherein R is a C_1–C_4 alkyl, and R_1, R_2, R_3, R_4 and R_5 are each selected from the group consisting of hydrogen and C_1–C_2 alkyl, the mole ratio of added halide to halogen being from about 1:2 to 1:12, and the amount of available elemental halogen in the halophor complex being between about 10 and about 50 weight percent.

4,782,079

2-(2,2-DIHALOETHENYL)-5-ARYLTHIOPHENE PESTICIDES

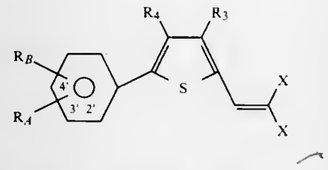
Susan E. Burkart, Trenton, N.J.; Richard B. Phillips, Riverbank, Calif., and David M. Roush, Princeton, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 869,472, Jun. 2, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 148,194

Int. Cl.[4] A01N *43/02;* **C07D** *333/00, 333/24*

U.S. Cl. 514—438 **14 Claims**

1. An acaricidal compound of the formula



in which:

R_A is hydrogen or a substituent at position 3′ or 4′ selected from lower alkoxy, fluoro, methoxymethoxy, 3′-methyl, 4′-methyl if X is bromo, methylcarbonyloxy, methylphenylsulfonyloxy, methylsulfonyloxy, methylsulfonyl, methylthio, or O,O-diethyl phosphonyloxy,

R_B is hydrogen or R_A and R_B together are —C_4H_4— bridging positions 2′–3+ or 3′–4′;

R_3 is hydrogen, methyl, or phenyl;

R_4 is hydrogen or methyl; and

X is bromo or chloro.

4,782,080

N-ALKENYL-2-HYDROXYBENZO(B)THIOPHENE-3-CARBOXAMIDE DERIVATIVES AS DUAL CYCLOOXYGENASE AND LIPOXYGENASE INHIBITORS

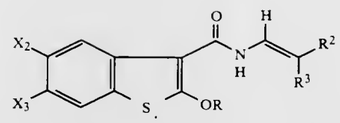
Bruce E. Witzel, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 16, 1985, Ser. No. 776,535

Int. Cl.[4] A61K *31/38;* **C07D** *333/66*

U.S. Cl. 814—443 **6 Claims**

1. A compound of formula:



or a pharmaceutically acceptable salt thereof wherein

R is

(a) H;

(b) $C_{1\text{-}6}$alkyl;

(c) halo $C_{1\text{-}6}$alkyl;

X_2, X_3 independently are

(a) H;

(b) $C_{1\text{-}6}$alkyl;

(c) halo $C_{1\text{-}6}$alkyl;

(d) halo;

(e) cyano;

(f) methylthio;

(g) methylsulfonyl; or

(h) formyl;

R^2 and R^3 independently are

(a) phenyl; or

(b) thienyl.

4,782,081

COMPOUNDS AND METHODS USEFUL FOR THE SYNTHESIS OF THROMBOXANE A_2

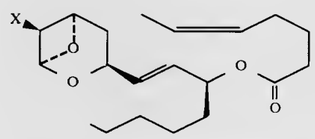
W. Clark Still, New York; Philip R. Hamann, Pearl River, both of N.Y., and Shripad S. Bhagwat, Scotch Plains, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 739,126, May 30, 1985, Pat. No. 4,672,131. This application Oct. 22, 1986, Ser. No. 922,036 Claims priority, application PCT Int'l Appl., May 30, 1986, PCT/US86/01179

Int. Cl.[4] A61K *31/335*

U.S. Cl. 514—450 **2 Claims**

1. A pharmaceutical composition which comprises an effective amount of a compound having the structure:



wherein X may be hydrogen, bromine, chlorine, fluorine, or iodine

to reduce vascular blood flow and a pharmaceutically acceptable carrier.

4,782,082

METHOD FOR TREATING ALLERGIC REACTIONS WITH FORSKOLIN

William Kreutner, West Caldwell; Michael J. Green, Skillman; Ho-Jane Shue, Pine Brook, and Anil K. Saksena, Upper Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

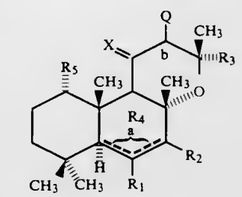
Continuation of Ser. No. 698,955, Feb. 6, 1985, abandoned, which is a division of Ser. No. 542,825, Oct. 17, 1983, Pat. No. 4,517,200, which is a continuation-in-part of Ser. No. 453,436, Dec. 27, 1982, abandoned. This application Aug. 7, 1986, Ser. No. 894,380

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—454 **9 Claims**

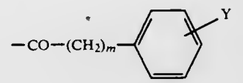
1. A method for treating allergic reactions in a mammal which comprises administering a bronchodilating effective

amount or an amount effective to inhibit histamine release of a compound having structural formula I



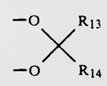
I

in combination with a pharmaceutically acceptable carrier to said mammal, wherein one of R_1 and R_2 may be =O and the other of R_1 and R_2 may be H, or OR_{11} or both of R_1 and R_2 may be H or OR_{11} wherein R_{11} is H, alkanoyl having from 1 to 6 carbon atoms or

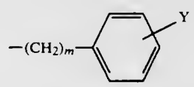


{wherein m is 0, 1, 2 or 3 and Y is hydrogen, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, alkylthio having from 1 to 6 carbon atoms, OH, CF_3, NO_2, CN, phenyl, benzyl, phenoxy or NR_aR_b wherein R_a and R_b are the same or different and are H or alkyl having from 1 to 6 carbon atoms}; or

R_1 and R_2 may be taken together to form



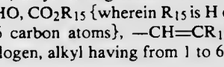
wherein R_{13} and R_{14} may be the same or different and are H, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, alkenyl having from 2 to 6 carbon, alkynyl having from 2 to 6 carbon atoms, or



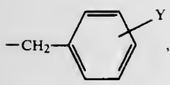
wherein m and Y are as defined above, or

R_2 may be SO_3OR' or OR′ wherein R′ is alkyl having from 1 to 6 carbon atoms;

R_3 is hydrogen, alkyl having from 1 to 10 carbon atoms, CH_2OH, CHO, CO_2R_{15} {wherein R_{15} is H or alkyl having from 1 to 6 carbon atoms}, —$CH{=}CR_{16}R_{17}$ {wherein R_{16} is H, halogen, alkyl having from 1 to 6 carbon atoms,



(wherein n is 0 or 1 and R_c is H, alkyl having from 1 to 6 carbon atoms, phenyl or benzyl), $CHOHR_c$ or $C(OR_d)_2R_c$ (wherein R_c is defined above and R_d is alkyl having from 1 to 6 carbon atoms), and R_{17} is H, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, benzyl, phenyl or halogen}, —C≡C—R_{18} {wherein R_{18} is H, alkyl having from 1 to 12 carbon atoms, alkoxy having from 1 to 6 carbon atoms,



CO_2Rc or

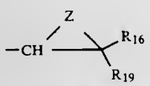


wherein Y and R_c are defined above},

—CHOH—C≡C—R_{19} {wherein R_{19} is H, alkyl of from 1 to 6 carbon atoms, phenyl or benzyl},

—CH=C=CHR_{19} {wherein R_{19} is defined above},

—CH=N—OR_{19} {wherein R_{19} is defined above},

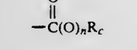


{wherein Z is O or S, and R_{16} and R_{19} are defined above},

—$CH(ZR_{20})_2$ {wherein Z is defined above and R_{20} is alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or the two groups R_{20} may together form —$(CH_2)_p$— wherein p is 2 or 3},



{wherein A and B are H, halogen, alkyl having from 1 to 6 carbon atoms, phenyl, benzyl or



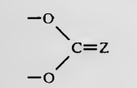
wherein n and R_c are defined above},

—CH=N—NDE {wherein D and E are H, alkyl having from 1 to 6 carbon atoms, benzyl, phenyl, COG, SO_2G, CO_2G (wherein G is alkyl having from 1 to 6 carbon atoms, benzyl or phenyl)};

R_4 is H or OH;

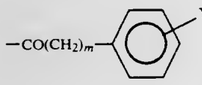
R_5 is OH; or

when R_4 and R_5 are taken together they may form



wherein Z is defined above;

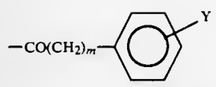
a is an optional bond which may be located in either the 5,6 or 6,7 position, such that when a is a 5,6 bond, R_2 is =O, H or OR_{11} with R_{11} equal to H, alkanoyl or



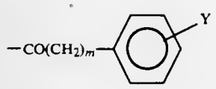
wherein m and Y are as previously defined, such that

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when R_2 is H or OR_{11}, R_1 is H or OR_{11} with R_{11} equal to alkanoyl or



and when R_2 is =O, R_1 represents H or OR_{11} with R_{11} equal to H, alkanoyl or



wherein m and Y are as previously defined, and when a is a 6,7 bond, R_1 can be H or OR_{11} where R_{11} is alkanoyl, and R_2 may be H or OR_{11} where R_{11} is alkanoyl;
b is an optional bond, such that when b is present, Q and R_3 are H;
X is O or H/OR" {wherein R" is H, alkanoyl having from 1 to 6 carbon atoms or trifluoroacetyl}; and
Q is hydrogen, chlorine or bromine.

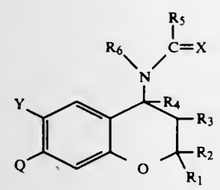
4,782,083

3,4-DIHYDRO-2H-1-BENZOPYRANS USEFUL AS ANTI-HYPERTENSIVE AGENTS

Frederick Cassidy; Geoffrey Stemp, and John M. Evans, all of Harlow, England, assignors to Beecham Group P.L.C., England

Filed Aug. 29, 1986, Ser. No. 902,428
Claims priority, application United Kingdom, Sep. 3, 1985, 8521857
Int. Cl.[4] A61K *31/35, 31/40, 31/445;* **C07D** *311/68, 405/04, 311/70*
U.S. Cl. 514—456 **7 Claims**

1. A compound of formula (I) or, when the compound of formula (I) contains a salifiable group, a pharmaceutically acceptable salt thereof:



(I)

wherein:
one of R_1 and R_2 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_1 and R_2 together are C_{2-5} -polymethylene;
either R_3 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} alkanoyloxy and R_4 is hydrogen or R_3 and R_4 together are a bond;
R_5 is hydrogen; C_{1-6} alkyl optionally substituted by halogen, hydroxy, C_{1-6} alkoxycarbonyl, carboxy or amino optionally substituted by one or two independent C_{1-6} alkyl groups, or C_{2-6} alkenyl; amino optionally substituted by a C_{1-6} alkyl or C_{2-6} alkenyl group or by a C_{1-6} alkanoyl group optionally substituted by up to three halo atoms, or by a phenyl group optionally substituted by C_{1-6} alkyl, C_{1-6} alkoxy or halogen; or a member selected from the group consisting of phenyl, naphthyl, furyl, thienyl, pyrryl, oxazolyl, thiazolyl, imidazolyl, thiadiazolyl, pyridyl, pyridazyl, pyrimidyl, pyrazyl, triazyl, benzofuranyl, benzothienyl, indolyl, indazolyl, quinolyl, isoquinolyl and quinazonyl, said member being optionally substituted by one or more groups or atoms selected from the class of C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, C_{1-12} carboxylic acyl, or amino or aminocarbonyl optionally substituted by one or two C_{1-6} alkyl groups;
R_6 is hydrogen or C_{1-6} alkyl;†
X is oxygen or sulphur;
Y and Q are halo, cyano, CHO, C_{2-7} alkanoyl or C_{1-6} alkoxycarbonyl; and
the nitrogen-containing group in the 4-position being trans to the R_3 group when R_3 is hydroxy, C_{1-6} alkoxy or C_{1-7} alkenoyloxy.

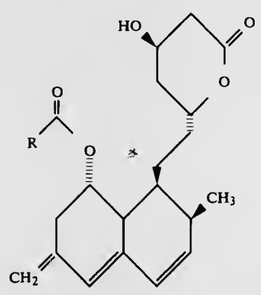
4,782,084

HMG-COA REDUCTASE INHIBITORS

Kamlesh P. Vyas, Harleysville, and Hanumath P. Kari, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 29, 1987, Ser. No. 67,503
Int. Cl.[4] A61K *31/365;* **C07D** *309/30*
U.S. Cl. 514—460 **6 Claims**

1. A substantially pure compound represented by the following general structural formula (I):



(I)

wherein:
R is C_{1-10} alkyl.

6. A method of inhibiting cholesterol biosynthesis comprising the administration to a subject in need of such treatment a nontoxic therapeutically effective amount of a compound of claim 1.

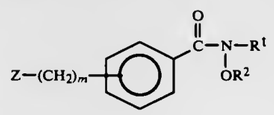
4,782,085

ARYLHYDROXAMATES AND USE THEREOF IN TREATING ALLERGIES

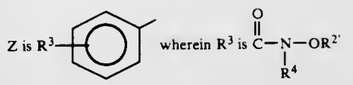
Ravi K. Varma, Belle Mead, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 888,616, Jul. 23, 1986. This application Jul. 27, 1987, Ser. No. 78,437
Int. Cl.[4] C07C *81/00, 83/10*
U.S. Cl. 514—507 **10 Claims**

1. A compound having the structure



wherein
R^1 is H, alkyl, aryl, lower alkenyl having 3 to 8 carbons, cycloalkyl, or aralkyl;
R^2 is H, alkyl, aryl, cycloalkyl, alkanoyl or aroyl;
m is 2 to 8;



wherein R^4 is H or alkyl and $R^{2'}$ is H, alkyl, aryl, cycloalkyl, alkanoyl or aroyl; and $(CH_2)_m$ is unsubstituted or substituted with 1 or 2 alkyl and/or 1 or 2 halogen substituents, including pharmaceutically acceptable basic salts thereof, wherein the term alkyl by itself or as part of another group is a straight chain or branched chain radical having 1 to 12 carbons and is unsubstituted or substituted with halogen, CF_3, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, alkylcycloalkyl, hydroxy, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol or alkylthio; the term aryl by itself or as part of another group is a monocyclic or bicyclic aromatic group having 6 to 10 carbons in the ring portion and is unsubstituted or substituted with 1 or 2 alkyl groups, 1 or 2 halogens, 1 or 2 alkoxy groups, an aryl group, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups, and the term cycloalkyl by itself or as part of another group has 3 to 8 carbons in the ring portion and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 alkyl groups, 1 or 2 alkoxy groups, an aryl group, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups.

8. A method of inhibiting Δ^5-lipoxygenase which comprises administering to the circulatory system of a mammalian hose an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

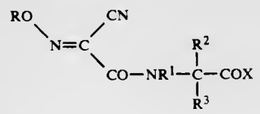
4,782,086

E-ISOMERS OF Nα-(2-CYANO-2-ALKOXIMINOACETYL)-AMINO ACID DERIVATIVES, COMPOSITIONS AND FUNGICIDAL USE

Winfried Lunkenheimer, Wuppertal; Hans Scheinpflug, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 868,844, May 29, 1986, abandoned. This application Feb. 20, 1987, Ser. No. 17,297
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521131; Jan. 25, 1986, 3602243
Int. Cl.[4] A01N *37/34, 37/46;* **C07C** *131/00;* **C07D** *295/18*
U.S. Cl. 514—521 **13 Claims**

1. An E-isomer of an Nα-(s-cyano-2-alkoximino-acetyl-)amino acid derivative or peptide of the formula



in which
R represents alkyl, alkenyl, alkinyl, cyanoalkyl, azolylalkyl or optionally substituted phenylalkyl, or represents optionally substituted cycloalkyl;
R^1 represents hydrogen, alkyl, optionally substituted phenyl or optionally substituted benzyl, or represents alkoxycarbonylamino;
R^2 represents hydrogen or alkyl;
R^3 represents hydrogen, alkyl, alkoxycarbonylalkyl, hydroxycarbonylalkyl, aminocarbonylalkyl, azolylalkyl, cyanoalkyl, hydroxyalkyl, alkenyl, alkinyl or optionally substituted cycloalkyl, or represents optionally substituted phenyl or phenylalkyl, or represents the grouping

$$R^4—SO_n—Z—$$

wherein
R^4 represents hydrogen, alkyl or optionally substituted phenylalkyl;
n represents the numbers 0, 1 or 2 and
Z represents a straight-chain or branched alkylene chain; or
R^1 and R^3, together with the nitrogen atom and the carbon atom to which they are bonded, represent a 5- or 6-membered heterocyclic ring; or
R^2 and R^3, together with the carbon atom to which they are bonded, represent cycloalkylidene and
X represents the grouping $—OR^I$ or $NR^{II}R^{III}$,
wherein
R^I represents hydrogen, alkyl or alkenyl, or represents alkinyl;
R^{II} represents hydrogen or alkyl;
R^{III} represents hydrogen, alkyl, alkenyl, alkinyl, halogenoalkyl, alkoxyalkyl, dialkylaminoalkyl, alkoxycarbonylalkyl, hydroxycarbonylalkyl, aminocarbonylalkyl, alkylaminocarbonylalkyl, dialkylaminocarbonylalkyl, cyanoalkyl, optionally substituted phenylalkyl, optionally substituted phenyl or optionally substituted cycloalkyl, or represents an acylamino radical, or represents the grouping

$$—N=CH—R^{IV}$$

wherein
R^{IV} represents alkyl or optionally substituted phenyl, or
R^{II} and R^{III}, together with the nitrogen atom to which they are bonded, represent an optionally substituted heterocyclic ring, which can contain further hetero atoms,
or an optionally substituted ammonium, alkali metal or alkaline earth metal salt or metal salt complex thereof.

11. A fungicidal composition comprising a fungicidally effective amount of a compound, salt or metal salt complex according to claim 1 and a diluent.

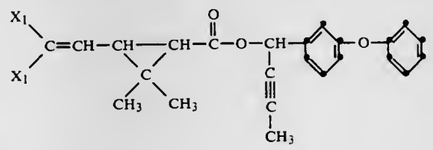
4,782,087

INSECTICIDAL PROP-1-YNYL-3-PHENOXYBENZYL-2,2-DIMETHYL-3-(2,2-DIHALOVINYL)-CYCLOPROPANE-1-CARBOXYLATES

Saleem Farooq, Ettingen; Peter Ackermann, Reinach; Jozef Drabek, Oberwil; Laurenz Gsell, Basel; Odd Kristiansen, Möhlin, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 216,222, Dec. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 122,543, Feb. 19, 1980, abandoned, which is a continuation of Ser. No. 049,363, Jun. 18, 1979, abandoned. This application Jun. 6, 1983, Ser. No. 501,457
Claims priority, application Switzerland, Jun. 27, 1978, 6990/78; Mar. 19, 1979, 2559/79
Int. Cl.[4] C07C *69/743;* **A01N** *53/00*
U.S. Cl. 514—531 **7 Claims**

1. A cyclopropanecarboxylic acid ester of the formula

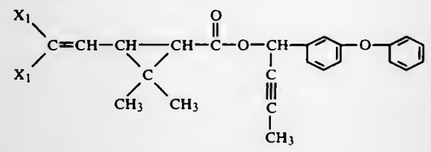


in which
X_1 is fluorine, chlorine or bromine.

6. A method of combating insects at a locus which comprises

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applying to said locus an insecticidally effective amount of a compound of the formula



in which
X_1 is fluorine, chlorine or bromine.

4,782,088

NITRO ALIPHATIC COMPOUNDS AND USE THEREOF

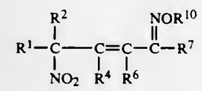
Masanori Okamoto, Osaka; Morita Iwami, Takarazuka; Shigehiro Takase, Nishinomiya; Itsuo Uchida, Kyoto; Kazuyoshi Umehara, Ashiya; Masanobu Kohsaka, Sakai, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 786,754, Oct. 11, 1985, which is a division of Ser. No. 559,260, Dec. 8, 1983. This application Dec. 29, 1986, Ser. No. 946,868

Int. Cl.[4] A61K *31/15;* **C07C** *131/00*

U.S. Cl. 514—534 **3 Claims**

1. A compound of the formula or its pharmaceutically acceptable salt:



wherein
R^1 is hydrogen, lower alkyl, or lower alkoxyphenyl,
R^2 is hydrogen or lower alkyl,
R^4 is lower alkyl,
R^6 is hydrogen or lower alkyl,
R^7 is lower alkyl which is optionally substituted by hydroxy or lower alkanoyloxy, and
R^{10} is hydrogen or lower alkyl which is optionally substituted by carboxy or esterified carboxy.

3. A method of treating angina pectoris, which comprises administering to a subject in need of such treatment an effective amount of the compound of claim **1**.

4,782,089

2-AMINO-3-AROYL-GAMMA-OXOBENZENEBUTANOIC ACIDS AND ESTERS

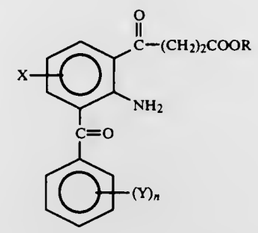
David A. Walsh, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Aug. 26, 1986, Ser. No. 900,599

Int. Cl.[4] C07C *101/447;* **A61K** *31/195, 31/24*

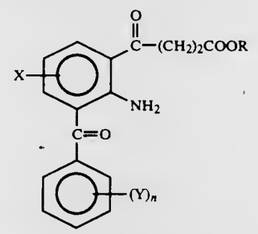
U.S. Cl. 514—541 **16 Claims**

1. A compound selected from the group having the formula:



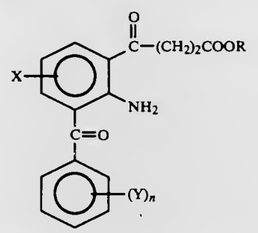
wherein;
X is selected from hydrogen, halogen, or loweralkyl;
Y is selected from hydrogen, halogemn, loweralkyl, nitro, trifluoromethyl, or loweralkoxy;
n is 1 or 2; and
R is hydrogen, loweralkyl, or
a pharmaceutically acceptable cation.

5. A method of treating inflammation in a living animal which comprises administering to said animal a therapeutically effective amount of a compound selected from the group having the formula:



wherein;
X is selected from hydrogen, halogen, loweralkyl, loweralkoxy, or trifluoromethyl;
Y is selected from hydrogen, halogen, loweralkyl, nitro, or trifluoromethyl;
n is 1 or 2; and
R is hydrogen, loweralkyl, or
a pharmaceutically acceptable cation.

9. A method of treating pain in a living animal which comprises administering to said animal a therapeutically effective amount of a compound selected from the group having the formula:



wherein;
X is selected from hydrogen, halogen, or loweralkyl;
Y is selected from hydrogen, halogen, loweralkyl, nitro, trifluoromethyl, or loweralkoxy;
n is 1 or 2; and
R is hydrogen, loweralkyl, or
a pharmaceutically acceptable cation.

4,782,090

BENZOYL(THIO)UREA PESTICIDES

Wilhelm Sirrenberg, Sprockhoevel; Benedikt Becker, Mettmann; Wolfgang Behrenz, Overath; Ingomar Krehan, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

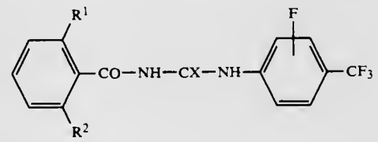
Filed Nov. 16, 1987, Ser. No. 121,318

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640176

Int. Cl.[4] A01N *9/12, 9/20;* **C07C** *127/22*

U.S. Cl. 514—584 **15 Claims**

1. A benzoyl(thio)urea of the formula



in which
X is oxygen or sulphur, and
R^1 and R^2 each independently is hydrogen, halogen or C_1-C_4-alkyl.

4,782,091

BENZOYL(THIO)UREA ARTHROPODICIDES

Wilhelm Sirrenberg, Sprockhoevel; Benedikt Becker, Mettmann; Wolfgang Behrenz, Overath; Ingomar Krehen, Cologne, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

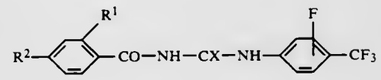
Filed Nov. 10, 1987, Ser. No. 118,906

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640175

Int. Cl.[4] A01N *47/28, 47/30;* **C07C** *127/22*

U.S. Cl. 514—594 **8 Claims**

1. A benzoyl(thio)urea of the formula



in which
X is oxygen or sulphur,
R^1 is halogen, and
R^2 is halogen.

4,782,092

5,8-DICHLORO-4-HYDROXY-1-[(AMINOALKYL) AMINO]-9,10-ANTHRACENEDIONES, PHARMACEUTICAL COMPOSITIONS AND USE

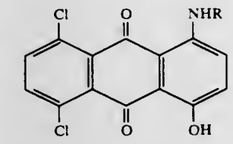
Robert K. Zee-Cheng, Shawnee, and Chia C. Cheng, Leawood, both of Kans., assignors to Mid-America Cancer Center, Kansas City, Kans.

Continuation of Ser. No. 585,432, Mar. 2, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 882,198

Int. Cl.[4] A61K *31/135;* **C07C** *87/64*

U.S. Cl. 514—649 **4 Claims**

1. 5,8-Dichloro-4-hydroxy-1[(aminoalkyl)]-9,10-anthracenedione compounds having in free base form the structural formula I:



I

and the pharmaceutically acceptable salts thereof, where R is alkylene $—NR_xR_y$ where alkylene is a 2 to 4 carbon straight or branched hydrocarbon chain which may be substituted by hydroxyl, and R_x and R_y are each independently H, 1 to 4 carbon straight or branched chain alkyl, or 2 to 4 carbon straight or branched chain hydroxyalkyl, wherein at least one of R_x and R_y is said hydroxyalkyl.

3. A pharmaceutical composition comprising a compound having the structural formula I according to claim **1** in combination with a pharmaceutically acceptable carrier.

4,782,093

METHOD OF TREATING EPILEPSY AND CEREBRAL CONCUSSION

Mihaly A. Tapolyai, 3643 Lindholm Rd., Cleveland, Ohio 44120

Filed May 28, 1987, Ser. No. 55,456

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—649 **10 Claims**

1. A method of treating epilepsy and cerebral concussion in mammals, which comprises administering to an affected mammal an effective amount of a vasodilator selected from the group consisting of bamethan, a bamethan derivative, bamethan sulfate, a bamethan sulfate derivative, a 1-epinephrine derivative having a terminal alkyl substitutent attached to nitrogen and containing at least three carbon atoms, and mixtures thereof.

4,782,094

DIFLUOROBROMOMETHOXYPHENYL DERIVATIVE AND MITICIDE COMPRISING SAID DERIVATIVE AS ACTIVE INGREDIENT

Satoshi Numata, Yokohama; Kouji Kitajima, Mobara; Kenji Kodaka, Yokohama; Yukiharu Fukushi, Yokohama; Shiroh Shiraishi, Yokohama; Masahiko Nakamura, Yokohama, and Masayuki Ooka, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

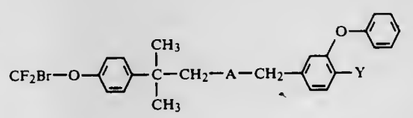
Filed Mar. 11, 1987, Ser. No. 24,462

Claims priority, application Japan, Mar. 14, 1986, 61-45967; Mar. 18, 1986, 61-58406; Mar. 18, 1986, 61-58407

Int. Cl.[4] A01N *43/30, 31/14;* **C07C** *43/267*

U.S. Cl. 514—721 **3 Claims**

1. A difluorobromomethoxyphenyl derivative represented by the following general formula (I)



(I)

wherein A represents an oxygen atom or a methylene group, and Y represents a hydrogen or fluorine atom.

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4,782,095

WATER-IN-VOLATILE SILICONE EMULSIFIER CONCENTRATES

Mary L. Gum, Granite Springs, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 580,320, Feb. 22, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,059
Int. Cl.[4] A61K *7/48, 9/08, 9/10*
U.S. Cl. 514—937 8 Claims

1. A water-in-silicone emulsifier concentrate providing greater than 90% light transmittance and which concentrate is used for mixing with water to form a water-in-silicone emulsion, said concentrate comprising:

(a) 2 to 10 wt.% of water in an internal phase;

(b) 45 to 74 wt.% of a volatile cyclic silicone liquid in an external phase, said cyclic silicone liquid having a normal boiling point of less than 250° C. and having the formula:

$$[R_2Sio]_x$$

wherein R is alkyl having 1 to 4 carbon atoms and R can individually be the same or different and x is an integer of 4 to 6; and

(c) 16 to 40 wt.% of a polyoxyalkylene substituted and silicone having the average formula: $MD_yD^*_zM$ wherein M is a trialkylsiloxy unit having the formula $R_3Sio_{0.5}$, D is a dialkylsiloxy unit of the formula R_2SiO, D^* is a polyoxyalkylene substituted alkylsiloxy unit of the average formula:

$$\begin{array}{l} C_nH_{2n}(OC_bH_{2b})_aOR^* \\ | \\ RSiO \end{array}$$

R is an alkyl group having 1 to 4 carbon atoms, R^* is a terminal groups selected from the group consisting of alkyl, aryl, aralkyl and acyl radicals, n is an integer of 2 to 8, a is a number of 5 to 12, b is 2, y is a number of 10 to 100, z is a number of 1 to 16, said percentages being based on the total weight of (a), (b) and (c) wherein the polyoxyalkylene chain has a molecular weight less than 1000.

4,782,096

PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS

David Banquy, Paris, France, assignor to Foster Wheeler USA Corporation, Clinton, N.J.

Filed Sep. 16, 1987, Ser. No. 97,387
Int. Cl.[4] C07C *27/06, 31/04*
U.S. Cl. 518—704 15 Claims

1. A process for producing an oxygenated hydrocarbon or mixtures thereof from a hydrocarbon containing feedstock, which comprises:

(a) dividing said feedstock into two fractions,

(b) subjecting the first fraction from (a) to a primary steam reforming reaction, by mixing said fraction with steam and heating the mixture thereof by indirect heat exchange, in the presence of a reforming catalyst, to form a gaseous effluent including hydrogen at a temperature between 650° and 850° C.,

(c) mixing the gas effluent from (b) with the second fraction from (a),

(d) reacting in a single stage the gas mixture from (c) with a free oxygen-rich gas, in a secondary reforming reactor operating under essentially adiabatic conditions, and containing a single bed of catalyst, thus producing a synthesis gas at a temperature between 850° and 1250° C., containing a percent methane equivalent of less than one-tenth of that of the gas mixture from (c), and having a Z ratio of between 0.80 and 1.00, where Z is defined as:

$$Z = \text{moles } H_2 \,[2(\text{moles CO}) + 3(\text{moles } CO_2)]$$

(e) mixing the gas effluent from (d) with a hydrogen-rich stream free from carbon oxides to form a final synthesis gas stream,

(f) injecting said final synthesis gas into a synthesis loop, forming said oxygenated hydrocarbon or mixtures thereof in said loop, and extracting from said loop a purge gas stream,

(g) separating said purge gas stream in a physical separation to form a hydrogen-rich gas stream free from carbon oxides and a residual gas stream, and

(h) recycling at least a portion of said hydrogen-rich gas stream to step (e).

4,782,097

PROCESS FOR THE PREPARATION OF HOLLOW MICROSPHERES

Mukesh Jain, and Sadashiv Nadkarni, both of Quebec, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Sep. 23, 1987, Ser. No. 100,090
Claims priority, application Canada, Oct. 1, 1986, 519529
Int. Cl.[4] C08J *9/32;* B01J *13/02*
U.S. Cl. 521—56 24 Claims



1. A process of forming hollow microspheres, which comprises:

forming a solution in a liquid solvent of a polymer having the following properties:

(a) a molecular weight of at least 10,000 and a long chain structure of at least 200 monomer units;

(b) an ability to be coagulated or precipitated from the solution upon contact of the solution with a non-solvent for the polymer;

(c) an ability to form a continuous stretchable film when coagulated or precipitated from solution;

(d) a chemical structure which is infusible or which is capable of being rendered infusible; and

(e) a high carbon yield of at least 30% by weight upon being carbonized in a non-reactive atmosphere;

incorporating into said solution an insoluble solid particulate blowing agent which is decomposable by heat to generate a gas;

dividing the solution into droplets and introducing the droplets into a liquid bath containing a non-solvent for the polymer, said non-solvent being such that the polymer is rapidly coagulated or precipitated from the solution, and said bath having a temperature high enough to cause decomposition of the blowing agent; and

removing the resulting hollow microspheres from the bath.

4,782,098

EXPANDABLE THERMOPLASTIC RESIN BEADS

Richard B. Allen, Pittsfield, Mass.; William E. Gibbs, Chesapeake, Va., and Lynn M. Hans, Pittsfield, Mass., assignors to General Electric, Co., Selkirk, N.Y.

Filed Jun. 12, 1987, Ser. No. 62,004
Int. Cl.[4] C08J *9/18, 9/22*
U.S. Cl. 521—81 9 Claims

1. A process for producing expandable thermoplastic interpolymer resin beads which comprises suspending in an aqueous medium from 1 to 50 parts by weight of a polyphenylene ether resin and 99 to 50 parts by weight of a vinyl aromatic monomer per 100 parts by weight of resin and monomer; adding a polymerization catalyst and polymerizing the vinyl aromatic monomer to form interpolymerized thermoplastic resin beads and during the interpolymerization or subsequently impregnating the interpolymerized thermoplastic resin beads under pressure with an easily volatilizable hydrocarbon or halogenated hydrocarbon blowing agent.

4,782,099

PROCESS FOR THE PRODUCTION OF ELASTIC, OPEN-CELLED FLEXIBLE POLYURETHANE FOAMS HAVING INCREASED COMPRESSION HARDNESS

Manfred Dietrich, Leverkusen; Hans-Walter Illger, Roesrath-Forsbach, both of Fed. Rep. of Germany, and Peter Vogtel, Tarragona, Spain, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 88,441
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630225
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—175 12 Claims

1. A process for the production of elastic open-celled flexible polyurethane foams having substantially increased compression hardness in which

(a) a polyisocyanate is reacted with

(b) a polyol mixture of

(1) 75–95 wt % polyether polyol with terminal OH groups having a functionality of from 2 to 4 and an OH number of from 25 to 60 and

(2) 5–25 wt % of a polyether polyol having a functionality of at least six and an OH number of from 150 to 200 which is the reaction product of an alcohol having a functionality of at least six and propylene oxide that has been modified to contain 5–50 wt % terminal ethylene oxide groups based on total alkylene oxide

in the presence of

(c) a blowing agent and, optionally

(d) a known catalyst, stabilizer and/or other known additive.

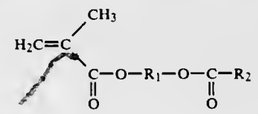
4,782,100

PROSTHETIC COMPOSITION

Osamu Iwamoto, Yokohama; Toru Ono, Fujisawa, and Koshi Kusumoto, Kamakura, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Jan. 28, 1987, Ser. No. 7,611
Claims priority, application Japan, Jan. 31, 1986, 61-18043
Int. Cl.[4] C08F *265/06*
U.S. Cl. 522—120 14 Claims

1. A prosthetic composition comprising (A) a diester monomer represented by the following general formula:



wherein

R_1 stands for an alkylene group having 2 to 6 carbon atoms and

R_2 stands for an alkyl group having 2 to 4 carbon atoms,

or a mixture of said diester monomer and other monomer copolymerizable therewith, (B) an organic polymer soluble in the monomer (A) in an amount of 0.5 to 5 parts by weight per part by weight of said monomer (A), said organic polymer (B) comprising poly(methyl methacrylate), poly(ethyl methacrylate), poly(methyl methacrylate/ethyl methacrylate), mixtures of any of the foregoing with each other, or mixtures of any of the foregoing with other polymer soluble in said monomer (A), and (C) a radical polymerization initiator.

4,782,101

PREVENTION OF OUTGASSING IN POLYVINYLSILOXANE ELASTOMERS BY THE USE OF FINELY DIVIDED PLATINUM BLACK

Duncan E. Waller, Ypsilanti, and Laurie D. Lovshe, Plymouth, both of Mich., assignors to Manufacturers Hanover Trust Company, New York, N.Y.

Continuation-in-part of Ser. No. 932,246, Nov. 19, 1986, abandoned. This application Mar. 25, 1987, Ser. No. 27,499
Int. Cl.[4] A61K *6/00*
U.S. Cl. 523—120 7 Claims

1. A two component dental impression material which comprises the following:

BASE PASTE	WT %	CATALYST PASTE	WT %
Vinyl Polydimethyl-siloxane	10–60	Vinyl Polydi-methylsiloxane	10–60
Hydropolydimethyl Siloxane	1–10	Cyclic Vinyl Siloxane	0–2
Silica Filler	20–80	Chloroplatinic Acid Complex	0.1–5.0
Liquid Petroleum	0–15	Platinum Black	0.2–20,000 ppm
		Plasticizer	0–15
		Filler	20–80

and wherein said platinum black has a surface area of about 24 M^2/gram and a size range of about 18 to 28 Angstrom Units.

4,782,102

NOVEL ORGANOFUNCTIONAL SILANES CONTAINING HINDERED GROUP

James G. Marsden, Rowayton; Herbert E. Petty, Bethel, both of Conn.; Anthony C. Vecere, White Plains, and Patrick Morabito, Mt. Vernon, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 452,938, Dec. 27, 1982, abandoned. This application Aug. 7, 1985, Ser. No. 763,320
Int. Cl.[4] C08K *3/36;* C08L *61/06*
U.S. Cl. 523—143 14 Claims

1. A binding agent for an inorganic oxide or filler material comprising a curable binder and an organofunctional silane, the improvement wherein the organofunctional silane is selected from the group of silanes of the general formula:

$$ZSiR_a(OR')_b(OR'')_c$$

wherein R is individually an alkyl, aryl, alkaryl or aralkyl group containing from one to twelve carbon atoms inclusive; R' is individually selected from the group consisting of $—CH_3$, $—CH_3H_7$, and $—CH_2CH_3OCH_3$; R'' is individually a sterically hindered hydrocarbon group; Z is a nitrogen containing group bonded to the silicon atom via a carbon-silicon bond; a and b are individually integers with a value of 0, 1 or 2; and c is an integer with a value of 1, 2 or 3 wherein the sum of a+b+c equals 3.

4,782,103

ULTRA VIOLET LIGHT RESISTANT CARBONATE POLYMERS WITH IMPROVED PROCESSING STABILITY

Samuel A. Ogoe, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

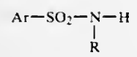
Filed Aug. 19, 1987, Ser. No. 86,994
Int. Cl.[4] C08K *5/47, 5/44*
U.S. Cl. 524—83 10 Claims

2. A composition comprising a carbonate polymer containing

(A) 0.01 to 10.0% by weight of one or more carbonate polymer compatible ultra violet light absorbing compounds selected from the group consisting of benzophenones, benzotriazoles, and acrylic esters, and

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(B) a functionally effective amount of an aromatic sulfonimide which is represented by the formula:



wherein Ar is an aromatic group, R is aryl carbonyl, aralkylaminocarbonyl, aromatic sulfonyl, or heterocylic sulfonyl, and R and Ar can be joined to form a benzosulfimide whereby said sulfonimide and the amount used are selected to provide a measurable degree of molecular weight stability to the carbonate polymer composition upon thermal processing.

4,782,104

WATER-SOLUBLE POLYMER COMPOSITION

Yasuyuki Nakanishi, Nakama, Japan, assignor to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed May 27, 1987, Ser. No. 54,503

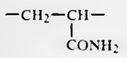
Claims priority, application Japan, May 27, 1986, 61-121765

Int. Cl.⁴ C08K *5/42*

U.S. Cl. 524—157 **7 Claims**

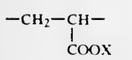
1. A water-soluble thermally stable polymer composition, comprising:

(1) a water-soluble homopolymer of acrylamide or a water-soluble copolymer of acrylamide comprising units of the formula (I):



(I)

and units of the formula (II):



(II)

wherein X is hydrogen, alkali metal or ammonium, and (2) methionine or a derivative thereof selected from the group consisting of methionine sulfoxide, methionine sulfone and the hydrochloride of methionine methyl ester, said methionine or said derivative thereof being incorporated in the composition in an amount ranging from 0.2 to 20% by weight of the amount of said homopolymer or copolymer.

4,782,105

LONG CHAIN N,N,-DIALKYLHYDROXYLAMINES AND STABILIZED COMPOSITIONS

Ramanathan Ravichandran, Yonkers; Ambelal R. Patel, Ardsley; Frank P. Cortolano, Valhalla, all of N.Y., and Richard W. Thomas, Nutley, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 10, 1987, Ser. No. 36,939

Int. Cl.⁴ C08K *5/32*

U.S. Cl. 524—236 **17 Claims**

1. A composition stabilized against thermal oxidative degradation, crosslinking, gel formation or chain extension, which comprises

(a) a poly(arylene sulfide) resin, and

(b) a stabilizing amount of a long chain N,N-dialkylhydroxylamine of the formula

E_1E_2NOH

wherein E_1 and E_2 are independently alkyl of 8 to 36 carbon atoms.

9. A composition stabilized against thermal, oxidative, light or gamma radiation induced degradation, which comprises

(a) an ethylenically unsaturated elastomer, and

(b) a stabilizing amount of a long chain N,N-dialkylhydroxylamine of the formula

E_1E_2NOH

wherein E_1 and E_2 are independently alkyl of 8 to 36 carbon atoms,

with the proviso that component (a) is not a copolymer of acrylonitrile-butadiene or a polymer of 2-chloro-1,3-butadiene.

4,782,106

RUBBER ADHESIVE MIXTURE CONTAINING CA(OH)2 FOR DIRECT BONDING TO GLASS OR METALLIC ARTICLES

Gerhard Fricke, Lohberg; Holger Hoffmann, Hanover, and Henning Umland, Luhe, all of Fed. Rep. of Germaoy, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Oct. 24, 1986, Ser. No. 922,696

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3538975

Int. Cl.⁴ C08K *3/10, 3/34;* **C08L** *7/00, 21/00*

U.S. Cl. 524—413 **10 Claims**

1. In a rubber adhesive mixture of a bonding system that has components including a natural and/or synthetic rubber base, and that is intended for direct bonding to glass or metallic articles, said mixture containing:

filler consisting of 20 to 100 parts by weight relative to 100 parts by weight rubber;

activator;

plasticizer;

vulcanizing agent;

an adhesive system having a resorcinol/hexamethylenetetramine base; and the improvement therewith which comprises:

calcium hydroxide as an inorganic base also contained as a further component of the bonding system in the rubber adhesive mixture to obtain good adhesion values for direct bonding to glass or metallic articles.

4,782,107

HEAT-VULCANIZABLE ORGANOPOLYSILOXANE COMPOSITIONS

Robert Lagarde, Feyzin, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jan. 8, 1987, Ser. No. 1,433

Claims priority, application France, Jan. 9, 1986, 86 00403

Int. Cl.⁴ C08K *3/18*

U.S. Cl. 524—433 **11 Claims**

1. A heat-vulcanizable organopolysiloxane composition of matter, comprising:

(A) 100 parts of at least one diorganoprlysiloxane resin having a viscosity greater than 1,000,000 mPa.s at 25° C.,

(B) 5 to 150 parts of a reinforcing filler,

(C) 0.1 to 7 parts of an organic peroxide,

(D) 0.01 to 5 parts of an organosilicon compound containing at least one acryloyloxyalkyl or methacryloyloxyalkyl group bonded to a silicon atom, and

(E) 0.1 to 20 parts of at least one oxide or hydroxide of an alkaline earth metal.

4,782,108

POLYPHENYLENE ETHER COMPOSITIONS

Kazunori Yano; Shigekazu Ohi; Yoshinobu Kobayashi, and Katsuhiro Abe, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 80,896

Claims priority, application Japan, Apr. 14, 1987, 62-91664

Int. Cl.⁴ C08K *5/01*

U.S. Cl. 524—490 **16 Claims**

1. A polyphenylene ether composition, comprising:

(i) 100 parts by weight of a resin composition comprising (A) a polyphenylene ether, (B) an alkenylaromatic polymer, wherein the weight ratio of (A) to (B) is (A)/(A)+(B)≧0.2, and 1 to 15 parts by weight, per 100 parts by weight of the total weight of (A) and (B), of (C) a rubber substance;

(ii) 0.5 to 10 parts by weight of (D) a copolymer obtained by copolymerizing ethylene with an α-olefin having 3 to 8 carbon atoms; and

(iii) 0.5 to 5 parts by weight of (E) a mineral oil.

4,782,109

LATEX PAINT FORMULATIONS AND METHODS

Donald C. DuLaney, and Robert H. Lindsay, both of Madison, Wis., assignors to Lindsay Finishes, Incorporated, Madison, Wis.

Continuation of Ser. No. 878,814, Jun. 26, 1986, abandoned. This application Jul. 28, 1987, Ser. No. 78,835

Int. Cl.⁴ C08J *3/02;* **C08K** *3/20*

U.S. Cl. 524—501 **29 Claims**

1. A paint solution substantially free of crosslinking consisting of:

an internal phase comprising pigment and latex resin; and

an external phase comprising an amine-soluble resin dissolved in water, said amine-soluble resin having a molecular weight sufficiently high that said amine soluble resin imparts an improvement in desirable film properties including hardness, flexibility, adhesion, water resistance and a high volume of solids to said paint while maintaining surface applicability of said paint, said external phase being effective in forming a substantially continuous film encapsulating said internal phase upon evaporation of said water at ambient temperature.

4,782,110

THERMOPLASTIC COMPOSITIONS OF CRYSTALLINE POLYOLEFIN, AND ETHYLENE/ALKYL ACRYLATE COPOLYMER ELASTOMER

James R. Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 7, 1985, Ser. No. 796,589

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.⁴ C08L *23/04, 23/10, 33/04*

U.S. Cl. 524—522 **16 Claims**

1. A melt processible multi-phase thermoplastic composition consisting essentially of a blend of:

(A) 15–75 parts by weight of a crystalline polyolefin resin comprising polymerized monomer units of ethylene or propylene or mixtures thereof forming the continuous phase of the composition, and

(B) 25–85 parts by weight of a dynamically crosslinked elastomer of an ethylene/alkyl acrylate copolymr said elastomer crosslinked by an agent selected from the group consisting of a diamine, a polyamine, or precursors thereof, said elastomer consists essentially of units derived from ethylene, an alkyl ester of acrylic acid wherein the alkyl group contains 1 ∝ 6 carbon atoms, and a monoalkyl ester of 1,4-butenedioic acid wherein the alkyl group contains 1–6 carbon atoms forming the discontinuous phase of the composition.

4,782,111

COLORANT FORMULATION

Peter Klein, Wiesbaden; Bernd Dewald, Idstein, and Wolfgang Teige, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

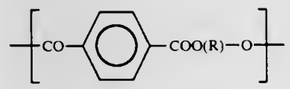
Continuation of Ser. No. 759,074, Jul. 25, 1985, abandoned, which is a continuation of Ser. No. 565,829, Dec. 27, 1983, abandoned. This application Dec. 5, 1986, Ser. No. 939,261

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248492

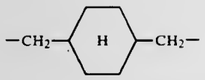
Int. Cl.⁴ C08L *67/02*

U.S. Cl. 524—539 **2 Claims**

1. A colorant formulation for mass-coloring high-melting polyesters of the basic unit



where R = -(CH₂)ₓ with x = 2–6 or



said colorant formulation comprising:

more than 3% by weight of a colorant consisting essentially of a dyestuff which is soluble in polyester or a pigment which is insoluble in polyester or a mixture thereof, essentially the balance of said colorant formulation consisting essentially of a support for the colorant comprising a mixture of a linear polyester having a softening point above 60° C. and a specific viscosity of from 0.4 to 1.0 gl/g and of high molecular weight polybutylene terephthalate having a specific viscosity of from 0.5 to 1.5 dl/g and where the amount of polybutylene terephthalate in the mixture is adjusted so that the colorant formulation has a recrystallization exotherm of 8 to 55 joule/b between 210° C. and 150° C.

4,782,112

SILICONE WATER-BASED EMULSION COMPOSITION

Hidetoshi Kondo, Ichihara, and Taro Koshii, Chiba, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,429

Claims priority, application Japan, Oct. 11, 1986, 61-267034

Int. Cl.⁴ C08L *83/07, 83/06, 83/05*

U.S. Cl. 524—837 **4 Claims**

1. Silicone water-based emulsion composition which provides a water-repellent material, said composition consisting of the mixture of

(A) a silicone water-based emulsion composed of emulsifying agent, water, and diorganopolysiloxane, the organo groups being monovalent organic groups selected from the group consisting of alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl and these groups in which all or part of the hydrogen atoms have been replaced by halogen, and having at least 2 silicon-bonded hydroxyl groups in each molecule;

(B) a silicone water-based emulsion composed of emulsifying agent, water, and organohydrogenpolysiloxane, the organo groups being monovalent hydrocarbon groups, and having at least 2 silicon-bonded hydrogen atoms in each molecule, containing 1 or less weight percent silicon-bonded hydrogen atoms in each molecule, and having no aliphatically unsaturated hydrocarbon groups, said organohydrogen-polysiloxane having a viscosity of from 1

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to 1,000,000 centipoises at 25° C. and being present in sufficient amount to provide at least one hydrogen atom for each hydroxyl group in the diorganopolysiloxane of component (A);

(C) 0.01 to 5 parts by weight per 100 parts by weight of the diorganopolysiloxane of (A) of curing catalyst; and optionally

(D) a filler; and wherein said components (A) and (B) are each prepared in advance separately from the other components.

4,782,113

NEOCARZINOSTATIN DERIVATIVES AND METHOD OF PRODUCING THE SAME

Hiroshi Maeda, 631-3, Aza-Tamukae, Hotakubohon-Machi, Kumamoto City, Kumamoto Pref.; Ryunosuke Kanamaru; Nakao Ishida, both of Sendai; Toshihiko Yoshitake, Kurashiki, and Minoru Ueda, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki; Yamanouchi Pharmaceutical Co., Ltd.; Kayaku Antibiotics Research Co., Ltd., both of Tokyo and Hiroshi Maeda, Kumamoto, all of, Japan

Continuation of Ser. No. 751,977, Jun. 28, 1985, abandoned, which is a continuation of Ser. No. 636,490, Aug. 1, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 911,454

Claims priority, application Japan, Aug. 8, 1983, 58-145418

The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.

Int. Cl.[4] A61K *31/785;* **C08F** *8/32*

U.S. Cl. 525—54.1 **24 Claims**

1. A substantially pure neocarzinostatin derivative having the formula (A):

(SMA)—(NCS)—(SMA) (A)

wherein (NCS) is a divalent neocarzinostatin residue and (SMA) comprises the monovalent residue of a partially half-esterified styrene-maleic acid copolymer having a weight-average molecular weight of from 800 to 2,500, said (NCS) residue being bonded to said (SMA) residues via amide linkages formed between primary amino groups of the neocarzinostatin molecule and carbonyl groups of the partially half-esterified styrene-maleic acid copolymer.

4,782,114

COMPATIBILIZING AGENT FOR POLYCARBONATE AND POLYAMIDE POLYMER BLENDS

Peter J. Perron, and Edward A. Bourbonais, both of Arlington, Tex., assignors to Dexter Corporation, Windsor, Conn.

Continuation-in-part of Ser. No. 915,239, Oct. 3, 1986, abandoned. This application Sep. 10, 1987, Ser. No. 95,497

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—66 **37 Claims**

1. A polycarbonate and polyamide melt compounded blend having improved chemical and physical properties, said blend consisting essentially of:

a polycarbonate resin in an amount sufficient to impart a heat distortion temperature of at least about 200° F. the blend;

a linear polyamide in an amount sufficient to impart to the blend chemical resistance against solvents and stress cracking agents as well as an impact strength of at least about 15 foot-pounds when measured by the notched izod test; and

a polymeric compatibilizing agent comprising a polyetherimide which has at least one functional group soluble in the polycarbonate and at least one functional soluble in the polyamide, each in particulate form, in an amount sufficient to provide a substantially uniform polymeric mixture, wherein the melting point or softening point of the polymeric compatibilizing agent is no greater than the melting or softening point of the polycarbonate and polyamide constituents of the blend, for an effective period of time under low shear conditions so as to form a substantially uniform mixture of the polycarbonate and polyamide components.

4,782,115

THERMOPLASTIC MOULDING COMPOSITIONS BASED ON POLYSILOXANE/POLYCARBONATE BLOCK COPOLYMERS

Winfried Paul; Hans-Jürgen Kress, both of Krefeld; Wolfgang Stix, Neckarsteinach; Christian Lindner, Cologne, all of Fed. Rep. of Germany; Dieter Neuray, Pittsburgh, Pa., and Werner Nouvertné, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 789,141, Oct. 18, 1985, abandoned, which is a division of Ser. No. 642,448, Aug. 20, 1984, Pat. No. 4,569,970. This application Nov. 2, 1987, Ser. No. 115,385

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331438; Dec. 24, 1983, 3347071

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **15 Claims**

1. A thermoplastic moulding composition containing (a) a polydiorganosiloxane polycarbonate block copolymer having an average molecular weight $\overline{M}_w$ of 10,000 to 200,000 and containing between 75% by weight and 97.5% by weight of aromatic carbonate structural units and between 25% by weight and 2.5% by weight of polydiorganosiloxane structural units, the block copolymers being prepared from polydiorganosiloxanes which contain α,Ψ-bis-hydroxyaryloxy terminal groups and have a degree of polymerisation $\overline{P}_n$ of 5 to 100,

(d) 5–20 parts by weight of an elastomeric polymer having a glass transition temperature of below −20° C. which is

(i) graft copolymers comprising butadiene/styrene copolymers, poly(meth)acrylates or polybutadienes onto which are grafted styrene, acrylonitriel, (meth)acrylates, or mixtures thereof,

(ii) ethylene vinylacetate copolymers containing 15–70% by weight vinylacetate and having melt indices from non-freeflowing to 1000, or

(iii) epm or epdm rubbers in which the weight ratio of ethylene radicals to propylene radicals is in the range from 40:60 to 90:10; and

(e) 0–50 parts by weight of thermoplastic polyalkylene terephthalate, the sum of the number of parts by weight of components (a)+(d)+(e) being 100 parts by weight in each case.

4,782,116

HOMOGENEOUS THERMOSET TERPOLYMERS

Mark D. Holte, La Crosse, Wis., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

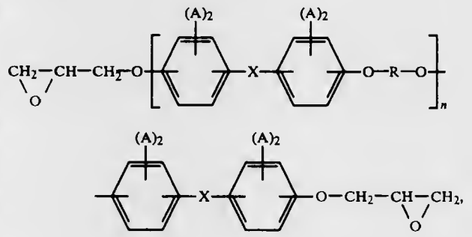
Continuation-in-part of Ser. No. 887,398, Jul. 21, 1986, abandoned. This application Jul. 6, 1987, Ser. No. 69,783

Int. Cl.[4] C08F *8/00, 283/10;* **C08L** *61/04;* **C08G** *65/08*

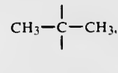
U.S. Cl. 525—109 **36 Claims**

1. Homogeneous thermoset terpolymers consisting essentially of:

(1) from about 30% to about 50% by weight of said terpolymer of a diepoxide of a polyether of a polyphenol having the structure:



in which X is selected from the group consisting of



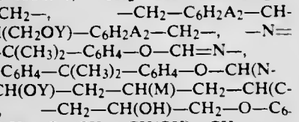
SO_2, O, and CH_2 radicals, R is selected from the group consisting of $—CH_2—C_6H_4—CH_2—$, $(CH_2)_b$ in which b ranges from 1 to about 6, $—CH_2—CH=CH—CH_2—$, $—CH_2—C\equiv C—CH_2—$, $—CH_2—C_6H_2A_2—CH(OY)—CH_2—CH(CH_2OY)—C_6H_2A_2—CH_2—$, $—N=CH—O—C_6H_4—C(CH_3)_2—C_6H_4—O—CH=N—$, $—CH(NH)—O—C_6H_4—C(CH_3)_2—C_6H_4—O—CH(NH)—$, $—C_6H_4—CH(OY)—CH_2CH(M)—CH_2CH(CH_2OY)—C_6H_4—$, $—CH_2—CH(OH)—CH_2—O—C_6H_4C(CH_3)_2—C_6H_4—O—CH_2—CH(OH)—CH_2—$, and $—CH_2—CH(OH)—CH_2—O—C_6H_2Br_2—C(CH_3)_2—C_6H_2Br_2—O—CH_2—CH(OH)—CH_2—$ radicals, where M is $—C_6H_5$, $—C_6H_4(CH_3)$ or $—C_6H_4(CH=CH_2)$ and Y is a free radical such as hydroquinone, A is independently selected from the group consisting of hydrogen, chlorine, bromine, fluorine, alkyl, alkoxy and phenyl radicals and n has a average value in range of from about 0 to about 20;

(2) from about 15% to about 20% by weight of said terpolymer of a dicyanate ester of a polyether of a polyphenol having the structure:

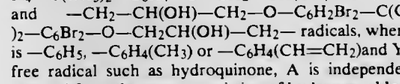
in which X is selected from the group consisting of

SO_2, O, S, and CH_2 radicals, R is selected from the group consisting of $—CH_2—C_6H_4—CH_2—$, $(CH_2)_b$ in which b ranges from 1 to about 6, $—CH_2—CH=CH—CH_2—$, $—CH_2—C\equiv C—CH_2$,

-continued



and;



radicals, B is independently selected from the group consisting of hydrogen, chlorine, bromine, fluorine, alkyl, alkoxy and phenyl radicals and m has an average value in the range of from about 0 to about 20;

(3) from about 30% to about 50% by weight of said terpolymer of an alkenyl aryl compound; and

(4) about 0.5% to about 5% by weight of a polyalkadiene.

17. A process for the production of a homogeneous thermoset terpolymer which consists of reacting a blend consisting of:

(1) a diepoxide of a polyether of a polyphenol having the structure:

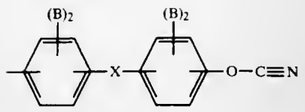
in which X is selected from the group consisting of

SO_2, O, and CH_2 radicals, R is selected from the group consisting of $—CH_2—C_6H_4—CH_2—$, $(CH_2)_b$ in which b ranges from 1 to about 6, $—CH_2—CH=CH—CH_2—$, $—CH_2—C\equiv C—CH_2—$, $—CH_2—C_6H_2A_2—CH(OY)—CH_2—CH(CH_2OY)—C_6H_2A_2—CH_2—$, $—N=CH—O—C_6H_4—C(CH_3)_2—C_6H_4—O—CH=N—$, $—CH(NH)—O—C_6H_4—C(CH_3)_2—C_6H_4—O—CH(NH)—$, $—C_6H_4—CH(OY)—CH_2—CH(M)—CH_2—CH(CH_2OY)—C_6H_4—$, $—CH_2—CH(OH)—CH_2—O—C_6H_4—C(CH_3)_2—C_6H_4—O—CH_2—CH(OH)—CH_2—$, and $—CH_2—CH(OH)—CH_2—O—C_6H_2Br_2—C(CH_3)_2—C_6Br_2—O—CH_2CH(OH)—CH_2—$ radicals, where M is $—C_6H_5$, $—C_6H_4(CH_3)$ or $—C_6H_4(CH=CH_2)$and Y is a free radical such as hydroquinone, A is independently selected from the group consisting of hydrogen, chlorine, bromine, fluorine, alkyl, alkoxy and phenyl radicals and n has an average value in the range of from about 0 to about 20, and an alkenyl aryl compound with a blend consisting of:

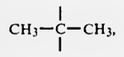
(2) a dicyanate ester of a polyether of a polyphenol having the structure:

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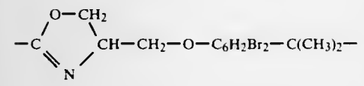
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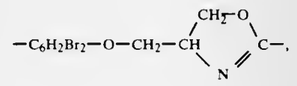


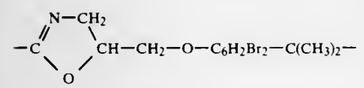
in which X is selected from the group consisting of

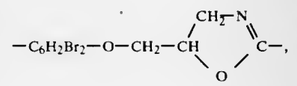


SO_2, O, S, and CH_2 radicals, R is selected from the group consisting of $-CH_2-C_6H_4-CH_2-$, $(CH_2)_b$ in which b ranges from 1 to about 6, $-CH_2-CH=CH-CH_2-$, $-CH_2C\equiv C-CH_2-$,

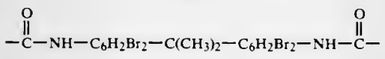








and;



radicals, B is independently selected from the group consisting of hydrogen, chlorine, bromine, fluorine, alkyl, alkoxy and phenyl radicals and m has an average value in the range of from about 0 to about 20;

(3) an alkenyl aryl compound at reaction conditions. and

(4) about 0.5% to about 5% by weight of a polyalkadiene and recovering the resultant homogeneous thermoset terpolymer.

4,782,117

THERMOPLASTIC MOLDING MATERIALS BASED ON NYLONS AND POLYCARBONATES

Dietrich Lausberg, Ludwigshafen, and Horst Reimann, Worms, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,843

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605573

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 525—146 **23 Claims**

I. A thermoplastic molding material, comprising:

(A) a nylon in an amount from 20 to 78 wt.%;

(B) a polycarbonate in an amount of from 20 to 78 wt.%; and

(C) a polymeric component having hydroxyl groups, —OH, in an amount from 0.1 to 30 wt.%;

wherein said wt.% are based on the sum of (A), (B) and (C).

4,782,118

CEMENT FOR FIXING A BONE PROSTHESIS

Michel Fontanille, Bordeaux, and Myrna Timar, Saint Denis, both of France, assignors to Ceraver, S.A., Paris, France

Filed Jun. 20, 1986, Ser. No. 876,675

Claims priority, application France, Jun. 20, 1985, 85 09397

Int. Cl.⁴ C03F *269/00*

U.S. Cl. 525—286 **4 Claims**

1. A cement for fixing a bone prosthesis, in particular an endoprosthesis for a joint, to a bone, the cement comprising:

(a) a solid phase, in powder form, including

a first part consisting of polymethylmethacrylate and an oligomer of methyl methacrylate with glycidyl methacrylate, the glycidyl methacrylate having an oxirane function, and

a second part consisting of an organic peroxide capable of generating free radicals; and

(b) a liquid phase including

methyl methacrylate;

an accelerator for accelerating decomposition of the organic peroxide, the accelerator including a methacrylate or an acrylate having a tertiary amine function for enabling the cement to set in bulk in a few minutes; and

a compound consisting of a methacrylate having a carboxylic acid function capable of reacting with the oxirane function of the oligomer.

4,782,119

RUBBER COMPOSITION COMPRISING A STYRENE-BUTADIENE BLOCK COPOLYMER HAVING TWO KINDS OF BLOCKS

Fumio Tsutsumi, Yokkaichi; Akio Iakashima, Kameyama; Mitsuhiko Sakakibara, Yokkaichi; Noboru Oshima, Suzuka; Tatsuo Fujimaki, Higshimurayama, and Yoshiyuki Morimoto, Kodaira, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Bridgestone Corporation, both of Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,923

Claims priority, application Japan, Aug. 27, 1984, 59-178064

Int. Cl.⁴ C08F *297/04*

U.S. Cl. 525—314 **14 Claims**

1. A rubber composition containing at least 20% by weight of a styrene-butadiene block copolymer consisting of a block (A) and a block (B) characterized in that:

(i) the block (A) is a styrene-butadiene copolymer block having a content of styrene of 10–80% by weight and the average content of the vinyl bonds in the butadiene portion is 30–70% by weight;

(ii) the block (B) is a polybutadiene block with the average content of the vinyl bonds in the butadiene portion being not more than 60% by weight;

(iii) the block copolymer contains at least 20% by weight of each of the block (A) and the block (B);

(iv) the average content of the vinyl bonds in the butadiene portion of the block (A) is greater by at least 5% by weight than that of the block (B);

(v) the glass transition temperature of the block (A) is higher by at least 30° C. than that of the copolymer block (B);

(vi) the whole content of the bound styrene in said block is 5–40% by weight;

(vii) the ratio Mw/Mn between the weight average molecular weight Mw and the number average molecular weight Mn of the block copolymer is 1.8–5.0 when calculated as polystyrene according to the gel permeation chromatogram; and

(viii) the Mooney's viscosity ($ML_{1+4}^{100°\ C.}$) of the block copolymer is 20–150,

wherein the styrene-butadiene block copolymer is produced by a continuous copolymerization method.

4,782,120

NON-POLLUTING THINNING ADJUVANT FOR SEA-WATER AND/OR FRESH WATER BASED DRILLING MUDS

Jacky Rousset, Baneins; Jean-Bernard Egraz, Ecully, and Gilles Letetour, Aurions, all of France, assignors to Coatex, S.A., Caluire, France

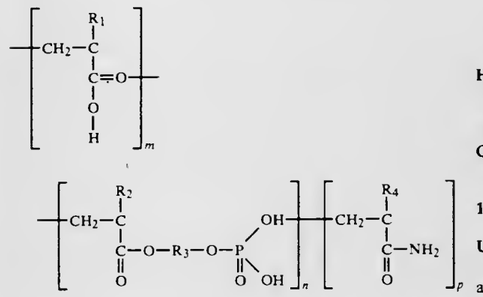
Continuation of Ser. No. 556,314, Nov. 30, 1983, abandoned. This application Apr. 13, 1987, Ser. No. 38,483

Claims priority, application France, Nov. 30, 1982, 82 20241

Int. Cl.⁴ C08F *130/02, 230/02*

U.S. Cl. 525—326.6 **12 Claims**

1. A non-polluting adjuvant for saline- or fresh-water based drilling muds to maintain the rheological characteristics under extreme conditions of temperature and pressure comprising a hydrosoluble copolymer obtained from copolymerization of ethylenic acids, acrylamides and ethylenic esters of phosphoric acid having the formula:



wherein the indices m, n and p expressed in mole % each define effective amount and are within the following ranges:

$0\% < m < 90\%$

$2\% < n < 100\%$

$0\% < p < 90\%$

and R_1, R_2 and R_4 are each selected from the group consisting of hydrogen and alkyl and R_3 is selected from the group consisting of alkylene, alkylene oxide and polyalkylene oxides.

4,782,121

FLUORINE INDUCED DEHYDROHALOGENATION PROCESS

Leo R. Novak, Lake Jackson; David C. Kelley, Angleton, and Philip Y. Lau, Houston, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 757,558, Jul. 22, 1985, Pat. No. 4,668,743. This application Mar. 11, 1987, Ser. No. 3,152

The portion of the term of this patent subsequent to Jun. 17, 2003, has been disclaimed.

Int. Cl.⁴ C08F *8/26*

U.S. Cl. 525—334.1 **5 Claims**

1. A polymer of solid form of chlorinated polyethylene having a surface conductive layer of about 40 microns or greater in thickness, the surface conductive layer being dehydrohalogenated highly oriented polymer molecules wherein the surface conductive layer has an electrical conductivity of about 10^{-9}/ohm cm or greater and has conjugated double bonds in the surface conductive layer.

4,782,122

IMPACT MODIFIER FOR IMIDE CONTAINING COPOLYMERS

Barry D. Dean, Broomall, Pa., assignor to Arco Chemical Company, Newtown Square, Pa.

Division of Ser. No. 895,990, Aug. 14, 1986, Pat. No. 4,703,085. This application May 15, 1987, Ser. No. 50,106

Int. Cl.⁴ C08F *8/30*

U.S. Cl. 525—375 **9 Claims**

1. An A-B-A triblock copolymer wherein each A separately represents a poly(2-alkyl-2-oxazoline) end block and B represents a polyisobutylene midblock.

4,782,123

PROCESS FOR THE PREPARATION OF COPOLYPHOSPHONATES OF HIGH NOTCHED IMPACT STRENGTH

Hermann Kauth, Krefeld; Klaus Reinking, Wermelskirchen, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 858,707, May 2, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 118,538

Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517271

Int. Cl.⁴ C08L *67/02, 69/00*

U.S. Cl. 525—437 **10 Claims**

1. Process for the preparation of aromatic copolyphosphonates with average molecular weights M_n of 5,000 to 200,000 and molar ratios of phosphonate groups to carboxylate plus carbonate groups of 95:5 to 5:95, which comprises transesterifying

I. aromatic polyester and

II. aromatic polyphosphonate, in

III. organic solvent, in an amount of 2 to 95% by weight, based on the sum of components I, II and III,

by extruding the mixture at temperatures of 150° to 420° C., until at least 80% transesterification, as determined by the ratio of the glass transition temperature peaks according to differential thermal analysis, is achieved with the solvent being removed during the extrusion.

4,782,124

POLYCARBONATE MODIFIED EPOXY RESINS

Robert E. Hefner, Jr., Lake Jackson; Deborah I. Haynes, Freeport, and Manuel C. Tyler, Jr., Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 14, 1987, Ser. No. 39,192

Int. Cl.⁴ C08F *283/02;* **C08L** *63/00*

U.S. Cl. 525—463 **23 Claims**

1. An epoxy resin composition consisting essentially of the reaction product of

(1) one or more epoxy resins with

(2) from about 0.1 to 10.0% by weight based on the total weight of the product of an aromatic polycarbonate resin or oligomer

whereby said epoxy resin is linked by one of more carbonate bonds to the transesterification induced chain scission products of said polycarbonate to provide chain branching and/or crosslinking of said epoxy resin.

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4,782,125

COMPOSITION FOR MAKING THERMOSET DICYCLOPENTADIENE POLYMER

Norman R. Newburg, deceased, late of Wilmington, Del. (by Betty Newburg, executor), assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 618,694, Jun. 8, 1984, abandoned, which is a continuation of Ser. No. 526,836, Aug. 26, 1983, Pat. No. 4,481,344. This application May 13, 1985, Ser. No. 733,418 The portion of the term of this patent subsequent to Nov. 6, 2001, has been disclaimed.

Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—216 2 Claims

1. In a composition for making a thermoset polymer of polymerized units of dicyclopentadiene formed by combining a plurality of reactant streams, a first reactant stream containing the activator of a metathesis-catalyst system, a second reactant stream containing a catalyst of said metathesis-catalyst system, and at least one of the reactant streams containing dicyclopentadiene, the improvement wherein at least one of the reactant streams comprises ethyl trichloroacetate.

4,782,126

POLYMERS FORMED FROM ALLYL-SUBSTITUTED OR METHALLYL-SUBSTITUTED, BICYCLIC, UNSATURATED DICARBOXYLIC ANHYDRIDES

Alfred Renner, Muntelier; Theobald Haug, Frenkendorf, and Bruno Schreiber, Aesch, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

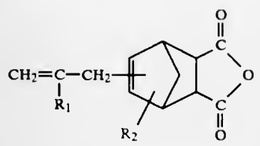
Division of Ser. No. 4,251, Jan. 5, 1987, Pat. No. 4,713,417. This application Sep. 16, 1987, Ser. No. 96,991

Claims priority, application Switzerland, Jan. 31, 1984, 448/84

Int. Cl.[4] C08F *34/02, 122/04, 222/04*

U.S. Cl. 526—271 3 Claims

1. A process for the preparation of polymers formed from anhydrides of the formula



wherein R_1 and R_2 are independently hydrogen or methyl, which comprises heating one or more of said anhydrides at a temperature between 150° C. and 350° C. in the absence of a catalyst.

4,782,127

STYRENIC POLYMER RESINS HAVING IMPROVED FLOW CHARACTERISTICS

Claude T. E. van Nuffel, Oostakker, Belgium, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1986, Ser. No. 882,314

Claims priority, application Netherlands, Jul. 8, 1985, 8501949

Int. Cl.[4] C08F *220/12*

U.S. Cl. 526—329.2 1 Claim

1. A thermoplastic polymeric molding composition the polymeric content thereof consisting in polymerized form from 99.9 to 85 weight percent styrene or a mixture of styrene and acrylonitrile and from 0.1 to 15 weight percent of n-butyl acrylate.

4,782,128

POLYURETHANE POWDER COATING COMPOSITIONS WHICH YIELD A MATTE SURFACE AFTER SETTING

Rainer Gras, Bochum, and Elmar Wolf, Recklinghausen, both of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 9, 1988, Ser. No. 154,014

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711374

Int. Cl.[4] C08G *18/80*

U.S. Cl. 528—45 7 Claims

1. A polyurethane powder coating composition with a matte surface after setting, comprising the following binder components:

(i) an isocyanate component comprising:

(a) an adduct of epsilon-caprolactam-blocked trans-1,4-cyclohexanediisocyanate with a diol or triol or mixtures thereof,

(b) an epsilon-caprolactam-blocked trimer of trans-1,4-cyclohexanediisocyanate, and

(c) epsilon-caprolactam-blocked trans-1,4-cyclohexanediisocyanate or epsilon-caprolactam-blocked isophoronediisocyanate or mixtures thereof, in the amount of 0.50 wt.% on the basis of the combined weight of (a) and (b); and

(ii) an alcohol component comprising one or more OH-group-containing polymers.

4,782,129

ACRYLATED POLYURETHANES BASED ON POLYOXYTETRAMETHYLENE GLYCOL CHAIN EXTENDED WITH SUBSTITUTED DIACIDS

Elias P. Moschovis, Morton Grove; Joseph J. Stanton, Buffalo Grove, and Clive J. Coady, Hanover Park, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 4, 1988, Ser. No. 140,726

Int. Cl.[4] C08G *18/04*

U.S. Cl. 528—49 19 Claims

1. An ultraviolet-curable coating composition adapted for the buffer coating of optical glass fiber, consisting essentially of an acrylate-capped polyurethane, which may contain urea groups, in admixture with at least about 25% of the weight of the acrylate-capped polyurethane of liquid monoethylenically unsaturated monomer having a low glass transition temperature below about 0° C., said acrylate-capped polyurethane being based on a generally linear polyurethane which is the reaction product of organic diisocyanate with a stoichiometric deficiency of a modified diol, said modified diol being the diester reaction product of polyoxytetramethylene glycol having a molecular weight of from about 200 to about 2000 with a stoichiometric deficiency of a long chain hydrocarbon-substituted dicarboxylic acid or derivative thereof, said long chain hydrocarbon containing at least 6 carbon atoms and having a molecular weight of up to about 1000 to provide a higher molecular weight polyoxytetramethylene glycol which includes ester groups and a long chain hydrocarbon substituent.

4,782,130

FLUORINATED POLYURETHANES CONTAINING POLYOXYPERFLUORO-ALKYLENE BLOCKS, ENDOWED WITH IMPROVED MECHANICAL CHARACTERISTICS

Alberto Re, Milan; Ezio Strepparola, Bergamo, and Piero Gavezzotti, Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Filed Feb. 12, 1986, Ser. No. 828,681

Claims priority, application Italy, Feb. 13, 1985, 19497 A/85

Int. Cl.[4] C08G *18/32*

U.S. Cl. 528—70 5 Claims

1. Method for producing protective coatings characterized by a low wettability and by a high resistance to atmospheric

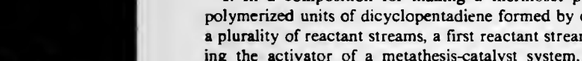
agents, wherein a coating layer consisting essentially of a fluorinated polyurethane having a glass transition temperature lower than −80° C., characterized by a chain structure comprising:

(A) sequences having average molecular weights of 500–7000 and consisting of fluorooxyalkylene units selected from the following classes:

I—(C_2F_4O), (CF_2O), said units being randomly placed along the fluoropolyoxyalkylene chain;

II—(C_3F_6O), (C_2F_4O), (CFXO) wherein X=F or CF_3, said units being randomly placed along the fluoropolyoxyalkylene chain;

III—$(CH_2CF_2CF_2O)$, said units in the fluoropolyoxyalkylene chain being linked between them as follows:

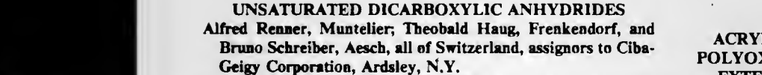


wherein R'_f is a fluoroalkylene group and p and q are integers, p+q being greater than 2;

IV

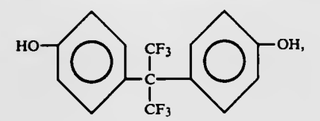


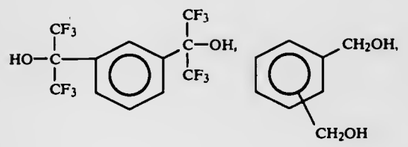
said units being linked between them in the fluoropolyoxyalkylene chain as follows:

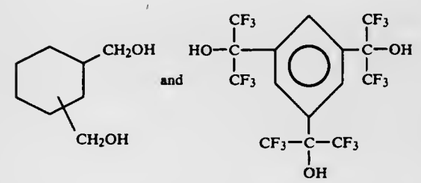


wherein R_f is a fluoroalkylene group, x is 0 or 1, a and b are integers, a+b being greater than 2; and

(B) units derived from fluorinated or non-fluorinated diols or triols containing one or more aromatic or cycloaliphatic or polycyclic rings, said diols and triols being selected from:







and characterized further in that for each type B unit there are present 1 to 20 fluoropolyoxyalkylene sequences as defined in item (A), is formed by a process consisting essentially in the reaction of:

(a) one or more di-isocyanates containing sequences of fluorooxyalkylene units of class from I to IV and having average molecular weights of 500–7000, with;

(b) polyols as defined in item B and optionally with;

(c) one or more fluoropolyoxyalkylene diols having sequences of fluorooxyalkylene units of class I to IV, having average molecular weights of B 500–7000, and optionally with:

(d) trihydroxy- or tetrahydroxy-polyoxyperfluoroalkylenes having average molecular weights of 500–7000, and furthermore characterized in that for an amount of component (a) equal to 100 equivalents of isocyanate there are used an amount of component (b) equal to 5–100 equivalents of —OH, the total amount of equivalents —OH being equal to B 70–100.

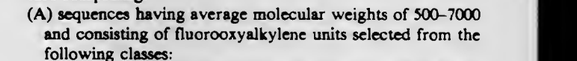
4. A fluorinated polyurethane having a glass transition temperature lower than −80° C., characterized by a chain structure comprising:

(A) sequences having average molecular weights of 500–7000 and consisting of fluorooxyalkylene units selected from the following classes:

I—(C_2F_4O), (CF_2O), said units being randomly placed along the fluoropolyoxyalkylene chain;

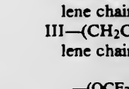
II—(C_3F_6O), (C_2F_4O), (CFXO) wherein X=F or CF_3, said units being randomly placed along the fluoropolyoxyalkylene chain;

III—$(CH_2CF_2CF_2O)$, said units in the fluoropolyoxyalkylene chain being linked between them as follows:

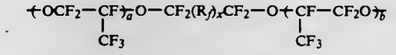


wherein R'_f is a fluoroalkylene group and p and q are integers, p+q being greater than 2;

IV

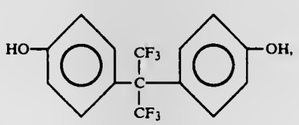


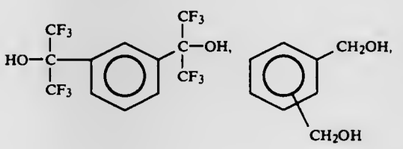
said units being linked between them in the fluoropolyoxyalkylene chain as follows:



wherein R_f is a fluoroalkylene group, x is 0 or 1, a and b are integers, a+b being greater than 2; and

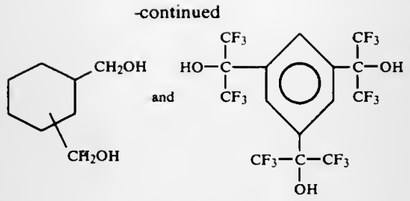
(B) units derived from fluorinated or non-fluorinated diols or triols containing one or more aromatic or cycloaliphatic or polycyclic rings, said diols and triols being selected from:





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and characterized further in that for each type B unit there are present 1 to 20 fluoropolyoxyalkylene sequences as defined in item (A).

4,782,131

ESTER INTERCHANGE POLYESTER PREPARATION WITH ALKALI METAL FLUORIDE CATALYST

Wilfred Sweeny, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jun. 29, 1987, Ser. No. 67,117
Int. Cl.[4] C08G *63/14*
U.S. Cl. 528—180 **9 Claims**

1. A process for preparing polyester from reactants comprising at least one aromatic diol and at least one member of the group consisting of diphenylester of an aromatic dicarboxylic acid and phenyl ester of a hydroxyaromatic acid which comprises subjecting the reactant(s) to an ester interchange reaction in the presence of a catalytic amount of an alkali metal fluoride selected from the group of cesium, rubidium, potassium and sodium fluorides.

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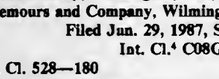
PROCESS FOR PRODUCING A COPOLYESTER

Seiichi Nozawa, Yamato; Osamu Kishiro, Atsugi; Atsushi Kasai, Machida; Seigo Okumura, Machida; Ken Honma, Machida, and Chieko Muramoto, Ichikawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 6, 1987, Ser. No. 853
Int. Cl.[4] C08G *63/02, 63/18, 63/16;* C08F *20/00*
U.S. Cl. 528—193 **15 Claims**

1. A process for preparing a copolymeric polyester, which comprises:

(a) preparing a copolymeric oligomer by reacting a starting material oligoester or polyester having repeating units of the formula:



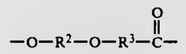
(A)

wherein R^1 is (i) a divalent aromatic hydrocarbon group having from 6 to 20 carbon atoms where a hydrogen atom in the aromatic ring of the aromatic hydrocarbon group may be substituted by a halogen atom or an alkyl or alkoxy group having from 1 to 4 carbon atoms, (ii) a divalent alicyclic hydrocarbon group having from 4 to 20 carbon atoms, (iii) a divalent aliphatic hydrocarbon group having from 1 to 40 atoms, or (iv) combinations thereof; and R2 is (i) divalent aliphatic hydrocarbon group having from 2 to 40 carbon atoms, (ii) a divalent alicyclic hydrocarbon group having from 4 to 20 carbon atoms, (iii) a divalent radical of polyalkylene oxide having a molecular weight of from 80 to 8000, or (iv) combinations thereof, in an amount of from 5 to 95 mol % as represented by the amount of the repeating units constituting the oligoester or polyester, with from 5 to 95 mol % of a hydroxycarboxylic acid of the formula:



(B)

wherein R^3 is a divalent aromatic hydrocarbon group having from 6 to 20 carbon atoms on its aromatic ring, said aromatic ring having a hydrogen atom substituted by a halogen atom or an alkyl or alkoxy group having from 1 to 4 carbon atoms, said copolymer oligomer thereby containing repeating units of the formula:



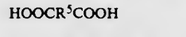
wherein R^2 and R^3 are as defined above and containing terminal —OH groups and —COOH groups in unbalanced amounts where the terminal —COOH groups are present in excess of the terminal —OH groups:

(b) adding acetic anhydride as an acylating agent to the oligomer copolymer obtained, thereby acylating the same, and, wherein at any time prior to the completion of the second step, adding (i) a dihydroxyl compound of the formula:



(C)

wherein R^4 has the same meaning as R^1 in formula A above, or adding (i), the compound of the formula (c), and (ii) the compound of the formula:



(D)

wherein R^5 has the same meaning as R^1 in the formula A above for reaction with oligomer being acylated; and

(c) polymerizing the acylated oligomer under reduced pressure.

4,782,133

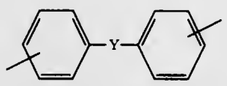
METHOD FOR PREPARING COMPOSITIONS CONTAINING MALEIMIDE-AMIDE COMPOUNDS

Adrianus de Koning, Munstergeleen; Jacobus A. Loontjens, Meerssen; Hubertus A. M. Mostert, Geleen, and Hubertus A. A. Omloo, Landgraaf, all of Netherlands, assignors to DSM Resins B.V., Zwolle, Netherlands

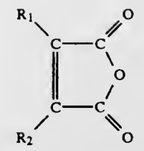
Divisioo of Ser. No. 823,576, Jan. 29, 1986, Pat. No. 4,684,706, which is a division of Ser. No. 650,080, Sep. 13, 1984, Pat. No. 4,582,883. This application May 13, 1987, Ser. No. 49,209
Claims priority, application Netherlands, Sep. 20, 1983, 8303229
Int. Cl.[4] C08G *73/12*
U.S. Cl. 528—345 **5 Claims**

1. A process for the preparation of a composition comprising a bismaleimide, a maleimide-amide and a maleic anhydride derivative, said process comprising:

(A) reacting a diamine having the formula, $H_2N—Z—NH_2$, wherein Z represents (I) an unsubstituted or substituted alkylene group containing 2-25 carbon atoms, (II) an unsubstituted or substituted meta- or para-phenylene group, or an unsubstituted or substituted group having the formula,



wherein Y represents $—CH_2—$, $—C(CH_3)_2—$, —O—, or $—SO_2—$, with a maleic anhydride derivative having the formula,



wherein R_1 and R_2 each independently represent hydrogen; an aliphatic, cycloaliphatic or aromatic group containing 1-12 carbon atoms; or halogen; or R_1 and R_2, together with the carbon atoms to which they are attached, form a ring system with at least one polymerizable C=C bond, the molar ratio of said diamine to said maleic anhydride being 1:0.75 to 1:2.5, the said reaction being carried out in a solvent for a period ranging from 30 minutes to 5 hours at a temperature ranging from 15° to 70° C., and

(B) reacting the reaction product of step (A) in the presence of a catalyst with an effective amount of an mono-carboxylic acid anhydride for a period of time ranging from 30 minutes to 4 hours at a temperature ranging from 50°-100° C., said catalyst being selected from the group consisting of (i) tri(n-butyl)amine, (ii) N,N,N',N'-tetramethylene diamine, (iii) triethylamine and (iv) 1,4-diazabicyclo-2,2,2-octane.

4,782,134

METHOD FOR IMPROVING THE MELT FLOW RATE OF POLYSTYRENE

Eugene R. Moore; Rudolph Lindsey, Jr., and Brian D. Dalke, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1986, Ser. No. 920,409
Int. Cl.[4] C08F *6/00;* C08J *9/18;* B29B *13/04*
U.S. Cl. 528—483 **18 Claims**

1. A method for stabilizing and controlling melt flow rate of a batch of particulate polymeric materials selected from the group consisting of vinyl aromatic polymrs and blends of polymers containing at least one vinyl aromatic polymer, whereby the melt flow rate of said batch is substantially consistent and can be increased, remain substantially the same or be decreased, comprising:

selecting a desired melt flow rate for said batch; and

contacting under approximatley ambient pressure said batch of polymeric materials with an activating gas selected from the group consisting of carbon dioxide, oxygen, argon and mixtures thereof for a substantial period of time sufficient for said polymeric materials to absorb said gas in an amount effective to provide said desired melt flow rate:

maintaining said polymer at a temperature below 80 degrees C. during said substantial period of time; and

terminating said contact between said activating gas and said batch of polymeric materials immediately prior to introduction of the polymeric materials into a molding machine.

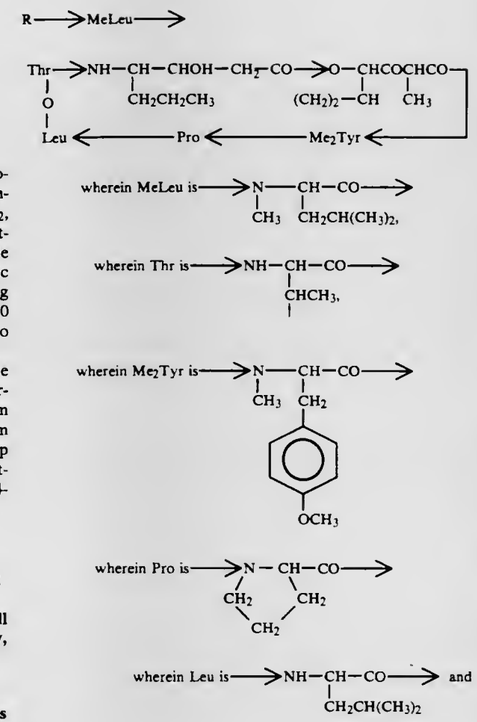
4,782,135

COMPOSITION OF MATTER AND PROCESS

Kenneth L. Rinehart, Jr., Cunningham Township, Champaign County, Ill., assignor to Board of Trustees, University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 299,897, Sep. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 186,932, Sep. 12, 1980, abandooed. This application Jan. 13, 1983, Ser. No. 457,615
Int. Cl.[4] C07K *5/12*
U.S. Cl. 530—317 **4 Claims**

1. A compound of the formula



wherein R is

(a) hydrogen

(b) $CH_3CHOHCO→Pro—$, or

(c) $CH_3CHOHCO$; or an acylate thereof derived from a carboxylic acid selected from the group consisting of:

(a) saturated or unsaturated, straight or branched chain aliphatic carboxylic acids,

(b) saturated or unsaturated, alicyclic carboxylic acids,

(c) saturated or unsaturated, alicyclic-aliphatic carboxylic acids,

(d) aromatic carboxylic acids,

(e) aromatic-aliphatic carboxylic acids, and

(f) an acid of group (a) through (e) substituted by one or more of the following substituents: halogen, nitro, hydroxy, keto, amino, cyano, thiocyano or lower alkoxy.

4,782,136

SYNTHETIC PEPTIDE COMPOUNDS PRODUCING ANITBODIES BINDING TO HUMAN LDH-C_4

Erwin Goldberg, Evanston, Ill., and Jose L. Millan, San Diego, Calif., assignors to Northwestern University, Evanston, Ill.

Filed Dec. 1, 1986, Ser. No. 936,170
Int. Cl.[4] C07K *7/08, 7/06, 7/10*
U.S. Cl. 530—326 **7 Claims**

1. A synthetic peptide compound capable of producing antibodies binding to the lactate dehydrogenase enzyme of human semen (LDH-C_4), consisting of a peptide selected from the group of peptides represented by the following N-terminal to C-terminal amino acid sequences:

(1 a) Glu-Gln-Leu-Ile-Glu-Lys-Leu-Ile-Glu-Asp-Asp-Glu;

(1 b) Lys-Glu-Gln-Leu-Ile-Glu-Lys-Leu-Ile-Glu-Asp-Asp-Glu;

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(1 c) Val-Lys-Glu-Gln-Leu-Ile-Glu-Lys-Leu-Ile-Glu-Asp-Asp-Glu;
(1 d) Thr-Val-Lys-Glu-Gln-Leu-Ile-Glu-Lys-Leu-Ile-Glu-Asp-Asp-Glu;
(1 e) Ser-Thr-Val-Lys-Glu-Gln-Leu-Ile-Glu-Lys-Leu-Ile-Glu-Asp-Asp-Glu;
(2) Thr-Leu-Asp-Pro-Lys-Leu-Gly-Thr-Asp-Ser-Asp-Lys-Glu-His-Trp-Lys;
(3) Gln-Val-Ile-Gln-Ser-Ala-Tyr-Glu-Ile-Ile-Lys-Leu-Lys;
(4) Glu-Glu-Leu-Phe-Leu-Ser-Ile-Pro-Cys-Val-Leu-Gly-Arg-Asn-Gly-Val-Ser-Asp-Val-Val-Lys;
(5) Ile-Asn-Leu-Asn-Ser-Glu-Glu-Glu-Ala-Leu-Phe-Lys-Lys; and
(6) Ile-Gln-Lys-Asp-Leu-Ile-Phe

wherein Gly represents glycine and Ala, Arg, Asn, Asp, Cys, Gln, Glu, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val respectively represent the L-amino acid forms of alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine and valine, and wherein Cys is either present or not present as an additional amino acid at the N-terminal end of the peptide compound.

4,782,137

SYNTHESIS OF PROTEIN WITH AN IDENTIFICATION PEPTIDE, AND HYBRID POLYPEPTIDE INCORPORATING SAME

Thomas P. Hopp; Susan L. Bektesh; Paul J. Conlon, III, and Carl J. March, all of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Division of Ser. No. 573,825, Jan. 24, 1984, Pat. No. 4,703,004. This application Jul. 23, 1987, Ser. No. 76,811
Int. Cl.⁴ A61K *37/02;* **C12P** *21/00*
U.S. Cl. 530—328 **8 Claims**

2. An hybrid polypeptide comprising:
(1) an identification peptide consisting of a hydrophilic antigenic N-terminal sequence comprising both hydropholic and aromatic amino acids;
(2) a constituent polypeptide; and
(3) a linking sequence of amino acids interposed between the identification peptide and the constituent polypeptide, said sequence being cleavable by a sequence-specific proteolytic agent at a specific amino acid residue adjacent to the constituent polypeptide.

4,782,138

PROCESS FOR SELECTIVELY SEPARATING THE ALPHA-LACTALBUMIN FROM THE PROTEINS OF WHEY

Jean-Paul Rialland, Retiers, and Jean-Pierre Barbier, St-Erblon, both of France, assignors to Laiteries E. Bridel, s.a., Retiers, France

Filed Jun. 17, 1986, Ser. No. 876,491
Claims priority, application France, Jun. 17, 1985, 85 09153
Int. Cl.⁴ A23J *1/20*
U.S. Cl. 530—366 **9 Claims**

1. A proess for selectively separating the alpha-lactalbumin from the proteins of whey, said process comprising heat treating whey concentrated to a dry matter content of 10 to 40% by weight, and acidified to a pH of less than 4, said whey being concentrated and acidified in any order, said heat treating being carried out at a temperature not exceeding 75° C., for a duration of 15 seconds to 1 hour sufficient to selectively precipitate substantially alpha-lactalbumin, and recovering said alpha-lactalbumin in the form of a precipitate from the whey.

4,782,139

SELECTIVE CHEMICAL REMOVAL OF A PROTEIN AMINO-TERMINAL RESIDUE

Richard D. DiMarchi, Carmel, and Gerald S. Brooke, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 791,837, Oct. 28, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 922,436
Int. Cl.⁴ A61K *37/24;* **C07C** *103/52;* **C07G** *7/00*
U.S. Cl. 530—407 **30 Claims**

1. A compound having the formula

H—X—Pro—Peptide

in which X is the residue of a naturally occurring amino acid; and Peptide is a sequence of amino acid residues defining that of a biologically active peptide or protein.

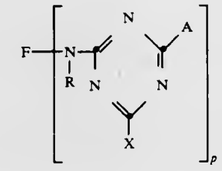
4,782,140

TRIAZINYL REACTIVE DYES CONTAINING ADDITIONAL FIBER REACTIVE GROUPS BOUND THROUGH THE SULFONYLALKYLAMINOALKYLAMINO BRIDGE

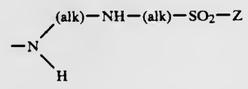
Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Giegy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 717,747, Mar. 28, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,832
Claims priority, application Switzerland, Apr. 5, 1984, 1718/84
Int. Cl.⁴ C09B *62/02, 62/08, 62/507;* **D06P** *1/382*
U.S. Cl. 534—637 **15 Claims**

1. A reactive dye of the formula



in which:
F is a radical selected from the group consisting of metal-free or metal-containing monoazo or disazo dyes containing at least one —SO_3H group, anthraquinone dyes, sulfophthalocyanine dyes, formazan dyes, phenazine dyes, oxazine dyes and nitroaryl dyes,
R is hydrogen, C_1–C_4 alkyl which is unsubstituted or substituted with —COOH or —SO_3H, cyanoethyl, or hydroxyethyl,
X is fluorine, chlorine, bromine, —SO_3H, phenylsulfonyl or C_1–C_4-alkylsulfonyl,
P is 1 or 2 and
A is a radical of the formula



in which:
the groups designated "alk" are independently of each other straight or branched polymethylene radicals having 2 to 6 carbon atoms, and
Z is β-halogenoethyl, vinyl, β-sulfatoethyl, β-thiosulfatoethyl or β-acetoxyethyl.

4,782,141

PROCESS FOR PREPARING PRIMYCIN SALTS

Gyula Dékány, and Judit Frank, both of Budapest, Hungary, assignors to Chinoin Gyogyszer ES Vegyeszeti Termekek Gyara RT., Budapest, Hungary

Filed Jul. 2, 1985, Ser. No. 751,624
Claims priority, application Hungary, Jul. 3, 1984, 2571/84
Int. Cl.⁴ C07H *15/04*
U.S. Cl. 536—6.5 **6 Claims**

1. A process for the preparation of a salt of primycin formed with a pharmaceutically acceptable organic acid or inorganic halogenic acid, which comprises the steps of:
(a) reacting a suspension of primycin sulfate in an aliphatic alcohol having 1 to 4 carbon atoms with a barium salt of the pharmaceutically acceptable organic acid or inorganic halogenic acid to produce a barium sulfate precipitate and a solution of the salt of primycin formed with a pharmaceutically acceptable organic acid or inorganic halogenic acid;
(b) filtering the product of step (a) to remove the barium sulfate precipitate leaving behind a filtrate containing the salt of primycin formed with a pharmaceutically acceptable organic acid or inorganic halogenic acid; and
(c) evaporating the filtrate to isolate the salt of primycin as a solid residue.

4,782,142

NOVEL 5-SUBSTITUTED 2-PYRIMIDINONE NUCLEOSIDES AND METHODS OF USE

Thomas J. Bardos, Snyder, N.Y.; Yung-Chi Cheng, Chapel Hill, N.C.; Alan C. Schroeder, Silver Spring, Md., and Simon M. N. Efange, Buffalo, N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 337,297, Jan. 5, 1982, Pat. No. 4,468,384. This application Aug. 20, 1984, Ser. No. 641,770
Int. Cl.⁴ C07H *19/04, 19/073*
U.S. Cl. 536—23 **3 Claims**

1. A compound which is 1-(2-Deoxy-beta-D-ribofuranosyl)-5-(ethynyl)-2-pyrimidinone.

4,782,143

STARCH HYDROLYZATES AND PREPARATION THEREOF

Alpha L. Morehouse, Muscatine, Iowa, and Pamela A. Sander, Hayfield, Minn., assignors to Grain Processing Corporation, Muscatine, Iowa

Division of Ser. No. 544,368, Oct. 21, 1983, Pat. No. 4,603,110. This application Apr. 14, 1986, Ser. No. 851,969
Int. Cl.⁴ C08G *59/00*
U.S. Cl. 536—102 **1 Claim**

1. A sweetness-imparting starch hydrolyzate having a dextrose equivalent value not above 20 and containing a sweetness-imparting amount of a saccharide component selected from the group consisting of glucose, maltose and combinations thereof, with the total amount of the said saccharide component not exceeding 40% by weight, said starch hydrolyzate having a definitive ratio of not more than 2, said definitive ratio being the quotient obtained by dividing the dextrose equivalent value by the sum of the percentages of glucose and maltose contents, said starch hydrolyzate being prepared by a process which comprises treating an aqueous slurry of starch at a temperature above the gelatinization point with acid or enzyme to liquefy the starch and provide a dispersion substantially free of residual starch granules with a measurable dextrose equivalent not substantially above 3, then treating said dispersion with bacterial alpha-amylase at a temperature of at least about 95° C. to produce a hydrolyzate with a dextrose equivalent not substantially above 6, and then treating the hydrolyzate with a glycogenic or maltogenic saccharifying enzyme to increase the glucose and/or maltose content and to provide a hydrolyzate having a dextrose equivalent value of not more than 20, heating to inactivate the enzymes and recovering the resulting hydrolyzate, and treating the recovered hydrolyzate with carbon and then filtering the treated hydrolyzate.

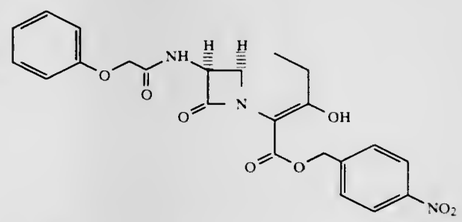
4,782,144

1-CARBA(DETHIA)-3-HYDROXY-3-CEPHEM ESTER CRYSTALLINE AND CRYSTALLINE SOLVATE THEREOF

John P. Gardner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 14, 1987, Ser. No. 95,721
Int. Cl.⁴ C07D *471/04*
U.S. Cl. 540—205 **7 Claims**

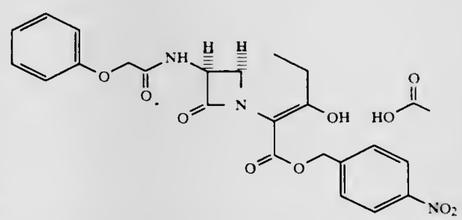
1. The compound of the formula



in crystalline form having the following x-ray powder diffraction pattern:

dA	I/I$_O$
14.66	.04
11.15	.82
9.73	.02
8.94	.42
6.96	.03
6.25	.27
5.92	.04
5.62	.24
5.37	.61
4.88	95
4.47	.12
4.36	14
4.24	.41
4.07	1.00
3.90	.25
3.73	.48
3.49	17
3.33	.16
3.23	.13
3.12	.22
2.96	.11
2.76	.10
2.69	.09

2. The acetic acid solvate of the formula



in crystalline form having the following x-ray powder diffraction pattern:

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dA	I/I$_O$
11.37	.26
9.79	.36
9.01	.05
6.03	.16
5.74	1.00
5.51	.40
5.31	.14
4.96	.13
4.79	.10
4.47	.30
4.31	.29
4.15	.19
4.05	.09
3.94	.08
3.84	.24
3.76	.17
3.65	.36
3.58	.23
3.47	.42
3.39	.08
3.30	.14
3.24	.06
3.15	.04
3.08	.07
2.86	.04
2.72	.04

3. The process for preparing in crystalline form p-nitrobenzyl 7β-phenoxyacetylamino-3-hydroxy-1-carba(dethia)-3-cephem-4-carboxylate or the crystalline mono-acetic acid solvate thereof which comprises mixing at a temperature between about 15° C. and about 30° C. a solution of said 3-hydroxy p-nitrobenzyl ester in dimethylformamide or dimethylacetamide with a carboxylic acid RCOOH or a sulfonic acid R_1SO_3H wherein R is hydrogen, C_1-C_8 alkyl, substituted C_1-C_8 alkyl substituted by halogen, carboxy, hydroxy or C_1-C_4 alkoxy, C_2-C_8 alkenyl or C_2-C_8 alkenyl substituted by halogen, carboxy, hydroxy or C_1-C_4 alkoxy, and R_1 is C_1-C_4 alkyl, phenyl or phenyl substituted by one or two of the same or different groups selected from C_1-C_4 alkyl, C_1-C_4 alkoxy, halogen or hydroxy; and when R is methyl, separating the said crystalline acetic acid solvate or when R is other than methyl or R_1SO_3H is mixed, separating the said non-solvated crystalline 3-hydroxy p-nitrobenzyl ester.

4,782,145

PROCESS FOR PENEM DERIVATIVES

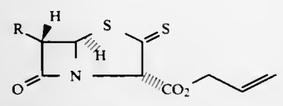
Katherine E. Brighty, Groton, and David L. Lindner, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 2, 1986, Ser. No. 869,760

Int. Cl.[4] C07D *499/04;* **A61K** *31/425*

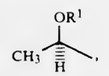
U.S. Cl. 540—214 **24 Claims**

1. A process for the preparation of a compound of the formula

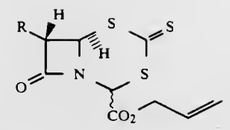


(I)

wherein R is hydrogen or



and R^1 is t-butyldimethylsilyl which comprises reacting a compound of the formula



(II)

with substantially one equivalent of a strong, anhydrous base of low nucleophilicity which is an alkali metal hydride, t-butoxide or hexamethyldisilazide, with or without the presence of triphenylphosphine, in a reaction inert solvent at a temperature in the range from about −50° C. to about 10° C.

4,782,146

PROCESS FOR THE SYNTHESIS OF PENEMS

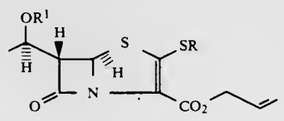
Katherine E. Brighty, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 891,493, Jul. 29, 1986, Pat. No. 4,695,626. This application Jun. 16, 1987, Ser. No. 62,798

Int. Cl.[4] C07D *499/00;* **A61K** *31/425*

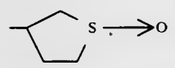
U.S. Cl. 540—310 **11 Claims**

1. A process for the preparation of a compound of the formula



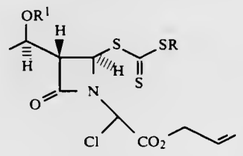
(I)

wherein R is (C_1-C_5) alkyl or



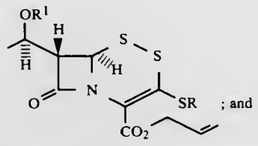
and R^1 is a conventional hydroxy-protecting group, which comprises

(a) treating a compound of the formula



(III)

with base in a reaction-inert solvent at −80° to 40° C. to produce a mixture comprising a compound of the formula (I) and a compound of the formula



(II)

; and

(b) desulfurization of the compound of the formula (II) with

$(R^2O)_3P$ or $(R^3)_3P$

wherein each R^2 is the same or different and selected from (C_1-C_4)alkyl and each R^3 is the same or different and selected from (C_1-C_4)alkyl or phenyl, at −50° to 40° C. in the same or a second reaction-inert solvent, to form additional compound of the formula (I).

4,782,147

1-SULFO-2-OXOAZETIDINE DERIVATIVES AND THEIR PRODUCTION

Michihiko Ochiai, Suita; Shoji Kishimoto, Takarazuka, and Taisuke Matsuo, deceased, late of Ibaraki, all of Japan (by Michiko Matsuo, heir), assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

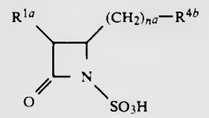
Continuation-in-part of Ser. No. 326,938, Dec. 3, 1981. This application May 31, 1983, Ser. No. 499,802

Claims priority, application PCT Int'l Appl., Dec. 5, 1980, PCT/JP80/00297; Apr. 30, 1981, PCT/JP81/00103; Aug. 21, 1981, PCT/JP81/00183; Sep. 24, 1981, PCT/JP81/00252; Japan, May 31, 1982, 57-93463

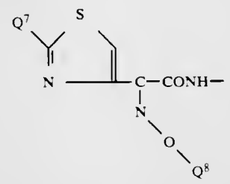
Int. Cl.[4] C07D *205/08, 417/12;* **A61K** *31/395, 31/425*

U.S. Cl. 540—355 **9 Claims**

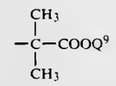
1. A compound of the formula



wherein R^{1a} is (i) an amino group protected with methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl or phenyloxycarbonyl, or (ii) a group of the formula

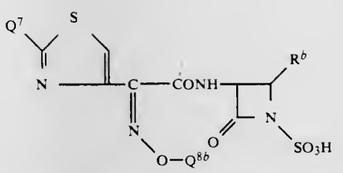


wherein Q^7 is amino or a protected amino group, and Q^8 is a C_{1-6} alkyl, a C_{2-6} alkenyl, a group $-CH_2COOQ^9$ or a group

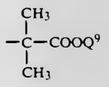


and $-COOQ^9$ is carboxyl or a C_{1-6} alkyl ester thereof, n^a is an integer of 1 to 3; and R^{4b} is carbamoylamino, (N-sulfocarbamoyl)-amino, carbamoyl, pyridinio, C_{1-6} alkoxy, C_{1-6} alkylsulfinyl, C_{1-6} alkylsulfonyl, 1-C_{1-6} alkoxyimino-C_{1-6} alkyl, C_{1-6} alkylcarbonyl or formylamino group the said pyridino- when present in R^{4b} forming an inner salt with the sulfo at the 1-position of the 2-oxoazetidine ring, or a pharmaceutically acceptable salt or an alkoxymethyl, α-alkoxyethyl, alkylthiomethyl, pivaloyloxymethyl, α-acetoxybutyl, ethoxycarbonyloxymethyl, or α-ethoxycarbonyloxyethyl ester of the carboxyl group contained in the group R^{1a} thereof.

2. A compound of the formula

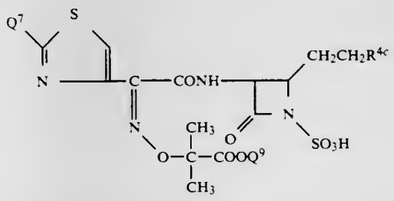


wherein Q^7 is amino or a protected amino group, Q^{8b} is $-CH_2COOQ^9$ or



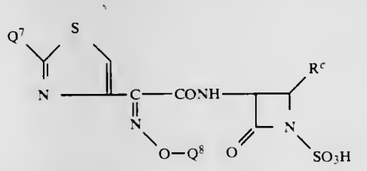
wherein $COOQ^9$ is carboxyl or a C_{1-6} alkyl ester thereof, and R^b is monochloroacetoxymethyl, or a pharmaceutically acceptable salt, or an alkoxymethyl, α-alkoxyethyl, alkylthiomethyl, pivaloyloxymethyl, α-acetoxybutyl, ethoxycarbonyloxymethyl, or α-ethoxycarbonyloxyethyl ester of the carboxyl group contained in the group Q^{8b} thereof.

3. A compound of the formula

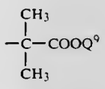


wherein Q^7 is amino or a protected amino group, $-COOQ^9$ is carboxyl or a C_{1-6} alkyl ester thereof, and R^{4c} is a C_{1-6} alkoxycarbonyl group or a C_{2-4} acyloxy group, or a pharmaceutically acceptable salt, or an alkoxymethyl, α-alkoxyethyl, alkylthiomethyl, pivaloyloxymethyl, α-acetoxybutyl, ethoxycarbonyloxymethyl or α-ethoxycarbonyloxyethyl ester of the carboxyl group contained in the group $-COOQ^9$ thereof.

4. A compound of the formula



wherein Q^7 is amino or a protected amino group, Q^8 is a C_{1-6} alkyl, a C_{2-6} alkenyl, a group $-CH_2COOQ^9$ is a group

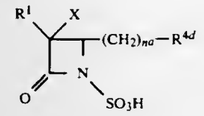


and $-COOQ^9$ is carboxyl or a C_{1-6} alkyl ester thereof, and R^c is sulfaminocarbonyloxymethyl or halo-C_{1-6}-alkylcarbonylcarbamoyloxymethyl, or a pharmaceutically acceptable salt, or an alkoxymethyl, α-alkoxyethyl, alkylthiomethyl, pivaloyloxymethyl, α-acetoxybutyl, ethoxycarbonyloxymethyl or α-

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ethoxycarbonyloxyethyl ester of the carboxyl group contained in the group Q^8 thereof.

5. A compound of the formula



wherein R^1 represents

(1) amino,

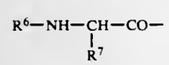
(2) an acrylated amino group wherein the acyl moiety is

(i) a group of the formula:

R^5—CO—

wherein R^5 is an alkyl other than C_{1-5} alkyl—CH_2 or a heterocyclic* group;

(ii) a group of the formula:



wherein R^6 is hydrogen, glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, threonyl, cysteinyl, cystyl, methionyl, α- or β-aspartyl, α- or γ-glutamyl, lysyl, arginyl, phenylalanyl, phenylglycyl, tyrosyl, histidyl, tryptophanyl, an amino-protective group or a group

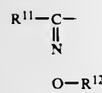
R^8—$(CH_2)_{n_1}$—CO—

where R^8 is a heterocyclic* group and n_1 is an integer of 0 to 2, and R^7 is an alkyl, phenyl*, heterocyclic*-carbonylamino or a heterocyclic* group;

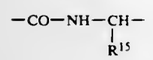
(iii) a group of the formula:

R^9—R^{10}—CO—

wherein R^9 is a group

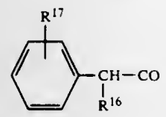


where R^{11} is alkyl*, heterocyclic* group or phenyl* and R^{12} is hydrogen, an alkyl, alkenyl or a group —R^{13}—R^{14} where R^{13} is an alkylene or alkenylene and R^{14} is phenyl*, carboxyl or an alkyl ester thereof or mono- or di-alkylamino, and R^{10} is a direct bond or a group



where R^{15} is an alkyl, phenyl* or thiazolyl*;

(iv) a group of the formula:



wherein R^{16} is hydroxy, hydroxysulfonyloxy, carboxy, ureido*, sulfamoyl*, sulfo, phenoxycarbonyl* or formyloxy and R^{17} is hydrogen, an alkyl, an alkoxy, halogen, nitro or hydroxy; or

(v) a group of the formula:

R^{18}—R^{19}—CH_2—CO—

wherein R^{18} is cyano, phenyl*, phenoxy*, an alkyl*, alkenyl* or a heterocyclic* group and R^{19} is a direct bond or —S—;

and, in symbols R^5 through R^{19},

(a) the heterocyclic group is 2- or 3-pyrrolyl; 2- or 3-furyl; 2- or 3-thienyl; 2- or 3-pyrrolidinyl; 2-, 3- or 4-pyridyl; N-oxido-2-, 3- or 4-pyridyl; 2-, 3- or 4-piperidinyl; 2-, 3- or 4-pyranyl; 2-, 3- or 4-thiopyranyl; pyrazinyl; 2-, 4- or 5-thiazolyl; 2-, 4- or 5-oxazolyl; 3-, 4- or 5-isothiazolyl; 3-, 4- or 5-isoxazolyl; 2-, 4- or 5-imidazolyl; 3-, 4- or 5-pyrazolyl; 3- or 4-pyridazinyl; N-oxido-3- or 4-pyridazinyl; 2-, 4- or 5-pyrimidinyl; N-oxido-2-, 4- or 5-pyrimidinyl; piperazinyl; 4- or 5-(1,2,3-thiadiazolyl); 3- or 5-(1,2,4-thiadiazolyl); 1,3,4-thiadiazolyl; 1,2,5-thiadiazolyl; 4- or 5-(1,2,3-oxadiazolyl); 3- or 5-(1,2,4-oxadiazolyl); 1,3,4-oxadiazolyl; 1,2,5-oxadiazolyl; 1,2,3- or 1,2,4-triazolyl; 1H- or 2H-tetrazolyl; pyrido[2,3-d]pyrimidyl; benzopyranyl; 1,8-, 1,5-, 1,6-, 1,7-, 2,7- or 2,6-naphthyridyl; quinolyl or thieno[2,3-b]pyridyl,

(b) the amino-protective group in R^6 is phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methyoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

(c) the heterocyclic, phenyl, thiazolyl, phenoxycarbonyl and phenoxy with a superscript asterisk "*" may be substituted with one to three members selected from the group consisting of alkyl, alkoxy, alkenyl, aryl, aralkyl, mercapto, alkylthio, arylthio, aralkylthio, alkylsulfonyl, arylsulfonyl, aralkylsulfonyl, mono- to trihaloalkyl, hydroxyl, oxo, thioxo, halogen, nitro, amino, cyano, carbamoyl, carboxy, acyl, acyloxy, acylamino, hydroxyalkyl, carboxylalkyl, and mono- or dialkylaminoalkyl, wherein the acyl group and the acyl moiety of acyloxy and acylamino are C_{1-6} alkylcarbonyl; benzoyl which may be substituted with hydroxyl or methoxy; C_{7-9} aralkylcarbonyl which may be substituted with hydroxyl or methoxy; 2-thienylcarbonyl; 2-furylcarbonyl; 2-, 4- or 5-thiazolylacetyl; 2- or 3-thienylacetyl; 2- or 3-furylacetyl or 2-amino-4- or 5-thiazolylacetyl,

(d) the alkyl with a superscript asterisk "*" may be substituted with one to three members selected from halogen, hydroxyl, cyano and trifluoromethyl,

(e) the ureido with a superscript asterisk "*" may be substituted with sulfo in the form of a salt with sodium or potassium, carbamoyl, sulfamoyl, amidino or alkyl,

(f) the sulfamoyl with a superscript asterisk "*" may be substituted with an alkyl or amidino,

(g) the alkenyl with a superscript asterisk "*" may be substituted with one to three members selected from carboxyl and cyano, wherein the amino group, the carboxyl group and the hydroxyl group may be protected, or

(3) amino protected with phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β,β,β-trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

X represents hydrogen or methoxy,

n^a is an integer of 1 to 3, and

R^{4d} is an alkoxy group,

and within the above groups R^1 and R^{4d}, alkyl is C_{1-6} alkyl; alkenyl is C_{2-6} alkenyl; alkoxy is C_{1-6} alkoxy; aryl is phenyl, α-naphthyl, β-naphthyl, biphenyl or anthryl; aralkyl is benzyl, phenethyl, phenylpropyl or naphthylmethyl; alkylene is C_{1-3} alkylene and alkenylene or C_{2-4} alkenylene, or a pharmaceutically acceptable salt thereof, or an alkoxymethyl, α-alkoxyethyl, alkylthiomethyl, pivaloyloxymethyl, α-acetoxybutyl, ethoxycarbonyloxymethyl or α-ethoxycarbonyloxyether ester of the carboxyl group or groups contained in the group R^1 thereof.

4,782,148

METHOD FOR PRODUCTION OF PERFLUORO N-(VINYL)AMINES

Takashi Abe, Kasugai, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,608

Claims priority, application Japan, Jul. 23, 1985, 60-162631; Jul. 23, 1985, 60-162632; Jul. 23, 1985, 60-162633

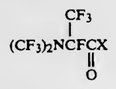
Int. Cl.⁴ C07C *87/26;* **C07D** *265/30, 211/68, 241/02*

U.S. Cl. 540—484 **5 Claims**

1. A method for the production of a perfluoro-(N-vinylamine) compound having the formula:

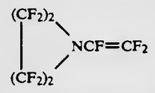
$(CF_3)_2NCF{=}CF_2$

which method comprises subjecting to a temperature in the range of 100° to 500° C. a perfluoro compound having the formula

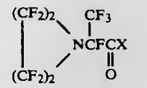


wherein X stands for a member selected from the group consisting of a fluorine atom, a perfluoroalkoxy group, and —OM where M stands for one member selected from the group consisting of monovalent alkali metal ions and alkaline earth metal ions.

2. A method for the production of a perfluoro-(N-vinylamine) compound having the formula:

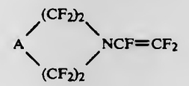


which method comprises subjecting to a temperature in the rage of 100° to 500° C. a perfluoro compound having the formula

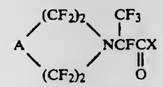


wherein X stands for a member selected from the group consisting of a fluorine atom, a perfluoroalkoxy group, and —OM where M stands for one member selected from the group consisting of monovalent alkali metal ions and alkaline earth metal ions.

3. A method for the production of a perfluoro-(N-vinylamine) compound having the formula:



wherein A stands for a member selected from the group consisting of $CF_2<$, $O<$, $>NC_nF_{2n+1}$, where n stands for an integer from 2 to 6, which method comprises subjecting to a temperature in the range of 100° to 500° C. a perfluoro compound having the formula



wherein A is as defined above, and X stands for a member selected from the group consisting of a fluorine atom, a perfluoroalkoxy group, and —OM where M stands for one member selected from the group consisting of monovalent alkali metal ions and alkaline earth metal ions.

4,782,149

PYRIDAZODIAZEPINE DERIVATIVES

Geoffrey Lawton, Hitchin, and Sally Redshaw, Stevenage, both of England, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 124,749, Nov. 24, 1987. This application Mar. 17, 1988, Ser. No. 169,266

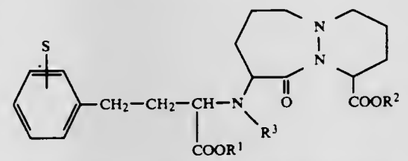
Claims priority, application United Kingdom, Dec. 15, 1986, 8629875

Int. Cl.⁴ C07D *245/00, 487/06, 237/02*

U.S. Cl. 540—500 **8 Claims**

1. A compound of the formula

IX



wherein R^1 and R^2 each individually are hydrogen, C_1–C_{10}-alkyl, adamantyl-(C_1–C_4-alkyl) or (C_2–C_6-alkanoyloxy)-(C_1–C_4-alkyl), R^3 is hydrogen or benzyl, and S is nitro, amino or 2-nitroguanidino.

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4,782,150

WATER-SOLUBLE TRIPHENDIOXAZINE COMPOUNDS

Hartmut Springer, Königstein/Taunus; Walter Helmling, Hofheim am Taunus, and Günther Schwaiger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

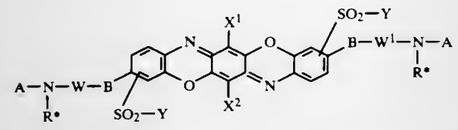
Filed Aug. 11, 1987, Ser. No. 84,427

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627458

Int. Cl.[4] C07D *498/04;* **C09B** *19/00, 19/02*

U.S. Cl. 544—77 **18 Claims**

1. A water-soluble triphendioxazine compound corresponding to the formula



in which:

B is an oxygen or sulfur or is an amino group of the formula —NH— or —N(R')—, in which R' is alkyl of 1 to 6 carbon atoms;

R* is hydrogen or alkyl of 1 to 4 carbon atoms unsubstituted or substituted by one or two substituents selected from the group consisting of: chlorine, alkoxy of 1 to 4 carbon atoms; benzoylamino; sulfobenzoylamino; alkanoylamino of 2 to 5 carbon atoms; hydroxy; sulfato; phosphato; alkanoyloxy of 2 to 5 carbon atoms; sulfo; carboxy; phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl; and naphthyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl; or

R* is phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl, or R* is naphthyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl, unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl, and carbamoyl unsubstituted or monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms or phenyl or alkyl of 1 to 4 carbon atoms and phenyl;

W is a bivalent group selected from an aliphatic group or a (C_5–C_{10})-cycloaliphatic group unsubstituted or substituted by C_1–C_4-alkyl, or from an aliphatic-(C_5–C_8)-cycloaliphatic group unsubstituted or substituted by C_1–C_4-alkyl in the cycloaliphatic moiety and unsubstituted or substituted in the aliphatic moiety by one or two substituents selected from the group consisting of: chlorine; alkoxy of 1 to 4 carbon atoms; benzoylamino; sulfobenzoylamino; alkanoylamino of 2 to 5 carbon atoms; hydroxy; sulfato; phosphato; alkanoyloxy of 2 to 5 carbon atoms; sulfo; carboxy; phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, bromine, nitro, carbalkoxy of 2 to 5 carbon atoms, sulfo and carboxy, at least one of these substituents being sulfo or carboxy;

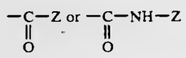
or from those groups which aliphatic radicals are interrupted by hetero groups which are selected from the groups —O—, —S—, —SO_2—, —CO—, 1,4—piperidino, —NH— and —N(R^o)—, wherein R^o has one of the meanings of R' or is an alkanoyl of 2 to 5 carbon atoms, and

W^1 has one of the meanings indicated for W and is identical to or different from W, or

the grouping —B—W^1—N(R*)— and the grouping —N(R*)—W—B—, identical to or different from each other, each represent together a bivalent five- or six-membered saturated heterocylic group which contains two nitrogen atoms,' or

the grouping —B—W^1— and the grouping —W—B—, identical to or different from each other, each represent together a bivalent five- or six-membered saturated heterocylic group which contains two nitrogen atoms and which is bonded by one of the two nitrogen atoms via an alkylene group of 2 to 4 carbon atoms to the grouping —N(R*)—A— or —A—N(R*)—;

A is a group of the formula



in which Z is phenyl or naphthyl both of which are substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine, bromine, nitro, carbalkoxy of 2 to 5 carbon atoms, sulfo and carboxy, at least one of these substituents being sulfo or carboxy;

X^1 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, nitro, sulfamoyl and carbamoyl;

X^2 is identical to or different from X^1 and has one of the meanings indicated for X^1;

Y is vinyl, or is an ethyl substituted in the β-position by an alkali-eliminable substituent;

said compound containing at least two sulfo groups selected from the sulfo substituents mentioned above.

4,782,151

POLYPRENYL COMPOUND AND PHARMACEUTICAL USE

Isao Yamatsu; Takeshi Suzuki, both of Ushikumachi; Shinya Abe, Kukizakimachi; Kouji Nakamoto, Tsuchiura; Akiharu Kajiwara, Yatabemachi; Manabu Murakami; Kiyoshi Oketani, both of Toyosatomachi, and Hideaki Fujisaki, Yatabemachi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

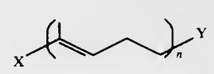
Division of Ser. No. 729,444, May 1, 1985. This application Jan. 29, 1988, Ser. No. 149,706

Claims priority, application Japan, May 9, 1984, 59-90995

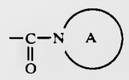
Int. Cl.[4] C07D *265/30, 239/00, 233/00, 295/00*

U.S. Cl. 544—176 **5 Claims**

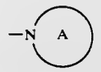
1. A polyprenyl compound having the formula:



wherein X represents a group of the formula:



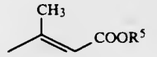
wherein



is a ring containing a nitrogen atom; and Y represents a group of the formula:



or a group of the formula:



wherein R^5 represents hydrogen or lower alkyl, and n represents an integer of from 2 to 5.

4,782,152

DECYANATION OF PERGOLIDE INTERMEDIATE

Jerry W. Misner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

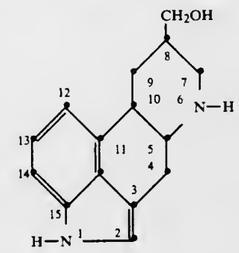
Filed Aug. 16, 1985, Ser. No. 766,362

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

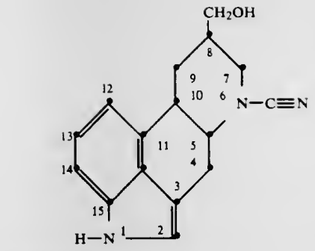
Int. Cl.[4] C07D *457/02*

U.S. Cl. 546—67 **5 Claims**

1. A process for preparing a compound of the formula



comprising hydrolyzing a cyanamide of the formula



with an alkali metal hydroxide in an alcoholic solvent having a boiling point greater than about 100° C. at a temperature in the range of about 100° C. to about 175° C.

4,782,153

PYRIDOQUINOLONE DERIVATIVES

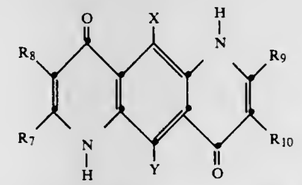
Alain C. Rochat, Fribourg; Abul Iqbal, Arconciel, both of Switzerland, and Edward E. Jaffe, Wilmington, Del., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 920,624, Oct. 20, 1986, Pat. No. 4,730,014. This application Nov. 17, 1987, Ser. No. 122,144

Int. Cl.[4] C07D *471/04*

U.S. Cl. 546—81 **4 Claims**

1. A compound of the formula VII



(VII)

in which one of R_7 and R_8 and one of R_9 and R_{10} are hydrogen and the other two radicals are, independently of each other, unsubstituted biphenyl or naphthyl or C_1–C_{12}-alkoxy-substituted phenyl, biphenyl or naphthyl or a heterocyclic radical selected from the group consisting of pyridyl, pyrazinyl, triazinyl, furyl, pyrrolyl, thienyl, quinolyl, coumarinyl, indolyl, benzofuranyl, benzimidazolyl and benzoxazolyl, and X and Y are independently of each other hydrogen, halogen or cyano.

4,782,154

ISOQUINOLINE DERIVATIVES

Tatsuo Kaiho; Seitaro Kajiya; Kengo Otsuka, all of Kanagawa; Masahiko Maruyama, and Makoto Hirayama, both of Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

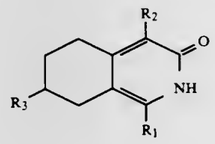
Filed Jul. 17, 1987, Ser. No. 75,828

Claims priority, application Japan, Aug. 27, 1986, 61-198977

Int. Cl.[4] C07D *217/16*

U.S. Cl. 546—141 **5 Claims**

1. An Isoquinoline derivative represented by the general formula (I):



(I)

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where

R_1 represents a lower C_1-C_4 alkyl group or cyclopropyl group,

R_2 represents formyl group, benzoyl group, lower C_1-C_4 alkyl group, lower C_1-C_4 alkenyl group, lower C_1-C_4 hydroxy substituted alkyl group and C_1-C_4 perfluoroalkyl group and

R_3 represents 4-pyridyl group or 2-pyridyl group respectively,

or a therapeutically acceptable salt thereof.

4,782,155

CEPHALOSPORIN DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND ANTIBACTERIAL AGENTS

Susumu Nakagawa; Norikazu Otake, and Ryosuke Ushijima, all of Okazaki, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

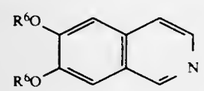
Continuation-in-part of Ser. No. 911,780, Sep. 26, 1986. This application Mar. 25, 1987, Ser. No. 29,903

Claims priority, application Japan, Mar. 19, 1986, 61-59368; Nov. 14, 1986, 61-269804

Int. Cl.⁴ C07D *217/02*

U.S. Cl. 546—47 **4 Claims**

1. A compound having the formula



(VII)

wherein R^6 is a hydrogen atom or an alkanoyl group, or a salt thereof.

4,782,156

NITRILES OF HALOGENATED QUINOLONECARBOXYLIC ACIDS

Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 754,563, Jul. 12, 1985, Pat. No. 4,680,401. This application Mar. 24, 1987, Ser. No. 29,939

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1984, 3426483

Int. Cl.⁴ C07D *215/56*

U.S. Cl. 546—153 **2 Claims**

1. 7-chloro-1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid nitrile.

4,782,157

PREPARATION OF SUBSTITUTED AND UNSUBSTITUTED 2-CARBAMOYL NICOTINIC AND 3-QUINOLINECARBOXYLIC ACIDS

John J. Pascavage, Morrisville, Pa., assignor to American Cyanamid Co., Stamford, Conn.

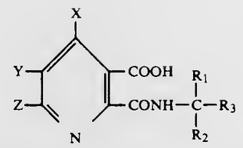
Filed Dec. 3, 1984, Ser. No. 677,647

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ C07D *215/48, 215/54, 213/803, 213/81*

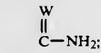
U.S. Cl. 546—169 **10 Claims**

1. In a method for the preparation of substituted and unsubstituted 2-carbamoyl nicotinic and 3-quinolinecarboxylic acids of formula (I):

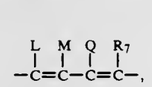


(I)

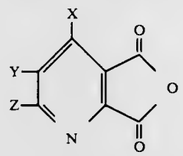
wherein R_1 is C_1-C_4 alkyl; R_2 is C_1-C_4 alkyl or C_3-C_6 cycloalkyl; and when R_1 and R_2 are taken together along with the carbon to which they are attached, they may represent C_3-C_6 cycloalkyl optionally substituted with methyl, and when R_1 and R_2 are not the same, the optical isomers thereof; R_3 is CN or



W is O or S; X is hydrogen, or C_1-C_4 alkyl, Y is hydrogen, halogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, trifluoromethyl, trichloromethyl, difluoromethoxy, diloweralkylamino, C_1-C_4 alkylthio, phenyl or phenoxy or phenyl or phenoxy substituted with one C_1-C_4 alkyl, C_1-C_4 alkoxy or halogen; Z represents hydrogen, C_1-C_4 alkyl, trifluoromethyl, trichloromethyl, phenyl or phenyl substituted with one C_1-C_4 alkyl, C_1-C_4 alkoxy or halogen; and when taken together, Y and Z may form a ring in which YZ are represented by the structure: $-(CH_2)_n-$, where n is an integer selected from 3 to 5, provided that X is hydrogen; or YZ is

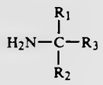


where L, M, Q and R_7 are each of hydrogen, halogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 haloalkyl, difluoromethoxy, diloweralkylamino, C_1-C_4 alkylthio, nitro, phenyl, phenoxy or mono-substituted phenyl or phenoxy where the substituent is one C_1-C_4 alkyl, C_1-C_4 alkoxy or halogen; with the proviso that only one of L, M, Q or R_7, may represent a substituent other than hydrogen, halogen, C_1-C_4 alkyl or C_1-C_4 alkoxy, comprising reacting an anhydride of formula (II)



(II)

wherein X, Y and Z are as described above with from 1.0 to 1.5 molar equivalents of an aminonitrile, aminocarboxamide, or aminothiocarboxamide of formula III:



(III)

wherein R_1, R_2 *and* $R3$ are as described above at from 5° to 45° C.,

the improvement comprising carrying out the reaction in the presence of 0.1 to 4 molar equivalents of a tertiary amine and 0.1 to 5.0 molar equivalents of an organic carboxylic acid in an organic solvent.

4,782,158

THIAZOLYLACETIC ACID DERIVATIVE

Takashi Kamiya, Suita; Kunihiko Tanaka, Toyonaka; Tsutomu Teraji, Osaka, and Yoshiharu Nakai, Ohtsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

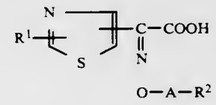
Division of Ser. No. 531,669, Sep. 13, 1983, Pat. No. 4,599,426, which is a division of Ser. No. 258,661, Apr. 29, 1981, Pat. No. 4,506,076, which is a division of Ser. No. 56,406, Jul. 11, 1979, Pat. No. 4,288,435. This application Jul. 8, 1986, Ser. No. 883,165

Claims priority, application United Kingdom, Jul. 17, 1978, 30080

Int. Cl.⁴ C07D *277/44, 417/12*

U.S. Cl. 546—280 **4 Claims**

1. A compound of the formula:



wherein

R^1 is amino or lower alkanoylamino;

R^2 is a group of the formula: $-CONH-R^5$ or $-NH-CO-R^5$, wherein

R^5 is pyridyl; thiazolyl; or isoxazolyl having lower alkyl and halogen substituted phenyl, and

A is lower alkylene, or a non-toxic salt thereof.

4,782,159

PROCESS FOR PREPARING BETA-METHYL-GAMMA-OXO-4-(4-OXO-1(4H)-PYRIDINYL) DERIVATIVE OF BENZENE BUTANOIC ACID

Michael B. Mitchell, Hildenborough, and Kiritkant D. Pancholi, Welwyn Garden City, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

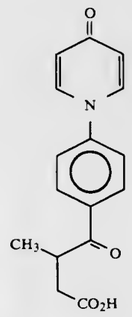
Continuation-in-part of Ser. No. 094,627, Sep. 9, 1987, abandoned. This application Jan. 29, 1988, Ser. No. 149,782

Claims priority, application United Kingdom, Sep. 11, 1986, 8621864

Int. Cl.⁴ C07D *211/86*

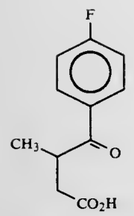
U.S. Cl. 546—301 **8 Claims**

1. A process for preparing a compound of the formula (1):



(1)

which comprises reacting a compound of the formula (3):



(3)

with 4-hydroxypyridine wherein the process is performed under aqueous conditions in the presence of a suitable base.

4,782,160

1,4-DIHYDROPYRIDINE DERIVATIVES

Takashi Fujikura, Saitama, and Yuzo Matsumoto, Tokyo, both of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

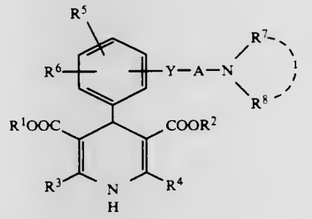
Filed Dec. 8, 1987, Ser. No. 130,023

Claims priority, application Japan, Dec. 8, 1986, 61-292694

Int. Cl.⁴ C07D *211/90*

U.S. Cl. 546—321 **1 Claim**

1. A 1,4-dihydropyridine derivative represented by general formula (I):



(I)

wherein:

R^1 and R^2: which may be the same or different, each represents an alkyl group which may be intervened by an oxygen atom, a cycloalkyl-substituted lower alkyl group or a halogen-substituted lower alkyl group;

R^3 and R^4: which may be the same or different, each represents a lower alkyl group;

R^5 and R^6: which may be the same or different, each represents a hydrogen atom, a nitro group, a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a lower alkylsulfonyl group or a lower alkylsulfinyl group;

R^7: a hydrogen atom or a lower alkyl group;

R^8: an aryloxy-lower alkyl group or an aryloxy-lower alkoxy group;

A: an alkylene group, an alkenylene group or an alkynylene group; and,

Y: an oxygen atom or a sulfur atom; or a salt thereof.

4,782,161

PREPARATION OF FLUOROPYRIDINES

Michael A. DesJardin, San Ramon, Calif., and Craig B. Murchison, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

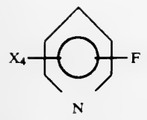
Filed Oct. 21, 1987, Ser. No. 111,375

Int. Cl.⁴ C07D *213/57, 213/26, 213/02*

U.S. Cl. 546—345 **15 Claims**

1. A process for preparing a fluoropyridine compound of the formula

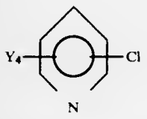
VOL 1096 ISS 1 NO 1 1988 UMI



wherein

each X independently represents H, CF_3, CHF_2, Cl, F, CN, or CH_3, with the proviso that no more than three of X represent H or CH_3

which comprises contacting a chloropyridine compound of the formula



wherein

each Y dependently represents H, CF_3, CHF_2, CCl_3, $CHCl_2$, Cl, F, CN, or CH_3, with the proviso that no

more than three of Y represent H or CH_3

with hydrogen fluoride at about 350° C. to about 650° C. in the presence of a thermostable, activated carbon catalyst having an average pore diameter of greater than about 60 Angstroms, under conditions conducive to fluoride exchange, and replacing at least one Cl substituent with F.

4,782,162

NOVEL INTERMEDIATES FOR THE SYNTHESIS OF CEPHALOSPORINS

Michael Boberg; Paul Naab, and Samir Samaan, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

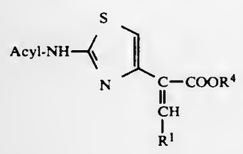
Division of Ser. No. 731,235, May 6, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 872,304

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418376

Int. Cl.⁴ C07D *277/46*

U.S. Cl. 548—195 **6 Claims**

1. A process for preparation of a compound of the formula



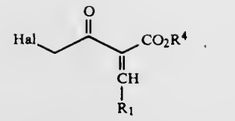
in which

acyl is alkylcarbonyl unsubstituted or substituted by halogen or aryl, or arylcarbonyl which is substituted by lower alkoxy, halogen or nitro,

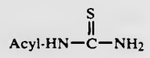
R^1 is an alkyl, alkenyl, cycloalkyl or cycloalkenyl radical, and

R^4 is an unsubstituted or substituted, branched or straight-chain C_1–C_6-alkyl radical or a cycloalkyl radical,

comprising reacting a 2-halogenoacetylacrylic acid ester of the formula



with an acylthiourea of the formula



in a dimethylformamide/water mixture which contains 30 to 50% water at a temperature from about 20° to 150° C., and the reaction medium is thereafter diluted with water and cooled, thereby crystallizing out substantially pure Z-isomer.

4,782,163

2-(2-HALO-3,4-DIMETHOXYBENZYL)-5-(4-METHOXY-PHENYL)-OXAZOLIDINES

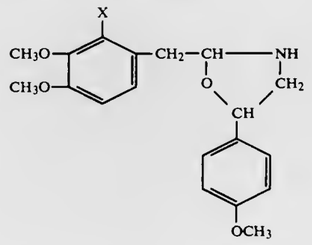
Clifford S. Labaw, Philadelphia, and Alan W. Tremper, Lansdowne, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 909,759, Sep. 16, 1986, Pat. No. 4,705,862, which is a continuation of Ser. No. 657,904, Oct. 5, 1984, abandoned. This application Aug. 17, 1987, Ser. No. 86,115

Int. Cl.⁴ C07D *263/04*

U.S. Cl. 548—215 **2 Claims**

1. A compound of the formula (1):



(1)

in which X is chloro or fluoro.

4,782,164

PROCESS FOR SYNTHESIZING ACTIVE ESTERS OF CARBOXYLIC ACIDS

Gérard Barcelo, Sainte-Genevieve des Bois; Bertrand Castro, Saint-Aunes, both of France; Mahmond Jaouadi, El Amra-G. de S fox, Tunisia; Jean Martinez, Caux, France; Jean-Pierre Senet, La Chapelle la Reine, France, and Gérard Sennyey, Gif sur Yvette, France, assignors to Societe Nationale des Poudres et Explosifs, Cedex, France

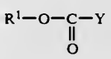
Filed Nov. 22, 1985, Ser. No. 801,081

Claims priority, application France, Dec. 4, 1984, 84 18433

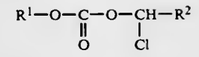
Int. Cl.⁴ C07D *207/404, 209/32, 249/18, 409/06*

U.S. Cl. 548—259 **9 Claims**

1. A method for the preparation of an active ester of formula



from an N-blocked aminocacid of formula YCOOH, wherein Y contains an N-protected amino group, which consists of reacting said aminoacid with a carbonate of formula



wherein

R^1 is:

(1) an N-succinimidyl

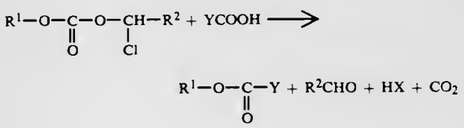
(2) an N-phthalimidyl

(3) 1-benzotriazolyl radical;

(4) phenyl substituted by 1–5 chlorine, fluorine or one or two nitro groups;

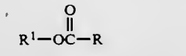
R^2 is: a saturated alkyl of 1 to 5 carbon atoms, unsubstituted or substituted by chlorine atoms, or an unsubstituted phenyl or phenyl substituted by chlorine atoms,

in the presence of an agent for binding hydrochloric acid which is a tertiary amine or an alkali metal carbonate in the presence of an inert solvent which is a member selected from the group consisting of cyclic or acyclic ethers, esters, nitriles, alcohols, amides and ketones wherein the reaction proceeds as follows:

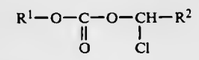


and isolating said active ester from the reaction mixture.

9. A method for the preparation of an active ester of formula



from a carboxylic acid of formula RCOOH, wherein said carboxylic acid is acetic acid, an acrylic acid, thiophenecarboxylic acid or benzoic acid, which consists of reacting said carboxylic acid with a carbonate of formula



wherein

R^1 is:

(1) an N-succinimidyl;

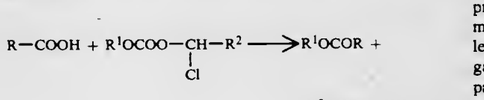
(2) an N-phthalimidyl;

(3) benzotriazolyl radical;

(4) phenyl substituted by 1–5 chlorine, fluorine or one or two nitro groups;

R^2 is: a saturated alkyl of 1 to 5 carbon atoms, unsubstituted or substituted by chlorine atoms, or an unsubstituted phenyl or phenyl substituted by chlorine atoms,

in the presence of an agent for binding hydochloric acid which is a tertiary amine or an alkaline metal carbonate in the presence of an inert solvent which is a member selected from the group consisting of cyclic or acyclic ethers, esters, nitriles, alcohols, amides and ketones, wherein said reaction proceeds as follows:



and isolating said active ester from the reaction mixture.

4,782,165

PROCESS FOR BIOTIN INTERMEDIATES

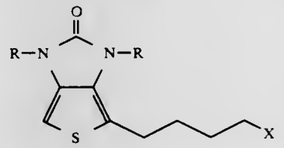
Constantine Sklavounos, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 879,231, May 23, 1986, Pat. No. 4,709,044. This application Oct. 1, 1987, Ser. No. 90,300

Int. Cl.⁴ C07D *473/00*

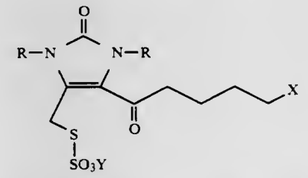
U.S. Cl. 548—303 **15 Claims**

1. A process for the preparation of a compound of the formula



(III)

wherein R is (C_1–C_5)alkanoyl or (C_2–C_5)alkoxycarbonyl and X is methyl or (C_2–C_5)alkoxycarbonyl which comprises reacting a compound of the formula



wherein R and X are as previously defined and Y is an alkali metal in a (C_1–C_5)alkanoic acid in the presence of water and a strong acid at 0°–50° C.

4,782,166

PROCESS FOR PRODUCING MALEIC ANHYDRIDE UTILIZING A CATALYST CONTAINING A SILICEOUS METAL-CONTAINING CRYSTALLINE COMPOSITION

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 335,887, Dec. 30, 1981, abandoned. This application Apr. 17, 1987, Ser. No. 39,573

Int. Cl.⁴ C07D *307/60*

U.S. Cl. 549—260 **19 Claims**

1. A process for producing maleic anhydride from a C_4 to C_{10} hydrocarbon which comprises oxidizing said hydrocarbon in the presence of an oxidation catalyst containgin vanadium, tin, phosphorus and a crystalline composition comprising silicon, oxygen and a rare earth metal selected from the group consisting of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and mixtures thereof, wherein said crystalline composition contains less than about 0.75 weight percent of aluminum, boron and gallium and is characterized by a X-ray powder diffraction pattern having a line of at least strong intensity at an interplanar spacing less than about 5 Angstroms and lines of at least weak intensity at interplanar spacings of 3.64 Angstroms, 3.44 Angstroms, 3.30 Angstroms and 3.14 Angstroms.

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4,782,167

PROCESS FOR PREPARING BUTYROLACTONES AND BUTANEDIOLS

Velliyur N. M. Rao, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 23, 1987, Ser. No. 6,239
Int. Cl.[4] C07D *307/32*; C07C *29/136*
U.S. Cl. 549—326 **10 Claims**

1. A process for preparing butyrolactones, butanediols, and mixtures thereof comprising hydrogenating a hydrogenatable precursor in the presence of an aqueous reaction medium and either (1) a catalyst consisting essentially of palladium and at least one support selected from the oxides of titanium, zirconium, and hafnium or (2) a catalyst comprising a combination of palladium and rhenium and at least one support selected from the oxides of titanium, zirconium and hafnium.

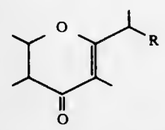
4,782,168

2,3-DIHYDRO-2,3,5-TRIMETHYL-4H-PYRAN-4-ONE DERIVATIVE AND SEX ATTRACTANT FOR DRUGSTORE BEETLES

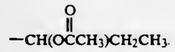
Hisashi Kodama, Kawasaki; Keiko Mochizuki, Yokohama; Masahiro Kohno, Sagamihara; Akio Ohnishi, Yokohama, and Mikio Ono, Fussa, all of Japan, assignors to Japan Tobacco, Inc. and Fuji Flavor Co., Ltd., both of Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,598
Claims priority, application Japan, Mar. 27, 1985, 60-62337; Feb. 26, 1986, 61-39155
Int. Cl.[4] C07D *309/30*
U.S. Cl. 549—416 **10 Claims**

1. A 2,3-dihydro-2,3,5-trimethyl-4H-pyran-4-one derivative represented by general formula:



where R is $-CH(OCH_3)_2$, $-CH(OC_2H_5)_2$, —CHO, $-CH_2OH$, $-CH{=}CH_2$, $=CHCH_2CH_3$, $-CH=CHCH_3$ or



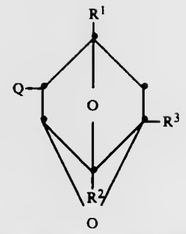
4,782,169

4,7-DIOXATRICYCLO(3.2.1.0^{3,6})OCTANE ETHER

Samuel B. Soloway, Modesto, Calif.; Pierre Vogel, Preverenges; Claude H. Aubin Le Drian, Lausanne, both of Switzerland, and James E. Powell, Ripon, Calif., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1986, Ser. No. 916,334
Int. Cl.[4] C07D *493/18*
U.S. Cl. 549—459 **8 Claims**

1. A compound of the Formula I



I

wherein R^1 is a hydrogen atom or a straight-chain alkyl group containing 1 to 4 carbon atoms; R^2 is a hydrogen atom, an alkyl group containing 1 to 4 carbon atoms or a cycloalkyl group containing 3 to 6 carbon atoms; R^3 is a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms, a cycloalkyl group containing 3 to 6 carbon atoms, an alkenyl or alkynyl group containing 2 to 4 carbon atoms, a phenyl group optionally substituted by one or more of chlorine, fluorine or methyl, tetrahydro-2H-pyran-2-yl, pyridinyl, pyridinylmethyl, mono- or bis(alkoxycarbonyl)methyl in which each alkyl group contains 1 to 4 carbon atoms, mono- or bis(hydroxycarbonyl)-methyl, mono- or dicyanomethyl, cyano, dihydroxyphosphinyl, dialkoxyphosphinyl or dialkylphosphinyl in which each alkyl group contains 1 to 4 carbon atoms, alkylthio or alkylsulfonyl in which each alkyl group contains 1 to 4 carbon atoms, arylthio or arylsulfonyl in which each aryl contains 6 to 10 ring carbon atoms in a monocyclic or fused bicyclic aromatic ring, or acylamino in which the acyl group contains 1 to 4 carbon atoms, and Q is OH or the group OCH_2R in which R is an optionally substituted unsaturated hydrocarbon group containing 2 to 4 carbon atoms; an aromatic group containing up to 14 carbon atoms, a heterocyclic group consisting of imidazolyl, triazolyl, thiadiazolyl, quinolinyl, isoquinolinyl, pyrrolyl, pyrazolyl, isoxazolyl, oxazolyl, isothiazolyl, thiazolyl, thienyl, furanyl, tetrahydropyranyl and pyridinyl, or N-oxide or acid addition salt of an N-heterocyclic group, a cyano group, a cycloalkenyl group containing 5 to 7 carbon atoms, or a cycloalkyl group containing 3 to 10 carbon atoms; and stereoisomeric forms or mixtures thereof.

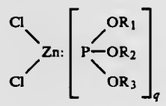
4,782,170

LIQUID POLYVINYL CHLORIDE RESIN STABILIZER SYSTEMS BASED ON COMPLEXES OF ORGANIC TRIPHOSPHITES WITH ZINC CHLORIDE

Kook J. Bae, East Northport, N.Y.; Michael Fisch, Wayne, and Otto Loeffler, Woodbridge, both of N.J., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed May 13, 1986, Ser. No. 862,882
Int. Cl.[4] C07F *3/06*
U.S. Cl. 556—13 **40 Claims**

1. A zinc chloride-organic triphosphite complex having the formula:



wherein:

R_1, R_2 and R_3 are selected from the group consisting of alkyl having from one to about eighteen carbon atoms; alkenyl having from one to about eighteen carbon atoms; cycloalkyl having from three to about twelve carbon atoms; alkylaryl having from seven to about twenty-four carbon atoms; and aryl having from six to ten carbon atoms; and

q is a number representing the number of phosphite groups per zinc chloride group, and is selected from 0.5, 1 and 2, the organic triphosphite of the zinc chloride-organic triphosphite complex being a liquid over the temperature range from about −10° C. up to about 200° C.

4,782,171

STABILIZATION OF AMINE ALANES

Everett M. Marlett; Frederick W. Frey; Steven W. Johnston, all of Baton Rouge, La., and Herbert D. Kaesz, Los Angeles, Calif., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 51,720, May 20, 1987, Pat. No. 4,730,070. This application Dec. 14, 1987, Ser. No. 133,141
Int. Cl.[4] C07F *5/06*
U.S. Cl. 556—171 **6 Claims**

1. Process for retarding the decomposition of an amine alane, said process comprising contacting an amine alane which is substantially titanium-free, with an effective amount of a decomposition retarding agent selected from the class consisting of O_2, CO, nitrogen oxides and alkyl nitrites.

4,782,172

REMOVAL OF POLYFUNCTIONAL SILANES FROM ORGANOSILANES

David S. Niswonger, Louisville, Ky., and Roland L. Halm, Madison, Ind., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 28, 1987, Ser. No. 137,893
Int. Cl.[4] C07F *7/08, 7/18*
U.S. Cl. 556—466 **22 Claims**

1. A process for the purification of an organosilane, having the formula,

$$R^i_aSiX_{4-a},$$

wherein each R^i is independently selected from a group consisting of hydrogen atoms, alkyl groups. substituted alkyl groups, alkenyl groups, and aryl groups; wherein each X is an independently selected halogen atom; wherein a has a value of 1, 2, 3, or 4; and wherein at least one R^i must be an alkyl group, a substituted alkyl group, an alkenyl group, or an aryl group,

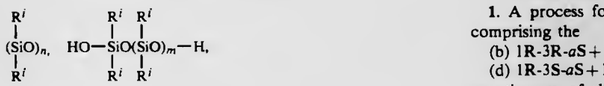
wherein the content of more highly functional silanes having the formula,

$$R^{ii}_bSiX_{4-b},$$

wherein each R^{ii} is independently selected from a group consisting of alkyl groups, substituted alkyl groups, alkenyl groups, aryl groups, and substituted aryl groups, wherein b has a value of 0, 1, 2, or 3 and wherein b must be less than a; and wherein X is defined above,

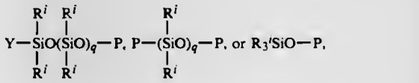
is reduced, said process comprising

(A) contacting a mixture comprising a major portion of the organosilane and a minor portion of one or more more highly functional silanes, with organosiloxanes, and a sufficient quantity of a catalyst effective in promoting reaction between said more highly functional silanes and said organosiloxanes, wherein the organosiloxanes are selected from a group consisting of



wherein R^i is defined above; wherein each Y is independently selected from a group consisting of halogen atoms and trialkylsiloxy groups; wherein n has a value of 3 to 9, inclusive; and wherein m has a value of less than about 1000;

(B) facilitating the reaction between the more highly functional silanes and the organosiloxane to convert the more highly functional silanes to polyfunctional siloxanes, said polyfunctional siloxanes having the formula,



wherein each P is independently selected from a group consisting of $-SiR^{ii}_2X$, $-SiR^{ii}X_2$, and $-SiX_3$ radicals, wherein each R^{ii}, X, and Y are independently selected and are defined above; and wherein q has a value of less than about 1000; and

(C) isolating the organosilane from the polyfunctional siloxanes and the organosiloxanes.

4,782,173

SYNTHESIS OF METHIONINE HYDROXY ANALOG OR DERIVATIVE, AND ESTERS THEREOF; SYNTHESIS OF 1-ACYLOXY-4-HYDROCARBYLTHIOPROPENE, AND PRODUCTS

James D. Burrington, South Euclid, and Mark C. Cesa, Richmond Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 3, 1983, Ser. No. 520,042
Int. Cl.[4] C07C *153/09, 149/20*
U.S. Cl. 558—255 **3 Claims**

1. 1-acetoxy-3-methylthiopropene.
2. 1-propionyloxy-3-methylthiopropene.
3. 2-acetoxy-4-(methylthio)thiobutanoic acid, methyl ester.

4,782,174

PROCESS FOR THE PREPARATION OF CERTAIN PAIRS OF ENANTIOMERS OF α-CYANO-3-PHENOXY-4-FLUOROBENZYL PERMETHRATE

Rainer Fuchs, and Andreas Wittig, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,989
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522629
Int. Cl.[4] C07C *121/75*
U.S. Cl. 558—354 **5 Claims**

1. A process for the preparation of a mixture principally comprising the

(b) 1R-3R-*a*S+1S-3S-*a*R and

(d) 1R-3S-*a*S+1S-3R-*a*R

enantiomers of the compound α-cyano-3-phenoxy-4-fluorobenzyl permethrate, comprising dissolving a mixture of all 8 stereoisomers of the compound α-cyano-3-phenoxy-4-fluorobenzyl permethrate in an alcohol having 2 to 4 carbon atoms, adding a secondary or tertiary alkyl amine having 2–6 carbon atoms in each alkyl moiety and allowing the mass to crystallize, whereby the desired mixture of enantiomers (b) and (d) crystallizes out of the solution.

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4,782,175

URETHANES COMPOSED OF ALIPHATIC FLUOROALCOHOLS, ISOCYANATES AND AROMATIC COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Frank Wehowsky, Burgkirchen; Rolf Kleber, Neu-Isenburg, and Lothar Jaeckel, Flörsheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

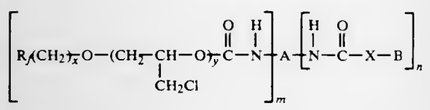
Filed Jul. 1, 1987, Ser. No. 68,924

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622284

Int. Cl.[4] C07C *125/07, 127/04, 147/06*

U.S. Cl. 560—26 **3 Claims**

1. A urethane formed from aliphatic fluoroalcohols, isocyanates and aromatic compounds and having the formula 1 below



(1)

in which

R_f denotes a perfluoroalkyl group having 4 to 20 carbon atoms, or an $R'_fSO_2NR_1$ group in which R'_f is a perfluoroalkyl group having 4 to 20 carbon atoms, and R_1 is H or an alkyl group having 1 to 4 carbon atoms,

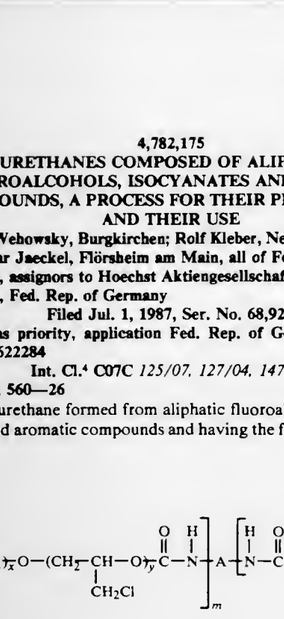
x denotes an integer from 1 to 4,

y denotes a number from 0 to 10,

m denotes a number from 1 to 2 and

n denotes a number from 1 to 2, the sum of m+n being not more than 3,

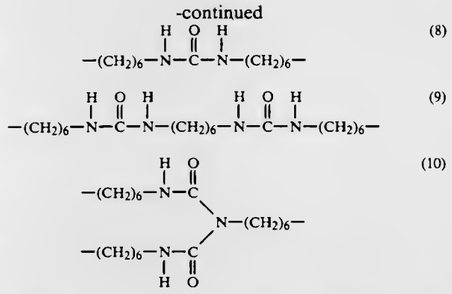
A denotes one of the groups corresponding to the formulae 2 to 10 below



(2) (3) (4) (5) (6) (7)

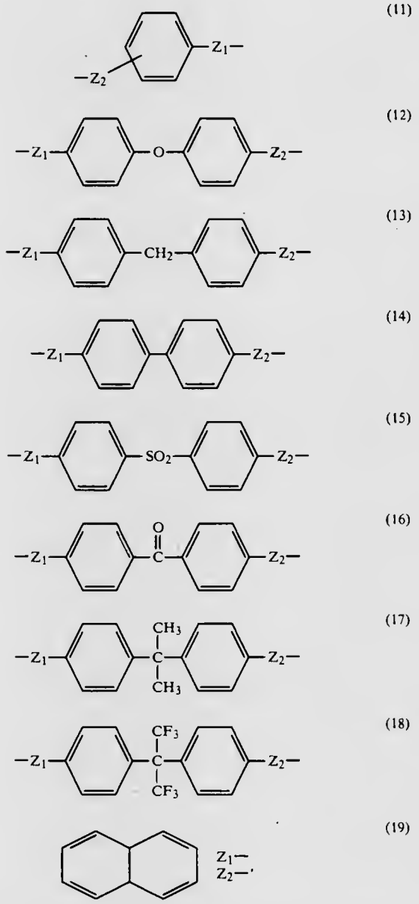
$-(CH_2)_6-$

-continued



(8) (9) (10)

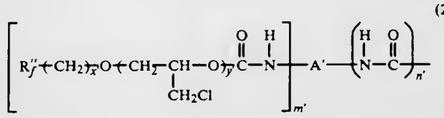
X denotes one of the groups corresponding to the formulae 11 to 19 below, which can be monosubstituted or polysubstituted by an alkyl group having 1 to 4 carbon atoms



(11) (12) (13) (14) (15) (16) (17) (18) (19)

in which Z_1 and Z_2 represent O, NH or COO in which the two substituents are not identical; in the case where Z_1 and Z_2 are COO, the carbonyl of the COO group is attached to the aromatic ring; or Z_1 and Z_2 represent 0 or NH in which the two substituents are identical, and

B denotes a hydrogen atom, an alkyl group having 1 to 4 carbon atoms or a group corresponding to the formula 20 below



(20)

in which R''_f, x', y', m', n' and A', have one of the meanings of R_f, x, y, m, n and A, respectively.

4,782,176

PHENOXYCARBOXYLIC ACIDS

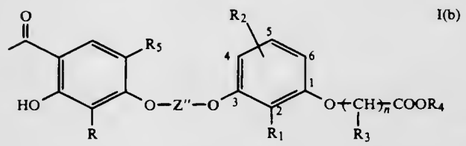
Matthew Carson, Nutley; Ronald A. LeMahieu, North Caldwell, and William C. Nason, Mountain Lakes, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 460,719, Jan. 24, 1983, Pat. No. 4,507,498, which is a continuation-in-part of Ser. No. 366,896, Apr. 9, 1982, abandoned. This application May 23, 1983, Ser. No. 497,375

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—53 **23 Claims**

1. A compound of the formula



I(b)

wherein R is hydrogen or lower alkyl R_1 is hydrogen or lower alkyl, R_2 is lower alkanoyl, R_3 is hydrogen or methyl, R_4 is hydrogen or lower alkyl, R_5 is hydrogen, halogen, lower alkyl or lower alkanoyl, Z^{11} is $-(CH_2)_s-O(CH_2)_s]_t$, wherein s is the integer 2, 3 or 4, t is the integer 1, 2 or 3, and n is an integer from 1 to 7, or, when R_4 is hydrogen,

a salt thereof with a pharmaceutically acceptable base.

4,782,177

ACRYLIC ACID DERIVATIVES AND FUNGICIDES WHICH CONTAIN THESE COMPOUNDS

Ulrich Schirmer, Heidelberg; Stefan Karbach, Ludwigshafen; Ernst-Heinrich Pommer, Limburgerhof; Eberhard Ammermann, Ludwigshafen; Wolfgang Steglich, Bonn-Roettgen; Barbara A. M. Schwalge, Lohmar, and Timm Anke, Kaiserslautern, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

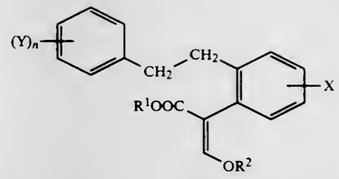
Filed Dec. 15, 1986, Ser. No. 941,323

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545318

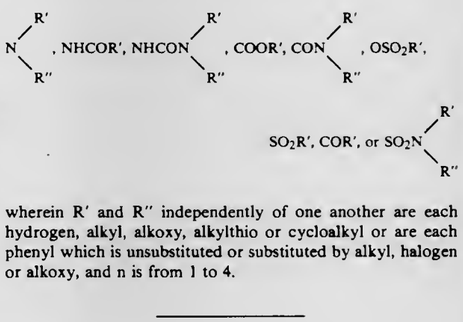
Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—060 **9 Claims**

1. An acrylic acid derivative of the formula:



wherein R^1 and R^2 independently of one another are each C_1–C_8-alkyl; X is hydrogen, halogen, C_1–C_4-alkoxy, trifluoromethyl, cyano or nitro; y is hydrogen, alkyl, haloalkyl, alkoxyalkyl, cycloalkyl, aralkyl, aryl, aryloxy, halogen, an unsubstituted or substituted C_4H_4 chain which is fused to the benzene radical, alkoxy, haloalkoxy, nitro, alkylthio, thiocyanato, cyano, or a group of the formula:



wherein R' and R'' independently of one another are each hydrogen, alkyl, alkoxy, alkylthio or cycloalkyl or are each phenyl which is unsubstituted or substituted by alkyl, halogen or alkoxy, and n is from 1 to 4.

4,782,178

HALOGENATED PHENYL CYANATES

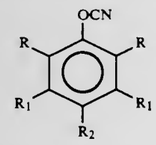
James P. Godschalx; Daniel J. Murray, and Abel Mendoza, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1987, Ser. No. 120,310

Int. Cl.[4] C07C *122/00*

U.S. Cl. 560—301 **13 Claims**

1. A halogenated phenyl cyanate of the formula:



wherein

each R is independently straight or branched C_{1-4} alkyl, $X—C_2—$, $Y—OCH_2—$, $Y—SCH_2—$, $Y—COCH_2—$, or $Y—COOCH_2—$;

each R_1 is independently hydrogen, halo, C_{1-4} alkyl, C_{1-4} alkoxy or thioalkoxy, or cyano;

R_2 is hydrogen, halo, straight or branched C_{1-4} alkyl, phenyl or phenyl substituted with halo or methyl, mercapto, cyano, formyl, Y—O—, Y—S—, Y—CO—, Y—COO—, $X—CH_2—$, $Y—OCH_2—$, $Y—SCH_2—$, $Y—COCH_2—$, or $Y—COOCH_2—$;

X is halo, phenyl or phenyl substituted with halo or methyl, mercapto, formyl, or cyano; and

Y is C_{1-4} alkyl, or phenyl or phenyl substituted with halo or methyl; provided at least one R_1 or R_2 is halo.

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4,782,179

3-AMINO-2,4,5-TRIFLUOROBENZOIC ACID AND A METHOD FOR MANUFACTURE THEREOF

Koichi Hirota, Suita; Osamu Kaieda, Osaka, and Tsuguo Takaya, Ohtsu, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Filed Feb. 9, 1988, Ser. No. 153,975
Claims priority, application Japan, Feb. 13, 1987, 62-29582
Int. Cl.[4] C07C *101/54*
U.S. Cl. 562—456 13 Claims

1. 3-amino-2,4,5-trifluorobenzoic acid.

4,782,180

PROCESS FOR TETRAFLUOROBENZOIC ACID

James N. Wemple, Holland; Timothy P. Puls, Muskegon, and James Vande Vusse, Holland, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 773,490, Sep. 9, 1985, abandoned. This application May 7, 1986, Ser. No. 860,728
Int. Cl.[4] C07C *51/38*
U.S. Cl. 562—479 10 Claims

1. A process for the preparation of 2,3,4,5-tetrafluorobenzoic acid which comprises heating tetrafluorophthalic acid at 105°–125° C. with an organic amine catalyst in a polar, aprotic solvent.

8. A process for the preparation of 3,4,5,6-tetrafluorophthalic acid which comprises heating perchlorophthalide and potassium fluoride at 100°–170° C. in a polar, aprotic solvent, and hydrolyzing with aqueous acid or aqueous base the resulting tetrafluorophthaloyl fluoride.

4,782,181

PROCESS FOR REMOVAL OF HIGH MOLECULAR WEIGHT IMPURITIES IN THE MANUFACTURE OF PURIFIED TEREPHTHALIC ACID

David E. James, Batavia, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jun. 4, 1987, Ser. No. 58,142
Int. Cl.[4] C07C *51/42*
U.S. Cl. 562—487 14 Claims

1. In a process for producing fiber grade terephthalic acid from an impure terephthalic acid having as impurities high molecular weight aromatic compounds derived from catalytic liquid-phase oxidation of paraxylene with molecular oxygen, wherein the improved process comprises the following sequence of operations:

(a) treating an aqueous solution containing at least about 5 percent of said impure terephthalic acid with hydrogen at a temperature in the range of about 450° F. to about 600° F. and at a pressure sufficient to maintain the solution in the liquid phase in the presence of a supported or unsupported metallic Group VIII noble metal catalyst wherein both the metal and support components are insoluble in the solution at the temperature and at a hydrogen partial pressure of from about 10 to about 200 pounds per square inch to ring hydrogenate said impurities;

(b) separating the treated solution from the catalyst;

(c) crystallizing terephthalic acid from the separated solution while retaining impurities and the reduced aromatic compounds dissolved in the resulting mother liquor at a temperature in the range of about 300° F. to about 450° F.;

(d) separating the mother liquor as a liquid phase containing dissolved impurities and reduction products from said crystals while continuing to maintain a temperature in the range of about 300° F. to about 450° F. whereby purified crystals of fiber grade terephthalic acid are recovered; and

(e) returning the mother liquor as a liquid phase containing dissolved impurities and reduction products to the oxidation reactor.

4,782,182

METHOD OF PRODUCING CRYSTALS OF L-ARGININE PHOSPHATE MONOHYDRATE

Gabriel M. Loiacono, Franklin Lakes, N.J., assignor to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 841,129, Mar. 18, 1986, abandoned. This application Sep. 16, 1987, Ser. No. 98,435
Int. Cl.[4] C07C *129/08*
U.S. Cl. 562—560 5 Claims

1. A method of producing large, optical quality crystals of L-arginine phosphate monohydrate, said method comprising:

(a) dissolving a sufficient quantity of L-arginine phosphate monohydrate in water to form a saturated aqueous solution of said L-arginine phosphate monohydrate at a temperature of 20° C.–80° C.;

(b) adjusting the pH of said solution to 2–3;

(c) suspending seed crystals of said L-arginine phosphate monohydrate in said solution and rotating said seed crystals at a rate of from 5 RPM to 50 RPM, and

(d) lowering the temperature of said solution at a rate of 0.01° C.–1° C. per day until crystallization is completed.

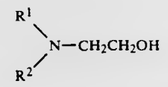
4,782,183

METHOD FOR MANUFACTURE OF AMINO-CARBOXYLIC ACID SALTS

Takakiyo Goto; Hiromi Yokoyama, both of Yokohama, and Hideyuki Nishibayashi, Machida, all of Japan, assignors to Nippon Sbokubai Kagaku Kogyo Co., Ltd., Japan

Continuation of Ser. No. 656,969, Oct. 2, 1984, abandoned. This application May 16, 1986, Ser. No. 863,718
Claims priority, application Japan, Oct. 5, 1983, 58-185179; Oct. 6, 1983, 58-185874; Nov. 1, 1983, 58-203650; Nov. 8, 1983, 58-208246
Int. Cl.[4] C07C *51/00, 51/097*
U.S. Cl. 562—526 17 Claims

1. A method for the manufacture of an aminocarboxylic acid salt by dehydrogenation of an aminoalcohol which comprises contacting an amino alcohol represented by the formula (I):



(I)

wherein R^1 and R^2 denote hydrogen, $—CH_2CH_2OH$, an alkyl group having 1 to 18 carbon atoms or an aminoalkyl group having 2 or 3 carbon atoms, which may be the same or different, with an alkali or alkaline earth metal hydroxide, water and a catalyst consisting essentially of (1) copper metal or a copper compound and (2) a zirconium compound, in the liquid phase wherein the copper content of said catalyst is between 3 and 50% by weight based on the total amount of copper and zirconium.

4,782,184

METHOD FOR MAKING ETHYNYLATED AROMATIC COMPOUNDS

Kreisler S. Y. Lau, Alhambra, and Thomas K. Dougherty, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 453,430, Dec. 27, 1982, abandoned. This application Dec. 19, 1984, Ser. No. 683,951
Int. Cl.[4] C07C *87/452*; C07D *215/12, 213/36, 207/00*
U.S. Cl. 564—307 3 Claims

1. A method for making ethynylated, amino-substituted biphenyl compounds comprising:

(a) reacting 2,2'-diiodobiphenyl with nitronium trifluoromethanesulfonate in homogeneous solution in a selected organic solvent at a temperature within the range of about zero to 5° C., to effect selective nitration in the position para to said iodo substituent to form 2,2'-diiodo-5,5'-dinitrobiphenyl;

(b) reacting said 2,2'-diiodo-5,5'-dinitrobiphenyl with a compound of the formula CuC≡CR to form a compound of the formula 2,2'-bis(C≡CR)-5,5'-dinitrobiphenyl, where R is selected from the group consisting of an alkyl group of one to 10 carbon atoms an alkenyl group consisting one to 10 carbon atoms, an aryl group and a heteroaryl group; and

(c) reacting the product of step (b) with hydrogen in the gas phase in the presence of a noble metal catalyst to reduce the nitro groups to amino groups.

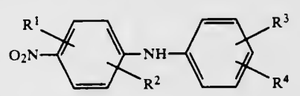
4,782,185

PROCESS FOR THE PREPARATION OF 4-NITRODIPHENYLAMINES

Ernst W. Müller, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

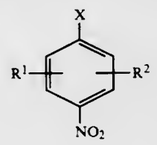
Filed Feb. 9, 1987, Ser. No. 12,483
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605197
Int. Cl.[4] C07C *85/04*
U.S. Cl. 564—406 4 Claims

1. In the process for the preparation of 4-nitrodiphenylamines of the formula



in which

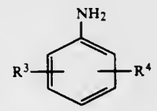
R^1, R^2, R^3 and R^4 are identical or different and each represents hydrogen or an alkyl with 1 to 9 carbon atoms, by reaction of halogenonitrobenzenes of the formula



in which

X represents chlorine or bromine, and in which

R^1 and R^2 have the above-mentioned meaning, with primary aromatic amines of the formula



in which

R^3 and R^4 have the above-mentioned meaning, in the presence of potassium carbonate and copper compounds or with the formyl derivatives of the aromatic amines in the presence of potassium carbonate,

the improvement comprises carrying out the reaction in the presence of a metal comprising aluminium, magnesium or zinc, or a mixture of two or more of these metals, or an alloy of two or more of these metals, or an alloy of one or more of these metals with one or more alkali metals, with or without calcium and tin, the amount of said metals being from 105 to 300% of theory, calculated on the amount of water liberated during the condensation and based on the fact that one equivalent of metal bonds one mol of by-product water, and working up the reaction mixture without azeotropic distillation.

4,782,186

CONDENSATION OF ALDEHYDES

Robert G. Beevor, Twickenham, England, assignor to British Petroleum Company p.l.c., London, England

Filed Sep. 24, 1986, Ser. No. 911,052
Claims priority, application United Kingdom, Oct. 15, 1985, 8525402
Int. Cl.[4] C07C *45/45*
U.S. Cl. 568—388 10 Claims

1. In a process for the production of an alpha-hydroxyketone by condensation of one or more aldehydes in the presence of a thiazolium salt and a base at a temperature in the range 20°–150° C. the improvement which comprises using, as base, a sterically hindered base having a pKa value greater than 12.0.

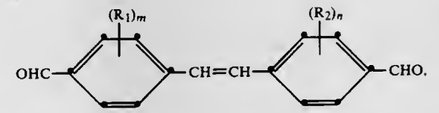
4,782,187

PROCESS FOR THE PREPARATION OF 4,4'-STILBENEDIALDEHYDES

Dieter Reinehr, Kandern, Fed. Rep. of Germany, and Heinz Steiner, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

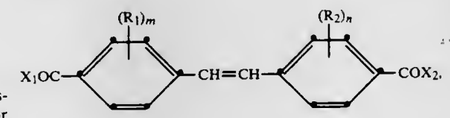
Filed Dec. 10, 1986, Ser. No. 940,312
Claims priority, application Switzerland, Dec. 19, 1985, 5447/85
Int. Cl.[4] C07C *45/41*
U.S. Cl. 568—437 20 Claims

1. A process for the preparation of a 4,4'-stilbenedialdehyde of formula



(1)

wherein R_1 and R_2 are each independently of the other alkyl or alkoxy, each of 1 to 4 carbon atoms, phenyl, phenoxy, chlorine or bromine; or are hydroxyl, carboxyl or sulfo groups or ester or amide derivatives thereof, and m and n are each independently of the other 0, 1 or 2, which process comprises hydrogenating a compound of formula



(2)

wherein R_1, R_2, m and n are as defined for formula (1) and X_1 and X_2 are each independently of the other hydrogen, chlorine or bromine, with the proviso that X_1 and X_2 are not simultaneously hydrogen, in an anhydrous, inert, aprotic organic solvent and in the presence of a noble metal catalyst, in the temperature range from 15° to 200° C. and under a pressure of 1 to 50 bar, until the absorption of a precalculated amount of hydrogen which is theoretically necessary to obtain the compound of formula (1), then separating the catalyst and isolating the compound.

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4,782,188

PROCESS FOR HYDROFORMYLATION OF UNSATURATED COMPOUNDS USING IRON CARBONYL CATALYSTS

Susan B. Butts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 14, 1983, Ser. No. 551,759
Int. Cl.⁴ C07C *45/00*
U.S. Cl. 568—444 **21 Claims**

1. A process for the hydroformylation of C_{2-4} alkenes, formyl-substituted C_{2-4} alkenes, aryl-substituted alkenes, unsaturated norbornane ring-containing compounds, and α-unsaturated acetals which comprises contacting a C_{2-4} alkene, a formyl-substituted C_{2-4} alkene, aryl-substituted alkene, an unsaturated norbornane ring-containing compound or an α-unsaturated acetal in a polar organic solvent with water and carbon monoxide in the presence of a catalytic amount of a catalyst which comprises a mixture of (a) an alkali metal iron carbonyl or alkaline earth metal iron carbonyl or a mixture thereof which corresponds to the formula $M_aFe_x(CO)_y$ and (b) iron pentacarbonyl under conditions such that an alcohol or aldehyde derivative of a C_{2-4} alkene, a formyl-substituted C_{2-4} alkene, an aryl-substituted alkene, unsaturated norbornane ring-containing compound or an α-unsaturated acetal, is prepared wherein M is an alkali metal or alkaline earth metal; a is 1 or 2; x is an integer of 2 to 4, inclusive; and y is 8, 11 or 13.

4,782,189

PROCESS FOR THE CONTINUOUS PREPARATION OF LAUROYL PEROXIDE

Hans Appel, and Gottfried Broesmann, both of Höllriegelskreuth, Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Hollriegelskreuth, Fed. Rep. of Germany

Continuation of Ser. No. 691,720, Jan. 15, 1985, abandoned, which is a continuation of Ser. No. 166,280, Jul. 7, 1980, abandoned. This application Sep. 15, 1987, Ser. No. 96,851
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2928020
Int. Cl.⁴ C07C *178/00*
U.S. Cl. 568—566 **13 Claims**

1. In a process for the continuous preparation of lauroyl peroxide in the absence of organic solvents from crude lauroyl chloride, aqueous sodium hydroxide solution and hydrogen peroxide by continuously adding the reaction components to a reaction stirrer vessel and carrying out the reaction with an average residence time of 15 to 30 minutes, the improvement comprising maintaining the temperature in the reaction vessel between 0° and 20° C. by cooling, adding 1.0 to 3% by weight of hydrogen peroxide, referred to the total amount of the reaction mixture, and sodium hydroxide in such amount that the concentration thereof in the reaction mixture run off is 0.15 to 0.3N, withdrawing the reaction mixture from the reaction vessel, adding sufficient acid to the reaction mixture to reduce the pH to a value of from 9.5 to 11, and then heating the reaction mixture, by the addition of water of a temperature of from 70° to 90° C. to above the melting point of lauroyl peroxide, and separating off the molten lauroyl peroxide in a separator.

4,782,190

PROCESS FOR THE PREPARATION OF 4-NITROPHENETOL

Josef Käsbauer, and Karlfried Wedemeyer, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,834
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610707
Int. Cl.⁴ C07C *79/35, 41/16*
U.S. Cl. 568—584 **14 Claims**

1. A process for the preparation of 4-nitrophenetol comprising reacting 4-chloronitrobenzene with ethanol and an alkali metal hydroxide in the presence of a phase-transfer catalyst, the reaction being carried out at temperatures from 80° to 95° C. and under pressure in the presence of oxygen-containing gases at an initial pressure of 1 to 4 bars to attain a total pressure of 2 to 10 bars of the oxygen-containing gas which in the process is mixed with inert gases, there being at the start of the reaction 0.2 to 1.0 moles of alkali metal hydroxide metered each hour into the reaction mixture for each 1 mole of 4-chloronitrobenzene, wherein the amount of inert gas admixed to the oxygen-containing gas is at least sufficient to prevent the formation of explosive mixtures.

4,782,191

PROCESS FOR THE PREPARATION OF ALKYLARYL ETHERS

Maurizio Brunelli, San Donato Milanese, and Giuseppe Bellussi, Piacenza, both of Italy, assignors to Enniricerche S.p.A., Milano, Italy

Filed May 18, 1987, Ser. No. 50,698
Claims priority, application Italy, May 27, 1986, 20574 A/86
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.⁴ C07G *41/09*
U.S. Cl. 568—630 **12 Claims**

1. A process for preparing alkylarylethers which comprise reacting a phenol or a mixture of phenols with an ether of aliphatic alcohol or a mixture of ethers of aliphatic alcohols, characterized in that the catalyst system is amorphous BPO_4 which has been calcined at a temperature of from 150° to 600° C. and the reaction temperature is selected from a temperature range of from 150° to 400° C.

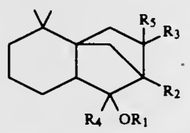
4,782,192

TRICYCLIC ALCOHOLS, ETHERS AND ESTERS, PROCESS FOR PREPARING SAME AND USE THEREOF IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF CONSUMABLE MATERIALS

Kenneth K. Light, N. Ogden, Utah; Joseph A. McGhie, Montclair, N.J.; Futoshi Fujioka, Wanamassa, N.J., and Takao Yoshida, West Long Branch, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 206,649, Nov. 13, 1980. This application Jun. 24, 1982, Ser. No. 391,568
Int. Cl.⁴ C07C *43/02*
U.S. Cl. 568—665 **6 Claims**

1. A tricyclic compound having the structure:



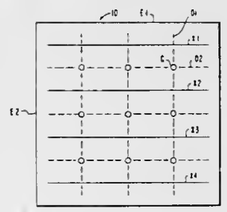
wherein R_1 represents, methyl and wherein R_2, R_3, R_4 and R_5 represent the same or different hydrogen, methyl or ethyl.

4,782,193

POLYGONAL WIRING FOR IMPROVED PACKAGE PERFORMANCE

Ralph Linsker, Millwood, N.Y., assignor to IBM Corp., Armonk, N.Y.

Filed Sep. 25, 1987, Ser. No. 101,228
Int. Cl.⁴ H05K *1/00*
U.S. Cl. 174—68.5 **14 Claims**



1. A wiring arrangement for connecting a plurality of electrical or electronic devices which are supported adjacent said wiring arrangement comprising:

a plurality of sets of wiring planes, each of said wiring planes supporting conductive wiring oriented in a principal wiring direction and further supporting a plurality of connection sites arranged at intersections of theoretical orthogonal lines,

connections between said connection sites being implemented by said wiring arrangement employing wiring planes exclusively within a single set of said wiring planes,

each of said sets of wiring planes including at least first and second wiring planes, a principal direction of wiring on a first wiring plane in a set lying at an acute angle to a principal direction of wiring on a second wiring plane of said set,

a principal direction of wiring on one of said first wiring planes lying orthogonal or parallel to a principal wiring direction of others of said first wiring planes,

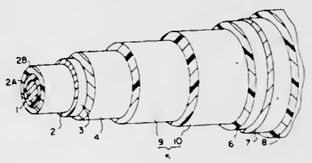
a principal direction of wiring on one of said second wiring planes lying orthogonol or parallel to a principal wiring direction of others of said second wiring planes.

4,782,194

HIGH VOLTAGE MASS-IMPREGNATED POWER CABLE

John N. Johnsen, Oslo, Norway, assignor to Alcatel USA Corp., New York, N.Y.

Filed Nov. 19, 1986, Ser. No. 932,808
Claims priority, application Norway, Nov. 25, 1985, 854698; Oct. 1, 1986, 863905
Int. Cl.⁴ H01B *7/18*
U.S. Cl. 174—107 **19 Claims**



1. A mass-impregnated power cable of circular cross section comprising:

a single core conductor for transmitting high voltage direct current power;

a plurality of mass-impregnated insulating tapes surrounding and positioned on said conductor;

a sheath of circular cross section surrounding and positioned on said insulating tapes;

a layer of a bedding material surrounding and positioned on said sheath; and

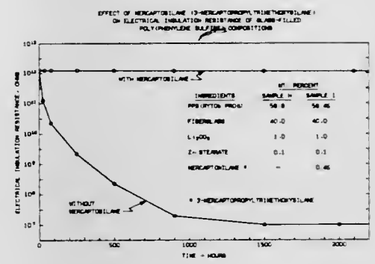
a pressure body surrounding said bedding material layer and including a first layer of an elastic tape helically surrounding said bedding material layer and a second layer of an elastic tape helically surrounding said first layer, each of said elastic tapes having longitudinal side edges and a predetermined width and being positioned such that one side edge of the tape is spaced a predetermined distance from the side edge of the adjacent helical turn of the tape, each of said tapes having a length of lay equal to or less than 1.5 times the diameter of said sheath.

4,782,195

ENCAPSULATION OF ELECTRONIC COMPONENTS WITH POLY(ARYLENE SULFIDE) CONTAINING MERCAPTOSILANE

Jennings P. Blackwell; John E. Leland; Robert D. Still, and James S. Dix, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 16, 1982, Ser. No. 399,110
Int. Cl.⁴ H05K *5/06*
U.S. Cl. 174—52 PE **9 Claims**



1. An electronic component encapsulated with a composition comprising:

(i) about 25 to about 45 weight percent poly(arylene sulfide),

(ii) 3-mercaptopropyltrimethoxysilane,

(iii) about 5 to about 30 weight percent glass, and

(iv) about 40 to about 60 weight percent filler;

wherein said weight percentages are based upon total amount of (i), (ii), (iii), and (iv); and wherein the viscosity of said composition does not exceed about 800 poise as tested on a capillary rheometer at 650° F. and at a shear rate of 1000 $(sec)^{-1}$.

4,782,196

COMPOSITE STRAND FOR TRANSMITTING ELECTRIC OR OPTICAL SIGNALS

Ryouichi Ukai, Sagamik, Japan, assignor to Maruichi Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1984, Ser. No. 613,980
Claims priority, application Japan, Nov. 30, 1983, 58-226125
Int. Cl.⁴ H01B *7/06, 13/00*
U.S. Cl. 174—131 A **8 Claims**

1. A composite strand for transmitting an electric signal comprising:

(1) a support strand including:

(a) an elastic center thread; and

(b) a non-extensible fiber helically wound around the center thread to limit extension of the center thread; and

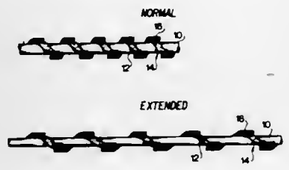
(2) a signal transmitting strand helically overlaying the non-extensible helically wound fiber, the signal transmitting strand having a length at least as long as the length of the non-extensible helically wound fiber and having a suffi-

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cient width such that when it is wound around the support strand that adjacent coils of the wound signal transmitting strand partly overlap in the axial direction when the composite strand is fully extended.

2. A method of making a composite strand for transmitting an electric signal comprising:

helically winding a non-extensible fiber around an elastic



polyurethane center thread to form a support strand of delimited extension having coils of non-extensible thread in a spaced apart relationship thereon; and

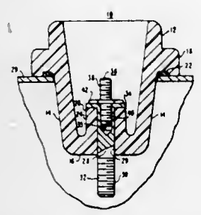
helically winding a signal transmitting strand around the support strand to form adjacent coils of the signal transmitting strand helically overlaying each coil of non-extensible fiber at a pitch with a suitable gap to extend with the extension of the support strand without breaking.

4,782,197

ELECTRICAL BUSHING HAVING A REPLACEABLE STUD

Joseph M. Stumzi, and Donald J. Ristuccia, both of Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1988, Ser. No. 171,080
Int. Cl.[4] H01B *17/26;* **H01R** *13/207*
U.S. Cl. 174—152 R **10 Claims**



1. An electrical bushing for use with an electrical apparatus, said electrical bushing comprising:

a molded bushing body having an internal cavity, said internal cavity being open at one end of said bushing body and closed off at the other end of said bushing body by an end wall having a reentrant boss including a shoulder portion thereon surrounding an axial opening in said end wall communicating with said cavity;

a flanged conductor molded in said axial opening, said flanged conductor having a radially extending flange on one end thereof overlying said shoulder portion on said reentrant boss, and electrical connection means at the other end thereof, said flanged conductor having a threaded bore in said flanged end;

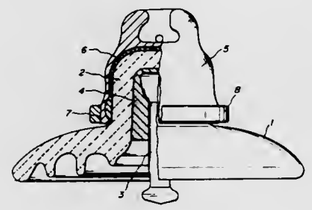
a replaceable stud for connecting the electrical apparatus to an external electrical connector, said replaceable stud including a pair of threaded end portions and a central flange portion including means for facilitating the rotation of said replaceable stud, said replaceable stud having one end threaded into said threaded bore to seat said central flange portion on said radially extending flange on said flanged conductor.

4,782,198

SUSPENSION INSULATORS

Tsutomu Moriya, Chita, and Hiroyuki Shinokubo, Konan, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Feb. 25, 1987, Ser. No. 19,137
Claims priority, application Japan, May 22, 1986, 61-118316
Int. Cl.[4] H01B *17/08*
U.S. Cl. 174—182 **6 Claims**



1. A suspension insulator comprising:

a bell-shaped ceramic insulator body having a radial shed portion and a radical head portion, said head portion having an outer surface which contacts said shed portion at a shed root portion of said head portion and an inner cavity;

a metal cap having an inner surface and an outer surface, said metal cap being secured to said outer surface of said head portion and in contact with said shed root portion;

a connecting pin secured in said inner cavity of said head portion; and

a metal ring shrink fitted on said outer surface of said metal cap surrounding said shed root portion so as to apply a prestress to said shed root portion;

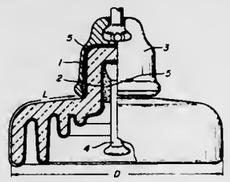
wherein a compressive strain of at least 60×10^{-6} exists in a circumferential direction within said body at about said shed root portion.

4,782,199

INSULATORS HAVING IMPROVED STEEP WAVE FRONT CHARACTERISTICS

Shoji Seike; Takao Totoki, and Toshiyuki Mima, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Oct. 26, 1987, Ser. No. 112,274
Claims priority, application Japan, Feb. 25, 1987, 62-40457
Int. Cl.[4] H01B *17/50;* **C03C** *8/02*
U.S. Cl. 174—189 **8 Claims**



1. A high voltage porcelain insulator having a glaze applied to at least a head portion of the porcelain insulator which head portion is covered with a metal fitting and cement, said glaze comprising, in terms of weight, from 64.0 to 68.0% of SiO_2, from 17.5 to 19.0% of Al_2O_3, from 5.0 to 6.5% of MgO, not more than 3.0% of CaO, from 2.0 to 2.8% of K_2O+Na_2O in a total amount, and from 3.0 to 9.0%, when calculated as MnO, of a compound which is converted to MnO or MnO_2 after being fired at a temperature range suitable for firing porcelain.

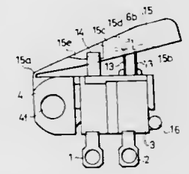
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4,782,200

SWITCH ASSEMBLY

Hiroki Oba, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 26, 1986, Ser. No. 900,504
Claims priority, application Japan, Aug. 30, 1985, 60-131729[U]
Int. Cl.[4] H01H *9/02, 15/00*
U.S. Cl. 200—16 A **4 Claims**



1. In a switch assembly including a lower housing having an opening on an upper side thereof and a cavity defined therein for mounting a pair of switch contacts, one of said switch contacts having a movable contact portion which is spring-biased so as to be reciprocable in up and down directions, an upper housing mountable over the opening of said lower housing to enclose said cavity and having a guide portion with a guide hole for guiding a slide positioned therein for reciprocating sliding movement in the up and down directions, said upper housing being assembled to said lower housing such that a lower end of said slide is pressed against said movable contact portion and an upper end of said slide projects externally of said upper housing for actuating said switch assembly,

the improvement wherein said upper housing and said slide are originally formed in a single body with said slide positioned in said guide hole and at least one runner portion attached between a side wall of the slide and an inner wall of said guide hole, said slide being separated from said upper housing during assembly by cutting said runner portion, wherein any cut ends remaining attached to said side wall of said slide and to said inner wall of said guide hole form respective runner projections, said side wall of said slide being formed with a relief slit recessed from the plane of the side wall so as to avoid or alleviate jamming contact with the runner projection attached to said inner wall of said guide hole, and said inner wall of said guide hole being formed with a relief slit recessed from the plane of the inner wall so as to avoid or alleviate jamming contact with the runner projection attached to said side wall of said slide during reciprocating sliding movement of said slide in said guide hole.

4,782,201

SWITCH ACTUATING ASSEMBLY

Lorne R. Pollard, Naperville, Ill.; Ronald Stowell, Oakville; William Flood, Burlington; Eugen J. Bexten, Ancaster, and J. Richard Harwood, Innerkip, all of Canada, assignors to J. I. Case Company, Racine, Wis.

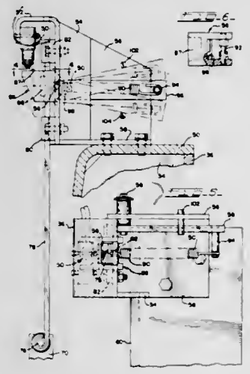
Filed Jun. 29, 1987, Ser. No. 67,219
Int. Cl.[4] H01H *3/16*
U.S. Cl. 200—61.44 **9 Claims**

1. In a mobile machine having a member moveable between two orientations, such as a wheel frame member moveable between working and transport orientations in an agricultural machine, an actuator assembly for actuating an electric switch from a spring-biased first position to a second position upon movement of said member from one of said two orientations and for accommodating actuation of said switch to said first position upon movement of said member from the other of said two orientations, said assembly comprising:

a support means for supporting said switch in a fixed position relative to said moveable member orientations and for maintaining said switch in said fixed position;

a motion response element operably connected to said moveable member for being moved in one of two opposite directions in response to movement of said moveable member toward one of said orientations and for being moved in the other of said two directions in response to movement of said moveable member toward the other of said orientations; and

switch actuating means comprising an actuating member defining an engaging surface for engaging said switch to actuate said switch to said second position, said actuating



member being biased into frictional contact with said motion response element to create a static friction force therebetween which operably connects said actuating member with said motion response member, whereby said actuating member moves with said response element until any force of resistance to the continued movement of said actuating member exceeds the static friction force between said actuating member and said motion response element, thereby permitting continued movement of said motion response element relative to said actuating member while said actuating member maintains said switch in said second position.

4,782,202

METHOD AND APPARATUS FOR RESISTANCE ADJUSTMENT OF THICK FILM THERMAL PRINT HEADS

Tetsunori Sawae; Hiromi Yamashita; Takafumi Endo; Kohei Katayama, and Yukio Murata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,968
Int. Cl.[4] H01L *49/00;* **B41J** *3/20*
U.S. Cl. 219—68 **13 Claims**

4. A method of adjusting the resistance values of heat generating resistor elements of a thermal head assembly, characterized by the steps of:

A. measuring the initial resistance values of said heat generating elements,

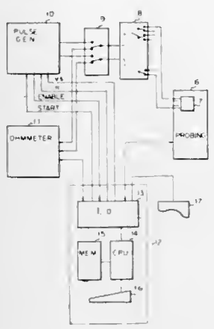
B. applying a first voltage pulse having a first peak voltage value to said heat generating resistor elements to decrease the initial resistance values of said heat generating resistor elements if the measured resistance values of said heat generating resistor elements are higher than a predetermined value,

C. measuring the resistance values of said heat generating elements,

D. applying a further voltage pulse having a further peak voltage value if the measured resistance values of said heat

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generating resistor elements are higher than said predetermined value, and



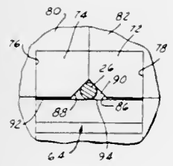
E. repeating Steps C and D with a sequence of voltage pulses wherein the peak voltage value of the voltage pulses in said sequence is increased in sequence.

4,782,203

WIRE GUIDE FOR ELECTRIC DISCHARGE MACHINE

John M. Check, Chelsea; Myron Johnson, Freeland, and George Barbulescu, Ann Arbor, all of Mich., assignors to Raycon Textron Inc., Ann Arbor, Mich.

Filed Apr. 16, 1987, Ser. No. 39,065
Int. Cl.[4] B23H *1/00, 7/10*
U.S. Cl. 219—69 E **8 Claims**



2. In an EDM apparatus having a source of conductive wire electrode and a refeed mechanism for feeding a tip of the wire electrode through a wire guide having an inlet, outlet and surfaces to precisely locate the tip of the wire electrode in a spaced spark gap relationship with a workpiece so as to produce a hole through the workpiece when current pulses are directed from the tip of the wire electrode to the workpiece and wherein the tip of the wire electrode is subject to spark induced vibrations the improvement comprising:

first and second guide means in the wire guide for controlling the direction of feed of the wire electrode from the refeed mechanism to the spark gap at the tip of the electrode;

said first guide means being rigidly supported on the wire guide;

said second guide means having a segment thereon rigidly supported on the wire guide to form a fixed path for the feed of wire electrode material from the refeed mechanism to the spark gap formed between the tip and the workpiece;

said second guide means having another segment thereon movably supported on the wire guide to form an extension of the fixed path which is axially concentric of the fixed path; and

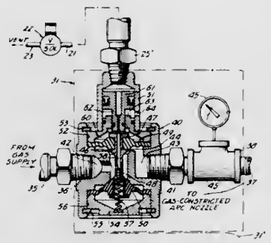
means for resiliently biasing said another segment with respect to said first guide means at the outlet of the wire guide for dampening vibrations in the wire electrode between its tip and the outlet of the wire guide so as to maintain the tip in a desired concentricity as established by the fixed path formed between the rigidly supported guide means and the another segment.

4,782,204

ADAPTER FOR CONTROL OF GAS FLOW TO A GAS-CONSTRICTED ARC NOZZLE OR THE LIKE

Thomas J. Gartland, Huntington Station, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Continuation of Ser. No. 850,626, Apr. 11, 1986, abandoned.
This application May 26, 1987, Ser. No. 53,737
Int. Cl.[4] F16K *31/128*
U.S. Cl. 219—74 **9 Claims**



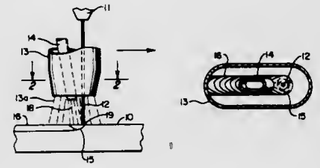
1. In combination, an existing gas arc welding system adapted to serve the greater gas-supply requirements of a gas-constricted arc nozzle, said existing system including a control unit and a torch body connected to said unit via a flexible hose, and said control unit including a solenoid-operated valve having a gas-supply inlet connection and a supplied-gas outlet connection to said hose for on/off control of shielding-gas flow to the torch body, an adapter comprising a normally-open pressure-operated main valve including pressure-operated valve closing means and having a body with inlet and outlet port connections and a valve member and seat interposed between said port connections for determining flow therebetween, means including a bleed orifice connecting the inlet-port connection to said pressure-operated means, said adapter further including an externally accessible venting-control connection to said pressure-operated means, a connection from the gas-supply inlet connection of said solenoid valve to said venting-control connection, and a pressurized-gas supply connection to said inlet-port connection, whereby selective opening of said solenoid valve will quickly open said main valve via selective venting of said pressure-operated means, and whereby upon solenoid-valve closure a main-valve-closing action is delayed as a function of the restriction at said bleed orifice.

4,782,205

METHOD OF WELDING INVOLVING WELD BEAD SHAPING AND ARC DEFLECTION AND APPARATUS FOR PRACTICING SAID METHOD

Chester S. Shira, 3634 7th Ave., Apt. 4C, San Diego, Calif. 92103

Filed Jun. 25, 1987, Ser. No. 65,435
Int. Cl.[4] B23K *9/00, 9/16*
U.S. Cl. 219—74 **8 Claims**



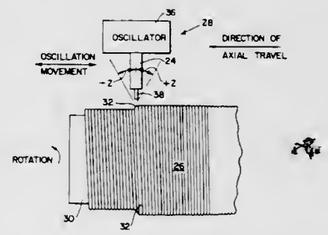
1. A method of welding a joint involving weld bead shaping and arc deflection which comprises moving a welding arc in a direction along the joint to be welded, forming a molten pool of metal by said arc along said joint, which said molten pool of metal will form a weld bead upon solidification of said molten pool, directing a high velocity stream of gas from a source behind the direction of travel of said welding arc in the direction of travel of said welding arc and at such an angle to the said weld bead being formed and at such an angle to the vertical axis of said arc so that said high velocity stream of gas impinges directly onto the surface of the molten pool of metal formed by said arc to such an extent as to overcome surface tension and gravity forces of the molten pool as said molten pool solidifies, whereby the surface shape of said solidified weld bead may be controlled and the welding speed may be increased.

4,782,206

METHOD AND APPARATUS FOR CONTROLLING WELD BEAD SHAPE TO ELIMINATE MICROFISSURE DEFECTS WHEN SHAPE MELTING AUSTENITIC MATERIALS

Paul S. Ayres, Forest, Va.; David P. Edmonds, N. Canton, Ohio; Dennis D. Hartwig, Massillon, Ohio; David E. Merker, Minerva, Ohio, and Charles M. Weber, Alliance, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 27, 1987, Ser. No. 7,146
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.14 **10 Claims**



1. A welding method for eliminating microfissure defects in shape melted austenitic material components by closely controlling the deposition of weld metal throughout the shape melting process to avoid weld bead shapes having any underbead sharp discontinuities, comprising the steps of:

providing an initial surface;

providing a welding torch for depositing weld metal upon said initial surface in layers of successively applied weld beads at a specified interpass temperature;

adjusting a torch angle Z of said welding torch in a plane 90 degrees with respect to a line of travel of the deposited weld beads to achieve improved tie-in between adjacent weld beads; and

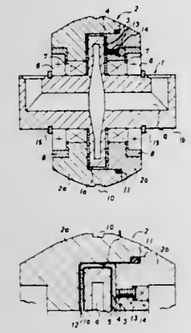
oscillating said welding torch in a side to side manner relative to the line of travel of said deposited weld beads during the shape melting process such that a penetration point of said weld beads is spread along the width of the bead to produce a flat, well rounded underbead shape lacking any sharp discontinuities.

4,782,207

ELECTRODE ROLL

Shunsuke Masuda, Kamakura; Masatoshi Yamamoto, Sagamihara; Katsuyoshi Shudo, Sagamihara; Hiroyuki Kato, Sagamihara, and Yasushi Kawai, Sagamihara, all of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 898,064
Claims priority, application Japan, Aug. 21, 1985, 60-183749
Int. Cl.[4] B23K *11/06, 35/00*
U.S. Cl. 219—84 **12 Claims**



1. An electrode roll of an electric resistance seam welding machine, comprising:

a stator fabricated substantially with copper or copper alloy components;

a rotor fabricated substantially or in part with copper or copper alloy components and rotatably mounted around said stator;

a gap portion formed by said stator and said rotor;

a filling hole provided in said rotor and extending into said gap portion;

a conductive liquid metal filled through said filling hole and sealed in said rotor in said gap portion, said conductive liquid metal being made of a fusible alloy composed mainly of gallium, said filling hole having an inner wall, at least that portion of said filling hole inner wall as may contact said conductive liquid metal being made of a metal or metal alloy that is hard to be corroded by said fusible alloy, said rotor comprising (1) a copper or copper alloy rotor member fabricated with copper or copper alloy components and (2) a corrosion resistant rotor member which is itself made of a metal or metal alloy that is hard to be corroded by said fusible alloy;

at least one layer of one or more metals or metal alloys that are hard to be corroded by said fusible alloy, the surface of said copper or copper alloy rotor member facing said gap portion being covered with said at least one layer, said at least one layer also covering the surface of said stator facing said gap portion, said filling hole being provided in said corrosion resistant rotor member such that the sur-

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face of said filling hole is thereby resistant to corrosion by said fusible alloy.

6. An electrode roll of an electric resistant seam welding machine, comprising:

a stator fabricated substantially with copper or copper alloy components;

a rotor fabricated substantially or in part with copper or copper alloy components and rotatably mounted around said stator;

a gap portion formed by said stator and said rotor;

a filling hole provided in said rotor and extending into said gap portion;

a conductive liquid metal filled through said filling hole and sealed in said rotor in said gap portion, said conductive liquid metal being made of a fusible alloy composed mainly of gallium, said filling hole having an inner wall, at least that portion of said filling hole inner wall as may contact said conductive liquid metal being made of a metal or metal alloy that is hard to be corroded by said fusible alloy; and

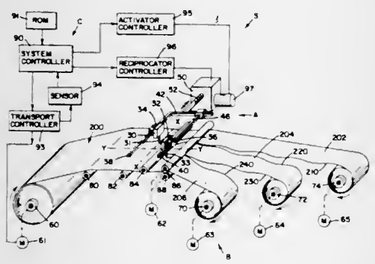
at least one layer of one or more metals or metal alloys that are hard to be corroded by said fusible alloy, said at least one layer covering (1) the surface of said rotor facing said gap portion, other than the part of said rotor surface defining said portion of said inner wall of said filling hole made of a metal or metal alloy hard to be corroded by said fusible alloy, and (2) the surface of said stator facing said gap portion, wherein said inner wall of said filling hole is a hollow tubular insert, said insert being made of a metal or metal alloy that is hard to be corroded by said fusible alloy, said insert being fitted into said rotor.

4,782,208

METHOD AND APPARATUS FOR SLITTING METAL STRIPS

David A. Withrow, 3366 Broad Vista NW., Uniontown, Ohio 44685, and Allen W. White, 1770 Clarendon, Lewisville, Tex. 75067

Filed Jun. 1, 1987, Ser. No. 56,418
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.72 **7 Claims**



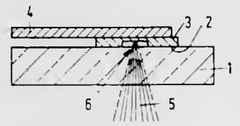
1. A method of cutting a flat metal workpiece into a plurality of individual strips and comprising the steps of: positioning in strip cutting position with respect to said workpiece, a pair of cutting heads for projecting respective strip cutting beams onto the surface of said workpiece, and causing relative movement of each of said cutting heads with respect to said workpiece to cause said pair of cutting heads to traverse and cut strands from said workpiece having side edges which alternately converge and diverge with respect to one another.

4,782,209

INTERCONNECTING A GLASS OR CERAMIC ELEMENT AND A METAL ELEMENT

Johan F. J. M. Caers; Joseph A. Meertens, and Johannes N. J. M. Van den Reek, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1987, Ser. No. 86,435
Claims priority, application United Kingdom, Aug. 18, 1986, 8620057
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.64 **10 Claims**



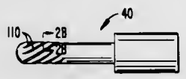
1. A method of interconnecting a first and a second element by means of laser welding, the first element consisting at least partly of glass and the second element consisting at least partly of metal, the bond between both elements being formed by the glass part of the first element and the metal part of the second element, characterized in that a metal auxiliary element is bonded to the glass part of the first element by means of a solid-state bond, after which substantially without heating, the metal part of the second element is welded to the metal auxiliary element by means of a laser beam.

4,782,210

RIDGED ELECTRODE

David J. Nelson, West Lebanon, N.H.; William Wakefield, Windsor, Vt., and Raymond G. Wilkins, Hanover, N.H., assignors to Thermal Dynamics Corporation, West Lebanon, N.H.

Filed Jun. 26, 1987, Ser. No. 67,017
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.52 **10 Claims**



1. In a plasma-arc system comprising spaced, electrically conductive electrode means defining an arc chamber therebetween, pilot arc voltage supplying means connected to said electrode means, and means for supplying a flow of plasma forming gas through said arc chamber, the improvement which comprises:

said electrode means including at least one electrode having at least one ridge formed thereon, said ridge being located substantially in said arc chamber and extending along said electrode so as to provide a path for arcing, thereby producing a longer wearing electrode.

4,782,211

METHOD OF WELDING AND PRODUCT OBTAINED THEREFROM

Matt Kiilunen, Brighton, Mich., assignor to Weld Mold Company, Brighton, Mich.

Continuation-in-part of Ser. No. 806,532, Dec. 9, 1985, Pat. No. 4,673,796. This application Apr. 21, 1987, Ser. No. 40,586
Int. Cl.[4] B23K *9/24, 35/36*
U.S. Cl. 219—137 R **6 Claims**

1. A method of arc welding, which comprises creating an arc between a base/metal and an electrode tip provided by a cluster electrode formed of a flux coated solid central low carbon steel rod electrode and surrounding flux coated lessen diameter solid low carbon steel rod electrodes to produce liquid weld metal, and cooling the liquid weld metal to produce a low carbon alloy steel body having substantially the following composition, the balance being iron:

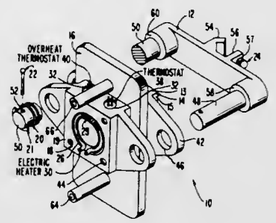
INGREDIENT	FROM ABOUT % WEIGHT TO ABOUT % WEIGHT
Carbon	0.01 to 0.15
Manganese	0.50 to 2.00
Silicon	0.05 to 1.00
Chromium	0.50 to 5.00
Molybdenum	0.25 to 2.50
Nickel	0.50 to 5.00
Tungsten	0.25 to 1.50
Vanadium	0 to 1.50
Columbium	0 to 1.00
Cobalt	0 to 2.00

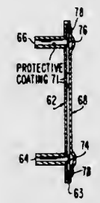
4,782,212

ELECTRIC BLOOD WARMER UTILIZING A METALLIC RIBBON-FLOW CARTRIDGE

Allan P. Bakke, 609 19th Ave. SW., Rochester, Minn. 55902

Filed Nov. 17, 1986, Ser. No. 931,558
Int. Cl.[4] H05B *1/02;* **F24H** *1/12;* **A61M** *5/14;* **B67D** *5/62*
U.S. Cl. 219—299 **2 Claims**





1. An apparatus for warming blood for transfusion, comprising:

a fluid-impervious rigid flat metal cartridge defining an enclosed cavity of small volume, having an inlet port and an outlet port at opposite ends thereof, the interior of said cartridge being compatible with the temporary storge of blood;

said cartridge including a pair of thin metal generally rectangular planar members spaced slightly apart and in parallelism with each other, said members being sealed together at their edges to define an unobstructed constant-width and uniform-thickness thin ribbon-like conduit for fluid between the interior surfaces of said members;

said cartridge further including an elongated recess defining an inlet chamber communicating with said inlet port, and an elongated recess defining an outlet chamber communicating with said outlet port, each chamber running completely across and communicating with a corresponding end of said conduit, whereby fluid can uniformly flow into and out of said thin ribbon-like conduit across the full conduit width;

two thick buffer blocks made of metal having good thermal conductivity, each having a flat clamping surface disposed to clamp against a corresponding flat outer surface of said cartridge, and each having on the side opposite of said flat clamping surface a heatable surface disposed to accommodate a heating means;

means for supporting said buffer blocks opposite one another with each said clamping surface facing toward and parallel to the other;

means releasably clamping said cartridge between and against said supported buffer blocks;

means for heating each buffer block heatable surface;

temperature sensing means located closely adjacent to said cartridge on each buffer block for sensing the temperature of each buffer block; and

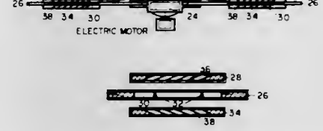
control means responsive to said temperature sensing means to control the amount of heat supplied by said heating means to each buffer block.

4,782,213

CEILING FAN ELECTRICALLY HEATING ENVIRONMENTAL AIR

Paul Teal, 237 Mariner Cir., Cotuit, Mass. 02635

Filed Aug. 19, 1987, Ser. No. 86,842
Int. Cl.[4] F04D *29/58;* **F24H** *3/04;* **H05B** *3/00*
U.S. Cl. 219—372 **12 Claims**



1. A heating fan for the circulation of heated air in an environment, which fan comprises:

(a) a fan housing;

(b) an electrical motor means in the housing, the motor means having a shaft, the motor means to provide for rotation of the shaft;

(c) a plurality of fan blades secured for rotation with the shaft, at least one of the fan blades characterized by an open interior space defining an air flow passage transversely through the thickness of the blade;

(d) an electrical heating element within said open interior space of at least one fan blade; and

(e) air deflecting means on at least one side of the open interior space of each of said at least one fan blade to direct air, on rotation of the said at least one fan blade, through said open interior space thereof over the electrical heating element and to direct heated air into the environment.

4,782,214

INDIRECT-HEATING TRUCK-TYPE BAKERY OVEN

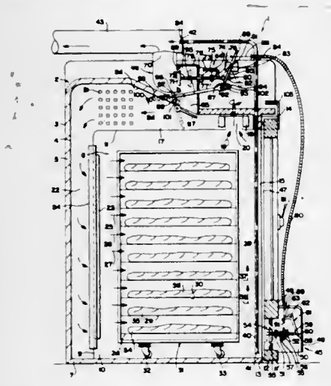
Rene Voegtlin, 2, rue de la Colline, Oberhausbergen, 67200 Strasbourg (Bas-Rhin), France

Filed Jan. 29, 1987, Ser. No. 8,173
Claims priority, application France, Feb. 5, 1986, 86 01667
Int. Cl.[4] H05B *3/62;* **A21B** *1/24*
U.S. Cl. 219—401 **25 Claims**

1. A truck-type bakery oven for baking, said oven comprising:

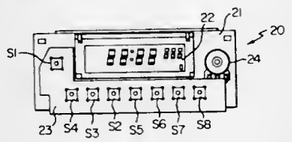
VOL 1096 ISS 1 NO 1 1988 UMI

(a) a baking chamber having an access opening on a first side of said chamber, said chamber further comprising a door for selectively closing said opening;
(b) means for recirculating air from said chamber, said recirculating means comprising a recirculation channel and a turbine-type fan;
(c) means for heating relatively cool air from said baking chamber, said heating means being located in said channel, said channel being located exteriorly of said baking chamber and within said oven;
(d) a second side of said chamber comprising a manifold



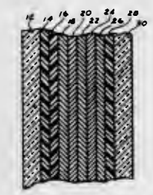
having a plurality of vertical louvres, said manifold comprising means for introducing streams of hot air into said baking chamber from said recirculation channel;
(e) a steam generator positioned in said manifold;
(f) means for rapidly exhausting steam from an upper portion of said chamber and for conducting said steam outwardly from said oven, at the end of a baking cycle, while said door is closed;
(g) means for drawing fresh air directly into a lower portion of said baking chamber from outside of said oven; and
(h) means for actuating said steam exhausting means and said fresh air drawing means in a coordinated manner.

4,782,215
CONTROL UNIT AND METHOD OF MAKING THE SAME
Brian J. Kadwell, Holland; Daniel L. Fowler, Kentwood, and Gregory F. Gawron, Holland, all of Mich., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Dec. 10, 1986, Ser. No. 939,872
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—494 **9 Claims**



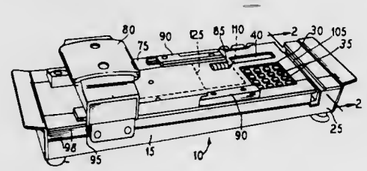
1. In a temperature regulating control unit comprising a RTD temperature sensor means, for applying electrical signal means to said sensor means, and a microcomputer for receiving digital signal means from said sensor means in relation to the temperature being sensed by said sensor means, the improvement wherein said means for applying electrical signal means to said sensor means has means for applying a varying to said sensor means and for comparing the resultant current level through said sensor means at certain values of said voltage applied thereto with a fixed reference current level that has been predetermined as being the current level that would exist through said sensor means when that particular certain voltage is being applied to said sensor means while said sensor means would be sensing a particular certain temperature within a predetermined temperature range, said means for applying electrical signal means to said sensor means having means to apply said varying voltage to said sensor means in one of an increasing manner and a decreasing manner from a starting voltage until a particular certain voltage is applied to said sensor means that creates a current level through said sensor means that substantially equals said fixed reference current level whereby said microcomputer will receive said digital signal means in a manner to determine the actual temperature being sensed by said sensor means at that time and when said actual temperature is within said temperature range.

4,782,216
ELECTRICALLY HEATABLE LAMINATED WINDOW
Floyd E. Woodard, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Aug. 11, 1987, Ser. No. 84,274
Int. Cl.[4] H05B *3/10*
U.S. Cl. 219—547 **11 Claims**



1. A transparent, laminated window having improved defrosting capability comprising, in combination:
(A) an optical element having a sheet resistivity of less than about 3 ohms per square containing:
(i) at least two electrically conductive metal layers;
(ii) at least one dielectric spacing layer between said conductive layers; and
(iii) a transparent substrate; and
(B) a bus bar electrically conductively associated with each conductive layer.

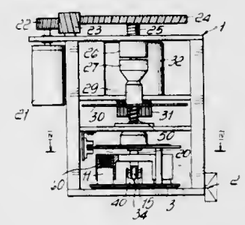
4,782,217
FINANCIAL TRANSACTION TERMINAL AND CARD READER SYSTEM ADAPTABLE THERETO
Harry R. Soza; Dennis E. Wilkison; Craig C. Williams, all of San Jose, and Thomas J. Clark, Santa Clara, all of Calif., assignors to Norand Corporation, Cedar Rapids, Iowa
Filed Jul. 31, 1986, Ser. No. 892,751
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **4 Claims**



1. A terminal for facilitating credit card and/or debit card transactions, comprising

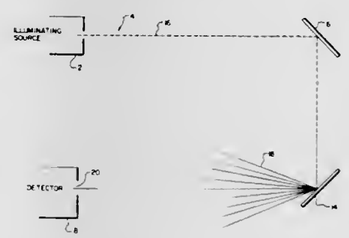
a terminal housing of an elongated configuration with extended guide means at frontal and rear sides thereof,
imprinter carriage means having rollers engaging with the guide means at an imprinter end of the housing and shiftable along the guide means to effect an imprinting operation,
card reader means at a card reader end of the housing, said housing having card access means for admitting a card to the card reader means for reading of data therefrom,
keyboard and display means carried by the housing, and
power supply means comprising a plug-in power supply unit having plug means for plug-in coupling with an alternating current outlet and having low potential power transmission cable means supplying output power from the power supply unit, including a length of power cable for extending into the housing at the card reader end thereof,
said housing providing impact absorbing means at the card reader end thereof outwardly of the card reader means, the card reader end of the housing having a power cable aperture through which said length of power cable extends, and having power cable restraining means engaging said length of power cable such that the housing can be supported against falling by a holding force applied to the cable means exteriorly of the housing.

4,782,218
READOUT AND OBLITERATION HEAD PARTICULARLY FOR MAGNETIC CARDS
Cesare Bona, and Achille Castelli, both of Arona, Italy, assignors to Ages Italia SpA, Borgo Ticino, Italy
Filed Jul. 7, 1986, Ser. No. 882,329
Claims priority, application Italy, Jul. 11, 1985, 21527 A/85
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—449 **5 Claims**



1. A readout and obliteration head, particularly for magnetic cards, comprising a load bearing frame, an entry in said load bearing frame for allowing insertion of a magnetic card, a channel in said load bearing frame in communication with said entry for receiving a portion of the magnetic card, a substantially vertical shaft carried on and axially and rotatably movable in said load bearing frame, a movable readout and obliteration assembly supported by said shaft in said load bearing frame, first motor means carried on said load bearing frame, said first motor means being connected to said shaft for moving said shaft and said readout and obliteration assembly toward and away from said channel, second motor means carried on said load bearing frame, said second motor means being connected to said shaft for rotating said shaft and said readout and obliteration assembly with respect to said channel, and a centering and locking pin movably carried on said load bearing frame and connected to said first motor means to be brought in and away from said channel for centering and locking said magnetic card in said channel, wherein said readout and obliteration assembly comprises an obliteration lever having a first and a second opposite ends and a middle portion, said lever being journalled at said middle portion to said shaft and having at said first end a rest foot and at said second end a dry obliteration tip, said lever being pushed against the magnetic card, resting downwardly with said rest foot and impressing a dry mark on the magnetic card on translation downwardly of said shaft.

4,782,219
SYSTEM AND METHOD FOR READING SPECULAR BARCODES
David J. Crater, Topanga, Calif., assignor to Laser Identification Systems, Inc., Camarillo, Calif.
Filed Jul. 2, 1986, Ser. No. 881,085
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—462 **11 Claims**



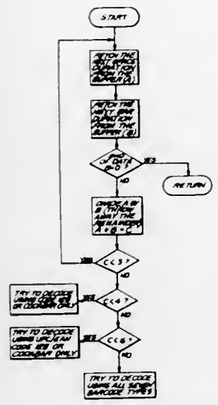
1. A system for reading the information encoded on specular barcode material, comprising:
an illuminating source adapted to emit a light beam with a predetermined cross-sectional area towards the barcode material,
a detector positioned to receive a light beam reflected by the specular barcode material, said detector including an entrance aperture which has a substantially greater cross-sectional area than said predetermined light beam cross-sectional area, and
a light diffusing means spaced from the detector and positioned in the beam path between the illuminating source and the detector, said diffusing means dispersing the light beam sufficiently for a readable portion of the beam to enter the detector aperture despite tolerances in the beam path.

4,782,220
METHOD AND APPARATUS FOR BAR CODE DATA AUTODISCRIMINATION
Thomas E. Shuren, Stanhope, N.J., assignor to Mars, Incorporated, McLean, Va.
Filed Sep. 29, 1986, Ser. No. 913,098
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—463 **13 Claims**

1. An improved method of autodiscrimination of barcode data comprising the steps of:
(a) storing in memory of barcode data comprising space and bar duration data;
(b) fetching from memory duration data for a first space from the stored space data;
(c) fetching from memory duration data for a first bar which follows the first space from the stored bar data;
(d) computing a first ratio of the duration data for the first space and the first bar;

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(e) comparing the first ratio with a first predetermined number; and



(f) determining whether or not the first space is a bar code margin based on the comparison.

4,782,221

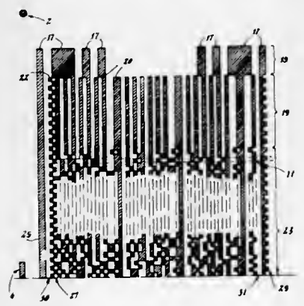
PRINTED DATA STRIP INCLUDING BIT-ENCODED INFORMATION AND SCANNER CONTROL

Robert L. Brass, Westport; John Glaberson, Stratford; Richard W. Mason, Cos Cob; Scott Santulli, Danbury, and G. Thomas Roth, Fairfield, all of Conn., assignors to Cauzin Systems, Incorporated, Waterbury, Conn.

Continuation-in-part of Ser. No. 718,173, Apr. 1, 1985, abandoned. This application Sep. 23, 1985, Ser. No. 779,062

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—494 **19 Claims**



1. A data strip containing a plurality of encoded data bits for scanning by an optical scanner, said strip including

a paper-like substrate,

a plurality of aligned, contiguous, parallel data lines, each said line being formed of contiguous bit areas, information being encloded in said bit areas by the presence or absence of printing thereon, and said bit areas being of uniform and predetermined height and width, the height thereof defining the width of said data line, said data lines running transversely of the longitudinal direction of said data strip, and

said plurality of data lines together defining an encoded data portion of said data strip, said data lines being an integrated whole, with said data lines being so interrelated that the totality of information carried within said data portion in said data strip is sequential from each said data line.

4,782,222

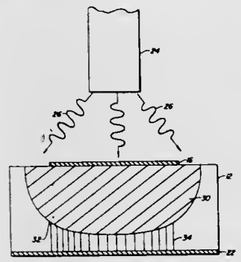
BULK AVALANCHE SEMICONDUCTOR SWITCH USING PARTIAL LIGHT PENETRATION AND INDUCING FIELD COMPRESSION

Larry O. Ragle, Palo Alto, and Stephen J. Davis, San Francisco, both of Calif., assignors to Power Spectra

Filed Sep. 3, 1987, Ser. No. 92,487

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—211 J **38 Claims**



1. A method for switching current comprising the steps of:

providing a semiconductor block having conducting contacts coupled to said block a predetermined distance apart;

applying a high voltage across said contacts; and

irradiating said block with electromagnetic radiation from a source of radiation having a predetermined wavelength such that a majority of said radiation penetrates the portion of said block between said contacts less than said distance to generate charge carriers and to cause sufficient field compression of said voltage to give avalanche conduction over a portion of said block.

4,782,223

OPTICALLY BISTABLE PHOTODIODE DEVICE WITH VOLTAGE CONTROL CIRCUITRY TO CHANGE PHOTODIODE LIGHT ABSORPTION

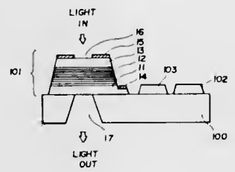
Akira Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 98,811

Claims priority, application Japan, Sep. 19, 1986, 61-221528

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—214 R **5 Claims**



1. An optically bistable photodiode device comprising,

a photodiode in which the absorption of light is changed in accordance with a voltage to be applied thereacross,

a circuit for detecting and amplifying photocurrent flowing through said photodiode, and

a circuit for controlling said voltage to be applied across said photodiode in accordance with output of said circuit for detecting and amplifying.

4,782,224

ELECTROOPTICAL PRESENCE RECOGNITION-SENSOR

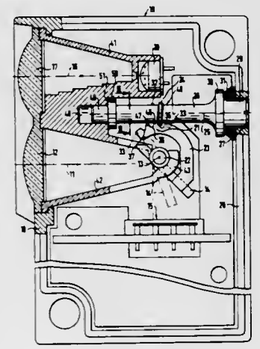
Klaus D. Haas, and Thomas Meinert, both of Emmendingen, Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,822

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1985, 3513671

Int. Cl.[4] G01V *9/04*

U.S. Cl. 250—221 **32 Claims**



32. Electrooptical presence recognition sensor for detecting the presence of an article within a predeterminable sensing range having a near end adjacent said sensor and a far end remote from said sensor, said sensor comprising a housing having an optical axis; a light transmitter disposed in said housing in a fixed position for generating a beam of light; transmitting lens means disposed at said housing for directing said beam of light as a bundled transmitted beam out of said housing along said optical axis and over said sensing range to said far end thereof; receiving lens means disposed at said housing spaced apart from said transmitting lens means for receiving a narrow beam of light inclined at an angle to said optical axis and being a narrow portion of a cone of scattered light generated by incidence of said transmitted beam on an article present in said sensing range, said angle having a minimum value at said far end of said sensing range; a photoreceiver arrangement disposed in said housing for detecting light from said received beam directed into said housing by said receiving lens means; an electronic circuit for processing signals generated by said photoreceiver arrangement in response to light received thereby; means for fixing said photoreceiving arrangement in said housing in a fixed position irrespective of the selected sensing range; a deflecting mirror disposed in said housing in one of two locations, namely a first location between said light transmitter and said transmitting lens means and a second location between said receiving lens means and said photoreceiver arrangement; means defining a pivot axis for said deflecting mirror and operator controlled means for rotating said deflecting mirror about said pivot axis on installation of said sensor to predetermine said minimum value of said angle at which articles are detected and thus the position of said far end of said adjustable sensing range, said operator controlled means comprising a worm gear drive, a toothed segment coaxial to the axis of rotation of said deflecting mirror upon which said mirror is mounted, a worm shaft rotatably journalled in the housing, the worm being arranged on said worm shaft, and an actuating knob on said worm shaft which can be rotated through an opening in a rear wall of the housing, said worm having between one and two turns and preferably rather more than 20% of one turn, and there are end surfaces projecting radially from the worm shaft which cooperate with counter-surfaces provided at the toothed region of the toothed segment to limit the angle of pivoting of the toothed segment, said turns of the worm having a sloped surface in two end regions radial to the end in such a way that on abutment of the associated end surface with the counter-surface, and on the application of a larger torque to the worm shaft which would give rise to danger of damage, the worm can snap in the region of the relevant end surface over the outer edge of the counter-surface, whereupon the worm will rotate without rotating the toothed segment until it falls into the first adjacent tooth gap.

4,782,225

SHEET-PROCESSING APPARATUS INCLUDING OPTICAL SENSOR CLEANING DEVICE

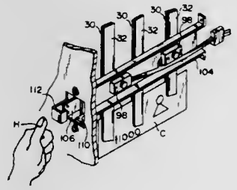
Minoru Hirose, Chigasaki; Hideo Okuyama, Yokohama; Junichiro Hara, Tokyo, and Hajime Watanabe, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1987, Ser. No. 29,771

Claims priority, application Japan, Mar. 25, 1986, 61-66298; Mar. 25, 1986, 61-66299

Int. Cl.[4] G01N *9/04*

U.S. Cl. 250—223 R **5 Claims**



5. A sheet processing apparatus including an optical sensor cleaning device, said apparatus comprising:

conveying means for conveying a plurality of supplied sheets one by one along a path, and

at least one optical detecting group having at least two optical detecting means arranged in a direction transverse with respect to said sheet conveying path of said conveying means, said optical detecting means optically detecting sheets conveyed in said conveying means, said sheet processing apparatus performing a predetermined processing of said sheets while said sheets are being conveyed by said conveying means, and

cleaning means for cleaning said optical detecting means having at least one lever extending from within said sheet processing apparatus and corresponding to one of said optical detecting groups, and

wiping means provided on said lever for wiping each of said optical detecting means which are contained in said optical detecting group corresponding to said lever, wherein

said lever is mounted for reciprocal movement between an overlap position, in which said wiping means overlap each of said optical detecting means in the corresponding group, and a non-overlap position, in which said wiping means are separated from said optical detecting means in the corresponding group, said reciprocal movement cleaning said corresponding optical detecting means by contact with said wiping means, and wherein

said lever does not interfere with an optical path of light directed towards said optical detecting means in a corresponding detecting group when said lever is in the non overlap position; and

inspecting means for inspecting said optical detecting means, said inspecting means utilizing shielding and non-shielding

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of an optical path of light emitted towards said optical detecting means which occurs when said wiping means cleans said optical detecting means; and

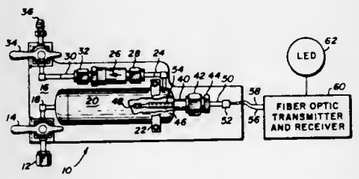
trouble display means for displaying, along with the results of inspection performed by said inspecting means, the location of a trouble occurring in one of said optical detecting means.

4,782,226

OPTOELECTRONIC CHEMICAL REACTION DETECTOR

Martin F. Jeffries, Jr., San Jose, and Edward Kulha, Santa Clara, both of Calif., assignors to Semi-Gas Systems, Inc., San Jose, Calif.

Filed Jul. 6, 1987, Ser. No. 69,763
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 **15 Claims**



13. A method for detecting a chemical reaction comprising the steps of:

filling a pressurized chamber with chemical reactants;

hermetically sealing a transparent member over an aperture in said chamber;

positioning a first end of a transmitting fiber optic cable adjacent said transparent member and connecting a second end to a fiber optic transmitter and receiver;

positioning a first end of a receiving fiber optic cable adjacent said transparent member and connecting a second end to said fiber optic transmitter and receiver;

operating said fiber optic transmitter and receiver to send a beam of light along said transmitting fiber optic cable and through said transparent member and hitting said chemical reactants to produce reflected light;

receiving said reflected light in said receiving fiber optic cable and delivering said reflected light to said fiber optic transmitter and receiver; and

operating said fiber optic transmitter and receiver to compare the intensity of the beam of light as originally transmitted with intensity of the reflected light in order to determine if said chemical reactants have fully reacted.

4,782,227

IMAGE SENSOR WITH MEMORY

Francois Micheron, Gif sur Yvette; Dominique Broussoux, Marcoussis, and Jacques Trotel, Palaiseau, all of France, assignors to Thomson-CSF, Paris, France

Filed Feb. 24, 1987, Ser. No. 17,584
Claims priority, application France, Feb. 25, 1986, 86 02582
Int. Cl.[4] G03G 5/16
U.S. Cl. 250—327.2 **13 Claims**

1. Image sensor with nondestructible memory comprising:

a first electrode made of a conductive material;

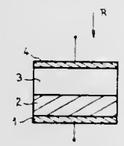
a first layer of a photoconductive material in contact with the first electrode;

a second transparent layer of a material with an impedance which is variable with the temperature, the said second layer being juxtaposed with the first layer of photoconductive material;

a second transparent electrode made of a conductive material in contact with the said second layer;

a recording voltage generator which can be connected with the said first and second electrodes;

a charge amplifier, two inputs of which can be connected to the said first and second electrodes, and one output of which is connected to a charge sensor; with a first changeover switch making it possible to connect the recording voltage generator or the charge amplifier, as desired, to the said first and second electrodes; and



a reading means including a heating means for heating the second layer at least at the location between the two said electrodes to read out recorded image information nondestructively;

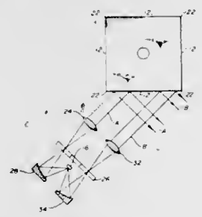
said image information recorded in the form of a charge distribution, which depends on illumination, at the interface of said first and second layers.

4,782,228

HIGH EFFICIENCY OPTICAL SCANNER WITH MULTIPLEXING MEANS

William E. Westell, Weston, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 16, 1987, Ser. No. 3,997
Int. Cl.[4] H01J 3/14; G02B 26/08
U.S. Cl. 250—236 **16 Claims**



1. An optical system for scanning a collimated beam of radiation comprising in combination:

moving means;

transducer means;

an optical deflection means having a plurality of scanning surfaces, each said surface delineated by boundaries separating said surface from adjacent surfaces, and optical scanning means coupled for movement in said beam by said moving means to form first and second optical paths for radiation between said surfaces and said transducer means;

means in said first optical path for directing radiation in said first beam to a first focus position and from the first focus position directing radiation to said transducer means;

means in said second optical path for directing radiation in said second beam to the first focus position and from the first focus position directing radiation to said transducer means; and

an optical multiplexer mounted at the first focus position, said multiplexer operating synchronously with the motion of said deflection means to alternatively block radiation in said first path and allow transmission along said second

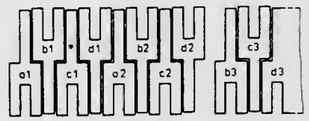
path so as to maximize the duty cycle of the optical system.

4,782,229

PHOTOELECTRIC DISPLACEMENT MEASURING DEVICE FOR OBTAINING HARMONIC FREE SIGNALS

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,764
Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616144
Int. Cl.[4] H01J 3/14, 5/16
U.S. Cl. 250—237 G **8 Claims**



1. In a photoelectric measuring device for obtaining harmonic free signals up to a predetermined bandwidth said system comprising a measuring scale and a scanning unit wherein the period P of said measuring scale and the period P' of said scanning unit sufficiently differ in a scanning direction such that upon scanning a Moire oscillation pattern having a period M is produced, said Moire period M being greater than the graduation periods P and P' of said measuring scale and said scanning unit respectively, said Moire oscillation being detected and converted into a periodic electric output signal (S1, S2) by a detector system comprising a plurality of photoelements, each photoelement generating an electric output signal, said photoelements being arranged to receive and convert said Moire oscillation into said periodic electric output signal, the improvement which comprises, said device comprises a plurality of detector systems (D1 . . . Dn), wherein each detector system comprises a plurality of photoelements (a1, b1, c1, d1, . . . an, bn, cn, dn) having a size, shape and position according to a Fourier analysis such that harmonics are optically eliminated from said periodic output signal of said detector system upon summing the output signal from said photoelements comprising said detector system.

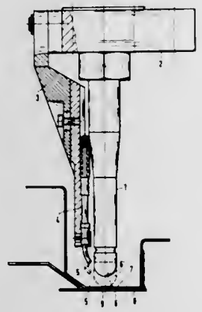
4,782,230

ARRANGEMENT FOR THE QUALITY TESTING OF A RESISTANCE WELDED CONNECTION

Wilfried Heinzel, Unterfoehring, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Munich, Fed. Rep. of Germany

Filed Jun. 27, 1986, Ser. No. 879,631
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523112
Int. Cl.[4] G01J 1/00; G21C 11/00
U.S. Cl. 250—338.1 **5 Claims**

1. An arrangement for quality testing a resistance welded connection, comprising a radiation detector means having an inlet opening directed onto a welding place for receiving emitted radiation from said welding place, and protection means for arranging and directing said inlet opening with respect to said welding place to be covered by said welding electrode means during a welding operation and to be exposed and in optical connection with the welding place upon removal of the



wlding electrode means from the welding place after termination of the welding operation.

4,782,231

STANDARD COMPONENT ^{99m}TC ELUTION GENERATOR AND METHOD

Kristian Svoboda; Frantisek Melichar, both of Prague; Zdenek Sebek, Klecany, and Milan Tympl, Prague, all of Czechoslovakia, assignors to Ustav jaderneho vyzkumu, Rez u Prahy, Czechoslovakia

Filed May 20, 1985, Ser. No. 735,878
Claims priority, application Czechoslovakia, May 18, 1984, 3764-84
Int. Cl.[4] G21G 1/02
U.S. Cl. 250—432 PD **6 Claims**



1. A method of preparation of ^{99m}Tc elution comprising the steps of,

filling a main column composed of a material selected from the group consisting of aluminum, zirconium, quartz, carbon and oxides thereof with a target material comprising at least 10% by weight of molybdenum;

plugging the ends of the main column with a porous material;

closing the ends of the main column;

wrapping the ends of the main column to protect against secondary bacterial contamination;

activating the target material to form a ^{99}Mo containing sorption matrix accompanied simultaneously by radiation sterilization of the main generator column and its contents by exposure to neutron and accompanied gamma radiation in a reactor;

opening the ends of the main generator column in sterile environment under aseptic conditions of manipulation;

connecting a supply tube to one end of the main column and a discharge tube to the other end in a sterile manner;

placing the main column, supply tube, and discharge tube in

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a transport container composed of a material selected from the group consisting of lead or depleted uranium;

placing the transport container in a laboratory container, the laboratory container also housing an elution vessel, a protective column, and at least one eluate collection bottle;

connecting the supply tube to an elution vessel in a sterile manner, the elution vessel containing an elution solution;

connecting the discharge tube to one end of a protective column in a sterile manner, the other end having a piercing head;

piercing the seal of an evacuated eluate collection bottle with the piercing head;

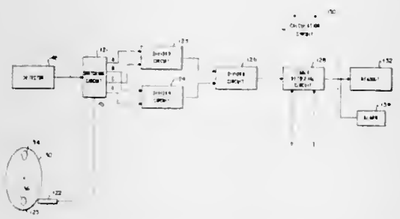
drawing the eluation solution through the supply tube, main column containing the sorption matrix, discharge tube, and protective column, and into the eluate collection bottle, the eluate containing ^{99m}Tc.

4,782,232

INFRARED MOLECULAR SPECIES MONITOR

Lawrence S. Bernstein, Bedford; Michael W. Matthew, Burlington, and Fritz Bien, Concord, all of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed Sep. 22, 1986, Ser. No. 909,918
Int. Cl.[4] G01N *21/61*
U.S. Cl. 250—343 **11 Claims**



1. An infrared monitor for measuring the presence of at least one gas phase molecular species comprising:

a sample path for containing a sample to be monitored for the molecular species;

means for providing to said sample path a sample beam of an infrared source of emission spectrum of the molecular species to be monitored including at least one primary emission line which is significantly absorbed by the molecular species and at least one secondary emission line which is not significantly absorbed by the molecular species for passage through said sample path;

means for selectively sensing the output intensities of said primary and secondary emission lines of said sample beam of radiation from said sample path and the intensities of said primary and secondary emission lines in a reference beam of said radiation;

means, responsive to said means for selectively sensing, for normalizing the sensed output intensity of the sample beam of radiation in one of said primary and secondary emission lines with respect to the other;

means, responsive to said means for selectively sensing, for normalizing the sensed output intensity of the reference beam of radiation in one of said primary and secondary emission lines with respect to one another; and

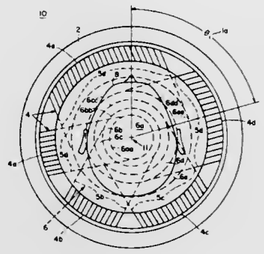
means for comparing the normalized sample beam intensity and the normalized reference beam intensity.

4,782,233

MULTIFIELD COLLIMATOR SYSTEM AND METHOD AND RADIONUCLIDE EMISSION TOMOGRAPHY CAMERA USING SAME

Sebastian Genna, Belmont, and Andrew P. Smith, Medford, both of Mass., assignors to Digital Scintigraphics, Inc., Cambridge, Mass.

Filed Jun. 20, 1986, Ser. No. 876,811
Int. Cl.[4] G01T *1/20*
U.S. Cl. 250—363 S **30 Claims**



1. A radionuclide emission tomography camera for imaging a region of an object, comprising:

at least two collimator segments whose fields of view overlap at least in part and in combination define at least two tomographic field of view boundaries, at least one of said boundaries encompassing the region to be imaged, and at least one of the other of said boundaries disposed within said encompassing boundary and interior to the outer portion of the region;

means responsive to said collimator segments for detecting radionuclide emissions from the region to collect at least one collimated image through each segment; and

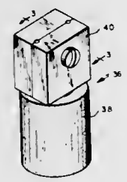
means for combining said collimated images to produce a final image of the region exhibiting enhanced sensitivity in the portion of overlap.

4,782,234

METHOD AND APPARATUS FOR SUBSURFACE CONTAMINANT DETECTION AND MEASUREMENT

Wayne A. Chudyk, and Jonathan E. Kenny, both of Somerville, Mass., assignors to Tufts University, Medford, Mass.

Filed May 23, 1985, Ser. No. 737,191
Int. Cl.[4] G01J *1/58*
U.S. Cl. 250—372 **11 Claims**



1. A test head for detecting contaminants by means of optical radiation emitted from a sample, comprising:

A. a channeled body for receiving and orienting in first and second channels thereof, respectively, a first fiber for reradiating a sample with fluorescence-inducing radiation transmitted through said fiber, and a second fiber for receiving fluorescent radiation emitted from said sample in response to irradiation, said channels positioning corresponding ends of said fibers in predetermined angular orientation with respect to each other, said body comprising first and second shoulders mateable with each other to enclose said fibers therein, at least one of said shoulders having the first and second channels formed therein and said channels being oriented at an acute angle to each other to provide a substantial overlap of radiation patterns associated with each of said first and second fibers;

B. means forming a filter enclosing at least said fiber ends and defining with said body an enclosed chamber exposed to said fiber ends for receiving by infiltration through said filter a liquid sample for irradiation by a first of said fibers and re-radiation to a second of said fibers; and

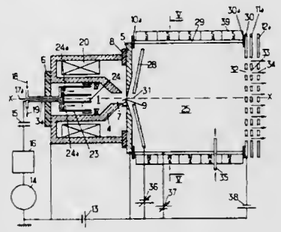
C. means for demountably coupling said test head to a radiation source and to a radiation measuring station.

4,782,235

SOURCE OF IONS WITH AT LEAST TWO IONIZATION CHAMBERS, IN PARTICULAR FOR FORMING CHEMICALLY REACTIVE ION BEAMS

Claude Lejeune, Gif/Yvette, and Jean P. Gilles, Pal ai Seau, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Continuation of Ser. No. 637,737, Aug. 6, 1984, abandoned. This application Oct. 1, 1986, Ser. No. 914,547
Claims priority, application France, Aug. 12, 1983, 83 13298
Int. Cl.[4] H01J *27/02*
U.S. Cl. 250—423 R **15 Claims**



1. An ion source having at least two ionization chambers and at least three electrodes, comprising successively along a longitudinal direction a cathode, an intermediate electrode with a first aperature at its center and an anode with a second aperature at its center, the first ionization chamber being disposed between said cathode and said intermediate electrode and the second ionization chamber being disposed between said intermediate electrode and said anode, comprising:

means for introducing an ionizable medium in said first ionization chamber in the vicinity of said cathode;

means for permanently applying, in operation, an A.C. voltage, at a frequency between about 20 and about 50 kHz, between said cathode and said intermediate electrode, thereby producing, in said first ionization chamber, a first plasma which remains ignited in a steady state;

means for applying, between said intermediate electrode and said anode, a D.C. voltage of a polarity such that said anode is maintained positive relative to said intermediate electrode, thereby extracting essentially electrons from said first ionization chamber into said second ionization chamber through said first aperature in said intermediate electrode, said electrons producing a second plasma in said second ionization chamber;

means for producing a longitudinal magnetic field between said intermediate electrode and said anode, thereby constricting said second plasma in said second ionization chamber; and

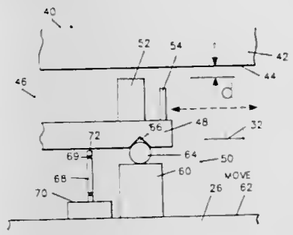
means for extracting ions from said second ionization chamber through said second aperature in said anode.

4,782,236

MEANS FOR LOCKING A WORKPIECE TO A BEAM-GENERATING APPARATUS

Anwar Chitayat, P.O. Box 107, Northport, N.Y. 11768

Filed Feb. 17, 1987, Ser. No. 15,375
Int. Cl.[4] G01F *21/00*; G21K *5/10*
U.S. Cl. 250—440.1 **10 Claims**



1. Apparatus for supporting a workpiece with respect to a processing apparatus, comprising:

a workpiece;

at least one dynamic support assembly effective for supporting said workpiece relative to a surface of said processing apparatus:

at least one psst on said workpiece extending toward said surface

said at least one post disposed on a surface of said workpiece opposite to a surface of said workpiece facing said at least one dynamic support assembly;

said at least one post being generally aligned with said at least one dynamic support assembly;

controllable means in said dynamic support assembly for urging said workpiece toward said surface for contacting said surface with said at least one post;

said controllable means including at least one transversely resilient member;

said controllable means further including means for removing all support from said workpiece except said at least one transversely resilient member and said at least one post;

said at least one post having rigidity effective for discouraging transverse resilience thereof;

said at least one transversely resilient member including means for permitting transverse motion thereof at an end thereof abutting said workpiece in response to transverse motion of said workpiece, whereby motion of said processing apparatus is transmitted through said at least one post to said workpiece for providing locked motion between said workpiece and said surface, and motion of said workpiece with respect to said controllable means is permitted by said at least one transversey resilient member.

4,782,237

RADIATION IMAGE STORAGE PANEL

Masanori Teraoka, and Takayuki Kuriyama, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

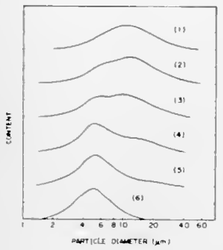
Continuation of Ser. No. 575,264, Jan. 30, 1984, abandoned. This application Mar. 12, 1987, Ser. No. 24,924
Claims priority, application Japan, Jan. 31, 1983, 58-14188
Int. Cl.[4] G01J *1/58*
U.S. Cl. 250—486.1 **3 Claims**

1. In a radiation image storage panel comprising a support and a phosphor layer provided thereon which comprises a binder and a stimulable phosphor disbursed therein for the use in a radiation image recording and reproducing method involving steps of causing the stimulable phosphor of the panel to absorb radiation energy having passed through an object or having radiated from an object; exciting the stimulable phosphor with an electromagnetic wave to sequentially release the

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radiation energy stored in the stimulable phosphor as light emission, photoelectrically converting the emitted light to give electric signals; and reproducing the electric signals as visible image;

the improvement comprising said stimulable phosphor having a particle size distribution showing at least two peaks in which a space between two peaks at both ends in said particle size distribution is not less than 2 μm, said stimulable phosphor having been prepared by mixing a stimulable phosphor having a small mean size in the range of 1–8 μm and a stimulable phosphor having a large mean size in the range of 4–30 μm, both stimulable phosphors having the same nature, having a mixing ratio by weight of the stimulable phosphor having a small mean size to the stimulable phosphor having a large mean size being in the range of from 20/80 to 90/10.

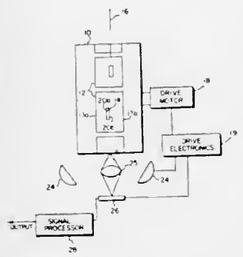


4,782,238

APPARATUS FOR GENERATING EDGE POSITION SIGNALS FOR USE IN LOCATING AN ADDRESS ELEMENT ON A MAILPIECE

Bruce M. Radl, Stow; John J. Lumia, North Reading, and Bennett I. Gold, Worcester, all of Mass., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 20, 1987, Ser. No. 111,004
Int. Cl.⁴ G01N *21/86*
U.S. Cl. 250—561 **9 Claims**



1. Apparatus for generating signals which are representataive of edges of an address element which is located adjacent to a substantially horizontal surface of a mailpiece, the address element including a first substantially horizontal surface as well as first and second substantially vertical side surfaces which are located between the first horizontal surface and the second horizontal surface so as to form the edges, the apparatus comprising:

a. illumination means including

(1) first light means for generating a first illuminative output directed toward the address element in a first direction and at an acute angle to the horizontal surfaces of the address element and the mailpiece, and

(2) second light means for generating a second illuminative output directed toward the address element in a second direction and at an acute angle to the horizontal surfaces of the address element and the mailpiece, the first light means and the second light means being positioned so that the address element is located therebetween;

b. detection means including

(1) first means for (i) detecting light reflected from the address element generated by the first light means in a manner that light reflected from the horizontal surfaces generates a first signal having a first level, light reflected from the first side generates a second signal having a second level which is greater than the first level, and light reflected from the second side generates a third signal having a third level which is less than the first level, and (ii) for generating a first output of the first, second and third signals, and

(2) means for (i) detecting light reflected from the address element generated by the second light means in a manner that light reflected from the horizontal surfaces generates a fourth signal having a fourth level, light reflected from the second side generates a fifth signal having a fifth level which is greater than the fourth level, and light reflected from the first side generates a sixth signal having a sixth level which is less than the fourth level, and (ii) for generating a second output of the fourth, fifth and sixth signals; and

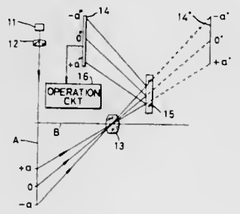
c. signal difference means including means for generating a difference between the levels of the second output and the first output in a manner that (i) a difference between the first signal and the fourth signal generates a first difference signal which has a level which is lower than that of the first signal and the fourth signal, (ii) a difference between the third signal and the fifth signal generates a second difference signal which has a level that is greater than the first difference signal and which is representative of the location of the second edge, and (iii) a difference between the second signal and the sixth signal generates a third difference signal which has a level that is greater than the first difference signal and which is representative of the location of the first edge.

4,782,239

OPTICAL POSITION MEASURING APPARATUS

Hideo Hirose, Kawaguchi, and Tomohide Hamada, Kawasaki, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Apr. 1, 1986, Ser. No. 846,950
Claims priority, application Japan, Apr. 5, 1985, 60-72311; Apr. 5, 1985, 60-72312
Int. Cl.⁴ G01H *21/86*
U.S. Cl. 250—561 **8 Claims**



1. Apparatus for measuring the distance to an object comprising:

projection means for projecting a radiation beam onto the object, said projection means including a radiation generating means and a first optical system for projecting the radiation beam on the surface of said object in accordance with said radiation, said first optical system having a lens component; and

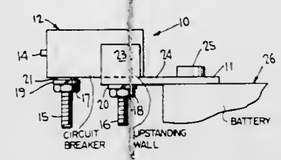
detection means for detecting the radiation beam reflected from the object, said detection means including radiation detecting means having a radiation-receiving surface for detecting the intensity distribution of the radiation on said radiation-receiving surface, and a second optical system cooperating with said lens component for guiding at least a portion of the reflected radiation beam from the object to said radiation-receiving surface, said lens component and said second optical system being so disposed as to bring said radiation-receiving surface into an optically conjugated relation with a line segment of the optical axis of the first optical system along which the object is located, said radiation-receiving surface being disposed so that a projection image of said radiation-receiving surface formed by said lens component intersects the optical axis of said lens component substantially at right angles and so that the position of said radiation beam on said radiation-receiving surface changes linearly in accordance with an amount of displacement of the object along said line segment of the optical axis of said first optical system.

4,782,240

SAFETY BATTERY CONNECTOR

Samuel L. Davidson, 3701 College Ave., Monroe, La. 71203

Filed Jun. 26, 1986, Ser. No. 879,174
Int. Cl.⁴ H01C *8/00*; HO2G *3/00*
U.S. Cl. 307—10 BP **10 Claims**



1. A safety battery connector for preventing overloading of a battery, comprising:

a rigid, electrically conducting support plate;

a means for connecting said support plate in electrical conducting relationship around a terminal of a battery;

a circuit breaker means;

a connector means for connecting said support plate to the circuit breaker means;

said circuit breaker means being manually resettable;

said circuit breaker means having an output member for providing electrical output connection for an electrically operated device;

said support plate providing electrical connection between said terminal and said circuit breaker means and preventing movement of said circuit breaker means relative to the battery, such that short circuiting and overloading is prevented;

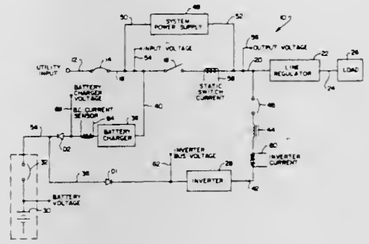
wherein said support plate comprises a metal body having an aperture for receiving a battery terminal, and having a pair of upstanding side walls to receive said circuit breaker means.

4,782,241

UNINTERRUPTIBLE POWER SUPPLY APPARATUS AND POWER PATH TRANSFER METHOD

Robert W. Baker, Westerville; James K. Martin, Columbus, both of Ohio, and Leonard E. Orsak, Los Altos, Calif., assignors to Liebert Corporation, Columbus, Ohio

Filed Aug. 11, 1987, Ser. No. 84,305
Int. Cl.⁴ H02J *9/06*
U.S. Cl. 307—66 **39 Claims**



1. Apparatus for use with a waveform synthesizing line regulator having an input and an output connectable with a load, said apparatus being connectable with a line power source of given frequency, variable voltage of given peak value and waveshape and comprising:

static switch means connectable intermediate said source and said line regulator input and actuable between conducting and non-conducting states for selectively conveying power from said source to said regulator input;

means deriving a stand-by source of d.c. power;

an inverter including d.c. energy storing bus means for connection in energy exchange relationship with said stand-by source, solid-state switch means coupled with said bus means and responsive to switch control signals to provide an inverter active state for deriving an unregulated power input to said line regulator input at said given frequency, and said inverter having a non-switching stand-by state in the absence of said switch control signals; and

control means for monitoring the condition of said line power source and responsive to predetermined defects therein including defects discernable from phase information to actuate said static switch from said conducting to said non-conducting state and to apply said switch control signals to said solid-state switching means so as to provide said active state control of said inverter and effect a transfer of power flow from said static switch means to said inverter.

4,782,242

CIRCUIT ARRANGEMENT FOR GENERATING HIGH VOLTAGE PULSES

Adam Kovacs, Buza u 2, H-2097 Pilisborosjeno, Hungary

PCT No. PCT/HU85/00053, § 371 Date Jan. 29, 1987, § 102(e) Date Jan. 29, 1987, PCT Pub. No. WO86/06226, PCT Pub. Date Oct. 23, 1986
PCT Filed Sep. 6, 1985, Ser. No. 2,619
Claims priority, application Hungary, Apr. 11, 1985, 1335/85
Int. Cl.⁴ F23Q *3/00*
U.S. Cl. 307—106 **6 Claims**

1. Circuit arrangement for generating high voltage pulses from DC voltage comprising:

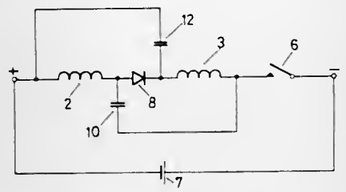
a transformer including a secondary winding and at least a first primary winding and a second primary winding;

a rectifying means connected between said first primary winding and said second primary winding;

a first capacitor connected in parallel with said first primary

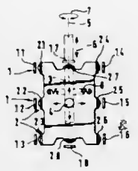
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winding and said rectifying means and in series with said second primary winding;
switching means, comprising the emitter-collector section of a switching transistor connected in series with a current sensing means, connected in series with said rectifying means and said first and second primary windings to form a first series circuit;
means for connecting said first series circuit to a voltage source;
a control means;
an amplifying means;
first connecting means for connecting an output of said control means to an input of said amplifying means;
second connecting means for connecting an output of said amplifying means to the base of said switching transistor;
said first connecting means further comprising



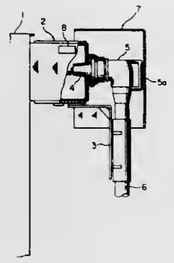
first and second resistors connected in series,
the common terminal of said first and second resistors being connected through the emitter-collector section of a first transistor to a first terminal of said voltage source connecting means, and
a voltage divider connected to the base of said first transistor, wherein said voltage divider comprises a first leg including a third resistor and a second leg including a fourth resistor and a fifth resistor connected in series, said first leg connected to a terminal between said switching transistor and said current sensing means, said second leg connected to a second terminal of said voltage connecting means, and a terminal between said fourth and fifth resistors connected through a second capacitor to a terminal between said switching transistor and said primary windings.

4,782,243
PULSE GENERATOR
Wolfgang Rösl, Eckental, and Jochen Rose, Röthenbach, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany
Filed Nov. 19, 1987, Ser. No. 122,436
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3608930
Int. Cl.[4] H01H *25/00*
U.S. Cl. 307—106 **16 Claims**



1. Pulse generator comprising a pin-shaped switching plunger capable of actuating at least one contact, characterized in that the switching plunger (3), which is guided in a housing (11), is slidable in the direction of and rotatable about its longitudinal axis (5), and that the switching plunger (3) is provided with at least one actuating member (4) which can enter into nonpositive engagement with at least one contact (2.1 to 2.8 and 1.1 to 1.8) both in any of the longitudinally shifted positions and in any of the rotated positions.

4,782,244
ELECTRIC MOTOR EQUIPPED WITH A QUICK-DISCONNECT CABLE CONNECTOR
Yasuo Wakimoto, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Dec. 17, 1987, Ser. No. 133,928
Claims priority, application Japan, Dec. 23, 1986, 61-307229; Jan. 16, 1987, 62-6224
Int. Cl.[4] H02K *5/10*
U.S. Cl. 307—116 **7 Claims**

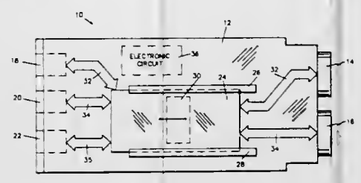


1. An electric motor equipped with a quick-disconnect cable connector comprising:
a motor housing which houses a rotor and a stator;
a terminal box which is mounted on the outside of said motor housing;
a terminal which is secured to said terminal box, one end of said terminal being electrically connected to a winding of said motor;
a quick-disconnect cable connector which can be detachably connected to the other end of said terminal, said quickdisconnect cable connector being mounted on the end of a power cable which is connected to the power supply of said motor;
a protective cover which can be detachably mounted on said terminal box so as to cover said quick-disconnect cable connector when it is connected to said terminal, the dimensions of said protective cover being such that it is impossible to connect or disconnect said quick-disconnect cable connector when said protective cover is mounted on said terminal box;
sensing means for sensing whether said protective cover is mounted on said terminal box and producing a corresponding output signal; and
control means responsive to said sensing means for electrically disconnecting said main power supply circuit from said power cable when said sensing means senses that said protective cover is not mounted on said terminal box.

4,782,245
CONNECTING AND SWITCHING APPARATUS WITH SELECTABLE CONNECTIONS
Mark B. Henry, Medford, N.J., assignor to Northern Telecom Limited, Montreal, Canada
Filed Sep. 14, 1987, Ser. No. 95,915
Int. Cl.[4] H01H *36/00*
U.S. Cl. 307—147 **5 Claims**

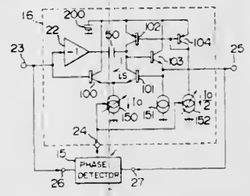
1. An array of connecting and switching modules, comprising:
at least one connecting and switching module;

at least first and second connectors on said at least one connecting and switching module;
said at least first and second connectors defining a plane;
said at least first and second connectors including a spacing therebetween;
said at least first and second connectors being mateable with first and second plugs, respectively;
said first and second plugs including a lateral dimension such that, when said first plug is mated with said first connector, it intrudes into a space required for mating said second plug with said second connector, whereby simultaneous mating of said first and second plugs with said first and second connectors is prevented;



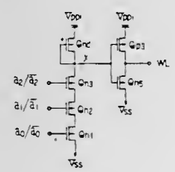
at least one adapter;
said at least one adapter including first means at a first end thereof for mating with said first connector;
said at least one adapter including second means at a second end thereof for mating with said first plug;
said at least one adapter including a length; and
said length being effective for displacing said first plug with respect to said second plug a sufficient distance to avoid interference between said first and second plugs, whereby simultaneous connection of said first and second plugs with said first and second connectors is enabled.

4,782,246
PHASE SHIFT CIRCUIT FOR ELECTRICAL SIGNAL
Tomomitsu Kuroyanagi, Katsuta; Yukinari Ueki, Yokohama; Shuzo Matsumoto, Fujisawa, and Masanori Kamiya, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 16, 1987, Ser. No. 62,587
Claims priority, application Japan, Jun. 16, 1986, 61-138318
Int. Cl.[4] H03K *5/00*
U.S. Cl. 307—262 **4 Claims**



1. A phase shift circuit comprising:
a variable phase shifter having a first terminal supplied with an input signal, a second terminal for delivering an output signal resulting from phase shifting the input signal supplied to said first terminal and a third terminal supplied with a control signal for controlling the amount of phase shift between the input and output signals;
said variable phase shifter further comprising; differential amplifier means having an input terminal connected to said first terminal, an inverting input terminal, an output terminal connected to said second terminal, and a gain control terminal; a capacitor having one side connected to the output terminal of said differential amplifier means; phase inverting means connected between said first terminal and the other side of said capacitor; connection means for DC coupling sard output terminal and inverting input terminal of said differential amplifier means; and variable current source means for supplying a current based on the voltage supplied to said third terminal, said current being supplied to said gain control terminal of said differential amplifier means; and
a phase detector supplied with said input and output signals of said variable phase shifter for generating a voltage complying with a phase difference between said input and output signals and supplying to said third terminal the voltage complying with the phase difference as said control signal to thereby suppress variation in the phase shift amount.

4,782,247
DECODER CIRCUIT HAVING A VARIABLE POWER SUPPLY
Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kanagawa, Japan
Filed Jul. 29, 1985, Ser. No. 759,980
Claims priority, application Japan, Aug. 8, 1984, 59-166114; Aug. 31, 1984, 59-182417
Int. Cl.[4] G11C *80/00, 11/34;* **H03K** *19/017*
U.S. Cl. 307—449 **3 Claims**



1. A decoder circuit connected to a variable power supply source to receive a variable power supply voltage having one of first and second power supply voltage levels selectively, for decoding address signals and providing a selection signal of said first or second power supply voltage level respectively, said decoder circuit comprising:
a decoding logic gate, for decoding the address signals supplied to said decoding logic gate and having an output to provide a decoded signal, said decoding logic gate having a constant current load with comprises a depletion transistor having a gate, a source connected to said gate, and providing an output therefrom, and a drain connected to said variable power supply source;
said decoding logic gate further including a plurality of input transistors, connected in series to said constant current load for receiving said address signals, such that said series connected input transistors form a NAND gate; and
an output circuit, connected to said variable power supply source and to said output of said decoding logic gate for receiving said decoded signal, and for providing said selection signal in response to said decoded signal.

4,782,248
STL EXCLUSIVE-OR BUFFER
Kevin M. Ovens, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 19, 1986, Ser. No. 944,625
Int. Cl.[4] H03K *19/086, 19/20, 19/092;* **G06F** *7/50*
U.S. Cl. 307—455 **2 Claims**

1. A STL logic circuit comprising:
a pair of schottky clamped transistors the emitter of each transistor being coupled through a platinum silicon schottky diode to the base of the other transistor;
the bases of each of said transistors being coupled to a voltage source through a resistor;
one of said transistors having a second emitter, said second

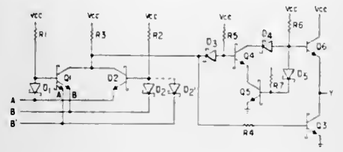
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emitter being coupled to the base of the other transistor through a further schottky diode;

the collectors of said pair of schottky clamped transistors being coupled together and forming the output thereof;

a resistor coupled between said collectors of said pair of schottky clamped transistors and a voltage source Vcc; and

buffer means coupled to said output to translate the voltage level of said output to a different value, said buffer means including a third schottky clamp transistor, a schottky diode coupled between the collectors of said pair of schottky clamped transistors and the base of the third transistor, the emitter of said third transistor being coupled to feedback means, a fourth schottky clamp transistor, a resistor coupled between the base of the fourth transistor and the collector of said pair of schottky clamped transistors, the emitter of said fourth transistor being coupled to a second voltage source, a bipolar transistor having its electron emitting electrode coupled to the collector of said fourth transistor, and a schottky diode coupled between the collector of said third transistor wherein the collector of said bipolar transistor is coupled to said voltage source and the control electrode of the bipolar transistor, the output of said buffer means being taken from the electron emitting electrode of said bipolar transistor.



4,782,249

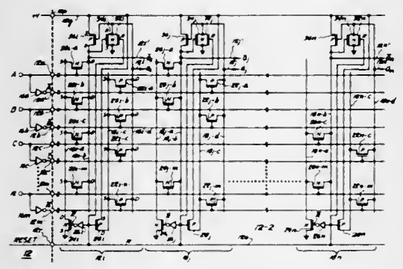
STATIC CMOS PROGRAMMABLE LOGIC ARRAY

William E. Engeler, Scotia; Menahem Lowy, and John T. Pedicone, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1987, Ser. No. 81,076

Int. Cl.[4] H03K *19/177*

U.S. Cl. 307—469 **16 Claims**



1. A static CMOS programmable logic array (PLA), comprising:

input terminal means for receiving a plurality of PLA input logic signals;

output terminal means for providing a plurality of PLA output logic signals;

a plurality of static CMOS logical OR planes, each having a first plurality of inputs each for receiving a different plane input logic signal, a second plurality of outputs and a third plurality of logic gates each for forming at a different one of the outputs a plane output logic signal which is a logical OR'ing of different selected ones of the input logic signals for that plane, and with all of said gates consuming substantially zero power as long as the logic states of all of the plane input logic signals do not change;

static CMOS means for providing, along with each logic signal input to at least one of the logical OR planes, another logic signal which is the logical inverse thereof, to convert each of said at least one logical OR planes to a logical AND plane, with each plane inverted output logic signal from that converted plane being a logical AND'ing of different selected ones of the input logic signals and the inverse input logic signals to the logical AND plane; and

means for interconnecting the input terminal means to the plane inputs of a selected first one of the totality of OR and AND logical planes, for interconnecting the plane outputs of the selected first logical plane to the plane inputs of a second logical plane, for thence sequentially connecting the plane outputs of the second logical plane to the plane inputs, if any, of the remaining logical planes, and for connecting the plane outputs of the last of the totality of logical planes to said output terminal means, all in accordance with a predetermined pattern.

4,782,250

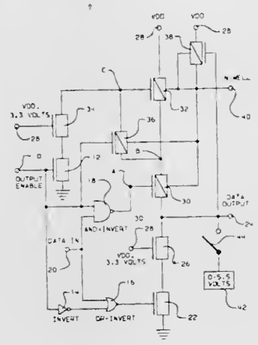
CMOS OFF-CHIP DRIVER CIRCUITS

Robert D. Adams, Essex Junction; Roy C. Flaker, Essex; Kenneth S. Gray, Jericho, and Howard L. Kalter, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,565

Int. Cl.[4] H03K *19/017, 19/096, 17/687, 17/04*

U.S. Cl. 307—473 **18 Claims**



1. An off-chip driver circuit comprising

a pull-up transistor,

a pull-down transistor,

voltage source means for providing a supply voltage of a given magnitude,

a first transistor connected between said voltage source means and said pull-up transistor,

an output terminal, said first transistor and said pull-up transistor being serially connected between said output terminal and said voltage source means,

a second transistor connected from a gate electrode of said first transistor to a common point between said first transistor and said pull-up transistor,

means for applying control voltages to the gate electrodes of said transistors, and

means for selectively applying a voltage to said output terminal having a magnitude significantly greater than that of said given magnitude.

4,782,251

LEVEL CONVERSION CIRCUIT

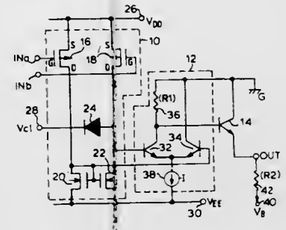
Kazunori Tsugaru, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 6, 1987, Ser. No. 848

Claims priority, application Japan, Jan. 9, 1986, 61-1258

Int. Cl.[4] H03K *19/092, 19/094*

U.S. Cl. 307—475 **4 Claims**



1. A level conversion circuit for converting a CMOS logic level signal to an ECL logic level signal comprising:

means for receiving the CMOS logical signal;

means connected to the signal receiving means for producing a control signal which is shiftable between two levels in response to the CMOS logic signal;

a high potential source;

a low potential source;

a ground potential source;

means for providing a current path between the ground potential source and the low potential source, the current path providing means including first and second bipolar transistors which are switched either into an unsaturated conduction state or a non-conducting state in dependence on said control signal so that the conductance or the non-conductance of the current path is controlled in response to the control signal;

an output terminal; and

a bipolar transistor means connected between the ground potential source and the output terminal for outputting the ECL logic signal in response to the conductance or the non-conductance of the current path.

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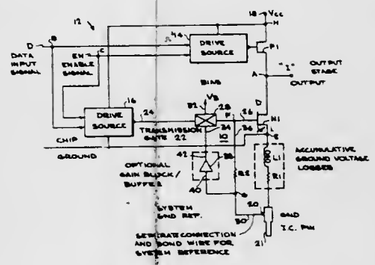
OUTPUT CURRENT CONTROL CIRCUIT FOR REDUCING GROUND BOUNCE NOISE

Roy J. Levy, Ashland, Oreg., and Steven B. Sidman, Campbell, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 8, 1987, Ser. No. 130,268

Int. Cl.[4] H03K *17/687, 5/00, 17/16*

U.S. Cl. 307—576 **5 Claims**



1. An output current control circuit for use with a CMOS output buffer for limiting the maximum output current thereof so as to reduce significantly ground bounce noise, said control circuit comprising in combination:

an output stage formed of a pull-up transistor (P1) and a pull-down transistor (N1) connected together in series;

said pull-up transistor (P1) having one of its main electrodes coupled to a first external power supply terminal (18), its other main electrode coupled to an output node (A), and its gate electrode connected to the output of a first drive source (14);

said pull-down transistor (N1) having one of its main electrodes coupled to a second external power supply terminal (20), its other main electrode coupled to the output node (A), and its gate electrode coupled to the output of a second drive source (16);

variable resistance means having a control line (34) for varying the resistance between said second drive source (16) and the gate electrode of said pull-down transistor (N1); and

feedback means coupled between the gate electrode of said pull-down transistor (N1) and a separate system ground reference line (30) connected to said second external power supply terminal (20) for feeding back a reference voltage to the control line of said variable resistance means so as to vary the resistance and thus limit the output current,

whereby the ground bounce noise at an internal ground potential node (E) connected between the source of said pull-down transistor and said second external power supply terminal is significantly reduced.

4,782,253

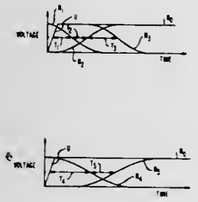
HIGH SPEED MOS CIRCUITS

Masakazu Shoji, Warren, N.J., assignor to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 768,501, Aug. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 580,232, Feb. 15, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 99,702

Int. Cl.[4] H03K *5/05, 5/01, 5/06, 5/12*

U.S. Cl. 307—602 **7 Claims**



1. An integrated circuit chip including first and second logic paths to which electrical signals are to be applied simultaneously, said first and second paths composed respectively of a plurality of logic elements characterized by high input impedance and connected in cascade, each of such elements having a characteristic pull-up and a characteristic pull-down delay, wherein in response to a rising input signal transition applied to an input end of each of the first and second paths the sum of the pull-down delays of the elements in said first path that pull-down their respective outputs in response thereto substantially equals the sum of the pull-down delays of the elements in said second path that pull-down their respective outputs in response thereto and in response to a falling input signal transition applied to the input end of each of the first and second paths the sum of the pull-up delays of the elements in said first path that pull-up their respective outputs in response thereto substantially equals the sum of the pull-up delays of the ele-

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ments in said second path that pull-up their respective outputs in response thereto.

4,782,254

DIRECT-CURRENT DYNAMO ELECTRIC MACHINE, AND METHOD OF MANUFACTURE

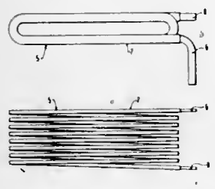
Helmut Kreuzer, and Klaus-Peter Meier, both of Schweiberdingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 724,799, Apr. 19, 1985, Pat. No. 4,682,410, which is a division of Ser. No. 409,561, Aug. 19, 1982, abandoned. This application Jan. 16, 1987, Ser. No. 4,063

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1981, 3147221

Int. Cl.⁴ H02K *15/10*

U.S. Cl. 310—45 **4 Claims**



1. Direct-current dynamo electric machine, particularly vehicular-type motor, having

at least two commutating poles (**4**) and a commutating pole winding (**5**) on each one of the commutating poles, wherein each commutating pole (**4**) is made by the steps of

winding a strip of conductive material (**6**), having essentially rectangular cross-sectional configuration, on edge,

permitting the thus-formed edge-wound winding to resiliently expand to form a spiral winding loop having major surfaces facing one another,

exposing said expanded spaced spiral winding loops to a fluidized bed in which a powder, comprising a curable, hardenable insulating material, is suspended, said powder precipitating in the fluidized bed on said expanded winding loops,

hardening and curing said powder to form a uniform coalesced insulating coating on the conductive material (**6**) forming the commutating pole winding, and

mounting the thus-insulated edge-wound winding on a commutating pole core (**4**).

4,782,255

STEPPING MOTOR AND MAGNETIC DISC REPRODUCING APPARATUS USING THE SAME

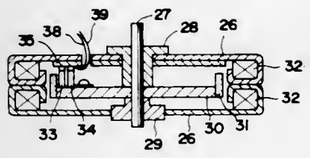
Shigenori Oosaka, and Naoki Takatori, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 1, 1987, Ser. No. 68,295

Claims priority, application Japan, Jul. 1, 1986, 61-152777

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 R **6 Claims**



1. A stepping motor comprising a casing, a rotor, stator, stator coils disposed opposite to said rotor in said casing, means for supplying current to said coils over a plurality of phase cycles, energizing current being applied to said coils in a predetermined sequence during each of said cyles to rotate said rotor through a predetermined angle in each phase cycle, and means for detecting the position of said rotor based on the detection of a predetermined phase cycle among said plurality of phase cycles and the occurrence of said energizing current at a predetermined point in said sequence of energization.

4,782,256

ELECTRICITY GENERATOR FOR WHEEL DETECTION

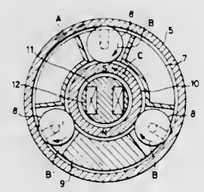
Sadao Kokubu, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Aug. 28, 1987, Ser. No. 90,543

Claims priority, application Japan, Aug. 30, 1986, 61-132869[U]

Int. Cl.⁴ H02K *21/22, 7/18*

U.S. Cl. 310—83 **2 Claims**



1. An electricity generator comprising:

a cylindrical case attached coaxially to a rotatable body having an inside circumferential surface and a central axis,

a hollow relatively stationary annular holder inside of and adjacent to said case;

a rotatable permanent magnet;

a plurality of rotary members supported in contact with said inside circumferential surface equidistantly spaced so that said rotary members are rotated around individual axes of said rotary members distinct from the axis of said case as said case is rotated, said rotary members projecting beyond said hollow relatively stationary annular holder and supporting said permanent magnet to rotate said permanent magnet in a direction opposite to the direction of rotation of said case and at a rate of rotation greater than the rate of rotation of said case; and

a coil centrally attached to said case and internally of said permanent magnet so that an alternating current is caused to flow through said coil as said permanent magnet is rotated.

4,782,257

DUAL ROTOR MAGNET MACHINE

Bernard Secher, Toulouse, and Roger Simon, Arnouville les Gonesses, both of France, assignors to Electromecanismes R.F.B., Societe Anonyme, Paris, France

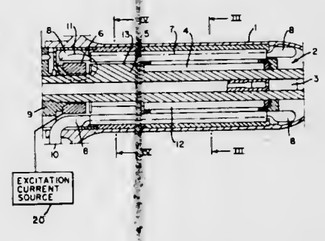
Continuation of Ser. No. 790,162, Oct. 22, 1985, abandoned. This application Feb. 19, 1987, Ser. No. 18,805

Claims priority, application France, Oct. 22, 1984, 84 16110

Int. Cl.⁴ H02K *16/02*

U.S. Cl. 310—114 **9 Claims**

3. A rotating machine including magnets and a power winding for supplying a magnetic flux pattern within a stator housing comprising an assembly of rotors including a common shaft on which is fixed a first rotor having permanent magnets and a second rotor defined by a solid rotor body having a plurality of longitudinally extending radial teeth, a common stator surrounding said assembly and including said power winding surrounding the two rotors, and at least one excitation coil



disposed on the stator housing in confronting relation to the second rotor.

4,782,258

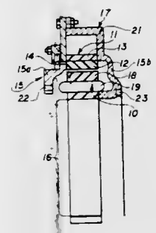
HYBRID ELECTRO-PNEUMATIC ROBOT JOINT ACTUATOR

Lyman J. Petrosky, Unity Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 28, 1987, Ser. No. 113,845

Int. Cl.⁴ H02K *7/00;* **G05B** *11/00*

U.S. Cl. 310—119 **5 Claims**



1. A hybrid drive comprising;

a. a housing;

b. a first rotor within said housing, said first rotor comprising a pneumatic rotor, said housing including a pneumatic stator, said pneumatic rotor and pneumatic stator comprising a pneumatic motor;

c. a second rotor coupled to said first rotor, such that the first and second rotors share the load of said hybrid motor, said second rotor comprising an electric rotor, and said hybrid motor further including an electric stator which engages said electric rotor, said second rotor and electric stator comprising an electric motor;

d. a controller which continuously adjusts the torque applied by the pneumatic motor so that the electric motor's load is decreased so as to prevent overheating the electric motor, and said controller further adjusts the torque of the electric motor to compensate for torque deficiencies of the pneumatic motor.

4,782,259

FREQUENCY GENERATOR AND MOTOR WITH THE SAME

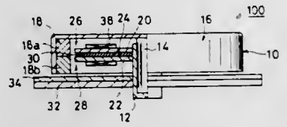
Shuuichi Shikama; Kinji Kawashima, and Toshiharu Yagi, all of Saitama, Japan, assignors to Sanyo Electric Co., Ltd., Japan and Kumagaya Seimitsu Co., Ltd., Japan

Filed Oct. 28, 1985, Ser. No. 791,779

Claims priority, application Japan, Nov. 1, 1984, 59-230564; Nov. 1, 1984, 59-230565; Nov. 1, 1984, 59-230566; Nov. 1, 1984, 59-230567

Int. Cl.⁴ H02K *21/12*

U.S. Cl. 310—156 **12 Claims**



1. A frequency generator, comprising:

an annular multipolar magnet having a plurality of magnetizable sectors sectioned in a circumferential direction of said multipolar magnet, said plurality of magnetizable sectors being magnetized in an axial direction of said multipolar magnet and alternately in reverse polarity in the circumferential direction thereof,

a first salient-pole line having a plurality of first salient poles distributed in the circumferential direction of said multipolar magnet, said plurality of first salient poles being opposed to said plurality of magnetizable sectors,

a second salient-pole line being spaced from said first salient-pole line in the axial direction of said multipolar magnet and having a plurality of second salient poles distributed in the circumferential direction of said multipolar magnet, said plurality of second salient poles being opposed to said plurality of magnetizable sectors,

said first and second salient poles corresponding to each other being overlapped in the axial direction of said multipolar magnet, the multipolar magnet being rotatable relative to the first and second salient poles, and

a generating coil wound between said first and second salient-pole lines and in the circumferential direction of said multipolar magnet, wherein

a boundary line defined by adjacent magnetizable sectors is intersected by an axial direction line defined by the overlapped first and second salient poles so that a respective one of the overlapped first and second salient poles is able to be simultaneously opposed to a magnetizable sector having a different polarity.

4,782,260

CLOSED SLOT ROTOR CONSTRUCTION

Deepakkumar J. Gandhi, and Thomas W. Neumann, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Feb. 27, 1987, Ser. No. 20,299

Int. Cl.⁴ H02K *1/00*

U.S. Cl. 310—216 **20 Claims**

1. A lamination for use in a lamination stack forming a rotor in a dynamo-electric machine, comprising:

a flat circular plate of ferromagnetic material having a number of equally circumferentially spaced closed slots extending radially in a region near the outer periphery of said plate,

said slots being formed to contain conducting members which extend axially along the rotor when like ones of said plates are stacked face-to-face with corresponding slots in communication with one another,

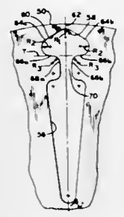
each of said slots having an upper edge that is substantially in the shape of a V at an upper slot region adjacent the

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periphery of said plate and symmetrical about a radial center line, portions of said upper edge corresponding to legs of the V diverging from one another in the direction towards the center of said plate, and

each upper edge portion corresponding to a leg of said V forms an angle of about 30 degrees with respect to a line drawn perpendicular to the radial center line of the slot;

wherein said circular plate has bridge areas between said upper slot regions and the outer periphery of said plate, a center region of the upper edge of each slot is curved at a



first radius between the edge portions corresponding to legs of said V to define a bridge area for each slot, and said slots are each formed to constrict toward the radial center line of the slot with opposing edges curved at a second radius between distal ends of the upper edge and a first set of points along which the opposing edges have a common tangent which is perpendicular to said radial center line;

wherein the center region of the upper edge of each slot forms a narrowest part of each bridge area, and the radial dimension of said narrowest part is in the range from about 0.25 mm to about 0.4 mm.

4,782,261

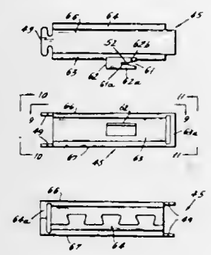
CONNECTION OF MOTOR BRUSH HOLDER TO STATOR COIL

R. Lent Crevling, Jr., Williamsport, and Rudolph W. Wacek, Montoursville, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Aug. 11, 1987, Ser. No. 84,394

Int. Cl.⁴ H01L *41/08*; H01R *4/26*; H02K *5/14*

U.S. Cl. 310—242 **11 Claims**



1. An electric motor comprising:

a wound rotor including an armature, a shaft defining a rotational axis for said rotor, and a commutator in a circuit with said armature for connecting the latter to a motor energizing source;

a stator including magnetic core means having an opening wherein said armature is rotationally disposed, and stator winding means coupled to said core means to generate magnetic flux in said core means, which flux interacts with electric current flowing in said armature to rotate said rotor about said axis;

brush means connected in circuit between said commutator and a motor energizing source, frame means on which said rotor is operatively mounted for rotation about said axis, and support means operatively mounting said brush means to said frame means;

said brush means comprising first and second sections each including a conducting tube, a brush conductively connected with said tube and having a radially outer end disposed within said tube and a radially inner end biased into engagement with said commutator;

a conductor tab on each of said tubes, and each of said tabs having a slit with an open end disposed at an edge of said tab;

said stator winding means comprising multiple turns of wire coated with insulation;

said wire having first and second end portions disposed within the slits of the respective first and second sections in direct contact with first and second confronting longitudinal boundary edges defining each of said slits, to electrically connect the first and second end portions with the terminal tabs of the respective first and second sections;

for each of said sections of said brush means said slit thereof extends generally radially and the open end thereof is radially inward.

4,782,262

ROTARY ACTUATOR

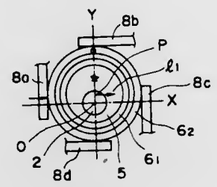
Hiroshi Kiyo-Oka, Kiyose, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,663

Claims priority, application Japan, Jun. 11, 1986, 61-136777

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **6 Claims**



1. A rotary actuator comprising:

a rotary member having an outer cylinder, an inner cylinder rotated by the rotation of said outer cylinder, and a rotary shaft eccentrically fixed to said inner cylinder, wherein a rotary angle of said inner cylinder being equal to a rotary angle of said outer cylinder, said rotary shaft being rotated by the rotation of said outer cylinder due to the eccentricity of said rotary shaft relative to said inner cylinder;

a plurality of electro-mechanical conversion members arranged around said rotary member at equal angular intervals, said plurality of electro-mechanical conversion members being shifted to successively exert a force against said outer cylinder, thereby causing said outer cylinder to revolve; and

drive means for driving said plurality of electro-mechanical conversion members, whereby said drive means drives at least one of said plurality of electro-mechanical conversion members to exert a force against said rotary member.

4,782,263

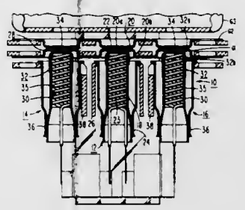
INLINE ELECTRON GUN HAVING AT LEAST ONE MODIFIED CATHODE ASSEMBLY

Richard E. Schlack, Lower Winsor Township, York County, and Stephen T. Opresko, Lancaster, both of Pa., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed May 21, 1984, Ser. No. 612,429

Int. Cl.⁴ H01J *29/02*

U.S. Cl. 313—409 **8 Claims**



1. In an inline electron gun for a cathode-ray tube having a plurality of cathode assemblies each comprising

a cathode sleeve having a cathode cap closing one end of said sleeve and extending longitudinally along said sleeve, said cap having an electron emissive coating thereon, and

a heater disposed within said sleeve, the improvement comprising

at least one of said cathode assemblies including a bimetal cathode cap integral with said sleeve, said cap having a length different from the length of the other cathode caps whereby the turn-on time of said at least one cathode assembly is different from that of the other cathode assemblies.

4,782,264

COLOR PICTURE DEVICE INCLUDING CONVERGENCE CORRECTING MAGNETIC PLATES

Hidetoshi Yamazaki, and Masatsugu Inoue, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 753,995, Jul. 11, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 28,029

Claims priority, application Japan, Jul. 12, 1984, 59-143343

Int. Cl.⁴ H01J *29/54, 29/72*

U.S. Cl. 313—413 **5 Claims**



1. A color cathode ray tube device comprising:

a tube envelope having a tube axis, said tube envelope including a neck section, a panel section and a funnel section formed between the neck section and the panel section;

an in-line type electron gun assembly disposed in the neck section and including three electron gun sections for emitting a center electron beam and two side electron beams toward the panel section, the three electron gun sections being arranged along a line perpendicular to the tube axis;

a deflection unit disposed around the neck section and the funnel section, said deflection unit including a pair of first deflecting coils for deflecting the electron beams in a horizontal scanning direction coinciding with the direction of the line of said three electron gun sections, and a pair of second deflecting coils for deflecting the electron beams in a vertical scanning direction perpendicular to the horizontal scanning direction;

a pair of high permeability metal plates with extend between the vertical and horizontal deflection coils; and

a pair of permanent magnet plates having opposed surfaces facing each other, each magnet plate being disposed between the neck section and the corresponding high permeability metal plate, the opposite surfaces of the permanent magnet plates having different magnetic polarities to form a magnetic field in a region of the color cathode ray tube through which said electron beams pass and directed opposite to the vertical scanning direction for cancelling remanent magnetization of said high permeability plates, said permanent magnet plates being arranged so that the magnetic field intensity acting on the center beam is higher than that acting on the side beams.

4,782,265

ELECTROCHEMICAL LUMINESCENT CELL

Hartwig Schaper, Roetgen; Erwin Schnedler, and Karl H. Wilhelm, both of Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 354,317, Mar. 3, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,329

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110879

Int. Cl.⁴ H01J *7/42*

U.S. Cl. 313—483 **3 Claims**



1. An electrochemical luminescent cell having a chamber filled with a solution of a substance capable of electrochemical luminescence and which chamber is bounded by two parallel spaced plates which plates are provided on their opposing surfaces, in contact with said solution, with operating and counter-electrodes respectively, at least one of which electrodes consists of an electrically-conductive translucent material, characterized in that at least one of said electrodes has a grid structure in which the size and mutual spacing of the holes of the grid structure lie in the order of magnitude of the spacing between said electrodes and in which the mutual spacing of said holes is sufficient to cause a disturbance in the flow of the solution which flow occurs upon energization of said electrodes.

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RAPID-START SINGLE-ENDED HIGH-PRESSURE DISCHARGE LAMP

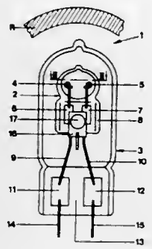
Jürgen Heider; Richard Kotschenreuther, both of Munich, and Wolfgang Schade, Kirchheim, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,322

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1985, 3537872

Int. Cl.⁴ H01J *61/04*

U.S. Cl. 313—631 **13 Claims**



1. Rapid-heating, arc-position-stabilized, single-ended high-pressure discharge lamp (1) having
a transparent discharge vessel (2) of high-temperature resistant glass;
a single press or pinch seal (8) at one end thereof;
a fill of mercury and additions of metal halides and a noble gas within the disclosure vessel; and
two wire electrodes (4, 5) of high-temperature resistant material having discharge tips (18, 19) pointing towards the axis of the lamp and towards each other, sealed through the single press seal,
wherein, in accordance with the invention,
each of the wire electrodes is lengthened by formation into a creaseless loop (20, 21) curving away from the lamp axis and adjacent the discharge tips (18, 19) which loops, in plan view, appear closed and hence each define, with a respective straight or shaft portion (22, 23) of the electrode wire extending from the pinch or press seal, a cross-over point (24, 25),
the discharge tips (18, 19) of the electrodes forming axial ends, of said respective loops, remote from said shaft portions, and extending toward each other beyond the closest mutual approach of said straight or shaft portions (22, 23), thereby assuring consistent striking of the arc on the tips and stable positioning of the arc, and
the loop of the wire extending and smoothly curving from the straight or shaft portion (22, 23) of the electrode shaft in a direction away from a discharge zone between the electrode tips (18, 19), and being offset with respect to the thickness of the wire to effect crossing of the respective looping wires over the straight or shaft portions without touching at the cross-over points (24, 25).

4,782,267

IN-SITU WIDE AREA VACUUM ULTRAVIOLET LAMP

George J. Collins, Fort Collins, and Zeng-qi Yu, Fort Collins, both of Colo., assignors to Applied Electron Corporation, Albuquerque, N. Mex.

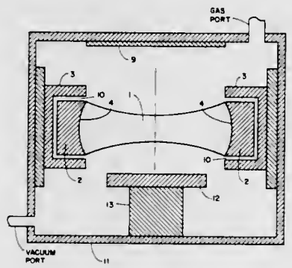
Filed Feb. 7, 1986, Ser. No. 827,336

The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.

Int. Cl.⁴ C23C *13/08;* **B05D** *3/06*

U.S. Cl. 315—111.81 **24 Claims**

1. An in-situ wide area vacuum ultraviolet radiation apparatus, the apparatus comprising:
vacuum chamber means;
a ring-shaped cold cathode within said vacuum chamber means having a geometrically shaped inner surface comprising a material selected for the efficient emission of secondary electrons and for minimum cathode sputtering;
a ring-shaped cathode shell coaxially covering an outer surface of said ring-shaped cold cathode;
D.C. power supply means electrically connected to said ring-shaped cold cathode and to the vacuum chamber means for accelerating secondary electrons emitted from the inner surface of said ring-shaped cold cathode to create a generally disc-shaped trapped electron beam discharge;
a workpiece positioned within said vacuum chamber means, adjacent one side of the dsc-shaped trapped electron beam discharge but outside the volume defined thereby, for receiving radiation from the disc-shaped trapped electron beam discharge;
vacuum control means coupled to said vacuum chamber means for establishing and maintaining a desired vacuum within said vacuum chamber means; and



gas port means for admitting and controlling the flow of ambient and reactant gases into said vacuum chamber means.

24. A method for in-situ wide area VUV processing of a thin film substrate structure, the method comprising the steps of:
establishing a controlled gas atmosphere in an evacuated chamber, the controlled gas atmosphere including one or more ambient and one or more feedstock reactant gases;
producing a confined, disc-shaped electron beam discharge within the evacuated chamber using a ring-shaped cold cathode located within the evacuated chamber, the confined, disc-shaped electron beam discharge being produced adjacent a selected surface of the thin film substrate structure so that a planar axis of the confined, disc-shaped electron beam discharge is substantially parallel to the selected surface of the thin film substrate structure so as to dissociate molcules of the one or more feedstock reactant gases to produce dissociation products by electron beam interaction with the one or more ambient gases and to create both VUV radiation and a flux of atomic species from one or more of the dissociation products of feedstock reactant gases.

4,782,268

LOW-PRESSURE DISCHARGE LAMP, PARTICULARLY FLUORESCENT LAMP HIGH-FREQUENCY OPERATING CIRCUIT WITH LOW-POWER NETWORK INTERFERENCE

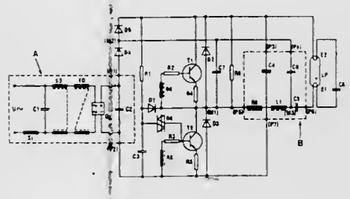
Hans-Jürgen Fähnrich, and Walter Hirschmann, both of Munich, Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,481

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611611

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—200 R **22 Claims**



1. Power frequency harmonic suppressed low-pressure discharge operating lamp circuit, particularly fluorescent lamp (LP) operating circuit, adapted to be connected to a power line circuit (U), at power line voltage and frequency, having
lamp circuit input terminals (P1, P2) defining a positive (P1) and a negative (P2) lamp circuit input terminal;
an input capacitor (C2) connected across said lamp circuit input terminals;
a push-pull transistor frequency generator having two alternately conducting transistors (T1, T2) and having a common junction (M1);
and an operating circuit for the transistors, including
said lamp (LP),
first and second windings (RK) of a current transformer, each winding being connected to the base of a respective transistor (T1, T2), and
a series resonance circuit having a series inductance (L1) defining two terminals and having one terminal connected to the common junction (M1) of the transistors (T1, T2) and another terminal connected through a coupling capacitor (C5) and through the lamp filaments (E1, E2) to the resonance capacitor (C6) in the preheating circuit of the lamp (LP),
and comprising, in accordance with the invention,
a power frequency harmonic suppression circuit including
a first and a second diode (D4, D5) serially connected in forward current passing direction and defining a diode junction (M2) between said diodes, said serially connected diodes having one end terminal connected to one terminal (P1) of the input capacitor (C2) and another end terminal connected to the network side of one electrode (E2) of the lamp (LP),
a capacitor (C7) connecting the diode junction (M2) and the common junction (M1) of the transistors (T1, T2); and
a power line choke (L2, L2') connected between said power line circuit (U) and the lamp circuit input terminals (P1, P2).

4,782,269

SAWTOOTH GENERATOR WITH S-CORRECTION

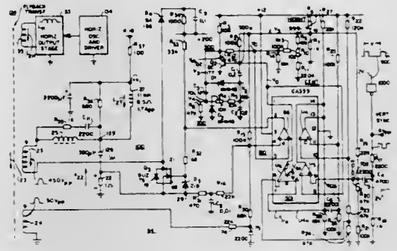
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Oct. 22, 1987, Ser. No. 111,334

Claims priority, application United Kingdom, Dec. 24, 1986, 8630921

Int. Cl.⁴ H01J *29/56, 29/70;* **H04N** *5/04*

U.S. Cl. 315—371 **34 Claims**



1. A television deflection apparatus responsive to a synchronizing input signal at a frequency that is related to a deflection frequency, comprising:
a controllable switch responsive to said input signal that operates at a frequency that is related to that of said input signal;
first and second capacitors forming a series arrangement that is coupled to said switch;
a current source coupled to said capacitors for charging said capacitors to generate a sawtooth signal having a ramping first portion that changes at a first direction when said switch is nonconductive such that when said switch becomes conductive said switch discharges said capacitors to form a ramping second portion of said sawtooth signal that changes at an opposite direction;
a source of a ramping voltage;
a first impedance coupled to said source of said ramping voltage and to a junction terminal that is coupled between said first and second capacitors for generating a first current that flows in said first impedance that controls S-shaping of said sawtooth signal by reducing the rate of change of said sawtooth signal at a first end time of one of said first and second portions of said sawtooth signal in accordance with said first current that flows in said first impedance;
a second impedance coupled to a terminal of said first impedance that is remote from said first junction terminal for bypassing a portion of a current that flows in a current path between said source of said ramping voltage and said junction terminal for reducing said first current in said first impedance and that reduces the rate of change of said sawtooth signal at an opposite end time of said one of said first and second portions of said sawtooth signal to control S-shaping at said opposite end time;
a deflection winding; and
means responsive to said sawtooth signal for generating a deflection current in said deflection winding that is S-corrected.

4,782,270

CRT RASTER REVERSAL BOARD

Karl E. Dueland, Lansing, and Michael D. Givens, Spencer, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 30, 1987, Ser. No. 44,095

Int. Cl.⁴ H01J *29/70;* **G09G** *1/06*

U.S. Cl. 315—399 **5 Claims**

1. Apparatus for reversing the raster scan across the screen of a CRT terminal having a horizontal deflection coil and

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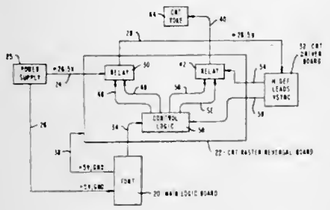
coupled to a source of supply voltage, said apparatus comprising

means comprising a clock generator for generating a signal indicative of the font appearing on the screen of the CRT terminal,

means comprising a flip-flop for latching the signal for a period of time to allow bleed-off of the supply voltage across the horizontal deflection coil of the CRT terminal, a

first counter,

means comprising a vertical drive signal for enabling said first counter for a period of time beyond the time for bleed-off of the supply voltage,



means comprising a first relay coupled to said flip-flop to disconnect the supply voltage,

means comprising a second relay to reverse the leads connected to the horizontal deflection coil, a

second counter,

means coupled to said first counter for enabling the second counter to continue for a period of time after actuating the second relay, and

means for generating a signal at the end of the period of time after actuating the second relay for resetting the latched signal to enable reconnection of the leads to the horizontal deflection coil of the CRT terminal and thereby reverse the direction of raster scan across the screen of the CRT terminal.

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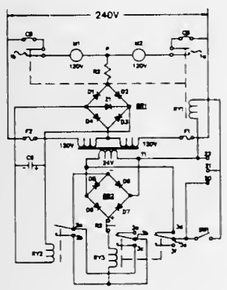
ELECTRONIC MOTOR CONTROL CIRCUIT

LeRoy N. Trowbridge, Richardson, Tex., assignor to Music & Sound, Inc., Dallas, Tex.

Filed Oct. 2, 1987, Ser. No. 103,709

Int. Cl.[4] H02P *7/74*

U.S. Cl. 318—113 **12 Claims**



1. A control circuit for two series connected motors, comprising the combination of two motors connected in series across a power source including a common connection point, a reference circuit providing a reference voltage and including a circuit for comparing the reference voltage and a voltage at said common connection point, a first relay having a pair of contacts through which a voltage from said power source is applied to said series connected motors, and a second relay for removing power from said first relay when the reference voltage and said voltage at said common connection point differ by a preset amount.

9. A control circuit for two series connected motors, comprising the combination of two motors connected in series across a power source including a common connection point, a reference circuit providing a reference voltage and including a circuit for comparing the reference voltage and a voltage at said common connection point, a first relay having a pair of contacts through which a voltage from said power source is applied to said series connected motors, and a second relay having set and reset windings for removing power from said first relay when the reference voltage and said voltage at said common connection point differ by a preset amount.

4,782,272

ELECTRICAL DRIVE SYSTEMS

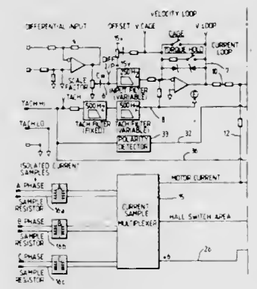
Maurice Buckley, Blackrock; Arthur Stone, Kilmallock, and Aengus Murray, Clontarf, all of Ireland, assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

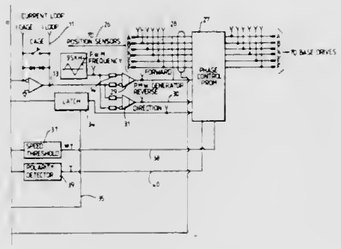
Filed Jul. 17, 1985, Ser. No. 755,786

Claims priority, application Ireland, Jun. 28, 1985, 1629/85

Int. Cl.[4] H02P *6/02;* **G05B** *11/28*

U.S. Cl. 318—254 **27 Claims**





1. A brushless d.c. drive system, comprising a multiphase motor having a stator, a rotor and a plurality of phase windings; control means for energizing said phase windings in paired combinations and in a predetermined sequence during system operation, two phase windings being energized in each paired combination; sensor means for indicating rotor disposition at each of a plurality of rotational dispositions of the rotor relative to the stator, each said disposition corresponding to a transition from energization of one said paired combination of the phase windings of the motor to energization of a further paired combination of the phase windings, one of the phase windings of a paired combination of phase windings energized prior to each said transition being de-energized at said transition and a further winding being energized at said transition to define a new paired combination of phase windings, and the energization of the other of said phase windings of said paired combination of phase windings energized prior to said transition being maintained through said transition and subsequent thereto in said new paired combination; current sample means for providing a signal indicative of the actual current present in each phase winding; means for establishing a current error signal by comparison of a required current signal with said signal indicative of actual current present in one of the phase windings of an energized paired combination of phase windings; means for regulating the current flowing in the phase windings, when energized, in dependence on said current error signal; and means for transferring the establishment of said current error signal from comparison of said required current signal with said signal indicative of actual current present in the phase winding whose energization is maintained at each said transition from one said paired combination of phase windings to another of said paired combinations of phase windings, to comparison of said required current signal with said signal indicative of actual current present in the phase winding being energized at said transition, the current present in said phase winding being energized being, at least initially, substantially zero, so that the current error signal is, at least initially, of relatively large magnitude, and thus demands a large phase current.

4. A brushless d.c. drive system, comprising a multiphase rotational motor having a stator, a rotor and a plurality of phase windings, control means for energizing said phase windings in paired combination and in a predetermined sequence during system operation, and sensor means associated with said control means for indicating rotor disposition at each of a plurality of rotational dispositions of the rotor relative to the stator, each said disposition corresponding to a transition from energization of one said combination of the phase windings of the motor to energization of a further combination of the phase windings, one said winding being de-energized at each said transition and a further winding being energized, and the disposition of the rotor for transition between any two phase combination in one direction of rotation being rotationally displaced from its disposition for transition between the same two phase combinations in the opposite direction of rotation.

7. A brushless d.c. motor, comprising a stator having a plurality of windings and formed from a multiplicity of laminations, and a rotor having a plurality of poles defined by axially extending permanent field magnets, the rotor being rotationally mounted within the stator and being substantially surrounded by the stator, a plurality of Hall effect devices being mounted on the stator at one axial end of the motor and positioned at a plurality of locations around a circumferential path in the vicinity of axial end regions of said axially extending permanent field magnets, said axially extending permanent field magnets serving also as triggering magnets for the Hall effect devices, and each of said devices being activated when there is a respective predetermined angular relationship between the rotor and the stator, the stator laminations having axially outwardly directed axial end faces, and the axial end regions of the axially extending permanent field magnets having axially outwardly directed axial end faces, the axial end face of the stator lamination at the axial end of the motor at which the Hall effect devices are mounted and the axial end faces of the permanent magnet axial end regions at said axial end of the motor being disposed in a substantially common radial plane extending at right angles to the axis of rotation of the rotor, the windings having winding end portions extending axially outwardly of said stator lamination axial end face at said axial end of the motor at which the Hall effect devices are mounted so that annular space is defined radially inwardly of the winding end portions and axially outwardly of the axial end faces of the axially extending permanent field magnet end regions, mounting means for the Hall effect devices extending through said annular space to support said Hall effect devices in dispositions which are radially inwardly of and underlie said axial end regions of said axially extending permanent field magnets.

9. A pulse width modulation power suppply for a two-terminal inductive load, having two switches and control means for regulating the on and off periods of each switch to control current magnitude and direction in said load, the on period of each switch being phase displaced relative to the on period of the other switch under zero net current conditions and of sufficient duration for overlap periods to be established between the on periods of the switches, a forward current pulse being established by a first said overlap period and a reverse current pulse being established by a second said overlap period, so that equal and opposite alternating current pulses flow through said load under said zero net current conditions.

14. A brushless d.c. drive system comprising a three phase rotational motor, control means for energizing the phase windings of the motor, and means for applying a signal indicative of a parameter of motor performance to said control means, said control means including means for connecting the phase windings of said motor either for energization in paired combinations or for single-phase energization, in dependence on said motor performance parameter, without interruption of motor rotation, and said control means being adapted to energize said windings, in each case, in a respective predetermined sequence, wherein said parameter of motor performance is speed, the system includes means for monitoring motor speed, and the control means includes a comparator for detecting whether or not motor speed exceeds a preset speed to provide an input to said means for connecting the phase windings either for energization in paired combinations or for single-phase energization so that said phase windings are connected for energization in paired combinations when motor speed is less than said preset speed and are connected for single-phase energization when motor speed exceeds said preset speed.

4,782,273

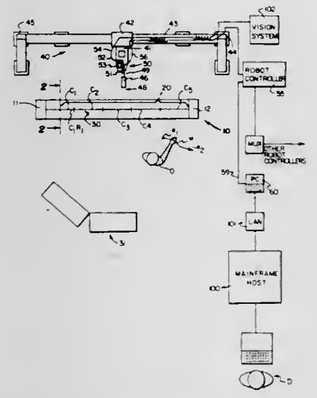
AUTOMATIC PART LOCATION AND MECHANICAL TESTING OF PART INSERTION

Kelan T. Moynagh, Huntsville, Ala., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 8, 1986, Ser. No. 894,546

Int. Cl.[4] H05K *3/32*

U.S. Cl. 318—568 **4 Claims**



1. A method for inserting parts into predetermined hole locations on a substantially planar structure, such that each particular part may be mated to each particular location identifiable by particular part location data, until all the parts are

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mated to their predetermined locations, comprising at least the steps:

(a) sending the location data for a part location to an automatic positioning mechanism equipped with a lighted probe and being located on one side of said substantially planar structure,

(b) automatically moving said lighted probe to said part location indicated by the location data from step "a".

(c) pushing said probe into said location such that the light of said probe may be visible to an operator on the other side of said planar structure,

(d) inserting said part into said location by said operator with force sufficient to push said lighted probe backward from said planar structure,

(e) release by said operator of said part,

(f) testing the seating of said part in said location by attempting insertion of said probe,

(g) if the part is improperly seated, signalling the operator to correct, then trying again by repeating this method starting at step "c", unless the probe is already inserted in which case then start at step "d" otherwise, if part is properly seated going to step "h",

(h) querying whether all parts have been inserted; if so signal the operator to do next task, else,

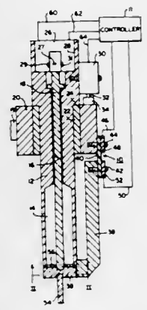
(i) go to step "a"

4,782,274

END EFFECTOR FOR ROBOTIC SYSTEM

Daniel J. Teegarden, Columbia, and Ernst R. Pemsel, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1987, Ser. No. 76,965
Int. Cl.[4] B25J *9/18*
U.S. Cl. 318—568 **19 Claims**



1. An end effector adapted to be disposed on a movable industrial manipulator arm capable of placing a holed object having an opening therethrough on a stud member comprising:

a tool adapted to centrally releasably support said holed object;

mounting means slidingly connected to said tool for mounting said tool to said industrial manipulator arm;

first sensing means for sensing when said holed object has been aligned with, and is disposed about, said stud member;

second sensing means for sensing when said holed object is misaligned with said stud member;

third sensing means for determining the amount of misalignment between said holed object and said stud member in one of two planar directions; and

fourth sensing means for determining the amount of misalignment between said holed object and said stud member in the other of the two planar directions.

13. An automated placement system for placing a holed object having an opening therethrough onto a stud member comprising:

a movable manipulator arm;

a controller connected to, and controlling movement of, said manipulator arm;

a tool adapted to centrally releasably support said holed object;

mounting means connected to said tool for mounting said tool to said manipulator arm;

alignment sensing means for sensing the extent of alignment between said holed object and said stud member; and

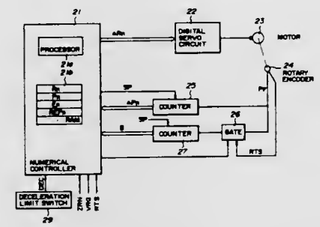
location determining means for determing the spatial location of said stud member with respect to said holed object, said location determining means having first and second locating members secured to said mounting means and physically and electrically contacting said tool at a ninety degree angle to each other, said first locating member being movable in a first planar direction and said second locating member being movable in a second planar direction at a right angle to said first planar direction.

4,782,275

REFERENCE POINT RETURN METHOD

Keiji Sakamoto, Tokyo, and Yukio Toyosawa, Kumamoto, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00099, § 371 Date Oct. 14, 1987, § 102(e) Date Oct. 14, 1987, PCT Pub. No. WO87/05130, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 17, 1987, Ser. No. 130,993
Claims priority, application Japan, Feb. 19, 1986, 61-034880
Int. Cl.[4] G05B *19/18*
U.S. Cl. 318—569 **4 Claims**



1. A reference point return method in a numerical control system having: a computerized numerical controller for generating a move command value ΔR_n at predetermined time intervals ΔT, a digital servo-circuit for digitally servo-controlling a servomotor on the basis of the move command value ΔR_n to transport a movable element, pulse generating means for generating a pulse whenever the servomotor rotates a predetermined amount and for generating a one-revolution signal whenever a predetermined amount of the pulses (N) are generated, first counting means for counting the pulses generated during the predetermined time interval so as to monitor an amount of travel ΔP_n of the movable element during the predetermined time interval, second counting means for counting the pulses from generation of the one-revolution pulse until an initial one of the predetermined time intervals so as to monitor an amount of travel B of the movable element during the predetermined time interval, and a deceleration limit switch with normal and depressed states, said method comprising the steps of:

(a) generating a reference point return command;

(b) transporting the movable element in accordance with the reference point return command;

(c) providing a command position R_n at an initial time within each of the predetermined time intervals;

(d) monitoring a present position P_n of the movable element;

(e) obtaining an error E_n, which is the difference between (a) the commanded position R_n and the present machine position Pn;

(f) obtaining a value REF_n corresponding to the sum of the error E_n and the amount of travel B;

(g) setting the commanded position to REF_n during the predetermined time interval when the position at which the one-revolution signal is generated is zero;

(h) updating REF_n during each of the predetermined time intervals in accordance with the formula

$$REF_n + \Delta R_n \rightarrow REF_n$$

(i) detecting a depressed state of the deceleration limit switch and the switch being restored from the depressed state; and

(j) outputting, as a final commanded amount of travel, ΔR_n obtained in accordance with the formula

$$(N\text{-}REF_n) \rightarrow \Delta R_n$$

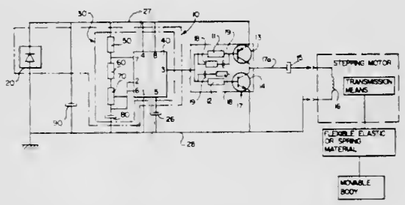
using a commanded position REF_n at an initial time after the deceleration limit switch is restored from the depressed state.

4,782,276

ELECTRIC SIGNAL GENERATOR SYSTEM AND ITS APPLICATION

Charles Guterman, Gif Sur Yvette, France, assignor to Solems, Palaiseau, France

Filed Apr. 7, 1987, Ser. No. 35,335
Claims priority, application France, Apr. 8, 1986, 86 05005
Int. Cl.[4] G05B *19/40*
U.S. Cl. 318—685 **13 Claims**



1. Light integrator signal generator system comprising:

a signal generating device including:

a low-energy electrical current generator;

an impulse generator being connected across the low-energy electrical current generator via a feed line and a ground line; wherein the impulse generator includes:

a capacitor having one terminal connected to the ground line of the circuit and the other terminal connected with three input terminals of an astable multivibrator;

a photovoltaic cell illuminated by a light source and connected across the terminals of the capacitor, the cell supplying the capacitor with electrical energy;

wherein the astable multivibrator is controlled by the capacitor and supplied with electrical energy by the low-energy electrical current generator via the feed line and the ground line, the multivibrator delivering at its output an electric signal whose frequency is proportional to the amount of light picked up by the photovoltaic cell; and

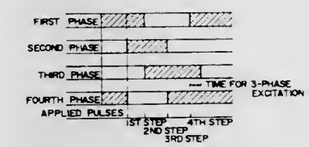
a photometer including a display unit and an impulse counter for receiving the signal delivered at the output of the multivibrator.

4,782,277

METHOD OF DRIVING AND CONTROLLING A STEPPING MOTOR

Naoyuki Morita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 29, 1987, Ser. No. 55,279
Claims priority, application Japan, May 29, 1986, 61-124409
Int. Cl.[4] H02P *8/00*
U.S. Cl. 318—696 **5 Claims**



1. A method of driving and controlling the shaft of a stepping motor from a starting position to a final position, said stepping motor having stationary field poles corresponding to N phases (N: an integer greater than or equal to 4), said method being of the type in which said stationary field poles are successively driven during m time intervals (m: an integer greater than or equal to 2) in such manner that a number n, ranging from 1 to (N−2), of phases are in an excited state at any time, said method comprising:

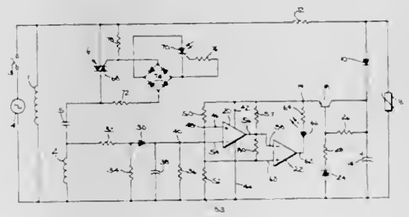
after the completion of an (m−1)th time interval exciting a number of phases larger than n until said rotor reaches a desired angular position, prior to said final position, and after said rotor has reached said desired angular position, continuing with only n phases in the excited state until said rotor reaches said final position.

4,782,278

MOTOR STARTING CIRCUIT WITH LOW COST COMPARATOR HYSTERESIS

Joseph S. Bossi, South Milwaukee, and Victor A. Murn, Muskego, both of Wis., assignors to PT Components, Inc., Milwaukee, Wis.

Filed Jul. 22, 1987, Ser. No. 76,297
Int. Cl.[4] H02P *1/42*
U.S. Cl. 318—786 **7 Claims**



1. In a single phase AC induction motor having a main winding and an auxiliary winding both connectable to an AC power source, and having a switch for disconnecting said auxiliary winding from said AC source, a control circuit for said switch comprising:

main voltage detector means sensing voltage from said AC source;

auxiliary voltage detector means sensing auxiliary winding voltage;

voltage comparator means having a first input connected to said main voltage detector means and a second input connected to said auxiliary voltage detector means and comparing said auxiliary winding voltage against said

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voltage from said AC source and outputting a turn-off signal causing said switch to disconnect said auxiliary winding from said AC source when said auxiliary winding voltage increases to a predetermined cut-out value relative to said voltage from said AC source as a function of motor speed, and outputting a turn-on signal causing said switch to connect said auxiliary winding to said AC source when said auxiliary winding voltage decreases to a predetermined cut-in value relative to said voltage from said AC source as a function of motor speed, said predetermined cut-in value corresponding to a voltage derived from rotationally induced voltage in said auxiliary winding during overload or stall of said motor after starting;

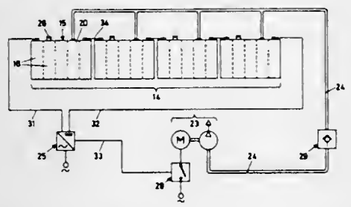
hysteresis means responsive to said turn-off signal to change the voltage at one of said inputs of said comparator means such that said auxiliary winding voltage must decrease to a cut-in value which is less than said cut-out value before reconnection of said auxiliary winding to said AC source, wherein said hysteresis means comprises a connection between the output of said comparator means and said one input of said comparator means to adjust the voltage level at said one input according to said output.

4,782,279

METHOD AND ARRANGEMENT FOR CHARGING A SEALED, SECONDARY ELECTROCHEMICAL POWER SOURCE

Per A. Selanger, August och Huldas väg, Sweden, assignor to Sab Nife AB, Landskrona, Sweden

Filed Jan. 29, 1987, Ser. No. 8,358
Claims priority, application Sweden, Feb. 4, 1986, 8600483
Int. Cl.⁴ H02J *7/16*
U.S. Cl. 320—46 **10 Claims**



1. A method for charging a sealed, secondary electrochemical power source having positive and negative electrodes, a water-based electrolyte and a gas space, and including provision for oxygen recombination at at least some part of the surface of the negative electrodes or of a plate tab associated therewith, said method comprising: reducing the pressure in the gas space from atmospheric pressure to a level not below the vapour pressure of the water present in the power source; and charging the power source by imposing a constant DC voltage while the pressure in the gas space is reduced.

4,782,280

TRANSISTOR CIRCUIT WITH E/C VOLTAGE LIMITER

Anthonius J. J. C. Lommers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

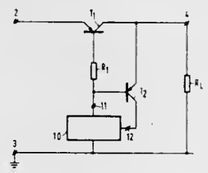
Filed Jun. 16, 1987, Ser. No. 62,918
Claims priority, application Netherlands, Jul. 2, 1986, 8601718
Int. Cl.⁴ G05F *1/56*
U.S. Cl. 323—276 **14 Claims**

1. A circuit arrangement comprising:

a first transistor of a first conductivity type having an emitter coupled to a first power-supply terminal, a collector coupled to an output terminal, and a base,

a drive circuit for driving the first transistor, said drive circuit being coupled to a second power supply terminal and having an output coupled to the base of the first transistor, and

a limiting circuit for limiting the voltage between the emitter and the collector of the first transistor to a specific value by reducing the drive to the first transistor when said voltage decreases below said specific value, wherein the limiting circuit comprises a first resistor connected between the output of the drive circuit and the base of the first transistor, and a second transistor of the first conductivity type having an emitter coupled to the collector of the first transistor, a collector coupled to a control input of the drive circuit, and a base coupled to that end of the first resistor which is situated nearest the drive circuit output.

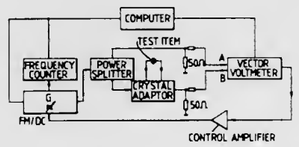


4,782,281

METHOD OF MEASURING THE PARAMETERS OF A RESONATOR

Roger J. Williamson, Harlow, Great Britain, assignor to STC plc, London, England

Filed Mar. 16, 1987, Ser. No. 25,947
Claims priority, application United Kingdom, Apr. 16, 1986, 8609311
Int. Cl.⁴ G01R *27/02*
U.S. Cl. 324—57 Q **3 Claims**



1. A method of measuring parameters including resonant frequency of a resonator, which includes:

installing the resonator to be measured in a testing jig which acts as an interface between the resonator to be measured and measuring means;

calculating the admittance of the resonator from the voltage transfer functions of the network which includes the resonator, which admittance is expressed in the form of a circle;

effecting initial measurements of the transfer function from which an approximate admittance circle is calculated;

using the circle as thus calculated to calculate optimum measurement positions for subsequent curve-fitting routines, which positions are symmetrically located around a series resonance position for the resonator; and

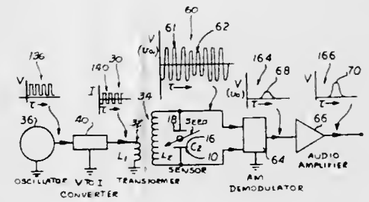
calculating the parameters of the resonator by least square fitting of the admittance circle and then the variation of phase or admittance around the circle with frequency.

4,782,282

CAPACITIVE-TYPE SEED SENSOR FOR A PLANTER MONITOR

Wesley J. Bachman, Auburn, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Jul. 9, 1986, Ser. No. 883,558
Int. Cl.⁴ G01R *27/26*
U.S. Cl. 324—61 R **24 Claims**



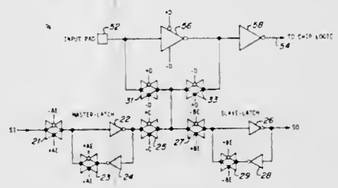
1. A sensor apparatus for detecting a flow of material along a given path of travel by detecting a change in the dielectric properties of a portion of said path of travel as the material passes therethrough, said apparatus comprising: electrode means disposed adjacent said path of travel and generally defining a capacitor having that portion of the path of travel adjacent thereto as a dielectric portion, such that the passage of material to be detected along the path of travel changes the dielectric constant thereof, thereby changing the capacitance of the capacitor defined by the electrode means; and a sensor circuit comprising a tuned circuit having said capacitor defined by the electrode means coupled in circuit therewith; said sensor circuit further comprising an oscillator circuit driving said tuned circuit at a predetermined frequency,, said predetermined frequency being selected removed from the resonant frequency of said tuned circuit in the absence of said material to be detected by an amount sufficient to cause a change in the voltage across the tuned circuit due to the flow of material along the path of travel to occur substantially entirely within a substantially constant slope, linear region of a pair of voltage-frequency curves characteristic of the response of the tuned circuit in the absence of said material and in the presence of said material respectively; said sensor circuit further including an AM demodulator circuit coupled therewith for developing a sensor circuit output signal at a substantially constant signal level in the absence of material to be detected and for producing a measurable change in said signal level when the material to be detected is present.

4,782,283

APPARATUS FOR SCAN TESTING CMOS INTEGRATED SYSTEMS

John J. Zasio, Sunnyvale, Calif., assignor to AIDA Corporation, Santa Clara, Calif.

Filed Aug. 22, 1986, Ser. No. 899,166
Int. Cl.⁴ G01R *15/12;* **G11C** *11/28*
U.S. Cl. 324—73 R **7 Claims**



1. An integrated circuit having internal functional circuitry integrally formed on a chip with testing circuitry, where the testing circuitry includes an interconnected plurality of shift register stages and control circuitry therefor integrally formed near the perimeter of the chip with signal pads disposed near the perimeter of the chip for supplying signals to the functional circuitry and to the testing circuitry, the integrated circuit comprising:

buffer means selectably operable in one of three logic operating states coupled between a signal pad and the functional circuitry of the chip; and

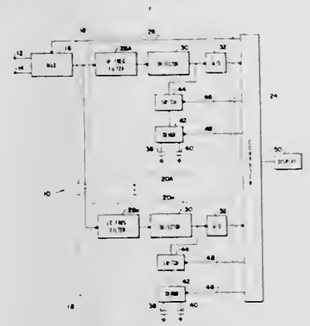
transfer gating means connected for selectively intercoupling the buffer means and selected ones of the plurality of shift register stages for bidirectionally transferring signals between the corresponding signal pad and shift register stage in response to control signals applied to the transfer gating means from said control circuitry.

4,782,284

FREQUENCY ANALYZER

Robert W. Adams, Acton, and Donald M. Boettger, Millbury, both of Mass., assignors to BSR North America Ltd., Newton, Mass.

Filed Jan. 12, 1988, Ser. No. 142,940
Int. Cl.⁴ G01R *23/16*
U.S. Cl. 324—77 B **36 Claims**



1. Apparatus for determining the frequency response, within at least one frequency band, of a frequency dependent system defined by a system input for receiving a system input signal and a system output for providing a system output signal in response to the system input signal, said apparatus comprising:

a first signal path for receiving and transmitting said system input signal;

a second signal path for receiving and transmitting said system output signal;

signal processing means, including an input and an output, for providing a signal output representative of the signal energy within said frequency band of each of said system input and output signals;

switching means, having a pair of inputs respectively coupled to said signal paths and an output coupled to the input of said signal processing means, for alternatively coupling said first and second signal paths to the input of said signal processing means at a predetermined sampling rate so that said signal processing means provides, at alternating sampling periods of a predetermined length, a first signal representative of the signal energy of said system input signal within said frequency band during each of the sampling periods said first signal path is coupled to the input of said signal processing means, and a second signal representative of the signal energy of said system output signal within said frequency band during each of the sampling periods said second signal path is coupled to the input of said signal processing means; and

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signal analyzing means, coupled to the output of said signal processing means, for determining said frequency response as a function of said first and second signals.

4,782,285

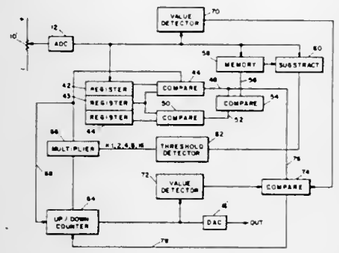
VARIABLE RESOLUTION CONTROL SYSTEM

Lloyd R. Bristol, Tigard, and Alfred K. Hillman, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 928,602, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 576,296, Feb. 2, 1984, abandoned. This application Oct. 19, 1987, Ser. No. 112,019

Int. Cl.[4] G01R *17/02, 15/10;* **H34B** *1/64*

U.S. Cl. 324—98 **11 Claims**



1. A variable resolution control system in which a variable analog input, having a given range of bi-directional amplitude adjustment, is converted into an analog output having an effectively larger range of adjustment, comprising:

means for detecting a reversal in the direction of increase or decrease of the amplitude of said variable analog input;

means for changing said analog output in proportion to said analog input over a first range of change of the amplitude of said analog input in a given direction following detection of a reversal; and

means for detecting an interval of change since said detected reversal for causing said means for changing said analog output to increase the proportionality factor between said output and input for successive ranges of change of said input in said given direction.

4,782,286

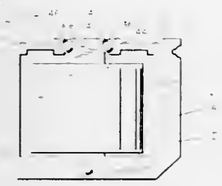
LIGHT LOAD ADJUSTMENT AND AIR GAP STABILIZATION IN VOLTAGE STATORS

David C. Coburn, Somersworth, N.H.; Aaron R. Dennis, Fort Wayne, Ind., and Glenn A. Watts, Eliot, Me., assignors to General Electric Company, Somersworth, N.H.

Filed Dec. 22, 1986, Ser. No. 944,073

Int. Cl.[4] G01R *11/02*

U.S. Cl. 324—137 **7 Claims**



4. A method for stabilizing first and second auxiliary air gaps in a core of a voltage stator, comprising:

forming first and second facing grooves in facing surfaces of said first auxiliary air gap;

inserting a first non-magnetic metallic spacer in said first and second facing grooves;

said first non-metallic spacer forming first and second interface lines with contiguous portions of said voltage stator core;

forming third and fourth facing grooves in facing surfaces of said second auxiliary air gap;

inserting a second non-magnetic metallic spacer in said third and fourth facing grooves;

said second non-metallic spacer forming third and fourth interface lines with contiguous portions of said second auxiliary air gap;

forming a first weld in a first direction at a first one of said first, second, third and fourth interface lines;

forming a second weld in a second direction at a second one of said first, second, third and fourth interface lines;

forming a third weld in a third direction at a third one of said first, second, third and fourth interface lines;

forming a fourth weld in a fourth direction at a fourth one of said first, second, third and fourth interface lines; and

selecting a sequence of said first one, second one, third one and fourth one effective for controlling an inherent light load error in said voltage stator.

4,782,287

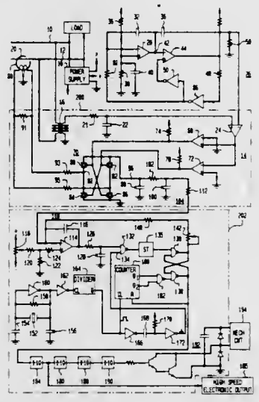
WATT-HOUR METER

Thomas I. Marx, Hingham, Mass., assignor to Sigma Instruments, Inc., Braintree, Mass.

Continuation of Ser. No. 553,184, Nov. 18, 1983, abandoned. This application Oct. 30, 1986, Ser. No. 924,897

Int. Cl.[4] G01R *21/06, 11/00*

U.S. Cl. 324—142 **7 Claims**



3. An energy meter for measuring energy as as function of power, comprising:

pulse generating means for producing a pulse width modulated signal representing one component of power in the energy to be measured;

chopper means responsive to another component of power in the energy to be measured for chopping the signals of the other component on the basis of the pulse width modulated signals and for smoothing the chopped signal;

pulse forming means for producing a plurality of output pulses;

spacing means coupled to said pulse forming means and said chopper means for spacing the output pulses of said pulse forming means in response to the output of said chopper means;

counting means for counting the number of spaced pulses;

said components being voltage and current;

said chopper means including sensing means for sensing the current, a chopper having a chopped output, and means for smoothing the output of the chopper and applying the output of the chopper to said spacing means, said chopper including only switches and passive elements;

said pulse generating means including triangle waveform forming means for forming triangle waveforms; and

comparing means for comparing the one component of the power of the energy to be monitored with the triangle waveforms so as to produce a pulse stream whose pulses have durations based on the comparison of the one component and the waveform;

said chopper including a bridge having the switching elements, said bridge being responsive to the other component of power in the energy to be monitored and to said pulse width modulated signals for reversing the polarity of the other of the signals in dependence upon the momentary polarity of the pulse width modulated signals.

4,782,288

METHOD FOR EVALUATING PROCESSING PARAMETERS IN THE MANUFACTURE OF SEMICONDUCTOR DEVICES

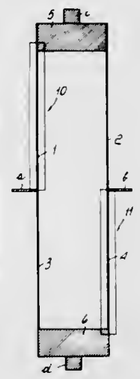
Giuseppe Vento, Agrate Brianza, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy

Filed Dec. 24, 1986, Ser. No. 946,239

Claims priority, application Italy, Dec. 31, 1985, 23417 A/85

Int. Cl.[4] G01R *17/00, 31/00*

U.S. Cl. 324—158 R **22 Claims**



19. A resistive bridge for evaluating processing parameters in the manufacture of semiconductor devices, having a pair of test resistive arms and a pair of reference resistive arms formed in a single semiconductor layer, wherein said bridge is symmetrical, each pair of resistive arms being formed by two equal and diagonally opposite line-shaped resistors, and said test resistive arms comprise resistors having a topography which is correlated to a processing parameter to be evaluated, wherein said test resistive arms comprise a plurality of adjacent lines.

4,782,289

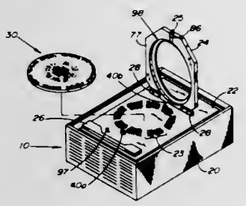
POSITIONING FIXTURE FOR INTEGRATED CIRCUIT CHIP TESTING BOARD

Charles H. Schwar, Irvine, and John D. Platt, South Laguna, both of Calif., assignors to Hilevel Technology, Inc., Irvine, Calif.

Filed May 30, 1986, Ser. No. 869,131

Int. Cl.[4] G01R *31/02*

U.S. Cl. 324—158 F **12 Claims**



1. An apparatus for accurately positioning an integrated circuit chip testing board in a design verification system for testing integrated circuits to ensure uniform electrical connection of the testing board and minimization of the application of erroneous signals to the testing board, the testing board having a central matrix of points at which the pins of an integrated circuit chip may be electrically coupled and an outer array of contact points electrically connectable to the central matrix, said apparatus comprising:

a testing platform with an array of electrical connectors protruding from the surface of said platform;

means for aligning the outer array of contact points on the testing board with said array of electrical connectors on said testing platform;

a hinged frame attached to said testing platform for clamping the testing board on said testing platform to electrically connect said contact points and said connectors so that the electrical coupling between each of the contact points and each of said electrical connectors is substantially identical, said hinged frame having a circumferential lip which directly abuts the testing board and holds it in place on said testing platform; and

a latch mounted on said testing platform and engageable with said hinged frame to hold said hinged frame substantially parallel with said testing platform to ensure uniform contact of said electrical connectors with said testing board.

4,782,290

APPARATUS FOR MEASURING CHARACTERISTICS OR ELECTRONIC DEVICES

Ryoichi Sakai, Kanagawa, and Hisashi Tamamura, Tokyo, both of Japan, assignors to Sony/Tektronix, Inc., Japan

Division of Ser. No. 780,957, Sep. 27, 1985, Pat. No. 4,727,318. This application Jul. 17, 1987, Ser. No. 74,910

Claims priority, application Japan, Oct. 4, 1984, 59-208791; Oct. 4, 1984, 59-208792; Oct. 26, 1984, 59-225553; Dec. 5, 1984, 59-257196

Int. Cl.[4] G01R *31/22*

U.S. Cl. 324—158 D **7 Claims**

1. An apparatus for measuring characteristics of electronic devices, comprising:

generator means for generating an alternating voltage in phase with an AC line voltage;

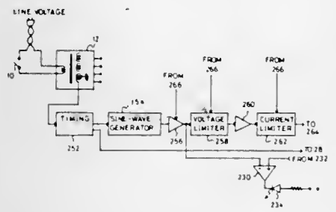
voltage supply means for supplying the alternating voltage from said generator means to an electronic device under test;

voltage and current limiter means provided between said generator means and said voltage supply means, said limiter means limiting a voltage and a current to be ap-

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plied to said electronic device to respective selected ranges of values;

voltage detector means for detecting the voltage across said electronic device;



current detector means for detecting the current flowing through said electronic device, and

display means for displaying the characteristics of said electronic device in accordance with output signals from said voltage detector means and said current detector means.

4,782,291

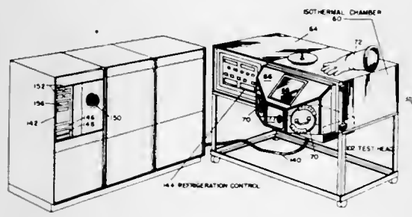
METHOD AND APPARATUS FOR THE TESTING OF ACTIVE OR PASSIVE ELECTRICAL DEVICES IN A SUB-ZERO ENVIRONMENT

Bruce A. Blandin, 698 LaFayette Dr., Hampton, N.H. 03842

Filed Oct. 4, 1985, Ser. No. 784,390

Int. Cl.[4] G01R *31/02, 31/28*

U.S. Cl. 324—158 F **9 Claims**



1. Apparatus for batch testing finished packaged electronic devices in a sub-zero environment, said packaged devices having semiconductor devices contained within said package, with conductors at least at a surface of the package comprising:

an isothermal chamber having insulated walls;

means for maintaining said isothermal chamber at a predetermined sub-zero temperature with a dry cooling fluid;

means for supporting the finished packaged devices to be tested within said chamber;

a test socket in said chamber having lead means extending exteriorly of said chamber through the insulation thereof;

means for moving a finished packaged device from a position within said chamber to said socket after all of the devices in said chamber are brought to said predetermined sub-zero temperature; and

means for providing test signals from a position exterior of the chamber via said socket lead means to the socket within the chamber to functionally test the devices therein at said sub-zero temperature, said finished packaged device moving means including means for removing a device from the socket after the tested device has been tested, the base of said chamber having detent mounting receptacles therein, said apparatus and further including a support plate having locator pins mounted upwardly therefrom and adapted to snap into said mounting receptacles in the bottom of said chamber, said support plate including a load board having a lead frame structure thereon and at least one socket extending upwardly therefrom,

the base of said chamber having an aperture therethrough, a bottom circuit board in said aperture having downwardly-extending contact means adapted to mate with the socket on said load board, a top circuit board in said aperture and having said test socket thereon, said top circuit board having interconnected contact means on the top and bottom surfaces thereof, and means for electrically connecting said downwardly-extending contact means to the contact means at the bottom surface of said top circuit board, said aperture being filled with thermally insulating material between top and bottom circuit boards.

4,782,292

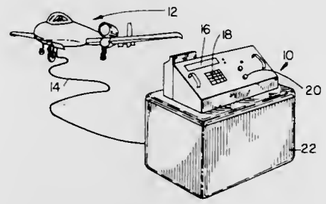
PORTABLE SERVOACTUATOR TEST SYSTEM

Dennis Gilfoy, Fillmore, and Charles S. McBride, Canoga Park, both of Calif., assignors to HR Textron, Inc., Valencia, Calif.

Filed Apr. 23, 1984, Ser. No. 603,014

Int. Cl.[4] G01R *31/00*

U.S. Cl. 324—158 R **3 Claims**



1. A portable testing system for use by an operator for on-board flight line testing of servoactuators on aircraft comprising:

(A) a housing containing the portable system;

(B) cable means for interconnecting said system to an aircraft to provide electrical signals simulating flight control for testing preselected servoactuators on said aircraft;

(C) means for selecting one of a plurality of servoactuators on said aircraft including an interface means for use by the operator and for selecting a sequence of test to be applied to said selected actuator for testing said selected actuator without mechanically disconnecting said selected actuator from said aircraft;

(D) means for generating a plurality of electrical command signals simulating flight control of said servoactuator which has been selected for testing;

(E) means for selectively sequentially applying said plurality of electrical command signals to said preselected servoactuator for causing said actuator to react responsively thereto;

(F) means for receiving from said actuator test results electrical signals generated responsive to reactions of said actuator to said command signals;

(G) means for comparing said test results signals to predetermined tolerance values to ascertain operability of said selected servoactuator;

(H) means for automatically applying the next sequential command signal when the compared test results are within said predetermined tolerances;

(I) means for automatically stopping said sequential application of said command signals responsive to said test results being outside said tolerances; and

(J) means for providing an indication to an operator that said selected actuator has failed to provide signals within said tolerances.

4,782,293

PROCESS FOR ADJUSTING THE MAGNETIC FIELD STRENGTH OF PERMANENT MAGNETS

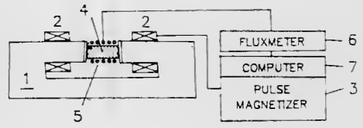
Dietrich Steingroever, 5060 Berg.-Gladbach 1, and Erich Steingroever, Flensburger Str. 33, 5300 Bonn 1, both of Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,401

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609530

Int. Cl.[4] G01N *27/74;* **G01R** *33/12;* **H01H** *47/00;* **H01F** *7/20*

U.S. Cl. 324—205 **9 Claims**



1. A process for automatically setting the operating point of permanent magnets to a specific value by means of successive demagnetizing pulses, characterized by the fact that the strength of the pulse is determined anew in each case from the ratio between the operating point reached and the desired operating point in a geometric progression.

4,782,294

METHOD OF MEASURING VARIATION IN THE ELONGATION OF A VERY LONG MAGNETIZABLE ELEMENT OF SMALL TRANSVERSE DIMENSIONS, AND APPARATUS FOR IMPLEMENTING THE METHOD

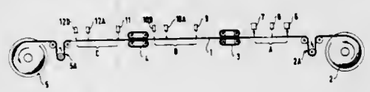
Jean-Francois Libert, Condette; Eric Milhamont, Calais; Jean-Luc Canivet, Oye Plage, and Jean-Patrick Vives, Calais, all of France, assignors to Les Cables de Lyon, Lyons, France

Filed Feb. 20, 1987, Ser. No. 16,780

Claims priority, application France, Feb. 27, 1986, 86 02738

Int. Cl.[4] G01B *7/04;* **B65H** *61/00*

U.S. Cl. 324—206 **9 Claims**



1. A method of measuring variation in the elongation of a very long element of small transverse dimensions and made of magnetizable material, the method comprising running the element through a first elongation zone in which a first elongation is imparted to the element and a second elongation zone in which a second elongation is imparted to the element, the elongation of the element being different in the second zone than in the first zone; periodically magnetically marking the elongate element simultaneously at two points spaced apart by a predetermined distance therealong in the first zone; detecting the instants at which said magnetic marks pass at least one point situated in the second zone; and providing in response to detecting the passage of said magnetic marks an indication of the variation in elongation of the element between the first and second zones.

4,782,295

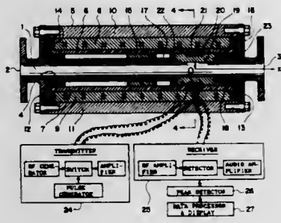
NUCLEAR MAGNETIC RESONANCE FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Jun. 1, 1987, Ser. No. 56,001

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—306 **11 Claims**



1. An apparatus for measuring fluid flow comprising in combination:

(a) a magnet providing a generally constant magnetic field in a region having a sizable lengthwise dimension, wherein magnetic fluxes in said magnetic field are generally perpendicular to a longitudinal axis parallel to said lengthwise dimension;

(b) an elongated conduit disposed in said magnetic field, said elongated conduit including a flow passage generally parallel to said longitudinal axis;

(c) a combination of a transmitter coil and a receiver antenna disposed at one section of said elongated conduit within said magnetic field for producing a localized alternating magnetic field generally perpendicular to said constant magnetic field and for receiving electromagnetic emission emitted by a localized fluid mass contained in said conduit, which is energized by said localized alternating magnetic field;

(d) an electronic transmitter for energizing said transmitter coil with a series of pulsed alternating currents oscillating at a nuclear magnetic resonance frequency of the fluid in said conduit, said electronic transmitter including a pulse control means for controlling value of time interval between pulses of said alternating currents, wherein the pulsed alternating currents with a controlled value of the time interval generate a series of pulsed electromagnetic emissions with peak values increasing with increasing fluid velocity; and

(e) an electronic receiver for detecting said peak values of the series of pulsed electromagnetic emissions as a measure of the fluid velocity.

4,782,296

ELECTRON SPIN RESONANCE SPECTROMETER

Klaus-Dieter Schmalbein, Marxzell-Burbach, and Károly Holczer, Karlsruhe, both of Fed. Rep. of Germany, assignors to Bruker Analytische Mebtechnik GmbH Silberstetten-, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,590

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726045

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—316 **5 Claims**

1. An electron spin resonance spectrometer comprising:

an electromagnet for generating a magnetic field of constant strength and high homogeneity over a predetermined space;

a microwave resonator arranged in said space and receiving a sample under investigation;

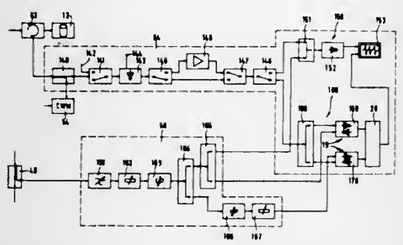
a microwave generator for generating a continuous wave microwave signal and for supplying microwave energy to a microwave bridge, said microwave bridge being con-

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nected to said resonator to supply microwave energy to said resonator and being, further, connected to signal detection means for receiving and processing signals emitted from said resonator;

a microwave divider having a first and a second output for dividing said microwave continuous wave signal from said microwave generator into two portions;

a first low-power continuous wave channel connected to said first output of said microwave divider and comprising means for adjusting the phase and amplitude one of said microwave signal portions to provide a first output continuous wave signal in the Milliwatt-range;



a second high-power pulse channel connected to said second output and comprising means for switching and amplifying and for adjusting phase and amplitude of the other of said microwave signal portions to provide a second an output pulse signal being in the Wattrange;

a microwave combiner for combining said first and second output signals and for feeding said combined signals to said microwave bridge;

means for operating said low-power continuous wave channel and said high-power pulse channel either separately or jointly.

4,782,297

ELECTRON SPIN RESONANCE SPECTROMETER

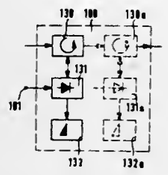
Klaus-Dieter Schmalbein, Marxzell-Burbach, and Károly Holczer, Karlsruhe, both of Fed. Rep. of Germany, assignors to Bruker Analytische Mebtechnik GmbH Silberstein, Rheinstetten-Forcheim, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,535

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726051

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—316 **4 Claims**



1. An electron spin resonance spectrometer comprising:

an electromagnet for generating a magnetic field of constant strength and high homogeneity over a predetermined space;

a microwave resonator arranged in said space and receiving a sample under investigation;

a microwave generator for generating a continuous wave microwave signal and for supplying microwave energy to a microwave bridge, said microwave bridge being connected to said resonator to supply microwave energy to said resonator and being, further, connected to signal detection means for receiving and processing signals emitted from said resonator;

a high-power microwave pulse forming channel being arranged between said microwave generator and said microwave bridge for feeding high-power microwave pulses to said resonator;

an attenuator being arranged between an output of said microwave pulse forming channel and an input of said microwave bridge, said attenuator comprising a circulator having a plurality of subsequent connectors, a first connector being connected to said output of said microwave pulse forming channel, a second connector being connected to a microwave switching diode arranged in series to a microwave absorber and being controlled by a switching input, and a third connector being connected to said microwave bridge.

4,782,298

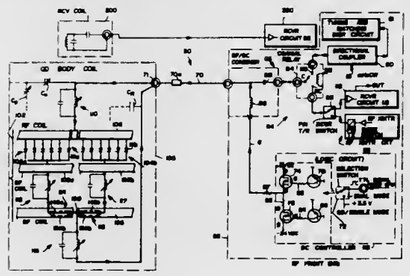
MRI QD RF COIL HAVING DIODE SWITCHED DETUNING CIRCUIT PRODUCING REDUCED ARTIFACT

Mitsuaki Arakawa, Hillsborough, and Barry M. McCarten, Los Altos, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 1, 1987, Ser. No. 91,916

Int. Cl.⁴ G01R *33/20*

U.S. Cl. 324—322 **21 Claims**



1. Magnetic resonance imaging apparatus comprising:

resonant RF circuit means for resonating at a predetermined radio frequency, said resonant circuit means including an RF coil;

means coupled to said RF coil and also connected to a DC control signal for preventing said resonant circuit means from resonating at said predetermined frequency in response to a first DC control signal level and for drawing a DC current through said RF coil in response to a second DC control signal level, said DC current generating a first magnetic field; and

further structure disposed in proximity to said RF coil and connected to said preventing means for generating a further magnetic field substantially cancelling said first magnetic field in response to said second DC control signal level.

4,782,299

METHODS OF ARC AND CORONA MONITORING FOR HIGH VOLTAGE GENERATORS

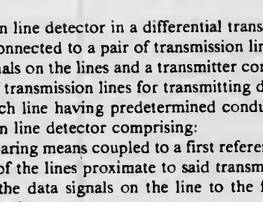
Michael A. Argentieri, West Orange, N.J., assignor to ITT Avionics, A Division of ITT Corporation, Nutley, N.J.

Filed Mar. 9, 1987, Ser. No. 23,363

Int. Cl.⁴ G01R *31/12*

U.S. Cl. 324—501 **19 Claims**

1. A method for monitoring the generation of a luminous discharge event associated with the malfunction of a high voltage generator which generator contains high voltage generating components located in the hollow of a housing shielded from ambient light comprising the steps of:



placing photographic film at various locations within said housing and positioning said film with respect to said components to cause said film to be exposed upon the generation of said discharge when said generator is providing said high voltage, and developing said film after exposure to determine the location of said discharge.

4,782,300

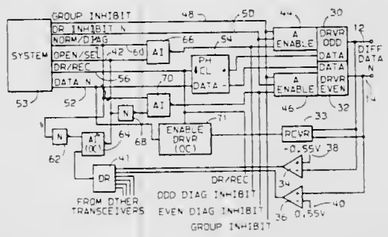
DIFFERENTIAL TRANSCEIVER WITH LINE INTEGRITY DETECTION

Anthony R. Bonaccio, Colchester, Vt.; Brent A. Carlson, Rochester; Lloyd S. Heim, Oronoco, both of Minn.; Kenneth A. Moe, Los Gatos, Calif., and Steven A. Schmitt, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1986, Ser. No. 835,674

Int. Cl.⁴ G01R *31/02;* **H04B** *3/46, 17/00*

U.S. Cl. 324—509 **23 Claims**



1. An open line detector in a differential transceiver having a receiver connected to a pair of transmission lines for receiving data signals on the lines and a transmitter connected to the same pair of transmission lines for transmitting data signals on the lines, each line having predetermined conductive properties, the open line detector comprising:

first comparing means coupled to a first reference signal and to one of the lines proximate to said transmitter for comparing the data signals on the line to the first reference signal; and

second comparing means coupled to a second reference signal and to the other one of the lines proximate to said transmitter for comparing the data signals on the line to the second reference signal, wherein a substantial reduction of the data signal conductive properties of at least one of the lines causes the comparator means coupled to said line during transmission of data signals to provide an output signal indicative to said comparisons.

4,782,301

FUSE INSPECTION DEVICE

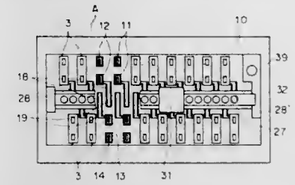
Hikoo Dohi; Akihiko Fujita, and Ryuetsu Oikawa, all of Kosai, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 9, 1986, Ser. No. 939,801

Claims priority, application Japan, Dec. 27, 1985, 60-292913

Int. Cl.⁴ H01H *85/32;* **G01R** *31/02;* **G08B** *21/00*

U.S. Cl. 324—550 **5 Claims**



1. A fuse inspection device comprising:

a fuse box;

plural pairs of receiving terminals arranged within said fuse box, each pair having a first receiving terminal and a second receiving terminal for receiving a fuse therein;

connecting terminals each having a base plate and a first elastic contact element, said connecting terminals being arranged substantially in an identical plane within said fuse box such that the base plate of each connecting terminal is aligned in a row with the base plates of other connecting terminals with spacings therebetween, said first elastic contact element being urged in a direction parallel to said identical plane against each first receiving terminal; and

slide contact means slidably provided along the base plates of said connecting terminals and having a second elastic contact element urged in a direction perpendicular to said identical plane toward said row for selectively contacting one of said base plates at one end thereof and connected at another end thereof to light emitting means.

4,782,302

DETECTOR AND ENERGY ANALYZER FOR ENERGETIC-HYDROGEN IN BEAMS AND PLASMAS

Robert J. Bastasz, Livermore, Calif.; Robert C. Hughes, and William R. Wampler, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 31, 1986, Ser. No. 925,590

Int. Cl.⁴ G01N *27/40, 27/12*

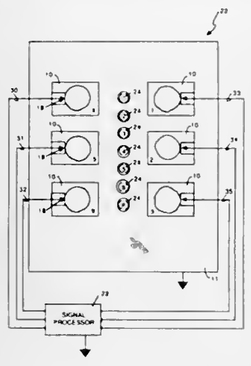
U.S. Cl. 324—71.3 **5 Claims**

1. A plasma or beam energy spectrum analyzer, comprising:

a plurality of energetic-hydrogen sensors selectively responsive to hydrogen ions and atoms of different kinetic ener-

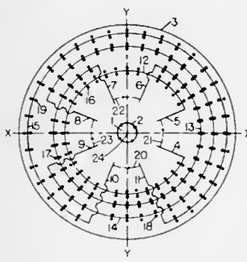
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gies in a plasma or a beam, said sensors providing electrical signals, and



means for processing the signals from said sensors to provide an energy analysis of the hydrogen ions and atoms in a plasma or beam.

4,782,303
CURRENT GUIDING SYSTEM
William I. Linlor, 107 Boyden La., Fortuna, Calif. 95540
Filed Apr. 6, 1987, Ser. No. 34,626
Int. Cl.[4] H05H *1/03*
U.S. Cl. 328—228 **9 Claims**



1. In an apparatus having:
a. an axis;
b. a current that flows along said axis; a current-guiding system comprising:
c. an array of magnetic materials surrounding said current, said array being symmetrically arranged with respect to said axis and being magnetized by said current, thereby producing magnetic fields to guide said current along said axis.

2. In an apparatus having:
a. an axis;
b. a charged particle beam current that flows along said axis; a current-guiding system comprising:
c. an array of magnetic materials surrounding said current, said array utilizing the magnetomotive force of said current to produce magnetic fields that guide said current along said axis; said array consisting of magnetic units arranged symmetrically with respect to said axis; each of said units consisting of a pair of approximately radial magnetic vanes having an angular separation approximately given by:

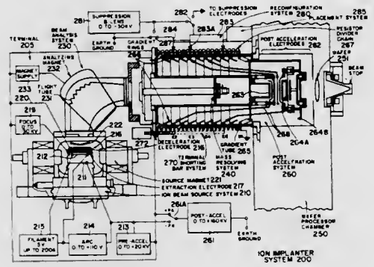
$$\text{Vane angle} = 180/n$$

wherein n denotes the number of said magnetic units, each vane pair being connected by a magnetic member encircling said current, said magnetic member having a uniformly-distributed coil having ampere-turns opposing the magnetomotive force of said current approximately in accordance with the relation:

$$\text{Ampere-turns} = -I(n-1)/n$$

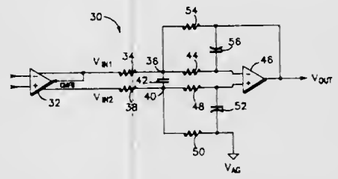
wherein I represents said current and n represents the number of said magnetic units.

4,782,304
SYSTEMS AND METHDS FOR ION BEAM ACCELERATION
Derek Aitken, South Holmwood, England, assignor to Applied Materials, Inc., Santa Clara, Calif.
Filed Aug. 20, 1986, Ser. No. 898,389
Int. Cl.[4] H01J *37/04, 37/317*
U.S. Cl. 328—233 **23 Claims**



1. In a system for post-accelerating a beam of ions between a beam input voltage and a beam destination voltage;
an electrode system having a first electrode at said beam input voltage, a last electrode at said beam destination voltage, and a set of intermediate electrodes therebetween;
means establishing a first beam acceleration mode, including first means for applying a first set of voltages to said set of intermediate electrodes to create a working beam acceleration region having a substantially linear voltage gradient;
means establishing a second beam acceleration mode, including second means for applying a second set of voltages to said set of intermediate electrodes to create a working beam acceleration region having a substantially non-linear voltage gradient to increase the beam focusing power within said working beam acceleration region; and
wherein said ion beam comprises a beam of ions of a selected polarity which have been pre-accelerated to a preselected initial energy at said first electrode and are accelerated to a final energy between said first electrode and said last electrode, said set of intermediate electrodes comprises at least a single electrode, and said second set of voltages comprises at least a single voltage of greater relative beam-attracting potential than both said beam input voltage and said beam destination voltage so that said ion beam is first positively accelerated between said first electrode and said intermediate electrode to an energy greater than said final energy and then negatively accelerated between said intermediate electrode and said last electrode to said final energy.

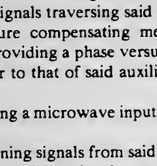
4,782,305
DIFFERENTIAL INPUT-SINGLE OUTPUT TWO POLE FILTER IMPLEMENTED BY A SINGLE AMPLIFIER
Alan L. Westwick, and Carlos A. Greaves, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 2, 1987, Ser. No. 104,008
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—107 **8 Claims**



6. A filter circuit which receives differential input signals and implements a predetermined transfer function to provide a single output signal, comprising:
a differential amplifier having first and second inputs. and an output for providing the output signal;
first circuit means coupled to the differential amplifier for receiving a first of the differential input signals, said first circuit means implementing in part the predetermined transfer function and comprising:
a first resistor having a first terminal for receiving the first of the differential input signals, and having a second terminal;
second resistor having a first terminal coupled to the second terminal of the first resistor, and having a second terminal coupled to the output of the differential amplifier;
a third resistor having a first terminal coupled to the second terminal of the first resistor, and having a second terminal coupled to the first input of the differential amplifier; and
first capacitance means having a first electrode coupled to the first input of the differential amplifier, and having a second electrode coupled to the output of the differential amplifier;
second circuit means coupled to the differential amplifier for receiving a second of the differential input signals, said second circuit means further implementing the predetermined transfer function; and
second capacitance means coupled between the first and second circuit means and to the differential input signals for further implementing the predetermined transfer function, said second capacitance means utilizing a differential voltage between the differential input signals when further implementing the predetermined transfer function.

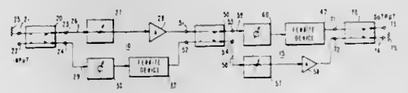
4,782,306
POWER AMPLIFIER
Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890
Filed Mar. 18, 1987, Ser. No. 27,561
Int. Cl.[4] H03F *3/26*
U.S. Cl. 330—262 **17 Claims**

1. Power amplifier, comprising:
an input amplifier means for amplifying the input signal of the power amplifier and providing a first and second output signals;
a first and second transistors of a first and second conductivity types respectively each having a base, emitter and collector, wherein the emitters are coupled together and the base of the first transistor is coupled to receive the first output signal of the input amplifier means;
a third transistor of the first conductivity type having a first and second electrodes and also having a collector coupled to the collector of the second transistor for providing an output signal of the power amplifier;
a means for applying the second output signal of the input amplifier means to the first electrode of the third transistor;
a first, second and third voltage sources;



a first means for coupling the first voltage source to the collector of the first transistor;
a second means for coupling the second voltage source to the base of the second transistor; and
a third means for coupling the third voltage source to the second electrode of the third transistor.

4,782,307
FEED-FORWARD MICROWAVE AMPLIFIER ARRANGEMENT WITH FERRITE TEMPERATURE COMPENSATION
Rui T. Hsu, Lawndale, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 8, 1987, Ser. No. 59,081
Int. Cl.[4] H03F *1/00, 3/60*
U.S. Cl. 330—151 **24 Claims**



1. A feed-forward microwave amplifier arrangement comprising:
a first signal path including a main amplifier;
a second signal path including means for adjusting the relative phase of signals traversing said first and second paths;
a third signal path including an auxiliary amplifier;
a fourth signal path including means for adjusting the relative phase of signals traversing said third and fourth paths and temperature compensating means including ferrite material for providing a phase versus temperature characterisitic similar to that of said auxiliary amplifier coupled in series;
means for applying a microwave input signal to said first and second paths;
means for combining signals from said first and second paths to provide an amplified signal containing distortion introduced by said main amplifier and an error signal representative of said distortion and for applying said error signal to said third path and said amplified signal containing distortion to said fourth path; and
means for combining signals from said third and fourth paths such that an amplified replica of said error signal substantially cancels the distortion on said amplified signal.

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4,782,308

CIRCUIT ARRANGEMENT OF A READING DEVICE FOR ELECTROMAGNETIC IDENTIFICATION CARDS

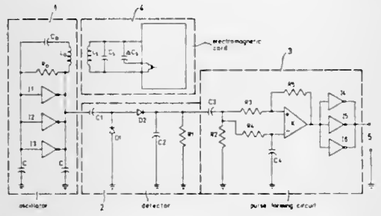
Franc Trobec, Trzic; Marko Zivlakovic, Kranj; Miro Rozman, Bled; Joze Zmavc, Kropa, and Vital Erzen, Dobrova, all of Yugoslavia, assignors to Iskra-Sozd Elektrokovinske Industrije n.sol.o, Ljubljana, Yugoslavia

Filed Mar. 6, 1987, Ser. No. 22,691

Claims priority, application Yugoslavia, Mar. 7, 1986, 340/86; Feb. 27, 1987, 314/87

Int. Cl.⁴ G06K *5/00*

U.S. Cl. 331—65 **5 Claims**



1. A circuit arrangement of a device for reading electromagnetic identification cards, comprising an oscillator (1, 1', 1''), a detector (2) and a pulse-forming circuit (3), said oscillator including a resonance circuit having a resistor (R_o, R) a capacitor (C_o, C_o', C5) and a coil L_o, L_o', L1) operatively interconnected in series and parallel connected inverters (11, 12, 13, I, 11', 12', 13') connected to the resistor, said inverters respectively having inputs and outputs, and capacitor means (C, C6) for interconnecting the inputs and outputs of the inverters with ground, said detector including a first coupling capacitor (C1) connected to said inverters of the oscillator, a grounded diode (D1), and coupling diode (D2), a first junction interconnecting the grounded diode and the coupling diode with said coupling capacitor, a first grounded capacitor (C2), a first grounded resistor (R1) and a second junction interconnecting the first grounded capacitor and the first grounded resistor with said coupling diode, said pulse-forming circuit including a second coupling capacitor (C3) connected to the second junction of the detector, a comparator (K) having positive and negative inputs and an output, a pair of resistors (R3, R4) respectively connected to said positive and negative inputs, a third junction interconnecting said pair of resistors with the second coupling capacitor, a second grounded resistor (R2) connected to said third junction, a second grounded capacitor (C4) connected to the negative input, a feedback resistor (R5) interconnecting the positive input and the output of the comparator, an output terminal (5) and a plurality of inverters (14, 15, 16) interconnected in parallel between the output of the comparator and the output terminal.

4,782,309

BILATERAL FREQUENCY ADJUSTMENT OF CRYSTAL OSCILLATORS

Albert Benjaminson, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1987, Ser. No. 66,808

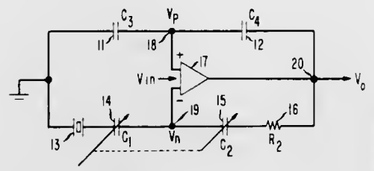
Int. Cl.⁴ H03B *5/32, 5/38*

U.S. Cl. 331—139 **8 Claims**

1. An oscillator circuit comprising:

a bridge circuit including a first pair of first and second connected arms, each having an impedance reactance means and a second pair of connected arms, the first arm of said second pair having a piezoelectric crystal connected in series with a capacitive reactance means, and the second arm of said second pair having a capacitive reactance means connected in series with a resistor;

a differential amplifier having an inverting input and a non-inverting input, said non-inverting input being connected between said first pair of arms and said inverting input being connected between said second pair of arms, the



output of said amplifier being connected between said second arm of said second pair and said second arm of said first pair.

4,782,310

HIGH FREQUENCY FILTER ASSEMBLY FOR ELECTRIC INSTRUMENT

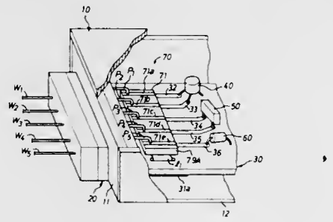
Toshiki Saburi, Anjo; Nobuyuki Obya, Kariya; Toru Yamazaki, Chiryu, and Taisei Katoh, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 26, 1986, Ser. No. 911,999

Claims priority, application Japan, Sep. 26, 1985, 60-213364

Int. Cl.⁴ H03H *7/01*

U.S. Cl. 333—167 **3 Claims**



1. A high frequency filter assembly for an electric instrument including a casing of metallic conductive material, an internal electric circuit element arranged within said casing, and a connector mounted on a peripheral wall of said casing for connecting an external electric circuit to said internal electric circuit element, said high frequency filter assembly comprising:

at least first, second, third and fourth insulation thin plates successively overlapped to be arranged between said connector and a connection terminal of said circuit element;

a first earth electrode strip disposed between said first and second insulation thin plates;

a second earth electrode strip disposed between said third and fourth insulation thin plates, said first and second earth electrode strips being connected to a portion of said casing;

a first signal electrode strip integrally provided on the upper surface of said first insulation thin plate for connection to said connector and being associated with said first earth electrode strip to form a first plate condenser;

a second signal electrode strip integrally provided on said third insulation thin plate and being associated with said first and second earth electrode strips to form second and third plate condensers; and

a third signal electrode strip integrally provided on the bottom surface of said fourth insulation thin plate for

connection to the connection terminal of said circuit element and being associated with said second earth electrode strip to form a fourth plate condenser;

wherein said second signal electrode strip is connected structurally in series at one end thereof with one end of said first signal electrode strip and at another end thereof with one end of said third signal electrode strip to electrically connect said plate condensers in parallel.

4,782,311

THREE TERMINAL FILTER

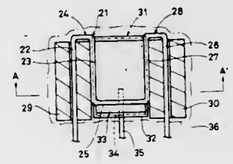
Akira Ookubo, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed May 27, 1987, Ser. No. 54,759

Claims priority, application Japan, Jun. 3, 1986, 61-85191[U]

Int. Cl.⁴ H03H *7/01*

U.S. Cl. 333—167 **14 Claims**



1. A three terminal filter comprising:

a hot lead terminal defined by a continuous conductor shaped to form a pair of substantially U-shaped first and second holding portions which are interconnected and spaced apart by a connecting portion and thereby held substantially parallel with each other to define therebetween a space, said U-shape of each of said first and second holding portions being defined by a pair of substantially parallel outer and inner leg portions interconnected by a head portion;

a pair of magnetic cores each mounted on a respective one of said outer leg portions of said holding portions and held between said outer leg portion and the corresponding inner leg portion;

a plate capacitor arranged between said magnetic cores in said space and having a pair of opposed electrodes, one of said electrodes being electrically connected to said hot lead terminal; and

a ground lead terminal arranged between said magnetic cores and electrically connected with the other said electrode of said capacitor.

4,782,312

MODE SELECTIVE MAGNETOSTATIC WAVE RESONATORS

Kok-Wai Chang, Sunnyvale, Calif.; Giuseppe Miccoli, Rome, Italy, and Waguih S. Ishak, Cupertino, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 22, 1987, Ser. No. 94,963

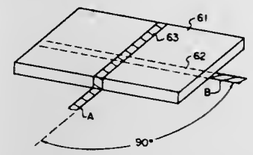
Int. Cl.⁴ H01P *7/06, 7/08*

U.S. Cl. 333—219 **15 Claims**

1. A magnetostatic wave resonator comprising:

a rectangular film of ferrimagnetic material having a set of walls that enclose a resonant cavity;

an input transducer for launching waves in said resonant cavity, said input transducer being located over a peak of



a resonant mode of interest to strongly couple into that mode.

4,782,313

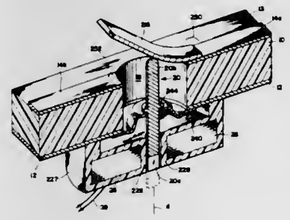
TRANSMISSION LINE SHORTING SWITCH

Donald S. Brant, Jr., South Brunswick Township, Middlesex County, N.J., assignor to General Electric Company, East Windsor, N.J.

Filed Jan. 12, 1988, Ser. No. 143,109

Int. Cl.⁴ H01P *1/10*

U.S. Cl. 333—246 **6 Claims**



1. A shorting switch for a transmission line, comprising:

a dielectric plate with substantially parallel first and second major surfaces, said plate defining a first aperture extending between said first and second major surfaces, said aperture having a periphery;

first and second unbalanced transmission lines terminating adjacent said periphery of said first aperture, each of said transmission lines including an elongated strip conductor lying on said first major surface of said dielectric plate overlying a common ground conductor lying on said second major surface of said dielectric plate;

a bridging element of conductive material mechanically and electrically connected to said strip conductor of said first transmission line and extending across at least a portion of said first aperture, said bridging element being dimensioned and formed in such a manner that in its resting state it presses against and makes electrical contact with said strip conductor of said second transmission line for forming a continuous circuit coupling said first and second transmission lines;

bridge opening and electrical grounding means comprising a conductive plunger mounted in said first aperture and electrically connected to said ground conductor, said plunger being actuable between retracted and actuated positions, said retracted position being one in which said plunger does not make contact with said bridging element, and said actuated position being one in which said plunger presses against said bridging element so as to disconnect said bridging element from said strip conductor of said second transmission line, whereby said first transmission line in said actuated state of said plunger is electrically and mechanically disconnected from said second transmission

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line for reducing coupling between said first and second transmission lines, and said bridging element is also electrically connected to ground for further reducing the coupling between said first and second transmission lines.

4,782,314

FLUID-TIGHT COUPLING DEVICE FOR MICROWAVES

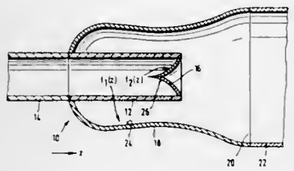
Günther Müller, Rudersberg, and Rolf Wilhelm, Calw/Stammheim, both of Fed. Rep. of Germany, assignors to Max-Planck Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany

Filed May 27, 1987, Ser. No. 54,850

Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617779

Int. Cl.⁴ H01P *1/08*

U.S. Cl. 333—252 **7 Claims**



1. A fluid-tight coupling means for microwave radiation of high energy comprising a first waveguide having an input end adapted to be coupled to a microwave source and an output end, a dielectric window in the form of a tube which forms a continuation of said waveguide having a first end sealed in a fluid-tight manner with said output end of said waveguide, a substantially conical microwave reflector sealed to a second end of said dielectric window which reflects the microwave radiation emerging axially from said output end of said waveguide laterally through said dielectric window, and an approximately cup-shaped second waveguide portion surrounding said dielectric window for reflecting said microwave radiation passing through said dielectric window substantially in a direction in which said microwave radiation emerges from said output end of said first waveguide towards an output end of said second waveguide.

4,782,315

BISTABLE POLARIZED ELECTROMAGNET

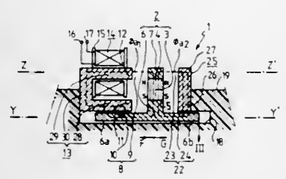
Christian Bataille, Ville d'Avray; Michel Lauraire, Courbevoie, and Elie Belbel, Epinay sur Seine, all of France, assignors to La Telemecanique Electrique, France

Filed Nov. 17, 1987, Ser. No. 121,719

Claims priority, application France, Nov. 19, 1986, 86 16071

Int. Cl.⁴ H01F *7/08*

U.S. Cl. 335—234 **7 Claims**



1. In a bistable polarized electromagnet having a fixed magnetizable circuit excited by a coil so as to give opposite magnetic polarizations to two pieces of this circuit placed facing each other, and a mobile armature which includes a permanent magnet whose internal flux flows parallel to these pieces and which moves between these two pieces so as to have a working air gap of variable thickness, and a sliding closure air gap of substantially constant thickness, placed in series with the first one, said closure air gap, which has a low reluctance conferred by a first pole piece fast with the magnet, is disposed in the vicinity of means for guiding the armature, said first pole piece, as well as a second pole piece fast with said magnet serving for channeling a holding flux in each of the two stable positions.

4,782,316

CORE WINDING WITH INORGANIC INSULATION BETWEEN THE INNER CONDUCTOR AND OUTER METAL SHEATH

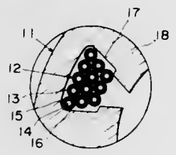
Yokichi Domeki; Masanori Nozaki, both of Hitachi; Hajime Ishimaru, Ibaraki, and Masao Tezuka, Hitachi, all of Japan, assignors to Sukegawa Electric Co., Ltd., Hitachi, Japan

Filed Nov. 14, 1986, Ser. No. 931,371

Claims priority, application Japan, Nov. 29, 1985, 60-270071; Feb. 12, 1986, 61-18513

Int. Cl.⁴ H01F *5/00*

U.S. Cl. 335—299 **12 Claims**



1. An electromagnetic part for use in electrical equipment comprising:

(a) a core and

(b) windings wound around said core, said windings being made with an inorganic insulating cable comprising conductive wires, a metal sheath surrounding said conductive wires and an inorganic insulating material provided between said conductive wires and said metal sheath.

4,782,317

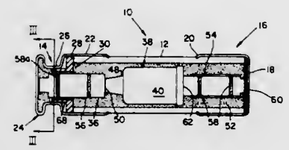
LOW VOLTAGE REJECTION FUSE HAVING AN INSULATING INSERT

Clifford J. Thwaites, Mississauga, Canada, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 4, 1987, Ser. No. 94,177

Int. Cl.⁴ H01H *85/16*

U.S. Cl. 337—251 **6 Claims**



1. An electric fuse comprising:

(a) a tubular casing of electric insulating material, said casing having a first open end at one axial end thereof and a second open end at the other axial end thereof;

(b) a first terminal cap receiving the portion of said tubular casing adjacent said first open end along substantially the entire axial length of said first cap to close said first open end of said casing;

(c) a second terminal cap closing said second open end of said casing, said second terminal cap having a portion of

restricted diameter in the lateral surface thereof, situated between the axially inner end and the end surface thereof to preclude insertion of the fuse into a fuse holder lacking an interference member engaging the outside diameter of said portion of restricted diameter; said second terminal cap receiving the portion of said tubular casing adjacent said second open end, said portion of restricted diameter allowing said tubular casing to be received in said second terminal cap for only a portion of the axial length of said second terminal cap;

(d) an elongated fusible element inside said casing, said fusible element conductively interconnecting said first and second terminal end caps and having a portion thereof extending axially along the portion of said second terminal cap not receiving said tubular casing; and

(e) an insulating insert disposed within said tubular casing and surrounding at least said portion of said fusible element extending along the portion of said second terminal not receiving said tubular casing, said insulating insert comprising a first portion in intimate contact with said second open end of said tubular casing and and a second portion forming an integral part thereof extending axially into the portion of restricted diameter of said second terminal cap to thereby provide an insulating barrier between said restricted portion of said second terminal cap and the portion of said fusible element adjacent said portion of restricted diameter.

4,782,318

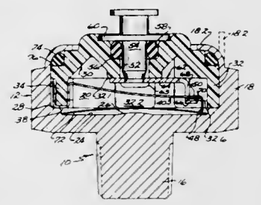
THERMALLY RESPONSIVE ELECTRIC SWITCH APPARATUS

Henry J. Boulanger, Nicholasville, Ky., assignor to Texas Instrumeots Incorporated, Dallas, Tex.

Filed Aug. 12, 1987, Ser. No. 84,528

Int. Cl.⁴ H01H *37/04, 37/52*

U.S. Cl. 337—380 **9 Claims**



1. A thermally responsive electric switch comprising a generally cup shaped housing formed of thermally and electrically conductive material having a bottom wall formed with a thermostatic disc seat in the bottom wall and having a generally cylindrical upstanding side wall extending from the bottom wall to define a switch cavity, an electrically insulative base member having a central hub portion and having a generally cylindrical depending side wall adapted to be telescopically and slidingly received within the side wall of the housing, means to secure the housing and base together, a bore formed through the hub, an electrical connector mounted in the bore, a stationary contact arm having a first portion connected to the connector and having a free distal end disposed in the switch chamber with a stationary contact mounted on the free distal end, an elongated movable contact arm formed of material having good electrical and spring characteristics, the movable contact arm having two opposite ends, one opposite end captured between the side walls of the housing and the base, a movable contact mounted on the other end with the other end extending into the switch cavity and adapted to move into and of engagement with the stationary contact, a thermostatic disc movable between oppositely dished configurations upon selected temperature conditions disposed on the disc seat, the movable contact arm having a portion bent out of the plane of the arm and extending toward an outer peripheral portion of the disc whereby movement of the disc from one of its configurations to the other configuration will transfer motion to the movable contact arm to disengage the movable contact from the stationary contact.

4,782,319

PRESSURE SENSOR

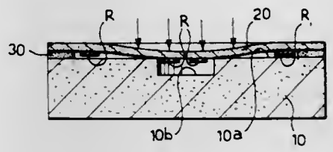
Roberto Dell'Acqua, Pavia; Giuseppe Dell'Orto, and Gilberto Dendi, both of Milan, all of Italy, assignors to Marelli Autronica S.p.A., Pavia, Italy

Filed Feb. 10, 1987, Ser. No. 13,097

Claims priority, application Italy, Feb. 10, 1986, 67097 A/86

Int. Cl.⁴ G01L *1/22*

U.S. Cl. 338—4 **2 Claims**



1. Pressure sensor comprising a rigid support, a diaphragm having a peripheral portion fixed by a layer of glue to the support and a central portion spaced from the support, and at least one thick-film resistor acting as a piezo-resistive transducer and carried by the diaphragm on its surface facing the support, the diaphragm being able to deform resiliently towards the support when a pressure is exerted on its other surface, wherein the surface of the support which is connected to the diaphragm is flat, and wherein the layer of glue has a calibrated thickness such that the distance between the diaphragm and the surface of the support at rest is substantially equal to the deflection of the diaphragm corresponding to the predetermined maximum pressure measured whereby the diaphragm will contact and be supported by said support when subjected to the predetermined maximum pressure.

4,782,320

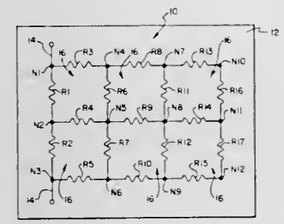
MESH NETWORK FOR LASER-TRIMMED INTEGRATED CIRCUIT RESISTORS

John S. Shier, Apple Valley, Minn., assignor to VTC Incorporated, Bloomington, Minn.

Filed Nov. 3, 1986, Ser. No. 926,391

Int. Cl.⁴ H01C *7/22*

U.S. Cl. 338—295 **6 Claims**



1. A method for obtaining a desired resistance value between two terminal leads, including:

providing a resistor network which includes a plurality of N-sided meshes of N discrete resistor elements which couple two terminal leads, wherein N is greater than or equal to three;

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storing data representative of patterns of broken resistor elements from the network and corresponding resistance values of the network; and

permanently breaking resistor elements from the network as a function of the stored data so as to cause the network to have the desired resistance value.

4,782,321

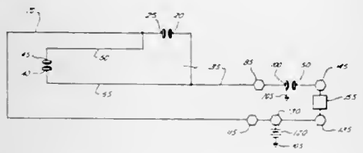
AUTO ALARM SYSTEM

James R. Colvin, Houston, Tex., assignor to Victor Branch, Houston, Tex.

Continuation-in-part of Ser. No. 706,598, Feb. 28, 1985, abandoned. This application May 27, 1986, Ser. No. 868,148

Int. Cl.⁴ B60R *25/00*

U.S. Cl. 340—63 **5 Claims**



1. A silent alarm system for vehicle theft prevention, a portion of which is mounted in the steering column, the steering column having a lock mechanism, of the vehicle, comprising:

a first set of contacts;

first contact means responsive to the act of pulling the lock mechanism from the steering column for causing said first set of contacts to mate;

a second set of contacts;

second contact means responsive to said mating of said first contacts for causing said second set of contacts to mate;

a frequency generator;

alarm means reponsive to said mating of said second contacts for activating an alarm signal from said frequency generator;

wherein the steering column has a bowl plate housing a projector mechanism and there is further included:

a third set of contacts;

third contact means responsive to the movement of the projector mechanism for causing said third set of contacts to mate; and

wherein said second contact means is responsive to said mating of said first contacts of said third contacts for causing said second contacts to mate.

4,782,322

AMPLITUDE MODULATION OF CONTROL SIGNALS OVER ELECTRICAL POWER LINES UTILIZING THE RESPONSE OF TUNING FORK FILTERS

Heinz Lechner, Renens, and Jean-Francois Taillens, Sullens, both of Switzerland, assignors to Transec Financiere S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 444,573 filed as PCT CH82/00038, Mar. 15, 1982, published as WO82/03299, Sep. 30, 1982, abandoned. This application Mar. 26, 1987, Ser. No. 32,975

Claims priority, application Switzerland, Mar. 16, 1981, 1757/81

Int. Cl.⁴ H04M *11/04*

U.S. Cl. 340—310 A **3 Claims**

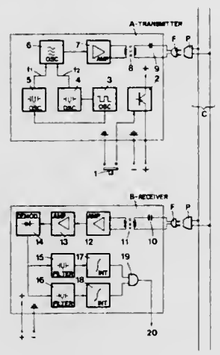
1. An apparatus for transmitting signals over an existing power network comprising

a transmitter (A) and a receiver (B) adapted to be connected to said network,

a power source for each of said transmitter and said receiver,

means (C) in said network for transmitting a modulated carrier wave from the transmitter to the receiver,

said receiver (B) including amplifier means (**12–13**) tuned to the carrier wave frequency, filter means (**15–16**), demodulator means (**14**) between said amplifier means (**12–13**) and said filter means (**15–16**) whereby a demodulated signal is applied to said filter means (**15–16**), integrator means (**17–18**) receiving output signals from said filter means (**15–16**), and gate means (**19**) adapted to deliver output signals from said integrator means (**17–18**) to a responsive device when such signals reach a predetermined level,



said transmitter (A) including oscillating means modulated by twin low frequency filtering means (**4–5**) whereby the carrier wave is amplitude modualted by two low frequency signals, and

wherein said receiver filter means includes two band-pass filters tuned respectively to the two modulation frequencies, said band-pass filters being of the tuning fork type.

4,782,323

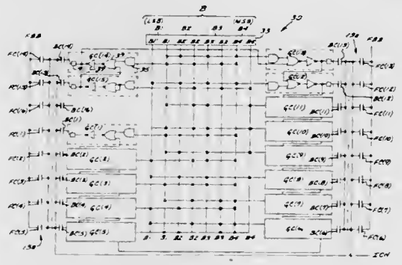
TECHNIQUE FOR MAINTAINING A COMMON CENTROID IN SWITCHED ELEMENT ANALOG-TO-DIGITAL CONVERTERS

Charles H. Lucas, Newport Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 868,498, May 30, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 175,635

Int. Cl.⁴ H03M *1/66*

U.S. Cl. 341—150 **9 Claims**



1. A circuit for use in digital-to-analog converters and analog-to-digital converters, said circuit comprising:

a first array of capacitors having substantially identical value arranged in a predetermined layout, each capacitor in said first array having a switched terminal;

a second array of capacitors having substantially identical value arranged in a predetermined layout, each capacitor in said second array having a switched terminal;

logic means responsive to a digital input signal having a value N for providing first and second logic control signals having values which when summed is equal to N; and

gating logic means, including a plurality of switches individually connected to the switched terminals of the capacitors of said first and second arrays, for switching a respective predetermined number of capacitors in said first and second arrays in a predetermined sequence from first to second voltages as a function of said first and second logic control signals, said predetermined sequences and said predetermined layouts cooperating to maintain the geometrical centroid of the switched capacitors of said circuit at a substantially constant location.

4,782,324

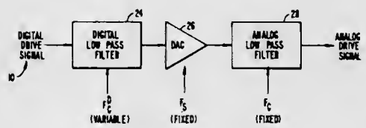
DIGITAL SIGNAL SYNTHESIZER

Marcos A. Underwood, Monta Vista, Calif., assignor to GenRad, Inc., Concord, Mass.

Filed May 6, 1987, Ser. No. 47,203

Int. Cl.⁴ H03M *1/12*

U.S. Cl. 341—147 **22 Claims**



1. An apparatus for synthesizing a designated waveform having a range of frequencies the upper end of which is selectable up to an analysis frequency, wherein the waveform is synthesized from a digital representation of a base level signal sampled at a predetermined sample rate and further wherein each of the samples is taken with a predetermined resolution, comprising

means operating at the predetermined resolution and at a fixed conversion rate for converting a digital representation of a signal, presented at the conversion rate, into analog form;

digital filter means for interpolating the digital representation of the base level signal to have an interpolated sample rate corresponding to the conversion rate without modifying the resolution of the samples and simultaneously achieving flat pass band ripple and high stop band attenuation, wherein the interpolated digital representation of the base level signal is supplied directly to the converting means for conversion into analog form; and

filter means, having a cutoff frequency which is fixed at a frequency corresponding to the analysis frequency and coupled to the converting means, for suppressing frequencies above the analysis frequency.

4,782,325

ARRANGEMENT FOR DATA COMPRESSION

Hakan Jeppsson, Grey Turegatan 49 ltr, S-114 38 Stockholm; Tina Jeppsson, Smedslättsvägen 66, S-161 39 Bromma, and Martin V. I. Jeppsson, Box 17049, 161 17 Bromma, all of Sweden

Continuation-in-part of Ser. No. 687,725, Dec. 31, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 905,237

Claims priority, application Sweden, Dec. 30, 1983, 8307228

Int. Cl.⁴ H03M *7/30*

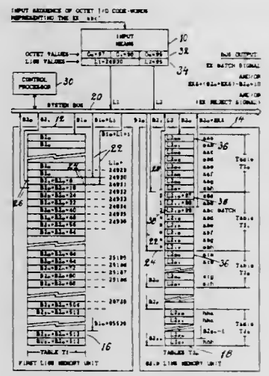
U.S. Cl. 341—55 **20 Claims**

1. A system for storing a set of entity keys and for providing a response to a subsequent input of an individual entity key code representation, comprising

input means for transforming part of a current entity key I/O code-word input into two or more linked digital words, which thereby each attains a current link value and jointly a current overall link value uniquely representing such part of such I/O code-word input,

memory means for holding in store link values and address component values related to previously stored entity keys, and

control means connected to said input means and to said memory means for determining a current address range for each link succeeding the first one, using at least one current link value to find previously stored address component values to determine the boundaries of such current range, for comparing the current value of each link succeeding the first one with at least one link value previously stored within such current address range, and for producing (i) an overall link value matching condition if, for each link succeeding the first one, the current link value matches a previously stored link value or (ii) an overall link value non-matching condition if the current overall link value is found to fall between overall link values related to previously stored keys.



4,782,326

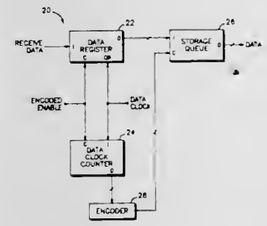
ADPCM TRANSCODER DATA INTERFACE CIRCUIT HAVING AN ENCODED ENABLE SIGNAL

David E. Bush, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1987, Ser. No. 103,552

Int. Cl.⁴ H03M *7/00*

U.S. Cl. 341—76 **8 Claims**



1. A circuit for receiving digital data having a predetermined frequency and selectively outputting the data with control information, comprising:

first means for receiving and storing the digital data in response to a single enabling control signal, and for outputting the data in frame format at a predetermined clock rate

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substantially equal to the predetermined frequency and established by a data clock, the data having frame boundaries determined by the single enabling control signal;

second means for receiving both the data clock and enabling control signal and providing said control information by providing an encoded algorithm signal in response thereto, said encoded algorithm signal controlling which one of a plurality of predetermined algorithms said data may subsequently be encoded or decoded in accordance with; and

third means coupled to both the first and second means for receiving, storing and outputting both the data in frame format and said encoded algorithm signal.

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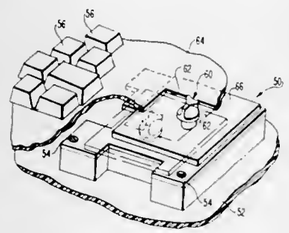
COMPUTER CONTROL

Victor B. Kley, 1119 Park Hill Rd., Berkeley, Calif. 94708, and Daniel J. Talken, Quincy, Ill., assignors to Victor B. Kley, Berkeley, Calif.

Filed Jan. 2, 1985, Ser. No. 688,444

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—365 P **73 Claims**



1. A computer control comprising

a housing,

a finger element extending above the housing and adapted to be gripped and moved by fingers in at least two dimensions to selected positions.

a pair of movable members mounted in the housing and coupled to the finger element for movement in respective orthogonal directions in response to corresponding movement of the finger element,

each of said pair of movable members including a light control grating defining alternating light and dark patterns along the corresponding direction of movement,

light emitting means and light responsive means disposed alongside each of the respective light control gratings for responding to light changes due to movement of each respective grating relative thereto wherein each light responsive means generates a pair of signals having opposite quadrature related phases for indicating motion in respective plus and minus directions of movement, and

means responsive to the pairs of signals for providing digital data corresponding to the two dimensional position of the control member.

4,782,328

AMBIENT-LIGHT-RESPONSIVE TOUCH SCREEN DATA INPUT METHOD AND SYSTEM

Michael B. Denlinger, Haworth, N.J., assignor to Product Development Services, Incorporated, Fairfield, Conn.

Filed Oct. 2, 1986, Ser. No. 914,484

Int. Cl.[4] G01S *5/16*

U.S. Cl. 340—365 P **21 Claims**

12. Touch screen apparatus comprising:

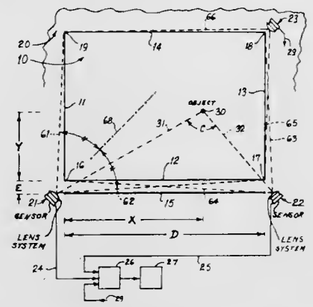
a pair of photosensor units adapted to be mounted proximate to but outside of a pair of successive corners of a passive touch screen area substantially uniformly significantly illiminated by ambient light,

each of said photosensor units having a front and a rear,

each of said units including mounting means for mounting the respective unit stationary with the front of the unit facing toward said touch screen area,

a light scanner array of closely spaced photo-responsive elements in the rear of each of said units,

a wide angle viewing lens assembly in the front of each of



said units intended to face toward said touch screen area, and

each of said wide angle viewing lens assemblies being adapted for transmitting light from a lateral field of vision spanning said touch screen area and with limited height above said touch screen area onto the line scanner array in the rear of the respective unit for activating at least one of said photo-sensitive elements when a pointer is brought near to any point of said touch screen area substantially uniformly significantly illuminated by ambient light.

4,782,329

DISPLACEMENT DETECTOR FOR AN ENCODER

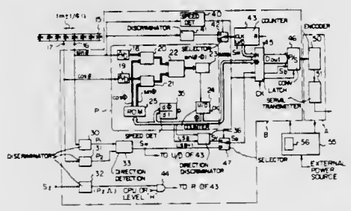
Kenzaburou Iijima, and Yoshinori Hayashi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Apr. 30, 1987, Ser. No. 44,816

Claims priority, application Japan, May 1, 1986, 61-101809; Jun. 13, 1986, 61-137569

Int. Cl.[4] H02M *1/48*

U.S. Cl. 341—6 **11 Claims**



1. A displacement detector for an encoder comprising

a detection head arranged facing a scale of said encoder and being relatively movable with respect thereto and being effective for generating a pair of phased output signals corresponding to the intensity of a signal stored in said scale,

first and second A/D converters connected to said detection head for digitalizing said output signals,

a function generating and multiplying unit connected to said first and second A/D converters for generating a first

product of an output signal from said first A/D converter with a cosine value of prescribed data and a second product of an output signal from said second A/D converter with a sine value of said prescribed data,

a reducer connected to said function generating and multiplying unit for calculating the difference between said first and second products,

a first counting unit connected to said reducer and said function generating and multiplying unit for counting a difference between said products, for shifting its mode of counting depending on the polarity of said difference, and for passing its count value as said prescribed data to said function generating and multiplying unit,

a signal switching unit connected to said detection head and said first counting unit, which detects a speed of said relative movement, selects one of said output signals from said detection head after wave shape discrimination when said speed exceeds a standard speed, and selects a signal in the highest bit of said count value from said first counting unit when said speed falls below said standard speed,

a second counting unit connected to said signal switching unit for counting an output signal from the latter, and

a parallel/serial converting unit coupled to said second counting unit and said first counting unit and effective for converting into first serial data first absolute displacement data which includes lower bits formed by said count value of said first counting unit and higher bits formed by a count value of said first counting unit, when said speed of said relative movement falls below said standard speed, and for converting into second serial data second absolute data which includes higher bits formed by said count value from said second counting unit and reset lower bits, when said speed exceeds said standard speed.

4,782,330

DATA ACQUISITION SYSTEM

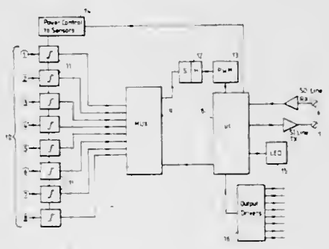
David W. Tindall, Caversham, England, and Ronald E. R. Patey, Georgetown, Canada, assignors to Chubb Electronics Limited, Feltham, England

Filed Jun. 25, 1987, Ser. No. 66,910

Claims priority, application United Kingdom, Jul. 3, 1986, 8616276

Int. Cl.[4] G08B *26/00*

U.S. Cl. 340—541 **11 Claims**



1. A data acquisition system comprising: a plurality of distributed sensors, each one of which is adapted to provide a voltage output indicative of a value or condition sensed thereby; a plurality of nodal units to which the outputs of respective sets of said sensors are connected; and a central unit adapted to receive data from said sets of sensors in response to its repetitive interrogation, in turn, of the respective said nodal units to which the sets of sensors are connected; each said nodal unit being adapted to derive, in respect of each said sensor in the set connected thereto, a pulse signal the width of which represents the voltage level of the respective sensor output and to transmit the corresponding set of pulse signals, in turn, to the central unit when interrogated thereby.

4,782,331

PHOTOELECTRIC ICING DETECTOR

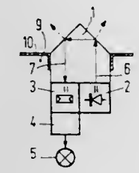
Gerd H. Martens, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1987, Ser. No. 61,231

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619538

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—583 **5 Claims**



1. An arrangement for the detection of icing on the surface of an object comprising

a source for generating a parallel beam of optical radiation,

an optical conductor in the shape of a prism and having two faces which project above the surface on which icing is to be detected, said radiation beam striking one of said faces from inside the conductor,

a detector which receives radiation reflected from both of said faces and converts it into an electrical signal,

an evaluation device which compares the signal with a threshold value and, depending on the result of the comparison, generates an alarm signal.

4,782,332

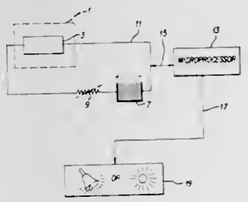
LUBRICANT OIL MONITORING SYSTEM, SENSOR FOR MONITORING LUBRICANT OIL QUALITY AND METHOD OF MANUFACTURING SENSOR FOR MONITORING LUBRICANT OIL QUALITY

Divna Cipris, Millburn, and Arthur T. Walsh, Morris Plains, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jun. 29, 1987, Ser. No. 67,982

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—603 **12 Claims**



1. In a sensor system for in-situ monitoring of lubricant oil quality wherein sensor means is arranged in a circuit in contact with said lubricant oil for supplying an electrical signal indicative of the lubricant oil deteriorating condition when said signal exceeds predetermined values, the improvement wherein said sensor comprises: a non-conductive support having a film of conductive metal electrochemically deposited thereon in a manner such that leads can be attached to said film to complete said circuit, said film comprising a first layer of a metal which is non-corrosible in spent oil which has been electrolessly deposited on the surfaces of said support and a second layer of metal corrosible in spent oil which has been

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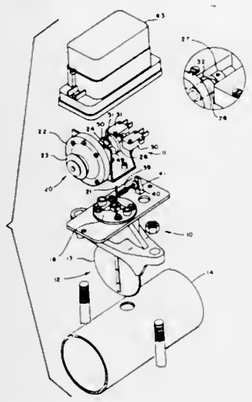
electrolitically deposited on said electrolessly deposited layer and said second layer being of a thickness such that upon continuous contact with deteriorating lubricant oil it will corrode away and will break open or change conductivity of said circuit after a predetermined amount of deterioration of said oil.

4,782,333

WATER-FLOW DETECTOR WITH RAPID SWITCHING

David E. Merchant, Lincoln, Nebr., assignor to Pittway Corporation, Northbrook, Ill.

Filed Mar. 23, 1987, Ser. No. 28,774
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—610 **14 Claims**



1. A water flow detector comprising:
a movably mounted water vane;
a delay timer responsive to the movement of said water vane and including a movable timer member and means for moving said timer member over a predetermined distance corresponding to a predetermined time;
a switch assembly including a spring biased switch arm movable between first and second positions for indicating movement of said water vane;
a movable cam having a profile controlling movement of said switch arm between its first and second positions as a function of the disposition of said cam; and
cam actuation means connected to said delay timer for driving said cam in a manner such that the cam profile maintains said switch arm in a first position during a portion of timer member movement and then permits relatively rapid movement of said switch arm to its second position, and wherein said spring biased arm delays movemet of said cam a sufficient time to allow for any water flow surges past said water vane.

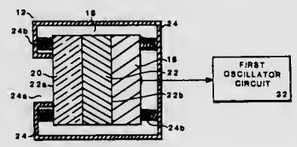
4,782,334

VAPOR OR GAS DETECTOR AND ALARM SYSTEM

Thomas A. Meaney, 2525 Lehigh Pl., Costa Mesa, Calif. 92626

Filed Aug. 13, 1987, Ser. No. 85,148
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—634 **9 Claims**

9. A vapor or gas detects wherein said detector comprises an element of a vapor or gas detecting and alarm system that is constructed as an integrated microcircuit wherein an absorbate on said vapor and gas detector projects through the surface of the microcircuit package to allow said absorbate to be exposed to the outside environment where said detector is comprised of a three-section dynamic junction further comprising:
(a) a resilient substrate having a front and a back,
(b) a resonant mechanical element rigidly attached to the back of said substrate, and
(c) said absorbate rigidly attached to the front of said substrate, where said absorbate is designed to attract and adsorb the vapor or gas molecules in proportion to their molecular density, molecular size and exposure time where:
(1) when no vapor or gas is being absorbed by said absorbate said element is under a no-strain, no-deformation condition and thus emits a first frequency signal, and
(2) when a vapor or gas is absorbed by said absorbate a pressure differential is created between said element and said substrate that causes said element to strain and deform and thus emit a second frequency signal that differs from the first frequency signal, and where said vapor or gas detecting and alarm system further comprises:
(a) a first oscillator circuit that oscillates at and emits a first frequency oscillator signal (f1) when the first frequency signal from said detector is applied and which changes and emits a second frequency oscillator signal (f2) when the second frequency signal from said detector is applied,



(b) a reference frequency crystal that emits a reference frequency signal,
(c) a second oscillator circuit that oscillates and emits a reference frequency oscillator signal (f3) when the reference frequency signal from said reference crystal is applied,
(d) a frequency comparator circuit that receives the first frequency oscillator signal (f1) or second frequency oscillator signal (f2) from said oscillator and the reference frequency oscillator signal (f3) from said second oscillator circuit, where said comparator emits a vapor/gas signal when said second frequency oscillator signal (f2) exceeds a preset signal level,
(e) a preset counter circuit connected to the output of said comparator circuit where said counter emits a trigger signal when the applied vapor/gas signal from said comparator exceeds a preset count within a specified time period,
(f) an alarm circuit that is energized upon the application of the trigger signal from said counter, and
(g) a power source designed to provide all the voltages and currents required to operate said system.

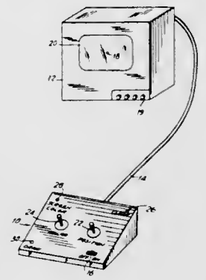
4,782,335

VIDEO ART ELECTRONIC SYSTEM

Edward L. Gussin, Agoura Hills, Calif., assignor to LJN Toys, Ltd., New York, N.Y.

Filed Oct. 30, 1986, Ser. No. 925,653
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—709 **16 Claims**

1. A video art electronic system for drawing and coloring on a conventional color television video monitor including a television screen having predetermined pixels, comprising:
a draw switch having a first position for drawing and coloring on the video monitor and a second position for not drawing and coloring on the video monitor;
means including a first joystick to produce first digital signals representing the "X" and "Y" coordinates of a pixel position of a cursor on the video monitors;
means including a second joystick to produce second digital signals representing the color of the cursor on the video monitor;
a pixel memory comprising a random access memory (RAM) having digital memory addresses corresponding to the pixels and adapted to be read in correspondence with the conventional horizontal and vertical scanning of the video monitor;
first connecting means operative when the draw switch is in its first position to connect said first and second digital



signals to said pixel memory so that the color and position of the cursor on the video monitor are written into said pixel memory;
means to convert output signals from said pixel memory to conventional color television signals; and
means to convert said first and second digital signals to conventional color television signals when said draw switch is in its second position, whereby digital signals in said pixel memory are displayed on the video monitor and the cursor is located on the video monitor at the position defined by said first digital signals with a color defined by said second digital signals.

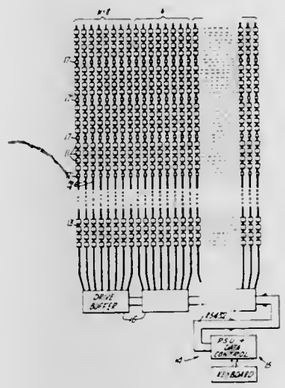
4,782,336

TWO DIMENSIONAL VISUAL DISPLAY

John E. Bailey, Rykkinn, Norway, assignor to Ferrnati, PLC, Cheadle, England

Filed Jul. 18, 1984, Ser. No. 631,878
Claims priority, application United Kingdom, Jul. 26, 1983, 8320171
Int. Cl.[4] G09G *3/32*
U.S. Cl. 340—752 **21 Claims**

1. A two dimensional visual display device comprising:
at least one group of one dimensional display components;
each display component comprising:
a multiconductor cable extending for the length of the component and having power supply conductors, a data conductor and a predetermined number m of switching signal conductors;
isolation means carried by the cable for electrically separating each conductor of said switching signal conductors into successive lengths of the multiconductor cable, thereby sub-dividing the cable into a plurality of sections along the length of the component; and
for each section repeated along the cable
a set of individually energizable display elements carried by and distributed along the cable section, each element having associated therewith a preset number of energization switches and the set having associated therewith m energization switches, each of said energization switches connected to one of said switching signal conductors, and
a shift register carried by the cable having m register stages, successive stages being connected individually to energization switches associated with respective successively disposed display elements, and connected serially with said data conductor to receive serial shift signals from a preceding section; and



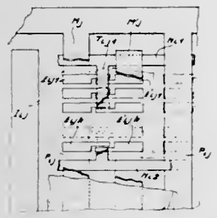
display driving means operable to generate a stream of multiple bit binary words and apply corresponding single bits of each word of the stream to said data conductor of an individual display component so that successive words of the stream are shifted between corresponding display element energization switches of the components of each group.

4,782,337

MATRIX DISPLAY DEVICE COMPRISING TWO GROUPS OF ROW ELECTRODES AND TWO COLUMN ELECTRODES FOR IMAGE ELEMENT AND ITS CONTROL PROCESS

Jean-Frédéric Clerc, Saint Egreve, and Aimé Perrin, Saint Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 29, 1987, Ser. No. 79,212
Claims priority, application France, Aug. 1, 1986, 86 11230
Int. Cl.[4] G09G *3/20*
U.S. Cl. 340—752 **11 Claims**



1. A matrix display device comprising an electro-optical material having an optical property inserted between first and second insulating walls, whereof at least one is transparent and which are kept spaced from one another, wherein on the inner face of the first wall are arranged n parallel row conductors, each row conductor being connected by k×m switches to k×m electrodes of a first family grouped into m groups of k parallel electrodes each and k×m electrodes of a second family grouped into m groups of k parallel electrodes each, the ni groups of electrodes of the first family and the m groups of

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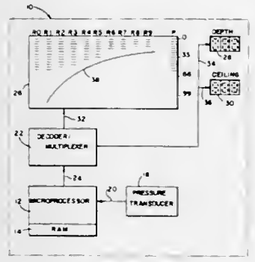
electrodes of the second family being juxtaposed with said row conductor and alternating with one another in such a way that each electrode E_{ijl} of a group P_{ij} of electrodes of the first family and each electrode E'_{ijl} of a group P'_{ij} of electrodes of the second family are connected by a switch T_{ijl} to a row conductor N_i with i, j and l being integers such that $1 \leqq i \leqq n$, $1 \leqq j \leqq m$ and $1 \leqq l \leqq k$ and wherein on the inner face of the second wall are arranged a first family of m parallel column conductors and a second family of m parallel column conductors, the column conductors of the second family alternating with the column conductors of the first family, one of the two families of column conductors being raised to a reference potential by a polarizing means, the column conductors of the first and second families intersecting with the row conductors, each column conductor of the first family facing n groups of electrodes of the first family and each column conductor of the second family facing n groups of electrodes of the second family, an image element being defined by the overlap zone of two column conductors respectively of the first and second families with respectively a group of k electrodes of the first family and a group of k electrodes of the second family connected by k switches to the corresponding row conductor, said conductors carrying appropriate signals for the excitation of the material emitted by the row and column control means.

4,782,338

DISPLAY SCHEME FOR DECOMPRESSION DATA

Craig W. Barshinger, St. John, V.I., assignor to Orca Industries, Inc., Newark, Del.

Continuation of Ser. No. 341,281, Jan. 21, 1982, abandoned. This application Oct. 15, 1985, Ser. No. 786,723
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—754 **20 Claims**



1. A portable device for displaying decompression data comprising:

a pressure sensor for sensing ambient pressure and for generating a signal representative of the sensed pressure;

a programmed computer for receiving pressure signals from the pressure sensor and for periodically generating data representative of the level of dissolved gases in each of a plurality of tissue models having differing saturation halftimes and data representative of a ceiling depth above which the current level of dissolved gases in any of the tissue models would form gas bubbles;

memory means for receiving and storing the dissolved gas level data for each of the tissue models; and

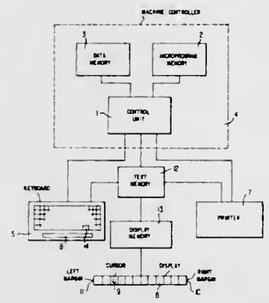
display means, including a graphic display device for receiving and simultaneously displaying the dissolved gas level data for at least two of the tissue models and the ceiling depth data.

4,782,339

METHOD AND APPARATUS FOR DISPLAYING TEXT ON A SINGLE-LINE DISPLAY OF A TEXT STATION

Norbert Zeising, Oldenburg, and Herbert Behrens, Neuenburg, both of Fed. Rep. of Germany, assignors to Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

Filed Feb. 27, 1987, Ser. No. 19,788
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606361
Int. Cl.⁴ G09G *3/00*
U.S. Cl. 340—791 **20 Claims**



1. A method for displaying text on a single-line display device of a text station which additionally includes a text memory and an input unit means for entry of text, the input unit means including a hyphenation key and a control member, the single-line display device having left and right margins and a line of character display positions between the margins, with successively entered characters of a line of text being displayed at respective display positions on the display device, said method comprising the steps of:

(a) after actuation of the hyphen key to divide a word into first and second parts as a displayed line of text approaches the right margin of the display device, erasing the text on the display device except for the first part of the divided word and the hyphen;

(b) thereafter displaying successively entered characters of the second part of the divided word at respective display positions adjacent the left margin of the display device; and

(c) erasing the first part of the divided word and the hyphen when entry of the second part thereof has been completed and the control member has been actuated.

4,782,340

ELECTRONIC ARRAYS HAVING THIN FILM LINE DRIVERS

Wolodymyr Czubatyj, Warren, and Roger W. Pryor, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 22, 1986, Ser. No. 899,442
Int. Cl.⁴ G09G *3/34*
U.S. Cl. 340—825.830 **41 Claims**

1. An electronic matrix display array adapted for light influencing information display, said electronic matrix display array having a plurality of integrated picture elements and intersecting, multiple x and y address lines, each of said picture elements being located at the intersection of an x address line and a y address line and adapted to be repetitively accessed, said matrix array comprising:

(a) a first x address line electrically connected to one set of picture elements;

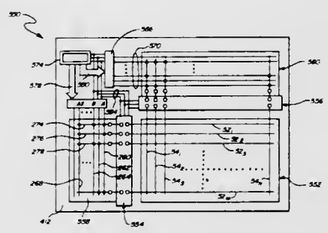
(b) line driver means for changing an electrical condition of said first x address line from a first nominal level to a second nominal level on the application of an electrical signal, and from the second nominal level back to the first nominal level when the electrical signal is removed and the second nominal level has been achieved, said line driver means including:

(i) an integrated thin film x address line threshold switching device having a threshold voltage and a negative resistance characteristic and being switchable between a high resistance off state and a relatively lower resistance on state by the application of an x address line electrical signal above the threshold voltage of the x address line threshold switch across the x address line threshold switch and from the lower resistance on state to the high resistance off state when the first electrical signal is below the threshold voltage of the x address line threshold switch;

(ii) isolation means electrically connected between said first x address line and said x address line integrated thin film threshold switching device for inhibiting the reverse flow of current between said threshold switching device and said x address line when said threshold switching device is in its off state; and

(iii) trigger means associated with said x address line threshold switching device for providing said electrical signals in response to control signals received by said trigger means;

(c) a first y address line electrically connected to one set of picture elements; and



(d) line driver means for changing an electrical condition of said first y address line from a first nominal level to a second nominal level on the application of an electrical signal, and from the second nominal level back to the first nominal level when the electrical signal is removed and the second nominal level has been achieved, said line driver means including:

(i) a y address line integrated thin film threshold switching device having a threshold voltage and a negative resistance characteristic and being switchable between a high resistance off state and a relatively lower resistance on state by the application of a y address line electrical signal above the threshold voltage of the y address line threshold switch across the y address line threshold switch and from the lower resistance on state to the high resistance off state when the y address line electrical signal is below the threshold voltage of the y address line threshold switch;

(ii) isolation means electrically connected between said first y address line and said y address line integrated thin film threshold switching device for inhibiting the reverse flow of current between said threshold switching device and said y address line when said threshold switching device is in its off state; and

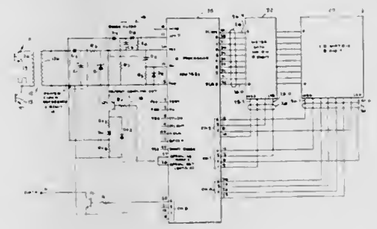
(iv) trigger means associated with said y address line threshold switching device for providing said electrical signals in response to control signals received by said trigger means.

4,782,341

METER DATA GATHERING AND TRANSMISSION SYSTEM

Bruce E. Gray, Murraysville, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 510,753, Jul. 1, 1983, Pat. No. 4,652,877. This application Apr. 4, 1986, Ser. No. 848,287
Int. Cl.⁴ G08S *23/00*
U.S. Cl. 340—870.02 **12 Claims**



1. A bi-directional signal transmission system for outputting data signals and for receiving a power and control signal comprising a series of signal bursts occurring at a first, relatively low frequency, each signal burst comprising a plurality of pulses occurring at a second, relatively high frequency and an envelope, said system comprising:

(a) inductive coupling means for inputting said power and control signal in a first direction through said inductive coupling means and for outputting said data signals in a second, opposite direction through said inductive coupling means;

(b) envelope detecting means coupled to said inductive coupling means for receiving said power and control signal and responsive to said envelopes for providing corresponding control signals of said first low frequency;

(c) data processing means coupled to receive said control signals from said envelope detecting means for effecting data processing to provide said data signals; and

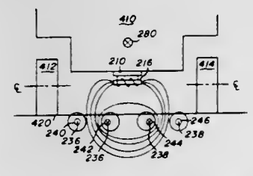
(d) means coupled to said inductive coupling means and to said data processing means and responsive to each of said control signals for outputting said data signals in said second direction through said inductive coupling means at a time between the occurrences of said signal bursts.

4,782,342

PROXIMITY IDENTIFICATION SYSTEM WITH LATERAL FLUX PATHS

Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif. 95030

Filed Aug. 4, 1986, Ser. No. 892,120
Int. Cl.⁴ G08G *1/01*
U.S. Cl. 340—941 **28 Claims**



1. A proximity identification system comprising:

an electronic reader section for reading inductively coupled electromagnetic coded flux signals, the reader section having a reader circuit connected to a reader antenna for supplying power to said reader antenna, said reader an-

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tenna including a pair of separate coils located proximate one another along a first coil pair line, said pair of coils both located in a reader plane and oriented with the electromagnetic flux paths being between the coils in a direction parallel to said first coil pair line, said flux paths located above and below said reader plane when said coils are energized by power from said reader circuit, said reader coils are connected to said reader circuit such that, for any time phase, if the current in one of the coils is flowing in a clockwise direction, then the current in the other coil is flowing in a counter clockwise direction; and

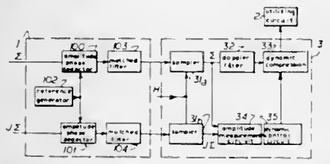
an identifier section detached from the reader section and movable relative to the reader section, the identifier section having an identifier circuit for storing and transmitting multiple bits of information, said identifier circuit being connected to an identifier antenna, said identifier antenna being oriented with its axis parallel to, and intersecting said flux from said reader section whereby the identifier section is powered by power radiated by said reader antenna.

4,782,343

DEVICE FOR ELIMINATING FIXED ECHOES IN A RADAR

Jean Claude Marchais, Paris, France, assignor to Thomson-CSF, Paris, France

Claims priority, application France, Dec. 16, 1977, 7738093
Filed Nov. 22, 1978, Ser. No. 964,376
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—160 **11 Claims**



1. A device for eliminating fixed echoes in a pulse radar containing, on reception, means for demodulating intermediate frequency signals to video-frequency signals, means for utilizing the video-frequency signals and means for processing the video-frequency signals connected between the demodulator means and the utilising means, processing means including, connected in series, range unit sampling means, Doppler filtering means and means for compressing the video-frequency signal dynamic, wherein said device also contains, series connected upstream the Doppler filtering means, means for measuring the video-frequency signal amplitude for at least two range units in the same transmission recurrence and means for controlling the dynamic compression means as a function of these amplitudes.

4,782,344

MICROWAVE SIZE/SPEED VEHICLE DETECTOR

Chon T. Ledinh; Mansour Loloyan, and Roger Garceau, all of Quebec, Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Mar. 18, 1987, Ser. No. 27,249
Int. Cl.[4] G01S *3/02*
U.S. Cl. 342—351 **12 Claims**

1. A vehicle sensing apparatus comprising a directional microwave non-emitting antenna for collecting reflected microwave signals from above a predetermined roadway area, an electronic vehicle sensing circuit connected to said antenna for processing detected reflected signals from said roadway and from a vehicle travelling through said area to identify a vehicle's physical parameter; said sensing circuit having an ambient temperature detector, a peak detector for detecting a reflected temperature signal at said antenna caused by said vehicle entering said area and generating a detected minimum amplitude signal, and a physical parameter calculating circuit for determining the true amplitude of the detected signal and interpreted by the maximum ratio of the solid angles of the antenna beam filled by the vehicle to be detected and a roadway in the beam of the antenna, said true amplitude determination being obtained by the formulation:

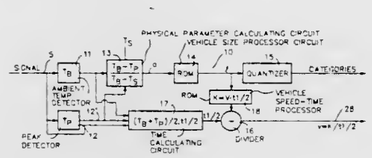
$$a=(T_B-T_P)/(T_B-T_S)$$

where

a is the true amplitude of the detected signal,

T_B is the ambient temperature in degree Kelvin,

T_P is the minimum amplitude of the received temperature, and



T_S represents the sky temperature in degree Kelvin,

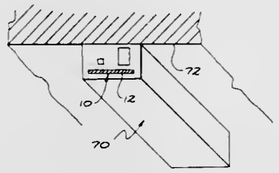
a processing circuit means having a memory processor circuit connected to an output of said calculating circuit for generating at an output thereof a signal proportional to the vehicle length parameter for identification of a class of vehicle, a vehicle speed/time calculating circuit connected to said output of said memory processor circuit for measuring characteristic parameters of said received reflected temperature signal, said speed time calculating circuit being connected to a divider circuit which is also connected to a time calculating circuit fed by said peak detector whereby to obtain the mean speed of said vehicle travelling through said predetermined area.

4,782,345

TRANSPONDER ANTENNA

Jeremy A. Landt, Los Alamos, N. Mex., assignor to Amtech Corporation, Santa Fe, N. Mex.

Filed Jul. 29, 1986, Ser. No. 891,226
Int. Cl.[4] H01Q *5/00, 1/40*
U.S. Cl. 343—727 **16 Claims**



1. In combination, a thin planar dielectric member,

first conductive material on a first portion of one surface of the planar member,

second conductive material on a second portion of the other surface of the planar to define with the first conductive material a first antenna operative at first frequencies, the second portion being displaced from the first portion in a first direction along the planar surfaces of the dielectric member, and

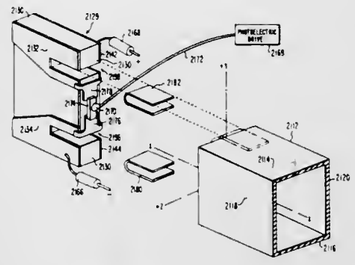
slots included in the first conductive material to define a conductive portion which extends from the first portion to a position of the first planar surface opposite to the second portion on the second planar surface and which defines a second antenna operative at second frequencies higher than the first frequencies.

4,782,346

FINLINE ANTENNAS

Arvind K. Sharma, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 11, 1986, Ser. No. 838,583
Int. Cl.[4] H01Q *1/38, 13/08*
U.S. Cl. 343—795 **18 Claims**



1. An antenna, comprising:

a truncated hollow conductive waveguide having a longitudinal axis, said waveguide being adapted for propagating electromagnetic energy towards a port formed by the truncation;

a dielectric plate located partially within said waveguide and having a region located partially without said waveguide at said truncation, and with the plane of said dielectric plate parallel to an electric field component of said electromagnetic energy within said waveguide;

a first conductive finline portion having a first pair of spaced conductors on one broad side of said dielectric plate defining a first longitudinal slot having a first slot axis parallel with said longitudinal axis, the width of said first longitudinal slot increasing with increasing distance from said port in said region without said waveguide to define a radiating portion having a gain;

a second conductive finline portion having a second pair of spaced conductors on a second broad side of said dielectric plate defining a second longitudinal slot having a second slot axis parallel with said longitudinal axis, the width of said second slot increasing with increasing distance from said port in said region without said waveguide for improving the performance of said radiating portion;

wherein at least said first finline is conductively isolated from said conductive waveguide, and further including electromagnetic signal generating means comprising:

charging means coupled to at least said first finline for charging said first finline to an electric potential;

controllable switch means coupled to said first finline at a location near said port for discharging said electric potential of said first finline in response to a control signal; and

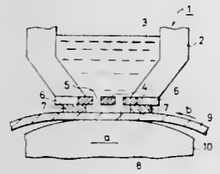
control signal generating means coupled to said controllable switch means for operating said controllable switch means at a time when at least said first finline is charged to an electric potential for discharging said first finline for radiating a pulse of electromagnetic energy from said radiating portion.

4,782,347

RECORDING HEAD USING A PLURALITY OF INK STORING PORTIONS AND METHOD OF CARRYING OUT RECORDING WITH THE USE OF THE SAME

Katsumi Kurematsu, Kawasaki; Akihiro Mouri, Kokubunji; Shuzo Kaneko, Suginami; Tsutomu Toyono, Yokohama, and Toshiya Yuasa, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,510
Claims priority, application Japan, Apr. 2, 1986, 61-74293; May 16, 1986, 61-110855; May 16, 1986, 61-110856; May 16, 1986, 61-110857; May 16, 1986, 61-110858; May 16, 1986, 61-110859; May 16, 1986, 61-110860; May 16, 1986, 61-110861
Int. Cl.[4] G01D *15/18;* B41J *3/12*
U.S. Cl. 346—1.1 **36 Claims**



1. A recording head comprising:

an ink housing for storing ink therein;

a plurality of ink passage portions for allowing ink to pass from said ink housing means;

a plurality of heating means capable of being selectively actuated for selectively passing ink through said plurality of ink passage portions; and

spacer means disposed between said ink passage portions and a recording medium, said spacer means defining an ink containing portion for temporarily containing the ink passing through said ink passage portions, wherein

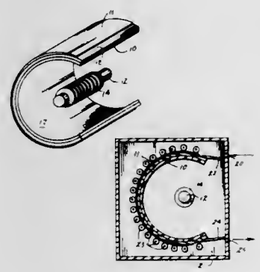
said heating means is actuated for a first predetermined period of time to allow a quantity of ink to flow into said ink containing portion and for a second predetermined period of time to allow the quantity of ink to flow from said ink containing portion onto the recording medium.

4,782,348

DEVICE FOR HIGH RESOLUTION RECORDING OF LIQUID CRYSTAL DISPLAY IMAGES

George L. Siegner, 3100 W. Riverview Dr., Post Falls, Id. 83854

Continuation-in-part of Ser. No. 887,543, Jul. 18, 1986. This application Nov. 30, 1987, Ser. No. 126,565
Int. Cl.[4] G01D *9/42;* G02F *1/13*
U.S. Cl. 346—107 R **13 Claims**

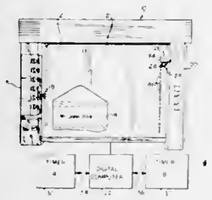


1. A recording device for generating and reproducing a presentation of visual information, comprising:

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a selectively operable radiation-transmissive liquid crystal display cell in the form of a partial or full cylinder having inner and outer coaxial surfaces centered along an axis spaced inwardly from the display;
a radiation sensitive recording sheet having an inner surface wrapped about the outer surface of the liquid crystal display cell;
radiation means located inwardly of the liquid crystal display cell and coaxially centered along the axis for directing radiation through the liquid crystal display to the inner surface of recording sheet; and
axial columnating means interposed between the radiation means and the liquid crystal display cell for limiting dispersion of radiation directed onto the sheet in a dimension parallel to the axis.

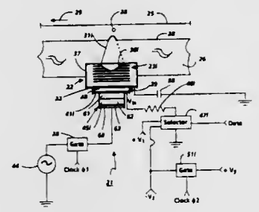
4,782,349
METHOD AND APPARATUS FOR CALLIGRAPHIC WRITING
Jonathan D. Sieber, and Joseph S. Sieber, both of 31 Granville Rd., Cambridge, Mass. 02138
Filed Nov. 26, 1986, Ser. No. 934,950
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—139 R **29 Claims**



1. In a writing system comprising:
an ink pen;
a table adapted to have a document mounted thereon;
means for mounting said pen slightly above said table; and
means for causing said pen to write a desired image on said document,
that improvement wherein said system includes means operative under selected writing conditions for maintaining flow of writing fluid in said pen, said means including a timer and being responsive to the timing out of said timer for causing selected movement of said pen to maintain said flow of writing fluid.

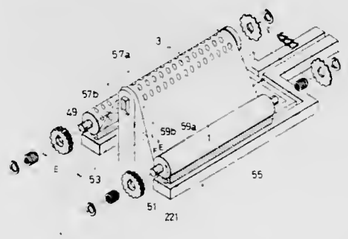
4,782,350
AMORPHOUS SILICON VARACTORS AS RF AMPLITUDE MODULATORS AND THEIR APPLICATION TO ACOUSTIC INK PRINTERS
Donald L. Smith, Palo Alto, and Scott A. Elrod, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1987, Ser. No. 114,182
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **20 Claims**

7. In combination with an acoustic ink printer including a supply of liquid ink with a free surface, a printhead having at least one droplet ejector, and an rf source; said droplet ejector including a piezoelectric transducer means, with said rf source being coupled across said transducer means for exciting it into oscillation to cause said droplet ejector to launch a converging acoustic beam into said ink such that said beam impinges upon and exerts an acoustic radiation pressure against said free surface; the improvement comprising
at least one aSi capacitor coupled to said rf source and to said transducer means; and
control means coupled to said capacitor for applying a variable polarity bias to it for switching it between a first capacitance level in response to data samples representing black pixels and a second capacitance level in response to data samples representing white pixels, whereby the rf applied to said transducer means is amplitude modulated



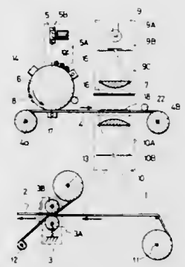
to vary the radiation pressure said acoustic beam exerts against the free surface of said ink between a level at least equal to an ejection threshold pressure level for the printing of black pixels and a lower, subthreshold level for the printing of white pixels.

4,782,351
RECORDING APPARATUS
Kunihiko Miura, Hiratsuka, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
Filed Jan. 21, 1987, Ser. No. 5,742
Claims priority, application Japan, Jan. 31, 1986, 61-18234
Int. Cl.[4] G01D *15/10, 15/16*
U.S. Cl. 346—140 R **8 Claims**



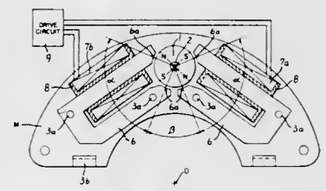
5. A recording apparatus of the type which is for filling recording ink in a film with numerous minute orifices and for heating the ink rapidly with heating elements to spurt the ink from the orifices by means of the pressure of bubbles generated in heating to record data on a member to be recorded by using a source voltage from outside, comprising:
main switching means for controlling an ON/OFF state of a source power;
means for detecting an ON/OFF state of said main switching means;
means for housing the film in a tightly sealed state;
means for transporting the film inside of and outside of the film housing means;
means for detecting and for generating a detecting signal indicating that a predetermined portion of the film is outside of the film housing means; and
means for supplying operating power to said film transporting means even when said main switching means is in the OFF state such that said film transporting means transports the predetermined portion of the film into said film housing means in accordance with a detecting signal from said film detecting means.

4,782,352
CAPSULE RUPTURE PRINTING SYSTEM
Shigemi Misono; Tomoyuki Torii, and Katsuhiro Konno, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan
Filed Sep. 29, 1987, Ser. No. 102,419
Claims priority, application Japan, Sep. 30, 1986, 61-232485; Sep. 30, 1986, 61-232486
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160.1 **4 Claims**



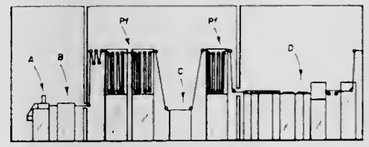
1. An apparatus for forming an image on an image-receiving sheet, comprising:
an imaging sheet coated with microcapsules sealing therein a photo-reactive composition and a chromogenic materials;
a laser scanner unit for forming a plurality of latent images corresponding to the images separated into three primary colors on the surface of a photosensitive drum according to image information;
a developing unit for developing the latent images on the surface of said photosensitive drum as toner images;
a film transferred said toner image from the surface of said photosensitive drum for projecting said toner images onto said imaging sheet by being interposed between a light source unit and a projection unit; and
means for pressing said imaging sheet and said image-receiving sheet with said capsules coating face of said imaging sheet facing said image-receiving sheet, so the layer of capsules lies sandwiched between said sheets.

4,782,353
STEPPING MOTOR-DRIVEN SECTOR OPENING/CLOSING DEVICE
Masuo Ogihara; Shigeru Tagami, and Nobuo Shinozaki, all of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Feb. 27, 1985, Ser. No. 706,127
Claims priority, application Japan, Feb. 27, 1984, 59-26804; Feb. 27, 1984, 59-26808
Int. Cl.[4] G03B *9/08*
U.S. Cl. 354—234.1 **14 Claims**



1. A sector opening/closing device in a shutter having a plurality of sectors for forming a lens aperture, a forward-/reverse rotatable stepping motor and a gear train for interconnecting the sectors and the stepping motor so as to control the sector opening and closing strokes: wherein said stepping motor comprises a support having an inner arcuate periphery, an outer periphery outwardly spaced from the inner arcuate periphery and an opening in the support, a rotor having a permanent magnet supported rotatably in the support opening and having four magnetic poles radially, two U-shaped elongated stators each made of a single piece, each stator having a pair of leg portions with magnetic pole portions formed at ends thereof, said two elongated stators being disposed on the support along the inner arcuate periphery thereof partially surrounding the periphery of the lens aperture around the rotor so that the magnetic pole portions of the stator are opposed to the outer periphery of the rotor, and coils for exciting said stators.

4,782,354
AUTOMATIC PHOTOGRAPH DEVELOPING PLANT
Giuseppe Gregoris, Azzano Decimo PN, Italy, assignor to Gregoris Photo Equipment-ICAMA s.n.c., Azzano Decimo PN, Italy
Filed Jul. 1, 1986, Ser. No. 881,051
Claims priority, application Italy, Jul. 16, 1985, 83382 A/85
Int. Cl.[4] G03D *3/13*
U.S. Cl. 354—322 **15 Claims**



1. An interface unit for a line of a plant having a line for the development and processing of photosensitive materials, said unit comprised of:
a frame having a vertical length;
a first support platform positioned in a first plane on the frame, said first platform having longitudinal and lateral axes;
a second support platform positioned in a second plane on the frame, said second plane being substantially parallel to the first plane in which the first support platform is positioned, said second platform having longitudinal and lateral axes;
means for selectively moving and securing either of the support platforms relative to the other support platform, such that the support platforms may be adjustably, selectively moved in a first vertical direction along the entire vertical length of the frame towards one another, and further such that the support platforms may be selectively moved in a second vertical direction along the entire vertical length of the frame away from one another;
a plurality of first pulleys carried by the first platform, said first pulleys being positioned along both the longitudinal and lateral platform axes, each said first pulley having a first mounting arm including a mounting portion having a first longitudinal axis being substantially perpendicular to the first plane, said first mounting arm further including a support portion having a second longitudinal axis being substantially parallel to the first plane and further being substantially perpendicular to the first longitudinal axis;
the mounting portion of each first pulley being rotatably journaled in and supported by the first support platform for rotational movement about the first longitudinal axis;
said first pulley being positioned along both the longitudinal and lateral platform axes of the first support platform;
each of said first pulleys further having a first sheave rotatably carried on and supported by the support portion thereof for rotational movement about the second longitudinal axis;

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a plurality of second pulleys carried by the second platform, said second pulleys being positioned along both the longitudinal and lateral axes, each said second pulley having a second mounting arm including a mounting portion having a first longitudinal axis being substantially perpendicular to the second plane, said second mounting arm of each second pulley further including a support portion having a second longitudinal axis being substantially parallel to the second plane and further being substantially perpendicular to the first longitudinal axis of the mounting portion of the second mounting arm;

the mounting portion of each second pulley being rotatably journaled in and supported by the second support platform for rotational movement about the first longitudinal axis of the mounting portion of the second mounting arm;

said second pulleys being positioned along both the longitudinal and lateral platform axes of the second support platform;

each of said second pulleys further having a second sheave rottably carried on and supported by the support portion of the secoond mounting arm for rotational movement about the second longitudinal axis thereof;

wherein said photosensitive material is continuously received in at least one of the sheaves of both the first and second pulleys and is serpentinely wound on alternating first and second sheaves; and

wherein said photosensitive material is continuously received form an up-line unit of the line in any one of the first and second sheaves and is serpentinely wound on any of the alternating first and second sheaves, and further along alternating longitudinal and lateral axes; and further wherein said photosensitive material is continuously passed from one of said first and second sheaves to a down-line unit of the line, whereby a plant having a line for the continuous development and processing of photosensitive materials is provided; and

further including means for selectively moving both of the support platforms relative to the other support platform including a resilient biasing means for constantly urging the said support platforms away from one another, whereby the photosensitive material is maintained tightly wound on the sheaves as said material continuously passes through the interface unit.

4,782,355

POWER SOURCE DEVICE

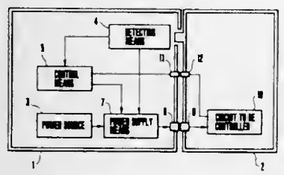
Shinji Sakai, Yokohama, and Ryosuke Miyamoto, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,264

Claims priority, application Japan, Jun. 26, 1985, 60-139916; Jun. 26, 1985, 60-139917; Jun. 26, 1985, 60-139918

Int. Cl.[4] G03B *3/00, 5/00, 7/26;* **G06F** *11/00*

U.S. Cl. 354—400 **158 Claims**



1. A system consisting of a combination of a power source device and an external device detachably connected to said power source device, comprising:

(A) the power source device including

(a) power supply means for supplying power according to the connection of said power source device with said external device, and

(b) control means for transmitting a first signal to said external device after starting the supply of power to said external device and then stopping the supply of power of said power supply means if a predetermined signal from said external device is not detected; and

(B) the external device including

(a) a first terminal for receiving the power supplied from said power supply means, and

(b) means for transmitting said predetermined signal when said first signal is transmitted.

4,782,356

AUTOMATIC FOCUSING APPARATUS

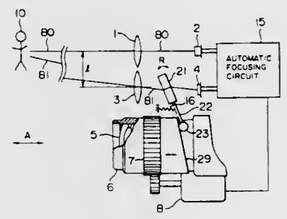
Kenji Sano; Hironobu Satoh; Takesuke Maruyama; Takanori Hisada, and Takashi Azumi, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,384

Claims priority, application Japan, Sep. 19, 1986, 61-219371

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—403 **6 Claims**



1. An automatic focusing apparatus including a light emitting section having an light emitting element and a projecting optical system for projecting a light onto an object, a light receiving section having a light receiving optical system and a light receiving element for receiving reflection light from the object of a projection light projected onto the object, said reflection light being reflected on the object, focusing lens, a lens retaining member for retaining said focusing lens, a lens driven mechanism section for driving said lens retaining member, and control means for controlling said lens driving mechanism section depending on a light reception state on said light receiving element, said focusing lens being driven and controlled to establish a focused image of said object depending on the light reception state of the reflection light comprising:

a light deflecting member disposed between said light receiving optical system and said light receiving element for deflecting said reflection light;

a member holding said light deflecting member for rotational movement about a pivot axis; and

light deflecting member drive means for rotating said holding member depending on the light reception state of the reflection light from said object wherein,

in order to set the light reception state, on said light receiving element, of the reflection light from said object to a predetermined state, and light deflecting member is rotated by said drive means and said lens retaining member is driven in cooperation with the rotation of said light deflecting member, thereby driving said focusing lens to a position where a focused image of said object is established.

4,782,357

LIGHT MEASURING DEVICE FOR CAMERA

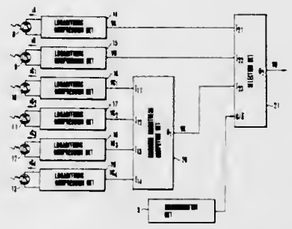
Shingo Hayakawa, and Shuichi Kiyohara, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1987, Ser. No. 43,935

Claims priority, application Japan, May 8, 1986, 61-106005

Int. Cl.[4] G03B *15/05*

U.S. Cl. 354—414 **5 Claims**



1. A light measuring device for a camera, the camera being settable in a fill-in flash mode in which a flash is set and used to illuminate the subject being photographed, the fill-in flash mode being useable where there is a difference between the brightness of the subject being photographed in the center of the field of view of the camera and the background of the subject outside such central area of the field of view, the light measuring device comprising:

(a) light receiving means having a plurality of light receiving portions for receiving the light from and developing a brightness value for each of at least two areas into which the field of view of the camera is divided, including a central area located at the center of the field of view and an outer area located outside said central area;

(b) discriminating means for discriminating whether or not the camera has been set in the fill-in flash mode; and

(c) computing means including a measuring light value computing circuit for developing a light value in accordance with a computation formula which includes at least one of the plurality of brightness values developed by said light receiving means, said computing means performing the light value computation without the brightness value developed by said light receiving means for at least said central area when the setting of the camera in the fill-in flash mode has been discriminated by said discriminating means.

4,782,358

DEVICE FOR SEPARATING TRANSFER SHEET

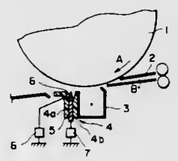
Tetsuhiro Shibayama, Kawasaki, and Haruhisa Honda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 39,985

Claims priority, application Japan, Apr. 18, 1986, 61-088196; Jun. 2, 1986, 61-125781; Jun. 18, 1986, 61-143926

Int. Cl.[4] G03G *15/14*

U.S. Cl. 355—3 TR **30 Claims**



1. A transfer material separating device for separating a transfer material from a surface of an image bearing member after an image formed on the image bearing member is electrostatically transferred onto a transfer material at a transfer station, comprising:

a separating electrode, disposed downstream of the transfer station with respect to movement direction of the transfer material, for applying electric discharge between the transfer material and said separating electrode; and

a moisture absorbable member disposed adjacent said separating electrode and electrically isolated, said moisture absorbable member being capable of absorbing moisture and having an electric resistance which changes with moisture absorbed thereby.

4,782,359

FIXING UNIT FOR SHELL-TYPE IMAGE FORMATION APPARATUSES AND A PROCESS FOR THE PLACEMENT AND REMOVAL OF THE SAME

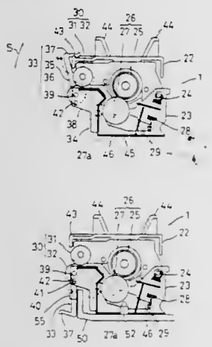
Tetsuro Tomoe, Osaka, Japan, assignor to Mita Industrial Co. Ltd., Osaka, Japan

Filed Nov. 17, 1986, Ser. No. 931,126

Claims priority, application Japan, Nov. 18, 1975, 60-177810

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 FU **6 Claims**



1. A fixing unit, comprising:

a pair of fixing rollers, one of which is an upper roller contained in an upper housing, said upper housing having an opening edge, and the other of which is a lower roller contained in a lower housing, said lower housing having an opening edge, said housing being pivotally held by a shaft that is parallel to said pair of fixing rollers, and

a lever that can be rotated at said opening edge of said lower housing, said lever being rotated so that it holds the upper housing to the lower housing in its first position, and being able to be released from the first position so that it switches to a second position where it holds the lower housing in a predetermined position.

4,782,360

ROTARY TYPE DEVELOPING APPARATUS

Ken-ichi Iwamoto, Nara; Kouichi Matsumoto, Gojo; Hiroshi Kida, Yamatokoriyama; Tatsuya Inoue, Yamatokoriyama, and Shoichiro Yoshiura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 12, 1987, Ser. No. 2,201

Claims priority, application Japan, Jan. 13, 1986, 61-5523; Jan. 13, 1986, 61-5525; Jan. 13, 1986, 61-5526; Jan. 13, 1986, 61-3194[U]

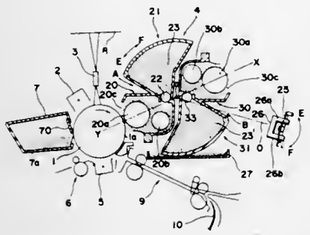
Int. Cl.[4] G03G *15/01, 15/08*

U.S. Cl. 355—4 **3 Claims**

1. A rotary type developing apparatus for use in an image

VOL 1096 ISS 1 NO 1 1988 UMI

forming arrangement, which comprises a first developing unit (A) accommodating therein a colored developer material, and a second developing unit (B) accommodating therein a non-colored developer material excluding a white group developer material, said first and second developing units (A, B) being respectively exchangeably disposed beside a photoreceptor drum (1), rotatably supported so as to selectively cause one of said developing units (A, B) to confront said photoreceptor



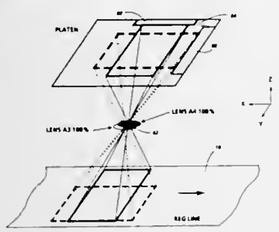
drum (1), and a receiving pan (27) provided below said developing units (A, B) for receiving the developer material scattering therefrom, the improvement comprising a rotation restricting means (26) for restricting a rotational range of said first developing unit (A) to an upper half, and that of said second developing unit (B) to a lower half, and a mounting position limiting means for enabling said first developing unit (A) to be mounted only at the upper side of a main body of said developing apparatus (4).

4,782,361

IMAGING SYSTEM WITH A PLURALITY OF DOCUMENT REGISTRATION POSITIONS

Richard A. Spinelli, Rochester; Edward C. Bock, Webster, and LeRoy A. Baldwin, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1987, Ser. No. 24,488
Int. Cl.[4] G03G *15/00;* **G03B** *27/34*
U.S. Cl. 355—14 R **5 Claims**



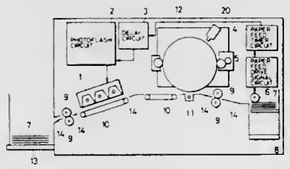
1. A imaging system for a document reproduction machine including:
- a transparent platen for supporting a document to be reproduced, said platen having at least a first and second document registration edge and an associated first and second corner registration position associated with a first and second mode of operation;
- sensing means for generating an electrical signal indicative of the presence of a document aligned with said at least first or second registration edge;
- means for generating an electrical signal indicative of a desired magnification value for the document to be reproduced;
- an optical system for flash illuminating said document and for forming latent images of said document on a photosensitive surface, said optical system including a projection lens adapted for three dimensional movement; and
- control means adapted to receive said electrical signals corresponding to a registrated document and said magnification values, and to position said lens, prior to document illumination so as to maintain one edge of a projected image along a common registration line parallel to one edge of photoreceptor through a magnification range and through said operational mode changes.

4,782,362

RECORDING APPARATUS HAVING A FLASH FUSING APPARATUS

Teruaki Mitsuya, Hitachi; Takao Kumasaka, Takahagi; Masaru Higaki, Katsuta, and Shigetake Fujiware, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd, both of Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,557
Claims priority, application Japan, Nov. 12, 1986, 61-267635; Mar. 31, 1987, 62-75799
Int. Cl.[4] G03G *15/20*
U.S. Cl. 355—14 FU **17 Claims**



1. A recording apparatus having a flash fusing apparatus comprising: a recording paper holding means for holding a plurality of recording papers, the recording paper being cut down at a predetermined length; a recording paper sending-out means for sending out one of a plurality of the recording papers; a recording paper carrying means for carrying a selected recording paper at a predetermined velocity; and a flash lamp members for photoflashing at a predetermined number of times and for fusing a toner members on said selected recording paper, characterized in that
- said recording paper sending-out means sends out one of a plurality of the recording papers in accordance with a predetermined timing signal, and said flash lamp members photoflashes at a predetermined number of times and stops the flashlight at a predetermined time in accordance with said predetermined timing signal as an index.

4,782,363

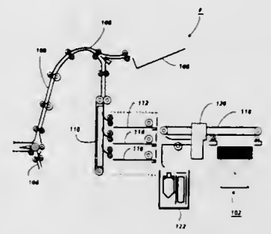
COPYING SYSTEM FOR ON-LINE FINISHING

James E. Britt, Penfield, N.Y.; Charles W. Spehrley, Jr., White River Junction, Vt.; Brian F. Walsh, Etna; Robert G. Palifka, Oxford, both of N.H.; Charles E. Smith, Pittsford, and Thomas Acquaviva, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1987, Ser. No. 98,096
Int. Cl.[4] G03G *15/00;* **B42B** *2/09;* **B65H** *31/24*
U.S. Cl. 355—14 SH **26 Claims**

1. An improved copying system for providing multiple precollated sets of copies from a recirculated set of documents, comprising:
- document recirculation and copying means for pluraly recirculating a set of documents and normally making 2 (first and second) consecutive identical copies (copy sheets) therefrom per documeni per one said circulation of said document set,
- compiler means having only 3 or 4 compiler bins for sequentially accumulating and stacking copy sheets into completed compiled collated copy sheet sets in respective said compiler bins,

- removal means for removing said completed collated copy sheet sets from said compiler bins,
- copy sheet directing means for feeding and directing each of said 2 identical copy sheets separately into only 2 of said 3 or 4 compiler bins for one said copying circulation of the set of documents,
- and control means controlling said copy sheet directing means for sequentially changing, for subsequent circulations of the set of documents, which 2 of said compiler



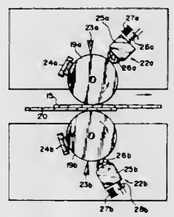
bins are so fed and are so accumulating said 2 identical copy sheets, and which other said compiler bin is not, said sequential changing occuring in coordination with said completions of accumulations of collated copy sheet sets, so that said removal means may remove an accumulated precollated set of copy sheets from at least one of said compiler bins while that compiler bin is not having a copy sheet fed thereinto, in coordination with and without interfering with said feeding and directing of other said copy sheets into other said compiler bins.

4,782,364

RECORDING APPARATUS

Osamu Takagi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 11, 1987, Ser. No. 131,807
Claims priority, application Japan, Dec. 26, 1986, 61-313059
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—30 **8 Claims**



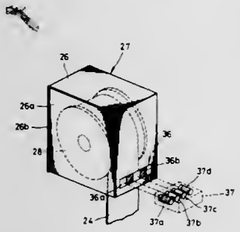
1. A recording apparatus comprising:
- exposing means for exposing a photo-pressure recording sheet carrying at least microcapsules on a surface of said photo-pressure recording sheet;
- pressing means for pressing the exposed photo-pressure recording sheet so as to break ones of said microcapsules; and
- cleaning means provided in the vicinity of said pressing means for removing foreign matters mainly containing the contents of microcapsules and attached to said pressing means.

4,782,365

PHOTOGRAPHIC PRINTING APPARATUS AND PAPER MAGAZINE FOR USE THEREWITH

Kunio Takagi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 5, 1986, Ser. No. 927,124
Claims priority, application Japan, Nov. 5, 1985, 60-169181[U]; Nov. 5, 1985, 60-169182[U]; Nov. 5, 1985, 60-246143
Int. Cl.[4] G03B *7/24, 27/72*
U.S. Cl. 355—38 **4 Claims**



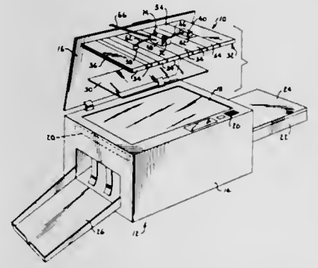
1. A photgraphic printing apparatus for use with a paper megazine containing therein a photgraphic paper on which prints are made, said apparatus comprising:
- means provided on the outside of said paper magazine for indicating the paper type of a photographic paper contained in said paper magazine;
- means provided on said apparatus adapted register with said paper type indication means when said magazine is mounted on said apparatus for detecting said paper type;
- means for determining a printing condition according to said detected paper type; and
- means for making a color print based on the thusdetermined printing condition, thereby to obtain a color print with proper color balance and density;
- said paper type indication means being coded means comprised of a plurality of lugs and a plurality of recesses the particular combination of which informs said detecting means of said paper type.

4,782,366

NUMBER PRINTING DEVICE FOR PHOTOCOPIERS

Steve Lindsay, 3923 N.W. Brickyard Rd., Topeka, Kans. 66618

Filed May 4, 1987, Ser. No. 45,374
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—40 **20 Claims**



1. Apparatus for sequentially numbering copies produced by a photocopy machine having a transparent panel for receiving materials to be copied and a cover for closure on the materials received on the panel, said apparatus comprising:
- a chase having a size and shape to be received on the trans-

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parent panel on top of the material to be copied between the cover of the machine and the material to be copied, said chase being detachable from the photocopy machine and being separable from the machine and from said cover;

a counter head carried on said chase and providing a numerical display of the current numerical count state of the counter head, said display being at a location to be exposed to the transparent panel when the chase is received thereon to effect copying of the count state of the counter onto each copy produced by the photocopy machine; and

means for incrementing the count state of said display each time a preselected number of copies have been produced by the machine.

4,782,367

EXTRA DATA ADDING UNIT FOR A COPIER

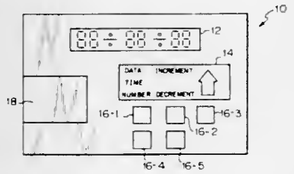
Koichi Noguchi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,573

Claims priority, application Japan, Nov. 12, 1986, 61-173457[U]

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—40 **10 Claims**



1. A thin flat unit usable with a copier for copying desired extra data together with data which are printed on an original document, comprising:

a base plate having a thin flat configuration;

a first display section provided on one surface of said base plate for displaying the extra data;

a second display section provided on the other surface of said base plate for monitoring the extra data;

switches arranged on said other surface of said base plate for setting modes and data; and

a control section responsive to outputs of said switches for controlling said first and second display sections.

4,782,368

METHOD FOR CORRECTION FOR CHROMATIC ABERRATION AND EXPOSURE APPARATUS USING THE SAME

Kazufumi Ogawa; Masaru Sasago, both of Hirakata; Masayuki Endo, Izumi, and Takeshi Ishihara, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial, Co., Ltd., Osaka, Japan

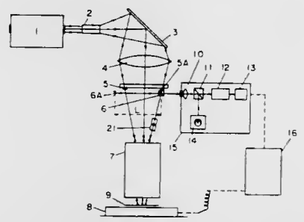
Filed Jul. 7, 1987, Ser. No. 70,715

Claims priority, application Japan, Jul. 11, 1986, 61-164061; Jul. 18, 1986, 61-170022

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—43 **5 Claims**

2. An exposure apparatus for fabrication of semiconductor devices comprising: a reduction-projection lens, a wafer stage, a reticle stage, and an excimer laser light source, positioned to pass alignment light and exposure light in said reduction-projection lens, a main beam splitter in an area corresponding to an alignment key and a mirror opposite to said main beam splitter disposed in the optical path between said reticle stage and said reduction-projection lens, and an alignment optical system composed of an alignment lens for magnifying an alignment mark, an alignment beam splitter, a camera unit, and an alignment mark illuminating system, and a drive unit for said alignment optical system disposed in a direction approximately perpendicular to the optical axis of exposure of said projection



lens, whereby the focal positions of the light for exposure and alignment light can be matched by adjusting the interval between said beam splitter and said opposing mirror.

4,782,369

DEVICE FOR ILLUMINATING AN ORIGINAL DOCUMENT

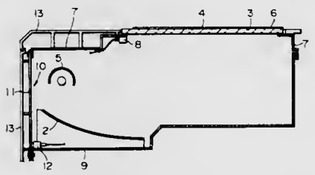
Yuji Yasuda, and Yoshiyuki Tanimoto, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 4, 1987, Ser. No. 116,683

Claims priority, application Japan, Nov. 4, 1986, 61-262575; Nov. 12, 1986, 61-268824

Int. Cl.⁴ G03B *27/72*

U.S. Cl. 355—69 **5 Claims**



1. A device for illuminating an original document laid on a glass platen of a recording apparatus to expose a photoconductive element imagewise by using a flash lamp which is triggered by a trigger wire, comprising:

a protective cover for protecting said flash lamp;

a trigger circuit for said trigger wire; and

a control means for disenabling said trigger circuit when the glass platen is broken or when said protective cover is opened.

4,782,370

ORIGINAL SUPPORTING TABLE FOR COPIER

Akira Sudou, Ayase, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1987, Ser. No. 39,843

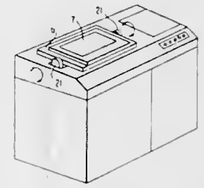
Claims priority, application Japan, Apr. 18, 1986, 61-57523[U]; Apr. 18, 1986, 61-57524[U]

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—76 **5 Claims**

1. An original supporting table for a copier having a copier body of such a type that an original is duplicated with its informational side facing down, said original supporting table comprising a turning frame mounted on the copier body through turning shafts for turning movement around their respective axes, an original cover incorporated in said turning frame, and a pair of original glass plates opposed to the original

cover and mounted respectively to both faces of said turning frame so as to be capable of being opened and closed, originals



being able to be clamped respectively between said pair of original glass plates and said original cover.

4,782,371

DOUBLE IMAGE RECORDING METHOD

Takashi Yokota, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,545

Claims priority, application Japan, Nov. 10, 1986, 61-267403

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—77 **2 Claims**

1. A method of recording double images on a recording medium by recording a first image on the recording medium and then recording a second image on the recording medium with main scanning means for scanning the recording medium in a first direction transverse to a second direction in which the recording medium is moved, and sub-scanning means for moving the recording medium in said second direction, said method comprising the step of:

varying an image magnification dependent on the magnification of an optical system, a main scanning clock signal, and the speed of movement of said main scanning means, or an image magnification dependent on a subscanning clock signal and the speed of movement of said sub-scanning means, or both of said image magnifications between said first and second images.

4,782,372

LATERAL CONDUCTIVITY MODULATED MOSFET

Akio Nakagawa, Hiratsuka; Hiromichi Ohashi, Yokohama; Yoshihiro Yamaguchi, Urawa; Kiminori Watanabe, Kawasaki, and Thuneo Thukakoshi, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

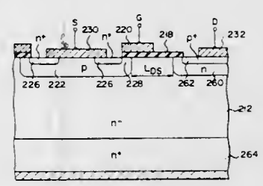
Continuation of Ser. No. 738,188, May 28, 1985, abandoned.

This application Feb. 26, 1987, Ser. No. 19,337

Claims priority, application Japan, May 30, 1984, 59-110244; Sep. 29, 1984, 59-204427; Nov. 20, 1984, 59-244811

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **4 Claims**



1. A lateral conductivity modulated metal oxide semiconductor field effect transistor, comprising:

a semiconductor substrate;

a high resistance semiconductor layer of a first conductivity type formed over said semiconductor substrate and having a high resistance;

a semiconductor region of the first conductivity type formed in a surface of said high resistance semiconductor layer and having an impurity concentration higher than that of said high resistance semiconductor layer;

a drain region of a second conductivity type formed and located in said semiconductor region;

a base region of the second conductivity type formed in said surface of said high resistance semiconductor layer, said base region surrounding a window of said high resistance semiconductor layer which is in said surface;

a source region of the first conductivity type formed in said base region;

a gate insulating film formed on a channel region which is formed in a surface of said base region between said high resistance semiconductor layer and said source region;

a gate electrode formed on said gate insulating film;

a source electrode ohmicly contacting said source region and said base region; and

a drain electrode ohmicly contacting said drain region, whereby said lateral conductivity modulated metal oxide semiconductor field effect transistor can be operated in a condition that a latch up current is larger than a saturation current.

4,782,373

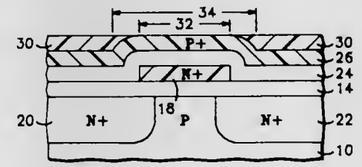
SELF-ALIGNED SEMICONDUCTOR DEVICE WITH NON-DIFFUSABLE CONTACTS

Clarence A. Lund, and Jenny M. Ford, both of Phoenix, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Sep. 25, 1987, Ser. No. 101,694

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.9 **8 Claims**



1. An active semiconductor device comprising a MOSFET and a variable resistor load device comprising:

a semiconductor substrate;

a source and a drain disposed in said substrate;

a gate dielectric layer disposed on said substrate;

a polycrystalline gate disposed on said gate dielectric layer;

a conformal dielectric layer disposed on said gate;

a conformal polycrystalline layer disposed on said conformal dielectric layer; and

at least two spaced-apart non-diffused contacts disposed on portions of said conformal polycrystalline layer, said contacts being aligned on said conformal polycrystalline layer by said gate.

4,782,374

CHARGE TRANSFER DEVICE HAVING A WIDTH CHANGING CHANNEL

Takao Kamata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 703,556, Feb. 20, 1985, abandoned.

This application Mar. 12, 1987, Ser. No. 24,923

Claims priority, application Japan, Feb. 23, 1984, 59-32854

Int. Cl.⁴ H01L *29/78, 27/04*

U.S. Cl. 357—24 **5 Claims**

1. A charge transfer device comprising:

a semiconductor substrate of one conductivity type;

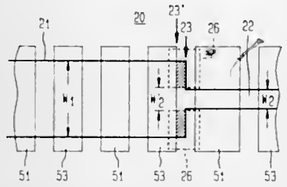
a channel region of the other conductivity type formed in

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said semiconductor substrate, said channel region having a wide part and a narrow part, said wide part contactiing said narrow part at a contacting portion to form a path for charges being transferred from said wide part to said narrow part;

a channel stopper region of said one conductivity type formed in the surface portion of said semiconductor substrate, said channel stopper region surrounding said channel region;

a plurality of transfer electodes formed on said semiconductor substrate via an insulating film, said plurality of transfer electrodes being arrayed in a line on said channel region, every other transfer electrode having side portions



on said channel region which overlap adjacent transfer electrodes to continuously cover said channel region, and with the position of said contacting portion being arranged to make alignment in plan view with a side surface of a predetermined one of said every other transfer electrodes;

at least one auxiliary channel stopper region formed at a portion surrounded by said channel stopper region, said wide part and said narrow part, to align the position of said contacting portion with said side surface of said predetermined transfer electrode; and

a means for applying clock pulses to said transfer electrodes to make charges transfer through said path of said channel region.

4,782,375

INTEGRATABLE HALL ELEMENT

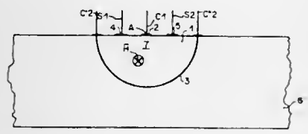
Radivoje Popovic, Zug, Switzerland, assignor to LGZ Landis & Gyr Zug, Zug, Switzerland

Continuation of Ser. No. 675,717, Nov. 28, 1984, abandoned. This application Dec. 19, 1986, Ser. No. 946,149

Claims priority, application Switzerland, Dec. 19, 1983, 6739/83

Int. Cl.[4] H01L *43/06*

U.S. Cl. 357—27 **20 Claims**



1. An integratable Hall element comprising:

a semiconductor layer having a major surface and having a thickness;

first and second sensor electrodes spaced apart from each other and at the major surface for deriving an electric Hall voltage between said first and second sensor electrodes;

a first current electrode at the major surface and located substantially at the midpoint of a straight line connecting said first and said second sensor electrodes; and

a plurality of additional current electrodes spaced away from said first current electrode, wherein at least some of said additional current electrodes are disposed approximately symmetrically about an axis which passes through said first current electrode at approximately a right angle to said major surface;

the thickness of said semiconductor layer being greater than the distance between said first and second sensor electrodes for enabling electrical currents to flow between said first current electrode and said additional current electrode along paths extending deeply into said semiconductor layer so that sufficient portions of the paths of the electrical currents are substantially perpendicular to the major surface below said first current electrode to provide said Hall element with sensitivity to a magnetic field component substantially parallel to the major surface.

4,782,376

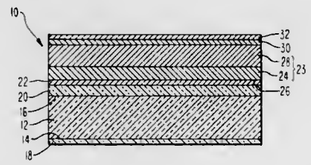
PHOTOVOLTAIC DEVICE WITH INCREASED OPEN CIRCUIT VOLTAGE

Anthony W. Catalano, Rushland, Pa., assignor to General Electric Company, Fairfield, Conn.

Filed Sep. 21, 1983, Ser. No. 534,154

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **12 Claims**



1. In a photovoltaic device comprising a body of semiconductor material between a first wide bandgap energy layer of first conductivity type through which light enters the device and a second layer having a second conductivity type opposite to that of the first layer, the improvement which comprises:

the body of semiconductor material comprising a first region which is closest to the first layer and a second region having substantially intrinsic type conductivity wherein the bandgap energy of the first region is constant and is greater than that of the second region and no greater than that of the first layer, the bandgap energy of the second region is less than or equal to about 1.7 electron volts and the thickness of the first region is less than that of the second region.

4,782,377

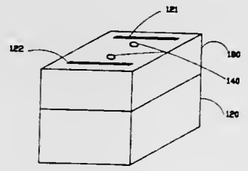
SEMICONDUCTING METAL SILICIDE RADIATION DETECTORS AND SOURCE

John E. Mahan, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Sep. 30, 1986, Ser. No. 913,354

Int. Cl.[4] H01L *27/14, 33/00;* **G01T** *1/24*

U.S. Cl. 357—30 **32 Claims**



15. A device comprising the composite structure of: substrate means;

a layer of semiconductive metal silicide deposited or grown on said substrate means.

4,782,378

TRANSISTOR HAVING INTEGRATED STABILIZING RESISTOR AND METHOD OF MAKING THEREOF

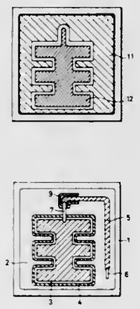
Tsuneto Sekiya; Shinichi Ito, and Hisao Shigekane, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 813,334, Dec. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 469,055, Feb. 23, 1983, abandoned. This application Nov. 18, 1987, Ser. No. 124,403

Claims priority, application Japan, Feb. 25, 1982, 57-29290

Int. Cl.[4] H01L *29/72, 29/08, 29/52*

U.S. Cl. 357—34 **5 Claims**



1. A transistor comprising: an emitter region, a base region having a base electrode, and a collector region, said emitter region being located within said base region; an elongated resistive region of the same conductivity type as said emitter region, said emitter region and said elongated resistive region defined by a single silicon dioxide pattern and a base electode pattern surrounding said emitter region a first end of said resistive region being connected to said emitter region and a second end of said resistive region being connected to said base region wherein said second end is formed close to said base electrode so that additional resistance to a current through the base region prevents the occurrence of secondary breakdown; and a partially surrounding floating emitter region of the same conductivity type as said emitter region, said partially surrounding floating emitter region only being located spaced apart from and around said first end of said resistive region such that said partially surrounding floating emitter region acts as a floating emitter and prevents the occurrence of secondary breakdown.

4,782,379

SEMICONDUCTOR DEVICE HAVING RAPID REMOVAL OF MAJORITY CARRIERS FROM AN ACTIVE BASE REGION THEREOF AT DEVICE TURN-OFF AND METHOD OF FABRICATING THIS DEVICE

Bantval J. Baliga, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 723,383, Apr. 15, 1985, abandoned, which is a continuation of Ser. No. 324,245, Nov. 23, 1981, abandoned. This application Apr. 17, 1987, Ser. No. 40,693

Int. Cl.[4] H01L *29/74*

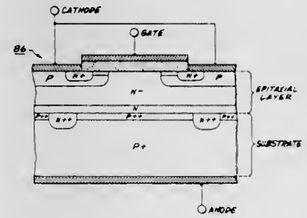
U.S. Cl. 357—38 **31 Claims**

1. A semiconductor device having the feature of rapid removal of majority carriers from an active base region thereof during turn-off of the device, comprising:

(a) a semiconductor substrate comprising first and second regions; said first region being doped to one conductivity type and said second region being doped to the opposite conductivity type; at least a major portion of said first region adjacent said second region being doped to a first concentration; said first concentration being equal to at least 5×10^{17} dopant atoms per cubic centimeter; said second region being doped to a second concentration which is at least as high as said first concentration; said substrate having a first surface comprising in part a surface of said second region and in further part a surface of said first region; said substrate having a second surface comprising a portion of said first region;

(b) a first main electrode disposed on said second surface of said substrate, said first electrode (1) being ohmically connected to said first region, (2) not being ohmically connected to said second region and (3) being spaced from said second region;

(c) a semiconductor layer disposed on said first surface of said substrate and comprising at least third and fourth regions; said third region comprising said active base region and separating said substrate from said layer fourth region; said third region being doped to said opposite conductivity type and said fourth region being doped to said one conductivity type; at least a major portion of said



third region being doped to a third concentration substantially lower than said first concentration; a major portion of said fourth region being doped to a fourth concentration substantially higher than said third concentration;

(d) second main electrode ohmically connected at least to a surface of said fourth region; and

(e) a gate electrode contiguous with said fourth region, said gate electrode, when appropriate main bias is applied between said first and second main electrodes, being responsive to an appropriately applied gate bias to render said device conductive between said first and second main electrodes;

(f) whereby when said device has been rendered conductive between said first and second main electrodes and said appropriate main bias is removed from said first and second main electrodes, opposite type conductivity carriers in said third region are rapidly transferred to said first region by being attracted toward and into said second region, causing said second region to effficiently inject opposite type conductivity carriers into said first region where said injected opposite type carriers combine with one type conductivity carriers in said first region to rapidly turn said device off.

4,782,380

MULTILAYER INTERCONNECTION FOR INTEGRATED CIRCUIT STRUCTURE HAVING TWO OR MORE CONDUCTIVE METAL LAYERS

Krishna Shankar, Mountain View, and Ram Ramani, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 22, 1987, Ser. No. 6,000

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—71 **8 Claims**

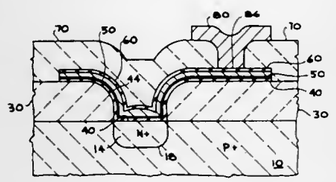
1. An improved integrated circuit structure comprising a novel multilayer conductive interconnection layer formed between the substrate and a second metal layer, and character-

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ized by reduced diffusion of conductive metal and silicon therebetween and reduced formation of spikes or hillocks, said structure comprising:

(a) a silicon substrate having at least one doped region and oxide portions adjacent said doped region;

(b) a lower conductive barrier layer in electrical contact with said doped region of said substrate comprising a material selected from the class consisting of TiW and TiN;



(c) an intermediate layer of conductive metal comprising a 2500–3500 Å layer of an aluminum base metal formed over and in contact with said lower conductive layer;

(d) an upper conductive barrier layer formed on said intermediate layer and selected from the class consisting of TiW, TiN, $MoSi_x$, and $TaSi_x$ wherein x equals 2 or more; said lower layer, intermediate layer, and upper layer functioning together as a multilayer interconnection layer; and

(e) a second metal layer in said structure having at least one portion thereof in electrical contact with said interconnection layer.

4,782,381

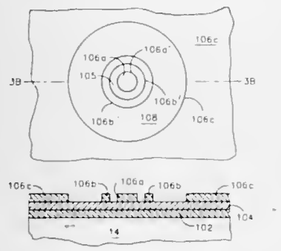
CHIP CARRIER

Richard C. Ruby, Menlo Park, and Clinton Chao, Redwood City, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 12, 1987, Ser. No. 62,005

Int. Cl.[4] H01L *23/48, 29/90, 39/02*; H01C *1/012*

U.S. Cl. 357—74 **2 Claims**



1. A chip carrier for carrying integrated circuit chips, said carrier comprising:

substrate means having a surface;

at least one component structure on the surface or forming a part of the substrate means at the surface of the substrate means;

integrated circuit contact means connected to said at least one component structure;

sandwich means including at least one insulating and one conducting layer in an alternating arrangement, said sandwich means being in contact with and covering at least a portion of the contact means and the surface, said sandwich means having a surface suitable for carrying integrated circuit chips; and

via means within said sandwich means for connecting the contact means to integrated circuit chips carried by the sandwich means, thereby coupling at least one component structure to the chips;

wherein said component structure comprises a sheet of a resistive material, said contact means comprising two contacts spaced apart from each other but both in contact with the sheet of resistive material, so that when an integrated circuit chip is connected to one of the two contacts by the via means, the portion of the sheet between the two contacts functions as a resistor for terminating signals from the chip;

wherein one of the two contacts completely surrounds the other contact, so that the portion of the sheet functioning as a resistor comprises a continuous band between the two contacts.

4,782,382

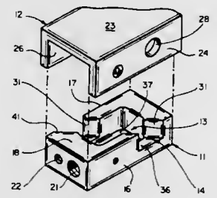
HIGH QUANTUM EFFICIENCY PHOTODIODE DEVICE

Lawrence A. Godfrey, Ontario, Calif., assignor to Applied Solar Energy Corporation, City of Industry, Calif.

Filed Oct. 17, 1986, Ser. No. 920,208

Int. Cl.[4] H01L *23/02, 23/12*

U.S. Cl. 357—74 **7 Claims**



5. In a photodiode device: a generally rectangular body having a central cavity opening through one surface thereof and a channel extending obliquely between opposite sides of the body and intersecting the central cavity, a pair of photodiodes mounted on the side walls of the channel and having generally planar light receiving surfaces facing each other in parallel spaced relation, a mirror positioned at one end of the channel with a reflecting surface generally perpendicular to the opposite sides of said body, a generally U-shaped cover mounted on said body with a central wall adjacent to the one surface of the body and side walls adjacent to the opposite surfaces of the body, and an aperture in the side wall of the cover at the end of the channel opposite the mirror for admitting light to the cavity.

4,782,383

APPARATUS FOR PROCESSING HIGH FREQUENCY EDGE INFORMATION IN A WIDESCREEN TELEVISION SYSTEM

Michael A. Isnardi, Plainsboro, N.J., assignor to General Electric Company, Princeton, N.J.

Division of Ser. No. 78,341, Jul. 27, 1987. This application Aug. 26, 1987, Ser. No. 89,637

Int. Cl.[4] H04N *11/00*

U.S. Cl. 358—12 **26 Claims**

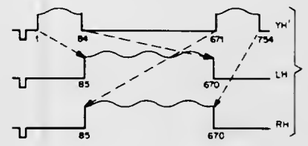
1. Apparatus for encoding a widescreen video signal representative of a widescreen image, comprising:

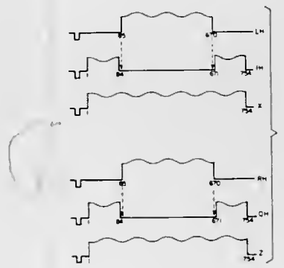
means for generating a widescreen color video signal including luminance and chrominance information within horizontal image lines, said widescreen video signal having an aspect ratio greater than a standard aspect ratio and having a center panel signal component and left and right side panel signal components within horizontal image lines; and

means for generating first and second simultaneous signals in

response to the occurrence of each said horizontal image lines, wherein

(a) left and right side panel high frequency chrominance information remains in a normal horizontal line spatial position in said first and second signals;





(b) left side panel high frequency luminance information is disposed between left and right side panel high frequency chrominance information in said first signal; and

(c) right side panel high frequency luminance information is disposed between left and right side panel high frequency chrominance information in said second signal.

4,782,384

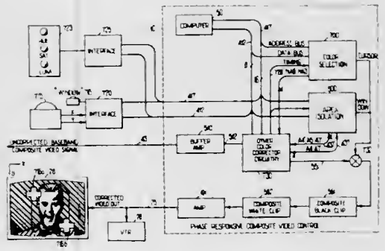
AREA ISOLATION APPARATUS FOR VIDEO SIGNAL CONTROL SYSTEM

Terry L. Tucker, Boca Raton; Craig F. Fearing, Hollywood, and Robert E. Schwarz, North Dade, all of Fla., assignors to Utah Scientific Advanced Development Center, Inc., Ft. Lauderdale, Fla.

Continuation-in-part of Ser. No. 776,438, Sep. 16, 1985, Pat. No. 4,710,800, which is a continuation-in-part of Ser. No. 760,339, Jul. 29, 1985, which is a continuation-in-part of Ser. No. 604,845, Apr. 27, 1984, Pat. No. 4,642,682. This application Oct. 24, 1986, Ser. No. 922,702

Int. Cl.[4] H04N *9/64, 9/74*

U.S. Cl. 358—22 **43 Claims**



1. In a video signal correction system, an apparatus for selecting a spatial region in a video image represented by an input video signal and for correcting a video parameter of said input video signal, comprising:

operator control means for selecting a spatial region on a video monitor displaying said image;

means for providing a plurality of sets of correction signals, each of said sets of correction signals comprising a plurality of correction signals;

means responsive to said selected spatial region for selecting a first set of video correction signals corresponding to a video characteristic for portions of said input video signal corresponding to said selected spatial region;

means responsive to said selected spatial region for selecting a second set of video signal correction signals corresponding to a video characteristic for portions of said input video signal corresponding to regions of said image outside said selected spatial region; and

video signal correction means responsive to a video characteristics of said input video signal and to a selected particular one of said first or alternatively of said second set of video signal correction signals for modifying a parameter of said input video signal to provide a corrected video output signal which has different corrections for said selected region and for regions outside said selected region.

4,782,385

FREQUENCY CONVERSION OF AN RF SIGNAL TRANSMITTED FOR COLOR-TELEVISION RECEIVERS

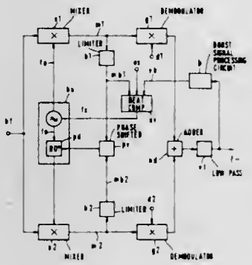
Gerhard Gunter, Neuweiler-Agenbach; Hermannus Schat, Freiburg; Herbert Elmis, Denzlingen; Bernd Novotny, Gundelfingen; Otmar Kappeler, Neuenburg, and Dietmar Ehrhardt, Freiburg, all of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 899,974

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1985, 85110734

Int. Cl.[4] H04N *9/66*

U.S. Cl. 358—25 **10 Claims**



8. A method for the frequency conversion of an RF signal transmitted for a color television receiver at the picture and sound carrier frequencies using a frequency reversal circuit to make the frequencies of the picture carrier, the chrominance subcarrier and at least one sound carrier appear transformed into the baseband, which transformation undesirably causes spurious signals due to unavoidable signal path differences in said frequency reversal circuit to appear as an undesirable moire pattern on the television screen, said method including the step of

using a frequency offset between the transformed picture carrier frequency and the transformed chrominance subcarrier frequency to shift said spurious signals frequencies resulting from said unavoidable signal-path differences which produce the moire pattern on the television screen

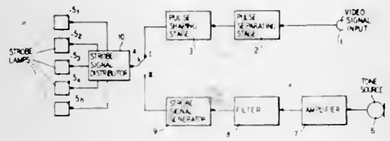
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to be placed into a frequency range causing said moire pattern to be minimized from the standpoint of a viewer.

4,782,386
VIDEO ENDOSCOPE WITH A LIGHT SOURCE OPERABLE IN A CONTINUOUS OR STROBOSCOPIC MODE

Felix Ams, Kaempfelbach; Reiner Hoffmann, Illingen, and Peter Jaggy, Oetisheim, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Mar. 4, 1987, Ser. No. 21,809
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607767
Int. Cl.⁴ H04H *7/18*
U.S. Cl. 358—93 **24 Claims**

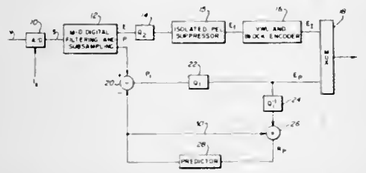


1. An apparatus for operating a light source to illuminate an examination subject for use with a video system for displaying an image of said subject, said apparatus comprising:
first means for triggering flashing of said light source at a frequency appearing as continuous illumination of said examination subject to a human observer including means for synchronizing triggering of said flashing so as to prevent interference with the video display of said image;
second means for triggering flashing of said light source for non-continuous appearing illumination of said examination subject; and
means connected to said light source and to said first and second means for triggering for selectively connecting one of said first or second means for triggering to said light source.

4,782,387
TWO-CHANNEL CODING OF DIGITAL SIGNALS

Mohamed S. Sabri, Beaconsfield; Albert Golembiowski, Nuns' Island, and Bireodra Prasada, Westmount, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 9, 1986, Ser. No. 939,983
Int. Cl.⁴ H04N *7/12*
U.S. Cl. 358—133 **44 Claims**

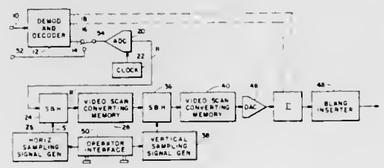


1. Signal processing apparatus comprising an encoder for encoding an analog signal (V) to produce a coded signal, said encoder comprising:
analog to digital encoder means (**10**) for sampling the analog signal (V) to provide a digitally encoded signal (S);
coding means (**12**) responsive to the output of said encoder means (**10**) for providing two distinct subsampled digital signals (E, P);
said coding means (**12**) including subsampling means (**56**) for subsampling said digitally encoded signal (S) to provide a subsampled digital signal (P) corresponding to the input signal, and also including filtering and subsampling means (**50,52,54**) for filtering and subsampling said digitally encoded signal (S) to provide a complementary subsampled signal (E) corresponding to the difference between the digitally encoded signal (S) and a filtered signal derived by filtering the signal (S); and
first and second coding means (**14,15,16; 20,22, 24,26,28,30**) for encoding said two distinct signals (E, P) to provide two coded distinct signals (E_I, E_P) respectively, each of said first and second coding means being operative to encode in a different way to that in which the other encodes.

4,782,388
METHOD AND APPARATUS FOR PROVIDING VIDEO MOSAIC EFFECTS

David E. Lake, Penn Valley, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Oct. 24, 1986, Ser. No. 923,771
Int. Cl.⁴ H04N *5/14*
U.S. Cl. 358—160 **9 Claims**



1. A method of processing a raster scan input video signal, the input video signal being a stream of digital data words occurring at a uniform clock rate, comprising the steps of:
(a) carrying out a sample and hold operation on the stream of digital data words by receiving each digital data word, and outputting the received digital data word when a first sample signal is in a first state and outputting the digital data word received just prior to the transition of the first sample signal to a second state so long as the first sample signal is in the second state, the number of periods of the clock rate for which the first sample signal is in the second state being variable so as to generate a second video signal having a stream of digital data words;
(b) rotating the effective scanning direction of the second video signal through a predetermined angle so as to generate a third video signal having a stream of digital data words; and
(c) carrying out a sample and hold operation on the third video signal as in step (a) using a second sample signal so as to generate a fourth video signal having a stream of digital data words.

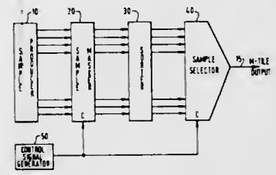
4,782,389
ADAPTIVE M-TILE SAMPLE PRODUCER

William T. Mayweather, III, Stone Mt., Ga., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Apr. 30, 1987, Ser. No. 44,375
Int. Cl.⁴ H04N *5/21, 5/14*
U.S. Cl. 358—167 **12 Claims**

1. An adaptive M-tile sample producer, comprising:
a source of a set of input samples;
a source of a control signal;
means, coupled to said sample source for producing a set of masked samples consisting of said set of input samples wherein a subset of said input samples, selected in response to said control signal, are replaced with samples having a predetermined value;
means, coupled to said masked sample producer, for producing an ordered set of samples consisting of said set of masked samples in rank order;

means, coupled to said ordered sample producer, for producing the one of said ordered set of samples having the

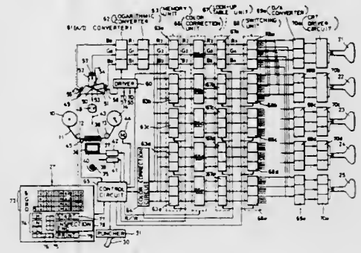


value corresponding to a desired M-tile of said input samples to an output terminal in response to said control signal.

4,782,390
COLOR NEGATIVE INSPECTION APPARATUS FOR DISPLAYING AND SEQUENTIALLY SHIFTING N COLOR POSITIVE IMAGES CORRESPONDING TO N COLOR NEGATIVE FRAMES

Ryoichi Hayashi, and Tsutomu Kimura, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 16, 1986, Ser. No. 942,445
Claims priority, application Japan, Dec. 16, 1985, 60-281195
Int. Cl.⁴ G03F *3/10, 3/08;* **G03B** *27/80;* **H04N** *1/46*
U.S. Cl. 358—76 **10 Claims**



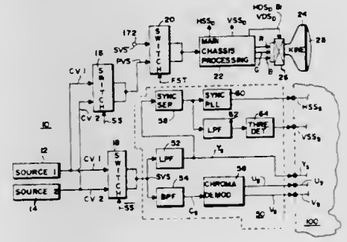
1. A color negative inspection apparatus comprising:
means for reading color image data from a frame of a color negative film;
memory means for storing color image data sequentially read from N frames of said color negative film by said reading means, N being an integer at least as large as 2;
color image display means for displaying N color positive images based on said color image data stored in said memory means, said N color positive images corresponding to said N frames of said color negative film; and
means for shifting one color positive image by one frame each time color image data is read from a frame of said color negative film by said reading means.

4. A color negative inspection apparatus comprising:
means for reading color image data from a frame of a color negative film;
N frame memories for storing color image data sequentially read from N frames of said color negative film by said reading means, N being an integer at least as large as 2;
N correction means for correcting said color image data stored in said N frame memories;
means for setting amounts by which said N correction means correct said color image data stored in said N frame memories;
N color image display means for displaying N color positive images based on said color image data stored in said N frame memories as corrected by said N correction means, said N color positive images corresponding to said N frames of said color negative film; and
means for shifting one color positive image by one frame each time color image data is read from a frame of said color negative film by said reading means.

4,782,391
MULTIPLE INPUT DIGITAL VIDEO FEATURES PROCESSOR FOR TV SIGNALS

David L. McNeely, and Donald H. Willis, both of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Aug. 19, 1987, Ser. No. 87,060
Int. Cl.⁴ H04N *5/262, 5/272*
U.S. Cl. 358—183 **10 Claims**



1. A television (TV) signal processing system for use with a display device having a screen and being responsive to a periodic raster synchronizing component; said system comprising:
a source of a video signal for generating a picture on said screen; said video signal including a periodic picture synchronizing component;
means for generating a first clock signal;
means for sychronizing the phase of said first clock signal with the phase of said periodic raster synchronizing component;
means coupled to receive said first clock signal and responsive to said periodic picture synchronizing component of said video signal for generating a second clock signal (1) having its phase adjusted once every period of said periodic picture synchronizing component to be in phase alignment therewith, and (2) having the same period as said first clock signal between successive phase alignments;
means coupled to receive said video signal and responsive to said second clock signal for developing a stream of signal samples occurring synchronously with said second clock signal;
clock transfer means responsive to said first and second clock signals for translating said stream of signal samples occurring synchronously with said second clock signal

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into a stream of signal samples occurring synchronously with said first clock signal; and

memory means coupled to said clock transfer means and responsive to said first clock signal for storing said signal samples representative of said picture and for providing, at an output port thereof, said stored signal samples synchronously with said first clock signal.

4,782,392

APPARATUS AND METHOD FOR GENERATING A ROTATING CLOCK VIDEO WIPE

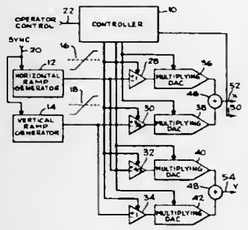
David A. Haycock, Lakewood, and Jay L. Flora, Boulder, both of Colo., assignors to Ampex Corporation, Redwood City, Calif.

PCT No. PCT/US86/00512, § 371 Date Nov. 12, 1986, § 102(e) Date Nov. 12, 1986, PCT Pub. No. WO86/05646, PCT Pub. Date Sep. 25, 1986

Continuation-in-part of Ser. No. 712,282, Mar. 15, 1985. This PCT application Mar. 14, 1986, Ser. No. 934,576

Int. Cl.[4] H04N *5/262*

U.S. Cl. 358—183 **41 Claims**



1. Apparatus for producing a rotating clock video wipe waveform control signal, from a ray having a positional relationship to a raster, said positional relationship defining a start angle and a current rotation angle, comprising:

ramp generating means for producing a horizontal control ramp signal at a horizontal video rate and a vertical control ramp signal at a vertical video rate;

control means responsive to said start angle and said current rotation angle for generating rotation control data and a logic control signal;

ramp rotation means responsive to said horizontal and vertical ramp signals and said rotation control data for producing a start angle waveform control signal and a rotation waveform control signal; and

logic means responsive to said start angle waveform control signal and said rotation waveform control signal and said logic control signal for combining said start angle waveform control signal and said rotation waveform control signal in a first manner when a difference between said current rotation angle and said start angle is less than a transitional angle and in a second manner when said difference is greater than said transitional angle to produce said rotating wipe waveform control signal.

4,782,393

TELEVISION CAMERA SYSTEM WITH A PROTECTION FUNCTION FOR A MISCONNECTION

Kazuo Kawamura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1987, Ser. No. 16,363

Claims priority, application Japan, Mar. 11, 1986, 61-53102

Int. Cl.[4] H04N *5/30*

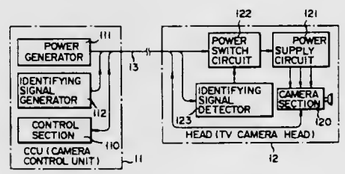
U.S. Cl. 358—209 **11 Claims**

1. A television camera system with a protection function for a misconnection, said system comprising:

a camera control unit including power generating means for generating power, and identifying signal generating means for generating an identifying signal;

a camera cable, one end of which is connected to said camera control unit, said camera cable being adapted to transmit the power and the identifying signal; and

a camera head connected to the other end of said camera cable, said camera head being provided with identifying



signal detecting means for receiving the identifying signal and identifying the appropriate type of camera head, power switching means for receiving the power and switching the power on the basis of a discrimination result of said identifying signal detecting means, and power supplied supply circuit means for utilizing the power from said power switching means.

4,782,394

IMAGE PICKUP APPARATUS HAVING SATURATION PREVENTION CONTROL MODES

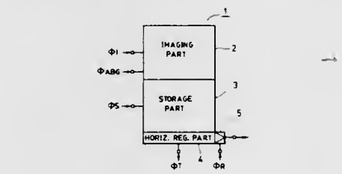
Teruo Hieda, Yokohama, and Yoshiaki Hirano, Kawagoe, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

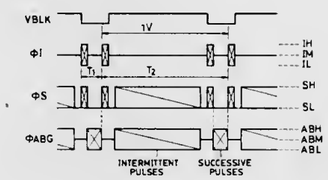
Filed May 22, 1986, Ser. No. 865,789

Claims priority, application Japan, Jun. 3, 1985, 60-120079; Jun. 20, 1985, 60-134833; Jul. 29, 1985, 60-166967

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.19 **113 Claims**





1. An image pickup apparatus comprising:

(a) converting means for converting an image into an electrical signal;

(b) means operative in response to a control signal for preventing the saturation of said converting means;

(c) driving means having a first mode which allows said converting means to eliminate said electrical signal and a second mode which allows said converting means to deliver said electrical signal to the outside of said image pickup apparatus as an electrical image signal; and

(d) generating means for generating said control signal in accordance with said modes of said driving means, wherein said generating means has a first control mode in which said control signal is intermittently generated after said second mode and before said first mode and a second control mode in which said control signal is generated continuously after said first mode and before said second mode.

4,782,395

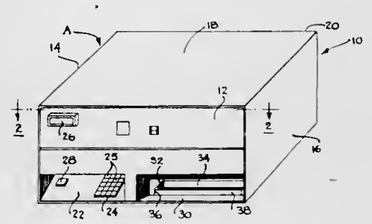
RECORDING OF IMAGES ON IMAGE SENSITIVE MATERIAL

Martin C. Jeffers, Playa del Rey, Calif., assignor to Modern Electronic Diagnostics Company, Inglewood, Calif.

Filed Apr. 16, 1987, Ser. No. 40,187

Int. Cl.[4] H04N *5/84;* **G03B** *27/72*

U.S. Cl. 358—244 **40 Claims**



1. An apparatus for making a photographic record of an image, said apparatus comprising:

(a) a housing;

(b) an image source within said housing for generating or presenting image containing radiation such that when permanently recorded will generate a visual image,

(c) means within said housing to direct the image containing radiation to a film plane,

(d) means to receive and position an image sensitive sheet at the film plane so that the sheet may be exposed to the image containing radiation,

(e) sheet loading means for automatically loading an image sensitive material at the film plane to enable exposure of the sheet to image containing radiation from the image source,

(f) sheet unloading means for automatically removing the image sensitive sheet after exposure and delivering the same to a discharge area of said apparatus, and

(g) control means for automatic positioning of the image source relative to the film plane in response to input control signals.

4,782,396

AUTOMATIC FOCUSING SYSTEM OF VIDEO CAMERA USING THE CONTRAST CHARACTERISTICS OF THE Y SIGNAL

Hong C. Park, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 14, 1986, Ser. No. 918,256

Claims priority, application Rep. of Korea, Aug. 7, 1986, 6525/1986

Int. Cl.[4] G03B *3/00;* **H04N** *5/232*

U.S. Cl. 358—227 **5 Claims**

1. An apparatus for automatically focusing a video camera having a zoom lens with a focus drive motor which uses Y signals generated by said video camera comprising:

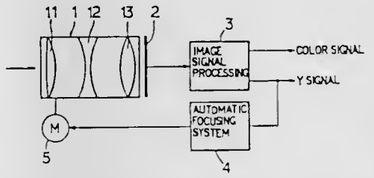
means for detecting successive Y signals;

rotation direction signal means for obtaining a focus motor rotation direction signal using said successive detected Y signals;

motor start direction signal means for obtaining a focus motor start signal using said detected Y signals; and

gating indication circuit means for generating a gating signal which indicates when to detect said Y signals, said gating indication circuit means including:

means for generating a constant value reference signal;



means for comparing said constant value reference signal with said Y signal contrast value to determine an address;

memory means for storing ranges corresponding to horizontal and vertical ranges at a plurality of said addresses;

means for using said addressed horizontal and vertical ranges to determine when to apply said gating signal.

4,782,397

IMAGE DATA PROCESSING APPARATUS WITH EDITING FUNCTION

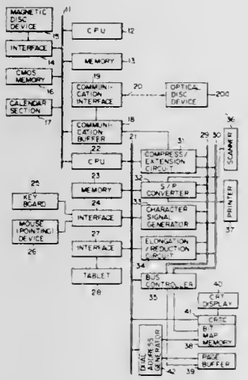
Katsumi Kimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 29, 1987, Ser. No. 55,368

Claims priority, application Japan, May 30, 1986, 61-124911

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—256 **21 Claims**



1. An image data processing apparatus comprising:

first memory means, for temporarily storing image data;

means for displaying the image data stored in said first memory means, said displaying means including first and second displaying areas;

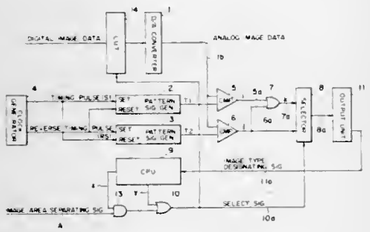
first indicating means, for allowing a portion of the image data displayed on said displaying means to be indicated as one unit to be registered for editing;

means for selecting a desired portion of the image data which has been displayed on said displayed means in

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accordance with an indication made by the first indicating means;
second indicating means, for allowing all of the image data which has been displayed on said display means to be indicated as one unit to be registered for editing;
second memory means, for temporarily storing the corresponding one of the portion and all of the image data, in accordance with an indication made by said first and second indicating means, as one unit to be registered for editing; and
processing mean for reading out the corresponding one of the portion and all of the image data stored in said second memory means and supplying those image data to said displaying means, so that said displaying means displays the corresponding one of the portion and all of the image data on the first and second displaying areas, respectively.

4,782,398
IMAGE PROCESSING APPARATUS
Yoshinobu Mita, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 12,322, Feb. 9, 1987, abandoned. This application Feb. 18, 1988, Ser. No. 161,266
Claims priority, application Japan, Feb. 14, 1986, 61-29068; Feb. 14, 1986, 61-29069; Feb. 14, 1986, 61-29070
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 **15 Claims**

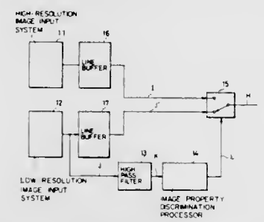


1. An image processing apparatus comprising:
image signal generating means for generating an image signal;
first pattern signal generating means for generating a first pattern signal;
means for processing the image signal using the first pattern signal and outputting a first pulse width modulation signal;
second pattern signal generating means for generating a second pattern signal different from the first pattern signal;
means for processing the image signal using the second pattern signal and outputting a second pulse width modulation signal; and
means for synthesizing the first and second pulse width modulation signals.

4,782,399
IMAGE PROCESSING APPARATUS WITH HIGH- AND LOW-RESOLUTION IMAGE SENSORS AND AN EDGE DETECTOR
Hiroaki Sato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 18, 1985, Ser. No. 746,103
Claims priority, application Japan, Jun. 26, 1984, 59-130182
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—280 **13 Claims**

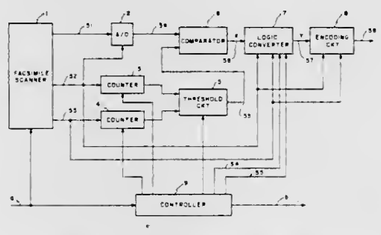
1. An image processing apparatus comprising:
first input means for inputting image data of high resolution;
second input means for inputting image data of low resolution;
discriminating means for discriminating an image content of the image data inputted by said second input means; and
selecting means for selecting the image data inputted by one of said first and second input means in accordance with a discrimination result of said discriminating means.

8. An image processing apparatus comprising:
first input means for inputting image data of low resolution;
second input means for inputting image data of high resolution;
means for detecting an edge candidate point in the image data of low resolution inputted by said first input means;
means for discriminating an image content of the image data of low resolution in accordance with a detection result of said detecting means; and
selecting means for selecting one of the image data of low resolution and the image data of high resolution in accordance with a discrimination result of said discriminating means.



13. An image processing apparatus comprising:
input means for inputting image data of low resolution;
means for detecting an edge candidate point in the image data inputted by said input means;
means for discriminating an image content of the image data in accordance with a detection result of said detecting means; and
processing means for performing different processing in accordance with a discrimination result of said discriminating means;
wherein said discriminating means comprises means for counting a number of edge candidate points, and discriminates the image content in accordance with the count of said counting means.

4,782,400
SYSTEM FOR ENCODING OR DECODING ANALOG VIDEO SIGNALS
Nobubiro Ohtani, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Jul. 24, 1987, Ser. No. 77,408
Claims priority, application Japan, Jul. 25, 1986, 61-176029
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—283 **11 Claims**



1. An encoder for encoding a video signal which is gradually

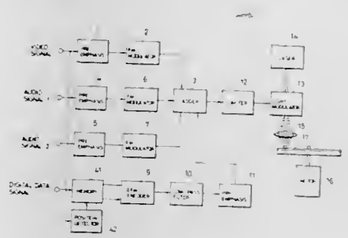
variable between high and low half tone density levels into a data-compression digitized signal, said encoder comprising:
first means for generating a plurality of threshold signals which in a preselected period successively take the values of a first predetermined number of halftone threshold levels, said halftone threshold levels being predetermined between said high and said low levels;
second means for comparing said video signal with said threshold signal to produce a first sequence of bits, each of said threshold signals being identified by a predetermined one of binary numbers "0" and "1", which identify said video signals as having a level which is higher and lower than each of said threshold levels, respectively;
third means for producing a second sequence of bits which are representative of codes "1" and "0" depending upon whether the sum of a current bit of said first sequence and i (i being a positive integer) bits taken from previous i sampling periods is an odd or even, said third means comprising i sets, each of said sets comprising a register for delaying one bit and an EX-OR gate for adding a bit and a bit delayed by one sampling period, said sets of registers and EX-OR gates being cascade-connected to each other so that the output of an EX-OR gate in one set is coupled to an input of another EX-OR gate in the next set and the output of a register in one set is coupled to the input of another register in the next set, said third means further comprising gate means arranged between said registers for enabling and disenabling a coupling between said register and said other register, and gate control means for providing a control signal to said gate means depending upon the numbers of bits which are to be added; and
fourth means for further converting said second sequence of bits into data-compression digitized signals.

4,782,401
EDITING METHOD AND APPARATUS FOR COMMERCIALS DURING VIDEO RECORDING
Nelson A. Faerber, 2900 14th St. N., Naples, Fla. 33940, and Edgar L. Bonner, Taylorsville, N.C., assignors to Nelson A. Faerber and Leonard Bloom, by said Nelson A. Faerber
Continuation-in-part of Ser. No. 38,161, May 11, 1979, Pat. No. 4,314,285. This application Mar. 30, 1981, Ser. No. 248,983
Int. Cl.[4] H04N *5/782*
U.S. Cl. 358—335 **21 Claims**



1. Apparatus for controlling the operation of a video recorder during the recording of a video signal containing picture information, including commercials of predetermined lengths or time intervals, to edit the commercials from the recording, wherein the apparatus comprises:
picture break detector means, connected to receive the video signal, for detecting dark picture breaks of intervals in the video signal having a length or duration greater than a predetermined minimum length and less than a predetermined maximum length;
timer means, actuated by the picture break detector means, for measuring and identifying at least one standard commercial length after each detected picture break;
means to detect segments which correpond in length to those used by standard commericals, actuated by the picture break detector means and the timer means, for detecting and identifying the length of a standard length commercial whenever the end of a standard commercial length measured and identified by the timer means after one detected picture break occurs during a subsequent detected picture break; and
rewind means, actuated by the commercial detector means, for initiating a video recorder operating sequence in which the recording operation is stopped, the recording is rewound for a length corresponding to the length of the detected commercial, and the recording operation is restarted.

4,782,402
VIDEO DISK WITH MULTIPLEXED VIDEO AND DIGITAL INFORMATION
Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Mar. 16, 1987, Ser. No. 26,329
Claims priority, application Japan, Mar. 14, 1986, 61-56461; Mar. 14, 1986, 61-56464; Mar. 14, 1986, 61-56465
Int. Cl.[4] G11B *7/00*; H04N *5/85*
U.S. Cl. 358—343 **9 Claims**



1. A video disk having recorded thereon in frequency division multiplex a television video signal and a digital data signal, wherein said recorded television video signal comprises a series of frames, each frame comprising a plurality of fields having a vertical synchronizing signal at one end thereof:
wherein said recorded digital data signal is divided into blocks each consisting of a prescribed number of bits and is interleaved, thereby having a recorded length after interleaving longer than one of said fields and shorter than one of said frames; and
wherein an end of said interleaved digital data signal is recorded at a fixed position before one of said vertical synchronizing signals of said recorded television signal.

4,782,403
RECORDING APPARATUS
Masahide Hasegawa, Kanagawa, and Makoto Fujiki, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1986, Ser. No. 843,729
Claims priority, application Japan, Mar. 27, 1985, 60-060896
Int. Cl.[4] G11B *5/03, 27, 02*
U.S. Cl. 360—66 **9 Claims**

1. A recording apparatus in which new image signals are recorded on a recording track of a recording medium having already recorded image signals, said recording track having image signals including a synchronizing signal and a tracking control pilot signal with a lower frequency than that of the image signals recorded together on the same recording track, comprising:
(A) a recording head for recording the image signals and the tracking control pilot signal by tracing the recording track on the recording medium;

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(B) an erasing head for erasing the signals recoded on the recording track on the recording medium by tracing the recording track on the recording medium ahead of the recording head;
(C) an erasing signal generating means for generating a first erasing signal for erasing only the image signals recorded on the recording track on the recording medium, and a second erasing signal for erasing the image signals and the tracking control pilot signal recorded on the recording track on the recording medium by the recording head; and
(D) output control means for controlling the outputs of various kinds of signals for the recording head and the erasing head in such a manner that in case new image signals are to be recorded on a recording track on which

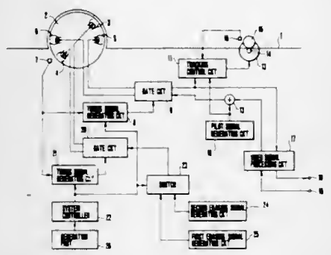
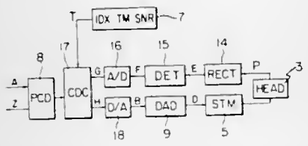


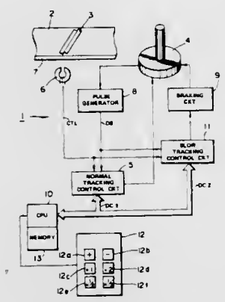
image signals have already been recorded, only the image signals on a part of the recording track are erased by supplying the first erasing signal generated by the erasing signal generating means to the erasing head, while the image signals and the tracking control pilot signal on the other part of the recording track are erased by supplying the second erasing signal generated by the erasing signal generating means to the erasing head, and only the new image signals are recorded by the recording head on the predetermined part of the recording track where only the image signals have been erased, while the new image signal and a tracking control pilot signal are recorded on said other part of the recording track where both the image signals and the tracking control pilot signal have been erased.

4,782,404
POSITIONING SYSTEM FOR A DISC DRIVE USING A STEPPER MOTOR
Hiroshi Baba, Fujisawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Continuation of Ser. No. 673,517, Nov. 20, 1984, abandoned. This application Apr. 13, 1987, Ser. No. 38,488
Claims priority, application Japan, Nov. 25, 1983, 58-221484
Int. Cl.[4] G11B *5/596, 21/10*
U.S. Cl. 360—77 **4 Claims**



4. A control system for positioning a head for reading/writing information from one data track of a plurality of data tracks concentrically formed on a disk comprising:
a disk drive motor including a rotary unit having an index, presumed position displacement means,
an index timing sensor for detecting the index at every revolution of said drive motor, the index representing a starting point of a data track extension having a position information recording area, and for feeding an index signal to said presumed position displacement means,
rectifying and envelope-detecting means,
alternately disposed magnetic flux-reversal areas and non-flux-reversal areas recorded over predetermined radial areas on the disk and having predetermined patterns arranged offset from a center-line and in a staggered sequence and within the extension of each of two data tracks spaced from each other by a plurality of other data tracks and generating consecutive respective position representing signals via a head in accordance with the position displacement of the head from the center-line of each of the two spaced data tracks,
means connected to the head for detecting the magnetic flux-reversal areas and feeding analog signals to said rectifying and envelope-detecting means to provide analog position signals representing by their magnitude the amount of the position displacement of the head from the center-line of each of the two spaced tracks,
said presumed position displacement means including means for memorizing the positions of the two spaced data tracks on the basis of the analog position siganls and for outputting presumed position displacement of a track which is intermediate the two spaced data tracks on the basis of linear approximation from the memorized positions, and
operating means including a stepping motor for moving the head in a direction crossing each of the data tracks and for positioning the head at the intermediate track in accordance with the presumed position dispalcement of the intermediate track.

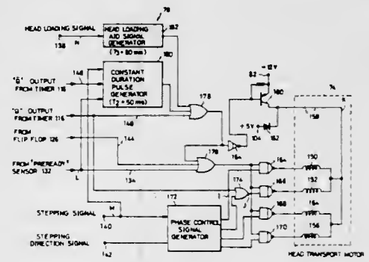
4,782,405
TRACKING CONTROL ADJUSTMENT FOR A TAPE USING MANUAL SWITCHES
Toshiaki Imai, Chiba, Japan, assignor to Sony Corporation, Japan
Filed Mar. 9, 1987, Ser. No. 23,788
Claims priority, application Japan, Mar. 20, 1986, 61-64562
Int. Cl.[4] G11B *5/58, 5/584*
U.S. Cl. 360—77 **10 Claims**



1. A tracking control system comprising:
a head assembly for reproducing data recorded on a recording track of a recording medium;
drive means for driving said recording medium with said recording track across said head assembly;
adjust means for adjusting relative position of said head assembly and said recording track on said recording medium at the position where said recorded data is reproduced through said head assembly, said relative position including a preset standard position;

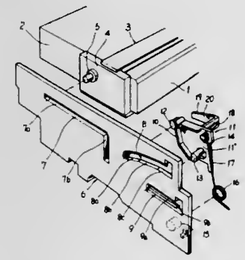
switch means, cooperative with said adjust means, for controlling said adjust means, said switch means including a manually operable first switch and a second switch ; and
control means, responsive to manual operation of said first switch, for operating said adjust means to cause shifting said relative position between said head assembly and said recording track in a first direction, and responsive to a manual operation of said second switch for operating said adjust means to cause shifting said relative position in a second direction opposite to said first direction, said control means being further responsive to simultaneous manual operation of said first and second switches, for operating said adjust means to set said relative position at said standard position.

4,782,406
DATA TRANSFER APPARATUS WITH A DISKLIKE RECORD MEDIUM AND A METHOD OF OPERATION THEREFORE
Makoto Shoji, Fussa; Hiroshi Tsuyuguchi, Tokyo; Shozo Toma, Kokubunji; Kazuhiro Hiraki, Mitaka, and Tsutomu Morita, Musashino, all of Japan, assignors to Teac Corporation, Tokyo, Japan
Continuation of Ser. No. 699,078, Feb. 7, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 133,162
Claims priority, application Japan, Feb. 10, 1984, 59-24010
Int. Cl.[4] G11B *5/55, 19/02, 21/02*
U.S. Cl. 360—78 **5 Claims**



3. A method of operation for a data transfer apparatus for use with a replaceable disklike record medium such as a flexible magnetic disk having data storage tracks thereon, with said data transfer apparatus including a disk drive motor for imparting rotation to the record medium, a transducer head for data transfer with the record meadium, and a head transport motor for transporting said transducer head radially of the record medium in response to a stepping signal so as to enable the transducer head to access individual data storage tracks on the record medium for data transfer therewith, which method comprises:
(a) setting the disk drive motor into rotation for driving the record medium;
(b) sensing a "ready" moment when the disk drive motor reaches a first prescribed speed at which the record medium is ready for commencing data transfer with the transducer head;
(c) determining a "preready" moment, immediately before the "ready" moment, at which the disk drive motor reaches a second prescribed speed less than the first prescribed speed;
(d) rotating the head transport motor in response to the stepping signal for transporting the transducer head from track to track on the record medium;
(e) impressing a first supply voltage to the head transport motor at least for a prescribed length of time following the "preready" moment and during the period when the head transport motor is in rotation, the first supply voltage being sufficiently high for the head transport motor to transport the transducer head and to correct its track position on the record medium; and
(f) impressing a second supply voltage, lower than the first supply voltage, to the head transport motor at least during at least part of the period from the moment the disk drive motor is set out of rotation to the subsequent "preready" moment.

4,782,407
VIDEO CASSETTE TAPE RECORDER INCLUDING A DEVICE FOR OPENING LID OF A TAPE CASSETTE DURING THE LOADING OPERATION THEREOF
Hak S. Hwang, Seoul, D.P.R. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jul. 17, 1986, Ser. No. 886,559
Claims priority, application Rep. of Korea, Jul. 18, 1985, 9065/1985
Int. Cl.[4] G11B *5/027*
U.S. Cl. 360—85 **1 Claim**



1. A cassette loading mechanism for a video cassette tape recorder; comprising:
a carrier for loading a tape cassette in the recorder, said carrier having a side wall provided with a guide protrusion;
a carrier-guiding side wall member having a guide slot for receiving said guide protrusion, said guide slot including a horizontal guide slot portion and a vertical guide slot portion, so that a tape cassette in said carrier can move horizontally from an ejecting position and then vertically to a forward operating position, by said carrier being guided along said guide slot;
upper and lower guide slots formed on said carrier-guiding side wall member at a forward location relative to said guide slot receiving said guide protrusion said upper guide slot having a first upwardly-inclined slot portion, a second upwardly-inclined slot portion having a lesser slope than the slope of said first slot portion, and an upwardly extending slot portion, and said lower guide slot having a horizontal slot portion and a vertically extending slot portion;
an operating member disposed adjacent an inside surface of said carrier-guiding side wall member and provided at a rear end thereof with a downward ramp portion for contacting a front end of the forwardly moving carrier, said operating member having an upper protusion engaged in said upper guide slot and a lower protrusion engaged in said lower guide slot in order to be guided by said upper and lower guide slots, so that said operating member is upwardly inclined at a slope corresponding to the portion of said upper guide slot in which said upper protrusion is engaged when said operating member is pushed forward by movement of said carrier from said ejecting position toward said operating position;
a lid-opening member attached to an inside portion of said

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operating member so as to be upwardly inclined according to the upward inclination of said operating member, said lid-opening member having an upward ramp portion which is disposed slightly beneath where the bottom of a lid of a cassette will be when said carrier initially contacts said operating member, whereby said lid-opening member may open the lid by the upward inclining movement thereof; and

a coil spring having first and second extended end portions adapted to urge said operating member to be downwardly inclined, said spring having coils which are supported by said carrier-guiding side wall member, said first end portion bearing against said operating member, and said second end portion bearing against said carrier guiding side wall member.

4,782,408

CASSETTE SUPPORT APPARATUS FOR CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS ACCOMMODATING CASSETTES OF DIFFERENCE SIZES

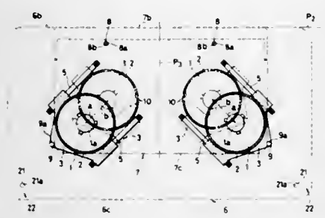
Kenichi Inoue, Kanagawa, and Takahide Ohtani, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,709

Claims priority, application Japan, Dec. 18, 1985, 60-194863

Int. Cl.⁴ G11B *15/00*

U.S. Cl. 360—96.5 **3 Claims**



1. Apparatus capable of selectively loading into a cassette tape recorder chassis at least a large-sized tape cassette and a small-sized tape cassette each having a pair of reels with respective distances between reels being different each other with said large-sized tape cassette and small-sized tape cassette each having a pair of positioning holes in a respective bottom surface at a front end thereof, the apparatus comprising a cassette holder movable between a cassette inserting position whereat one of said cassettes is horizontally inserted front end first and lowered vertically to a cassette loading position situated thereunder and whereat said selected cassette is respectively loaded, a pair of right and left reel bases movably mounted on said chassis so as to coincide in one position with said distance between the reels of the large-sized tape cassette and in another position with said distance between the reels of said small-sized tape cassette, a pair of right and left position reference pins mounted on the chassis used in common to selectively put each said large-sized and small-sized tape cassette in a predetermined horizontal position with the front of said selected cassette in a predetermined vertical position in said cassette loading position by cooperating with said positioning holes formed in said bottom surface of each said large-sized and small-sized tape cassette, and a pair of right and left height reference pins mounted for movement together with said pair of reel bases respectively for further selectively positioning a rear portion of each said large-sized and small-sized tape cassette in a vertical position which is the same as said predetermined vertical position of said front of said cassette.

4,782,409

TAPE CASSETTE LOADING DEVICE

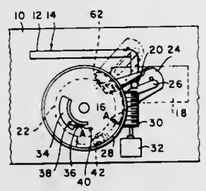
Hak S. Hwang, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 24, 1986, Ser. No. 946,030

Claims priority, application Rep. of Korea, Dec. 27, 1985, 17744

Int. Cl.⁴ G11B *5/008, 15/00, 17/00*

U.S. Cl. 360—96.5 **1 Claim**



1. A tape cassette loading device comprising in combination:

a bracket,

a guide groove formed on said bracket for slidably receiving a guide pin of a cassette carrier,

an arm gear having an arm which includes a longitudinal slot for slidably receiving said guide pin to move said cassette carrier between a loaded and an unloaded state,

a worm wheel coaxially mounted on said arm gear and interlocked with a worm which is connected to a motor,

a coil spring having a first end fixed to a protrusion of said arm gear through an arcuate opening formed on said worm wheel and a second end fixed to a protrusion of said worm wheel for transmitting the driving force of said worm wheel to said arm gear,

a lever mounted to an axle at the peripheral surface of said arm gear, said lever including an upright protrusion and forward and backward inclined portions opposite to said upright protrusion, respectively, for transmitting the driving force of said worm wheel directly to said arm gear,

a wire spring wound around said axle of said lever for resiliently biasing said lever,

a stopper protruded from the arm gear limiting the rotation of said lever by said wire spring,

a contacting member formed on the peripheral surface of said worm wheel for engaging with said upright protrusion of said lever thereby directly transmitting the driving force of said worm wheel to said arm gear, and

an arcuate slot formed on said bracket for receiving said forward and backward inclined portions of said lever to disengage said lever and said contacting member when said lever resides in said arcuate slot whereby said coil spring transmits the driving force of said worm wheel to said arm gear.

4,782,410

HOUSING STRUCTURE FOR FIXED MAGNETIC DISK DEVICE

Naohiro Okutsu, Kamakura, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed May 19, 1987, Ser. No. 51,915

Claims priority, application Japan, May 19, 1986, 61-74917[U]

Int. Cl.⁴ G11B *5/48, 21/16*

U.S. Cl. 360—98 **3 Claims**

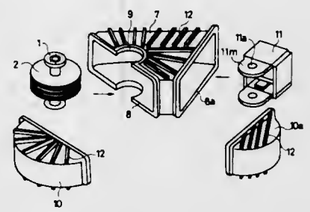
1. A housing structure for a fixed magnetic disk device, which comprises:

a housing body having a polygonal shape defined by a plurality of sides;

first and second sides of said polygonal housing body being made at right angles making first and second reference sides;

said first reference side having a first opening with a mounting flange on which a magnetic disk stack may be pivotally mounted with a spindle;

said second reference side having a second opening through which a rotational positioner may be inserted widthwise and mounted on a third side of said polygonal housing body;



a first cover to be mounted on said first reference side for covering said first opening; and

a second cover to be mounted on said second reference side for covering said second opening, thereby providing a housing structure which is rigid and compact yet easy-to-assemble with high precision.

4,782,411

COUPLING DEVICE FOR TRANSMITTING AXIAL MOVEMENT TO A ROTATABLE BODY

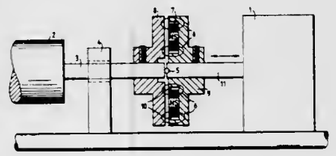
Adelbert Schalk, Furtwangen, Fed. Rep. of Germany, assignor to Deutsche-Thomson-Brandt GmbH, Villengen-Schwenningen, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,497

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 3606012

Int. Cl.⁴ G11B *5/52, 15/60*

U.S. Cl. 360—107 **8 Claims**



1. Coupling device for the transmission of an axial movement from a lift generator to a rotatable, axially movable body comprising: means creating a pressure-transmitting contact between the lift generator and the body; and means including a magnet producing a magnetic field which creates a magnetic attraction force between the lift generator and the body.

4,782,412

AZIMUTHALLY ADJUSTABLE MEANS FOR ATTACHING MAGNETIC HEADS

Satoru Koizumi; Daisuke Teshima, and Yoshio Katayama, all of HigashiHiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 827,786, Feb. 6, 1986, abandoned. This application Aug. 10, 1987, Ser. No. 85,307

Claims priority, application Japan, Feb. 8, 1985, 60-17567[U]

Int. Cl.⁴ G11B *5/56*

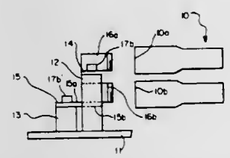
U.S. Cl. 360—109 **5 Claims**

1. Means for attaching magnetic heads to a cassette tape recorder comprising

a cassette compartment section with two cassette compartments one on top of the other for mounting tape cassettes individually at different heights,

two magnetic heads at said different heights, each adapted to engage with one of cassettes mounted in said cassette compartments,

individually separate means for supporting said magnetic heads,



a slidable plate with said individual supporting means secured separately thereon at different horizontal distances from said cassette compartment section, and

means for independently effecting azimuthal adjustments of said magnetic heads.

4,782,413

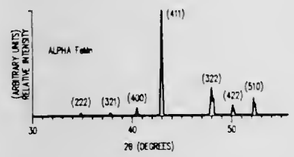
MAGNETORESISTIVE SENSOR WITH MIXED PHASE ANTIFERROMAGNETIC FILM

James K. Howard, Morgan Hill, and Ting C. Huang, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1987, Ser. No. 43,674

Int. Cl.⁴ G11B *5/12, 5/30*

U.S. Cl. 360—113 **5 Claims**



1. An improved magnetoresistive sensor of the type having an antiferromagnetic layer in direct contact with a magnetoresistive ferromagnetic layer for inducing a longitudinal bias in the ferromagnetic layer, wherein the improvement is an antiferromagnetic layer comprising an iron-manganese (FeMn) alloy having at least a portion of the FeMn in the alpha phase.

4,782,414

MAGNETORESISTIVE READ TRANSDUCER WITH INSULATOR DEFINED TRACKWIDTH

Mohamad T. Krounbi, San Jose; Gerald G. Lopatin, Los Gatos, and Arthur L. Thaver, Jr., San Jose, all of Calif., assignors to International Business Machine, Armonk, N.Y.

Filed Jul. 28, 1987, Ser. No. 78,739

Int. Cl.⁴ G11B *5/127*

U.S. Cl. 360—113 **5 Claims**

1. A magnetoresistive read transducer comprising:

an elongated magnetoresistive element having passive end regions separated by an active region;

a layer of insulating material in contact with and extending across only said active region of said magnetoresistive element having a predetermined width, terminating in first and second edges, each of said edges extending toward one of the passive regions of said magnetoresistive element;

first and second spaced conductor means each being in

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electrical contact with a respective end region of said magnetoresistive element extending to contact one of said edges of said layer of insulating material and having a portion which overlaps said layer of insulating material whereby, upon connection of said conductor means to a

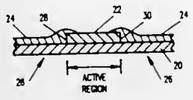
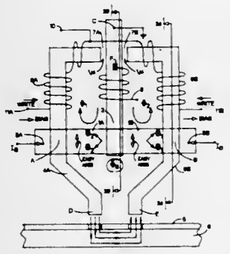


FIG. 6

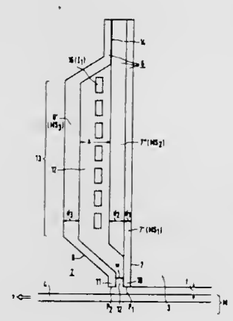
signal sensing means, said signal sensing means determines the resistance changes in said magnetoresistive element as a function of the fields which are intercepted by said magnetoresistive element over an effective track width defined by said predermined width of said layer of insulating material.

4,782,415
DIFFERENTIAL TWIN TRACK VERTICAL READ/WRITE MAGNETIC HEAD STRUCTURE
Albert W. Vinal, Cary, N.C., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Oct. 2, 1985, Ser. No. 782,660
Int. Cl.[4] G11B *5/30*
U.S. Cl. 360—113 **6 Claims**



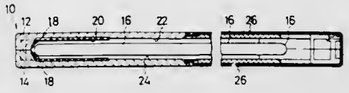
1. A differentially sensitive twin track magnetic read/write head structure having two physically separate magnetically permeable flux coupling members arranged in a magnetic circuit to conduct flux to or from a magnetic medium and further comprising:
- a serially connected pair of magnetic sensors spanning said two physically separate flux coupling members and magnetically coupled thereto, said sensors sharing a common central electrical and magnetic connection; and
- a third magnetically permeable electrically conductive member in magnetic and electrical connection with said central connection.

4,782,416
MAGNETIC HEAD HAVING TWO LEGS OF PREDETERMINED SATURATION MAGNETIZATION FOR A RECORDING MEDIUM TO BE MAGNETIZED VERTICALLY
Bernhard Hillenbrand, Uttenreuth, and Herbert Schewe, Herzogenaurach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and München, Fed. Rep. of Germany
Continuation of Ser. No. 738,099, May 24, 1985, abandoned. This application Jun. 11, 1987, Ser. No. 59,173
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420746
Int. Cl.[4] G11B *5/127, 5/147*
U.S. Cl. 360—125 **9 Claims**



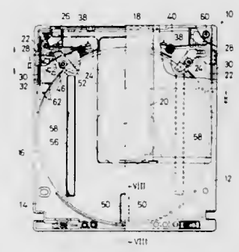
1. A magnetic head comprising a stratified buildup on a non-magnetic substrate for a recording medium, said medium being provided with a magnetizable storage layer into which information can be written along a track by vertical magnetization of the storage layer, the magnetic head comprising a ring-like conducting body for carrying magnetic flux having first and second magnet legs each comprising at least one magnetic layer of high-permeability material having predetermined saturation, said magnet legs each having a pole facing the recording medium, said poles being arranged one behind the other as viewed in a direction of relative motion of the head and medium, said poles being spaced from each other by a gap of having a width of less than 1 μm, said magnet legs being spaced from each other outside of a region of their poles with a predetermined spacing through which the turns of an at least largely flat write/read coil winding extend, said first magnet leg comprising, at least in the vicinity of its pole, at least a first magnetic layer with a thickness pointing along the direction of relative motion of at most 2 μm comprising a first material having a predetermined relative low saturation magnetization, said second magnet leg comprising, at least in the vicinity of its pole, at least one magnetic layer comprising a second material having a saturation magnetization which is larger than the saturation magnetization of the first magnetic layer of the first magnet leg, whereby at least the region of the pole of the first magnetic layer of the first magnet leg is driven by a write current flowing in the coil winding into magnetic saturation so that said first magnet leg executes substantially alone a write function whereas said first and said second magnet legs execute together a read function, said first magnet leg comprising, in addition to the first magnetic layer having low saturation magnetization, at least one further magnetic layer outside the region of its pole having a saturation magnetization which is larger than the low saturation magnetization of the first magnetic layer.

4,782,417
DISC CARTRIDGE
Kimio Tanaka, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan
Filed Dec. 16, 1986, Ser. No. 942,494
Claims priority, application Japan, Dec. 18, 1985, 60-194557[U]
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **10 Claims**



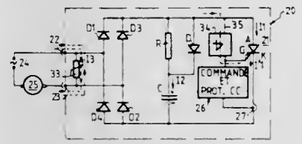
1. A disc cartridge comprising:
- a casing comprising an upper cover plate and a lower cover plate joined together to define a space therebetween; and
- a disc rotatably housed in said space of said casing;
- said casing having an inner surface which has a peripheral surface section which is opposite to an insertion side of said disc cartridge and against which said disc abuts, at least a part of said peripheral surface section comprising a slanting surface shape section formed so as to slant toward a center of said peripheral surface section in a width direction thereof between said cover plates wherein said slanting surface shape section has a lubricating disc holding member applied thereto.

4,782,418
DISC CARTRIDGE
Kimio Tanaka, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan
Filed Dec. 16, 1986, Ser. No. 942,623
Claims priority, application Japan, Dec. 18, 1985, 60-194555[U]
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **16 Claims**



1. A disc cartridge comprising:
- a casing comprising an upper cover plate and a lower cover plate joined together to define a space therein, and said casing having sidewalls;
- a disc rotatably housed in said space of said casing;
- a shutter for opening and closing at least one window provided in said casing to allow inserting of a disc drive mechanism of a disc player therethrough into said disc cartridge;
- actuator means slidably arranged in said casing and engaged with said shutter to releasably lock said shutter;
- a disc receiver operatively connected to said actuator means to be selectively moved from a position remote from said disc to a position which receives therein a part of a peripheral portion of said disc, said disc receiver being arranged in said casing;
- a slot formed in at least one of said side walls of said casing;
- said actuator means being fittedly and slidably engaged with said slot of said casing so as to be outwardly projected through said slot to ensure the sliding movement of said actuator means; and
- cover means arranged for constantly sealedly covering said slot of said casing during both use and nonuse of said casing.

4,782,419
INHIBITABLE STATIC SWITCH FOR AN AC ELECTRIC CIRCUIT INCLUDING AN INDUCTIVE LOAD
Elie Belbel, Epinay sur Seine; Louis Fechant, Le Vesinet; Jean-Paul Riotte, Epinay sur Seine, and Bruno Vitale, Ermont, all of France, assignors to La Telemecanique Electrique, France
Filed Jan. 13, 1987, Ser. No. 4,010
Claims priority, application France, Jan. 13, 1986, 86 00345
Int. Cl.[4] H02H *7/09*
U.S. Cl. 361—33 **2 Claims**



1. In an AC electric circuit supplied from an AC energy source and including an inductive load, a static switch comprising:
- an inhibitable thyristor whose anode and cathode are connected to terminals of said static switch which are connectable to the AC circuit,
- a circuit controlling the gate of the inhibitable thyristor by applying thereto a turn-on signal and a turn-off signal, said turn-off signal being applied in response to a control signal under normal service conditions or to a signal indicating an overcurrent in the circuit,
- a network of protection against the voltage gradients disposed in parallel with the anode-cathode path of the inhibitable thyristor, this network including a capacity having means charging on turn-off and discharging on turn-on, wherein:
- the anode-cathode path of the inhibitable thyristor and its network of protection against the voltage gradients on turn-off are connected to the AC energy source through a full-wave rectifier device,
- a voltage clipping member is disposed at the terminals of the rectifier device, said voltage clipping member comprising a varistor connected to the AC voltage terminals of the rectifier device and having a first predetermined voltage threshold, whilst there is provided, on the DC side of the rectifier device, a non linear member having a second predetermined voltage threshold greater than said first threshold, said non linear member comprising a break-over diode disposed in an anode-gate short circuit path of the inhibitable thyristor.

4,782,420
SAFETY SWITCH APPARATUS
Kurt Holdgaard-Jensen, Dalstroget 6, Silkeborg, Denmark DK 8600
Filed Jun. 5, 1987, Ser. No. 58,454
Int. Cl.[4] H01H *3/34*
U.S. Cl. 361—58 **22 Claims**

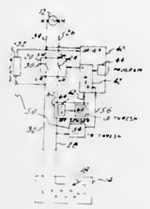
1. An apparatus for controlling power to an electrical load, the load being operable between an on condition wherein the load carries at least a first threshold current magnitude when

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the power is applied, and an off condition wherein the load carries less than a second threshold current when the power is applied, the apparatus comprising:

(a) on sensing means for sensing the on condition of the load in response to current in the load;

(b) means for connecting the power to the load; and



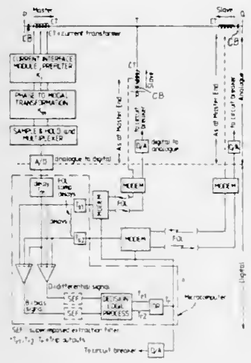
(c) means for interrupting the connecting means, the interrupting means substantially removing the power from the load when the power is applied for the duration of a predetermined period of time after occurrence of the on condition,

wherein the on sensing means comprises means for detecting a trickle current magnitude in the load when the connecting means is interrupted by the interrupting means.

4,782,421
ELECTRICAL SUPPLY LINE PROTECTION APPARATUS

Allan T. Johns, Corsham, and Raj K. Aggarwal, Bath, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 11, 1986, Ser. No. 838,812
Claims priority, application United Kingdom, Mar. 11, 1985, 8506256
Int. Cl.[4] H02H *3/30*
U.S. Cl. 361—65 7 Claims



1. Electrical supply line protection apparatus used with Teed circuit supply lines having three terminals, comprising:

a master unit at one terminal;

slave units at each of the other terminals;

broad band communication links between the master unit and the slafe units and separate from the supply lines;

a line current transformer and a circuit breaker at each master and slave unit;

logical decision-making means at the master unit;

means for feeding measurement signals derived from the current transformers at the slave units along the broad band links to the decision-making means;

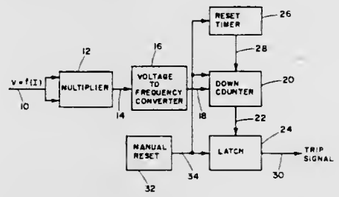
said decision-making means including means for obtaining a differntial quantity proportional to a sum of the mesurement signals received through the broad band links, and means for obtaining a bias quantity proportional to the difference between the measurement signals from the master unit and the measurement signals from the slave units; and

means for transmitting operating signals along the broad band links from the decision-making means to open the circuit breakers in accordance with the differential quantity and the bias quantity.

4,782,422
I^2T MONITORING CIRCUIT

Gregory Jones, and William Owens, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 27, 1987, Ser. No. 78,366
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—87 17 Claims



1. A detection circuit, comprising:

first means for providing a first signal representative of an electrical current;

second means for providing a second signal representative of the squared value of said first signal, said first providing means being connected in signal communication with an input of said second providing means;

third means for providing a third signal, said third signal comprising a series of pulses, said series of the pulses having a frequency that is representative of the magnitude of said second signal, an input of said third providing means being connected in signal communications with an output of said second providing means;

means for decrementing a stored value, said decrementing means being operative in response to said third signal, an input of said decrementing means being connected in signal communication with an output of said third providing means;

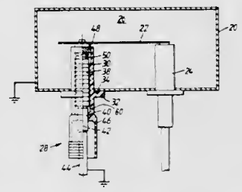
fourth means for providing a fourth signal when said stored value is equal to a first predetermined magnitude, an input of said fourth providing means being connected in signal communication with an output of said decrementing means; and

means for periodically setting said stored value equal to a second predetermined magnitude, an output of said setting means being connected in signal communication with an input of said decrementing means.

4,782,423
LIGHTNING ARRESTER

Kunihiko Takagi, Tama; Masaki Ikuta, Tachikawa, and Takao Takeshina, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 25, 1987, Ser. No. 90,242
Claims priority, application Japan, Sep. 9, 1986, 61-212328
Int. Cl.[4] H02H *1/04*
U.S. Cl. 361—127 7 Claims



1. An arrester for discharging electricity from an electrode when an excessive voltage is imposed on the electrode, the electrode fixed in a container of ground voltage level put in atmosphere, and the container being filled with electric insulation fluid, the arrester comprising:

a characteristic member having first and second ends, the characteristic member discharging electricity only when a voltage higher then a predetermined value is imposed between the first and second ends;

means for electrically connecting the first end of the characteristic member to the electrode;

means positioned entirely outside of the container for selectively electrically connecting and disconnecting the second end of the characteristic member with a ground voltage located outside of the container; and

an insulation tube made of electrically insulating material for enclosing the characteristic member and filled with a gas, the tube so arranged that the first end of the characteristic member is inserted in the container and the second end of the characteristic member projects in the atmosphere, the insulation fluid is sealed in the container outside the tube, and an insulation distance in the insulation fluid from the electrode to the container and an insulation distance in the gas in the insulation tube from the electrode to the second end of the characteristic member are substantially equal in voltage durability.

4,782,424
CIRCUIT ARRANGEMENT FOR THE NON-CONTACTING CONTROL OF A SANITARY FITTING

Helmut Wertenauer, Stuttgart, Fed. Rep. of Germany, assignor to Hansa Metallwerke AG, Stuttgart, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,542
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629580
Int. Cl.[4] H01H *47/24*
U.S. Cl. 361—175 7 Claims

1. A circuit arrangement for non-contacting control of the water flow of a sanitary fitting which includes:

(a) a sensor which contains a light source and a light receiver that can pick up the light reflected on a user and generate a signal whereby in a case of great sensitivity the water jet of the sanitary fitting is located in the detection range of the sensor;

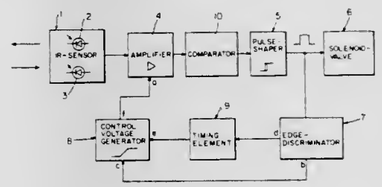
(b) an amplifier which amplifies the signal produced by said light receiver;

(c) a comparator which compares the output signal of said amplifier with a certain threshold value and which produces an output signal if this threshold value is exceeded;

(d) a pulse shaper having an output signal which changes from a first to a second value forming a first generally rising pulse edge when the output signal of said comparator appears, and which changes fropm said second value to said first value forming a second generally decaying pulse edge when the output signal of said comparator disappears with or without a time lag,

(e) at least one solenoid valve which is controlled by the output signal of said pulse shaper and which releases the water flow as long as this output signal has its second value,

(f) an edge discriminator which monitors the appearance of



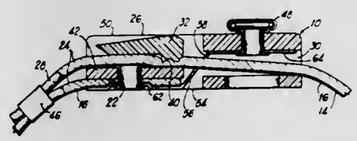
said first pulse edge and of said second pulse edge in the output signal of said pulse shaper; and

(g) a device which is controlled by said edge discriminator and which reduces the sensitivity of the circuit arrangement upon the appearance of said first pulse edge of the output signal of said pulse shaper from a high to a low value and upon the appearance of said second pulse edge of said output signal of said pulse shaper returns the sensitivity from said low to said high value with or without a time lag.

4,782,425
CONDUCTIVE ELASTIC STRAP CLOSURE

Albert C. Breidegam, Sharpsburg, Ga., assignor to Semtronics Corporation, Peachtree City, Ga.

Continuation-in-part of Ser. No. 804,052, Dec. 2, 1985, Pat. No. 4,639,825, which is a continuation-in-part of Ser. No. 654,636, Sep. 25, 1984, Pat. No. 4,577,256. This application Jan. 23, 1987, Ser. No. 6,467
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—212 17 Claims



1. A clasp for a conductive grounding strap, comprising:

(a) a clasp body;

(b) connection means attacbed to the clasp body for connecting a first end of a length of material having at least one conductive section to the clasp body which connection means is electrically connected to the conductive section of the material;

(c) a grounding cord fastener attached to the clasp body;

(d) a passageway formed in the body through which portions of the material may extend;

(e) a gate means pivotally connected to the body and which is openable and closeable to obstruct the passageway adjustably for adjustably securing a second end of the material in the body so that the second end exits the clasp to overlay the first end; and

(f) a conductive fitting electrically connecting the fastener and the connection means so that the fastener is electrically connected at all times to the conductive section of

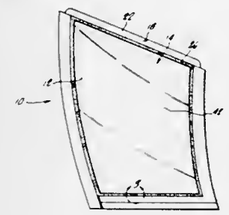
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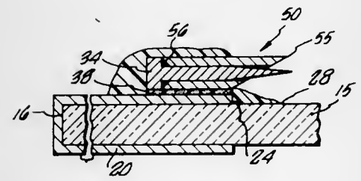
the material, regardless of whether the gate means is opened or closed.

4,782,426
METHOD AND APPARATUS FOR REMOVING STATIC CHARGE

Howard S. DeCamp, and Oded E. Sturman, both of Northridge, Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Jan. 27, 1987, Ser. No. 7,365
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—218 **38 Claims**



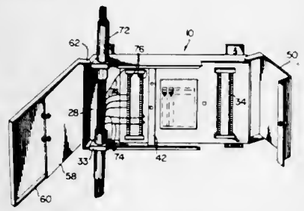


16. A window assembly comprising:
(a) a window having an outer surface and a perimeter, the outer surface comprising a dielectric material;
(b) a frame around the window for housing the perimeter, the frame having means for retaining the window in the frame;
(c) at least one corona point attached to he window assembly proximate a border between the window and the frame, each corona point being positioned substantially outside the window or static generating area; and
(d) means for grounding the corona point, the grounding means being in electrical communication with the corona point.

4,782,427
BUILDING ENTRANCE TERMINAL

Robert J. Marks, Carpentersville, Ill., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 2, 1987, Ser. No. 56,776
Int. Cl.[4] H01R *9/24*
U.S. Cl. 361—426 **6 Claims**

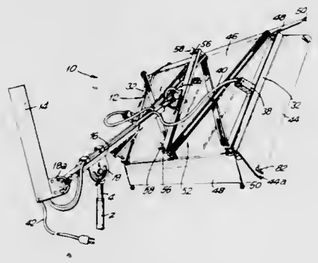


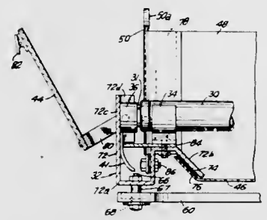
1. A building entrance terminal comprising:
(a) a housing having a back wall, side walls, and upper and lower walls defining a housing interior accessible from a front of the housing,
(b) a terminal block in an incoming field,
(c) a mounting block in a protection field said mounting block carrying a plurality of overvoltage protection units,
(d) the terminal block and the mounting block being wired together in a back plane within the housing behind the terminal block and mounting block, and
(e) the housing also defining an integrally formed stowage space for incoming cable, the stowage space, terminal block and mounting block disposed side-by-side in a transverse direction across the housing from one said side wall to another for unrestricted and direct access of the terminal block, mounting block and stowage space from the front of the housing.

4,782,428
COLLAPSIBLE FLUORESCENT LIGHT FOR PHOTOGRAPHY

Ross Lowell, c/o Lowel-Light, 475 Tenth Ave., New York, N.Y. 10018; Edward Calamai, 9 Oneida Rd., Pleasantville, N.Y. 10570; Stephen Doll, 4 W. 103 St. - #5C, New York, N.Y. 10025; Dale Marks, 425 Benignus, Houston, Tex. 77024; Apiruk Pronputhsri, 46-16 44 St., #4G, Sunnyside, N.Y. 11104, and Marvin Seligman, 700 Carroll Pl., Teaneck, N.Y. 07666

Filed Aug. 21, 1987, Ser. No. 88,049
Int. Cl.[4] G03B *15/02*; F21V *21/24*; F21S *3/12*
U.S. Cl. 362—11 **20 Claims**





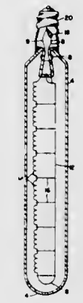
1. A collapsible fluorescent tube fixture comprising:
a frame having a pair of spaced apart tube ends supports each carrying a row of sockets, each socket being for receiving electrodes of one end of a fluorescent tube, and collapsing means operatively connected between said supports permitting said supports to be moved together into a storage position and apart into a used position, fluorescent tubes being connectable between sockets of said supports when said supports in their use position;
a boom having one end connected to said collapsing means for supporting said frame, and an opposite end;
an electrical ballast mechanically connected to said opposite end of said boom and electrically connected to said sockets for electrically ballasting fluorescent tubes connected to said socket; and
a pivot clamp connected to said boom intermediate its ends for engagement on a support structure to carry the fixture, said collapsing means comprises a collapsible scissors assembly having a central rod and a pair of pivotally connected together scissors members operatively connected between said central rod and each support.

12. A collapsible fluorescent tube fixture comprising:
a frame having a pair of spaced apart tube ends supports each carrying a row of sockets, each socket being for receiving electrodes of one end of a fluorescent tube, and collapsing means operatively connected between said supports permitting said supports to be moved together into a storage position and apart into a used position, fluorescent tubes being connectable between sockets of said supports when said supports in their use position;
a boom having one end connected to said collapsing means for supporting said frame, and an opposite end;
an electrical ballast mechanically connected to said opposite end of said boom and electrically connected to said sockets for electrically ballasting fluorescent tubes connected to said socket; and
a pivot clamp connected to said boom intermediate its ends for engagement on a support structure to carry the fixture, each support comprises a bent sheet metal channel having a U-shaped portion with a long leg on which said sockets are mounted and a short leg, and a V-shaped portion connected to said short leg, a barn door pivotally connected to said long leg of said channel, a row of tube clips connected to said V-shaped portion and each aligned with one of said sockets for engaging an end of a tube whose electrodes are engaged in said socket, a connecting plug connected to said channel and electrical wires connected between said sockets and said electrical plug each disposed in said U-shaped portion.

4,782,429
LONG-LIFE LUMINAIRES

John F. Walton, 6853 Strata St., McLean, Va. 22101, and Al R. Roshdieh, 688 College Pkwy., Rockville, Md. 20850

Filed Apr. 10, 1987, Ser. No. 37,230
Int. Cl.[4] F21V *19/04*
U.S. Cl. 362—20 **10 Claims**

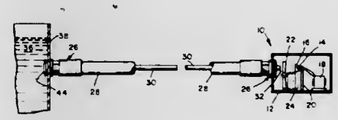


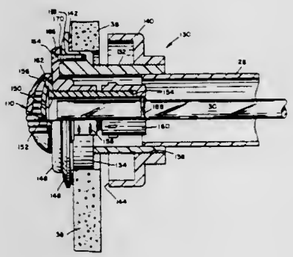
1. A long-life luminaire comprising:
a string of long-life, low-voltage filaments;
said filaments becoming incandescent when heated;
means adapted to connect said filaments in series across a source of electrical energy;
a long-lived resistor connected in series with said string;
said resistor having a resistance at least equal to that of one of said filaments when incandescent.

4,782,430
LIGHT CONDUIT ILLUMINATION SYSTEM FOR UNDERWATER LIGHTING

John A. Robbins, Canoga Park, and Paul E. Robbins, Granada Hills, both of Calif., assignors to Lumenyte Corporation, Chatsworth, Calif.

Filed Jul. 22, 1986, Ser. No. 888,830
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—32 **9 Claims**



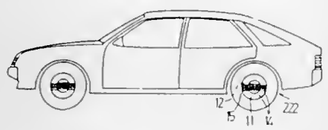


1. A waterproof fitting comprising:
a. a hollow screw having a transparent head;
b. a face plate having a threaded central aperture through which said hollow screw is inserted;
c. an elongated male coupling having a central aperture therethrough, through which said hollow screw and said face plate assembly are inserted;
d. a nut in mating engagement with said elongated male coupling; and
e. a plurality of fasteners securing said face plate to said elongated male coupling.

3. An apparatus for providing underwater lighting, comprising:
a. a light conduit illumination system;
b. a waterproof fitting installed in a wall of a water-retaining structure, remote form said light conduit illumination system wherein said waterproof fitting includes a hollow screw having a transparent head, a face plate having a threaded central aperture through which said hollow screw is inserted, an elongated male coupling having a central aperture therethrough, through which said hollow screw and said face plate assembly are inserted, a nut in mating engagement with said elongated male coupling, and a plurality of fasteners securing said face plate to said elongated male coupling;
c. a conduit having aone end connected to said waterproof fitting, and the other end connected to said light conduit illumination system; and
d. a light conduit disposed within said conduit and having substantially the same length as said conduit.

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4,782,431
LIGHTING APPARATUS FOR WHEELS OF VEHICLES
Seung M. Park, 92-12 Yonhee 2-dong, Seodaemoon-ku, Seoul 120, Rep. of Korea
PCT No. PCT/KR86/00001, § 371 Date Nov. 13, 1986, § 102(e) Date Nov. 13, 1986, PCT Pub. No. WO86/04308, PCT Pub. Date Jul. 31, 1986
PCT Filed Jan. 18, 1986, Ser. No. 925,119
Claims priority, application Rep. of Korea, Jan. 28, 1985, 497/85
Int. Cl.[4] B60Q *1/32;* **H02K** *7/18;* **F21V** *33/00*
U.S. Cl. 362—61 **2 Claims**

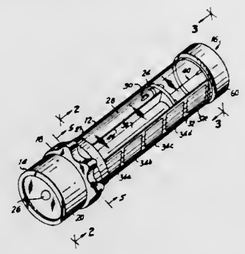




1. Lighting apparatus for a wheel cover for a wheel of a motor vehicle wherein said wheel cover is provided with light windows and said lighting apparatus includes an electrical generator having a rotor and a stator, said lighting apparatus comprising:
a first plate fixedly mounted to said wheel cover for rotation therewith;
a shaft mounted by bearing means to said first plate;
a second plate mounted mounted on said shaft with said stator being fixedly mounted on said second plate;
said rotor being fixedly mounted on said first plate for rotation therewith and about said shaft and said stator;
means cooperating with said second plate for preventing rotation of said shaft;
light emitting diodes (LED) or mini bulbs mounted to correspond with respective light windows;
means for electrically connecting said light emitting diodes or said mini bulbs to said generator.

4,782,432
MULTI-FUNCTION LIGHT
Stephen L. Coffman, New Gloucester, Me., assignor to ME Generations Inc., Portland, Me.
Continuation of Ser. No. 868,359, May 29, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 133,715
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—184 **9 Claims**

1.
A multi-function portable illuminating device, comprising:
a housing;
a source of electrical power disposed in said housing:
solar-cell means disposed within said housing for generating a recharging current;
means coupled to said source of electrical power for supplying thereto the charging current generated by said solar cell means;
plural illuminating lamps disposed within said housing including a first light and a strobe light;
selector means for selecting one of said illuminating lamps to be energized;
first switch means for connecting said first light to said source of electrical power;



a strobe circuit coupled to said strobe light;
oscillating means coupled to said strobe circuit for supplying AC power thereto; and
second switch means for connecting said oscillating means to said source of electrical power.

4,782,433
FLASHLIGHT ATTACHMENT AND METHODS OF CONSTRUCTING AND UTILIZING SAME
John G. Rombough, 4591 W. Overlook Dr., Williamsville, N.Y. 14221
Filed Aug. 12, 1987, Ser. No. 61,815
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—186 **12 Claims**



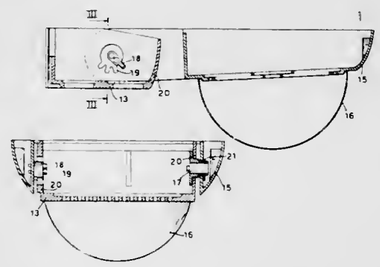
1. A wand attachment for flashlights, comprising:
a hollow, elongated body member having an opening formed at a lower end thereof; and
a bushing member detachably fitted in said opening at the lower end of said body member;
said body member including a first annular lip formed on an inner surface of the lower end thereof and said bushing member includes a second annular lip formed on an outer surface thereof, said first and second annular lips securely engaging each other when said bushing member is fitted in said body member; and
said bushing member having a central opening defined therein, said central opening being sized such that side surfaces thereof securely engage an upper, light-emanating end of a flashlight.

4,782,434
LIGHTING UNITS
Robert L. Cole, 32 Holdbrook, Hitchin, Hertfordshire, England SG4 9QW
Filed Nov. 10, 1987, Ser. No. 119,046
Claims priority, application United Kingdom, Nov. 22, 1986, 8627987
Int. Cl.[4] F21P *3/00*
U.S. Cl. 362—252 **5 Claims**



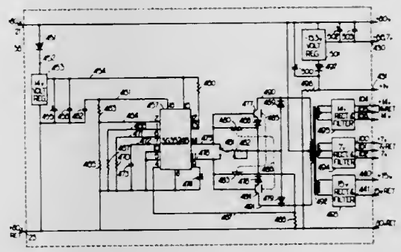
1. A lighting unit comprising a plurality of individual lamps within one lighting unit, triggering means to cause each lamp to be illuminated repetitively at time intervals determined for each said lamp and initiated for each lamp independently of the other lamps, the time intervals not being equal for said lamps and each of said time intervals itself being variable with time in a random manner, and with the periods of illumination of the lamps being short in order to produce a flashing effect, and connector means by which the unit can be fitted, as a unit, to an associated plug.

4,782,435
POSITION-WISE ADJUSTABLE LIGHTING FITTING
Luigi Manzoni, Via Dei Chiostri, 4 - 20121 Milano, Italy
Filed Aug. 25, 1987, Ser. No. 89,268
Claims priority, application Italy, Sep. 16, 1986, 23058[U]
Int. Cl.[4] F21M *3/18;* **F21S** *1/02*
U.S. Cl. 362—427 **3 Claims**



1. A lighting fitting of the type comprising a support disposed to be fixed to a wall or ceiling, a body having opposed sides, and connection means mounting said body on said support in a position-wise adjustable manner, said connection means comprising a floating pin connection on one side of the said support and a cooperating tooth and recess engagement system on the opposite side thereof supporting said body for angular adjustment with respect of the support, said connection means also supporting said body for limited tilting movement transversely of the axis of said pin selectively to disengage said tooth from said recess to effect angular adjustment of said body, and to reengage said tooth in another recess after angular adjustment of said body, said engagement of said tooth in said recess being assured by weight of the body of the lighting fitting itself.

4,782,436
APPARATUS AND METHOD FOR BALANCING OUTPUT CURRENT OF TRANSISTORS
Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067
Division of Ser. No. 791,224, Oct. 25, 1985, Pat. No. 4,716,274. This application Nov. 4, 1987, Ser. No. 117,227
Int. Cl.[4] H02H *7/122;* **H02M** *7/538*
U.S. Cl. 363—56 **19 Claims**



1. A method for providing a balanced current flow in a first transistor and a second transistor for use in a circuit across a range of temperatures, each said transistor having a drive terminal connected to a drive source in said circuit, an output terminal connected to a drive input point of said circuit, and a common terminal connected to a reference point of said circuit, said first transistor being provided with a first drive power by said drive source, and said second transistor being provided with a second drive power by said drive source, comprising the steps of:
monitoring the temperature of said first transistor,
monitoring the temperature of said second transistor,
increasing said first drive power as said temperature of said second transistor increases; and
increasing said second drive power as said temperature of said first transistor increases.

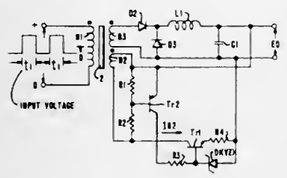
2. An externally-matched transistor pair for use in a circuit having a first drive input point and a second drive input point, requiring matched transistors and having a first drive means and a second drive means, each of said drive means being for providing a finite amount of driving power to a respective one of said transistors, comprising:
a first transistor having a drive terminal coupled to said first drive means, an output terminal connected to said first drive input point of said circuit, a common terminal coupled to a reference point of said circuit, and having a first set of electrical characteristics;
a second transistor having a drive terminal coupled to said second drive means, an output terminal connected to a second drive input point of said circuit, a common terminal coupled to said reference point of said circuit and having a second set of electrical characteristics, said second set differing from said first set in at least one of said electrical characteristics;
switching means for selectably connecting a switched terminal to said drive terminal of said first transistor or said drive terminal of said second transistor; and
power absorpotion means connected between said switched terminal and said reference point;
whereby said switching means is positioned to cause said power absorption means to absorb a portion of said driving power from the one of said driving means which is coupled to the one of said transistors which is conducting more current than the other of said transistors.

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4,782,437
MAGNETIC MATERIAL BIASING METHOD AND APPARATUS

Yoshiaki Nishiyama, Hiratsuka, and Hidesumi Nakahashi, Kamakura, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Jul. 30, 1987, Ser. No. 79,853
Claims priority, application Japan, Aug. 29, 1986, 61-201901
Int. Cl.⁴ H02M *3/335*
U.S. Cl. 363—56 **7 Claims**



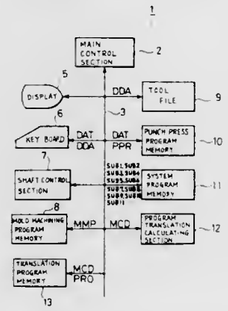
4. A transformer apparatus comprising, in combination:
a primary winding having input means associated therewith for applying potential to said primary winding;
a secondary winding having output means associated therewith;
a magnetic core operatively associated with said primary and secondary windings, said primary winding when potential is applied thereto generating magnetic flux in said core;
an auxiliary winding operatively associated with said magnetic core and operable to decrease the magnetic flux of said core;
first switching means having operating means associated therewith and coupled across said auxiliary winding;
second switching means having operating means associated therewith;
first circuit means coupled across the output means of said secondary winding and serially coupling said second switching means and said auxiliary winding; and
second circuit means coupled across the output means of said secondary winding and serially coupling said first switching means and said operating means for said second switching means, whereby applying potential to said input means of said primary winding produces potentials in said secondary winding and said auxiliary winding, the potential in said auxiliary winding causing operation of said first switching means, which in turn causes operation of said second switching means to cause the potential on the output means of the secondary winding to be applied to the auxiliary winding to bias the magnetic core to prevent saturation thereof.

4,782,438
MEANS AND METHOD FOR TRANSLATING A TURRET PUNCH PRESS CONTROL PROGRAM INTO A LASER BEAM MACHINE CONTROL PROGRAM

Masayoshi Mizukado, Kani; Ken Yamazaki, Oobu, and Masaki Ito, Aichi, all of Japan, assignors to Yamazaki Mazak Corporation, Niwa, Japan

Filed Jun. 9, 1987, Ser. No. 60,072
Claims priority, application Japan, Jun. 10, 1986, 61-134326; Jun. 12, 1986, 61-137085
Int. Cl.⁴ G05B *19/00*
U.S. Cl. 364—191 **6 Claims**

6. A program translating apparatus for use of a laser beam machine, comprising;
a first memory means for storing a mold machining program which is used for machining a hole using a laser beam machine, said machining hole corresponding to the configuration of a punched hole which is formed by each mold of a turret punch press, and,
second memory means for storing first translation program groups adapted to calculate the position of each hole when one or more holes are machined using the same mold, and to generate a machining path for the laser beam machine according to the mold machining program which is stored in said first memory means with reference to said calculated hole position, and
third memory means for storing second translation program groups adapted to generate a machining path used when a predetermined area which is successively machined by the

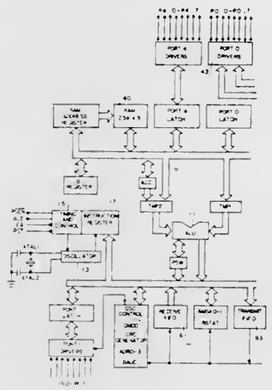


turret punch press, is machined by the laser beam machine, and,
program translation calculating means for reading out the first and second translation program groups, which are stored in said second and third memory means, according to a machining program of the turret punch press and generating a machining path of said laser beam machine from the machining program of the turret punch press according to said first and second translation program groups.

4,782,439
DIRECT MEMORY ACCESS SYSTEM FOR MICROCONTROLLER

Shekhar Borkar, Portland, Oreg.; Martin Pawloski, and James White, both of Gilbert, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 17, 1987, Ser. No. 15,799
Int. Cl.⁴ G06F *13/00*
U.S. Cl. 364—200 **4 Claims**

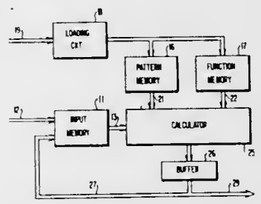


1. An integrated circuit microcontroller having a bus, an arithmetic logical circuit, a random access memory coupled to said bus, an external memory for coupling to said bus, and at least one port driver for coupling to external devices, said random access memory and said external memory being directly accessible by said external devices through said at least one port driver, said microcontroller comprising:
(a) at least two channels coupled to said bus for directly accessing at least one of said memories to selectively effect the transfer of data from (i) a first portion of said random access memory to a second portion of said random access memory; (ii) a portion of said random access memory to a portion of said external memory; (iii) a portion of said external memory to a portion of said random access memory; and (iv) a first portion of said external memory to a second portion of said external memory;
(b) direct memory access control means coupled to said bus, said at least one port driver and said at least two channels for generating channel control signals for said at least two channels based upon signals on said bus, and said at least one port driver, said channel control signals for controlling the operation of said at least two channels;
wherein each of said channels comprises:
(i) a control register for storing the status of the channel;
(ii) a source address resgister for storing the address of a byte in said internal memory or extgernal memory to be transferred;
(iii) a destination address register for storing the destruction address of a byte in said internal memory or external memory; and
(iv) a byte count register for storing the number of bytes remaining to be transferred by said channel.

4,782,440
LOGIC SIMULATOR USING SMALL CAPACITY MEMORIES FOR STORING LOGIC STATES, CONNECTION PATTERNS, AND LOGIC FUNCTIONS

Nobuyoshi Nomizu, and Tohru Sasaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 1, 1985, Ser. No. 761,281
Claims priority, application Japan, Aug. 3, 1984, 59-162843
Int. Cl.⁴ G06F *15/20, 7/38*
U.S. Cl. 364—200 **4 Claims**

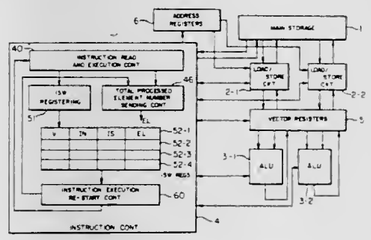


1. A logic simulator for carrying out logic simulation of a logic circuit comprising successive groups of gates, said logic simulator comprising:
an input memory for memorizing input bits which are input to the gates of a selected one of said successive groups, said successive groups being selected in sequence;
pattern memory means for memorizing pattern bit sequences corresponding to respective ones of said gates, each of said pattern bit sequences consisting of a plurality of bits such that, for a particular pattern bit sequence corresponding to a particular group of gates, each bit corresponds to a respective gate of the group preceding said particular group and represents a connection state of said respective gate to a gate in said particular group;
function memory means for memorizing logic functions of the gates of said logic circuit;
calculating means, responsive to said input bits supplied from said input memory, the particular pattern bit sequence corresponding to the gates of said particular group and supplied from said pattern memory means, and the logic functions of the gates of said particular group and supplied from said function memory means, for calculating successively, for the gates of said particular group, output bits which are produced from the gates of said particular group; and
supplying means for supplying said output bits to said input memory as said input bits to be given to the gates belonging to the next successive group to be selected as said particular group.

4,782,441
VECTOR PROCESSOR CAPABLE OF PARALLELY EXECUTING INSTRUCTIONS AND RESERVING EXECUTION STATUS ORDER FOR RESTARTING INTERRUPTED EXECUTIONS

Yasuhiro Inagami, Kodaira; Shigeo Nagashima, Hachioji; Koichiro Omoda, Sagamihara; Takayuki Nakagawa, Kokubunji, and Teruo Tanaka, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1986, Ser. No. 872,396
Claims priority, application Japan, Jun. 14, 1985, 60-128124
Int. Cl.⁴ G06F *9/28, 7/00*
U.S. Cl. 364—200 **7 Claims**



1. A data processing apparatus for parallely executing a plurality of instructions each requesting an operation on a set of data signals, comprising:
instruction execution start control means for controlling the start of execution of a plurality of instructions in a program stored in a program storage means;
a plurality of parallely operable instruction execution means connected to said instruction execution start control means for executing operations requested by said instructions being executed using a plurality of sets of data signals received from a main storage or a plurality of registers wherein each set of data signals is requested by the instructions;
means connected to said instruction execution start control means for generating, every time the execution of an instruction is started, an order indicating signal indicating that an instruction to be executed appears in the program later than an instruction being executed;
means connected to said plurality of instruction execution means for counting the number of data signals already processed for the instructions being executed by said plurality of instruction execution means; and
instruction status word storage means connected to said instruction execution start control means, said order indicating signal generating means and said count means for storing instruction status words for a plurality of instructions for which the execution has been started but not finished, each of instruction status words including the order indicating siganl for each instruction, a count of the number of data signals processed for each instruction and an instruction.

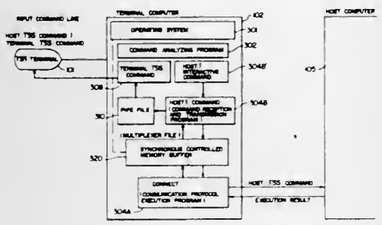
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4,782,442

TIME-SHARING COMPUTER SYSTEM OPERABLE IN A HOST TSS MODE AND A TERMINAL TSS MODE

Tomihiko Kojima, Machida; Hidehiko Akita, Tokyo; Hisashi Hashimoto; Tsutomu Miyairi, both of Yokohama, and Yutaro Hori, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 542,464, Oct. 17, 1983, abandoned.
This application Jan. 8, 1987, Ser. No. 1,438
Claims priority, application Japan, Oct. 18, 1982, 57-181308
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**



1. In a time-sharing computer system including a host computer system which operates in response to a host TSS command, a terminal computer system which is connected to said host computer system through a line and operates in response to a terminal TSS command, and a plurality of terminals which are connected to said terminal computer system for operating said host computer system and said terminal computer system in an interaction mode, said terminal computer system comprising:

first means for storing a first set of programs each of which defines an operation of said terminal computer system to be executed in response to a respective terminal TSS command inputted from one of said terminals;

second means for storing a second set of programs each of which, when executed, produces a series of character codes to be sent as a host TSS command to said host computer system in response to a corresponding host TSS input command inputted from one of said terminals and transfers the execution result of the host TSS input command by the host computer to the one of said terminals to which the host TSS input command was inputted by a user;

command analyzing means for selecting within said first and second sets of programs a group to be executed in response to a terminal TSS command or a host TSS input command received from one of said terminals;

means responsive to said analyzing means for executing said selected program; and

communication means for transmitting character codes, produced by execution of a program of said second set of programs, as a host TSS command to said host computer system through said line between said terminal computer system and said host computer system and for receiving the result of operation of said host computer system in response to the host TSS command;

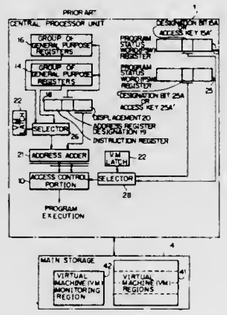
wherein each of said terminals receives the execution results of operation in a host interaction mode in response to the inputting of a host TSS input command, and the execution results of an operation in a terminal interaction mode in response to inputting of a terminal TSS command without the need for switching of the interaction mode of operation of said terminal computer system.

4,782,443

MAIN STORAGE CONTROL SYSTEM FOR VIRTUAL COMPUTING FUNCTION SYSTEM WITH PLURAL ADDRESS MODES IN MAIN STORAGE ACCESS OPERATIONS

Toshio Matsumoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,796
Claims priority, application Japan, Nov. 13, 1985, 60-254027; Nov. 13, 1985, 60-254029
Int. Cl.[4] G06F *12/02*
U.S. Cl. 364—200 **2 Claims**



1. A main storage access control system for a virtual computing function system, including a central processing unit and a main storage, executing programs stored in virtual machine regions and a virtual machine monitoring region of the main storage, the programs including instructions with a register designating portion, said system comprising:

address registers in groups of general purpose registers in the central processing unit, used for calculating memory addresses for accessing the main storage, said address registers being operated under a plurality of address modes for memory addresses having different effective bit lengths, the address designating portion of the instructions designating one of the general purpose registers in the central processing unit;

a tag register for registering tag bits indicating a mode of use of said address registers, each bit of said tag register corresponding to one of the general purpose registers operating as one of said address registers, the address designating portion of the instructions designating one of the tag bits of said tag register; and

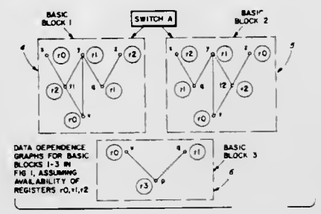
selection means in the central processing unit, connected to said tag register, for generating an output signal selecting the mode of use of the one of said address registers designated by the address designating portion of one of the instructions in dependence upon the one of the tag bits corresponding thereto by means of an operand address on one of the instructions to be executed by the program stored in the virtual machine monitoring region, the mode of use of said address registers being determined by the output signal of said selection means.

4,782,444

COMPILATION USING TWO-COLORED PEBBLING REGISTER ALLOCATION METHOD SUCH THAT SPILL CODE AMOUNT IS INVARIANT WITH BASIC BLOCK'S TEXTUAL ORDERING

Ashfaq A. Munshi, San Jose, and Karl M. Schimpf, Santa Cruz, both of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Dec. 17, 1985, Ser. No. 809,989
Int. Cl.[4] G06F *15/00, 9/44;* **G06I** *12/02, 12/08*
U.S. Cl. 364—300 **5 Claims**



1. A method for allocating and optimizing register assignments during the compiling of source into executable code in either a scalar or a vector processor,

the source code including regions of code without branches termed "basic blocks", each basic block having statements defining computations,

each processor comprising memory for storing sequences of executable code and data, and means for accessing said memory and executing any accessed code; the memory being mapped as a two-level model including a finite number p greater than 0 of registers and a comparably infinite internal memory, said registers having access times faster than that of internal memory,

comprising the processor-implemented steps of:

(a) ascertaining data dependency graph attributes of each basic block;

(b) generating a local register allocation and assignment for q of the p registers in the range $0<q<p$ with reference to all computations within each basic block by performing a "two-color pebbling game" heuristic over the ascertained data dependency graph utilizing the two-level memory model; and

(c) performing live variable analysis upon a flow graph-like representation of the basic blocks and responsively generating a global register allocation and assignment among (p-q) remaining registers assuming that loops expressed in the flow graph among the basic blocks are the most significant optimization entity.

4,782,445

CONTROL APPARATUS FOR COOKING APPARATUS

Mario Pasquini, Milford, Conn., assignor to Food Automation-Service Techniques, Inc., Stratford, Conn.

Filed Dec. 18, 1986, Ser. No. 943,949
Int. Cl.[4] G06F *15/20;* **H05B** *1/02*
U.S. Cl. 364—400 **32 Claims**

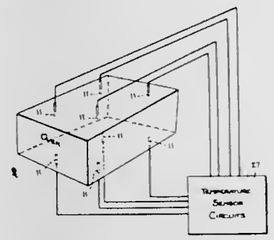
1. Apparatus for averaging the temperatures of a plurality of temperature probes in an oven comprising:

means for counting the number Y of Y probes in the oven and for storing said number Y thereof and for indicating individual probes successively;

means for reading the temperature of each probe indicated by said Y probe counting and storing means;

means for decrementing said Y probe counting and storing and probe-indicating means;

means for determining whether said Y probe counting and storing and probe-indicating means has been decremented to zero; and



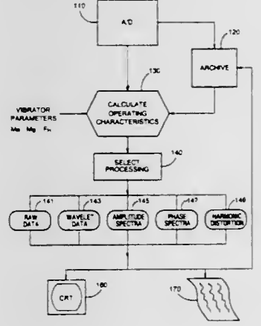
means for averaging the temperatures of said Y probes when said Y probe counting and storing and probe indicating means has been decremented to zero.

4,782,446

VIBRATOR QUALITY CONTROL METHOD AND SYSTEM

Jerry W. Ehler; O. Guy Marney, Jr.; Randol R. Read; Daniel T. Johnson, and Jerome D. McCoy, Jr., all of Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed May 29, 1987, Ser. No. 56,494
Int. Cl.[4] G01V *1/24*
U.S. Cl. 364—421 **13 Claims**



10. A system for analyzing and adjusting the performance of swept frequency vibrators in the field, comprising:

(a) sensing means mounted with the vibrator reaction mass and sensing means mounted with the vibrator baseplate for obtaining signals representative of reaction mass acceleration and baseplate acceleration;

(b) means for monitoring pilot sweep signals controlling the swept frequency vibrator;

(c) calculating means for determining a set of operating characteristics from the reaction mass acceleration signal, baseplate acceleration signal and pilot sweep signal;

(d) processing means for processing the operating characteristics and obtaining a plurality of sets of analysis characteristics; and

(e) means for simultaneously displaying two or more analysis characteristics for analyzing and adjusting the performance of the swept frequency vibrator.

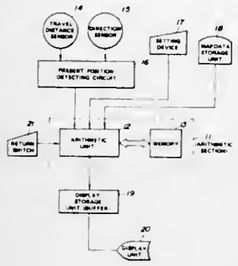
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4,782,447

SYSTEM AND METHOD FOR NAVIGATING A VEHICLE

Hiroshi Ueno; Toshiyuki Itoh, both of Yokosuka; Masakazu Tsunoda, Fujisawa; Yasushi Kawakami, Tokyo; Shuei Tamura, Ryugasaki, and Makoto Iwabuchi, Tone, all of Japan, assignors to Nissan Motor Company, Ltd, Kanagawa and Niles Parts Company, Ltd., Tokyo, both of, Japan

Filed Mar. 28, 1986, Ser. No. 846,560
Claims priority, application Japan, Apr. 3, 1985, 60-70622
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **18 Claims**



1. A system for navigating a vehicle, comprising:
(a) first means for monitoring a distance travelled by the vehicle and vehicle direction and deriving data on the instantaneous position and direction of the vehicle;
(b) second means for storing roadmap data including configurations of a plurality of known branching points;
(c) third means for designating a route of travel from a first known branching point through which the vehicle is first to pass to a final destination;
(d) fourth means for determining a first road connected to the first known branching point and through which the vehicle is to arrive at the first known branching point on the basis of the present direction of the vehicle with respect to the first known branching point, derived by said first means, and based on direction data stored in said second means for each road branched from the first known branching point; and
(e) fifth means for displaying on a display screen thereof a relative positional relationship between the first road and a second road branched from the first known branching point and through which the vehicle is to travel along the designated route of travel from the first known branching point.

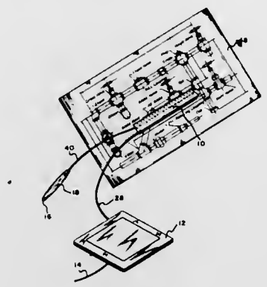
4,782,448

CONTRACT ESTIMATING SYSTEM UTILIZING A DIGITIZING RULER

Irving Milstein, Margate, N.J., assignor to Judith Titton, Margate, N.J.

Continuation-in-part of Ser. No. 784,338, Oct. 4, 1985, Pat. No. 4,744,034. This application May 13, 1987, Ser. No. 49,259
Int. Cl.[4] G06F *15/20, 15/60*
U.S. Cl. 364—464.01 **2 Claims**

1. A contract estimating system comprising:
an elongated substantially thin ruler having a length which is substantially longer than its width, at least a substantial portion of said ruler being divided into a plurality of equally spaced increments;
a digitizer circuit within said ruler;
a hand held probe connected to said digitizer circuit;
said digitizer circuit generating an output signal indicative of the distance along said ruler touched by said probe;
a digitizer board connected to said ruler digitizer circuit, said digitizer board having an upper surface with a menu thereon including a plurality of indicia, some of said indicia representing different types of materials or construction components and some of said indicia representing different sizes of components, said digitizer board generating an output signal representing one of said indicia touched by said probe;
computer means having an input receiving information from said ruler digitizer circuit and said digitizer board, said



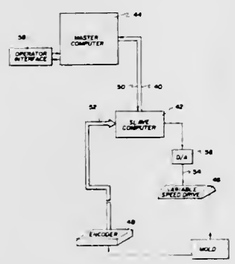
computer means being capable of identifying a signal from said ruler and said board as a component identification, a component size or a length and including means for separately accumulating information concerning each type and size component, and
means for displaying the information accumulated by said computer means.

4,782,449

POSITION CONTROLLER FOR GLASS SHEET PROCESSING SYSTEM

Gary D. Brinker, Perrysburg; Eric D. Fintel, Genoa, and Jeffrey N. Klopping, Toledo, all of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Apr. 17, 1986, Ser. No. 853,121
Int. Cl.[4] G06F *15/46;* **C03B** *23/03*
U.S. Cl. 364—473 **18 Claims**



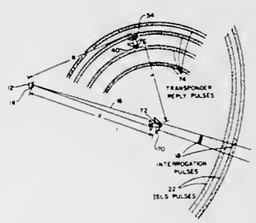
1. In a glass sheet processing system, a position controller for positioning a movable component driven by a variable speed drive, the position controller being adapted for use with a central control system which monitors and controls the processing of the glass sheets, the central control system including a master computer having means for providing command signals and data signals relating to preselected end points, the position controller including a position encoder connected to the movable component, and a slave computer, the slave computer comprising:
a first input connected to the master computer for receiving digital signals corresponding to positioning commands, position data and velocity profile data from the master computer;
a second input connected to the position encoder for receiving digital signals corresponding to current position information from the position encoder;
a first output connected to the variable speed drive for providing control signals to the variable speed drive;
a second output connected to the master computer for transmitting digital signals corresponding to command acknowledgement, error, position data, and velocity profile data to the master computer; and
logic means for calculating the distance required to position the movable component from the component's current position to a preselected point, calculating the desired current velocity according to position and velocity profile data for that preselected point, and calculating a digital control signal necessary to drive the variable speed drive to move the movable component to the preselected point at the desired current velocity in response to a positioning command received from the master computer, and transmitting an acknowledge signal to the master computer when the movable component has reached the preselected point.

4,782,450

METHOD AND APPARATUS FOR PASSIVE AIRBORNE COLLISION AVOIDANCE AND NAVIGATION

Bennett Flax, 1001 Playford La., Silver Spring, Md. 20901

Filed Aug. 27, 1985, Ser. No. 769,701
Int. Cl.[4] G01S *1/24*
U.S. Cl. 364—461 **11 Claims**



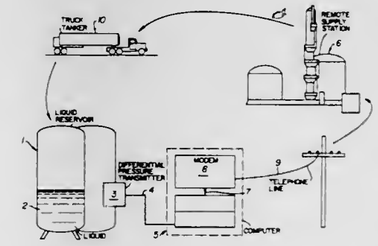
3. A method of passively determining in own aircraft the position of said own aircraft by utilizing differences between times of arrival at said own aircraft of Improved Sidelobe Suppression (ISLS) pulse pairs transmitted from a Secondary Surveillance Radar (SSR) and trains of reply pulses (replies) transmitted by a fixed secondary-radar transponder in response to mode A and mode C interrogation pulse pairs (interrogations) transmitted by said SSR, and for passively determining the position of any proximate transponder-equipped other aircraft by utilizing said determined position of said own aircraft and differences between times of arrival at said own aircraft of said ISLS pulse pairs and replies transmitted by said other aircraft's airborne transponder in response to said interrogations, comprising the steps of:
prestoring location data for said SSR and for said fixed transponder, and prestoring signal data identifying said fixed transponder's mode A reply;
determining times of arrival at said own aircraft of leading edges of said ISLS and interrogation pulse pairs;
determining times of arrival at own aircraft of leading edges of said replies by said fixed transponder and by said other-aircraft transponder;
determining said own aircraft's altitude;
determining said other aircraft's altitude from said other-aircraft-transponder replies to said mode C interrogations;
calculating the position of said own aircraft utilizing said own aircraft's altitude, said times of arrival of said interrogation pulses, said times of arrival of said leading edges of said ISLS pulses and said replies from said fixed transponder, and said prestored location and signal data; and calculating the position of said other aircraft utilizing said other aircraft's altitude, said calculated position of said own aircraft, said times of arrival of said leading edges of said ISLS pulses and said replies by said other aircraft transponder, and said prestored location and signal data; and
indicating said calculated position of said own aircraft for navigational purposes, and indicating said calculated positions of said own aircraft and said other aircraft for collision-avoidance purposes.

4,782,451

PROCESS FOR MAINTAINING LIQUID SUPPLY

Richard B. Mazzarella, Grand Island; John P. Borcuch, Williamsville, and David E. Brown, Kenmore, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 676,845, Nov. 30, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 93,604
Int. Cl.[4] G06F *15/24;* **G01F** *23/18*
U.S. Cl. 364—510 **12 Claims**



1. A method for maintaining a supply of liquid in a reservoir while ensuring that liquid is not delivered to the reservoir after it is empty or before the reservoir requires refilling, comprising sending liquid to the reservoir from a supply station remote to the reservoir so as to have a predetermined supply time for supplying liquid to the reservoir, by the steps of:
(A) determining a first amount of liquid in the reservoir, after a period of time determining a second amount of liquid in the reservoir, sending each determination to signal receiving means, subtracting the second amount from the first amount, and dividing the remainder by the period of time to obtain the time rate of change of the liquid; and
(B) dividing the second amount by the time rate of change and, if this first quotient is equal to or less than the predetermined supply time, sending a signal from the receiving means to a supply station remote to the reservoir and thereafter sending liquid in response to said signal from the supply station to the reservoir;
(C) dividing the second amount by the predetermined supply time and, if this second quotient is equal to or less than the time rate of change, sending a signal from the receiving means to a supply station remote to the reservoir and thereafter sending liquid in response to said signal from the supply station to the reservoir; or
(D) multiplying the time rate of change by the predetermined supply time and, if this product is equal to or greater than the second amount, sending a signal from the receiving means to a supply station remote to the reservoir and thereafter sending liquid in response to said signal from the supply station to the reservoir.

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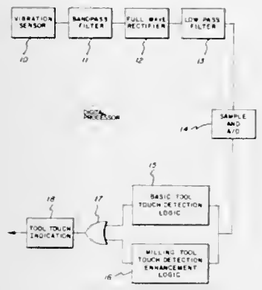
ACOUSTIC DETECTION OF MILLING TOOL TOUCH TO A WORKPIECE

Charles E. Thomas, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,123

Int. Cl.[4] G08B *21/00;* **G06F** *15/36;* **G01M** *7/00*

U.S. Cl. 364—550 **12 Claims**



1. A method of acoustically detecting the initial contact of a workpiece and rotating milling tool having one or more cutters comprising:

sensing vibrations and generating a vibration signal as said milling tool slowly toward said workpiece and makes light rubbing contact;

preprocessing said signal in an analog channel to restrict the output waveform to a specific band of frequencies and prepare the signal for sampling and analog-to-digital conversion;

digitally processing signal samples of said analog output waveform concurrently through basic tool touch detection logic and milling tool touch detection enhancement logic, and generating a tool touch indication when either set of detection logic is satisfied;

said basic tool touch logic comprising checking each sample amplitude against a threshold set above continuous background noise peaks, and generating said tool touch indication upon detecting a predetermined number of positive slope above-threshold signal samples;

said milling tool touch logic comprising entering into a touch suspicion mode upon detecting one above-threshold signal sample and setting up an acceptance time window about the expected time of contact of the next cutter and said workpiece, and generating said tool touch indication upon detecting an above-threshold signal sample in said acceptance window.

4,782,453

METHOD OF DETERMINING THE LOCATION OF A NAVIGATIONAL MAGNETIC FIELD SENSOR IN A VEHICLE

Harald Bauer, Nürnberg, and Reinhard Helldörfer, Igelsdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 20, 1986, Ser. No. 898,376

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1985, 3534480

Int. Cl.[4] G01C *17/38*

U.S. Cl. 364—559 **6 Claims**

1. Method permitting relatively unskilled installers to install in a vehicle, a navigational magnetic field sensor (**11**) in a location where saturation of said sensor and consequent erroneous navigation indications are avoided,

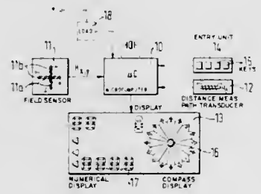
in which the entire magnetic field to which the field sensor is subjected is composed of the geomagnetic field and, when present, a stray or disturbance field resulting from at least one of permanent magnetic characteristics of said vehicle and transient magnetic fields emanating from energized equipment in said vehicle,

the magnetic field sensor is responsive to the entire magnetic field permeating the sensor,

navigation of the vehicle is guided by reference to the geomagnetic field forming at least a component of the entire field,

a vector diagram of a measured magnetic field vector with respect to axes (x, y) of said sensor, upon rotation together of said vehicle and sensor, traces out and defines a locus curve (O) which has a center point (M), and

in which the disturbance field causes a shift of the center point (M) of the locus curve from a null position in an orthogonal vectorial system, which shift is determined by the disturbance field present at the location of the magnetic field sensor,



said method comprising, in accordance with the invention, the steps of determining field strength values (Hx_{max}, Hy_{max}) which represent saturation of said sensor along each of its respective axes (x,y) and, iteratively,

(a) securing the field sensor (**11**) at a new location in the vehicle;

(b) moving the vehicle through 360°;

(c) continuously measuring, during movement of the vehicle, field strength values and determining, in an evaluation circuit (**10, 13**) coupled to the field sensor (**11**), which of said measured values represent the maximum and minimum value, along each axis, of the entire field vector (Hg_x, Hg_y) encountered during said 360° movement; and

(d) determining the magnitude, along each axis, of the disturbance field (Hs_x, Hs_y) at said new location;

at least until the field strength of the disturbance field (Hs) is not greater than half the saturation field strength (Hx_{max}, Hy_{max}) of the magnetic field sensor (**11**).

4,782,454

COMBINATION WEIGHING DEVICE

Sadao Nakamura, Kobe, Japan, assignor to Yamato Scale Company, Limited, Japan

Filed Aug. 28, 1986, Ser. No. 901,317

Claims priority, application Japan, Dec. 5, 1985, 60-274798

Int. Cl.[4] G01G *17/00, 19/22, 19/34*

U.S. Cl. 364—567 **12 Claims**

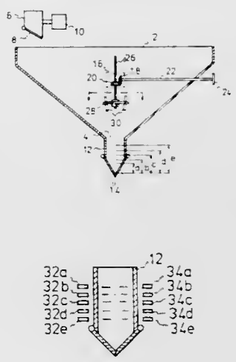
1. A combination weighing machine for delivering quantities of product measured by weight with each quantity having an allowable total weight, comprising:

a set of separate devices for holding and unloading weighed batches of product, each batch having a weight constituting only a fraction of said allowable total weight;

means for selecting a combination of batches having an allowable total weight;

means for unloading the devices corresponding to said selected combination of batches;

a retainer constituting part of said combination weighing machine located below said devices for receiving and retaining the selected combination of batches unloaded from corresponding devices, said retainer having an outlet adapted to open for discharge of said selected combination of batches from the combination weighing machine for delivery to a packaging machine or the like; and



means for detecting the volume of said selected combination of batches retained in said retainer.

4,782,455

CARD SPEED DETERMINATION IN A CARD READER

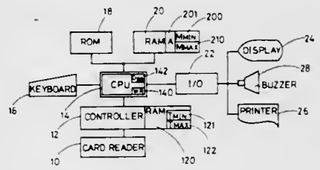
Kinya Morinouchi, Kashihara, and Shigeru Kitano, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 697,034, Jan. 31, 1985, abandoned. This application May 18, 1987, Ser. No. 51,171

Claims priority, application Japan, Feb. 2, 1984, 59-18966; Feb. 3, 1984, 59-19223

Int. Cl.[4] G06F *15/02;* **G06K** *5/00*

U.S. Cl. 364—569 **7 Claims**



1. A card reader control system for a card reader wherein a card is manually driven to travel through a card reader, said card reader control system comprising:

a card reader for reading information stored on said card and for generating a clock signal in response to occurrence of said information on said card;

measuring means for measuring time intervals of said clock signal generated by said card reader when the card is manually driven to travel in said card reader;

first storing means for storing said time intervals of said clock signal measured by said measuring means, said storing means further storing a first maximum time interval and a first minimum time interval at least before said card travels in said card reader;

second storing means for storing predetermined time intervals, a second maximum time interval and a second minimum time interval;

a working register operatively connected to said first storing means and said second storing means for temporarily storing said time intervals measured by said measuring means;

determination means for determining card speed by comparing the time intervals measured by said measuring means with said predetermined time intervals stored in said second storing means, said determination means further comparing each of said time intervals temporarily stored in said working register with each of first maximum and first minimum time intervals stored in said first storing means, said determination means updating said first maximum time interval by each of said time intervals temporarily stored in said working register which is greater than said first maximum time interval, said determination means also updating said first minimum time interval by each of said time intervals temporarily stored in said working register which is less than said first minimum time interval, and said determination means comparing the first and second minimum time intervals and the first and second maximum time intervals stored in the respective first and second storing means for determining a minimum and a maximum card speed, said determination means being programmable by computer software; and

alarm means for generating an alarm signal when said determination means determines said card speed fails to be within a preferred range, said preferred range being between said second maximum time interval and said second minimum time interval.

4,782,456

SYSTEM FOR DETECTING THE PRESENCE OF A PURE SIGNAL IN A DISCRETE NOISY SIGNAL MEASURED AT A CONSTANT AVERAGE NOISE LEVEL WITH A PROBABILITY OF FALSE DETECTION BELOW A PREDETERMINED FALSE DETECTION LEVEL

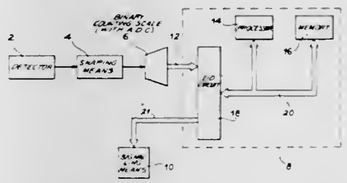
Emile Poussier, Is sur Tille, and Michel Rambaut, Bures sur Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 23, 1986, Ser. No. 855,494

Claims priority, application France, Apr. 23, 1985, 85 06164

Int. Cl.[4] H04B *15/00;* **G06F** *15/20*

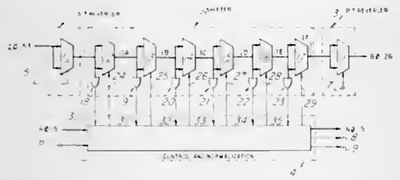
U.S. Cl. 364—574 **5 Claims**



1. A system for detecting the presence of a pure signal in a discrete noisy signal measured at a constant average noise level, comprising: in series a converter for converting radiation received thereby into electrical pulses, a shaping means, a binary counting scale, a processing means, and a signalling means; said processing means comprising a processor, at least one memory, and an input-output circuit, said processor comprising means for measuring a counting rate N during successive equal time periods, means for estimating a value of an average noise level M, means for calculating a false detection probability PF as a function of said counting rate N and of the estimated average noise level M, and means for comparing said false detection probability PF with a predetermined false detection level TF, to thereby ascertain that a pure signal has been detected when said false detection probability PF is below said false detection level.

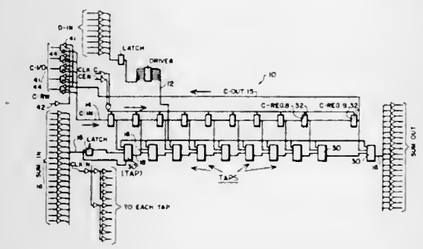
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4,782,457
BARREL SHIFTER USING BIT REVERSERS AND HAVING AUTOMATIC NORMALIZATION
James H. Cline, Allen, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Aug. 18, 1986, Ser. No. 897,700
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—715.04 **10 Claims**



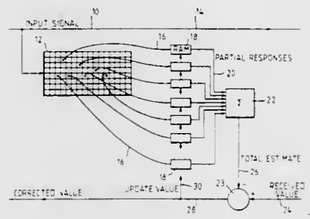
1. A barrel shifter comprising: a first bit reverser stage having a first input for a first plurality of data bits and a first output bus for a second plurality of data bits;
said first bit reverser stage selectively, in response to a first control signal, operative to output said first plurality of data bits in reverse order as said second plurality of data bits on said first output bus;
a shifting stage having a second input coupled to said first output bus for receiving said second plurality of data bits, and a second output bus for a third plurality of data bits;
said shifting stage selectively, in response to a second control signal, operative to shift said second plurality of data bits in a first direction and output as said third plurality of data bits on said second output bus;
a second bit reverser stage having a third input coupled to said second output bus for said third plurality of data bits and a third output bus for a fourth plurality of data bits; and
said second bit reverser stage selectively, in response to a third control signal, operative to output said third plurality of data bits in reverse order as said fourth plurality of data bits on said third output bus.

4,782,458
ARCHITECTURE FOR POWER OF TWO COEFFICIENT FIR FILTER
Arup K. Bhattacharya, Peekskill; Michael G. Cristofalo, Pleasantville; David Koo, Briarcliff Manor; Amihai Miron, Ossining, and Imran A. Shah, North White Plains, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 18, 1986, Ser. No. 944,295
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.16 **16 Claims**



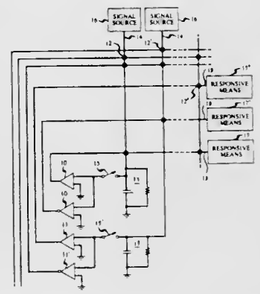
1. A non-recursive finite impulse response (FIR) digital filter of n taps, where $1 \leqq n$, comprising:
means to receive and store a plurality of coefficients, one coefficient per tap, wherein each coefficient is an integral power of 2;
means to receive and shift a data input word in each of said taps, the extent of said shift being determined by the value of the coefficient stored in said tap;
said shifted data word being equivalent to the product of said input data word and said coefficient of said tap;
means to add said product at each tap to the delayed output of the previous tap to thereby form at each tap the cumulative sum of the products at all previous taps;
means to delay and forward said cumulative sum to the next tap, and
means to output the cumlative sum of all taps in said filter.

4,782,459
ADAPTIVE RECOGNIZING DEVICE
Robert D. Johnston, Woodbridge, England, assignor to British Telecommunications, plc, London, England
Filed Oct. 24, 1985, Ser. No. 790,931
Claims priority, application United Kingdom, Oct. 26, 1984, 8427165
Int. Cl.[4] G06F *7/38*; H04B *3/00*
U.S. Cl. 364—724.19 **35 Claims**



1. An electronic adaptive recognizing device comprising:
a device input;
an input store, connected to said device input, having a plurality of storage locations allowing data representative of elements of a signal pattern to be recognized to be stored at locations related to the positions of the elements in said pattern;
a plurality of addressable stores each having only one address line specifying one or more store locations therein, each of said addressable store locations being capable of containing a word of at least one bit, said address lines each being connected to a respective location in said input store such that the contents of said input store are capable of specifying a store location in each of said addressable stores;
means for deriving a common value dependent on the contents of the store locations specified by the contents of said input store;
means for receiving values related to said signal pattern;
calculating means for calculating a corrected value dependent on said common value and a corresponding one of said received values;
an output coupled to said calculating means for outputting said corrected values; and
updating means for applying an update value dependent on said corrected value to the contents of said specified store locations.

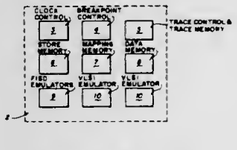
4,782,460
COMPUTING APPARATUS COMPRISING A PROGRAMMABLE RESISTOR
Edward G. Spencer, Berkeley Heights, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 6, 1987, Ser. No. 35,416
Int. Cl.[4] G06F *7/00*
U.S. Cl. 364—807 **9 Claims**

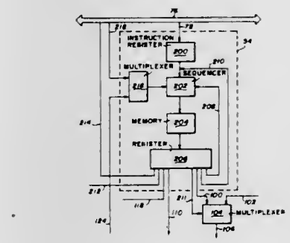


1. Electronic computing apparatus comprising
(a) a multiplicity of amplifier means, each one of the amplifier means having at least one input terminal and at least one output terminal;
(b) means for electrically connecting the output terminal of any given amplifier means A_j to the input terminal of at least one other amplifier means A_i, the electrical connection having a predetermined resistance;
(c) means for applying an electrical signal at least to the input terminal of one of the amplifier means; and
(d) means that are responsive to the output signal of at least one of the amplifier means;
characterized in that
(e) the means of (b) comprise a programmable resistor body consisting substantially of a material having a state of relatively high resistivity and having a first and second major surface, a portion S_i of the first surface being associated with A_i and a portion S_j of the second surface being associated with A_j, associated with the programmable resistor body is a resistance R_{ij} between S_i and S_j, the value of R_{ij} being changeable from a relatively high value associated with the state of relatively high resistivity to a lower value by application of a "write" voltage between S_i and S_j, and the value of R_{ij} being furthermore changeable from the lower value to a higher value by application of an "erase" voltage between S_i and S_j; and
(f) the apparatus further comprises means for applying the "write" voltage and the "erase" voltage between S_i and S_j, such that a predetermined resistance R_{ij} can be formed between S_i and S_j, and such that the electrical connection of predetermined resistance between the input terminal of A_i and the output terminal of A_j is established.

4,782,461
LOGICAL GROUPING OF FACILITIES WITHIN A COMPUTER DEVELOPMENT SYSTEM
John R. Mick, Los Altos Hills; Darrell L. Wilburn, Saratoga, and Michael J. Miller, San Jose, all of Calif., assignors to Step Engineering, Sunnyvale, Calif.
Filed Jun. 21, 1984, Ser. No. 623,160
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **10 Claims**

1. A logical grouping of facilities within a development system, comprising:
a means for controlling clock signals;
a plurality of facilitates including a means for controlling break points to halts the system at a predetermined match point, a plurality of means for emulating or simulating program or microprogram storage, means for detecting a trace match word and storing trace data, and a plurality of functional microprogrammable very large scale integrated circuits (VLSI) emulators and a plurality of fixed instruction set microprocessor emulators;
a microprocessor programmed to selectively assign said plurality of facilitaties for operation in association with said clock control means such that the assigned facilities and clock control means form an execution site for the design, debugging and testing of a microprogrammable target machine;
a plurality of means for connecting said assigned facilities to said target machine; and
wherein said VLSI emulator includes a device plug for insertion in said target machine, a plurality of target machine input/output buffers connected to the device plug by a plurality of signal paths, a VLSI device connected to the target machine input/output buffers by a plurality of signal paths, a means for controlling an emulator head clock connected to the target machine input/output buffers by a signal path and to the VLSI device by a signal path, a plurality of emulator controller input/output buffers connected to the means for controlling an emulator head block by a signal path and to the VLSI device by a plurality of signal paths, a state machine connected to the target machine input/output buffers by a signal path, to





the VLSI device by a plurality of signal paths and to the emulator controller input/output buffers by a signal path, a plurality of emulator head input/output buffers connected to the emulator controller input/output buffers by a plurality of signal paths, a second means for controlling a clock connected to the emulator head input/output buffers by a signal path, a microprogrammable means for controlling the transmission of instructions and control signals to the VLSI device and the reception of data from the VLSI device and the target machine, the microprogrammable control means being connected to the emulator head input-output buffers by a signal path and to the clock control means by a signal path, a means for storing data corresponding to the current state of the VLSI device, said means for storing data corresponding to the current state of the VLSI device connected to the emulator head input/output buffers by a signal path, a means for storing new operands, a means for selecting the source of signals to be transmitted to the VLSI device, the selector means being connected to the current state data storage means by a signal path, to the microprogammable control means by a signal path, to new operand storage means by

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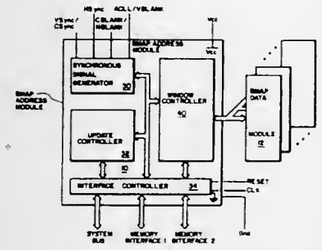
a signal path, and to the emulator head input/output buffers by a plurality of signal paths, and a host computer bus connected to the current state data storage means by a signal path, to the new operand storage means by a signal path and to the micro-programamble control means by a signal path.

4,782,462

RASTER SCAN VIDEO CONTROLLER WITH PROGRAMMABLE PRIORITIZED SHARING OF DISPLAY MEMORY BETWEEN UPDATE AND DISPLAY PROCESSES AND PROGRAMMABLE MEMORY ACCESS TERMINATION

Cecil H. Kaplinsky, Palo Alto, and Jan-Kwei J. Li, San Jose, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Dec. 30, 1985, Ser. No. 815,363
Int. Cl.[4] G06F *9/46*
U.S. Cl. 364—900 **5 Claims**



1. A circuit for programmed sharing of a plurality of system resources for use in processing operations in a computer system, said resources to be shared between update and display processes in a raster scan video controller, comprising:

A display memory having one or more signal terminals on which data is read or written;

two or more processing devices, each having a number of signal terminals on which they read or write data;

a raster scan video display;

first means which reads out selected contents of said display memory and transforms said contents to signals which control a raster scanning beam of the video display during an active display time;

second means which provides horizontal and vertical retrace signals at appropriate intervals to said video display and which blanks the raster scan during retrace;

third programmed means which assigns a priority to each of the processing devices;

fourth means which are used by each processing device to request system resources to access and display data;

fifth means which grants said resource requests;

sixth means coupled to said third means and responds to the priority assigned thereby for controlling said fifth means, which allocate said system resources among said processing devices in response to said priority assignment;

first terminating means connected to said sixth means which terminate a series of display memory accesses in response to an event signal;

second terminating means connected to said sixth means which terminates a series of display memory accesses in response to a programmed count of said accesses for the device performing them;

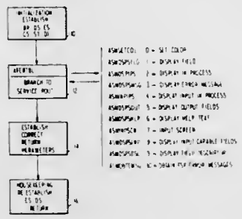
seventh means connected to both first and second terminating means for controlling whether said first terminating means or said second terminating means terminates a particular display memory access.

4,782,463

METHOD FOR GENERATING DISPLAY SCREENS FOR A SET OF APPLICATION PROGRAMS BY CALLING SCREEN MANAGEMENT SUBROUTINES

John R. Sanders, and Bern E. Hofmann, both of Cobb County, Ga., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,545
Int. Cl.[4] G06F *3/14, 15/00*
U.S. Cl. 364—900 **5 Claims**



1. A method for generating display screens for a set of application programs which allows application programmers to write programs without having to code the specific locations on a computer display screen where information and data are to be displayed in fields of various display screens of the set of application programs comprising the steps of:

providing a series of screen management subroutines callable from an application program in the set of application programs, said subroutines including display screen headings, display field descriptors, display data fields, and read screen input;

defming a screen for at least one of said application programs by inputting from an application program screen specification data indicative of information and data to be displayed including for each field a row number, a column number, a length and a type; and

managing a display screen from one of said application programs by reading said screen specification data, calling said display screen headings and display field descriptors subroutines and calling said display data fields subroutine, and calling said read screen input subroutine to read said screen specification data and display screen headings and display data fields on the display screen and, in response to user input data, to read data fields on the display screen and return the data to the application program.

4,782,464

COMPACT SPELLING-CHECK DICTIONARY

R. William Gray, Ithaca; Donald T. Adams, Homer, and Howard C. Duncan, IV, Marathon, all of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Filed Dec. 26, 1985, Ser. No. 813,342
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **15 Claims**

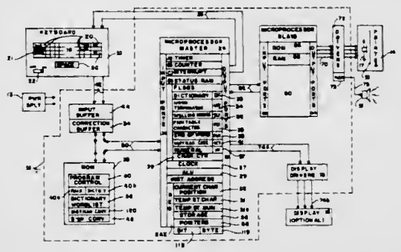
1. An electronic dictionary storage apparatus for use in an electronic typewriter or handheld dictionary, the apparatus containing an electronic processor and a memory storing a list of correctly spelled words for verifying the spelling order of character inputs comprising:

(a) input means for receiving characters from a keyboard;

(b) a first storage means for storing character information structured to sequentially check the spelling order of a first predetermined series of characters received from said input means, wherein said character information comprises a plurality of character sequences, each said sequence having a predetermined series N of characters therein and being combinable with a first character to form a sequence as a preliminary portion of one word in said list and wherein said characters are stored in ordered sets consisting of groups so that each group of set is located by a respective address associated with a particular one of said first characters;

(c) a second storage means extending from said first storage means and containing further character information structured to check the spelling order of a variable string of character inputs stemming from said predetermined series to validate spelling of words, wherein character information in said second storage comprises a tree structure with a plurality of branches, each branch having a unique address in said second storage means and each branch holding a least one word remnant associated with said character sequence;

(d) processing comparison means connected to said input means and to said first and second storage means, and being operative in response to receipt of a character from said keyboard to ascertain occurrence of a match upon comparing the received character and a corresponding stored character in proper spelling order according to said character information stored in the first and second storage means.

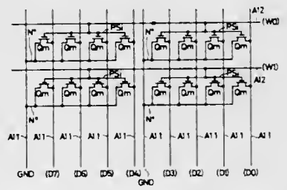


4,782,465

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH MEMORY CELLS CONNECTED TO A DIVIDED SUB-WORD LINE

Makio Uchida, Fuchu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 635,210, Jul. 27, 1984, abandoned. This application Apr. 21, 1987, Ser. No. 41,759
Claims priority, application Japan, Jul. 27, 1983, 58-135815
Int. Cl.[4] G11C *5/06, 11/40*
U.S. Cl. 365—72 **30 Claims**



1. A semiconductor integrated circuit device comprising:

a first wiring layer;

a first circuit having a first insulated gate field effect transistor and a second wiring layer formed of a material different from said first wiring layer, coupled to the gate electrode of said first insulated field effect transistor, connected to said first wiring layer, and is supplied with a signal from said first wiring layer, said first wiring layer and said second wiring layer being substantially parallel to each other;

a second circuit having a second insulated gate field effect transistor, and a third wiring layer formed of a material different from said first wiring layer, coupled to the gate electrode of said second insulated gate field effect transistor, connected to said first wiring layer, and supplied with a signal from said first wiring layer, said first wiring layer and said third wiring layer being substantially parallel to each other; and

said second and third wiring layers being divided from each other so as not to be directly electrically connected together and said signal from said first wiring layer being supplied to said second and third wiring layer substantially simultaneously.

4,782,466

PROGRAMMABLE SEMICONDUCTOR READ ONLY MEMORY DEVICE

Satoru Yamaguchi, Nagoya; Kunihiko Wada, Kawasaki, and Noriaki Sato, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 2, 1986, Ser. No. 902,675
Claims priority, application Japan, Sep. 4, 1985, 60-195167; Nov. 29, 1985, 60-268547
Int. Cl.[4] G11C *11/24*
U.S. Cl. 365—149 **13 Claims**

1. A programmable semiconductor read only memory device comprising:

a memory cell array including:

a plurality of word lines;

a plurality of bit lines intersecting said word lines; and

a plurality of memory cells arranged in a matrix arrangement, said plurality of memory cells being respectively coupled at said intersections of said word lines and bit lines, each of said plurality of memory cells in said memory cell array comprising:

a transistor having a gate coupled to a respective one of said word lines, a source, and a drain, one of said source and drain coupled to ground;

a capacitor including an insulator layer and having a first terminal coupled to a respective one of said bit lines and having a second terminal coupled to said one of said source and drain of said transistor coupled to ground, said bit lines being selectively driven to a first predetermined voltage greater than ground and said word lines being selectively driven to a second predetermined voltage for turning on said transistor;

said insulator layer of said capacitor of a selected one of said memory cells breaking down thereby making said capacitor conductive when a specific one of said word lines and a specific one of said bit lines coupled to said one of said selected memory cells are driven to the first and second predetermined voltages, respectively.

4,782,467

RADIATION HARD GATED FEEDBACK MEMORY CELL

Ronald A. Belt, Plymouth; Gary D. Havey, St. Anthony, and Dale Berndt, Plymouth, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 781,421, Sep. 30, 1985, abandoned. This application Sep. 25, 1987, Ser. No. 102,304
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—154 **30 Claims**

1. A solid-state gated feedback memory cell which will retain its current logic state despite the introduction of certain transient electrical signals at certain locations within said memory cell, comprising:

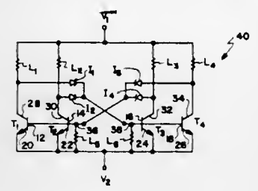
first, second, third and fourth switching means, each of said switching means having a first region, a second region and a control region, wherein said first and second regions are doped so as to be partially conductive and wherein said control region controls the flow of current between said first and second regions, wherein said first regions of said first and second switching means are connected at a first

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node and said first regions of said third and fourth switching means are connected at a second node;

first, second, third and fourth load means, wherein said first load means is connected to and between said second region of said first switching means and a third node, said second load means is connected to and between said second region of said second switching means and said third node, said third load means is connected to and between said second region of said third switching means and a fourth node and said fourth load means is connected to and between said second region of said fourth switching means and said fourth node;

first, second, third and fourth isolation means for controlling electrical signals applied to said control regions, where said first isolation means is coupled between the intersection of said first switching means, said first load means and the control regions of said third and fourth switching means, said second isolation means is coupled between the intersection of said second load means, said second



switching means and the control regions of said third and fourth switching means, said third isolation means is coupled between the intersection of said fourth switching means, said fourth load means and the control regions of said first and second switching means, and said fourth isolation means is coupled between the intersection of said third load means, said third switching means and the control regions of said first and second switching means; and

wherein said first and second nodes are connected to a first voltage reference point and said third and fourth nodes are connected to a second voltage reference point, so that different voltages may be applied to said first and second voltage reference points to supply electrical energy to said cell, and wherein said load means, said isolation means and said switching means form a bistable regenerative device with logic values provided at said second regions, and wherein if said transient electrical signals are introduced at only one of said second regions, the logic values of the remainder of said second regions will be unaffected.

4,782,468

LINE POWER FAILURE SCHEME FOR A GAMING DEVICE

Steven W. Jones, Wood Dale, and Chandra Alifen, Hoffman Estates, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Aug. 5, 1986, Ser. No. 893,577

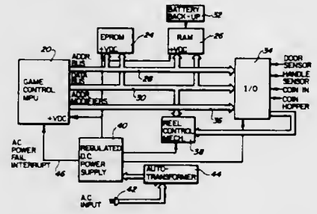
Int. Cl.[4] G11C *8/00;* **G06F** *11/00;* **H03M** *13/00;* **A63B** *7/00*

U.S. Cl. 365—229 **10 Claims**

1. In a gaming device having processing means for controlling the operation of the gaming device including the accessing of a safe memory which can be accessed by the processing means for only a limited period of time using a key, said processing means being powered by a regulated power supply operating on line power for the building in which the gaming device is installed, a line power failure system implementation comprising:

power fail interrupt means responsive to a failure of the line power for interrupting the current control operation of the processing means;

means for determining whether the accessing of the safe memory was interrupted by said power fail interrupt means; and



means responsive to a determination that the accessing of the safe memory was interrupted by said processing means for causing said processing means to complete said interrupted safe RAM access.

4,782,469

ULTRA-SOUND SENSOR

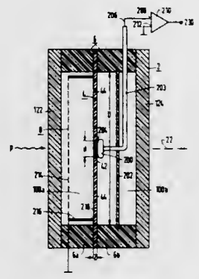
Bernd Granz, Oberasbach; Georg Naser, Zirndorf, and Helmut Reichenberger, Eckental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,756

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637494

Int. Cl.[4] H04R *17/00*

U.S. Cl. 367—157 **10 Claims**



1. In an ultrasound sensor with a polymer foil fastened to a support body at least at its outer region and which polymer foil is piezoelectrically activated at least at a portion thereof and is electrically coupled to electrodes, an improvement which comprises a first electrode contacting said piezoelectrically activated portion of the polymer foil under resilient pretension, and a second electrode arranged at a position which is physically separated from said piezoelectrically activated portion of the polymer foil.

4,782,470

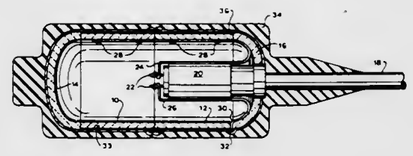
HYDROPHONE WITH EXTENDED OPERATIONAL LIFE

Alfred S. Poturnicki, Jr., Duxbury, and James E. Traft, Quincy, both of Mass., assignors to General Instrument Corp., New York, N.Y.

Division of Ser. No. 797,190, Nov. 13, 1985, which is a continuation of Ser. No. 603,990, Apr. 25, 1984, abandoned, which is a continuation of Ser. No. 298,098, Aug. 31, 1981, abandoned. This application Nov. 24, 1986, Ser. No. 934,002

Int. Cl.[4] H04R *17/00*

U.S. Cl. 367—157 **10 Claims**



1. A method of fabricating a hydrophone comprising the steps of: forming a hollow piezoelectric ceramic enclosure with an exterior surface; coating the exterior surface of the enclosure with a thin, substantially uniform, acoustically transparent, water impervious epoxy layer; curing the epoxy layer by heating to a temperature less than the temperature at which the enclosure loses its polarity and molding a rubber housing around the enclosure, said housing being relatively thicker than said epoxy layer, the housing having an interior surface, the epoxy layer bonding substantially the entire exterior surface of the enclosure to said interior surface of the housing.

4,782,471

OMNIDIRECTIONAL TRANSDUCER OF ELASTIC WAVES WITH A WIDE PASS BAND AND PRODUCTION PROCESS

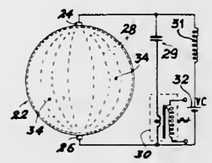
Siegfried Klein, 42 Rue de la Tour d'Auvergne, Paris 75009, France, assignor to Commissariat a l'Energie Atomique and Siegfried Klein, both of Paris, France

Filed Aug. 21, 1985, Ser. No. 768,039

Claims priority, application France, Aug. 28, 1984, 84 13296; Nov. 13, 1984, 84 17282; Nov. 13, 1984, 84 17283

Int. Cl.[4] H04R *15/00*

U.S. Cl. 367—168 **8 Claims**



1. An elastic wave transducer comprising a rigid magnetostrictive diaphragm having a spherical shape, each elementary part of the surface of the diaphragm constituting a unidirectional elastic wave transducer in its normal direction, said transducer also comprising an electric control means provided with two electric terminals for producing in the vicinity of the diaphragm a homogeneous magnetic field in relation with an electrical signal applied to the terminals of the control means or for supplying an electrical signal in relation with the variation of the magnetic field in the diaphragm as a function of an elastic wave received, said control means being located close to said diaphragm so that any electrical current flowing between said electric terminals flows parallel to the surface of the diaphragm, said transducer including means for providing a continuous polarization of the diaphragm, said two electrical terminals being electrically connected respectively to two points on the diaphragm which are diametrically opposite each other.

4,782,472

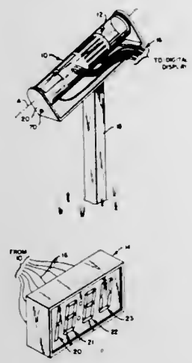
SOLAR CLOCK WITH DIGITAL TIME DISPLAY

Stephen P. Hines, 433 N. Jackson St., Glendale, Calif. 91206

Filed Sep. 28, 1987, Ser. No. 101,808

Int. Cl.[4] G04B *19/26, 49/00;* **G04C** *19/00*

U.S. Cl. 368—15 **10 Claims**



1. A solar clock comprising:

(a) an opaque mask member having a plurality of spaced apertures therein adapted to transmit solar energy;

(b) a plurality of optical fiber light guides adapted to receive light at a first end and transmit such received light to a second end where the light is discharged, said first ends being arranged to form a plurality of linear arrays;

(c) means for supporting said light guides so that said arrays are arranged in predetermined positions relative to said apertures to be illuminated by solar radiation passing through certain of said apertures at predetermined times of day; and

(d) digital display means comprising a plurality of spaced, selectively illuminable elements, each of said elements being optically coupled to one or more of the respective second ends of said light guides for displaying, in digital form, the solar time.

4,782,473

DRIVE CONTROL METHOD FOR MULTI-DISK PLAYER

Naoki Masaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,331

Claims priority, application Japan, Oct. 22, 1986, 61-249492

Int. Cl.[4] G11B *17/22*

U.S. Cl. 369—34 **3 Claims**



1. In drive control method for a multi-disk player in which a plurality of disks are housed in a magazine and said disks are sequentially extracted from said magazine and played, in which player there are provided a disk changing mechanism which pulls said disk out of said magazine and returns said disk

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into said magazine, a motor for driving said mechanism, a motor drive circuit for driving said motor, and a controller which supplies a control signal to said motor drive circuit are provided, the improvement comprising the steps of: performing reverse driving of a disk having completed playing in a direction to pull said disk out of said magazine if the return of said disk to said magazine is not completed within a predetermined time after said disk has completed playing, and returning said disk into said magazine after said disk is pulled out of said magazine.

4,782,474

TRACKING SERVO SYSTEM FOR CONTROLLABLY PROJECTING AN OPTICAL BEAM ON AN OPTICAL DISK

Shigeru Arai, Zushi, and Toshitaka Iwamoto, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 30, 1986, Ser. No. 824,277

Claims priority, application Japan, Jan. 31, 1985, 60-18024; May 30, 1985, 60-118532; Aug. 3, 1985, 60-171615; Aug. 3, 1985, 60-171616

Int. Cl.⁴ G11B *7/095*

U.S. Cl. 369—44 **13 Claims**



1. A tracking servo system for controlling an optical beam to store information on and to read information from tracks on a rotatable optical disk, comprising:

means for deflecting the optical beam towards the optical disk;

means for focusing the optical beam on the optical disk, said focusing means having a back focal point on the opposite side of said focusing means from the optical disk and movable in a first plane perpendicular to the optical disk and in a second plane parallel to the optical disk;

means for converting at least a portion of the optical beam reflected from the optical disk into photoelectric currents and, in response thereto, generating a tracking error signal; and

control means, responsive to the tracking error signal, for controlling said deflecting means in cooperation with said focusing means so that the optical beam passes through the back focal point of said focusing means.

4,782,475

FLEXURE SUPPORTED READ HEAD

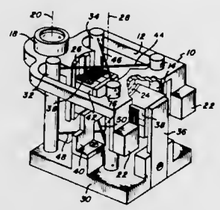
Jasper S. Chandler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,128

Int. Cl.⁴ G11B *7/095*

U.S. Cl. 369—45 **11 Claims**

1. An optical read head comprising a movable support member, an optical element carried by said movable support member, a base member, and flexure means connecting said support member to said base member, said flexure means comprising four, non-elastic, omnidirectionally flexible flexure bars, each of which is attached at one end to said support member and at its other end to said base member, two of said bars extending diagonally between said members in a first direction and the other two of said bars extending diagonally between said members in crosswise relation to said first two bars, whereby the flexibility of said bars allows a rotational mode of movement of said support member relative to said base member about an effective pivot axis located along a line intersecting all four bars, said bars lying in planes substantially parallel to one



another and perpendicular to said pivot axis, whereby the flexibility of said bars allows a translational mode of movement of said support member relative to said base member along the direction of said pivot axis; said support member being constrained by said bars against any other modes of movement relative to said base member.

4,782,476

OBJECTIVE LENS-DRIVING UNIT

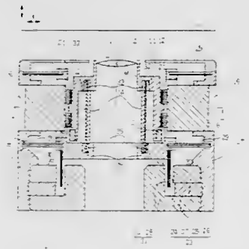
Yoshihiro Sekimoto; Toshihisa Deguchi, both of Nara; Mitsuo Ishii, Yamatokoriyama, and Masaru Nomura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1987, Ser. No. 65,285

Claims priority, application Japan, Jun. 24, 1986, 61-147500; Jul. 17, 1986, 61-168277; Dec. 1, 1986, 61-286167; Dec. 1, 1986, 61-286168

Int. Cl.⁴ G11B *7/12*

U.S. Cl. 369—45 **7 Claims**



1. An objective lens-driving unit comprising a lens supporting means for supporting the objective lens having an optical axis vertical to a recording medium on which light beams converge through the objective lens so as to attain optical recording, optical playing and optical erasing of information on the recording medium; an intermediate supporting means for supporting said lens supporting means by use of springs that are movable in the tracking direction; a fixed supporting means for supporting said intermediate supporting means by use of springs that are movable in the focusing direction; at least one driving means for driving said lens supporting means in the tracking direction, said tracking direction-driving means being positioned between said fixed supporting means and said lens supporting means; a driving means for driving said intermediate supporting means in the focusing direction, said focusing direction driving means being positioned between said fixed supporting means and intermediate supporting means,

wherein said tracking direction-driving means comprises a magnetic circuit that produces magnetic flux in the circumferential direction of the recording medium, and a tracking direction-driving coil that is positioned to cross a gap formed in the magnetic circuit to thereby receive an electro-magnetic force due to an interaction between the magnetic field of the magnetic circuit and the current passing through said coil, said tracking direction-driving coil being positioned within the excitation area of the magnetic circuit even when said coil moves in the focusing direction.

4,782,477

OPTICAL RECORDING MEDIUM WITH FLUORINE RESIN ADHESIVE

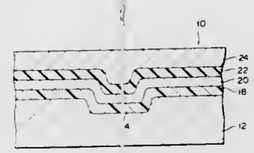
Katsutarou Ichihara, Tokyo; Yoshiaki Terashima, Yokosuka; Nobuaki Yasuda, Zushi, and Akio Hori, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 4, 1986, Ser. No. 903,487

Claims priority, application Japan, Sep. 30, 1985, 60-214519; Mar. 6, 1986, 61-47338

Int. Cl.⁴ G11B *7/24, 11/12*

U.S. Cl. 369—275 **19 Claims**



1. An optical recording medium comprising:

a transparent resinous substrate with a pre-groove, said substrate allowing a radiation beam to pass therethrough;

a metallic recording layer formed above said substrate, said recording layer changing its optical characteristic in an area on which the radiation beam is focused to form a beam spot; and

a transparent adhesive layer provided between said substrate and said recording layer, for allowing the radiation beam to pass therethrough, and for causing said recording layer to be adhered to said substrate to prevent said recording layer from being peeled off from said substrate, said adhesive layer comprising a fluorine resin material which is contained therein in such a manner that said adhesive layer is made of pure fluorine resin material at least in the surface region of said adhesive layer which is in contact with said substrate, to thereby maximize the adhesion force between said transparent resinous substrate and said metallic recording layer.

4,782,478

TIME DIVISION CIRCUIT SWITCH

Chester Day, Jr., Randolph; James N. Giacopelli, Flanders, both of N.J.; Nian-Chyi Huang, Boca Raton, Fla., and Llang T. Wu, Gladstone, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Mar. 4, 1987, Ser. No. 21,664

Int. Cl.⁴ H04Q *11/04*; H04J *3/24*

U.S. Cl. 370—60 **4 Claims**

1. A circuit switch for use in a node of a telecommunications network for switching circuit signals comprising slots organized into frames on a slot-by-slot basis, said switch comprising:

a self-routing packet switching network having a plurality of inputs and a plurality of outputs,

means associated with said inputs for receiving input signals comprising slots organized into frames,

means for storing headers containing information indicating addresses of said packet switching network outputs,

means for combining at least some of said slots with said headers to form packets capable of being routed through



said self-routing network to the specific addresses indicated by said headers, and

means associated with said outputs for receiving said packets from said network and for converting said packets routed through said network into output signals comprising slots organized into frames.

4,782,479

ELECTRONIC DIGITAL CROSSCONNECT SYSTEM

John G. Rozema, Elmhurst, Ill., assignor to Rockwell International, El Segundo, Calif.

Filed Sep. 8, 1986, Ser. No. 904,727

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—68 **7 Claims**

1. In an electric digital crossconnect system for interconnecting a plurality of high frequency T-carrier lines, each having an input line and an output line, comprising:

a plurality of means for interfacing with the input and output lines of the T-carrier lines, each means for interfacing connected to a predetermined one of the T-carrier lines and having an output port and an input port wherein said means for interfacing comprises.

receive T-1 interface connected to said incoming T-1 line;

receive frame alignment module connected to said T-1 interface;

signalling reinsertion module connected to said receive frame alignment module;

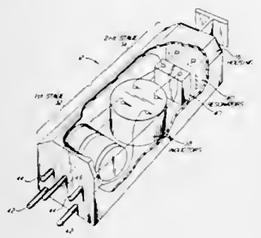
address counter timing generator module connected to said receive frame alignment module and to said signalling reinsertion module;

trunk conditioning function connected to said address

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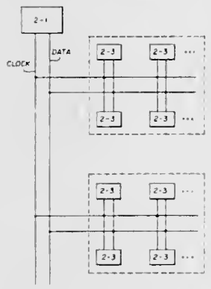
counter generator module and to said outgoing information bus and to said transmit T-1 interface;
master controller interface connected to said trunk conditioning function and to said receive frame alignment module;
transmit T-1 interface connected to said address counter and timing generator and to said trunk conditioning function and connected to the T-1 outgoing line;
wherein said incoming information bus is connected to said signalling reinsertion module said receive frame alignment module and said receive T-1 interface;
means for providing time slot interchanges having at least one input port, at least one output port;
means for providing an incoming information bus connected between each of said output ports of said means for interfacing and said input port of said means for providing time slot interchanges;
means for providing an outgoing information bus connected between each of said input ports of said means for interfacing and said output port of said means for providing time slot interchanges;
means for controlling connected via a provisioning data link to each of said master controller interface and to said means for time slot interchanging;
wherein signals received from the input lines of the T-carrier lines by the means for interfacing are placed in pre-determined time slots on the incoming information bus means and wherein the means for time slot interchanging reorders the signal in time slots on said outgoing information bus means so at the signals can be sent out on predetermined output lines of the T-carrier lines by means for interfacing.

4,782,480
TELEPHONE LINE ACCESS APPARATUS
Franklin Hargrave; Francisco A. Middleton, both of Newton, and David A. Zeller, Jr., Brookfield, all of Conn., assignors to Alcatel USA, Corp., New York, N.Y.
Filed Nov. 19, 1985, Ser. No. 799,522
Int. Cl.[4] H04J *1/14*
U.S. Cl. 370—76 **14 Claims**



1. A telephone line access apparatus; said apparatus comprising:
a first stage, said first stage providing high voltage protection means and being connected across a subscriber pair of wires;
a second stage, said second stage providing filter means, said first stage and second stage being in series with each other, said second stage including a pair of coupling inductors and a first resonator device, said first resonator device being connected across said coupled inductors; and
a housing adapted to plug into a main distribution frame, for housing said first and second stages, said housing including a first pair of pins, said first pair of pins having said first stage connected thereacross, said first pair of pins being cooperatively arranged to plug into a main distribution frame, whereby connection is made to a subscriber pair of wires, and a second pair of pins, said second pair of pins having said second stage connected there across, said second pair of pins being cooperatively arranged to plug into a main distribution frame, whereby connection is made to a switch such that said apparatus is in series between said subscriber pair of wires and said switch, whereby a telephone line may be accessed without interfering with the telephone services supported thereby.

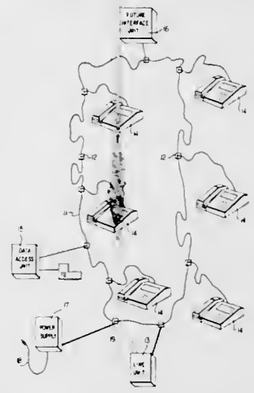
4,782,481
APPARATUS AND METHOD FOR TRANSFERRING INFORMATION
Steven G. Eaton, Mt. View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 24, 1987, Ser. No. 17,400
Int. Cl.[4] H04J *3/02, 25/38*
U.S. Cl. 370—85 **12 Claims**



1. A method for transferring a plurality of data messages comprised of a plurality of data bits, the data messages including a first data message comprising a plurality of first data bits and a second data message comprising a plurality of second data bits, the method comprising the steps of:
(a) sending over a clock line a clock signal comprising a plurality of periodic single clock cycles, with each of the single clock cycles alternating between a first clock interval and a second clock interval;
(b) sending over a data line a message classifier bit during the first clock interval, the message classifier but indicating that a data bit is one of a first data bit of a first data message and a second data bit of a second data message;
(c) sending over the data line a message data bit during the second clock interval, the message data bit being one of a first data bit of the first data message and a second data bit of a new data message; and
(d) alternately sending during each single clock cycle the message classifier bit and the message data bit on the same data line.

4,782,482
SIMULTANEOUS VOICE AND DATA COMMUNICATIONS SYSTEM
Edmundo V. Kiatipov, and Carlos Hita de la Torre, both of Madrid, Spain, assignors to Alcatel Standard Electrica S.A., Madrid, Spain
Filed Sep. 23, 1985, Ser. No. 779,174
Int. Cl.[4] H08J *3/00;* **H08M** *11/04*
U.S. Cl. 370—86 **16 Claims**

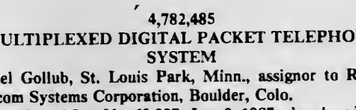
1. A communication system for the simultaneous conveying of voice and data messages comprising:
a ring transmission medium for the serial transmission of message information;
a plurality of taps disposed along said ring transmission medium, each of said plurality of taps forming a means to break said ring and connect into it a receiver, each of said plurality of taps for receiving connections from a communications module having at least an input and an output and connecting said communications module to said ring transmission medium, each of said plurality of taps having input and output means connected to said ring transmission medium and acting when no communications module is connected thereto to convey message information on said ring transmission medium directly from said input means to said output means, each of said plurality of taps further acting when a communication module is connected thereto to apply message information on said ring transmission medium to said input of said communications module and to connect said output of said communications module to said ring transmission medium;
a plurality of telephone stations for communicating voice messages, each of said plurality of telephone stations being connected to an individual one of said plurality of taps, each of said plurality of telephone stations taking the form of a communications module having a basic component



nucleus for interfacing with said ring transmission medium and at least one additional component for performing telephone station functions, said basic component nucleus comprising dc to dc converter means, ring interface means, synchronism and switching means and central control means;
a data access unit for connection to one of said plurality of taps for coupling data messages to said ring transmission medium, said data access unit including said basic component nucleus for interfacing with said ring transmission medium and at least a further component for coding digital data applied thereto;
power supply means connected to an individual one of said plurality of taps, said power supply means enabling appropriate voltage and current levels to be provided to each communications module connected to one of said plurality of taps; and
means for applying digital data to said data access unit for application to said ring transmission medium.

4,782,483
DATA TRANSMISSION SYSTEM AND METHOD OF PASSING ROLE OF PRIMARY STATION
Derek W. Lambert, Workingham, and Stephen G. Scoltock, Bracknell, both of England, assignors to International Computers Limited, London, England
Filed Jun. 30, 1987, Ser. No. 68,649
Claims priority, application United Kingdom, Nov. 14, 1986, 8627238
Int. Cl.[4] H04J *3/14*
U.S. Cl. 370—90 **8 Claims**

1. A method of operating a data transmission system comprising a plurality of stations connected together in a ring, the method comprising the steps:
(a) selecting one of the stations to act as a primary station and selecting the other stations to act as secondary stations,
(b) operating the primary station to transmit messages and polling signals to the other stations via the ring,
(c) operating each of said secondary stations, on receipt of



one of said polling signals, to transmit a message around the ring, and
(d) operating the primary station to keep a record of the number of messages transmitted by each of the secondary stations, to select the secondary station that has transmitted the greatest number of messages in a particular time period, and then to send a request signal to the selected secondary station inviting it to become the primary station.

4,782,484
ENCODING AND DECODING SIGNALS FOR TRANSMISSION OVER A MULTI-ACCESS MEDIUM
John O. Limb, Colchester, England, assignor to Bell Communications Research, Inc., Livingston, N.J.
Filed Apr. 18, 1986, Ser. No. 853,619
Int. Cl.[4] H04J *3/06;* **H04L** *7/00*
U.S. Cl. 370—100 **4 Claims**



1. A method for decoding incoming channel frames, each of said frames comprising a plurality of bit positions having a pulse in the first of said positions, no pulse in the position corresponding to the midpoint of said positions, and data samples occupying the remaining ones of said positions, wherein the duration of one position determines a data rate, said method characterized by the steps of
filtering said incoming frames to provide a first sinusoid having a frequency given by the frame rate,
frequency multiplying said first sinusoid to produce a second sinusoid having a frequency given by said data rate,
deriving a sampling waveform from said second sinusoid, said waveform comprising sampling signals located at essentially the midpoints of all the bit positions except the first position and the midpoint position, and
sampling said each of said frames with said sampling waveform to obtain said data samples.

4,782,485
MULTIPLEXED DIGITAL PACKET TELEPHONE SYSTEM
Raphael Gollub, St. Louis Park, Minn., assignor to Republic Telcom Systems Corporation, Boulder, Colo.
Continuation of Ser. No. 60,997, Jun. 9, 1987, abandoned, which is a continuation of Ser. No. 769,153, Aug. 23, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 119,273
Int. Cl.[4] H04J *15/00, 3/24*
U.S. Cl. 370—118 **31 Claims**

1. A method for communicating speech signals from a first

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location to a second location over a digital communication medium comprising the steps of:

providing a speech signal of predetermined bandwidth in analog signal format at said first location;

periodically sampling said speech signal at a predetermined sampling rate to provide a succession of analog signal samples;

representing said analog signal samples in a digital format thereby providing a succession of binary digital samples;

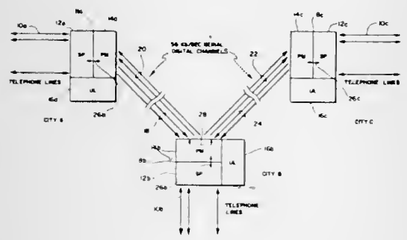
dividing said succession of binary digital samples into groups of binary digital samples arranged in a temporal sequence;

transforming at least two of said groups of binary digital samples into corrspondiing frames of digital compression variables by means of a computational speech compression algorithm whereby the compression ratio of the number of binary bits in each of said frames to the number of binary bits in the corresponding group of binary digital samples is less than one;

appending an identifying header to each of said frames of digital compression variables to provide a succession of speech information packets;

transmitting said speech information packets over said digital communication medium;

receiving said speech information packets at said second location;



removing said identifying header from received ones of said speech information packets to recover said frames of digital compression variables at said second location;

successively synthesizing groups of binary digital words at said second location from said frames of digital compression variables by means of a computational inverse speech compression algorithm, said groups of synthesized binary digital words being approximate representations of said groups of binary digital samples;

arranging said groups of synthesized binary digital words into a queue in a temporal order generally corresponding to said temporal sequence of said groups of binary digital samples;

periodically removing the synthesized binary digital word at the head of said queue at said predetermined sampling rate;

representing said periodically removed words in analog signal format thereby providing a sequence of discrete analog signal values; and

filtering said sequence of discrete analog signal values to approximately reproduce said speech signal of predetermined bandwidth in analog signal format at said second location.

4,782,486

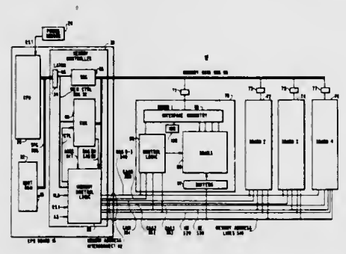
SELF-TESTING MEMORY

Jesse B. Lipcon, Harvard; Barry A. Maskas, Marlboro, and David K. Morgan, Hopkinton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 14, 1987, Ser. No. 49,812

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—21 **26 Claims**



1. A self-testing memory composed of a plurality of independent memory banks and comprising:

means for simultaneously writing the same test patterns into corresponding locations in each of said plurality of memory banks;

means for accessing the contents at corresponding locations in each of said memory banks;

means for selecting one of said memory banks;

means for simultaneously comparing the contents at the locations of said selected one of said memory banks with the contents at corresponding locations of the others of said memory banks; and

means for recording, as errors, occurrences when the contents at the locations of said selected memroy banks are different from the contents at the corresponding locations of any of the others of said memory banks.

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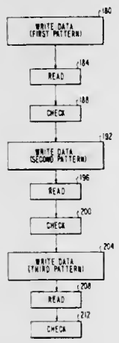
MEMORY TEST METHOD AND APPARATUS

Donald W. Smelser, Bolton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 15, 1987, Ser. No. 50,847

Int. Cl.[4] G06F *11/22*

U.S. Cl. 371—21 **19 Claims**



1. A method for testing a memory comprising the steps of:

writing a first pattern of data into the memory in a pseudo-random address sequence determined by an address generator;

reading the first pattern from the memory;

checking the first pattern for any error;

writing a second pattern of data into the memory in the pseudo-random address sequence determined by the address generator, wherein the second pattern of data is the complement of the first pattern;

reading the second pattern from the memory;

checking the second pattern for any error;

writing a third pattern of data into the memory in the pseudo-random address sequence determined by the address generator, wherein the third pattern has the effect of complementing respective check bits which are the same for the first pattern and the second pattern, and wherein check bits are associated with each data pattern;

reading the third pattern from the memory; and

checking the third pattern for any error.

4,782,488

DIGITAL SIGNAL SCRAMBLER

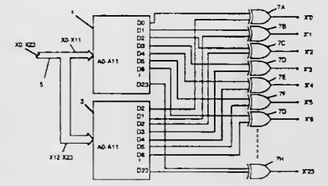
Duane L. Anderson, Carp, Canada, assignor to Mosaid Technologies Inc., Canada

Filed Apr. 29, 1987, Ser. No. 44,103

Claims priority, application Canada, May 6, 1986, 508494

Int. Cl.[4] G01R *31/28*

U.S. Cl. 371—27 **20 Claims**



1. A digital signal scrambler, comprised of:

(a) means for receiving a digital input signal comprised of a plurality of bits,

(b) a plurality of memory circuits for storing a plurality of intermediate scrambled digital signals,

(c) means for addressing respective ones of said memory circuits with predetermined ones of said bits such that each of said memory circuits generates a predetermined one of said intermediate scrambled signals, and

(d) a plurality of logic circuits for receiving said intermediate scrambled signals, performing an EXCLUSIVE OR function thereon and generating a scrambled digital output signal in response thereto,

whereby a unique scrambled output signal is generated for each possible input signal according to the form of said stored intermediate scrambled signals.

4,782,489

METHOD FOR DECODING BINARY CODE WORDS USING ESTIMATED VALUES

Timothy J. Moulsley, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,645

Claims priority, application United Kingdom, Oct. 30, 1985, 8526731

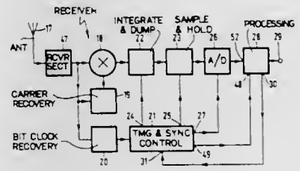
Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—30 **10 Claims**

1. A method of decoding a succession of binary code word signals $y_j(t)$ comprising the steps of:

(a) receiving the code word signals $y_j(t)$ from a transmission channel, which code word signals result from transmission over the channel of successive binary code word signals $x_j(t)$ representative of respective successive values $u_j(t)$ of an analogue signal, where $x_j(t)=F(u_j(t))$; and

(b) generating successive values $v_j(t)$ by estimating from the successive received code word signals $y_j(t)$ to correspond to the successive values $u_j(t)$, the estimation process taking the form



$$v_j(t) \cong \frac{\sum_{i=1}^{n} p(x_i|y_j(t))F^{-1}(x_i)}{\sum_{i=1}^{n} p(x_i|y_j(t))}$$

where F^{-1} denotes the inverse of mapping function F, n is an integer, and each $p(x_i|y_j(t))$ is an estimate of the relative conditional probability that x_i was transmitted, $y_j(t)$ having been received,

(c) providing $v_j(t)$ as output signals; wherein the improvement comprises that said estimate is calculated taking into account a prevailing condition.

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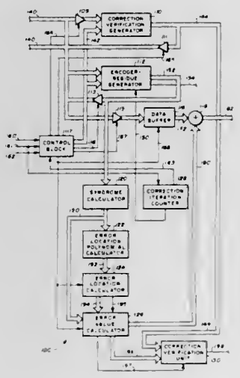
METHOD AND A SYSTEM FOR MULTIPLE ERROR DETECTION AND CORRECTION

Grigory Tenengolts, San Jose, Calif., assignor to Cythera Corporation, San Jose, Calif.

Filed Mar. 16, 1987, Ser. No. 25,978

Int. Cl.[4] C06F *11/10*

U.S. Cl. 371—40 **20 Claims**



2. A system for receiving signals representing data and for developing signals representing a codeword, the system comprising in combination:

correction verification generator means including a set of inputs for connection to receive the data signals and a set of outputs at which said correction verification generator means develops signals representing at least one first check symbol; and

encoder/residue generator means including a set of inputs connected to receive said data signals followed by said first check symbol signals, and a set of outputs at which said encoder/residue generator means develops the codeword signals, said encoder/residue generator means including means for generating from said data and said first

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check symbols as "data" a plurality of second check symbols with an interleaved Reed-Solomon code with a generator polynomial

$$g(x)=g_0(x^h),$$

where x is a variable, h is the degree of interleaving, and $g_0(x)$ is a generator polynomial of the form

$$g_0(x) = \prod_{j=v}^{v+3} (x + \alpha^j) = x^4 + \alpha^a x^3 + \alpha^b x^2 + \alpha^a x + 1,$$

where

$$v=2^{m-1}-2.$$

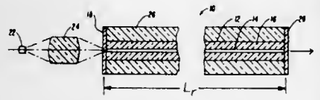
α is a primitive element of the Galois field GF(2^m), a is a positive integer, b is a positive integer, and m is a positive integer and for appending said first and said second check symbols to said data to develop said codeword.

4,782,491

ION DOPED, FUSED SILICA GLASS FIBER LASER

Elias Snitzer, Wellesley, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 9, 1987, Ser. No. 36,506
Int. Cl.[4] H01S *3/30*
U.S. Cl. 372—6 **16 Claims**



1. An optical fiber laser comprising:
a gain cavity formed of a length of single mode optical fiber having a core with a given index of refraction and a cladding that surrounds said core and has an index of refraction lower than that of said core, said core being fabricated predominantly of fused silica into which there is uniformly incorporated a predetermined concentration of neodymium ions, said length of said gain cavity and the concentration of said neodymium ions being in accordance with the expression:

$$e^{-clb} < \text{or} = \text{approx. } 0.05,$$

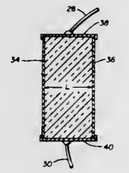
where c is said predetermined concentration of said neodymium ions and is less than 2 weight percent, l is twice the length of said fiber, and b is the effective absorption coefficient for light travelling in said core at at least one of its absorption bands whereby said core will absorb in a double pass 95% of any light travelling through it that is within said at least one absorption band thereof with concentration quenching lowering its fluorescence absorption efficiency in said at least one absorption band thereof by no more than approximately 10% where the fluorescence absorption efficiency is understood to means the ratio of the total radiative transition probability from a particular upper state to all lower states of said core to the sum of the radiative and non-radiative probabilities from the upper state to all of the lower states of said core;
reflection means optically coupled to each end of said gain cavity for providing feedback to said cavity at at least one emission line of said neodymium ions in said predominantly fused silica core and for permitting pumping energy to be introduced into said gain cavity core at said at least one absorption band of said neodymium ions in said predominantly fused silica core; and
means for pumping energy into said gain cavity core through one end thereof at said at least one absorption band thereof so that said gain cavity oscillates substantially at said at least one emission line,
said optical fiber laser being thus structured for optimal utilization of pump energy.

4,782,492

THERMALLY CONTROLLABLE OPTICAL DEVICES AND SYSTEM

Donald H. McMahon, Carlisle, and William A. Dyes, Groveland, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 5, 1986, Ser. No. 859,487
Int. Cl.[4] H01S *3/04*; F27D *23/024*; G02F *1/01*; G02B *6/02*
U.S. Cl. 372—34 **11 Claims**



1. A thermally controllable optical device comprising:
a body of light transmitting material forming at least part of an optical cavity structure having a resonant characteristics which vary with temperature, said body being formed with first and second substantially parallel faces;
means defining a surface in heat conducting relationship with said body;
a coating of an electrically conductive material formed on said first face so as to have light transmitting and reflecting characteristics;
another coating of an electrically conductive material formed on said second face so as to have light transmitting and reflecting characteristics; and
circuit means for connecting said one coating and said other coating in electrical circuit with one another for passing an electrical current therethrough to develop thermal energy sufficient to vary the resonant characteristics of said optical cavity structure.

4,782,493

GAS DISCHARGE TUBE WITH HOLLOW CATHODE FOR METAL VAPOR LASER

Nikola V. Sabotinov; Margarita G. Grozeva, and Ivan R. Angelov, all of Sofia, Bulgaria, assignors to Institute PO Phisica Na Tvardoto Tyalo, Sofia, Bulgaria

Filed Sep. 1, 1987, Ser. No. 91,808
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—88 **3 Claims**



1. In a gas discharge tube of a hollow cathode laser having a vacuum compact housing a medium where an anode and the hollow cathode are connectable to a source of excitation voltage, the improvement comprising
said hollow cathode comprising a metal tube wound as a spiral within which metal tube a metal medium is disposed, said metal tube being provided with apertures in portions of said tube along an inner upper part of the spiral cathode, whereby upon excitation, said metal medium

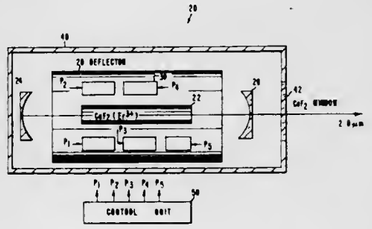
interacts with said lasing medium to produce conditions for laser generation.

4,782,494

METHOD OF PROVIDING CONTINUOUS LASING OPERATION

Siava A. Pollack, Palos Verdes Estates, and David B. Chang, Tustin, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 30, 1986, Ser. No. 868,929
Int. Cl.[4] H01S *3/09*
U.S. Cl. 372—91 **9 Claims**



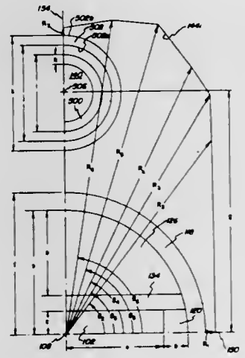
1. The method of producing continuous lasing operation between initial lasing states of $^4I_{11/2}$ and terminal lasing states of $^4I_{13/2}$ in a laser medium within a resonator comprising the steps of:
selecting a laser medium containing an upconverting material in a concentration sufficient to recycle electrons away from the terminal lasing states which provides for exchange of energy between sufficient number of electrons at the terminal lasing state so as to maintain population inversion between the initial and terminal lasing states durng lasing operation; and
applying CW excitaton input energy to the laser medium during a time period of about 20 msec or greater to recycle electrons away from the lower lasing states through upconverting so that population inversion is maintained during a continuous time period and laser emission occurs in the range of 2.7 to 2.8 μm.

4,782,495

REFLECTOR DESIGN FOR A SLAB LASER

Farzin H. Azad, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,952
Int. Cl.[4] H01S *3/093, 3/16*
U.S. Cl. 372—99 **2 Claims**



1. A reflector for use in a slab laser including a solid-state yttrium aluminum garnet lasing medium having a generally rectangular shape and cross section, said lasing medium having first and second opposing major face surfaces disposed parallel to each other and to a longitudinal axis extending through a center of the lasing medium rectangular cross section, a first axis intersecting said longitudinal axis at a lasing medium cross section center point and substantially bisecting a thickness of the lasing medium rectangular cross section, a second axis intersecting the lasing medium cross section center point and bisecting a width of the lasing medium rectangular cross section, said slab laser including a first and a second tubular krypton flash lamp respectively disposed adjacent said first and second lasing medium major face surfaces for impinging electromagnetic radiation thereon, a longitudinal lamp axis of each said first and second flash lamp being parallel to said lasing medium longitudinal axis and intersecting said second axis at points equidistant from the lasing medium cross section center point on opposite sides thereof, said lasing medium being positioned within an annular optically clear support tube coaxial with said lasing medium longitudinal axis such that a center of curvature of both an inside surface and an outside surface of said support tube is located at the lasing medium cross section center point, a first and a second optically clear filler each having a curved surface generally conforming to said support tube inside surface and a substantially flat surface, said first and second fillers being positioned within said support tube with their flat surfaces respectively parallel to said lasing medium first and second major surfaces, the curved surface of each said first and second filler being fastened to said support tube inside surface, a first cooling fluid channel being defined between said first filler flat surface and said lasing medium first major surface, a second cooling fluid channel being defined between said second filler flat surface and said lasing medium second major surface, a first and a second optically clear lasing medium support being respectively positioned between a first and a second side surface of said lasing medium and said support tube inside surface, said first and second flash lamps respectively being coaxially positioned within a first and a second flow tube to form a flash lamp cooling fluid channel between a flash lamp outer surface and a flow tube inner surface, said reflector surrounding said first and second flow tubes and said support tube, an inside surface of said reflector having a shape effective to introduce a positive focal power lens effect into a central portion of the lasing medium width, the positive lens effect having a magnitude approximately equal to a negative focal power lens effect experienced in lateral edge portions of said lasing medium, a cross section of the slab laser including said reflector inside surface being symmetrical about each said first and second axis, the lasing medium rectangular cross section having a width of 0.984±0.004 inches and a thickness of 0.244±0.002 inches, said first and second fillers each having a thickness dimension of 0.424+0.000/−0.005 inches extending from its flat surface to its curved surface along said second axis, said first and second supports each having a thickness dimension substantially equal to that of said lasing medium and a width dimension of 0.122±0.002 inches as measured along said first axis, an inside and an outside diameter dimension of said support tube respectively being 1.252±0.002 inches and 1.442±0.002 inches, said lamp axis of each said flash lamp being 1.230±0.005 inches from the lasing medium cross section center point as measured along said second axis, a cross section of each said flash lamp having a nominal outside diameter and wall thickness of 10.0 mm and 1.0 mm respectively, said first and second flow tubes each respectively having an inside and an outside diameter of 0.496±0.001 inches and 0.591+0.010/−0.000 inches, the cross section of said reflector inside surface in a first quandrant of the slab laser cross section comprising:
a plurality of reflector shape segments each having a start point and an end point;
a first reflector shape segment being a straight line having a

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start point at a radial distance of 0.761±0.005 inches from the lasing medium cross section center point along said first axis and an end point at a radial distance of 1.205±0.005 inches from the lasing medium cross section center point measured at an angle of 50.864° relative to said first axis;

a second reflector shape segment being a straight line having a start point coincident with the end point of said first shape segment and an end point at a radial distance of 1.423±0.005 inches from the lasing medium cross section center point measured at an angle of 58.000° relative to said first axis;

a third reflector shape segment being a straight line having a start point coincident with the end point of said second shape segment and an end point at a radial distance of 1.514 ±0.005 inches from the lasing medium cross section center point measured at an angle of 64.500° relative to said first axis;

a fourth reflector shape segment being a straight line having a start point coincident with the end point of said third shape segment and an end point at a radial distance of 1.649±0.005 inches from the lasing medium cross section center point measured at an angle of 72.500° relative to said first axis;

a fifth reflector shape segment being a straight line having a start point coincident with the end point of said fourth shape segment and an end point at a radial distance of 1.621±0.005 inches from the lasing medium cross section center point measured at an angle of 80.800° relative to said first axis;

a sixth reflector shape segment being a straight line having a start point coincident with the end point of said fifth shape segment and an end point at a radial distance of 1.565±0.005 inches from the lasing medium cross section center point measured at an angle of 90.000° relative to said first axis; and

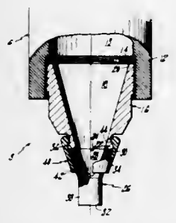
each angle measured relative to said first axis having a tolerance that is a function of the corresponding radial distance from the lasing medium cross section center point.

4,782,496

BREAKAWAY NOZZLE FOR A LASER PROCESSING MACHINE

Donald I. Conturier, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 5, 1987, Ser. No. 117,253
Int. Cl.⁴ H01S *3/00*
U.S. Cl. 372—109 **4 Claims**



1. A nozzle for a laser processing machine, said laser processing machine including a system of optical devices wherein the optical devices are aligned for directing a laser beam from a laser source through a laser head to a workpiece, comprising:

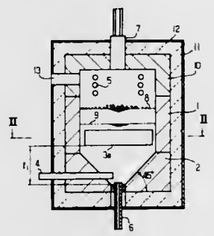
a nozzle tip having a bore extending along one axis for allowing passage of a laser beam and means for displaceably attaching the nozzle to the laser head so that the nozzle tip is urged to remain in a fixed position relative to the laser head but the nozzle tip is displaced from the fixed position if a force vector having a magnitude greater than a preselected value is applied to the nozzle tip in a direction perpendicular to the one axis so that the optical devices of the laser processing machine remain aligned after application of the force vector to the nozzle tip.

4,782,497

ELECTRIC MELTING FURNACE FOR GLASSIFYING HIGH-RADIOACTIVE WASTE

Noriaki Sasaki; Hiroshi Igarashi; Noboru Endo, all of Ibaragi; Katsumi Inada, Kusatsu; Toshio Nakamura, Otsu, and Hirokazu Takeuchi, Kusatsu, all of Japan, assignors to Doryoku Kaunenryo Kaihatsu Jigyodan, Tokyo and Nippon Denki Garasu Kabushiki Kaisha, Shiga, both of, Japan

Filed Dec. 5, 1986, Ser. No. 938,183
Claims priority, application Japan, Dec. 6, 1985, 60-275595
Int. Cl.⁴ C03B *5/027*
U.S. Cl. 373—29 **6 Claims**



1. An electric melting furnace for glassifying high-radioactive waste comprising: a melting tank for melting glass material to form molten glass containing platinum-group elements derived from said high-radioactive waste, at least a pair of spaced electrodes for supplying electric current through said molten glass in said melting tank to maintain the temperature of said molten glass at a value suitable for melting said glass material, and a furnace bottom for discharging said molten glass, said furnace bottom having a glass outlet surrounded by an inclined sidewall having an inclination of more than 30° and not more than 70° with respect to the horizontal plane of the glass outlet, and the distance between said glass outlet at said furnace bottom and the bottom ends of said pair of electrodes being at least one-half of the distance between said spaced electrodes whereby said electrodes will be spaced from said glass outlet to prevent a concentration of electric current at said furnace bottom and said inclined sidewall will enhance the flow of said platinum-group elements in molten glass removed from said furnace bottom.

4,782,498

MODEM WITH IMPROVED HANDSHAKING CAPABILITY

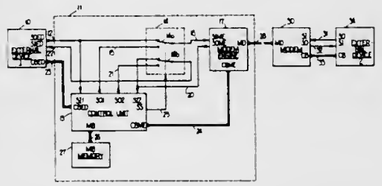
John A. Copeland, III, Dunwoody, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Aug. 28, 1986, Ser. No. 901,134
Int. Cl.⁴ H04B *1/38*
U.S. Cl. 375—8 **33 Claims**

1. In a method of operating a first data communications device to establish communication between said first data communications device and a second data communications device, which includes the step of said first and second data communications devices establishing data communications in a first predetermined communications mode, a method of testing said second data communications device for an ability to communicate in a second predetermined data communications mode, comprising the steps of:

(a) causing said first data communications device to transmit a first predetermined set of one or more data words in said first predetermined data communications mode, said data words in said first predetermined set each corresponding to nonprinting characters;

(b) causing said first data communications device to respond to subsequent receipt of a second predetermined set of data words by switching to operation in said second predetermined data communications mode; and



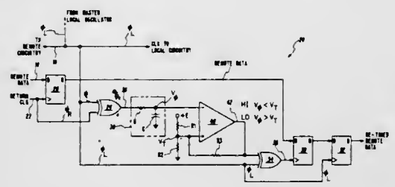
(c) alternatively causing said first data communications device to remain in said first predetermined data communications mode in response to subsequent receipt of one or more data words which are not part of said second predetermined set of data words.

4,782,499

AUTOMATIC ALIGNMENT OF A SYNCHRONOUS DATA SYSTEM USING A LOCAL REFERENCE CLOCK AND EXTERNAL CLOCK WITH AN UNKNOWN DELAY BETWEEN THE TWO CLOCKS

Steven J. Clendening, McKinney, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1986, Ser. No. 912,292
Int. Cl.⁴ H04L *7/06*
U.S. Cl. 375—113 **6 Claims**



1. Apparatus for synchronizing the transfer of a data signal from a remote data source through a clock-responsive logic gate to a local circuit in accordance with a local clock signal under conditions in which the remote data signal is shifted in phase with respect to the local clock signal comprising, in combination:

means for producing a remote clock signal which is phase shifted with respect to the local clock signal by an amount corresponding with the shift of the remote data signal relative to the local clock signal;

means for detecting a phase difference between the remote clock signal and the local clock signal; and,

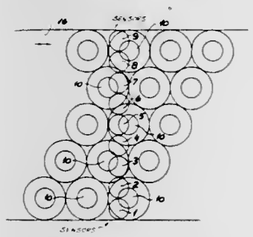
means for inverting the local clock signal and applying it to the clock input of said logic gate for a phase difference less than a predetermined value, and for buffering the local clock signal and applying the buffered clock signal to the clock input of said logic gate for a phase difference which exceeds a predetermined value.

4,782,500

METHOD AND AN APPARATUS FOR COUNTING UNIFORM OBJECTS ON A CONVEYOR

Gorm Lyngsie, Birkerod, Denmark, assignor to De Forenede Bryggerier A/S, Copenhagen, Denmark

PCT No. PCT/DK86/00045, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06526, PCT Pub. Date Nov. 6, 1986
PCT Filed May 1, 1986, Ser. No. 19,796
Claims priority, application Denmark, May 2, 1985, 1981/85
Int. Cl.⁴ G06M *7/00*
U.S. Cl. 377—6 **6 Claims**



1. In a method of counting uniform objects passing a row of sensors in non-contact relation thereto over a conveyor for the objects, each of the sensors being able to detect the presence of any of the objects within a predetermined detection area, the detection areas of adjacent ones of the sensors at least touching each other, the sensors operating a counter through a control circuit interconnected in such a manner that activation of a first of the sensors by one of the objects inhibits the control circuit for a group of others of the sensors which might be activated by the same one of the objects, the improvement comprising:

scanning the control circuit respectively for the sensors, and, upon activation of one of the sensors, inhibiting the control circuit for the sensor or sensors adjacent to that one of the sensors whereby only one count pulse per object is permitted.

4,782,501

METHOD FOR DETERMINING PORE VOLUME COMPRESSIBILITY OF A POROUS MATERIAL

James R. Dixon, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 4, 1987, Ser. No. 93,278
Int. Cl.⁴ G01N *23/06*
U.S. Cl. 378—4 **6 Claims**

1. A method for determining porosity in a porous media under confining stress, comprising the steps of:

(a) determining the porosity of a sample of said porous media at atmospheric reference pressure,

(b) saturating said sample with a fluid of predetermined X-ray attenuation.

(c) placing the fluid saturated sample in a confining pressure cell,

(d) scanning said fluid saturated sample with X-rays at a plurality of points along said sample at zero confining stress,

(e) producing a first set of computed tomographic images at said plurality of points along said sample for zero confining stress,

(f) determining from said first set of computed tomographic images an X-ray attenuation coefficient for zero confining stress,

(g) increasing the pressure within said cell to provide a confining stress to said sample,

(h) scanning said sample with X-rays at said plurality of points along said sample for said confining stress,

(i) producing a second set of computed tomographic images

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at said plurality of points along said sample for said confining stress,

(j) determining from said second set of computed tomographic images an X-ray attenuation coefficient for said confining stress, and



(k) determining porosity of said sample at said confining stress from the determinations of sample porosity at atmospheric reference pressure, saturating fluid X-ray attenuation coefficient, sample X-ray attenuation coefficient at zero confining stress, and sample X-ray attenuation coefficient at said confining stress.

4,782,502

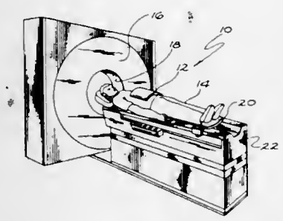
FLEXIBLE CALIBRATION PHANTOM FOR COMPUTER TOMOGRAPHY SYSTEM

Eloy E. Schulz, 25010 Daisy Ave., Loma Linda, Calif. 92354

Filed Oct. 1, 1986, Ser. No. 914,170

Int. Cl.[4] A61B *6/02;* **G01N** *23/00*

U.S. Cl. 378—18 **18 Claims**



1. A process for examining a body with X-rays and generating a computer tomograph, the steps comprising:

placing a flexible calibration phantom adjacent the body, the phantom including a flexible sample of solid reference material of substantially uniform X-ray density and a flexible encasement of solid material surrounding the sample of reference material, the encasement having a substantially uniform X-ray density different than that of the sample of reference material, the degree of flexibility of the phantom being such that when the flexible calibration phantom is placed adjacent a selected portion of the body, the phantom adapts substantially in shape to the anatomical contours in response to no more force than its own weight;

projecting X-rays through a slice of the body; and

detecting the X-rays emergent from the body for producing output signals indicative of the absorption suffered by the X-rays.

4,782,503

DENTAL X-RAY DIAGNOSTIC INSTALLATION

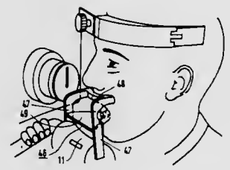
Dieter Molitor, Bürstadt, and Werner Günther, Bensheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1986, Ser. No. 897,799

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1985, 3530234

Int. Cl.[4] A61B *6/14, 6/02*

U.S. Cl. 378—169 **16 Claims**



1. In a dental x-ray diagnostic installation for producing a congruent panorama strip of exposures of a jaw of a patient, said installation containing a pillar and a bogie truck adjustably arranged on the pillar for adjustment in a vertical height direction, a rotary unit secured to the bogie truck and carrying a radiation source and a film cassette and two positioning means for placing a patient's head in position with reference to the rotary unit, one of said two positioning means being a horizontally adjustable forehead support and said installation containing a display means for illustrating an adjusted position of said forehead support, the improvement comprising a carrier being mounted on said bogie truck, each installation only using two positioning means with a second means of the two positioning means providing both a fixing point and a pivot point, said second means being selected from a first seating part having a seating surface for engaging front teeth of a patient and a second seating part having a contact surface for engaging a sub-nasal point of the patient, both the first and second seating parts having mounting means and said carrier having a first acceptance device for receiving the mounting means to hold the selected seating parts without rotation in a rigid defined position on the carrier so that it is possible to make exposures of both patients who have all of their teeth and patients who do not have all of their teeth by changing from the first to the second seating part.

4,782,504

METHOD AND APPARATUS FOR AN IMPROVED PROGRAMMABLE X-RAY FILM CHANGER

Otto K. Weber, Chatsworth; Mark H. Helmick, Canoga Park, and Lief A. Johansson, Agoura, all of Calif., assignors to Medrad, Inc., Pittsburgh, Pa.

Filed Nov. 23, 1985, Ser. No. 801,595

Int. Cl.[4] G03B *42/02;* **H05G** *1/10*

U.S. Cl. 378—173 **26 Claims**

1. An X-ray film changer, said film changer including a film supply cassette and a film exposure frame including at least one X-ray photoluminescent layer, said film supply cassette for holding unexposed film to be fed into said film exposure frame, comprising:

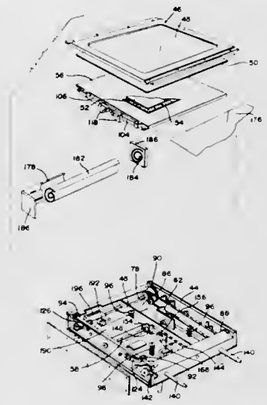
a movable pressure plate having a natural substantially flat configuration and disposed within said exposure frame for receiving said film from said film supply cassette;

means for moving said pressure plate and simultaneously deforming said pressure plate from its natural substantially flat configuration into a generally convex configuration with respect to said film;

means for feeding said film from said film supply cassette into said exposure frame adjacent the deformed pressure plate and the at least one X-ray photoluminescent layer;

means for moving said deformed pressure plate toward said

film to maintain said film in intimate contact with said at least one X-ray photoluminescent layer within said exposure frame for an exposure operation, said means for moving said pressure plate permitting said pressure plate to assume its substantially flat configuration;



means for removing said film from said exposure frame after the exposure operation; and

means for receiving said film removed from said exposure frame.

4,782,505

X-RAY FILM HOLDING APPARATUS PROVIDING TIGHT CONTACT BETWEEN FILM AND INTENSIFYING SCREEN

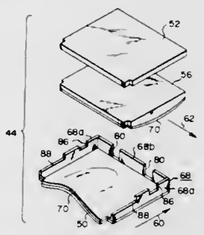
Yoshimasa Ogo, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 26, 1986, Ser. No. 935,520

Claims priority, application Japan, Nov. 27, 1985, 60-266943

Int. Cl.[4] G03B *42/04*

U.S. Cl. 378—187 **12 Claims**



1. An X-ray film holding apparatus for holding an X-ray film, said X-ray film holding apparatus comprising:

(a) a front plate through which X-rays transmit and a rear plate, said front plate having an interior surface facing said rear plate and said rear plate having an interior surface facing said front plate, said front plate being flexible and having a periphery comprising a first part and a second part, interior surface of said front plate being provided with a curved portion extending toward said rear plate, said curved portion being curved along first and second directions, the first and second directions crossing each other;

(b) a holding frame for holding said first part of the periphery of said front plate in a plane while leaving said second part of the periphery of said front plate free to flex;

(c) a cushion member having elasticity and being provided on said interior surface of said rear plate, said cushion member being provided with an interior surface facing said front plate, said interior surface of said cushion member being provided with a curved portion extending toward said front plate, said curved portion on said cushion member being curved along at least one of the first and second directions;

(d) intensifying screen means lain between said interior surfaces of said front plate and said cushion member; and

(e) supporting means for supporting said holding frame and said rear plate to provide tight contact between the X-ray film and said intensifying screen means,

(f) wherein the deflection of said curved portion of said front plate from said plane defined by said holding frame is at its maximum at the midway point of said second part of the periphery of said front plate.

4,782,506

ARRANGEMENT FOR OPERATING AND MAINTAINING A TELECOMMUNICATIONS SYSTEM

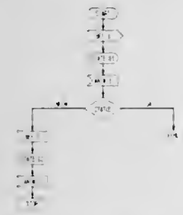
Maximilian Sevcik, Mettmenstetten, Switzerland, assignor to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Filed Jun. 26, 1986, Ser. No. 878,944

Claims priority, application Switzerland, Jul. 5, 1985, 02903/85

Int. Cl.[4] H04M *7/06, 3/28*

U.S. Cl. 379—10 **4 Claims**



1. An arrangement for the preparation of operating and maintenance procedures for at least one stored program controlled telecommunications system, more particularly, a telephone exchange system, where the operator can transmit the desired procedures via an operator station to the control apparatus of the telecommunications system and corresponding reactions of the telecommunications system are transmitted to the operator station, characterized in that there is inserted between the operator station (DSS) and the telecommunications system (S) a control arrangement (BWS) comprising an input/output unit (EAB) forming the interface to the operator station (DSS) and to the telecommunications system (S), and a processor, which control arrangement (BWS) further comprises a memory (RSP) in which all operating and maintenance procedures of the telecommunication system (S), being represented in accordance with a procedural version of a specification and description language (SDL/PR), are stored; that the control arrangement (BWS) has access to a correlation memory (ZSP) in which is stored, for all SDL/PR output signals, the structure—defined in a formal representation—of the commands corresponding to these signals and to be given to the telecommunication system (S) or to the operator station (DSS); that in the correlation memory (ZSP), there are stored further, for all reactions originating from the operator station (DSS) or from the telecommunication system (S), the SDL/PR input signals corresponding to the reactions and converted into said formal representation, that the control arrangement (BWS) further comprises a translator (I) which interprets the reactions originating from the telecommunication system (S) or from the operator station (DSS) and converts them to the formal representation and generates therefrom the corresponding SDL/PR input signal based on the data in the correlation memory (ZSP); and that the translator (1) correlates to the SDL/PR output signals to be given to the telecommunication system (S)

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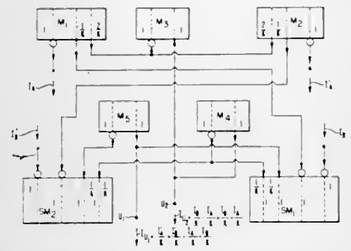
or to the operator station (DSS), on the basis of the data in the correlation memory (ZSP), the respective formal command, then converting the command to a form suitable for delivery to the operator station (DSS) or to the telecommunication system (S).

4,782,507

MONOLITHICALLY INTEGRATABLE CIRCUIT FOR MEASURING LONGITUDINAL AND TRANSVERSE CURRENTS IN A TWO-WIRE TRANSMISSION LINE

Marco Siligoni, Vittuone, and Ferdinando Lari, Bozzolo, both of Italy, assignors to SGS Microelettronica SPA, Milan, Italy

Filed Mar. 20, 1986, Ser. No. 841,789
Claims priority, application Italy, Mar. 20, 1985, 19983 A/85
Int. Cl.⁴ G05F *3/16*; H04M *19/00*
U.S. Cl. 379—27 **2 Claims**



2. A monolithically integratable circuit for receiving a plurality of external input currents and for outputting at least two output currents, said circuit comprising:

a means for receiving an input current I_A;

a means for receiving an input current I'_A;

a means for receiving an input current I_B;

a means for receiving an input current I'_B;

a means for outputting a current I_{U1} having a value in accordance with the equation:

$$I_{U1} = \frac{I'_A}{K} + \frac{I'_B}{K} - \frac{I_A}{K} - \frac{I_B}{K}$$

and a means for outputting a current I_{U2} in accordance with the equation:

$$I_{U2} = \frac{I_B}{K} - \frac{I_A}{K} + \frac{I'_B}{K} - \frac{I'_A}{K};$$

wherein said means for receiving said input current I_A comprises a first current mirror of a first type which receives said current I_A and which has a first output for outputting a current equal to I_A/K and having a second output for outputting a current $2I_A/K$;

a second current mirror of said first type having an input for receiving said current I'_A and having a first output for outputting a current I'_A/K and having a second output for outputting a currect $2I'_A/K$;

a third current mirror of said first type having an input connected to said second outputs of said first and second current mirrors of said first type for receiving said output currents therefrom and having an output for outputting a current equal to the sum of said currents output by said second outputs of said first and second current mirrors of said first type;

a first current mirror of a second type having a first input for receiving said current I'_B and having a second input connected to said first output of said second current mirror of said first type for receiving said current output therefrom and having first output for outputting a current equal to the sum of the currents received by said first and second inputs divided by K and having a second output for outputting a current equal to the sum of said currents received by said first and second inputs divided by K;

a second current mirror of said second type having a first input for receiving said current I_B and having a second input connected to said first output of said first current mirror of said first type for receiving said current output therefrom and having a first output for outputting a current equal to the sum of the currents received by said first and second inputs divided by K and having a second output for outputting a current equal to the sum of the currents received by said first and second inputs;

a current mirror having an input connected to said first output of said first current mirror of said second type and having an output connected to said first output of said second current mirror of said second type and an output U_1.

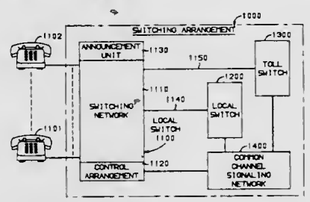
a current mirror having an input connected to said second outputs of said first and second current mirrors of said second type for receiving said currents output therefrom and having an output connected to said output of said third current mirror of said first type and to an output terminal U_2.

4,782,508

METHOD OF DISCOURAGING THE COMPLETION OF WRONG-NUMBER CALLS

James W. Borchering, West Chicago, and Louis M. Taff, Warrenville, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 3, 1986, Ser. No. 839,865
Int. Cl.⁴ H04M *3/42*
U.S. Cl. 379—67 **15 Claims**



1. A method of discouraging the completion of wrong-number calls, said method comprising the steps of:

receiving a call request defining a call from a calling station to a called directory number,

determining the calling directory number of said calling station,

examining a screening list of directory numbers, and

when said examining indicates an absence of said calling directory number on said screening list, ascertaining whether said call is a wrong-number call, wherein said ascertaining comprises transmitting a message to said calling station to provide a caller with information enabling a determination by said caller of whether said call is a wrong-number call.

4,782,509

APPARATUS AND METHOD FOR OBTAINING INFORMATION IN A WIDE-AREA TELEPHONE SYSTEM WITH MULTIPLE LOCAL EXCHANGES AND MULTIPLE INFORMATION STORAGE SITES

David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Stamford, Conn.

Continuation of Ser. No. 644,811, Aug. 27, 1984, abandoned.
This application Jul. 6, 1987, Ser. No. 69,828
Int. Cl.⁴ H04M *3/50, 7/00, 11/00*
U.S. Cl. 379—88 **10 Claims**

5. The method of obtaining information stored alphanumerically in any selected one of a plurality of geographically remote regions by operating a telephone in a telephone system of the kind including a plurality of local exchanges each connectible by respective voice-grade channels to any of a corresponding set of telephones including a plurality of keying means for producing respective decimal signals, said keying means comprising a set of keying means each designating a group of alphabetic letters and an associated numeral so that the signals produced by each of said set of keying means can be used to represent the corresponding alphabetic group and the associated numeral;

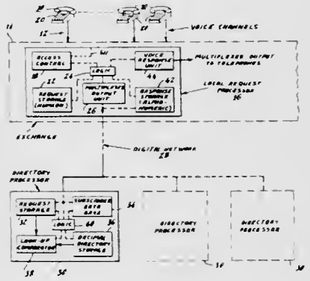
said method comprising the steps of:

operating said keying means at any one of said telephones of any of said sets of telephones to produce a request signal in the form of a plurality of decimal signals identifying the information at said selected one remote region which is desired;

directing said decimal signals through the respective voice-grade channel from said one telephone to the corresponding local exchange;

storing said decimal signals at a request processor at said corresponding local exchange;

directing signals corresponding to said request signal in digital signal format through a digital network to an information retrieval processor at the selected region geographically remote from said local exchange and including storage means storing alphanumeric data identifying information in said remote region;



carrying out a look-up of said stored information at said information retrieval processor at said selected remote region to locate the particular information desired as identified by the decimal siganls entered through said one telephone;

directing back through said digital network to said corresponding local exchange digital alphanumeric signals representing said particular information;

storing at said request processor at said corresponding local exchange alphanumeric reply signals corresponding to said alphanumeric signals sent back through said digital network;

operating a voice-response unit at said corresponding local exchange in accordance with said stored alphanumeric reply signals to develop speech siganls identifying said particular information; and

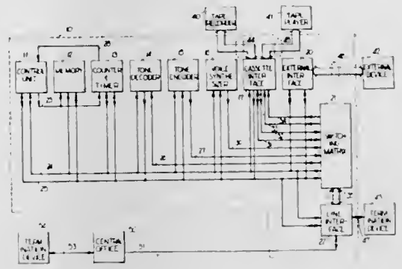
directing said developed speech signals through said respective voice-grade channel back to said one telephone to furnish the requested information to the person operating said one telephone.

4,782,510

TELEPHONE ANSWERING MACHINE WITH DIGITAL STORAGE OF ANNOUNCEMENTS AND MESSAGES

Aleksander Szlam, Marietta, Ga., assignor to Melita Electronic Labs, Inc., Norcross, Ga.

Division of Ser. No. 752,053, Jul. 5, 1985, Pat. No. 4,677,663.
This application Jan. 12, 1987, Ser. No. 2,691
Int. Cl.⁴ H04M *1/65*
U.S. Cl. 379—88 **2 Claims**



2. In a telephone automatic answering device of the type which is connected to a telephone subscriber line, including means providing seizure of said subscriber line in response to an incoming call, and means for providing an outgoing audio message onto said subscriber line subsequent to said seizure, the improvement comprising in combination:

tone decoder means connected to said subscriber line and responsive to predetermined tone signals on said subscriber line for providing digital output signals corresponding to each said predetermined tone signal on said subscriber line subsequent to said seizure, said predetermined tone signals and said digital output signals representing a set of commands and a set of calling party data;

control means, responsive to said digital output signals corresponding to said set of commands and to the absence of digital output signals corresponding to said set of commands, for providing read and write signals to a storage means and for providing a first enabling signal to a voice generator means and a second enabling signal to said telephone automatic answering device;

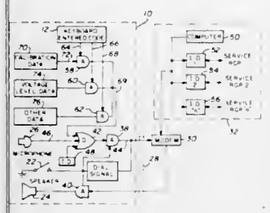
storage means responsive to said read and write signals and connected to said tone decoder means for storing and recalling said digital output signals corresponding to said set of calling party data as a stored digital word, said storage means having a sufficient capacity for storing a plurality of sets of said calling party data; and

voice generator means responsive to said first enabling signal and to said stored digital word for providing to said subscriber line a vocal audio signal corresponding to said predetermined tone signal for each said stored digital word;

wherein said set of commands comprises a first command to play back said calling party data by a selected priority code, said calling party data comprising a telephone number for a calling party and said priority code, a second command to play back said calling party data by chronological sequence, a third command to advance to another said set of said calling party data, a fourth command to go back to a prior set of said calling party data, a fifth command to erase a said set of said calling party data, and a sixth command to record a new said outgoing audio message on said telephone automatic answering device.

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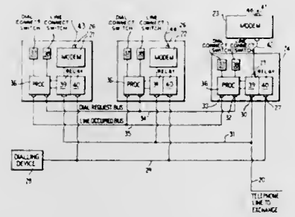
4,782,511
INTERACTIVE MEDICAL LABORATORY SPECIMEN APPARATUS SYSTEM
Edward M. Nemec, and Miles G. Hossom, both of Duluth, Ga., assignors to Murex Corporation, Norcross, Ga.
Filed Jul. 11, 1986, Ser. No. 884,713
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—93 **6 Claims**



1. An interactive medical laboratory specimen test system for communicating with a source of assistance remote from said test apparatus comprising:
a. diagnostic apparatus for use in performing a diagnostic routine on a specimen, said apparatus generating signals representing both results of said diagnostic routine and selected operating parameters such as operating voltage levels and calibration data,
b. a user activated switch on said diagnostic apparatus for causing automatic dialing of a predetermined telephone number to contact said source of assistance when said switch is activated,
c. means for converting said generated signals to data for transmission to said source,
d. keyboard means for generating a control code to select one of said generated signals,
e. gate means coupled to said signal converting means and responsive to said control code for enabling transmission of said converted data representing a selected one of said signals to said source represented by said predetermined telephone number for analysis at said source,
f. microphone on said diagnostic apparatus electrically coupled to said switch such that when said switch is activated verbal communication by said user to said source of assistance regarding said operating parameters of said diagnostic apparatus and said results of said routine is possible,
g. means at said source for receiving and analyzing said converted signal data,
h. a speaker on said apparatus activated by said switch, and
i. means for transmitting the results of said analysis to said user verbally through said speaker when said switch is activated.

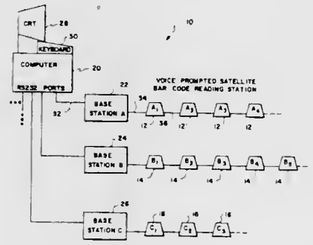
4,782,512
INTERFACING DATA UNITS TO A TELEPHONE LINE
Adrian P. Hutton, Ipswich, England, assignor to British Telecommunications, plc, London, England
Filed Dec. 15, 1986, Ser. No. 941,327
Claims priority, application United Kingdom, Dec. 16, 1985, 8530916
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—98 **17 Claims**

10. An interface circuit for connecting a data unit to a switched telephone network, comprising a data port for connection to the data unit; a dial port for connection to a common dialing device; a line port for connection to a telephone line; a dial request port for connection to a dial request bus; a line occupied port for connection to a line occupied bus; a dial connect switch; a line connect switch; a first switching means for selectively connecting the line port to the dial port on operation of the dial connect switch; a second switching means for disconnecting the line port from the dial port and connecting the line port to the data port on operation of the line connect switch; and processing means arranged to supply a dial request signal to the dial request port, when the dial port is



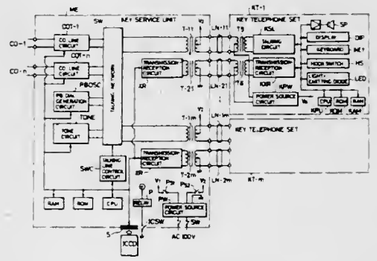
connected to the line port, and to supply a line occupied signal to the line occupied port when the data port is connected to the line port.

4,782,513
VOICE PROMPTED BAR CODE READING SATELLITE SYSTEM
Loren L. Krueger, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Jun. 30, 1987, Ser. No. 68,681
Int. Cl.[4] H04M *1/15*
U.S. Cl. 379—110 **19 Claims**



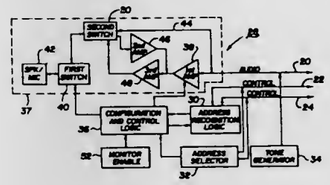
1. A voice prompted bar code reading satellite system comprising:
a plurality of bar code reading satellite stations, wherein each bar code reading satellite station comprises:
reading means for optically reading a bar code;
switching means for active switching of said reading means;
first indicating means for indicating busy-on said interconnecting means being in active use;
a logic unit having the properties such that: if said first indicating means indicates a busy said interconnecting means being in active use, then said transforming means, reading means and switching means are disabled; if said first indicating means does not indicate a busy said interconnecting means, then said transforming means, reading means and switching means are enabled; if said switching means is disposed in a way that said reading means is capable of being enabled and if said first indicating means indicates a busy said interconnecting means, then said first indicating means continues to indicate a busy said interconnecting means until said switching is changed in disposition in a way that said reading means is not capable of being enabled; and if said switching means is disposed in a way that said reading means is not capable of being enabled and if said first indicating means does not indicate a busy said interconnecting means, then a busy signal is sent out so that said first indicating means on each of other said satellite stations indicates a busy said interconnecting means and said first indicating means on said station originating said busy signal does not indicate a busy said interconnecting means;
interconnecting means for interconnecting said plurality of stations;
decoding means, for decoding bar code signals from said satellite stations, connected to said plurality of stations;
computing means, for computing said decoded bar code signals from said decoding means, connected to said decoding means; and
converting means, for converting computer output signals into voice signals to be sent to said satellite stations, connected to said computing means and to said plurality of stations.

4,782,514
KEY TELEPHONE SYSTEM
Hironobu Oshikata; Hiroshi Fukushima, and Teruo Matsufuji, all of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed May 28, 1987, Ser. No. 55,245
Claims priority, application Japan, Jun. 5, 1986, 61-129143
Int. Cl.[4] H04M *3/00*
U.S. Cl. 379—165 **2 Claims**



1. A key telephone system comprising a key service unit and a plurality of key telephone sets further comprising an IC card having a plurality of electrodes thereon electrically connected to an electrically erasable and programmable read-only memory (EEPROM) therein which has system data registered therein, and an IC card connector fixed in position wherein said key service unit and having a connection part therein electrically connected to an address bus, a data bus, and a control line provided in said key service unit, and further having a switch therein capable of controlling application of electrical power to said key service unit and said key telephone sets, said IC card connector adapted to receive therein, removably, said IC card selectively inserted therein so that said IC card electrodes are in electrical contact with said IC card connector connection part and so that said switch is actuated, wherein supply of said system data from said IC card to said key service unit is attained by inserting said IC card into said IC card connector to place said IC card electrodes in electrical contact with said IC card connector connection part and to actuate said switch so that electrical power is supplied to said key service unit permitting it to direct system data to appear on said address bus therein from said EEPROM.

4,782,515
DIGITALLY CONTROLLED INTERCOMMUNICATIONS SYSTEM
Martin J. Phillips, deceased, late of Chandler, Tex., and by Margaret J. Phillips, executrix, Rte. 1, Box 23B-0, Chandler, Tex. 75758
Filed Nov. 7, 1986, Ser. No. 928,169
Int. Cl.[4] H04M *9/02*
U.S. Cl. 379—172 **20 Claims**



1. An intercommunications system for the selective establishment of two-way communications between a multiplicity of stations, said intercommunications system comprising:
a terminal located at each of said stations, each terminal being capable of being configured to operate in a mode for calling other terminals, each terminal also being capable of being configured to operate in a mode for being called by other terminals and operate in a "hands off" mode;
a communications network comprising a predetermined number of lines for interconnecting any one of said terminals to at least one other of said terminals;
each of said terminals comprising:
an audio subsystem operatively coupled to said communications network, said audio subsystem including squelch means capable of disabling a predetermined portion of said audio subsystem, said audio subsystem further including slave enable means capable of configuring said terminal to a slave condition such that communications may be carried on in a "hands off" mode at the called terminal;
means for generating coded address information to be transmitted to all terminals over said communications network, said coded address information being a digital signal which is capable of being coded to be recognized by a particular one of said terminals and capable of causing the particular one of said terminals to be configured for a "hands off" mode of operation;
means for decoding said coded address information when received over said communications network and providing address signals after decoding said received coded address information at the terminal being addressed;
logic means operatively connected to said audio subsystem, said means for decoding and said means for generating coded address information, said logic means being structured to provide an operative signal to said squelch means upon receipt of an output signal from said means for generating coded address information, said logic means further being structured to provide an operative signal to said slave enable means upon receipt of an output signal from said means for decoding.

7. An intercommunications system for the selective establishment of two-way communications between a multiplicity of stations, said intercommunications system comprising:
a terminal located at each of said stations, each terminal being capable of being configured to operate in a mode for calling other terminals, each terminal also being capable of being configured to operate in a mode for being called by other terminals and operate in a "hands off" mode;
a communications network comprising a predetermined number of lines for interconnecting any one of said terminals to at least one other of said terminals;
each of said terminals comprising:

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an audio subsystem operatively coupled to said communications network, said audio subsystem including squelch means capable of disabling a predetermined portion of said audio subsystem, said audio subsystem further including slave enable means capable of configuring said terminal to a slave condition such that communications may be carried on in a "hands off" mode;

means for generating address data for selecting a particular terminal to be called;

means for generating line select data for selecting a particular line in said communications network to be used for the transmission of audio signals in the two-way communications;

encoder and register means operatively connected to receive said address data and said line select data and combine same into a control data word;

means for transmitting said control data word over a designated line in said predetermined number of lines in said communications network to all terminals;

line select means operatively configured for connecting the terminal to the particular line in said communications network which was selected to be used for the transmission of audio signals in the two-way communications;

control means operatively connected between said means for generating line select data and said line select means, said control means being structured to decode said line select data and provide said line select means with the correct enable signal causing said line select means to connect the terminal to the particular line which was selected; and

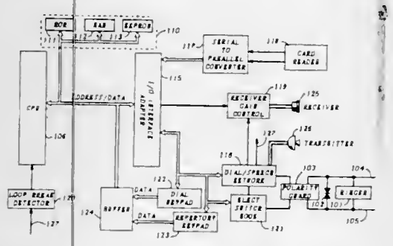
decoder means operatively connected to said designated line in said communications network and to said control means, said decoder means structured to decode said control data word and provide said line select data to said control means.

4,782,516

FRAUD PREVENTION IN A PUBLIC TELEPHONE STATION

Richard L. Maybach, Holmdel, and S Devendra K. Verma, Middletown, both of N.J., assignors to AT&T Information Systems Inc. American Telephone and Telegraph Company, Murray Hill, N.J.

Filed Jun. 25, 1987, Ser. No. 66,288
Int. Cl.[4] H04M *1/66*
U.S. Cl. 379—189 **16 Claims**



1. A fraud prevention circuit for use in a telephone station for restricting telephone calls originating at the station, the circuit comprising:

means for establishing an initial telephone connection between the telephone station and a switching facility over a pair of input lines;

means for receiving a loop break from the switching facility, the loop break being reflective of a momentary interruption in the telephone connection;

means for receiving a dial tone signal from the switching facility; and

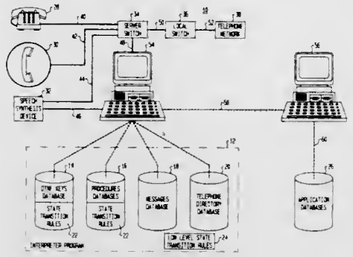
means for receiving a call screening process in the telephone station, the call screening process allowing only certain telephone calls to originate at the telephone station, and the means for activating the process being provided in response to the joint reception of the loop break and the dial tone signal from the switch facility.

4,782,517

SYSTEM AND METHOD FOR DEFINING AND PROVIDING TELEPHONE NETWORK SERVICES

Jeffrey J. Bernardis, Belle Mead; Charles F. Fowler, Whitehouse Station, and Barry K. Schwartz, Delaware Township, Hunterdon County, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 8, 1986, Ser. No. 904,973
Int. Cl.[4] H04M *3/42*
U.S. Cl. 379—201 **33 Claims**



1. A method for allowing an administrator of a telephone system to provide new services to a plurality of terminating means in a telephone network by generating a response event in the system in response to a request event to control the operation of the terminating means connected to the telephone network through interposed server means, comprising the steps of:

monitoring by the server means for the occurrence of the request event initiated by any one of the terminating means;

detecting the request event and processing the request event with processor means coupled to said server means, said processor means including a directly accessible database for storing state transition rules, said processing step including the steps of directly accessing from said database a stored state transition rule corresponding to the request event and providing control information corresponding to the response event in accordance with said state transition rule;

activating the server means in accordance with said control information corresponding to the response event for communication to the terminating means; and

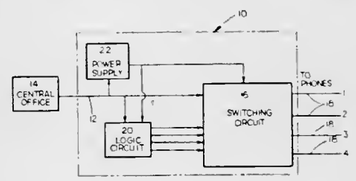
when invoked by the administrator through means for directly accessing said database, modifying said state transition rules to provide the new services without reconfiguring said server means.

4,782,518

APPARATUS FOR CONVERTING DISTINCTIVE RING TO SELECTIVE RING IN TELEPHONE LINES

Danny G. Mattley, P.O. Box 174, Hastings, Nebr. 68902, and Paul Hunt, Brainerd, Minn., assignors to Danny G. Mattley, Hastings, Nebr.

Filed Dec. 16, 1987, Ser. No. 133,539
Int. Cl.[4] H04M *3/42*
U.S. Cl. 379—201 **8 Claims**



1. An apparatus for converting distinctive rings in a telephone line provided as a special service by the central office to a selective ring, a main telephone line connected to said apparatus supplying conventional speech carrying current and an AC ring current, the distinctive rings being a plurality of specific ring cadences transmitted along said main telephone line in response to a specific telephone number, said main telephone line being selectively connected to at least two ancillary telephone lines at a customer's premises, comprising:

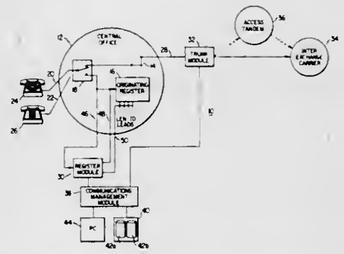
means for selectively switching only ring current from said main telephone line to at least one said ancillary telephone line in response to a specific ring cadence, and means for powering said selective switching means.

4,782,519

METHOD AND APPARATUS FOR ENHANCING THE OPERATING CAPABILITIES OF A TELEPHONE SWITCHING SYSTEM

Rajendra Patel, Plano; Kenneth A. Lauffenburger, Carrollton; David W. Thorn, Richardson; Donald D. Binford, Jr., Plano; Zye-Kong Cheng, Richardson; Yeong-Haw Yang, Plano; Gerald K. Coley, Terrell, and Charles C. Miller, Allen, all of Tex., assignors to Network Access Corporation, Richardson, Tex.

Filed May 22, 1986, Ser. No. 866,165
Int. Cl.[4] H04Q *3/495, 3/70, 3/76, 3/78*
U.S. Cl. 379—221 **26 Claims**



1. An apparatus for enhancing the operation of a central office in a telephone switching system to provide one or more extended subscriber features, the central office including a switch element for connecting a subscriber line to one of a plurality of outgoing trunks and control means for controlling the switch element, comprising:

a register module interposed between the subscriber line and the control means of the central office, said register module receiving subscriber signals from the subscriber line intended for the central office and including:

(a) a line identification receiver connected to receive line information from the control means identifying the subscriber line and for translating the line information into automatic number identification and pre-subscription information,

(b) a memory for storing the subscriber signals, the automatic number identification and the pre-subscription information at one of a plurality of addressable locations,

(c) a central processing unit for analyzing the subscriber signals to determine whether processing of the subscriber signals requires an extended subscriber feature and for generating a coded signal if processing of the subscriber signals requires an extended subscriber feature, the coded signal including the address location in the memory where the subscriber signals, the automatic number identification and the pre-subscription information resides,

(d) means for connecting the coded signal to the control means and the switch element;

a trunk module interposed between the switch element and the plurality of outgoing trunks for receiving the coded signal from the switch element; and

communication management means connected between the register module and the trunk module for routing the subscriber signals, the automatic number identification and the pre-subscription information to the trunk module in response to receiving the coded signal from said trunk module to thereby select an outgoing trunk.

9. A method for routing data between nodes of a network, each of the nodeshaving one or more ports associated therewith, comprising the steps of:

compiling a primary routing table at each node for identifying a port of the node from which a data message should be sent to reach each node of the network via a shortest possible path;

generating at a node a data message to be routed, the data message including a first portion to control routing of the data message and a second portion for identifying a destination node where the data message is to be routed; and

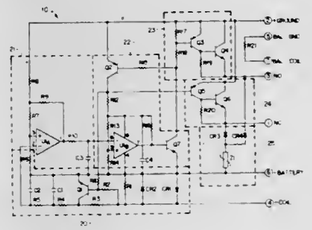
using the information in the first and second portions of the data message to identify the port of the node from which the message should be routed to reach the destination node over the shortest possible path.

4,782,520

PULSE RECEIVER CIRCUIT PROVIDING LONGITUDINAL BALANCE

William T. Mostyn, Jr., Hewitt, Tex., assignor to Telco Systems, Inc., Waco, Tex.

Continuation-in-part of Ser. No. 290,731, Aug. 6, 1981, Pat. No. 4,501,932. This application Nov. 14, 1983, Ser. No. 551,562
Int. Cl.[4] H04B *1/24, 3/36;* H04Q *1/34, 3/04*
U.S. Cl. 379—342 **7 Claims**



7. A pulse receiver for connection in a circuit including a first inductance and second inductance connected between an

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operating voltage potential and a ground reference potential including an external impedance intermittently connectable in series circuit relation with the first and second inductances, said pulse receiver comprising:

a sensing resistor connected in series circuit relation with the first inductance;

input means connected to the sensing resistor for detecting a connection of the external impedance in series circuit relation with the first and second inductances,

switching circuit means connected to said input means for changing the state of a first output node from a first state to a second state and changing the state of a second output node from a first state to a second state upon the detection of the external impedance series connection; and,

said switching circuit means including voltage bias means for maintaining the first and second output nodes in their respective first states when the external impedance is less than a predetermined value and for maintaining the first and second output nodes in their respective second states when the external impedance is greater than a predetermined value.

4,782,521

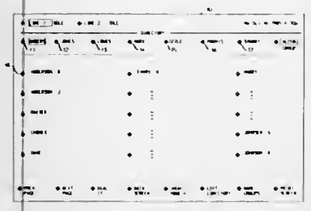
COMMUNICATION TERMINAL CALL REMINDER WITH AUTOMATIC DIALING

Richard A. Bartlett, Middletown; Timothy A. Cole, Montclair, and Esther L. Davenport, Dunellen, all of N.J., assignors to AT&T Information Systems Inc. American Telephone and Telegraph Company, Murray Hill, N.J.

Continuation of Ser. No. 830,210, Feb. 18, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 118,361

Int. Cl.[4] H04M *1/274*

U.S. Cl. 379—354 **5 Claims**



1. An arrangement for a terminal having a display comprising

means for storing information inputted by a user of said terminal, said information including a telephone number and selectively including a common keyword indicative of a dialing function to be performed by said terminal,

means for displaying said information as a message at a time selected by said user, and

means responsive to said user pointing to said displayed message for dialing said telephone number over a telephone line connected to said terminal if said displayed message includes said keyword.

4,782,522

TERMINAL FOR A TELECOMMUNICATIONS SWITCHING SYSTEM HAVING AN ADDITIONAL KEYBOARD AND/OR VISUAL DISPLAY

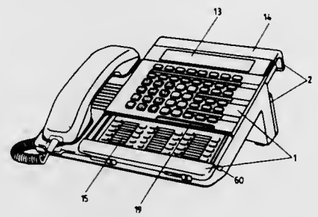
Dieter Kramer, Idstein; Gerhard Sussner, Meerbölz; Wolfgang Girscher; Karl-Heinz Niederhofer, both of Frankfurt; Werner Beck, Damstadt, and Bernd Ogorczyk, Karben, all of Fed. Rep. of Germany, assignors to Telenorma Telefonbau und Normalzeit GmbH, Fed. Rep. of Germany

Filed Jan. 23, 1987, Ser. No. 6,943

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602271; Mar. 8, 1986, 3607728

Int. Cl.[4] H04M *1/23*

U.S. Cl. 379—368 **9 Claims**



1. A telecommunications terminal having a base with an upper side, a telephone handset rest on the base and an operator facing panel mounted on the base, the panel having at least one of: a dialing and an operating keyboard; and, a data input keyboard, as well as at least one visual display, the terminal comprising:

at least one of an additional keyboard and an additional visual display disposed on said base, under said panel; and,

at least a portion of said panel defining a sliding carriage and carrying said at least one panel keyboard, said carriage being movable between a closed position, overlying said at least one of said additional keyboard and said additional visual display, and an open position, projecting outwardly from said terminal in a space exterior of said terminal cantilevering said terminal, and exposing said at least one of said additional keyboard and said additional visual display to enable utilization thereof.

4,782,523

TONE DETECTION PROCESS AND DEVICE FOR IMPLEMENTING SAID PROCESS

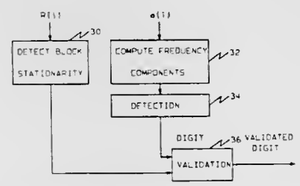
Claude Galand, Cagnes sur Mer; Guy Roulier, Nice; Robert Vermot-Gauchy, Saint Paul de Vence, and Hélène Cerf-Danon, Paris, all of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 27, 1987, Ser. No. 43,053

Claims priority, application European Pat. Off., Apr. 30, 1986, 864330013.2

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—386 **13 Claims**



1. A digital process for detecting, within a received signal,

the presence of a tone comprising at least one single frequency f(k) said received signal being sampled at a frequency fs and digitally encoded using Linear Prediction Coding techniques over fixed lengths blocks of samples said encoding providing a set of coefficients a(i) per block,, i=0, . . . ,p, with p being a predetermined integer value, said processing including:

computing Fourier transform terms A(f(k)) over said a(i) set

$$A(f(k)) = \sum_{n=0}^{P-1} a(n) \cdot e^{-2j\pi \cdot n \cdot f(k)/fs}$$

for f(k) being equal to each of said tone frequency (ies); deriving a tone amplitude F(k) from each A(f(k), using:

$$F(k) = |A(f(k)|$$

comparing said tone amplitude to a predetermined threshold(s) to detect said tone reception.

4,782,524

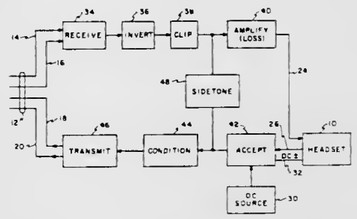
TELEPHONE HEADSET INTERFACE CIRCUIT

Jeffrey R. McQuinn, Bolingbrook, and Robert Anderson, Lisle, both of Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 5, 1987, Ser. No. 47,079

Int. Cl.[4] H04M *1/19, 1/60*

U.S. Cl. 379—395 **19 Claims**



1. An interface circuit for interfacing a four wire telephone circuit to a telephone headset, comprising:

means for receiving said line input signal on the four wire telephone circuit to produce a received signal;

means for inverting said received signal and having an adjustable gain to produce a normalized signal;

means for clipping said normalized signal to produce a limited signal;

means for amplifying said limited signal and having a predetermined value of loss to produce a headset input signal for the telephone headset;

adjustable means for outputting a line output signal to the four wire circuit and receiving a headset output signal from the headset; and

means for providing a predetermined DC voltage to be used by the headset and connected to said means for outputting.

4,782,525

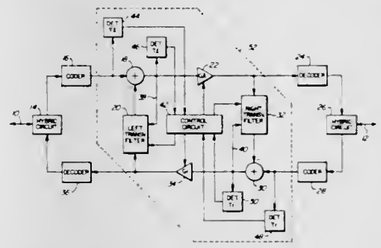
ECHO CANCELLATION IN TWO-WIRE TRANSMISSION PATH REPEATERS

Dany Sylvain, Gatineau; Douglas J. Millar, Verdun, and Gilles Dupuis, Brossard, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 27, 1985, Ser. No. 802,292

Int. Cl.[4] H04B *3/23*

U.S. Cl. 379—410 **6 Claims**



1. Apparatus comprising:

a transmit path and a receive path;

echo cancelling means for cancelling echoes on the transmit path of signals on the receive path, the echo cancelling means comprising a transversal filter having adaptive filter coefficients, the echo cancelling means further having a first input coupled to the transmit path, a second input coupled to the receive path, and an output;

substantially linear amplifying means having a controllable gain and having an input coupled to the output of the echo cancelling means; and

control means responsive to the power ratio between signals at the first input and the output of the echo cancelling means for controlling the gain of the amplifying means and for controlling adaptation of the filter coefficients;

wherein the control means is responsive to the ratio of the power of signals at the first input of the echo cancelling means to the power of signals at the output of the echo cancelling means falling below a given value to:

increase the gain of the amplifying means for a predetermined period;

allow adaptation of the filter coefficient during the predetermined period; and

prevent adaptation of the filter coefficients and decrease the gain of the amplifying means at the end of the predetermined period.

4,782,526

TELEPHONE SET

Yasuhito Uchino, Hino; Tsuneo Tomita, Kunitachi, and Hiroshi Morikawa, Hino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Mar. 18, 1986, Ser. No. 840,785

Claims priority, application Japan, Aug. 30, 1985, 60-191214

Int. Cl.[4] H04M *1/19, 1/04, 1/06*

U.S. Cl. 379—419 **2 Claims**

1. A telephone set, comprising:

a. a telephone body having a projected portion with a pair of end faces at opposite ends thereof;

b. a handset detachably mountable on said telephone body, said handset having a receiving portion and a sending portion at opposite ends thereof connected by a longitudinally extending junction portion, said receiving and sending portions having opposing inside faces extending from opposite ends of said junction portion to define a holding recess for receiving said projected portion of said telephone body with said inside faces of said handset being respectively adjacent said end faces of said projected

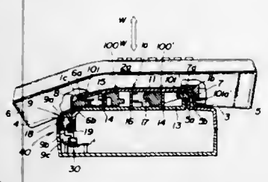
VOL 1096 ISS 1 NO 1 1988 UMI

portion, said handset being mountable on and removable from said telephone body in a predetermined mounting direction substantially perpendicular to said longitudinally extending junction portion; and

c. means for locking said projected portion of said telephone body in said holding recess of said handset, said locking means including:

a first engagement recess formed in one of said inside faces of said handset and a second engagement recess formed in the other of said inside faces of said handset, said first engagement recess including a bottom holding face extending substantially perpendicular to said mounting direction.

first and second engagement blocks each disposed in said projected portion of said telephone body and extending outwardly from one of said end faces of said projected portion, said first and second engagement blocks having respective first and second pawl portions configured to fit into said corresponding first and second engagement recesses of said handset, at least said first engagement block



moving in a direction substantially perpendicular to said mounting direction and said first pawl portion including a bottom engagement face extending substantially parallel to and in contact with said bottom holding face of said first engagement recess at times when said first pawl portion is fit into said first engagement recess, said first engagement block including a cam face,

spring means for biasing said first and second engagement blocks to move in opposite directions away from each other, and

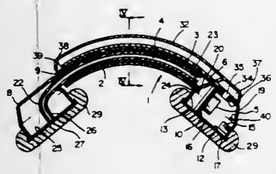
an unlocking button disposed in said telephone body and movable toward and away from said first engagement block in a direction substantially perpendicular to the direction of movement of said first engagement block, said unlocking button including an actuating portion that engages said cam face of said first engagement block and moves said first engagement block against said spring means to disengage said first pawl portion from said first engagement recess in response to said unlocking button being moved toward said first engagement block.

4,782,527

TELEPHONE HEAD/HAND SET

Alfred T. Williamson, and Kerry L. Williamson, both of 4515-33 Avenue, Edmonton, Alberta, Canada (T6L 4X8)

Filed Sep. 29, 1987, Ser. No. 102,464
Claims priority, application Canada, Sep. 30, 1986, 519467
Int. Cl.[4] H04R *1/03, 1/05*
U.S. Cl. 379—430 **7 Claims**



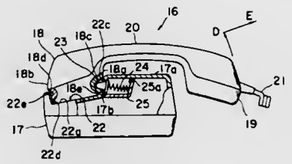
1. A combination telephone handset and headset device comprising elongated, extensible body means; mouthpiece means at one end of said body means; earpiece means at the other end of said body means; microphone means in said mouthpiece means for transmitting sound made by the user of the device; speaker means for receiving sound signals sent to the user of the device in said body means; and tubular arm means pivotally connected to said body means at the mouthpiece end thereof for rotation between handset and headset positions, whereby the device can be used in the same manner as a conventional handset, or by extension of said body means and rotation of said arm means into close proximity with the mouth of a user, used as a conventional headset.

4,782,528

TELEPHONE APPARATUS

Hidetoshi Inone; Yasunobu Taguchi, and Teruo Baba, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1986, Ser. No. 913,759
Claims priority, application Japan, Sep. 19, 1986, 61-142522[U]
Int. Cl.[4] H04M *1/04*
U.S. Cl. 379—455 **6 Claims**



1. A telephone apparatus comprising

a handset having a receiver part and a transmitter part, one of said receiver and transmitter parts including outer and inner sides having outer and inner engagement members respectively thereon; and

a base unit for receiving said handset, said base unit including

a housing having an inside and an outside;

a fixed protrusion member for engaging said outer engagement member and a movable protrusion member for engaging said inner engagement member when said handset is mounted on said base unit, said movable protrusion member comprising a flange portion having first and second coplanar opposite sides and an abutment portion extending therefrom, said abutment portion having first and second opposite inclined surfaces converging toward a tip which projects through an opening in said housing to the outside thereof, the opening in said housing having a periphery; and

support means including a compression spring for resiliently supporting said movable protrusion member within said housing and urging the tip of the abutment portion thereof through the opening in said housing and the flange portion thereof against the periphery of said opening;

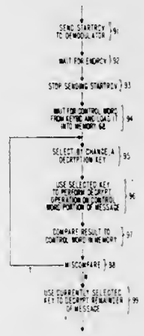
whereby said handset is lifted off said base unit by rotating it away from said base unit about said fixed protrusion member thereby causing said movable protrusion member to be rotatably retracted against the force exerted by said compression spring as the result of the first inclined surface of said movable protrusion member being pressed against said inner engagement member and the first side of the flange portion of said movable protrusion member being pivoted about a first pivot point on the periphery of the opening in said housing; said handset being replaced on said base unit by engaging said outer engagement member with said fixed protrusion member and rotating said handset toward said base unit thereby causing said movable protrusion member to be retracted against the force exerted by said compression spring as the second inclined surface of said movable protrusion member presses against said inner engagement member and the second side of the flange portion of said movable protrusion member pivots about a second pivot point located opposite said first pivot point on the periphery of the opening in said housing; the abutment portion of said movable protrusion member being forced by said compression spring into engagement with said inner engagement member when said handset is seated on said base unit.

4,782,529

DECRYPTION OF MESSAGES EMPLOYING UNIQUE CONTROL WORDS AND RANDOMLY CHOSEN DECRYPTION KEYS

George T. Shima, Tokyo, Japan, assignor to Unisys Corporation, Detroit, Mich.

Continuation of Ser. No. 902,742, Sep. 2, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 96,772
Int. Cl.[4] H04L *9/04*
U.S. Cl. 380—44 **14 Claims**



1. For use in a communication network of the type in which a transmitting station sends an encrypted message to a plurality of receiving stations in a manner that enables only a selected receiving station in said plurality to decrypt the messages, a method of operation each receiving station, wherein:

each of said receiving stations stores one and the same set of several decryption keys;

each of said receiving stations stores a control word which is any series of bits that is unique to that station; and

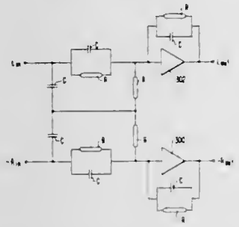
each of said receiving stations identifies an encrypted message as being sent to it by—(a) automatically choosing a decryption key at random from said set, (b) performing a decrypt operation on the same portion of the encrypted message from said transmitting station using the selected key, (c) comparing the result of said decrypt operation to its stored control word, and (d) repeating steps (a) thru (c) until either a match occurs or all keys in said set have been selected.

4,782,530

NON-RECURSIVE SYSTEM FOR EXPANDING THE STEREO BASE OF STEREOPHONIC ACOUSTIC DIFFUSION APPARATUS

Guido Torelli, S. Alessio, and Alejandro De La Plaza, Bergamo, both of Italy, assignors to SGS Microelettronica SpA, Catania, Italy

Filed Sep. 8, 1986, Ser. No. 904,392
Claims priority, application Italy, Sep. 12, 1985, 22114 A/85
Int. Cl.[4] H04S *1/00*
U.S. Cl. 381—1 **4 Claims**



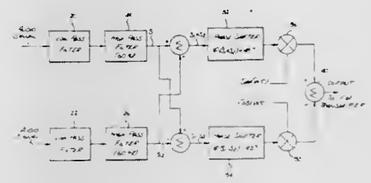
1. A system for expanding the stereo base for a stereophonic acoustic diffusion apparatus, in which first and second input signals, providing together a stereophonic pair, are directly coupled to operational amplifiers via respective series coupled impedances to obtain a first and a second output signal, wherein said operational amplifiers are interconnected by an H-like symmetrical network of impedances having four external branches and a common branch, a first pair of external branches of said H-like network being connected to the respective input signals, and a second pair of external branches of said H-like network being connected to the respective nodes between said series-coupled impedances and the inputs of said operational amplifiers, wherein the impedance in the common branch of said H-like network is a short-circuit.

4,782,531

MULTICHANNEL FM SUBCARRIER BROADCAST SYSTEM

Lawrence J. Karr, 445 15th St., Santa Monica, Calif. 90402; Steven J. Davis, 616 8th St., Manhattan Beach, Calif. 90266, and Andrew Barber, 4109 Via Marina, Apt. R120, Marina Del Rey, Calif. 90291

Filed Jun. 23, 1987, Ser. No. 65,911
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—14 **2 Claims**



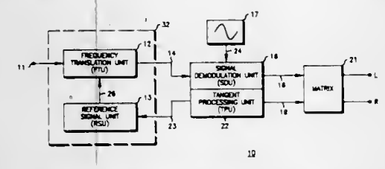
1. A multichannel FM subcarrier transmission system for providing a transmitter modulation signal for broadcasting first and second information signals as independent sidebands of a suppressed carrier in the subcarrier band of an FM transmitting station, comprising:

filter means for limiting the bandwidth of the first and second information signals to predetermined values to provide first and second filtered signals;

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summing means for providing a sum signal which is the sum of the first and second filtered signals;
difference means for providing a difference signal which is the difference between the first and second filtered signals;
phase shift means for shifting the phase of the sum signal by a first amount to provide a first phased signal, and for shifting the phase of the difference signal by a second amount to provide a second phased signal, where the first and second amounts are chosen to provide a 90° phase difference between the sum and difference signals;
first mixing means for mixing the first phased signal with the sine of the suppressed carrier to provide a first mixed signal;
second mixing means for mixing the second phased signal with the cosine of the supressed carrier to provide a second mixed signal;
second summing means for summing the first and second mixed signals to provide the transmitter modulation signal;
and means for applying the transmitter modulation signal to frequency modulate a carrier wave.

4,782,532
AUTOMATIC IF TANGENT LOCK CONTROL CIRCUIT
Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 15, 1987, Ser. No. 38,563
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—15 **5 Claims**



1. A method of maintaining an IF frequency in a radio receiver substantially at a predetermined value for input signals of different frequencies, the method comprising the steps of:
(A) in a mixer, receiving:
an input signal of the form:

$$(1+L+R)\cos(wct+\phi)$$

where
L and R comprise information signals;
wct comprises a first carrier signal; and
ϕ comprises a signal of the form: arc tan $(L-R)/(1+L+R)$; and
a reference signal;
(B) in said mixer, providing an output IF signal based upon said input signal and said reference signal, wherein said IF signal comprises said input signal as translated in frequency and phase by an amount related to said reference signal, and wherein said IF signal is of the form:

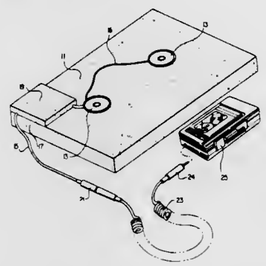
$$(1+L+R)\cos(wit+\phi);$$

where wit comprises a second carrier signal;
(C) dividing said IF signal by $\cos\phi$ to obtain a resultant signal of the form:

$$(1+L+R)\cos(wit+\phi)/\cos\phi;$$

(D) processing said resultant signal in a Q detector to obtain a signal substantially of the form L−R and using said L−R signal to provide a control signal;
(E) using said control signal to control frequency and phase for said reference signal; such that said IF signal frequency will remain substantially at a predetermined value for input signals of different frequencies.

4,782,533
STEREOPHONIC PILLOW SPEAKER SYSTEM
James L. Haynie, 501 N. Main, Suite 117, Fort Worth, Tex.
Filed Jan. 12, 1987, Ser. No. 2,297
Int. Cl.[4] H04R *5/02*
U.S. Cl. 381—24 **2 Claims**



1. A stereophonic pillow speaker system, for a pillow having corners, the speaker system comprising:
a rectangular cellular foam base member;
a pair of stereophonic loudspeakers, mounted within holes in the base member, each loudspeaker having an axis spaced apart from and substantially parallel with the other, each loudspeaker having an upper edge flush with the upper side of the base member and located substantially in the same plane as the other loudspeaker;
an inner cushion wrapping of a fibrous material, wrapped entirely around the base member and the loudspeakers, the cushion wrapping having an inner surface that overlies and contacts the upper edges of the loudspeakers;
an outer cushion wrapping of fibrous material wrapped around the inner cushion wrapping;
an electric wire, extending from the loudspeakers between the cushion material and the base material and out of the pillow; and
a jack, attached to the outer end of the electric wire for connection to a sound source.

DESIGNS

NOVEMBER 1, 1988

298,280
SANDWICH COOKIE
Juan F. Concepcion, Brooklyn, N.Y.; Michael P. Lucas, Ridgewood, N.J.; Robert Tabor, New York, N.Y., and Richard B. Gerstman, Tenafly, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.
Filed May 7, 1985, Ser. No. 731,491
The portion of the term of this patent subsequent to Jul 4, 1992, has been disclaimed.
Term of patent 14 years
U.S. Cl. D1—109



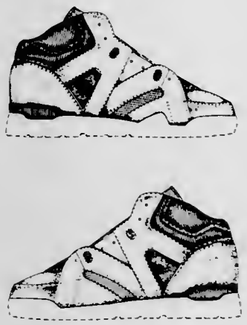
298,281
KARATE SHOE
Soo S. Cho, Roseland, Fla., assignor to Macho Products, Inc., Palm Bay, Fla.
Filed Mar. 17, 1986, Ser. No. 845,014
Term of patent 14 years
U.S. Cl. D2—271



298,282
ELEMENT OF A SHOE UPPER
Paul D. Brown, Hingham, and Tuan Le, Cohasset, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Sep. 4, 1987, Ser. No. 93,506
Term of patent 14 years
U.S. Cl. D2—314



298,283
SHOE UPPER
Joan Swett; K. Wayne Spinney; Peter W. Metcalf; Bruce MacGregor, all of Lake Oswego, and Brenda Kelley, Beaverton, all of Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.
Filed Feb. 17, 1988, Ser. No. 156,644
Term of patent 14 years
U.S. Cl. D2—314



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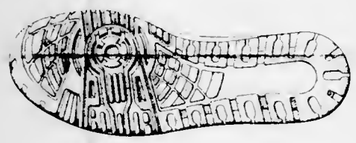
298,284
ELEMENT OF A SHOE UPPER
Lawrence Selbiger, Portland, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
Filed Feb. 17, 1988, Ser. No. 156,566
Term of patent 14 years
U.S. Cl. D2—314



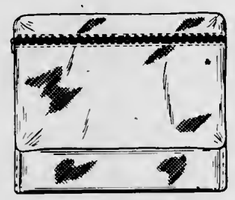


298,285
SHOE SOLE
James K. Tong, Beaverton, Oreg., assignor to AVIA Group International, Inc., Portland, Oreg.
Filed Feb. 17, 1988, Ser. No. 156,652
Term of patent 14 years
U.S. Cl. D2—320

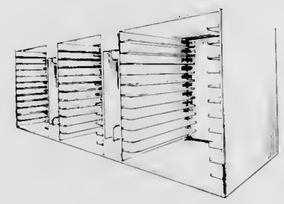


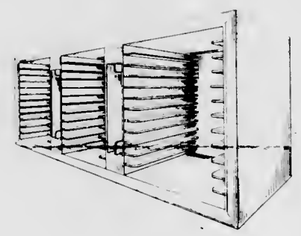


298,286
CASSETTE CARRYING CASE
Patrick Mastronardo, Stamford, Conn., assignor to Lebo Peerless, Inc., Bloomfield, N.J.
Continuation of Ser. No. 850,334, Apr. 9, 1986. This application Feb. 6, 1987, Ser. No. 11,722
Term of patent 14 years
U.S. Cl. D3—35



298,287
STORAGE RACK
David M. Stravitz, 16 Park Ave., New York, N.Y. 10016
Filed Aug. 27, 1985, Ser. No. 769,869
Term of patent 14 years
U.S. Cl. D6—407





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298,288
COMBINED ETAGERE AND TABLE
Kaizo Oto, deceased, late of New York, N.Y. by Zenaida Oto, administrator, assignor to Design Institute America, Inc., Montpeller, Ohio
Filed Jan. 8, 1986, Ser. No. 817,095
Term of patent 14 years
U.S. Cl. D6—474



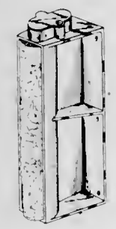
298,289
TABLE TOP OR SIMILAR ARTICLE
William E. Stumpf, Winona, Minn., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Mar. 5, 1985, Ser. No. 708,224
Term of patent 14 years
U.S. Cl. D6—511



298,290
VERTICAL HOLDER FOR ROLLER PAPER PRODUCTS
James L. Wilkerson, 6040 N. 3rd St., Phoenix, Ariz. 85012
Filed Jun. 23, 1986, Ser. No. 877,726
Term of patent 14 years
U.S. Cl. D6—521

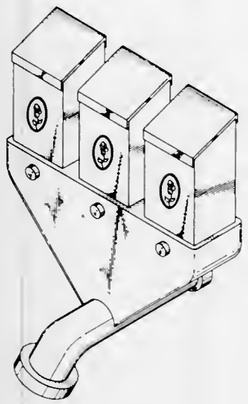


298,291
COMBINED WALL-MOUNTED WATER-POWERED SHOWER BRUSH AND ACCESSORY SHELF UNIT
David C. Lanier, Rte. 1, Box 43-A, Holly Ridge, N.C. 28445
Filed May 16, 1985, Ser. No. 734,838
Term of patent 14 years
U.S. Cl. D6—524



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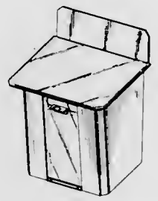
298,292
SHOWER WATER ADDITIVE DISPENSER
William H. Townes, 4332 Fontana Ave., Chesapeake, Va. 23325
Filed Jul. 24, 1986, Ser. No. 888,833
Term of patent 14 years
U.S. Cl. D6—542



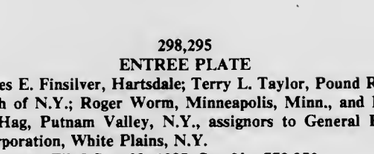
298,293
CABINET FOR AN AEROSOL SPRAY DISPENSER
Al Marven, Hollywood, Fla., assignor to Cook International, Palm Beach, Fla.
Filed Nov. 10, 1986, Ser. No. 928,384
Term of patent 14 years
U.S. Cl. D6—542



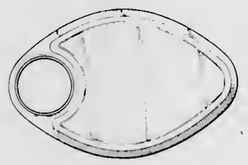
298,294
PHOTO FILM DROP STAND
Lynn E. Everett, New Philadelphia, Ohio, assignor to Tusco Manufacturing Company, Gnadenhutten, Ohio
Filed Jun. 23, 1986, Ser. No. 877,677
Term of patent 14 years
U.S. Cl. D6—559



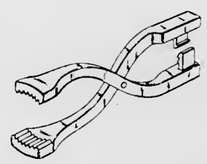
298,295
ENTREE PLATE
Charles E. Finsilver, Hartsdale; Terry L. Taylor, Pound Ridge, both of N.Y.; Roger Worm, Minneapolis, Minn., and Nabil El-Hag, Putnam Valley, N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed Sep. 20, 1985, Ser. No. 778,052
Term of patent 14 years
U.S. Cl. D7—21



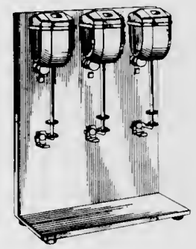
298,296
COMBINED TRAY AND CUP HOLDER
Michael B. Washburn, deceased, late of Gibraltor, and Terry L. Washburn, executor, Northville, both of Mich., assignors to Social Ware, Inc., Gibraltar, Mich.
Filed Oct. 2, 1985, Ser. No. 783,288
Term of patent 14 years
U.S. Cl. D7—38



298,297
RIB HOLDER DEVICE
Gary W. Maltby, 317 "B" Encino La., San Clemente, Calif. 92677
Filed Feb. 10, 1986, Ser. No. 827,920
Term of patent 14 years
U.S. Cl. D7—105



298,298
DRINK MIXER
Bruno M. Valbona, Farmington, and Robert G. Hamblett, Windsor Locks, both of Conn., assignors to Dynamics Corporation of America, Greenwich, Conn.
Filed Dec. 12, 1985, Ser. No. 807,997
Term of patent 14 years
U.S. Cl. D7—379

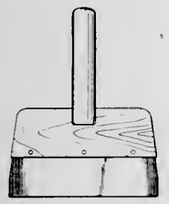




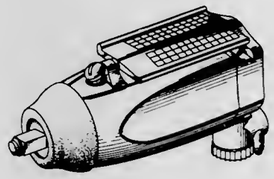
298,299
FLEXIBLE LIFTING TOOL
John Deibel, 825 S. 80th, Tacoma, Wash. 98408
Filed Nov. 14, 1985, Ser. No. 804,985
Term of patent 14 years
U.S. Cl. D8—14



298,300
SPATULA FOR PLASTER OR THE LIKE
Henri Leray, Nyköping, Sweden, assignor to Henri Leray AB, Nyköping, Sweden
Filed Jan. 23, 1985, Ser. No. 694,102
Claims priority, application Sweden, Aug. 16, 1984, 84-2210
Term of patent 14 years
U.S. Cl. D8—45

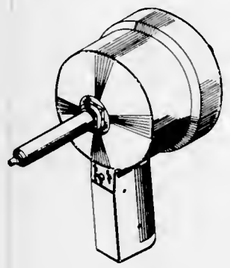


298,301
PALM GRIP IMPACT WRENCH
Michael D. Stephan, Wixom, Mich., assignor to Snap-on Tools Corporation, Kenosha, Wis.
Filed Aug. 27, 1985, Ser. No. 769,950
Term of patent 14 years
U.S. Cl. D8—61

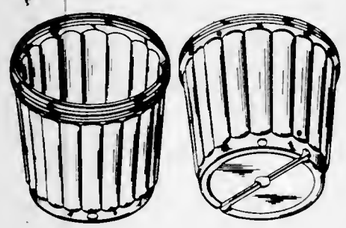


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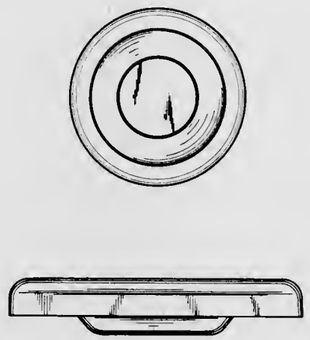
298,302
AIR-POWERED BLIND RIVETER
Larry A. Lambert, Derby, Conn., assignor to USM Corporation, Farmington, Conn.
Filed Jan. 3, 1986, Ser. No. 815,959
Term of patent 14 years
U.S. Cl. D8—61



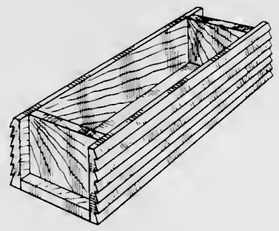
298,303
PLANT CONTAINER
Norman C. Lee, Greensboro, N.C., assignor to Zarn, Incorporated, Reidsville, N.C.
Filed Nov. 18, 1985, Ser. No. 805,365
Term of patent 14 years
U.S. Cl. D11—152



298,304
REVERSIBLE FLOWER ARRANGEMENT CONTAINER
Gene Meyer, 12 Quay Ct., Centerport, N.Y. 11721
Filed Oct. 16, 1986, Ser. No. 919,828
Term of patent 14 years
U.S. Cl. D11—152



298,305
PLANTER BOX
Ray L. Granger, 772 Bird Bay Dr., #204, Venice, Fla. 33595
Filed Jul. 10, 1986, Ser. No. 884,268
Term of patent 14 years
U.S. Cl. D11—156



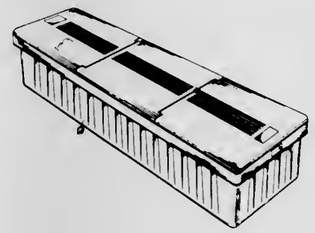
298,306
PACKAGE BOW
Francis Hunstiger, Parma Heights, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio
Filed Sep. 24, 1985, Ser. No. 779,656
Term of patent 14 years
U.S. Cl. D11—184



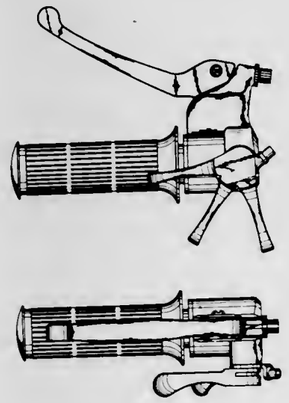
298,307
REMOVABLE ITEM CARRIER FOR STROLLERS
Betty P. Balter, and Ruben A. Balter, both of 7048 Santa Ana Cir., Buena Park, Calif. 90620
Filed Sep. 8, 1986, Ser. No. 904,264
Term of patent 14 years
U.S. Cl. D12—133



298,308
VEHICLE TOOL BOX
LeRoy VanKirk, White Pigeon, Mich., assignor to LRV Corporation, Elkhart, Ind.
Filed Jan. 21, 1986, Ser. No. 820,119
Term of patent 14 years
U.S. Cl. D12—157

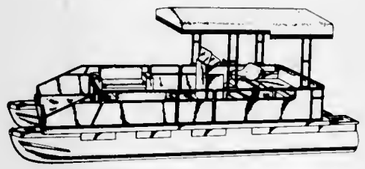


298,309
BRAKE AND DERAILLEUR ACTUATING UNIT
Maurice E. L. Coue, Feucherolles, France, assignor to Huret et ses Fils, Feuquieres en Vimeu, France
Filed Jun. 27, 1985, Ser. No. 749,873
Claims priority, application France, Dec. 27, 1984, 84 5832
Term of patent 14 years
U.S. Cl. D12—179

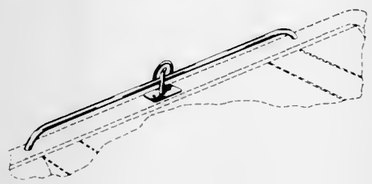


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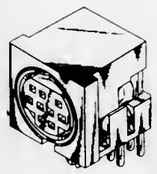
298,310
PONTOON BOAT
Richard J. Robbins, Derby, Kans., assignor to Tracker Marine Corporation, Springfield, Mo.
Filed Jul. 31, 1986, Ser. No. 891,762
Term of patent 14 years
U.S. Cl. D12—306



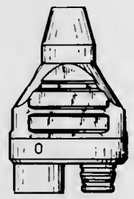
298,311
TOW RAIL
Robert A. Greenberg, Cocoa, Fla., assignor to Ray Industries, Inc., Knoxville, Tenn.
Filed Sep. 26, 1986, Ser. No. 911,819
Term of patent 14 years
U.S. Cl. D12—317



298,312
ELECTRICAL SOCKET
Shigemi Sekiguchi, Gunma, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan
Filed Oct. 21, 1985, Ser. No. 789,548
Claims priority, application Japan, May 24, 1985, 60-21849
Term of patent 14 years
U.S. Cl. D13—24



298,313
ELECTRICAL CONNECTOR
Siegfried A. De Jong, The Hague, Netherlands, assignor to Sensor Nederland B.V., Netherlands
Filed Nov. 26, 1985, Ser. No. 806,554
Claims priority, application Hague, May 28, 1985, DM/005304
Term of patent 14 years
U.S. Cl. D13—24

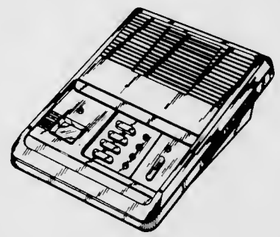


298,314
CONTROL PANEL FOR DIMMING SYSTEM OR THE LIKE
Martin L. Lasker, Edison, N.J.; Richard C. Counts, Dallas, and James E. Palmer, The Colony, both of Tex., assignors to Prescolite, Inc., San Leandro, Calif.
Filed Nov. 4, 1985, Ser. No. 803,853
Term of patent 14 years
U.S. Cl. D13—35

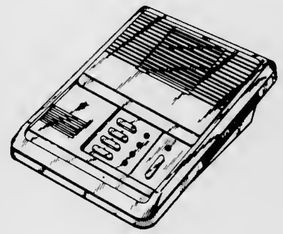




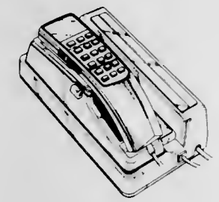
298,315
TELEPHONE ANSWERING INSTRUMENT
John Maliskas, Newtown, Conn., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 23, 1985, Ser. No. 812,028
The portion of the term of this patent subsequent to Nov. 1, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—4

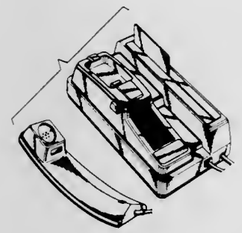


298,316
TELEPHONE ANSWERING INSTRUMENT
John Maliskas, Newtown, Conn., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 23, 1985, Ser. No. 812,029
The portion of the term of this patent subsequent to Nov. 1, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—4

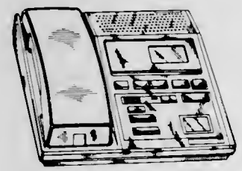


298,317
MOBILE HANDSET TELEPHONE AND STAND THEREFOR WITH INTEGRAL SPEAKERPHONE AND MAGNETIC CARD READER
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 17, 1986, Ser. No. 945,297
Claims priority, application Japan, Jun. 20, 1986, 23645
Term of patent 14 years
U.S. Cl. D14—52





298,318
STAND AND HANDSET FOR TELEPHONE ANSWERING MACHINE
Isao Doi, Ohra, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Feb. 25, 1985, Ser. No. 704,753
Claims priority, application Japan, Aug. 24, 1984, 59-35561
Term of patent 14 years
U.S. Cl. D14—52





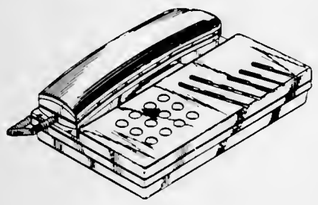
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298,319
HANDSET TELEPHONE
Page Falconburg, 1158 SE. 32nd St., Cape Coral, Fla. 33907
Filed Mar. 18, 1987, Ser. No. 27,508
Term of patent 14 years
U.S. Cl. D14—53

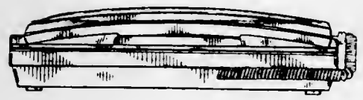




298,320
TELEPHONE SET
Yosbitsugu Hirose; Satoshi Fukutome; Nobuyuki Tani, and Yasuhisa Hashimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 8, 1987, Ser. No. 59,867
Claims priority, application Japan, Dec. 17, 1986, 61-50232
Term of patent 14 years
U.S. Cl. D14—53





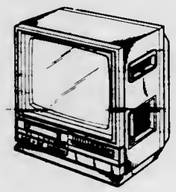


298,321
PORTABLE HANDSET RADIO TELEPHONE
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 25, 1987, Ser. No. 66,740
Claims priority, application Japan, Dec. 27, 1986, 61-51198
Term of patent 14 years
U.S. Cl. D14—64



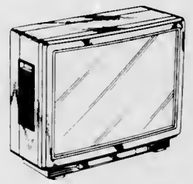


298,322
COMBINED TELEVISION AND VIDEO RECORDER
Kyu S. Shim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 9, 1986, Ser. No. 872,470
Claims priority, application Rep. of Korea, Dec. 9, 1985, 17424/1985
Term of patent 14 years
U.S. Cl. D14—79



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298,323
TELEVISION RECEIVER
Tsukasa Ariyoshi, Kokubunji; Shigeki Gushiken, Tokyo; Hiroyuki Kogane, Tokyo; Yasushi Fujitani, Hachiouji; Toru Kiyota, Tachikawa, and Ryuichiro Tanaka, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 11, 1986, Ser. No. 828,345
Claims priority, application Japan, Jan. 22, 1986, 61-1660
Term of patent 14 years
U.S. Cl. D14—80



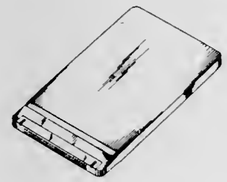
298,324
KEYBOARD
Masaki Takahashi, Kawasaki, and Osamu Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 30, 1986, Ser. No. 824,145
Claims priority, application Japan, Aug. 2, 1985, 60-33074
Term of patent 14 years
U.S. Cl. D14—100



298,325
COMBINED CARD READER AND DATA ENTRY TERMINAL OR SIMILAR ARTICLE
Hiromi Isozaki; Junnosuke Takeda, and Tadashi Kubo, all of Kanagawa, Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Oct. 18, 1985, Ser. No. 789,053
Claims priority, application Japan, May 2, 1985, 60-17922
Term of patent 14 years
U.S. Cl. D14—105



298,326
MEMORY CARD FOR A COMPUTER SYSTEM
Masatoshi Kimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1986, Ser. No. 845,810
Claims priority, application Japan, Oct. 16, 1985, 60-43638
Term of patent 14 years
U.S. Cl. D14—114

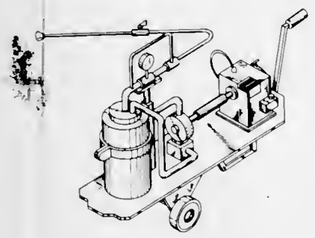


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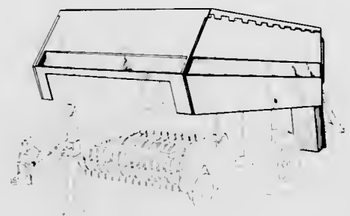
298,327
MEMORY CARD FOR A COMPUTER SYSTEM
Masatoshi Kimura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1986, Ser. No. 845,811
Claims priority, application Japan, Oct. 16, 1985, 60-43639
Term of patent 14 years
U.S. Cl. D14—114

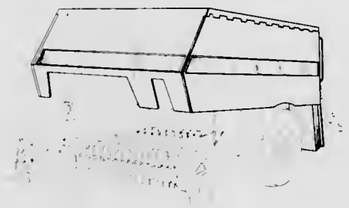


298,328
PORTABLE ORCHARD SPRAYER
Charles E. Keough, and Jewel Keough, both of Rte. 4, Box 300, Coldwater, Miss. 38618
Filed Jun. 25, 1986, Ser. No. 878,496
Term of patent 14 years
U.S. Cl. D15—13

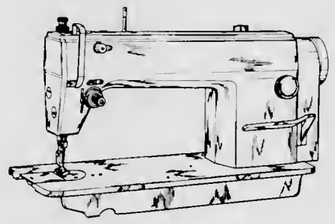


298,329
SHIELDING FOR AGRICULTURAL BALERS
Robert R. Todd, Leola, and Constantine J. Kermes, Lancaster, both of Pa., assignors to New Holland Inc., New Holland, Pa.
Filed Feb. 26, 1986, Ser. No. 836,184
Term of patent 14 years
U.S. Cl. D15—33

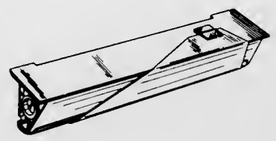




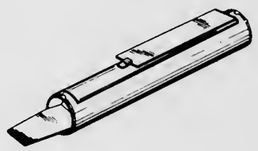
298,330
SEWING MACHINE
Shigemasa Kato, and Sanae Takada, both of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1986, Ser. No. 834,490
Claims priority, application Japan, Sep. 5, 1985, 60-37555
Term of patent 14 years
U.S. Cl. D15—69



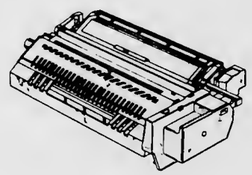
298,331
TONER CARTRIDGE FOR A COPYING MACHINE
Ichirou Takahashi, Moriguchi, and Masanobu Maeshima, Sakai, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Feb. 4, 1986, Ser. No. 826,050
Claims priority, application Japan, Dec. 6, 1985, 60-51045
Term of patent 14 years
U.S. Cl. D16—32



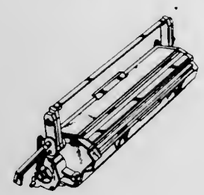
298,332
TONER CARTRIDGE FOR A COPYING MACHINE
Toshio Yoshiyama, Sakai, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Feb. 28, 1986, Ser. No. 838,048
Claims priority, application Japan, Sep. 20, 1985, 60-39731
Term of patent 14 years
U.S. Cl. D16—32



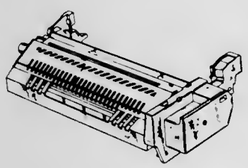
298,333
PROCESS KIT FOR ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Kawasaki, and Naoki Tashiro, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 16, 1986, Ser. No. 819,307
Claims priority, application Japan, Jul. 19, 1985, 60-30945
Term of patent 14 years
U.S. Cl. D16—32



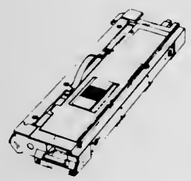
298,334
DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Kawasaki, and Naoki Tashiro, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 16, 1986, Ser. No. 819,308
Claims priority, application Japan, Jul. 19, 1985, 60-30946
Term of patent 14 years
U.S. Cl. D16—32



298,335
DRUM KIT FOR ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Kawasaki, and Naoki Tashiro, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 16, 1986, Ser. No. 819,309
Claims priority, application Japan, Jul. 19, 1985, 60-30947
Term of patent 14 years
U.S. Cl. D16—32

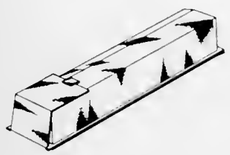


298,336
DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHIC COPIER
Nobuo Masaki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 8, 1986, Ser. No. 850,912
Claims priority, application Japan, Oct. 12, 1985, 60-42850
Term of patent 14 years
U.S. Cl. D16—32



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298,337
TONER CARTRIDGE
Masahide Iseki, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Feb. 5, 1986, Ser. No. 826,412
Claims priority, application Japan, Sep. 20, 1985, 60-39729
Term of patent 14 years
U.S. Cl. D16—32



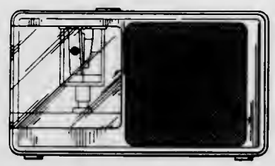
298,338
RANGE FINDING DEVICE FOR CLOSE-UP
Michio Yoshida, Tokyo, and Isao Nakazawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1985, Ser. No. 813,959
Claims priority, application Japan, Jul. 8, 1985, 60-29009
Term of patent 14 years
U.S. Cl. D16—38



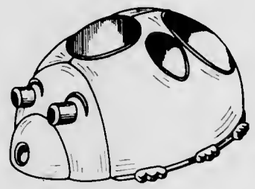
298,339
TAPE DISPENSER
Peter M. Eisenberg, Minneapolis, and Richard H. Schmidt, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 9, 1986, Ser. No. 862,387
Term of patent 14 years
U.S. Cl. D19—67



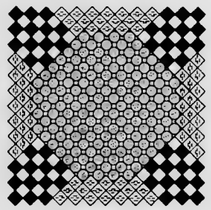
298,340
CORDLESS PENCIL SHARPENER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Aug. 13, 1985, Ser. No. 765,110
Claims priority, application United Kingdom, Mar. 6, 1985, 1025398
Term of patent 14 years
U.S. Cl. D19—73



298,341
DESK ORGANIZER
Clive W. Warwicker, Cookley, Nr. Kidderminster, England, assignor to Helix Limited, Stourbridge, England
Filed Nov. 8, 1985, Ser. No. 803,886
Claims priority, application United Kingdom, May 8, 1985, 1026708; Jul. 17, 1985, 1027979
Term of patent 14 years
U.S. Cl. D19—75



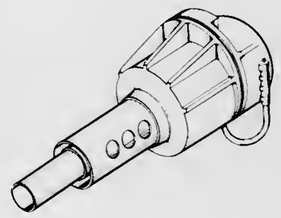
298,342
GAME BOARD
Antoine T. Haddad, 9853 Waller Court, Richmond, British Columbia, Canada V7E 5S9
Filed Nov. 25, 1985, Ser. No. 806,334
Claims priority, application Canada, Aug. 8, 1985, 08-08-85-11
Term of patent 14 years
U.S. Cl. D21—24



298,343
GAME BOARD
Antoine T. Haddad, 9853 Waller Court, Richmond, B.C., Canada V7E 5S9
Filed Nov. 25, 1985, Ser. No. 806,335
Claims priority, application Canada, Aug. 20, 1985, 20-08-85-5
Term of patent 14 years
U.S. Cl. D21—33



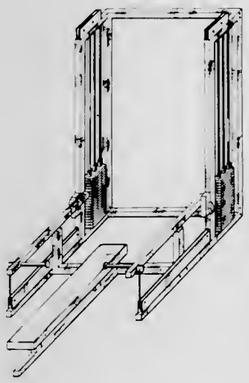
298,344
GUN FOR AN AMUSEMENT RIDE
Bruce A. Sellner, Faribault, Minn., assignor to Sellner Productions, Inc., Faribault, Minn.
Filed Nov. 7, 1985, Ser. No. 803,937
Term of patent 14 years
U.S. Cl. D21—146



298,345
MOVEABLE FIGURES TOY
Norman S. Ko, Honolulu, Hi., assignor to Sun Ming Enterprise Co., Honolulu, Hi.
Filed Sep. 30, 1985, Ser. No. 782,007
Term of patent 14 years
U.S. Cl. D21—149



298,346
EXERCISE FRAMES OR SIMILAR ARTICLE
David Ringel, 72 Halstead St., Clinton, N.J. 08809, and Kenneth Domzalski, 2250 Plainfield Ave., Piscataway, N.J. 08854
Filed Dec. 4, 1985, Ser. No. 804,545
Term of patent 14 years
U.S. Cl. D21—191

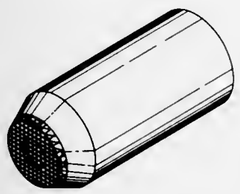


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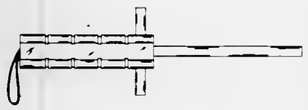
298,347
LAUNCHING DEVICE
Dany Peretz, 3957 Moody St., St. Petersburg Beach, Fla. 33706
Filed Mar. 21, 1986, Ser. No. 845,428
Term of patent 14 years
U.S. Cl. D21—210



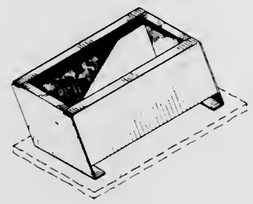
298,348
CARTRIDGE CASE FOR A BLACK POWDER OR PRIMITIVE WEAPON
Rickey M. Posey, 526 Noojin St., Attalla, Ala. 35954
Filed Oct. 24, 1985, Ser. No. 791,094
Term of patent 14 years
U.S. Cl. D22—116



298,349
FISH HOOK REMOVER
Steven J. Kolar, 3217 S. 130th Cir., Omaha, Nebr. 68144, and Joseph P. Negrete, 4211 S. 17th St., Omaha, Nebr. 68107
Filed Feb. 26, 1986, Ser. No. 836,592
Term of patent 14 years
U.S. Cl. D22—149



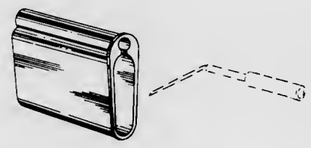
298,350
COVER FOR A TRANSPORT REFRIGERATION UNIT
Daniel T. Neimy, and Jerry A. Brownfield, both of Minneapolis, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed Apr. 16, 1986, Ser. No. 852,911
Term of patent 14 years
U.S. Cl. D23—325



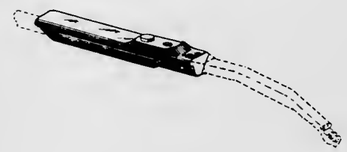
298,351
HUMIDIFIER
Russell E. Ihlenfeld, Reedsburg, and Joseph T. Reeder, Wisconsin Dells, both of Wis., assignors to Gerber Products Company, Fremont, Mich.
Filed Nov. 14, 1986, Ser. No. 931,301
Term of patent 14 years
U.S. Cl. D23—356



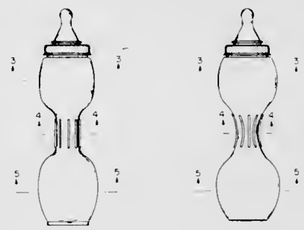
298,352
HYPODERMIC NEEDLE GUARD
Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.
Filed Apr. 28, 1986, Ser. No. 858,230
Term of patent 14 years
U.S. Cl. D24—25



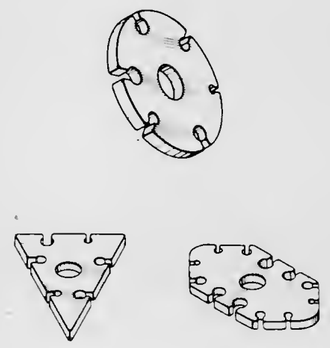
298,353
HANDLE FOR SURGICAL INSTRUMENT
Joseph J. Manno, La Jolla, Calif., assignor to Vitalmetrics, Inc., San Diego, Calif.
Filed May 6, 1986, Ser. No. 860,755
Term of patent 14 years
U.S. Cl. D24—30



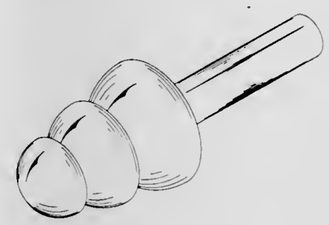
298,354
BABY BOTTLE
April Viator, 1606 E. Patout, New Iberia, La. 70560
Filed May 19, 1986, Ser. No. 864,908
Term of patent 14 years
U.S. Cl. D24—47



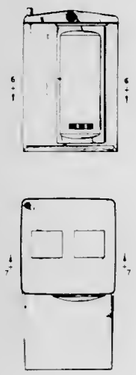
298,355
MULTIPLE I.V. HOLDER
Bette J. Young, 215 #3 Selby Ranch Rd., Sacramento, Calif.
Filed Mar. 3, 1986, Ser. No. 841,364
Term of patent 14 years
U.S. Cl. D24—53



298,356
EARPLUG OR SIMILAR ARTICLE
Robert N. Falco, Indianapolis, Ind., assignor to Cabot Corporation, Waltham, Mass.
Filed Aug. 22, 1985, Ser. No. 768,356
Term of patent 14 years
U.S. Cl. D24—67

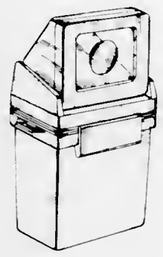


298,357
PORTABLE TOILET FOR HANDICAPPED INDIVIDUALS
William A. Adams, Rochester, Ind., assignor to Olympic Fiberglass Industries, Inc., Rochester, Ind.
Filed Aug. 20, 1985, Ser. No. 767,519
Term of patent 14 years
U.S. Cl. D25—16



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298,358
ADJUSTABLE LAMP
Peter F. Connolly, Parsippany, N.J., assignor to Alupower, Inc., Bernardsville, N.J.
Filed Nov. 18, 1985, Ser. No. 805,372
Term of patent 14 years
U.S. Cl. D26—44

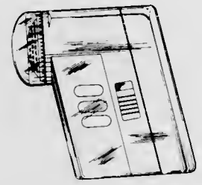


298,359
AUTOMOBILE TAILLIGHT
Yasuji Oda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 6, 1985, Ser. No. 805,558
Term of patent 14 years
U.S. Cl. D26—35

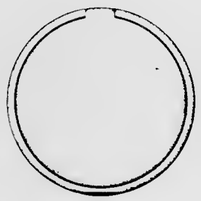
298,360
WALL SCONCE
Romeo Dacanay, Schaumburg; Mark F. Wilson, Addison, and James Vafal, Hoffman Estates, all of Ill., assignors to Cooper Industries, Houston, Tex.
Filed Jun. 11, 1986, Ser. No. 873,230
Term of patent 14 years
U.S. Cl. D26—85

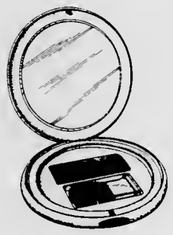


298,361
ELECTRIC LINT REMOVER FOR CUTTING FABRIC PILLS
Arnold Thaler, 7041 S. 7th St., Plantation, Fla. 33317
Filed Mar. 12, 1987, Ser. No. 25,083
Term of patent 14 years
U.S. Cl. D28—50



298,362
COSMETIC COMPACT
Alain Filiz, New York, N.Y., and Salvatore J. Ascolese, Edison, N.J., assignors to L'Oreal S.A., Paris, France
Filed Apr. 10, 1986, Ser. No. 851,384
Term of patent 14 years
U.S. Cl. D28—82





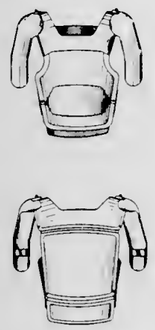
298,363
LIPSTICK CASE
Susan D. Freeman, New York, N.Y., assignor to L'Oreal S.A., Paris, France
Filed May 23, 1986, Ser. No. 867,269
Term of patent 14 years
U.S. Cl. D28—85



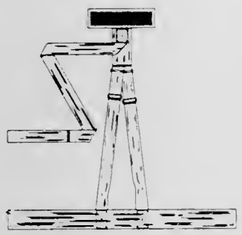
298,364
LIPSTICK CASE
Theodore Simonetti, New York, N.Y., assignor to L'Oreal S.A., Paris, France
Filed Jun. 17, 1986, Ser. No. 875,744
Term of patent 14 years
U.S. Cl. D28—85



298,365
UPPER TORSO PROTECTOR
Franco Acerbis, Via Volta, 5, Albino (Bergamo), Italy
Filed Feb. 13, 1986, Ser. No. 834,012
Term of patent 14 years
U.S. Cl. D29—10

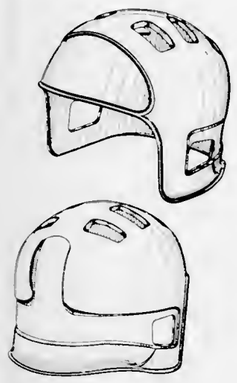


298,366
INFANT HARNESS OR THE LIKE
Donald A. Zimmerman, Sanford, N.C., assignor to Tot-Safe, Inc., Sanford, N.C.
Filed Mar. 20, 1986, Ser. No. 845,393
Term of patent 14 years
U.S. Cl. D29—11

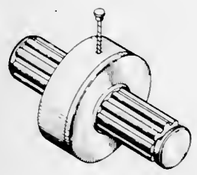


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298,367
HELMET
Roger M. Ball, Toronto, Canada, assignor to Cooper Canada Limited, Toronto, Canada
Filed Feb. 14, 1986, Ser. No. 834,035
Claims priority, application Canada, Jun. 1, 1986, 06-01-86-6
Term of patent 14 years
U.S. Cl. D29—15



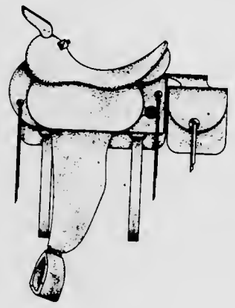
298,368
RETRACTABLE LEASH
Louis J. Musetti, 3455 7th Ave., Carmel, Calif. 93923
Filed Jun. 20, 1986, Ser. No. 877,397
Term of patent 14 years
U.S. Cl. D30—153



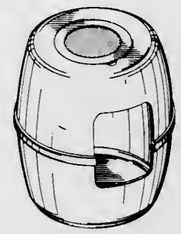
298,369
ANIMAL FECES SCOOP
James S. Shun, and Sandra L. Shun, both of Rte. 2, Box 238F, Buffalo, Minn. 55313
Filed Jul. 25, 1986, Ser. No. 889,503
Term of patent 14 years
U.S. Cl. D30—162



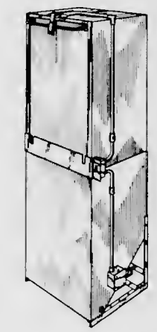
298,370
COMBINED SADDLE AND STEREO RADIO
Dale A. Westerbeek, Rte. 1, Box 898, Bloomfield, N. Mex. 87413
Filed Feb. 11, 1985, Ser. No. 700,669
Term of patent 14 years
U.S. Cl. D30—135

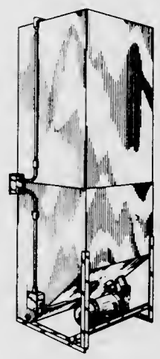


298,371
PORTABLE VENTILATED PET STATION
Connie E. Reynolds, 5640 E. Windsor, Scottsdale, Ariz. 85257
Filed Oct. 10, 1986, Ser. No. 917,838
Term of patent 14 years
U.S. Cl. D30—161

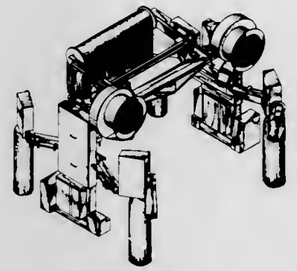


298,372
SPRAY CABINET WASHER FOR AUTOMOTIVE MACHINE PARTS, TOOLS OR THE LIKE
Joseph R. Taylor, Jr., Rte. 2, Box 111, Richlands, N.C. 28574
Filed Aug. 7, 1985, Ser. No. 763,339
Term of patent 14 years
U.S. Cl. D32—1

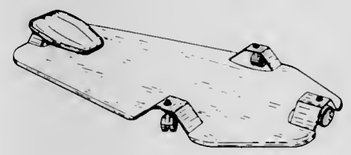




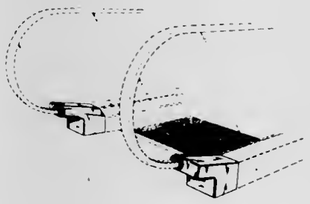
298,373
VEHICLE WASH AND DRYER
James A. Nelson, Des Moines, Iowa, assignor to Ryko Manufacturing Company
Filed Aug. 26, 1985, Ser. No. 769,667
Term of patent 14 years
U.S. Cl. D32—4



298,374
MECHANIC'S CREEPER
Jerry O. Hamrick, 200 Burnham Ct. #C, Campbell, Calif. 95008
Filed Oct. 28, 1985, Ser. No. 791,742
Term of patent 14 years
U.S. Cl. D34—23

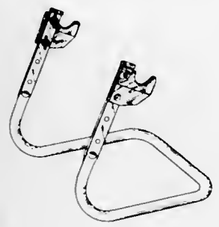


298,375
PAIR OF ESCALATOR CONTROL BOXES
Dietrich Herrmann, Vechelde, and Rido Busse, Elchingen, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.
Filed Feb. 8, 1985, Ser. No. 699,708
Term of patent 14 years
U.S. Cl. D34—30

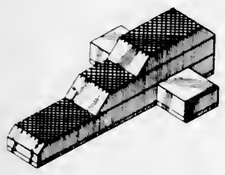


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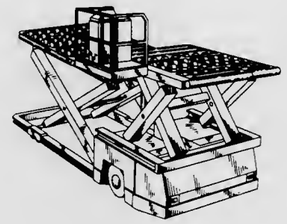
298,376
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William H. Patten, 1745 London Cir., Sparks, Nev. 89431
Filed Nov. 15, 1985, Ser. No. 805,216
Term of patent 14 years
U.S. Cl. D34—31



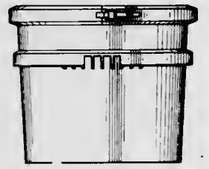
298,377
T SHAPED JACK
William D. Murray, Jr., Rte. 1, Box 744, Avinger, Tex. 75630
Filed Jul. 21, 1986, Ser. No. 887,648
Term of patent 14 years
U.S. Cl. D34—31



298,378
AIRCRAFT LOADER
Paul D. Eckstedt, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.
Filed Apr. 25, 1986, Ser. No. 857,571
Term of patent 14 years
U.S. Cl. D34—34



298,379
DRUM
Bernardus A. Lesscher, Harbrinkhoek, Netherlands; Edward H. Hamilton, Wilmington, Del., and Ralph M. Onstenk, Papendrecht, Netherlands, assignors to Wavin B.V., Zwolle, Netherlands
Filed Dec. 10, 1984, Ser. No. 679,686
Claims priority, application Hague, Oct. 10, 1984, 004289
Term of patent 14 years
U.S. Cl. D34—39



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TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF NOVEMBER, 1988

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Abe, Shinya: *See—*
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Abrahamsson, Rolf; and Berencreutz, Mats, to Molnlycke AB Readily tearable package for sterile articles. 4,781,297, Cl. 206-610.000.

Ace, Ronald S. Modular optical manufacturing system. 4,781,452, Cl. 351-177.000.

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Ackeret, Peter, to Licinvest AG. Container for accommodating a pile of pictures. 4,780,976, Cl. 40-511.000.

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Aggarwal, Raj K.: *See—*
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Ahlbeck, Irving, III: *See—*
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Ahroni, Joseph M. Electric plug with snap-fitted housing components. 4,781,614, Cl. 439-391.000.

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Air Products and Chemicals, Inc.: *See—*
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Allington, Robert W.; Brunken, Wylee D.; and Sedlak, Lawrence L., to Isco, Inc. Gel scanner. 4,781,464, Cl. 356-419.000.

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Thermal Dynamics Corporation: *See*—
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Thiele, Jurgen; and Zeikus, Joseph G., to Michigan Biotechnology Institute. Method for biomethanation. 4,781,836, Cl. 210-603.000.
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Yoshihara, Muneaki, to Kinki Sharyo Kabushiki Kaisha. Construction of articulating portion of articulated railway cars or the like. 4,781,123, Cl. 105-8.100.
Yoshimura, Hironori; and Kato, Munenori, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface-coated cutting member. 4,781,989, Cl. 428-552.000.
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Zanno, Paul R.; Barnett, Ronald E., and Roy, Glenn M., to General Foods Corporation. Sweetening with l-aminodicarboxylic acid esters. 4,781,927, Cl. 426-003.000.
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Lawrence, James, to Sanders Associates, Inc. Pinch roller assembly. Re. 32,775, Cl. 346-136.000.

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Saylor, Richard, to IDR, Incorporated. Piggy back row grabbing system. Re. 32,776, Cl. 358-142.000.

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309 4,781,021
337 4,781,020
489 4,781,022
506 4,781,023
533 4,781,024
536 4,781,025
547.1 4,781,026
602 4,781,027
612 4,781,028
641.7 4,781,029
743 4,781,030

CLASS 62

18 4,781,738
22 4,781,739
255 4,781,031
498 4,781,032
514 JT 4,781,033
514 R 4,781,034

CLASS 63

4 4,781,035
12 4,781,036
13 4,781,037
26 4,781,038

CLASS 65

3.12 4,781,740
21.2 4,781,741
29 4,781,742
30.13 4,781,743
33 4,781,744
323 4,781,745
332 4,781,746
348 4,781,747

CLASS 66

9 A 4,781,039
121 4,781,040

CLASS 68

18 F 4,781,041

CLASS 70

14 4,781,042
54 4,781,043
177 4,781,044

CLASS 71

28 4,781,748
4,781,749
85 4,781,750
103 4,781,751
121 4,781,752

CLASS 72

31 4,781,045
58 4,781,046
84 4,781,047
146 4,781,048
220 4,781,049
241 4,781,050
247 4,781,051
4,781,052
273.5 4,781,053
306 4,781,054
402 4,781,055

CLASS 73

1 B 4,781,056
49.2 4,781,057
84 4,781,058
117.3 4,781,059
146 4,781,060
149 4,781,061
152 4,781,062
159 4,781,063
168 4,781,064
198 4,781,065
239 4,781,066
620 4,781,067
861.38 4,781,068
4,781,069
861.72 4,781,070

CLASS 74

50 4,781,071
318 4,781,072
440 4,781,073
476 4,781,074
567 4,781,075
4,781,076
573 F 4,781,077
711 4,781,078
4,781,079
867 4,781,080
868 4,781,081

CLASS 75

0.5 B 4,781,753
4,781,754
10.19 4,781,755
66 4,781,756

CLASS 81

53.2 4,781,082
63.1 4,781,083
111 4,781,084
177.85 4,781,085
476 4,781,086

CLASS 83

18 4,781,087
38 4,781,088
51 4,781,089
74 4,781,090
107 4,781,091
153 4,781,092
176 4,781,093
488 4,781,094
502 4,781,095

CLASS 84

1.01 4,781,096
1.13 4,781,097
470 R 4,781,099

CLASS 89

33.04 4,781,100
36.09 4,781,101

CLASS 91

41 4,781,102
171 4,781,103
497 4,781,104

CLASS 92

29 4,781,105

CLASS 98

2.18 4,781,106
33.1 4,781,107
36 4,781,108

CLASS 99

483 4,781,109

CLASS 100

26 4,781,110
99 4,781,111

CLASS 101

38 A 4,781,112
93.04 4,781,113
123 4,781,114
425 4,781,115
4,781,116

CLASS 102

493 4,781,117
496 4,781,118

CLASS 104

93 4,781,119
118 4,781,120
279 4,781,121

CLASS 105

8.1 4,781,123
168 4,781,124
250 4,781,125

CLASS 106

11 4,781,757
22 4,781,758
36 4,781,759
89 4,781,760
446 4,781,761

CLASS 108

6 4,781,126
137 4,781,127

CLASS 110

102 4,781,128

CLASS 111

73 4,781,129

CLASS 112

121.12 4,781,130
130 4,781,131
228 4,781,132
264.1 4,781,133
451 4,781,134

CLASS 114

56 4,781,135
4,781,136
102 4,781,137
221 R 4,781,138
222 4,781,139
244 4,781,140
288 4,781,141
304 4,781,142
353 4,781,143
365 4,781,144

CLASS 118

620 4,781,145

CLASS 119

15 4,781,146
17 4,781,147
19 4,781,148
27 4,781,149
98 4,781,150

CLASS 122

26 4,781,151

CLASS 123

41.35 4,781,152
59 BS 4,781,153
65 VD 4,781,154
70 V 4,781,155
192 R 4,781,156
193 CH 4,781,158
193 H 4,781,157
193 P 4,781,159
198 F 4,781,160
339 4,781,161
399 4,781,162
492 4,781,163
533 4,781,164
555 4,781,165
597 4,781,166

CLASS 124

23 R 4,781,167
24 R 4,781,168

CLASS 126

21 A 4,781,169
39 E 4,781,170
343.5 A 4,781,171
378 4,781,172
433 4,781,173
452 4,781,174

CLASS 128

77 4,781,178
80 C 4,781,179
4,781,180
92 VD 4,781,182
92 YP 4,781,183
92 YZ 4,781,181
205.12 4,781,184
303.1 4,781,185
303.17 4,781,175
305 4,781,186
4,781,187
4,781,188
327 4,781,189
334 R 4,781,190
4,781,191
344 4,781,192
402 4,781,193
419 PG 4,781,194
633 4,781,195
642 4,781,196
644 4,781,197
654 4,781,198
660.01 4,781,199
670 4,781,200
671 4,781,201
754 4,781,202
897 4,781,177

CLASS 131

79 4,781,203
276 4,781,762
282 4,781,204

CLASS 134

26 4,781,763
34 4,781,764
131 4,781,205
174 4,781,206

CLASS 136

249 4,781,765
258 4,781,766
265 4,781,767

CLASS 137

13 4,781,207
110 4,781,208
119 4,781,209
202 4,781,218
315 4,781,210
383 4,781,211
515.7 4,781,212
516.29 4,781,213
527 4,781,214
580 4,781,215
614.19 4,781,216
624.14 4,781,217
625.24 4,781,219
625.65 4,781,220

CLASS 139

116 4,781,221
307 4,781,222
420 R 4,781,223
435 4,781,224
452 4,781,225
453 4,781,226

CLASS 140

92.1 4,781,227

CLASS 144

2 Z 4,781,228
213 4,781,229
372 4,781,230

CLASS 148

16.5 4,781,770
29 4,781,769
403 4,781,771
404 4,781,772

CLASS 150

52 K 4,781,231

CLASS 152

540 4,781,232

CLASS 156

69 4,781,773
79 4,781,774
89 4,781,775
187 4,781,776
4,781,777
196 4,781,778
219 4,781,779
287 4,781,780
328 4,781,781
361 4,781,782
382 4,781,783
394.1 4,781,784
448 4,781,785
468 4,781,786
507 4,781,787
630 4,781,788
633 4,781,789
4,781,790
659.1 4,781,791
663 4,781,792

CLASS 157

16 4,781,233

CLASS 160

23.1 4,781,234
269 4,781,235

CLASS 162

55 4,781,793
199 4,781,794
359 4,781,795

CLASS 164

40 4,781,236
255 4,781,237
415 4,781,238
475 4,781,122
486 4,781,239

CLASS 165

1 4,781,240
4,781,241
32 4,781,242

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47 4,781,243
80.4 4,781,244
94 4,781,245
104.12 4,781,246
104.32 4,781,247
167 4,781,248

CLASS 166

187 4,781,249
240 4,781,250
274 4,781,251

CLASS 169

68 4,781,252

CLASS 172

508 4,781,253
730 4,781,254

CLASS 174

52 PE 4,782,195
68.5 4,782,193
97 4,781,255
107 4,782,194
131 A 4,782,196
152 R 4,782,197
182 4,782,198
189 4,782,199

CLASS 175

329 4,781,256

CLASS 180

9.5 4,781,257
68.1 4,781,258
75 4,781,259
89.12 4,781,260
140 4,781,261
4,781,262
143 4,781,263
219 4,781,264
233 4,781,265
248 4,781,266
268 4,781,267
287 4,781,268

CLASS 182

5 4,781,269

CLASS 187

56 4,781,270

CLASS 188

32 4,781,271
73.1 4,781,272
73.42 4,781,273
82.1 4,781,274
251 A 4,781,275
361 4,781,276

CLASS 190

1 4,781,277
107 4,781,278

CLASS 192

3.3 4,781,279
70.27 4,781,280

CLASS 198

365 4,781,281
414 4,781,282
460 4,781,283
497 4,781,284
774 4,781,285
789 4,781,286
803.01 4,781,287

CLASS 200

16 A 4,782,200
61.44 4,782,201

CLASS 202

117 4,781,796
173 4,781,797

CLASS 204

1 T 4,781,798
9 4,781,799
15 4,781,800
25 4,781,801
37.1 4,781,802
129 4,781,803
141.5 4,781,804
149 4,781,805
4,781,806
157.98 4,781,807
181.7 4,781,808
182.4 4,781,809
228 4,781,810
273 4,781,811
279 4,781,812
297 W 4,781,813

CLASS 206

0.83 4,781,290
23.5 4,781,291
37 4,781,288
45.24 4,781,289
309 4,781,292
441 4,781,293
469 4,781,294
524.6 4,781,295
610 4,781,296
4,781,297

CLASS 208

112 4,781,814
120 4,781,815
4,781,816
216 R 4,781,817
251 R 4,781,818
309 4,781,819
333 4,781,820

CLASS 209

3 4,781,298
214 4,781,821
459 4,781,822

CLASS 210

86 4,781,823
101 4,781,824
107 4,781,825
139 4,781,826
169 4,781,827
225 4,781,828
231 4,781,829
232 4,781,830
247 4,781,831
321.8 4,781,832
321.81 4,781,833
321.88 4,781,834
331 4,781,835
603 4,781,836
640 4,781,837
692 4,781,838
725 4,781,839
730 4,781,840
747 4,781,841
751 4,781,842
764 4,781,843

CLASS 211

144 4,781,299

CLASS 219

68 4,782,202
69 E 4,782,203
74 4,782,204
4,782,205
76.14 4,782,206
84 4,782,207
121.52 4,782,210
121.64 4,782,209
121.72 4,782,208
137 R 4,782,211
299 4,782,212
372 4,782,213
401 4,782,214
494 4,782,215
547 4,782,216

CLASS 220

7 4,781,300
72 4,781,301
94 R 4,781,302
269 4,781,303
280 4,781,304

CLASS 221

23 4,781,305
33 4,781,306
131 4,781,307

CLASS 222

56 4,781,308
129.1 4,781,309
4,781,310
153 4,781,311
309 4,781,312
464 4,781,313
465.1 4,781,314

CLASS 224

165 4,781,315

CLASS 225

71 4,781,316

CLASS 226

27 4,781,317

CLASS 227

67 4,781,318

CLASS 228

4.5 4,781,319
183 4,781,320

CLASS 229

1.5 B 4,781,321
73 4,781,322
123.3 4,781,323

CLASS 235

380 4,782,217
449 4,782,218
462 4,782,219
463 4,782,220
494 4,782,221

CLASS 236

15 BF 4,781,324
58 4,781,325

CLASS 239

2.1 4,781,326
203 4,781,327
230 4,781,328
305 4,781,329

CLASS 241

236 4,781,331

CLASS 242

18 DD 4,781,332
4,781,333
35.5 A 4,781,334
54 R 4,781,335
58.6 4,781,336
71.1 4,781,337
131 4,781,338
199 4,781,339
4,781,340

CLASS 244

13 4,781,341
137.4 4,781,342
145 4,781,343
154 4,781,344
155 R 4,781,345

CLASS 248

1 R 4,781,346
183 4,781,347
218.4 4,781,348
249 4,781,349
286 4,781,350
291 4,781,351
309.4 4,781,352
395 4,781,353
429 4,781,354
441.1 4,781,355

CLASS 250

211 J 4,782,222
214 R 4,782,223
221 4,782,224
223 R 4,782,225
227 4,782,226
236 4,782,228
237 G 4,782,229
327.2 4,782,227
338.1 4,782,230
343 4,782,232
363 S 4,782,233
372 4,782,234
423 R 4,782,235
432 PD 4,782,231
440.1 4,782,236
486.1 4,782,237
561 4,782,238
4,782,239

CLASS 251

8 4,781,356

CLASS 252

8.551 4,781,845
8.6 4,781,844
49.3 4,781,846
4,781,847
49.5 4,781,848
4,781,849
49.6 4,781,850
62.56 4,781,851
62.59 4,781,852
79.5 4,781,853
100 4,781,854
135 4,781,855
174.19 4,781,856
299.61 4,781,857
315.2 4,781,858
520 4,781,859
628 4,781,860

CLASS 260

349 4,781,861
369 4,781,862
404.5 4,781,863
420 4,781,864
502.5 D 4,781,865
506 4,781,866
543 P 4,781,867
549 4,781,868

CLASS 261

109 4,781,869

CLASS 264

1.9 4,781,870
4.3 4,781,871
40.5 4,781,872
44 4,781,873
65 4,781,874
157 4,781,875
261 4,781,876
266 4,781,877
267 4,781,878
328.12 4,781,879
541 4,781,880

CLASS 266

45 4,781,357
80 4,781,358

CLASS 267

71 4,781,359
91 4,781,360
140.1 4,781,361
219 4,781,362
225 4,781,363
260 4,781,364
294 4,781,365

CLASS 270

31 4,781,366
45 4,781,367

CLASS 271

267 4,781,369
270 4,781,368
277 4,781,370
293 4,781,371

CLASS 272

70 4,781,372
126 4,781,373
134 4,781,374

CLASS 273

15 R 4,781,375
26 A 4,781,376
86 R 4,781,377
138 R 4,781,378
148 R 4,781,379
153 S 4,781,380
157 A 4,781,381
183 B 4,781,382
228 4,781,383
285 4,781,384
411 4,781,385
422 4,781,386

CLASS 277

12 4,781,387
53 4,781,388
235 B 4,781,389

CLASS 279

4 4,781,390

CLASS 280

5.2 4,781,391
414.1 4,781,392
422 4,781,393
477 4,781,394
610 4,781,395
653 4,781,396
655 4,781,397
673 Re.32,774
784 4,781,398

CLASS 285

8 4,781,399
39 4,781,400
44 4,781,401
47 4,781,402
94 4,781,403
4,781,404
178 4,781,405
408 4,781,406

CLASS 292

37 4,781,407

CLASS 294

99.2 4,781,408

CLASS 296

97.6 4,781,409
217 4,781,410

CLASS 297

184 4,781,411
238 4,781,412
252 4,781,413
313 4,781,414
362 4,781,415
4,781,416
458 4,781,417

CLASS 299

23 4,781,418

CLASS 301

108 A 4,781,419

CLASS 303

9.69 4,781,420
115 4,781,421

CLASS 307

10 BP 4,782,240
66 4,782,241
106 4,782,242
4,782,243
116 4,782,244
147 4,782,245
262 4,782,246
449 4,782,247
455 4,782,248
469 4,782,249
473 4,782,250
475 4,782,251
576 4,782,252
602 4,782,253

CLASS 310

45 4,782,254
68 R 4,782,255
83 4,782,256
114 4,782,257
119 4,782,258
156 4,782,259
216 4,782,260
242 4,782,261
323 4,782,262

CLASS 312

72 4,781,422
183 4,781,423

CLASS 313

409 4,782,263
413 4,782,264
483 4,782,265
631 4,782,266

CLASS 315

111.81 4,782,267
200 R 4,782,268
371 4,782,269
399 4,782,270

CLASS 318

113 4,782,271
254 4,782,272
568 4,782,273
4,782,274
569 4,782,275
685 4,782,276
696 4,782,277
786 4,782,278

CLASS 320

46 4,782,279

CLASS 323

276 4,782,280

CLASS 324

57 Q 4,782,281
61 R 4,782,282
71.3 4,782,302
73 R 4,782,283
77 B 4,782,284
98 4,782,285
137 4,782,286
142 4,782,287
158 D 4,782,290
158 F 4,782,289
4,782,291
158 R 4,782,288
4,782,292
205 4,782,293
206 4,782,294
306 4,782,295
316 4,782,296
4,782,297
322 4,782,298
501 4,782,299
509 4,782,300
550 4,782,301

CLASS 328

228 4,782,303
233 4,782,304

CLASS 330

107 4,782,305
151 4,782,307
262 4,782,306

CLASS 331

65 4,782,308
139 4,782,309

CLASS 333

167 4,782,310
4,782,311
4,782,312
4,782,313
252 4,782,314

CLASS 335

234 4,782,315
299 4,782,316

CLASS 337

251 4,782,317
380 4,782,318

CLASS 338

4 4,782,319
295 4,782,320

CLASS 340

63 4,782,321
310 A 4,782,322
365 P 4,782,327
4,782,328
541 4,782,330
583 4,782,331
603 4,782,332
610 4,782,333
634 4,782,334
709 4,782,335
752 4,782,336
4,782,337
754 4,782,338
791 4,782,339
825.830 4,782,340
870.02 4,782,341
941 4,782,342

CLASS 341

6 4,782,329
55 4,782,325
76 4,782,326
147 4,782,324
150 4,782,323

CLASS 342

160 4,782,343
351 4,782,344

CLASS 343

727 4,782,345
795 4,782,346

CLASS 346

1.1 4,782,347
107 R 4,782,348
136 Re.32,775
139 R 4,782,349
140 R 4,782,350
4,782,351
160.1 4,782,352

CLASS 350

96.15 4,781,425
96.16 4,781,426
4,781,427
96.19 4,781,428
96.20 4,781,429
4,781,430
96.21 4,781,431
96.23 4,781,432
4,781,433
4,781,434
96.3 4,781,424
130 4,781,435
281 4,781,436
332 4,781,437
339 F 4,781,438
341 4,781,439
347 V 4,781,440
350 S 4,781,441
354 4,781,442
357 4,781,443
4,781,444
409 4,781,445
426 4,781,446
427 4,781,447
429 4,781,448
469 4,781,449

CLASS 351

114 4,781,450
156 4,781,451
177 4,781,452
205 4,781,453

CLASS 354

234.1 4,782,353
322 4,782,354
400 4,782,355
403 4,782,356
414 4,782,357

CLASS 355

3 FU 4,782,359
3 TR 4,782,358
4 4,782,360
14 FU 4,782,362
14 R 4,782,361
14 SH 4,782,363
30 4,782,364
38 4,782,365
40 4,782,366
4,782,367
43 4,782,368
69 4,782,369
76 4,782,370
77 4,782,371

CLASS 356

1 4,781,454

34 4,781,455
51 4,781,456
250 4,781,457
301 4,781,458
335 4,781,459
336 4,781,460
350 4,781,461
4,781,462
371 4,781,465
394 4,781,463
419 4,781,464

CLASS 357

23.4 4,782,372
23.9 4,782,373
24 4,782,374
27 4,782,375
30 4,782,376
4,782,377
34 4,782,378
38 4,782,379
71 4,782,380
74 4,782,381
4,782,382

CLASS 358

12 4,782,383
22 4,782,384
25 4,782,385
76 4,782,390
93 4,782,386
133 4,782,387
142 Re.32,776
160 4,782,388
167 4,782,389
183 4,782,391
4,782,392
209 4,782,393
213.19 4,782,394
227 4,782,396
244 4,782,395
256 4,782,397
280 4,782,398
4,782,399
283 4,782,400
335 4,782,401
343 4,782,402

CLASS 360

66 4,782,403
77 4,782,404
4,782,405
78 4,782,406
85 4,782,407
96.5 4,782,408
4,782,409
98 4,782,410
107 4,782,411
109 4,782,412
113 4,782,413
4,782,414
4,782,415
125 4,782,416
133 4,782,417
4,782,418

CLASS 361

33 4,782,419
58 4,782,420
65 4,782,421
87 4,782,422
127 4,782,423
175 4,782,424
212 4,782,425
218 4,782,426
426 4,782,427

CLASS 362

11 4,782,428
20 4,782,429
32 4,782,430
61 4,782,431
184 4,782,432
186 4,782,433
252 4,782,434
427 4,782,435

CLASS 363

56 4,782,436
4,782,437

CLASS 364

191 4,782,438
200 4,782,439
4,782,440
4,782,441
4,782,442
4,782,443
300 4,782,444
400 4,782,445
421 4,782,446
449 4,782,447
461 4,782,450
464.01 4,782,448
473 4,782,449
510 4,782,451
550 4,782,452
559 4,782,453
567 4,782,454
569 4,782,455
574 4,782,456
715.04 4,782,457
724.16 4,782,458
724.19 4,782,459
807 4,782,460
900 4,782,461
4,782,462
4,782,463
4,782,464

CLASS 365

72 4,782,465
149 4,782,466
154 4,782,467
229 4,782,468

CLASS 366

2 4,781,466
150 4,781,467
213 4,781,468

CLASS 367

157 4,782,469
4,782,470
168 4,782,471

CLASS 368

15 4,782,472

CLASS 369

34 4,782,473
44 4,782,474
45 4,782,475
4,782,476
275 4,782,477

CLASS 370

60 4,782,478
68 4,782,479
76 4,782,480
85 4,782,481
86 4,782,482
90 4,782,483
100 4,782,484
118 4,782,485

CLASS 371

21 4,782,486
4,782,487
27 4,782,488
30 4,782,489
40 4,782,490

CLASS 372

6 4,782,491
34 4,782,492
88 4,782,493
91 4,782,494
99 4,782,495
109 4,782,496

CLASS 373

29 4,782,497

CLASS 374

27 4,781,469

CLASS 375

8 4,782,498
113 4,782,499

CLASS 376

216 4,781,881
271 4,781,882
272 4,781,883
352 4,781,884
444 4,781,885

CLASS 377

6 4,782,500

CLASS 378

4 4,782,501
18 4,782,502
169 4,782,503
173 4,782,504
187 4,782,505

CLASS 379

10 4,782,506
27 4,782,507
67 4,782,508
88 4,782,509
4,782,510
93 4,782,511
98 4,782,512
110 4,782,513
165 4,782,514
172 4,782,515
189 4,782,516
201 4,782,517
4,782,518
221 4,782,519
342 4,782,520
354 4,782,521
368 4,782,522
386 4,782,523
395 4,782,524
410 4,782,525
419 4,782,526
430 4,782,527
455 4,782,528

CLASS 380

44 4,782,529

CLASS 381

1 4,782,530
14 4,782,531
15 4,782,532
24 4,782,533

CLASS 383

7 4,781,470
4,781,471
16 4,781,472
4,781,473
29 4,781,474
119 4,781,475

CLASS 384

136 4,781,476

CLASS 400

124 4,781,477
279 4,781,478
462 4,781,479
691 4,781,480
697.1 4,781,481

CLASS 401

1 4,781,482
55 4,781,483
132 4,781,484

CLASS 402

45 4,781,485

CLASS 403

303 4,781,486
326 4,781,487
408.1 4,781,488

CLASS 404

65 4,781,489
75 4,781,490
95 4,781,491

CLASS 405

16 4,781,492
63 4,781,493
202 4,781,497

CLASS 406

52 4,781,494

CLASS 408

1 R 4,781,495
4,781,496

CLASS 410

118 4,781,498
151 4,781,499

CLASS 411

36 4,781,500
43 4,781,501
87 4,781,502
301 4,781,505
368 4,781,503
387 4,781,506
433 4,781,507
452 4,781,508
512 4,781,504

CLASS 414

52 4,781,509
119 4,781,510
217 4,781,511
222 4,781,512
489 4,781,513
520 4,781,514
534 4,781,515
555 4,781,516
590 4,781,517
724 4,781,518
730 4,781,519
751 4,781,520
754 4,781,521

CLASS 415

1 4,781,522
2 A 4,781,523
27 4,781,524
30 4,781,525
121 G 4,781,526
127 4,781,527
151 4,781,528
168 4,781,529
170 R 4,781,530
212 R 4,781,531

CLASS 416

157 R 4,781,533
193 A 4,781,534
222 4,781,532

CLASS 417

12 4,781,536
53 4,781,535
54 4,781,537
223 4,781,538
269 4,781,539
4,781,540
312 4,781,541
4,781,545
369 4,781,542
378 4,781,543
392 4,781,544
417 4,781,546
444 4,781,547
474 4,781,548

CLASS 418

55 4,781,549
4,781,550
63 4,781,551
72 4,781,552
104 4,781,553

CLASS 419

49 4,781,886

CLASS 420

129 4,781,887
531 4,781,888

CLASS 422

48 4,781,889
56 4,781,890
64 4,781,891
69 4,781,892
4,781,893
106 4,781,894
125 4,781,895
134 4,781,896
265 4,781,897
295 4,781,898

CLASS 423

206 T 4,781,899
210 4,781,900
226 4,781,901
239 4,781,902
244 4,781,903
308 4,781,904
321 S 4,781,905
328 4,781,906
351 4,781,907
447.4 4,781,908
489 Re.32,777
531 4,781,909
573 R 4,781,910
616 4,781,911

CLASS 424

1.1 4,781,912
54 4,781,913
59 4,781,914
4,781,915
61 4,781,916
65 4,781,917
70 4,781,918
78 4,781,919
79 4,781,920
81 4,781,921
92 4,781,922
130 4,781,923
449 4,781,924
465 4,781,925
486 4,781,926

CLASS 425

4 R 4,781,554
4,781,555
62 4,781,556
71 4,781,557
115 4,781,558
133.5 4,781,560
135 4,781,559
4,781,561
141 4,781,562
185 4,781,563
289 4,781,564
378.1 4,781,565
400 4,781,566
406 4,781,567
451 4,781,568
504 4,781,569
547 4,781,570
556 4,781,571
564 4,781,572
577 4,781,573

CLASS 426

69 4,781,928
92 4,781,929
96 4,781,930
003 4,781,927
132 4,781,931
138 4,781,932
242 4,781,933
264 4,781,934
290 4,781,935
429 4,781,936
457 4,781,937
549 4,781,938
646 4,781,939

CLASS 427

2 4,781,940
27 4,781,941
54.1 4,781,942
96 4,781,943
228 4,781,944
255.3 4,781,945
327 4,781,946
385.5 4,781,947
388.1 4,781,948
407.1 4,781,949
421 4,781,950

CLASS 428

17 4,781,951
31 4,781,952
35 4,781,953
4,781,954
4,781,955
43 4,781,956
4,781,957
76 4,781,958
95 4,781,959
109 4,781,967
119 4,781,960
122 4,781,961
138 4,781,962
141 4,781,963
4,781,964
143 4,781,965
152 4,781,966
156 4,781,975
209 4,781,968
4,781,969
210 4,781,970
212 4,781,971
265 4,781,972
266 4,781,973
288 4,781,974
318.6 4,781,976
332 4,781,977
383 4,781,978
390 4,781,979
403 4,781,980
4,781,981
4,781,982
407 4,781,983
418 4,781,984
421 4,781,985
423.7 4,781,986
424.6 4,781,987
450 4,781,988
457 4,781,990
552 4,781,989
626 4,781,991
694 4,781,992
698 4,781,993
703 4,781,994

CLASS 429

13 4,781,995
36 4,781,996
144 4,781,997
214 4,781,999

CLASS 430

60 4,782,000
137 4,782,001
138 4,782,002
4,782,003
203 4,782,004
284 4,782,005
292 4,782,006
313 4,782,007
4,782,008
326 4,782,009
538 4,782,010
544 4,782,012
551 4,782,011
564 4,782,013

CLASS 431

7 4,781,574
90 4,781,575
186 4,781,576
320 4,781,577
347 4,781,578

CLASS 432

10 4,781,579
107 4,781,580
156 4,781,581

CLASS 433

17 4,781,582
39 4,781,583
48 4,781,584
51 4,781,585
57 4,781,586
93 4,781,587
123 4,781,588
127 4,781,589
142 4,781,590
174 4,781,591
181 4,781,592

CLASS 434

22 4,781,593
48 4,781,594
81 4,781,595
236 4,781,596
296 4,781,597
327 4,781,598
364 4,781,599

CLASS 435

7 4,782,014
4,782,015
21 4,782,016
4,782,017
22 4,782,018
89 4,782,019
106 4,782,020
116 4,782,021
172.3 4,782,022
188 4,782,023
247 4,782,024
255 4,782,025

CLASS 436

69 4,782,026
86 4,782,027

CLASS 437

3 4,782,028
33 4,782,030
41 4,782,032
56 4,782,033
94 4,782,034
011 4,782,029
039 4,782,031
129 4,782,035
164 4,782,036
192 4,782,037

CLASS 439

45 4,781,600
77 4,781,601
82 4,781,602
95 4,781,603
101 4,781,604
161 4,781,605
4,781,606
191 4,781,607
212 4,781,608
215 4,781,609
217 4,781,610
259 4,781,611
328 4,781,612
359 4,781,330
391 4,781,613
4,781,614
392 4,781,618
395 4,781,615
409 4,781,616
461 4,781,617
488 4,781,619
497 4,781,620
559 4,781,621
585 4,781,622
610 4,781,623
620 4,781,624
654 4,781,625
680 4,781,626
687 4,781,627
748 4,781,628
822 4,781,629

CLASS 440

24 4,781,630
63 4,781,631
64 4,781,633
66 4,781,632
4,781,634
75 4,781,635

CLASS 441

6 4,781,636
61 4,781,637
129 4,781,638

CLASS 445

43 4,781,639
50 4,781,640
60 4,781,641

CLASS 446

38 4,781,642
75 4,781,643
123 4,781,644
188 4,781,645
219 4,781,646
4,781,647
321 4,781,648
435 4,781,649

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	CLASS 450		192	4,782,050		CLASS 521		345	4,782,133	326	4,782,167		88	4,781,679
55		4,781,650	210	4,782,051	56		4,782,097	483	4,782,134	416	4,782,168		93	4,781,680
79		4,781,651	212	4,782,052	81		4,782,098		CLASS 530	459	4,782,169		96	4,781,681
	CLASS 464		229.2	4,782,066	175		4,782,099	317	4,782,135		CLASS 556			4,781,682
14		4,781,652	231.2	4,782,053		CLASS 522		326	4,782,136	13	4,782,170		110	4,781,683
		4,781,662	235.2	4,782,054	120		4,782,100	328	4,782,137	171	4,782,171			4,781,684
58		4,781,653	241	4,782,055		CLASS 523		366	4,782,138	466	4,782,172		117	4,781,685
89		4,781,654	242	4,782,056			4,782,101	407	4,782,139		CLASS 558		118	4,781,686
	CLASS 474		248	4,782,057	143		4,782,102		CLASS 534	255	4,782,173			4,781,687
28		4,781,655	250	4,782,058		CLASS 524		637	4,782,140	354	4,782,174		132	4,781,688
29		4,781,656	252	4,782,059	83		4,782,103		CLASS 536		CLASS 560		134	4,781,689
49		4,781,663		4,782,060	157		4,782,104	6.5	4,782,141	26	4,782,175		164	4,781,690
78		4,781,657	254	4,782,061	236		4,782,105	23	4,782,142	53	4,782,176			4,781,691
87		4,781,664	262	4,782,062	413		4,782,106	102	4,782,143	060	4,782,177			4,781,692
91		4,781,658	288	4,782,063	433		4,782,107		CLASS 540	301	4,782,178		175	4,781,693
94		4,781,659	296	4,782,064	490		4,782,108	205	4,782,144		CLASS 562			4,781,694
133		4,781,665	299	4,782,065	501		4,782,109	214	4,782,145	456	4,782,179			4,781,695
174		4,781,660	300	4,782,067	522		4,782,110	310	4,782,146	479	4,782,180		189	4,781,696
190		4,781,661	312	4,782,068	539		4,782,111	355	4,782,147	487	4,782,181		192	4,781,697
253		4,781,666	338	4,782,069	837		4,782,112	484	4,782,148	526	4,782,183		218	4,781,699
	CLASS 493		344	4,782,070		CLASS 525		500	4,782,149	560	4,782,182		234	4,781,700
359		4,781,667	353	4,782,071	54.1		4,782,113		CLASS 544		CLASS 564		240	4,781,701
365		4,781,668	363	4,782,072	66		4,782,114	77	4,782,150	307	4,782,184		244	4,781,702
	CLASS 494		381	4,782,073	67		4,782,115	176	4,782,151	406	4,782,185		246	4,781,698
16		4,781,669	400	4,782,074	109		4,782,116		CLASS 546		CLASS 568		264	4,781,703
27		4,781,670	411	4,782,075	146		4,782,117	47	4,782,155	388	4,782,186		270	4,781,704
31		4,781,671		4,782,076	286		4,782,118	67	4,782,152	437	4,782,187		289	4,781,705
	CLASS 501		423	4,782,077	314		4,782,119	81	4,782,153	444	4,782,188		317	4,781,706
304		4,782,038	424	4,782,078	326.6		4,782,120	141	4,782,154	566	4,782,189			4,781,707
		4,782,039	438	4,782,079	334.1		4,782,121	153	4,782,156	584	4,782,190		338	4,781,708
401		4,782,040	450	4,782,081	375		4,782,122	169	4,782,157	630	4,782,191		349	4,781,709
	CLASS 503		454	4,782,082	437		4,782,123	280	4,782,158	665	4,782,192		378	4,781,710
227		4,782,041	456	4,782,083	463		4,782,124	301	4,782,159		CLASS 600			4,781,711
	CLASS 514		460	4,782,084		CLASS 526		321	4,782,160				385.1	4,781,712
9		4,782,042	507	4,782,085	216		4,782,125	345	4,782,161	30	4,781,176			4,781,713
11		4,782,043	521	4,782,086	271		4,782,126		CLASS 548		CLASS 604		890.1	4,781,714
12		4,782,044	531	4,782,087	329.2		4,782,127	195	4,782,162	9	4,781,672			CLASS 623
23		4,782,045	534	4,782,088		CLASS 528		215	4,782,163		4,781,673		3	4,781,715
54		4,782,046	541	4,782,089	45		4,782,128	259	4,782,164		4,781,674			4,781,716
174		4,782,047	584	4,782,090	49		4,782,129	303	4,782,165	10	4,781,675		6	4,781,717
184		4,782,048	594	4,782,091	70		4,782,130		CLASS 549	21	4,781,676			4,781,718
185		4,782,049	649	4,782,092	180		4,782,131	260	4,782,166	28	4,781,677			4,781,719
				4,782,093	193		4,782,132			45	4,781,678		16	4,781,720
			721	4,782,094										4,781,721
			937	4,782,095										CLASS 814
				CLASS 518									443	4,782,080
			704	4,782,096										

CLASSIFICATION OF DESIGNS

D1—	109	298,280		105	298,297		35	298,314	D16—	32	298,331	D22—	116	298,348			298,364
D2—	271	298,281		379	298,298	D14—	4	298,315			298,332		149	298,349	D29—	10	298,365
	314	298,282	D8—	14	298,299			298,316			298,333	D23—	325	298,350		11	298,366
		298,283		45	298,300		52	298,317			298,334		356	298,351		15	298,367
		298,284		61	298,301			298,318			298,335	D24—	25	298,352	D30—	135	298,370
	320	298,285			298,302		53	298,319			298,336		30	298,353		153	298,368
D3—	35	298,286	D11—	152	298,303			298,320			298,337		47	298,354		161	298,371
D6—	407	298,287			298,304		64	298,321		38	298,338		53	298,355		162	298,369
	474	298,288		156	298,305		79	298,322	D19—	67	298,339		67	298,356	D32—	1	298,372
	511	298,289		184	298,306		80	298,323		73	298,340	D25—	16	298,357		4	298,373
	521	298,290	D12—	133	298,307		100	298,324		75	298,341	D26—	35	298,359	D34—	23	298,374
	524	298,291		157	298,308		105	298,325	D21—	24	298,342		44	298,358		30	298,375
	542	298,292		179	298,309		114	298,326		33	298,343		85	298,360		31	298,376
		298,293		306	298,310			298,327		146	298,344	D28—	50	298,361			298,377
	559	298,294		317	298,311	D15—	13	298,328		149	298,345		82	298,362		34	298,378
D7—	21	298,295	D13—	24	298,312		33	298,329		191	298,346		85	298,363		39	298,379
	38	298,296			298,313		69	298,330		210	298,347						

CLASSIFICATION OF PLANTS

P.—	34	6,361	41	6,363	54	6,365		6,367	71	6,369	77	6,371
	36	6,362	43	6,364	68	6,366	70	6,368	73	6,370	88	6,372

STATUTORY INVENTION REGISTRATIONS

89—	134	H538	102—	495	H540	342—	204	H548	378—	144	H547	419—	7	H546			
92—	151	H541	204—	147	H544	350—	96.25	H542	384—	614	H539	424—	1.1	H545	428—	635	H543

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
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Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
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Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,780,949	4,781,328	4,781,924	4,781,182	4,781,147	4,781,067
	4,780,985	4,781,343	4,781,936	4,781,195	4,781,210	4,781,121
	4,781,326	4,781,358	4,781,939	4,781,300	4,781,235	4,781,138
	4,781,880	4,781,379	4,781,942	4,781,317	4,781,293	4,781,166
	4,781,922	4,781,382	4,782,015	4,781,510	4,781,344	4,781,196
	4,782,273	4,781,419	4,782,028	4,781,665	4,781,349	4,781,198
04 :	4,780,974	4,781,423	4,782,047	4,781,684	4,781,373	4,781,257
	4,780,992	4,781,425	4,782,048	4,781,696	4,781,378	4,781,275
	4,781,109	4,781,437	4,782,074	4,781,797	4,781,386	4,781,336
	4,781,231	4,781,448	4,782,161	4,781,934	4,781,391	4,781,351
	4,781,374	4,781,458	4,782,166	4,782,026	4,781,411	4,781,376
	4,781,401	4,781,495	4,782,169	4,782,267	4,781,436	4,781,527
	4,781,548	4,781,499	4,782,184	4,782,295	4,781,502	4,781,564
	4,781,775	4,781,507	4,782,217	4,782,377	4,781,534	4,781,611
	4,781,953	4,781,508	4,782,219	4,782,392	4,781,543	4,781,618
	4,782,373	4,781,509	4,782,222	09 :	4,780,940	4,781,554	4,781,679
06 :	Re.32,775	4,781,520	4,782,226		4,780,989	4,781,558	4,781,691
	4,780,915	4,781,565	4,782,283		4,781,008	4,781,593	4,781,695
	4,780,921	4,781,577	4,782,289		4,781,050	4,781,601	4,781,725
	4,780,922	4,781,590	4,782,292		4,781,076	4,781,636	4,781,931
	4,780,924	4,781,598	4,782,298		4,781,183	4,781,638	4,782,023
	4,780,929	4,781,604	4,782,302		4,781,201	4,781,656	4,782,129
	4,780,950	4,781,606	4,782,303		4,781,241	4,781,759	4,782,135
	4,780,956	4,781,620	4,782,307		4,781,345	4,781,794	4,782,136
	4,780,972	4,781,640	4,782,312		4,781,399	4,781,827	4,782,181
	4,780,986	4,781,651	4,782,323		4,781,566	4,781,853	4,782,201
	4,780,987	4,781,669	4,782,324		4,781,746	4,781,883	4,782,282
	4,781,003	4,781,672	4,782,327		4,781,884	4,782,384	4,782,422
	4,781,006	4,781,674	4,782,334		4,781,900	4,782,401	4,782,427
	4,781,018	4,781,680	4,782,335		4,781,979	13	4,780,913	4,782,468
	4,781,019	4,781,686	4,782,342		4,782,007		4,780,970	4,782,479
	4,781,043	4,781,687	4,782,350		4,782,008		4,781,126	4,782,508
	4,781,053	4,781,697	4,782,380		4,782,050		4,781,303	4,782,524
	4,781,069	4,781,703	4,782,381		4,782,060		4,781,310	4,782,532
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C. William Verity, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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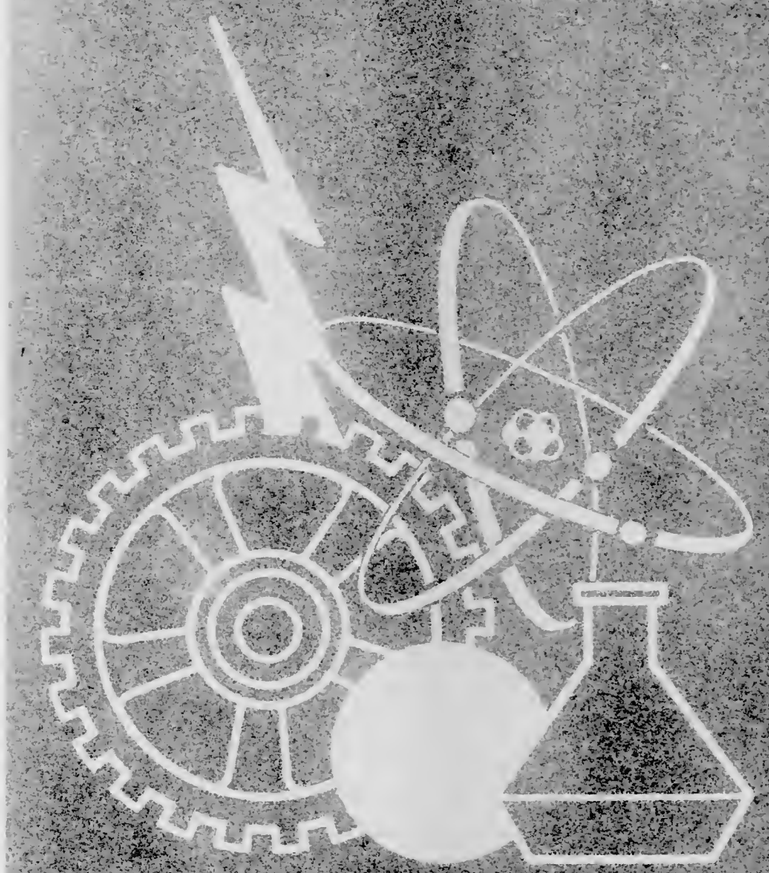
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Aug. 11, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 5, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,550,445 through 4,551,856
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 21, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,466,136	06/428,891	8/21/84
4,466,140	06/479,806	8/21/84
4,466,141	06/397,156	8/21/84
4,466,146	06/390,527	8/21/84
4,466,152	06/374,336	8/21/84
4,466,157	06/331,348	8/21/84
4,466,185	06/470,057	8/21/84
4,466,191	06/457,007	8/21/84
4,466,192	06/477,543	8/21/84
4,466,193	06/435,257	8/21/84
4,466,197	06/333,872	8/21/84
4,466,198	06/472,846	8/21/84
4,466,203	06/253,032	8/21/84
4,466,205	06/456,609	8/21/84
4,466,206	06/415,815	8/21/84
4,466,209	06/474,373	8/21/84
4,466,212	06/404,214	8/21/84
4,466,214	06/421,372	8/21/84
4,466,216	06/396,197	8/21/84
4,466,220	06/277,284	8/21/84
4,466,222	06/336,059	8/21/84
4,466,223	06/456,341	8/21/84
4,466,228	06/320,662	8/21/84
4,466,233	06/429,209	8/21/84
4,466,238	06/498,671	8/21/84
4,466,245	06/500,260	8/21/84
4,466,249	06/322,582	8/21/84
4,466,260	06/370,149	8/21/84
4,466,261	06/441,907	8/21/84
4,466,265	06/361,806	8/21/84
4,466,266	06/432,444	8/21/84
4,466,268	06/358,713	8/21/84
4,466,269	06/424,066	8/21/84
4,466,277	06/452,244	8/21/84
4,466,283	06/401,364	8/21/84
4,466,285	06/404,098	8/21/84
4,466,289	06/358,854	8/21/84
4,466,292	06/376,561	8/21/84
4,466,298	06/386,269	8/21/84
4,466,307	06/299,532	8/21/84
4,466,309	06/365,567	8/21/84
4,466,314	06/330,203	8/21/84
4,466,315	06/411,640	8/21/84
4,466,325	06/372,051	8/21/84
4,466,327	06/428,484	8/21/84
4,466,329	06/367,377	8/21/84
4,466,334	06/356,552	8/21/84
4,466,339	06/400,249	8/21/84
4,466,358	06/466,319	8/21/84
4,466,364	06/378,448	8/21/84
4,466,365	06/380,477	8/21/84
4,466,374	06/425,642	8/21/84
4,466,378	06/392,708	8/21/84
4,466,382	06/508,842	8/21/84
4,466,388	06/354,103	8/21/84
4,466,391	06/414,592	8/21/84
4,466,420	06/348,471	8/21/84
4,466,421	06/554,233	8/21/84
4,466,428	06/398,738	8/21/84
4,466,429	06/338,470	8/21/84
4,466,432	06/302,736	8/21/84
4,466,448	06/253,902	8/21/84
4,466,450	06/382,646	8/21/84
4,466,457	06/350,069	8/21/84
4,466,459	06/416,511	8/21/84
4,466,481	06/352,488	8/21/84
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4,466,494	06/411,544	8/21/84
4,466,498	06/422,586	8/21/84
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Patent Number	Serial Number	Issue Date
4,466,572	06/413,022	8/21/84
4,466,584	06/330,516	8/21/84
4,466,588	06/390,198	8/21/84
4,466,593	06/239,349	8/21/84
4,466,599	06/320,941	8/21/84
4,466,611	06/303,936	8/21/84
4,466,616	06/445,666	8/21/84
4,466,617	06/500,213	8/21/84
4,466,626	06/325,030	8/21/84
4,466,627	06/339,742	8/21/84
4,466,630	06/417,143	8/21/84
4,466,633	06/443,377	8/21/84
4,466,639	06/359,634	8/21/84
4,466,647	06/409,044	8/21/84
4,466,651	06/300,575	8/21/84
4,466,652	06/261,104	8/21/84
4,466,657	06/424,072	8/21/84
4,466,662	06/320,893	8/21/84
4,466,665	06/342,574	8/21/84
4,466,674	06/416,962	8/21/84
4,466,681	06/419,416	8/21/84
4,466,698	06/478,302	8/21/84
4,466,709	06/344,769	8/21/84
4,466,715	06/427,746	8/21/84
4,466,716	06/286,519	8/21/84
4,466,720	06/376,746	8/21/84
4,466,721	06/480,509	8/21/84
4,466,735	06/403,205	8/21/84
4,466,745	06/317,488	8/21/84
4,466,751	06/449,516	8/21/84
4,466,759	06/351,101	8/21/84
4,466,762	06/273,155	8/21/84
4,466,770	06/551,784	8/21/84
4,466,775	06/440,285	8/21/84
4,466,779	06/430,975	8/21/84
4,466,783	06/332,301	8/21/84
4,466,795	06/420,248	8/21/84
4,466,797	06/512,028	8/21/84
4,466,799	06/455,966	8/21/84
4,466,811	06/406,433	8/21/84
4,466,816	06/439,222	8/21/84
4,466,817	06/390,369	8/21/84
4,466,818	06/387,919	8/21/84
4,466,827	06/475,939	8/21/84
4,466,860	06/304,257	8/21/84
4,466,867	06/467,744	8/21/84
4,466,868	06/546,240	8/21/84
4,466,885	06/397,934	8/21/84
4,466,906	06/483,631	8/21/84
4,466,908	06/431,999	8/21/84
4,466,921	06/537,770	8/21/84
4,466,944	06/515,750	8/21/84
4,466,953	06/431,735	8/21/84
4,466,968	06/310,103	8/21/84
4,466,982	06/266,825	8/21/84
4,467,051	06/533,859	8/21/84
4,467,067	06/554,397	8/21/84
4,467,072	06/374,583	8/21/84
4,467,078	06/548,385	8/21/84
4,467,085	06/258,408	8/21/84
4,467,092	06/410,174	8/21/84
4,467,096	06/525,248	8/21/84
4,467,101	06/420,534	8/21/84
4,467,117	06/464,532	8/21/84
4,467,121	06/402,165	8/21/84
4,467,140	06/259,787	8/21/84
4,467,143	06/426,596	8/21/84
4,467,163	06/226,259	8/21/84
4,467,186	06/343,041	8/21/84
4,467,198	06/304,673	8/21/84
4,467,202	06/353,397	8/21/84
4,467,208	06/374,711	8/21/84
4,467,213	06/392,841	8/21/84
4,467,216	06/365,971	8/21/84
4,467,217	06/379,076	8/21/84
4,467,218	06/429,121	8/21/84
4,467,221	06/412,245	8/21/84
4,467,231	06/435,434	8/21/84
4,467,238	06/298,836	8/21/84
4,467,239	06/319,785	8/21/84
4,467,265	06/456,623	8/21/84
4,467,266	06/363,240	8/21/84
4,467,278	06/296,998	8/21/84
4,467,300	06/374,058	8/21/84
4,467,351	06/325,656	8/21/84
4,467,356	06/305,049	8/21/84
4,467,361	06/406,486	8/21/84
4,467,364	06/422,826	8/21/84
4,467,370	06/304,900	8/21/84
4,467,375	06/288,151	8/21/84
4,467,376	06/326,337	8/21/84
4,467,377	06/335,319	8/21/84
4,467,388	06/395,108	8/21/84
4,467,396	06/477,411	8/21/84
4,467,402	06/259,904	8/21/84
4,467,403	06/483,893	8/21/84
4,467,424	06/395,229	8/21/84
4,467,429	06/339,204	8/21/84
4,467,434	06/303,627	8/21/84
4,467,442	06/325,695	8/21/84
4,467,459	06/337,032	8/21/84
4,467,466	06/464,085	8/21/84
4,467,470	06/375,473	8/21/84
4,467,474	06/533,276	8/21/84

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,613,133, Re. S.N. 150,444, Filed Jan. 28, 1988, Cl. 005/502, BED CLOTHES, Richard A. Isola, et al., Owner of Record: *Habitation, Inc., Wesfield, N.J.*, Attorney or Agent: H. Keith Miller, Ex. Gp.: 358

4,569,469, Re. S.N. 157,439, Filed Feb. 11, 1988, Cl. 227/19, BONE STAPLER CARTRIDGE, Gerald D. Guthrie, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: William L. Huebsch, Ex. Gp.: 324

4,584,447, Re. S.N. 185,757, Filed Apr. 20, 1988, Cl. 219/10.55, ELECTROMAGNETIC WAVE ENERGY SEAL ARRANGEMENT, Shigeru Kusunoki, et al., Owner of Record: *Matsushita Electric Ind., Osaka-fu, Japan*, Attorney or Agent: Robert J. Frank, Ex. Gp.: 214

4,613,885, Re. S.N. 248,764, Filed Sept. 23, 1988, Cl. 357/42, HIGH-VOLTAGE CMOS PROCESS, Roger A. Haken, Owner of Record: *Texas Instruments, Dallas, Tex.*, Attorney or Agent: Carlton H. Hoel, Ex. Gp.: 253

4,613,956, Re. S.N. 249,019, Filed Sept. 23, 1988, Cl. 365/185, FLOATING GATE MEMORY WITH IMPROVED DIELECTRIC, James L. Paterson, Owner of Record: *Texas Instruments Inc., Dallas, Tex.*, Attorney or Agent: John D. King, Ex. Gp.: 233

4,685,293, Re. S.N. 249,769, Filed Sept. 26, 1988, Cl. 60/327, AIR BLEEDING SYSTEM FOR HYDRAULIC CLOSED CIRCUITS, James B. McBeth, Owner of Record: *Teleflex Inc., Limerick, Pa.*, Attorney or Agent: Harold W. Milton, Jr., Ex. Gp.: 341

4,703,098, Re. S.N. 245,411, Filed Aug. 29, 1988, Cl. 526/283, METATHESIS POLYMERIZATION OF THERMALLY OLIGOMERIZED DICYCLOPENTADIENE, Albert S, Matlack, Owner of Record: *Hercules Inc., Wilmington, Del.*, Attorney or Agent: W. Stanley Alexander, Ex. Gp.: 155

4,721,013, Re. S.N. 245,820, Filed Sept. 16, 1988, Cl. 74/750, MULTI-SPEED HUB FOR BICYCLES OR THE LIKE, Werner Steuer, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: David Toren, Ex. Gp.: 352

4,739,895, Re. S.N. 251,547, Filed Sept. 29, 1988, Cl. 220/5A, UPRIGHT TANK CONSTRUCTION WITH DOUBLE BOTTOM AND METHOD OR ITS MANUFACTURE, Werner Bachman, Owner of Record: *Adisa Entwicklungs AG, Gurdorf, Switzerland*, Attorney or Agent: Stephen H. Frishauf, Ex. Gp.: 241

Erratum

In the Reissue Applications Filed published at 1092 OG 5 (July 5, 1988), the serial number for patent number 4,710,781 should be 189,554.

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,949,722, Reexam. No. 90/001,609, Requested: Sept. 26, 1988, Cl. 123/24, SEMICONDUCTOR CONTROLLED IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES, Hans Lenstedt, et al., Owner of Record: *Robert Bosch GmbH, Stuttgart, Germany*, Attorney or Agent: Flynn & Frishauf, Ex. Gp.: 340, Requester: Siemens AG, Postfachen, Germany

4,575,330, Reexam. No. 90/001,611, Requested: Sept. 28, 1988, Cl. 425/174.4, APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEROLITHOGRAPHY, Charles W. Hull, Owner of Record: *UVP Inc., San Gabriel, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: E. I. Du Pont de Nemours & Co., Wilmington, Del.

4,720,332, Reexam. No. 90/001,610, Requested: Sept. 26, 1988, Cl. 204/146, NICKLE STRIP FORMULATION, Barry Coffey, Owner of Record: *Inventor, Lenoir, N.C.*, Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 110, Requester: Chemisphere Corp., Princeton, N.J.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers. Applications for license may be addressed to Counsel-Patent and Legal Operation, Corporate Research and Development, General Electric Co., P.O. Box 8, Bldg. K-1, Rm 4A70, Schenectady, N.Y. 12301

4,676,586. APPARATUS AND METHOD FOR PERFORMING LASER MATERIAL PROCESSING THROUGH A FIBER OPTIC.
4,681,396. HIGH POWER LASER ENERGY DELIVERY SYSTEM.
4,697,118. PIEZOELECTRIC SWITCH.

4,185,407. DISPLAY DEVICE ELECTRIC OR BATTERY RUN, *Jack W. Lamb*, 10822 Magnolia Blvd. #142, North Hollywood, Calif. 91601.
4,576,178. AUDIO SIGNAL GENERATOR, *David Johnson*, Box 68, 436 E. 69th St., New York, N.Y. 10021.
4,660,237. PORTABLE RECLINER, *William E. Brodnax*, 11 Tennessee Ave., Alexandria, La. 71301.
4,702,704. TETRAHEDRAL CODON STEREO-TABLE, Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, P.O. Box 747, Falls Church, Va. 22046.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrants at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Sun Spot Enterprises, Inc., Albuquerque, N. Mex., Reg No. 1,246,833, for the mark "SUNSPOT" and design, Canc. No. 17,104.

Jalisco Mexican Products, Inc., Artesia, Calif., Reg. No. 1,296,594, for the mark "LA VAQUITA", Canc. No. 16,772.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to registrants at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

GT 500 Corp., Ft. Lauderdale, Fla., Reg. No. 1,213,747, for the mark "GT 500", Canc. No. 16,757.

Golden State Seed Co., Inc., Reg. No. 1,091,053, for the mark "GOLD COAT", Canc. No. 17,091.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Department of Commerce
Patent and Trademark Office
37 CFR Part 100

[Docket No. 80995-8195]

Rights Determinations in Government Employee Inventions

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: Executive order 10096 as amended by Executive Order 10930 sets forth the policies and procedures for determining the rights of Government employees and the Government in inventions made by employees. The Delegation of Authority from the Secretary of Commerce, dated Sept. 15, 1988, transferred administration of these provisions from the Commissioner of Pa-

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tents and Trademarks to the Under Secretary for Economic Affairs in the Department of Commerce. This final rule removes 37 CFR Part 100 in its entirety.
Effective date: This rule is effective Nov. 1, 1988.
For Further Information Contact: John H. Raubitschek by telephone at [703] 557-4035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights of Government employees and the Government is inventions made by the employees. The function of reviewing agency rights determinations assigned to the Secretary of Commerce was delegated by the Secretary to the Commissioner of Patents and Trademarks. On Sept. 15, 1988, the Secretary changed the delegation to the Under Secretary for Economic Affairs, who is republishing Part 100 as new Part 501 in 37 CFR.

All rights determinations and appeals relating thereto, which are pending before the Commissioner at the time 37 CFR Part 501 becomes effective, will be acted upon by the Commissioner under the procedures in 37 CFR Part 100.

The Patent and Trademark Office has determined that this notice is not a rule within the meaning of section 1(a) of Executive Order 12291. Therefore, no Regulatory Impact Analysis has to or will be prepared. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given by section 553 of the Administrative Procedure Act (5 U.S.C. 553), or by any other law, no initial or final Regulatory Flexibility Analysis has to or will be prepared for the purposes of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)).

This final rule does not contain a policy with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612. Nor does this rule contain a collection of information for purposes of the Paperwork Reduction Act of 1980.

For reasons set forth in the preamble, 37 CFR Part 100 is amended as follows:

PART 100—[REMOVED AND RESERVED]

1. Part 100 is removed and reserved.

DONALD J. QUIGG,
Oct. 4, 1988 *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 88-23238 Filed 10-7-88, 8:45 am]
Billing Code 3510-16-M

Department of Commerce
Patent and Trademark Office
37 CFR Part 501

[Docket No. 80627-8127]

Uniform Patent Policy for Domestic Rights in Inventions Made by Government Employees

Agency: Under Secretary for Economic Affairs. Department of Commerce.
Action: Final rule.
Summary: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal employee inventions with respect to the Federal employee and the Government employer. The Delegation of Authority from the Secretary of Commerce dated, Sept. 15, 1988 and effective Nov. 1, 1988, transferred administration of the provisions of Executive Order 10096 as amended by Executive Order 10930 from the Commission of Patents and Trademarks to the Under Secretary for Economic Affairs in the Department of Commerce. This final rule establishes 37 CFR Part 501 which sets forth this delegation of authority to the Under Secretary. In addition, each Government agency is authorized to determine whether the results of research, development, or other activity within the agency constitute an invention with the purview of Executive Order 10096, as amended by Executive Order 10930 and to determine initially the rights therein in accordance with the provisions of section 501.6 and 501.7 herein. By separate notice in today's *Federal Register* the Patent and Trademark Office is deleting 37 CFR Part 100.
Effective Date: Nov. 1, 1988.

However, all rights, determinations, and appeals submitted to the Commissioner prior to the effective date, will be reviewed by the Commissioner under the procedures of 37 CFR Part 100.
Address: Comments may be sent to Mr. Joseph P. Allen, Acting Director, Federal Technology Management Division, Office of the Under Secretary for Economic Affairs, United States Department of Commerce, Room 4839, Herbert C. Hoover Bldg., Washington, D.C. 20230.
For Further Information Contact: Mr. Joseph P. Allen, by telephone at (202) 377-8100 or Robert B. Ellert by telephone at (202) 377-5394.
Supplementary Information: Executive Order 10096, as amended by Executive Order 10930, sets forth the policies and procedures for determining the rights in Federal Employee inventions with respect to the Federal employee and the Government employer. The Under Secretary for Economic Affairs of the Department of Commerce was delegated responsibility for oversight of the Executive Order on Sept. 15, 1988. Functions required by the Executive Order were previously performed by the Commissioner of Patents and Trademarks. This final rule is substantially the same as the rule set out in 37 CFR Part 100, except, the Secretary of Commerce is substituted for the Commissioner of Patents and Trademarks, and advance approval is given to agency heads to make final determinations relating to determinations of rights decisions of Government employee inventions, subject to employee appeal to the Secretary.

President Reagan in Executive Order 12591, on Apr. 10, 1987 directed all Government agencies to facilitate the transfer of technology developed at federal laboratories to the private sector and to promote its commercialization. To accomplish the goals of E.O. 12591 it is necessary that rights to inventions made by government employees be determined as expeditiously as possible. Accordingly, the Secretary has reviewed the existing procedures and policies under 37 CFR Part 100 and concluded that administration of the functions thereunder could be performed on a more efficient basis by confining the role of the Department of Commerce to appeals by employees from disputed agency determinations. Accordingly, under 37 CFR Part 501 each Government agency is given the authority to determine whether the results of research, development of other activities within the agency constitute an invention by an employee, and to determine initially the rights relating to ownership within the provisions of Executive Order 10096 as amended by Executive Order 10930. If no appeal is taken to the Secretary by an employee under section 501.8, the initial determination of the agency will be final.

Notwithstanding the fact that this is a final rule, comments are requested.

Because this rule concerns agency management and personnel, it is not a rule or regulation within the meaning of section 1(a) of Executive Order 12291, and it is not subject to the requirements of the Order. Accordingly, no preliminary or final regulatory impact analysis has to be or will be prepared.

Because a notice of proposed rulemaking and an opportunity for public comments are not required to be given for this rule by section 553 of the Administrative Procedure Act (5 U.S.C. 553), or by any other law, no

regulatory flexibility analysis has to be or will be prepared for purposes of the Regulatory Flexibility Act (5 U.S.C. 603(a) and 604(a)).

This final rule does not contain policies with Federalism implications sufficient to warrant preparation of a Federalism assessment under Executive Order 12612. This rule does not contain collections of information for purposes of the Paperwork Reduction Act.

The changes in the process of determining employee rights to inventions made by this rule do not have takings implications sufficient to require preparation of a Takings Implications Assessment under Executive Order 12630.

List of Subjects in 37 CFR Part 501

Uniform patent policy. Domestic Rights in inventions, Inventions made by Government employees.

ROBERT ORTNER,
Oct. 3, 1988 *Under Secretary for Economic Affairs.*

* * * * *

For the reasons set forth in the preamble 37 CFR is amended by adding Chapter V, consisting of Part 501, to read as follows:

CHAPTER V—UNDER SECRETARY FOR ECONOMIC AFFAIRS, DEPARTMENT OF COMMERCE

PART 501—UNIFORM PATENT POLICY FOR DOMESTIC RIGHTS IN INVENTIONS MADE BY GOVERNMENT EMPLOYEES

Sec.

501.1 Purpose.
501.2 Scope.
501.3 Definitions.
501.4 Determination of Inventions and Rights therein.
501.5 Agency Liaison Officer.
501.6 Criteria for The Determination of Rights in and to Inventions.
501.7 Agency Determination.
501.8 Appeals by employees.
501.9 Patent protection.
501.10 Dissemination of this part and of implementing regulations.

Authority: Sec. 4, E.O. 10096, 3 CFR 1949-1953 Comp., p. 292, as amended by E. O. 10930, 3 CFR 1959-1963 Comp., p. 456; and Delegation of Authority by the Secretary of Commerce, Sept. 15, 1988, DOO 10-9.

§501.1 Purpose.

The purpose of this part is to provide for the administration of a uniform patent policy for the Government with respect to the domestic rights in inventions made by Government employees and to prescribe rules and regulations for implementing and effectuating such policy.

§501.2 Scope.

This part applies to any invention made by a Government employee and to any action taken with respect thereto.

§501.3 Definitions.

(a) The term "Secretary," as used in this part, means the Under Secretary of Commerce for Economic Affairs.
(b) The term "Government agency" as used in this part, means and Executive department or independent establishment of the Executive branch of the Government (including any independent regulatory commission or board, any corporation wholly owned by the United States, and the Smithsonian Institution), but does not include the Department of Energy for inventions made or conceived under the provisions of 42 U.S.C. 2182.
(c) The term "Government employee," as used in this part, means any officer or employee, civilian or military, of any Government agency, including any part-time consultant or part-time employee except as may otherwise be provided for by agency regulation approved by the Secretary.
(d) The term "invention," as used in this part, means any art, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the patent laws of the United States.

§501.4 Determination of Inventions and rights therein.

Each Government agency has the approval of the Secretary to determine whether the results of research, development, or other activity in the agency constitute an invention within the purview of E.O. 10096, as amended by E.O. 10930 and to determine the rights therein in accordance with the provisions of §501.6 and 501.7 herein.

§501.5 Agency Liaison Officer.

Each Government agency shall designate a liaison officer to represent the agency before the Secretary. Provided, however, that the Departments of the Army, the Navy, and the Air Force may each designate a liaison officer.

§501.6 Criteria for the Determination of Rights In and To Inventions.

(a) The following rules shall be applied in determining the respective rights of the Government and of the inventor in and to any invention that is subject to the provisions of this part:

(1) The Government shall obtain, except as herein otherwise provided, the entire domestic right, title and interest in and to any invention made by any Government employee:

(i) During working hours, or
(ii) With a contribution by the Government of facilities, equipment, materials, funds or information, or of time or services of other Government employees on official duty, or
(iii)Which bears a direct relation to or is made in consequence of the official duties of the inventor.

Foreign patent rights are governed by the provisions of 37 CFR Part 101.

(2) In any case where the contribution of the Government, as measured by any one or more of the criteria set forth in paragraph (a)(1) of this section, to the invention is insufficient equitably to justify a requirement of assignment to the Government of the entire domestic right, title, and interest in and to such invention, or in any case where the Government has insufficient interest in an invention to obtain the entire domestic right, title, and interest therein (although the Government could obtain same under paragraph (a)(1) of this section), the Government agency concerned shall leave title to such invention in the employee, subject however, to the reservation to the government of a nonexclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes, such reservation, in the terms thereof, to appear, where practicable, in any patent, domestic or foreign, which may issue on such invention. Reference is made to section 15 of the Federal Technology Transfer Act of 1986 (15 U.S.C. 3710d) which requires a Govern-

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ment agency to allow the inventor to retain title to any covered invention when the agency does not intend to file a patent application or otherwise promote commercialization.

(3) In applying the provisions of paragraphs (a)(1) and (2) of this section to the facts and circumstances relating to the making of a particular invention, it shall be presumed that an invention made by an employee who is employed or assigned:

(i) To invent or improve or perfect any art, machine, design, manufacture, or composition of matter,
(ii) To conduct or perform research, development work, or both,
(iii) To supervise, direct, coordinate, or review Government financed or conducted research, development work, or both, or
(iv) To act in a liaison capacity among governmental or non-governmental agencies or individuals engaged in such research or development work, falls within the provisions of paragraph (a)(1) of this section, and it shall be presumed that any invention made by any other employee falls within the provisions of paragraph (a)(2) of this section. Either presumption may be rebutted by a showing of the facts and circumstances in the case and shall not preclude a determination that these facts and circumstances justify leaving the enire right, title and interest in and to the invention in the Government employee, subject to the law.

(4) In any case wherein the Government neither:

(i) Obtains the entire domestic right, title and interest in and to an invention pursuant to the provisions of paragraph (a)(1) of this section nor
(ii) Reserves a nonexclusive, irrevocable, royalty-free license in the invention, with power to grant licenses for all governmental purposes, pursuant to the provisions of paragraph (a)(2) of this section.

The Government shall leave the entire right, title and interest in and to the invention in the Government employee, subject to law.

§501.7 Agency determination.

(a) If the agency determines that the Government is entitled to obtain title pursuant to §501.6(a)(1) and the employee does not appeal, no further review is required.

(b) In the event that a Government agency determines, pursuant to paragraph (a)(2) or (a)(4) of §501.6, that title to an invention will be left with the employee, the agency shall notify the employee of this determination.

(c) In the case of a determination under either paragraph (a) or (b) of this section, the agency shall promptly prepare, and preserve in appropriate files, accessible to the Secretary, a written, signed, and dated statement concerning the invention including the following:

(1) A description of the invention in sufficient detail to identify the invention and show its relationship to the employee's duties and work assignments;
(2) The name of the employee and employment status, including a detailed statement of official duties and responsibilities at the time the invention was made; and
(3) An explanation of the agency determination and reasons therefor. The agency shall, subject to considerations of national security, or public health, safety, or welfare, submit to the Secretary, if an appeal is taken, a copy of this written statement.

§501.8 Appeals by employees.

(a) Any Government employee who is aggrieved by a Government agency determination pursuant to §501.6(a)(1) or (a)(2), may obtain a review of any agency determination by filing, within 30 days (or such longer period as the Secretary may, for good cause shown in writing, fix in any case) after receiving notice of such determination, two copies of an appeal with the Secretary. The Secretary then shall forward one copy of the appeal to the Government agency.

(b) On receipt of a copy of an appeal filed pursuant to paragraph (a) of this section, the agency official who made the agency determination being appealed shall, subject to considerations of national security, or public health, safety, or welfare, promptly furnish both the Secretary and the inventor with a copy of a report containing the following information about the invention involved in the appeal:

(1) A copy of a statement by the agency containing the information specified in §501.7, and
(2) A detailed statement of the points of dispute or controversy, together with copies of any statements or written arguments filed with the agency, and of any other relevant evidence that the agency considered in making its determination of Government interest. Within 25 days (or such longer period as the Secretary may, for good cause shown, fix in any case) after the transmission of a copy of the agency report to the employee, the employee may file a reply thereto with the Secretary and file one copy thereof with the appropriate agency decision maker.

(c) After the time for the inventor's reply to the Government agency's report has expired and if the inventor has so requested in his or her appeal, a date will be set for hearing of oral arguments before the Secretary, by the employee (or by an attorney whom he or she designates by written power of attorney filed before, or at the hearing) and a representative of the Government agency involved. Unless it shall be otherwise ordered before the hearing begins, oral arguments will be limited to thirty minutes for each side. The employee need not retain an attorney or request an oral hearing to secure full consideration of the facts and his or her arguments. The employee may expedite such consideration by notifying the Secretary when he or she does not intend to file a reply to the agency report.

(d) After a hearing on the appeal, if a hearing was requested, or after expiration of the period for the inventor's reply to the agency report if no hearing is set, the Secretary shall issue a decision on the matter within 120 days, which decision shall be final after a thirty day period for requesting reconsideration expires or on the date that a decision on a petition for reconsideration is finally disposed of. Any request for reconsideration or modification of the decision must be filed within 30 days from the date of the original decision (or within such an extension thereof as may be set by the Secretary before the original period expires). The decision of the Secretary shall be made after consideration of the statements of fact in the employee's appeal, the agency's report, and the employee's reply, but the Secretary at his or her discretion and with due respect to the rights and convenience of the inventor and the Government agency, may call for further statements on specific questions of fact or may request additional evidence in the form of affidavits or depositions on specific facts in dispute.

§501.9 Patent protection.

(a) A Government agency, upon determining that an invention coming within the scope of §501.6(a)(1) or (a)(2) has been made, shall thereupon determine whether patent protection will be sought in the United States by the agency for such invention. A controversy over the respective rights of the Government and of the employee in any case shall not delay the taking of the actions provided for in this section. In cases coming within the scope of §501.6(a)(2), agency action looking toward such patent protection shall be contingent upon the consent of the employee.

(b) Where there is an appealed dispute as to whether §501.6(a)(1) or (a)(2) applies in determining the respective rights of the Government and of an employee in and to any invention, the agency will determine whether patent protection will be sought in the United States pending the Secretary's decision on the dispute and, if it decides that an application for patent should be filed, will take such rights as are specified in §501.6(a)(2), but this shall be without prejudice to acquiring the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

(c) Where an agency has determined to leave title to an invention with an employee under §501.6(a)(2), the agency will, upon the filing of an application for patent take the rights specified in that paragraph without prejudice to the subsequent acquistion by the Government of the rights specified in paragraph (a)(1) of that section should the Secretary so decide.

§501.10 Dissemination of this part and of implementing regulations.

Each Government agency shall disseminate to its employees the provisions of this part, and any appropriate implementing agency regulations and delegations. Copies of any such regulations shall be sent to the Secretary. If the Secretary identifies an inconsistency between this part and the agency regulations or delegations, the agency, upon being informed by the Secretary of the inconsistency, shall take prompt action to correct it.

[FR Doc. 88-23239 Filed 10-7-88; 8:45 am]
Billing Code 3510-EA-M

Further Clarification on Patent and Trademark Office Implementation of 37 CFR 1.56

This notice is intended to provide further clarification to the O.G. Notice titled "Patent and Trademark Office Implementation of 37 CFR 1.56", published on Oct. 11, 1988 at 1095 O.G. 16.

As indicated in the previous notice, for a number of reasons, the Patent and Trademark Office will no longer investigate and reject original or reissue applications under 37 CFR 1.56 and will not comment upon duty of disclosure issues, which are brought to the attention of the Office, except to note in the application, in appropriate circumstances, that such issues are no longer considered by the Office during its examination of patent applications.

Further, the Office will also not consider duty of disclosure issues in interferences declared pursuant to 35 U.S.C. 135. Duty of disclosure issues which are raised by the parties in an interference will not be commented upon by the Examiner-in-Chief except to note that such issues are no longer considered by the Office. The policy is considered proper for the same reasons previously set forth regarding ex parte cases. Even though interferences are inter partes proceedings, the Office does not take live testimony where the demeanor of witnesses subjected to cross-examination can be observed.

Duty of disclosure issues which exist in pending interferences will not be decided but it merely will be noted that the Office no longer considers such issues.

Oct. 17, 1988

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

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PATENT NOTICES

Certificates of Correction for the Week of Nov. 8, 1988

B1 3,963,254	4,715,717	4,737,419	4,749,853
B1 4,571,665	4,716,176	4,737,809	4,750,296
Re. 32,681	4,720,454	4,737,850	4,750,297
4,023,265	4,720,650	4,737,852	4,750,307
4,087,887	4,720,707	4,737,889	4,750,378
4,210,982	4,721,490	4,738,195	4,750,482
4,281,436	4,721,720	4,738,227	4,750,571
4,391,530	4,724,581	4,738,456	4,750,884
4,475,535	4,724,620	4,738,634	4,750,887
4,534,838	4,724,761	4,738,810	4,751,108
4,561,081	4,725,001	4,739,079	4,751,211
4,580,156	4,725,149	4,740,060	4,751,720
4,600,390	4,726,134	4,740,389	4,752,579
4,604,299	4,726,821	4,741,177	4,753,037
4,610,951	4,726,941	4,741,337	4,753,050
4,631,080	4,727,025	4,741,363	4,753,132
4,636,518	4,727,424	4,741,613	4,753,175
4,642,854	4,727,426	4,741,681	4,753,241
4,645,801	4,728,222	4,742,099	4,753,262
4,651,749	4,728,726	4,742,815	4,753,337
4,657,981	4,728,786	4,742,909	4,753,361
4,660,413	4,728,893	4,743,176	4,753,538
4,661,578	4,729,109	4,743,246	4,753,643
4,663,995	4,730,769	4,744,123	4,753,757
4,667,099	4,730,780	4,744,236	4,753,991
4,667,513	4,731,084	4,745,024	4,754,260
4,671,756	4,731,375	4,745,044	4,754,475
4,676,987	4,731,504	4,745,121	4,754,709
4,679,160	4,731,563	4,745,469	4,755,202
4,683,332	4,731,651	4,746,034	4,755,283
4,685,985	4,731,845	4,746,236	4,755,296
4,688,076	4,732,037	4,746,322	4,755,927
4,689,310	4,732,700	4,746,327	4,756,215
4,689,740	4,732,711	4,746,524	4,756,337
4,690,371	4,732,802	4,746,617	4,756,469
4,690,939	4,732,850	4,746,667	4,756,589
4,691,354	4,732,943	4,746,707	4,756,686
4,692,590	4,733,471	4,746,847	4,756,697
4,694,279	4,733,533	4,747,412	4,756,842
4,699,815	4,733,551	4,747,445	4,756,937
4,699,861	4,733,841	4,748,024	4,757,172
4,700,376	4,734,418	4,748,481	4,757,224
4,700,992	4,735,007	4,748,594	4,757,248
4,704,296	4,735,167	4,748,617	4,757,273
4,705,734	4,735,250	4,749,036	4,757,421
4,706,313	4,735,650	4,749,038	4,757,475
4,707,447	4,735,796	4,749,078	4,757,619
4,707,909	4,736,023	4,749,140	4,757,902
4,711,764	4,737,044	4,749,164	4,758,317
4,712,283	4,737,075	4,749,205	4,759,046
4,713,684	4,737,133	4,749,412	4,759,163
4,713,886	4,737,229	4,749,753	
4,715,042	4,737,334	4,749,850	

Disclaimer Erratum

3,933,644.—*James R. Skinner*, Cupertino, and *Albert Lang, Jr.*, Palo Alto, Calif. SPUTTER COATING APPARATUS HAVING IMPROVED TARGET ELECTRODE STRUCTURE. In the notice of Disclaimers appearing on page 103 in the Official Gazette of Mar. 29, 1988, claims of said patent were erroneously mentioned and should be corrected to read as follows:

Hereby enters this disclaimer to claim 6 of said patent.

Disclaimers

3,933,644.—*James R. Skinner*, Cupertino, and *Albert Lang, Jr.*, Palo Alto, Calif. SPUTTER COATING APPARATUS HAVING IMPROVED TARGET ELECTRODE STRUCTURE. Patent dated Jan. 20, 1976. Disclaimer filed Dec. 4, 1987, by the assignee, *Varian Associates, Inc.*

Hereby enters this disclaimer to claim 6 of said patent.

4,074,737.—*John S. Stewart*, Greensboro, N.C. WOOD PLANER CUTTERHEAD DESIGN FOR REDUCED NOISE LEVEL. Patent dated Feb. 21, 1978. Disclaimer filed Mar. 2, 1988, by the *inventor.*

Hereby enters this disclaimer to claim 9 of said patent.

4,699,540.—*Robert M. Gibbon* and *J. William Houtz*, Fort Worth, Tex. EXPANSION JOINT. Patent dated Oct. 13, 1987. Disclaimer filed Aug. 26, 1988, by the assignee, *JMK International, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

4,730,355.—*Mark L. Kreinbihl*, Mansfield, *Randall L. Mosher*, Loundonville, *Kevin D. Pramer*, Mansfield and *Robert P. Miller*, Wooster, Ohio. PNEUMATIC WAVE GENERATOR EMPLOYING FOUR-WAY VALVE ARRANGEMENT. Patent dated Mar. 15, 1988. Disclaimer filed Sept. 16, 1988, by the assignee, *Aquatic Associates, Ltd.*

Hereby enters this disclaimer to claims 1-16 of said patent.

4,738,249.—*E. Kelly Linman* and *Eugene Weinshenker*, Cincinnati, Ohio. METHOD AND APPARATUS FOR AUGMENTING BLOOD CIRCULATION. Patent dated Apr. 19, 1988. Disclaimer filed Aug. 29, 1988, by the assignee, *The Proctor & Gamble Co.*

Hereby enters this disclaimer to claims 2, 3, 5, 6, 19, 20 and 22 of said patent.

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Washington, D.C. 20231

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Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications. (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications.
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain data received and/or serial number for patent applications prior to the Office's standard notification (return post card or the official "Filing Receipt", "Notice to File Missing Parts," or " Notice of Incomplete Information Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Potent Classification, Classification Definitions*, and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska—Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 8, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-3-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	10-24-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-12-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-28-87
DESIGN, GROUP 290—K. L. CAGE, Director	12-23-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-10-87
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	3-9-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-6-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-16-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-6-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,609,763 to 3,616,462, inclusive

Plant Patents ..... 3,063 to 3,081 inclusive

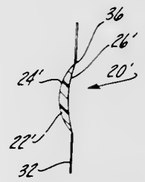
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REEXAMINATIONS

NOVEMBER 8, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 31,998 (939th)
POSTERIOR CHAMBER LENS IMPLANT
William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48010
Reexamination Request No. 90/001,290, Jul. 27, 1987.
Reexamination Certificate for Reissue Patent Re. 31,998, issued Oct. 8, 1985, Ser. No. 587,955, Mar. 9, 1984.
Original No. 4,412,359, dated Nov. 1, 1983, Ser. No. 371,541, Apr. 26, 1982.
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **2** is confirmed.

2.-A posterior chamber lens implant for a human eye for use after extracapsular surgery in which a posterior capsule is left substantially intact, said lens implant comprising:

a substantially circular optic having a front surface, a rear surface and a substantially circular and continuous outer rear edge, said front surface being a continuous convex surface and said rear surface being a continuous concavely curved surface extending between said outer rear edge,

means for securing said optic to the eye within the posterior chamber so that said outer rear edge abuts against the posterior capsule and so that the rear concavely curved surface of said optic is spaced from the posterior capsule by a distance sufficient to safely allow a subsequent laser posterior capsulotomy,

wherein said optic is constructed of a material so that, with said optic implanted within the posterior chamber, said optic maintains a rigid shape following implantation.

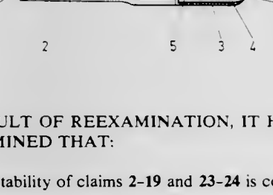
B1 3,758,978 (940th)
GRIPS FOR HANDGUNS
Paris Theodore, New York, N.Y., assignor to W. Simon Katz, Buffalo, N.Y.
Reexamination Request No. 90/001,212, Apr. 6, 1987.
Reexamination Certificate for Patent No. 3,758,978, issued Sep. 18, 1973, Ser. No. 211,530, Dec. 23, 1971.
Int. Cl.[4] F41C *23/00, 25/06*
U.S. Cl. 42—71.02

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** is confirmed.

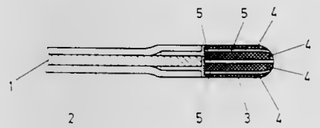
New claims **5–7** are added and determined to be patentable.

4. In a handgun having a trigger guard, a projection extending forward from the lower front portion of said trigger guard so as to form a pocket on the front portion of said trigger guard for accommodating the forefinger of the free hand of the shooter, the forwardmost point of said projection being at least



one-tenth inch in front of the rearwardmost point of said pocket so as to at least partially capture the underside of said forefinger and thereby enable said forefinger to control the upward recoil action caused by firing said handgun.

B1 3,911,928 (941st)
ENDOCARDIAL ELECTRODE
Hans Lagergren, Stockholm, Sweden, assignor to Hans Lagergren, Stockholm, Sweden
Reexamination Request No. 90/000,913, Nov. 27, 1985.
Reexamination Certificate for Patent No. 3,911,928, issued Oct. 14, 1975, Ser. No. 460,211, Apr. 11, 1974.
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1973, 2319054
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—786



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

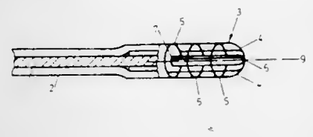
The patentability of claims **2–19** and **23–24** is confirmed.

Claims **1**, **21** and **22** are cancelled.

2. Endocardial electrode as claimed in claim **1**, the surface of said electrode head having a maximum area of 15 mm^2.

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B1 3,935,864 (942nd)
ENDOCARDIAL ELECTRODE
Hans Lagergren, Ostermalmsgatan 89,, S11459, Stockholm, Sweden
Reexamination Request No. 90/000,914, Nov. 27, 1985.
Reexamination Certificate for Patent No. 3,935,864, issued Jun. 18, 1974, Ser. No. 480,536, Feb. 3, 1976.
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1973, 2334049
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—786



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–20** is confirmed.

Claims **1–3** are cancelled.

4. Endocardial electrode as claimed in claim **3**, said surface area being about 2 mm^2.

B1 4,315,508 (943rd)
SELF-CENTERING MULTIPLE USE GARMENT SUSPENSION SYSTEM
Martha E. Bolick, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Reexamination Request No. 90/001,174, Feb. 26, 1987.
Reexamination Certificate for Patent No. 4,315,508, issued Feb. 16, 1982, Ser. No. 135,536, Mar. 31, 1980.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—392



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** is confirmed.

New claims **11–21** are added and determined to be patentable.

11. In combination, an incontinent garment and suspension system, consisting essentially of:
a generally rectangular absorbent assembly including a liquid impervious backing, a liquid pervious facing, and a absorbent medium between said backing and said facing; said absorbent assembly having a width from 6 to 22 inches and a length from 10 to 34 inches, and a releasable attachment means adjacent each corner thereof, and
a pair of elastic straps having at their respective ends fastening means being refastenable to said attachment means, and formed from a soft, nonirritating, nonabrasive elastic having high strain and low stress properties,
each said elastic strap having a length from 2 to 20 inches and width from ½ to 5 inches, and an elongation of at least about 200%, thereby accommodating various size users,
an intermediate portion of each said elastic strap being extendable upwardly and outwardly from said absorbent assembly at an angle of from 25° to 45° with the horizontal to provide an upwardly and outwardly directed force vector, whereby said absorbent assembly is self-centering due to the oppositely applied upwardly and outwardly directed force vectors of said elastic straps.

B1 4,472,499 (944th)
REAGENTS FOR THE DETERMINATION OF ENZYMES
Ralph P. McCroskey, Poway, Calif., assignor to American Hoechst Corporation, Somerville, N.J.
Reexamination Request No. 90/001,185, Mar. 2, 1987.
Reexamination Certificate for Patent No. 4,472,499, issued Sep. 18, 1984, Ser. No. 341,872, Jan. 22, 1982.
Int. Cl.[4] C12Q *1/34, 1/00, 1/40, 1/42;* **C12N** *9/96*
U.S. Cl. 435—18

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–7** are cancelled.

[1. A reagent for the temperature-independent determination of an enzyme in a sample containing same, comprising:
a substrate capable of releasing p-nitrophenol at a rate proportional to the amount of enzyme in the sample, said substrate selected from the group consisting of p-nitrophenyl derivatives of mono and oligosaccharides and mixtures thereof; and
a buffer which affects the release of p-nitrophenol from said substrate at a temperature-independent rate, said buffer selected from the group consisting of 2-(N-morpholino)ethanesulfonic acid, N-(2-acetamido)aminodiacetic acid, 1,3-bis(tris(hydroxymethyl)methylamino)propane, N-(2-acetamido)2-aminoethanesulfonic acid, 3-(N-morpholino)propanesulfonic acid, N-tris(hydroxymethyl)-methyl-2-aminoethanesulfonic acid, N-2-hydroxyethyl-piperazine-N'-3 -propanesulfonic acid, N-tris(hydroxymethyl)methylglycine,N,N-bis(2-hydroxyethyl)glycine, cyclohexylaminoethanesulfonic acid, and mixtures thereof.**]**

B1 4,474,939 (945th)
METHOD OF MAKING SELECTED POLYESTERS
Edward J. Holzrichter, Redlands, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.
Reexamination Request No. 90/001,326, Sep. 10, 1987.
Reexamination Certificate for Patent No. 4,474,939, issued Oct. 2, 1984, Ser. No. 565,302, Dec. 27, 1983.
Int. Cl.[4] C08G *63/18*
U.S. Cl. 528—272

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **4** and **5** are cancelled.

Claims **1** and **6–10** are determined to be patentable as amended.

Claim **3**, dependent on an amended claim is determined to be patentable.

New claim **11** is added and determined to be patentable.

1. An improved method of making selected polyesters, said method comprising
a. **[**forming a eutectic mixture of a plurality of diols suitable for use in the preparation of polyesters, said eutectic mixture having a melting point below that of the individual diols in said mixture**]** *separately forming at least two molten diols, which diols are solid at ambient temperature, said diols being selected from the group consisting of neopentyl glycol, 1,6 hexanediol, cyclohexane dimethanol and trimethyl pentanediol, and while said formed diols are still molten forming an eutectic mixture therefrom, which eutectic mixture remains liquid at ambient temperature*; and,
b. reacting the eutectic mixture in the liquid state with sufficient amount of polyester-forming organic acid under conditions to form an ester and effect polymerization of the same and thereafter recovering the resulting polyester, said method effecting a saving in the amount of time and energy necessary to prepare said polyester.

B1 4,549,087 (946th)
LEAD SENSING SYSTEM
Robert J. Duncen, Magnolia; Richard B. Maxner, Danvers; Jean A. McLean, South Hamilton, and William H. Mirley, Jr., North Reading, all of Mass., assignors to USM Corporation, Farmington, Conn.
Reexamination Request No. 90/001,365, Nov. 2, 1987.
Reexamination Certificate for Patent No. 4,549,087, issued Oct. 22, 1985, Ser. No. 451,921, Dec. 27, 1982.
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—561

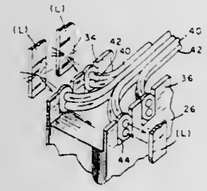
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claims **2–14**, dependent on an amended claim, are determined to be patentable.

New claim **15** is added and determined to be patentable.

1. In a **[**component insertion**]** machine *for inserting a DIP electronic component having a plurality of leads arranged in opposed parallel rows* wherein the leads of **[**components**]** *the component* are inserted through holes in a **[**medium**]** *circuit board* after the **[**medium**]** *circuit board* has been positioned for receipt of the leads through the holes, a system for determining whether the leads are properly inserted through the holes in the **[**medium**]** *circuit board*, said system comprising:
means for illuminating the inserted leads to simultaneously define a predetermined lighting condition on a selected portion of each inserted lead,
a *corresponding* plurality of optical **[**sensors,**]** *sensor means each including*
an optical sensor located below the positioned **[**medium, each optical sensor**]** *circuit board and spaced from a respective inserted lead for* individually sensing the presence or



absence of **[**only one**]** *said predetermined lighting condition on the selected portion of said* respective lead **[**of the component extending beneath the medium**]***; and*
means for presenting in readable form the status of said optical sensor;
means for reading the status of each of said plurality of optical sensors **[**after the component leads have been inserted into the holes in the positioned medium**]** *while said inserted leads are illuminated to simultaneously define the predetermined lighting condition on the selected portion of each inserted lead*; and
means for verifying that the status of each optical sensor is in accordance with a predetermined status for that particular optical sensor.

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REISSUES

NOVEMBER 8, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,778
FROTHERS DEMONSTRATING ENHANCED RECOVERY OF COARSE PARTICLES IN FROTH FLOATATION

Robert D. Hansen; Richard R. Klimpel, and Roger W. Bergman, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Original No. 4,582,596, dated Apr. 15, 1986, Ser. No. 617,284, Jun. 4, 1984. Application for reissue Oct. 27, 1986, Ser. No. 923,523

Int. Cl.[4] B03D *1/14*

U.S. Cl. 209—166 **15 Claims**

1. A process for recovering coal or metal values from raw coal or metal ore which comprises subjecting the raw coal or metal ore in the form of an aqueous pulp, to a flotation process in the presence of a flotation collector for coal or metal values and a flotating amount of a flotation frother which comprises the reaction product of a monohydroxy aliphatic C_6 alcohol and between about 1 and 5 moles of propylene oxide, butylene oxide or mixtures thereof, under conditions such that the coal or metal values are recovered in the froth.

Re. 32,779
RADIOGRAPHIC SYSTEMS EMPLOYING MULTI-LINEAR ARRAYS OF ELECTRONIC RADIATION DETECTORS

Robert A. Kruger, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Original No. 4,383,327, dated May 10, 1983, Ser. No. 211,792, Dec. 1, 1980. Continuation of Ser. No. 725,433, Apr. 22, 1985. Application for reissue May 14, 1986, Ser. No. 863,592

Int. Cl.[4] G01N *23/00*

U.S. Cl. 378—19 **5 Claims**



23. A scanning radiographic imaging system comprising:

(a) a source for propagating penetrative radiation along a path;

(b) a radiation detector positionable in said path and being sensitive to a pattern of radiation incident thereon to produce and retain spatially distributed radiation intensity indication representing generally the relative spatial distribution of radiation intensity across the received pattern, said detector being capable of integratively updating said intensity indication in response to subsequent receipt of radiation;

(c) means for generating relative scanning motion between said detector and a subject when interposed in said path, said scanning motion being defined by a first average velocity;

(d) synchronizing means coupled to said detector for causing motion of said radiation intensity indication relative to said detector in a second direction defined by a second average velocity which is substantially equal and opposite to said first velocity;

(e) output means coupled to said detector for outputting information defined by said moving intensity indication as portions of said intensity indication respectively arrive at a predetermined location relative to said detector, and

(f) means responsive to said outputted information for producing an image corresponding to said pattern of incident radiation.

Re. 32,780
CORE MATERIAL FOR AN AUTOMOBILE BUMPER

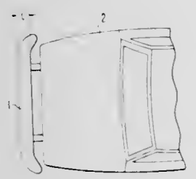
Shohei Yoshimura, Tomioka, and Akira Adachi, Shakura, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Original No. 4,600,636, dated Jul. 15, 1986, Ser. No. 708,937, Mar. 6, 1985. Application for reissue Sep. 17, 1987, Ser. No. 98,052

Claims priority, application Japan, Mar. 8, 1984, 59-44541

Int. Cl.[4] B32B *3/18, 5/18*

U.S. Cl. 428—304.4 **14 Claims**



3. In an automobile bumper which is composed of a core material and a surface covering material, the improvement wherein said core material is composed of a molded article of prefoamed particles of a polyolefin resin, and having a density of 0.05 to 0.15 g/cm^3 and the relation represented by the following expression

$$E_{20}/\rho \geq 20 \text{ kg-cm/g}$$

wherein E_{20} is the amount of energy absorption (kg-cm/cm^3) when the core material is compressed to 50% at 20° C., and ρ is the density (g/cm^3) of the core material, wherein said particles are nearly spherical in shape, have a particle diameter of 2 to 15 mm, a cell diameter of 0.10 to 2.00 mm and a proportion of closed cells of at least 90% and contain air filled within the cells.

11. The automobile bumper of claim 3 wherein the core material is composed of a polyolefin resin that is not cross linked.

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Re. 32,781

FLEXIBLE DISK CASSETTE WITH IMPROVED RADIAL SHIFT LIMITATION STRUCTURE FOR USE IN A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Kiyoshi Takahashi, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan

Original No. 4,445,157, dated Apr. 24, 1984, Ser. No. 292,447, Aug. 13, 1981. Application for reissue Apr. 24, 1986, Ser. No. 855,316

Claims priority, application Japan, Aug. 14, 1980, 55-115305

Int. Cl.[4] G11B *23/02, 5/82, 5/012, 5/016*

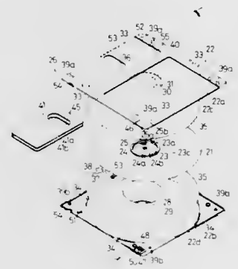
U.S. Cl. 360—133 **23 Claims**

19. A [magnetic] *flexible* disk cassette *for use in a magnetic recording and reproducing apparatus*, comprising:

a flexible disk;

a cover [having] *including* upper and lower walls *having confronting inner surfaces* between which the flexible disk is positioned, said lower wall having a driving hole [means] therein through which the flexible disk [may be] *is* driven *and said upper wall having a ring-like projection extending therefrom toward said inner surface of said lower wall and said driving hole; and*

a pan-shaped center-core disk of magnetic material [is] positioned centrally on the [magnetic] *flexible* disk and [has] *having* an outer convex portion *at a central portion* receivable in and *of* a diameter [slightly] smaller than *an inner diameter of* said driving hole [means] in the lower wall and [a] *an upwardly opening* center hollow having an inner diameter [slightly] larger than [a] *an outer* diameter of [a] *said* ep projection from said upper wall [receivable within said center hollow], *both said driving hole at an edge thereof and said projection being radially engageable with said outer convex portion for locating said*



flexible disk within said cover, said outer convex portion extending into said driving hole or said projection extending into said center hollow radially inside said outer convex portion in all positions of said flexible disk and center-core disk between said upper and lower walls of said cover.

PLANT PATENTS

GRANTED NOVEMBER 8, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,373

LILY PLANT NAMED 'PANTOMIME'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Nov. 10, 1986, Ser. No. 929,322

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental hybrid lily plant, substantially as herein shown and described, characterized by its unique upright to semi-upright flowers with their pink coloration, deeper magenta-rose midribs and complete lack of spotting, the plant has a vigorous growth habit and rapid natural propagation and is characterized by the excellence of its flower form, size and substance, its versatility both as a garden plant and as a cut flower producer, and its high resistance to diseases.

6,374

LILY PLANT NAMED 'SNOW KING'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Nov. 10, 1986, Ser. No. 929,323

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Oriental hybrid lily plant, substantially as herein shown and described, characterized by its unique upright to semi-upright bowl-shaped flowers of pure white coloration, accented with magenta-rose spots forming a very light and open band surrounding the flower center; and by its vigorous growth and rapid natural propagation and its versatility both as a garden plant and as a cut flower producer.

6,375

LILY PLANT NAMED 'RED SONG'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Nov. 10, 1986, Ser. No. 929,325

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive Asiatic hybrid lily variety, substantially as herein shown and described, particularly characterized by its large, broad-tepalled, glossy flowers of rich deep red coloring and inconspicuous spotting; its vigorous growth and rapid natural propagation; the excellence of its flower form; and its versatility both as a garden plant and as a cut flower producer from precooled bulbs forced under glass.

6,376

LILY PLANT NAMED 'ROUGE PIXIE'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Aurora, Oreg.

Filed Nov. 17, 1986, Ser. No. 931,433

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Asiatic hybrid lily, substantially as herein shown and described, particularly characterized by its orange-red flowers, the excellence of its flower form and by its short height and abundant foliage providing an upright flowering silhouette ideal for a pot plant.

6,377

BEGONIA PLANT NAMED 'NANCY'

Soeren Hvid, Aarup, Denmark, assignor to L. Daehnfeldt A/S, Odense, Denmark

Filed Jun. 6, 1986, Ser. No. 871,634

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of *Begonia hiemalis* plant named Nancy, as shown and described, and particularly characterized by its vigorous, compact growth habit; pure white tepals that maintain color even under high light conditions; floriferous habit; and by its excellent keeping qualities.

6,378

GERANIUM PLANT "CALYPSO"

Richard Craig, State College, Pa., assignor to Research Corporation, New York, N.Y.

Filed Jul. 3, 1986, Ser. No. 881,922

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new distinct cultivar of geranium, substantially as illustrated and described, characterized as being particularly well adapted to both commercial greenhouse production and garden performance, and possessing unique flavonol and anthocyanin profiles, double flowers and clear floral color.

6,379

GERANIUM PLANT "SIREN"

Richard Craig, State College, Pa., assignor to Research Corporation, New York, N.Y.

Filed Jul. 3, 1986, Ser. No. 882,069

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new distinct cultivar of geranium substantially as illustrated and described characterized as being particularly well adapted to both commercial greenhouse production and garden performance, and possessing unique flavonol and anthocyanin profiles and double flowers when compared to the geranium cultivar "Bruni".

6,380

PLUM TREE, "SHARRON'S"

Giovanni B. Bubani, Fresno, Calif., assignor to R.E.U.S., Inc.; Pruner A.G.I.; Pruner A.G.II and Agri-Cal, Inc., all of Fresno, Calif.

Filed Dec. 15, 1986, Ser. No. 942,081

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of Plum Tree substantially as illustrated and described which is somewhat similar to the Casselman Plum Tree, (U.S. Plant Pat. No. 1,756), with which it most closely resembles, but from which it is distinguished therefrom by bearing fruit which are larger, uniform and a full dark red color, which ripens approximately July 26 to August 18 at Sanger, Calif., and which further has a firm yellow colored flesh which resists heat damage and a skin which shows a resistance to shoulder and stem end cracks; the variety displaying exceptional handling and shipping characteristics.

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6,381
ALSTROEMERIA NAMED ADVENDO
Jac. van Leeuwen, Poeldijk, Netherlands, assignor to Lezan V.O.F., Hillegom, Netherlands
Filed Jan. 12, 1987, Ser. No. 2,551
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive alstroemeria cultivar, substantially as herein shown and described, characterized by its butterfly formation and abundant production of medium large flowers particularly distinguished by the reddish violet coloring of its relatively large outer petals, and its smaller and multi-colored inner petals which are heavily striped from base to tip.

6,382
ALSTROEMERIA NAMED FLAMENGO
Jac. van Leeuwen, Poeldijk, Netherlands, assignor to Lezan V.O.F., Hillegom, Netherlands
Filed Jan. 12, 1987, Ser. No. 2,552
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive alstroemeria variety, substantially as herein shown and described, characterized by its butterfly form and abundant production of very large flowers particularly distinguished by the generally whitish color of the upper petals, the outer center portion of which bear a large, reddish spot and the petal body being heavily marked by brownish stripes extending radially from the petal base toward the outer margins.

6,383
CRAPE MYRTLE
Carl E. Whitcomb, Stillwater, Okla., assignor to Oklahoma State University, Stillwater, Okla.
Filed Sep. 20, 1985, Ser. No. 778,221
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—54 1 Claim

1. A new and distinct variety of *Lagerstroemia indica* plant substantially as shown and described and particularly characterized by a vigorous upright growth habit, a plurality of major stems and little if any secondary suckering at the base, large inflorescenses of wine-red flower, Spiraea red #0-25, and dark green leathery leaves that turn red-orange in the fall.

6,384
ROSE PLANT — MEIGEKANU VARIETY
Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Aug. 11, 1986, Ser. No. 895,451
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of shrub rose plant characterized by the following combination of characteristics:
(a) forms throughout the season attractive semi-double bright red blossoms,
(b) exhibits a well-branched semi-erect growth habit,
(c) exhibits above-average disease resistance,
(d) exhibits a propensity to readily undergo asexual propagation from cuttings, and
(e) is particularly well-suited for growing in the landscape; substantially as herein shown and described together with the parts thereof.

6,385
ROSE PLANT—MEIRANOVI VARIETY
Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.
Filed Aug. 11, 1986, Ser. No. 895,491
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of shrub rose plant characterized by the following combination of characteristics:
(a) forms attractive semi-double pink blossoms,
(b) exhibits a flowing growth habit which forms a plant having a greater width than height,
(c) exhibits excellent disease resistance,
(d) exhibits excellent hardiness,
(e) exhibits a propensity to readily undergo asexual propagation from cuttings, and
(f) is particularly well-suited for growing in the landscape; substantially as herein shown and described together with the parts thereof.

6,386
SPATHIPHYLLUM PLANT
Hideo Oobayashi, Toyohashi, Japan, assignor to Yugen Kaisha Daijuen, Toyohashi, Japan
Filed May 2, 1986, Ser. No. 859,080
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of Spathiphyllum plant, substantially as herein disclosed, characterized as to novelty by compact plant form with a larger ratio of bract to the whole plant as well as of bract to leaf in length, dark green colored leaves and round, big, erect and yellowish white colored bracts.

6,387
PEACH TREE NAMED STARCREST
Paul Chapus, St.-Laurent-du-Pape, and Hubert Veauvy, Crest, both of France, assignors to G.I.E. Star Fruits, Vedene, France
Filed Jan. 12, 1987, Ser. No. 2,041
Int. Cl.[4] A01H 5/03
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of peach tree as described, illustrated and identified by the characteristics enumerated above, the fruit of which is juicy with a medium aroma, has a medium yellow color, provides good eating, keeping and shipping qualities and is useful for fresh market.

6,388
CHRYSANTHEMUM PLANT NAMED MIRAGE
Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, and William E. Duffett, Salinas, Calif., assignors to Grace H. Mack, New Canaan, Conn.
Filed Jan. 15, 1987, Ser. No. 3,602
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct chrysanthemum plant named Mirage, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; pompon capitulum type; orange-bronze ray floret color; diameter across face of capitulum of up to 4 cm at maturity; medium plant height with spreading and prolific branching pattern; average natural season flower date of August 21 in Salinas, Calif. and September 15 in Hightstown, N.J.; uniform seven week photoperiodic flowering response to short days in photoperiodic controlled flowering programs; and durable, uniform performance in outside all flowerings and in spring small pot flowering programs.

PATENTS

GRANTED NOV. 8, 1988

ERRATA

For CLASS	See PATENT NO.
057-279	4,782,653
600-017	4,782,817
160-310	4,782,887
356-348	4,783,055
273-319	4,783,092
437-015	4,783,237
424-001	4,783,313
156-307	4,783,365
502-170	4,783,445
514-456	4,783,533
341-154	4,783,643
341-166	4,783,644
357-080	4,783,697
369-266	4,783,717
379-067	4,783,800

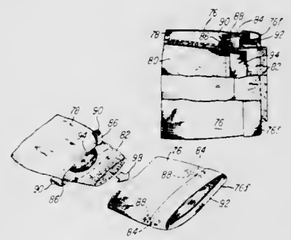
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PATENTS

GRANTED NOVEMBER 8, 1988

GENERAL AND MECHANICAL

4,782,534
FIREFIGHTER'S GARMENT HAVING DOUBLE WRISTLET SLEEVE AND CUFF
William L. Grilliot, and Mary I. Grilliot, both of 1986 Home Ave., Dayton, Ohio 45417
Filed Feb. 8, 1988, Ser. No. 153,353
Int. Cl.[4] A41D *1/02, 3/02*
U.S. Cl. 2—81 27 Claims

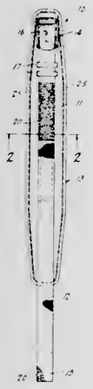


1. A firefighter's garment comprising a sleeve having a given length, the sleeve including an outer layer of flame resistant material, an intermediate layer of moisture barrier material and an inner layer of thermal barrier material, each of the layers extending substantially the length of the sleeve, a cuff member of moisture barrier material, means attaching the cuff member to the intermediate layer whereby the cuff member extends from the intermediate layer, the cuff member having an outer surface, the outer layer having an inner surface, a first flexible annular seal member, the first flexible annular seal member being positioned between the surfaces, means attaching the first flexible annular seal member to one of the surfaces as the first flexible annular seal member engages the other surface, a second flexible annular seal member, the second flexible annular seal member being encompassed by the cuff member, and means connecting the second flexible annular seal member to the cuff member, whereby the cuff member and the second flexible annular seal member are adapted to engage the wrist of a firefighter who wears the garment and whereby the cuff member and the flexible annular seal members prevent fluids and debris from travel to the wrist and arm of the firefighter who wears the garment.

16. A firefighter's coat which is provided with a sleeve member, the sleeve member comprising a plurality of layers, one of the layers including a cuff-like extension portion, one of the layers including an extension portion which comprises a flexible annular seal member which is encompassed by the cuff member, the flexible annular seal member being adapted to engage the wrist of the firefighter who wears the coat, and one of the layers including an extension portion which comprises a flexible annular seal member which encompasses and engages the cuff member.

22. A firefighter's garment of the type provided with a pair of sleeve members, each of the sleeve members having a plurality of layers, there being a first layer and a second layer, each of the layers having an extremity portion, the combination comprising a first annular seal member, an annular cuff member extending from the extremity portion of one of the layers, the first annular seal member being positioned between the other layer and the cuff member, a second annular seal member, the second annular seal member being encompassed by the cuff member, and means attaching each of the seal members to one of the layers.

4,782,535
BELT
Edward H. Yewer, Jr., 6251 N. Hwy. 83, Hartland, Wis. 53029, and Clifford L. Cook, Boise, Id., assignors to Edward H. Yewer, Hartland, Wis.
Filed Nov. 23, 1987, Ser. No. 124,003
Int. Cl.[4] A41F *9/00*
U.S. Cl. 2—321 5 Claims



1. A support belt comprising:
(a) an inner layer of stretchable fabric;
(b) an intermediate layer, substantially coextensive in size and shape with said inner layer and joined thereto, of an elastically yieldingly compressible and shape-restoring foam material having a thickness greater than that of said inner layer;
(c) an outer layer of stretchable fabric substantially coextensive in shape and size with said intermediate layer and joined thereto;
(d) said three layers being in substantial overlying registration with respective confronting surfaces being heat combined with one another to provide a sandwich combination and configured to define said support belt; and
(e) adjustable fastener means for joining the opposite ends of said belt.

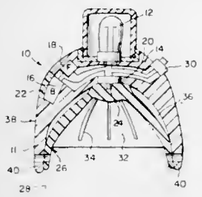
4,782,536
EMERGENCY SAFETY HELMET
Bobby R. Stricklin, 621 E. Tennessee St., Florence, Ala. 35630, and George Spector, 233 Broadway, RM 3815, New York, N.Y. 10007
Filed Apr. 20, 1987, Ser. No. 40,092
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—414 3 Claims

1. An emergency safety helmet comprising:
(a) a strobe lamp connected to top of said safety helmet;
(b) an electrical circuit disposed within said safety helmet;
(c) a power supply connected to said electrical circuit within said safety helmet, said power supply having a source of electricity for energizing said strobe lamp;
(d) a flasher connected to said electrical circuit within said safety helmet between said strobe lamp and said power supply for interrupting electrical connection between said strobe lamp and said power supply at predetermined intervals;
(e) a normally opened switch connected to said electrical

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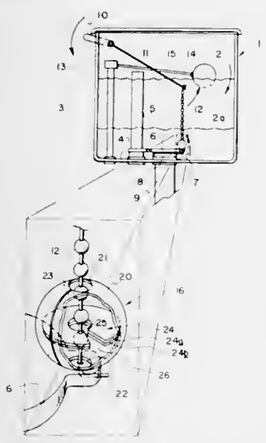
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circuit within said safety helmet that can be manually operated for closing said electrical circuit;
(f) said power supply being a dry cell battery;
(g) an access door disposed in said safety helmet so as to replace said dry cell battery when needed;
(h) said switch being a push button type having an operating



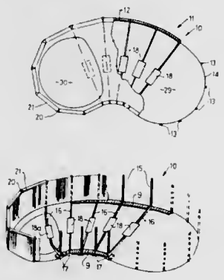
member extending downwardly into interior of said safety helmet; and
(i) a soft inner liner secured within said safety helmet adapted to engage said operating member of said switch when head of a wearer presses said soft inner liner to move said operating member of said switch.

4,782,537
QUICK CONNECT WATER SAVER FOR A FLUSH TOILET
John A. Kinslow, Collegeville, Pa., assignor to John A. Kinslow Enterprises, Inc., Collegeville, Pa.
Filed Jun. 2, 1987, Ser. No. 56,725
Int. Cl.[4] E03D *1/00*
U.S. Cl. 4—415 **7 Claims**



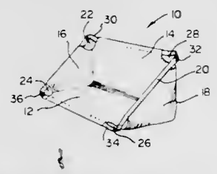
1. A water saver unit to be immersed in and filled with the water of a water-flush toilet system, the unit comprising:
a hollow body having a pair of clearance holes disposed diametrically opposite one another;
a slot formed in the body and connected to and extending between said clearance holes, the slot and clearance holes providing communication between the outside and inside of the body to permit the body to be filled with water;
the body being formed of flexible material so that pressure applied adjacent each said clearance hole and respectively directed toward the center of the body causes the body to distort, which distortion causes the slot to increase in width and so that when said pressure is relieved, the body will return to the non-distorted condition wherein the width of the slot is the same as before said distortion; and
weight means inside of said body and being in the form of an annular member, having a central clearance aperture and a slot extending from the aperture to the periphery of the member.

4,782,538
RESERVOIRS
Donald Chisholm, and David McPherson, both of 3327 Pacific Highway, Springwood, Qld. 4127, Australia
Filed Jul. 23, 1986, Ser. No. 888,978
Claims priority, application Australia, Jul. 23, 1985, PH01597
Int. Cl.[4] E04H *3/16, 3/18*
U.S. Cl. 4—506 **20 Claims**



1. A reservoir assembly free of external supporting braces having a base wall, a side wall and support means for supporting said side wall, and an end wall having a smaller radius of curvature than said side wall, whereby said end wall is substantially self supporting and is free of external bracing, said support means including a U-shaped supporting frame extending across said reservoir to support opposed portions of said side wall, said supporting frame being free of external bracing and having a base member in the form of a continuous beam formed integrally with the lower ends of opposed cantilevered wall supporting members whereby said beam resists outward splaying of said wall supporting members, said base member extending beneath said base wall such that the weight of the reservoir water applied through said base wall to said base member reduces upward deflection of the central portion of said base member and thus outward splaying of said cantilevered wall supporting members to a significant extent.

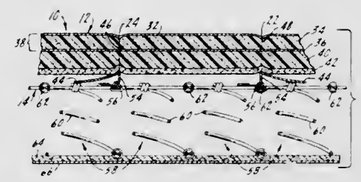
4,782,539
RESCUE SEAT
Larry Elliott, P.O. Box 1052, Rosetown, Saskatchewan, Canada S0L 2V0
Filed Jun. 24, 1986, Ser. No. 879,515
Claims priority, application Canada, Sep. 4, 1985, 489974
Int. Cl.[4] A61G *7/08, 1/00*
U.S. Cl. 5—81 R **2 Claims**



1. An emergency rescue seat comprising:
a flexible bottom support panel including first and second side edges and a rear edge;
a flexible back support panel including first and second side edges and a bottom edge and joined along said bottom edge to said rear edge of said bottom support panel;

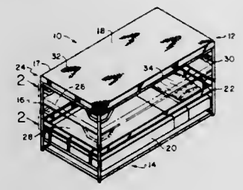
two flexible triangular side support panels including first and second side edges and said first and second bottom edges and joined to respective ones of said first and second side edges of said bottom and back support panels, said edges of said triangular panels extending over a major portion of said edges of said bottom and back support panels;
and first and second pairs of lifting means located respectively adjacent the upper corners of said first back panel and the forward corners of said bottom panel; and
wherein said panels are constructed of material having sufficiently flexibility that said seat is longitudinally and transversely flexible to partially enfold the patient being carried therein,
said support panels including a reinforcing strip along their respective free edges, in which said strip is continuous around the free edge of said support panels, the outer corners of said support panels are truncated and the said continuous strip passes across said truncated areas whereby to form handles which comprise said lifting means, and in which the said strip is a woven webbed material.

4,782,540
SLEEPER SOFA MATTRESS
Robert K. Parker, No. 6 Northridge Cir., Johnson City, Tenn. 37601
Continuation of Ser. No. 917,728, Oct. 10, 1986, abandoned.
This application Feb. 22, 1988, Ser. No. 161,359
Int. Cl.[4] A47C *27/00*
U.S. Cl. 5—249 **16 Claims**



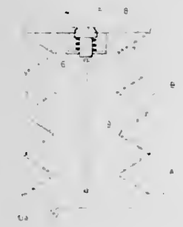
1. A sofa bed mattress adapted to be extended flat to provide a sleeping surface and to be folded about transverse flexure lines for storage within a sofa, the sofa bed mattress comprising:
a foldable inner spring unit including a plurality of uniformly-spaced rows of coil springs extending transversely across said mattress with adjacent rows of springs being connected by transversely-extending wires such that the flexure lines may be defined between any two rows of springs;
a cover encasing the spring unit and including a continuous top cushion overlying the inner spring unit to provide a sleeping surface;
each of said inner spring and said top cushion being of substantially uniform thickness;
means for securing the top cushion to the inner spring unit along at least one line extending transversely of said mattress such that the position of the top cushion relative to the inner spring unit is substantially maintained when the mattress is folded, said connection of said top cushion to said inner spring unit overlying the junction of two adjacent rows of springs to define one of said transverse flexure lines.

4,782,541
EARTHQUAKE PROTECTIVE BED
David C. Tuchman, 370 Mansfield St., Apartment T1, New Haven, Conn. 06511
Filed Jul. 21, 1987, Ser. No. 75,970
Int. Cl.[4] A47C *29/00*
U.S. Cl. 5—414 **20 Claims**



1. A protective bed comprising a lower section forming a base suitable for supporting a mattress; an upper section arranged above and substantially covering said lower section; interconnecting means for maintaining said upper and lower sections spaced at least a predetermined distance from each other to define an occupant space, said upper section being resistant to penetration by falling debris, whereby an occupant within said occupant space is shielded between said upper and lower sections and protected from impact of falling debris, such as during an earthquake, wherein said interconnecting means comprises a plurality of telescoping tubes extending between said upper and lower sections for enabling movement of said upper section between upper and lower positions relative to said lower section, said upper section normally being disposed in said upper position and moving to said lower position in response to the weight of debris accumulated on said upper section; and maintaining means for maintaining said upper section in said upper position prior to impact by and accumulation of debris on said upper section, and wherein said maintaining means comprises frangible members which extend through at least one tube of each set of telescoping tubes which prevent collapse of said telescoping tubes prior to accumulation of debris on said upper section and resulting fraction of said frangible members.

4,782,542
PNEUMATIC MAT WITH SAFETY APPARATUS
Hisashi Sato, Tokyo, Japan, assignor to Michiko Tsuchiya, Japan
Filed Nov. 4, 1986, Ser. No. 927,263
Claims priority, application Japan, Nov. 4, 1985, 60-169335[U]; Nov. 4, 1985, 60-169337[U]
Int. Cl.[4] A47C *27/08;* A61G *7/00*
U.S. Cl. 5—453 **7 Claims**

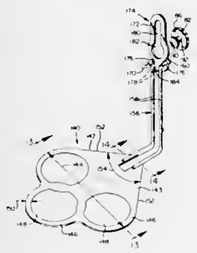


1. A pneumatic bed, comprising
an inflatable member,
a fixed member,

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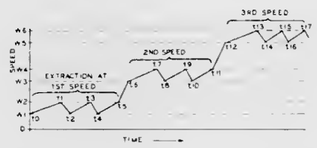
a valve,
an element having a port in which said valve is seated, said element normally confining inflation gas supplied to said inflatable member, said element normally being movable with respect to said fixed member upon inflation of said inflatable member, and
flexible member means extending between said fixed member and said valve, for unseating said valve when said element is moved beyond a predetermined point with respect to said fixed member when said inflatable member is inflated beyond a pre-determined limit, wherein
said inflatable member is constituted by one of a plurality of inflatable mats affixed to said bed,
said element is a plate mounted on top of said inflatable mat,
said valve is situated within said inflatable mat,
said flexible member means are constituted by one of a rope, wire, cord, or spring interconnecting said valve and said fixed member such that when said mat is inflated beyond said predetermined limit, said flexible member means are tensioned and unseat said valve from said port,
and additionally comprising
a shaft fitted against said valve and connected to said flexible member means, said shaft mounted for free sliding with respect to said element,
spring means for biasing said valve upwardly to seat in said port, said spring means extending about said shaft, and
a frame affixed to said plate from underneath and having a hole through which said shaft slides, said spring means being mounted upon said frame which is situated within said inflatable mat,
wherein said valve is disposed to reseat in said port when said inflatable mat deflates below said predetermined limit.

4,782,543
ATTACHMENT OF FLAT SHEETS TO WATERBEDS
William B. Hutton, and Deanice B. Hutton, both of 58481 Ross Rd., Warren, Oreg. 97053
Filed Apr. 3, 1987, Ser. No. 34,424
Int. Cl.[4] A47C *21/02*
U.S. Cl. 5—508 **21 Claims**



1. A device for holding bedding neatly in place on a waterbed including a fluid-filled mattress supported within a waterbed frame structure, the device comprising:
(a) fastener means for gripping a portion of a bed cover for a waterbed;
(b) an elongate flexible elastic connector member having opposite first and second ends, said first end being attached to said fastener means; and
(c) a relatively stiff, generally planar retainer member, said second end of said elastic connector member being attached to said retainer member, said retainer member being adapted for placement beneath the mattress and within the frame of a waterbed and said retainer member including means defining at least one opening extending therethrough for receiving a portion of the mattress of said waterbed protruding downwardly therethrough.

4,782,544
WATER EXTRACTION METHOD AND CONTROL FOR AUTOMATIC WASHER
Arne M. Nystuen, Lincoln Township, Berrien County; David W. Mundy, and John M. Kuss, both of St. Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Apr. 16, 1987, Ser. No. 39,321
Int. Cl.[4] D06F *33/02*
U.S. Cl. 8—159 **37 Claims**



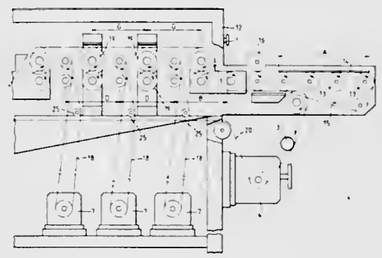
1. A method of extracting moisture from a fabric load in an automatic washer which has a rotatable wash basket comprising the steps:
rotating said basket at a first, low rotational speed level until all of the moisture removable at that rotational speed level has been removed;
increasing the rotational speed of the basket to a next, higher rotational speed level until all of the moisture removable at that rotational speed level has been removed; and
repeating the prior step until a desired degree moisture removal has occurred.

22. A control for use in an automatic washer which has a rotatable wash basket driven by an electric motor comprising:
means for energizing said motor to rotate said basket at a first low speed level;
means for periodically sensing an incremental amount of moisture removed from a fabric load within said wash basket;
means for repeatedly increasing the rotational speed of said basket to a next higher speed level upon the occurrence of sensing an incremental amount of removed moisture below a preselected amount; and
means for terminating the rotation of said basket when said increment amount of removed moisture is below a preselected amount at a predetermined maximum rotational speed level.

4,782,545
APPARATUS FOR OPERATING AND CONTROLLING MACHINES CLEANING THIN METAL OR METAL COATED SHEETS AND BOARDS
Umberto Aiassa, Via Zarotto No. 38, 43100 Parma, Italy
Continuation-in-part of Ser. No. 791,553, Oct. 25, 1985, abandoned. This application May 1, 1987, Ser. No. 44,713
Claims priority, application Italy, Oct. 25, 1984, 46870 A/84
Int. Cl.[4] A46B *13/04*
U.S. Cl. 15—77 **6 Claims**

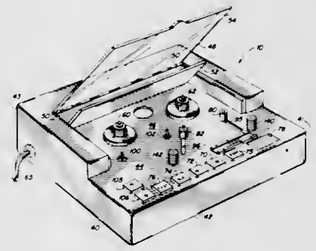
1. An operating and control apparatus for board-cleaning machines of the type comprising at least one horizontal cylindrical brush (**17**) as well as means (**19**) for feeding the boards (**14**) to be cleaned, characterised in that it comprises a reading member (**1**) capable of detecting the presence of the incoming board (**14**), a device (**3**) designed to control the forward movements of the board (**14**), a memory for storing the dimension (A) of the board (**14**) which is parallel to the direction of the movement of the latter, a motor unit (**7**) for driving said at least one brush (**17**) in the same direction as the feeding direction of the board (**14**), as well as a processor (**5**) designed to collect and process the signals output from the said member (**1**) and device (**3**) and to compare them with the data stored in the said memory so as to operate, by means of a special power unit (**6**), the said motor unit (**7**), so that it causes said at least one brush

(**17**) to rotate, when the latter is engaged with the rear end part of the board, at a velocity having absolute values greater than



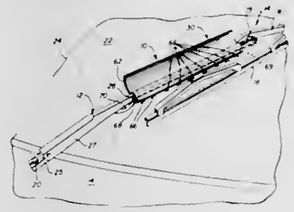
or equal to zero and in the opposite direction to the direction in which the board (**14**) is fed, in accordance with a predetermined method of operation.

4,782,546
TAPE REPAIR APPARATUS
Leroy George, 7915 W. Orangewood, Glendale, Ariz. 85301, and Wiley H. Voyles, 15627 W. Grand Ave., Surprise, Ariz. 85374
Filed Jun. 8, 1987, Ser. No. 59,413
Int. Cl.[4] B08B *11/02*; B31F *5/06*; G03D *15/04*
U.S. Cl. 15—100 **4 Claims**



1. An apparatus for repair of audio and video tapes of the type contained within a cartridge having spaced-apart reels for winding the tape in a forward or reverse direction, said apparatus comprising:
(a) a housing defining a compartment for securing said tape cartridge;
(b) drive means engaging said reels for selectively driving said tape in a forward or reverse direction;
(c) tape extractor means including at least a pair of spaced-apart roller means having a first position engageable with said tape when said cartridge is in said compartment; and
(d) actuator means for selectively moving said tape extractor means to a second position maintaining at least a segment of said tape extending between said rollers spaced away from said cartridge in a position convenient for repair and review of the tape.

4,782,547
ATTACHMENT STRUCTURE
Michael G. Mohnach, Valpariaso, Ind., assignor to The Anderson Company of Indiana, Michigan City, Ind.
Filed Jan. 29, 1987, Ser. No. 8,464
Int. Cl.[4] B60S *1/46*
U.S. Cl. 15—250.04 **17 Claims**



1. An attachment structure for connection to a windshield wiper arm, said structure comprising:
a body;
means on the body defining an airfoil to vary air flow characteristics in front of a windshield surface adjacent to which the wiper arm is attached;
conduit means integral with the body and defining a fluid passageway alongside said body,
said conduit means having an inlet opening for introducing a windshield cleaning fluid into the fluid passageway and at least one discharge opening for directing cleaning fluid from the passageway against a windshield; and
means for snap-fitting a substantial length of the body directly against and to a windshield wiper arm.

4,782,548
LINEAR-MOTION WIPER STRUCTURE FOR WINDSHIELD AND LIKE SURFACE
Edward Y. Wong, F. 6, No. 8, Lane 143, Sec. 3, Thern I Rd., Taipei, Taiwan
Filed Aug. 24, 1987, Ser. No. 88,253
Int. Cl.[4] A47L *1/00*
U.S. Cl. 15—250.21 **1 Claim**



1. A linear-motion wiper structure comprising:
a pair of blades each having a center and each being provided about its center with first and second pivots;
a pair of arms each being a multistage hydraulic cylinder with a piston which is pivotally connected to said second pivot of a respective one of said pair of blades, said piston of each arm having a slide groove, a tongue for each piston, each tongue having one end with a stop engaged in said slide groove of one piston, each tongue having another end pivotally connected to said first pivot of one of said pair of blades, each arm having one end with a supporting point, a supporting arm extending downwardly from said supporting point of each arm;
a vertical transmission mechanism having a motor, a gear

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connected to be driven by said motor, a vertical gear rack engaged with said gear to be driven by said gear and a link connected to said vertical gear rack, said link having opposite ends each pivotally connected to said supporting point of one of said pairs of arms respectively; and

a horizontal transmission mechanism, a further gear connected to be driven by said motor, a horizontal gear rack engaged with said further gear and driven horizontally by said further gear, a vertical rod connected to said horizontal gear rack for horizontal movement therewith, a transverse rod connected to said vertical rod and extending substantially parallel to said link, said transverse rod being pivotally connected to each supporting arm;

whereby said arm is driven by said link to move up and down in a vertical direction, each supporting arm being simultaneously driven by said transverse rod to move back and forth in a horizontal direction, said vertical and horizontal gear racks being structured so that the frequency of vertical movement is twice that of horizontal movement so that each blade is driven by the arm to wipe a windshield in a linear reciprocating motion.

4,782,549

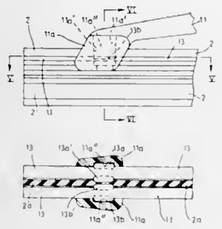
DEVICE FOR CONNECTING A WIPING ELEMENT TO THE SUPERSTRUCTURE OF A WIPER BLADE

Christian Beneteau, Gorcy, France, and Norbert Guerard, Virton, Belgium, assignors to Champion Spark Plug Europe S.A., Binche, Belgium

Continuation-in-part of Ser. No. 086,364, Aug. 17, 1987. This application Feb. 25, 1988, Ser. No. 160,244

Int. Cl.[4] B60S *1/02*

U.S. Cl. 15—250.42 **2 Claims**



1. A device for securing a resilient wiping element (2) to a superstructure (1, 11) on a wiper blade, said resilient wiping element reinforced by two backing strips (3,13) each having interior and exterior longitudinal edges, said backing strips being located in two longitudinally extending recesses provided in the wiping element so that the interior edges are adjacent to the wiping element (2) and wherein the superstructure (1, 11) is provided with at least two claws (1*a*, 11*a*) which partially surround the two backing strips (3, 13) and a portion of the wiping element (2), and means are provided to maintain at least one of the claws (1*a*, 11*a*) in a predetermined position on the two backing strips (3, 13), characterized in that in the area of at least one of the claws (1*a*, 11*a*) of the superstructure (1, 11) each of the two backing strips (3, 13) is provided, at its interior longitudinal edge, with at least one flattened area (13*a'*, 13*b'*) which laterally projects from said interior longitudinal edge compressibly against the wiping element with the wiping element and superstructure assembled, each said flattened area having an oval configuration with an elongate edge in alignment with the length of its respective interior longitudinal edge and compressibly maintained against the wiping element, said elongate edges on the two backing strips being aligned with each other transverse to the length of the backing strips and being entirely aligned transversely of said backing strips with the lengthwise extent of said one claw.

4,782,550

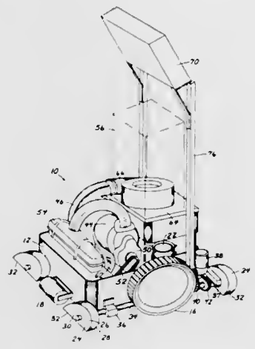
AUTOMATIC SURFACE-TREATING APPARATUS

Stephen Jacobs, Arcata, Calif., assignor to Von Schrader Company, Racine, Wis.

Filed Feb. 12, 1988, Ser. No. 155,312

Int. Cl.[4] A47L *9/00*

U.S. Cl. 15—320 **19 Claims**



1. Automatic surface-treating apparatus of the type supported by and traversing a horizontal surface unattended, comprising:

a frame;

mobility members on the frame rotatable about axes extending in a first horizontal direction;

means on the frame fo treating the surface as the apparatus traverses the surface;

side-step members on the frame rotatable about horizontal axes transverse to the first direction and a given distance above the surface, each side-step member having:

a first sector with a far periphery spaced from its axis by more than the given distance, and

a second sector with a near periphery spaced from its axis by less than the given distance;

whereby rotation of the side-step members will lift and move the apparatus laterally a predetermined distance.

4,782,551

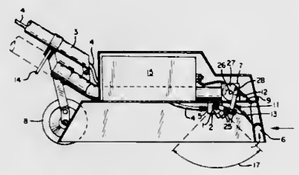
APPARATUS FOR CLEANING SURFACES

Arnold E. Ballwebber, 19447 Grim Rd. NE., Aurora, Oreg. 97002

Continuation of Ser. No. 773,668, Sep. 6, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,121

Int. Cl.[4] A47L *11/00*

U.S. Cl. 15—321 **8 Claims**



1. An apparatus for cleaning carpets comprising:

(a) means for supplying cleaning fluid under pressure;

(b) a pressure feed tube interconnected from said means for supplying cleaning fluid under pressure to a delrin block within which is a groove;

(c) at least one hole in a hollow manifold which is positioned in said delrin block to communicate through said groove with said pressure feed tube;

(d) at least one nozzle connected to said manifold so that cleaning fluid can exit through said manifold and said nozzle;

(e) a power source to operate a motor; and

(f) an oscillating mechanism connecting said motor's output to said manifold with at least one nozzle where said nozzle oscillates about an axis parallel to the surface to be cleaned and in the same and opposite direction as the movement of said apparatus.

4,782,552

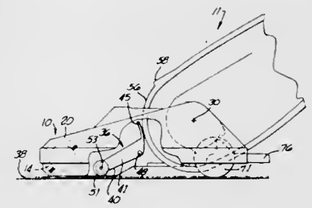
UPRIGHT VACUUM CLEANER

William L. Bartlett, Santa Barbara, and David A. Weir, Santa Ynez, both of Calif., assignors to Riccar America Company, Tustin, Calif.

Filed Jul. 24, 1987, Ser. No. 77,626

Int. Cl.[4] A47L *5/34*

U.S. Cl. 15—333 **4 Claims**



1. An upright vacuum cleaner comprising

a main body having a body housing and a cover, a suction opening provided in the cover of the main body through which dust and dirt can be picked up from a floor surface to be cleaned,

a handle body pivotally mounted to the main body and being movable to various positions including inclined positions normally used during cleaning and an upright position, said handle body having a surface adjacent the main body with a projection thereon forming a cam actuator, and

cam lever means pivotally mounted with respect to said main body and including a cam face engageable by said cam actuator, said cam lever means having floor contacting means for extending through the cover of said main body for engaging a floor surface for raising the suction opening from the floor surface when the handle body is moved to its upright position, said cam lever means having a cam body formed of sheet metal substantially in the form of a box and having a base, sides extending upward from the base, and the cam face extending upwardly from the base.

4,782,553

DOOR STOP

Steven P. Morrison, 8533 Hawthorne, Alta Loma, Calif. 91701

Filed Jun. 17, 1987, Ser. No. 63,002

Int. Cl.[4] E05F *5/02*

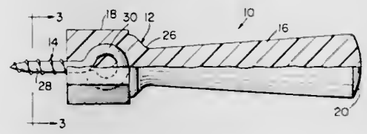
U.S. Cl. 16—86 A **3 Claims**

3. A door stop comprising:

an elongated one piece unitary body including an elongate normally substantially straight shank having a tip at one end and a base portion at the other end of said shank adapted to engage a support,

a fastener secured to and extending from said base portion longitudinally of said body to engage in the support, said fastener comprises a screw eye having a ring at one end embedded in said base portion with the plastic material of said body extending through the opening in the screw eye to firmly anchor the screw to said body.

said shank being tapered to a diminishing diameter uniformly from said tip to said base portion, whereby said shank has a minimum diameter cross-section contiguous to said base portion and forming a neck, and wherein



the material of the entire body comprises an elastically yieldable plastic having a resiliency such that said body will yield longitudinally without lateral deflection to cushion longitudinal impact of a door against said shank tip and the shank will bend laterally at said neck upon application of a lateral force to the shank and then return to its normal, substantially straight configuration upon removal of said lateral force.

4,782,554

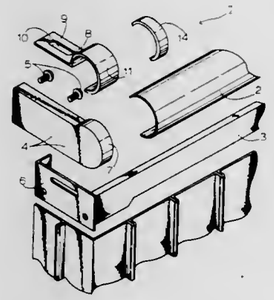
CURTAIN ROD COVER

Richard W. Lawson, 167 Woodlake, Hilton Head Island, S.C. 29928

Filed Dec. 29, 1986, Ser. No. 947,435

Int. Cl.[4] A47H *1/02*

U.S. Cl. 16—87.4 R **15 Claims**



1. A cover adapted to be used with an existing and fully functional drapery rod assembly, wherein the drapery rod assembly comprises an elongated member adapted to support the drapery, at least a pair of brackets with one of the brackets being located at each end of the elongated member, means to connect each end of the elongated member to an end of the adjacent bracket and means at the opposite end of each bracket to secure the assembly to a wall structure, said cover comprising an elongated tubular member open along its entire length for a portion of its circumference, a pair of end pieces with each piece having a curved end corresponding in size and shape to the inner surface of said tubular member and means for detachably securing each end piece to one of the brackets of the drapery rod assembly, said securing means including an element adapated to engage an inner surface of said one bracket, means interconnecting said element to an adjacent end piece in order to clamp said adjacent end piece to the outer surface of the said one bracket, whereby each end piece may be fastened to an existing bracket with each said curved end projecting beyond the existing drapery rod assembly so that said tubular member may be fastened over said curved ends,

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thereby occupying a position in front of the drapery rod assembly and thus providing a cover therefore.

4,782,555
UTENSIL HANDLE FOR FASTENING ON BOLTS

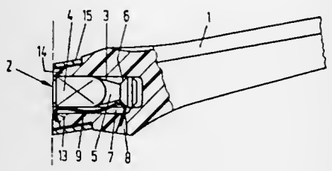
Wolfgang Fischbach, Daaden, Fed. Rep. of Germany, assignor to Heinrich Baumgarten KG, Spezialfabrik fuer Beschlagteile, Neunkirchen, Fed. Rep. of Germany

Continuation of Ser. No. 875,853, Jun. 18, 1986, abandoned. This application Jul. 22, 1987, Ser. No. 77,035

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 8517666[U]; European Pat. Off., Dec. 23, 1985, 85116527.4

Int. Cl.[4] A47J *45/10;* **B25G** *3/24*

U.S. Cl. 16—110 A **10 Claims**



1. In a utensil handle consisting of a handle member of plastic having a front opening recess for the receiving of a bolt which is adapted to be secured to a utensil wall, a cross section of said recess in said handle member and a cross section of the bolt being conformed with one another and both have a polygonal cross section, said bolt being provided with a notch having a sloped surface so that said bolt and said handle member are held together frictionally with a spring which is held in said handle member and acts onto said sloped surface of said bolt, the improvement comprising wherein a back of said spring lies approximately in an insertion direction of said handle member in said recess, wherein said spring is pivotally supported about at least one bearing point on said handle member, wherein said spring has in said insertion direction two support points for said bolt, said support points lie spaced from one another, wherein means are provided for effecting a tensioning of said spring only when both said support points rest on said bolt when said bolt is inserted a majority of the way into said recess, said handle becoming attached and said spring being tensioned when the bolt is moved the remainder of the way into said recess to a fully inserted position, said spring remaining untensioned at all other times during an insertion of said bolt into said recess in said handle, and wherein said support points of said spring are guided for movement perpendicularly with respect to said insertion direction of said bolt to facilitate a keeping of said spring from becoming tensioned until said support points both engage said bolt.

4,782,556
HANDLE FOR LUGGAGE CASE

Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

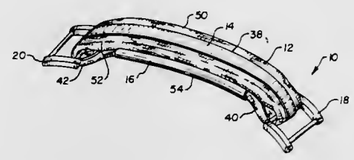
Filed Jun. 29, 1987, Ser. No. 68,120
Int. Cl.[4] A45C *13/26*

U.S. Cl. 16—125 **3 Claims**

1. In a handle assembly for a luggage case of the type in which a handle is attached to the body of the luggage case by a loop located at each end of said handle, said handle comprising:

strap means having a central portion and two opposed end portions, each said end portion being adjacent said central portion and extended through a respective said loop and folded under said central portion to an extent that said central portion becomes a first layer for said strap and said end portions substantially come together to form a second layer for said strap with slots for said respective loop,

strip means attached along a longitudinal centerline on an outer surface of said strap means and extended along said first layer, around said folded end portions, and along a



bottom surface of said second layer of said strap means, and

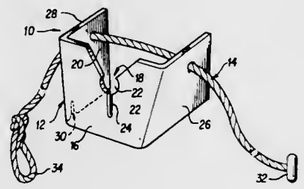
sleeve means arranged around said end portions and generally centrally located and substantially extending the length of only said second layer.

4,782,557
SQUIRREL SKINNING DEVICE

Tommy Gladney, P.O. Box 363, and William E. Baker, 804 Hwy. 9 S., both of Eupora, Miss. 39744

Filed Mar. 16, 1988, Ser. No. 169,008
Int. Cl.[4] A22B *1/00*

U.S. Cl. 17—44.2 **12 Claims**



1. A skinning device for aiding in the skinning of a squirrel or other small animal, said device comprising:

a support member for supporting the squirrel during a skinning process and including a front wall, and first and second side walls which extend rearwardly of said front wall, said front wall including a slot therein having a lower, relatively narrow slot portion in which the tail of the squirrel is received during a first stage of the skinning process and a further slot portion contiguous with said lower slot portion in which the head of the squirrel is received during a second stage of the skinning process; and

an elongate securing means for securing the support member in place relative to an upright or support with the front wall of the support member spaced from the upright by said side walls;

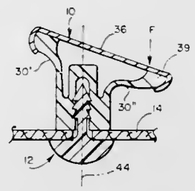
said side walls each including an aperture therein through which said securing means extends, and said apertures being located relative to said front wall and the slot therein such the head of the squirrel is captured beneath said securing means when the head of the squirrel is received in said further slot portion.

4,782,558
TILTABLE BUTTON

Timothy H. Sparrow, Harrodsburg, Ky., assignor to Universal Fasteners Inc., Lawrenceburg, Ky.

Filed May 11, 1987, Ser. No. 48,257
Int. Cl.[4] A44B *1/38*

U.S. Cl. 24—90 R **12 Claims**



1. A button for attachment to compliant sheet material comprising:

a unitary button body formed of elastic material and including a post member having a closed top and a centrally disposed-opening extending from the bottom of said body, an upwardly flaring dishshaped resilient web portion formed to circumferentially surround said post and having a peripheral rim formed at the outermost edge of said web,

a cap secured to said rim to cover said button;

a rivet having a head and a shank projecting centrally from said head to pierce said sheet material, enter into and be retained within said opening of said body to join said rivet to said body with said material interposed therebetween;

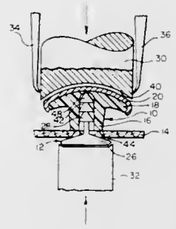
wherein said cap mounted to said web portion can be tilted in any direction relative to the central axis of said body and said rivet against the resilience of said web portion.

4,782,559
BUTTON COLLET AND METHOD AND APPARATUS FOR MAKING THE SAME

Timothy H. Sparrow, Harrodsburg, Ky., assignor to Universal Fasteners, Inc., Lawrenceburg, Ky.

Filed Jun. 3, 1987, Ser. No. 57,038
Int. Cl.[4] A44B *1/18*

U.S. Cl. 24—113 MP **16 Claims**



15. An apparatus for forming a domed cap on a button during attachment of a button collet and a tack member to a sheet of fabric wherein: the button collet has an elastic body that includes a shank, a central opening having a longitudinal axis in one end of said shank and a radially extending flange at the other end, and a cap member formed of a malleable material overlying and crimped to the peripheral edge portion of said flange; and said tack member has a head and a pronged member adapted to enter said central opening, comprising;

reciprocable punch means for supporting said button collet on the longitudinal axis of said central opening,

a concave surface on said punch means for engaging said cap member when moving said collet,

reciprocable ram means for supporting said tack member on the longitudinal axis,

means for actuating said punch means and said ram means to move toward each other wherein said prong member first pierces said fabric and enters and seats in said central opening of said collet,

said concave surface simultaneously bending both said cap member and said flange into a substantially convex dome shape as said punch member drives said elastic button collet into engagement with said prong member of said tack member,

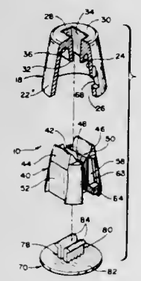
whereby said cap member retains a dome shape and said flange member reverts to its original plate-like configuration upon the reverse reciprocable movement of both said punch means and said ram means.

4,782,560
TASSEL STRUCTURE

Gary E. Keller, Mesa, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.

Filed Jun. 15, 1987, Ser. No. 61,804
Int. Cl.[4] F16G *11/00*

U.S. Cl. 24—136 L **21 Claims**



7. A tassel structure for joining the opposite ends of a draw cord comprising:

(a) a shell having a top and an endless side wall which defines a cavity of frusto-conical configuration, said shell having an open bottom and an aperture formed axially through the top thereof for receiving the ends of the draw cord;

(b) a plug having a top and a bottom, said plug being of frusto-conical configuration for linearly pushed insertion into the cavity of said shell through the open bottom thereof;

(c) cooperating elements of a cord gripping means formed in said shell and on said plug for frictionally gripping the ends of the draw cord, said cooperating elements including,

I. said shell having socket means formed by a pair of ribs which depend from the top into the cavity of said shell, said pair of ribs being disposed on opposite sides of the aperture formed through the top of said shell and cooperating with adjacent portions of the side wall of said shell to provide a pair of sockets which provide said socket means of said shell,

II. said plug having an upstanding central ridge on its top and an upstanding projection member means in the form of a pair of upstanding projection members on opposite sides and in spaced relationship with the central ridge to provide a pair of pockets on opposite sides of the ridge;

(d) each of said pair of ribs on said shell being alignedly disposed in different ones of said pair of pockets of said

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plug for frictionally holding a first portion of each of the ends of the draw cord in different ones of said pair of pockets of said plug;

(e) each of said pair of projection members of said plug being aligningly disposed in different ones of said pair of sockets of said shell for frictionally holding a second portion of each of the ends of the draw cord in different ones of said pair of sockets of said shell; and

(f) said plug being formed with a pair of flats on diametrically opposed sides thereof to provide a pair of spaces between said flats of said plug and the adjacent portions of the side wall of said shell for frictionally wedging a third portion of each of the ends of the draw cord in different ones of said pair of spaces.

4,782,561

CONE LOCK

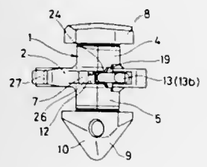
Eisaku Hayama, Fukuyama, Japan, assignor to Koei Kinzoku Kogyo Kabushiki Kaisha, Hiroshima, Japan

Filed Jun. 23, 1987, Ser. No. 65,531

Claims priority, application Japan, Apr. 15, 1987, 62-55947[U]

Int. Cl.⁴ B65D *21/02*

U.S. Cl. 24—287 **16 Claims**



1. A cone lock operable to engage first and second aligned socket openings to effect locking together of said socket openings, comprising a casing means, a shaft means rotatably supported in said casing means, said shaft means having an axis which is substantially vertically disposed during use of the cone lock, upper and lower cone means fixed to respective upper and lower ends of said shaft means, said upper cone means extending laterally from said shaft means at one angle, said lower cone means extending laterally from said shaft at another angle which is different from said one angle, a lever means connected to said shaft means and extending laterally from said shaft means, said lever means being rotatable between a stop position, a first operable position and a second operable position, spring biased stop means biasingly urging said lever means in said stop position, said housing means having upper and lower projection portions adopted to align with said first and second socket openings, each of said upper and lower cone means having an aligned rotational position in which the respective cone means is aligned with its respective housing portion so that respective aligned cone means and respective housing portions can be inserted into and removed from a respective socket opening, each of said first and second cone means having non-aligned rotational positions in which the respective cone means is non-aligned with its respective housing portion so that the respective nonaligned cone means and respective housing portion is precluded from being inserted into and removed from a respective socket opening, each of said upper and lower cone means being in a non-aligned position when said lever means is in said stop position, said upper and lower cone means being in respective aligned and non-aligned positions when said lever means is in said first operable position to thereby provide for inserting said upper cone means and upper housing portion into a first socket opening, said upper and lower cone means being in respective non-aligned and aligned positions when said lever means is in said second operable position to thereby provide for inserting said lower cone means and lower housing portion into a second socket opening, and engageable contour means on said lower cone means operable to be engaged by said second socket opening to automatically rotate said lower cone means and said connected shaft and lever means, in opposition to said bias of said spring biased stop means, from said stop position to said second operable position to thereby provide for insertion of said lower cone means and lower housing portion into said second socket opening without requiring any manual manipulation of the cone lock, said spring biased stop means being operable to rotate said lever means from said second operable position to said stop position after said second cone means has been inserted into said second socket opening.

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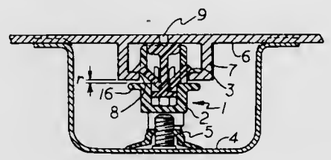
TWO-PART PLASTIC CLIP

Kiyoteru Yuta, Toyohashi, Japan, assignor to Emhart Enterprises Corp., Farmington, Conn.

Filed May 21, 1987, Ser. No. 52,808

Int. Cl.⁴ E04F *19/02*

U.S. Cl. 24—297 **1 Claim**



1. A two part plastic clip suitable for attaching a trim moulding to a panel from which a threaded stud projects, which comprises a hollow body member as the first part and a locking member as the second part,

said hollow body member having resilient pawls to receive the stud and engage the thread thereof, an upper part of said member with apertures in its side wall to receive resilient arms of the locking member, longitudinal grooves to accommodate guide ribs of said locking member and a flange disposed to abut the trim moulding, which is thus held between the flange and the resilient arms,

said locking member having resilient arms with free ends which are shaped with angled surfaces to facilitate entry into a hole in the moulding, but resist retraction therefrom, and further having guide ribs which are accommodated in the longitudinal grooves of the body member, the locking member being slideable in the body member and assuming under the influence of the resilient arms a condition in which the arms project outwardly through said apertures to secure the apertured moulding into a hole in which the body member has been inserted and wherein the locking member is released from the body member by pushing the locking member towards the panel to cause the arms to be retracted by engagement with an annular shoulder of the body member.

4,782,563

END STOP FOR SLIDE FASTENERS

Masahiro Kusayama, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Continuation of Ser. No. 046,578, May 6, 1987, abandoned. This application Feb. 1, 1988, Ser. No. 153,571

Claims priority, application Japan, May 6, 1986, 61-68060[U]

Int. Cl.⁴ A44B *19/36*

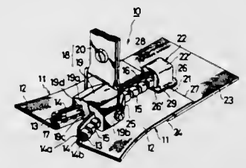
U.S. Cl. 24—435 **5 Claims**

1. A slide fastener comprising:

(a) a pair of slide fastener stringers each having a stringer tape and a row of coupling elements mounted on and along a folded inner longitudinal edge of each stringer tape;

(b) a slider slidably mounted on the two rows of coupling elements to take the latter into and out of coupling engagement with each other to close and open said slide fastener; and

(c) an end stop mounted on said stringer tapes adjacent to one end of said rows of coupling elements for limiting movement of said slider, said end stop including a substantially rectangular block attached to a portion of said



folded inner longitudinal edges including a plurality of coupling elements, and a flared bottom peripheral seat integral with said block and attached to said stringer tapes, said block having an end wall engageable with said slider and a cut-out recess extending in said end wall and defined by and between said block and a portion of said peripheral seat, said portion of said peripheral seat terminating slightly short of said end wall.

4,782,564

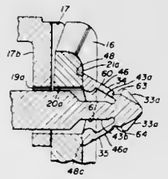
SAFETY RELEASE PIN FOR FIRE EXTINGUISHERS

Donald R. Sloan, North Aurora, Ill., assignor to Pittway Corporation, Northbrook, Ill.

Filed Jul. 27, 1987, Ser. No. 77,808

Int. Cl.⁴ A62C *23/10*

U.S. Cl. 24—704.1 **14 Claims**



1. A safety release pin comprising a head portion and a cylindrical shank including a nose portion and locking means, said shank extending from said head portion with the free end of said shank terminating in said nose portion, said shank having a portion of reduced diameter rearwardly of said nose portion including at least one flat surface extending axially of said shank, said locking means including a locking member having a fixed end formed integrally with said shank and a free end extending in cantilever fashion rearwardly of said nose portion in overlying relation with said flat surface and pivotal relative thereto, said locking member having a transverse groove formed therein near its fixed end defining a weakened section for said locking member, and projection means on one of said locking member and said flat surface for limiting pivotal movement of said locking member rearwardly and towards said flat surface, said nose portion including fins secured thereto with one fin being associated with each said locking member and extending radially outwardly beyond said groove in the associated locking member, said locking member defining a detent surface near its free end which extends generally normal to the axis of said shank whereby a force applied to said detent surface tends to pivot said locking member about a pivot axis extending parallel to said groove, forwardly and away from said flat surface of said shank, for severing said locking member from said shank along a fracture line defined by said weakened section.

4,782,565

AIR PROCESSING APPARATUS

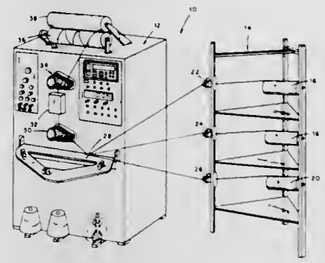
Richard W. Sheehan, Johnson City, and Kenneth A. Williford, Limestone, both of Tenn., assignors to World Tech Fibres, Inc., Johnson City, Tenn.

Continuation of Ser. No. 541,556, Oct. 13, 1983, Pat. No. 4,685,179. This application Nov. 26, 1986, Ser. No. 935,240

The portion of the term of this patent subsequent to Aug. 26, 2004, has been disclaimed.

Int. Cl.⁴ D02G *1/16*; D02J *1/06, 1/08*

U.S. Cl. 28—248 **5 Claims**



1. An air processing apparatus for air entangling at least one strand of yarn from a source comprising:

an air entangler for receiving the strands of yarn from the source and entangling the strands of yarn with a high pressure air stream;

at least one delivery roll for engaging and pulling the entangled yarn from said air entangler at a delivery rate;

delivery motive means for rotatably driving said delivery roll independently;

at least one wind roll for engaging and pulling the entangled yarn at a wind rate from said delivery roll;

wind motive means for rotatably driving said wind roll independently from said delivery roll;

a delivery rate sensor for monitoring the delivery rate of said delivery roll;

a wind rate sensor for monitoring the wind rate of said wind roll;

output means responsive to said sensors for selectively outputting speed information of the delivery rate and the wind rate;

control means for independently controlling said wind motive means and said delivery motive means to independently vary the wind rate and the delivery rate of the yarn, and thus the speed information, whereby a selected wind rate and a selected delivery rate may be chosen based on the speed information to achieve a desired over-delivery or underdelivery to produce a desired effect on the yarn and to achieve a desired production rate.

4,782,566

METHOD OF TEXTURIZING CONTINUOUS FILAMENT THREADS

Werner Nabulon, Ruedlingen, and Peter Grossenbacher, Winterthur, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Continuation of Ser. No. 877,432, Jun. 23, 1986. This application Jul. 30, 1987, Ser. No. 79,831

Claims priority, application Switzerland, Jul. 15, 1985, 03059/85

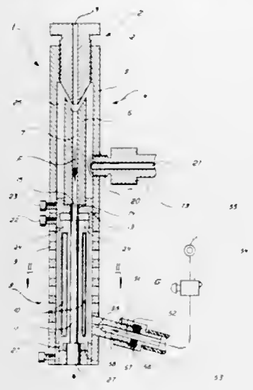
Int. Cl.⁴ D02G *1/12, 1/16*

U.S. Cl. 28—255 **3 Claims**

1. A method of operating a texturizing nozzle for texturizing continuous filament threads by means of a heated flowing medium, comprising the steps of feeding the threads to be

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crimped, together with the medium, into a stuffing chamber of a crimping portion of a housing for the threads to be longitudinally compressed therein to produce crimping of such threads and for the medium to escape from the stuffing chamber through openings provided in the crimping portion; and introducing a gas stream into the stuffing chamber in a direction differing from the direction of advancement of the threads through the stuffing chamber as a single gas stream which enters the stuffing chamber directly sideways substantially transversely to the stuffing chamber to achieve a retardation of



the threads during their passage through the stuffing chamber only at the commencement of the crimping operation, said crimping portion including a plurality of lamellae extending in the advancement direction and arranged in a radiating pattern to jointly bound the stuffing chamber, said introducing including blowing the gas stream between said lamellae as said single gas stream; selectively switching the gas stream on at the commencement of the crimping operation and off after damming of the threads has been initiated in the stuffing chamber; supplying the threads to the housing; and supplying the heated flowing medium to the housing.

4,782,567

WORKPIECE TRANSFERRING, POSITIONING AND MACHINING SYSTEM

Kostaro Kanaya; Fugio Ueno; Seiichi Aihara, and Ryuichi Toyama, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,742

Int. Cl.⁴ B23B *5/34*

U.S. Cl. 29—33 P **17 Claims**

1. A system for transferring, positioning and machining a workpiece, comprising:

a transfer device for transferring the workpiece to a prescribed position;

a positioning mechanism disposed in the prescribed position for positioning the workpiece;

a machine tool for machining the workpiece; and

a loading robot operatively disposed adjacent to the prescribed position for delivering the workpiece to the machine tool;

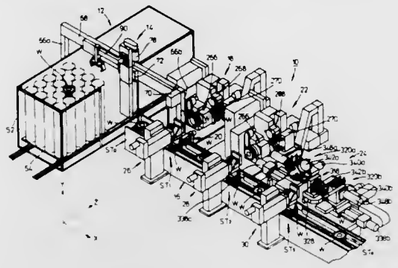
said positioning mechanism comprises:

a holder mechanism for holding the workpiece;

turning means of turning the workpiece;

detector means disposed near the workpiece for detecting the workpiece as it is turned closely to or away from the detector means and for generating a detected signal;

a positioning pin displaceable toward the workpiece for engaging a portion of the workpiece; and



displacing means responsive to the detected signal from the detector means for displacing the positioning pin toward or away from the workpiece.

4,782,568

PRESS ROLL

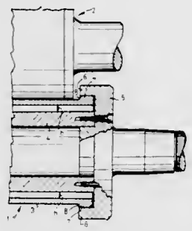
Kyösti Halttula, Pirkkala, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Feb. 20, 1987, Ser. No. 17,081

Claims priority, application Finland, Feb. 21, 1986, 860766

Int. Cl.⁴ B21B *27/00*

U.S. Cl. 29—123 **6 Claims**



1. A rotatable press roll arranged to interact with a second roll in the wet end of a paper of a paper board machine for forming a nip between rolls, said press roll comprising a surface arranged to be pressed against the second roll and being made of an elastic material for extending the nip, said elastic material surface being formed by a separate shell portion surrounding a body of the press roll, and being positioned over its entire length at a distance from the body to form a space therebetween, said surface being further supported to be nonrotatable with respect to the body be means of end flanges provided in the ends of the body and contacting each end of said surfaces, the shell portion and the ends thereof being readily yieldable over the entire length thereof radially inwards towards the body locally at the nip point whereby a section of said shell portion in contact with said second roll temporarily deforms along with the end portions of said section of said shell portion.

4,782,569

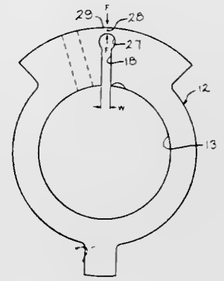
METHOD FOR MANUFACTURING A ROLLING PISTON ROTARY COMPRESSOR

Mark W. Wood, Erie, Mich., assignor to The DeVilbiss Company, Toledo, Ohio

Filed Sep. 21, 1987, Ser. No. 98,649

Int. Cl.⁴ B23P *15/00*

U.S. Cl. 29—156.4 R **6 Claims**



1. A method for manufacturing a cylinder block for a rolling piston rotary compressor comprising the steps of forming a cylinder block having a cylinder bore and a vane slot extending from said bore to a thin walled section, finishing the vane slot to a width less than the thickness of a vane to be inserted into said vane slot, and plastically deforming the thin walled section to expand the vane slot to a desired width for receiving said vane.

4,782,570

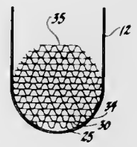
FABRICATION AND ASSEMBLY OF METAL CATALYTIC CONVERTER CATALYST SUBSTRATE

Jack P. Spridco, New Berlin, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1987, Ser. No. 121,404

Int. Cl.⁴ B21D *53/00*; **B23P** *15/00*

U.S. Cl. 29—157 R **2 Claims**



1. A method of fabricating and assembling a metal catalytic converter catalyst substrate of predetermined cross-sectional profile comprised of a tubular sheet metal shell containing layers of metal foil, said method comprising the steps of (1) initially forming a strip of sheet metal stock of predetermined width into a concave shape (2) sequentially laying strips of metal foil of predetermined widths onto the concave sheet metal strip so as to assemble layers of foil thereon conforming to said predetermined profile, (3) finally forming the strip of sheet metal stock about the layers of foil into a single seam tube conforming to said predetermined profile, (4) sealingly joining the seam of the tube along the length thereof, and (5) cross-cutting the tube with the layers of foil therein to predetermined lengths so as to form catalyst substrate units therefrom.

4,782,571

METHOD FOR SECURING STRAIGHT TUBES BETWEEN TWO TUBE SHEETS IN A PRESSURE-TIGHT MANNER

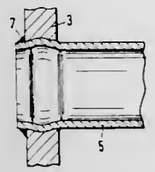
Herbert Krips, Bochum, and Miroslan Podhorsky, Ratingen, both of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,325

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611108

Int. Cl.⁴ B21D *53/02*

U.S. Cl. 29—157.3 C **6 Claims**



1. A method of securing straight tubes between two tube sheets in a pressure-tight manner, with each of said tubes having two oppositely disposed ends and associated end faces, and with each of said tube sheets having bores for receiving respective ones of said tubes; said method including the steps of:

inserting said tubes, with play, into said bores of said tube sheets;

hydraulically expanding one of said ends of each of said tubes, via a pressure medium, to thereby press said one end against the associated tube sheet;

securing said one end, in said end face region thereof, to the associated tube sheet;

heating each tube, in conformity with a prescribed prestress that is to be produced in secured ones of said tubes to take into account subsequent operating conditions, to thereby expand said tube and push a portion of the non-secured other end of said tube out of its associated tube sheet until a predetermined difference in length between the cold and heated-up states of said tube is achieved;

hydraulically expanding that portion of said other end of said tube that is disposed in one of said bores of the associated tube sheet; and

securing said pushed-out portion of said other end of said tube to its associated tube sheet.

4,782,572

TOOL FOR RELEASING A PIPE JOINT OF TWO PIPES FITTED INTO EACH OTHER

Albert Engert, Rügshöfer Strasse 28, 8723 Gerolzhofen, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 941,196

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1985, 3546287

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—234 **11 Claims**

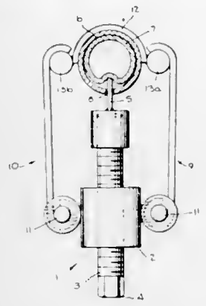
1. A tool for releasing a pipe joint, wherein said pipe joint is formed as a result of an interference fit in which an inner pipe is fitted inside an outer pipe, said inner pipe having an outer surface diameter which is slightly less than an inner surface diameter of said outer pipe, said tool comprising:

pressing means having a mandrel mounted thereon so that said pressing means is capable of forcing said mandrel through a slot in said outer pipe, the slot being in the vicinity of said pipe joint, in order to at least partially deform the diameter of said inner pipe, said pressing means further including at least one hook pivotally mounted thereon; and,

a counter plate having at least one edge, said edge being

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capable of being gripped by said hook of said pressing means so that said counter plate is in a position opposite to



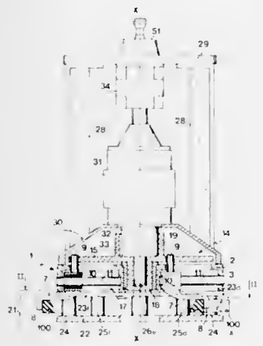
said mandrel and said counter plate is thereby capable of securing said pipe joint so that said mandrel is capable of said deforming of the diameter of said inner pipe.

4,782,573

APPARATUS FOR DEFORMING A GASKET

Alain Le Floch, Blois, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Jul. 10, 1987, Ser. No. 71,963
Claims priority, application France, Jul. 10, 1986, 86 10307
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—235 **9 Claims**



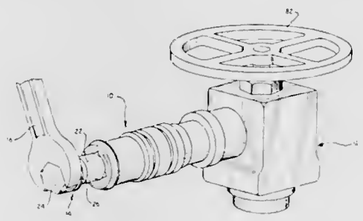
1. An apparatus for seating a ring gasket (**100**) in a groove (**41**) defined within a cylindrical space formed by a pipe socket (**40**) or the like that is to be sealed, comprising: a plurality of radially oriented prongs (**7**) disposed at regularly spaced intervals around the circumference of a first support member (**1**), a second support member (**22**) disposed below the first support member, an equal plurality of studs (**24**) upstanding from the second support member, said studs being disposed in a circular orientation and interleaved with said prongs, means (**14**) for reciprocably driving said prongs together in a radial direction on the first support member, and means for translating the first support member and prongs along an axis (X—X) perpendicular to the plane of radial motion of the prongs such that a gasket may be engaged by the prongs and studs at spaced intervals around its outer periphery and elastically deformed into an undulating polygonal configuration of reduced maximum diameter by the radially inward movement of the prongs, inserted into the pipe socket, and released to expand into the groove by the axial withdrawal of the support members and prongs.

4,782,574

METHOD FOR MOUNTING A SOCKET

Thomas D. Karcher, Rocky River, and John Westun, Columbia Station, both of Ohio, assignors to Tuthill Corporation, Cleveland, Ohio

Filed Feb. 25, 1987, Ser. Nu. 18,717
Int. Cl.[4] B23Q *17/00*
U.S. Cl. 29—407 **10 Claims**



1. A method of mounting a socket of a plug and a socket type coupling assembly, said method comprising the steps of providing a socket operable between released and engaged conditions and having locking elements which are engagable with a plug to hold the plug in the socket when the socket is in the engaged condition and are ineffective to hold the plug in the socket when the socket is in the released condition, engaging threads on the socket with threads on a mounting member, operating the socket to the released condition, inserting an assembly tool into the socket while the socket is in the released condition, engaging a plurality of force transmitting surfaces on the socket with a plurality of force transmitting surfaces on the assembly tool, operating the socket to the engaged condition after inserting the assembly tool into the socket, engaging the locking elements with the assembly tool to block withdrawal of the assembly tool from the socket when the socket is in the engaged condition, applying force to the assembly tool tending to rotate the assembly tool in a direction in which the extent of engagement of the threads on the socket with the threads on the mounting member increases, transmitting force from the assembly tool to the socket through engagement of the force transmitting surfaces on the assembly tool with the force transmitting surfaces on the socket, interrupting the transmission of force from the assembly tool to the socket when the force exceeds a predetermined magnitude, operating the socket to the released condition, and removing the assembly tool from the socket while the socket is in the released condition.

4,782,575

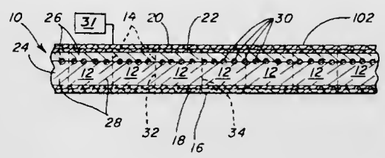
METHOD OF FABRICATING A POWER TRANSMISSION BELT AND APPARATUS THEREFOR

Yosbibiko Kamiyama, Kobe; Misao Fukuda, Miki, and Akihiro Nagata, Komaki, all of Japan, assignors to Mitsuboshi Belting Ltd., Nagato, Japan

Filed Mar. 18, 1987, Ser. No. 27,304
Claims priority, application Japan, Mar. 25, 1986, 61-67824
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—411 **27 Claims**

1. A method of forming power transmission V-belts comprising the steps of:
providing a belt sleeve;
dividing said belt sleeve into a plurality of belt preforms defining opposite side portions and a back surface;
situating individual belt preforms around a pair of spaced pulleys;

driving the belt preforms on the spaced pulleys; and
seriatum forming V-belts from said preforms by simultaneously cutting said side portions of the individual belt



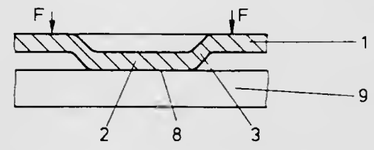
preforms as the belt preforms are being driven about the pulleys to define opposite converging side surfaces of the V-belt.

4,782,576

METHOD FOR ADJUSTMENT OF MACHINE PARTS

Manfred Brandenstein, Eussenheim, and Horst M. Ernst, Eltingshausen, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 15,221
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605355
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—445 **2 Claims**



1. In the method for adjusting the relative positions of first and second juxtaposed machine parts by deformation of at least one projection formed on at least one of said machine parts, the improvement comprising:
(a) forming said projection by stamping out said projection on said first machine part, the projection having a planar contact surface and remaining connected to said first machine part via a transition region, whereby said step of stamping out subjects said transition region to increased tensile stresses; and then
(b) adjusting the position of said planar contact surface by setting back the projection with plastic deformation of the transition region between the projection and the rest of said first machine part, said step of setting back comprising the mutual pressing of said second machine part and said contact surface, whereby the contact surface is substantially unchanged in area by the setting back of the projection.

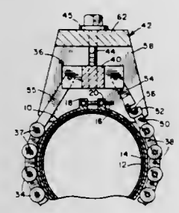
4,782,577

METHOD OF USING V-CLAMP INSTALLATION TOOL

David C. Bahler, Riverside, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Dec. 10, 1987, Ser. No. 130,917
Int. Cl.[4] B23P *19/00, 19/04*
U.S. Cl. 29—525.1 **1 Claim**

1. A method of installing a V-clamp around a joint, comprising the steps of:
positioning a V-clamp around a joint with its adjusting bolt positioned at the top of the joint;
tightening the adjusting bolt to maintain orientation around the joint;
seating an installation tool over the V-clamp bolt and passing an elongate member which is secured at one end to a tightening device of the tool around the clamp so that it is centered over it, and securing the free end of the elongate member to the tightening device over the adjusting bolt on the top of the joint, the elongate member having transverse rollers spaced along its length which bear against the outer surface of the V-clamp;



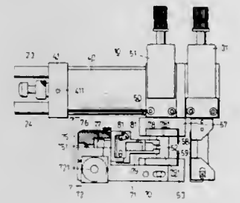
repeatedly tightening the tightening device to tighten the elongate member around the V-clamp, and retightening the V-clamp bolt until no further tightening of either the tightening device or the V-clamp bolt is possible; and
releasing the end of the elongate member and removing the installation tool from the V-clamp.

4,782,578

PNEUMATIC WIRE STRIPPING AND TWISTING MACHINE

Txay Jaw Wu, No. 11, Lane 19, Sec. 3, Chung-san Rd., Taichung, Taiwan

Filed May 15, 1987, Ser. No. 49,793
Claims priority, application Taiwan, Mar. 27, 1987, 76202705
Int. Cl.[4] H01R *43/28*
U.S. Cl. 29—564.4 **10 Claims**



1. A pneumatic wire stripper comprising wire clamping jaw means for clamping a wire to be stripped, a first pneumatic piston-cylinder assembly for opening and closing the clamping jaw means, cutting jaw means for cutting through wire insulation, a second pneumatic piston-cylinder means for opening and closing the cutting jaw means, the first and second piston-cylinder assemblies having parallel longitudinal axes, a third pneumatic piston-cylinder assembly including a cylinder having the cutting jaw means mounted thereon and a piston rod attached to the clamping jaw means, the third pneumatic piston-cylinder assembly having a longitudinal axis which is perpendicular to the longitudinal axes of the first and second assemblies for separation of the cutting jaw means from the clamping jaw means upon supply of pressurized air to the third assembly for stripping the insulation from one end of the wire, and sequence control means for providing supply of pressurized air to the third assembly only after the clamping jaw means and cutting jaw means have been operated to clamp a wire and cut the insulation and a predetermined air pressure value has been established in the first and second assemblies, the sequence control means including air passage means connected between the first and second assemblies and the third

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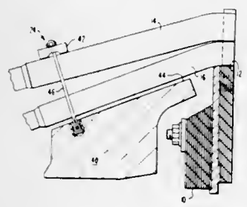
assembly for supply of air under pressure to the third assembly, and a pressure responsive valve in said passage means for closing the passage means when the pressure in the first and second assemblies is below the predetermined value and for opening the passage means when the pressure exceeds the predetermined value.

4,782,579

METHOD OF ASSEMBLING A PRECURED RING CLAMP ASSEMBLY

Charles M. Rowe, Orlando; Hector O. Ponce, Winter Park, and David H. Kistler, Deltona, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 3, 1987, Ser. No. 116,090
Int. Cl.[4] H02K *15/14*
U.S. Cl. 29—596 **6 Claims**



1. A method for clamping top and bottom coils extending from slots in an electric generator stator core and arranged in an overlapping pattern forming a plurality of apertures between adjacent coils, a top ring positionable above the top coils, a ring shaped support cone positioned below the bottom coils, the support cone having an inside annular surface positioned against the bottom coil and including a hole through the inside annular surface, the top ring including at least one aperture aligned with an opening between phase groups, the hole being aligned with the opening, the method comprising the steps of:

forming a resin impregnated radial band;

twisting the radial band to form loops at each end thereof;

precuring the radial band under tension;

coupling one of the loops to an assembly;

passing the anchor assembly between the coils and into the cone hole;

securing the anchor assembly within the cone hole;

aligning a top ring aperture with the cone hole;

aligning a top ring aperture with the cone hole;

passing another of the loops of the radial band through the ring aperture; and

placing a pin through another of the loops to secure the precured radial band.

4,782,580

METHOD OF MANUFACTURE OF SLIP RING ASSEMBLY

Joseph C. Cacioppo, Akron; Donald R. Wuerzer, Uniontown, and Peter J. Piglia, Stow, all of Ohio, assignors to National Machine Company, Inc., Stow, Ohio

Division of Ser. No. 857,319, Apr. 30, 1986, Pat. No. 4,705,976. This application Aug. 3, 1987, Ser. No. 82,689
Int. Cl.[4] H01R *43/10*
U.S. Cl. 29—597 **13 Claims**

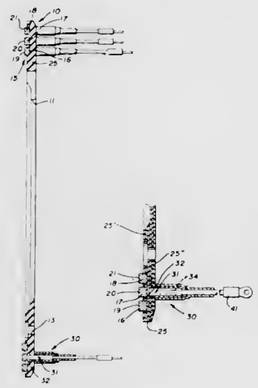
1. A method for making a slip ring assembly comprising the steps of:

welding to one face of each of a plurality of varying diameter concentric conducting rings a plurality of electrically conducting studs;

positioning a plurality of said rings within grooves inscribed in a first mold section in an accurately spaced concentric arrangement with respect to each other;

surrounding said rings radially interiorly thereof with one or more pre-cut insulating plies;

placing insulating material in the spaces between said concentrically spaced rings and radially outwardly thereof;



positioning a plurality of pre-cut insulating plies axially of said rings and insulating material aligned to permit passage of said studs through pre-cut holes in said plies;

closing a second mold section on said first mold section; and

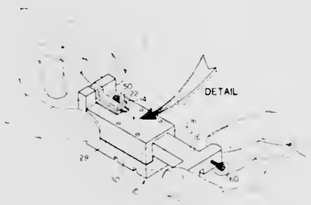
heating the assembly under pressure in said mold sections until the assembly is cured.

4,782,581

FERRITE CORE PLACEMENT METHOD

Marat G. Katz, Golden Valley, and Gino E. Gori, Eden Prairie, both of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Feb. 11, 1988, Ser. No. 154,819
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **2 Claims**



1. A method of placing a magnetic workpiece in a slot of a second non magnetic workpiece comprising the steps of

mounting below a non magnetic table a circular magnet with its center slidable along a predetermined line;

clamping a second workpiece having a slot on the table; with said slot exposed and its centerline aligned with said line and the center of the magnet;

placing said first magnetic workpiece on the table adjacent the magnet; and

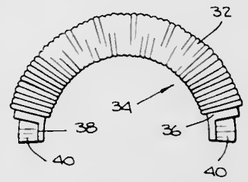
sliding the magnet towards the slot along said predetermined line thereby moving and aligning the first magnetic workpiece along the slot centerline until it enters the slot.

4,782,582

PROCESS FOR THE MANUFACTURE OF A TOROIDAL BALLAST CHOKE

Josepb A. Venezia, Staten Island, N.Y., assignor to Eastrock Technology Inc., Edison, N.J.

Continuation of Ser. No. 681,493, Dec. 13, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 99,667
Int. Cl.[4] H01F *41/08*
U.S. Cl. 29—605 **7 Claims**



1. A process for the manufacture of a choke, comprising the steps of:

providing a layer of an insulative material on an annular core of a magnetic material, said annular core having at least two distinct surfaces each extending around the entire circumference of the core, said layer-providing step being performed in such a manner that the layer covers all of one surface of the core and leaves at least two portions of at least one other surface of the core uncovered;

dividing the core into at least two piece by dividing the core at each of the two uncovered portions;

winding a wire of an electrically conductive material to form a respective winding on each of the pieces; and

connecting the respective windings in series and mechanically joining the pieces to form a ballast choke which is a complete annulus.

4,782,583

METHOD OF ASSEMBLING A MOLDED CASE CIRCUIT BREAKER CROSSBAR

Roger N. Castonguay, Terryville; David Arnold, Old Saybrook, and David J. Meiners, Southington, all of Conn., assignors to General Electric Company, New York, N.Y.

Continuation of Ser. No. 3,002, Jan. 13, 1987, Pat. No. 4,733,211. This application Jul. 27, 1987, Ser. No. 78,322
Int. Cl.[4] H01H *11/04*
U.S. Cl. 29—622 **6 Claims**

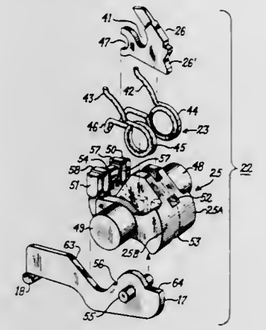
1. A method of assembling a molded case circuit breaker comprising the steps of:

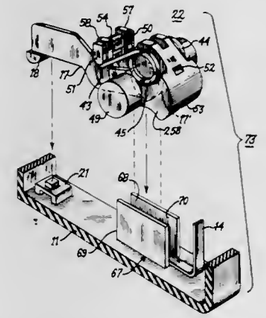
providing a circuit breaker case having a first contact arranged on a bottom surface;

inserting a part of a contact carrier having a second contact at one end within a slotted crossbar assembly;

positioning a crossover loop of a contact spring within means formed on a top surface of said contact carrier;

rotating said contact spring and trapping ends of said contact spring under detent projections formed on said crossbar assembly to bias said contact spring against said contact carrier; and





inserting said crossbar assembly, contact carrier and contact spring within said circuit breaker case with said first and second contacts in operational alignment.

4,782,584

ALKALINE CELL MANUFACTURING METHOD

Motoo Mohri, Nara, and Tetsuya Yoneda, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 3, 1987, Ser. No. 33,687
Claims priority, application Japan, Apr. 4, 1986, 61-78474
Int. Cl.[4] H01M *6/00*
U.S. Cl. 29—623.1 **25 Claims**



1. An alkaline cell manufacturing method comprising the steps of:

sequentially filling a positive mixture powder, a separator mixture powder and a negative mixture powder into a mold;

compacting said positive mixture powder, said separator

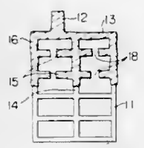
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mixture powder and said negative mixture powder in said mold so as to form a laminated cell tablet;
placing said laminated cell tablet into a container;
impregnating said laminated cell tablet with an alkaline electrolyte solution; and
sealing said container so as to produce an alkaline cell.

4,782,585
GRID FOR LEAD STORAGE BATTERY AND METHOD FOR ITS PRODUCTION

Kenji Kobayashi, Kanagawa; Tetsunari Kawase, Chigaskai; Sadao Furuya, Hiratsuka, and Hiroshi Yasuda, Fujisawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 28, 1982, Ser. No. 425,256
Claims priority, application Japan, Oct. 1, 1981, 56-157076; Jan. 21, 1982, 57-8360
Int. Cl.⁴ H01M *4/72*
U.S. Cl. 29—623.5 **8 Claims**



1. A method for production of a grid for a lead storage battery, comprising the steps of:
(i) preparing a grid structure including an integral connector lug, said grid structure being made of acid proof synthetic resin;
(ii) immersing the grid structure with said connector lug into molten lead or lead alloy to coat part of the grid rib structure inclusive of the connector lug and the portion contiguous thereto with molten lead or lead alloy, said part of the grid rib structure which is coated with the lead or lead alloy comprising part of a frame rib and an active material support rib forming said grid rib structure, and the active material support rib being partly cut off to partly open the grid structure; and
(iii) cooling the grid structure to form a lead or lead alloy film coated thereon.

4,782,586
PROCESS FOR THE PRODUCTION OF A POROUS MONOLITHIC GRAPHITE PLATE

Louis A. Joó, Johnson City; Kenneth W. Tucker, Elizabethton, and Jay R. Shaner, Johnson City, all of Tenn., assignors to Great Lakes Carbon Corporation, Briarcliff Manor, N.Y.

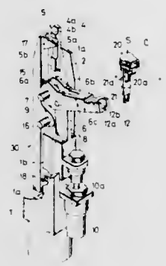
Continuation of Ser. No. 878,904, Jun. 26, 1986, abandoned, which is a continuation of Ser. No. 723,419, Apr. 15, 1985, Pat. No. 4,611,396. This application Mar. 23, 1988, Ser. No. 172,958
Int. Cl.⁴ H01M *6/00*
U.S. Cl. 29—623.5 **8 Claims**

1. A process for the production of a porous monolithic graphite plate useful as an electrode in a fuel cell and having a zone of low porosity in a band at the perimeter approximately 1 cm in width of less than 30% porosity by volume and a center zone of over 70% porosity by volume, said process consisting of impregnating a porous sheet selected from the group consisting of cellulosic filter paper, synthetic fiber paper and felts with an impregnant selected from the group consisting of creosote and coal tar derivatives and resins giving a coke yield of less than 50% by weight, curing the impregnated sheet in air for a period of 2 to 24 hours at a temperature of from 150° to 300° C., carbonizing by baking the sheet for a period of 4 hours to 4 days at a temperature cycle rising at 500° to 1100° C. in an inert atmosphere, sealing the perimeter with an impregnant selected from the group consisting of liquid coal tar, phenolic resins, and polymers having a coke yield of 40 to 70%, curing and baking the impregnant as before, and final heat treating the sheet at a temperature over 1800° C.

4,782,587
SLIDER HOLDING APPARATUS

Akio Yunoki, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 66,061
Claims priority, application Japan, Jun. 25, 1986, 61-148682
Int. Cl.⁴ A41H *37/06*
U.S. Cl. 29—768 **7 Claims**

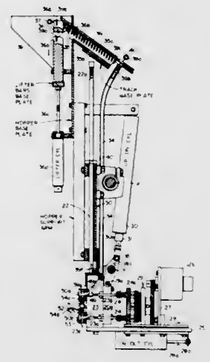


1. An apparatus for holding a slider in position during the threading of a slide fastener chain through the slider, the slider including a pull tab pivotally connected to a slider body and having an aperture, the slider being supplied toward said apparatus, said apparatus comprising:
(a) a holder body defining a space opening upwardly and rearwardly for receiving the pull tab as the slider is supplied to the apparatus;
(b) a slider support disposed across said space and having at an upper end a first seat for supporting thereon one half portion of the slider body, and also having a bore below said first seat;
(c) a supporting arm having two ends, said supporting arm being pivotally disposed in said space rearwardly of the slider support and having at one end a second seat or supporting thereon the other half portion of the slider body;
(d) a locking lever pivotally disposed in said space forwardly of the slider support and having a locking projection, said lever being normally urged by spring means in a direction in which said locking projection projects through said bore of the slider support; and
(e) means for angularly moving said supporting arm from an inclined position in which said second seat is positioned remotely from said first seat and the other end of the supporting arm presses said locking lever against the bias of the spring means such that said locking projection is retracted into the bore, to an upright position in which said second seat is positioned adjacent to and in horizontal alignment with said first seat for cooperating with said first seat in supporting the slider body with the pull tab being held between said slider support and supporting arm; so that
(f) as said supporting arm is angularly moved from the inclined position to the upright position, said locking lever turns under the bias of said spring means, so that said locking projection projects into engagement with an edge of the aperture in the pull tab.

4,782,588
DOOR HINGE APPLICATOR

Erling S. Jangaard, Maderia Beach, Fla., assignor to Ruvo Automation Corp., Largo, Fla.

Filed Nov. 19, 1986, Ser. No. 932,265
Int. Cl.⁴ B23Q *7/10*
U.S. Cl. 29—810 **42 Claims**

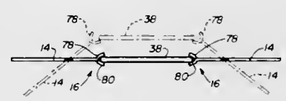


1. A machine that simultaneously attaches, by screw threaded engagement, a hinge to a door and an associated door jamb, comprising:
a hopper member for the retention of a plurality of randomly distributed screw members;
a screw member lifting means;
said screw member lifting means being positioned within said hopper member;
said screw member lifting means including a plurality of laterally spaced screw lifting members;
each of said screw lifting members being mounted for reciprocation in a vertical plane between a first position where it is burrowed into a pile of screw members retained by said hopper member and a second position where it is contiguous to an upper rim of said hopper member, spaced upwardly of said pile of screw members;
and a plurality of screw member discharge stations being provided by said lifting members when in their respective uppermost positions contiguous to said hopper rim.

4,782,589
PROCESS OF CONNECTING LEAD FRAME TO A SEMI-CONDUCTOR DEVICE AND A DEVICE TO EFFECT SAME

Richard K. Dennis, R.D. #2, Box 2039, Paddletown Rd., Etters, Pa. 17319

Filed Apr. 6, 1987, Ser. No. 34,663
Int. Cl.⁴ H01R *43/02*
U.S. Cl. 29—827 **14 Claims**

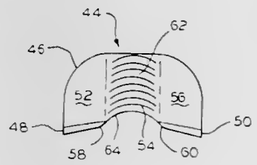


1. A method of mounting geometric semiconductor devices respectively upon similar lead frame units connected to each other in strip form and each unit having at least an opposed pair of rows of similar leads on opposite sides of a central opening in each frame unit, said leads having on one end heads comprising a pair of similar legs evenly bent into fork-like configurations and the distance between the ends of said legs on said opposite rows thereof being less than the transverse dimension of said semi-conductor devices to be supported between said rows of heads, said rows of leads being connected integrally intermediately of the ends thereof by an elongated connecting strip, the ends of said strip are connected to portions of said lead frame by bendable portions of said lead frame adjacent opposite ends of said connecting strip, said method comprising the steps of:
a. positioning a unit of said lead frame upon a supporting plate of a forming mechanism which plate has flat clamping areas and an opening alignable with the central opening in said units,
b. moving a pressure plate provided with a flat clamping surface and a similar central opening into firm clamping position against said unit disposed upon said supporting plate with the openings thereof in alignment to form bending axes along the aligned edges of said openings and the headed ends of said leads projecting beyond said aligned edges and into the aligned openings of said plates,
c. moving a pair of parallel narrow bending members into said aligned openings respectively adjacent the rows of headed leads projecting beyond the portions of said lead frames which are clamped between said members and bending said bendable portions of said frame in common direction uniformly through an angle of sufficient degree to the plane of said lead frame to form angularly disposed bendable portions and thereby space apart the ends of the upper legs of the opposite rows of heads a distance greater than the transverse dimension of said semi-conductor device,
d. depositing a semi-conductor device through said aligned openings in said plates and resting it upon the opposite legs of the opposed rows of heads,
e. withdrawing said bending members from engagement with said bendable portions of said frame,
f. moving additional narrow bending members into engagement with the surfaces of said angularly disposed bedable portions of said frame opposite those engaged by said first-mentioned bending members to reversely bend said portions and restore the leads and heads thereon to the plane of the lead frame and thereby cause the ends of said upper legs of said heads to overlie the edges of said device and thereby secure it to said lead frame unit while adjacent portions of said lead frame remain clamped, and
g. releasing said frame units from said clamping means for further processing to complete said units.

4,782,590
PERSONAL GROOMING DEVICE

H. Maie' Pope, 511 W. Melrose St., #104, Chicago, Ill. 60657

Filed Jul. 15, 1985, Ser. No. 731,122
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.⁴ B26B *21/00*
U.S. Cl. 30—50 **5 Claims**

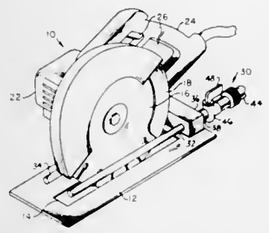


1. A cutter for trimming and shaping facial hair, said cutter comprising:
first and second discrete, relatively narrow metal blades,

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each said blade having a pair of longitudinally-extending and opposed edges,
the first of said blade edge being honed or sharpeded; and
a handgrip to hold said blades,
said handgrip having a central segment and a pair of longitudinally-extending wings integral with said central segment, said wings formed by inclining or angling said handgrip side edges one toward the other with respect to said central segment,
each said wing having a top edge formed from a segment of said handgrip top edge,
said wing top edges being non-parallel one to the other;
each said handgrip wing segment engaging one said blade at each said second blade edge and over a portion of each said blade towards each said first blade edge,
each said first or sharpened blade edge remaining exposed when said blade is engaged by said handgrip,
said blades secured to said handgrip at each said wing top edge segment,
said central segment devoid of any cutting blade,
each said blade held in one said winged segment top edge in an angled or inclined attitude with respect to said central handgrip segment and in a non-parallel relationship one to the other.

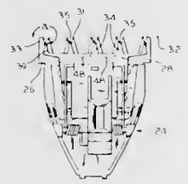
4,782,591
SAW BLADE COOLING SYSTEM
Anthony DeVito, 33 Croft La., Smithtown, N.Y. 11787, and Jesse P. Competiello, 239 N. Suffork Ave., Massapequa, N.Y. 11758
Filed Nov. 23, 1987, Ser. No. 124,029
Int. Cl.[4] B23D *45/16*
U.S. Cl. 30—123.3 **3 Claims**



1. In combination, a circular saw having a base plate, a rotatable cutting blade for sawing, and readily dismountable means for cooling said blade while in operation consisting of a readily removable manifold mounted on said base plate, a pair of readily removable pipes extending from said manifold along opposite sides of said blade, a plurality of spaced openings along each of said pipes located on the circumference of said pipes facing said cutting blade, and a hose connected into said manifold through a readily removable connecting pipe for supplying water under pressure into said pipes so as to cause a spray of said water on the surfaces of said blade while the latter is in operation.

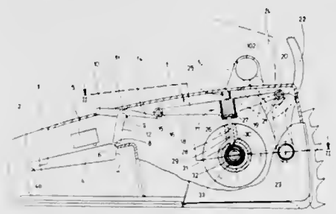
4,782,592
METHODS AND APPARATUS FOR CLIPPING HAIR
Nicolo Altamore, Rockford, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.
Continuation-in-part of Ser. No. 796,307, Nov. 8, 1985, abandoned. This application Feb. 2, 1987, Ser. No. 9,761
Int. Cl.[4] B26B *19/00*
U.S. Cl. 30—195 **1 Claim**

1. Apparatus for clipping hair comprising:
a handle and a cutting head secured to said handle, said handle having a source of electrical power, an electric motor and drive means operatively connecting said motor to said cutting head;
said head comprising a stationary blade and a reciprocating blade operatively connected to said drive means to reciprocate with respect to said stationary blade during operation;
said stationary blade having a set of stationary teeth arranged in a row, said stationary teeth each having at least one cutting edge and a tip, said tips defining a blade edge; each of said stationary teeth being separated from adjacent said stationary teeth by a substantially unobstructed space;
said reciprocating blade having a plurality of reciprocating



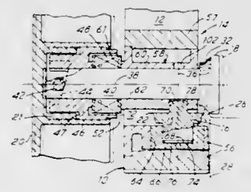
teeth complementing said stationary teeth so that one of said reciprocating teeth passes one of said cutting edges of said stationary blade teeth;
said reciprocating teeth being separated from each other by substantially unobstructed gaps, said gaps being arranged so that a substantially portion of each of said spaces is substantially unobstructed by said reciprocating teeth;
said stationary blade defining a total distance "b" over which hair strands could encounter said blades, and said reciprocating teeth defining a plurality of spaced linear distances "c" over which hair strands are likely yo be cut, the ratio of the sum of said distances "c" to said distance "b" being less than about 0.2.

4,782,593
CHAIN SAW WITH A STOPPING DEVICE
Hermann Kieser, Nürtingen, and Norbert Schur, Metzingen, both of Fed. Rep. of Germany, assignors to Metabowerke GmbH & Co., Nürtingen, Fed. Rep. of Germany
Filed Feb. 27, 1987, Ser. No. 20,099
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607376
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—382 **15 Claims**



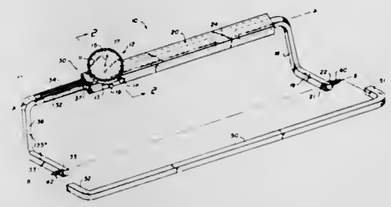
1. A portable power-operated tool, particularly a portable chain saw, comprising a housing; a prime mover carried by said housing and having a rotary output member; means for starting said prime mover; manually operable means for normally blocking the operation of said starting means; a rotary tool driving member; a wrap spring clutch interposed between said members to rotate said driving member in response to rotation of said output member, said clutch including a first component which is driven by said output member to rotate in a predetermined direction in response to rotation of said output member, a second component which drives said driving member, and a prestressed coil spring surrounding and normally frictionally engaging said components, said coil spring having convolutions surrounding said components in such orientation that the spring tends to reduce its diameter, to bear against said components and to be driven by said first component due to the prestressing thereof; means for disengaging said clutch including a manually displaceable disengaging element of said housing, said clutch further including means for braking said driving member in response to displacement of said disengaging element so that the driving member is braked substantially simultaneously with the interruption of transmission of torque thereto, said spring including or constituting said braking means and being disengageanble from at least one of said components in response to displacement of said disengaging element, said disengaging means further including means for interrupting the rotation of said spring with said one component in response to displacement of said disengaging element, said spring comprising a portion which extends from said first component and said interrupting means comprising a stop which is engageable with said portion of said spring in response to displacement of said disengaging element to thereby prevent the spring from rotating with said first component; an means for engaging said stop with said portion of said spring in response to blocking of the operation of said starting means by said blocking means, said stop including a reciprocable decoupling element and said engaging means including means for biasing said decoupling element to a position in which said decoupling element extends into the path of movement of said portion of said spring, said disengaging means having retracting means for normally maintaining said decoupling element away from the path of movement of said portion of said spring, said retracting means comprising a retracting lever having a first arm cooperating with said disengaging element and a second arm cooperating with said blocking means, said retracting lever having a hub receiving a portion of said biasing means and reciprocably receiving a portion of said decoupling element.

4,782,594
CAN OPENERS
Paul Porucznik, Kennington, and Keith Longstaff, Wantage, both of England, assignors to Metal Box Limited, Berkshire, England
Continuation of Ser. No. 817,743, filed as PCT GB85/00126, Mar. 29, 1985 published as WO85/04645, Oct. 24, 1985, abandoned. This application Feb. 4, 1988, Ser. No. 154,496
Claims priority, application United Kingdom, Apr. 5, 1984, 8408798
Int. Cl.[4] B26B *19/00*
U.S. Cl. 30—417 **19 Claims**



1. A can opener comprising: a housing; a cutter member comprising a cutter wheel having a circumferential cutting edge for severing a seaming wall of a double end seam of a can; a traction wheel defining a traction wheel axis and having a peripheral first surface, parallel to the traction wheel axis for engaging the top of the seam and a second surface diverging outwardly from the first surface, for engaging a chuck wall of the seam, means mounting each of said wheels rotatably in the housing with their axes substantially perpendicular to each other; actuating means for driving one of the said wheels; a first abutment projecting from the housing behind the wheels, with respect to the direction of movement of the housing relative to the seam during cutting, the said first abutment having a seam-engaging surface for engaging the top of the seam to tilt the housing about the traction wheel axis when said seam-engaging surface is engaged with the top of the seam, whereby to determine an angle of dive greater than zero between the planes of the said cutting edge and the top of the seam; a second abutment on said housing for engaging the side of the can during cutting; and a bearing member contained in a bore in the housing and having a first thrust surface, the cutter member having a terminal second thrust surface axially offset from the cutter wheel and bearing on said first thrust surface of the bearing member, said second thrust surface being the only non-axial surface of the cutter member in contact with any other part of the can opener, whereby all axial thrust imposed on the cutter wheel is transmitted through said thrust surfaces.

4,782,595
BRAKE DRUM MEASURING APPARATUS
Arman Diewert, 3225 Wildwood Road, Kelowna, Canada V1W 2S3
Filed Oct. 26, 1987, Ser. No. 113,021
Int. Cl.[4] G01B *5/02*
U.S. Cl. 33—147 J **8 Claims**



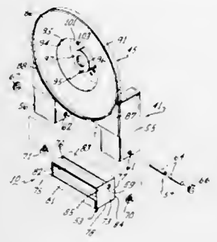
1. A brake drum measuring apparatus comprising:
a receiving bracket having a main portion with a longitudinal cavity and a distal depending portion for mounting a pin to abut against the inner circumference of a brake drum;
a gauge member slidably received within the longitudinal cavity of the receiving bracket, having a main portion with a coarse measuring scale, an actuating means for operating a fine measuring scale, a distal depending portion for mounting a pin to abut against the inner circumference of a brake drum;
locking means for fixing the position of the gauge member in the longitudinal cavity of the receiving bracket.
fine measuring scale means mounted on said receiving bracket cooperating with said actuating means of said gauge member in the longitudinal cavity; and
a pointer mounted on said receiving bracket to point to the coarse measuring scale,
said distal depending portions of said receiving bracket and said gauge member comprising coplanar first portions extending from said main portions in an essentially vertical plane, said first portions being bent to form coplanar second portions extending out of said vertical plane, each of said second portions providing a mounting location for one of said pins, said pins defining an axis that is parallel to the longitudinal cavity of said receiving bracket.

4,782,596
WHEEL ALIGNING METHOD AND APPARATUS
James A. Mieling, 1030 Viking Ct., Batavia, Ill. 60510
Filed Nov. 30, 1987, Ser. No. 126,573
Int. Cl.[4] G01B *5/255*
U.S. Cl. 33—203.18 **15 Claims**

1. Wheel alignment device for attachment to a vehicle strut assembly having an axle hub, comprising:

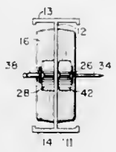
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support means including a pair of rigid, spaced apart upright support members;
rigid member means mounted on said support members and adapted to be mounted to the strut assembly;
base means pivotally attached to said rigid member means at the bottom thereof to enable said rigid member means and said base means to pivot relative to one another during adjustment of said assembly, said base means being adjustable in its height dimension to accommodate different size vehicle wheels, said base means being an elongated block having a sufficient length to extend substantially the entire distance between said upright support members and having a plurality of elongated sides for engaging a supporting surface, said base means including pivot means dis-



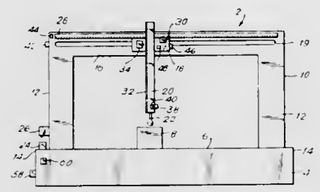
posed in an off-center position relative to a central axis of said base means to enable it to be rotated about said axis to enable a selected one of said sides to face downwardly;
large hub means being connected to said rigid member means and projecting rearwardly therefrom defining a well, said hub means having an upright rear wall, said rear wall having a rear surface for engaging a portion of the vehicle strut assembly; and
small hub means being connected to raid rear wall and projecting forwardly therefrom within said large hub well, said small hub means having a front upright wall positioned substantially parallel to said rear wall for receiving and supporting gauge means to facilitate wheel alignment and being opened at its rear to receive the vehicle axle hub.

4,782,597
ATTACHABLE LEVEL INDICATOR
Norman J. Mills, 820 Aspen Rd., West Palm Beach, Fla. 33409
Filed Feb. 4, 1988, Ser. No. 152,242
Int. Cl.[4] G01C *9/26*
U.S. Cl. 33—370 **4 Claims**



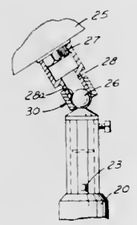
1. A level-indicating-device comprising:
(A) supporting means for a bubble tube, said supporting means comprising a plate-like portion,
(B) a bubble tube fixedly supported by said supporting means,
(C) nail guiding means fixedly attached to said supporting means, said nail-guiding means comprising a rigid tube comprising a threaded outer surface passing through said plate-like portion, synthetic polymeric nail-gripping material confined in said tube and nut means locking said tube to said plate-like portion, and
(D) pointed nailing means slidingly gripped in said nail guiding menas whereby said device may be removably attached to a wooden structure being leveled.

4,782,598
ACTIVE ERROR COMPENSATION IN A COORDINATE MEASURING MACHINE
Antonio Guarini, Bellville, Mich., assignor to Digital Electronic Automation, Inc., Livonia, Mich.
Continuation of Ser. No. 778,346, Sep. 19, 1985, Pat. No. 4,663,852. This application Jan. 30, 1987, Ser. No. 9,481
Int. Cl.[4] G01B *7/00*
U.S. Cl. 33—503 **9 Claims**



1. An error compensated, coordinate measuring machine, which comprises:
a ram;
a supporting structure for the ram, the ram being mounted to the structure and movable with respect thereto;
an object sensing probe mounted to the ram;
means for sensing the angular orientation of the ram relative to a reference plane, and for providing angularity data representative of the relative angular orientation of the ram, said means for sensing being capable of sensing angular orientation when said probe is stationary;
means for measuring the position of the ram and for providing ram positional data; and
means responsive to the angularity data for adjusting the ram positional data.

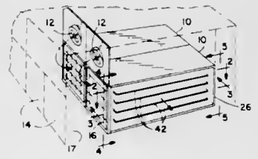
4,782,599
MEASURING LOCATION SENSOR FOR LINEAR MEASURING DEVICES
Hans R. Bergstrom, Kungsor, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.
Filed Jul. 6, 1987, Ser. No. 69,983
Claims priority, application Sweden, Jul. 7, 1986, 8603010
Int. Cl.[4] G01B *5/255*
U.S. Cl. 33—608 **8 Claims**



1. A linear measuring device for measuring the location of a round hole in a surface inclined at an acute included angle to at least one of three mutually perpendicular coordinate axes, comprising, at least one measuring beam constructed and ar-

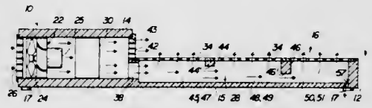
ranged to extend longitudinally and be supported in a substantially horizontal plane, a carriage slidably mounted on said beam for movement longitudinally thereof along a first axis, a slide mounted on said carriage for movement therewith and along a second axis perpendicular to said first axis, a probe assembly removably carried by said slide for movement therewith and having a probe which can be extended and retracted relative to said slide along a third axis pependicular to both said first axis and said second axis, a spherical tip received on said probe for movement therewith and having an outside diameter greater than the inside diameter of the round hole in the inclined surface, a measuring scale carried by said probe assembly and calibrated as a function of the outside diameter of the spherical tip and a given inside diameter for a round hole, and a housing removably received and seated in said slide for movement therewith, said probe being telescopically slidably received in said housing, said spherical tip being removably received and seated on said probe, and said scale being caried by said probe for movement therewith relative to said housing.

4,782,600
JET TUBE ASSEMBLY FOR A JET TUBE SHEET DRYER
Fred Coulson, Post Office Box 989, Eagle Point, Oreg. 97524
Filed Feb. 27, 1987, Ser. No. 19,572
Int. Cl.[4] F26B *3/04, 13/04*
U.S. Cl. 34—23 **12 Claims**



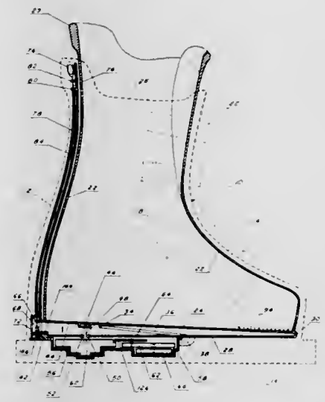
1. A jet tube assembly for a jet tube sheet dryer, comprising an elongate jet tube that is generally rectangular in cross section and tapers from a large air-delivery end to a small end, a post rigidly attached to the tube at its small end in a manner such as not to block the small end of the tube and extending longitudinally of the tube beyond the small end of the tube, and a closure member formed with an aperture so that it can fit over the post and move relative thereto between first and second positions, the closure member being sized so that in its first position the small end of the tube is substantially blocked and in its second position a substantial portion of the cross-sectional area of the tube at its small end is unobstructed by the closure member.

4,782,601
FOOT DRYING ASSEMBLY
Alejandro R. Gonzalez, 13941 SW. 92nd Ave., Miami, Fla. 33176
Filed Dec. 6, 1985, Ser. No. 805,675
Int. Cl.[4] F26B *9/00*
U.S. Cl. 34—233 **16 Claims**



1. A drying assembly primarily designed to dry a person's feet, said assembly comprising:
(a) a housing including a hollow interior portion structured to include an air chamber,
(b) a support platform mounted on said housing and including an apertured construction, said support platform disposed in overlying relation to at least a portion of said air chamber,
(c) said support platform dimensioned for placement of a person's foot thereon and said apertured construction disposed to establish fluid communication between said air chamber and the feet on said support platform,
(d) air driving means mounted on said housing for directing air from an exterior of said housing and into said air chamber and structured to establish a continuous forced flow of air along at least a portion of said hollow interior portion,
(e) air guide means mounted on said housing and disposed to define a path of fluid flow within said air chamber and out through said support platform,
(f) said air chamber comprising a plurality of chamber segments disposed within said hollow interior portion, each of said chamber segments separated from a next adjacent chamber segment by said air guide means, said plurality of chamber segments collectively disposed successively along a length of said housing,
(g) said air guide means disposed within said air chamber in at least partially interruptive relation to said forced flow of air therethrough, said air guide means dimensioned to direct a different quantity of air to various portions of said air chamber,
(h) heating means mounted on said housing and disposed in heat transferring relation to said flow of forced air for heating the air, and
(i) control means mounted on said housing and accessably disposed on an exterior thereof, said control means connected to said air driving means and said heating means for regulation thereof.

4,782,602
SHOE WITH FOOT WARMER INCLUDING AN ELECTRICAL GENERATOR
Nikola Lakic, 73-355 Guadalupe Ave. Unit M, Palm Desert, Calif. 92260
Filed May 26, 1987, Ser. No. 54,189
Int. Cl.[4] A43B *7/02*
U.S. Cl. 36—2.6 **19 Claims**



1. In a foot warmer mechanism for a shoe having a heel with an open compartment and an outer sole and having an inner sole mounted within said shoe for relative vertical movement therein and with a mechanical translator located in said open compartment of said heel and mechanically linked to the reciprocal vertical movement of said inner sole and electrical generation means seated in said compartment within said heel and including a gearbox and a mechanically interconnected electri-

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cal generator and electrical heating means within said shoe in circuit to said electrical generator, the improvement comprising:.

a. a flywheel mounted for rotational movement on a vertical axis in the heel of said shoe and mechanically coupled through said gearbox to said electrical generation means;

b. a sleeve coupled to said mechanical transducer also mounted in the heel of said shoe coaxial with said flywheel; and

c. a resilient helical coil spring with its inner end secured to said sleeve and its outer end secured to said flywheel,

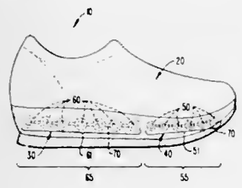
whereby rotational movement of said sleeve is resiliently transmitted to said flywheel, and said spring absorbs the shock from impacts applied to said sleeve by rapid and forceful movements of said inner sole.

4,782,603

MIDSOLE

Stephen C. Brown, San Francisco, Calif., assignor to The Summa Group Limited, San Francisco, Calif.

Filed Aug. 12, 1986, Ser. No. 895,766
Int. Cl.[4] A43B *13/20, 13/18*
U.S. Cl. 36—29 **7 Claims**



1. A midsole for a shoe, said shoe having a toe, a heel, an upper and an outsole, comprising:

a molded midsole element having embedded within it a forefoot tube assembly and a heel tube assembly;

said midsole element being characterized by a sole axis extending from said heel to said toe; and

wherein said forefoot tube assembly and said heel tube assembly further comprise a plurality of tubes in parallel arrangement, each tube sealed at both ends, each tube having a longitudinal tube axis, said tubes maintained in a diametrically spaced apart relation by spacing means integrally formed as part of each tube assembly, with said tube axes generally perpendicular to said sole axis, said midsole element sandwiched between said upper and said outsole.

4,782,604

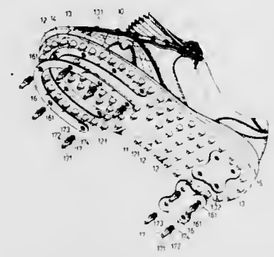
SOLE STRUCTURE FOR GOLF SHOES

Lo Wen-Shown, 4 Tung Pei Street, Feng Yuan city, Taichung Hsien, Taiwan

Filed Jun. 26, 1987, Ser. No. 67,270
Int. Cl.[4] A43B *5/00;* **A43C** *15/00*
U.S. Cl. 36—127 **7 Claims**

1. A sole structure for golf shoes having a front end and a rear end comprising

a plurality of removable metal nails located at the front end corresponding to the ball portion of the sole and the rear end corresponding to the heel portion of the sole and a plurality of soft cleats formed as integrated parts of the sole around the said metal nails to bear load and to provide elasticity to golf shoes,



said sole having a recession of a predetermined form with a pad of the same form for removably fixing the said metal nails.

4,782,605

SHOE INSERT CONSTRUCTION AND METHOD OF MAKING

Bernard Chapnick, Beverly, Mass., assignor to Packaging Service Corporation, Ky.

Continuation of Ser. No. 697,474, Feb. 1, 1985, Pat. No. 4,648,923, which is a division of Ser. No. 566,186, Dec. 28, 1983, Pat. No. 4,586,273. This application Aug. 1, 1986, Ser. No. 891,898
The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.
Int. Cl.[4] A43B *10/00, 13/41*
U.S. Cl. 36—44 **11 Claims**



1. A shoe insert comprising: a base layer of a relatively resilient material, a foam layer disposed over the base layer, a fabric disposed over the foam layer, means integrally forming the base layer, foam layer and fabric into a sheet tri-laminate, a pre-formed cupped support member disposed only at the heel area of the insert and of a rigid material of higher density than that of the tri-laminate, and means attaching and forming the tri-laminate with the support layer, said support layer being disposed under said base layer, said base and foam layers each being of comparable thickness and each substantially thicker than the fabric layer, said foam layer and support layer both constructed of polyurethane foam material, said base layer and foam layer having densities on the same order of magnitude, and said foam layer having a density substantially less than the density of the support layer, said support layer being formed of a compressed polyurethane foam to obtain greater density and thus greater rigidity in comparison to that of the foam layer.

10. A method of making a shoe insert comprising the steps of; providing a foam layer, providing a fabric layer, heating the foam layer, joining the foam and fabric layers, providing a base layer, heating one of said base layer and foam layer, joining the base layer with the foam layer to form a trilaminate, providing a pre-formed heel member of a density substantially greater than the density of the foam layer and formed of a compressed form material to obtain greater density and thus greater rigidity in comparison to that of the foam layer, applying adhesive between the heel member and the trilaminate, said adhesive being heat and pressure reactivatable, and molding under pressure, said heel member and trilamipate so as to cause shaping, of the trilaminate into the heel member and forming into an integral one-piece shoe insert with the pre-formed heel

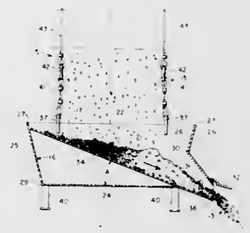
member forming the bottom surface of the finished shoe insert at the heel area thereof, and the base layer forming the bottom surface of the finished shoe insert at the forward area thereof.

4,782,606

METHOD AND APPARATUS FOR BACKFILLING DITCHES

Kelly Surface, 4223 Mountain View Rd., Roanoke, Va. 24017

Filed May 1, 1987, Ser. No. 44,641
Int. Cl.[4] E02F *5/22*
U.S. Cl. 37—117.5 **6 Claims**



1. Diverting apparatus adapted for removable association with a rectangularly elongated dumping scoop of a front end loader, said apparatus comprising:

(a) a rigid compartment having: (1) an open upper extremity having an elongated rectangular perimeter comprised of paired short edges and long edges, (2) identical opposed flat front and rear walls, each having a horizontally disposed upper edge that constitutes a long edge of said rectangular perimeter, and having at least one upright side edge, said walls being disposed such that said side edges are in facing juxtaposition and convergent in the downward direction, (3) at least one flat end panel of generally trapezoidal perimeter having a horizontally disposed upper edge that constitutes a short edge of the rectangular perimeter of said upper extremity, two side edges in joinder with the side edges of said front and rear walls, a horizontally disposed lower edge, and an exit port positioned adjacent the lower edge of one end panel, (4) a bottom panel extending between said front and rear walls and downwardly inclined toward the lower edge of the end panel which has said exit port, and (5) valve means associated with said exit port, and

(b) support means comprised of paired harnesses, each having a transverse tether attached to diametrically opposed sites on said front and rear walls adjacent their upper edges and extending upwardly in a V-shaped path having joining means at its apex, and a compliant lifting tether attached at its lower extremity to said joining means and having an upper extremity adapted to attach to the rearward edge of the rectangular dumping scoop, the sites of attachment of said transverse tethers being adjacent said short edges and equally spaced from the midline axis between said short edges.

4,782,607

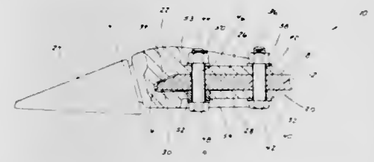
REMOVABLE BUCKET TOOTH ASSEMBLY

Claude M. Frisbee, Bettendorf; Rudolf Horsch, Davenport, and Victor R. Bowen, Bettendorf, all of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Jul. 14, 1986, Ser. No. 885,295
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—141 T **16 Claims**

1. In means for removably attaching to the cutting edge member of an earth-moving bucket a tooth of the type having a shank portion with substantially parallel upper and lower prong surfaces forming a slot which is wider than the distance between substantially parallel upper and lower surfaces of the edge member and extends from an open end to a closed end, with the cutting edge member received within the slot, the improvement comprising:

first clamping means applying sandwiching pressure on the upper and lower surfaces of the edge member at a position near the open end; and



second clamping means applying sandwiching pressure on the upper and lower surfaces of the edge member at a position near the closed end, the second clamping means being in direct contact with one of said upper and lower cutting edge member surfaces,

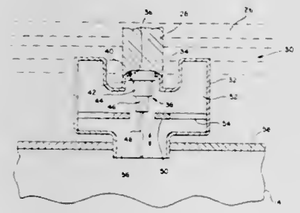
whereby the tooth is both firmly held in place against both front and side impacts and readily removable and reattachable.

4,782,608

VARIABLE STEAM CONTROL FOR ELECTRIC IRON

John Petrik, Newtown, Conn., assignor to Black & Decker, Inc., Newark, Del.

Filed Nov. 7, 1986, Ser. No. 928,319
Int. Cl.[4] D06F *75/18*
U.S. Cl. 38—77.83 **6 Claims**





1. A variable steam control for an electric iron, said electric iron including a water reservoir and a heatable steam chamber, comprising:

a tap-water valve communicable with water in said water reservoir;

a metering rod passing through an opening in said tap-water valve;

a water channel from said tap-water valve to said heatable steam chamber;

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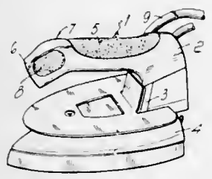
said metering rod including at least first and second generally cylindrical portions having first and second different cross-sectional dimensions, respectively;
said opening having a minimum third cross-sectional dimension;
said third cross-sectional dimension being larger than said first and second cross-sectional dimensions;
means for selectively positioning one of said at least first and second dimensions in said minimum dimension, whereby at least first and second different water flow rates into said heatable chamber are provided;
said means for selectively positioning includes:
a steam-control actuator rod;
a cam having at least first and second lands joined by a ramp;
engagement means on said steam-control actuator rod for contacting said at least first and second lands and said ramp; and
means for permitting said cam to be moved with respect to said engagement means, whereby said steam-control actuator rod is displaced to attain said selective positioning.

4,782,609

HANDLE FOR A MANUALLY OPERABLE INDUSTRIAL PRESSING IRON

Giovanni Cartabbia, Via Fusline, 36, 25036 Palazzolo Sull'Oglio (Brescia), Italy

Filed Mar. 13, 1987, Ser. No. 25,502
Claims priority, application Italy, Mar. 21, 1986, 21318/86[U]
Int. Cl.⁴ D06F *75/34*
U.S. Cl. 38—90 **3 Claims**



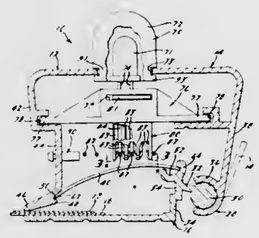
1. A handle for a pressing iron, comprising an elongate element,
a root portion of said elongate element,
a shaped intermediate hand grip portion of said elongate element and,
an unsupported free end portion of said elongate element,
the surface of said intermediate portion of said elongate element being worked in such a way as to be anti-slip and to allow an air flow to take place between said intermediate portion of said elongate element and the palm of the hand of a user,
said elongate element having an approximately cylindrical shape, said intermediate hand grip portion having a substantially oval cross section, and said root portion, which is intended to be fitted to an upstanding handle support of a body of said pressing iron, having a shape which corresponds to that of the upper face of said handle support,
wherein the surface of said intermediate hand grip portion of said elongate element, at least in the region where it is contacted by the palm of the hand and fingers (excluding the thumb) of the operator, is worked by means of one of chiselling, chipping and equivalent working operations in such a way as to form a plurality of closely adjacent microcavities.

4,782,610

DISPLAY ASSEMBLY WITH ILLUMINATION SYSTEM

David U. Hillstrom, Novi; Donald R. Gaines, Farmington Hills; Donald L. Gaines, Northville, and John E. Chandler, Plymouth, all of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Sep. 10, 1986, Ser. No. 905,867
Int. Cl.⁴ G09F *13/00*
U.S. Cl. 40—152.2 **24 Claims**



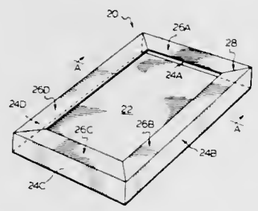
1. An assembly for displaying a signal, said assembly including a sign frame and at least one light on said frame, the light including at least one electrical conductor thereon for conducting electric current thereto from an electrical power source, said assembly further comprising:
at least one electrical conductor associated with the frame and connectable to the electrical power source;
a light socket interconnected with said frame and having a socket opening therein for receiving the light inserted therein, said light socket including a connector opening therein;
a connector interconnectable with said light socket, said connector having at least one electrical conductor thereon disposed for electrical contact with said electrical conductor on the light when the light is inserted into said light socket and said light socket is interconnected with said connector, said connector including connecting means for connecting said frame electrical conductor in electrical contact with said electrical conductor on said connector in order to establish electrical communication between the light and the electrical power source, said connector including a tab portion insertable into said connector opening in said light socket in an interlocking relationship therewith.

4,782,611

ONE-PIECE FOLDABLE FRAME ASSEMBLY

Zelko Papov, 2825 Islington Avenue N, Weston, Canada M9L 2K1

Filed Feb. 24, 1987, Ser. No. 17,722
Claims priority, application Canada, Feb. 27, 1986, 502919
Int. Cl.⁴ G09F *1/12*
U.S. Cl. 40—154 **9 Claims**



1. A one-piece, picture frame made from suitably-foldable

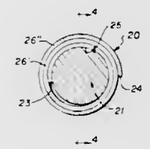
material, for framing material to be framed which comprises at least one flat, planar object to be framed and a suitable backing material under the object to be framed, comprising:
a back piece having a plurality of sides;
an edge piece foldably extending from each respective side of the back piece;
a front piece foldably extending from each respective edge piece, wherein the shape of each front piece is substantially the same as the shape of the other front pieces, and has a front edge and side edges;
wherein the front is folded around the material to be framed such that:
the edge pieces form side faces extending in the same direction and substantially at right angles to the back piece;
the front pieces form front faces extending inwardly from the respective side faces;
each side edge of each front piece abuts against the adjacent side edge of the adjacent front pieces;
an open channel is formed between each front face and the back piece;
the depth of the channel is substantially the same as the depth of the material to be framed; and
the material to be framed is positioned within the frame by positioning a respective outer edge of the material to be framed within the respective channel;
wherein each front face is adhered to the top face of the material to be framed;
wherein the back piece is cut so as to form a flap which permits insertion and withdrawal of the object to be framed; and
wherein the suitable backing material is cut so as to form a flap which permits a insertion and withdrawal of the object to be framed.

4,782,612

IDENTIFICATION TAG

James F. Eidmann; John C. Eidmann, and Robert P. Eidmann, all of Star Rte. #3, Orrin, N. Dak. 58359

Filed Jul. 21, 1986, Ser. No. 888,323
Int. Cl.⁴ G09F *3/00*
U.S. Cl. 40—300 **2 Claims**



1. An animal identification tag for attachment to a cow's tail by spiral encirclement about the cow's tail comprising a resilient sheet resiliently biased in length into a spiral path of overlapping layers of connecting curves circling about a central point in one plane with said curves constantly increasing in size; said sheet having an innermost end and an outermost end in said spirial; said sheet having its smallest curve at its innermost end of the spiral and its largest at its outermost end; said sheet having a length in excess of its circumference and a width in excess of its circumference; said tag, in its biased position, having its smallest curve smaller in diameter than the outside diameter of the cow's tail with said tag's resilient biasing thereby acting to contract the tag, when the tag is encircled about the cow's tail, toward its position that is smaller than the outside diameter of the cow's tail to frictionally engage the tag about the cow's tail and with said bias having sufficient force to frictionally retain the tag in position on the cow's tail; said tag having its layers sufficiently separable and straightenable from one another whereby the tail of the cow may be slipped laterally of the length of the tail between the outermost end of the spiral tag and the next adjacent layer and the tag may be rotated relative to the tail to slide the tail along the spiral sheet between the layers until the tail slides out the innermost end of the sheet into the inside of the tag to be spirally encircled by the innermost curved layer of the spiral tag; indicia along the outside of the outermost layer to identify the cow.

4,782,613

IDENTIFICATION SEAL FOR ELECTRICIAL CABLE

Richard S. Guiler, Newton, and Allan W. Swift, Denville, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.

Filed Mar. 27, 1984, Ser. No. 594,403
Int. Cl.⁴ G09F *3/00*
U.S. Cl. 40—316 **3 Claims**



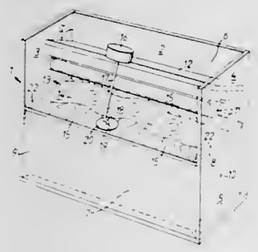
1. An identification seal for a cable having an insulating cover, said seal comprising a seal body formed of deformable plastic, said body being generally thin and rectangular in cross section, and having a side surface for receiving identifying marks and a top surface having spaced apertures extending into the body, and a shackle having a pair of legs with ends shaped and dimensioned for locking engagement in the apertures, said shackle having portions at the upper ends of the legs which are inclined upward and inwardly toward each other to a connecting loop portion, said loop portion having a circumferential extent of greater than 180° forming a restricted entrance to the loop which is smaller than the diameter of the cable onto which the seal is to be assembled, said loop having an inside diameter which is slightly less than the outside diameter of the cable.

4,782,614

DISPLAY UNIT

Martin Beacom, Walton-on-Thames, England, assignor to Living Images Limited, Hampton, England

PCT No. PCT/GB86/00398, § 371 Date Mar. 11, 1987, § 102(e) Date Mar. 11, 1987, PCT Pub. No. WO87/00328, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 11, 1986, Ser. No. 26,575
Claims priority, application United Kingdom, Jul. 11, 1985, 8517663
Int. Cl.⁴ G09F *13/12, 19/12*
U.S. Cl. 40—427 **8 Claims**

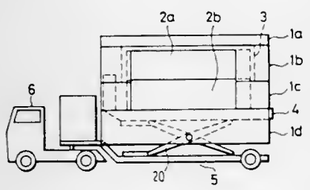


1. A display unit for producing an unsupported image in space, which display unit comprises:

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(a) a light source;
(b) a beam splitter;
(c) a layer of retroreflective material;
(d) an undulant, flexible stencil disposed between said light source and said beam splitter; and
(e) means for disturbing the undulations in said stencil to give a changing wave like appearance thereto.

4,782,615
ADVERTISING BOARD FOR MOBILE DISPLAY SYSTEM
Shunichi Futatsuishi, and Shozo Fujita, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 353,275, Mar. 1, 1982, abandoned. This application Jan. 25, 1984, Ser. No. 572,980
Claims priority, application Japan, Mar. 11, 1981, 56-34721
Int. Cl.⁴ G09F *21/04*
U.S. Cl. 40—591 **9 Claims**



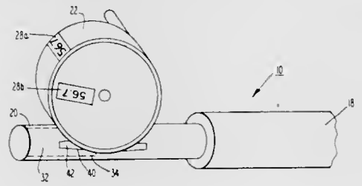
1. An advertising display board for a mobile display system adapted to be mounted on the chassis of a vehicle comprising a stand adapted to be mounted for vertical movement on the chassis of a vehicle, means for moving said stand vertically relative to said chassis, a first vertically disposed display board carried by said stand, a support member mounted on said stand for vertical movement relative thereto, means for moving said support member vertically relative to said stand, and a second display board carried by said support member whereby upon lowering of said support member, said second display board will be disposed at the same level as said first display board for transport and upon raising said support member said second display board will be disposed above said first display board to define an enlarged display surface.

4,782,616
PORTABLE BLIND APPARATUS FOR OUTDOOR USAGE
John D. Hambleton, R.R. 1, Guthrie Center, Iowa 50115
Filed Dec. 8, 1987, Ser. No. 130,163
Int. Cl.⁴ A01M *31/02*
U.S. Cl. 43—1 **10 Claims**



1. A portable camouflage apparatus for outdoor usage comprising:
a base adapted to be fixed with respect to the ground;
a chair having a seat portion and a back portion interconnected together, said chair also having a front and a rear;
a vertical post attached to said chair and extending downwardly therefrom;
means for rotatably attaching said post to said base;
a cloth cover, including a top, a bottom edge, a front and a rear, said front having an opening therein;
a pack frame means operatively attached to the rear of said chair for selective attachment to a user's back;
means for supporting the top of said cover, said supporting means comprising at least one support member extending upwardly from said pack frame;
a hoop extending completely around said post, said cover extending over, around and below said hoop; and
means for attaching said hoop to said post for supporting said hoop up off of the ground whereby a user can sit in said chair and be concealed by said cover while at the same time being able to rotate the chair and cover about 360 degrees to look in any direction through the opening in the front cover.

4,782,617
WATER TEMPERATURE MEASUREMENT APPARATUS
Aaron J. Peikin, 315 N. Wayne Ave., Wayne, Pa. 19087
Filed Oct. 24, 1986, Ser. No. 922,876
Int. Cl.⁴ A01K *89/00, 79/00*
U.S. Cl. 43—18.1 **9 Claims**

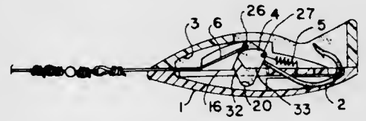


1. In a fishing rod comprising a shaft portion having a tip portion at one end and a handle portion at the other end, said handle portion comprising a grip segment and a reel mounting segment, and a reel removably mounted on said reel mounting segment, an improvement comprising:
(a) temperature sensing means disposed adjacent said tip portion;
(b) temperature readout means disposed in said reel;
(c) first electrical contact means disposed in said reel, said first electrical contact means being electrically connected to said temperature readout means;
(d) second electrical contact means disposed in said reel mounting segment, positioned in electrical contacting relationship with said first electrical contact means when said reel is mounted on said reel mounting segment;
(e) an electrical power source; and
(f) means for electrically interconnecting said temperature sensing means, said second electrical contact means and said electrical power source.

4,782,618
WEEDLESS FISHING LURE
Jack D. Rainey, R.R. 2, Box 797A, Granite City, Ill. 62040
Filed Jul. 10, 1987, Ser. No. 71,904
Int. Cl.⁴ A01K *85/02*
U.S. Cl. 43—35 **7 Claims**

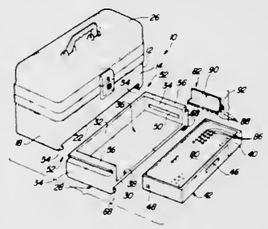
1. A fishing lure for affixing to a line and for use in piscatorial pursuit of a fish, including, a body means, hook means, including a hook portion normally concealed within said lure body means, spring means urging said hook means within said body means, a cam means secured to said hook means, said fishing line capable of securing to said cam means during lure application, cam surfaces provided within said body means, and upon which the cam means moves as it shifts forwardly or rearwardly of the body means during lure application, said body

means having a slot therein, said hook means disposed for partially extending exteriorily of the body means, through its slot, for exposure of the hook portion as during the bite of a fish, said body means formed of two halves, and said halves being secured together with the hook and cam means therein during assembly of the fishing lure, fastener means securing said body halves together during lure assembly, a plate means supported internally of the two body means halves, said plate means functioning as a first cam surface cooperating with the



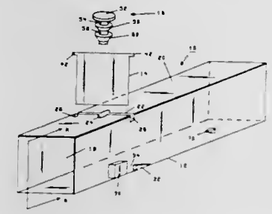
cam means to shift the hook between the operative and inoperative positions, said plate means having a formed slot therethrough, said cam means extending through said formed slot, part of said cam means disposed above the said plate means and having another cam surface provided thereon for riding upon the cam first surface of the plate means as the cam means shifts the hook between its operative and inoperative positions, projections extending from that portion of the cam means disposed beneath the plate means to retain the cam means with respect to the plate means within the lure body means.

4,782,619
MODULAR FISHING TACKLE BOX
Mark S. Richards, 8285 Englewood, Clarkston, Mich. 48016
Filed Aug. 3, 1987, Ser. No. 80,906
Int. Cl.⁴ A01K *97/06;* **A47B** *87/02*
U.S. Cl. 43—54.1 **13 Claims**



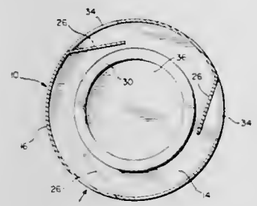
1. A modular fishing tackle box comprising:
a box portion including a pair of opposed vertical sidewalls, a pair of opposed vertical end walls disposed between and connecting said sidewalls, a horizontal bottom connecting said sidewalls and end walls, and an open top opposite said bottom;
a lid fitting over said open top of said box portion and engageable with said sidewalls and end walls opposite said box bottom;
at least two shelf members each including an upper portion, a bottom and a shelf portion defining an upwardly facing horizontal shelf surface;
at least two drawers each including a drawer portion defining a downwardly facing horizontal surface dimensioned to be restable upon and slidable along one or both of said horizontal shelf surfaces; and
means for selectively reversibly detachably connecting either of said shelf members to said bottom of said box portion or to the other end of said shelf members;
wherein said connecting means comprises a pair of spaced horizontally disposed sliding tongue and groove joints on each of said box bottom, said member bottoms, and said member upper portions.

4,782,620
RODENT TRAP
Antonio M. Syszczyk, 14170 SW. 93 La., Miami, Fla. 33186, and Basilio M. Jaroslewicz, 2814 SW. 67th Way, Miramar, Fla. 33023
Filed Jun. 5, 1987, Ser. No. 58,568
Int. Cl.⁴ A01M *23/18*
U.S. Cl. 43—61 **19 Claims**



1. An apparatus for capturing rodents, comprising in combination:
an enclosure having an opening at an end thereof for allowing entry of a rodent;
a door for closing said opening, said door including an upper and a lower edge;
hinging means, coupled to an upper portion of said enclosure, for allowing said door to swing from said upper edge thereof;
ramping means, coupled to said enclosure and situated adjacent said lower edge of said door, for allowing said door to open freely from a set position when urged inward by said rodent, and for causing said door to slide over said ramping means to a latched position when urged outward by said rodent or by the force of swinging to a closed position after having been opened by said rodent.

4,782,621
INSECTICIDE BAIT HOLDER
Seth Wissman, 5605 Dittmar Pl., Dallas, Tex. 75229
Filed Aug. 13, 1986, Ser. No. 895,840
Int. Cl.⁴ A01M *1/20*
U.S. Cl. 43—131 **6 Claims**

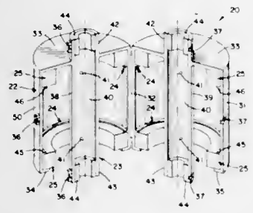


1. An insecticide bait holder for luring insects and the like comprising a box having a top wall, a bottom wall, and a peripheral wall connecting the top and the bottom walls, the peripheral wall having at least one opening therein defining at least an entrance to the box for insects, an insecticide holding means located within the box, a movable closure flap for said opening mounted on said peripheral wall and stop means within the box between the peripheral wall and the insecticide holding means for limiting inward movement of the flap to an acute angle and thereby precluding straight line access to the

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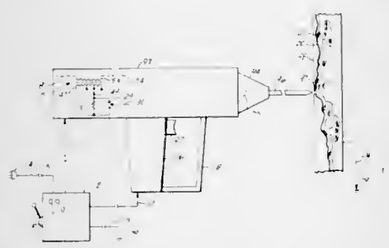
insecticide holding means from said entrance, said means including an upwardly extending ridge in the bottom wall.

4,782,622
TRAP-GUARD FOR VERMIN REPELLANT DESTRUCTION
Ernest H. Roberts, 119 Huntington Cir., Elyria, Ohio 44035
Filed Nov. 20, 1987, Ser. No. 123,310
Int. Cl.[4] A01M *25/00*
U.S. Cl. 43—131 **7 Claims**



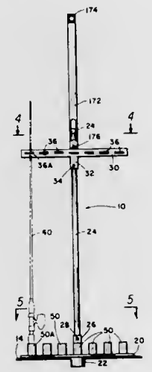
1. A trap-guard for use on a line, rope or hawser for vermin repellant and destruction, said trap-guard comprising:
a body formed by mating sections interconnected by a pliable hinge to have a closed periphery, said body mating sections when closed together by fastening means having a closed end and an open end;
a central tube extending axially through said body and formed by mating sections interconnected with said closed ends of said body mating sections, said tube mating sections when closed together by fastening means defining a cylindrical inner surface for enclosing said line, rope or hawser; and,
a mounting means for positioning a vermin repellantdestruction chemical compound within the interior of said body including a retaining flange surrounding said body open end and a spaced apart retaining ring integrally formed on said body mating sections.

4,782,623
METHOD AND APPARATUS FOR TERMITE CONTROL
Lucas G. Lawrence, San Bernardino, Calif., assignor to Daniel J. Bondy, Las Vegas, Nev.
Filed Jan. 27, 1988, Ser. No. 149,120
Int. Cl.[4] A01M *3/00*
U.S. Cl. 43—132.1 **15 Claims**



1. A high voltage pulse generator for pest destruction comprising,
a source of electrical energy,
a pulse generator for producing a plurality of high voltage electrical pulses at a fixed frequency from the electrical energy supplied by the energy source, and an applicator for applying the energy pulses to a pest infested target.

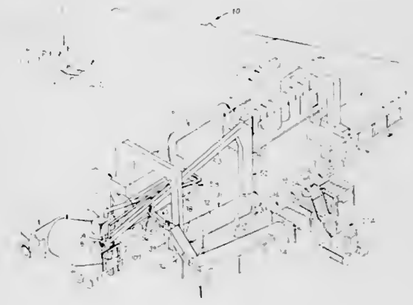
4,782,624
FISHERMAN'S ALL PURPOSE BOAT MOUNTED STAND
James R. Head, Rte. 3, Box 6, Wilburton, Okla. 74578
Filed Feb. 25, 1988, Ser. No. 160,252
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—21.2 **4 Claims**



1. Apparatus for supporting preassembled fishing rods and reels in a boat, each rod comprised of a butt end and a tip, said apparatus comprising a base and having means extending below said base for supporting said base upon said boat;
a vertical column removably attachable to said pedestal;
a transverse member removably attached to said column at a vertically spaced position above said pedestal;
a plurality of a lined and spaced spring bias clips attached to said transverse member, each said clip to releasably retain a respective rod;
a plurality of tubular receptacles attached to said pedestal, each receptacle adapted to receive the respective butt end of said rod, each receptacle positioned in alignment with each of said clips, said receptacles spaced sufficiently apart to prevent contact of the next adjacent rod and reel.

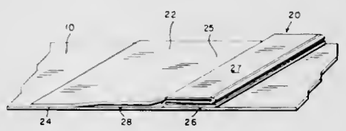
4,782,625
METHOD OF CONTAMINATED SOIL REMEDIATION AND APPARATUS THEREFOR
Steven L. Gerken; Brian M. Bell and John P. Isley all of Valparaiso, Ind., assignors to Canonic Environmental Services, Inc., Porter, Ind.
Filed Apr. 3, 1987, Ser. No. 34,295
Int. Cl.[4] A01B *77/00*
U.S. Cl. 47—1.42 **18 Claims**

1. A method of on-site remedial soil restoration activity of a work site contaminated with volatile substances disposed at said site at an earlier time, which substances have soaked into said soil, the steps comprising:
removing contaminated soil from the ground and transporting it to an initial feed hopper means;
conveying said contaminated soil from said initial feed hopper means to an inlet end of a hollow rotating cylinder having plural flights therein for effecting a moving of said contaminated soil lengthwise of said rotating cylinder toward an outlet end of said cylinder in response to a rotating of said cylinder;
heating the contaminated soil as it tumbles about in said rotating cylinder and as the soil moves from said inlet end toward said outlet end, said volatile substances being volatilized inside said rotating cylinder;
evacuating the interior of said rotating cylinder by drawing hot gases containing the volatilized substances therefrom;
filtering the volatilized substances for purposes of collecting soil fines from which said substances have been volatilized;
conveying the soil exiting the outlet end of said rotating cylinder to a controllable gate whereat, when said controllable gate is in a first position all of said soil is fed to said inlet end and recirculated multiple times through said rotating cylinder;



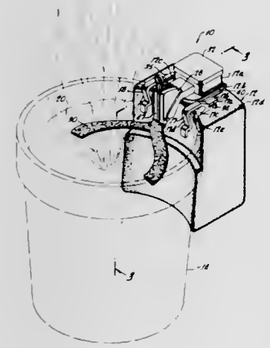
opening said controllable gate to a second position to prevent the recirculating of said soil to said rotating cylinder and feeding all of the now cleaned soil to a conveying means, whereat said cleaned soil is delivered to a selected location;
placing said cleaned soil into the ground;
scrubbing the volatilized gases, by using air and a liquid, and collecting any organics, acids and phosgenes that might be present therein in a liquified form; and
feeding the volatilized gases with the organics, acids and phosgenes removed therefrom to a bed of activated carbon for the purpose of extracting the remaining volatilized substances therefrom and allowing the now clean air to escape into the atmosphere.

4,782,626
DEGRADABLE AGRICULTURAL MULCH SHEETING
Gerard E. Shanley, Madison, and Michael J. Lubar, Phillipsburg, both of N.J., assignors to Keuffel & Esser Company, Rockaway, N.J.
Filed Apr. 23, 1984, Ser. No. 602,989
Int. Cl.[4] A01G *7/00*
U.S. Cl. 47—9 **8 Claims**



1. Degradable agricultural mulch sheeting comprising:
(a) a base sheet of creped natural kraft paper having a basis weight of about 30 to 80 grams/sq. meter and an extensibility of about 5 to 15 percent; and
(b) a coating on both sides of said base sheet, each comprising about 20 to 25 grams/sq. meter of the dried residue of a composition of polyvinylidene chloride latex dispersion having an average particle size in the range of $\times$ to 3×10^{-4} mm.

4,782,627
PLANT FEEDING AND WATERING METHOD AND APPARATUS
Thomas D. Hauk, 10422 El Dorado Way, Los Alamitos, Calif. 90720
Filed Nov. 14, 1986, Ser. No. 931,405
Int. Cl.[4] A01G *27/00*
U.S. Cl. 47—81 **23 Claims**



1. A system for providing fluid to a plant having its roots in aggregate, the system comprising:
reservoir means for the retention of fluid;
first at least partially absorbent means having a portion thereof in fluid transfer relation with the fluid in said reservoir means and having another portion external to the fluid in said reservoir means;
second at least partially absorbent means having a portion thereof in fluid transfer relation with the aggregate in which the plant is rooted and having another portion thereof external to the aggregate;
means for retaining at least part of said another portion of said first absorbent means in constant contacting relation to said another portion of said second absorbent means; and
means for adjustably controlling the surface area of contact of said at least part of said another portion of said first absorbent means with said another portion of said second absorbent means for enabling control of the transfer of fluid from said reservoir means to the aggregate by means of capillary action through the varying contact surface of said first and second absorbent means.

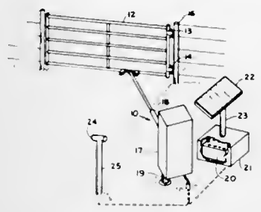
4,782,628
GATE OPENING APPARATUS
John J. Gaddis, Rte. 1, Box 422, Edwards, Miss. 39066
Filed Jan. 29, 1987, Ser. No. 8,469
Int. Cl.[4] E05F *15/10*
U.S. Cl. 49—340 **4 Claims**

1. An opening and closing apparatus for a gate hingedly mounted for swinging between open and closed positions, comprising:
pivot means for supporting an arm in rotation about a vertical axis above the ground, said pivot means being spaced apart from the gate and having a vertically extending shaft with upper and lower ends, said shaft being mounted for rotation about a vertical axis and having a flange mounting portion at said upper end;
said arm being extendable along a longitudinal axis, having opposite ends, and including an intermediate bearing mounted on said flange mounting portion for rotation about a vertical axis therewith;

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said arm further including a rod having two opposite ends, a threaded portion at one end and being journaled between said ends for rotation in said bearing about said longitudinal axis, a traveling tubular portion having opposite ends and being mounted for movement along said longitudinal axis, and mounted concentrically on said rod, said traveling tubular portion having a block at one of said opposite ends including a threaded bore for engaging the threads of said threaded portion;

a drive mechanism in a housing supported by said vertically extending shaft for driving said threaded potion in rotation about said longitudinal axis and including a reversible, motor, a belt driven pulley system having first and second pulleys and a transmission belt drivingly connecting said pulleys, said housing having frame means for supporting said reversible motor and said first pulley, said first pulley



being mounted to said reversible motor, and said second pulley being mounted on second end of said rod for fixed rotation therewith, said reversible motor being drivingly connected with said threaded rod through said belt driven pulley system to drive said threaded rod in clockwise and counter-clockwise rotation; and

means for connecting the second of said opposite ends of said traveling tubular portion to the gate to prevent rotational movement of said traveling member about said longitudinal axis while permitting pivotal movement between said traveling member and the gate when said threaded portion is rotated to drive said block and said traveling tubular portion along said threaded portion to extend or retract said traveling tubular portion along said longitudinal axis such that the gate is driven toward the open or closed positions.

4,782,629

AUTOMOBILE WINDOW GLASS ASSEMBLY

Keiji Mori, Kariya; Keiici Ishida, and Kenji Ono, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Joshida Kabsuhiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 907,794, Sep. 16, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 170,050

Claims priority, application Japan, Sep. 26, 1985, 60-145789

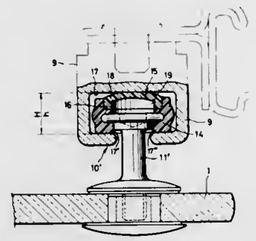
Int. Cl.[4] E05D *15/16*

U.S. Cl. 49—428 **4 Claims**

1. A guide assembly for securely guiding a vehicle window glass between raised and lowered positions comprising:

a guide rail mounted on the vehicle, said guide rail having an interior surface defining a guide groove extending substantially continuously along a length of said guide rail; said interior surface having opposing end surfaces along said guide groove providing an open section therebetween;

a guide shaft attached at a first end to said window glass for positioning said window glass relative to said guide rail, said guide shaft extending through said open section and including a second end supporting guide means disposed within said guide groove for slidably engaging said interior surface, said guide means including a substantially cylindrical roller adapted to be mounted on said second end and having an annular groove along said second end, said roller being frictionally engaged to said interior surface of said guide rail proximate said opposite end sections, said guide means also including a resilient cap member including an annular support member and a cap, said support member being adapted to be attached to said roller along said annular groove of said roller, said cap having an arcuate cross section disposed to engage a



portion of said interior surface positioned substantially opposite said open section and to hold said roller in engagement with said guide rail along said interior surface, said cap and said support member defining a cavity extending substantially adjacent said second end, said cap member being elastically deformable along said cavity enabling smooth movement of said guide within said guide rail.

4,782,630

CLOSURE FRAME ASSEMBLIES

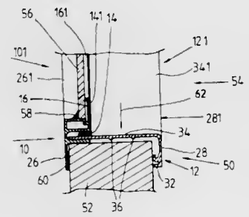
Robert J. Kleyn, 95 Kommissaris Street, Welgemoed, 7530, South Africa

Filed Aug. 25, 1987, Ser. No. 89,077

Claims priority, application South Africa, Aug. 25, 1986, 86/6405

Int. Cl.[4] B06B *1/04*

U.S. Cl. 49—505 **7 Claims**



1. A closure frame assembly, which includes an outer circumferential part receiving a panel member and having first abutment means abutting on the outer surface of a wall surrounding an aperture; a jaw component associated with the outer circumferential part and having an elongated recess; a first locking formation provided inside the elongated recess; an inner circumferential part having second abutment means abutting on the inner surface of a wall surrounding an aperture in a wall; a tongue component associated with the inner circumferential part and extending therefrom; a second locking formation provided at an extremity of the tongue component and being spaced away from the second abutment means, the first and second locking formations locking together when the second locking formation is located in the elongated recess of the jaw component and is pressed against the first locking

formation; and a removable locking member inserted be into the recess for pressing the first and second locking formations firmly into locking contact.

4,782,631

DOUBLE-END SURFACE GRINDING MACHINE

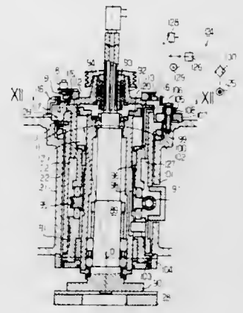
Kiyoshi Nishio, Toyonaka, Japan, assignor to Nissei Industry Corporation, Osaka, Japan

Filed Feb. 5, 1987, Ser. No. 11,909

Claims priority, application Japan, Feb. 6, 1986, 61-16201[U]; Feb. 6, 1986, 61-16202[U]; Mar. 27, 1986, 61-69445; Oct. 22, 1986, 61-162762[U]

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—111 R **2 Claims**



1. A double-end surface grinding machine comprising a pair of opposing wheel heads mounted on a frame for feeding a work between the wheels to grind opposite sides of said work simultaneously by said two wheels, wherein one of the wheel heads requiring the tilt adjustment is constructed by a spindle rotating the wheel mounted at one end, a quill supporting the spindle freely rotationally, a sleeve holding said quill supported on the frame freely swivelably by a swivel construction, an adjusting mechanism for swivelling said sleeve freely relative to the frame to adjust its tilt optionally, a clamping mechanism for fixing said sleeve to the frame, a sensor provided on the sleeve rotationally for detecting the tilt of the wheel electrically, and an annular zero guide disposed on the opposite side of said sensor and mounted on the frame after centering, and means including a cylinder chamber defined by a piston on one end of said quill and on the inner portion of said sleeve for eliminating a backlash.

4,782,632

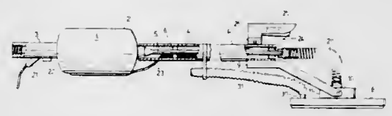
DRYWALL SANDER

William Matechuk, 314-20 Bradmon Drive, St. Catharines Ontario, Canada L2M 3S5

Filed Oct. 1, 1987, Ser. No. 103,362

Int. Cl.[4] B24B *23/00*

U.S. Cl. 51—180 **5 Claims**



1. A motorized sander comprising a rotary sanding head pivotally mounted on one end of a tubular arm, electric drive motor mounted on the other end of said arm, a shaft coupled to said drive motor and extending through said arm, said rotary sanding head including a rotary abrasive bearing disc, flexibly connected to said shaft and an enclosure surrounding the periphery of said disc, said enclosure extending slightly beyond the face of the abrasive on said disc, the edge of said enclosure comprising a resilient spongy material which resiliently engages the surface being sanded.

4,782,633

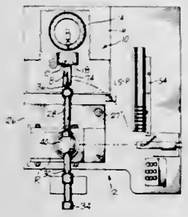
DRILL BIT SHARPENING METHOD

Robert L. Fuller, Jr., Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 822,198, Jan. 24, 1986. This application Dec. 31, 1987, Ser. No. 139,907

Int. Cl.[4] B24B *5/02*

U.S. Cl. 51—288 **11 Claims**



1. A method of sharpening the point of a drill bit, comprising:

providing a drill bit sharpener of a type which includes a grinding wheel and a drill bit holder which serves to position the drill bit against the grinding wheel during grinding;

providing a drill bit carrier which is swingable in position between a drill bit receiving position and a drill bit inserting position;

providing said drill bit carrier with a carrier collet for receiving the shank end of a drill bit;

positioning the carrier in a drill bit receiving position;

inserting a drill bit into the carrier collet, shank end first;

closing the carrier collet to securely grip the drill bit;

swinging the carrier from its drill bit receiving position into its drill bit inserting position, said drill bit being aligned with the drill bit holder of the drill bit sharpener when the carrier collet is in its drill bit inserting position;

moving the carrier collet and the drill bit endwise an amount sufficient to insert the drill bit into the drill bit holder;

operating the drill bit holder to grip the drill bit;

opening the carrier collet to release the drill bit from the carrier;

moving the carrier away from the drill bit and back into its drill bit receiving position, for receiving another drill bit; and

operating the drill bit sharpener to sharpen the drill bit that is in the drill bit holder of the drill bit sharpener.

4,782,634

BUILDING CONSTRUCTION

Geoffrey W. Fry, Sassafrass, Australia, assignor to G. & M. Fry Pty. Ltd., Victoria, Australia

Filed Feb. 12, 1987, Ser. No. 13,705

Int. Cl.[4] E04D *15/00*

U.S. Cl. 52—125.1 **21 Claims**

1. A method of constructing a building including at least a lower level and a roof, which method permits raising of at least a portion of the roof as a unitary structure to an elevated position to enable an additional level to be constructed intermediate the lower level and roof, said method comprising the steps of:

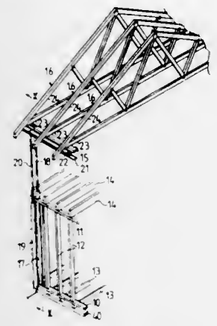
providing a plurality of stabilizing members adapted to maintain at least lateral alignment of said roof during

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raising thereof, each stabilizing member being extendable and having at least first and second parts, said second part of each member being movable relative to said first part of each member between a first position in which said second part is substantially contracted relative to said first part and a second position in which said second part is extended relative to said first part;

beginning construction of the lower level of the building;

locating said stabilizing members in said first contracted position in respective wall cavities of the lower level of said building during initial construction of said lower level so that the first part of each stabilizing member is held against movement relative to said lower level of said building;



constructing said roof during initial construction of the building so that at least a portion of the roof may be subsequently raised to said elevated position as a unitary structure;

fixing the second part of each stabilizing member to said roof;

completing construction of said lower level by substantially conventional techniques;

selectively raising at least said portion of said roof to an elevated position as a unitary structure when it is desired to construct an intermediate level; and

extending said stabilizing members to said second position while maintaining lateral alignment of the roof to enable said additional level to be constructed intermediate the lower level and said roof in the elevated position by substantially conventional techniques.

4,782,635

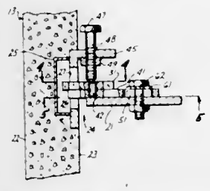
CONNECTOR FOR HANGING PANELS TO A BUILDING FRAME

Richard L. Hegle, Whittier, Calif., assignor to Rockwin Corporation, Santa Fe Springs, Calif.

Filed Jul. 20, 1987, Ser. No. 75,085

Int. Cl.[4] E04H *1/00*

U.S. Cl. 52—126.4 **7 Claims**



1. A connector for hanging a panel with opposing substantially parallel surfaces to a building frame having an horizontally disposed flat surface, said connector comprising:

first means on said panel having an adjustment means to provide vertical "up-and-down" adjustment between said panel and said building frame;

second means slidably connected to said first means and capable of being mounted to said horizontal flat surface to provide "in-and-out" adjustment, and "left-and-right" adjustment; and in co-operation with said first means to provide said "up-and-down" adjustment; and

said second means having a pair of pivotally connected members and having an axle so that said second means is capable of being rotated about said axle with respect to said flat surface.

4,782,636

WALL STRUCTURES

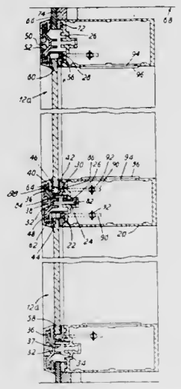
Richard L. Stoakes, "Clouds" Northdown Road, Woldingham, Surrey, England

Filed Jan. 15, 1987, Ser. No. 3,414

Claims priority, application United Kingdom, Jan. 20, 1986, 8601289; Jun. 16, 1986, 8614573

Int. Cl.[4] E04H *1/00*

U.S. Cl. 52—235 **9 Claims**



1. A wall structure comprising a series of frame members forming a plurality of cells or spaces in said structure, multiple-layered infill panels for dividing an interior space from an exterior space, said panels being held in said cells, each panel comprising a pair of panels with an air space between said layers, peripheral regions of said panels and said cells being adjacent each other, and sealing means engaging the panels and the frame members in order to seal between said peripheral regions of the panels and cells, said sealing means comprising a respective flexible sealing member or gasket for each panel in the form of a closed loop extending around the peripheral region of the panel, the cross-section of the sealing member comprising forward and rearward portions that overlap and seal against the forward and rearward margins of said peripheral region of the panel, and a thin web connecting said forward and rearward portions and providing therewith an enclosed space that extends around the periphery of the panel, said periphery having a lower portion whereat the panel rests, via hollow spacer means, upon an associated peripheral extent of the web, said hollow spacer means being interposed between the panel and the web at said lower portion to maintain continuity of said enclosed space therealong, and connection means from the exterior to said enclosed space for the application of gas pressure to said space, whereby to test the integrity of the peripheral seal between the associated gasket and its panel.

4,782,637

FRAME STRUCTURE

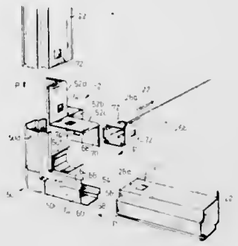
Arne Eriksson; Weine Hammarberg, and Kurt Pettersson, all of Enköping, Sweden, assignors to AB Bahco Ventilation, Enköping, Sweden

Filed Mar. 31, 1987, Ser. No. 32,342

Claims priority, application Sweden, Apr. 7, 1986, 8601549

Int. Cl.[4] E04B *1/38;* **F16B** *12/20*

U.S. Cl. 52—280 **9 Claims**



1. A corner frame structure of a casing, consisting of: a single corner element having three mutually perpendicular identical protrusions, each protrusion having a substantially closed, longitudinally constant cross section and consisting of an external and internal part of said corner element; and three straight profile members, each profile member having a substantially closed longitudinally constant cross section snugly externally fitted onto the respective protrusion to thereby secure the external and internal parts to each other.

4,782,638

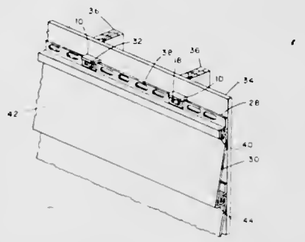
HURRICANE PROTECTOR CLIPS

John K. Hovind, Clarence, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Nov. 3, 1986, Ser. No. 925,964

Int. Cl.[4] E04D *1/34*

U.S. Cl. 52—547 **2 Claims**



1. In combination with thin horizontal siding sections having a thin fastening portion along an upper edge portion of said siding sections, a hurricane clip for strengthening the wind resistance of exterior siding comprising a rigid elongate thin walled channel having a back leg section, a front leg section and a top connecting section, forming a downwardly opening groove therewithin of about ⅛ inch width, said clip having a nail hole extending therethrough located about midway vertically of said clip, said hurricane clip being disposed over the thin fastening portion of said siding and a nail extending through the nail hole in said clip and through the thin fastening portion of said siding and into a building element disposed thereunder, in which said hurricane clip front leg section is formed with a top narrow portion and, extending downwardly therefrom, a bottom face, said top narrow portion projecting outwardly further than said bottom face of said front leg section, providing means for guiding the depth of insertion of a nail.

4,782,639

SHINGLE OR SHAKE PANEL AND PROCESS FOR USING THE SAME

Stewart Ferguson, P.O. Box 376, Pacific Beach, Wash. 98571

Filed Mar. 13, 1986, Ser. No. 840,261

Int. Cl.[4] E04D *1/34*

U.S. Cl. 52—551 **9 Claims**



1. A group of shingle or shake panel articles of commerce, each panel article comprising only one row of shingles or shakes which are not all of equal width and which are tapered in thickness from butt to tip and arranged with their butt ends generally in alignment and with the shingles or shakes in all the panels in the same pattern as to width from one end of the panel to the other, and an integrating strip removably secured lengthwise of said row to the outer face of the butt portion of each of said shingles or shakes in each panel holding said shingles or shakes together in such row with the edge of said integrating strip farther from the shingle or shaker butt ends spaced from the shingle or shake butt ends a distance equal to the desired width of exposure of the butt portions of said shingles or shakes to the weather when they have been laid so that said integrating strip is exposed after said shingles or shakes have been laid and can be removed from the outer faces of said shingles or shakes after said shingles or shakes have been laid.

4,782,640

STRUCTURAL ASSEMBLY FOR PRODUCING INTERCONNECTED STRUCTURES

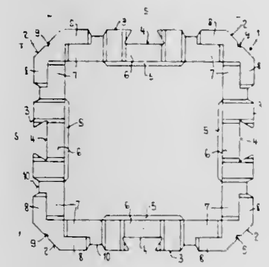
Rolf Scheiwiller, Lindeneggweg 10, CH-3645 Gwatt, Switzerland

Filed Sep. 10, 1986, Ser. No. 905,407

Claims priority, application European Pat. Off., Sep. 26, 1985, 85810442

Int. Cl.[4] E04C *1/10*

U.S. Cl. 52—586 **24 Claims**



1. A structural assembly comprising:

a first member including a first and second pair of substantially parallel and opposed vertical side walls, a lateral

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external surface of each side wall of said first pair having an external vertical groove, and an upper surface of each side wall of said first pair having a horizontal continuous groove adjacent said vertical groove, and a pair of recesses disposed one to either side of said continuous groove, each of said recesses sharing a common border with said continuous groove on a first side and being at least partially obstructed by a stop member on a second side opposite said first side; and

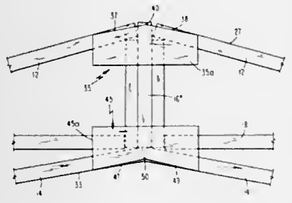
a second member including at least one vertical tongue member dimensioned to fit into one of said vertical grooves.

4,782,641

SCISSORS TRUSS CONNECTOR PLATES

Thomas J. Manenti, Coral Springs, Fla.; Marc Olden, Arlington, Tex., and John C. Fitzgerald, Sunrise, Fla., assignors to MiTek Industries, Inc., St. Louis, Mo.

Filed Jan. 12, 1987, Ser. No. 2,353
Int. Cl.⁴ E04B *1/32*
U.S. Cl. 52—639 **32 Claims**



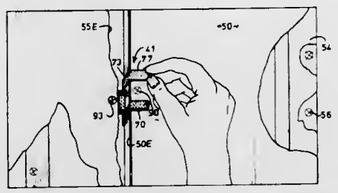
1. A scissors truss comprising a plurality of elongate structural wooden members establishing a pair of top chords and a pair of bottom chords, upper ends of said top chords and upper ends of said bottom chords being connected together to define a top apex joint and a bottom apex joint, respectively, lower ends of the top chords being connected to lower ends of the bottom chords to define a pair of heel joints, an elongate wooden member extending between the top and bottom apex joints with upper and lower ends of said elongated wooden member respectively forming a part of said apex joints, and means for structurally securing together (1) said upper end to establish the top apex joint and (2) said lower ends to establish the bottom apex joint, said securing means being a top nail plate and a bottom nail plate respectively forming the top and bottom joints, each nail plate in the form of a sheet metal generally planar plate having a plurality of teeth struck therefrom for embedment into side faces of said chords and said wooden member, the top nail plate having upper inclined edges approximating the pitch of upper edge surfaces of the top chords without projecting upwardly above said upper edge surfaces of the chords, the bottom nail plate having lower inclined edges approximating the pitch of lower edge surfaces of the bottom chords and extending generally coextensive therewith without projecting downwardly below said lower edge surfaces of the bottom chords, said top and bottom nail plates being dimensioned in relation to each other such that interfitting of the upper inclined edges of the top nail plate with the lower inclined edges of the botom nail plate results in an overall plate structure of rectangular configuration in plan view.

4,782,642

METHOD AND APPARATUS FOR PANEL EDGE COUPLING

David J. Conville, 316 N. Point Lookout, Hot Springs, Ark. 71913

Filed Jun. 29, 1987, Ser. No. 67,369
Int. Cl.⁴ E04B *1/40*; E04G *23/02*
U.S. Cl. 52—770 **8 Claims**



1. A construction method for securely coupling together adjacent panels of gypsum board, sheet rock, masonite, insulation board, plywood or the like, which panels have abutting finished edges which, during wall assembly, terminate at random positions spaced apart from the wall studs, support columns or the like, said method comprising the steps of:

conventionally installing a first panel upon and between spaced apart studs or vertical support columns during assembly with an exposed edge of said first panel randomly positioned apart from the nearest stud or vertical support column over a hollow region of the wall structure;

applying at least one clip to the exposed, finished panel edge to prepare said first panel for coupling to a second panel finished edge, each of said clips comprising:

a generally planar, perforated body portion adapted to be blindly penetrated by a self tapping screw, said body portion having a length greater than the thickness of said panel(s), a front, a rear, and a pair of spaced apart sides;

prong-like spring tab means integrally projecting from said clip body portion on opposite sides thereof, each of said spring tab means including a vertical portion generally perpendicular to said clip body portion and an integral offset horizontal flange portion oriented generally parallel with said clip body portion adapted to readily frictionally grasp a finished edge of a panel to sandwich same against said clip body; said spring tab flange portions spaced apart from said clip body portion a distance approximately equal to or less than the thickness of said panel;

installing a self-tapping screw through said first panel substantially within a region defined between said spring tab means horizontal portions so as to penetratingly engage said clip body in a substantially random position thus permanently affixing said at least one clip to said first panel;

positioning a second panel having an exposed finished edge immediately adjacent to the exposed finished edge of said first panel over exposed planar portions of said at least one clip with said finished edges of said panels substantially abutting one another;

installing another self-tapping screw through said second panel immediately adjacent said spring tab means horizontal portions so as to permanently couple said second panel to said at least one clip body portion whereby said first and second panels are coupled together along their exposed finished edges with the clip(s) forming the sole backup structure for the adjacent panels without additional mechanical linkage to a stud, support column or the like; and,

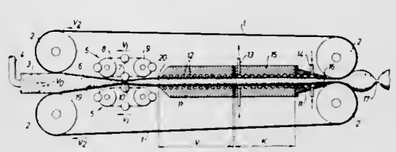
thereafter manually removing said horizontal flange portions of said spring tab means by bending them until breakage occurs along a predefined scored junction, whereby to ultimately construct an unobstructed wall surface for subsequent finishing.

4,782,643

ARRANGEMENT FOR THE CONTINUOUS HEAT TREATMENT AND PACKAGING OF A LIQUID PRODUCT

Sven O. S. Stark, Sjörup, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 39,761, Apr. 17, 1987, Pat. No. 4,731,256, which is a continuation of Ser. No. 708,804, Feb. 8, 1985, abandoned. This application May 29, 1987, Ser. No. 55,320
Claims priority, application Sweden, Feb. 16, 1984, 8400827
Int. Cl.⁴ B65B *55/06, 55/14*
U.S. Cl. 53—127 **12 Claims**



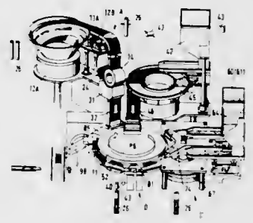
1. Apparatus for the continuous aseptic packaging of a liquid product having a predetermined boiling point comprising: means for advancing a flexible wall tube of packaging material, said means for advancing including a pair of opposed bands arranged to receive said tube between and in frictional engagement with said bands, said bands being arranged to substantially enclose the tube, supporting elements on opposite sides of the tube for restricting expansion of the tube, said bands being interposed between said supporting elements and the tube, means for heating the product in the tube along said supporting elements, and pump means cooperating with said bands for increasing the fluid pressure in the tube as it continuously advances to increase said predetermined boiling point and in combination with the heating means heating the fluid in the tube for sterilization without vaporization.

4,782,644

MACHINE FOR SORTING, FILLING AND CLOSING HOLLOW CONTAINERS

Rolf Haarer, Winterbach; Theo Moser, Steinenberg, and Klaus Reum, Korb, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 17, 1987, Ser. No. 63,207
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626734
Int. Cl.⁴ B65B *1/04, 7/28*
U.S. Cl. 53—282 **26 Claims**



6. A machine for sorting, filling and closing elongated containers having an open end and a second at least partially closed end, said machine comprising:

A. a rotatable indexing means including a container carrier means and a stopper carrier means;

B. a container supply means for providing upwardly oriented containers to the indexing means including a first receptacle for holding a random supply of containers, a sorting means for orienting the containers to a position wherein their open ends are upwardly oriented, a means for delivering containers from the first receptacle to the sorting means, and means for delivering and transferring the upwardly oriented containers to the container carrier means of the indexing means;

C. a stopper supply means including a second receptacle for holding a supply of stoppers and a means for delivering and transferring stoppers to the stopper carrier means of the indexing means;

D. a material supply means including a third receptacle for holding a supply of the material to be loaded into the containers and a means for delivering said material into the open ends of the containers while said containers are supported by the container carrier means of the indexing means; and

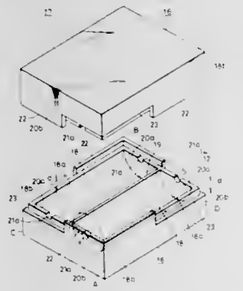
E. a means for inserting the stoppers supported by said stopper carrier means into the open ends of the loaded containers while the containers are supported by the container carrier means of the indexing means.

4,782,645

PACKAGING OF INFORMATION RECORDING MEDIA

Yukitoshi Tajima, Zama; Hiromitsu Sakamoto, Fujisawa, and Nagisa Horiguchi, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 25, 1987, Ser. No. 18,421
Claims priority, application Japan, Feb. 28, 1986, 61-28617[U]
Int. Cl.⁴ B65B *35/50, 5/06*
U.S. Cl. 53—409 **1 Claim**



1. A method for packaging a number of disc-like information recording media each having a hole at its center portion, comprising the steps of:

collecting said disc-like information recording media with the holes thereof being aligned with each other to form a cylindrical assembly with a through-hole;

inserting an elongated member into said through-hole;

setting a pair of collars on said elongated member from both ends so as to fix said cylindrical assembly with respect to said elongated member;

wrapping said cylindrical assembly by a shrinkable material; and

encasing said wrapped cylindrical assembly in a case comprising first and second half bodies each having a semicylindrical receiving portion which is formed to be equal in dimension to the semicylindrical half portion of said cylindrical assembly.

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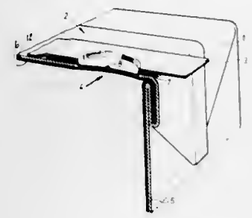
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4,782,646

METHOD AND AN ARRANGEMENT FOR THE FINISHING OF AN OPENING ARRANGEMENT ON A PACKING CONTAINER

Hans Nantin, Trelleborg, Sweden, assignor to AB Tetra Pak, Lund, Sweden

Filed Apr. 16, 1987, Ser. No. 38,988
Claims priority, application Sweden, Apr. 17, 1986, 8601761
Int. Cl.[4] B65B *61/18*
U.S. Cl. 53—410 4 Claims



1. A method for forming an opening arrangement on a filled and closed packing container manufactured from a flexible packing material including a carrier layer and a liquid-tight thermoplastic layer which covers a surface of the carrier layer adapted to be an inside surface of the packing container, comprising the steps of:

converting the packing material into individual filled and closed packing containers each having an openable area defined therein by an opening provided in the carrier layer of the packing material which exposes the thermoplastic layer to the opening;

positioning a gripping element on the filled and closed packing container with the gripping element covering the openable area and defining an opening space between the gripping element and the thermoplastic layer exposed to the opening;

applying a vacuum pressure to the opening space to cause the thermoplastic layer and the gripping element to be pulled together; and

heat-sealing the gripping element at the openable area to the thermoplastic layer exposed to the opening so that upon removal of the strip the thermoplastic layer will be removed from the opening along with the gripping element.

4,782,647

FLEXIBLE PACKAGING AND THE METHOD OF PRODUCTION

Joel L. Williams, Cary, N.C., and Walter P. Miller, III, Parsippany, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Oct. 8, 1987, Ser. No. 109,679
Int. Cl.[4] B65B *47/02, 61/00*
U.S. Cl. 53—454 4 Claims

1. A process for the controlled simultaneous forming, filling, and sealing a plurality of flexible packages containing a material with a liquid component;

comprising

(a) supplying in a first supplying step a first web of material for forming a first side of the flexible packages to be formed;

(b) supplying in a second supplying step a second web of material for forming a second side of the flexible package to be formed;

(c) utilizing a pair of heated opposed surfaces positioned in cooperating engagement for receiving and joining said first and second webs from said first and second supplying steps in a flexible package forming area;

(d) prior to said utilizing step, depositing a plurality of spaced apart quantitites of filling material for said packages on said first web from said first supplying step;

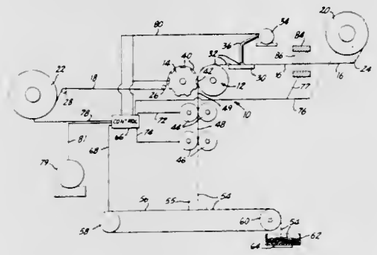
(e) passing said web from said utilizing step to a cutting means;

(f) cutting said web from said passing step into a plurality of filled flexible packages;

the improvement characterized by the steps, of

(g) prior to said utilizing step, exposing said first web of material to the effects of corona discharge;

(h) said first web from said first supply roll is a laminate comprised of a membrane film layer, an adhesive film over



one surface of said membrane film layer, and a peelable film on the side of said adhesive opposite said membrane film;

(i) said membrane film allowing controlled passage of the contents of the package therethrough;

(j) said membrane film being a silicone film having a chemically modified surface by exposure to corona discharge, and

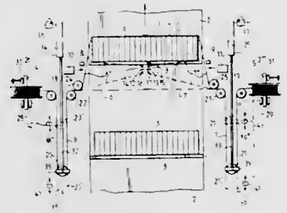
(k) said second web is a backing layer comprised of a laminate film of polyester laminated to a sealing film of polyvinyl acetate.

4,782,648

DEVICE FOR APPLYING A PRE-TENSIONED BINDING ELEMENT, AROUND OBJECTS

Johannes G. W. Van Ottele, Oss, Netherlands, assignor to 501 Endra B.V., Al Oss, Netherlands

Filed Nov. 17, 1986, Ser. No. 931,035
Claims priority, application Netherlands, Dec. 6, 1985, 8503373
Int. Cl.[4] B65B *11/08*
U.S. Cl. 53—553 7 Claims



1. In a wrapping device, the combination of:

conveyer means for transporting batches of goods along a conveying path,

supply means for supplying binding material,

first brake means for resisting supply of the binding material from the supply means until a first predetermined tension is exceeded,

reciprocable tensioning means for subjecting the binding material to a second predetermined tension which is greater than the first predetermined tension, means for moving the tensioning means in one direction of reciprocation to issue binding material from the supply means and establish a length of the binding material sufficient to extend across the conveyer path to be intercepted by a batch of goods and potentially to encircle such batch of goods,

second brake means responsive to a predetermined length of movement of the tensioning means in attaining a length of the binding material for halting further supply of the binding material from the supply means and thereby arresting further movement of the tensioning means in the one direction and subject the binding material to the second predetermined tension so that when the binding material extending across the conveyer path is intercepted and bowed forwardly by a leading batch of goods in response to movement of the conveyor means, the intercepting batch of goods takes up and is intimately engaged by a portion of the length of binding material while the tensioning means is moved opposite to said direction by the movement of the binding material to maintain the material under the second predetermined tension due to the resistance in the movement of the tensioning means in said opposite direction,

binding means for passing the bowed binding material transversely across the conveying path behind the intercepting batch of goods while further taking up the length of binding material in opposition to the resistance created by further movement of the tensioning means in the opposite direction of movement and for joining the binding material in encircling relation to the batch of goods while the binding material is under the second predetermined tension, whereby the intercepting batch of goods is intimately surrounded by binding material under the second predetermined tension, and

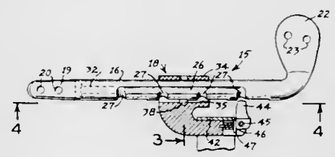
brake release means for releasing the second brake means in preparation for a next batch of goods.

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ADJUSTABLE SUPPORT FOR STIRRUP STRAP

Bruce R. Zubrod, 114 Brookridge Dr., Lavergne, Tenn. 37086

Filed Apr. 9, 1987, Ser. No. 36,439
Int. Cl.[4] B68C *1/16*
U.S. Cl. 54—46 7 Claims



1. A support device for adjustably attaching a stirrup strap to one side of a riding saddle, comprising:

(a) an elongated support bar having front and rear portions, a longitudinal front-to-rear axis, and a generally cylindrical coaxial surface,

(b) means securing said front and rear end portions to one side of a saddle,

(c) an elongated travel channel formed longitudinally in said surface of said support bar parallel to said longitudinal axis,

(d) a plurality of longitudinally spaced position channels formed circumferentially in said cylindrical surface and intersecting said travel channel,

(e) an elongated locking channel formed longitudinally in said surface, spaced circumferentially from said travel channel, and intersecting and projecting rearward from a corresponding position channel,

(f) a hanger bar member comprising an elongated sleeve member and a hanger bar secured to and projecting longitudinally rearward from said sleeve member for receiving the upper end of a stirrup strap,

(g) said sleeve member having a substantially cylindrical bore receiving said support bar and adapted to be moved axially and circumferentially of said support bar,

(h) a detent projecting radially inward from said bore and adapted to freely move along and within any of said channels in registry with said detent, whereby said sleeve member may be axially moved along said support bar when said detent registers with said travel channel, and rotated to any position corresponding to one of said position channels in registry with said detent, and locked against rotary movement relative to said support bar when said detent is received in said corresponding locking channel, and

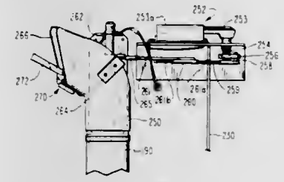
(i) limit means limiting the rearward movement of said detent in said locking channel.

4,782,650

MOWING APPARATUS

Dean M. Walker, Ft. Collins, Colo., assignor to Walker Manufacturing Company, Fort Collins, Colo.

Continuation-in-part of Ser. No. 606,530, May 3, 1984. This application Aug. 31, 1987, Ser. No. 91,416
Int. Cl.[4] A01D *34/48*
U.S. Cl. 56—16.6 5 Claims



1. A mower comprising:

a vehicle controllably powered to be steerably moved over an area to be mowed;

a cutter assembly mounted on said vehicle for mowing;

a closed hopper mounted on said vehicle;

means including a conduit for delivering cuttings from said cutter assembly to said hopper;

an outlet mounted within the upper interior of said hopper for distributing cuttings, received from said conduit, on into the interior of said hopper;

driving means mounted with respect to said hopper for continuously moving said outlet reciprocally in order to vary the direction of distribution of said received clippings in a repetitive pattern over a portion of the width of said interior;

an elongated paddle;

means for coupling one end of said paddle to said outlet in a position projecting outwardly therefrom whereby nominally to swing reciprocally over said portion of the width in correspondence with reciprocal movement of said outlet;

means responsive to a signal for providing an indication;

a switch actuatable to effectuate said signal;

and means, included within said coupling means, for actuating said switch upon the occurrence of impedance against swinging of said paddle, during said movement of said outlet, by said cuttings as collected within said hopper.

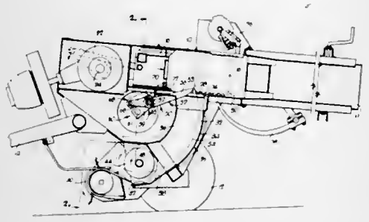
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4,782,651

BOTTOM LOADING IN-LINE CROP BALER

Howard J. Ratzlaff, Hesston, Kans., assignor to Hay and Forage Corporation, Hesston, Kans.

Filed Feb. 2, 1987, Ser. No. 10,187
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 8 Claims



1. A crop baler comprising:

a generally horizontally disposed baling chamber extending in a fore-and-aft direction with respect to the path of travel of the baler;

a plunger mounted for reciprocation within said chamber in said fore-and-aft direction,

said chamber having an entrance opening in a lower wall thereof over which said plunger passes during said reciprocation;

a tubular loading duct depending from said chamber with its upper end in direct communication with said opening and having a length which is at least as great as the vertical dimension of said chamber.

said duct curving downwardly and forwardly from said opening, having a longitudinally slotted top wall and terminating in a forwardmost end defining an open, crop-receiving mouth;

apparatus forwardly of said duct for picking up crop material from the ground as the baler moves along said path of travel;

conveying means adapted to receive picked up crop materials in locations laterally outboard of the opposite lateral confines of said mouth and to converge the same inwardly to a point aligned fore-and-aft with the mouth,

said conveying means including a pair of axially aligned and axially spaced augers rotatable about a common transverse axis and presenting inner ends disposed adjacent said opposite confines of the mouth to define a deposit zone immediately in front of the mouth; and

a stuffer assembly directly above said augers and operable to load the baling chamber with successive charges of crop materials from said mouth of the duct in timed relation to reciprocation of the plunger,

said stuffer assembly including a fork, a continuously rotating drive shaft positioned beneath said baling chamber, a crank arm on said drive shaft pivotally coupled with the fork for driving the latter, and control structure connected to the fork in a manner to cause a crop-engaging tip of the fork to move through the duct in a generally kidney-shaped path of travel during each stuffing cycle of the fork,

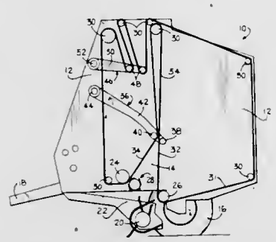
said axis of rotation of the augers, said deposit zone and said mouth of the duct being positioned back underneath said drive shaft in generally vertical alignment therewith such that the tip of the fork initially plunges down to the deposit zone at a point forwardly of the mouth of the duct, sweeps rearwardly and upwardly thereafter through the remainder of the duct along the lower stretch of its path of travel and to a location above said drive shaft, and then returns downwardly and forwardly along the upper stretch of its path of travel to the deposit zone.

4,782,652

ROUND BALER HAVING ANTI-PLUGGING MEANS

Bruce L. White, North Newton, Kans., assignor to Hay and Forage Corporation, Hesston, Kans.

Filed Sep. 29, 1987, Ser. No. 102,099
Int. Cl.[4] A01D *39/00*
U.S. Cl. 56—341 7 Claims



1. In a baler for forming large round bales of fibrous crop material, wherein the bale is formed off the ground above a transverse roll that has a web stretch looped below the same, said web stretch normally engaging the periphery of the bale during said rolling thereof and being driven in a direction that causes the stretch to move generally from the bale toward the roll, a bale supporting roller adjacent the side of the roll receiving the stretch from the bale and located in disposition to engage the lower periphery of the rolling bale and bear the weight thereof otherwise borne by said roll and said web stretch as it moves around said roll, said support roller including a shaft extending across the machine in parallelism with said roll and mounted for rotation about its own longitudinal axis, means for rotating said roller in the same direction as said roll, said roll and roller being spaced-apart and generally defining a zone therebetween, the improvement comprising:

a resilient flap extending outwardly from said roller shaft and along the length thereof, said flap passing through said zone as said roller rotates thereby removing crop materials from said zone, said resilient flap yielding to said bale when brought into contact with the bale during the rotation of the support roller.

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DEVICE FOR DISPLACING A TENSER IN A TWO-FOR-ONE TWISTER

Hideo Yanobu, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

PCT No. PCT/JP85/00575, § 371 Date Jun. 5, 1987, § 102(e) Date Jun. 5, 1987, PCT Pub. No. WO87/02393, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 15, 1985, Ser. No. 66,420
Int. Cl.[4] D01H *13/10, 7/86;* B65H *59/22*
U.S. Cl. 57—279 7 Claims

1. A device for displacing a tenser in a two-for-one twister, comprising:

a cylindrical housing;

a lower supporting member secured within the housing;

a yarn guide pipe inserted into the housing and being movable up and down;

an upper supporting member secured to the yarn guide pipe;

a tenser held between the lower supporting member and the upper supporting member;

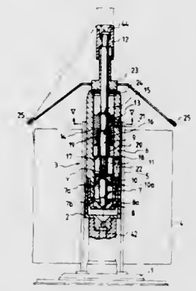
a means for locating upper and lower positions of said yarn guide pipe;

a spring for axially urging the yarn guide pipe; and

a magnet provided on the housing to attract and hold the tenser at a position displaced from a yarn running area;

wherein the means for locating upper and lower positions of the yarn guide pipe comprises a pin and a cam member formed with a cam groove in engagement with the pin;

wherein said pin is provided to be projected into the housing, and said cam member has a cam groove for locating upper and lower positions of the yarn guide pipe, said cam member being rotatably disposed around the yarn guide pipe whereby said cam groove is formed about the outer periphery of the yarn guide pipe; and



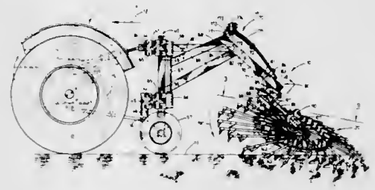
wherein the cam groove comprises a first recess for determining a lower position of the cam member, a second recess for determining an upper position of the cam member, a first guide groove and a second guide groove to make the first recess continuous to the second recess, and a third guide groove to make the second recess continuous to the first recess to thereby form a guide groove in the form of a closed loop.

4,782,654

APPARATUS FOR REMOVING MATERIAL FROM A WORK AREA

Paul A. Bezzerides, 41645 Road 142, Orosi, Calif. 93647

Filed Jan. 25, 1988, Ser. No. 147,700
Int. Cl.[4] A01D *78/00*
U.S. Cl. 56—370 14 Claims



1. An apparatus for removing material from a work area on the earth's surface during substantially continuous movement therealong, the apparatus comprising:

A. a frame adapted to be mounted on a tractor or the like for substantially continuous movement along the work area along a path of travel substantially parallel thereto;

B. an arm mounted on the frame having a distal end portion disposed for movement in relative proximity to the work area during said substantially continuous movement therealong;

C. a wheel assembly mounted on the distal end portion of the arm for rotational movement about a substantially upright axis of rotation and having a plurality of ground engaging projections mounted on the wheel assembly outwardly spaced from and substantially concentric to said axis of rotation;

D. a plurality of material removing members mounted on the wheel assembly extending outwardly therefrom for engagement with material in said work area during said substantially continuous movement therealong; and

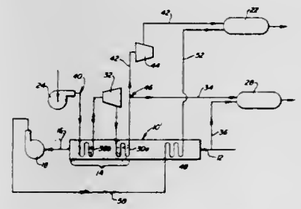
E. means for adjusting the attitude of said wheel assembly relative to said earth's surface to place a portion of said projections into engagement with the earth's surface whereby said wheel assembly is driven in rotational movement about the axis of rotation by said engagement of the projections with the earth's surface during said substantially continuous movement along the work area to pass the removing members through the work area to remove material therefrom.

4,782,655

AIR LIQUIFICATION SYSTEM FOR COMBUSTORS OR THE LIKE

Kent Weber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 5, 1986, Ser. No. 938,392
Int. Cl.[4] F02C *3/22;* F02K *9/42*
U.S. Cl. 60—39.02 13 Claims



11. An air liquification process for a pair of combustors or the like, comprising the steps of:

condensing air to substantially a liquid state with a liquid hydrogen cooling medium;

conducting the liquid air through a precooler before conducting the air to one of the combustors; and

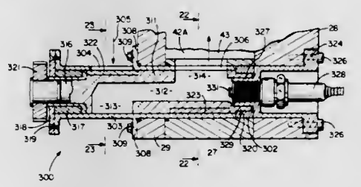
conducting the hydrogen to the pair of combustors after the hydrogen has been used to condense the air in a manner wherein a portion of the hydrogen is conducted directly to one of the combustors operating at ambient air pressure while the remaining portion of the hydrogen is compressed to a given combustor pressure before being conducted to the other of the combustors.

4,782,656

ROTARY VALVE ASSEMBLY FOR ENGINE

Craig N. Hansen, Minnetonka, Minn., assignor to Hanseo Engine Corporation, Minnetonka, Minn.

Continuation of Ser. No. 715,523, Mar. 25, 1985, Pat. No. 4,667,468. This application May 21, 1987, Ser. No. 52,836
Int. Cl.[4] F02G *3/00*
U.S. Cl. 60—39.6 13 Claims



1. A rotary valve assembly for an internal combustion engine having a housing with gas intake means, a gas expansion chamber and a bore connecting the gas intake means with the gas

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expansion chamber comprising: a sleeve locatable in said bore, means for securing the sleeve to the housing, said sleeve having an inlet port open to the gas intake means and an outlet port open to said gas expansion chamber, a rotatable valving member rotatably mounted within said sleeve, said valving member including a passage having an inlet aligned with the inlet port, an outlet aligned with the outlet port, and an end adjacent the outlet therein, said inlet and outlet of the passage extended laterally from the valving member in opposite directions whereby when the inlet is open to the inlet port, the outlet port is closed, and when the outlet is open to the outlet port, the inlet port is closed, said inlet and outlet ports being separately opened and closed during rotation of the valving member, a holder locatable in said bore, said holder having an end cooperating with the end of said valving member and open to said passage, means attaching the holder to the housing, means mounted on the end of said holder having spark generation means located in said passage operable to ignite an air and fuel mixture in the passage whereby the air and fuel mixture burns in said passage and continues to burn and expand in said gas expansion chamber.

4,782,657

VARIABLE AREA AIRCRAFT AIR INTAKE

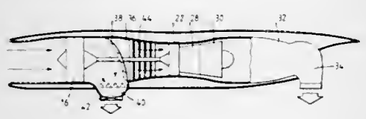
William J. Lewis, Somerset, and Clifford S. Woodward, Bristol, both of England, assignors to Rolls-Royce PLC, London, England

Filed Jul. 14, 1987, Ser. No. 73,161

Claims priority, application United Kingdom, Jul. 25, 1986, 8618166

Int. Cl.[4] F02K *3/02*

U.S. Cl. 60—226.1 **3 Claims**



1. An aircraft air intake for supplying air to a first compressor and a second compressor of a gas turbine engine capable of operating in either a series flow mode or a parallel flow mode, the air intake comprising:

an inlet opening;

an inlet duct, which communicates with the inlet opening and which has a first portion which communicates with the first compressor and a second portion which communicates with the second compressor;

an obturator door, which in a first position acts to obturate the second portion and in a second position acts to uncover the second portion; and

a means for altering the area of the inlet opening in accordance with the airflow requirements comprising a movable member having an upstream end and a downstream end, said downstream end being pivotally attached to a fixed point on the aircraft and said upstream end being translatable across the inlet opening from a first position in which it reduces the area of the inlet opening to a second position in which it increases the area of the inlet opening.

4,782,658

DEICING OF A GEARED GAS TURBINE ENGINE

Derick A. Perry, Derby, assignor to Rolls-Royce Plc, London, United Kingdom

Filed May 7, 1987, Ser. No. 46,708

Int. Cl.[4] F02K *3/02*; **F02G** *3/00*

U.S. Cl. 60—226.1 **18 Claims**

1. A geared gas turbine engine comprising a gas generator, at least one rotor carrying a plurality of blades, a gear assembly, a surface to be deiced,

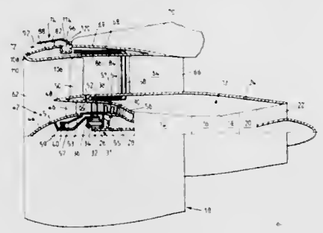
the at least one rotor being driven by the gas generator via the gear assembly,

a lubricant supply to lubricate and cool the gear assembly,

a heat exchanger to cool the lubricant for the gear assembly,

an air scoop having an upstream end and a downstream end, the upstream end of the air scoop forming an intake opening, the downstream end of the air scoop forming an outlet opening,

the air scoop including a first duct means downstream of the heat exchanger, said first duct means supplying air warmed by the heat exchanger to said surface of the geared gas turbine engine to be deiced,



the air scoop including a second duct means to convey air warmed by the heat exchanger to the outlet opening,

a valve means mounted in the air scoop downstream of the heat exchanger, the valve means having a first position and a second position, the valve means being movable between the first position in which substantially all the warmed air is supplied via said first duct means to said surface of the geared gas turbine engine and the second position in which substantially all the warmed air is supplied via said second duct means to the outlet at the downstream end of the air scoop.

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VARIABLE AREA AIRCRAFT AIR INTAKE

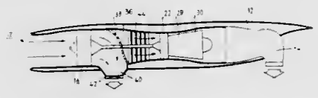
William J. Lewis, Somerset, and Clifford S. Woodward, Bristol, both of England, assignors to Rolls-Royce plc, London, England

Filed Jul. 14, 1987, Ser. No. 73,157

Claims priority, application United Kingdom, Jul. 25, 1986, 8618167

Int. Cl.[4] F02K *3/02*

U.S. Cl. 60—226.1 **4 Claims**



1. An aircraft air intake for supplying air to a first compressor and a second compressor of a gas turbine engine capable of operating in either a series flow mode or a parallel flow mode, the air intake comprising:

an inlet opening;

an inlet duct, which communicates with the inlet opening and which has a first portion which communicates with the first compressor and a second portion which communicates with the second compressor;

an obturator door, which in a first position acts to obturate the second portion and in a second position acts to uncover the second portion; and

a means for altering the area of the inlet opening in accordance with the airflow requirements comprising a movable member which is angled relative to the longitudinal

axis of the aircraft and is movable radially inwardly and axially rearwardly from a first position in which it reduces the area of the inlet opening, to a second position in which it increases the area of the inlet opening.

4,782,660

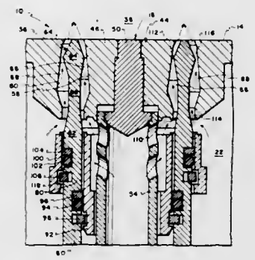
SEQUENCED AND PRESSURE CONTROLLED INJECTOR

Frank F. Domyan, Mission Viejo, and Frank J. Gombos, Calabasas, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 20, 1987, Ser. No. 4,520

Int. Cl.[4] F02K *9/00, 9/42, 9/72*

U.S. Cl. 60—258 **9 Claims**



1. An injector assembly for injecting first and second propellants into a combustion chamber of a fluid fueled rocket engine, comprising:

a stationary housing;

a plate member rigidly attached to said housing, said plate member having an upstream face and a downstream face, the downstream face being adjacent a combustion chamber, said plate member having at least one opening therethrough;

an injector subassembly contained within said opening, including:

a plug centrally disposed therein, said plug being rigidly attached to said housing, an outer surface of said plug and an inner surface of said plate member forming said opening cooperatively defining a flow passageway; and

an elongated injector throttle means comprising a single element surrounding said plug and located within said flow passageway for dividing said flow passageway into an inner passageway for a flow of said first propellant and an outer passageway for a flow of said second propellant, said throttle means being movable within said flow passageway for simultaneous flow control of each propellant at inner and outer downstream sealing locations adjacent the downstream face of said plate member and at inner and outer upstream sealing locations adjacent the upstream face of said plate member, this simultaneous flow control being dependent upon the position of the throttle means within the plate member, said throttle means including:

an upstream end portion;

an upstream sealing portion, located adjacent said upstream end portion and at said upstream sealing locations, said upstream sealing portion having a cross-sectional area substantially equal to the area of said flow passageway;

a downstream sealing portion located at said downstream sealing locations with a cross-sectional area substantially equal to the area of said flow passageway; and

a decreased cross-sectional area portion located between said upstream sealing portion and said downstream sealing portion; and

actuation means for controlling the movement of said throttle means, said actuation means being operably engaged with said upstream end portion,

said upstream sealing portion serving to control the flow of propellants at said upstream locations for controlling the propellant pressure at the downstream sealing locations during thrust level changes and corresponding combustion chamber pressure changes of the engine, thereby maintaining a constant stream momentum and combustion efficiency.

4,782,661

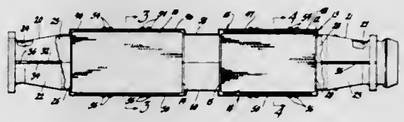
MAT SUPPORT/SUBSTRATE SUBASSEMBLY AND METHOD OF MAKING A CATALYTIC CONVERTER THEREWITH

Michael A. Motley, Flint, and Kenoeth J. Pomeroy, Genesee, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 14,283, Feb. 13, 1987, Pat. No. 4,750,251. This application Feb. 29, 1988, Ser. No. 162,274

Int. Cl.[4] F01N *3/28*

U.S. Cl. 60—299 **4 Claims**



1. A catalytic converter for purifying the exhaust gases of an internal combustion engine comprising:

a tubular metal shell of predetermined peripheral dimension;

a first gas pervious ceramic catalyst element enclosed by the shell and spaced in one manner from the inside of said shell and arranged so that flow through the element is substantially axial with respect to the axis of the shell;

a second gas pervious ceramic catalyst element enclosed by the shell and spaced in another manner from the inside of said shell and in serial alignment with said first catalyst element for serial flow therebetween and arranged so that flow through said second catalyst element is substantially axial with respect to the axis of the shell;

and first and second layered intumescent means respectively in the space formed between the shell and said first and second catalyst elements;

said first intumescent means having a different number of layers than said second intumescent means whereby to compensate for the different manner of spacing between the shell and the respective catalyst elements.

4,782,662

BOOM CRANE CENTERING

William E. Reeves, and Jasper E. Cobb, III, both of Gainesville, Tex., assignors to National-Oilwell, Houston, Tex.

Continuation of Ser. No. 655,215, Sep. 27, 1984, Pat. No. 4,653,271. This application Mar. 30, 1987, Ser. No. 32,180

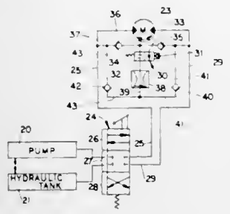
Int. Cl.[4] F16D *31/00, 31/02*

U.S. Cl. 60—327 **5 Claims**

1. A method of controlling rotational movement of a boom on a crane provided with a hydraulic system either of the closed loop type or the open loop type wherein a hydraulic swing motor and swing control means impart rotational movement in either of two directions to said boom, said method comprising regulating the rate of flow of hydraulic fluid from a high pressure line through said hydraulic motor to a low pressure line by transferring a portion of the hydraulic fluid from said high pressure line to said low pressure line through an adjustable fluid coupling between said high pressure line and said low pressure line, and operating said hydraulic swing

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motor as a pump in transferring said portion of hydraulic fluid through said fluid coupling, whereby to reduce the rotational



speed of said hydraulic motor and consequent swing speed of said boom.

4,782,663
PNEUMATIC HYDRO-ELECTRIC POWER CONVERSION SYSTEM

Norman W. Bellamy, Coventry, England, assignor to Hydro Energy Associates Limited, England

Filed Apr. 15, 1986, Ser. No. 852,230
Claims priority, application United Kingdom, Apr. 16, 1985, 8509671; Jun. 26, 1985, 8516148
Int. Cl.⁴ F16D *31/02*
U.S. Cl. 60—398 **18 Claims**



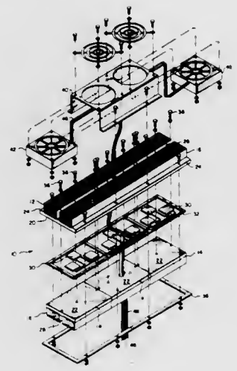
1. A method for the conversion of energy in liquids, comprising the steps of:
causing liquid to travel in a duct over a flexible membrane means;
displacing a gaseous medium under the membrane means as said liquid travels thereover;
driving a prime mover by the displacement of said gaseous medium;
returning the gaseous medium under said membrane means to re-inflate the membrane means so as to temporarily block continued flow of the liquid along the duct;
thereafter allowing the liquid to displace the gaseous medium under the membrane means; and
cylically repeating the above steps;
whereby the membrane means is cylically inflated and deflated and the liquid flow along the duct is broken into slugs so that the systems is self oscillating.

4,782,664
THERMOELECTRIC HEAT EXCHANGER

Jaroslaw Sterna, Des Plaines, and Samuel G. Boytor, Elgin, both of Ill., assignors to Allied Products Corporation, Chicago, Ill.

Continuation of Ser. No. 097,506, Sep. 16, 1987, abandoned. This application Feb. 3, 1988, Ser. No. 153,492
Int. Cl.⁴ F25B *21/02*
U.S. Cl. 62—3 **9 Claims**

1. A thermoelectric heat exchanger comprising:
a first finned heat sink comprising at least two planar regions;
at least two second heat sinks, each shaped to fit over a respective one of the planar regions;
a plurality of sets of thermoelectric cooling elements, each set made up of three cooling units arranged in a triangular pattern and mounted in a respective one of the planar regions between the first heat sink and the respective one of the second heat sinks;
means for electrically connecting the cooling elements in each set together;
means for securing each of the second heat sinks to the first

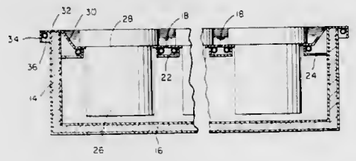


heat sink to create a low thermal resistance contact between the cooling elements and the heat sinks, each of said cooling elements establishing at least point contact with both of the respective heat sinks; and
means for applying an electrical voltage in parallel across each of the sets of cooling elements.

4,782,665
FROSTED CONDIMENT HOLDER

John J. Wolfe, Highway 69, P.O. Box 497, Savannah, Tenn. 38372

Filed Apr. 8, 1987, Ser. No. 35,826
Int. Cl.⁴ F02K *5/00*
U.S. Cl. 62—246 **7 Claims**

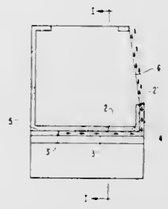


1. A refrigerated condiment holder comprising a frost top unit including a plate having a plurality of openings therethrough for receiving and holding condiment containers with the containers depending substantially into the area below said plate, refrigerant conduit means below said plate and in heat exchange relation thereto to form frost on the upper surface of said plate thereby forming a frost top unit, said refrigerant conduit means being disposed outwardly of the periphery of said openings and adjacent the undersurface of the plate to enable containers of different vertical dimensions to be fully inserted into the openings without contact with the refrigerant conduit means, said refrigerant conduit means being disposed adjacent the periphery of said openings to cool the area below the plate and maintain the containers and condiments therein at a substantially constant cool temperature, said plate having a recessed central area in which the openings are disposed and a raised periphery to form a cold air retaining well, the condiment containers extending above the plate and terminating generally in the same horizontal plane as the raised periphery of the plate so that the cold air in the well is in heat exchange relation with the upper end portion of the containers for maintaining the upper end portion of the containers and the upper end portion of the condiments contained therein at a desired lowered temperature.

4,782,666
REFRIGERATED CASE WITH VENTILATED GLAZED FRAME

Alberto Costan, Limana, Italy, assignor to Costan S.p.A., Limana, Italy

PCT No. PCT/IT86/00083, § 371 Date Aug. 11, 1987, § 102(e) Date Aug. 11, 1987, PCT Pub. No. WO87/03671, PCT Pub. Date Jun. 18, 1987
PCT Filed Nov. 19, 1986, Ser. No. 96,882
Claims priority, application Italy, Dec. 11, 1985, 83444 A/85
Int. Cl.⁴ A47F *3/04*
U.S. Cl. 62—248 **3 Claims**



1. In a refrigerator display cabinet including a refrigerated chamber having at least one transparent display window, a cooling system for cooling said refrigerated chamber and including a condenser and a compressor positioned below said refrigerated chamber and means for drawing exterior air through said condenser to thereby warm said air and then directing said warm air to said compressor, and means for preventing condensation from forming on said display window, the improvement wherein said condensation preventing means comprises:
deflector means for diverting a portion only of the flow of warm air from said condenser to said compressor;
duct means for receiving and conveying the diverted portion of said warm air and for discharging said diverted portion in a direction to pass across the outer surface of said display window;
said duct means comprising a first duct extending horizontally from said deflector means above said compressor, the horizontal dimension of said first duct, in a direction transverse to the direction of air flow from said condenser to said compressor, progressively decreasing in a direction away from said deflector means, and said first duct opening laterally along one entire side thereof extending transverse to said horizontal dimension; and
said duct means further comprising a second duct connected to and extending upwardly from said side of said first duct and opening in a direction toward said outer surface of said display window;
whereby said diverted portion of said warm air passes horizontally through said first duct above said compressor and then passes upwardly through said second duct and is discharged therefrom across said outer surface of said display window.

4,782,667
ICE DISCHARGE SECTION IN AUGER TYPE ICE MAKING MACHINE

Yoshikazu Kito, Obu, and Susumu Tatematsu, Nagoya, both of Japan, assignors to Hoshizaki Electric Company Ltd., Sakae, Japan

Filed Jan. 7, 1988, Ser. No. 141,379
Claims priority, application Japan, Jan. 8, 1987, 62-1293[U]
Int. Cl.⁴ F25C *1/14*
U.S. Cl. 62—354 **2 Claims**



1. An ice discharge section in an auger type ice making machine wherein an evaporator connected to a refrigerating system is sealingly wound along an outer peripheral surface of a cylindrical refrigerating casing and thin ice formed upon an inner wall surface of said refrigerating casing is scraped off by means of an auger rotatably supported interiorly of said refrigerating casing so as to transfer the resulting ice flakes upwardly so that compressed ice obtained by compressing said ice flakes by means of an extruding head may be discharged into an ice storage chamber by means of an ice discharge passage provided at the top of said refrigerating casing, characterized in that:
an ice transfer passage disposed within the interior of said ice storage chamber is connected to an open end of said ice discharge passage;
said ice transfer passage comprises a drainage portion within the area disposed immediately downstream of said open end of said ice discharge passage, and an upwardly inclined surface disposed immediately downstream of said drainage portion; and
a water collecting section provided between said drainage portion and said upwardly inclined surface for recovering water so as to drain said water from said ice transfer passage to the exterior of said machine.

4,782,668
FOOD FREEZING TUNNEL

Malcolm L. Stokes, Surrey, England, assignor to The BOC Group plc, Windlesham, England

Filed May 7, 1987, Ser. No. 47,959
Claims priority, application United Kingdom, May 12, 1986, 8611538
Int. Cl.⁴ F25D *25/04*
U.S. Cl. 62—380 **7 Claims**

1. Apparatus suitable for freezing food, comprising a tunnel defined by a trough member and a separate roof member; a conveyor extending through the tunnel from its entrance to its exit and having an upper run and a lower run; means for introducing liquefied gas into the tunnel; means for creating in the tunnel turbulence in cold gas formed as a result of vaporisation of the liquefied gas; at least one mechanical means for raising and lowering the trough member between an upper position in which the trough member engages the roof member and a lower position in which the trough member is spaced from the

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roof member, said mechanical means having a single or common drive, said trough member having counterweights, and



the trough and roof members being adapted to engage one another at a level above that of the upper conveyor run.

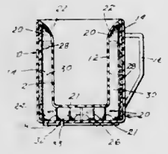
4,782,669

COOLING SYSTEM FOR A BURST POWER FUEL CELL

John C. Trocciola, Glastonbury, and Leslie L. VanDine, Manchester, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Nov. 17, 1986, Ser. No. 931,592
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—434 **11 Claims**





1. A closed loop cooling system for a heat generating device located in a spacecraft comprising: a coolant stream continuously recirculatable through said heat generating device, said coolant being heated therein; a heat sink disposed within said coolant stream and in fluid communication therewith, wherein said coolant passes therethrough; and, subcooled ice, disposed within said heat sink, said subcooled ice being in direct contact with said coolant such that all heat generated in said device is absorbed by said subcooled ice wherein a total phase change is achieved.

4,782,670

DUAL HOT-COLD MAINTENANCE CONTAINER

Timothy S. Long, and Kimberly T. Long, both of P.O. Box 1041, Chico, Calif. 95927

Filed Mar. 10, 1988, Ser. No. 166,192
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **10 Claims**

1. an insulated beverage container with both heating and cooling capabilities comprising:

a. a single-walled tubular inner receptacle having an outwardly flanged opened end, and oppositely, a flat closed end; the orientation of said tubular inner receptacle being said outwardly flanged opened end upwardly as the top of said tubular inner receptacle, said flat closed end downwardly as the bottom of said tubular inner receptacle, and said wall vertically inclined, the outer surface of said vertically inclined wall affixed in vertical longitudinal alignment therewith by a multiple of substantially rectangular, spaced having the shorter sides of said baffles radiating outwardly from said outer wall surface beginning upwardly adjacently below said outwardly flanged open top end of said tubular inner receptacle and continuing downwardly along said outer wall surface somewhat beyond said flat closed bottom end of said tubular inner receptacle with said baffles, the downwardly terminal ends thereof, then extending inwardly beneath said closed bottom end of said tubular inner receptacle to connect to one another at the center thereof, the lower outer edges of said baffles shaped into support legs for said tubular inner receptacle and curved upwardly centrally to produce semicircular flow-passage arches;

b. a single-walled tubular housing structured to encase said tubular inner receptacle; said tubular housing having an opened end, and oppositely, a flat closed end, the orientation of said tubular housing being said opened end upwardly as the top of said tubular housing, said flat closed end downwardly as the bottom of said tubular housing, and said single wall vertically inclined; said vertically inclined wall sized for cooperative alignment with said tubular inner receptacle wall with a space therebetween with said baffles therein and having said flat bottom of said tubular housing paralleling said flat bottom of said tubular inner receptacle with a space therebetween with said downwardly terminal ends of said baffles therein, said lower outer edges of said bafiles as said support legs for said tubular inner receptacle resting against the inner surface of said bottom of said tubular housing;

c. a thin wall styrofoam insulator sleeve; said insulator sleeve of tubular configuration and sized for insertion into said space therebetween said vertically inclined wall of said tubular housing and said vertically inclined wall of said tubular inner receptacle with said insulator sleeve sufficiently thinned to fit snugly against the inner surface of said wall of said tubular housing and clear the outer edges of said baffles attached to said outside wall of said tubular inner receptacle; said styrofoam sleeve, the interfaced surface thereof, manufactured with a liquid blocking finish protective of said styrofoam which is cellar on the outer side against the interfaced side of said vertically inclined wall of said tubular housing;

d. a permanently sealing means attaching the outside edge of said flanged lip of said top of said tubular inner receptacle to the interfaced surface immediate said top of said vertically inclined wall of said tubular housing with said tubular housing encasing said styrofoam sleeve and said tubular inner receptacle with said baffles in said wall spaces formed between said vertically inclined walls of said inner receptacle and said housing and said space between paralleling said bottoms thereof, with said spaces formed between said walls and said bottoms with said baffles therein being a chamber for containment of a thermal gel solution;

e. a liquid thermal gel composition formatted to withstand a cooling environmental condition of −200 celsius and a heating environmental condition of 260 celsius with said thermal gel capable of remaining cooled or heated for extended periods of time away from mechanical cooling and heating sources and being capable of radiating heat or cold to wall surfaces of a confining chamber.

f. said liquid thermal gel confined in said chamber formed by said vertically inclined wall of said tubular inner receptacle and said vertically inclined wall of said tubular housing and said paralleling bottoms thereof, there being sufficient open space in said chamber between said and said flow-passage arches in said downwardly and inwardly ends of said baffles to allow circulatory movement within said chamber of said thermal gel when said thermal gel is sufficiently liquified to reposition;

g. access means for introducing said liquid thermal gel into said chamber;

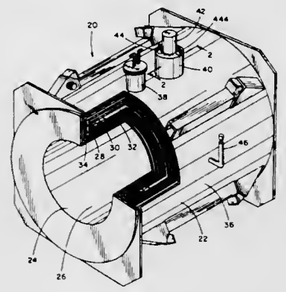
h. a safety pressure release means activated by pressure applied from inside said chamber to a pressure sensitive fixture having predetermined pressure releasing mechanics.

4,782,671

COOLING APPARATUS FOR MRI MAGNET SYSTEM AND METHOD OF USE

Bruce C. Breneman, and Raymond E. Sarwinski, both of San Diego, Calif., assignors to General Atomics, San Diego, Calif.

Filed Sep. 28, 1987, Ser. No. 101,516
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R **9 Claims**



1. An improvement in a magnet system for providing a localized, substantially homogeneous magnetic field for use in magnetic resonance imaging, said magnet system comprising:

a vacuum vessel including a first wall defining a bore for receiving the subject of the imaging;

a cryogenic containment vessel supported within said vacuum vessel and containing a coil formed of superconductive wire for providing said magnetic field along with a quantity of liquid helium to maintain said wire below its critical temperature;

an inner thermal radiation shield disposed between said containment vessel and said vacuum vessel;

an outer thermal radiation shield disposed between said inner shield and said vacuum vessel;

a cryocooler supported by said vacuum vessel and extending inside said vacuum vessel, said cryocooler having a first-stage heat station for cooling said outer shield and a second-stage heat station for cooling said inner shield, said improvement comprising:

a tank holding a quantity of a second liquid, which has a boiling point above liquid helium but well below ambient temperature, for cooling said outer shield, said tank being supported in good heat transfer relationship with said first-stage heat station between said vacuum vessel and said outer shield and spaced from said outer shield;

means for transferring said second liquid from said tank so that said second liquid boils in good heat transfer relationship with said outer shield; and

means for returning gas resulting from the boiling of said second liquid back to said tank, said gas being cooled by said cryocooler to liquefy the gas in said tank.

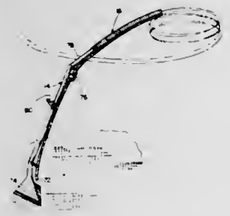
4,782,672

CARPET STEAM DYE MACHINE

William J. Secolo, 14631 9th Ave., NE., Seattle, Wash. 98155

Filed Jun. 17, 1987, Ser. No. 63,017
Int. Cl.[4] D06B *1/02*
U.S. Cl. 68—205 R **8 Claims**





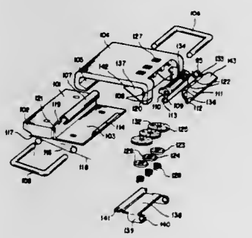
1. A carpet dyeing machine including an upwardly opening vacuum chamber, a liquid dye receptacle loosely removably received in said chamber, closure means removably closing said chamber from above, a vacuum hose having an outlet end opening into the upper portion of said chamber and positioned to discharge liquid therefrom into said receptacle and an inlet end equipped with a vacuum nozzle, liquid dye conveying conduit means including an inlet end opening into a lower portion of said receptacle and a spray outlet equipped outlet end supported adjacent said nozzle, said conduit means including pump means and heater means serially connected therein for pumping liquid from said receptacle to said outlet end and heating the pumped liquid.

4,782,673

CONNECTION DEVICE

Rene Castelli, Ghent; Willibald van Hoye, Zwijnaarde, both of Belgium; Ulf G. Rasch, Nachrodt-Einsal; Klaus-Dieter Hesse, Sundern, both of Fed. Rep. of Germany, and Richard Miles, Crowborough, Great Britain, assignors to Samsonite Corporation, Denver, Colo.

Continuation of Ser. No. 772,341, Aug. 20, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,109
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 8337033[U]; Jan. 25, 1984, 3402430
Int. Cl.[4] E05B *65/48*
U.S. Cl. 70—72 **6 Claims**



1. In a connection device for releasably interconnecting two

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separable members, comprising hook means adapted to be connected to one of the members, a lower component adapted to be connected to the other member, an elongated lever pivotably connected to the lower component, counterhook means connected at one end of the lever and operative for engaging the hook means when the connection device is in a closed position to hold the two members together and operative for disengaging from the hook means when the connection device is in an open position to allow the two members to separate, pivotable means for pivotably connecting the other end of the lever to the lower component and to allow the other end of the lever to move outward away from the lower component when the connection device is moved out of the closed position into the open position and to allow movement of the lever disengaging the hook means and the counterhook means to achieve the open position, snapper means pivotably connected to the other end of the lever, a locking projection extending from the snapper means, a projecting locking member connected to the lower component, the locking projection and the locking member operatively engaging one another to prevent the other end of the lever from moving outward away from the lower component when the locking projection is pivoted into a first position and the connection device is in the closed position, the locking projection and the locking member also operatively disengaging from one another when the locking projection is pivoted to a second position to allow the other end of the lever to move outward from the lower component and the connection device to be moved to the opened position, means for biasing the locking projection toward the first pivotable position, actuator means pivotably connected to the other end of the lever for operatively contacting and pivoting the snapper means to pivot the locking projection to the second pivotable position upon pivoting said actuator means as a result of manual force, and an improvement in combination therewith, comprising:

means pivotably connecting said snapper means and said actuator means and operative for allowing said locking projection to pivot into the second pivotable position from the first pivotable position independent of pivoting of the actuator means by manual force, the independent pivoting of the locking projection occurring upon moving the lever adjacent to the lower component to place the connection device in the closed position, the biasing means returning the locking projection to the first pivotable position after such independent pivoting movement.

4,782,674

LOCKING MEANS FOR THE DOORS OF TRUCKS VANS AND THE LIKE

James J. Johnson, 2760 Halpern, Ville St. Laurent, Quebec, Canada H4S 1R6

Filed Jan. 23, 1986, Ser. No. 821,586
Int. Cl.[4] F05B *65/08*
U.S. Cl. 70—95 **4 Claims**



1. A mobile vehicle having an enclosure including an end wall, an opening in said end wall, first and second side walls on either side of said end wall, and a roll-up door for rolling up and down over said opening to respectively open and close said opening, said first and second side walls and said end wall comprising the walls of said enclosure, and a locking arrangement which automatically locks said door when it is closed; said locking arrangement comprising:

a striker member mounted on one side of said door adjacent said first side wall to define a striker path when said door is moved upwardly or downwardly;

a lock mechanism, having a cylinder and a key opening, said key opening being mounted on the exterior of said first side wall and between the top and bottom ends of said opening, said cylinder extending from said key opening and through said first side wall, whereby, said lock mechanism is mounted within said enclosure and said key opening is disposed on said first side wall exterior of said enclosure;

said lock mechanism including a dog, said dog comprising a plate member of a somewhat triangular shape and having a top camming edge and a bottom stop edge, and means for biasing said camming edge of said dog to removably extend into said striker path such that the plate member extends at right angles to said path;

said dog being pivotally mounted such that when said door is above said dog and is moved downwardly, said striker cams with said camming surface and forces said dog out of said striker path; and

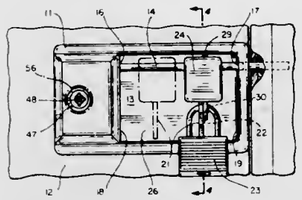
when said striker is below said dog and said door is moved upwardly, said striker engages said bottom stop surface of said dog and said door is therefore stopped by said bottom stop surface.

4,782,675

LOCK ASSEMBLY

Maxwell Thorburn, P.O. Box 707, Clear Lake Oaks, Calif. 95423

Filed Sep. 9, 1987, Ser. No. 94,657
Int. Cl.[4] E05B *65/06*
U.S. Cl. 70—129 **8 Claims**



1. In a lock assembly which allows a first person normally to have access to a space and allows a second person to enter the space and to lock the first person out of the space: a bolt moveble between extended and retracted positions, a slide movable with the bolt, first lock means controlled by the first person for securing the bolt to the slide when engaged, and second lock means controlled by the second person and movable between a first position in which the slide is held in a fixed position and the bolt is free to move between the extended and retracted positions unless the first lock means is engaged, a second position in which the slide is free to move and the bolt can be moved between the extended and retracted positions even if the first lock means is engaged, and a third position in which the bolt is locked in the extended position and cannot be moved to the retracted position even if the first lock means is disengaged.

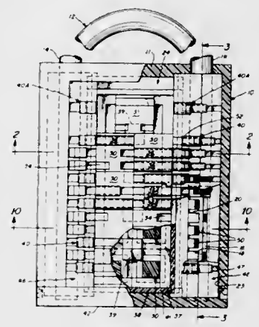
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4,782,676

PUZZLE LOCK

Ira Friedman, 12815 Guildford Clr., West Palm Beach, Fla. 33414

Filed Oct. 5, 1987, Ser. No. 105,098
Int. Cl.[4] E05B *37/20*
U.S. Cl. 70—289 **35 Claims**



1. An interlocking puzzle game comprising,

a body,

a locking member,

said body having means for receiving said locking member,

a plurality of combination blocks,

said body having means for receiving said blocks in a block array,

plurality of separate and manually operable keys,

said body having means for separately supporting said keys for individual sliding relationship in said body and adjacent said blocks,

at least some of said blocks having means for receiving a key,

each of said keys having at least a locked position and an unlocked position,

said key in the locked position engaging said locking member to prevent disengagement thereof from said body,

said key in the unlocked position being disposed in said block and out of engagement with the locking member to enable disengagement thereof from said body.

4,782,677

LOCK REPAIR PLATE FOR SURFACE MOUNTED BOLT CASINGS

James O'Gara, 444 W. 258th St., Riverdale, N.Y. 10471

Filed Apr. 6, 1987, Ser. No. 34,752
Int. Cl.[4] E05B *9/08*
U.S. Cl. 70—417 **21 Claims**

1. A lock repair plate assembly for a surface mounted bolt casing, said assembly comprising:

a plate having an opening through which an operating tang can connect a lock cylinder with said casing;

a plurality of threaded holes provided in said plate at locations for registration with respective holes formed in said bolt casing and normally used for securing said casing directly to a door;

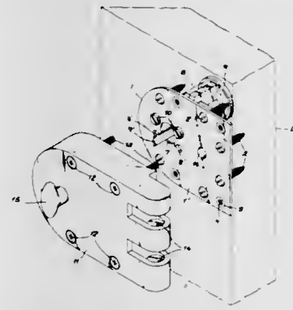
respective casing screws having matching threads with those of said threaded holes passing through said respective holes of said casing and engaging said threaded holes of said plate for mounting said casing on said plate;

a plurality of screw holes formed in said plate and offset from said threaded holes for enabling said plate to be mounted on said door by respective plate screws traversing said screw holes in a first position of said plate at one edge of said door;

a first pair of apertures formed in said plate flanking said opening for registration with threaded bores of said cylinder in said first position of said plate;

a second pair of apertures formed in said plate flanking said opening for registration with said threaded bores of said cylinder in a second position of said plate at another edge of said door;

a pair of cylinder screws traversing selectively one of said pairs of apertures for engagement with said threaded bores for securing said cylinder to said plate, each of said threaded holes being formed in a respective insert provided in said plate, said insert being formed with a flange seated in a recess and abutting a rearwardly facing shoulder formed in said plate for preventing said insert from being pulled out of said plate from an outwardly facing surface thereof, said inserts being flush with said outwardly facing surface and with an inwardly facing surface of said plate; and



indicator means on an outwardly facing surface of said plate opposite said door for insuring that said outwardly facing surface is not mounted facing said door.

4,782,678

METHOD FOR MINIMIZING SCRAP LOSS IN MAKING A DRAWN CONTAINER

James F. Reimschissel, St. Louis, Mo., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 14, 1987, Ser. No. 73,267
Int. Cl.[4] B21C *51/00*
U.S. Cl. 72—4 **5 Claims**



1. A method of minimizing the generation of scrap in cutting articles from a strip of sheet material in a press, said press having a plurality of cooperative reciprocating punch and die sets arranged in an adjacent relationship to cut out a plurality of articles across the width of said sheet material, said method comprising the steps of:

(a) unwinding said sheet material from a coil horizontally positioned on a coil mount;

(b) feeding sheet material from said coil into said press, said sheet material being advanced at a predetermined speed selected relative to the reciprocal speed of said punch and die sets;

(c) positioning a monitor apparatus in close proximity to said sheet material and at a preselected distance upstream of said press, said monitor apparatus being capable of detect-

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ing any defects present across the width of said sheet material and generating corresponding signals as to the size and location of the defects on said sheet material;

(d) relaying said size and location signals of said defects to a controller which is operatively connected to each of said punch and die sets; and

(e) controlling the operation of each of said punch and die sets in correspondence to said size and location signals received from said monitor apparatus to cut articles out of said sheet material only in those areas where no defects are detected and suspending cutting where a defect is detected while intermittently advancing said sheet material through said press until said defect on said sheet material clears said punch and thereafter resume operation of said punch and die sets to continue cutting articles from said sheet material in only said areas.

4,782,679

PROCESS FOR THE PRODUCTION OF FLANGES OR COLLARS ON HOLLOW PARTS BY LATERAL EXTRUSION

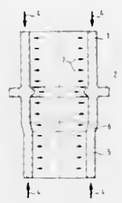
Helmut Bögel, Aalen, Fed. Rep. of Germany, assignor to Gesenkschmiede Schneider GmbH, Aalen, Fed. Rep. of Germany

PCT No. PCT/DE85/00276, § 371 Date Apr. 8, 1987, § 102(e) Date Apr. 8, 1987, PCT Pub. No. WO87/01991, PCT Pub. Date Apr. 9, 1987

PCT Filed Aug. 14, 1985, Ser. No. 37,256

Int. Cl.⁴ B21D *26/02*

U.S. Cl. 72—57 **9 Claims**



1. A process for producing a flange or collar on a hollow part having a bore which comprises:

shaping said hollow part to produce said flange or collar using a technique wherein material forming said part flows at least in part radially outwardly from the bore;

internally supporting said hollow part during said shaping so as to substantially prevent the formation of a lap in the region of said flange or collar and so as to be able to substantially constantly adjust to instantaneous geometrical requirements; and

said supporting step comprising introducing a medium which produces a relatively high interior pressure and which is at least one of an elastic medium and a plastic medium into the bore.

4,782,680

METHOD FOR ROLLING A SHAFT OR TENON HAVING CROSS-BORED HOLES

Garri Berstein, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed May 13, 1987, Ser. No. 49,659

Claims priority, application European Pat. Off., Jul. 19, 1986, 86109930

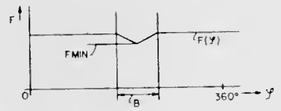
Int. Cl.⁴ B21H *1/00*

U.S. Cl. 72—81 **12 Claims**

1. A method for milling with milling roller means a surface of a work piece having at least one bore defining a bore range on said surface of said work piece, comprising the following steps:

(a) causing relative rotation between said work piece and said milling roller means while simultaneously applying a compression force between said milling roller means and said work piece surface,

(b) controlling the size of said compression force applied between said milling roller means and said work piece surface in accordance with such a control function that a



starting static compression force applied to said work piece surface outside said bore range is reduced to a lower compression force in said bore range of said surface where said bore is located, so that the rolling force per unit area being rolled remains substantially constant, and

(c) synchronizing said controlling of said compression force with said relative rotation so that said lower compression force reaches its minimum at the latest when said milling roller means align with a diameter of said bore.

4,782,681

METHOD OF ROLLING A SCREW WITH GROOVE FOR SELF-LOCKING

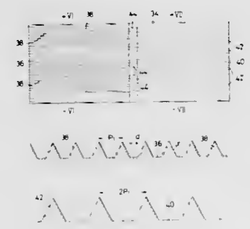
Masao Kawashima, Funabashi, Japan, assignor to JSM Screw Co., Ltd., Tokyo, Japan

Division of Ser. No. 909,399, Sep. 19, 1986. This application Jul. 27, 1987, Ser. No. 77,838

Claims priority, application Japan, Nov. 22, 1985, 60-263223; Jun. 25, 1986, 61-146797

Int. Cl.⁴ B21H *3/06*

U.S. Cl. 72—88 **19 Claims**



1. A method of manufacturing a self-locking threaded element comprising the steps of disposing a blank element in which the self-locking threads are to be formed between two spaced generally planar rolling dies, each of said rolling dies having a start end and a finish end, contacting the start ends of each die with said blank element such that one die extends from its start end to its finish end in one direction to one side of said blank element and the other die extends from its start end to its finish end in a direction opposite to said one direction to an opposite side of said blank element opposite to said one side, applying a pressure to said rolling dies such that said rolling dies are in pressure contact with said blank element, moving said two rolling dies in opposite directions a first distance, rotating said blank element a first amount as said two dies are moved said first distance causing said two oppositely moving dies to form a helical first groove in said rotating blank element with said first groove having a first depth and a first pitch, moving said dies in said opposite direction a second distance, rotating said blank element a second amount as said two dies are moved said second distance causing said two oppositely moving dies to superimpose a second deeper groove over alternate first grooves as said blank element rotates said second amount such that said deeper grooves define the flanks of a thread having a pitch which is twice that of said first pitch and with the outer radial crest ends of said thread having a self-locking center groove defined by said first groove.

4,782,682

ROLLING MILL TOOL

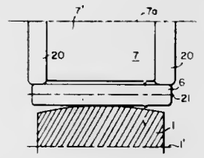
Garri Berstein, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed May 13, 1987, Ser. No. 49,699

Claims priority, application European Pat. Off., Jul. 19, 1986, 86109931

Int. Cl.⁴ B21H *1/00*

U.S. Cl. 72—110 **12 Claims**



1. A rolling mill tool, comprising rotatable milling roller means for smooth rolling a contoured surface of a journal, pressure application roller means mounted for pressing said milling roller means against said contoured surface, said milling roller means having a length to diameter ratio sufficient for flexing and conforming a flexed shape of said milling roller means to said contoured surface of said work piece, said pressure application roller means having a configuration for permitting and causing said flexing of said milling roller means, said tool further comprising support roller means arranged for directly contacting said journal.

4,782,683

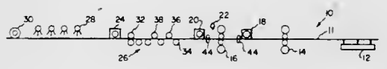
HOT STRIP MILL SHAPE PROCESSOR AND METHOD

George W. Tippins; John E. Thomas, both of Pittsburgh, and Ronald D. Gretz, Tarentum, all of Pa., assignors to Tippins Incorporated, Pittsburgh, Pa.

Filed Mar. 3, 1986, Ser. No. 835,478

Int. Cl.⁴ B21B *1/34, 37/12;* B21D *1/02*

U.S. Cl. 72—229 **8 Claims**



1. A method of controlling strip flatness on a hot strip mill including a hot reversing mill as the final reducing stand comprising:

(a) reducing the thickness of a workpiece by passing it back and forth along a pass line through the hot reversing mill while reducing a roll gap on said mill after each successive pass; and

(b) equalizing the strain developed during rolling whether or not a shape defect appears by passing the workpiece at a temperature above an eutectoid decomposition temperature of the strip through a shape processor having a plurality of upper and lower rolls that intermesh along the pass line said upper rolls comprising at least a roll pair adjustable in the vertical direction and tiltable in a plane transverse to the pass line and a lower roll positioned intermittent the roll pair and adjustable in the vertical direction, said shape processor located immediately downstream of and separate from the hot reversing mill, said equalizing of the strain occurring after certain selected passes through the hot reversing mill, said shape processor equalizing the strain by subjecting the strip to one of transverse bending, simple tension, tension and bending, strip flexing and differential transverse bending.

7. A hot strip mill including:

(a) a hot reversing mill as the final reducing stand and having a coiler furnace on the upstream and the downstream sides thereof;

(b) a shape processor positioned immediately downstream of the downstream coiler furnace and comprising a plurality of upper and lower rolls adapted to intermesh along a pass line, said upper rolls having at least a roll pair adjustable in the vertical direction and tiltable in a plane transverse to the pass line and at least a lower oll positioned intermittent each roll pair and adjustable in the vertical direction, a pinch roll and a coiler; and

(c) cooling means downstream of the shape processor whereby said shape processor receives a workpiece from the mill after a final and/or intermediate pass and equalizes strain developed in the workpiece during rolling.

4,782,684

BENDING MACHINE

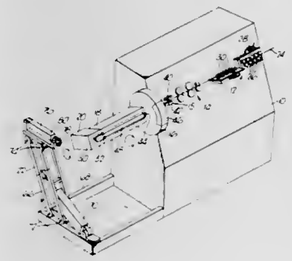
Ronald E. Benton, "Mount Royal", Lipbook Road, Headley, Hampshire GU35 8LL, England

Filed May 1, 1987, Ser. No. 45,391

Claims priority, application United Kingdom, May 7, 1986, 8611153

Int. Cl.⁴ B21D *7/024, 43/00*

U.S. Cl. 72—307 **3 Claims**



1. A bending machine for bending elongate material, comprising:

(a) a support structure;

(b) feed means which are supported by the support structure and which serve to feed such material along a feed axis of the machine;

(c) a fixed member fixed to said support structure and having a cylindrical bore which extends along said feed axis;

(d) a generally cylindrical rotary component which extends within said cylindrical bore so as to be rotatable about said feed axis;

(e) a bending head supported by said support structure and connected to said rotary component for rotary movement relative to said support structure about said feed axis, to enable the bending head to bend such material in any selected imaginary plane which passes through said feed axis;

(f) working-fluid-operated parts of said bending head;

(g) an axial through-bore through said rotary component to enable such material to be fed to said bending head along said feed axis;

(h) at least one further bore in said rotary component which

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extends in an axial direction along the rotary component, generally parallel with said axial through-bore, which further bore serves as a duct for working fluid which acts on said bending head;

(i) at least one duct in said fixed member which also serves as a duct for such working fluid; and

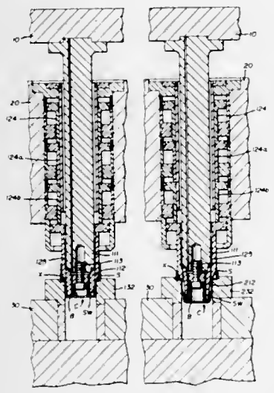
(j) at least one annular duct, between said fixed member and said rotary component, which connects the said at least one duct in said fixed member to said at least one further bore in said rotary component, irrespective of the angular position of said rotary component with respect to said fixed member.

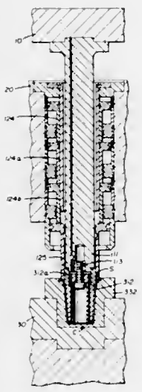
4,782,685

APPARATUS FOR FORMING TALL TAPERED CONTAINERS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Dec. 7, 1987, Ser. No. 129,482
Int. Cl.[4] B21D *22/20*
U.S. Cl. 72—349 **10 Claims**





1. Apparatus for forming a tapered container from a preformed cup, comprising:

(A) at a first station, a die having a substantially straight walled cavity;

(B) a die center having a tapered periphery;

(C) a fluidly actuated pressure sleeve movable toward and away from said die;

(D) said pressure sleeve engaging the bottom of the cup upon movement toward said die;

(E) said die center being movable toward said die to engage the cup and draw the same, in cooperation with said die, into a partial length container having first and second substantially straight sidewall portions interconnected by a transition portion;

(F) at a second station, a second die having a substantially straight walled cavity;

(G) a second die center having a tapered periphery and being movable toward said second die to further elongate said container while maintaining said first and second substantially straight sidewall portions and at least a part of said transition portion;

(H) at a third station, a third die having a tapered die cavity; and

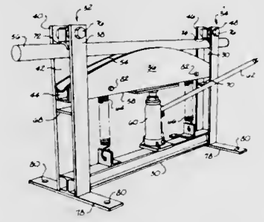
(I) a third die center having a tapered periphery and being movable toward said third die to further elongate said container and impart a taper to the sidewall thereof.

4,782,686

TUBE BENDER FOR GREENHOUSE STRUCTURAL SUPPORTS

Edward C. Carson, Jr., 204 Forest Dr., Greenwood, S.C. 29646

Filed Jun. 1, 1987, Ser. No. 56,961
Int. Cl.[4] B21D *7/022*
U.S. Cl. 72—389 **14 Claims**



1. A tube bending apparatus for imparting a predetermined radius of curvature to an initially substantially straight, indefinite length of tube without crimping same, said apparatus comprising:

a substantially horizontal, fixed support base, situated substantially at the bottom of said apparatus;

a pair of spaced parallel, vertical guide channels defined by respective opposing pairs of fixed vertical members having opposing ends supported on said base at one end of said members with a predetermined lateral and widthwise separation therebetween defined by said base, to permit introduction into the side thereof an indefinite length of tube;

a pair of tube capture elements, one each mounted at the opposite ends of each of said members defining said guide channels, for capturing pipe contained in said guide channels to be bent;

a bending shoe, received within and having opposing lateral ends extending transversely between said guide channels for controlled reciprocation of said bending shoe with said lateral ends thereof guided in their respective guide channels over the full reciprocation of said bending shoe in said guide channels, said bending shoe having a lower surface adapted to be driven upwardly during a tube bending operation, and a curved upper surface adapted for engaging the tube to be bent and progressively imparting the desired predetermined radius of curvature thereto during said tube bending operation; and

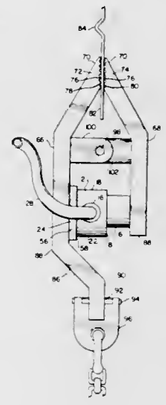
controllable driving means, operatively situated between said support base and said bending shoe lower surface, for selectively driving said bending shoe upward to perform a tube bending operation on an initially substantially straight, indefinite length of tube residing in said guide channels and between said bending shoe curved upper surface and said capture elements, such tube being forced to conform to the curvature of said bending shoe upper surface by continued upward driving of said shoe after such tube is engaged with said tube captive elements, and being removable laterally from said apparatus guide channels after said bending operation.

4,782,687

POWER TOOL FOR AUTO BODY REPAIR

Thomas S. Papesh, 1809 N. Center St., Crest Hill, Ill. 60435

Filed Dec. 12, 1986, Ser. No. 940,897
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—409 **6 Claims**



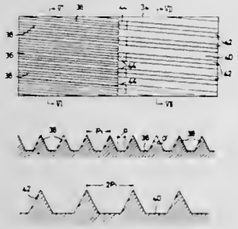
1. A power tool for auto body repair comprising a first tool member and a second tool member movable between a working position and a non-working position, a powered reciprocating ram positioned on said first tool member for contact with said second tool member to move it to said working position, said powered reciprocating ram being movable between a retracted and an extended position for contact with said second tool member when in said extended position, and a power source to power said reciprocating ram, wherein said powered reciprocating ram includes a small compact body having a length, width and height each of which is greater in dimension than the longitudinal length of travel of said ram between said retracted position and said extended position, said reciprocating ram having an outwardly facing planar free end, said planar free end having a broad flat bearing surface, said first tool member on which said ram is positioned having a broad planar positioning surface, said second tool member having a broad planar contact surface, said broad flat bearing surface of said planar free end of said reciprocating ram being in full face bearing contact with said broad planar contact surface of said second tool member and substantially coplanar therewith when said ram is in said extended position, wherein said power tool comprises a tool to grip a portion of a bent auto body part for straightening by pulling force applied to said tool in a direction away therefrom and axially aligned with a straight line coincident with the longitudinal axis of said bent auto body part when straightened, said first tool member comprising a first elongated lever having a working end and an opposite powered end, said broad planar positioning surface of said first tool member being on said powered end thereof, said second tool member comprising a second elongated lever having a working end and a powered end, said broad planar contact surface of said second tool member being on said powered end thereof, coupling means to couple said first elongated lever to said second elongated lever whereby said working ends thereof are moved toward said working position when said powered ends thereof are moved in one direction relative to each other, said powered reciprocating ram positioned on said first tool member comprising said first elongated lever being operative to move said powered ends in said one direction relative to each other, a first jaw member on said working end of said first elongated lever, a second jaw member on said working end of said second elongated lever, said jaw members each having a planar gripping surface facing toward each other, each having gripping means projecting therefrom for gripping a portion of an auto body part for pulling thereon when said first and second elongated levers are moved to their said working position, said planar free end of said reciprocating ram then being substantially coplanar with said planar contact surface of said second tool member, and an integrally formed connecting extension member extending from said powered end of one of said elongated levers for connection of a chain thereto, the other of said elongated levers terminating at said powered end thereof.

4,782,688

ROLLING FLAT DIE FOR MANUFACTURING A SCREW WITH GROOVE FOR SELF-LOCKING

Masao Kawashima, Funabashi, Japan, assignor to JSM Screw Co., Ltd., Tokyo, Japan

Division of Ser. No. 909,399, Sep. 19, 1986. This application Jul. 24, 1987, Ser. No. 87,063
Claims priority, application Japan, Nov. 22, 1985, 60-263223; Jun. 25, 1986, 61-146797
Int. Cl.[4] B21H *3/06*
U.S. Cl. 72—469 **12 Claims**



1. A rolling flat die operable on a blank to produce a threaded element having self-locking threads comprising a flat die moveable in a linear forward direction to engage said blank and form said self-locking threads on said blank, said flat die having a forward section and a rear section, said forward section having a first plurality of first thread-forming parts parallel to one another, each of said first thread-forming parts having a first outer crest end and a first inner root end, said first outer crest ends being spaced from one another by a first die pitch, said first outer crest ends being spaced from said first inner root ends by a first die depth, said rear section having a plurality of second thread-forming parts parallel to one another and parallel to said first thread-forming parts, each of said second thread-forming parts having a second outer crest end and a second inner root end, said second outer crest ends being spaced from one another by a second die pitch, said second outer crest ends being spaced from said second inner root ends by a second die depth, said second die pitch being twice said first die pitch, said second die depth being greater than said first die depth, whereby said forward section of said flat die is operable to form a helical first groove in said blank with said first groove having a first groove pitch and a first groove depth corresponding respectively to said first die pitch

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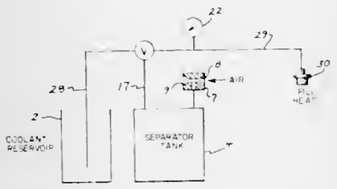
and said first die depth, said rear section of said flat die being operable to superimpose a second deeper groove over alternate first grooves such that said second deeper groove defines the flanks of a thread with said second deeper groove having a second groove pitch which is twice that of said first groove pitch and with the outer crest ends of said thread having a self-locking center groove defined by said first groove.

4,782,689

APPARATUS AND METHOD FOR TESTING, FILLING AND PURGING CLOSED FLUID SYSTEMS

Raymond D. DeRome, 10401-336th Ave., Twin Lakes, Wis. 53181

Filed Jun. 4, 1987, Ser. No. 57,313
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—49.2 **5 Claims**



1. A method of testing the fluid tightness of a closed fluid system having an access port, comprising the steps of:
draining the fluid system of the fluid therein;
releasably and sealingly connecting a evacuation unit to the access port of the fluid system;
actuating the evacuation unit to produce a vacuum on the system to a predetermined pressure less than atmospheric pressure;
discontinuing application of the vacuum on the system;
observing any pressure increase that may occur;
re-filling the system with system fluid after observing any pressure increase that may have occurred through the access port without disconnecting the evacuation unit, said step of re-filling comprises connecting the evacuated system to a source of system fluid which is at atmospheric pressure;
disconnecting the system from the source of system fluid; and thereafter
re-actuating the evacuation unit to produce a vacuum on the system to a predetermined pressure less than atmospheric pressure at a time prior to the system being completely filled with system fluid.

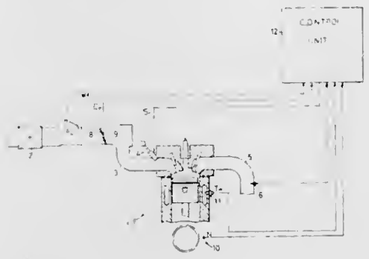
4,782,690

AIR/FUEL RATIO DETECTING APPARATUS, AND METHOD OF DETECTING NORMAL AND ABNORMAL CONDITIONS OF THE SENSOR

Katsunori Terasaka, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 16, 1986, Ser. No. 886,067
Claims priority, application Japan, Jul. 17, 1985, 60-110399[U]
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 **18 Claims**

1. An air/fuel ratio detecting and controlling apparatus which comprises:
an air/fuel ratio sensor for detecting air/fuel ratio of exhaust gas from an engine and having a sensing section outputting a voltage in accordance with oxygen concentration in the air/fuel ratio sensor;
a pump current means for changing a pump current supplied to the air/fuel ratio sensor;
a pump current detecting circuit connected to said air/fuel ratio sensor for comparing an output voltage from said sensing section with a reference voltage and for detecting a change in pump current as a change in detection voltage (V_1); and



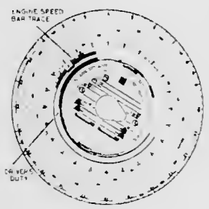
detecting means for detecting any normal and abnormal conditions of said air/fuel ratio sensor according to the detection voltage (V_1) from said pump current detecting circuit.

4,782,691

TACHOGRAPH INCLUDING MEANS FOR RECORDING ENGINE SPEED

Frank Clish, Dundee, Scotland, assignor to Veeder-Root Limited, Smethwick, England

Filed Aug. 11, 1987, Ser. No. 84,379
Claims priority, application United Kingdom, Aug. 26, 1986, 8620596
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 **9 Claims**



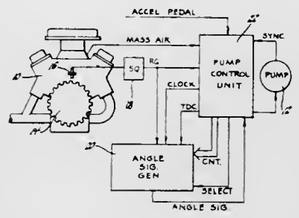
1. In a vehicle tachograph for recording vehicle engine speed and comprising chart drive means for driving a tachograph chart with respect to time and recording means operable for receiving signals representing engine speed and for recording an indication of engine speed in the form of a bar trace on a tachograph chart as it is driven by the chart drive means, the improvement wherein the recording means is operable to record a bar trace with a plurality of different, readily distinguishable levels, each level representing a threshold of engine speed, said threshold indicating that said engine speed is at or below the respective threshold and within a predetermined range, and selector means for selectively setting said thresholds so that the bar trace levels stay the same but represent different engine speed thresholds.

4,782,692

ENGINE CRANKSHAFT POSITION SENSOR

Richard A. Peden, Livonia, and Ronald Paul, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 14, 1987, Ser. No. 95,867
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 **1 Claim**



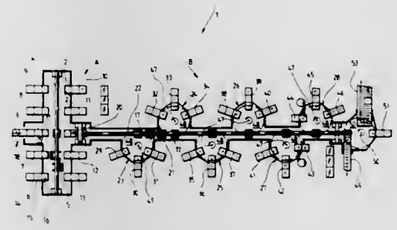
1. For a multi-cylinder internal combustion engine having an output crankshaft rotated by the engine, a system for generating angle signals for engine control upon rotation of the crankshaft, the system comprising:
a crankshaft rotation sensor comprising (A) a ring gear rotated by the crankshaft, the ring gear having teeth spaced at predetermined angles around its periphery and (B) means for sensing the passing of the teeth on the ring gear as the crankshaft is rotated and providing a ring gear angle signal for each tooth sensed, each ring gear angle signal representing a rotation of the crankshaft equal to the predetermined angle;
means for determining the value of engine speed upon the occurrence of each cylinder top dead center position of the crankshaft;
a clock for generating clock pulses at a predetermined frequency;
means for determining, upon the occurrence of each cylinder top dead center position of the crankshaft, the number of clock pulses at the predetermined frequency that will occur over a time period required for the crankshaft of the engine to rotate over one-half of the predetermined angle at the measured engine speed;
a counter for repeatedly counting clock pulses applied thereto to a number preset therein, the counter having a bistable output shifting between first and second states each time the number of clock pulses counted equals the number preset therein; and
means for presetting the determined number of clock pulses into the counter upon the occurrence of each cylinder top dead center position of the crankshaft, the output of the counter comprising simulated crankshaft angle signals, each simulated crankshaft angle signal representing a rotation of the crankshaft equal to the predetermined angle;
means for sensing a failure in the crankshaft rotation sensor; and
means selecting the ring gear angle signal in the absence in a sensed failure in the crankshaft rotation sensor and selecting the simulated crankshaft angle signals during a sensed failure in the crankshaft rotation sensor, the selected ring gear angle comprising the angle signals for engine control.

4,782,693

PROCESS FOR CHECKING AND/OR ADJUSTING AND/OR ASSEMBLING VALVES AND ARRANGEMENT AND DEVICE FOR CARRYING OUT THE PROCESS

Rainer Heyer, Mülheim; Günter Stiefeling, Heiligenhaus; Bernd Portmann, Kaarst, and Josef Otulak, Dormagen, all of Fed. Rep. of Germany, assignors to Pierburg Luftfahrtgeräte Union GmbH, Neuss, Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,291
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3624750
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A **12 Claims**



7. A device for testing and adjusting valves, especially electronically controlled injection valves for internal combustion engines, said device having a transportation system which conveys the valves arranged in pallets through a test line consisting of successive computer monitored and computer controlled test stands, characterized in that said device includes a first test block A comprising a first linear portal with a computer controlled articulated arm roboter for a run-in test of the valves, extending, transversely to a transportation direction of a pallet feeding device, between test stands aligned opposite each other, said device further including a second test block B and an intermediate storage in a transition region between the first test block A and the second test block B, the second test block B comprising a second linear portal with computer controlled articulated arm roboter, said second linear portal extending in the transportation direction of the pallet feeding device, transversely to the first linear portal, and test cells each having at least two test stands arranged in an operative region of the second linear portal, an articulated arm roboter being integrated into each test cell, said device also comprising a conveyor for conveying said pallets away from the test stand, wherein said first linear portal is coordinated by an overriding control with the test stands in said first test block A, as well as with said second linear portal in said second block B.

4,782,694

PRESSURE COMMUNICATING, FLUID ISOLATING INTERFACE

John R. Dennis, and Billy W. White, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 4, 1987, Ser. No. 21,835
Int. Cl.[4] E21B *47/06*
U.S. Cl. 73—155 **11 Claims**

1. An apparatus for communicating pressure from a bore hole fluid between a pressure inlet receiving the bore hole fluid and a pressure outlet while isolating the bore hole fluid from the pressure outlet, said apparatus comprising:
a housing having the pressure inlet and the pressure outlet defined therein and further having a hollow region defined therein between the pressure inlet and the pressure outlet;
a pressure communicating fluid received in said housing; and
means, disposed within said hollow region, for communicating the pressure from the bore hole fluid to said pressure

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communicating fluid and for providing a plurality of passageways through which the bore hole fluid and the pressure communicating fluid can flow in response to expansion and contraction of said pressure communicating fluid, said means including:

a filter disposed within said housing between the pressure inlet and said pressure communicating fluid, said filter having said plurality of passageways;



another filter disposed within said housing between said pressure communicating fluid and the pressure outlet; and

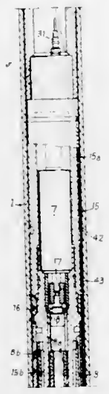
biasing means, disposed within said housing between said two-mentioned filters, for holding said filters spaced from each other so that a volume is defined between said filters, said volume having said pressure communicating fluid therein.

4,782,695

METHOD AND APPARATUS FOR MEASURING THE BUBBLE POINT OF OIL IN AN UNDERGROUND FORMATION

Bernard J. P. Glotin, Saint Maur, and Jacques P. Exbrayat, Milan, both of France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Sep. 22, 1986, Ser. No. 910,038
Claims priority, application France, Sep. 23, 1985, 85 14060
Int. Cl.[4] E21B *49/10*
U.S. Cl. 73—155 **9 Claims**



1. A method of measuring the bubble point of oil in an underground formation into which a well has been drilled, the method comprising the steps of:

lowering a tool down the well, said tool including a chamber whose volume is variable on command;

opening the chamber so that it fills with oil;

closing the chamber and causing its volume to vary while measuring the pressure P inside the chamber for each value of volume V imposed thereon, said variation of the volume being initially a reduction so as to make the pressure in the chamber greater than the ambient pressure of the well, and said reduction being followed by gradual increases;

establishing the curve P=f(V) from the measurement points obtained in this way; and

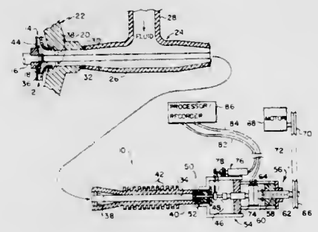
deducing the bubble point from said curve.

4,782,696

MEASURING AXIAL PUMP THRUST

Bernard P. Suchoza, McMurray, and Imre Becse, Washington, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 6, 1987, Ser. No. 23,097
Int. Cl.[4] G01L *5/12*
U.S. Cl. 73—168 **12 Claims**



1. An apparatus for measuring hydraulic axial thrust of a pump which is pumping a pressurized hot fluid, which thrust is measured by causing axial displacement of a rotating impeller mounted on a rotating shaft, where the pump includes a suction port located adjacent the impeller and axially upstream from a distal end of the rotating shaft, said apparatus comprising:

an impeller retainer bolt attached on the distal end of the rotating shaft for rotation therewith, said bolt including a distal end adjacent the suction port, the retainer bolt being engagable to cause axial displacement of the impeller;

an elongate rod which extends coaxially away from the rotating shaft, said rod including a distal end and a proximal end adjacent said distal end of said bolt;

a fluid connector means for fluidly connecting the fluid to the suction port, said connector means including a housing surrounding said distal end of said rod and a mounting means for mounting said distal end of said rod for reciprocating axial movement in said housing;

a force means extending through said housing which engages said distal end of said rod for forcing said rod coaxially and nonrotatably toward said bolt in order to cause axial displacement of the impeller;

a bearing means provided between said distal end of said bolt and said proximal end of said rod for frictionlessly transmitting the axial force exerted on said nonrotating rod to said rotating bolt; and

a measuring means for measuring the axial thrust force exerted by said force means on said rod in order to cause axial displacement of the impeller.

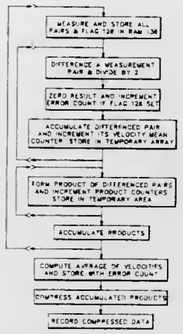
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4,782,697

ACOUSTIC CURRENT METER

Albert J. Williams, 3rd, P.O. Box 308, Woodshole, Mass. 02543

Filed Jul. 31, 1986, Ser. No. 892,182
Int. Cl.[4] G01W *1/02;* **G01F** *1/66*
U.S. Cl. 73—170 A **5 Claims**



1. An acoustic travel time current flow meter comprising:

means for making instantaneous measurements of turbulent vector flow in ocean currents near the ocean floor;

means for deriving compressed data therefrom for each of a series of averaging periods sufficient to reconstruct turbulent flow energy and Reynolds stress data; and

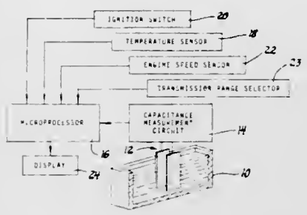
means for recording the compressed data for reconstruction after recovery of the meter from the ocean.

4,782,698

METHOD AND APPARATUS FOR MEASURING OIL LEVEL

Thomas H. Wilson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 29, 1986, Ser. No. 947,297
Int. Cl.[4] G01F *23/22;* **G01R** *27/26*
U.S. Cl. 73—304 C **9 Claims**



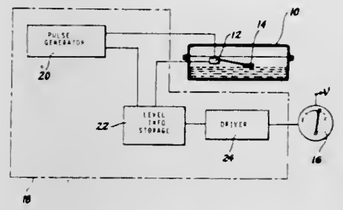
1. Means for measuring oil level in an automotive vehicle subject to change of oil level according to engine running conditions, comprising an oil reservoir containing oil the level of which is to be measured, a single capacitor in the reservoir positioned for immersion in said oil to a predictable amount during a reference measuring period and for immersion in said oil to a variable level during a level measuring period, and means controlled by engine running conditions for measuring the capacitances of said capacitor respectively during the reference and level measuring periods and for comparing the two capacitances to determine the level of oil in said reservoir.

4,782,699

PULSED FUEL LEVEL INDICATING SYSTEM

Eugene V. Gonze, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1986, Ser. No. 931,771
Int. Cl.[4] G01F *23/36*
U.S. Cl. 73—308 **1 Claim**



1. In a fuel level indicating system having a sending unit comprising a variable resistor subject to electrochemical corrosion and a display unit for indicating fuel level, an interface circuit for energizing the sending unit and driving the display unit comprising;

means coupled to the sending unit for generating a series of spaced current pulses having a low "on" duty cycle of the order of 0.1 microsecond and a frequency of occurrence of the order of one current pulse per minute to periodically energize the variable resistor of said sending unit to produce a fuel level output, whereby the electrochemical action on the sending unit is minimized; and

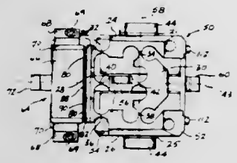
means responsive to the sending unit output and coupled to the display unit for generating a display drive signal.

4,782,700

FRAME ASSEMBLY AND DITHER DRIVE FOR A CORIOLIS RATE SENSOR

Rand H. Hulsing, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 17, 1987, Ser. No. 75,839
Int. Cl.[4] G01P *3/46*
U.S. Cl. 73—505 **14 Claims**



1. A frame for use in a Coriolis rate sensor including two accelerometers each having a preferred axis, comprising:

two accelerometer carriers disposed on opposite sides of the frame and adapted for mounting the two accelerometers with their preferred axes in alignment;

two substantially parallel flex members, each extending between the two accelerometer carriers at opposite sides thereof, the flex members each including a cross brace disposed at their center, adapted for attaching the frame to a supporting structure, and further including a plurality of flexures having parallel bending axes, the flexures being disposed at the corners of a parallelogram, with one of the flexures connecting two sides of the parallelogram at each corner and one of the flexures disposed at each end of the cross brace and connecting the centers of the two sides of the parallelogram, the flexures at each end of one of said two sides of each flex member being oriented to provide maxi-

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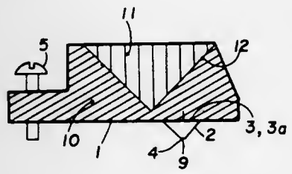
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mum stiffness on a line between the two carriers and disposed so that when the two accelerometers are mounted on the carriers, the centers of mass of each carrier and the accelerometer mounted thereon are aligned with the flexures at each end of said one side.

4,782,701
TRANSDUCER FOR MEASURING TRANSIENT TANGENTIAL MOTION

Thomas M. Proctor, Jr., 22901 Old Hundred Rd., Barnesville, Md. 20838

Filed Mar. 30, 1987, Ser. No. 31,870
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—587 **2 Claims**



1. A transducer that acts as a point receiver and has a broad band frequency response for elastic waves that manifest themselves as surface waves which are characterized by motion parallel to the surface of a solid body, comprising:

(a) a piezoelectric element having two parallel plane faces of contact, one being a rear face for attachment to a backing member and the other being a front face for coupling to the solid body, the area of the rear face being much larger than the front face, and the cross section of the piezoelectric element continuously decreasing to the front face, the two faces comprising sensing electrodes;

(b) a backing member comprising a first part attached to the piezoelectric element and having an acoustic impedance nearly equal to the acoustic impedance of the piezoelectric element, and a second part having an acoustic impedance similar to the first part but having higher ultrasonic attenuation, and the first part being much larger than the piezoelectric element and having an irregularly shaped reflecting surface to provide a wide range of reflection paths possessing a wide range in delay times;

(c) a leveling means for insuring that the front face of contact of the piezoelectric element to the solid body of interest makes parallel plane contact with that surface; and

(d) a means for coupling the transducer to the solid body of interest that will provide tight elastic and acoustic coupling between the small front face of the transducer element and the elastic medium of the solid body.

4,782,702
ULTRASONIC TESTING SYSTEM WITH VARIABLE ANGLE TRANSDUCER MOUNT

Bruce T. Boone, Cobb County; Steven Nafziger, Dekalb County; Thomas A. Rak, and John A. McMennamy, both of Cobb County, all of Ga., assignors to Movats Incorporated, Marietta, Ga.

Filed Jun. 10, 1987, Ser. No. 60,747
Int. Cl.[4] G01B *17/00*
U.S. Cl. 73—597 **6 Claims**

3. Method of searching for, detecting and locating an object within a casing, said method comprising the steps of:

mounting a transducer search unit for rotational and angular movement within a housing;

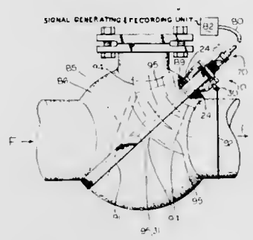
immersing the transmitter head of the search unit in a fluid couplant;

holding the housing stationary against the casing;

repeatedly transmitting a signal beam from the search unit into the casing in search of the object and receiving the reflected beam;

rotating and pivoting the search unit within the housing while repeatedly transmitting the signal beam;

detecting at least a segment of the object with the signal beam;



measuring the inclination angle between the centerline of the signal beam and the vertical axis;

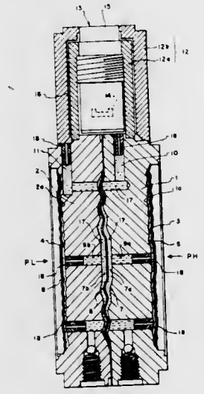
measuring the plane angle between the centerline of the signal beam and a reference Z-axis; and

calculating the location of the segment of the object relative to the transmitter head.

4,782,703
TEMPERATURE COMPENSATED PRESSURE SIGNAL GENERATOR

Takeshi Nishi, Yokohama, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1986, Ser. No. 934,240
Claims priority, application Japan, Nov. 29, 1985, 60-183826[U]
Int. Cl.[4] G01L *7/08, 9/00*
U.S. Cl. 73—708 **6 Claims**



1. A differential pressure signal generator comprising

a pressure sensor,

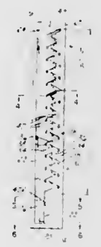
a pair of right and left pressure measuring chambers in right and left portions of a signal generator body to which high and low pressure-side measured pressures are applied through respective barrier diaphragms and

a center diaphragm means arranged to define right and left pressure measuring chambers with the center diaphragm means providing a pressure coupling to a fill fluid contacting said pressure sensor and having a larger thermal expansion coefficient than the right and left portions of the generator body, wherein said right and left portions are made of carbon steel and said center diaphragm means includes a center diaphragm made of austenitc stainless steel.

4,782,704
MERCURY MANOMETER

John Webb, Clearwater, Fla., assignor to G. S. Phillips, Lakeland, Fla.

Filed Dec. 16, 1986, Ser. No. 942,238
Int. Cl.[4] G01L *7/18, 9/00*
U.S. Cl. 73—749 **6 Claims**



1. A manometer containing an electrically conductive fluid, comprising in combination:

a base plate including a fluid reservoir fluidly connected to a fluid column with an input connected to said reservoir and an output connected to an output of said column;

a plurality of electrical contacts connected in electrical contact with said column;

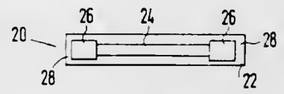
said column being alternatively vertically leftward and rightward configured to increase the effective length of said column relative to the overall length of said column to increase the resolution of the manometer, said alternating vertical leftward and rightward configuration of said column comprising alternating leftward column segments serially connected with rightward column segments at apex points to define an accordion shaped configuration; and

one of said electrical contacts is positioned at each of a plurality of said apex points.

4,782,705
STRAIN GAUGE

Horst Hoffmann, Pentling; Peter Kersten, Leonberg; Hans Volz, Schwieberdingen, and Ulrich Seyfried, Stuttgart, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 821,638, Jan. 23, 1986, abandoned. This application Jul. 10, 1987, Ser. No. 73,355
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1985, 3502008
Int. Cl.[4] G01L *1/00;* **H01L** *43/06*
U.S. Cl. 73—776 **7 Claims**



1. A planar Hall effect strain gauge comprising:

a substrate;

a two dimensional planar amorphous metal film disposed on said substrate, said film having an energetically favorable direction of magnetization in the plane of said planar film in first predetermined direction oriented approximately 45 degrees with respect to a second predetermined direction in the direction of a strain to be measured;

means for providing a driving current across and in the plane of said planar film in a third predetermined direction having a component in said first predetermined direction; and

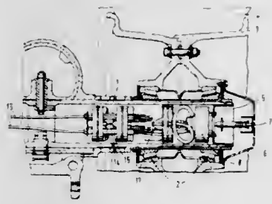
means for measuring a planar Hall effect voltage across and in the plane of said planar film in a fourth predetermined direction having a component perpendicular to said first predetermined direction.

whereby a strain applied to said gauge will result in a planar Hall effect voltage that may be measured by said measuring means.

4,782,706
HOLDING DEVICE FOR MOUNTING AN ELECTRIC TRANSDUCER

Horst Kister, Wehrheim; Jean-Francois Schwab, Schmitten; Michael Quenzer; Klaus Schult, both of Frankfurt am Main, and Hans-Norbert Patzig, Bad Homburg, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 9, 1987, Ser. No. 12,443
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1986, 3604030
Int. Cl.[4] G01B *7/24*
U.S. Cl. 73—779 **30 Claims**



1. In a holding device for mounting an electric transducer, particularly a shear-strain gauge, within a tubular structural part, particularly an airplane axle, the transducer including a coil part having two magnet coils spaced apart from each other and a disk part which has a disk which in normal position extends equidistantly between the magnet coils, the holding device comprising two holding rings arranged at a predetermined distance axially from each other, the coil part being secured to a first of the holding rings and the disk part being secured to a second of the holding rings, the improvement wherein

both of the holding rings are developed with radial resilience and with a smaller outside diameter than an inside diameter of the tubular structural part, and have radially protruding holding lugs which rest under initial spring tension against an inner wall of the tubular structural part; and wherein

each of the holding rings have support parts, the coil part being secured by a support part of said first holding ring and the disk part being secured by a support part of said second holding ring.

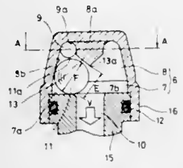
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4,782,707

APPARATUS FOR DETECTING FLOW AMOUNT OF FLUID IN PASSAGE

Shigeru Yamazaki, Kyoto; Hiroyuki Matsui, Osaka; Yoshitaka Morikawa, Yamatokoriyama, and Hideaki Konishi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 2, 1987, Ser. No. 115,316
Claims priority, application Japan, Nov. 5, 1986, 61-263409; Jan. 28, 1987, 62-17701
Int. Cl.[4] G01F *1/05*
U.S. Cl. 73--861.05 5 Claims



1. An apparatus for detecting a flow amount of a fluid, comprising:

a body;

a scroll chamber defined in said body, said scroll chamber having a circular horizontal cross section and having an inlet opening defined in a tangential direction of said scroll chamber and an outlet opening defined at a substantially center portion of a bottom surface of said scroll chamber, the bottom surface located downstream of the inlet opening, said fluid being introduced through said inlet opening and discharged from said outlet opening, said scroll chamber having a conical portion whose diameter is decreased toward an end of the chamber having the inlet opening and said inlet opening being defined in the tangential direction of said conical portion;

a protruding member provided on a substantially center portion of a top surface of said scroll chamber so as to be partially protruding downstream along the axis of said scroll chamber but positioned at a distance removed from the outlet opening;

a spheral member encased in said scroll chamber so as to turn about said protruding member and along a wall of said scroll chamber in response to introduction of said fluid through said inlet opening, said turning spheral member being brought into contact with the wall surface of said conical portion wherein an axial component of force on the spheral member due to the introduced fluid maintains the spheral member in stable motion along the bottom chamber surface and out of registry with the inlet opening; and

a detecting unit for detecting the number of turns of said spheral member to measure a flow amount of said fluid.

4,782,708

THERMOCOUPLE SENSORS

Charles R. Harrington, and Joseph P. Heremans, both of Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.

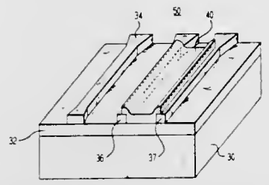
Filed Aug. 27, 1987, Ser. No. 90,012
Int. Cl.[4] G01F *1/68;* G01P *5/10, 5/18*
U.S. Cl. 73—861.05 8 Claims

1. A sensor for use in an air flow sensor system which comprises:

means forming a common substrate;

means forming a resistive strip heater of a first metal supported on said substrate and adapted to be supplied with heating power; and

means for forming a pair of thermocouple junctions including a pair of spaced junction elements of the first metal and, extending between the pair of junction elements and



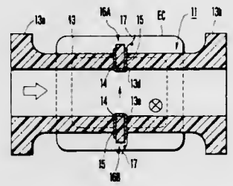
forming junctions therewith, a continuous film of $Bi_{1-x}S_{bx}$ where X=0.01 to 0.15.

4,782,709

ELECTROMAGNETIC FLOWMETER

Tsotomu Goto, Tokyo; Yoshiro Tanaka, Isehara, and Sakae Ishikawa, Yokohama, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1986, Ser. No. 891,005
Claims priority, application Japan, Aug. 19, 1985, 60-180423; Aug. 19, 1985, 60-180424; Aug. 19, 1985, 60-180425; Aug. 19, 1985, 60-125716[U]
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 22 Claims



1. An electromagnetic flowmeter comprising:

a ceramic main member having a hollow interior and an electrode aperture; and

an electrode directly secured within said electrode aperture and forming a shrink-fitted fluid tight seal therewith, said electrode comprising a ceramic core member having a first end exposed to said hollow interior and a second end and a conductive member fabricated from a refractory metal, said conductive member covering substantially all of said first end of said core member and extending toward said second end of said core member.

4,782,710

KARMAN VORTEX FLOW METER

Mutsumi Nagumo; Masashi Machida, and Michihiko Tsuruoka, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Apr. 27, 1987, Ser. No. 43,044
Claims priority, application Japan, Apr. 30, 1986, 61-98364; Jun. 10, 1986, 61-134455; Aug. 22, 1986, 61-195260
Int. Cl.[4] G01F *1/32*
U.S. Cl. 73—861.22 6 Claims

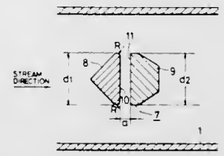
1. A Karman vortex flow meter for measuring the flow rate of a fluid by detecting the frequency of Karman vortex streets, said flow meter comprising:

a pipeline for leading the flow of the fluid therein;

vortex generating means provided in said pipeline for generating Karman vortices around both sides thereof;

vortex detecting means for detecting the frequency of the Karman vortices generated around said vortex generating means; and

said vortex generating means comprising an upstream columnar body having a substantially isosceles triangular cross section and a downstream columnar body having a substantially isosceles trapezoidal cross section, said downstream columnar body having a base surface which



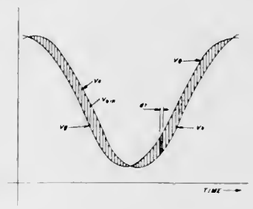
is substantially equal in width to a base surface of said upstream columnar body, each base surface of said upstream and downstream columnar bodies being spaced apart from the other by a predetermined distance in parallel to the other, said upstream columnar body having a pair of rounded longitudinal edges along the base surface thereof.

4,782,711

METHOD AND APPARATUS FOR MEASURING MASS FLOW

Wayne Pratt, Scottsdale, Ariz., assignor to K-Flow Division of Kane Steel Co., Inc., Millville, N.J.

Filed Oct. 14, 1986, Ser. No. 918,404
Int. Cl.[4] G01F *1/84*
U.S. Cl. 73—861.38 21 Claims



1. Method for determining the mass flow of a fluid flowing within a conduit, periodically oscillated transverse to the flow therein, comprising the steps of:

(a) receiving periodic signals representative of the movement of the conduit at discrete spaced locations on the conduit,

(b) determining the instantaneous amplitude difference between the signals at a plurality of discrete adjacent intervals,

(c) determining the product of the absolute value of the instantaneous amplitude difference and the width of the interval for each said interval,

(d) determining the sum of said products for each interval over a cycle of oscillation, and

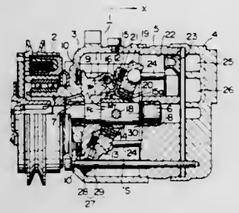
(e) generating from the sum a signal representative of mass flow.

4,782,712

VARIABLE DISPLACEMENT COMPRESSOR

Yukio Takahashi; Kenichi Kawashima; Masaru Ito, all of Katsuta; Atsushi Suginuma, Mito, and Kunihiko Takao, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 2, 1987, Ser. No. 92,140
Claims priority, application Japan, Sep. 3, 1986, 61-205880
Int. Cl.[4] F04B *1/16;* F16H *23/08*
U.S. Cl. 74—60 3 Claims



1. In a variable displacement compressor of the type that includes a drive shaft, a sleeve axially slidably mounted on said drive shaft, a swash plate tiltably connected to said sleeve through connecting pins and adapted to make an oscillatory rotation, a piston carrier mounted on said swash plate through bearing means, and pistons drivingly connected to said piston carrier and slidably received in cylinder bores so as to be reciprocatingly moved in said cylinder bores in response to the oscillatory rotation of said swash plate, the angle of tilt of said swash plate being variable by an axial movement of said sleeve and a movement of said swash plate the improvement comprising:

a driving plate fixed to said drive shaft and engaged with said swash plate so as to transmit the torque of said drive shaft to said swash plate;

a fulcrum pin connected between a pair of lugs projecting from a first surface of said swash plate causing said fulcrum pin to be moveable together with said swash plate; and

a lug projecting axially from a first side of said drive plate, said lug includes therein a cam groove in the form of a closed loop;

wherein said fulcrum pin is moved along said cam groove towards said drive shaft as the tilting angle of said swash plate is decreased.

4,782,713

INDUSTRIAL ROBOT SHAFT SUPPORTING MECHANISM

Nobutoshi Torii, Hachioji, and Ryo Nihei, Musashino, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00462, § 371 Date Jun. 11, 1987, § 102(e) Date Jun. 11, 1987, PCT Pub. No. WO87/01327, PCT Pub. Date Mar. 12, 1987
PCT Filed Sep. 10, 1986, Ser. No. 50,301
Claims priority, application Japan, Sep. 10, 1985, 60-20025
Int. Cl.[4] F16H *25/24;* B25J *11/00;* F16C *29/02*
U.S. Cl. 74—89.15 3 Claims

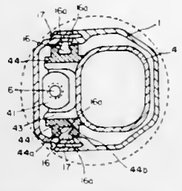
1. A shaft supporting mechanism of an industrial robot in which an arm is supported by a freely extendable support shaft inside a hollow post and a working plane of the arm is variably set, comprising:

(a) a drive mechanism positioned outside said support shaft for driving said support shaft to extend and retract the same vertically;

(b) a plurality of guide seats connected to said support shaft, arranged at positions substantially laterally symmetrical

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with respect to said drive mechanism and each having an opening; and



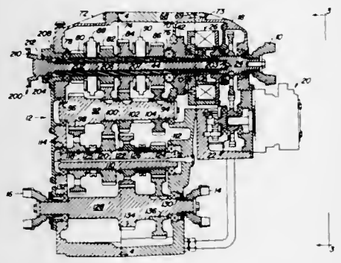
(c) a corresponding plurality of linear support guides engaging said guide seats and being attached to opposing inner wall portions of said post.

4,782,714

MULTI-RANGE SYNCHRONIZED TRANSMISSION AND HOUSING THEREFOR

John W. Schletzbaum, Hudson; Howard T. Ueble, Cedar Falls; David L. Mixdorf, Waterloo; Claire E. Rojohn, Denver, and Kendall D. Tjepkes, Dike, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 14, 1987, Ser. No. 38,187
Int. Cl.⁴ F16H *3/08, 5/06*
U.S. Cl. 74—360 **30 Claims**



1. A transmission for a power source comprising:

a first rotatable shaft rotatably drivable by the power source and having a first plurality of gears concentrically and rotatably mounted thereabout;

first means for selectively coupling any gear of said first plurality to said first shaft;

a second rotatable shaft parallel to said first shaft and having a second plurality of gears concentrically fixed thereto, each gear of said second plurality being drivable by a different gear of said first plurality;

a third rotatable shaft parallel to said first shaft and having a third and a fourth plurality of gears concentrically and rotatably mounted thereabout, each gear of said third plurality drivable by a different gear of said second plurality;

second means for selectively coupling any gear of said third plurality and any gear of said fourth plurality to said third shaft; and

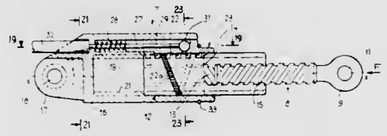
a fourth rotatable shaft parallel to said first shaft and having fifth plurality of gears concentrically fixed thereto, each gear of said fifth plurality being drivable by a different gear of said fourth plurality.

4,782,715

SYSTEM FOR LOCKING A LINEAR DEVICE FOR RAPIDLY ADJUSTING AND IMMOBILIZING A MOVABLE PART RELATIVE TO A FIXED PART

Claude Chevance, Savigny-sur-Orge, France, assignor to Rockwell-CIM, France

Filed Oct. 13, 1987, Ser. No. 107,696
Claims priority, application France, Oct. 13, 1986, 86 14179
Int. Cl.⁴ F16H *25/20*
U.S. Cl. 74—424.8 R **3 Claims**



1. A locking system in combination with a linear device for rapidly adjusting and immobilizing a movable part relative to a fixed part, said linear device comprising a housing, at least a pair of elements consisting of a screw and a nut which are screw threadedly interengaged and carried by the housing for cooperation with the fixed and movable parts, the helix angles of the screw threads of the screw and nut being sufficiently large to ensure that the efficiency of the conversion of translation of one of said pair of elements into rotation of the other of said pair of elements is slightly positive, said system being adapted to be capable of locking a rotary element of said pair of elements after adjustment of the position of the movable part of said parts, said system comprising an abutment in the housing, a locking cylinder portion axially movably mounted in the housing and provided with inner screw threads conjugate with outer screw threads on the nut, and complementary splines which are provided in said conjugate screw threads and are parallel to the screw, an elastically yieldable element for biasing the locking cylinder portion against said abutment in the housing and into a position in which the splines of the locking cylinder portion are engaged with the splines of the nut and lock the nut against rotation, said adjusting device being then at rest, a screw thread formed in the housing and similar to the screw threads of the outer nut, so that the nut is capable of rotating in said screw thread formed in the housing and travelling axially through the housing and in the screw threads of the spline of locking cylinder portion when the locking cylinder portion is not engaged with the spline of nut, and manual control means associated with the locking cylinder portion for axially displacing the locking cylinder portion disengaging the locking cylinder portion from the splines of the nut and thereby unlocking the nut as concerns rotation and permitting the nut to rotate in the screw thread of the housing.

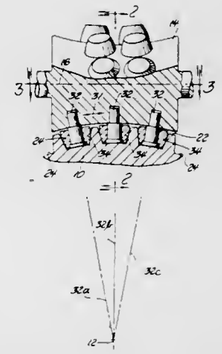
4,782,716

ROLLER BEARING GEAR SYSTEM

Erwin F'Geppert, Oakland County, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 15, 1982, Ser. No. 434,792
Int. Cl.⁴ F16H *1/16, 55/22*
U.S. Cl. 74—425 **1 Claim**

1. An anti-friction worm-wheel assembly comprising a relatively large diameter wheel having a first rotational axis, and a relatively small diameter worm having a second rotational axis extending at right angles to the first axis in non-intersecting relationship; said wheel having a circular peripheral edge surface (**22**) and two end faces (**18** and **20**); said wheel having regularly spaced grooves in its peripheral edge surface, acutely angled to the planes defined by the wheel end faces; said worm comprising a circular hourglass body and a plurality of similarly-dimensioned rollers projecting from said body for sequential reception in the aforementioned grooves, for thereby transmitting a driving force between the worm and wheel; each roller including post means mounting the roller for rotation around an imaginary axis that radiates from the worm rotational axis and is normal to the surface of the worm body; each roller comprising a roller sleeve freely rotatable on the associated post means; said worm body having an hourglass profile conforming to the edge surface contour of the wheel in a radial plane coincident with the worm body rotational axis; the peripheral edge surface of the wheel being concave in radial plane coincident with the wheel rotational axis; the concave edge surface on the wheel having a radius of curvature conforming to the worm body surface contour such that the wheel edge surface is uniformly spaced from the worm body surface at all points therealong within the axial length confines of the worm body; the rollers being arranged in a multi-row helical pattern extending around the worm body surface; the number



of rollers being sufficient to provide at least two complete helical rows of rollers around the worm body; the rollers being spaced closely together on the worm body; the spacing of the rollers within each helical row being slightly varied in accordance with the hourglass profile dimension of the worm body, the variation in roller spacing being such that the rollers are more widely spaced near the ends of the worm body and less widely spaced at the midpoint of the worm body, to maintain a constant pitch distance from one helical row of rollers to the next helical row of rollers; the aforementioned grooves in the wheel periphery being of uniform depth from one end face of the wheel to the other end face of the wheel, whereby each roller within the wheel plane has its entire axial dimension in a groove; the wheel having a sufficient axial dimension, measured between its two end faces, such that each groove in the wheel edge surface is capable of simultaneously accommodating at least three rollers in driving relationship.

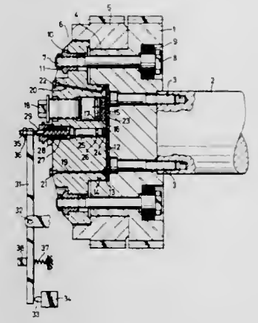
4,782,717

DEVICE FOR ADJUSTING A RELATIVE ROTATIONAL POSITION OF A GEARWHEEL AND A RING GEAR WHICH ARE COAXIALLY MOUNTED

Willi Becker, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 35,066
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611324
Int. Cl.⁴ B41F *13/24;* **F16H** *55/00*
U.S. Cl. 74—439 **10 Claims**

1. Device for releasably setting a relative rotational position of a gearwheel and a ring gear which are coaxially mounted, comprising means for applying a spring force to at least one of the gear wheel and the ring gear so as to form a positive connection between the gear wheel and ring gear, and decoupling means for counteracting said spring force-applying means so as to reduce the spring force applied thereby, said decoupling means including a pressurized hydraulic fluid, a fully sealed pressure chamber wherein said hydraulic fluid is received, said pressure chamber being defined by the gearwheel and a clamping disc which presses the ring gear under the action of said spring force against the gearwheel, and adjusting means disposed in said clamping disc for adjusting the pressure of said hydraulic fluid received in said pressure chamber.

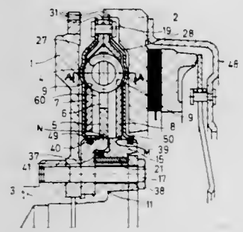


4,782,718

FLY-WHEEL UNIT FOR AN INTERNAL-COMBUSTION ENGINE

Franz Hartig, Dittelbrunn; Friedrich Kittel, Schweinfurt; Manfred Caspar, Oberwerrn; Bernhard Schierling, Kürnach; Norbert Pieper, Lengerich; Alfred Schraut, Waigolshausen; Werner Wiesner, and Wolfgang Grosspietsch, both of Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 29, 1986, Ser. No. 857,240
Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3515928
Int. Cl.⁴ F16F *15/10;* **F16D** *3/14*
U.S. Cl. 74—574 **6 Claims**



1. A fly-wheel unit for an internal combustion engine comprising a first fly-wheel (**1**) and a second fly-wheel (**2**) having a common rotational axis and being limitedly angularly movable with respect to each other about said rotational axis, said first fly-wheel (**1**) being provided with first fixing means for fixing it to a crank-shaft (**3**), said second fly-wheel (**2**) being provided with second fixing means for fixing a clutch unit (**48**) thereto, a resilient torque transmission unit being provided for torque transmission between said first fly-wheel (**1**) and said second fly-wheel (**2**), said torque transmission unit including a central disc (**5**) substantially coaxial with said fly-wheels (**1, 2**) and two cover plates (**7, 8**) on both axial sides of said central disc (**5**), at least one group of substantially axially aligned windows (**6, 9**) being provided in said central disc (**5**) and said

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cover plates (7, 8), respectively, said windows (6, 9) of said at least one group accommodating a torsion spring (4), namely a compressional spring having a spring axis substantially tangential with respect to said rotational axis and having end portions engaging substantially radially directed edges (6a, 9a) of said windows (6, 9), said central disc (5) and said cover plates (7, 8) with the compressional spring therebetween being in torque transmitting serial connection between said fly-wheels (1, 2) and fastened to respective ones of said fly-wheels (1, 2) for common rotation therewith,

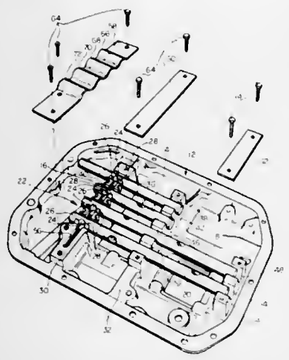
a liquid receiving chamber (60) being provided, said liquid receiving chamber (60) accommodating at least said torsion spring (4), said liquid receiving chamber (60) being at least partially filled with at least one of a lubricating or cooling liquid, said liquid receiving chamber (60) being axially confined by sealing plates (27,28) which are provided axially adjacent to said cover plates (7,8) on the sides thereof, which are remote from each other, said windows (9) in said cover plates (7,8) being open windows, said liquid receiving chamber (60) being confined in radially outward direction by said sealing plates (27,28), said sealing plates (27,28) and said cover plates (7,8) approaching each other radially outward of said torsion spring (4), said cover plates (7,8) sealingly engaging each other and said sealing plates (27,28) sealingly engaging respective cover plates (7,8).

4,782,719

SHIFTER HOUSING ASSEMBLY FOR MULTIPLE SPEED POWER TRANSMISSION

James A. Yarnell, Temperance, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed May 11, 1987, Ser. No. 48,150
Int. Cl.⁴ F16H *57/02;* **G05G** *5/10, 3/00, 13/00*
U.S. Cl. 74—606 R **19 Claims**



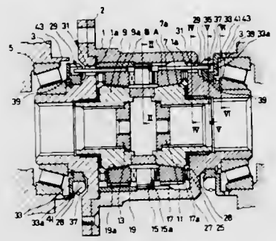
1. A shifter housing assembly for a multiple speed power transmission comprising: a housing, said housing being formed integrally in one piece from a first metallic material and having a plurality of circumferentially open notches formed therein, each of said notches having a longitudinal axis, the longitudinal axes of said notches being spaced apart and being disposed parallel to one another; a plurality of shifter rods, one of said plurality of shifter rods being mounted for shifting movement in each of said plurality of notches along said longitudinal axis of said each of said plurality of notches and engaging an as formed surface of said each of said plurality of notches; a circumferentially open interrupted notch extending transversely through said plurality of notches; interlock mechanism means slidably positioned in said interrupted notch and engaging each of said plurality of shifter rods; and a retainer formed from a second metallic material removably attached to said housing and retaining said plurality of shifter rods in said plurality of notches and said interlock mechanism means in said interrupted notch, said second metallic material being different than said first metallic material.

4,782,720

POWER TRANSMISSION UNIT

Masao Teraoka; Sakuo Kurihara, both of Sano, and Yukio Yuhashi, Kitaseitama, all of Japan, assignors to Tochigifujisangyo Kabushikigaisha, Japan

Continuation of Ser. No. 796,860, Nov. 12, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 90,414
Int. Cl.⁴ F16H *35/04;* **F16D** *43/04, 43/30*
U.S. Cl. 74—650 **5 Claims**



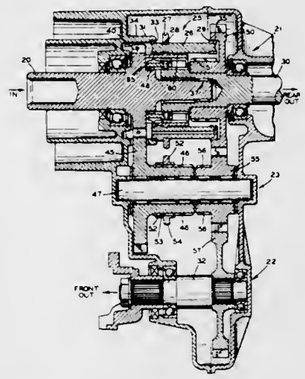
1. A power transmission apparatus comprising:
an input member for receiving a rotational input;
first and second output means disposed within and rotatably supported with respect to the input member; and
first and second clutch means each disposed within the input member and associated respectively with the first and second output means, said first and second clutch means being operable to connect the input member to the respective first and second output means when the angular velocity of the input member is greater than that of the respective associated first and second output means, and to release the connection between the input member and the respective first and second output means when the angular velocity of the input member is less than the angular velocity of the respective first and second output means; said first and second clutch means respectively comprising:
first and second rotatable clutch members axially shiftable into and out of frictional connection with the respective associated first and second output means; and
cam means for rotatably engaging and axially shifting the first and second clutch members, said cam means having first and second recessed cam surfaces respectively disposed in the first and second clutch members, and first and second projected cam surfaces respectively engageable with the first and second recessed cam surfaces; said apparatus further comprising:
brake means for applying a rotational frictional force to each of the first and second clutch members; and
a return spring means for respectively urging the first and second recessed cam surfaces towards the first and second projected cam surfaces.

4,782,721

VEHICLE GEAR ASSEMBLY FOR TORQUE TRANSFER TO TWO OR FOUR WHEELS

Wesley M. Bick, Sylvania, Ohio, assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 708,737, Mar. 6, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 913,332
Int. Cl.⁴ F16H *37/06*
U.S. Cl. 74—665 GA **14 Claims**



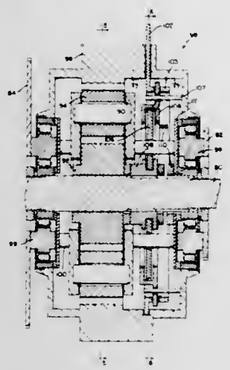
1. A gear assembly for selectively shifting a power driven vehicle to a two-wheel or a four-wheel drive mode comprising
a case for said gear assembly,
an input shaft for supply of driving power to said assembly,
a first output shaft for driving a first pair of wheels and a second output shaft for driving a second pair of wheels,
said input shaft and said first output shaft being arranged in abutting collinear relation with each other,
a gear set comprising three constant mesh gears including a first output gear mounted for free rotation on said first output shaft,
an intermediate gear in meshed relation with said first output gear and an intermediate shaft on which said intermediate gear is rotatably mounted and
a second output gear for said second wheels fixed to said second output shaft and having a meshed driven relation with said intermediate gear,
means for selectively connecting said input shaft in driving relation with said first output shaft to drive said first pair of wheels,
a synchronizer mounted for rotation concentrically with said first output shaft and for frictional engagement with the input shaft side of said freely rotatable first output gear,
means for selectively activating said synchronizer to establish such frictional engagement of the synchronizer with said first output gear to effect matching of rotational speeds between said first output gear and first output shaft,
means for positive connection of said first output gear and first output shaft for rotation in unison upon such matching of speeds and
shift control means for operating said means for selectively activating said synchronizer and for positive connection of said first output gear and first output shaft in said assembly corresponding to desired operating modes whereby the driving power of said input shaft can be selectively supplied to said first pair of wheels alone or to both of said pairs of wheels,
said means for connecting said input shaft directly with said first output shaft comprising an annular collar having internal splines,
said input shaft and first output shaft being axially aligned and having matching external splines with which the internal splines of said collar are slidably mateable whereby said collar can be selectively moved onto one of said shafts and alternately in bridging connecting relation between said shafts,
said annular collar comprising an internal collar having external splines and a concentric outer collar having internal splines meshed with said external splines, said internal collar having a locking member within an aperture therein for locking said internal collar to said output shaft in its bridging relation between said shafts, said outer collar being laterally moveable over said internal collar to hold said locking member in position to effect the locked relation between said shafts, said outer collar having an interior recess for receipt of said locking member to release said locked relation between shafts when said outer collar is moved to a position with said recess over said locking member.

4,782,722

BICYCLE DRIVE SYSTEM

George Powell, 5805 Fifth Ave., NE., Seattle, Wash. 98105

Filed Jul. 15, 1986, Ser. No. 886,282
Int. Cl.⁴ F16H *3/44*
U.S. Cl. 74—750 B **7 Claims**



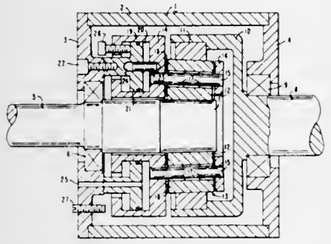
1. A bicycle transmission comprising:
a splined driving shaft,
first sprocket means selectively engaged through a first drive train with the shaft to provide a direct drive link,
a planetary gear set surrounding said driving shaft including a sun gear means selectively engaged with the splined shaft, at least one planet gear for rotating around said sun gear means, and a rigid annulus means in which the planet gear rotates within,
second sprocket means driven by the planetary gear set forming a second drive train,
a shiftable spur means to selectively engage the splined shaft with either the first or second drive train:
wherein, the second drive train becomes active only when the planet gear rotates within the rigid annulus means
wherein said at least one planet gear is mounted on a cage and the cage is connected to a first sprocket wheel, the first sprocket wheel forming said first sprocket means through said first drive train by a direct drive link with the driving shaft and the spur means, the first sprocket wheel forming said second sprocket means through said second drive train by the planetary gear set and said cage
wherein the cage is further connected to a second sprocket wheel, the second sprocket wheel providing a third sprocket means through a third drive train with the driving shaft to provide a direct drive link, the second

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sprocket wheel further providing a fourth sprocket means forming a fourth drive train through the planetary gear set.

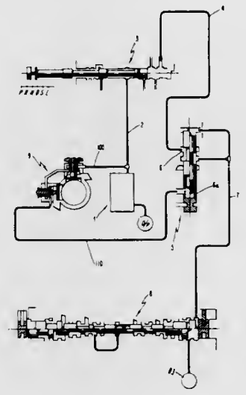
4,782,723
TRACTION ROLLER TRANSMISSION
Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.
Filed Nov. 2, 1987, Ser. No. 115,822
Int. Cl.[4] F16H *13/06, 13/10, 15/56, 57/10*
U.S. Cl. 74—798 **6 Claims**



1. A planetary type traction roller transmission comprising a housing having coaxial input and output shafts supported therein rotatably about a central transmission axis and disposed in said housing traction elements including a sun associated with one of said shafts, a traction ring concentric with, but spaced from, said sun and being mounted on the other of said shafts and motion transmitting planetary type traction rollers rotatably supported in the space between said sun and said traction ring, said sun, said traction rollers and said traction ring all having, with respect to their axes, somewhat conical traction surfaces and also being so disposed in said housing that the tangential axial lines of all said traction surfaces intersect in a point on the axis of said transmission, and said traction rollers being supported on an axially movable carrier having engaging means associated therewith for forcing it toward the other traction elements to provide for engagement forces with the traction elements for the transmission of motion therebetween, said engagement means having adjustable members associated therewith for limiting the engagement forces to a predetermined value corresponding to the largest torque to be transmitted through the transmission.

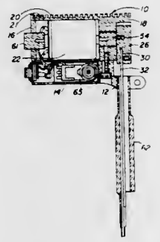
4,782,724
AUTOMATIC TRANSMISSION CONTROL SYSTEM INCORPORATING AN EXHAUST BRAKE
Choji Furusawa, Okazaki; Shigeki Goto, Toyota; Isamu Minemoto, Toyota, and Satoshi Maruchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan
Filed Sep. 29, 1986, Ser. No. 912,373
Claims priority, application Japan, Sep. 30, 1985, 60-216988
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—867 **2 Claims**

1. An automatic transmission for an automotive vehicle having a torque converter, a planetary gear mechanism receiving an output from the torque converter and including a brake actuated by servo hydraulic pressure to achieve low gear, and a hydraulic pressure circuit for supplying the hydraulic pressure that actuates the brake, said automatic transmission comprising:
- a regulator valve for providing line hydraulic pressure;
- a manual pump receiving the line hydraulic pressure from said regulator valve;
- a low-coast valve provided with the line hydraulic pressure by said manual pump for producing regulated low-coast hydraulic pressure;
- a 1-2 shift valve which receives the hydraulic pressure from said low-coast valve and which is shifted for supplying the hydraulic pressure to a chamber in the brake to actuate said brake; and



- a governor valve arranged between said regulator valve and said low-coast valve for receiving the line hydraulic pressure from said regulator valve and for supplying a valve chamber of said low-coast valve with governor hydraulic pressure, the hydraulic pressure supplied to said 1-2 shift valve taking on a value regulated by said governor valve, whereby the hydraulic pressure supplied to the chamber of said brake varies depending upon vehicle velocity.

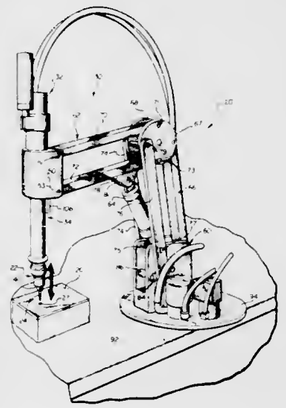
4,782,725
ARTICLE IDENTIFICATION DEVICE
Darwin Spaulding, Voorheesville, N.Y., assignor to Spaulding & Rogers Mfg., Inc., N.Y.
Filed Aug. 7, 1987, Ser. No. 83,700
Int. Cl.[4] B43K *5/00*
U.S. Cl. 81—9.22 **18 Claims**



1. An identification device for applying permanent identification ink to an article comprising:
- a housing having a slotted portion forming a track;
- a motor mounted within said housing;
- a needle support member mounted in said slotted portion of said housing for upward and downward reciprocating movement along said track, said needle support member having a needle receiving portion and having a transmission slot;

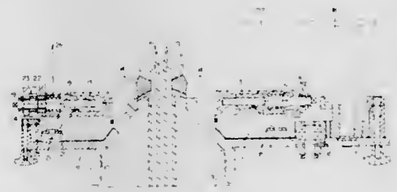
- a rotor rotatably mounted in said housing and operatively connected to said motor for rotation about a central axis;
- a connection pin mounted on said rotor and spaced apart from said rotor central axis so as to move in a circular path upon rotation of said rotor, said connection pin extending into said needle support member transmission slot so as to be engageable with said needle support member;
- a needle bar engageable with said needle support member; and,
- locking means connected to said needle support member for connecting and disconnecting said needle bar, said pin member causing said needle support member to reciprocate between an upper and lower position along said track upon circular motion of said pin member as said pin member engages said needle support member in said needle support member transmission slot.

4,782,726
LEAD SCREW DRIVER
Francis E. Ryder, Arab; Rowland W. Kanner; Donald W. Hunter, both of Guntersville, and Timothy R. White, Hanceville, all of Ala., assignors to Ryder Internation Corporation, Arab, Ala.
Filed Jan. 13, 1987, Ser. No. 2,729
Int. Cl.[4] B25B *29/00*
U.S. Cl. 81—57.4 **27 Claims**



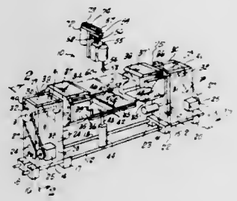
1. A lead screw driver system comprising:
- drive head means for engaging and driving a complementary driver head portion of a threaded fastener;
- releasably locking manipulator means for selectively positioning said drive head means and a fastener engaged therewith for alignment of the same for driving said fastener into a given location in a workpiece, and for releasably locking in place in the selected position;
- motor means for rotating said drive head;
- mounting means for operatively coupling said motor means to said drive head means;
- and lead screw means operatively coupled with said drive head means for advancing the drive head means at a given rate corresponding to the thread pitch of a fastener to be driven thereby so as to minimize stresses upon the material of the workpiece during the driving of said fastener.

4,782,727
PROCESS OF REPLACING A SLEEVE MOUNTED WITHIN A PIPE, AND DEVICES FOR CARRYING OUT THAT PROCESS
Alain Martin, Lyons, and Philippe Maillard, Marcy l'Etoile, both of France, assignors to Framatome & Cie., Courbevoie, France
Division of Ser. No. 709,270, Mar. 7, 1985, Pat. No. 4,682,725.
This application Apr. 16, 1987, Ser. No. 39,200
Int. Cl.[4] B23B *5/00*
U.S. Cl. 82—4 C **2 Claims**



1. Device for performing a cross cutting operation with removal of material of a pipe having an axis of symmetry, said device comprising:
- (a) a frame in two parts having an axis of symmetry and fixable around the external wall of the pipe in such a way that the axis of the frame coincides with the axis of the pipe;
- (b) a rotating element in two parts, each carried by one part of the frame, rotatable about the axis of the frame;
- (c) at least one support for a cross cutting tool carried by the rotating element but movable in translation towards the axis of the frame;
- (d) means for turning the rotating element about the axis of the frame;
- (e) means for moving the tool support towards the axis of the frame; and
- (f) means for stopping the movement of the tool support towards the axis of the frame just before the tool can break into an interior space of the pipe;
- said means for stopping being constituted by an indicator fixed to the tool support, a detector of the position of the indicator, fixed to the frame, and means for controlling the stopping of the movement of the tool support when the indicator reaches a predetermined position.

4,782,728
AUTOMATIC CUTTER FOR BLOW MOLDED PLASTIC OBJECTS
Alan J. Thatcher, 9182 E. Russell St., La Habra, Calif. 90631
Filed Apr. 16, 1987, Ser. No. 39,462
Int. Cl.[4] B26D *1/06, 3/16, 5/20*
U.S. Cl. 82—47 **14 Claims**



1. An automatic cutter for separating a blow molded plastic object into two parts, said cutter and object comprising:

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a blow molded, hollow, plastic object having a first portion and a second portion, said first and second portions being attached to each other at a web lying along a cutting line which lies in a single plane and which web is noncircular in the plane of the cutting line;

a cutter machine frame:

a first portion grasping arm affixed to said cutter machine frame, said first portion grasping arm holding said first portion of the hollow, plastic object, said first portion grasping arm including means for rotating said arm and said plastic object about an axis of rotation which is within said plastic object and perpendicular to the plane of the cutting line of the hollow, plastic object;

means for cutting said plastic object including a cutter, said means for cutting being mounted on said frame, said means for cutting including means for moving said cutter upwardly and downwardly into the plane of the cutting line to an extent that the cutter of the means for cutting pierces the web at the cutting line, said means for moving said cutter upwardly and downwardly actively drives the cutter upwardly and downwardly toward and away from the rotational axis of the object so that the cutter maintains cutting contact with the web as the hollow, plastic object is rotated about the axis of rotation of the grasping arms; and

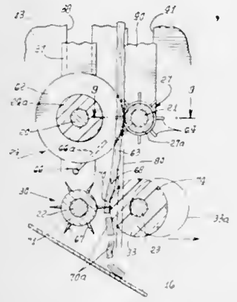
means for moving the first portion grasping arm into and out of contact with said blow molded plastic object.

4,782,729

ANIMAL FIBER CUTTING MACHINE

Ernest R. Mathot, 1429 Virginia Ave., Unit "O", Baldwin Park, Calif. 91706

Filed Sep. 11, 1987, Ser. No. 95,105
Int. Cl.[4] B26D *1/62, 3/18*
U.S. Cl. 83—408 **10 Claims**



1. In a machine for cutting tough, fibrous animal tissue into pieces, the combination comprising

(a) a frame,

(b) slicer means including slicers carried by the frame to rotate for slicing the tissue into elongated strands fed along parallel paths of widths determined by spacing of the slicers, said slicer means comprising an elongated shaft, and said slicers comprise parallel slicer discs which are spaced apart along the length of the shaft,

(c) rotary cutter means including cutters carried by the frame to rotate and intercept the strands fed along said paths, and for cutting the strands crosswise thereof and at intervals predetermined by rotary spacing of said cutters, thereby to form said pieces having predetermined sizes, said rotary cutter means comprising an elongated shaft carrying said cutters which are spaced apart circumferentially of the shaft, said cutters extending helically along and about an axis defined by the cutter means shaft,

(d) and including a back-up roller spaced from and parallel to the cutter means shaft so that tips defined by the helical cutters intercept a cylinder defined by the outer surfaces of the back-up roller; the back-up roller having helical grooves that receive said cutter tips as the roller and cutter means shaft rotate, and including gearing operatively connected with the roller and cutter means shafts to control synchronized rotation thereof,

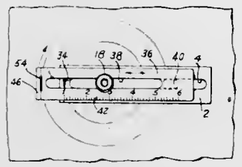
(e) and including slot roller means having slots positioned to receive outer portions of the slicer discs as the discs are rotated, and also having peripheral teeth to engage to drive the strands, said teeth projecting between said slicer discs.

4,782,730

STRADDLING GASKET CUTTER

John Picone, 195 Quebec Rd., Island Park, N.Y. 11558, and Thomas W. Timmins, Jr., 166 Lake Ave., Staten Island, N.Y. 10303

Filed Nov. 26, 1986, Ser. No. 935,387
Int. Cl.[4] B26D *5/00;* **B27B** *3/00, 5/18;* **B26B** *3/00*
U.S. Cl. 83—745 **5 Claims**



1. A gasket cutting assembly for cutting an inner diameter and an outer diameter of a gasket simultaneously, comprising:

(a) a rectangular bar base having a first longitudinal slot therein;

(b) means for securing a first cutting blade at one end of said rectangular base;

(c) an L-shaped adapter arm having a second longitudinal slot therein parallel to said first longitudinal slot;

(d) means for securing a second cutting blade at said L-shaped end of said adapter arm;

(e) means mounted in said first and second longitudinal slots for adjusting the distance between said first blade and said second blade comprising a bolt having a first threaded end, a second end with two flat, parallel sides and an adjustable thumb screw on said threaded end;

(f) a recess adapted to receive a pivot point in said second end of said bolt;

(g) said rectangular base having a third longitudinal slot therein parallel to said first slot and wider than said first slot and adapted to guide said two flat, parallel sides; and

(h) a key comprising two flat, parallel sides mounted on an end opposite said L-shaped end of said adapter arm and adapted to slide in said first longitudinal slot, each of said sides of said key being in mating relationship with inside walls of said first longitudinal slot whereby said L-shaped adapter arm remains in aligned parallel relation with said rectangular base.

4,782,731

BRUSH CUTTING BLADE

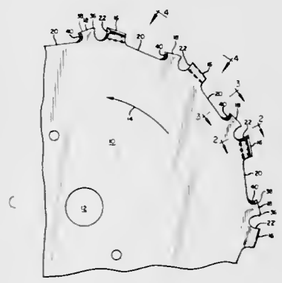
Kent L. Huntington, Molalla, Oreg., assignor to Blount, Inc., Portland, Oreg.

Filed Aug. 7, 1987, Ser. No. 83,578
Int. Cl.[4] B27B *33/08;* **A01D** *34/52*
U.S. Cl. 83—837 **10 Claims**

1. A brush cutting blade comprising;

a circular saw blade body establishing a body plane defining a radial direction and have a periphery defined by a repeating sequence of a primary cutting tooth having a leading cutting edge, and an appendage forming a depth gauge peak preceding and spaced from the cutting edge of the primary cutting tooth, said leading cutting edge establishing the radially outermost cutting point of said saw blade body,

one of said primary cutting teeth extended laterally outwardly and then back over the body plane to form a curved portion terminating at the body plane, and another of said primary cutting teeth extended laterally outwardly from the opposite side of the body plane and then back over the body plane to form a curved portion terminating



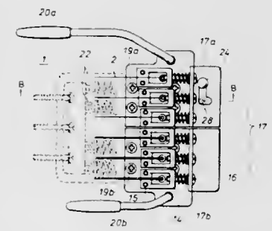
at the body plane, the leading edge of said curved portions being shaped into cutting edges and each defining an outwardly directed cutting edge from the outermost lateral point to a point over the blade body for slitter type cutting action, said point over said blade body providing said radially outermost cutting point and said slitter type cutting action forming a substantially parabolically curved kerf that is wider than the blade body to reduce binding and pinching.

4,782,732

SPLIT TREMOLO DEVICE

Hisashi Kato; Daiji Okai, both of Tokyo; Nobuyuki Yoshiba, Saitama, and Yukihisa Yuasa, Chiba, all of Japan, assignors to Kabushiki Kaisha Arai Gakkiten, Japan

Filed Mar. 21, 1988, Ser. No. 170,798
Claims priority, application Japan, Mar. 23, 1987, 62-68643
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **6 Claims**



1. A tremolo device for a stringed musical instrument, comprising:

a string support assembly pivotally mounted on the musical instrument body;

a plurality of bridge means mounted on the string support assembly;

spring means for biasing the string support assembly in opposition to the tension of the strings; and

handle means for imparting vibrato effects to the spring support assembly;

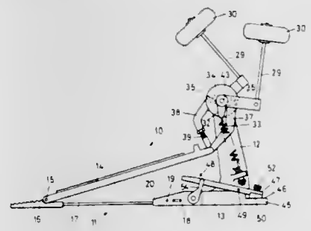
the string support assembly comprising at least one individually pivoted segments, each carrying at least one of the bridge means, one of the spring means, and one of the handle means.

4,782,733

DOUBLE DRUM BEATER

Michael H. Herring, 3 Melrose Street, Modbury Heights, Australia 5092

Filed Nov. 24, 1987, Ser. No. 124,837
Claims priority, application Australia, Nov. 24, 1986, PH9127
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—422 R **8 Claims**



1. A double drum beater comprising

a base frame, a post upstanding from the base frame near a first end thereof, a foot pedal overlying the base frame, pivot means joining an end of the foot pedal to the base frame near a second end thereof for pivotal movement about a transverse axis,

a transverse pivot bar carried by the post, a pair of spaced beater arms carried by the pivot bar for oscillatory movement about the transverse axis thereof, beater balls on respective said beater arms,

coupling means coupling the foot pedal to the beater arms in such a way that they oscillate at the same frequency but out of phase with each other upon depression of the foot pedal,

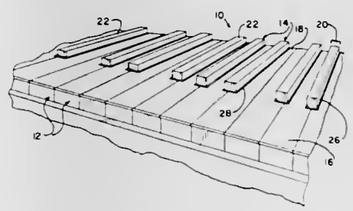
and a return spring co-operable between the beater arms and the base frame to effect reverse oscillation upon release of the foot pedal, such that a foot pedal depression drives one beater ball in a drum beating direction and the return spring drives the other beater in that direction upon release of the foot pedal.

4,782,734

KEYBOARD KEYS FOR LARGER HANDS

Erma L. Rose, 3300 Green Ridge Rd., NW., Roanoke, Va. 24019

Filed Aug. 25, 1987, Ser. No. 89,086
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—423 R **2 Claims**



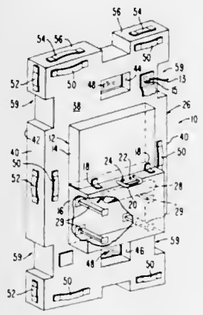
1. A keyboard for a piano or the like comprising;

a plurality of adjacent white and black keys each having a planar top surface, said white keys having a full-width front portion joined to a narrower rearmost shank portion,

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said black keys of a shorter length and disposed intermediate said white key shank portions, vertically disposed side walls on said black keys,
said white and black keys each including a keybase and defining a minimal spacing therebetween,
said black keys each having akey bottom comprising a horizontally disposed flange atop its respective keybase and extending laterally from said black key side walls,
said black key flanges disposed co-planar with said white key shank portions with said keys in a normal at-rest position, and
said black key top surfaces each defining a width substantially less than that of said top surfaces of said white key shank portions whereby,
an enlarged lateral spacing is provided between adjacent ones of said black keys to facilitate striking of said white key shank portions therebetween without requiring modification of said key base.

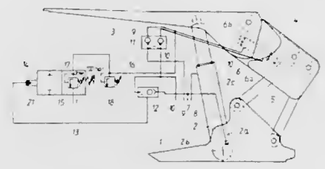
4,782,735
BULLETPROOF PROTECTION APPARATUS
Paul Mui, and Rosa Y. M. Tso, both of 3218 Quintara St., San Francisco, Calif. 94116
Filed Aug. 12, 1987, Ser. No. 85,433
Int. Cl.[4] F41H *5/12*
U.S. Cl. 89—36.07 **16 Claims**



1. Bulletproof protection apparatus comprising:
a case capable of being opened and closed; a collapsible, inflatable shield; means coupling the shield to the case, the shield being of a size sufficient to allow the shield to be contained in the case in its collapsed condition when the case is closed; and means carried by the case for inflating the shield when the case is opened.

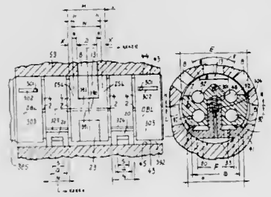
4,782,736
PRESSURE-CONTROL VALVE
Karl Krieger, Wuppertal, and Werner Reinelt, Bochum, both of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany
Filed Feb. 4, 1986, Ser. No. 825,736
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1985, 3504553
Int. Cl.[4] F01B *1/00*
U.S. Cl. 91—170 MP **6 Claims**

1. A pressure-control valve, especially for use in an hydraulic, walking, mine roof support, comprising a valve housing an hydraulically-loadable control piston in said housing, an operating spring acting on said control piston against the force of the hydraulic load, a valve-closure member in said valve housing arranged to be displaceable through a predetermined displacement distance, and a valve-closure spring acting on said valve closure member to determine the opening pressure of the valve, said valve-closure member being adapted to seal off a pressure chamber of a connected hydraulic working cylinder from a low-pressure conduit, wherein the valve-closure member is securable in the closure position by the hydraulically-loaded control piston with the operating force of the operating spring being adjustable in such a manner that the control pis-



ton, in the case of a drop in the pressure of the pressurised fluid loading it below a predetermined minimum pressure, is returnable into a position in which the valve-closure member is displaceable out of the closure position into an opening position by the pressure present in the pressure chamber of the working cylinder during operation of the latter.

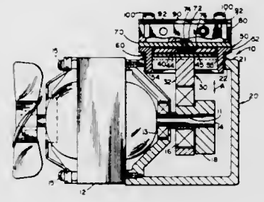
4,782,737
CONTROL PINTLE INCLUDING A THRUST MEMBER FOR A RADIAL FLOW DEVICE
Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan
Continuation-in-part of Ser. No. 575,620, Jan. 31, 1984, abandoned, which is a division of Ser. No. 264,772, May 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 911,246, May 31, 1978, abandoned, and Ser. No. 910,809, May 30, 1978, abandoned. This application Dec. 23, 1986, Ser. No. 945,635
Int. Cl.[4] F01B *13/06*
U.S. Cl. 91—484 **19 Claims**



1. An assembly of two bodies, comprising, in combination, a first body, forming a rotor, provided with a bore whereby said body forms a cylindrical inner face around the axis of said bore with said inner face bordering said bore and forming a cylindrical face of a radius around said axis while said second body forms a control pintle which is located in said bore of said first body;
wherein said second body is provided with a thrust chamber which extends perpendicular to said axis into a portion of said second body and has a passage means communicated to a source of fluid under high pressure,
wherein said thrust chamber has a cylindrical configuration and on one of its axial ends a slot which extends perpendicular to the axis of said cylindrical configuration of said thrust chamber whereby it extends perpendicular to said axis of said bore in said first body, and,
wherein a thrust member is provided in said thrust chamber and in said slot with an inner portion of said thrust body closely fitting in and inserted into said cylindrical configuration of said thrust chamber while the outer portion of

said thrust member is inserted into said slot and forms on its outer end a seal face portion of a radius equal to said radius around said axis of said bore and said seal face of said thrust member is pressed against a portion of said inner face when fluid under high pressure is led by said source of fluid under high pressure into said thrust chamber,
whereby said control pintle is continuously pressed into an eccentric location relative to said rotor.

4,782,738
COMPRESSOR WITH ADJUSTABLE HEAD CLEARANCE
Floyd G. Jackson, Baroda, and Michael L. Beidler, St. Joseph, both of Mich., assignors to Gast Manufacturing Corporation, Benton Harbor, Mich.
Filed Sep. 18, 1985, Ser. No. 777,232
Int. Cl.[4] F01B *31/14*
U.S. Cl. 92—60.5 **18 Claims**

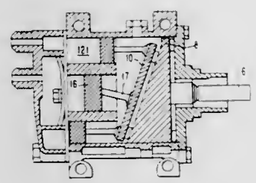


1. A pneumatic compressor comprising:
a housing for receiving a prime mover, said housing including an opening for receiving a cylinder;
a cylinder extending into said housing for receiving a piston, said cylinder having flange means overlaying the periphery of said opening;
a piston mounted within said cylinder;
deformable spacer means positioned between said flange means and said housing for adjustment during assembly to provide a predetermined output flow rate and pressure characteristic for said compressor;
head means for enclosing said cylinder; and
means for securing said head mdans to said housing.

4,782,739
WOBBLE PLATE TYPE COMPRESSOR WITH ROTATION-PREVENTING MECHANISM
Yoshiyuki Saito, Honjo, Japan, assignor to Sanden Corporation, Gunma, Japan
Filed Jul. 16, 1987, Ser. No. 74,145
Claims priority, application Japan, Jul. 16, 1986, 61-107984[U]
Int. Cl.[4] F01B *3/02;* F04B *27/08*
U.S. Cl. 92—71 **3 Claims**

1. In a refrigerant compressor including a compressor housing having a cylinder block provided with a plurality of cylinders and a crank chamber adjacent said cylinder block; reciprocative pistons slidably fitted within each of said cylinders; a drive shaft supported within a front end plate which is mounted on one end portion of said compressor housing; a cam rotor mounted on an inner end of said drive shaft and having an inclined end surface; a wobble plate disposed in proximity with said inclined end surface and having a centered first bevel gear; a second bevel gear supported on said cylinder block and coupled with said first bevel gear so as to nutatably support said wobble plate; and rods connecting respective pistons to said wobble plate; the improvement comprising:
said first bevel gear being permanently located with respect to said wobble plate so that said connecting rods are inclined relative to the axis of said cylinders to provide a torque transmitted to said wobble plate in a direction





opposite to a rotational drag created in said wobble plate by said cam rotor.

4,782,740
PISTON AND SHAFT ASSEMBLY FOR AN END-OF-CAR CUSHIONING UNIT
Donald R. Fagin, LaGrange Park; Howard E. Tonn, Lombard, both of Ill., and Clebern W. Sigley, Orange Park, Fla., assignors to Co-Ordinated Railway Services, Inc., Downers Grove, Ill.
Continuation of Ser. No. 867,761, May 28, 1986, Pat. No. 4,719,686. This application Jul. 17, 1987, Ser. No. 74,627
Int. Cl.[4] B23P *11/02;* F16J *1/00*
U.S. Cl. 92—255 **5 Claims**



1. A piston and shaft assembly for an end-of-car cushioning device, comprising:
a shaft having a central length of a first diameter, a threaded portion of a second outside diameter larger than the first diameter, and a stop of a third diameter larger than the second diameter;
a piston having a bore through its center of a diameter greater than the diameter of the central length of the shaft, threads formed on the surface of the bore, and a stop formed in one end of the bore, adapted to mate with the stop of the shaft, the threads being adapted to mate with the threads of the shaft such that the shaft threads provide a positive abutment to axial movement of the piston along the shaft in one direction while the shaft stop provides a positive abutment to axial movement of the piston along the shaft in the other direction.

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4,782,741

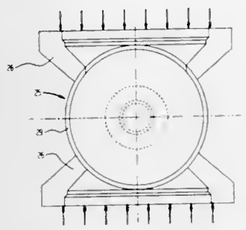
VANELESS ROTARY AIRLOCK VALVE

James W. Sigmon, 2415 Knollwood Rd., Charlotte, N.C. 28211

Continuation-in-part of Ser. No. 882,351, Jul. 7, 1986, abandoned, and a continuation-in-part of Ser. No. 570,586, Jan. 13, 1984, abandoned. This application Mar. 5, 1987, Ser. No. 22,050

Int. Cl.[4] B65G 47/82

U.S. Cl. 92—261 18 Claims



1. A rotary airlock valve for providing a fluid tight transition of process stream material from a first to a second zone, comprising:

a. a casing communicating with first and second zones;

b. a vaneless cylindrical rotor having a compartment therein for receiving and containing process stream material from said first zone;

c. a first pair of sealing mean providing sealing engagement of the rotor and the casing in surrounding relation to the first zone from the second zone;

d. a second pair of sealing means for providing sealing engagement of the rotor and the casing in surrounding relation to the second zone from the first zone; and

e. means for rotating the rotor between a first position wherein process stream material may be received into the compartment from the first zone when said first zone is sealed from said second zone and a second position wherein process stream material may be discharged from the compartment into the second zone when said second zone is sealed from said first zone.

4,782,742

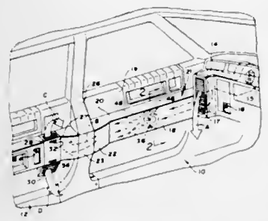
AIR DISTRIBUTION SYSTEM FOR THE OCCUPANT COMPARTMENT OF AUTOMOTIVE VEHICLES

Edward W. Yott, Fraser, Mich., and Robert C. Mellin, Centerville, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1987, Ser. No. 91,019

Int. Cl.[4] B60H 1/26

U.S. Cl. 98—2.03 4 Claims



2. In an air distributing system for the occupant compartment of a vehicle, said compartment having discrete front and rear seating areas, front duct work for said front seating area including primary blower means for forcing air through said front duct work, a rearwardly extending duct operatively connected to said front duct work for the passage of air from said front duct work to said rear seating area, said rearward extending duct having a generally rectilinear cross section and having an outlet in said rear seating area, variable output speed motor means mounted externally with respect to said rearwardly extending duct work, transverse fan means operatively mounted within said rearwardly extending duct and rotatably driven by said motor means to thereby control the quantity of air flowing to said rear compartment.

4,782,743

RIDGE TILE WITH VENTILATING APERTURE

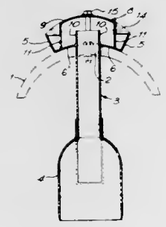
Geoffrey C. Quinnell, 32 The Gill, Pembury, Kent, England

Filed Feb. 19, 1987, Ser. No. 16,342

Claims priority, application United Kingdom, Feb. 19, 1986, 8604054

Int. Cl.[4] F24F 7/02

U.S. Cl. 98—42.21 16 Claims



12. A ridge tile assembly comprising:

(a) a ridge tile having an upwardly directed longitudinal ventilating aperture therein,

(b) a cap disposed over said aperture, said cap comprising a top portion covering said ventilating aperture and depending side walls on either side of said ventilating aperture,

(c) means defining laterally directed ventilating slots in lower portions of said depending side walls,

(d) longitudinally extending baffle members adjacent said side walls shielding each said lower portion, and

(e) fins extending between said cap and said baffle members.

4,782,744

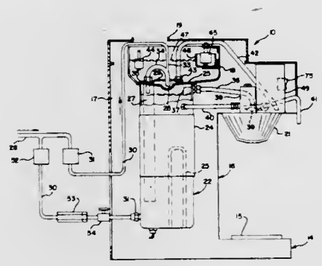
BEVERAGE BREWER AND HOT WATER DISPENSER

George R. Bunn, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Jan. 20, 1988, Ser. No. 145,908

Int. Cl.[4] A47J 31/40

U.S. Cl. 99—307 7 Claims



1. In a combination beverage brewer means and hot water dispenser means each said means being connectible to a source of cold water under pressure and said brewer having a hot water sprayhead and said dispenser having a hot water faucet each being independently connected in hot water receiving relationship to a common hot water reservoir tank, comprising:

a first cold water inlet line connected at its inlet end to a pressurized source of cold water with its discharge end having cold water delivering relationship with the lower portion of said hot water reservoir tank, a first hot water line connecting said sprayhead with the upper portion of said tank, a first solenoid operated valve disposed in said first cold water inlet line, first manual switch means for energizing and opening said first solenoid operated valve, and automatically actuated means for deenergizing said first solenoid operated valve after a predetermined quantity of cold water has flowed through said first cold water inlet line; and

a second cold water inlet line connected at its inlet end to a pressurized source of cold water with its discharge end having cold water delivering relationship with the lower portion of said hot water reservoir tank, a second solenoid operated valve disposed in said second cold water inlet line, a second hot water line interconnecting the upper portion of said hot water reservoir tank and said hot water faucet, a third solenoid operated valve disposed in said second hot water line, and second manual switch means for manually simultaneously energizing and deenergizing said second and third solenoid operating valves.

4,782,745

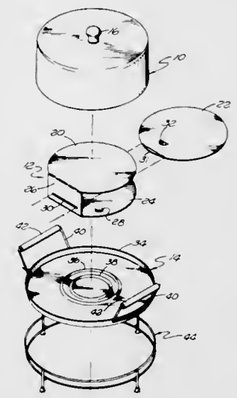
TORTILLA WARMER ASSEMBLY

Benjamin B. George, Jr., Santa Ana, Calif., assignor to Tivoli Industries, Inc., Santa Ana, Calif.

Filed Apr. 13, 1984, Ser. No. 599,920

Int. Cl.[4] A47J 39/00, 36/34

U.S. Cl. 99—483 2 Claims



1. An assembly for warming tortillas and the like comprising:

a substantially flat base means having a circular configuration with a continuous raiser outer rim at its periphery and an upper surface with an interior configuration defining shallow liquid reservoir areas consisting of concentric circular areas within raised circular ridges surrounding the center of said base means;

a cylindrical base cover means having a lower open end shaped to fit snugly within the raised outer rim of the base means and having vertically extending side portions and an upper closed end to form a cylindrically shaped sealed enclosure above the base; and

a holder structure defining at least one substantially horizontal plate on which tortillas may be stacked to be disposed substantially horizontal above said upper surface of said base means within said enclosure.

4,782,746

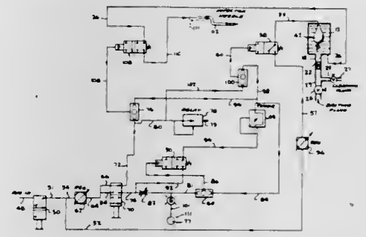
MEANS FOR PUMPING BASTING FLUID

Paul L. Niccolls, 1300 S. Roach St., California, Mo. 65018

Filed Apr. 22, 1987, Ser. No. 41,325

Int. Cl.[4] A23L 1/32, 3/34

U.S. Cl. 99—532 17 Claims



1. Means for dispensing a quantity of fluid comprising:

(a) a pressure tight container including a fluid inlet opening, a fluid outlet opening and a gas inlet;

(b) a fluid discharge line having opposed first and second ends and including fluid injection means, said first end being connected to said fluid outlet opening;

(c) a source of pressurized gas;

(d) a gas line having opposed first and second ends connected respectively to said source of pressurized gas and to said gas inlet;

(e) pressure actuated gas valve means having a control signal inlet port and first and second ports connected in said gas line for normally venting said pressure tight container and closing said gas line to prevent gas from flowing from said source of pressurized gas into said pressure tight container but including pressure responsive control means communicating with said control signal inlet port for opening said gas line to permit pressurized gas from said source of pressurized gas to flow to said pressure tight container;

(g) a fluid control valve mounted in said fluid discharge line for normally blocking fluid flow through said fluid discharge line but additionally including a control signal input port and a pressure responsive control means, said pressure responsive control means communicating with said control signal input port for opening said fluid discharge line to permit fluid to be discharged from the pressure tight container through said fluid discharge line and said fluid injection means in response to an input pressure signal; and

(h) control means operable for cyclically actuating said gas valve means and said fluid control valve to cause pressurized gas to enter said pressure tight container to force fluid from said container into said fluid discharge line and to cause said gas valve means to vent gas from said pressurized container to permit liquid to flow into said container following which the cycle is repeated.

4,782,747

ROLL PRESS FOR RECOVERING LIQUID FROM PULP

Daniel D. Unger, 330 W. Sixth St., and Gregory T. Unger, 309 W. Sixth St., both of Boyertown, Pa. 19512

Filed Dec. 11, 1986, Ser. No. 940,630

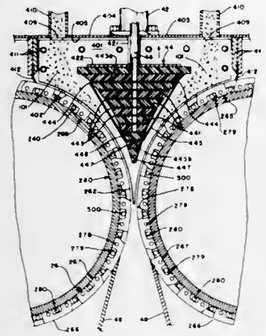
Int. Cl.[4] B30B 5/02, 9/22

U.S. Cl. 100—37 11 Claims

1. An apparatus for extracting liquid from a liquid bearing material such as mash, sludge or pulp bearing slurry comprising:

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a. a pair of counter-rotation rolls with solid circumferences disposed longitudinally and snugly in a chamber for rotation about a horizontal axis and spaced from each other to form a nip, each roll having circumferentially disposed thereon snugly a cylindrical grid member, the grid member comprising a multiplicity of interbolted upstanding partially overlapping leaves which are aligned in rows perpendicular to the roll axis, each leaf acting as a spacer between adjacent leaves to form slots of a width equal to the leaf's thickness which slots communicate with axially extending channels defined by the grid's inner surface, the grid being interbolted to circular end flanges disposed on the roll ends having a diameter larger than the roll and



passageways bored through the end flanges connecting to the channels;

b. rotating means to counter-rotate the rolls;

c. a roof to fit sealingly over the chamber with orifice means to introduce liquid bearing material over the top of the rolls;

d. prismatically shaped platen means with rectangular faces reciprocating through the roof to a region between the rolls, said means having expandable bladders disposed on its faces;

e. inflation means to inflate the bladders toward the grid members of the rolls; and

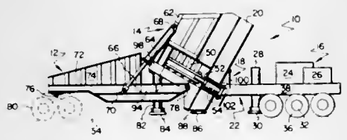
f. conduit means for applying negative pressure to the channels.

4,782,748

MOBILE SCRAP SHEAR MACHINE

Thomas R. Betsinger, 407 Fourth Ave., South, Onalaska, Wis. 54650

Filed Nov. 20, 1987, Ser. No. 123,307
Int. Cl.[4] B30B *9/32, 15/30*
U.S. Cl. 100—95 **23 Claims**



1. A scrap shear machine comprising:

shear head assembly means, said shear head assembly means including an inclined scrap processing bed;

chute means having a scrap feed bed and being positionable between a first position wherein said feed bed is essentially coplanar with said processing bed and a second position wherein said feed bed is lowered out of said coplanar relationship with said processing bed;

means for positioning said chute means between said first position and said second position;

means for transportably supporting the weight of said shear head assembly means; and

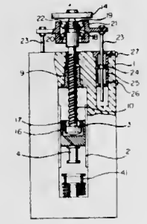
means substantially independent of said means for transportably supporting said shear head assembly means, for directly supporting the weights of both said shear head assembly means and said chute means when said chute means is in said first position.

4,782,749

SCREW PRESS WITH AN ACTUATOR

Shigeo Iwasaki; Hiroshi Haguchi, and Kengo Ujihara, all of Okayama, Japan, assignors to Kabushiki Kaisha Mitsuishi Fukai Tekkosho, Okayama, Japan

Filed Aug. 1, 1986, Ser. No. 891,913
Claims priority, application Japan, Aug. 5, 1985, 60-171092; Aug. 5, 1985, 60-171093
Int. Cl.[4] B30B *1/18*
U.S. Cl. 100—271 **2 Claims**



1. A screw press comprising:

a frame;

a female screw fixed to said frame;

a screw spindle being threadably engaged with said female screw to be movable up and down, said screw spindle being provided with a flywheel at an upper end;

a ram being slidably mounted in said frame under said screw spindle, said ram being provided with a punch at a lower end;

an actuator for producing an axial thrust in a direction parallel to an axial direction of said screw spindle provided in said frame, said screw spindle being rotatably driven when moved up and down by said actuator; and

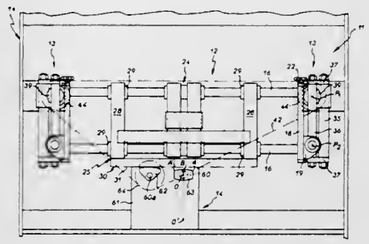
a driving holder in which said screw spindle is rotatably supported by a bearing while not axially movable in said bearing, said driving holder being connected with said actuator to transmit said axial thrust produced by said actuator to said screw spindle so that said screw spindle is axially moved, said flywheel being exclusively rotatably driven by said screw spindle connected with said female screw when said ram moves downward, said flywheel having a force of inertia accumulated during the rotation of said flywheel, said force of inertia being applied as an impact to said punch through said screw spindle and said ram when said punch abuts a die and said ram is substantially stopped in a downward movement.

4,782,750

PRINTING MACHINE FOR ARTICLES WITH NONCIRCULAR CONVEX SURFACES

Gilles Marette, Coulommiers, France, assignor to Societe d'Exploitation des Machines Dubuit, Noisy-le-Grand, France

Filed Aug. 17, 1987, Ser. No. 85,712
Claims priority, application France, Aug. 18, 1986, 86 11800
Int. Cl.[4] B41F *17/22*
U.S. Cl. 101—39 **12 Claims**



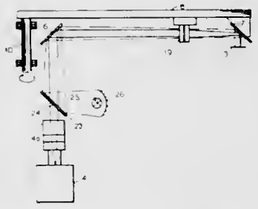
1. A printing machine for printing on at least one noncircular, convex surface area of a three dimensional object, said printing machine comprising a mobile assembly adapted to carry a flat printing means having a general plane, means for reciprocating said printing means in a printing stroke across said area, means for pivoting the object about a fixed position rotation axis during printing such that the area remains substantially in the general plane of the printing means, mechanical means connected to said mobile assembly for transmitting movement to said printing means transversely to the general plane of said printing means and selectively towards and away from the rotation axis during printing to compensate for the noncircular surface area of the object.

4,782,751

SILK-SCREEN PRINTING APPARATUS WITH OPTICAL READING DEVICE FOR REGISTRATION

Fabio Colapinto, Milan, Italy, assignor to Argon Industrie Meccaniche S.R.L., Milan, Italy

Filed Apr. 16, 1987, Ser. No. 39,606
Claims priority, application Italy, Feb. 20, 1987, 20889 A/87
Int. Cl.[4] H04N *7/22;* **B41L** *13/00*
U.S. Cl. 101—126 **19 Claims**



1. A registration-mark detector for a silk-screen printing apparatus having a printing plane in which an object to be printed, having at least one registration mark, can be positioned, said detector comprising:

means defining a path for said object to permit said object to be positioned in said printing plane;

a framework disposed along said path;

a video camera substantially stationarily fixed to said framework;

an arm mounted on said framework for swinging movement between a position in which said arm lies alongside said object and a position in which said arm overhangs said object; and

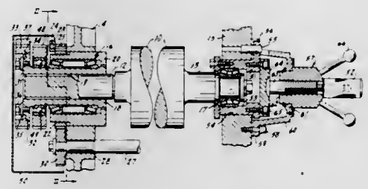
optical means including a plurality of reflective surfaces including at least one reflective surface on said arm for deriving an optical image of the registration mark of said object and transmitting said optical image to said camera when said arm is positioned over said object.

4,782,752

CONTROL DEVICE FOR CIRCUMFERENTIAL AND LATERAL ADJUSTMENT OF PRINTING CYLINDER

Gordon Etchell, Downers Grove, Ill., assignor to Pathfinder Graphic Associates Inc., Justice, Ill.

Filed Jun. 22, 1987, Ser. No. 64,865
Int. Cl.[4] B41F *13/14*
U.S. Cl. 101—248 **9 Claims**



1. In a rotating printing press having a support frame, a helical drive gear and a mating driven helical gear, a rotating plate cylinder having a drive side journal fixed on one end and an operating side journal fixed on the opposite end, a device for adjusting the circumferential and lateral displacement of the plate cylinder comprising:

(a) drive side bearing means mounted to said support frame for rotatably supporting the drive side journal;

(b) said drive side bearing means including a cylindrical inner sleeve;

(c) single retaining means for prohibiting circumferential movement and limiting lateral movement of said drive side bearing means;

(d) said cylindrical inner sleeve rotatably coupled but slidably laterally coupled to the drive side journal and rotatably coupled to the driven helical gear;

(e) circumferential adjustment means for laterally moving said drive side bearing means within the lateral limits defined by said single retaining means;

(f) means for operating said circumferential adjustment means;

(g) means for mounting said operating side journal rotatably but slidably mounted to the support frame;

(h) independent adjusting means independent of said circumferential adjusting means for laterally adjusting the position of said operating side journal;

(i) whereby said drive side journal slides laterally, during such lateral adjustment, with respect to said driven helical gear and does not effect the relative positions of said helical drive gear and said helical driven gear.

4,782,753

PRINTING COUPLE FOR NEWSPAPER AND PERIODICAL PRINTING

Hans-Bernhard Bolza-Schunemann, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,459
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3237686
Int. Cl.[4] B41F *11/00*
U.S. Cl. 101—363 **7 Claims**

1. A switchable printing couple adapted for being selectively

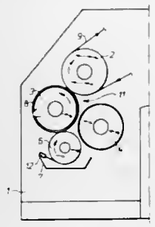
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switched between two printing modes with either direct inking of a soft printing plate or indirect inking of a hard printing plate, said printing couple comprising:

a counter pressure cylinder shiftably secured to spaced side frames of a printing unit and adapted to receive covers of selectable hardness which are securable to a peripheral portion of said counter pressure cylinder;

a plate cylinder having printing plate clamping means and adapted to selectively carry a hard or a soft printing plate secured to a surface thereof and cooperating with said counter pressure cylinder to print a web passing therebetween;

at least one plate inking cylinder having a resilient surface and being adjustably positionable in said side frames and adapted to be engagable with said plate cylinder when said plate cylinder carries said hard printing plate and being disengagable from said plate cylinder when said plate cylinder carries said soft printing plate;



a hard screen roller adjustably positionable in said side frames and adapted to selectively directly engage said plate cylinder when said plate cylinder carries said soft printing plate or to engage said at least one plate inking cylinder having a resilient surface when said plate cylinder carries said hard printing plate, the direction of rotation of said hard screen roller being reversed when said printing couple is switched between the two printing modes; and

an ink fountain having no ink keys and into which said screen roller dips, said ink fountain supplying ink to the surface of said screen roller for transfer selectively directly to said soft printing plate or indirectly through said at least one resilient surfaced plate inking cylinder to said hard printing plate carried by said plate cylinder to print said web.

4,782,754

MECHANISM HAVING INK RESERVOIR WITH ELECTRODES FOR INK MONITORING IN INK PRINTER DEVICES

Dietmar Poblig, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

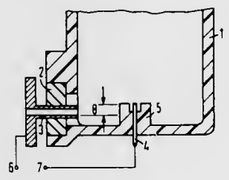
Filed Dec. 15, 1986, Ser. No. 941,862

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607576

Int. Cl.⁴ B41F *31/02;* **G05D** *9/00*

U.S. Cl. 101—364 **2 Claims**

1. A mechanism for ink monitoring by acquiring the level-dependent change of resistance between two electrodes in ink printer devices wherein a hollow needle penetrating a sealing element is provided for the connection between an ink reservoir and an ink supply system, this hollow needle simultaneously forming a first electrode, comprising the improvement wherein the sealing element and hollow needle are arranged in a side wall of the ink reservoir and a second electrode is a metal needle which is conducted through a floor part of the ink reservoir and is arranged in an insulating ring formed by shaped portions of the floor drawn up toward the inside of the reservoir, and an upper edge of the insulating ring is at a higher



level than a lowest point of the hollow needle penetrating the sealing element.

4,782,755

PROCESS FOR TRANSFERRING A SHEET OF PAPER FROM A TABLE TO A PRINT CYLINDER IN A PRINTING MACHINE, AND AN OSCILLATING GRIPPER UNIT FOR EFFECTING THIS PROCESS.

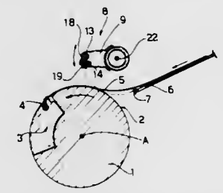
Carlo Grua, Turin, Italy, assignor to Nebiolo Macchine S.p.A., San Mauro Torinese, Italy

Filed Apr. 28, 1987, Ser. No. 43,441

Claims priority, application Italy, Apr. 30, 1986, 67357 A/86

Int. Cl.⁴ B41F *21/10;* **B65H** *5/10*

U.S. Cl. 101—409 **6 Claims**



1. In an oscillating gripper unit for a printing machine, of the type operable to transfer a sheet of paper from a table to the surface of a rotatable cylinder having conveying grippers for said sheet and an axis of rotation, said oscillating gripper unit including a rocking support element which is mounted for rotation about an axis of oscillation for performing respective forward and return strokes between said table and said cylinder along an angular arc of predetermined magnitude, said rocking support element carrying a gripper member and a gripper foot, said gripper member being mounted on a first control shaft rotatably mounted on said rocking support element, said gripper member and said gripper foot cooperating to grip said sheet during the forward stroke of said rocking support element, the improvement wherein the axis of oscillation of said rocking support element is maintained at a predetermined distance from the axis of rotation of said cylinder, said gripper foot is angularly fixed to a second control shaft in an eccentric position with respect to the axis of said second control shaft on the side remote from said first control shaft, and said oscillating gripper unit further comprises means for rotating said second control shaft relative to said rocking support element.

4,782,756

PRINTING PRESS ROLLER INK REMOVER

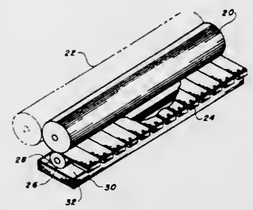
Paul C. Howard, 10006 Karmont Ave., South Gate, Calif. 90280

PCT No. PCT/US86/00893, § 371 Date Nov. 3, 1987, § 102(e) Date Nov. 3, 1987, PCT Pub. No. WO87/06528, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 28, 1986, Ser. No. 133,108

Int. Cl.⁴ B41F *35/04*

U.S. Cl. 101—425 **10 Claims**



1. A printing ink removing apparatus for lithographic printing presses and letter presses comprising:

(a) a solid ink transfer roller contiguously engaging and rotated by an ink roller on said printing press, conveying a portion of ink therefrom;

(b) a plurality of movable ink scraping blades having a sharp edge tangentially engaging the surface of said transfer roller at its lowest point in such a manner as to selectively remove ink from the exterior when rotated thereupon, for cleaning purposes and controlling color density;

(c) an ink collector roller intimately adjacent to the joint of engagement said ink scraping blades with said transfer rollers and directly beneath said transfer roller to collect surplus ink;

(d) a doctor blade tangentially engaging the entire length of said ink collector roller with said doctor blade continuously removing ink from the surface of the collector roller; and,

(e) an ink collecting pan positioned under said doctor blade to accumulate the ink removed from said printing press.

4,782,757

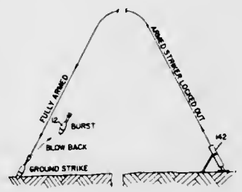
FUSE ASSEMBLY FOR MILITARY PROJECTILE

Harry R. Carter, Moscow, Pa., assignor to Carter Research and Development Technological Systems Incorporated, Moscow, Pa.

Filed Sep. 11, 1987, Ser. No. 95,151

Int. Cl.⁴ F42B *13/24;* **F42C** *15/04, 15/34*

U.S. Cl. 102—394 **31 Claims**



1. A fuse assembly for use in a projectile such as a mortar shell or the like containing a main explosive charge, said assembly comprising body means having a front nose section and a rear section adapted to be connected to a projectile, means releasably connecting said nose and rear sections together, chamber means within said body means adapted to house a blowback charge means, detonating means mounted in said nose section in operative association with said chamber means, stop means mounted within said body means for movement from a safe unarmed position in which it prevents said detonating means from causing detonation of said blowback charge means to an armed position following propulsion of the projectile wherein it permits said detonating means to cause detonation of said blowback charge means, whereby upon impact of said nose section with a target said detonating means causes detonation of the blowback charge means to release said rear section from said nose section and throw said rear section and projectile back up into the air to produce a near surface burst of the projectile.

4,782,758

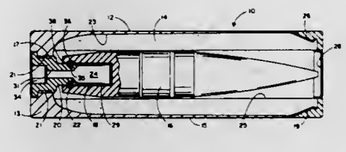
AMMUNITION ROUND

William J. Washburn, San Clemente, Calif., assignor to AeroJet-General Corporation, La Jolla, Calif.

Continuation of Ser. No. 825,429, Feb. 3, 1986, abandoned. This application Dec. 16, 1986, Ser. No. 942,553

Int. Cl.⁴ F42B *5/02*

U.S. Cl. 102—434 **4 Claims**



1. An improved telescoped ammunition round having a projectile and a cartridge case, said cartridge case having a main propellant charge forming an axial bore for receiving said projectile, the projectile having a forward end and an aft end; the improvement comprising:

an imperforate booster tube having (1) a closed first end affixed to said cartridge case adjacent the aft end of said projectile and extending toward said projectile within said axial bore to an open second end, and (2) a first annular recess formed in an external surface of said booster,

said projectile being contained within said cartridge case and having an axial recess extending from its aft end for receiving said second end of said booster tube, said axial recess including an internal conical portion, a cylindrical portion and a second annular recess interfacing with said conical portion and said cylindrical portion therebetween, where said internal conical portion extends from said projectile aft end toward said second annular recess,

said booster tube including a frangible retaining means for releasably coupling said projectile to said booster tube when each of said respective first and second annular recesses are aligned each to the other, said frangible retaining means being contained at least partially within each of said annular recesses, said booster tube further having means for generating ignition gases within said projectile recess for propelling said projectile away from said booster tube within said bore whereby said gases are exposed to said main propellant charge at said second end of said booster tube for igniting said main propellant charge after predetermined motion of said projectile.

4,782,759

DUAL SEALED COMPOSITE WAD STRUCTURE

Walter J. Hawk, P.O. Box 191, Jefferson City, Tenn. 37760

Filed Jun. 30, 1987, Ser. No. 68,990

Int. Cl.⁴ F42B *7/08*

U.S. Cl. 102—450 **14 Claims**

1. A dual sealed composite wad structure for use within a cartridge for a firearm which produces less shot deformation and provides a more accurate, dense shot cloud, such composite wad structures comprising:

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a shot column member for receiving shot of said cartridge, said shot column member having a base for substantially conforming with an interior surface of said cartridge to form a gas seal therebetween, and at least two pliable petal-shaped elements extending from said base, said petal-shaped elements configured whereby edges thereof closely approach to form a substantially continuous shot column wall when within said cartridge but substantially diverge when exterior said cartridge;

a post section having at least two pliable post members each having a first end integrally joined to said base of said shot column, and a further end, said post members each being provided with a crimped portion intermediate said first and further ends whereby said post members bend upon application of compression force to opposite ends and
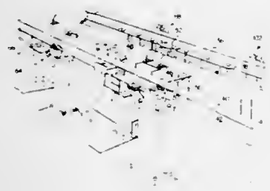


resume initial configuration upon removal of said compressive force; and

a powder chamber gas seal member, said powder chamber gas seal member provided with an upper surface integrally joined to, said further ends of said post members, and an inverted cup-shaped lower surface defining an outer rim, said outer rim of said powder chamber gas seal having a diameter about 0.94 to about 0.97 times a diameter of said base of said shot column member, said powder chamber gas seal defining a peripheral cylindrical surface to be proximate to but spaced from said inner surface of said cartridge when within said cartridge to define a gap between said peripheral and said inner surface, said gap providing initial partial escape of gases from below said powder chamber gas seal into said post section.

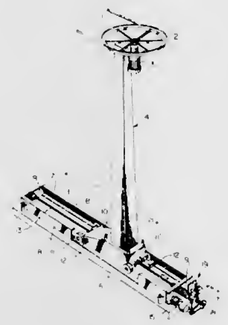
4,782,760
VEHICLE PRECISION LOCATION ASSEMBLY
Peter Rohrbach, Bath, and Per E. Lindquist, Easton, both of Pa., assignors to S I Handling Systems, Inc., Easton, Pa.
Filed Aug. 14, 1986, Ser. No. 896,908
Int. Cl.[4] B61K *7/00*
U.S. Cl. 104—166 **11 Claims**





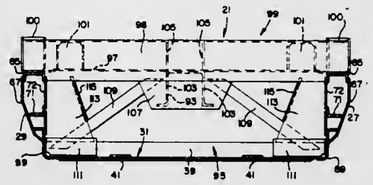
1. A vehicle precision location assembly comprising a frame supporting a drive tube between spaced tracks, motor means coupled to said tube for rotating said tube about its longitudinal axis, means for elevating the vehicle so that support wheels thereon are spaced from the track, and centering means for centering the vehicle in direction transverse to the direction of travel of the vehicle as it is being elevated, said centering means including a first shoe mounted on the vehicle, said first shoe having front and rear ends and inclined planar surfaces which converge toward one of said ends of the shoe and intersect along an edge inclined with respect to the horizontal, and a pair of rollers having their axes of rotation canted with respect to each other such that said rollers contact both said inclined planar surfaces whereby the vehicle is centered without any play in said transverse direction as said rollers wear.

4,782,761
CABLE TENSIONING DEVICE FOR SKI LIFTS OR AERIAL CABLEWAYS
Bengt Asberg, Stockholm, Sweden, assignor to Liftbyggarna AB, Ostersund, Sweden
PCT No. PCT/SE86/00338, § 371 Date Apr. 3, 1987, § 102(e) Date Apr. 3, 1987, PCT Pub. No. WO87/01080, PCT Pub. Date Feb. 26, 1987
PCT Filed Jul. 16, 1986, Ser. No. 45,857
Claims priority, application Sweden, Aug. 15, 1985, 8503818
Int. Cl.[4] B61B *12/06*
U.S. Cl. 104—196 **3 Claims**



1. Cable tensioning device for ski lifts or aerial cableways of the kind comprising an endless transporting cable extending between two rotatable wheels mounted on posts or carriers, at least one of the wheels being movable by the fact that its associated carrier is slideably movable backwards and forwards in relation to a fixed, elongated foundation in order to keep the cable properly tensioned independently of variations of length in said cable characterized in that said carrier by means of at least one nut device is connected to a screw and that a tension sensing device is associated to a power source for causing a rotating relative movement between the screw and the nut device in order to, when a change in tension occurs, actuate the power source and to effect said relative movement between the screw and the nut device and in this way move the carrier with its associated wheel a distance along the foundation corresponding to the actual tensional change.

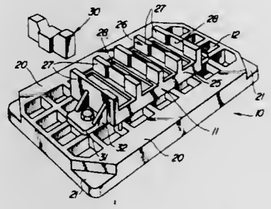
4,782,762
WELL CAR END GIRDER ARRANGEMENT
Bradford Johnstone, Flossmoor, Ill.; Phillip G. Przybylinski, Schererville, and Eugene R. Tylisz, Michigan City, both of Ind., assignors to Trinity Industries, Inc., Hammond, Ind.
Filed May 7, 1987, Ser. No. 47,981
Int. Cl.[4] B61F *1/10*
U.S. Cl. 137—355 **17 Claims**



1. A railway car comprising:
first and second longitudinally opposite end structures;
a pair of laterally spaced side structures connecting the end structures;
a floor structure supported between the side structures and between the end structures;
a pair of truck means each supporting a respective end structure;
the first end structure comprising;
a center sill having an inward portion;
a girder member fixedly connected with the inward portion of the center sill and extending transversely with respect thereto, said girder member being fixedly connected with the side structures;
the floor structure including a cross beam member supported below the girder member of the end structure;
each of the side structures including a longitudinally extending lower portion fixedly connected with the cross beam member;
first and second floor supported members each being connected with the cross beam member adjacent respective lower portions of the side structures;
said first and second floor support members extending generally upwardly and inwardly of the car from said cross beam member and being fixedly connected with said girder member adjacent said center sill for securing said cross beam member to the end structure sand for beaming loads in the lower portions of the side structures upwardly and inwardly to be supported by the center sill; and
said center sill being a stub center sill; and
a top plate member fixedly connected with the center sill and with the side structures for beaming longitudinal loads therebetween.

4,782,763
MOLDED PLASTIC PALLET SYSTEM
James S. Sallouum, Oxford, Mich., assignor to Creative Techniques, Inc., Auburn Hills, Mich.
Filed Jun. 17, 1987, Ser. No. 63,028
Int. Cl.[4] B65D *19/18*
U.S. Cl. 108—55.3 **13 Claims**

1. A pallet system for supporting said conveying articles, comprising:
a pallet base formed of a normally horizontally arranged, integral plastic molded grid made of spaced apart, elongated, longitudinal strips and transverse strips that intersect and are integral at their junctions to form grid openings;
said strips each being of a substantially uniform, generally rectangular cross-section whose vertical height is substantially greater than it horizontal width, and said
said strips having upper edges that define an upper carrying surface of the pallet base and having lower edges with the lower edges of some of the strips being coplanar to form a planar skid-like lower support surface of the pallet base;
said transverse strips being of a lesser height than at least some of the longitudinal strips, and with the lower edges of the transverse strips being arranged generally coplanar to form recesses with substantially coplanar lower, fastener engaging surfaces recessed relative to the lower support surface of pallet base;
an article holding nest having an upper portion shaped to receive and hold an article, and a lower surface shaped to rest upon the pallet base upper carrying surface;
said nest having a number of spaced apart, downward projections that are formed on its lower surface and are arranged to overlap and fit into the grid openings for engaging an adjacent strip portion and thereby, accurately positioning the nest upon the pallet base;



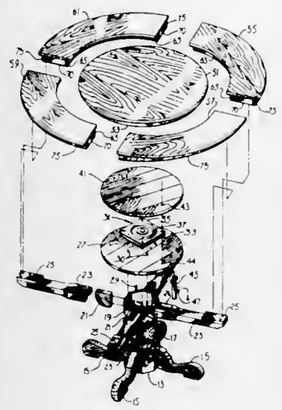
and releasable fastening means mechanically interlocking the nest to the pallet base, said fastener means adapted to include a generally T-shaped body having a stem extending through a pallet base opening and an integral head engaging the fastener engaging surface of a pair of adjacent strips, with the head being somewhat resilient, and a mechanical fastener securing the nest to the stem, whereby the body portion may be seated upwardly relative to the plane of the lower support surface so that when the mechanical fastener is tightened, the head resiliently bows to maintain fastener pressure upon the engaged strips;
whereby articles may be placed within a correspondingly shaped nest for handling and conveying the articles upon the pallet, and the nest may be selectively replaced with a different shaped nest for handling different shaped articles.

4,782,764
TABLE WITH ANNULAR LEAVES
Floyd E. Robison, 7918 Joseph St., Fort Smith, Ark. 72903
Filed Jan. 4, 1988, Ser. No. 140,498
Int. Cl.[4] A47B *13/08, 11/00*
U.S. Cl. 108—90 **17 Claims**

1. A circular table extendable by addition of leaves comprising
a base with a vertical axis and having at least three legs extending radially from said axis,
an upright member mounted on said base,
a circular table top mounted on said upright member,
at least three arms adapted to removably fasten to and extend radially from the upper half of said upright member,

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a plurality of table leaves having concave edges which conform to the periphery of said table top, and



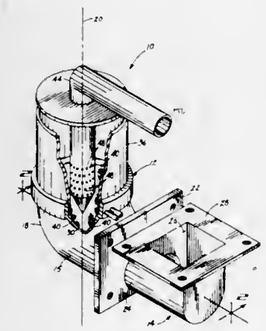
means for securing said leaves on top of said arms adjacent to said table top to form an extension thereof.

4,782,765

PELLET FUEL BURNER

Bill R. Miller, and Ronald G. Coffland, both of Lewiston, Id., assignors to MCC Research & Development Corporation, Lewiston, Id.

Filed Oct. 26, 1987, Ser. No. 113,754
Int. Cl.[4] F23H *5/18*
U.S. Cl. 110—186 **27 Claims**



1. A burner for burning granular, pellet or similarly sized solid heating fuel, comprising:

retort means for burning solid fuel, the retort means having an upright central axis and a predetermined elevation at which an uppermost surface of solid fuel is adapted to reach and be maintained at for burning within the retort means;

feed means for supplying solid fuel to the retort means;

igniter means mounted internally within the retort means for initiating self-sustaining combustion of solid fuel at its uppermost surface, the igniter comprising an electrical resistance element that annularly extends about the internal periphery of the retort means at the predetermined elevation and which in operation contacts the solid fuel; and

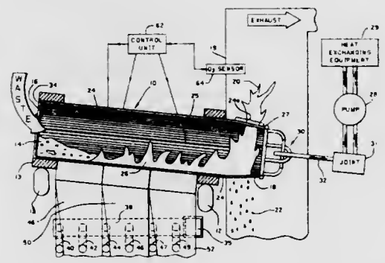
combustion air supply means centered along the upright central axis at the predetermined elevation for emitting combustion air radially outward from the center portion of the retort means at the predetermined elevation to burn solid fuel evenly across its uppermost surface.

4,782,766

AUTOMATIC COMBUSTION CONTROL FOR A ROTARY COMBUSTOR

Suh Y. Lee, Monroeville; William G. Collins, Jr., Greensburg, both of Pa., and John T. Healy, Irvine, Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1987, Ser. No. 18,682
Int. Cl.[4] F23N *5/02*
U.S. Cl. 110—190 **5 Claims**



1. A combustion gas controller for controlling combustion gas supplied to a rotary combustor, the rotary combustor including a combustion barrel having a gas-porous side wall and windboxes disposed underneath the combustion barrel for supplying the combustion gas to the combustion barrel through the gas-porous side wall, said combustion gas controller comprising:

plural sensing means, disposed outside the combustion barrel, for sensing a fire characteristic at a plurality of respective locations in the rotary combustor above a corresponding windbox and generating corresponding fire characteristic sensor signals indicating one of temperature and existence of a flame in the area above the corresponding windbox; and

automatic control means, operatively connected to said plural sensing means, for automatically controlling the supply of the combustion gas to the rotary combustor in dependence upon the fire characteristic sensor signals to maintain the fire characteristic at the respective locations according to predetermined criteria.

4,782,767

SOLID FUEL BURNING STOVE APPARATUS

James L. Stoner, 2744 Sears Rd., Spring Valley, Ohio 45370

Filed Jul. 17, 1987, Ser. No. 74,630
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—233 **9 Claims**

1. A stove or heat generating apparatus for burning sawdust, ground corn cobs, wood pellets, and other materials comprising:

a plurality of vertical structural supports;

a housing structure disposed substantially horizontally over said vertical structural supports;

said housing structure having two terminal ends; a first terminal end and a second terminal end;

said second terminal end being disposed at a proximate right angle, upwardly, from a longitudinal axis of said housing structure;

a firebox;

said firebox being substantively horizontally disposed within said housing structure;

a truncated conical tubular feeder-hopper; said truncated conical tubular feeder-hopper being upwardly or vertically disposed on said housing structure;

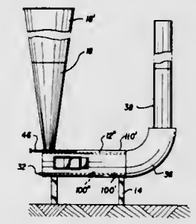
said truncated conical tubular feeder-hopper having a hinged lid disposed on the top thereof;

said truncated conical tubular feeder-hopper being disposed proximate to said first terminal end of said housing structure;

said housing structure and said truncated conical tubular feeder-hopper having a two-position slidably disposed fuel control handle means for controlling the gravity fed passage of fuel from said feeder-hopper into said firebox for the cooperative regulation of fuel into said firebox;

a firegrate having a plurality of combustion orifices;

said firegate being substantially horizontally disposed within said firebox; said firegrate being disposed proximate to said first terminal end of said housing structure and said



firegate being disposed proximate to said truncated conical feeder-hopper such that solid fuel flows downward from said truncated conical feeder-hopper onto said firegrate and accumulates thereon;

a solid firegrate extension and a restrictor band which function in cooperative arrangement with said firegrate to force air for combustion through said combustion orifices in said firegrate;

a flue conduit;

said flue conduit substantively vertically disposed over second terminal end of said housing structure;

said housing structure and said firebox having means for the cooperative inflow of air thereto and the regulation thereof in said firebox;

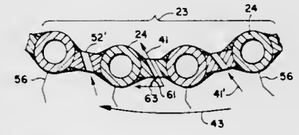
said housing structure, truncated conical tubular feederhopper, said flue conduit, said firebox constructing thereby an apparatus for the burning of ground corn cobs, sawdust and other combustible grandular fuels therethrough.

4,782,768

ROTARY COMBUSTOR WITH EFFICIENT AIR DISTRIBUTION

Suh Y. Lee, Monroeville, and Graham A. Whitlow, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 24, 1987, Ser. No. 92,849
Int. Cl.[4] F27B *7/38, 7/36*
U.S. Cl. 110—246 **13 Claims**



1. A generally cylindrical side wall of a combustion barrel in a rotary combustor used for incinerating solid material with combustion gas from a combustion gas supply entering the interior of the combustion barrel through said side wall to support combustion of the material, the combustion barrel having input and exit ends and said side wall being connected to a coolant loop containing heat exchanging equipment and rotating in a direction of rotation about a central axis of rotation, said side wall comprising:

plural cooling pipes, extending longitudinally in parallel, spaced axial relationship, having connections to the coolant loop at at least one of the input and exit ends; and

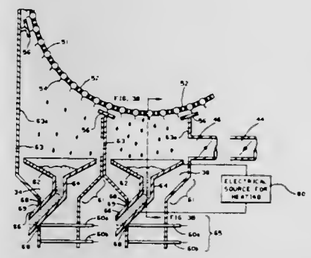
plural gas-porous interconnections having openings therein, the openings directing the combustion gas from the combustion gas supply into the interior of the combustion barrel at an acute angle to a vector corresponding to the direction of rotation.

4,782,769

APPARATUS FOR PREVENTING CLOGGING OF ROTARY COMBUSTORS BY LOW-MELTING TEMPERATURE METAL

Suh Y. Lee, Monroeville, and George B. Levin, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 18,569, Feb. 25, 1987, abandoned. This application Jan. 11, 1988, Ser. No. 144,625
Int. Cl.[4] F23G *5/06*
U.S. Cl. 110—246 **13 Claims**



1. An apparatus for preventing solidification of molten metal in particulate matter dropping from a combustion barrel and accumulating in a windbox of a rotary combustor, said apparatus comprising:

a heatable contact surface disposed inside the windbox;

means for supporting said heatable contact surface in the windbox with said heatable contact surface disposed in the path of molten metal dropping from the combustion barrel and for separating said heatable contact surface from the windbox; and

means for heating said heatable contact surface above the temperature of said supporting means, above the temperature of gases inside the windbox and above the temperature of the particulate matter dropping on said heatable contact surface.

4,782,770

COMBUSTOR FOR FINE PARTICULATE COAL

Larry W. Carlson, Oswego, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 26, 1988, Ser. No. 148,513
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 **3 Claims**

1. A combustor for particulate coal comprising:

an inner cone open at its upper and lower ends for the passage of combustion gas through the inner cone in an upward direction;

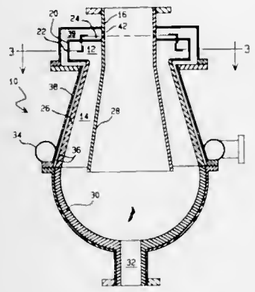
an outer cone separated from and surrounding the inner cone, the distance between the inner and outer cones

VOL 1096 ISS 2 NO 8 1988 UMI

being greater at their lower ends than at their upper ends, the annular space between the cones forming a chamber in communication with the passage through the inner cone;

a base attached to a lower end of the outer cone, separating the annular chamber and gas passageway from atmosphere;

a torus at to the upper end of the outer cone, the torus formed by an upper and an outer wall cooperating with



the inner cone to form an enclosed space in communication with the annular chamber;

a plurality of ports in the outer wall of the torus for injection of a mixture of particulate coal and combustion air into the torus tangentially to its outer wall and in a circular direction around the inner cone; and

a second plurality of ports in the upper wall of the torus for injection of additional combustion air in a circular direction around the inner cone.

4,782,771

METHOD OF REDUCING THE CONTENT OF NITROGEN OXIDES IN MULTIPLE BED COMPOSITION BOILERS

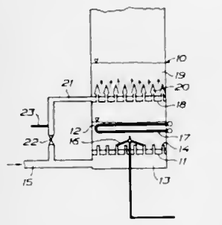
Jörgen Bergkvist, Finspang, Sweden, assignor to Asea Stal AB, Linköping, Sweden

Filed Jul. 8, 1987, Ser. No. 70,944

Claims priority, application Sweden, Jul. 8, 1986, 8603035

Int. Cl.⁴ F23J *11/00, 15/00*

U.S. Cl. 110—345 **5 Claims**



1. Method of supplying ammonia gas to boilers having at least two fluidized beds located one above the other, for reducing the content of nitrogen oxides in the flue gas, comprising the steps of intermixing ammonia gas with at least one of secondary air and tertiary air, dividing the flue gases into individual streams and supplying said mixture to each of said individual streams from below a lower fluidized bed and through an upper fluidized bed, distributing the streams over the area of the upper bed, said upper bed being fluidized by means of the gas streams consisting of flue gas and said air having ammonia gas intermixed therewith.

4,782,772

METHOD OF DIRECTLY REMOVING SULFUR, WITH FLUE DUST BEING RETURNED

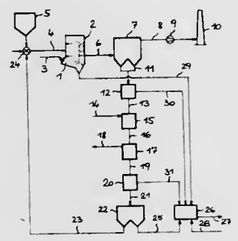
Yaqub Chughtai, Gummersbach, and Volkmar Sitte, Wiehl, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Oct. 14, 1987, Ser. No. 108,723

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635027

Int. Cl.⁴ F23J *11/00*

U.S. Cl. 110—345 **14 Claims**



1. In a method of purifying flue gas that comes from the firing equipment of a combustion unit, especially flue gas from firing equipment to which low-ash fuel is supplied, or from a grating firing having a high degree of ash removal, with said flue gas containing noxious compounds, including the step of using a pulverous basic additive on which said noxious compounds produced during firing are adsorbed, whereby flue dust, especially flue dust/additive mixture, that is carried along in said flue gas is separated from the latter, with at least a portion of the separated-off flue dust being hydrated and sifted, whereby subsequently at least a portion of the dry, hydrated flue dust is returned to the flue gas purification process, the improvement comprising the steps of:

homogeneously mixing non-pulverized, separated-off flue dust with finely sprayed water to effect said hydration; and

undertaking said return of flue dust to the flue gas purification process by returning at least a portion of dry, thus-hydrated flue dust to said firing equipment of said combustion unit.

4,782,773

METHOD FOR CONTROLLING INCINERATION IN COMBUSTOR FOR RADIOACTIVE WASTES

Yoshinobu Takaoku, Tokorozawa, and Akio Uehara, Ichihara, both of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

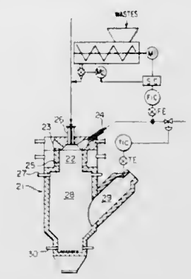
Filed Sep. 25, 1987, Ser. No. 100,918

Int. Cl.⁴ F23G *7/00*

U.S. Cl. 110—346 **3 Claims**

1. A method for controlling incineration in a combustor for radioactive wastes which comprises, on incinerating combustible radioactive wastes together with supplemental fuel fed to said combustor, detecting an outlet gas temperature of the combustor by means of a thermometer: wherein when said detected temperature is higher than a set temperature, the flow rate of supplemental fuel fed to the combustor is reduced and when the detected temperature is lower than said set temperature, the flow rate of supplemental fuel fed to the combustor is increased; as well as detecting a flow rate of supplemental fuel fed to the combustor by means of a flow meter: wherein when

said detected flow rate is inclined to decrease, the amount of radioactive wastes fed to the combustor is decreased and when



the detected flow rate is inclined to increase, the amount of radioactive wastes fed to the combustor is increased.

4,782,774

DEEP BAND FERTILIZER AND DOUBLE SIDE BAND SEEDING ATTACHMENT

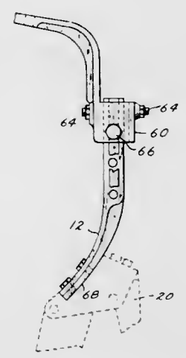
George P. Clarke, 309 Assiniboine Drive, Saskatoon, Saskatchewan, Canada S7K 3Z1

Continuation-in-part of Ser. No. 793,895, Nov. 1, 1985. This application Apr. 7, 1987, Ser. No. 35,410

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.⁴ A01C *5/08*

U.S. Cl. 111—73 **2 Claims**



1. An apparatus for simultaneously fertilizing and seeding and adapted to connect to a cultivator shank, said apparatus comprising:

an adapter member fixedly securable to said shank and including a pair of conduits for individually conveying fertilizer and seed respectively;

means for pivotally mounting a fertilizer blade to said adapter and including means limiting pivoting motion of the fertilizer blade in a backward direction to the working position and having a fertilizer conveying channel communicating with one of said conduits at said normal operating position and extending to a distal end of said fertilizer blade; and

means pivotally mounting a double seeder blade to said adapter and including means limiting pivoting motion of said double seeder blade in a backward direction to the working position and a seed conveying channel communicating with the other of said conduits at said normal operating position and extending to a distal end of said double seeder blade; and

said apparatus being mounted adjacent one end of shank means, said shank means being means having releasable shank positioning means carried by a bracket so that, in use, said shank means is vertically movable to a selected position relative to said bracket means.

4,782,775

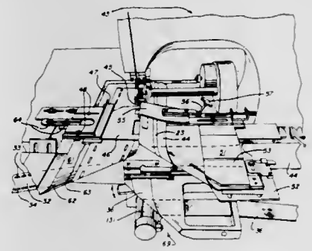
LINEARLY MOVING FEED MECHANISM FOR INTRODUCING AN INTERLINING IN A GARMENT'S WAISTBAND

Charles D. Scher, Deerfield, and Steven Levy, Skokie, both of Ill., assignors to QST Industries, Inc., Chicago, Ill.

Filed Oct. 1, 1987, Ser. No. 103,512

Int. Cl.⁴ D05B *23/00, 37/04, 97/00*

U.S. Cl. 112—121.27 **25 Claims**



1. In a device for feeding a plurality of fabric strips to a sewing mechanism, said device including:

(1) first guiding means for directing a first strip of fabric to said sewing mechanism;

(2) second guiding means for directing a second strip of fabric to said sewing mechanism, said second guiding means including:

(a) injecting means for moving said second strip a predetermined distance in a particular linear direction toward said sewing mechanism; and

(b) cutting means for severing a portion of said second strip near said sewing mechanism from the remainder of said second strip, the improvement wherein said injecting means comprises:

(A) transporting means for moving said predetermined distance in a substantially straight line in said particular linear direction toward said sewing mechanism and for moving away from said mechanism; and

(B) gripping means, connected to and moving with said transporting means, for, when said transporting means moves in said particular linear direction, attaching to a particular location on said second strip and moving said second strip in said particular linear direction.

4. The improvement of claim 3 wherein said gripping means includes feed means having at least one sharp point partially directed toward both said second strip and toward said particular linear direction, said sharp point making contact with said second strip when said transporting means moves in said particular linear direction.

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4,782,776

LOOPER TO MACHINE FOR SEWING-UP NETTING WEBS

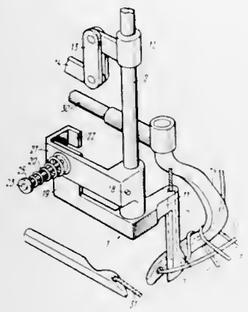
Nikolai N. Raikov, Kerch, U.S.S.R., assignor to Tsentralnoje Projektno-Konstruktorskoje I Tekhnologicheskoje Bjuro Vsesojuznogo Rybopromyshlennogo Objedinenija Azovo-Chernomorskogo Basseina, Sevastopol, U.S.S.R.

PCT No. PCT/SU85/00065, § 371 Date Mar. 9, 1987, § 102(e) Date Mar. 9, 1987, PCT Pub. No. WO87/00874, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 30, 1985, Ser. No. 49,105

Int. Cl.[4] D05B *1/10*

U.S. Cl. 112—270 3 Claims



1. A looper machine for sewing-up netting webs, comprising a knee-shaped needle (1) operatively connected with the main shaft (5) of the machine and including a stud (6) and a blade (7) interconnected by a crosspiece (11), the blade (7) having a passage (8) and the eye (10) of the needle (1), the knee-shaped needle (1) being mounted on a vertical bar (2) of the machine, characterized in that the knee-shaped needle (1) is mounted on the vertical bar (2) of the machine for rotation of the crosspiece (11) with the blade (7) about the vertical axis of the bar (2) and is associated with means for limiting this rotation and returning the crosspiece (11) with the blade (7) into the normal position.

4,782,777

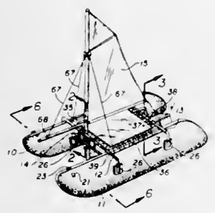
INFLATABLE CATAMARAN

Robert A. Sussman, P.O. Box 3744, Tustin, Calif. 92860

Filed Dec. 1, 1986, Ser. No. 936,378

Int. Cl.[4] B63B *35/00*

U.S. Cl. 114—39.1 4 Claims



1. In an inflatable catamaran, the combination of:

first and second inflatable pontoons, each of said pontoons having forward and aft pockets on each side of each pontoon, with each pocket providing an upwardly opening passage;

first and second spreader members, each of said spreader members having four depending ends spaced laterally from one another, with said depending ends positionable in said pontoon pockets in said passages and joining said pontoons and spreader members in a rectangular form,

with each of said spreader members including first and second U-shaped bars joined in spaced relation at the bights thereof by spacer bars; and

first and second longitudinal side members, with each of said side members positioned between said first and second spreader members with said spreader members and said side members cooperating to define a deck area.

4,782,778

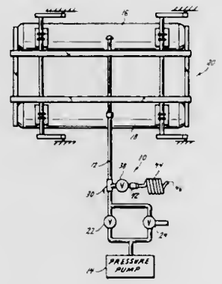
INFLATION VALVE DEVICE

Michael J. Barbaglia, 8607 Virgil, Affton, Mo. 63123

Filed Jul. 31, 1987, Ser. No. 79,934

Int. Cl.[4] B63C *1/02*

U.S. Cl. 114—52 20 Claims



1. An inflation valve device for releasing air stored in at least one inflatable pontoon of a pontoon type boat lift to inflate various inflatable devices comprising:

a tee having three ends, two of the ends connected to a hose of the pontoon boat lift;

a screw bushing having two ends, one end being screwed into the third end of the tee;

a valve having two ends, one end being threaded into the other end of the screw bushing; and

a second hose having a hose adaptor at one end, the hose adaptor being inserted into the other end of the valve, the other end of the second hose being for inserting into the inflatable devices.

4,782,779

BARGE LATTICE SKEGS

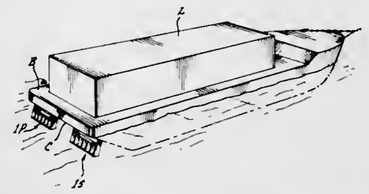
Jacques Heyrman, and Josip Gruzling, both of North Vancouver, Canada, assignors to Seatronics Technologies Ltd., Canada

Continuation of Ser. No. 689,742, Jan. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 91,254, Nov. 5, 1979, Pat. No. 4,569,302, which is a continuation of Ser. No. 870,034, Jan. 16, 1978, Pat. No. 4,217,844, which is a continuation of Ser. No. 802,140, May 31, 1977, abandoned, which is a continuation of Ser. No. 688,014, May 19, 1976, abandoned. This application Jan. 7, 1987, Ser. No. 4,760

Int. Cl.[4] B63B *1/00*

U.S. Cl. 114—63 20 Claims

1. A barge comprising a nonpowered, nonsteered hull designed for towing by a towline trailing a towboat, said hull having a substantially flat bottom and a raked stern counter, and a box lattice skeg unit projecting downward from the aft portion of said stern counter for effecting yaw stability of said hull, said box lattice skeg unit including an athwartships row of upright vanes, a lower tie plate disposed edgewise generally horizontally higher than the hull bottom and bridging between and connecting lower portions of said vanes and an upper tie plate disposed edgewise generally horizontally and bridging between and connecting upper portions of said vanes, and means mounting said box lattice skeg unit to said barge stern



counter with said upper tie plate spaced downward a substantial distance from said barge stern counter.

4,782,780

SAILBOARD BOOMS

Dennis M. Smith, Claremont, Australia, assignor to Smitech Pty. Ltd., Australia

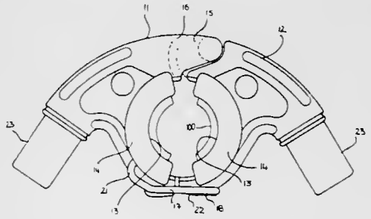
PCT No. PCT/AU86/00241, § 371 Date Apr. 21, 1987, § 102(e) Date Apr. 21, 1987, PCT Pub. No. WO87/01086, PCT Pub. Date Feb. 26, 1987

PCT Filed Aug. 19, 1986, Ser. No. 61,344

Claims priority, application Australia, Aug. 22, 1985, PH2048

Int. Cl.[4] B63B *15/00*

U.S. Cl. 114—98 17 Claims



1. A mast end boom fitting for a sailing craft, comprising:

(a) a first member having respective first and second sides;

(b) a second member having respective first and second sides, said second member being hingedly interconnected at its first side to the first side of said first member;

(c) locking means for securing said first member to said second member and to cause said first and second members to clampingly engage said mast, said locking means secured to said first member at its respective second side and secured to said second member at its respective second side, said first member, said second member and said locking means together configured and dimensioned to together define an opening encompassing said mast within said opening in close abutting relationship, at least one of said members being adapted to be mounted to one end of a boom.

4,782,781

QUICK-ACTION COUPLING BETWEEN A SHIP AND A MOORING SYSTEM

Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings Inc., Marly, Switzerland

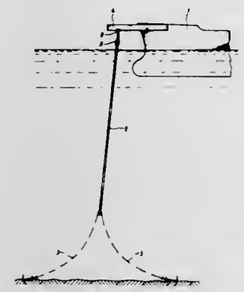
Filed Sep. 18, 1986, Ser. No. 908,818

Claims priority, application Netherlands, Oct. 15, 1985, 8502824

Int. Cl.[4] B63B *21/50*

U.S. Cl. 114—230 4 Claims

1. A quick-action coupling for performing a connection or disconnection between a floating body such as a ship, and a mooring system, said coupling comprising two parts one of which is a sleeve and the other of which is a core slidably fitting into the sleeve, there being a circumferentially extending space between an inner wall of the sleeve and an outer wall of the core, said space being axially defined between spaced apart radially extending surfaces on one of said parts, said space containing a plurality of annular elements alternating



with rigid rings disposed in said space, which annular elements can be expanded radially to press simultaneously against said inner wall of the sleeve and said outer wall of the core respectively thereby engaging said walls by friction and which thereafter can be collapsed radially to allow relative movement of said sleeve and core with respect to each other, and means for selectively expanding and collapsing said plurality of annular elements.

4,782,782

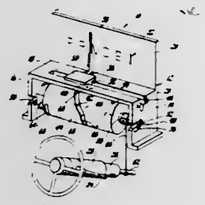
TRANSMISSION POSITION INDICATOR MECHANISM

Walter J. Nill, Davison, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1987, Ser. No. 112,370

Int. Cl.[4] G01D *7/00*

U.S. Cl. 116—28.1 2 Claims



2. A transmission position indicator comprising: operator controlled transmission shift lever means for permitting establishment of a plurality of transmission operating positions including park, reverse, neutral and drive positions, upon movement by an operator; housing means having disposed thereon indicia means for indicating the transmission positions; rotatable drum means rotatably supported in said housing means and having a cam track thereon, said cam track having a plurality of dwell portions extending circumferentially and being aligned with respective indicia and a plurality of oblique portions extending obliquely to the longitudinal axis of the drum means with each of said oblique portions joining successive pairs of said dwell portions to form said cam track whereby said cam track is continuous from end to end; indica-

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tor pointer means for cooperating with said indicia means for indicating the position established; cam follower means secured to the indicator pointer means and being disposed in said cam track, said indicator pointer means being guided on said housing for linear movement enforced by rotary movement of said drum means through the cooperation of said cam track and said cam follower means, said indicator pointer means being stationary relative to said indicia means and aligned with respective transmission operating positions when said cam follower means is disposed in respective ones of said dwell portions and being moved between successive operating positions when said cam follower means is disposed in said oblique portions and said drum means is rotated; and means interconnecting said drum means and said shift lever means for rotating said drum means when said shift lever means is moved by said operator.

4,782,783

TRAFFIC CHANNELIZER MOUNTABLE VERTICAL PANEL

Jack N. Kulp, and Carl L. Erwin, both of 16330 Phoebe Ave., La Mirada, Calif. 90637

Filed Feb. 13, 1986, Ser. No. 829,439
Int. Cl.⁴ E01F *9/10*
U.S. Cl. 116—63 P **17 Claims**



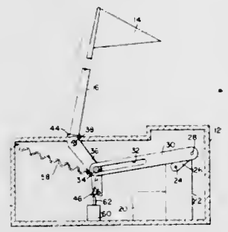
1. In combination, a traffic channelizer having means for securing an object thereto arranged and constructed adjacent a top side of the traffic channelizer, a vertically extending reflecting means secured to said securing means and extending substantially vertically upward from the top side of the traffic channelizer, said reflecting means being constructed and defined with supporting means adapted to be secured to said securing means and having a reflective surface extending outwardly of the supporting means and extending substantially vertically above said supporting means when the supporting means and traffic channelizer are secured at said securing means, and said reflecting means being formed from a resilient, impact resistant, plastic material, the combination of traffic channelizer and reflecting means being constructed and defined to maintain the reflecting means in a substantially vertical position when secured to the traffic channelizer, the reflecting means including spring-like means responsive to wind forces applied to the reflecting means, the spring-like means reacting under wind forces without tipping the traffic channelizer.

4,782,784

MOTORIZED BOAT-MOUNTED SIGNALING DEVICE FOR WATER SKIERS

Cheryl G. Little, 14718 Burbank Blvd., Van Nuys, Calif. 91401

Filed Dec. 15, 1986, Ser. No. 941,633
Int. Cl.⁴ G09B *5/26*
U.S. Cl. 116—303 **2 Claims**



1. A warning device for use on a ski boat to indicate the presence of a downed water skier in the water, comprising:
- a pole mounted at one end thereof for angular rotation with respect to said boat between a first substantially horizontal position and a second substantially vertical position, said pole having a warning flag attached to the other end thereof;
- means for generating an electrical signal when said water skier falls;
- electrical motor means for driving said pole from said first position to said second position when said electrical signal is generated; and
- pole retraction means for returning said pole from said second position to said first position when said electrical signal is no longer generated, wherein said pole retraction means comprises:
- biasing means for biasing said pole toward said first position; and
- means for retaining said pole in said second position until said electrical signal is no longer generated, wherein said retaining means comprises:
- a shaft supporting said pole at said one end;
- an arm extending from said shaft;
- a pawl mounted on the end of said arm; and
- a solenoid having a solenoid core extending therefrom when said electrical signal is generated, said pawl slipping over said solenoid core when said pole is raised, said pawl catching on said solenoid core, which is extended to prevent said pole from being lowered until said electrical signal is no longer generated.

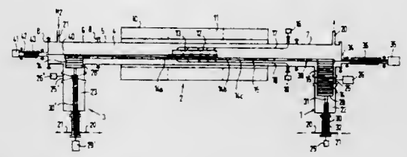
4,782,785

SYSTEM FOR PRODUCING SEMICONDUCTOR LAYER STRUCTURES BY WAY OF EPITAXIAL GROWTH

Bernward Gobla, Stuttgart, and Richard Linnebach, Erdmannhausen, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 757,216, Jul. 19, 1985, abandoned. This application Dec. 23, 1986, Ser. No. 945,235
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1984, 3427056
Int. Cl.⁴ B05C *11/115, 3/18, 13/02*
U.S. Cl. 118—696 **8 Claims**

1. A system for producing semiconductor layer structures by way of epitaxial growth from a molten coating substances, which comprises:
- at least one crucible having a lower part which holds the uncoated semiconductor wafer, and an upper part which holds the coating substances, said upper part being displaceable relative to the lower part;
- said system having a reaction space into which the crucible is introduced and retained under a protective gas atmosphere;
- a furnace in proximity to the reaction space for heating the crucible while in the reaction space to the temperature necessary for effecting epitaxial growth, and
- a conveyor extending through the reaction space and by which one of the crucible parts is displaced relative to the other, in the course of which the semiconductor wafer is brought into contact with the required molten coating substance, wherein the improvement comprises:
- said system having a loading area in which several lower crucible parts together with the semiconductor wafers are introduced into the reaction space and are successively fed to the conveyor,
- an epitaxial-growth region in the reaction space which is capable of being heated by the furnace, through which the lower crucible parts are successively moved in a step-by-step manner,



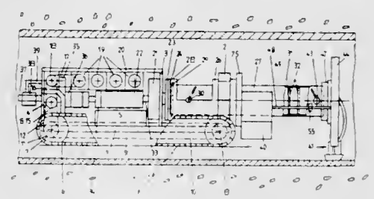
- an upper crucible part which is stationarily arranged within the epitaxial-growth region, below which the lower parts are passed in such a way that each semiconductor wafer comes into contact with the contents of one or more chambers of the upper part during a predetermined period of time,
- an unloading area lying in the conveying direction behind the epitaxial-growth region, in which the lower crucible parts are removed from the reaction space,
- a first airlock through which lower crucible parts pass prior to introduction into the reaction space for preventing the atmosphere surrounding said system from entering the reaction space through the loading area, and
- a second airlock through which lower crucible parts pass after removal form the reaction space for preventing the atmosphere surrounding said system from entering the reaction space through the unloading area.

4,782,786

DEVICE TO FILL AND GLUE ALL KINDS OF DEPRESSIONS IN INACCESSIBLE PIPE CONDUITS

Erich Himmler, Zurich, Switzerland, assignor to Kunststoff-Technik AG Himmler, Zurich, Switzerland

PCT No. PCT/CH85/00026, § 371 Date Nov. 25, 1986, § 102(e) Date Nov. 25, 1986, PCT Pub. No. WO86/04975, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 13, 1985, Ser. No. 921,054
Int. Cl.⁴ B05C *7/08*
U.S. Cl. 118—713 **10 Claims**



1. A vehicle for filling and gluing all kinds of depressions in inaccessible pipe conduits said vehicle comprising:
- a spreading means associated with said vehicle, said spreading means acting to deposit and spread a material used to fill and glue said depressions;
- locking means;
- a container for holding said material used to fill and glue said depressions, said container being removably connected to said vehicle by said locking means and communicating with said spreading means; and
- a piston held within said container and freely movable therein, said piston acting to push said material out of said container into said spreading means wherein upon release of said locking means said container may be easily removed from said vehicle.

4,782,787

APPARATUS FOR LASER-INDUCED CHEMICAL VAPOR DEPOSITION

Gregory A. Roche, 4287 Dry Bed Ct., Santa Clara, Calif. 95054

Filed Jan. 8, 1986, Ser. No. 817,072
Int. Cl.⁴ C23C *16/48, 16/52*
U.S. Cl. 118—722 **38 Claims**



1. In a combination for providing for the direction of a substance to a surface of a planar substrate to affect the surface of the substrate,
- means for defining a chamber,
- means for holding the substrate in the chamber,
- means for directing a beam of energy along the substrate, the beam having properties of becoming weakened with passage along the substrate,
- means for introducing ionizable gases into the chamber for ionization by the energy beam and for the formation from the ionized gases of the substance to be directed to the surface of the substrate,
- means for exhausting the ionizable gases from the chamber after the flow of the ionizable gases through the chamber, and
- means for compensating, in a single pass of the energy beam along the substrate, for the weakening of the energy beam during the passage of the energy beam along the substrate.

4,782,788

LITTER BOX WITH HANDLE AND BLANK THEREFOR

Marcel Arcand, Montreal, Canada, assignor to Domta Inc., Montreal, Canada

Continuation-in-part of Ser. No. 81,689, Aug. 5, 1987, abandoned. This application Oct. 30, 1987, Ser. No. 115,629
Int. Cl.⁴ A01K *29/00*
U.S. Cl. 119—1 **8 Claims**

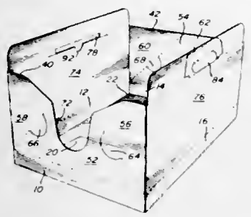
1. A disposable litter box having four wall panels foldably connected and defining opposed end walls and opposed side walls,
- each of said wall panels having a given height and extending several times said height into a foldably connected bottom panel, means of fastening each of said bottom panel to define a bottom for said box, whereby said wall panels and said bottom define a shallow container for receiving a litter or mat,
- each of said side walls extending several times said height away from said bottom panel, via a first fold line, into a foldably connected outer top panel, each said outer top panel having opposite end edges,
- each of said end walls extending several times said height away from said bottom panel via a second fold line into an inner top panel, each said inner top panel having opposite

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side edges, each of said side edges being adjacent one of said end edges, said each of said side edges intersecting said second fold line at a corner,

said each of said side edges foldably connected to said adjacent one of said end edges to define a substantially rectangular open-top box,

in each of said inner top panel, originating from each of said corner, an oblique fold line subtending a substantially 45° angle with said second fold line and dividing each of said inner top panel into a substantially triangular panel with its base defined as said second fold line, said substantially triangular panel via each said oblique fold line being foldably connected to two wing panels,



a first of said outer top panel having a cutout portion defining an elongated aperture,

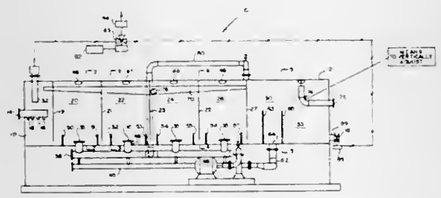
a second of said outer top panel, about an edge remote from said first fold line, having a foldable flap whereby upon inwardly folding each said outer top panel, said second of said outer top panel slides under said first of said outer top panel and said foldable flap is inserted into said elongated aperture to releaseably lock said first and said second of said outer top panel into a top for sealing said box and define a handle for easily horizontally carrying said box with one hand without touching said wall panels and said bottom.

4,782,789

INDUCED STATIC FLOATATION CELL

Anthony S. Canzoneri, Kenner, La., assignor to L'eau Claire Systems, Inc., Kenner, La.

Filed Oct. 26, 1987, Ser. No. 112,397
Int. Cl.[4] BOID *17/05*
U.S. CL. 210—703 **18 Claims**



11. A method for clarifying liquid from a particulate matter an/or oil suspended in the liquid, the method comprising the steps of:

providing a substantially cylindrical, gas-tight vessel, said vessel having partitions that divide the vessel sequentially into an inlet chamber, at least one gasification chamber and an outlet chamber;

introducing a flow of liquid having suspended matter and/or oil into the inlet chamber;

introducing a flow of gas into the at least one gasification chamber for creating a turbulent area, allowing the gas to attract the suspended matter and carry it to an upper portion of the vessel;

providing a first skim collection channel in the upper portion of the vessel extending from the inlet chamber and terminating in the at least one gasification chamber adjacent the outlet chamber; providing a secondary skim collection channel, independent of said primary channel, located in the upper portion of the outlet chamber;

providing means to control the skimming of the collected suspended matter intermittenly at a pre-determined adjustable rate;

providing means in the at least one gasification chamber for directing substantially all fluid flow into the turbulent area;

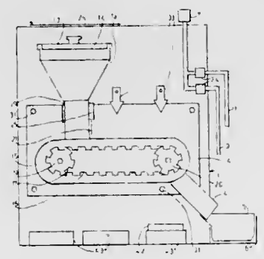
removing clarified liquid from the vessel; and removing the collected suspended matter from the vessel.

4,782,790

AUTOMATIC DOG FEEDER

Dalton B. Batson, 11141 NW. 39th St., Coral Springs, Fla. 33065

Filed Jul. 8, 1987, Ser. No. 71,207
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—51.11 **12 Claims**



1. An automatic animal feeding machine for providing food to an animal in a feeding dish in measured amounts at predetermined time intervals without human attendance, comprising:

a. food hopper means for holding a supply of dry food in a vertical structure for gravity feeding to a lowermost portion with an opening at the bottom, said lowermost portion including a side aperture contiguous with said opening;

b. gate moving means;

c. conveyor belt drive means;

d. movable gate means applied to said side aperture, said gate means movable by said gate moving means between two positions, a first, closed position for closing off said side aperture to prevent the passage of said food therethrough, and a second, open position for permitting the passage of said food through said side aperture;

e. endless conveyor belt means driven by said conveyor belt drive means arranged below said hopper means so as to close off said opening at said bottom of said hopper means and to carry said food through said side aperture when said gate means is in said second, open position and said belt means is being driven by said belt drive means;

f. control means connected to said gate moving means and said belt drive means to open said gate for a predetermined time interval and to drive said belt means for a time interval beginning substantially with the opening of said gate and extending beyond the time of closing of said gate for a time sufficient to permit said food carried through said side aperture to fall from said belt means, said control means providing adjustments of said time intervals to adjust portion size and dispensing intervals.

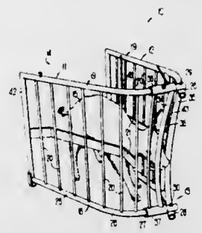
g. food chute means arranged below said belt means to catch said food as it falls from said belt means when said belt reaches the extent of its linear motion in one direction, said chute means further directing said food into said feeding dish for consumption by said animal.

4,782,791

ANIMAL HOLDER

Grady Brock, P.O. Box 420, Rt. #1, Arabi, Ga. 31712

Filed Sep. 21, 1987, Ser. No. 99,245
Int. Cl.[4] A01K *15/04;* **A61D** *3/00*
U.S. Cl. 119—99 **15 Claims**



1. Apparatus for temporarily holding an animal of certain size, comprising:

a pair of substantially upright frames each having a lower side for placement on an unattached subjacent support surface, each frame including side means extending upwardly to an upper side at least sufficient to provide external restraint for an animal between said frames;

each frame having a front end and a back end;

the frames being hingedly connected to each other at the front ends thereof so that the frames can selectively pivotably assume either a closed position where the front ends and the back ends of the frames are in mutually confronting spaced apart relation with the side means snugly engaging the sides of an animal between the frames, or an open position where the front ends remain in relatively close spaced apart relation and the back ends of the frames are relatively far apart, releasing the sides of the animal; and

means on the front ends of the frames defining a space sufficiently wide to receive the neck of the animal without permitting passage of the animal's head or shoulder when the frames are in the closed position engaging the sides of the animal, and sufficiently wide to permit passage of the animal's head but not forward passage of the body when the frames are in the open position releasing the sides of the animal,

so that the animal is restrained within the closed frames and is free to enter or exit the open frames only at the relatively widely spaced apart back ends thereof.

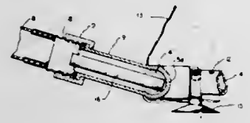
4,782,792

ANIMAL SHOWER

Michael F. Anthony, 3521 W. Ridge Dr., West Valley City, Utah 84119, and Weldon S. Fox, 1475 S. Gillespie Ave., Apt. B, Salt Lake City, Utah 84104

Filed Jul. 7, 1986, Ser. No. 882,404
Int. Cl.[4] A01K *13/00*
U.S. Cl. 119—158 **7 Claims**

1. A shower for showering an animal comprising: (a) a plurality of U-shaped conduits which collectively define an open area to be occupied by said animal and (b) a base conduit; wherein said base conduit is comprised of a first base conduit section, a second base conduit section and a third base conduit section; wherein said second base conduit section is coupled to one end of said first base conduit section and is substantially perpendicular to said first base conduit section; wherein said third base conduit section is coupled to the other end of said first base conduit section and is substantially perpendicular to said first base conduit section; wherein said third base conduit section is substantially parallel with said second base conduit section; wherein one end of each U-shaped conduit section is coupled to said second base conduit section and the other end of each U-shaped conduit is coupled to said third base conduit section; wherein said base conduit is adopted to receive water from a water source; wherein said U-shaped conduits are adapted to receive water from said water source through said base conduit; wherein said U-shaped conduits are perforated and the perforations are positioned to direct said water onto said animal; and wherein said shower further comprises a soap introduction system wherein said system comprises (i) a primary conduit, (ii) a secondary conduit connected at an angle to



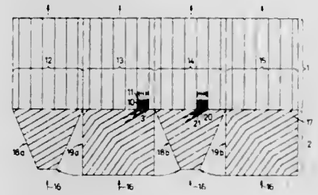
said primary conduit to allow for a flow of water from said secondary conduit to said primary conduit, and (iii) a soap tablet adapted to be positioned inside of said secondary conduit; wherein the length of said soap tablet is sufficiently greater than the inside diameter of said primary conduit such that the initial flow of water does not cause said tablet (when positioned inside of said secondary conduit) to be lost to said primary conduit; wherein said primary conduit is said first base section; and wherein said secondary conduit provides a means through which water from said water source can be introduced into said base conduit.

4,782,793

FOSSIL-FUEL FIRED VAPOR GENERATOR

Abdulla Salem, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 21, 1986, Ser. No. 898,693
Claims priority, application Switzerland, Sep. 23, 1985, 4110/85
Int. Cl.[4] F22B *37/00*
U.S. Cl. 122—6 A **11 Claims**



1. A fossil-like fired vapor generator comprising:

a vertical gas flue including a plurality of vertically extending tubes extending throughout said flue for conveying a working medium therethorugh; and

a funnel sealingly connected to a bottom end of said gas flue, said funnel including a plurality of helically extending tubes extending throughout said funnel for conveying the working medium therethrough, said helically extending tubes being in communication with said vertically extending tubes at said bottom end of said flue to convey the working medium therebetween, said funnel having two inclined walls bounding two long sides of a horizontal rectangular outlet opening at a bottom end of said funnel and two vertical plane walls bounding two short sides of said outlet opening.

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4,782,794

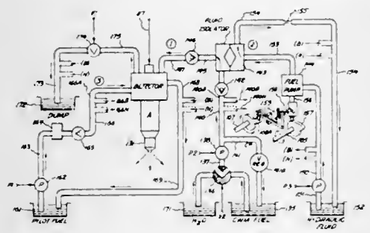
FUEL INJECTOR SYSTEM

Bertrand D. Hsu, Erie, Pa., and Gary L. Leonard, Schenectady, N.Y., assignors to General Electric Company, Erie, Pa.

Continuation-in-part of Ser. No. 897,458, Aug. 18, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,207

Int. Cl.[4] F02D *19/04*

U.S. Cl. 123—23 30 Claims



1. A system for injecting slurry fuel into a combustion chamber comprising:

(a) an injector comprising:

a housing defining a bore including a guide portion communicating with an accumulator chamber, said accumulator chamber having sufficient volume to store a predetermined amount of elastic energy in a slurry fuel having a given compressibility contained therein at a predetermined pressure, said housing having an inlet port and an outlet orifice communicating with said accumulator chamber;

a movable needle valve extending through said bore and having a section thereof slidably disposed in said bore guide portion;

control means associated with said needle valve for permitting external control of its movement between an open position wherein said outlet orifice is open and a closed position wherein said outlet orifice is blocked; and

said housing further defining a purge chamber in a surface of said bore guide portion generally surrounding said needle valve section, and an aperture communicating with said purge chamber, the volume of said purge chamber being selected to be a predetermined relatively small percentage of the volume of said accumulator chamber;

(b) first means connected to said inlet port and adapted to supply slurry fuel to said accumulator chamber;

(c) second means for connecting said aperture to a supply of purging fluid; and

(d) pumping means adapted to be connected to said first and second means and operative periodically to cause a charge of slurry fuel to be supplied by said first means to said accumulator chamber and concurrently to cause said second means to deliver a charge of purging fluid to said purge chamber at a pressure higher than the pressure of slurry fuel in said accumulator chamber.

4,782,795

ANTI-KNOCK SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Takao Kubozuka, Yokosuka, and Yoshinori Hirano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Mar. 18, 1987, Ser. No. 27,330

Claims priority, application Japan, Mar. 22, 1986, 61-64485

Int. Cl.[4] F01P *3/22;* F02P *5/04*

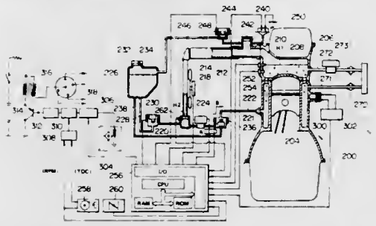
U.S. Cl. 123—41.21 11 Claims

1. In a method of controlling an internal combustion engine the step of:

(a) detecting the engine operating in a predetermined mode;

(b) sensing the presence of engine knock;

(c) reducing the temperature of the engine toward a predetermined lower limit using an evaporative cooling technique in response to engine knock being sensed;



(d) retarding the engine ignition timing by incremental amounts in response to engine knock being detected;

(e) sensing the termination of the engine knock; and

(f) advancing the ignition timing by incremental amounts until the engine knocking threshold is reached.

4,782,796

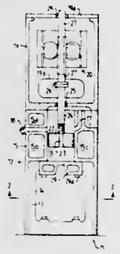
UNSYMMETRICAL FREE PISTON ENGINE

Anton Braun, 6421 Warren Ave. South, Minneapolis, Minn. 55435

Filed Jul. 17, 1986, Ser. No. 886,341

Int. Cl.[4] F22B *9/00*

U.S. Cl. 123—46 SC 9 Claims



1. An unsymmetrical free piston engine comprising a housing having a base portion with open upper and lower end portions and at least one side opening, an engine cylinder portion positioned above said base portion and extending from said upper end of said base portion to an upper end of said cylinder portion and providing an open-ended combustion chamber, a cylinder head detachably secured to said cylinder portion across a lower end thereof, a balancing unit mounted above the upper end of said cylinder portion and having a window in a side wall thereof, a piston in said cylinder portion and having a piston rod extending from said piston through sealing means in a bottom of said balancing unit, balancing means in said unit including a drive shaft that extends through sealing means in an upper end of said balancing unit for connection with an energy absorbing device, and said drive shaft being operably connected to said piston rod.

4,782,797

INDUCTION SYSTEM

Toshio Kurahashi, Fukuroi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

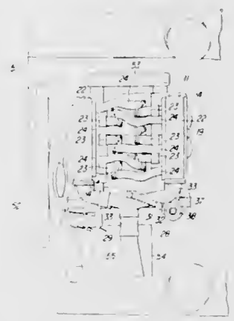
Continuation-in-part of Ser. No. 904,510, Sep. 5, 1986. This application Sep. 8, 1986, Ser. No. 904,981

Claims priority, application Japan, Oct. 11, 1985, 60-226285

Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 MV 15 Claims

1. An induction system for an internal combustion engine comprising a first plenum chamber, a first series of runners extending from said first plenum chamber to a first series of combustion chamber intakes, a second plenum chamber, a second series of runners communicating said second plenum chamber with a second series of combustion chamber intakes, an air inlet device, means for communicating said air inlet device with each of said plenum chambers for introducing an air change to the engine combustion chambers, an exhaust



system for receiving engine exhaust gases, and means for recirculating a portion of said engine exhaust gases back to said combustion chambers including an E.G.R. outlet communicating with said air inlet device including a passageway formed integrally with said air inlet device.

4,782,798

CYBERNETIC ENGINE

Horace L. Jones, P.O. Box 292, Manakin, Va. 23103

Filed May 11, 1987, Ser. No. 48,171

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] F01L *9/04*

U.S. Cl. 123—90.11 7 Claims



1. A timing mechanism adapted for use in conjunction with a four stroke internal combustion engine including a plurality of pistons disposed to reciprocate within cylinders and attached to a crankshaft in a timed sequence, each of said cylinders including a fuel-air intake and an exhaust valve; said timing mechanism comprising:

a timing disc rotatably attached to said engine and operably attached to and rotated by said crankshaft, said timing disc including:

a number of sets of firing order magnets attached to said timing disc each being spaced radially outward from the axis of rotation of said timing disc; and

a number of sets of return magnets attached to said timing disc 180° outward from a corresponding set of firing order magnets;

a hall effect sensor attached to said engine and disposed in closely spaced relationship to one side of said timing disc such that the magnetic field of said magnets is detected by said sensor; and

means for electrically coupling said sensor to selectively operate said fuel-air intake and said exhaust valve of each of said cylinders in a timed sequence.

4,782,799

SELF-ADJUSTING HYDRAULIC VALVE TAPPET

Dieter Goppelt, Auracher; Dieter Schmidt, Nurnberg; Steffen Hertrich, Herzogenaurach, and Jürgen Rabe, Auracher, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

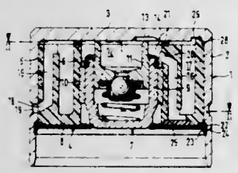
Filed Aug. 11, 1987, Ser. No. 84,627

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628619

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.55 14 Claims

1. A self-adjusting hydraulic valve tappet arranged in a guide bore of a cylinder head of an internal combustion engine and being contacted at one end face of the valve tappet by a cam and bearing with a second end face against the end of a valve stem, the tappet comprising a cup-shaped housing comprised of a hollow cylindrical wall closed at one end by an end member against the outside of which the cam and a cylindrical guide sleeve concentric with the cylindrical wall and surrounded by an external oil reservoir and in which the play compensating element is guided for longitudinal movement and abuts at its end against the valve stem, characterized in that a polymeric inner element (4,31,32) defining the guide sleeve and forming the external oil reservoir (17) together with the cupshaped housing (1) comprises two concentric cylindrical walls (5,6), one of which abuts tightly against the bore wall of the hollow cylindrical wall (2) of the housing (1) and the second defines the guide sleeve for the self-adjusting play compensating element (7) and which are connected to each other by a radial flange (8,27) in a fluid-tight manner at least at



their ends facing away from the end face (3) of the housing (1) and axially extending tube like channels (15,16) at the facing surfaces of the two cylindrical walls (5,6) at a respective circumferential area with the channel (15) arranged at the radially outer cylindrical wall (5) communicating freely at its end adjacent to the end face (3) of the housing with the external oil reservoir (17) and extending at its opposite end into a radial opening (18) aligned with a radial oil supply port (19) in the hollow cylindrical wall (2) of the housing (1) and channel (16) arranged at the guide sleeve extends at its end adjacent to end face (3) of the housing (1) into a radial opening (20) leading to the interior of the guide sleeve and communicating at its opposite end with the external oil reservoir (17).

4,782,800

DIESEL ENGINE CONTROL APPARATUS

Jay L. Hanson, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Aug. 24, 1987, Ser. No. 92,979

Int. Cl.[4] F02P *19/02*

U.S. Cl. 123—179 BG 3 Claims

1. Diesel engine control apparatus, comprising:

a Diesel engine having glow plugs and a temperature sensor,

a voltage source,

a momentary contact switch,

said momentary contact switch, when actuated, completing a first circuit which connects the voltage source to the glow plugs,

a safety circuit which is open when the Diesel engine is running normally and closed when the Diesel engine is off,

and automatic glow plug preheat control means having a ready-to-start indicator.

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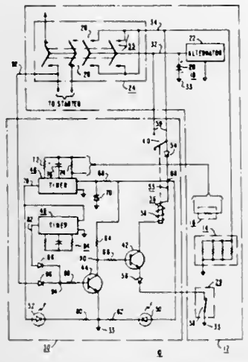
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said preheat control means being connected to said safety circuit, and connectable to said voltage source via said momentary contact switch,

said preheat control means being operative when the momentary contact switch is actuated and the safety circuit is closed to comprise a second circuit which connects the voltage source to said glow plugs,

said preheat control means including a first timer for controlling the actuation of said ready-to-start indicator after the voltage source has been connected to the glow plugs via the second circuit for a time responsive to said temperature sensor,

said preheat control means including a second timer for initiating opening of the second circuit a predetermined period of time after actuation of the ready-to-start indicator,



said preheat control means including a solid state switch, and a latching relay having an electromagnetic coil and normally open contacts, with said normally open contacts being connected across the momentary contact switch,

and wherein the second circuit which connects the voltage source to the glow plugs includes said normally open contacts, with the actuation of the momentary contact switch rendering the solid state switch conductive, to energize the electromagnetic coil and close the normally open contacts of the latching relay,

and wherein the opening of the safety circuit drops out the latching relay and renders the solid state switch non-conductive, to open the normally open contacts of the latching relay and the second circuit which connects the voltage source to the glow plugs.

4,782,801

INTERNAL COMBUSTION MOTOR

Reinhold Ficht, Kirchseeon; Franz Sinseder, Dorfen, and Andreas Baumueller, Munich, all of Fed. Rep. of Germany, assignors to Ficht GmbH, Kirchseeon, Fed. Rep. of Germany

Filed Nov. 6, 1986, Ser. No. 927,770

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1985, 3540441

Int. Cl.⁴ F01L *7/00*

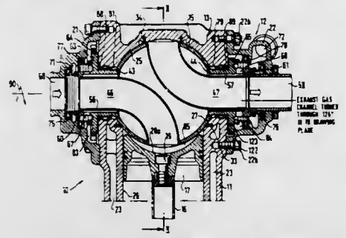
U.S. Cl. 123—190 BD **37 Claims**

1. Internal combustion motor, in particular a lift-piston motor with internal combustion and with cylinders arranged in-line, as well as with at least one rotating control element for the gas charge change processes which is arranged between cylinder block and cylinder cover of cylinder head with an axis of rotation lying perpendicular to the cylinder axis and presents between two rotational-axially extending pivots a control body standing in fixed connection with the pivots, there being provided in the cylinder head counter-surfaces uniformly surrounding the control body and the pivots, and each pivot being traversed by an axially extending gas channel, which in each case goes over into an elbow-form gas control channel arranged in the control body, which channel emerges with an opening at the surface of the control body, and means being provided for the transfer of a rotary movement from the crankshaft to the control element, characterized in that:

the control body comprises a spherical rotary slide valve (**15**) consisting of two hemispherical shell-shaped parts (**40** and **41**) welded together gas-tight;

said parts (**40** and **41**) supplementing each other to provide a hollow sphere having an equatorially arranged separating seam (**39**);

the pivots being tubular bearing pivots (**43** and **44** welded centrally onto opposite sides of said hollow sphere;



the two elbow-form channels (**46** and **47**) penetrate said separating seam (**39**) of said hollow sphere at a predetermined control angle;

one end (**48** and **49**) of each channel (**46** and **47**) issuing in closed linkage into associated one of openings (**50** and **51**) of the parts (**40** and **41**); and

the other end (**53** and **54**) of each channel (**46** and **47**) penetrating an associated one of said tubular bearing pivots (**43** and **44**) coaxially with each other to provide cooling channels (**56** and **57**) adjacent to said other ends (**53** and **54**) and bounded by outer mantle surfaces of said control channels (**46** and **47**) and inner mantle surfaces of said bearing pivots (**43** and **44**).

4,782,802

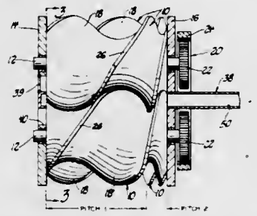
POSITIVE DISPLACEMENT ROTARY MECHANISM

Constantinos A. Koromilas, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 20, 1987, Ser. No. 5,077

Int. Cl.⁴ F02B *53/00*

U.S. Cl. 123—246 **2 Claims**



1. A positive displacement rotary mechanism comprising at least three and no more than four essentially identical rotary helical intermeshing lobes with parallel axes and identical helical surfaces extending between axially spaced ends thereof, a stationary concave sided cylindrical member extending centrally of said lobes and parallel to said axes, said helical surfaces having a varying pitch and a cross sectional profile as viewed axially having at least two convex circular apexes joined by convex circular sides such that said helical surfaces cooperate through close apex-to-side and apex-to-apex relationships therebetween and also cooperate with said cylindrical member through close apex relationship therewith to define a repetitive working space internal of said lobes having boundaries along and between said lobes and along and between said lobes and said cylindrical member which boundaries move on rotation of said lobes to effect expansion and contraction of said working space while repetitively moving same from one of said ends of said lobes toward the other end, and said stationary member having an exhaust passage extending therethrough with an opening to said working space.

4,782,803

FUEL INJECTION CONTROL METHOD FOR FUEL INJECTION PUMP

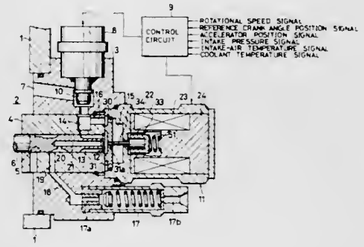
Hideya Kikuchi, Higashimatsuyama, Japan, assignor to Diesel Kiki, Co, Ltd., Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 64,084

Claims priority, application Japan, Jun. 24, 1986, 61-147888

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—300 **3 Claims**



1. A fuel injection control method for a fuel injection pump having a high pressure chamber which is selectively communicable with fuel injection nozzles of an internal combustion engine, fuel being pressurized in said high pressure chamber and pressurized fuel being pressure delivered from said high pressure chamber to said fuel injection nozzles, a low pressure chamber, a communicating passageway connected to said high pressure chamber and said low pressure chamber, and a solenoid valve for selectively opening and closing said communicating passageway to selectively deliver pressurized fuel from said high pressure chamber to said fuel injection nozzles, and wherein while fuel is pressurized in said high pressure chamber, said solenoid valve is selectively opened and closed at determined timings so that pilot injection and subsequently main injection of fuel into said engine via said injection nozzles are carried out,

the method comprising:

(1) determining a starting time and a terminating time of pilot injection depending on operation conditions of said engine;

(2) determining a first point of time at which a first period of time elapses from said terminating time of said pilot injection as a starting time of said main injection, said first period of time being set at a value depending upon operating conditions of said engine;

(3) determining a second point of time at which a second period of time elapses from said starting time of said main injection as a terminating time of said main injection, said second period of time being set independently of said first period of time; and

(4) driving said solenoid valve to selectively open and close said solenoid valve to thereby control fuel injection from said fuel injection nozzles, in accordance with (i) said starting time and terminating time of said pilot injection which are determined in step (1), and (ii) said starting time and terminating time of main injection which are determined respectively in steps (2) and (3).

4,782,804

CENTRIFUGAL SPEED GOVERNOR FOR INTERNAL COMBUSTION ENGINES

Werner Lehmann, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00498, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03647, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 4, 1986, Ser. No. 113,273

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3543157

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—365 **22 Claims**

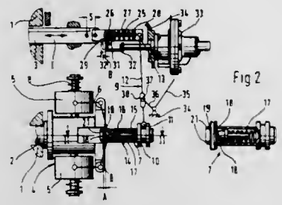


Fig 2

1. An idling/final speed governor for internal combustion engines, comprising:

quantity control means for setting a fuel injection quantity and including a control rod reciprocably movable, said control rod being formed to increase the fuel injection quantity while moving in one direction to a full load position and to decrease the fuel injection quantity while moving in an opposite direction opposite said one direction;

centrifugal-weight rectangular means (**4**) rotatably driveable at a speed proportional to a speed of an internal combustion engine, said centrifugal-weight regulator means (**4**) having centrifugal weights (**5**), said centrifugal weights being in an inoperative position when said centrifugal-weight regulator means (**4**) is not being rotatably driven, said centrifugal weights (**5**) being formed to exert centrifugal forces in response to said centrifugal-weight regulator means (**4**) being rotatably driven, said centrifugal-weight regulator means (**4**) also including idling springs (**8**) exerting biasing forces against said centrifugal weights (**5**), said centrifugal weights (**5**) cooperating with said idling springs (**8**) so as to move into and out of an equilibrium position in response to said centrifugal forces, said centrifugal weights being formed to move against said biasing force of said idling springs (**8**) in response to said centrifugal forces as caused by an increase in said speed until equilibrium develops between said centrifugal forces of said centrifugal-weights (**5**) and said biasing forces of said idling springs (**8**), said control rod (**3**) being formed to move in association with a movement of said centrifugal-weights (**5**);

means for determining a maximum fuel injection quantity and including a full-load stop (**32**) movable so as to adjustably block movement of said control rod (**3**);

means for selecting said fuel injection quantity as desired up to said maximum fuel injection quantity and including a regulating member (**35**);

starting means (**23**, **23A**, **23B**, **23C**) for starting the internal combustion engine and including a starting spring (**27**) having a biasing force, said regulating member (**35**) being movable through a plurality of relative positions between said centrifugal weights (**5**) and said starting spring (**27**), said starting spring (**27**) being formed so that said control rod (**3**) is movable in dependence upon said relative positions of said regulating member (**35**) and said movement of said centrifugal weights (**5**) and thereby change said fuel injection quantity and so that said control rod (**3**) is mov-

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able into an extra-quantity position that exceeds said full-load position while said centrifugal weights are in said inoperative position so as to produce an extra starting quantity, said starting spring (27) being connected to said control rod (3) so that regulating said full-load stop (32) as a function of operating parameters does not cause any change in said biasing force of said starting spring (27);

a governor sleeve (7, 7A) having a drag member (14) with a drag spring (17), said governor sleeve (7, 7A) being formed to travel in dependence upon said speed of said centrifugal-weight regulator means (4); and

a coupling (9) between said control rod (3) and said governor sleeve (7, 7A), said starting means (23, 23A, 23B, 23C) including a slide (26, 26A, 26B, 26C), said starting spring (27) being formed so as to e compressible for producing said extra starting quantity, said starting spring (27) cooperating with said full-load stop (32) so as to bias said control rod (3) in said opposite direction for decreasing said injection quantity and to load against said slide (26, 26A, 26B, 26C) for enabling said extra starting quantity, said starting mans (23, 23A, 23B, 23C) further including guiding means for guiding said slide (26, 26A, 26B, 26C) in a regulating direction (I) of said control rod (3), said idling springs (8) being formed to exert a force on said control rod (3) and said starting means (23, 23A, 23B, 23C) via said governor sleeve (7, 7A) and said coupling (9), said slide (26, 26A, 26B, 26C) being formed to cooperate with said full-load stop (329 so that said slide (26, 26A, 26B, 26C) displaces relative to said control rod (3) along a starting travel path (S) in response to said force of said idling springs (8).

4,782,805

CONTROL DEVICE FOR THROTTLE VALVE FOR INTERNAL COMBUSTION ENGINE

Hirotoshi Kawano, Katsuta; Shozo Yanagisawa, Ibaraki; Tadao Osawa, Katsuta; Toshifumi Usui, Katsuta, and Yutaka Takaku, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,477

Claims priority, application Japan, Oct. 16, 1985, 60-228732; Dec. 2, 1985, 60-269285

Int. Cl.[4] F02D *11/04*

U.S. Cl. 123—403 **3 Claims**



1. A control device for a throttle valve arranged in an intake passage formed in a throttle body of an internal combustion engine installed in a vehicle, which has a throttle valve shaft secured to said throttle valve, and a linkage to be driven by a linkage member connected to the accelerator pedal for opening and closing said throttle valve;

said linkage has a throttle level secured at an end thereof to said throttle valve shaft, a lever-mounting shaft at said throttle body, a drive lever having a pair of arms joined at apex to form an L-shape lever such that the arms straddle said throttle valve, a free end of one of the arms being rotatably mounted on said lever-mounting shaft, and a rod connecting another end of said throttle lever and a free end of the other arm of said drive lever, said throttle lever generally extending toward the apex of said L-shaped lever, sand linkage member being connected at the apex of said dive lever so as to be at a position displaced laterally with respect to a virtual line connecting the point on said one arm at which said drive lever is pivotably mounted on said lever-mounting shaft and the point on said other arm at which said drive lever is connected to said rod.

4,782,806

FUEL INJECTION SYSTEM AND METHOD FOR A PREMIXTURE TYPE INTERNAL COMBUSTION ENGINE

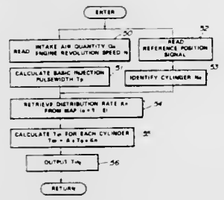
Kenji Hatanaka, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 17, 1987, Ser. No. 63,231

Claims priority, application Japan, Jun. 17, 1986, 61-141038

Int. Cl.[4] F02D *41/62;* **F02M** *51/00*

U.S. Cl. 123—486 **10 Claims**



1. A fuel supply system for an internal combustion engine, comprising:

(a) a chamber connected to intake air ports of engine cylinders via a plurality of branch passages;

(b) a device for supplying fuel into the chamber at a controllable rate and timing;

(c) first means for determining a timing of a suction stroke of each engine cylinder; and

(d) second means for controlling an amount of fuel supplied from the device to each cylinder in the suction stroke determined by the first means according to dimensions of each branch passage connected to a corresponding cylinder so as to substantially equally distribute the actual amount of fuel sucked into the cylinders.

4,782,807

UNIT INJECTOR FOR AN INTERNAL COMBUSTION ENGINE

Takeshi Takahashi, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 12, 1987, Ser. No. 84,557

Claims priority, application Japan, Sep. 5, 1986, 61-210126

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **10 Claims**

1. A unit injector for an internal combustion engine, the injector comprising:

a pressurizer unit for pressurizing fuel;

a nozzle unit for injecting the pressurized fuel; and

a spill unit disposed between the pressurizer unit and the nozzle unit, the spill unit including

a fuel supply path connecting the pressurizer unit to the nozzle unit,

a cylindrical passage having a center axis transversely intersecting the fuel supply path and forming at one end a spill port opening into a fuel return path,

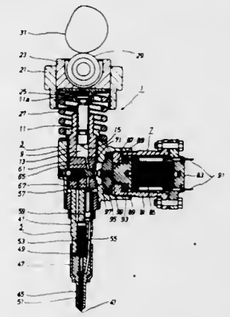
a spill valve movable in the cylindrical passage between an open position for permitting communication between the fuel supply path and the fuel return path through the spill port and a shut position for preventing communication through the spill port, and

actuating means for moving the spill valve between the open position and the shut position,

wherein the actuating means comprises:

a piezoelectric element having a dimensional change axis and an actuating end transverse to said axis, said actuating end being movable parallel to the actuating axis in response to energization and deenergization of the piezoelectric element;

an actuator piston mechanically coupled to the actuating end of the piezoelectric element for movement there-



with, the actuating piston having a first end with a first cross-sectional area;

an actuated piston mechanically coupled to the spill valve, the actuated piston having a first end with a second cross-sectional area substantially smaller than the first cross-sectional area of the actuator piston; and

means for hydraulically coupling the first end of the actuator piston and the first end of the actuated piston such that a linear displacement of the actuator piston produces a linear displacement of the actuated piston amplified by the ratio of the first cross-sectional area to the second crosssectional area.

4,782,808

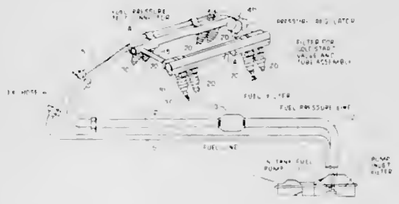
PROCESS AND APPARATUS FOR REDUCING PORT FUEL INJECTOR DEPOSITS

Giles L. Bostick, Ashland; Carlton H. Jewitt, Catlettsburg, and Victor L. Kersey, Ashland, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 13, 1986, Ser. No. 896,168

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—514 **5 Claims**



1. An improved internal combustion engine fuel delivery system comprising in combination:

A. a source of fuel,

B. an injector delivering fuel to a combustion chamber within said internal combustion engine,

C. a fuel pressure line connecting said source with said injector,

D. a fuel pump maintaining said fuel pressure line at a predetermined supraatmospheric pressure during operation of said internal combustion engine,

E. a fuel return line through which fuel, which does not enter said injectors, returns from the area of said injectors to said source, said fuel return line operating at a lower pressure than said fuel pressure line during the operation of said internal combustion engine,

F. pressure regulating means located within said system for maintaining and controlling the pressure in said fuel pressure line,

G. depressurizing means for reducing the pressure below 5 kPa in said fuel pressure line upon ignition cut-off of said internal combustion engine,

whereby, upon ignition cut-off, said pressure in said fuel pressure line is reduced.

4,782,809

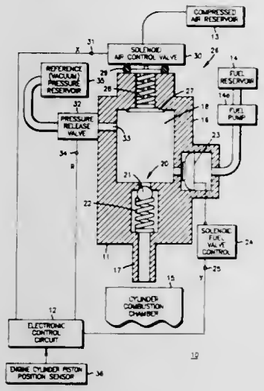
FUEL INJECTOR WITH ELECTRONIC CONTROL CIRCUIT

Jeffrey P. Kotowski, and Jeffrey T. Barylak, both of Palatine, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 19, 1987, Ser. No. 123,447

Int. Cl.[4] F02M *67/02*

U.S. Cl. 123—531 **20 Claims**



1. A fuel injector comprising:

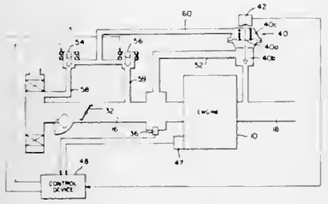
a body having a fixed volume receiving cavity with an outlet valve, said outlet valve adaptable to selectively inject the contents in said cavity into an engine combustion chamber;

a fuel inlet valve means connected to said cavity for periodically providing fuel thereto in accordance with a received fuel metering electrical control signal, comprising periodic pulses, said fuel metering control signal controlling actuation of said fuel inlet valve means, and the effective duration of said fuel metering control signal pulses controlling the amount of fuel provided to said cavity; and

a compressed air inlet valve means connected to said cavity for periodically providing compressed air to said cavity in accordance with a received injection occurrence electrical control signal, separate from said fuel metering signal, said injection occurrence control signal comprising periodic pulses which control actuation of said compressed air inlet valve means and control at least the initial time of occurrence of injection of the contents of said cavity, comprising fuel and air, through said outlet valve and into said combustion chamber.

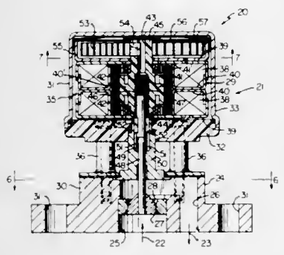
VOL 1096 ISS 2 NO 8 1988 UMI

4,782,810
FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE
Shigeaki Shimoda; Tatsuya Tomii, and Yasunori Sasaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Sep. 9, 1987, Ser. No. 94,595
Claims priority, application Japan, Sep. 10, 1986, 61/213140
Int. Cl.[4] F02M *25/06, 51/00;* **F02D** *41/04*
U.S. Cl. 123—571 **20 Claims**



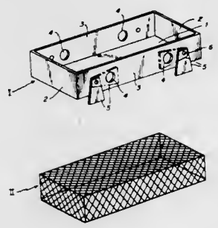
1. A fuel injection system for an internal combustion engine comprising:
(a) an engine having a crankshaft and a plurality of cylinders each with an intake passage and an exhaust passage;
(b) intake stroke detecting means for detecting if a cylinder of said engine is experiencing an intake stroke;
(c) fuel injection means actuated responsive to said intake stroke detecting means for injecting fuel into the intake passage of said cylinder during intake stroke of said cylinder;
(d) exhaust gas recirculation means for recirculating a part of exhaust gases from the exhaust passage to the intake passage of said cylinder; and
(e) fuel injection timing control means for advancing fuel injection timing responsive to operation of said exhaust gas recirculation means to control the fuel injection period relative to the intake stroke, said fuel injection timing control means starting fuel injection during intake stroke when said exhaust gas recirculation means is not operating, and before intake stroke when said exhaust gas recirculation means is operating.

4,782,811
EXHAUST GAS RECIRCULATION VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME
Chip Hewette, Knoxville, and Jay L. Lewis, Knox County, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Mar. 30, 1987, Ser. No. 32,509
Int. Cl.[4] F02M *25/06;* **F16K** *31/04*
U.S. Cl. 123—571 **14 Claims**



1. In an exhaust gas recirculation valve construction comprising a housing means provided with an inlet and an outlet separated by a valve seat, an axially movable valve member carried by said housing means for opening and closing said valve seat, and electrically operated stepper motor means carried by said housing means and being operatively interconnected to said valve member for axially positioning said valve member relative to said valve seat, said motor means having a rotatable rotor threadedly interconnected to said valve member to cause axial movement of said valve member upon rotatable movement of said rotor, said valve member and said valve seat being arranged so as to be reverse acting, the improvement wherein said valve construction has spring means operatively interconnected to said valve member to always move said valve member from an open position thereof to its closed position with said valve seat upon loss of electrical current to said motor means.

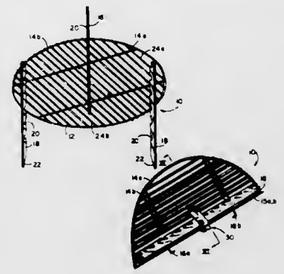
4,782,812
MEAT GRILL
Dan Kellerman, 27 Antwerpen Street, Haifa, Israel
Filed May 26, 1987, Ser. No. 54,385
Claims priority, application Israel, Jan. 13, 1987, 81237
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—9 A **13 Claims**



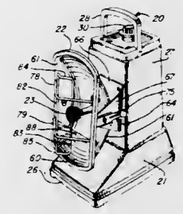
1. A grilling device comprising:
an open box of a non-combustible material,
a disposable fuel pack of a size permitting its ready insertion into said box,
said box including a substantially flat bottom, opposed side walls connected to said bottom and an open top, at least two side walls being perforated with air openings,
said fuel pack including a fuel supply and wire netting completely surrounding said fuel supply, said wire netting including a flat upper surface serving as a grid, said fuel supply including a first upper layer of lumps of charcoal, a second middle layer of wood shavings covered by a readily inflammable material, and a third lowermost layer of an igniting material in the form of strips of a mass containing a high percentage of a fast-igniting and burning material.

4,782,813
COLLAPSIBLE GRILL KIT
Robert J. Kopke, 3516 Windsor Dr., Boise, Id. 83705
Filed Jul. 20, 1987, Ser. No. 75,548
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—25 A **9 Claims**

1. A grill kit comprising:
a first grill section having a plurality of food-contacting members;
a plurality of elongated support members adjacent a first face of said first grill section;
a clip having first and second interconnected legs straddling said support members, an end portion of one said leg removably engaging one of said food-contacting members whereby said clip retains said support members to said grill section; and
a second grill section having a plurality of food-contacting members, said second grill section abutting a second face of said first grill section opposite said first face and wherein an end portion of the other said leg removably engages one said food-contacting member on said second grill section whereby said clip further retains said grill sections together.

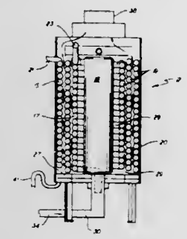


4,782,814
BURNER FOR RADIANT HEATER
John T. Cherryholmes, Potwin, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.
Filed Feb. 1, 1984, Ser. No. 576,037
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—92 B **14 Claims**



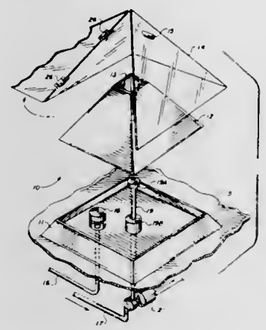
1. A burner assembly for a heater comprising a burner tube and a porous burner head mounted on the burner tube, the burner head being generally spherical and including a first generally hemispherical portion adjacent the burner tube and a second generally hemispherical portion remote form the burner tube, the porosity of the first portion being greater than the porosity of the second portion whereby fuel flowing through the burner tube and into the burner head will flow at a higher rate through the first portion of the burner head than through the second portion, and a generally cylindrical port screen connected to the burner tube and extending inside the burner head, the port screen including a first open end which is connected to the burner tube and a second end which is formed by overlapping portions of the screen so that the porosity of the second end is less than the porosity of the side of the port screen.

4,782,815
LIQUID-BACKED GAS-FIRED HEATING SYSTEM
James N. Friedman, and Chester D. Ripka, both of Syracuse, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Feb. 20, 1987, Ser. No. 17,393
Int. Cl.[4] F24H *1/00;* **F24D** *3/00*
U.S. Cl. 126—361 **7 Claims**



1. A heating system for heating a space comprising:
a closed fluid flow loop means having a heat transfer fluid flowing therethrough;
means for circulating said heat transfer fluid through said closed fluid flow loop means;
heating module means for transferring heat to said heat transfer fluid flowing through said closed fluid flow loop means, said module means including a tank enclosure, an infrared burner disposed within said tank enclosure, said burner connected to a supply for a mixture of vaporous fuel and air, heat exchange tubing disposed within said tank enclosure and in heat exchange relationship with said infrared burner, said heat exchange tubing configured in a spiral juxtaposed to said infrared burner for absorbing heat from said infrared burner to heat the fluid flowing through said tubing;
a fan coil connected in said closed fluid flow loop means downstream of said heating module means for transferring heat from said fluid to the space to be heated.

4,782,816
APPARATUS FOR A SOLAR WATER HEATER
Angel M. Salgado, 6060 W. Royal Palm Rd., Glendale, Ariz. 85302, and Harold L. Drury, 3852 W. Dalphin Rd., Phoenix, Ariz. 85021
Filed Nov. 20, 1986, Ser. No. 932,938
Int. Cl.[4] F24J *2/04*
U.S. Cl. 126—437 **8 Claims**



1. A solar fluid heater comprising:
a base structure adapted to form a reservoir for storing said fluid;

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a radiation absorbing structure detachable from and adapted to be positioned within said reservoir and be in contact with fluid stored in said reservoir, said radiation absorbing structure having planar elements coupled in a pyramidal shape;

fluid distribution means for applying said fluid to said radiation absorbing structure, said applied fluid flowing into said base structure; and

an enclosing structure having planar elements generally having said pyramidal shape for contacting said base structure and thermally isolating said radiation absorbing element and said stored fluid from an exterior environment.

4,782,817

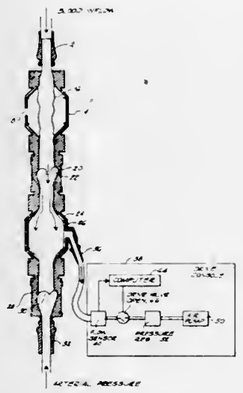
VENTRICULAR SUPPORT SYSTEM

Param I. Singh, Lexington; William J. Bolt, Beverly, and Dana C. Sawyer, Wakefield, all of Mass., assignors to Abiomed Cardiovascular, Inc., Danvers, Mass.

Filed May 29, 1987, Ser. No. 55,648

Int. Cl.⁴ A61M *1/03*; A61F *1/24*

U.S. Cl. 600—17 **8 Claims**



1. In an extracorporeal ventricular support system for a patient having,

a first chamber having an external wall with an opening to admit ambient air therethrough and including a first flexible bladder element and;

an input port for fluidic coupling between said patient and said first bladder to allow free flow of blood from said patient through said port to said first bladder;

a second chamber having a nonelastic outer wall and a second flexible bladder element contained within the volume enclosed by said non-elastic wall, the volume of said chamber external to said bladder being pneumatically sealed with respect to the interior of said bladder;

first valve means coupled between said first and second bladders constructed to allow fluid flow between said first and second bladders only in the direction from said first toward said second bladder;

an output port for conveying fluid from said second bladder to the arterial system of said patient;

a second valve means coupled between said second bladder and said output port and constructed to pass fluid from said second bladder to said output port only in the direction from said second bladder toward said output port;

said first and second chambers being positioned with respect to one another and to said patient so as to permit gravity flow from said input port through said first bladder into said second bladder;

a pressurized gas source at substantially constant pressure;

a controllable valve,

a pneumatic line coupling the volume of said second chamber external to said bladder to said controllable valve,

said controllable valve being operative in a first position to couple said gas source to the interior of said second chamber external to said second bladder, and in a second position to vent the interior of said second chamber external to said bladder;

means for sensing volumetric gas flow passing in a direction away from said second chamber toward said controllable valve and providing an output signal indicative of said gas flow, the improvement comprising;

programmable means responsive to said signal indicative of the sensed gas flow to control said controllable valve to provide for a predetermined target output volume per beat from said pump by controlling the period said controllable valve is in said second position, so that it ends when said sensed gas flow decreases below a value indicating that blood inflow into said second chamber has substantially terminated.

4,782,818

ENDOSCOPE FOR GUIDING RADIATION LIGHT RAYS FOR USE IN MEDICAL TREATMENT

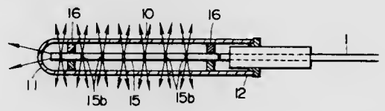
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 914,896

Claims priority, application Japan, Jan. 23, 1986, 61-12498

Int. Cl.⁴ A61B *1/06*

U.S. Cl. 128—6 **22 Claims**



1. An endoscope for guiding radiation light rays for use in medical treatment comprising an elongated optical conductor for transmitting light rays corresponding to the visible light rays component of solar rays, said conductor having a longitudinal end portion, an elongated tube means having one longitudinal end which is closed, the other longitudinal end of said tube means having receiving means for receiving said longitudinal end portion of said conductor such that said longitudinal end portion of said conductor extends into said tube means, filter means in said tube means, said longitudinal end portion of said conductor having a terminating end disposed between said filter means and said receiving means, said tube means having an elongated longitudinally extending tube section of constant inner and outer diameters extending between said closed end and said receiving means, said inner diameter of said elongated tube section being greater than the outer diameter of said conductor so as to form an annular space between said inner diameter of said elongated tube and said conductor such that light rays transmitted by said conductor radiate from said terminating end of said conductor are transmitted in a generally axially and radially outward direction to pass through said filter means and onto said elongated tube section to thereby effect radiation of filtered light rays generally radially outwardly along the axial length of said elongated tube section.

4,782,819

OPTICAL CATHETER

Edwin L. Adair, 2800 S. University Blvd., #97, Denver, Colo. 80210

Continuation-in-part of Ser. No. 18,630, Feb. 27, 1987, Pat. No. 4,736,733. This application Apr. 9, 1987, Ser. No. 36,553

Int. Cl.⁴ A61B *1/06*

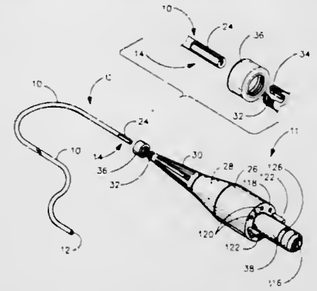
U.S. Cl. 128—6 **13 Claims**

1. A sterilizable small diameter optical catheter for viewing and/or treatment within body cavities by nonsurgical or micro-surgical procedures and having a distal end for insertion into a body cavity and a proximate end, said catheter comprising:

a coherent fiber optical bundle having a micro-thin diameter and extending from said distal end to a point adjacent said proximate end and having a planar surface at its proximate end;

a plurality of light transmitting fibers spaced around said optical bundle;

a tubular outer cover extending over said fibers to hold them in place, said outer cover extending from said distal end to a point spaced from said proximate end;



optical lens means at said distal end of said optical bundle to focus an image of a portion of the cavity on said distal end of said optical bundle for transmission through said optical bundle;

a coupling means for removably connecting said catheter to a viewing means in fixed angular relationship, fixedly attached to said proximate end of said catheter and having a diameter no larger than the diameter of said outer covering so that said catheter can pass completely through a trochar lumen or operating channel of a larger endoscope; and

a strain relief unit having a first smaller end for receiving said coupling means in aligned relationship and having a second larger end with a male connector for reception in optical alignment in a receptacle of a viewing means.

4,782,820

IRIS RETAINING DEVICE

Randall L. Woods, 2460 East Raynell, Springfield, Mo. 65804

Filed Oct. 22, 1987, Ser. No. 111,198

Int. Cl.⁴ A61B *17/02*

U.S. Cl. 128—20 **5 Claims**



1. An iris retainer for use during eye surgery and comprising and elongated, arcuate, flexible, resilient body sized to fit within the inner defining margin of the iris of a human eye, said body including a generally U-shaped in cross section iris-receiving sidewall presenting an inboard central bight portion and a pair of spaced apart wall sections respectively extending outwardly from said bight portion, said sidewall being configured for engaging the inner margin of the iris of the human eye in order to maintain the pupillary opening of a size to permit surgical procedures.

4,782,821

SHOCK WAVE GENERATOR FOR AN INSTALLATION FOR NON-CONTACTING DISINTEGRATION OF CALCULI IN THE BODY OF A LIFE FORM

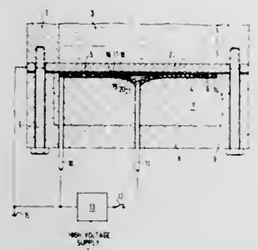
Josef Reitter, Mochrendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 57,315

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1986, 3623703

Int. Cl.⁴ A61B *17/22*

U.S. Cl. 128—24 A **10 Claims**



1. A shock wave generator operable at a high voltage comprising:

a housing have a volume containing a shock wave transmitting medium, said volume terminating on one side with a membrane consisting of electrically conductive material;

a high voltage source for providing said high voltage;

a coil arranged opposite to said membrane outside said volume;

switch means for connecting said coil to said high voltage source such that the high voltage drops along said coil, said coil and said membrane thereby having a varying voltage difference therebetween with at least one region of said coil having a higher voltage difference with respect to said membrane than another region of said coil; and

means for supporting said coil relative to said membrane so that said one region of higher voltage difference is disposed a farther distance from said membrane than said other region.

4,782,822

RESONANCE FREQUENCY STIMULATOR

James F. Ricken, Box 3832 H.S., Ruidoso, N. Mex. 88345

Filed Aug. 7, 1987, Ser. No. 82,589

Int. Cl.⁴ A61H *1/00*

U.S. Cl. 128—33 **6 Claims**

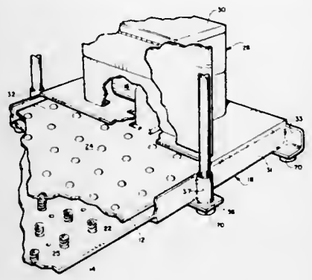
1. A resonance frequency stimulator for increasing blood circulation in horses comprising:

an elongated bottom plate having a width greater than that of a horse and a length greater than that of a horse and being oriented in a substantially horizontal plane, said bottom plate having a top surface having a predetermined number of coiled compression springs positioned thereon with their axes directed substantially vertically;

an elongated top plate having a width substantially the same as that of said bottom plate and a length substantially the same as that of said bottom plate and being oriented in a substantially horizontal plane, said top plate having a bottom surface that rests resiliently on said coiled com-

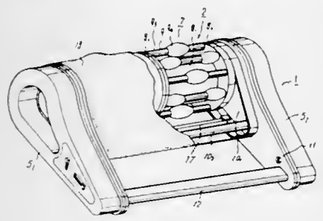
VOL 1096 ISS 2 NO 8 1988 UMI

pression springs at a predetermined height above said bottom plate;
fastening means that pass through said coiled compression springs and secure said top plate to said bottom plate;
a frame assembly having a length greater than the length of said top plate and a width greater than that of said top plate, said frame having a substantially vertical front wall, rear wall and laterally spaced side walls so that said top plate has unrestricted upward and downward motion on said coiled compression springs, said bottom plate being fixedly secured to said frame assembly;
a hand rail assembly extending upwardly at least to the chest height of a horse from said frame assembly, said hand rail assembly extending along both lateral sides of said frame



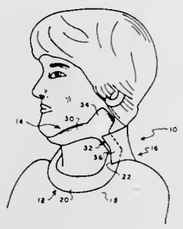
assembly, said lateral sides each having a vertically oriented front tubular pipe member and a vertically oriented rear tubular pipe member, said front tubular pipe members being located rearwardly from the front end of said frame assembly a distance approximating the length of a horse's head, a front safety rail extends laterally between the top ends of said front tubular pipe members so that a horse's head can extend over it, a vertically oriented front plate extends between said front tubular pipe members to prevent a horse from kicking structure mounted forwardly of said tubular pipe members; and
a rotary vibrator with motor is mounted on said top plate for producing a resonance frequency vibration in said top plate, said motor being mounted forwardly of said tubular pipe members adjacent the front end of said top plate.

4,782,823
ROLL ROTATION TYPE MASSAGING APPARATUS
Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fujl Iryoki, Osaka, Japan
Filed Mar. 17, 1987, Ser. No. 26,938
Int. Cl.⁴ A61H *15/00*
U.S. Cl. 128—57 **6 Claims**



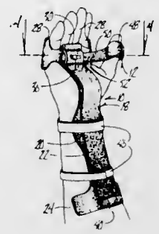
1. A portable rotating roll-type massaging apparatus, comprising:
a generally U-shaped frame having a pair of generally parallel elongate end plates rigidly joined together adjacent one end thereof by an elongate connecting bar extending transversely therebetween;
a driving unit disposed between and supported on said end plates adjacent the other end thereof, said driving unit including (1) a shaft extending transversely between and nonrotatably supported on said end plates, (2) an elongate driving cylinder rotatably supported on and surrounding said shaft and disposed between said end plates, and (3) motor means disposed within said driving cylinder for drivingly rotating said driving cylinder;
an elongate roll unit extending transversely between said end plates and being concentrically and nonrotatably supported on said driving cylinder for rotation therewith about a rotational axis defined by said shaft;
said roll unit including (1) an elongate drum concentrically and nonrotatably supported on said driving cylinder, (2) a pair of axially spaced annular end flanges fixed to said drum and projecting radially outwardly therefrom, (3) a plurality of elongate support bars extending parallel with said axis so that opposite ends of said support bars are mounted on said end flanges, said support bars being spaced radially outwardly from said drum and being disposed substantially uniformly angularly spaced thereabout, and (4) a plurality of roll-like massaging elements rotatably supported on said plurality of support bars.

4,782,824
EXTERNAL AIRWAY SUPPORT
Gerald G. Davies, 403 Magowan Ave., Iowa City, Iowa 52240
Filed Jul. 23, 1987, Ser. No. 76,790
Int. Cl.⁴ A61F *5/01*
U.S. Cl. 128—76 R **15 Claims**



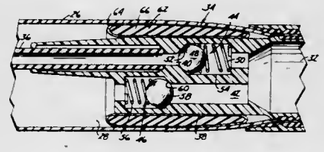
1. A device to be worn by a human patient for maintaining the upper airway of the patient in an open, unobstructed position, said device comprising:
a lower portion arranged to rest upon the upper thorax of the patient;
an upper portion connected to and braced by said lower portion, said upper portion including means for lifting the lower jaw of the patient and a pair of lower jaw rami supports for thrusting the lower jaw of the patient forward; and
a posterior portion connected to said lower and upper portions, said posterior portion being arranged to maintain the positioning of said lower and upper portions.

4,782,825
COMBINATION ARM SPLINT AND FINGER SUPPORT MEANS
Robert Lonardo, 680 Capri Blvd., Treasure Island, Fla. 33706, assignor to Robert Lonardo, Treasure Island, Fla., Trustee of the Robert Lonard Living Trust Agreement
Filed May 21, 1987, Ser. No. 52,477
Int. Cl.⁴ A61F *5/10*
U.S. Cl. 128—77 **7 Claims**



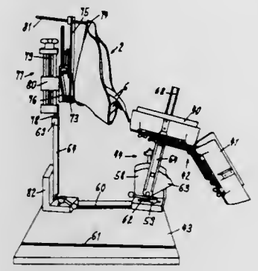
1. In combination,
a finger support,
a forearm and wrist splint, comprising
an elongated base strip having a longitudinal axis adapted to conform to the underside of a patient's forearm,
said base strip having first and second layers, each having forward and rearward ends; said base strip being folded at its upper forward end and extending rearwardly with said second layer dwelling coextensively with said first layer, and
a hand support portion formed at said forward end of said first layer, and
connecting means detachably connecting the rearward ends of said first and second layers, said connecting means comprising a U-shaped portion formed at said rearward end of said first layer, said U-shaped portion receives the rearward end of said second layer, and
a slot means formed between said first and second layers adjacent said forward ends, said slot means extending transversely with respect to the longitudinal axis of said base strip and being adapted to transversely slidably receive said finger support, and
means for detachably securing said finger support within said slot means.

4,782,826
PENILE PROSTHESIS
Terence M. Fogarty, Hudson, Wis., assignor to Mentor Corporation, Minneapolis, Minn.
Filed May 21, 1987, Ser. No. 52,844
Int. Cl.⁴ A61F *2/26*
U.S. Cl. 128—79 **21 Claims**



1. A penile implant device in fluid communication with an implantable reservoir, the device comprising:
a pressurizable cylinder adaptable for implantation, the cylinder including a pressurizable chamber and a means for pumping fluid from the reservoir to the pressurizable chamber, a deformable valving portion disposed within the cylinder, and cushioning means surrounding the valving portion whereby accidental deformation of the valving portion is minimized.

4,782,827
ORTHOPEDIC APPARATUS
Bernard Paratte, 23 Général-Dufour, 2300 La Chaux-de-Fonds, Switzerland
Filed Dec. 5, 1985, Ser. No. 804,859
Int. Cl.⁴ A61F *5/00*
U.S. Cl. 128—80 R **20 Claims**



1. An orthopedic apparatus comprising:
an orthopedic support means for supporting a foot, said orthopedic support means comprising a sole means extending in a first plane beyond the toes for receiving a plantar surface of the foot and for supporting any overlying bedclothes and coverlets;
a clamp means for removably fastening said orthopedic support means to the foot;
first means for removably mounting said orthopedic support means on a base extending in a second plane and for adjusting a distance between said orthopedic support means and the base;
second means for orienting said orthopedic support means in said first plane;
third means for orienting said orthopedic support means in a sagittal plane perpendicular to said first plane;
a set of first and second cradle splint means pivotably coupled for supporting respectively a calf and a thigh;
fourth means for adjusting a distance between said cradle splint means;
fifth means for adjusting an angle of inclination of said cradle splint means;
sixth means for removably mounting said set of cradle splint means on said base and for adjusting a distance between said set of cradle splint means and said base; and
seventh means for adjusting an angle of inclination of said set of cradle splint means with respect to said second plane.

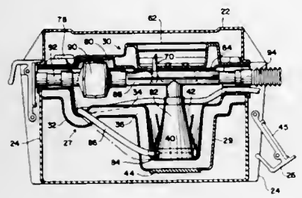
4,782,828
RADIOAEROSOL DELIVERY APPARATUS
Thomas W. Burnett, Bellevue; Thomas R. Clary, Seattle, both of Wash.; Vincent F. Iannuzzelli, Califon, N.J., and Carl P. Kremer, Jr., Darien, Conn., assignors to Mallinckrodt, Inc., St. Louis, Mo.
Continuation of Ser. No. 477,277, Mar. 21, 1983, abandoned. This application Jan. 10, 1986, Ser. No. 817,808
Int. Cl.⁴ A61M *11/00*
U.S. Cl. 128—200.14 **8 Claims**

1. An apparatus comprising:
a radioaerosol generating source and support means for supporting the radioaerosol generating source;
transport means including a passage providing a first inlet for communication with the surrounding atmosphere and an outlet adapted for connection to a patient, said trans-

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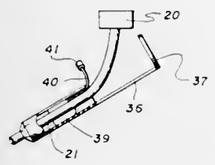
port means including a second inlet connected to said source for transporting the radioaerosol generated by said source to said outlet; and

shielding means substantially surrounding said transport means for reducing the amount of radiation transmitted to the surrounding atmosphere, said shielding means including a first opening aligned with said first inlet for providing communication between said first inlet and the surrounding atmosphere during use of said apparatus and a second opening aligned with said outlet, said shielding means including a lower portion and a cover portion, said



lower portion formed to define said support means and to substantially surround said support means and including means for supporting said transport means, said cover portion engaging said lower portion to enclose said transport means, said cover portion including latch means releasably attachable to said transport means for holding said cover portion in engagement with said transport means, said cover portion being removable with said transport means and said source from said source support means, said transport support means and said lower portion of said shielding means as a unit.

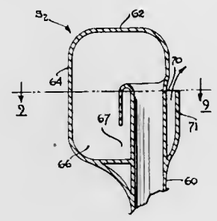
4,782,829
APPARATUS FOR PREVENTING BREAKAGE OF BAGS OF TRACHEAL TUBES
Sol Weiss, 17227 Queson Pl., Encino, Calif. 91304
Filed Jan. 12, 1987, Ser. No. 2,580
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—200.26 **14 Claims**



8. A protector adapted to surround a tracheal tube and protect a bag surrounding and secured to the same, the protector comprising:

an elongated tubular body portion with a forward end and rear end, and having a central longitudinal axis, said tubular body portion being of a resilient material and having an end to end slit for separation thereat, said body portion being open at both ends and having an extension portion extending away from the rear end of said body portion, the forward end of said body portion comprising a nose, said nose being convex and disposed generally normal to the longitudinal axis of said body portion and having a restricted opening located centrally therein, said central longitudinal axis extending through said restricted opening, a plurality of spaced slits through said nose extending radially outwardly from said restricted opening for a selective spreading of the nose and an enlargement of the restricted opening.

4,782,830
SNORKEL
Bruce J. Forman, 4455 Jasmine Ave., Culver, Calif. 90230
Filed Nov. 21, 1986, Ser. No. 933,376
Int. Cl.[4] B63C *11/16*
U.S. Cl. 128—201.11 **2 Claims**



1. A snorkel capable of use in underwater swimming where the attitude of the swimmer can vary substantially, said snorkel comprising:

(a) a housing forming a chamber with a combined inlet and outlet opening which is upwardly presented when a user is in a normal swimming attitude and said snorkel housing is in an upright generally vertical disposition,

(b) an elongate breathing tube extending through said housing and having a lower end and an upper end, said upper end being located upwardly of the opening of said chamber when the user is in a normal swimming attitude,

(c) a secondary tube having an upper end and a lower end,

(d) a lower tube section connecting the lower end of said secondary tube to the chamber of said housing,

(e) an upper tube section connecting the upper end of said breathing tube to the upper end of said secondary tube, said secondary tube having a relatively straight section arranged so that water may accumulate therein, but having a length sufficient so that water cannot pass from the secondary tube through the upper section into the elongate breathing tube when the snorkel is tilted with respect to an upright generally vertical disposition, such that water inhalation by a user is precluded when the attitude of the diver is changed so that the elongate tube is not vertically disposed, and

(f) a mouthpiece on the lower end of said elongate breathing tube and adapted to be received at a mouth of a user of said snorkel.

4,782,831
VOLUME-CONTROLLED MANUAL RESUSCITATOR
John H. Gallant, 432 High St. East, Strathroy, Ontario, Canada N7G 1H5
Filed May 27, 1987, Ser. No. 54,707
Claims priority, application Canada, May 27, 1986, 510134
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—264.18 **5 Claims**

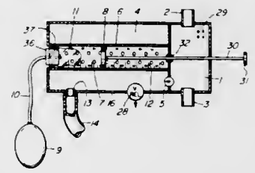
5. A manual resuscitator comprising:

(i) a chamber for receiving patient gas;

(ii) a one-way valve leading from a source of gas and operatively connected to said chamber;

(iii) a piston-like element defining one wall of said chamber, and means for adjusting the position of said piston-like element within said chamber and for securing said piston-like element in place to control the volume of said chamber;

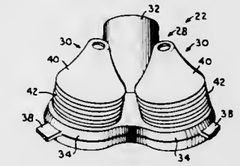
(iv) an inflatable element within said chamber and manually operated means to inflate said element to fill said chamber



and thereby displace a measured volume of gas therefrom; and

(v) means for supplying the measured volume to a patient.

4,782,832
NASAL PUFF WITH ADJUSTABLE SEALING MEANS
Russell L. Trimble, Overland Park, Kans.; Roger J. Dolida, Kingwood, Tex.; Frederick R. Rose, and Philip M. Metzler, both of Overland Park, Kans., assignors to Puritan-Bennett Corporation, Lenexa, Kans.
Filed Jul. 30, 1987, Ser. No. 79,881
Int. Cl.[4] A61M *15/08*
U.S. Cl. 128—207.18 **12 Claims**



1. A nasal puff, comprising:

a plenum chamber including structure defining an inlet adapted for coupling with a source of gas, and a pair of separate, spaced apart gas outlets in communication with said inlet; and

a pair of elongated gas delivery elements each having a structure defining gas flow passageway therethrough and respectively operatively coupled with a corresponding gas outlet for conveying gas from the outlet through and out said passageway,

said elements each being configured to present an end portion for insertion into a respective naris of a patient to receive said gas,

there being means for selective alteration of the effective position of each of said elements individually for permitting custom fitting of said elements with respect to the nares of different patients,

said gas delivery element alteration means including, for each element, an elongated bellows-type corrugated section forming a part of said passageway-defining structure and located between the corresponding end portion and said plenum chamber,

each of said corrugated sections including at least a pair of axially spaced apart outboard peripheral wall segments, an inboard wall segment disposed between and located radially inward of the outboard wall segments, and a pair of wall stretches interconnecting said inboard wall segment and both of said outboard segments, said wall stretches extending generally transverse to the longitudinal axis of the associated gas delivery element.

4,782,833
BONE BORING INSTRUMENT
Thomas A. Einhorn, 1155 Park Ave., New York, N.Y. 10128; Andrew Valenti, 277 Laclede Ave., Uniondale, N.Y. 11553, and Matthew Alves, Kalamazoo, Mich., assignors to Thomas A. Einhorn, New York and Andrew Valenti, Uniondale, both of, N.Y.
Filed Feb. 19, 1987, Ser. No. 16,587
Int. Cl.[4] A61B *17/16*
U.S. Cl. 128—310 **11 Claims**



1. A manually operable bone boring instrument for removing, by the hand manipulation of the user, a cylindrical section of bone for a medical purpose comprising:

an elongated trephine having a hollow shaft, circularly-arranged saw teeth at the distal end thereof and an enlarged head portion at the proximal end thereof, and

a handle means for engaging and causing rotation of said trephine about its longitudinal axis for cutting a cylindrical core of bone for removal,

said handle means including

a body having a longitudinally extending central bore,

a drive shaft extending longitudinally within said central bore,

means for supporting said drive shaft on said body for rotation within said central bore including

means for providing one-way driving engagement between said body and said drive shaft so that when said body is caused to rotate in one direction relative to said drive shaft, said means for providing one-way driving engagement causes conjoint movement of said drive shaft and said body, and when said body is caused to rotate in the opposite direction relative to said drive shaft, said body is free to rotate freely relative to said drive shaft, so that the user can by an oscillating hand motion on said handle means perform a manual bone cutting operation by rotating the trephine in only one direction without letting go of said handle means,

said drive shaft having an end portion extending from one end of said body, and

quick-release coupling means on said extended portion of said drive shaft for releasably engaging said trephine at said enlarged head portion thereof.

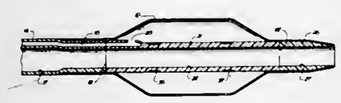
VOL 1096 ISS 2 NO 8 1988 UMI

4,782,834

DUAL LUMEN DILATATION CATHETER AND METHOD OF MANUFACTURING THE SAME

Mark A. Maguire, San Jose; Lambert J. Dietrich, Danville, and Nitin P. Matani, San Jose, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Jan. 6, 1987, Ser. No. 647
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 **16 Claims**



1. A dilatation catheter for use in transluminal angioplasty having a longitudinally extending tubular member, said tubular member comprising:
(a) a first tubular section formed of polymeric material having first and second longitudinally extending lumens positioned side by side with openings for each lumen at the distal end of said section;
(b) a second tubular section formed of polymeric material having a longitudinally extending lumen joined to the distal end of the first tubular section with the first longitudinally extending lumen in the first tubular section in fluid communication with the longitudinally extending lumen in the second tubular section, the polymeric material of said second tubular section having a different flexibility from the polymeric material of the first tubular section to provide variable flexibility along the length of the tubular member of the catheter; and
(c) an inflatable balloon mounted on the distal extremity of the tubular member and disposed concentrically about the second tubular section with the second tubular section extending along substantially the entire length of balloon, the proximal end of the balloon joined to the distal end of the first tubular section and the distal end of the balloon joined to the second tubular section and with the second longitudinally extending lumen in the first tubular section in fluid communication with the interior of the inflatable balloon.

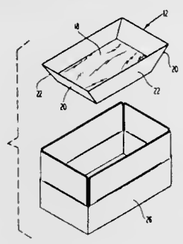
4,782,835

REFILL UNIT FOR PORTABLE HEAT TREATMENT SYSTEM

Ronald J. Bernardini, Ambler, Pa., assignor to Michael Litman, Huntingdon Valley, Pa., a part interest

Division of Ser. No. 376,000, May 7, 1982, Pat. No. 4,696,303. This application Mar. 26, 1987, Ser. No. 31,345
Int. Cl.[4] A61F *7/00*
U.S. Cl. 128—403 **2 Claims**

1. A replacement refill unit usable in conjunction with a heating shoe of a portable heat treatment system to administer heat treatment to a part of the human body characterized in that said unit includes a heat conductive container having an inner surface defining a compartment, a body treating wax material which is solid at room temperature, said solid body treating wax material only partially filling the compartment



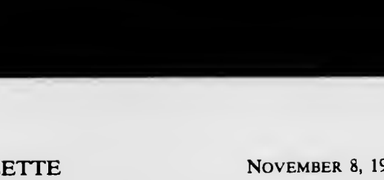
and being adapted to be melted by use of the heating shoe, and packaging means for said partially filled container.

4,782,836

RATE ADAPTIVE CARDIAC PACEMAKER RESPONSIVE TO PATIENT ACTIVITY AND TEMPERATURE

Eckhard Alt, Munich, Fed. Rep. of Germany, assignor to Intermedics, Inc., Angleton, Tex.

Continuation-in-part of Ser. No. 747,111, Jun. 20, 1985, Pat. No. 4,688,573. This application Aug. 5, 1987, Ser. No. 82,598
The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PG **14 Claims**



1. An implantable cardiac pacemaker for adaptively varying the heart rate of a patient according to whether the patient is resting or undergoing exercise, comprising
first sensing means for measuring the blood temperature of the patient and for generating a signal representative of that instantaneous temperature,
second sensing means for detecting a physiological parameter of the patient other than blood temperature indicative of whether the patient is then in a state of rest or a state of exercise and for generating a signal representative thereof,
means storing separate mathematical relationships between heart rate and blood temperature having, respectively, a rate of change in the range from 5 to 25 beats per minute per degree C representing rest state of the patient, and a rate of change in the range from 40 to 120 beats per minute per degree C representing exercise state of the patient, and
means responsive to the signals generated by the first and second sensing means for stimulating the patient's heart rate according to one of the stored rest state and exercise state relationships between heart rate and blood temperature selected based on whether said determination is that the patient is then in the rest state or in the exercise state.

4,782,837

DENTAL ANALGESIA METHOD AND APPARATUS

Dennis E. Hegan, 6204 Belmore Ln., Hopkins, Minn. 55434

Filed Apr. 25, 1986, Ser. No. 855,633
Int. Cl.[4] A61N *1/34*
U.S. Cl. 128—421 **4 Claims**



1. A method for anesthetizing selected regions of the jaw and mouth areas of an individual under going normally painful medical procedures being performed in those regions, comprising the steps of:
(a) providing an electrical nerve stimulation mechanism having a pair of electrodes;
(b) applying a first of the electrodes at a known nerve location on the individual's hand;
(c) applying a second of the electrodes externally at a known nerve location proximate the region where the medical procedure is being performed;
(d)affording control of operation of the electrical nerve stimulation mechanism to the individual being anesthetized to regulate current flow induced thereby to effect anesthetization of the region; and
(e) restricting control of the mechanism operation to a defined range of current flow generated by the mechanism by placing a stop on the mechanism proximate the unit's control means to limit the availability of current flow selections.

4,782,838
Patent Not Issued For This Number

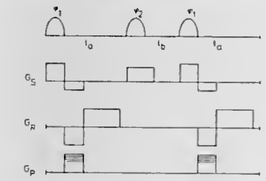
4,782,839

METHOD FOR DETERMINING FLOWING MATTER BY MEANS OF NMR TOMOGRAPHY

Jürgen Hennig, Freiburg, Fed. Rep. of Germany, and Marcel Müri, Rüschlikon, Switzerland, assignors to Spectrospin AG, Fallanden/Zurich, Switzerland

Filed Feb. 19, 1987, Ser. No. 16,299
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 3605990
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 **6 Claims**

1. A method for determining flowing matter within a self-contained body by means of NMR tomography, in which said body consists of molecules including spins and is subjected to selected magnetic fields and the spins which are present in the area of a cross-sectional plane of said body that is defined by a slice gradient are excited during a scanning period by sequences of RF excitation pulses, whose spacing is shorter than a spin-lattice relaxation time of a majority of spins included in said body, thereby producing at least a partial saturation of the magnetization produced by spins present in said area during the scanning period, which saturation in turn reduces the intensity of resonance signals induced by said magnetization, and in which said resonance signals are processed in such a manner as to produce an image of said cross-sectional plane of



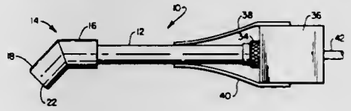
said body in which those locations in which matter is present which has flowed into said cross-sectional plane from outside and is therefore less saturated are emphasized relative to their surroundings through their greater brightness as a result of the greater intensity of said resonance signals, wherein between successive RF excitation pulses a further slice gradient is applied and said body is irradiated with at least one additional RF saturation pulse, at least one of the values comprised of the time intervals between said RF excitation pulses and said RF saturation pulses and of flip angles that are produced by said pulses, being appropriately selected to produce a stationary state of minimal magnetization in at least one zone defined by said slice gradients.

4,782,840

METHOD FOR LOCATING, DIFFERENTIATING, AND REMOVING NEOPLASMS

Edward W. Martin, Jr., Delaware, and Marlin O. Thurston, Columbus, botb of Ohio, assignors to Neoprobe Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 585,887, Mar. 2, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 905,880
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—654 **20 Claims**



1. In a surgical procedure wherein an animal suspected of containing neoplastic tissue is surgically accessed and the tissue

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therein examined visually and by palpation for evidence of neoplastic tissue, the improved methodology which comprises:

(a) administering to said animal an effective amount of a labelled antibody specific for neoplastic tissue and being labelled with a radioactive isotope exhibiting photon emissions of select energy levels;

(b) delaying said surgery for a time interval following said administering for permitting said labelled antibody to preferentially concentrate in any neoplastic tissue present in said animal and for the unbound labelled antibody in the blood pool to be cleared to a blood pool background level, so as to increase the ratio of photon emissions from neoplastic tissue to background photon emissions in said animal;

(c) after said delaying, surgically accessing the operative field of said animal;

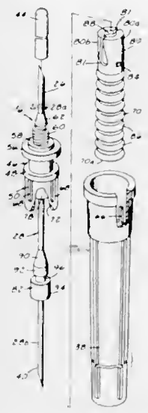
(d) determining the background photon emission count for tissue within said operative filed which is to be examined for neoplastic tissue;

(e) manually positioning a hand-held probe within said operative field adjacent tissue suspected of being neoplastic, said probe configured for facile hand positioning and maneuvering within said operative field of said animal and characterized by having a collimatable radiation detector having a selective photon entrance and having an output deriving discrete signals responsive to photon emissions when said entrance is positioned immediately adjacent thereto, amplifier means having an input coupled with said radiation detector output pulses, and readout means responsive tos aid output pulses and actuable to an initial condition for commencing the provision of a perceptible indication of an inidica corresponding to the number of said output pulses received;

(f) determining from said perceptible indication the extent of tissue exhibiting a number of said output pulses having a value above said background output pulses for tissue within said operative field as determined in step (d); and

(g) surgically removing a sample of said tissue determined in step (f) for histological analysis of said sample.

4,782,841
MEDICAL DEVICE
George A. Lopez, Huntington Beach, Calif., assignor to ICU Medical, Inc., Mission Viejo, Calif.
Continuation of Ser. No. 35,434, Apr. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 849,148, Apr. 7, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 129,362
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—164 **13 Claims**



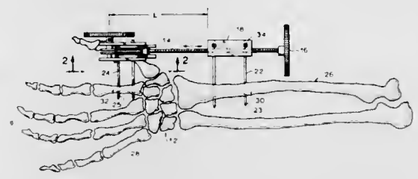
1. In a device used to withdraw blood or other fluids from a patient, including (a) tube means having a seal in an open end adapted to be penetrated by a needle, with said seal then being self-sealing upon withdrawal of the needle penetrating said seal, (b) reusable tube holder means into which the tube means is received during use, said tube holder means having an open end which receives the sealed end of the tube means, (c) opposite the open end, a connector for a needle assembly, and (d) a disposable needle assembly adapted to be removably connected to the tube holder means,

the improvement wherein the needle assembly includes needle means having a first needle segment extending into the tube holder means upon connection with the tube holder means and a second needle segment extending outwardly from the tube holder means upon connection of the needle assembly to the tube holder means with the tip of the second needle segment being exposed prior to insertion of this second segment into the patient,

a guard member mounted on the shaft of the second needle segment and movable axially along the shaft of said second needle segment between a first position where the guard means is displaced inwardly from the tip to expose said tip to enable it to penetrate the body of a patient and a second position where the guard member covers said tip to prevent needle sticks, and

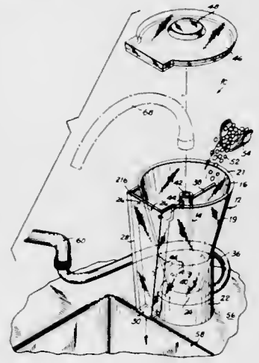
locking means mounted along said needle shaft which permanently locks the guard member in the second position upon movement of said guard member from the first position to the second position.

4,782,842
ARCUATE FIXATOR
Vincent G. Fietti, Jr., 115 E. 61st St., New York, N.Y. 10021
Filed Feb. 2, 1987, Ser. No. 9,909
Int. Cl.[4] A61M *37/00*
U.S. Cl. 128—92 Z **23 Claims**



1. A device for use in setting of fractured joints or other joint disorders along a limb, comprising a rigid member adjustable in length, a pair of holders fastened to the member and each carrying at least one transcutaneous pin which is intended to penetrate the skin and muscle so that the free ends of the at least one pin may be secured in holes drilled in the bone parts, the at least one pin of one holder adapted for entering the bone distal the joint and at least one pin of the other holder adapted for entering proximal the joint, said pin adapted for entering the bone distal the joint being operatively connected to a compound arc gear means, said compound arc gear means being positioned substantially perpendicular to the longitudinal axis of the limb permitting the bone distal the joint to move in a predetermined generally vertical path of flexion or extension, said compound arc gear means having a plurality of sections each of predetermined varying radius of curvatures to correspond to the physiologic path of flexion or extension of the patient fitted with the device.

4,782,843
APPARATUS FOR CLEANING PARTICULATE MATERIAL
James Lapaglia, 1061 Ditmas Ave., Uniondale, N.Y. 11553
Filed May 15, 1987, Ser. No. 49,945
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—104 **16 Claims**



1. Apparatus for cleaning particulate material, comprising:

a hopper including at least one sidewall and a bottom wall defining a downwardly tapering chamber adapted to receive particulate material to be cleaned, each of said at least one sidewall having an upper edge;

an overflow weir formed in said at least one hopper sidewall at a level below the level of a lowermost one of said upper edge of said at least one hopper sidewall;

a cover for closing an upper end of said hopper chamber, said cover having an inner surface facing into said hopper chamber;

liquid nozzle means situated in the region of said bottom wall of said hopper and adapted to be coupled to a source of liquid under pressure for directing a liquid jet into said hopper chamber; and

a tubular riser situated within said chamber having a lower end situated proximate to and spaced from said liquid nozzle means and an upper end spaced from said inner surface of said cover, said liquid nozzle means positioned to direct said liquid jet into said lower end of said riser and through said riser to discharge from said upper end of said riser.

4,782,844
TEXTURE REMOVAL APPARATUS
Joel Hughes, Wilmington, N.C., assignor to Container Products Corp., Wilmington, N.C.
Filed Mar. 30, 1987, Ser. No. 31,360
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—184 **8 Claims**

1. An apparatus for removing and collecting disposable contaminated surface materials comprising:

(a) a movable platform for the apparatus,

(b) an adjustable column vertically extending from said platform and supporting at its free end and material removal unit and a material collector,

(c) said material collector comprising a receptacle having an open face defining a surface area to be treated, and a material collecting hopper surrounding an opposite open face of said receptacle,

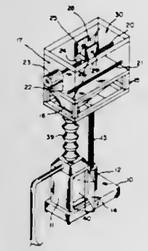
(d) a shroud movably attached about said open face of said receptacle,

(e) means for movably attaching said shroud to said receptacle so as to yieldably position said shroud into contact with the surface to be treated,

(f) a sealing gasket mounted on said shroud for sealing said defined surface area to be treated,

(g) said material removing unit providing a material remover, a portion of which extends through said open face of said receptacle,

(h) means for operating said material remover so as to remove surface material within said defined surface area,



(i) means for reciprocally removing said material remover within said receptacle through the area to be treated, and

(j) vacuum means connected to said hopper for withdrawing removed surface material from said receptacle with said sealing gasket preventing escape of said material into the ambient environment during its removal from the surface area being treated.

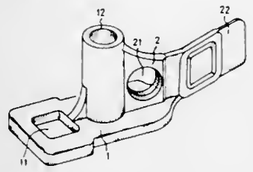
4,782,845
DOUBLE-LOCKING ADJUSTABLE BRACE
Lung-Chiao Chou, 1, Alley 9, Lane 250, Cheng Kung Rd., Sec. 2, Nei Hu, Taipei, Taiwan
Filed Nov. 18, 1987, Ser. No. 122,302
Int. Cl.[4] A45B *9/00*
U.S. Cl. 135—75 **3 Claims**



1. A double-locking adjustable brace comprising an inner rod, an outer tube: a locking device and a torsion reducer; said inner rod having an internal toothing in the head and a flat-ended bolt extending from the center of the internal: toothing for the locking device to fit on; said outer tube fitted on the inner rod and having a circular projection corresponding to the circular groove of the plastic cover of the torsion reducer to absorb the torsion of the inner rod after being locked so as to prevent the outer tube from being released; said locking device providing the telescopic inner rod and outer rod with double locking and easy adjusting.

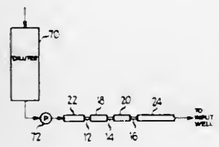
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4,782,846
FOOTING SUPPORT FOR SECUREMENT OF TENT
Lawrence S. Ting, Hwa S. Rd., Taipei, Taiwan
Filed Nov. 13, 1986, Ser. No. 930,649
Int. Cl.[4] E04H *15/32, 15/62*
U.S. Cl. 135—120 **2 Claims**



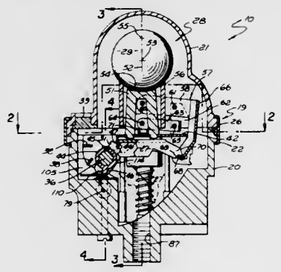
1. A foot supporting means for use with a camping tent comprising an elongated horizontal sheet portion, an upright sheet portion integral with and perpendicular to said horizontal sheet portion extending in a direction of elongation of said elongated horizontal sheet portion, and an upwardly opening tubular support disposed substantially centrally of said horizontal sheet portion, said tubular support being for receipt of a tent pole, said upright sheet portion being joined to and terminating at said tubular support, said tubular support and said upright sheet portion being of substantially the same height, said horizontal sheet portion having a predetermined transverse dimension, said upright sheet portion having an end opposite said tubular support, and said horizontal sheet portion having an end substantially at said end of said upright sheet portion, said upright sheet portion having a flap extending beyond said end of said upright sheet portion and adapted to be sewn onto a corner of a tent inner sheet, said horizontal sheet portion having an opening disposed on an end beyond said tubular support opposite from said upright sheet portion, said opening having a width which is a substantial portion of said transverse dimension of said horizontal sheet portion, said opening being for receipt of a tent ground engaging member, and said upright sheet portion having a hole, said hole being a substantial portion of the height of said sheet portion, said hole being for receipt of fastening means such as a cord to anchor an outer sheet of a tent.

4,782,847
FLOW CONTROL APPARATUS AND METHOD
Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
Continuation of Ser. No. 391,240, Jun. 23, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 638,056
Int. Cl.[4] F17D *1/16*
U.S. Cl. 137—13 **5 Claims**



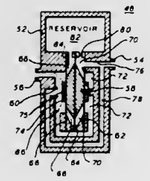
3. A method for controlling the flow of polymer solutions of the type employed as drive fluids and/or mobility control agents in the recovery of oil from subterranean oil-bearing formations to prevent shear degradation of the polymer dissolved in the solution prior to introducing the polymer solution into an input well of the oil-bearing formation: including the steps of diluting the polymer solution to provide a concentration of the polymer in the solution sufficient to enable the solution to substantially meet the permeability requirements of an oil-bearing subterranean formation; passing the diluted polymer solution at one fluid pressure through conduit means comprising at least two headers having the same diameter interconnected in spaced relation to one another by a length of pipe which is shorter in length and smaller in diameter than the headers, and flow control means in the form of a needle valve, said headers, said pipe, and said valve cooperating to effect a lowering of the fluid pressure of the polymer solution while at the same time substantially preventing any shear degradation of the polymer dissolved in the solution and transporting the polymer solution to an input well site where it is to be introduced into an oil-bearing formation.

4,782,848
SHOCK ACTUATED DEVICE
Richard D. Sibley, Anaheim, and William F. Keller, Covina, both of Calif., assignors to Koso International, Inc., Santa Fe Springs, Calif.
Filed Jan. 20, 1988, Ser. No. 145,926
Int. Cl.[4] G05G *17/00;* **F16K** *17/36*
U.S. Cl. 137—38 **34 Claims**



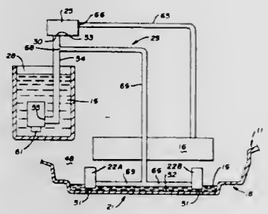
1. For use a source of pressurized fluid and an actuator operable by the pressure of fluid from said source, the combination comprising:
valve means for controlling the delivery of pressurized fluid from said source to said actuator;
a shock responsive mechanism operable by shock forces to actuate said valve means to a condition operating said actuator by pressurized fluid from said source; and
a device operable automatically in response to a decrease in the pressure of said fluid from said source to admit pressurized fluid to said actuator for operating it.

4,782,849
CONTROL UNIT FOR INTERMITTENT SUCTION SYSTEM
Colin G. Hodge, Columbia, Md., assignor to The BOC Group, Inc., Montvale, N.J.
Filed Feb. 9, 1987, Ser. No. 12,396
Int. Cl.[4] A61M *1/00;* **F17D** *3/00*
U.S. Cl. 137—103 **3 Claims**



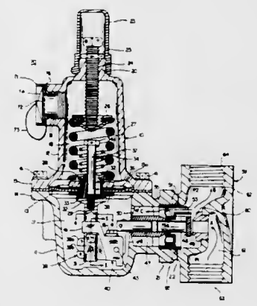
1. A control unit for use with an intermittent suction device for withdrawing fluids from a patient cavity, said control unit having an inlet for connecting to a source of vacuum and having first and second outlets,
(a) means connected to the inlet for providing a signal alternating between vacuum and atmospheric pressure at predetermined intervals,
(b) first and second passage means receiving said alternating signal and transmitting said signal to first and second outlets,
(c) means in said second passage means to delay by a predetermined amount of time, the time between said first and second passages sensing said signal changing from vacuum to atmospheric pressure and the time said change in signal is transmitted to said second outlet.

4,782,851
CAPILLARY VALVE FOR HYDRAULIC SYSTEMS
Marvin J. Malik, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 10, 1987, Ser. No. 83,320
Int. Cl.[4] F16N *7/14*
U.S. Cl. 137—183 **1 Claim**



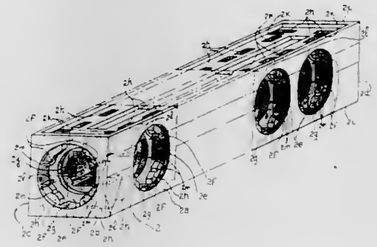
1. A scavenging system for hydraulic recirculating installations comprising: a sump which collects circulating hydraulic fluid and which is to be maintained essentially dry, said sump defining a supply chamber and having a floor that delineates the lowest level of said sump; at least one collecting well in the floor of said sump; at least one pickup head assembly disposed within said well; each said pickup head assembly having a shroud with one open end, one capped end and a flow filter therebetween; a coupler penetrating said capped end of the shroud to define an admission chamber interiorly of said shroud; a plurality of capillary ducts extending through said flow filter, each capillary duct having and inlet end and an exhaust end; the inlet end of each capillary duct communicating with said supply chamber; the exhaust end of each capillary duct communicating with said admission chamber; a reservoir for storing hydraulic fluid; a pump for circulating hydraulic fluid, said pump having an inlet port; and, conduit means for communication among the inlet port of said circulating pump, said reservoir and the coupler penetrating each said pickup head assembly.

4,782,850
TRAVEL STOP FOR DIAPHRAGM REGULATOR VALVE
John W. Duffy, Tama, and Gregory P. Nichols, Marshalltown, both of Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.
Filed May 26, 1987, Ser. No. 54,297
Int. Cl.[4] F16K *31/126*
U.S. Cl. 137—116.5 **9 Claims**



1. A diaphragm type regulator valve including a first and a second casing and an elastomeric diaphragm separating said casings;
a pusher post in said first casing and operatively coupled to one side of said diaphragm for travel therewith;
valve means for regulating flow in a flowpath, said valve means comprising a movable valve disc and linkage means coupling said valve disc to said pusher post, said linkage means comprising an axially movable valve stem connected to said valve disc and a pivotably mounted flat, sheet metal lever coupling said valve stem and said pusher post for transmitting forces between said diaphragm and said valve disc, both said pusher post and said lever having bifurcated portions forming legs, the legs of said lever extending between the legs of said pusher post, and further including a pin joining the legs of said pusher post and operatively engaging the legs of said lever; and
stop means mounted in said first casing for limiting the stress on said linkage means in the event of an excess pressure condition in said first casing, said stop means comprising a pair of stop ears on said pusher post and a retainer supporting said lever for pivotal movement and having stops blocking the travel path of said stop ears for positively restraining travel of said pusher post beyond a predetermined point.

4,782,852
ASSEMBLY FOR PERFECTING FLUID DISTRIBUTION IN MULTIPLE CONDUITS
André A. J. Legris, Rennes, France, assignor to Legris, Rennes, France
Continuation of Ser. No. 855,567, Apr. 25, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 133,177
Claims priority, application France, Apr. 29, 1985, 8506628
Int. Cl.[4] F16K *27/00*
U.S. Cl. 137—269 **20 Claims**



1. A grouped fluid tube modular connection assembly for distributing a main circuit fluid in multiple tubular circuits, said assembly comprising:
at least one module having a module body with in order,

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first, second, third and fourth adjacent flat sides, and longitudinally opposite ends, identical orifices within said first and third opposite flat sides of said body, said orifices being defined by a cylindrical boring, radially projecting lugs within said cylindrical boring, openings extending through said module body from opposite second and fourth sides of said module body placing said lugs in relief, said second and forth opposite sides having rectangular recesses cut out, said openings from opposite second and fourth sides of said module body defining, together with said lugs and the cylindrical borings, female bayonet orifices, with four bayonet positions, a central conduit running lengthwise of said modular body, means communicating said female bayonet orifices with said central conduit, said assembly further comprising a plurality of male bayonet elements, said male bayonet elements being in the form of a hollow cylindrical part including a reduced diameter portion with radially projecting arms forming a cross of complimentary shape to the female bayonets internally of said at least one module with the arms of the male bayonet elements being positioned by rotation behind the lugs of the female bayonet orifices, said male bayonet elements being integrated to different function connections, and fixing holes extending completely through the module body within the cut out recesses of said second and said fourth opposite sides for fixing the module body to a support by screws projected through said fixing holes.

4,782,853

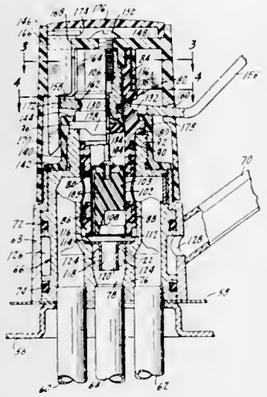
HOT AND COLD WATER MIXING VALVE WITH CONSTANT FRICTIONAL RESISTANCE

Alfred M. Moen, Destin, Fla., assignor to Stanadyne, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 944,202, Dec. 22, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 109,999

Int. Cl.[4] F16K *11/078*

U.S. Cl. 137—454.6 **24 Claims**



22. A hot and cold water mixing valve including

a valve fixture such as a kitchen faucet, lavatory faucet or shower/tube control, a sleeve means formed and adapted to fit within the valve fixture and a rotatable and reciprocal step positioned within the sleeve means, said sleeve means having hot and cold water inlet ports and an outlet, said stem having an inlet and an outlet, with the stem inlet being movable into register with the sleeve means inlet ports and with the stem outlet being registrable with the sleeve means outlet,

locating means formed on the exterior of said sleeve means and cooperating with locating means on the interior of the valve fixture for positioning the sleeve means and stem within the valve fixture,

said locating means including at least one cam surface on the exterior of said sleeve means which cooperates with a cam surface on the interior of the valve fixture whereby, upon rotation of a fully inserted sleeve means within a valve fixture, the cam surfaces cause the sleeve means to be moved outwardly from the valve fixture.

4,782,854

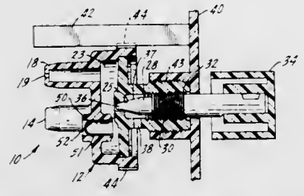
ASPIRATOR SYSTEM

Roy J. Rozek, Plymouth, Wis., assignor to Thomas Industries, Inc., Sheyboygan, Wis.

Filed May 11, 1987, Ser. No. 48,036

Int. Cl.[4] F16K *35/00*

U.S. Cl. 137—315 **4 Claims**



1. A manual mechanically lockable regulator valve assembly for an aspirator system, said regulator valve assembly including

a manifold housing which forms a manifold,

said manifold housing having a generally circular peripheral portion,

means carried by the manifold housing for supporting said manifold housing from a base structure comprising cooperating thread means on the housing and the base structure to thereby provide rotary coupling motion between the manifold housing and the support base,

a pressure regulation inlet in the manifold in communication with a source of vacuum,

a pressure regulation outlet in the manifold adapted for communication with a space to be evacuated,

a pressure regulation port in the manifold housing which connects the manifold to the atmosphere,

a pressure regulator associated with the pressure regulation port for varying the size of the pressure regulation port and thereby the absolute pressure in the manifold,

said pressure regulator being movable from a fully opened position in which it enables atmospheric pressure to be established in the manifold to a fully closed position in which it closes off communication between the manifold and the atmosphere through the pressure regulation port to thereby enabled a less than atmospheric pressure to be established, and

mechanical locking means for positively mechanically locking the manifold housing and pressure regulator into a fixed position

said mechanical locking means including a plurality of ratchet teeth and a ratchet member,

said ratchet teeth and being carried by the base structure

said ratchet member engaging said ratchet teeth, said ratchet teeth and ratchet member thereby precluding rotary movement of the manifold with respect to said base structure until said ratchet teeth and ratchet member are manually operated to override the mechanical lock formed by the ratchet teeth and ratchet member, thus permitting rotary uncoupling motion.

4,782,855

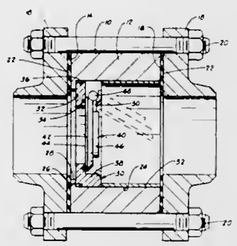
CHECK VALVE SEAT AND CAGE RETAINER

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Sep. 8, 1987, Ser. No. 93,973

Int. Cl.[4] F16K *15/03*

U.S. Cl. 137—527.8 **11 Claims**



1. A valve for use between flanges, comprising:

a tubular body having upstream and downstream planar ends for mating with adjacent flanges, said body having a counterbore in the downstream end thereof forming an annular shoulder in the body facing in the same direction as said downstream end;

an annular seat in the body facing the downstream end of the body;

a ring-like cage in said counterbore between the seat and the downstream end of the body;

a disc supported in the cage for swinging movement toward and away from the seat; and

a tubular retainer lining the walls of the counterbore and extending from the cage to the downstream end of the body for holding the cage in position against the seat.

4,782,856

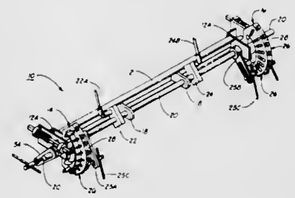
MODULATING FLOW CONTROL VALVE

George H. Siedhoff, Wichita, Kans., assignor to Gordoo-Piatt Energy Group, Inc., Winfield, Kans.

Filed Apr. 15, 1987, Ser. No. 38,878

Int. Cl.[4] F16K *37/00, 31/524*

U.S. Cl. 137—556.3 **6 Claims**



1. A modulating flow control valve responsive to actuation of a characterizing linkage assembly, comprising:

a central valve body having an internal bore and having an inlet port, an outlet port and a body access port;

a tubular body member removably supported by the central valve body at the inlet port, the inner walls of the body member being tapered so that an upper portion of the internal bore defines an upwardly converging passageway, the uppermost end of the tubular body member providing a valve seat therein;

a plug member removably supported by the central valve body in the body access port and having a bore therethrough communicating with the internal bore of the central valve body;

stem means for selectively restricting the valve seat in the inlet port, the stem means comprising:

a valve stem extensive through the bore of the plug member and having a spring stop portion disposed in the internal bore of the central valve body;

valve means removably supported by the spring stop portion of the valve stem for selectively restricting the valve seat of the tubular body member, the valve member comprising a valve seating member forming an upper portion of the valve means and a needle zone forming a lower portion of the valve means, the valve seating member having an inverted frusto-conical shaped configuration for matingly engaging the valve seat for sealing same, the needle zone having a substantially elongated, cylindrical-shaped configuration, the needle zone having a diameter selected to provide a predetermined flow rate when disposed in the valve seat;

spring means disposed between the spring stop and the plug member for biasing the valve means toward the valve seat; and

stem modulator means in motor engagement with and responsive to the characterizing linkage assembly and cooperating with the spring means for moving the valve stem relative to the valve seat so that the valve means supported thereby selectively opens and closes the tubular body member to fluid flow.

4,782,857

METHOD AND APPARATUS FOR UNIFORMLY DISTRIBUTING SOLIDS-CONTAINING LIQUID

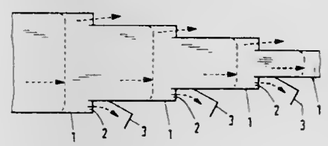
Robert Bieri, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 21, 1987, Ser. No. 5,760

Claims priority, application Switzerland, Feb. 7, 1986, 00505/86

Int. Cl.[4] F16K *51/00*

U.S. Cl. 137—561 A **18 Claims**



1. A method of distributing a solids-containing liquid uniformly over a cross-sectional area of a distribution channel, said method comprising the steps of

directing a flow of solids-containing liquid into an elongated horizontally disposed distribution channel;

sub-dividing the flow into discrete vertical parallel components along the length of the distribution channel;

expelling at least one sub-divided component of flow under gravity from the distribution channel sequentially along the length of the distribution channel in parallel to the flow while maintaining the remaining flow in the distribution channel at a constant velocity; and

deflecting each component of flow outside the channel vertically downwardly under gravity.

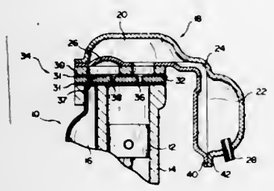
VOL 1096 ISS 2 NO 8 1988 UMI

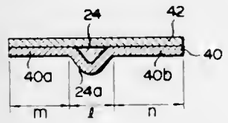
4,782,858

VALVE COVER FOR A COMPRESSOR

Takayoshi Fujiwara, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 801,308, Nov. 25, 1985, Pat. No. 4,667,387. This application Feb. 4, 1987, Ser. No. 10,704
Claims priority, application Japan, Nov. 29, 1984, 59-252324
Int. Cl.⁴ F04B *21/00*
U.S. Cl. 137—571 **4 Claims**





1. A valve cover for a compressor mounted on a cylinder of the compressor, having a discharge chamber, a muffling chamber, and a connecting passage connecting said discharge and said muffling chambers, comprising:

a first metal plate having depressed portions for individually defining portions of said muffling chamber and said connecting passage; and

a second metal plate having depressed portions for individually defining portions of said discharge chamber and said muffling chamber;

said first and second metal plates joined to form an integral structure having said discharge chamber, said muffling chamber, and said connecting passage defined by said depressed portions; said integral structure has a bend on said first metal plate connecting passage depressed portion so that said first metal plate forms an inner part of a bend of said connecting passage and a predetermined angle is formed between said discharge chamber and said muffling chamber; and

said integral structure is attached to said cylinder so that said discharge chamber faces an open end of said cylinder and said muffling chamber faces an outer peripheral surface of said cylinder.

4,782,859

PRESSURIZED HYDRAULIC FLUID SPOOL VALVE

Kriker Constantinian, Bron, France, assignor to Rexroth-Sigma, Venissieux, France

Filed Jan. 16, 1987, Ser. No. 4,068
Claims priority, application France, Jan. 17, 1986, 86 00632
Int. Cl.⁴ F15B *13/08*
U.S. Cl. 137—596.2 **8 Claims**

1. A pressurized hydraulic fluid spool valve, intended to be stacked against other similar spool valves, including a valve body (1) having at least one intake port (P) for the pressurized fluid, at least one return port (T) for returning the fluid to a reservoir, two connection ports (A, B) for connection to a hydraulic apparatus, and a spool (4) adapted for sliding in a bore (5) of the spool valve body (1), the body (1) and the spool (4) having passages adapted so as to cooperate for establishing the desired connections or closures of the different ports of the body of the spool valve depending on the position occupied by the spool among at least three possible positions, namely a direct position (D), a neutral position (N) and a reverse position (M), the body (1) further having a transverse channel (8) extending from one face (2) of the body of the spool valve intended to serve as bearing face in the stack, to another parallel face (3), this channel (8) being combined with at least one pressure selector (S) for transmitting downstream the highest of the two pressures formed respectively by the pressure upstream of the channel and a working pressure of the spool valve,

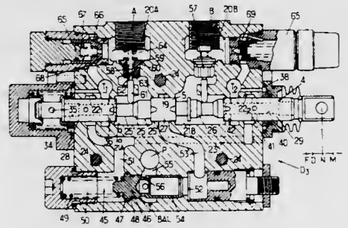
the intake port (P) for the pressurized fluid being connected to a first recess (19) of the bore (5) substantially in the central region thereof;

the two ports (A, B) for connection to a hydraulic apparatus being connected respectively, to two second recesses (21A, 21B) of the bore (5) situated on each side of the first recess (19);

the fluid return port connected to two third recesses (T_1, T_2) of the bore (5) situated respectively beyond said second recesses, with respect to the first recess;

said transverse channel (8) connected to two fourth recesses (22_1, 22_2) of the bore (5) situated respectively towards the ends of said bore, beyond said third recesses, with respect to the first recess;

the spool (4) includes two annular zones of reduced diameter, situated approximately opposite the second recesses when the spool is in the neutral position;



the two end zones (28, 29) of the spool (4), situated beyond the two annular grooves respectively, being pierced respectively with two axial passages (34, 40) opening onto the lateral surface of the spool respectively through two radial passages (36, 42) situated approximately opposite the third recesses when the spool is in the neutral position;

at least one bore (33) in the spool valve body providing communication between one (34) of the end axial passages of the spool and the corresponding third recess (T_1) of the bore (5);

two radial passages (35, 41) formed respectively in the two end zones (28, 29) of the spool approximately opposite the fourth recesses (22_1, 22_2) respectively, when the spool is in the neutral position;

and wherein the sliding spool (4) is of one of the two following types:

(a) in a first type of spool, the grooves of the spool have a bottom without flange, the spool valve (D_1) equipped with such a spool having three functional positions, namely direct (D), neutral (N) and reverse (M);

(b) in a second type of spool, one (26) of the grooves of the spool has a flange (44) situated approximately centrally and having peripherally the nominal diameter of the spool, the spool valve (D_2, D_3, D_4) equipped with such a spool having four functional positions, namely direct (D), neutral (N), reverse (M) and indeterminate (F);

whereby it is possible to form, with the above mentioned arrangements, two types of hydraulic spool valve having the same valve body.

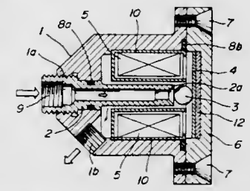
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4,782,860

MAGNETIC FLOW CONTROL VALVE

Yuji Sakaguchi; Takeo Takagi, and Yoshinori Imamura, all of Kodaira, Japan, assignors to Bridgestion Corporation, Tokyo, Japan

Continuation of Ser. No. 024,217, Mar. 10, 1987, Pat. No. 4,771,983, which is a continuation-in-part of Ser. No. 875,511, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 743,732, Jun. 23, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 99,969
Claims priority, application Japan, Jun. 15, 1984, 59-122108
Int. Cl.⁴ F16K *31/06;* **F15B** *13/044*
U.S. Cl. 137—596.17 **12 Claims**



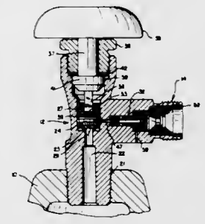
1. A magnetic flow control valve including a valve housing consisting of a housing body and a cover closing an opening of said housing body and having an inlet and an outlet for pressurized fluid, a valve seat member located in said housing and having a valve seat in the form of a substantially conical inner surface, a substantially spherical valve body to be seated on said valve seat in said housing, a throttle adjusting plate made of a magnetic material arranged in the valve housing on opposite side of the valve seat with respect to said valve body and supported in said valve housing and shiftable toward and away from said valve seat, and electromagnet means for shifting said throttle adjusting plate toward and away from said valve seat to control flow rate of said pressurized fluid by changing electric current supplied to the electromagnet, said throttle adjusting plate further comprising elastic cushioning means on a side opposite to said valve body, for absorbing inertia forces of said throttle adjusting plate as the flow rate of said pressurized fluid is changed.

4,782,861

MULTIPLE OUTLET CYLINDER VALVE

Albert Ross, Elyria, Ohio, assignor to Western/Scott Fetzer Company, Westlake, Ohio

Filed Sep. 29, 1986, Ser. No. 913,021
Int. Cl.⁴ F16K *1/02, 31/12*
U.S. Cl. 137—613 **10 Claims**



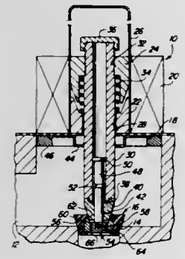
1. A compressed gas supply system comprising a storage tank containing gas compressed to a pressure no greater than a maximum tank pressure, a valve on said tank including a body assembly, said body assembly providing a single inlet port providing the only connection with said tank and providing at least two threaded outlet ports, and a single shut-off manually operable valve in said body assembly operating in a closed position to isolate both of said outlet ports from said inlet port and in turn from said compressed gas in said tank and an open position operating to establish communication between both of said outlet ports and said compressed gas in said tanks, one of said outlet ports having a size and thread configuration proportioned to meet a first standard for connections of equipment using said compressed gas, the other of said outlet ports having a size and thread configuration different from said one port and proportioned to meet a second different standard for connection of equipment using said compressed gas, said single shut-off valve being the only manually operable valve for isolating said ports from said tank.

4,782,862

SOLENOID VALVE

Hung P. Nguyen, Lockport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1987, Ser. No. 135,650
Int. Cl.⁴ F16K *31/06*
U.S. Cl. 137—630.14 **8 Claims**



1. A solenoid valve comprising;

a solenoid assembly having a coil, a movable armature within the coil for movement in valve-closing direction when the coil is energized and a spring within the coil and coupled to the armature for biasing the armature in valve-opening direction,

a tubular plunger fixed to the armature for movement therewith and extending centrally through the solenoid assembly, the plunger terminating in an end portion comprising a pilot valve poppet,

a main valve poppet having passage means for fluid flow through the poppet and having a pilot seat surrounding the passage means,

means for securing the main valve poppet to the plunger including a stem attached to the main valve poppet, the stem extending into the plunger for limited axial movement therein to permit selective engagement of the pilot valve poppet with the pilot seat on the main valve, whereby upon coil energization the plunger moves the pilot poppet against the main valve to close the passage means and to urge the main valve in valve-closing direction, and upon coil de-energization the plunger moves first to open the pilot valve and the passage means and then to open the main valve.

4,782,863

REMOVABLE SHUTTER FOR AN ORIFICE ACCESSIBLE ONLY THROUGH A NARROW PASSAGE

Claude Lavalerie, L'Isle Adam, and Jean-Pierre Cartry, Lyons, both of France, assignors to Framatome, Courbevoie, France

Filed Aug. 24, 1987, Ser. No. 89,023
Claims priority, application France, Jul. 16, 1985, 85 10899
Int. Cl.⁴ F16L *55/12*
U.S. Cl. 138—89 **7 Claims**

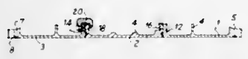
1. A removable shutter for an orifice which is accessible only

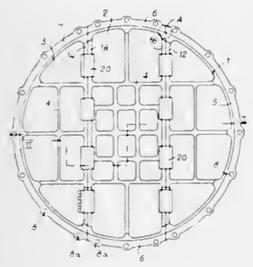
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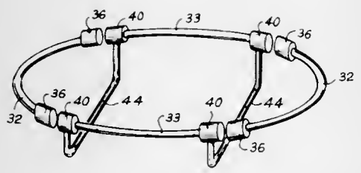
through a narrow passage and which is formed by an assembly of at least three independent panels (**1**, **2**, **3**), said shutter comprising:

(a) a central panel (**2**) having, on one part of its periphery, a flange (**6**) which is intended for fastening on the periphery of the orifice to be closed and which is provided with a seal (**33**, **40**), and, on the other part of its periphery, two rectilinear lateral rims (**16**, **18**);

(b) a first side panel (**1**) comprising, on one part of its periphery, a flange (**5**) which is intended for fastening on the periphery of the orifice to be closed and which is provided with a seal (**32**, **36**), and, on the other part of its periphery, a rectilinear rim (**12**) which forms a face for support on one of the lateral rims (**16**, **18**) of said central panel (**2**) and







on which are mounted members (**20**) for positioning said first side panel (**1**) on one of said lateral rims (**16**, **18**) of said central panel;

(c) a second side panel (**3**) comprising, on one part of its periphery, a flange (**7**) which is intended for fastening on the periphery of said orifice to be closed and which is provided with a seal (**32**, **36**), and, on the other part of its periphery, a rectilinear rim (**14**) which forms a face for support on one of said lateral rims (**16**, **18**) of said central panel (**2**) and on which are mounted members (**20**) for the positioning of said second side panel (**3**) on one of said lateral rims of said central panel, said positioning member consisting of a rider (**20**) in which is engaged the rectilinear lateral rim (**16**, **18**) of said adjacent central panel (**2**).

4,782,864

THREE DIMENSIONAL WOVEN FABRIC CONNECTOR

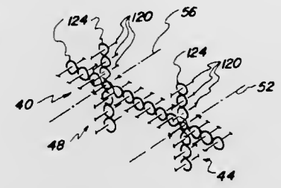
Dale Abildskov, deceased, late of Salt Lake City, Utah (by Tracy Collins, Bank & Trust, Personal Representative), assignor to Edo Corporation, College Point, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,956
Int. Cl.⁴ D03D *3/00*; B64C *3/18*
U.S. Cl. 139—384 R **2 Claims**

1. A fabric joint for providing three-dimensional structural support for at least two intersecting structural members comprising

a first section of fabric for attachment to one of the structural members and composed of fiber bundles interwoven together as warp and weft,

a second section of fabric for attachment to the other of the structural members and also composed of fiber bundles interwoven together as warp and weft, and interwoven with said first section along an intersection of the two sections, with at least one fiber bundle of the warp, located at the intersection, being common to the two sections, wherein at least some of the fiber bundles of the weft of the first section extend through the intersection to form at least some of the fiber bundles of the weft of the second section, and



a third section of fabric for attachment to one of the structural members at a location spaced from that at which either the first or second section is attached and composed of fiber bundles interwoven with the first section along a second intersection of the first and third sections which is generally parallel with and spaced apart from the first mentioned intersection, with at least one fiber bundle of the warp, located at the second intersection, being common to the first and third sections, and

wherein the second and third sections each extend laterally in opposite directions from the first and second intersections respectively, and wherein the first section extends outwardly from the second section in one direction, and outwardly from the third section in the opposite direction.

4,782,865

BOX FILLING APPARATUS

Wayne F. Everman, Cedar Falls, Iowa, assignor to Container Corporation of America, Alton, Ill.

Filed Jun. 29, 1987, Ser. No. 67,533
Int. Cl.⁴ B65B *1/28, 1/32*
U.S. Cl. 141—83 **9 Claims**

1. Apparatus for simultaneously weighing and vibrating the contents of a multi-sided box, standing alone or supported on a pallet, as the box is filled from a filling means, said apparatus comprising:

(a) a base;

(b) at least one scale load cell supported by said base;

(c) a scale platform supported by said at least one load cell;

(d) a conveyor supported by said base independently of said at least one load cell and including a pair of spaced parallel rails and a plurality of rollers extending between said rails;

(e) a box vibrating assembly supported by said scale platform and including:

(i) a vibrating frame positioned under said conveyor and having portions capable of being moved vertically between the rollers of said conveyor for engagement with the underside of said box, or box supporting pallet, positioned on said conveyor;

(ii) mechanism carried by said frame for vibrating said box as said box is being filled;

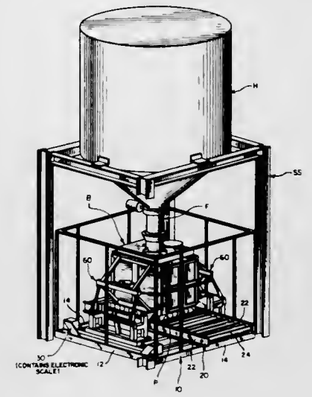
(iii) means for varying the intensity of the vibration of said box with the changing weight of the contents as the box is being filled, as determined by said at least one load cell;

(iv) box clamping means movable into and out of engagement with all sides of said box to prevent said sides from bulging as the box is being filled;

(f) said clamping means including:

(i) a lower frame section mounted on said base;

(ii) a pair of upper frame sections pivotally connected to said lower frame section on opposite sides of said conveyor;



(iii) said upper frame sections each including a box side wall engaging plate and each being mounted for movement in a vertical plane between side wall engaging and non-engaging positions;

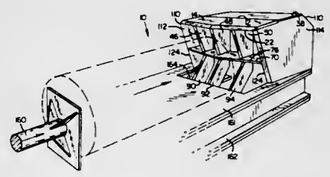
(g) means for supporting said vibrating frame on said base and for moving said vibrating frame portions upwardly through said conveyor.

4,782,866

LOG SPLITTING HEAD

Charlie Valdez, 8171 Deer Creek Rd., Selma, Oreg. 97538

Filed Jan. 19, 1988, Ser. No. 145,374
Int. Cl.⁴ B27L *7/00*
U.S. Cl. 144—193 E **21 Claims**



21. A log splitting head adapted for mounting to a horizontal platform comprising:

an upper horizontal blade member comprising a downwardly sloping cutting portion having a sharpened leading edge, said cutting portion sloping downward at about a 10° angle; said sharpened leading edge comprising a first longitudinal section and a second longitudinal section each being of equal length and oriented at an angle relative to each other to form a V-shaped cutting edge, said cutting portion further comprising an upper face and a lower face parallel to each other, said lower face terminating in said sharpened leading edge;

a first row of a plurality of vertical blade members beneath said upper horizontal blade member, each vertical blade member of said first row comprising a sharpened leading edge and a rear portion, said plurality of vertical blade members of said first row comprising first and second outer blade members and an inner blade member between said outer blade members, said inner blade member being longer than said outer blade members, with said outer blade members being equal in length and spaced at an equal distance from said inner blade member, said rear portions of said first and second outer blade members being tilted outwardly at about a 3° angle;

a second row of a plurality of vertical blade members beneath said first row of vertical blade members, each vertical blade member of said second row comprising a sharpened leading edge and a rear portion, said plurality of vertical blade members of said second row comprising first and second outer blade members and an inner blade member between said outer blade members, said inner blade member being longer than said outer blade members, with said outer blade members being equal in length and spaced at an equal distance from said inner blade member, said read portions of said first and second outer blade members being tilted outwardly at about a 3° angle;

a medial horizontal blade member positioned between said first row of vertical blade members and said second row of vertical blade members, said medial horizontal blade member comprising an upper face and a lower face, said faces being parallel to each other, said upper face terminating in a sharpened leading edge, said sharpened leading edge comprising a first longitudinal section and a second longitudinal section each being of equal length and oriented at an angle relative to each other to form a V-shaped cutting edge, said sharpened leading edges of said vertical blade members of said first row each forming about a 56° angle relative to said medial horizontal blade member, and said sharpened leading edges of said vertical blade members of said second row each forming about a 45° angle relative to said medial horizontal blade member;

a vertical panel at each side of said head, said first row of vertical blade members, second row of vertical blade members and medial horizontal blade member being positioned therebetween, each vertical panel comprising an inner face and an outer face parallel to each other, said inner face terminating in a sharpened leading edge, said sharpened leading edge forming an angle of about 75° relative to said horizontal platform, each vertical panel further comprising a rear portion which is tilted outwardly at about a 6° angle; and

mounting means for securing said log splitting head to said horizontal platform comprising at least one extension member secured to each of said vertical blade members of said second row, said extension member being adapted to engage the underside of said horizontal platform to enable said splitting head to be maintained in position thereon.

4,782,867

APPARATUS FOR SPLITTING LOGS

Norman W. Forsyth, P.O. Box 148, Oxbow, Saskatchewan, Canada S0C 2B0

Filed Jan. 11, 1988, Ser. No. 141,753
Int. Cl.⁴ B27L *7/00*
U.S. Cl. 144—193 B **6 Claims**

1. Apparatus for splitting logs comprising:

a base frame,

a splitting wedge fixed to said base frame and having an upwardly facing blade edge,

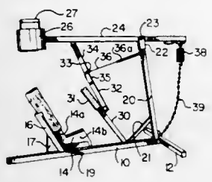
means for supporting a log with its lower end resting on said blade edge,

a post projecting upwardly from said base frame at a point spaced away from said wedge and carrying pivot means spaced above the level of said blade edge,

a beam pivotally mounted on said pivot means and having, adjacent one end, a hammer weight arranged to strike the

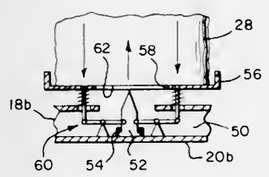
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upper end of a log supported by said supporting means, and



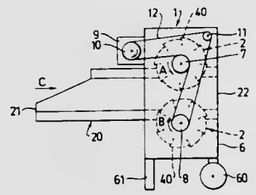
means limiting downward movement of the beam to prevent the hammer weight from striking the wedge.

4,782,868
WOOD SPLITTER BACK HOE ATTACHMENT
Roy E. Coller, 136 Sipes Rd., Freeport, Pa. 16229, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007
Filed Nov. 2, 1987, Ser. No. 115,837
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 A **2 Claims**



1. A wood splitter attachment for a backhoe having a dipperstick and a hydraulic curl cylinder, said wood splitter attachment comprising:
(a) a base member having a platform, said base member mounted on a free end of the dipperstick in a vertical position so that the platform is in a horizontal position to contact the ground and support the wood thereupon;
(b) means for holding the hydraulic curl cylinder in a vertical position above the platform of said base member; and
(c) a wedge member mounted onto a free end of the hydraulic curl cylinder which drives said wedge member down into contact with the wood so as to split the wood apart; wherein said holding means includes a cylinder support bracket and a back plate both mounted in conjunction with each other onto the dipperstick adjacent the free end thereof, wherein said base member further comprises the platform being of an adjusting type that includes three transversely moveable side plates with spring means biasing said plates inwardly against the wood to hold the wood securely on said platform.

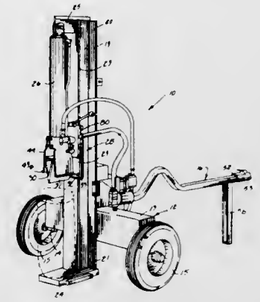
4,782,869
DEVICE FOR MECHANICALLY SPLITTING CLEAVABLE OBJECTS
Max Segerljung, Vänäs, Sweden, assignor to Maxwheel AB, Vannas, Sweden
PCT No. PCT/SE86/00134, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/05736, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 25, 1986, Ser. No. 10,193
Claims priority, application Sweden, Mar. 27, 1985, 8501512
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 R **8 Claims**



1. A device for mechanically splitting cleavable objects, especially blocks of wood, comprising:
a frame;
a pair of rotatable splitting wheels mounted on respective axles which are journalled for rotation on the frame so that said splitting wheels have respective axes of rotation arranged in a common plane and have respective outer peripheral surfaces which spacedly confront one another at a cleavable object-receiving nip between the splitting wheels;
drive means operatively connected to at least one of said splitting wheels for power-rotating at least one of said splitting wheels about the respective said axis;
said splitting wheels each having two axially opposite side faces rimmed by the respective said outer peripheral surface;
at least one of said splitting wheels having a plurality of angularly-spaced teeth provided on and projecting outwardly from said outer peripheral surface thereof; and
each said splitting wheel which is provided with said teeth having a plurality of angularly spaced, generally radially extending tooth edges provided on each said opposite side face thereof, each said tooth edge having a shoulder which faces angularly of the respective splitting wheel.

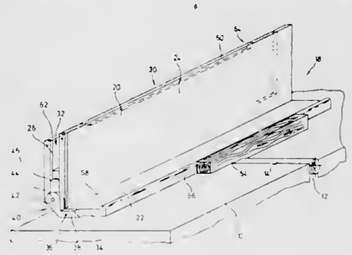
4,782,870
PORTABLE WOOD SPLITTER
Dennis Duerr, Rte. 1, Box 144, E. 12122 Day Mt. Spokane Rd., Mead, Wash. 99021
Filed Oct. 30, 1987, Ser. No. 116,072
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 A **17 Claims**

1. A portable wood splitter, comprising:
a ground supported wheeled frame;
a splitter frame mounted to the wheeled frame for pivotal movement about a pivot axis between a substantially horizontal orientation and a substantially upright orientation;
means on the wood splitter frame for splitting wood;
a towing tongue having a forward end with a hitch connector thereon, and a rearward end;
adjustment means mounting the towing tongue to the wheeled frame for selective positioning between a first position wherein the towing tongue is in a substantially horizontal towing orientation and a second position wherein the towing tongue is in a substantially upright storage orientation; and



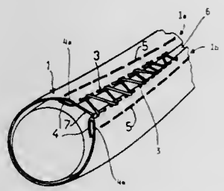
ground engaging means for ground contact to stabilize the splitter frame and towing tongue in their upright orientations.

4,782,871
STOP DEVICE FOR WOODWORKING MACHINES, PARTICULARLY PLANING MACHINES
Georg Aigner, Thannenmais, Reisbach D-8386, Fed. Rep. of Germany
PCT No. PCT/EP86/00417, § 371 Date Apr. 17, 1987, § 102(e) Date Apr. 17, 1987, PCT Pub. No. WO87/00479, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 16, 1986, Ser. No. 26,667
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525296
Int. Cl.[4] B27C *31/00, 1/12*
U.S. Cl. 144—253 R **14 Claims**



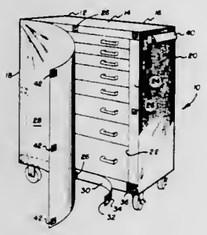
1. A stop device for woodworking machines, particularly planing machines having a machine table comprising:
a stop plate comprising a front wall (60) and a rear wall (26) defining a recess therebetween;
means for attaching the stop plate to the machine table;
an auxiliary stop ledge (22) having a free longitudinal side forming a stop edge (56) and being pivotally mounted on said stop plate; said auxiliary stop ledge being swingable from an operating position resting on said machine table into a ready position into said recess in said stop plate for securely housing said auxiliary stop ledge.

4,782,872
COVER FOR STEERING WHEELS
Franco Moschini, Tolentino, Italy, assignor to Poltrona Frau S.p.A., Tolentino, Italy
Filed Jun. 25, 1987, Ser. No. 66,768
Claims priority, application Italy, Jun. 27, 1986, 22410/86[U]
Int. Cl.[4] B62D *1/06;* **B65D** *65/08*
U.S. Cl. 150—52 M **12 Claims**



1. A tubular cover, particularly for the steering wheel of a vehicle, comprising a substantially annular body of flexible material, said body having an annular slot and including two marginal portions bounding said slot; rows of stitches provided on said marginal portions and extending along said slot, each of said stitches defining an eyelet; and a lace lacing said marginal portions together and passing through said eyelets.

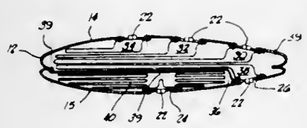
4,782,873
FITTED TOOL BOX COVER
Kenneth Messner, 825 Cascade Dr., San Jose, Calif. 95129, and William Camara, 1082 Princess Ann Dr., San Jose, Calif. 95128
Filed May 26, 1987, Ser. No. 53,847
Int. Cl.[4] B65D *65/02, 65/24*
U.S. Cl. 150—52 R **11 Claims**



1. A fitted tool box cover, comprising:
a first member having a top, back and side portions, the top and side portions defining an open face, the top and side portions include a border adjacent the open face and extending therein, and the first member including a tensioning member extending from one side portion to the other;
a second member defining a front cover being sized and shaped to fit compatibly over the first member open face; and
a plurality of fastening means along the periphery of the second member and the border of the first member for removably attaching the second member to the first member.

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4,782,874
CONVERTIBLE PURSE AND TOTE BAG
Elisibeth Chartier, 153 S. Reeves Dr., Beverly Hills, Calif. 90212
Filed Sep. 16, 1987, Ser. No. 97,608
Int. Cl.[4] A45C 3/04, 3/06, 7/00, 13/10
U.S. Cl. 150—112 5 Claims



1. A convertible purse and tote bag, comprising:
a purse having rectangular front and rear faces in generally side-by-side relation and joined together along the margins of said faces into a thin, flat and rectangular purse, said front face having at least two elongated and generally parallel front openings;
means defining a front compartment in said purse for each of said front openings, including a lining disposed inside said purse secured to said front face on opposite sides of the front opening, and closure means for the front opening;
said rear face having at least two elongated and parallel rear openings, one of said rear openings being centrally located in said rear face and the other being located along one margin of said rear face;
means defining a first rear compartment in said purse for said other rear opening, including a lining disposed inside said purse alongside the linings for said front openings, and closure means for said other rear opening;
means defining a second rear compartment in said purse for said centrally located rear opening and including closure means for said centrally located opening;
a tote bag composed of flexible fabric and disposed in said second rear compartment in a folded condition, said tote bag having a bottom joined to the inside of said purse, being of rectangular cross-sectional shape when unfolded, having an open end opposite said bottom, and being sized to receive the purse snugly within the bag at the bottom thereof with said rear face against the bottom and said front face facing up, whereby the tote bag may be withdrawn from said second rear compartment into the unfolded condition and inverted to dispose the purse entirely within the bag as a stiffening element for the bottom thereof.

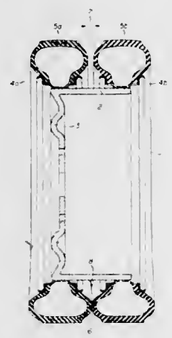
4,782,875
GROUND-ENGAGING WHEELS FOR VEHICLES
Sydney Jones, Cornerstones, Back Lane, Malvern, Worcestershire, England
Filed Apr. 2, 1987, Ser. No. 33,943
Claims priority, application United Kingdom, Apr. 4, 1986, 8608270
Int. Cl.[4] B60B 9/00
U.S. Cl. 152—80 10 Claims

1. A ground-engaging wheel for a vehicle comprising a hub rotatable about a wheel axis, an inextensible wheel rim encircling the hub and spaced therefrom, a plurality of similar circumferentially spaced two-part spoke assemblies connected between the hub and wheel rim, each spoke assembly comprising a substantially rigid inner element hingedly connected to the hub and a resilient outer element connected to the wheel rim, the rigid inner element extending from the hub to the wheel rim at an angle to the radial direction and being connected to the resilient outer element by a connection which is normally adjacent the wheel rim, the resilient element extending around part of the periphery of the wheel rim and being pre-stressed outwardly so as to maintain said connection in a position adjacent the wheel rim, whereby the rigid inner elements normally act as substantially rigid spokes unless the forces acting on the wheel are sufficient to overcome the outward pre-stressing of at least some of the resilient outer



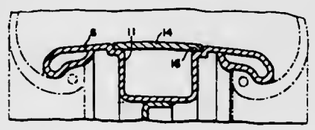
elements, whereupon said resilient elements yield inwardly to permit relative translational and rotational displacement between the wheel rim and hub.

4,782,876
VEHICLE WHEEL
Jaroslaw V. M. Juhan, Geneve, Switzerland, assignor to JJD S.A., Geneva, Switzerland
Continuation of Ser. No. 618,343, Jun. 7, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 906,614
Claims priority, application Switzerland, Jun. 13, 1983, 3239/83; Nov. 24, 1983, 6298/83
Int. Cl.[4] B60B 11/04
U.S. Cl. 152—340.1 11 Claims



1. A vehicle wheel comprising: a rim structure for supporting at least two pneumatic tires in side-by-side relationship, each tire having two axially spaced apart bead portions, sidewalls and a peripheral road-engaging portion, said rim structure having an axis of rotation and including at least two side-by-side, fixed coaxial rigid rim means each of which engages the outside of both bead portions of a tire and supports the respective tire in a fixed position relative to said axis of rotation, said rim means providing a relative axial spacing between said tires such that, when said tires are inflated within the limits of normal inflation pressure,
(a) adjacent tires are axially spaced from each other by a gap which exists between the mutually facing side walls of adjacent tires and which extends over the entire circumference of the tires when no load is applied to the wheel; and
(b) when the weight of the vehicle is applied to the wheel, the mutually facing side walls of adjacent tires move into contact with each other and into lateral bearing relation in a zone close to the surface of contact of the tires with the road surface solely as a result of outward deformation of said mutually facing side walls due to the weight of the vehicle, said contact existing in said zone when the wheel is at rest and in motion, and said gap existing circumferentially outside said zone when the wheel is at rest and in motion.

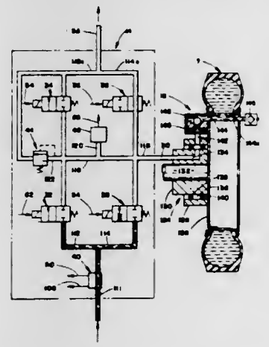
4,782,877
VEHICLE WHEEL FOR PNEUMATIC TIRE
Udo Frerichs, Langenhagen, and Heinz-Dieter Rach, Garbsen, both of Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany
Filed Aug. 27, 1986, Ser. No. 900,829
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531177
Int. Cl.[4] B60B 21/10
U.S. Cl. 152—379.5 5 Claims



1. A vehicle wheel having a rigid unitary rim on which can be mounted a pneumatic tire; said rim having rim flanges that essentially extend radially inwardly; said wheel also having a drop base that is centrally disposed relative to said rim and that includes side walls which have recesses at radially outer location to form support surfaces therewith, said drop base being open radially outwardly; disposed on the radially inner side of said rim, between said drop base and each of said rim flanges, are respective recessed mounting portions for receiving the beads of a tire; said wheel further comprises the improvement in combination therewith including:
means for enlargement of supporting surfaces achieved while maintaining rigidity characteristics of a wheel having a drop base and including an annular support member for spanning said drop base of said wheel between radially outer location of the side walls, with said support member being in the form of an annular ring that is outwardly arched in cross-section to a predetermined extent for also increasing the diameter of support surfaces thus resulting in greater operating efficiencies when a flat tire is encountered, said support member being supported between said walls in said drop base on the recesses such that the radially outer side of said support member is flush with the radially outer side of said rim to form a common support surface therewith.

4,782,878
TIRE INFLATING AND DEFLATING SYSTEM AND APPARATUS
Chander P. Mittal, Rowland Heights, Calif., assignor to Tire Inflation Systems, Corp., Eastlake, Ohio
Filed Dec. 18, 1986, Ser. No. 943,068
Int. Cl.[4] B60C 23/10, 29/00
U.S. Cl. 152—417 29 Claims

1. A system for controlling the inflation pressure of at least one pneumatic tire of a vehicle comprising, a source of air under pressure, flow line means between said source and said tire, pneumatically actuated tire isolating valve means in said flow line means normally biased closed by air in said tire to maintain air under pressure in said tire, inflating and deflating control means including means to open said isolating valve means, means to continuously produce a first signal having a given magnitude representing a desired tire pressure, means to continuously produce a second signal having a variable magnitude and representing the pressure of air in said tire, and means receiving and continuously comparing said first and second signals and continuously providing control signal output means representing the difference between the magnitudes of said first and second signals, a normally closed tire inflating valve in said flow line means between said source and said isolating valve means, said inflating valve being opened by said control signal output means when said first signal first greater than said second signal to provide for air flow from said source to said tire, a normally closed tire deflating valve in said flow line means between said source and said isolating valve means, said deflating valve being opened by said control signal output means when said first signal is less than said second signal to provide for air flow from said tire to atmosphere across said deflating valve, an exhaust valve in said flow line means between said isolating valve means and said source, said exhaust valve being closed during inflating and deflating of said tire and being opened by said control signal output means when said first and second signals are equal to provide for exhausting all of the air in said flow line means between said isolating valve means and said source to atmosphere across said exhaust valve, and said means for opening said isolating valve means including a normally closed flow restricting control valve in said flow line means and means to open said control valve for a predetermined period of time while said inflating valve and said deflating valve are in said normally closed dispositions thereof, said control valve when open providing restricted flow of air from said source to said isolating valve means for



said predetermined period of time to control the opening of said isolating valve means.

21. In a system for inflating and deflating a pneumatic tire of a vehicle and which system comprises a source of air under pressure, flow line means between said source and said tire, normally closed tire isolating valve means in said flow line means to maintain an existing air pressure in said tire, and control means for inflating and deflating said tire across said isolating valve means, the improvement comprising: said isolating valve means including housing means having upstream and downstream ends with respect to the direction of flow from said source to said tire and a single flow passageway therethrough between said ends, means providing a valve seat in said housing means intermediate said ends, pneumatically actuable valve element means in said housing having upstream and downstream surface areas, said value element means including poppet valve member means displaceable relative to said seat and providing said downstream surface area, air under pressure in said tire acting against said downstream surface area to normally close said poppet valve member means against said seat, said valve element means further including pneumatically displaceable diaphragm means providing said upstream surface area and tubular push rod means having an upstream end attached to said diaphragm and a downstream end engaging said poppet valve member, said diaphragm means having a central aperture opening into said upstream end of said tubular push rod means, said poppet valve member

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means being displaceable away from said seat by said push rod means in response to air under pressure from said source against said upstream surface area of said valve element means, and said upstream and downstream surface areas having a ratio of from about 1.25:1 to about 2.5:1.

4,782,879

HYDRAULIC OR PNEUMATIC PRESSURE CONTROL DEVICE AND ITS APPLICATION IN DEVICES REGULATING THE PRESSURE OF TIRES OF VEHICLES IN MOTION

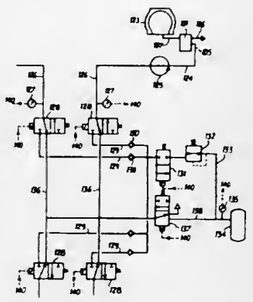
Robert Le Chatelier, Paris, and Jean-Jacques Diefenbach, Sannois, both of France, assignors to Precision Mecanique Labinal, France

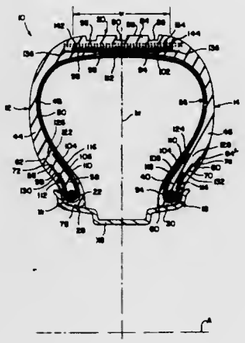
PCT No. PCT/FR85/00276, § 371 Date Apr. 14, 1987, § 102(e) Date Apr. 14, 1987, PCT Pub. No. WO87/01062, PCT Pub. Date Feb. 26, 1987

PCT Filed Oct. 4, 1985, Ser. No. 39,456

Int. Cl.⁴ B60C *23/10, 29/00*

U.S. Cl. 152—417 **25 Claims**





1. A device for controlling hydraulic or pneumatic pressure adapted to be interposed between a source of pressure, a utilization chamber and an escape, so as to ensure a feeding of fluid under pressure to said chamber or reservoir, and a discharge of the fluid under pressure from said reservoir to the escape, said device comprising a single body including a first orifice arranged to be connected to the source of pressure, a second orifice arranged to be connected to the utilization reservoir, a third, escape orifice, means responsive to a first control pressure, of low value, for connecting the utilization reservoir to the escape orifice, means responsive to a second pressure, of high value, for putting said second orifice in communication with the source of pressure and for preventing communication between said second orifice and the escape orifice, and a short passage of relatively large cross section, unconnected to said first orifice, directly connecting said escape orifice and said second orifice together.

4,782,880

HIGH PERFORMANCE PASSENGER TIRE

Paul C. Staab, Akron, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Continuation of Ser. No. 798,072, Nov. 14, 1985, abandoned. This application Sep. 24, 1987, Ser. No. 102,751

Int. Cl.⁴ B60C *15/06*

U.S. Cl. 152—542 **5 Claims**

1. A radial pneumatic passenger tire (10) with a speed rating which indicates suitability for use on automobiles capable of speeds in excess of 130 mph (210 km/hr), said tire having an axis of rotation (A) and a medial plane (M) normal to said axis of rotation and containing the circumferential center line of said tire, said tire comprising:

a carcass (26) comprising first and second full plies (48, 50) of rubberized textile cords (54, 52) disposed in planes containing said axis of rotation and substantially normal to said medial plane;

an annular crown portion (20) including an elastomeric tread portion (84) with a road contact surface (86); an annular, axially extending portion (82) of said carcass disposed radially inwardly of said tread portion; and an annular belt assembly (94) comprising at least two cut, unfolded plies (96, 98) of rubberized steel cords (102) of selected diameter and end count, said two cut plies (96, 98) disposed radially between said tread portion and said carcass portion; and

bead assemblies (16, 18) including annular bead cores (22, 24) of inextensible wires (32) adjacent each radially inward end (28, 30) of said tire, and ends (58, 60, 62, 64) of said first and second plies (48, 50) of rubberized textile cords folded around their adjacent bead cores (22, 24) to define turn ups (68, 70, 72, 74) extending such that each end (62, 64) of said second ply (50) is disposed radially outwardly a distance greater than ends (58, 60) of said first ply, said bead assemblies also including a split ply (104) formed of two short insert plies (106, 108) of rubberized steel cords (110), one said insert ply for each said bead assembly, each of said insert plies being folded around, and in direct contact with, its adjacent bead core and positioned between said first and second full plies and said bead cores, each of said insert plies having axially inside ends (122, 124) and axially outside ends (130, 132) and being disposed such that each inside end (122, 124), as well as each of the carcass turn up ends (58, 60, 62, 64) extends radially outwardly from its adjacent bead core for a distance greater than a distance (d1) which each outside end (130, 132) extends from its adjacent bead core, said steel cords of said insert plies being of less diameter and end count than said steel cords of said cut plies of said belt assembly and forming a low bias angle with respect to the circumferential center line of said tire.

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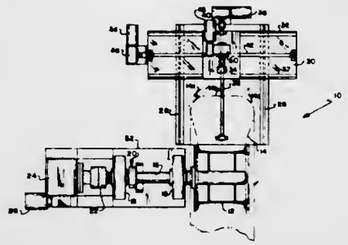
METHOD AND APPARATUS FOR GROOVING TIRE TREAD

Max D. Brinkley, North Canton; Richard J. Greenhorn, Stow; John M. Maloney, and Clifford O. Mangun, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 561,025, Dec. 13, 1983, abandoned, which is a continuation of Ser. No. 333,735, Dec. 23, 1981, abandoned, which is a continuation of Ser. No. 140,949, Apr. 16, 1980, abandoned. This application Sep. 27, 1984, Ser. No. 655,401

Int. Cl.⁴ B29H *21/08*

U.S. Cl. 157—13 **19 Claims**



1. Apparatus for cutting a tread design into a tire, comprising:

first means for receiving and rotating said tire about the tire axis;

a carriage in juxtaposition to said first means and movably maintained upon a first set of tracks parallel to the tire axis and a second set of tracks normal to the tire axis;

a knife maintained upon said carriage, said knife being rotatable about a pair of intersecting orthogonal axes, said knife being heated by an electrical current control source, including a plurality of temperature selector means which, upon actuation, are operatively connected to a transformer which correspondingly applies electrical current to said knife; and

programmed control means connected to said temperature selector means for selectively actuating certain of said temperature selection means for regulating the current to said knife during the cutting of the tread design to regulate temperature dependent upon the depth of cut, curvate nature of the cut, speed of cut, and state of cure of the tire.

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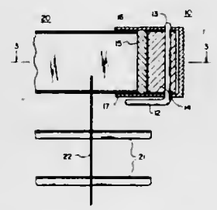
VENETIAN BLIND MOUNTING BRACKET

Joseph Amedeo, 360 D, Joe Parker Rd., Lakewood, N.J. 08701, and Joseph Moscato, Jr., 97 Heratige Dr., Howell, N.J. 07731

Filed Nov. 23, 1987, Ser. No. 124,042

Int. Cl.⁴ E06B *9/38*

U.S. Cl. 160—178.1 **11 Claims**



1. A device for supporting a venetian blind having a head rail, said device comprising a first mounting bracket having an open end constructed to fit over one end of said head rail; a pivotable shaft extending into said mounting bracket; a lever arm attached to said shaft externally of said first mounting bracket; a cam rigidly and fixedly attached to said shaft within said first mounting bracket; a separate spacer positioned within said first mounting bracket between said cam and said open end of said first mounting bracket, whereby said cam pivots and urges said spacer towards said open end and against said one end of said head rail upon pivoting of said shaft by said lever arm to force said first mounting bracket away from said head rail and against the inside of a jamb of a window frame to hold said venetian blind in place.

4,782,883

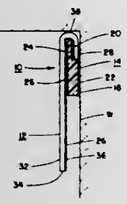
FABRIC WALL COVERING SYSTEM

Dominick C. Braiotta, 252B Stonegate, Nissequogue, N.Y. 11789, assignor to Marc Eiseman, Bayside and Dominick C. Braiotta, Nissequogue, both of, N.Y.

Filed Mar. 30, 1987, Ser. No. 32,039

Int. Cl.⁴ A47H *23/00*

U.S. Cl. 160—368.1 **28 Claims**



1. A system for non-adherently mounting a fabric wall covering on a wall, comprising at least one track member fastened to the surface of said wall in predetermined position relative to the expanse of said wall, a recessed surface portion on said track member facing said wall to provide a space therebetween; said fabric wall covering including a fabric panel having a backing with fastener means; said fabric panel being superimposable on said track member such that the end of said fabric panel is tuckable into the space between said track member and the wall; and complementary fastener means on the front surface of said track member and on the recessed surface portion of said track member and for detachably engaging the fastener means on said fabric panel backing.

4,782,884

METHOD FOR CONTINUOUS FABRICATION OF FIBER REINFORCED TITANIUM-BASED COMPOSITES

Paul A. Siemers, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1987, Ser. No. 10,654

Int. Cl.⁴ B22D *23/00*

U.S. Cl. 164—46 **9 Claims**

1. The method for fabrication of filament reinforced titanium base alloy in sheet form which comprises

providing a source of multiple strands of silicon carbide filaments,

providing means to continuously align and closely space the filaments onto a polished refractory metal drum to form a continuously advancing tape,

rotating the drum to pass the tape of aligned and closely spaced filaments on the drum into a low pressure plasma deposition zone,

providing a source of titanium base alloy metal in powder form having an average particle size in excess of 100 μm,

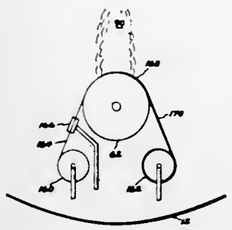
supplying the powder to a low pressure radio frequency

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plasma deposition gun so as to pass through the plasma flame of said gun,

aiming the plasma flame from said gun at a portion of said drum in said low pressure plasma deposition zone to continuously deposit said titanium base alloy metal powder in



molten form on and among the filaments of the tape of aligned and closely spaced filaments and

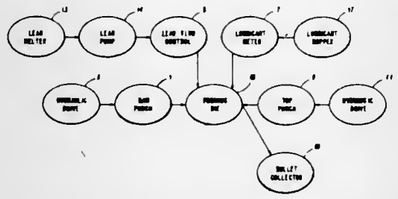
continuously separating the titanium base alloy bearing tape from said drum after it has passed from said plasma deposition zone.

4,782,885

METHOD FOR FORMING SMALL OBJECTS SUCH AS BULLETS

James P. Evans, 503 Washington St., Cedar Falls, Iowa 50613

Division of Ser. No. 677,512, Dec. 3, 1984, Pat. No. 4,721,147.
This application Jan. 20, 1988, Ser. No. 145,922
Int. Cl.[4] B22D *17/10, 18/02, 27/11*
U.S. Cl. 164—72 **4 Claims**



1. A method for producing a small lead object such as a bullet comprising: supplying a predetermined amount of suitable lubricant into a forming die; controllably supplying lead in a flowable state to the forming die allowing the lead to start solidifying; applying high pressure to the lead in the forming die while the lead in still in a plastic state so as to form the lead object and force lubricant into its surface; and ejecting the formed lead object from the forming die.

4,782,886

DEGASSING APPARATUS FOR A METAL MOLD

Masashi Uchida, and Minoru Kuriyama, both of Yamaguchi, Japan, assignors to UBE Industries, Ltd., Japan

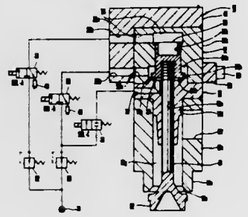
Filed Oct. 28, 1987, Ser. No. 114,643
Claims priority, application Japan, Nov. 4, 1986, 61-260715; Nov. 4, 1986, 61-260716
Int. Cl.[4] B22D *17/70*
U.S. Cl. 164—305 **33 Claims**

1. A degassing apparatus incorporated with a molding apparatus having a mold cavity, which comprises:

a spool having a bore formed therein, the spool further having formed therein a gas inlet opening adapted to be communicatively coupled to the mold cavity of the molding apparatus, and a gas outlet opening, the gas inlet and outlet openings being in selective communication and non-communication with each other;

means for selectively controlling the communication and non-communication between the gas inlet and gas outlet openings; and

a piston mounted in the bore and coupled to the communication controlling means, the piston being reciprocatingly slidable between a first position and a second position, the bore being further formed with a head-side chamber and a rod-side chamber situated on opposite axial sides of the piston, and a lower chamber radially surrounding a portion of said piston;



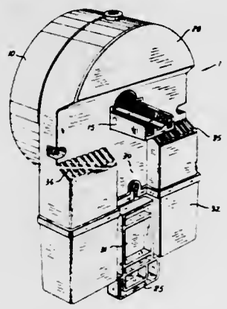
the spool further including first, second and third fluid ports formed therein, said ports being in communication with the head-side, rod-side and lower chambers respectively, said lower chamber being in communication with said rod-side chamber when said piston is in the second position, wherein the gas inlet and outlet openings are in non-communication, and said lower chamber being in non-communication with said rod-side chamber when said piston is in the first position, wherein the gas inlet and outlet openings are in communication.

4,782,887

ROLLING DOOR DRIVE ASSEMBLY

Richard E. Jones, Carlingford, and Mitchell J. Billows, Bankstown, both of Australia, assignors to Byrne & Davidson Doors (N.S.W.) Pty. Limited, Revesby, Australia

Filed Jan. 20, 1987, Ser. No. 4,981
Claims priority, application Australia, Apr. 15, 1986, PH5471
Int. Cl.[4] E06B *9/204*
U.S. Cl. 160—310 **7 Claims**



6. A rolling door drive assembly comprising a chassis, a final drive unit rotatably mounted to said chassis about an axis of rotation for operating said door, a motor fixed with respect to said chassis, drive means interconnecting said motor and said final drive unit, housing means defining a mounting channel on said assembly remote from said final drive unit, said mounting channel extending transversely to the axis of rotation of said final drive unit and adapted to receive part of a mounting

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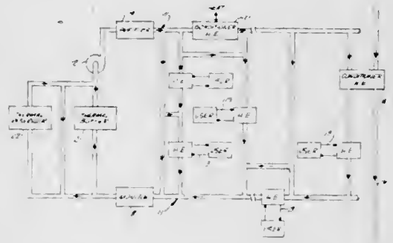
bracket on which said assembly is to be mounted, mounting means extending into said mounting channel in a direction parallel to said axis for engagement with said part of said mounting bracket.

4,782,888

COMMUNITY THERMAL ENERGY EXCHANGE SYSTEM

Jean W. Bardenheier, 207 N. Glenroy Ave., Los Angeles, Calif. 90049

Filed Jul. 21, 1986, Ser. No. 887,980
Int. Cl.[4] F24F *3/00*
U.S. Cl. 165—22 **30 Claims**



1. A community thermal energy exchange system comprising:

a primary closed loop pipe system containing a primary heat transfer liquid;

a plurality of primary heat exchangers connected to the pipe system;

a plurality of thermal energy exchange system users;

a secondary pipe system interconnecting each of such users and such a primary heat exchanger, each of such secondary pipe systems including a secondardy heat transfer fluid;

a portion of such users performing cooling and hence comprising heat sources for transferring heat to such a secondary heat transfer fluid for transferring heat to the primary heat transfer liquid;

a portion of such users performing heating and hence comprising heat sinks for receiving heat from such a secondary heat transfer fluid for receiving heat from the primary heat transfer liquid; and

means for selectively exchanging heat in either direction between the primary heat transfer liquid and a fluid stream selected from the group consisting of municipal water, irrigation water, ground water, ground injection water, sewage, industrial effluent, power plant effluent, river water, sea water, lake water, and surface water, separately from said primary heat exchangers for maintaining the average temperature of the primary heat transfer liquid within a selected range.

4,782,889

LOW MASS HYDRONIC RADIANT FLOOR SYSTEM

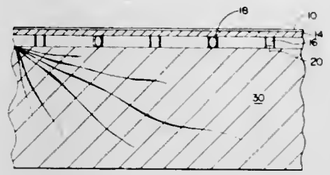
Richard C. Bourne, 123 C St., Davis, Calif. 95616

Filed May 5, 1986, Ser. No. 859,491
Int. Cl.[4] F24H *9/08;* **F24D** *3/00*
U.S. Cl. 165—56 **12 Claims**

1. A low mass radiant floor heating system comprising;

a metal deck for supporting flooring including a plurality of regularly spaced parallel troughs oriented perpendicular to parallel floor joists for supporting said deck, and a corresponding plurality of deck flat portions between said troughs, said troughs providing structural support to said deck for spanning across said floor joists;

resilient tubing located in and held by at least some of said troughs for distributing heat by circulating warm liquid through said tubing, said deck flat portions adjacent the tubing in said troughs transferring heat laterally from said tubes held in said troughs;



and wherein the size of said resilient tubing is slightly greater than the width of said troughs to contact sidewalls of said troughs to securely hold said resilient tubing in said troughs.

4,782,890

HEAT PIPE

Saburo Shimodaira, Izumi; Isamu Uchida, Sakai; Minoru Hasegawa, Sakai; Koichiro Fukui, Sakai; Yuichi Furukawa, Sakai, and Kazunari Noguchi, Sendai, all of Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Apr. 20, 1987, Ser. No. 39,856
Claims priority, application Japan, Apr. 23, 1986, 61-95391; Jul. 28, 1986, 61-115589[U]; Jul. 28, 1986, 61-115590[U]; Jul. 28, 1986, 61-11591[U]; Jul. 28, 1986, 61-115592[U]
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.27 **19 Claims**



1. A heat pipe comprising a container having water enclosed therein as a working fluid and made of a material reactive with water to evolve hydrogen gas, the heat pipe being characterized in that the container has placed therein a solid oxidizing agent for oxidizing the hydrogen gas to water.

4,782,891

CORROSION INHIBITING COOLANT FILTER

Brian E. Cheadle, Bramalea, and Richard J. Rusiniak, Oakville, both of Canada, assignors to Long Manufacturing Ltd., Oakville, Canada

Filed May 18, 1987, Ser. No. 50,777
Claims priority, application Canada, Dec. 23, 1986, 526256
Int. Cl.[4] F28F *19/00*
U.S. Cl. 165—134.1 **18 Claims**

1. A filter device for an engine coolant comprising,

a housing having inlet means for inflow of a liquid coolant

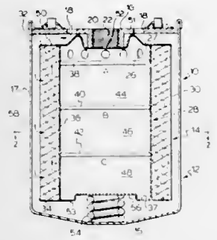
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into said housing and outlet means for outflow of coolant from said housing,

a flow path in said housing for flow of coolant from said inlet means to said outlet means,

a filter means in said flow path effective to filter the coolant,

a container of corrosion inhibitor for said coolant in said housing, said container being effective to maintain said

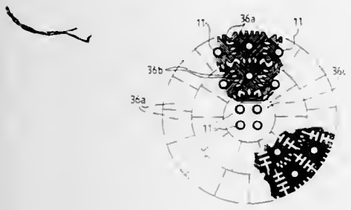


corrosion inhibitor isolated from and in non-contacting relationship with coolant in said flow path and having a portion with a surface exposed to said flow path, at least part of said portion being adapted to disintegrate by corroding when coolant in said flow path has a corrosiveness above a predetermined level, to release corrosion inhibitor from said container into said flow path.

4,782,892
HEAT EXCHANGER

Karl Östbo, Fredhällsgatan 7, Stockholm, Sweden 11254

PCT No. PCT/SE84/00282, § 371 Date Apr. 16, 1985, § 102(e) Date Apr. 16, 1985, PCT Pub. No. WO85/01101, PCT Pub. Date Mar. 14, 1985
Division of Ser. No. 726,904, Apr. 16, 1985, abandoned. This PCT application Aug. 22, 1984, Ser. No. 104,542
Claims priority, application Sweden, Aug. 26, 1983, 8304626
Int. Cl.[4] F28D *7/02;* F28F *1/14*
U.S. Cl. 165—164 **6 Claims**



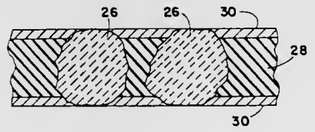
3. A heat exchanger comprising:

a core having a plurality of first passage for a first heat transporting medium extending therethrough, said core being enclosed in a casing governing the flow of a second heat transporting medium in a second passage outside said core, said core including a plurality of elongate blocks of a cast metal each having four side faces and a high heat conducting capacity, at least one tube having a rugged outward face and forming one of said first passages being embedded in each said elongate block and integral therewith, the side faces of said blocks being each provided with outwardly projecting flanges running parallel to the direction of elongation of said blocks for presenting contact surfaces to said second medium, the flanged side faces of each of said blocks being cut by transverse grooves therein interrupting and subdividing each said flanged side face into plural flanged fields, the flanges of each said field being displaced laterally in relation to the flanges of a respective following field whereby the flanges of each said field are aligned with gaps between the flanges of the respective preceding and following fields, said blocks being packed closely together within said casing, a plurality of flow paths for said second medium being defined by gaps between juxtaposed flanged side faces of said blocks and between outwardly facing faces of said blocks of said core and said casing thereby providing a plurality of tortuous flow passages for said second medium along said side faces of said blocks.

4,782,893
ELECTRICALLY INSULATING THERMALLY CONDUCTIVE PAD FOR MOUNTING ELECTRONIC COMPONENTS

Daniel L. Thomas, Portland, Oreg., assignor to Trique Concepts, Inc., San Jose, Calif.

Continuation of Ser. No. 906,954, Sep. 15, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 159,619
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—185 **3 Claims**



1. A pad for thermally joining and electrically insulating a heat-generating electronic component and a heat sink, said pad comprising:

a thin film of high dielectric strength material having top and bottom major surfaces;

a plurality of substantially uniform size diamond pieces imbedded in said film, each of said diamond pieces having a first portion protruding through said top surface of said film and a second portion protruding through said bottom surface of said film; and

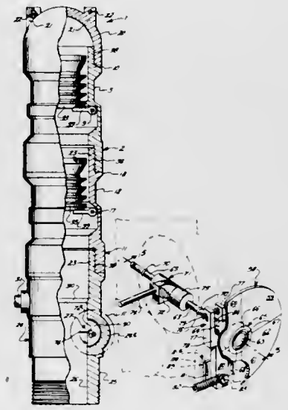
a first thin layer of a high thermal conductivity material bonded to said top surface of said film and a second thin layer of a high thermal conductivity material bonded to said bottom surface of said film, said first thin layer and said second thin layer contacting said first and second portions of said diamond pieces protruding through said film surfaces, said first and second thin layers ensuring a direct heat transfer path between said electronic component and said heat sink.

4,782,894
CEMENTING PLUG CONTAINER WITH REMOTE CONTROL SYSTEM

K. K. LaFleur, 210 Clear Lake La., Weatherford, Tex. 76086

Filed Jan. 12, 1987, Ser. No. 2,280
Int. Cl.[4] E21B *33/16*
U.S. Cl. 166—70 **16 Claims**

1. A cementing plug container and remote control system for controlling the insertion of cementing plugs in a well pipe, comprising a housing having a hollow interior, said housing adapted for attachment to the well pipe; at least one plug release means carried by said housing and extending into said hollow interior for supporting and sequentially releasing the cementing plugs in said hollow interior; and a plug pass indicator located below said plug release means for indicating passage of the cementing plugs through said cementing plug container, said plug pass indicator further comprising a drop arm bracket disposed inside said hollow interior of said housing and a drop arm carried by said drop arm bracket, said drop arm normally projecting into the path of the cementing plugs; a shaft rotatably extending from said drop arm bracket through said housing; bias means provided in mechanical cooperation with said shaft for normally biasing said drop arm in the path of the cementing plugs; a cam fixedly carried by said shaft and an indicator plate wheel rotatably carried by said cam, whereby said indicator plate wheel and said shaft rotate a selected distance from a first position to a second position



responsive to rotation of said drop arm inside said hollow interior and said indicator plate wheel remains at said second position, but said shaft and said drop arm return to said first position responsive to operation of said bias means, for rotatably indicating when said drop arm is deflected inside said hollow interior of said housing responsive to passage of the cementing plugs through said hollow interior and operation of said cam.

4,782,895
PUMPED OIL WELL BOTTOM SAFETY VALVE

Jean-Luc Jacob, Lescar, and Jean Mourlevat, Verneuil sur Seine, both of France, assignors to Societe Nationale Elf Aquitaine Production, France

Filed Apr. 2, 1987, Ser. No. 34,105
Claims priority, application France, Apr. 2, 1986, 86 04679
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—108 **8 Claims**

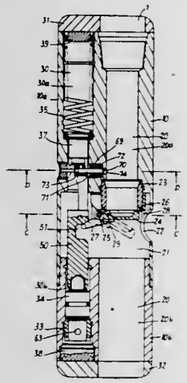
1. A well bottom safety valve for pumped oil wells, wherein the valve is disposed in a production tube, a valve pump being placed in the production tube, the valve controlling the oil input into the production tube as a function of the pressure in the production tube and in the bottom of the well outside the production tube, the valve comprising:

a valve body; a first channel passing through the valve body, the first channel having an upper end, and the production tube having a lower end at and the production tube extending from the upper end of the first channel;

a cavity defined inside the valve body; an orifice in the valve body communicating between the cavity and outside of the valve body; the first channel having an upper portion above the cavity and the upper portion of the first channel having a lower end communicating into the cavity; a valve seat defined at the lower end of the upper portion of the first channel at the cavity; a flap valve pivotally supported at an axis in the valve body; a lever connected to the flap valve and movable for pivoting the flap valve around the pivot axis therefor;

a second channel defined in the valve body, spaced from the first channel; means closing the ends of the second channel, the second channel defining a second pathway along the length thereof; the cavity extending to the second channel whereby the cavity interrupts the second channel to define an upper section and a lower section of the second channel; the second channel lower section forming a lower seat admission chamber; a cylinder in the admission chamber and a piston movable through the cylinder;

a push rod above the piston and slidably supported in the cylinder for moving together with the piston in the cylinder, the push rod having a lower end which bears upon the piston in the cylinder, the push rod having an upper part which extends up through the cavity to the upper section of the second channel above the cavity; a return spring housed in the upper part of the second channel, the push rod having an upper end which bears upon the return spring;



the push rod having a median part along its length which passes through the cavity in the valve body; a notch defined in the median part of the push rod and the lever connected to the flap valve extending into the notch; the lever and the flap valve being so placed that sliding of the push rod against the force of the return spring causes the lever to engage the push rod and causes the pivoting open of the flap valve, and return motion of the push rod permitting the notch to move to permit reclosing of the flap valve; and

a duct connecting the admission chamber to a part of the production tube past the valve and past the pump on the production tube, downstream of the pump.

4,782,896
RETRIEVABLE FLUID FLOW CONTROL NOZZLE SYSTEM FOR WELLS

Eric B. Wittea, Anchorage, Ak., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 28, 1987, Ser. No. 55,489
Int. Cl.[4] E21B *34/06, 23/02*
U.S. Cl. 166—116 **9 Claims**

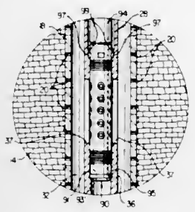
1. In a system for controlling the injection of fluids from a wellbore to a subterranean earth formation wherein said wellbore includes an elongated tubing string extending within said wellbore, the improvement comprising:

a generally tubular mandrel interposed in said tubing string and including port means for conducting fluid into said wellbore from a passage in said tubing string; and

an elongated sleeve insertable through said tubing string and within said mandrel, said sleeve including means forming at least one orifice means in said sleeve and in communication with an interior passage formed in said sleeve for controlling the flow of fluid from said tubing string to said wellbore through said port means in said mandrel;

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said sleeve and said mandrel including cooperable means for locating said orifice means longitudinally within said tubing string relative to said port means and for locking said sleeve in a predetermined rotational position with



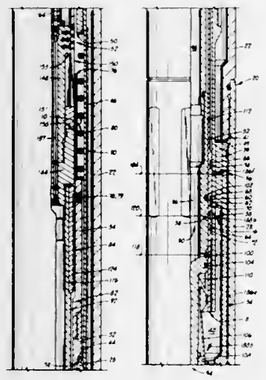
respect to the longitudinal axis of said sleeve and said mandrel for aligning said orifice means with said port means to minimize flow losses and erosion of said mandrel during injection of fluid from said orifice means into said wellbore through said port means.

4,782,897

MULTIPLE INDEXING J-SLOT FOR MODEL E SRO VALVE

Vincent P. Zeller, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 2, 1987, Ser. No. 20,427
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—240 **12 Claims**



1. An apparatus for releasably connecting a probe to a pipe string portion of a downhole tool, comprising:
pin means, protruding form one of said probe and said pipe string portion, for effecting a connection therebetween,
wherein said pin means comprises three pins spaced circumferentially at 90° intervals;
channel means, on the other of said probe and said pipe string portion for receiving said pin means when said probe is lowered into proximity with said pipe string portion, for latchingly engaging said pipe string portion and said probe upon subsequent upward movement of said probe, and for maintaining said latching engagement through at least one subsequent downward and upward reciprocation of said probe,
wherein said channel means comprises a circumferential path defined by a plurality of radially extending lands on a collar;
alignment means for aligning said pin means with said channel means;
wherein said lands comprise:
a major land at the top of said collar including a plurality of downwardly extending peninsulas;
a plurality of support islands below said peninsulas;
an obliquely upwardly extending deflector headland associated with one of said support islands; and
wherein said alignment means comprises:
an obliquely downwardly extending alignment headland associated with said one of said support islands; and
a plurality of obliquely downwardly extending alignment islands below said alignment headland and in substantially parallel relationship thereto.

4,782,898

DETERMINING RESIDUAL OIL SATURATION USING CARBON 14 LABELED CARBON DIOXIDE

Scott L. Wellington, and Edwin A. Richardson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 12, 1986, Ser. No. 873,558
Int. Cl.[4] E21B *47/00, 49/00;* G01N *33/24*
U.S. Cl. 166—252 **8 Claims**

1. A process for determining the oil saturation in a reservoir, penetrated by at least one well, comprising:
preparing an aqueous carrier liquid solution containing solutes comprising:
(a) a acid-generating material, which is substantially oil-insoluble,
(b) a carbonic acid salt, which is substantially oil-insoluble, and wherein at least one carbon atom of the carbonic acid salt molecule is C^{14} and capable of forming a C^{14} labeled CO_2 oil tracer, and
(c) a radioactive water tracer, which is substantially oil-insoluble and substantially nonreactive with the reservoir;
injecting the aqueous carrier liquid solution into the reservoir;
displacing the aqueous carrier liquid solution within the reservoir with an aqueous displacement solution, which is substantially free of the acid-generating material, the radioactive water tracer, and bicarbonate ions;
allowing the acid-generating material to form an acid, the acid to react with the carbonic acid salt to form a C^{14} labeled CO_2 oil tracer, and the CO_2 oil tracer to partition between oil and water phases in the reservoir;
recovering tracer-containing fluid from the reservoir;
determining the chromatographic separation between the oil and the water tracers in the recovered fluid; and
determining the oil saturation in the reservoir from the chromatographic separation.

4,782,899

MEASURING OIL SATURATION WITH GASEOUS OIL TRACERS

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 800,849, Nov. 22, 1985, Pat. No. 4,646,832. This application Oct. 15, 1986, Ser. No. 919,101
The portion of the term of this patent subsequent to Mar. 3, 2003, has been disclaimed.
Int. Cl.[4] E21B *47/00, 49/00;* G01N *33/24*
U.S. Cl. 166—252 **23 Claims**

1. In a process in which a solution containing oil and water tracers is formed within a subterranean reservoir formation for determining the saturation of oil phase fluid within that formation by measuring the extent to which the tracers are chromatographically separated when the tracer-containing solution is flowed within the formation, the improvement comprising:
injecting into the reservoir an aqueous solution containing solutes which are substantially completely insoluble in reservoir oil;

including among said solutes (a) compounds which react within the reservoir to form at least one gaseous oil tracer which partitions between oil and water phases of fluid in the reservoir and is substantially unreactive with oil, and (b) at least one compound which is, or becomes, a water soluble water tracer which is substantially completely immiscible in oil phase fluid within the reservoir; and
flowing the injected aqueous solution into a selected location within the reservoir in which the saturation of oil phase fluid is to be measured and allowing said tracer forming reaction to occur in that location to form the solution containing oil and water tracers.

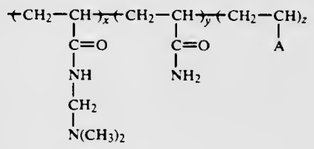
4,782,900

AMINOALKYLATED POLYACRYLAMIDE ALDEHYDE GELS, THEIR PREPARATION AND USE IN OIL RECOVERY

Fu-Ning Fung, Salem, and Raymond C. Glowaky, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 24, 1987, Ser. No. 42,073
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—270 **5 Claims**

1. A method of improving oil recovery from strata of a subterranean hydrocarbon-containing reservoir, which comprises the steps of:
(a) combining an aminomethylated polyacrylamide having a molecular weight of from about 1 to 10 million and a structural formula II



II

wherein
$x/(x+y+z)$=about 0.6 to 0.8,
$z/(x+y+z)$=0 to about 0.1,
A =COOH or COOM and
wherein
M=alkali metal or NH_4
with a dialdehyde selected from glyoxal and glutaraldehyde in aqueous medium at a temperature of from about 10° to 80° C. and pH of from about 5.5 to 8.5 to form a gel-forming composition;
(b) stopping oil recovery from the strata;
(c) introducing the composition into the strata;
(d) allowing the composition to gel; and
(e) resuming oil recovery from the strata.

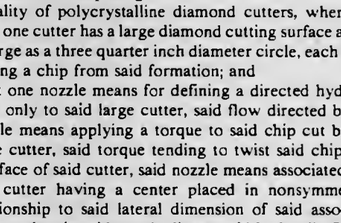
4,782,901

MINIMIZING GRAVITY OVERRIDE OF CARBON DIOXIDE WITH A GEL

Craig H. Phelps, and Krishnaswamy Sampath, both of Carrollton, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1986, Ser. No. 941,136
The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.
Int. Cl.[4] E21B *33/138, 43/22*
U.S. Cl. 166—270 **26 Claims**

1. A method for recovering hydrocarbonaceous fluid from a formation having at least two zones of different permeability comprising:
(a) mixing into water a water thickening amount of a water soluble scleroglucan polysaccharide and a substantially small amount of an alkaline metal hydroxide sufficient to cause gelation within a substantially effective time period then;
(b) complexing said polysacharide with an amount of water-soluble compound of a polyvalent metal ion sufficient to cause gelation of said polysaccharide thereby forming a stable gel;
(c) injecting into a first zone of greater permeability said polysaccharide gel which gelates sufficiently to close pores in said first zone; and



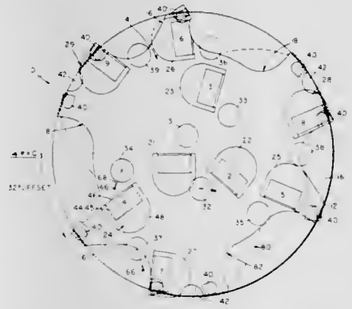
(d) injecting into a second zone of lesser permeability a fluid in an amount sufficient to remove hydrocarbonaceous fluids from said second zone which fluid is diverted from said first zone containing said closed pores.

4,782,902

LARGE COMPACT CUTTER ROTARY DRILL BIT UTILIZING DIRECTED HYDRAULICS FOR EACH CUTTER

William R. Trujillo, West Jordan, Utah, assignor to Eastman Christensen Company, Salt Lake City, Utah

Filed Sep. 11, 1986, Ser. No. 906,169
Int. Cl.[4] E21B *10/00*
U.S. Cl. 175—65 **17 Claims**



1. An improvement in a rotating bit for cutting chips from a plastic formation comprising:
a plurality of polycrystalline diamond cutters, wherein at least one cutter has a large diamond cutting surface at least as large as a three quarter inch diameter circle, each cutter cutting a chip from said formation; and
at least one nozzle means for defining a directed hydraulic flow only to said large cutter, said flow directed by said nozzle means applying a torque to said chip cut by said large cutter, said torque tending to twist said chip from said face of said cutter, said nozzle means associated with said cutter having a center placed in nonsymmetrical relationship to said lateral dimension of said associated cutter, wherein said nozzle directs said hydraulic flow to said cutter face of said large cutter at a position in the proximity of the center of gravity of said chip,
whereby said chips of said plastic formation are cut by the minimum tendency of said bit to ball.
9. A method for removing chips cut from a formation by a bit having a center and gage comprising the steps of:

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cutting a chip by a cutter, said chip having a center of gravity as determined by the shape of said chip, the shape of said chip in turn being determined by said cutter which cuts said chip from said formation;

directing a defined hydraulic flow including a pressure core toward said chip to apply a torque to said chip by said pressure core, to thereby twist said chip off said cutter, said hydraulic flow being directed by a nozzle means associated with said cutter cutting said chip said nozzle means for defining a directed hydraulic flow substantially only to said cutter, said nozzle means having a center placed in nonsymmetrical relationship to said lateral dimension of said cutter,

whereby said formation is drilled without substantial risk of balling said bit.

4,782,903

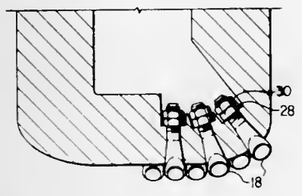
REPLACEABLE INSERT STUD FOR DRILLING BITS

William S. Strange, Rte. 3, Box 489, Marshall, Tex. 75670

Continuation-in-part of Ser. No. 7,498, Jan. 28, 1987, abandoned. This application Oct. 22, 1987, Ser. No. 112,259

Int. Cl.[4] E21B *10/62, 10/46*

U.S. Cl. 175—410 **1 Claim**



1. A drilling bit comprising:

a bit body having a central axis, a working end and an inlet end;

said bit body having being a unitary structure with side walls extending from an end wall to form a deep cavity;

a plurality of closely-grouped holes disposed in said working end extending through the end wall in a non-interfering fashion;

a plurality of substantially identical insert studs being generally elongated along central axes thereof and having first and second ends;

said first ends being cutter ends;

said second ends being adapted for insertion into said holes in said working end of said bit body;

said second ends having threads;

said insert studs engaged with said holes such that said second threaded ends extend into said cavity in said inlet end;

a plurality of locking nuts engaged with said second threaded ends to secure said insert studs in said holes;

said first and second ends being joined by tapered frustoconical middle portions, and said holes being tapered to closely interfit with said middle portions;

longitudinal slots formed in the middle portions of the insert studs, longitudinal slots formed in the holes, said longitudinal slots in said middle portions being substantially equal in width to said longitudinal slots in said holes, said longitudinal slots in said middle portions being aligned with said longitudinal slots in said holes, and elongated rectangular keys engaged with said aligned longitudinal slots to prevent rotation of said insert studs in said holes; and

said central axes of said insert studs near the outer portion of said working end being inclined relative to said central axis of said bit body and said central axes of said insert studs near the inner portion of said working end being parallel to said central axis of said bit body.

4,782,904

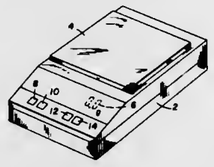
ELECTRONIC BALANCE

Christopher W. Brock, Morris Plains, N.J., assignor to Ohaus Scale Corporation, Florham Park, N.Y.

Filed Nov. 7, 1986, Ser. No. 929,093

Int. Cl.[4] G01G *19/40, 23/10*

U.S. Cl. 177—25 **19 Claims**



1. An electronic balance, comprising:

a weight receiving means;

a transducer means responsive to the weight receiving means for producing a digital signal related to a weight placed on the weight receiving means;

a signal processing means responsive to said transducer means;

said processing means including a digital filter means responsive to the digital signal from the transducer means, the digital filter comprising:

a means for repetitively sampling the magnitude of the digital signal at preselected times;

a means for storing predetermined ones of the sampled magnitudes;

an averaging means for generating a signal related to a weighted average of predetermined ones of the stored magnitudes;

a manual data entry means for entering a desired level of filtering into the processing means; and

a means responsive to the manual data entry means and to selected operational conditions of the balance for selecting which predetermined ones of the stored magnitudes are used by the averaging means and the weight assigned to each selected magnitude in the average; and

means responsive to the signal related to the weighted average of predetermined ones of the stored magnitudes for displaying an indication related to the weight placed on the weight receiving means.

4,782,905

MINIATURE WEIGHING APPARATUS

Albert Lam, Hong Kong, Hong Kong, assignor to Tron International Corporation, New Rochelle, N.Y.

Filed Jan. 22, 1988, Ser. No. 146,836

Int. Cl.[4] G01G *5/04*

U.S. Cl. 177—208 **6 Claims**

1. A weighing apparatus comprising:

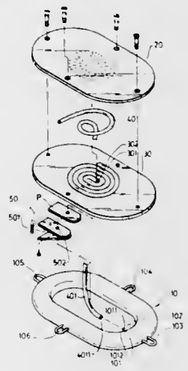
a liquid container;

a transparent press plate fixed on an upper surface of said liquid container and having a top surface adapted for being pressed by an article to be weighed, said top surface of said press plate having weight indexing marks which are indicated in a vortexlike arrangement, said liquid container being pressable by said press plate to discharge liquid from said liquid container in such a manner that amount of said discharged liquid is proportional to weight of said article;

a transparent, thin hose having an open end communicated with said liquid container, and a closed end;

means for positioning said closed end of said hose just under said indexing marks of said press plate in such a manner that said closed end of said hose is self-wound in a vortex-like arrangement; and

a holding mechanism for gripping a portion of said hose to prevent said discharged liquid from flowing back into said liquid container when said press plate is not pressed, said hose being released from said holding mechanism when said press plate is pressed;



whereby, when said article is placed on said press plate so that part of said liquid in said liquid container is discharged from said liquid container into said hose, said liquid will flow along said hose to a visible position just under one of said indexing marks.

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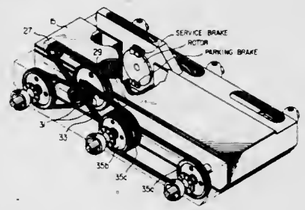
MULTI-WHEEL STEERABLE RIGID FRAME POWER MODULE VEHICLE

James S. Kole, 421 San Bruno, Garland, Tex. 75043

Filed Oct. 7, 1987, Ser. No. 106,060

Int. Cl.[4] B62D *61/10*

U.S. Cl. 180—23 **3 Claims**



1. In an off-highway vehicle having a prime mover power source; a chassis; a plurality of wheels supporting said chassis; power transmission means for usably conveying power from said prime mover power source to said wheels; and steering means connected with at least a pair of said wheels for steering, the improvement comprising:

a. a plurality of wheels on each side of said chassis with each said plurality of said wheels on each side of said chassis being mechanically lockedly and commonly connected together and to the transmission means such that all said wheels rotate together and only together; each of said wheels in each of said plurality of wheels being mounted also so as to be steerable; and

b. said steering means having a plurality of modes with a selector means for selecting one of said plurality of steering modes such that said steering means has the capability of steering said wheels in accordance with said selected modes; said steering means being operably connected with each and every one of said wheels for effecting steering of said wheels in said selective one of said plurality of selectable modes

such that traction of said vehicle remains constant even if one wheel loses contact with the ground.

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MOTOR-DRIVEN POWER STEERING SYSTEM FOR FRONT AND REAR ROAD WHEELS

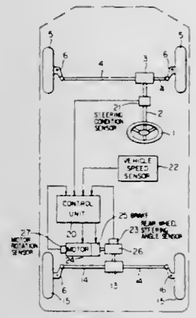
Mitsuharu Morishita, and Shinichi Kohge, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 21, 1987, Ser. No. 40,814

Claims priority, application Japan, Apr. 22, 1986, 61-95127

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—140 **4 Claims**



1. A motor-driven power steering system for front and rear road wheels of a vehicle adapted to provide a fail-safe steering operation, said power steering system comprising:

a motor electrically connected to receive current from an electric power source and mechanically connected to transmit a force to steer the rear road wheels;

a steering condition sensor electrically connected to detect at least one of a plurality of steering conditions of a steering wheel connected to the front wheels, such as direction, steering angle, steering torque, and steering speed, and generating an output signal representative thereof;

a vehicle speed sensor electrically connected to detect travelling speed of the vehicle and generating an output signal representative thereof;

a motor rotation sensor electrically connected to detect rotational direction and rotational speed of said motor and generating an output signal representative thereof;

a rear-wheel steering angle sensor electrically connected to detect steering angle of the rear road wheels and generating an output signal representative thereof;

an electromagnetic brake electrically connected to the power source and operable independently of said motor to lock steering motion of said rear road wheels when the electrical power is disconnected from said electromagnetic brake; and

a control unit connected to receive the output signals of said sensors and operable to disconnect the power supply to said motor and said electromagnetic brake, responsive to failure of any one of said sensors and electrical connections of said system, so as to lock the rear wheels against steering while allowing the vehicle to be steered by the steering wheel through the front wheels.

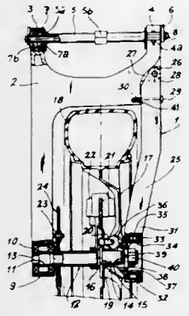
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SUPPORTING DEVICE FOR A VEHICLE DRIVING WHEEL

Daniel Trema, Bezons, France, assignor to Elf France, Courbevoie, France

Filed Jul. 22, 1987, Ser. No. 76,301
Claims priority, application France, Aug. 1, 1986, 86 11189
Int. Cl.⁴ B60G *7/02*
U.S. Cl. 180—227 **6 Claims**



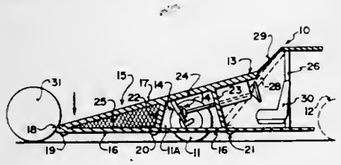
1. A supporting device for the rear driving wheel of a motorcycle of the type having a chassis, said device comprising:
- a wheel supporting arm having a first end pivotably mounted on the chassis through a transverse axle, and having a second end;
- a swinging link hingedly mounted on said arm, said swinging link having an internal ring with a conical abutment;
- a rotatable wheel axle at the second end of said arm for supporting a wheel hub of the rear driving wheel for rotation;
- first bearing means at the second end of said arm for rotatably supporting one end of said wheel axle;
- second bearing means at one end of said swinging link for rotatably supporting the opposite end of said wheel axle through said internal ring;
- said internal ring of said swinging link is crossed through by the opposite end of the wheel axle; and
- securing nut means screwed on said opposite end of said steel axle for pressing said conical abutment between the wheel hub and the securing nut means so as to block the internal ring on said wheel axle.

4,782,909

COLLISION RESISTANT MOTOR VEHICLE

Walter Kolodka, Grahamdale, Manitoba, Canada R0c 1C0

Filed Sep. 21, 1987, Ser. No. 98,860
Int. Cl.⁴ B60R *21/00, 27/00*
U.S. Cl. 180—271 **10 Claims**



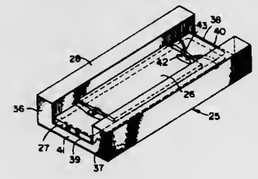
1. A motor vehicle comprising a vehicle body defining a passenger compartment, a pair of front ground wheels and a pair of rear ground wheels for supporting the body for movement across the ground, a front of the vehicle body being formed as a wedge member including a front apex of the wedge member transverse to the vehicle arranged at a lowest height of the body of the vehicle and at a height such that it can move underneath a body of an opposing vehicle in collision therewith, one side of the wedge member forming a lowermost surface for the front of the vehicle at said lowest height of the body and an opposed upper side of the wedge member being formed to define a structurally rigid body having a substantially planar ramp surface raising from said apex to a position adjacent a windshield of the vehicle, and structural interconnecting means rearwardly of said apex and extending transversely of said vehicle support in said ramp surface from said lowermost surface to enable said ramp surface to lift and support said opposing vehicle substantially without damage to said ramp surface.

4,782,910

BI-POLAR BENDER TRANSDUCER FOR LOGGING TOOLS

Claude C. Sims, Orlando, Fla., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 866,560, May 23, 1986, abandoned.
This application Dec. 4, 1987, Ser. No. 129,911
Int. Cl.⁴ G01V *1/40;* **H01L** *41/10*
U.S. Cl. 181—106 **15 Claims**



1. An acoustic transducer for a borehole logging tool comprising:
- a compartment filled with a coupling liquid;
- a flat, elongated, piezoelectric element having an exposed side and a second side, said piezoelectric element having electrodes on both of said sides;
- a flat, elongated, inert element having an exposed side and a second side, said second side of said piezoelectric element being affixed to said second side of said inert element;
- a supporting mass suspended in said borehole logging tool, said inert element being hinged to said supporting mass; and
- means for applying a voltage to said electrodes to flex said inert element, whereby a bi-polar acoustic wave is generated by said exposed side of said piezoelectric element and said exposed side of said inert element into said coupling liquid;
- said edge of said inert element and said side of said supporting mass separated by a specified distance to define a space, said space permitting transmission of said bi-polar acoustic wave to said borehole logging tool; and
- said supporting mass including means for separating said acoustic energy generated into said coupling liquid by said exposed side of said piezoelectric element and said exposed side of said inert element.

4,782,911

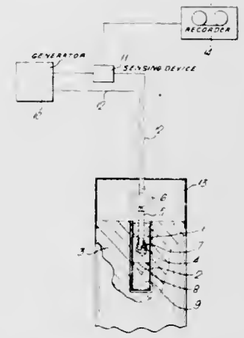
SEISMIC RECORDING

Raymond M. Dixon, Dundonald; Alan G. King, Ardrossan, and Stephen R. Thompson, Sedgefield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, Victoria, Australia

Filed Jun. 3, 1982, Ser. No. 384,751
Claims priority, application United Kingdom, Jun. 1, 1981, 8116633
Int. Cl.⁴ G01V *1/00*
U.S. Cl. 181—107 **6 Claims**

1. A method of seismic recording wherein seismic waves are generated by firing an explosive charge by means of a detonator having an electrical ignition element and are subsequently recorded after reflection or refraction at subterranean rock layer interfaces, the said method comprising the steps of:

feeding firing energy from an A.C. energy source to said electric ignition element through a transformer which has a primary circuit connected to said A.C. source and a



secondary circuit connected to said electric ignition element, said primary circuit having a breakable portion adapted and disposed so as to be ruptured by the explosion of said explosive charge;

detecting the time when the said breakable circuit portion is broken; and, in response thereto,

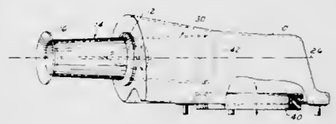
making a mark on the seismic record to indicate a time-break on the record.

4,782,912

ENGINE AIR CLEANER - NOISE REDUCER

Darrel G. Wandless, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 18, 1987, Ser. No. 27,478
Int. Cl.⁴ F02M *35/00*
U.S. Cl. 181—229 **5 Claims**



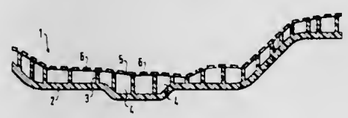
1. An air inlet housing for an internal combustion engine having an air induction system, comprising an enlarged volume shell-type housing having walls defining the housing and a snorkel-like air inlet tube extending through an opening in one of the walls into a portion of the housing and an air outlet through another wall of the housing adapted to be connected to the engine induction system for the induction of air thereto, the inlet tube having a volume small relative to the enlarged volume of the housing whereby the housing constitutes an expansion chamber, the relative smaller volume of the inlet tube to the larger volume of the expansion chamber causing a sudden expansion in area as the air exit from the tube into the expansion chamber, and a conical-like engine induction noise reducing flow controlling insert coaxially positioned in the inlet tube, the insert being shaped to have apex and base portions situated upstream and downstream, respectively, in the tube, whereby the induction of air by the engine through the inlet tube increases the velocity and lowers the pressure thereof upon passage past the insert for the flow of air into the expansion chamber and therefrom into the engine in an efficient manner, the engine induction system passing acoustical waves into the large expansion chamber to be dissipated therein, any passage therefrom towards the inlet tube flowing against the base portion reflecting the waves back into the expansion chamber to be broken-up and dissipated therein, the inlet tube and outlet each have an axis so located that the axis of the outlet from the chamber is located essentially at right angles to the axis of the inlet tube providing greater reflection of the acoustical waves off the walls of the expansion chamber and absorption of the acoustical energy therein.

4,782,913

CONSTRUCTIONAL ELEMENT WITH ACOUSTIC PROPERTIES

Manfred Hoffmann, Nienhof, and Norbert Seemann, Nienhagen, both of Fed. Rep. of Germany, assignors to Dr. Alois Stankiewicz GmbH, Adelheidsdorf, Fed. Rep. of Germany

Filed May 4, 1987, Ser. No. 46,462
Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615360
Int. Cl.⁴ E04B *1/82*
U.S. Cl. 181—286 **9 Claims**



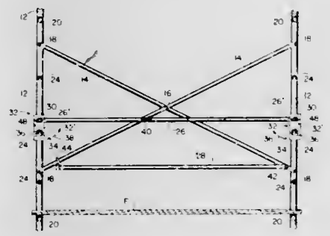
1. A constructional element having acoustic properties, consisting of a shell having a low intrinsic bending stiffness webs integrally constructed with and fixed to the shell and forming a cellular grid defining individual cells, and a foil system having low bending stiffness closing off the cells opposite said shell, characterized in that the foil system is provided with flattened air pockets, and dimensions of the webs forming the individual cells and dimensions of the shell are selected such that the individual cells are irregularly distributed and differently sized so as to achieve acoustic tuning, utilizing frictional damping and only considering sound wave resistance in air, so that absorption of airborne sound is achieved.

4,782,914

SAFETY GUARD RAIL FOR SCAFFOLDING

Donald E. Nail, 2704 NE. 114th St., Vancouver, Wash. 98686

Filed Dec. 22, 1987, Ser. No. 137,406
Int. Cl.⁴ E04G *1/26*
U.S. Cl. 182—113 **7 Claims**



1. In combination with a scaffold having at least one pair of horizontally spaced apart, vertically extending uprights and a supporting cross brace assemby including a pair of elongated brace members pivotally connected intermediate their longitudinal ends and connected detachably at their opposite terminal ends to said pair of opposite uprights to secure the latter in upstanding position, a safety guard rail assembly configured to

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obstruct the open spaces between a scaffold floor and the crossed bracing, comprising:

(a) a longitudinally elongated guard rail mounted pivotally at one of its terminal ends to one cross brace member, and

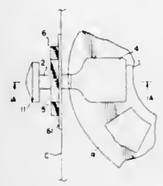
(b) a slide ring connector mounted adjacent the opposite terminal end of said guard rail and freely engaging and being carried by the other cross brace member of the pair, the guard rail extending substantially horizontally between the pair of cross brace members.

4,782,915

METHOD AND APPARATUS FOR SUSPENDING CLADDING FROM SCAFFOLDING

Peter King, Brampton, Canada, assignor to Anthes Industries Inc., Mississauga, Canada

Filed Nov. 12, 1987, Ser. No. 119,580
Claims priority, application Canada, Nov. 13, 1986, 522938
Int. Cl.⁴ E04G *21/28, 21/30*
U.S. Cl. 182—129 **6 Claims**



1. An apparatus for suspending cladding or protective sheeting from scaffolding, including a first member detachably securable to an element of scaffolding, and a second member capable of attachment to said sheeting or cladding, said second member being adapted to hang from said first, thereby to hang said cladding or sheeting from said scaffolding, wherein said first member comprises:

(i) a post insertable in an apparatus formed in a rosette which extends radially from said scaffolding, said post having side walls which taper inwardly from top to bottom, to fit snuggly in the apertures in said rosettes;

(ii) an intermediate support member atop said post and integral therewith;

(iii) a cylindrical rod-like member extending radially outerwardly from said intermediate support member, relative to said scaffolding, said rod-like member being integral with said intermediate support member and capable of accommodating said second member;

(iv) limiting means on the end of said rod-like member, to prevent said second member from slipping off said rod-like member.

4,782,916

PLATFORM FOR SUPPORT WHILE WORKING IN THE ENGINE COMPARTMENT OF A VEHICLE

Kenneth E. Hays, 22 Elannchester Dr., Manchester, Mo. 63011

Filed Mar. 30, 1987, Ser. No. 31,773
Int. Cl.⁴ B60R *3/00*
U.S. Cl. 182—150 **3 Claims**

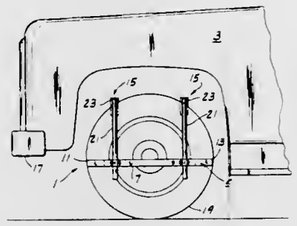
1. A platform for supporting a person while working in the engine compartment of a vehicle, such as a truck, the platform comprising:

a planar member having a generally channel-shaped configuration with depending flanges at its front and back, each flange having an inwardly turned, generally horizontal lip adjacent its lower end,

a pair of hook means, each hook means comprising a leg and a hook on the leg adapted to hook over the wheel of the vehicle, and

means for releasably attaching the planar member to the hook means to support the planar member on the hook means,

the hook of each hook means comprising an inner portion extending from the leg adapted to extend over the top of the wheel, and an outer portion at the outer end of the inner portion adapted to engage the back side of the



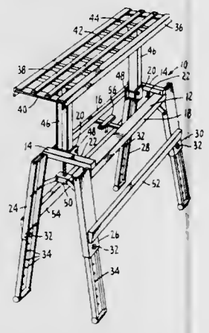
wheel, the inner portion having a length less than the distance between the flanges on the planar member but greater than the distance between the lips on the flanges, so that the hook means can be stored on the underside of the planar member between the flanges with at least a portion of the hook means disposed between the lips and the bottom of the planar member.

4,782,917

ADJUSTABLE SCAFFOLD

Richard H. Schulz, 845 N. L St., Livermore, Calif. 94550

Continuation-in-part of Ser. No. 86,302, Aug. 17, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 167,361
Int. Cl.⁴ B27B *21/00*
U.S. Cl. 182—182 **9 Claims**



1. An adjustable scaffold comprising:

a generally rectangular frame having ends and sides, said frame having a first step section comprising one side thereof and extending partially across the width of an end of said frame, said frame including a pair of clamp sections, one connected to each end of said frame opposite said first step section, said clamp sections and said first step section defining a space between said clamp sections and said first step section, said space being in general alignment with the longitudinal axis of said frame;

first and second pairs of legs pivotly mounted to said frame at the ends thereof, respectively, each of said legs being extensible; and

a generally rectangular platform having top and bottom surfaces, the surfaces of said platform being at least equal in area to the surface area of said frame to provide maximum working area relative to the support of said frame,

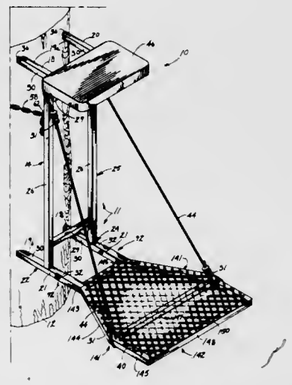
said platform including a pair of downwardly extending support arms which are complementary to said clamp sections and adapted to telescope within said clamp sections and to be secured by said clamp sections at a desired platform position, said platform being transversely closer to one side of said frame than the other when said support arms are secured by clamp sections for close access to a wall that may be adjacent said frame and also allowing access to said platform by said first step section which is inherently offset from said platform, said support arms being removable from said clamp sections and storable in the space between said clamp sections and said first step section, said platform being generally aligned and nested with respect to said frame when said support arms are stored in such space.

4,782,918

PORTABLE COLLAPSIBLE TREE STAND

Paul B. Brunner, and Karen L. T. Brunner, both of Box 10, Ovando, Mont. 59854

Filed Nov. 17, 1986, Ser. No. 931,677
Int. Cl.⁴ A45F *3/26;* **A47C** *9/10*
U.S. Cl. 182—187 **19 Claims**



1. A tree stand for supporting hunters, photographers and the like at elevated positions upon a tree trunk, comprising:

a stationary framework having:

at least one longitudinal member;

a plurality of tree-engaging extensions; said tree-engaging extensions projecting transversely from the longitudinal member in a treeward direction sufficiently far so as to space the longitudinal member substantially free from the tree and carry forces applied by the stand against the tree;

at least one seat mounting extension rigidly connected to the longitudinal member and extending transversely therefrom in an outward direction opposite to said treeward direction;

at least one seat mounting extension and tree-engaging extension being made from a single piece transversely connected to the longitudinal member;

at least one platform mounting extension rigidly connected to the longitudinal member and extending transversely therefrom in an outward direction opposite to said treeward direction; and further comprising:

seat means pivotally connected to said seat mounting extension for pivotal motion between extended and retracted positions;

platform means pivotally connected to said platform mounting extension for pivotal motion about a platform pivot spaced from said longitudinal member;

platform support means for supporting the platform means in at least one extended position; and

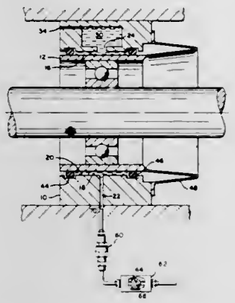
tree girthing means detachably connectable to the stationary framework at upper portions thereof.

4,782,919

SUPPLY SYSTEM FOR OIL DAMPERS

Donald K. Chalaire, Jupiter; John A. Muller, and Halfen L. Hoyt, both of Stuart, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,767
Int. Cl.⁴ F16C *27/00, 39/04*
U.S. Cl. 184—6.11 **4 Claims**



1. An oil supply system for maintaining the stiffness and high pressure of the oil film of an annular oil film damper for dampening the high energy vibrations occasioned by a rotating shaft comprising

a nonrotating cylindrical sleeve disposed within a surrounding support member;

a fluid-tight annular volume defined between the outer surface of said nonrotating cylindrical sleeve and the inner surface of said surrounding support member;

means, including a fluid supply line, for conducting fluid from a pressurized source to said fluid-tight volume;

a first check valve having a high frequency response characteristic disposed in said fluid supply line; and

a second check valve having a relatively low frequency response characteristic relative to the frequency responsiveness of said first check valve also disposed in said fluid supply line.

4,782,920

LOAD-LIFTING MAST ESPECIALLY ADAPTED FOR USE WITH AUTOMATICALLY-GUIDED VEHICLES

Dennis W. Gaibler, Gresham, Oreg.; Jeffrey R. Skinner, Camas, Wash., and Alan T. Edwards, Portland, Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Feb. 4, 1987, Ser. No. 10,830
Int. Cl.⁴ B66B *9/20*
U.S. Cl. 187—9 R **17 Claims**

1. A load-lifting mast for a load-carrying vehicle comprising:

(a) a load supporting carriage for supporting a load;

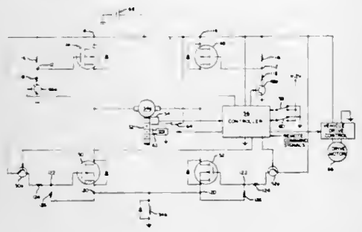
(b) power-driven means for vertically supporting and vertically reciprocating said carriage;

(c) sensor means connected to said power-driven means for sensing whether or not said carriage is vertically supported by said power-driven means; and

(d) motor means automatically responsive to said sensor means for withdrawing said carriage from said load in response to said sensor means sensing that said carriage is not vertically supported by said power-driven means, said motor means comprising means for selectively advancing and withdrawing said carriage horizontally relative to said load.

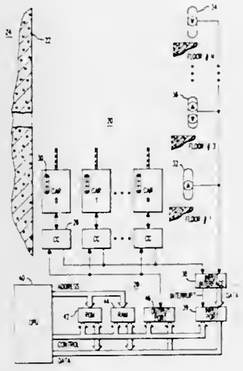
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5. A load-lifting mast for a load-carrying vehicle comprising:
(a) a load-supporting carriage for supporting a load;
(b) power-driven means for vertically supporting and vertically reciprocating said carriage;
(c) carriage height-sensor means for sensing the elevation of said carriage relative to a predetermined elevation;



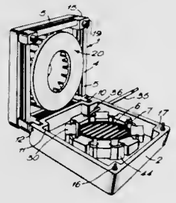
(d) position sensor means for sensing when said carriage is at said predetermined elevation; and
(e) calibrating means responsive to said position sensor means for referencing the elevation sensed by said height-sensor means, when said carriage is at said predetermined elevation, to a predetermined value in response to said carriage being at said predetermined elevation.

4,782,921
COINCIDENT CALL OPTIMIZATION IN AN ELEVATOR DISPATCHING SYSTEM
Robert C. MacDonald, W. Caldwell, and Elsa Abrego, Nutley, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 16, 1988, Ser. No. 168,791
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—127 **2 Claims**



1. A method for assigning hall calls registered from floors of a building to a plurality of elevator cars which provide elevator service for the floors of the building, comprising the steps of:
selecting a travel path for each car relative to a floor having a registered hall call to be assigned,
preparing a trip list for each car using the travel path selected, including stops to be made for car calls,
determining the time (ETA) for each car to service the associated trip list and arrive at the floor of a hall call under consideration,
and assigning each hall call to an elevator car based upon the relative ETA times,
said step of determining the ETA time for each car including the step of determining if the car presently being considered has a car call stop on its trip list for the floor of the hall call presently being considered, calculating a bias value which is inversely proportional to the distance from the car position to the floor of the hall call being processed, and biasing the ETA time by subtracting an amount from the ETA of a car having a car call stop coincident with the floor of the hall call being considered.

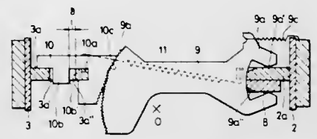
4,782,922
BRAKE DEVICE
Barry Pearson, and Clive A. Barker, both of Bedford, England, assignors to Ti Interlock Limited, Bedford, England
Filed Aug. 26, 1986, Ser. No. 900,554
Claims priority, application United Kingdom, Aug. 30, 1985, 8521630
Int. Cl.[4] F16D *55/00, 55/02, 65/09*; B60T *11/00*
U.S. Cl. 188—71.1 **18 Claims**



1. A brake device for braking a rotatable shaft comprising:
a brake member carried by said shaft for rotation therewith;
a plurality of brake assemblies, each brake assembly comprising a brake pad and an actuator for moving said brake pad between inoperative and operative positions, and
a generally rectangular box-shaped housing receiving said brake member therein, said housing comprising a fixed housing portion and a movable housing portion, mounting means mounting said plurality of brake assemblies on said movable housing portion, and hinge means connecting together said fixed and said movable housing portions for selective movement about a pivot axis located along one edge of said housing between a closed position, in which said plurality of brake assemblies is located for engagement of said brake member by said brake pads in the operative positions thereof, and an open position, in which said plurality of brake assemblies is spaced from said brake member so as to be readily accessible for servicing.

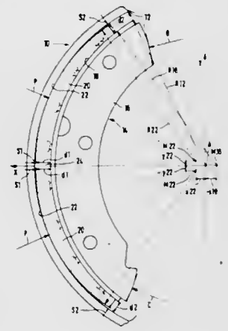
4,782,923
AUTOMATIC GAP REGULATOR FOR DRUM BRAKE
Kimihiro Yamazaki, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,873
Claims priority, application Japan, Feb. 12, 1986, 61-17561[U]
Int. Cl.[4] F16D *55/58*
U.S. Cl. 188—79.64 **2 Claims**

1. A strut type automatic gap regulator for a drum brake comprising:
a pair of brake shoes mounted opposite to each other and adapted to be moved linearly apart in a braking action, each shoe having a web;
a platelike strut having a fulcrum at one end engaging the web of one shoe and a toothed portion at the other end;
a platelike latch having a linearly extending guide groove defined therein for guiding the web of the other shoe for only linear movement with respect thereto and having a toothed portion for engaging the toothed portion of said strut, said strut and said latch being in substantially one plane;
a first spring means extending between said latch and said one shoe for urging said toothed portions into engagement; and



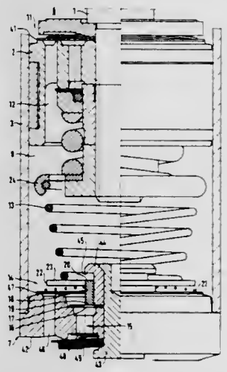
a second spring means extending between said strut and said one shoe for biasing said strut toward rotation in a direction to extend its effective length.
wherein a gap δ is defined between said latch and the other braking shoe in the guide groove so as to act as a braking clearance.

4,782,924
INTERNAL SHOE DRUM BRAKE WITH TWO LINERS ON EACH LINING SUPPORT AND MEANS FOR REDUCTION IN WEARING-IN PERIOD
Wilfried T. Giering, Mendig; Sigmar H. Micke, Koblenz-Metternich; Franz-Helmut Holl, Mastershausen, and Jörg Thielecke, Hillscheid, all of Fed. Rep. of Germany, assignors to Lucas Industries public limited company, Birmingham, England
Filed May 26, 1987, Ser. No. 53,718
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 8614259[U]
Int. Cl.[4] F16D *69/00, 65/08*
U.S. Cl. 188—250 A **4 Claims**



1. An internal shoe drum brake, comprising
a brake drum (10) which has a circular cylindrical internal braking surface (12) and
at least one brake shoe (14) which comprises a lining support member (16) and two lining sections (20) fastened one behind the other in circumferential direction to the support member (16),
each lining section (20) having an at least approximately circular cylindrical friction surface (22) the radius of curvature (R22) of which is smaller than the radius of curvature (R12) of the braking surface (12) and the center of curvature (M22) of which is located such that only a central portion of the friction surface (22) engages the braking surface (12) upon actuation of the brake, the lining sections (20) of each brake shoe (14) having a fist thickness (d1) at their ends facing each other, and a second thickness (d2) at their ends remote from each other, the first thickness (d1) being substantially greater than the secnd thickness (d2), wherein in a rectangular coordinate system (X,Y) the origin of which lies on the axis (A) of the brake drum (10) and the abscissa (X) of which is formed by a center line between the two lining sections (20), the center of curvature (M22) of each friction surface (22) lies between that particular friction surface (22) and the axis (A) of the brake, the center of curvature (M22) having a distance (y22) from the abscissa which is smaller than the distance (X22) from the ordinate, upon actuation of the brake.

4,782,925
DOUBLE-TUBE VIBRATION DAMPER
Manfred Grundei, Niederwerrn, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG
Filed Dec. 31, 1986, Ser. No. 948,050
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602224
Int. Cl.[4] F16F *9/49*
U.S. Cl. 188—322.14 **22 Claims**



1. A double-tube vibration damper comprising a cylinder member (3) having a axis and two ends, namely a first end and a second end,
a container member (4) surrounding said cylinder member (3),
a piston rod member (1) coaxial with said cylinder member (3) and extending inwards and outwards of said cylinder member (3) through the first end thereof,
a piston rod guiding and sealing unit (5, 6) substantially closing said cylinder member (3) and said container member (4) adjacent said first end and sealingly guiding said piston rod member (1) inwards and outwards of said cylinder member (3),
an end wall (4) closing said container member (4) adjacent said second end,
a bottom valve unit (7) adjacent said second end of said cylinder member (3),
a piston unit (2) connected with said piston rod member (1) within said cylinder member (3),
a cavity (8, 0) being defined within said cylinder member (3) axially between said piston rod guiding and sealing unit (5, 7) and said bottom valve unit (7),
said cavity (8, 9) being separated by said piston unit (2) into two working chambers, a first working chamber (8) adjacent said piston rod sealing and guiding unit (5, 6) and a second working chamber (9) adjacent said bottom valve unit (7),
said cavity (8, 9) being substantially filled with a liquid,
an annular reservoir chamber (10) being defined radially

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between said cylinder member (3) and said container member (4),
said annular reservoir chamber (10) being partially filled with said liquid and partially filled with a gas,
said working chambers (8, 9) being interconnected by piston unit passage means (11) allowing liquid flow between said two working chambers (8, 9),
said bottom valve unit (7) allowing liquid flow between said second working chamber (9) and said annular reservoir chamber (10) and comprising an inward movement valve unit (15) allowing liquid flow from said second working chamber (9) to said annular reservoir chamber (10) in response to inward movement of said piston rod member (1) with respect to said cylinder member (3),
said inward movement valve unit (15) being variable in flow resistance in response to axial movement of said piston rod member (1),
said piston rod member (1) being provided at the inner end thereof with abutment spring means (13) cooperating with said inward movement valve unit (15) in response to inward movement of said piston rod member (1) starting at a predetermined position during inward movement of said piston rod member (1),
said inward movement valve unit (15) comprising a control body (18) connected with and axially movable with respect to said bottom valve unit (7) between a minimum damping position and a maximum damping position, being biased by return spring means (21) towards said minimum damping position and being provided with a substantially axially directed abutment face (23), said abutment face (23) being engageable by said abutment spring means (13) on inward movement by said piston rod member (1) starting at said predetermined position, said control body (18) being movable by said abutment spring means (13) towards said maximum damping position,
said control body (18) cooperating with inward movement flow passage means (17, 16) of said inward movement valve unit (15) such as to vary a flow cross-sectional area of said inward movement flow passage means (17, 16) in response to axial movement of said control body (18),
said control body (18) cooperates with at least one flow passage opening (16) defined by a flow passage disc (17),
said flow passage disc (117) is shaped as a cup spring, and said cup spring (117) establishes at least part of said return spring means.

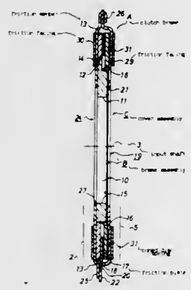
4,782,926

CLUTCH BRAKE

Seiichi Kitano, Shijounawate; Yasunobu Fukatani, Hirakata, and Masaaki Asada, Ibaragi, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Mar. 3, 1987, Ser. No. 21,066
Claims priority, application Japan, Mar. 4, 1986, 61-46786
Int. Cl.⁴ F16D *67/02*
U.S. Cl. 192—13 R **7 Claims**

1. A clutch brake having a brake assembly interconnected to a rotatable shaft through means of driving function and a cover assembly provided with an external friction surface and carried rotatably in relation to said brake assembly; characterized by that a coned disc spring is interposed in said cover assembly, and a friction plate composing said cover assembly is pressed



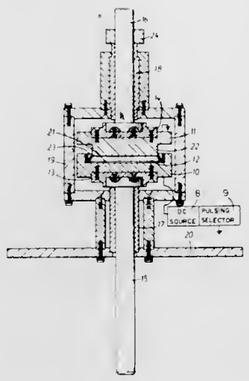
on a friction member composing said brake assembly by means of said coned disc spring.

4,782,927

ELECTROVISCOUS FLUID-ACTUATED DEVICES

John L. Sproston, Heswall; Nigel G. Stevens, Coventry, both of England, and Ian M. Page, Rustenburg, South Africa, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 516,600, Jul. 22, 1983, abandoned. This application May 4, 1987, Ser. No. 45,451
Claims priority, application United Kingdom, Jul. 22, 1982, 8221191
Int. Cl.⁴ F16D *37/02*
U.S. Cl. 192—21.5 **11 Claims**



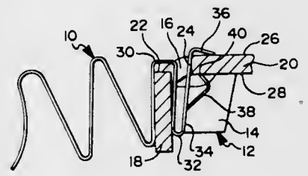
1. An electroviscous fluid-actuated device comprising
electrodes defining a gap therebetween,
an electroviscous fluid in said gap, and
means for applying a pulsating electrostatic field to the electroviscous fluid in said gap by connecting a direct current voltage source to said electrodes,
said direct current voltage source being rapidly pulsed to repeatedly provide a plurality of direct current pulses per second.

4,782,928

OVERRUNNING CLUTCH WITH IMPROVED SPRING ATTACHMENT

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 14, 1986, Ser. No. 918,575
Int. Cl.⁴ F16D *41/06*
U.S. Cl. 192—45 **3 Claims**



1. In an overrunning roller clutch of the type having a cage with a vertical cross bar and an adjacent horizontal cross bar having circumferentially extending inner and outer surfaces and a radially extending thickness with an edge circumferentially spaced from said vertical cross bar by a predetermined amount, and an accordion type roller energizing spring having a mounting fold adapted to be press fitted over said vertical cross bar as said spring is attached to said cage an also having a spring tail, an improved latch for positively retaining said spring to said cage, said improved latch comprising,
a resilient retrorse stop flange extending, in its free state, outwardly and downwardly from said spring tail and,
a contralateral biasing finger extending, in its free state, outwardly and upwardly from said spring tail toward said stop flange to a free end spaced from said retrorse stop flange by less than the radial thickness of said horizontal cross bar, whereby, as a pushing force is applied to said spring to press said spring mounting fold over said vertical cross bar, said biasing finger slides along and is flexed toward said spring tail by said horizontal cross bar edge until said retrorse stop flange is flattened against said horizontal cross bar outer surface and said biasing finger free end passes said horizontal cross bar edge and returns substantially to its free state, at which point said pushing force is released and said retrorse stop flange returns to substantially its free state, thereby resiliently grasping said outer and inner horizontal cross bar surfaces between said retrorse stop flange and the free end of said contralateral biasing finger respectively so as to securely latch said spring to said cage.

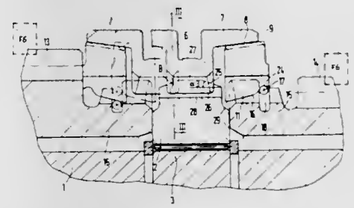
4,782,929

LOCKING SYNCHRONIZER FOR A GEAR TRANSMISSION OF A MOTOR VEHICLE

Robert Müller, Mönsheim, Fed. Rep. of Germany, assignor to Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,492
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612741
Int. Cl.⁴ F16D *23/06*
U.S. Cl. 192—53 F **9 Claims**

1. A locking synchronizer for a gear transmission of a motor vehicle, having loose and fixed gears, with shift sleeve means that are non-rotatably mounted on guide sleeve means and axially displaceable with tensioning of snap ring means, said shift sleeve means having shift teeth for engaging corresponding shift teeth on a loose gear and a conical surface directed radially inward for cooperation with an outer cone of a synchronizing ring means, said synchronizing ring means being equipped with a plurality of claws, distributed symmetrically around the inner circumference of the synchronizing ring means and projecting radially inward, said claws being engageable with broad gaps between said shift teeth of the loose gear, said synchronizing ring means being rotatable to a limited extent in said gaps between said loose gear shift teeth, wherein:
said claws of said synchronizing ring means have conical inner circumferential surfaces for radially tensioning the snap ring means during a lengthwise displacement of said synchronizing ring means, and



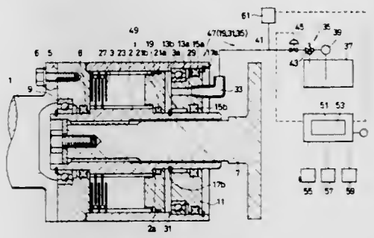
wherein said snap ring means is guided in radially outwardly open annular groove means in the loose gear for movement only in a radial direction while preventing axial movement of said snap ring means.

4,782,930

POWER TRANSMISSION APPARATUS

Toshiaki Kurokwa, and Masao Teraoka, both of Tochigi, Japan, assignors to Tochigifujisangyo Kabushiki Kaisha, Japan

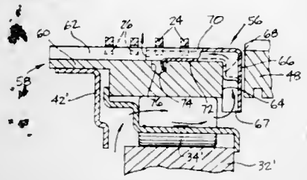
Filed Jan. 30, 1987, Ser. No. 8,777
Claims priority, application Japan, Feb. 4, 1986, 61-13979[U]; Feb. 5, 1986, 61-14478[U]; Jun. 9, 1986, 61-86532[U]
Int. Cl.⁴ F16D *35/00*
U.S. Cl. 192—58 C **4 Claims**



1. A power transmission apparatus comprising:
first and second rotary means rotatable with respect to each other;
a partition plate means disposed between the second rotary means and a housing of the apparatus and movable in the axial direction of the second rotary means;
a sealed chamber hermetically formed between the second rotary means and the housing, and partially defined by the partition plate means and filled with viscous fluid;
first and second resistance plate means disposed within the sealed chamber and respectively rotatable together with the first and second rotary means to transmit torque therebetween by the shearing resistance of the viscous fluid;
a clearance defined by the partition plate means and a stationary portion of the apparatus and filled with a second fluid; and
third means for controlling the pressure of the viscous fluid within the sealed chamber through the axial movement of the partition plate means in accordance with a running state of an object provided with the apparatus, said third means supplying the second fluid to the clearance and having a pressure sensor for detecting the pressure of the second fluid in the clearance.

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4,782,931
OVERRUNNING CLUTCH WITH LUBRICANT COLLECTING AND DISTRIBUTING MEANS
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 3, 1987, Ser. No. 92,758
Int. Cl.[4] F16D *13/74, 47/04*
U.S. Cl. 192—70.12 **3 Claims**



1. In a vehicle transmission of the type having a central shaft defining an area from which lubricant is supplied and sent generally radially outwardly and an input clutch unit having a plurality of first clutch plates and a plurality of second clutch plates interleaved with the first and said first and second clutch plates being radially spaced from said central shaft to define an annular space, said interleaved clutch plates spinning rapidly relative to and closely to one another when said input clutch unit is disengaged, said input clutch unit also including an overrunning clutch in said annular space having an outer race with a generally annular end face lying in a plane generally perpendicular to the axis of said central shaft and a generally cylindrical outer surface joined to the inner diameter of said second clutch plates, a means to collect lubricant and direct it around said overrunning clutch and between said interleaved plates when said input clutch unit is disengaged, said means comprising,

a generally annular end plate joined to said outer race and spaced from said outer race end face so as to form a chamber in cooperation with said end face, said end plate extending radially inwardly toward said central shaft sufficiently far so as to capture lubricant in said chamber to be directed radially outwardly along said outer race end face, and,

at least one feed channel opening to said chamber and extending axially between said outer race outer surface and said second clutch plates so as to distribute lubricant from said chamber between said interleaved clutch plates when said input clutch unit is disengaged.

4,782,932
TORSION DAMPING MECHANISM
David A. Janson, Plymouth, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 1, 1985, Ser. No. 793,802
Int. Cl.[4] F16D *13/68*
U.S. Cl. 192—70.17 **25 Claims**

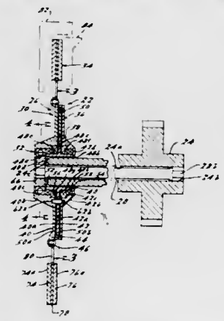
1. A clutch plate apparatus adapted to drivingly interconnect driving and driven members of a driveline; said apparatus comprising:

an annular housing assembly adapted for rotation about an axis of the driven member, said housing assembly including first and second radially extending sidewall members having mutually facing surfaces defining a radially extending chamber closed at its radially outer extent and open at its radially inner extent, and a radially inner portion of the first side wall member defining an axially extending hub portion;

an annular clutch assembly including an annular radially extending clutching member driven by a clutch hub member adapted to be connected to the driven member, said clutching member disposed in said chamber for viscous clutching coaction with said sidewall members via a viscous liquid, and said clutch hub member having an axially extending hub portion for journaling the hub portion of said first sidewall member thereon;

dynamic seal means interposed between said housing and clutch assemblies for sealing the radially inner extent of said chamber;

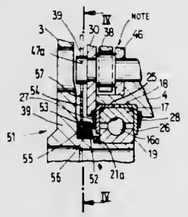
lost motion means adapted to be interposed between said driven member and said clutching member for allowing minor to-and-fro relative rotation between said housing assembly and said driven member without corresponding



to-and-fro relative rotation between said housing assembly and clutching member; and

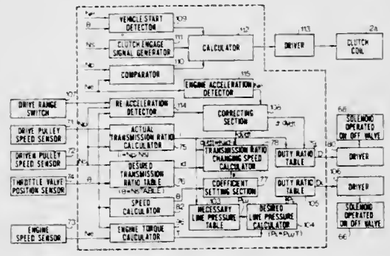
a friction assembly including first and second axially facing friction surfaces respectively defined on opposite sides of an annular flange disposed radially outward of said housing assembly, drivingly connected to said housing assembly, and adapted to be frictionally clamped between pressure plates of an engagement mechanism defining said driving member.

4,782,933
APPARATUS FOR COMPENSATING FOR FLUCTUATIONS OF TORQUE BETWEEN COAXIAL FLYWHEELS IN A MOTOR VEHICLE
Johann Jäckel, Bühl, and Rudolf Hönemann, Ottersweier, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany
Filed Mar. 26, 1986, Ser. No. 844,475
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511060
Int. Cl.[4] F16D *13/18*
U.S. Cl. 192—70.18 **81 Claims**



1. A torque compensating apparatus, particularly for counteracting abrupt changes of torque which is transmitted in a motor vehicle having an engine with an output element and a change-speed transmission with an input element, comprising a flywheel including a first rotary component which is arranged to receive torque from the output element of the engine and a second rotary component which is coaxial with the first component and is arranged to transmit torque to the input element of the transmission, one of said components having an axially extending protuberance and a radially extending flange, said components being rotatable relative to each other in clockwise and counterclockwise directions; damping means for yieldably opposing rotation of said components relative to each other, comprising at least one friction generating device on said one component and means for deactivating said device during rotation of said components relative to each other through a predetermined angle upon each reversal of the direction of rotation of one of said components with reference to the other of said components; and antifriction bearing means having an inner race on said protuberance, an outer race and an annulus of rolling elements between said races, said damping means being disposed between said inner race and said flange as considered in the axial direction of said components.

4,782,934
CONTROL SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION
Toshio Takano, Hamuramachi; Hiroshi Tanaka, Tokyo, and Motohisa Miyawaki, Choufu, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 2, 1987, Ser. No. 43
Claims priority, application Japan, Jan. 7, 1986, 61-899; Mar. 28, 1986, 61-70226
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.073 **17 Claims**



8. A control system for a continuously variable transmission for transmitting the power of an internal combustion engine to driving wheels of a motor vehicle through a clutch, having a drive pulley including a hydraulically shiftable disc and a first hydraulic cylinder for shifting the disc, a driven pulley including hydraulically shiftable disc and a second hydraulic cylinder for shifting the disc, a belt engaged with both pulleys, a transmission ratio control valve having ports and a spool, a first hydraulic circuit having a pump for supplying oil to the first and second cylinders through the transmission ratio control valve, a second hydraulic circuit for supplying a part of the oil to both ends of the spool of the transmission ratio control valve, solenoid operated on-off control valve means provided in the second hydraulic circuit for controlling amount of oil supplied to the ends of the spool,

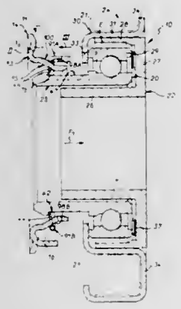
sensor means for detecting load on the engine and for producing a load signal, first means responsive to the load signal for producing a desired transmission ratio signal,

second means responsive to the desired transmission ratio signal for deciding a duty ratio of electric pulses, driving means for driving the solenoid operated on-off control valve means at the decided duty ratio and for shifting the spool of the transmission ratio control valve so as to provide a transmission ratio, the system comprising:

third means for detecting disengagement of the clutch at vehicle speed lower than a predetermined value and for producing a disengagement signal;

fourth means for positively increasing the desired transmission ratio and drive pulley speed under the condition of existence of the disengagement signal.

4,782,935
CLUTCH RELEASE BEARING ASSEMBLY IN PARTICULAR FOR AUTOMOBILE VEHICLES
Christian Gay, Paris, and Philippe Lassiaz, Boulogne, both of France, assignors to Valeo, Paris, France
Filed Apr. 10, 1987, Ser. No. 37,174
Claims priority, application France, Apr. 18, 1986, 86 05575
Int. Cl.[4] F16D *23/14*
U.S. Cl. 192—98 **14 Claims**



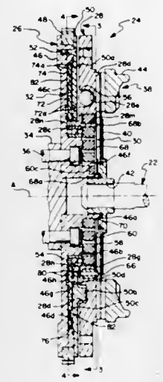
1. Clutch release bearing assembly comprising a clutch release bearing and, adapted to couple said clutch release bearing to a clutch release device of a clutch, on the one hand, a coupling part adapted to be attached to said clutch release device and comprising a substantially radial bearing flange adapted to bear axially on said clutch release device and a substantially axial bush adapted to pass axially through said clutch release device, and, on the other hand, a drive part on said clutch release bearing and fastening means operative in traction between said coupling part and said drive part and adapted to couple said coupling part and said drive part together in the axial direction from said clutch release device to said clutch release bearing, in which clutch release bearing assembly said fastening means comprise an annular coupling member carried by one of said coupling and drive parts and which is elastically deformable in the radial direction and a transverse drive bearing surface on the other of said coupling and drive parts, said annular coupling member is adapted to cooperate in axial bearing engagement with said drive bearing surface, said annular coupling member comprises at least two substantially radial lugs and said bush comprises respective openings each adapted to have a respective one of said at least two lugs pass through it, said clutch release bearing assembly further comprising a guide surface coaxial with said bush and a guide bearing surface forming part of said guide surface, each of said at least two lugs being adapted to cooperate in bearing engagement with said guide bearing surface said guide surface being part of the surface of said bush of said coupling part opposite that along which the main part of said annular coupling member extends circumferentially.

4,782,936
TWO MASS FLYWHEEL ASSEMBLY WITH TORSIONAL DAMPING MEANS
Warren G. Bopp, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Jun. 5, 1987, Ser. No. 58,735
Int. Cl.[4] F16F *15/10;* **F16D** *3/14, 47/02*
U.S. Cl. 192—106.2 **17 Claims**

1. A torsional damping mechanism comprising first and second flywheels respectively adapted for direct connection to an engine and selective connection to a multiratio transmission; a damping assembly including first and second clutch elements respectively fixed to said first and second flywheels and disposed for clutching coaction therebetween in response to

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relative rotation of the numbers; said first flywheel including axially extending outer and inner hub portions radially and axially spaced apart, said outer hub portion having an outer peripheral surface; said second flywheel including an annular, axially extending hub portion drivingly connected to said second element of the damping assembly and having an inner peripheral surface journaled on the outer peripheral surface of the outer hub member of the first flywheel; first and second nested spiral wound springs each having a radially inner and outer end; said first flywheel having a portion for securing the radially inner ends of the springs thereto; said second flywheel



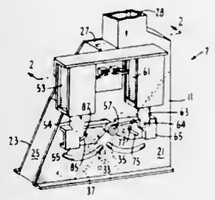
having a portion spaced radially outward of the first flywheel portion and including fastening means for securing the radially outer ends of the springs thereto; said fastening means including means for restricting circumferential movement of the outer spring ends relative to the second flywheel and surface means rigid with the second flywheel portion, said surface means being in supporting contact with a radially inwardly facing surface portion of the springs adjacent their radially outer ends for restricting pivotal movement of the spring ends during spring windup for improving stress distribution in the spring.

4,782,937

ESCROW DEVICE FOR COIN-OPERATED SYSTEMS

Abraham Y. Chen, Mountain View, and Douglas D. Lau, Hillsborough, both of Calif., assignors to Tatung Telecom Corp., Palo Alto, Calif.

Filed Nov. 3, 1986, Ser. No. 925,926
Int. Cl.⁴ G07F *1/04*
U.S. Cl. 194—346 **14 Claims**



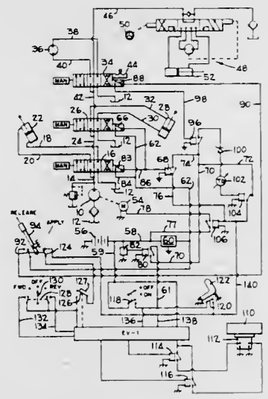
1. A coin escrow device for use in vending systems that operate with minimal energy, comprising:
a housing;
a first gate means pivotably mounted within the housing to support coins in a latched position and to discharge coins to a coin return outlet in an unlatched position;
a second gate means pivotably mounted within the housing to support coins in a latched position and to discharge coins to a coin collection outlet in an unlatched position;
first actuating means connected to selectively unlatch the first gate means and, thereafter, to provide a biasing force that returns the first gate means to the latched position;
second actuating means connected to selectively unlatch the second gate means and, thereafter, to provide a biasing force that returns the second gate means to the latched position; and
the first and second actuating means each including: a solenoid stationarily mounted to the housing, a core member movable vertically within the solenoid, a lever member pivotably connected between the core member and a common point on the housing, an arcuate track formed in said lever member, and a pin member fixed to the gate means and located to ride in the arcuate track such that the associated gate member is moved to an unlatched position by upward movement of the associated solenoid core and downward motion moves the gate means toward the latched position.

4,782,938

HYDRAULIC AND ELECTRICAL SYSTEM FOR AIRCRAFT BELT LOADER

Robert R. Cooper, Orlando, and William C. Dean, Orange City, both of Fla., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 871,169, Jun. 3, 1986, abandoned, which is a continuation of Ser. No. 586,524, Mar. 5, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 18,791
Int. Cl.⁴ B65G *67/00*
U.S. Cl. 198—301 **4 Claims**



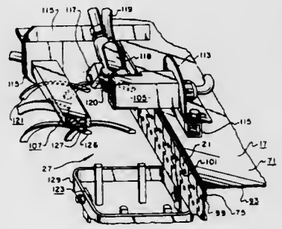
1. In an aircraft belt loader having an operator seat, a parking brake, battery capable of being recharged, a belt conveyor driven by a hydraulic motor, a hydraulic pump driven by an electric pump motor and ground-engaging wheels driven by an electric traction motor, the improvement comprising:
conveyor valve means moveable from a neutral position for connecting said pump to said hydraulic motor;
first means responsive to movement of said conveyor valve means from neutral for connecting said battery to said electric pump motor;
a traction drive lever moveable to connect said battery with said electric traction motor;
detector means for detecting when the charge in said battery falls below a predetermined level;
disabling means responsive to said detector means for disabling the connection between said battery and said electric pump motor while permitting connection between said battery and said electric traction motor when the battery charge falls below said predetermined level;
seat occupied means for preventing connection of said battery with said electric traction motor while permitting connection of said electric pump motor to said battery when said seat is unoccupied; and
brake set means for permitting operation of said traction drive motor only when said parking brake is released and of said conveyor only when said parking brake is applied.

4,782,939

CAN UNSCRAMBLER SYSTEM

W. George Fields, Box 431, Newark, Tex. 76071

Continuation-in-part of Ser. No. 815,227, Dec. 31, 1985, Pat. No. 4,736,831. This application May 29, 1987, Ser. No. 55,729
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.⁴ B65G *43/08*
U.S. Cl. 198—395 **3 Claims**



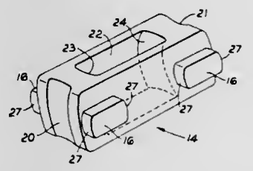
1. An apparatus for conducting operations on unfilled cans of the type having an open end and a closed end and that have become disoriented such that the open ends of some cans face different directions from the open ends of other cans and the closed ends of some cans face the same direction as the open ends of other cans, said operations resulting in the orientation of said cans such that all of the open ends of said cans face the same direction and all of the closed ends of said cans face a direction opposite to the direction faced by the open ends, comprising:
means for sorting said cans into said first and second categories, said first category comprising those cans that have their open ends facing a first direction and said second category comprising those cans that have their open ends facing a second direction that is opposite to said first direction,
conveying means for conveying said cans one at a time through said means for sorting said cans, said cans being conveyed until disengaged from said conveyance means by said means for sorting said cans, whereby the movement of said cans is continually controlled, said conveying means comprising,
a chamber with an open portion,
belt means supported to move past said open portion,
means for moving said belt means past said open portion,
apertures extending through said belt means,
means for creating a partial vacuum in said chamber for producing a partial vacuum at the apertures for holding the cans onto said belt means,
means for arranging said sorted cans into the same orientation so that all of the open ends of said cans face the same direction and all of the closed ends of said cans face in a direction which is opposite to the direction faced by the open ends,
said means for sorting said cans further comprises means for distinguishing between said open ends and said closed ends of said cans and means for guiding said cans of said first category to an arranger means and said cans of said second category to another arranger means,
said means for distinguishing between said open ends and said closed ends of said cans comprises proximity detecting means for sensing the outwardly facing ends of said cans on said belt means for determining whether said cans are in said first or second orientation on said belt means,
said guide means comprises means responsive to said detecting means for producing an air blast against each of said cans on said belt means which is in a predetermined one of said orientations on said belt means to remove said cans from said belt means.

4,782,940

CAPTIVATED BLOCK AND STRAP LINK CHAIN

Thomas M. Hogg, Lanarkshire, Scotland, assignor to Anderson Strathclyde PLC, Glasgow, Scotland

Filed Jun. 10, 1986, Ser. No. 872,483
Claims priority, application United Kingdom, Jun. 13, 1985, 8515033
Int. Cl.⁴ B65G *17/38, 19/20*
U.S. Cl. 198—735 **8 Claims**



1. A flexible track held captive in an armored face conveyor and comprising a plurality of identical blocks arranged in longitudinally spaced relation and a pair of links at opposed transverse sides of each adjacent two blocks, co-operating connecting means on the blocks and links to interconnect adjacent blocks in longitudinally spaced relation to create an aperture between adjacent blocks, said co-operating connecting means having a clearance to permit a small degree of longitudinal movement between said blocks, each block having an aperture in its upper face and in the under face of its body, the apertures in the upper face of blocks and the apertures between the end faces of adjacent blocks being adapted to receive a tooth of a toothed wheel mounted on a machine movable along the conveyor, each block being individually reversible and invertible whereby faces worn by engagement with the toothed wheel can be replaced.

4,782,941

CLEANING RECEPTACLE FOR SPECTACLES

Siegfried Freise, Wilhelmvon Miller-Weg 8, D-8100 Garmisch-Partenkirchen/Upper Bavaria, Fed. Rep. of Germany

Filed Jan. 22, 1987, Ser. No. 5,936
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 8601566[U]
Int. Cl.⁴ B65D *81/22*
U.S. Cl. 206—5 **15 Claims**

1. A cleaning receptacle for spectacles, comprising:
a cleaning vessel having a closed end and an open end;
a cover, said cover being such that it sealably fits over said open end of said cleaning vessel and is thereby capable of retaining liquid within the receptacle without spillage or leakage; and
at least one holder for holding spectacles said holder being internally and centrally mounted in said closed end of said cleaning vessel or in said cover and being adapted to receive and to retain, in cooperation with the inner surface of an opposing end of the cleaning receptacle, spectacles of different lengths along the lengths of the spectacles

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such that the lenses of the spectacles do not touch a wall portion of said cleaning vessel.

12. A cleaning receptacle for spectacles, comprising:

a cleaning vessel having a closed end and an open end;

a cover, said cover being such that it sealably fits over said open end of said cleaning vessel and is thereby capable of



retaining liquid within the receptacle without spillage or leakage;

at least one holder for holding the spectacles, wherein said cover is provided on its inside with securing means for resiliently receiving and retaining, said holder in a relatively central position.

4,782,942

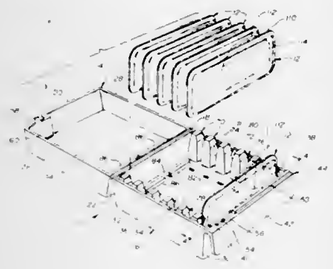
CONTAINER FOR A NUMBER OF PACKAGED CONTACT LENSES

Charles R. Ashley, Pattenburg, N.J.; Crossman:Russell J., Jacksonville, Fla.; John P. Hennessy, Jacksonville, Fla., and William J. Lahm, Jacksonville, Fla., assignors to Vistakon, Inc., Jacksonville, Fla.

Filed Feb. 6, 1987, Ser. No. 11,820

Int. Cl.[4] A45C *11/04*

U.S. Cl. 206—5.1 **15 Claims**



1. A container for a plurality of individually packaged contact lenses for holding said individual packages during sterilization and for later acting as a storage and shipping container for said individual packages, comprising:

a bottom portion having a bottom, integral left and right side walls extending upwardly from said bottom and integral front and back walls extending upwardly from said bottom and integrally attached to said left and right side walls;

a plurality of projections extending from said bottom and spaced at predetermined intervals along said left and right side walls and integral with the respective side wall along which they extend, each of said projections spaced from the adjacent projection a predetermined distance to provide a slot therebetween for holding said individual package;

each of said slots along said right side wall aligned with a corresponding slot along said left side wall;

a top portion having a top, having integral left and right side walls extending downwardly from said top and integral front and back walls extending downwardly from said top and integral with said left and right side walls;

a hinge disposed along an edge of said top portion back wall and disposed along said bottom portion back wall and integral therewith for hinging said top portion and said bottom portion together to permit said top portion to rotate about said hinge from an open position to a closed position to form a closed container for said individual packages; and,

a plurality of steps projecting from said bottom portion bottom and aligned with said slots defined by said projections disposed along said left and right side walls of said bottom portion for providing a means to elevate said individual packages above said bottom portion bottom to facilitate easy circulation of sterilization medium.

4,782,943

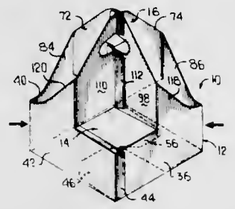
BASKET-LIKE CARRIER FOR CUPS AND THE LIKE AND BLANK FOR FORMING THE SAME

Stephen M. Blackman, Westmont, Ill., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Dec. 11, 1986, Ser. No. 940,617

Int. Cl.[4] B65D *5/46*

U.S. Cl. 206—175 **15 Claims**



1. A basket-like carrier comprising a base having a bottom, said base being defined by side walls, and combined separator and handle structure extending upwardly from central portions of said side walls, said combined separator and handle structure including a panel member extending from each of said side walls and intersecting like panel members in a centrally located vertical line, each of said panel members having an upper portion forming part of said handle structure, said handle structure being primarily of a single thickness with each of said panel members having a major portion thereof free of others of said panel members, two adjacent ones of said panel members being joined along a fold extending along said centrally located vertical line and together having a rounded tip and partially rounded base portions.

8. A blank for a basket-like carrier, said blank comprising a lower portion, an intermediate portion and an upper portion, said lower portion being in the form of a plurality of bottom forming panels and flaps, said intermediate portion being in the form of a plurality of body forming panels, and said upper portion being in the form of a plurality of panel members for defining a combined separator and handle structure with said handle structure being primarily of a single thickness, said panel members including two central panel members joined together and spaced end panel members, said end panel members carrying flaps forming sole means for securing said panel members together in said handle structure, the configuration of the space between each end panel member and said central panel members being of a configuration corresponding to the configuration of said joined together central panel members.

9. A blank assembly comprising two blanks formed from a web in opposed longitudinally offset nested relation, each of said blanks comprising a lower portion, an intermediate portion and an upper portion, said lower portion being in the form of a plurality of bottom forming panels and flaps, said intermediate portion being in the form of a plurality of body forming panels, and said upper portion being in the form of a plurality of panel members for defining a combined separator and handle structure with said handle structure being primarily of a single thickness, said panel members including two central panel members joined together and spaced end panel members, said end panel members carrying flaps forming sole means for securing said panel members together in said handle structure, the configuration of the space between each end panel member and said central panel members being of a configuration corresponding to the configuration of said joined together central panel members.

4,782,944

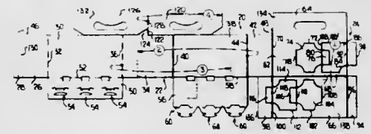
MULTI-CELLULAR CARRIER

Arnold B. Engdahl, Jr., Irwin, Calif., assignor to Federal Paper Board, Inc., Montvale, N.J.

Filed Mar. 11, 1987, Ser. No. 24,761

Int. Cl.[4] B65D *5/46, 5/48*

U.S. Cl. 206—185 **17 Claims**



1. A blank for forming a multicellular carrier of the type including an upwardly open body and a divider assembly, said blank comprising a body forming blank portion and a divider assembly forming blank portion, said blank portions being integrally directly joined together, said body forming blank portion including joined together body panels arranged in longitudinal relation by transverse connections, said divider assembly forming blank portion forming a transverse extension of said body forming blank portion, said divider assembly forming blank portion including two divider panels connected together by a first longitudinal connection, each of said divider panels having divider leaves adapted to be struck from said divider panels and secured to adjacent body panels, and a first handle panel connected to one of said divider panels along a second longitudinal connection, and said body forming blank portion carrying second and third handle panels in longitudinal alignment with said first handle panel.

4,782,945

RECLAIMABLE POLYESTER BOTTLE AND CARRIER ASSEMBLY

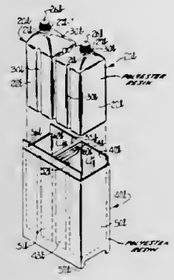
William A. Geiler; Eileen M. Geiler, both of Rte. 1, Box 100-H, Holly Ridge, N.C. 28445, and Kristeen E. Geiler, 7411 Crowflock Ct., Matthews, N.C. 28105

Filed Jun. 12, 1987, Ser. No. 62,060

Int. Cl.[4] B65D *1/24, 21/02, 85/62*

U.S. Cl. 206—203 **24 Claims**

15. A bottle and carrier assembly adapted to facilitate the recycling of polyester resin bottles, comprising a reusable bottle carrier having side wall means and a bottom surface, and a plurality of recyclable polyester resin bottles, each of said bottles having an upper neck portion, an elongate body portion, and a rounded bottom portion which prevents said bottles from standing upright when placed on a level surface, each of said bottles being removably disposed within said bottle carrier in an upright configuration with said side wall means of said bottle carrier overlying a major part of each of said bottle elongate body portions, said side wall means of said bottle carrier and said elongate body portions of each of said bottles having interengaging portions for maintaining said upright configuration of each of said bottles, and whereby said



rounded bottom portion of each of said bottles serves to discourage the removal by a consumer of said recyclable bottles from said reusable bottle carrier.

4,782,946

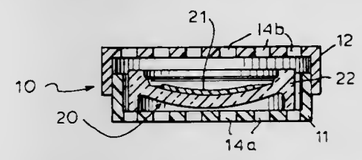
SOFT CONTACT LENS HYDRATION DEVICE AND KIT

Martin M. Pollak, Laurel Hollow, N.Y., assignor to Allergan, Inc., Irvine, Calif.

Filed Sep. 17, 1987, Ser. No. 97,868

Int. Cl.[4] A45C *1/04*; B65D *85/30*

U.S. Cl. 206—223 **19 Claims**



1. A hydration device comprising an enclosure possessing means for permitting contact of a dehydrated contact lens in resident association with a mold element in which the lens was formed with hydration liquid, said device containing at least one such combined lens/mold element assembly.

4,782,947

ARRANGEMENT FOR SECURELY HOLDING GARMENT HANGERS WITHIN GARMENT BAGS

Samuel R. Sheiman, Brooklyn, N.Y., assignor to Crest Lock Co. Inc., New York, N.Y.

Filed May 7, 1987, Ser. No. 46,724

Int. Cl.[4] A45C *5/12*; B65D *85/18*

U.S. Cl. 206—279 **17 Claims**

1. An arrangement for holding garment hangers within a travel garment bag having an interior top wall, said arrangement comprising:

(a) a top plate stationarily mounted to the interior top wall of the garment bag;

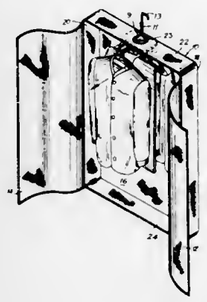
(b) an elongated supported rail having front and rear end regions and longitudinal side edge regions extending lengthwise along the rail;

(c) means for stationarily mounting the rail to and below the top plate, including upright front and rear posts respectively fixed at the front and rear end regions of the rail, said front post being centrally mounted between the side edge regions of the rail;

(d) a garment hanger having a stem with side, base, and

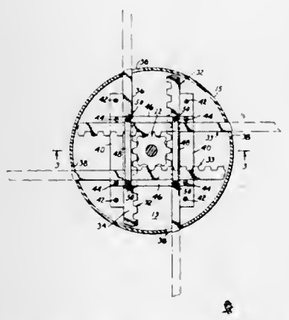
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flange portions bounding an interior channel in which the rail is slidingly received for suspendably and slidably supporting the hanger from the rail, said flange portions slidably contacting the side edge regions of the rail and extending transversely toward, but terminating short of, each other to form therebetween a clearance passage through which the front post passes with clearance, while maintaining sliding contact between the flange portions and the side edge regions of the rail, upon sliding the hanger past the front post; and



(e) means for locking the garment hanger on the rail to prevent demounting of the hanger during handling of the garment bag in transit, said locking means including a pivotable elongated track extension mounted to and below the top plate for pivoting movement relative to the stationary rail along a path between an extended position in which the track extension is aligned with the stationary rail and forms a continuation thereof along which garment hangers are suspendably and slidably supported, and a locked position in which the track extension is transverse to the stationary rail and prevents garment hangers from sliding off the stationary rail.

4,782,948
GOLF BAG AND SUPPORT THEREFOR
Kenneth E. Weise, P.O. Box 1320, La Quinta, Calif. 92253
Filed Dec. 21, 1987, Ser. No. 135,672
Int. Cl.[4] A63B *55/00*
U.S. Cl. 206—315.7 **8 Claims**



1. A golf bag with built-in stabilizing means adjustable between a stabilizing mode in which it maintains the bag in an upright position on a horizontal surface and one in which it is compacted for easy handling and storage of said bag, comprising:

chamber means situated at the bottom of the golf bag;

rack and pinion means comprising a pinion and a plurality of elongate rack members housed in said chamber means, each of said rack members being meshed with said pinion and the pinion being coaxial with the golf bag;

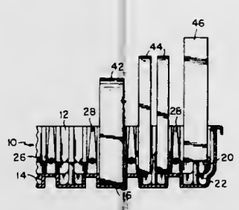
said chamber means having an encircling sidewall with a plurality of opening sized and positioned to permit passage through each of an outer segment of a separate one of said rack members;

retaining and guide means for confining said rack members to movement back and forth between positions of extension from said chamber means through said openings to prevent tipover of said golf bag when it is standing on a horizontal surface and positions of retraction substantially within said chamber means, said rack members being of such length as to permit this;

shaft means fixedly secured to said pinion and extending upwardly through the center of said golf bag to termination at a point where it can be turned by hand to rotate said pinion;

whereby rotation of said shaft means in one direction results in movement of said rack members outwardly through said openings to said positions of extension from said chamber means and rotation of the shaft means in the opposite direction causes withdrawal of said rack members substantially within said chamber means.

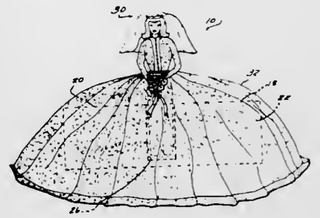
4,782,949
STORAGE MODULE FOR MIXED-SIZE MAGNETIC TAPE RECEPTACLES
Joseph L. Berkman, Mamaroneck, N.Y., assignor to Berkman Industries, Inc., Boynton Beach, Fla.
Filed Sep. 10, 1987, Ser. No. 95,531
Int. Cl.[4] B65D *85/672, 1/36*
U.S. Cl. 206—387 **19 Claims**



1. A storage module for magnetic tape cassettes and magnetic tape cassette boxes of various dimensions comprising:

at least one row of a plurality of parallel storage compartments, each compartment defined by a bottom surface and two opposing side walls, at least one said side wall of each compartment having at least one horizontal interior lower support surface spaced from and parallel to said bottom surface, and at least one wall divider dividing at least one lower support surface to define two parallel storage zones per compartment, and at least one horizontal undivided interior upper support surface spaced from and parallel to said bottom surface, said lower support surface for each compartment extending further from the side wall than said upper support surface, the bottom of each compartment being dimensioned to receive with a close fit a digital audio tape cassette, each said zone of the divided lower support surface being dimensioned to receive an unboxed cassette with a close fit, said upper support surface being dimensioned and spaced apart from the opposing side wall to receive a cassette box with a firm fit.

4,782,950
DECORATIVE FIGURE ARTICLE HOLDER
Catherine J. Santoro, 852 Beaconsfield, Grosse Pointe Park, Mich. 48230
Filed Jan. 16, 1984, Ser. No. 570,700
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—457 **8 Claims**



1. An article holder comprising:

a hollow container;

a first aperture formed in the container;

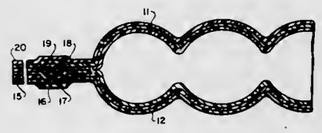
means, disposed within the container, for supporting a decorative figure;

decorative figure means insertable through the first aperture in the container and mountable within the decorative figure supporting means; the decorative figure extending partially outward from the container through the first aperture;

a hollow cavity formed within the container adjacent to the supporting means; and

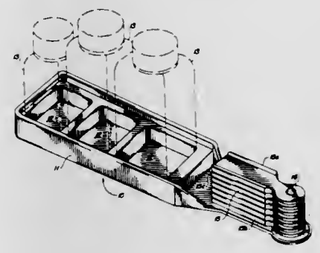
a second aperture formed in the container in communication with the hollow cavity in the container, the second aperture allowing access to the hollow cavity when the decorative figure means is mounted in the decorative figure supporting means.

4,782,951
RECLOSABLE PACKAGE AND METHOD OF MAKING RECLOSABLE PACKAGE
Ray H. Griesbach, Monona, and Gerald O. Hustad, McFarland, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.
Filed Mar. 20, 1986, Ser. No. 841,916
Int. Cl.[4] B65B *51/10;* **B65D** *77/12*
U.S. Cl. 206—484 **16 Claims**



1. A method of enclosing a product between first and second sheets of packaging material, said method comprising the steps of: inserting a product between said first and second sheets of packaging material; attaching interlocking closure strips or profiles on said first and second sheets adjacent and peripheral to the areas of said first and second sheets destined to become a hermetic seal and extending substantially the length of one side of the package; contacting said first and second sheets with each other at a hermetic seal area adjacent to the product and around the periphery of the product, said first and second sheets having respective opposed first and second adhering surfaces at the hermetic seal area whereby there is formed immediately adjacent to the product, a hermetic seal which completely encloses said product between said first and second sheets of packaging material wherein said hermetic seal comprises at least one peelable bond area adjacent to the interlocking closure strips.

4,782,952
MEDICATION SUPPLY HOLDER/ORGANIZER
Judy P. Allen, 1912 Warfield Ave., Redondo Beach, Calif. 90278
Filed Dec. 21, 1987, Ser. No. 135,393
Int. Cl.[4] B65D *83/04, 85/42*
U.S. Cl. 206—534 **1 Claim**



1. A medication supply holder and dose-organizer for assisting a patient taking timed dosages of multiple medications, said device comprising:

(a) a base member, including a storage portion for temporarily locating a plurality of containers for separately storing bulk quantities of each said medication;

(b) a plurality of timed-dose medication holders, each said holder including

(i) a tray for temporarily storing a plurality of different medication doses,

(ii) means forming an erasable marking surface for displaying prescription information of each;

(c) means for carrying said plurality of holders on said base in at least two operative positions,

(i) a first position in which each said holder is temporarily maintained until the medication doses carried thereby are taken by the patient, and

(ii) a second position in which each said holder is maintained after the medication dosages carried thereby are taken by the patient,

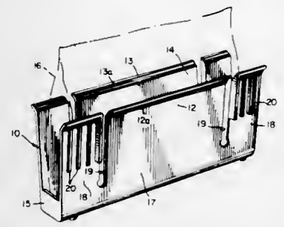
movement of each said holder from said first position to said second position automatically exposing the holder carrying the medication doses to be taken next in sequence by the patient.

4,782,953
FOOD POUCH HOLDER
Charles J. McPhee, 856? [illegible]rthorn Dr., Huntington Beach, Calif. 92646
Filed Dec. 8, [illegible], Ser. No. 130,073
Int. C[illegible] B65D *81/34*
U.S. Cl. 206—557 **18 Claims**

1. A holder for serving foods cooked in plastic pouches, comprising a stand formed of hard, flexible, plastic material having a planar base and two generally planar, horizontally elongated, spaced and generally parallel side walls formed integrally with said base and extending upwardly therefrom to define an open-topped pouch-receiving channel therebetween; each side wall having a main section and at least one end section separated from each other by a generally vertical slit, with the respective end sections and main sections of said two side walls opposing each other; said end sections of said two side walls being flexible towards each other, when squeezed between a user's fingers, to clamp a side edge portion of a food

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pouch therebetween for retaining the same within said channel; said slits of said side walls permitting such flexure of said



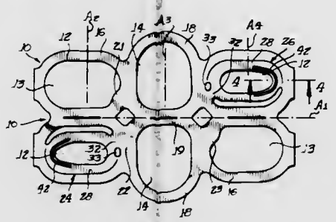
end portions into pouch-clamping relation without appreciably affecting the spacing between said main sections.

4,782,954
MENDING KIT
Jack M. Reynolds, 33 Rolling Green Cir., San Francisco, Calif. 94015
Filed Jun. 11, 1987, Ser. No. 61,750
Int. Cl.[4] B65D *81/36, 85/24*
U.S. Cl. 206—574 **8 Claims**



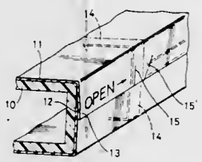
1. A mending kit comprising:
a needle having a length, an eye at a first end and a point at a second end;
an elongated housing, made of a relatively stiff plastic material, having an upper surface, a first end and a second end, which housing includes:
a needle-receiving seat section, adapted to receive said needle, generally longitudinally disposed along said upper surface, said seat section including:
a horizontally disposed needle guide/point protector, adapted to receive and protect said pointed second end of said needle; and
resilient means, movable from a normal, blocking position to a deflected, non-blocking position, for blocking inadvertent longitudinal movement of said needle, said blocking means located at and extending away from said upper surface generally near said first housing end, said blocking means opposite and axially aligned with said eye when said blocking means is in the blocking position to prevent removal of said needle from said needle guide/point protector, said blocking means spaced apart from said eye, permitting longitudinal movement of said needle from said needle guide/point protector, when said blocking means is in the non-blocking position; and
a spool section between said needle guide/point protector and said resilient blocking means; and
a length of thread, having a first end and a second end, wrapped about said needle and said spool section of said housing;
whereby said needle and thread are visible with said needle point protected by said needle guide/point protector.

4,782,955
BOTTLE CARRIER DEVICE
William N. Weaver, Northbrook, and Mindaugas J. Klygis, Barrington, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.
Filed Sep. 22, 1986, Ser. No. 909,860
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—161 **14 Claims**



1. A carrier device for unitizing a plurality of containers having a cylindrical body region and reduced diameter neck portion, the carrier device being formed from a resilient elastic deformable sheet of plastic material and comprising a plurality of integrally connected bands defining ranks and rows of apertures disposed along a longitudinal axis and equal in number to said plurality of containers, the rows being situated on opposite sides of said longitudinal axis, and the said ranks being disposed transversely to said longitudinal axis, the apertures in at least one rank being elongated in the direction of said longitudinal axis and the apertures in another rank being elongated transversely of said longitudinal axis, the bands creating the apertures being configured so that the lateral outermost regions of the bands and associated apertures of the transversely elongated apertures extend laterally beyond the lateral outermost regions of the bands and associated apertures of the longitudinally elongated apertures, and handle means extending from an inner margin of at least one of said longitudinally elongated apertures wherein the total length of said carrier device is substantially the same as the array of containers associated therewith in assembly.

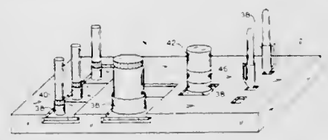
4,782,956
MAGNETIC TAPE CASSETTE WRAPPER
Keiichi Yoshizawa, Chiba, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan
Filed Jan. 24, 1983, Ser. No. 460,703
Claims priority, application Japan, Jul. 12, 1982, 57-104391; Aug. 6, 1982, 57-118906
Int. Cl.[4] B43M *7/00*
U.S. Cl. 206—606 **16 Claims**



1. A magnetic tape cassette in a case overwrapped tightly with a plastic film having a tear tape wound on all four sides of the case close to, and substantially in parallel with, one case end, said film being overlapped at the mating edge portions and glued together on a side of the case adjoining said one case end, with said tear tape extended between the overlapped edge

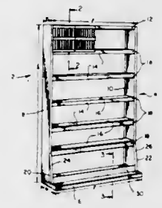
portions, characterized in that two cuts are made in the overlying one of the edge portions, one cut extending along the edge of said tear tape closer to said one case end and the other cut extending obliquely away from the opposite edge of said tear tape.

4,782,957
LOCKABLE FLANGED ITEM CADDY
James W. Kernodle, Sr., Rt. 2, Box 542, Durham, N.C. 27705
Filed May 15, 1987, Ser. No. 51,050
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **18 Claims**



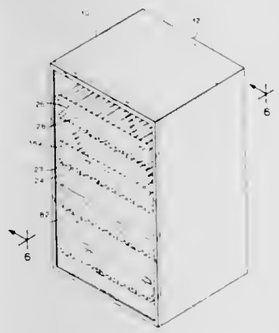
1. A device for holding supplies, comprising:
(a) a support structure having at least one upper plane; said upper plane having a lower surface;
(b) said upper plane having at least one square receiving structure, said receiving structure having a circular interior area below the upper plane; and wherein each side of the square receiving structure has angled stops, said angled stops having a narrowed end toward the center of each side of the receiving structure;
(c) at least one square container base of a size to fit in the square receiving structure, said container base rotable from a first position to a second postion within the circular interior area, the square base has wedge shaped projections on each side of the base of a size to fit into the receiving structure, and
(d) means for locking the container base into the receiving structure.

4,782,958
TAPE-CARTRIDGE STORAGE SYSTEM
Macy J. Price, Golden, and Laurence G. Ball, Thornton, both of Colo., assignors to Engineered Data Products, Inc., Broomfield, Colo.
Continuation of Ser. No. 883,110, Jul. 8, 1986, Pat. No. 4,688,682, which is a continuation of Ser. No. 767,154, Aug. 19, 1985, Pat. No. 4,600,107. This application Aug. 21, 1987, Ser. No. 87,776
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—41 **5 Claims**



1. A storage system for computer tape cartridges comprising:
a plurality of equal size box-type tape cartridge storage holder units made of one piece of molded plastic material, each of said tape cartridge storage holder units having at least a top wall portion, a bottom wall portion and opposite side wall portions connected at one end by a transverse connecting rear wall portion to provide a rectangular storage space therewithin and having an access opening at the opposite end and having divider means therein to support at east two parallel rows of multiple tape cartridges arranged in side by side relationship;
a storage rack means having a plurality of horizontally extending vertically equally spaced shelf means defining a plurality of horizontally extending vertically spaced rows of equal size storage openings for receiving and supporting said tape cartridge storage holder units in side by side relationship in each of said storage openings in a plurality of horizontally extending equally vertically spaced rows of tape cartridge storage holder units with said open sides of said tape cartridge storage holder units facing outwardly away from said storage rack means to permit insertion and removal of said tape cartridges from said tape cartridge storage holder units and also to permit selective removal and placement of each of said tape cartridge storage holder units on said shelf means;
each of said shelf means having an outwardly facing vertically extending front wall portion and each front wall of each of said shelf means having an equal vertical dimension;
each of said tape cartridge storage holder units having a vertical dimension between said top wall portion and said bottom wall portion which is approximately equal to the vertical dimension of said equal size storage openings and having a horizontal dimension between said opposite wall portions being a multiple of the horizontal dimension of said equal size storage openings so that each of said equal size storage openings is substantially filled by said tape cartridge storage holder units mounted on each of said shelf means;
each of said tape cartridge storage holder units having at least one laterally outwardly extending generally rectangular shaped flange portion adjacent said cartridge access opening for location in front of the front side surface of an associated one of said shelf means when located in one of said equal size storage openings and supported on one of said shelf means; and
means for retaining said tape cartridge storage holder units in position on said shelf means.

4,782,959
DISPENSING RACK
Rudy Kral, Clifton, N.J., and Paul Belokin, North Denton, Tex., assignors to M&M/Mars, Hackettstown, N.J.
Filed Apr. 3, 1987, Ser. No. 33,760
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—59.2 **9 Claims**



1. A dispensing rack adaptable in a refrigeration unit for dispensing a leading item from a stack of items comprising:

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a housing adapted to receive a plurality of items to be dispensed and having a plurality of horizontal retention members;

at least one individual ramp releasably secured within the housing and retaining the items therein on a base and having a front flange extending upwardly from the base, a rear flange extending downwardly from the base, a plurality of abutment posts extending downwardly from the base, and means to constrain the items therein; and

a plurality of horizontal connecting rods each having first and second ends, the ends each being cooperatively retained to a horizontal retention member by clip retention means which insertably receives and retains the horizontal retention members and cooperatively retains the ends of the rods supporting the ramp within the housing, one of the connecting rods engaging the abutment posts and another rod engaging the rear flange at a horizontal plane above the horizontal plane of the rod engaging the abutment posts to releasably secure the ramp in a generally horizontal inclined position wherein the leading item in the ramp is restrained from advancing therein by the front flange and when the leading item is withdrawn, the next leading item is placed into a convenient position to be withdrawn as a result of the positive gravity feed of the ramp.

4,782,960

DIVIDER WITH RESILIENT BASE ENGAGEMENT

Steve Mavrakis, New York City, N.Y., assignor to Supreme Equipment & Systems Corp., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 876,742, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 501,704, Jun. 6, 1983, abandoned. This application May 14, 1987, Ser. No. 50,225

Int. Cl.⁴ A47F *5/00*

U.S. Cl. 211—184 **8 Claims**



1. An adjustable divider arrangement for use in a shelf or file cabinet, of the type provided with a horizontal base member having a longitudinal axis, and a divider member for engaging with the base member at a selective location along the longitudinal axis of said base member, said adjustable divider arrangement futher comprising:

(a) a notch means formed in said base member parallel with its longitudinal axis, said notch means having a reference plane portion offset from, and below, a base plane of said base member by a predetermined offset distance, said notch and base member formed of a continuous piece of the same material;

(b) first and second wall portions for coupling said reference plane portion to said base plane of said member, said first wall portion forming an acute angle with respect to said reference plane of said notch and said second wall portion orthogonal with respect to said reference plane of said notch;

(c) a first distance between said first and second wall portions at said reference plane being greater than a second distance between said first and second wall protions at said base plane of said base member;

(d) a trough formed in said base member parallel to said notch means;

(e) said divider member formed of a continuous wire like material, a first end of which is bent to form a generally "U" shaped engagement means having first and second longitudinal portions arranged substantially parallel with each other for communicating with respective ones of said first and second wall portions, and a resilient portion for connecting said first and second longitudinal portions to one another and;

(f) a divider portion of said divider member extending outwardly from said notch and formed so that a second end of said divider member engages said trough to preventing rotation of said divider about said notch means.

4,782,961

CRANE

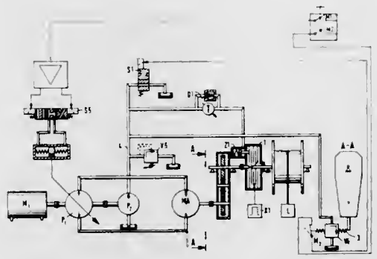
Walter Länge, Ludesch, Austria, assignor to Liebherr-Werk Nenzing G.m.b.H., Nenzing, Austria

Filed Feb. 19, 1987, Ser. No. 16,411

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605324

Int. Cl.⁴ B66C *23/53*

U.S. Cl. 212—191 **11 Claims**



8. A crane comprising a winch having a hoisting rope mounted thereon with the winch including a rotatable drum capable of being rotated in one direction to wind the rope thereon and rotated in the opposite direction to payout the rope for supporting a load, lifting a load and lowering a load, drive means for said winch, said drive means including means progressively increasing the pulling force exerted on the hoisting rope over a predetermined short time span to support and lift the load with opposing forces which tend to pull the hoisting rope from the winch exceeding the insantaneous rope pulling force exerted on the hoisting rope by the winch.

4,782,962

BACK PACKABLE PORTABLE UNIT

Harry L. Hackworth, and Gerald D. Mitchell, both of P.O. Box 15339, Tulsa, Okla. 74112

Filed Feb. 16, 1982, Ser. No. 348,816

Int. Cl.⁴ B66C *23/72, 23/06;* **A45F** *4/02*

U.S. Cl. 212—195 **2 Claims**

1. A portable lift comprising:

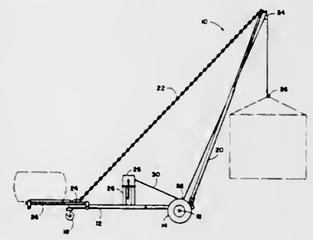
(a) a frame mounted on wheels such that said frame is essentially horizontal during operation;

(b) a boom pivotally attached to one end of said frame and adapted to extend beyond said frame during operation and fold back upon said frame during transportation and storage;

(c) a boom support means attached to said frame and adapted to maintain said boom in an elevated position during operation and fold back upon said frame during transportation and storage;

(d) a hoist with hoist cable attached to said frame with said hoist cable threaded through a pulley on the end of said boom for raising a load attached to the end of said cable; and

(e) a carrying means for assisting in the manual transportation of said portable lift when folded, said carrying means



comprising a backpackable means removably attached to said frame and adapted to strap to shoulders during manual transportation and further adapted during operation to attach to said frame and to extend horizontally away from said boom such as to accept ballast to compensate for said load to be elevated by said lift.

4,782,963

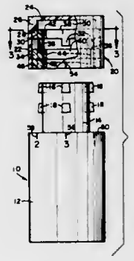
CHILD-RESISTANT CONTAINER AND CLOSURE CAP

Robert M. Hunter, 320 S. Willson Ave., Bozeman, Mont. 59715

Filed Oct. 26, 1987, Ser. No. 113,461

Int. Cl.⁴ A61J *1/00;* **B65D** *55/02, 85/56*

U.S. Cl. 215—206 **48 Claims**



1. A child resistant container and closure cap comprising two elements:

a container having an opening through a neck; and

a closure cap conforming to said neck fastenable over the opening;

one of said two elements having at least two parts movable relative to that element and at least one interfering part of the other element engagable by at least one of the movable parts to prevent separation of the elements in all but at least one selected relative position in which at least one unlocked position of the movable parts allows separation.

4,782,964

CLOSURE ASSEMBLY FOR A CONTAINER

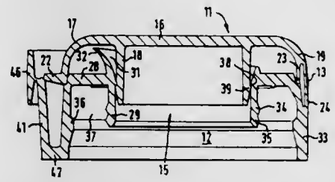
Albert C. Poore, New Malden, and Bernard Sams, London, both of England, assignors to Duma Packaging A/S, Naestved, Denmark

Filed Oct. 20, 1987, Ser. No. 110,406

Claims priority, application United Kingdom, Oct. 21, 1986, 86-25169

Int. Cl.⁴ B65D *55/02*

U.S. Cl. 215—216 **32 Claims**



1. A closure assembly for a container, the closure assembly comprising a first cap portion hingedly connected to a second cap portion, the second cap portion being adapted to be positioned over the mouth of an associated container and including an aperture to permit dispensing from the container, the first cap portion being arranged whereby in one position it overlies the aperture to close the container, and in another position is lifted clear of the aperture to open the container, the cap portions together including means or being arranged such that they can be snapped together and their separation from a closed to an open position requires the exertion of a positive force by the user, the first cap portion including at its periphery opposite its hinged connection with the second cap portion a lip which co-operates with an inwardly displaceable section of the second cap portion, the inwardly displaceable section including at its upper edge face adjacent the lip a portion which is associated with an outermost lower edge of the lip when the two cap portions are in a closed position and raised above that lower lip edge in a manner such that on inward displacement of the said section the raised portion first offers resistance to displacement in its engagement with the lip edge and then, as displacement pressure is increased, forces the lip upwards at least to begin to overcome the snap action of the two cap portions and positively to open the closure.

4,782,965

CHILDPROOF CLOSURE SYSTEM

Victor Wassilieff, 84, rue de l'Assomption F-75016, Paris, France

PCT No. PCT/EP86/00279, § 371 Date Jan. 16, 1987, § 102(e) Date Jan. 16, 1987, PCT Pub. No. WO86/07035, PCT Pub. Date Dec. 4, 1986

PCT Filed May 13, 1986, Ser. No. 6,669

Claims priority, application Fed. Rep. of Germany, May 18, 1985, 3517926

Int. Cl.⁴ B65D *55/02*

U.S. Cl. 215—220 **4 Claims**

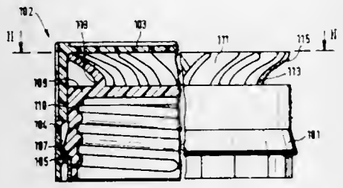
1. A child-proof seal having an axial-radial plane for containers, in particulr bottles, having a threaded inside cap and an outside cap with an inside wall which is axially displaceable relative to said inside cap, a cover plate having a plane on said inside cap, a crown of spring tabs having free ends located on said cover plate, said tabs oblique relative to said plane of said inside cap, an annular support on the inside of said outside cap, wherein:

(a) said free ends point to said annular support;

(b) said spring tabs having a slant in a circumferential direction relative to said axial-radial plane over at least a portion of their lengths that upon a rotation of the outer cap they brace themselves against said annular support;

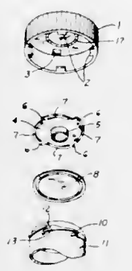
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(c) so that
(c1) said inside cap is carried along by said spring tabs when said outside cap is rotated in a direction of screwing-shut;
(c2) upon reaching a torque exceeding that required for screwing-shut and of an amplitude predetermined by dimensioning and material selection of said spring tabs and of said support, said ends of said spring tabs slip on said support;



(c3) said spring tabs being elastically bent against said cover plate of said inside cap on which they are seated when said outer cap is rotated in an unscrewing direction and an axial force is applied against said inside cap, said free ends resting against said support and said inside cap dragged along by said spring tabs; and
(c4) said outside cap rotating freely relative to said spring tabs when said outside cap is rotated in said unscrewing direction in the absence of an axial force exerted by said outside cap on said inside cap.

4,782,966
COMPLIANCE-ENHANCING PRESCRIPTION VIAL
James D. Thackrey, 13852 Dell La., Santa Ana, Calif. 92705
Filed Oct. 7, 1987, Ser. No. 105,397
Int. Cl.[4] B65D *83/04*
U.S. Cl. 215—230 **10 Claims**



1. A container for medicinal doses, the cap of which contains a window through which a serial indicator is visible, the serial indicator advancing each time the container is opened and closed by having spring fingers abut on portions of the attachment threads and so prevent rotation of the cap from driving the member which carries the serial indicator, the open end of the container and cap being generally cylindrical and being attached to each other by multiple start threads on the container which are engaged by inward-projecting tangs on the cap, and having a spring-disc member inside the cap, held down by the cap and sealing to the rim of the container opening, in which the improvement comprises:
an index plate having the serial indicators on the top surface of its central portion and having a number of spring fingers mounted so as to extend around the periphery of the central portion yet spaced therefrom, each said spring finger being of such length as to terminate short of the mounting portion of the adjacent spring finger, and also projecting below the bottom surface of said index plate, said index plate being located in the cap above the disc spring member with the spring fingers projecting below and past the outer diameter of the disc spring member, and
multiple start threads on the container, the space between them forming a thread-start one side of which also comprises an abutment for the tip of a spring finger as said index plate rotates relative to the container, said multiple start threads having a lower flank terminating in a rotational stop surface against which the inward-projecting tang of the cap stops, and
an extension portion on the upper flank of the thread which extends the upper flank clockwise from above the rotational stop surface to the side of the adjacent thread-start looking down, said extension portion having an upper flank which slopes away from the container rim in a clockwise direction when viewed from above whereby the finding of a thread-start by the user is facilitated.

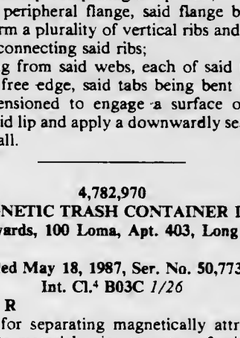
4,782,967
MEDICINE VIAL OPENER
Robert E. Thomas, 650 Floyd Avenue, Chula Vista, Calif. 92010
Filed Jan. 5, 1987, Ser. No. 415
Int. Cl.[4] B65D *41/32*
U.S. Cl. 215—231 **8 Claims**



1. In combination with medicine vial for pills, capsules or the like where a resilient packing material is inserted below in the neck of the vial to immobilize its contents and a closure assembly which comprises:
a foil seal adhesively bonded to the rim of the vial opening;
a filiform member having a first length running under a portion of said seal, and a second length protruding above said seal;
means for attaching one end of said first length of filiform member to said packing material; and
means for pulling the end of said second length of filiform member, above said foil seal and container, wherein said first length is positioned and bonded to said portion so that the filiform element when pulled rupture said foil seal and extracts the packing material from the vial.

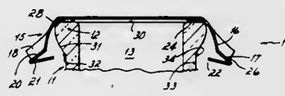
4,782,968
COMPOSITE CLOSURE AND METHOD OF MANUFACTURE
Thomas H. Hayes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Apr. 20, 1987, Ser. No. 39,747
Int. Cl.[4] B65D *53/00*
U.S. Cl. 215—276 **5 Claims**

1. In a composite closure for a container having a laminated plastic cover portion fitted into a ring portion and having container engaging members on the radially inner surface of said ring, the improvement comprising:
said ring comprising a cylindrical plastic member with a cover receiving groove positioned downwardly from the ring top and engaging the outer edge only of the cover portion,
the said ring engaging an edge portion of said cover plastic,



said laminated cover portion comprising a plurality plastic layers of generally equal and substantial thickness, and means adhering the cover portion to the said ring.

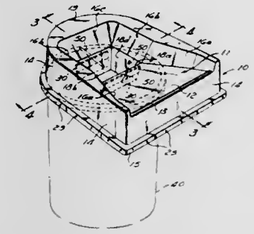
4,782,969
TWIST-OFF BOTTLE CAP
John C. Henning, Fairfield, Ohio, assignor to Product Investment Incorporated, Cincinnati, Ohio
Filed Apr. 30, 1987, Ser. No. 44,228
Int. Cl.[4] B65D *41/12*
U.S. Cl. 215—295 **17 Claims**



9. The combination of a container comprising
a neck having an outer wall and a pouring opening therethrough;
an endwise lip surrounding said pouring opening, said lip including a sloping peripheral wall extending downwardly and inwardly;
a plurality of outwardly extending ribs formed adjacent to the juncture of said sloping peripheral wall and said outer wall;
a tamper-proof cap comprising a top wall;
a depending peripheral flange, said flange being configurated to form a plurality of vertical ribs and a plurality of webs interconnecting said ribs;
tabs extending from said webs, each of said tabs having a transverse free edge, said tabs being bent inwardly and being dimensioned to engage a surface on said bottle adjacent said lip and apply a downwardly sealing force on said top wall.

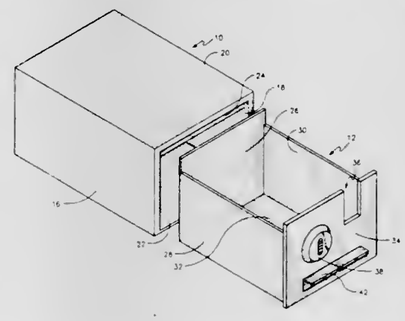
4,782,970
MAGNETIC TRASH CONTAINER LID
Richard E. Edwards, 100 Loma, Apt. 403, Long Beach, Calif. 90803
Filed May 18, 1987, Ser. No. 50,773
Int. Cl.[4] B03C *1/26*
U.S. Cl. 220—1 R **6 Claims**

1. A device for separating magnetically attractable items from food waste material prior to entry of said food waste material into a waste container comprising:
a housing adapted to be supported adjacent the entrance of a waste container;
a generally U-shaped channel formed on the upper surface of said housing comprising a first surface portion having a generally horizontal orientation formed to receive the food waste material thereon and a second surface portion having an orientation generally perpendicular to said first surface portion to define an impact surface for food waste material being manually slid upon said first surface portion toward said second surface portion;
an aperture formed in said housing between said first and second surface portions having plural sidewalls defining



an unobstructed vertical entry for the food waste material into the waste container; and
magnet means disposed on one side of selected ones of said plural sidewalls to be physically isolated from contact with the food waste material traveling through said aperture yet exert a magnetic force adjacent said aperture sufficient to magnetically hold magnetically attractable items contained in the food waste material upon said selected ones of said plural sidewalls.

4,782,971
DEVICE FOR PREVENTING THE UNAUTHORIZED USE OF AN ELECTRICAL APPARATUS
Mary V. Hill, 3104 Firewood Dr., Colorado Springs, Colo. 80918
Filed Aug. 11, 1987, Ser. No. 84,078
Int. Cl.[4] H02G *3/02*
U.S. Cl. 220—3.2 **10 Claims**



1. A lock box adapted for receiving a plug attached to a cord from an electrical apparatus to prevent the use of the apparatus, said lock box comprising:
a substantially enclosed housing including a top wall and an open end;
a drawer adapted to slide into and out of said housing through said open end, said drawer including a front panel, a back panel, and a pair of side panels;
a catch stop protruding downwardly from said top wall into the interior of said housing, said catch stop being positioned adjacent to said open end;
a slot in communication with an edge of said front panel of

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said drawer, said slot being sized large enough to allow the cord to freely pass therethrough, but small enough to prevent the plug from passing therethrough when the drawer is shut; and

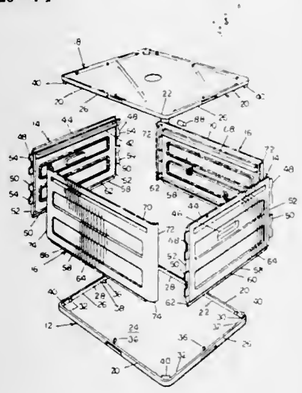
a key operated barrel lock mounted on said front panel that selectively engages said catch stop to selectively prevent said drawer from being slid open.

4,782,972

COLLAPSIBLE FILE BOX

Gregory J. Wenkman, Middleton, and Ferdinand F. Salzmann, Prairie du Sac, both of Wis., assignors to Traex Corporation, Dane, Wis.

Filed Jun. 30, 1986, Ser. No. 879,906
Int. Cl.[4] B65D *6/22*
U.S. Cl. 220—4 F **15 Claims**



1. A collapsible file box comprising:

(a) a rectangular base;

(b) a pair of generally rectangular ends adapted to extend vertically upwardly from the rectangular base, each end including an upper side tab and a lower side tab which both extend outwardly from each of two edges of the end in substantially co-planar relationship with the end, the upper side tabs having a different width than the lower side tabs; and

(c) a pair of generally rectangular sides adapted to extend vertically upwardly from the rectangular base, each side having an upper groove and a lower groove in each of two side extremities of the side, the upper grooves being slightly wider than the vertical dimension of the upper tabs so that each upper groove may receive an upper tab, the lower grooves being slightly wider than the vertical dimension of the lower tabs so that each lower groove may receive a lower tab; wherein the upper tab and the lower tab of each edge of a rectangular end can be simultaneously inserted into only the corresponding upper groove and lower groove of an extremity of a rectangular side, so that the collapsible file box can be assembled only with the sides and ends in correct vertical orientation with respect to each other.

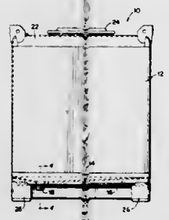
4,782,973

CUSHION BOTTOM TANK

Delmar R. Wiese, Springfield, Mo., assignor to Custom Metalcraft, Inc., Springfield, Mo.

Filed Jun. 16, 1987, Ser. No. 62,680
Int. Cl.[4] B61D *27/00*
U.S. Cl. 220—68 **9 Claims**

1. A liquid storage tank comprising: a vessel having side walls, an inner bottom wall and an outer bottom wall, said inner bottom wall being formed with a discharge member which allows liquid to exit from the tank and with said inner bottom wall sloping towards said discharge member from all side walls, said discharge member being secured to both said inner and outer bottom walls, and with a layer of structural, insulating or vibration dampening material being provided between said inner and outer bottom walls so as to completely fill the space between said inner and outer bottom walls, thus making said inner and outer bottom walls integral for superior strength and vibration resistance, said vessel having a generally



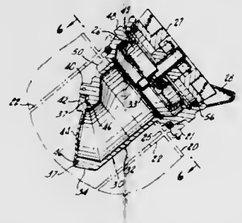
square cross-section with four side walls which intersect to provide four corners for said tank, said inner bottom wall having a plurality of channels, with one of said channels sloping downwardly from each corner of said tank, said discharge member including a valve flange casting secured to both said inner bottom wall and said outer bottom wall, said flange casting having a valve seal surface, and with said flange casting having means located around the circumference thereof for receiving fasteners for fastening a valve to said flange casting.

4,782,974

OIL TANK SAFETY CAP ADAPTER AND METHOD OF APPLICATION BY RETROFITTING

Raphael Elkayam, 14534 SW. 76th St., Miami, Fla. 33183

Filed Dec. 14, 1987, Ser. No. 132,879
Int. Cl.[4] B67D *5/04*
U.S. Cl. 220—86 R **12 Claims**



1. A device to prevent loss of fluid from a fluid storage tank having a filler spout extending downward into said tank due to improper closure of a closure cap for said filler spout,

said device comprising an adapter having an adapter pipe constructed and arranged of smaller cross-section than said filler spout to be inserted within said filler spout and a one-way valve at the inner end portion of said adapter pipe,

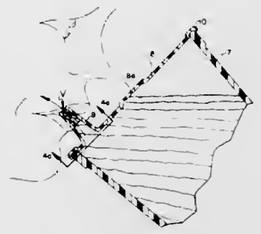
characterized by an enlarged collar thicker than said adapter pipe and extending axially outward therefrom, said adapter being provided with securing means sufficiently similar to securing means provided on said closure cap to secure said enlarged collar to cooperating securing means fixed to said filler spout in non-leaky relation thereto in the same manner as said closure cap would be secured directly to said filler spout in the absence of said adapter, whereby said adapter replaces said cap in retrofit relation to said tank.

4,782,975

VALVED CONTAINER CLOSURE

Peter Coy, 2677 South Ave., Box 229, Bryn Athyn, Pa. 19009

Filed Feb. 5, 1988, Ser. No. 152,537
Int. Cl.[4] A47F *19/22*
U.S. Cl. 220—90.4 **12 Claims**



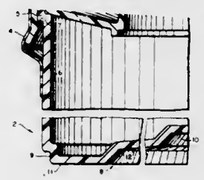
1. A controllable valve device for use in dispensing a liquid from a container, said device comprising two tubular components nested one within the other and each formed of resilient sheet material, the outer one of said components being normally open at both ends and having its inlet end presented toward the container and its outlet end presented in a direction away from the container, and the inner one of said components having an outlet end normally open and presented in the same direction as the outlet end of the outer component, and the inner component having an inlet end presented in the same direction as the inlet end of the outer component, and the resilient sheet material of the inlet end portion of the inner component having planar terminal portions at opposite sides of the inner component providing a normally closed valve apex yieldingly openable by application of lateral compression to the inner component through the wall of the outer component in a direction edgewise to said planar terminal portions providing said valve apex.

4,782,976

TAMPER-EVIDENT CANISTER, LID AND SHRINK BAND ASSEMBLY

Maynard A. Kenyon, 2nd., Hamilton Square, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Apr. 7, 1988, Ser. No. 178,729
Int. Cl.[4] B65D *41/18*
U.S. Cl. 220—306 **7 Claims**



1. A tamper-evident plastic canister, plastic reclosure lid and shrink band assembly comprised of:

(a) a circular, molded thermoplastic straight-walled canister which terminates at its upper, open end with a circular rim and which terminates at its bottom end with an inwardly stepped profile which is connected to a circular base, said base having a depressed, circular center and an outer annular ring which ring forms the most bottom surface of the canister, said annular ring having inner and outer diameters similar, but slightly smaller than a generally U-shaped, annular channel depressed in the top surface of a matched reclosure lid, and said canister having a peripheral ridge located at or near the top of the canister which ridge extends outwardly from the canister wall;

(b) a one-piece, non-segmented, molded, flexible, thermoplastic reclosure lid having a continuous, depending skirt and an inverted U-shaped upstanding rim around the lid periphery, said rim being comprised of inner and outer side walls, a horizontal top wall and an internal channel which is sized smaller than the thickness of the rim of the canister and which co-acts therewith to form a hermetic wedge seal upon application of lid onto the cannister rim;

(c) said lid skirt shaped to receive and secure itself to the container rim by means of an integral and inwardly-extending circular ring which co-acts to form a lock with the peripheral ridge of the canister and wherein said outer skirt wall terminates at its bottom end with an outwardly-flared section sized to exceed the outer diameter of the canister rim and the canister peripheral ridge, said flared portion forming a guide to aid in mating the canister and lid;

(d) said inner wall of the U-shaped, upstanding rim being sized slightly larger than the outer diameter of the annular ring which forms the bottom surface of the canister in order to provide a primary nesting means when stacking lidded canisters;

(e) said lid containing on its upper surface a shoulder which provides a secondary nesting means to co-act with the canister bottom, said secondary nesting means being comprised of a raised, circular, horizontal, central area, which area is at a height slightly above the top of the U-shaped rim, and a horizontal, or downwardly sloping transition section connecting the inner wall of the U-shaped upstanding rim and said shoulder and wherein said raised central area is sized to be slightly smaller in diameter than the inner diameter of the annular ring which forms the bottom surface of the canister; and

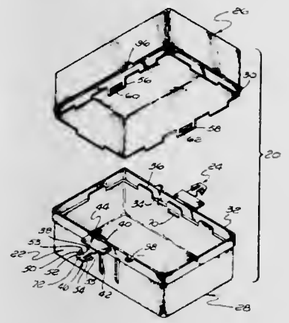
(f) a circular shrink band which is shrunk to engage the depending skirt of the plastic lid, including said outwardly-flared section, and the side wall of the canister such that the reclosure lid cannot be removed from and replaced on the canister without evidencing visible signs of tampering, said shrink band being positioned so as not to extend above or over the horizontal top wall of the U-shaped rim.

4,782,977

TAMPER RESISTANT CONTAINER

Gary Watanabe, Redondo Beach, and Johnson N. S. Woog, Rolling Hills, both of Calif., assignors to Evergreen Industries, Inc., Los Angeles, Calif.

Filed Dec. 16, 1987, Ser. No. 133,578
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 **22 Claims**



1. A device comprising:

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a container defined by a cover and a base which can be fit together, said cover and said base each being formed with at least one wall which is placed adjacent to a wall of the other when said cover and base are fitted together, each of said adjacently disposed walls being formed with apertures which are brought into alignment when said walls are positioned adjacent to one another by the fitting of the cover and base together; and

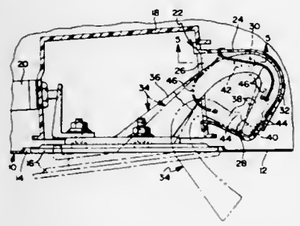
at least a first hasp means attached at one end to either said cover or said base, said hasp means having a second end to which is affixed a resiliently deflectable means, said deflectable means including a portion thereof which projects out along side said hasp means and is movable towards said hasp means to allow passage through said aligned apertures and which is movable away from said hasp means once through said aligned apertures to prevent removal therefrom, said hasp means further formed with a severance means which can be grasped and pulled to cause the tearing of a portion of said hasp means away from said container.

4,782,978

REMOTELY RELEASABLE FUEL FILLER DOOR WITH CONTROLLED OPENING

John M. Appleby, Wolverhampton, W. Va.; James Bolsworth, Glasgow, Great Britain, and Charles M. Wilson, Westland, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1987, Ser. No. 92,761
Int. Cl.[4] B60J 9/00
U.S. Cl. 220—335 **3 Claims**



1. A remotely releasable fuel filler door assembly for closing an opening in a body panel of a vehicle, said filler door assembly having a limited and controlled opening motion, comprising,

a door sized so as to substantially cover said body panel opening,

a hinge member fixed to said door and pivoted to said vehicle so as to mount said door to swing about a hinge axis from a closed position covering said opening and flush with said body panel to a fully open position substantially normal to said body panel,

a support portion of said vehicle body relative to which said hinge member moves in a substantially parallel plane as said door swings about said hinge axis,

a first positive detent member on said vehicle body support portion, and

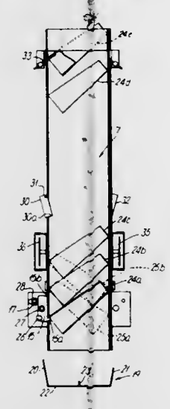
a second positive detent of said hinge member and located so as to blockingly engage said first detent when said door is remotely released to maintain said door at a partially opened intermediate position just sufficiently removed from said body panel for an operator to insert a finger between said door and body panel, with at least one of said detents being sufficiently flexible that said operator may pull on said partially opened door to flex said positive detents relative to one another and fully open said door.

4,782,979

APPARATUS FOR DISPENSING A SUCCESSION OF CONICAL OBJECTS

Alan Smith, Accrington, and George K. Butler, Preston, both of England, assignors to Hollingsworth UK (Ltd.), Accrington, England

Filed Apr. 16, 1987, Ser. No. 43,891
Claims priority, application United Kingdom, May 23, 1986, 8612637
Int. Cl.[4] B65G 59/06; B65H 3/44
U.S. Cl. 221—6 **15 Claims**



1. A device for dispensing conical objects, comprising at least two side-by-side stacks, each said stack having a cross-section defining a narrow end and a wide end which limits said conical objects to a non-vertical orientation, said stacks containing said conical objects in alternating and reverse orientations from one stack to the next so that the wide end of a first stack is adjacent the narrow end of the stack adjacent thereto; means defining a collecting surface beneath said stacks; means for releasing conical objects from said stacks wherein conical objects released from one stack and on said collecting surface adjacent to conical objects released from a next adjacent stack having the reverse orientation, and means to laterally move said conical objects along said collecting surface before release of the next conical objects in a sequence which follows from the first-released conical objects so that a delivered stream of said conical objects is produced in which said conical objects alternate and are reversed in their orientation.

4,782,980

CAPSULE DISPENSER

Philip F. Heimlich, Coral Springs, and Barry N. Heimlich, Hollywood, both of Fla., assignors to hiMedics, Inc., Hollywood, Fla.

Filed Jan. 5, 1987, Ser. No. 525
Int. Cl.[4] B65G 59/00
U.S. Cl. 221—265 **35 Claims**

32. A dispenser for capsules or the like comprising a housing having a reservoir for containing a supply of said capsules, a cap mounted on said housing and relatively rotatable therewith in a preselected position into first and second positions for dispensing said capsules, and detent means to detain said cap in said first and second dispensing positions, said detent means comprising:

a continuous guiding slot about the circumference of said cap;

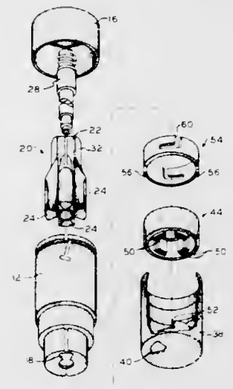
a plurality of detent knobs on said housing slidable in said guiding slot as said cap and housing are relatively rotated;

a plurality of detent slots extending from said guiding slot for receiving said detent knobs and preventing rotation of said cap in said first and second positions;

positive action detent means at the juncture of said guiding slot and at least one of said detent slots for preventing movement of a detent knob in a preselected direction beyond said detent slot without first sliding at least partially into said detent slot; and

means for biasing said cap to slide said detent knobs from said guiding slot at least partially into said detent slots,

means for preventing said cap from being rotated in a direction opposite said preselected direction such that said cap



is rotatable only in said preselected direction to slide said detent knobs in said guiding slot until one of said detent knobs is stopped by said positive action detent means whereupon said cap biasing means biases said detent knobs into said detent slots thereby preventing further rotation of said cap,

said cap being further rotatable by movement of said cap against said biasing means to slide said detent knobs into said guiding slot whereupon said cap is again rotatable in said preselected direction until one of said detent knobs is stopped by said positive action detent means.

4,782,981

DISPENSER FOR TABLETS AND PILLS

Wilhelm Schuster, Frankfurt am Main, Fed. Rep. of Germany, assignor to Knoll AG, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,724
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632546
Int. Cl.[4] B65D 83/04
U.S. Cl. 221—265 **10 Claims**



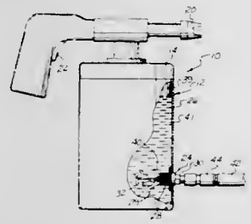
1. A dispenser for shaped solids, in particular tablets and pills of very small format, consisting of a cylindrical housing which consists of an upper part which is closed at one end and open at the other end, a dosing means provided with dosing orifices, and a lower part which encloses a collecting chamber, part of the dosing means being rotatable about the longitudinal axis of the housing, wherein the dosing means (2) consists of three parts, i.e. (a) a cylindrical ring part (4) which can be inserted, with an exact fit, into the open end of the upper part (1) of the housing and from whose inner wall a lug (6) projects radially, b) a dosing wheel (8) which can be inserted into the open end of the ring part (4), which end faces away from the upper part (1) of the housing, and rotated about the longitudinal axis of the housing (G) and which has a perforated plate (9) with dosing orifices (10) arranged in the region of the peripheral edge and from whose peripheral edge a rim (12) projects at right angles, whose inner wall is provided with locking notches (13) assigned to the dosing orifices (10), and c) a base part (15) which can be inserted into the rim (12) of the dosing wheel (8) and has a plate (16) from which an ejection hole (17) has been cut out and from whose peripheral edge a continuous edge strip (16') projects at right angles, on whose free edge is arranged a locking stud (18) which interacts with the locking notches (13) on the rim (12) of the dosing wheel (8), the base part (15) and the ring part (4) being non-rotatably connected to one another in such a way that the lug (6) of the ring part (4) lies above the ejection hole (17) of the base part (15).

4,782,982

SELF-PRESSURIZING SPRAYER

Garry L. Ellison, Grand Rapids, Mich., assignor to Root-Lowell Manufacturing Company, Lowell, Mich.

Continuation-in-part of Ser. No. 3,469, Jan. 15, 1987. This application Jun. 5, 1987, Ser. No. 58,519
Int. Cl.[4] B65D 83/14; B05B 9/04
U.S. Cl. 222—1 **19 Claims**



1. In a portable sprayer for dispensing water or water solutions under pressure, said sprayer comprising

a closed receptacle for containing water or water solutions under pressure, said receptacle including a dispensing outlet operably connected to dispensing valve means which can be opened to dispense water or water solutions under pressure or closed to seal said container, said receptacle including a resealable closure which can be opened to allow the insertion of chemicals into said container and then reclosed and resealed to allow pressurization through the introduction water under pressure;

a one-way valve extending from outwardly of said receptacle to inside the receptacle, said one-one valve including a nonthreaded quick disconnect fitting operably connected thereto for connection to a nonthreaded quick disconnect hose coupling on a water hose and comprising means for allowing entry of water into said receptacle while preventing backflow out of said receptacle, whereby said receptacle is pressurized during entry of water into said receptacle when said dispensing valve means is closed;

said container including a bottom, a sidewall and a top wall, said one-way valve, including said nonthreaded quick disconnect fitting being located in said top wall separately from said releasable closure whereby one can connect a

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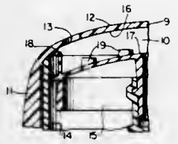
nonthreaded quick disconnect hose coupling to said nonthreaded quick disconnect fitting by pressing downwardly with said receptacle being seated on a firm surface.

4,782,983

DISPENSING PACKAGE WITH RUNOUT SIGNAL

Calvin S. Cook, Erie, Pa., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 15, 1987, Ser. No. 108,680
Int. Cl.[4] B67D *5/22*
U.S. Cl. 222—45 **6 Claims**



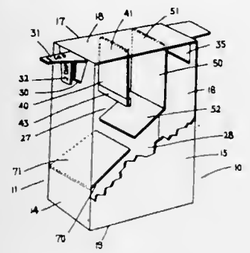
1. A dispensing package for cream products, said dispensing package comprising:
(a) a container body having an interior product chamber of generally uniform cross section and a longitudinal axis;
(b) a wall closing the outer end of the interior chamber and having an applicating surface formed thereon which has at least one orifice therein communicating with said interior product chamber;
(c) a piston having a cross section congruent to and mounted for axial movement within said chamber, said piston being nonrotable relative to the container body;
(d) means for causing axial advance of said piston; and
(e) a flexible fin cantilevered outwardly from the piston, said fin being laterally offset from the orifice and adapted to be deflected so as to progressively move laterally across said orifice in response to axial advance of the piston as it approximates said wall, thereby providing an exteriorly visible signal that the cream product is nearly depleted.

4,782,984

POURING DEVICE WITH QUANTITATIVE CHAMBER FOR POWDERY OR GRANULAR MATERIALS

Peter T. Su, 15 Valley Forge, Houston, Tex. 77024

Filed Oct. 13, 1987, Ser. No. 107,096
Int. Cl.[4] G01F *11/26, 11/28*
U.S. Cl. 222—456 **14 Claims**



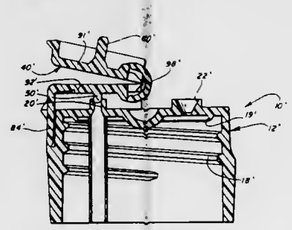
1. A container comprising:
container housing having four side walls, a top wall and a bottom wall for containing a quantity of powdery or granular materials and adapted to rest in an upright position on a surface;
a guard panel within said container housing attached to said top wall and dividing the interior into a storage chamber and a volume control chamber with said storage chamber in the lower part when the container is held upright;
a metered dispensing outlet at an upper portion of the side wall which permits material to dispense from said volume control chamber, but not said storage chamber; and,
a swinging control panel within said volume control chamber attached to the top wall between said guard panel and said metered dispensing outlet;
and said control panel being of sufficient length such that when the container is tilted to a dispensing position, the end of said swinging control panel will seat on the side wall at the upper portion thereof, preventing further outflow of material through said metered dispensing outlet.

4,782,985

CLOSURE FOR DRIP AND POUR DISPENSING

John P. Kinsley, Crystal Lake, Ill., assignor to Seaquist Closures, Crystal Lake, Ill.

Filed Feb. 20, 1987, Ser. No. 17,069
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—481.5 **6 Claims**



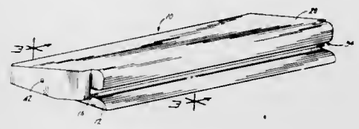
1. A dispensing device for an open mouth of a container to serve alternatively for dispensing the container contents in drops and in a pour stream, said device comprising:
closure means for being mounted over said open mouth on said container, said closure means including a closure wall to occlude said container open mouth, said closure wall defining a contents dispensing orifice and a vent orifice;
a first cover portion having a dispensing orifice sealing means for releasably engaging said closure means for occluding said dispensing orifice;
a second cover portion having a vent orifice sealing means for releasably engaging said closure means for occluding said vent orifice;
main snap-action hinge means for mounting said second cover portion to said closure means to bias said second cover portion relative to said closure means in a first state to an engaged position in which at least said vent orifice sealing means occludes said vent orifice and in a second state to an open position in which said vent orifice sealing means is spaced from said vent orifice to open said vent orifice; and
connecting snap-action hinge means for connecting said second cover portion with said first cover portion to bias said first cover portion in a first state to a first position relative to said second cover portion and in a second state to a second position relative to said second cover portion whereby, when said second cover portion is in said engaged position, said first position of said first cover portion occludes said dispensing orifice and said second position of said first cover portion is spaced from said dispensing orifice to open said dispensing orifice.

4,782,986

APPARATUS AND METHODS FOR REMOVING MARGIN PORTIONS FROM PERFORATED FLEXIBLE SHEET MATERIALS

Ray Loesche, P.O. Box 3446, Spokane, Wash. 99220

Filed Feb. 6, 1987, Ser. No. 12,080
Int. Cl.[4] B26F *3/02*
U.S. Cl. 225—1 **45 Claims**



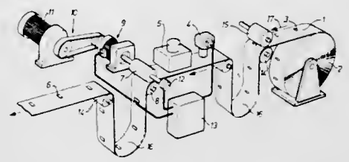
17. A method of removing margin portions from paper or other prepared flexible sheet material which have been previously perforated, scored, or otherwise prepared for separation from a main part of the sheet material, the method comprising:
guiding a margin portion of sheet material between converging lip portions of a pair of elongate opposing jaws;
positioning the margin portion of the sheet material against a backstop for aligning said margin portions between the pair of elongate opposing jaws having jaw faces extending along said margin portion;
grasping said margin portion with the pair of jaws substantially along the length of said margin portion, the outside edges of the jaw faces engaging along a line of contact, the jaw faces being positioned such that the line of contact engages the margin portion intermediate between perforations or other preparations for separation and an outer edge; and
tearing said main part of the sheet material from said margin portion while the margin portion is grasped by said jaws.

4,782,987

METHOD FOR THE FEEDING OF A MATERIAL WEB

Peter Giacomelli, Husmansvägen, and Anders Sundberg, Malmö, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Jan. 20, 1987, Ser. No. 4,478
Claims priority, application Sweden, Jan. 28, 1986, 86003654
Int. Cl.[4] B65H *23/00, 23/04*
U.S. Cl. 226—2 **2 Claims**



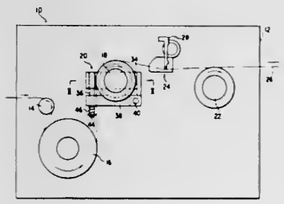
1. In the stepwise feeding and processing of a material web, a method of stopping the web when a center line of an irregularity on the web is in a predetermined position at a processing device including the steps of:
presetting first and second counters to a predetermined value representative of a distance between a front edge of an irregularity on the web and the predetermined position at the processing device,
generating pulses upon the movement of the material web a fixed distance in the direction of travel of the web,
sensing the passage of the front edge of the irregularity at a predetermined distance in front of the processing device,
initiating counting down of pulses received by the first and second counters upon the sensing of the front edge of the irregularity,
sensing the passage of the rear edge of the irregularity at the predetermined distance in front of the processing device,
changing the value in the second counter by a number of pulses corresponding to one half the width of the irregularity such that the value in the second counter after the sensing of the rear edge of the irregularity is reduced from the preset value by an amount corresponding to one half the width of the irregularity,
counting down the remaining value in the counter, and
stopping the web when the value in the counter equals zero so that the center of the irregularity is positioned at the predetermined position.

4,782,988

APPARATUS FOR FEEDING A SURFACE TYPE FASTENER TAPE OR THE LIKE ALONG A PREDETERMINED PATH

Hissai Nishiyama, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 3, 1986, Ser. No. 926,211
Claims priority, application Japan, Nov. 1, 1985, 60-167518[U]
Int. Cl.[4] B65H *20/02, 23/06, 59/18*
U.S. Cl. 226—52 **3 Claims**



1. An apparatus for feeding a surface type fastener tape, or like elongate, flexible strip having a multiplicity of protuberant elements thereon, in a predetermined direction along a predetermined path, comprising:
(a) a drive roller for forcibly driving a desired strip along the predetermined path, the drive roller having a multiplicity of wire bristles on its surface for releasable engagement with the strip, each wire bristle on the drive roller being bent at a midpoint thereof to provide a proximal portion on the drive roller and a distal portion away therefrom, wherein the proximal portion of each wire bristle on the drive roller is inclined away from a radial direction of the drive roller in the predetermined traveling direction of the strip, and wherein the distal portion of each wire bristle on the drive roller is inclined away from a radial direction of the drive roller in a direction opposite to the predetermined traveling direction of the strip;
(b) an idler roller disposed upstream of the driver roller with respect to the predetermined traveling direction of the strip, the idler roller also having a multiplicity of wire bristles on its surface for releasable engagement with the strip, each wire bristle on the idler roller being bent at a midpoint thereof to provide a proximal portion on the idler roller and a distal portion away therefrom, wherein the proximal portion of each wire bristle on the idler roller is inclined away from a radial direction of the idler roller in a direction opposite to the predetermined traveling direction of the strip, and wherein the distal portion of each wire bristle on the idler roller is inclined away from a radial direction of the idler roller in the predetermined traveling direction of the strip; and
(c) brake means for retarding the rotation speed of the idler

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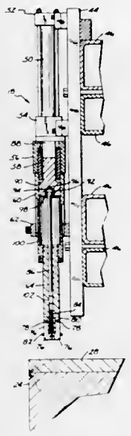
roller to less than a traveling speed of the strip as the idler roller is driven by the drive roller via the strip.

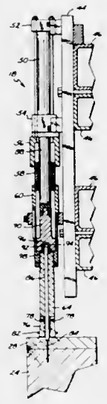
4,782,989

COMPENSATING NAIL-DRIVING CHUCK FOR PALLET-MAKING MACHINE

Roger N. Wallin, St. Francis, Minn., and Jack Gresham, Armuchee, Ga., assignors to Viking Engineering & Development, Inc., Fridley, Minn.

Filed Aug. 17, 1987, Ser. No. 86,937
Int. Cl.[4] B27F *7/09*
U.S. Cl. 227—149 **8 Claims**





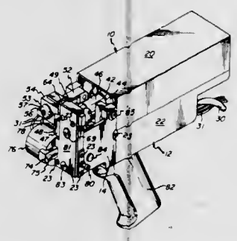
1. A nail-driving chuck for driving a nail into a board, the chuck comprising:
- hydraulic drive means for driving a drive member in downward and upward directions along a generally vertical axis;
- nail driving means connected to a lower end of the drive member and coaxially aligned with the drive member for driving the nail downwardly into the board;
- a chuck body coaxially aligned with the drive member and the nail driving means, the chuck body having a cavity into which the drive member extends and a bore positioned below the cavity and through which the nail driving means extends;
- jaw means positioned at a lower end of the chuck body for holding the nail;
- means for permitting telescoping movement of the chuck body with respect to the hydraulic drive means;
- wherein at a beginning of a nail driving cycle the drive member, the nail driving means and the chuck body are at upper end positions of their travel along the vertical axis;
- wherein during a first portion of the cycle the drive member is driven downward and the nail driving means and the chuck body move downward with the drive member until a top surface of the board is engaged;
- wherein during a second portion of the cycle the drive member and the nail driving means continue to move downward while the chuck body remains stationary to drive the nail out through the jaw means and into the board so that a top end of the nail is countersunk with respect to the top surface of the board, the drive member moving downward until stopped by engagement with a lower end of the cavity; and
- wherein during a third portion of the cycle the drive member and nail driving means move upward toward their upper end positions and wherein the drive member engages an upper end of the cavity to cause the chuck body to move with the drive member toward the upper end position of the chuck body.

4,782,990

PORTABLE GUN FOR ULTRASONICALLY WELDING WIRES

Michael Patrikios, Stratford; Guillermo Coto, Monroe, and Betty Link, Stratford, all of Conn., assignors to American Technology, Inc., Milford, Conn.

Filed Jun. 29, 1987, Ser. No. 67,164
Int. Cl.[4] B23K *20/10;* **B32B** *31/16*
U.S. Cl. 228—1.1 **6 Claims**



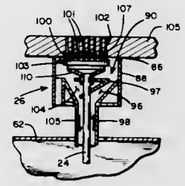
1. A portable ultrasonic welding apparatus for welding wires together comprising:
- a housing,
- a handle connected to said housing,
- said housing including
- ultrasonic means for welding wires together having
- a welding tip,
- an anvil for clamping the wires to be welded to said welding tip,
- means for gathering the wires to be welded between said anvil and welding tip to prevent the wires from splaying during the welding operation,
- means connected to said anvil for changing the position of said anvil relative to said welding tip from an open position for the receipt of wires to be welded between said anvil and welding tip to a working position clamping said wires to be welded between said anvil and welding tip,
- said position changing means connected to said anvil further including
- a horizontal arm connected to said anvil,
- a vertical rocker arm connected to said horizontal arm,
- means pivotably mounting said horizontal and vertical arms at the intersection thereof for oscillating said anvil, and
- motor means pivotably connected to said vertical rocker arm for rotatably driving said rocker arm about said pivotable mounting means to oscillate said horizontal arm and anvil relative to said welding tip.

4,782,991

HOT LIQUID SOLDER REFLOW MACHINE

Dennis L. Bren, Stillwater, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Nov. 24, 1987, Ser. No. 124,714
Int. Cl.[4] B23K *3/00, 3/06, 37/06*
U.S. Cl. 228—19 **6 Claims**



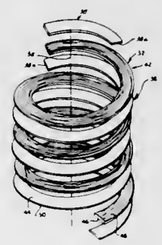
1. A solder reflow machine for removing a component having a plurality of leads which are soldered to connectors in a printed circuit board comprising
- storage means for holding a heat transfer liquid,
- vacuum source,
- vacuum conduit means coupled to said vacuum source,
- pump means for pumping said heat transfer liquid from said storage means,
- liquid conduit means coupled to said pump means to receive said heat-transfer liquid,
- solder reflow means comprising vacuum plate means in vacuum communication with said vacuum for creating a suction on said component when a vacuum occurs in said vacuum conduit means and liquid channel means in liquid communication with said liquid conduit means for conducting said heat-transfer liquid past said leads and said vacuum plate means, and
- control means for selectively moving said vacuum plate means into engagement with said component and then pulling said component away from said board.

4,782,992

METHOD OF FORMING ARTICLES

Gordon S. Doble, Shaker Heights, Ohio, assignor to Textron Inc., Providence, R.I.

Filed Nov. 21, 1986, Ser. No. 933,436
Int. Cl.[4] B32B *15/14*
U.S. Cl. 228—190 **15 Claims**



1. A method of forming an article comprising the steps of providing a helical tape of filaments, providing a helical tape of metal foil, interleaving the helical tape of filaments and the helical tape of metal foil to form a helical assembly having turns of filaments interspersed with turns of metal foil, applying deformation force against the turns of the helical assembly in a direction parallel to the central axis of the helical assembly and bonding the turns of the helical tape of metal foil to the turns of the helical tape of filaments while maintaining the filaments substantially free of plastic deformation forces extending axially along the filaments.

4,782,993

PROCESS FOR MANUFACTURING TWIN LAYER BOTTOMS WITH FILLING OF THE HOLLOW SPACE

Ferdinando Cartossi, Stresa, Italy, assignor to AMC-International Alfa Metalcraft Corporation AG, Rotkreuz, Switzerland

Continuation of Ser. No. 877,462, Jun. 23, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,391
Claims priority, application Italy, Jun. 26, 1985, 21295 A/85
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—265 **7 Claims**





1. A process for manufacturing a layered bottom of a metal pot wherein said bottom is comprised of the pot bottom, said pot bottom having a first perimeter; an intermediate metal filling layer of heat conductive material, said intermediate filling layer having a perimeter that is smaller than that of said pot bottom and a melting temperature lower than that of said pot bottom; and an outer metal layer being somewhat cake-pan like in shape with sides and a base such that it may receive said intermediate fillng layer, said outer layer having an inside perimeter greater than said perimeter of said intermediate filling layer, and having a melting point greater than that of said intermediate filling layer, said process being comprised of the following steps:
- performing cleaning and degreasing operations on the necessary intermediate and outer layers and said pot bottom;
- placing said intermediate filling layer of a given thickness and diameter generally centrally of said pot bottom, said intermediate filling layer having an initial thickness that is at least 20% greater than the thickness of the intermediate filling layer when said process is completed, said diameter being decreased proportionately when calculating said initial thickness;
- locating said outer layer over said intermediate filling layer such that said intermediate filling layer is generally housed within said outer layer sides and base;
- heating said intermediate and outer layers and said pot bottom to a temperature nearing that of said melting point of said intermediate filling layer;
- applying an impact pressure to said intermediate and outer layers and said pot bottom, said impact pressure being first applied generally centrally of said layers and then moved

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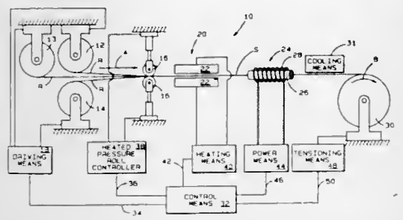
outwardly therefrom such that said outer layer sides are brought into peripheral contact with said pot bottom and said intermediate filling layer is flattened to completely fill the space between said pot bottom and said outer layer and metallurgically bonded thereto.

4,782,994

METHOD AND APPARATUS FOR CONTINUOUS IN-LINE ANNEALING OF AMORPHOUS STRIP

Derek Raybould; Dulari L. Sawhney, both of Denville, and Anthony J. Esposito, Lake Hiawatha, all of N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 24, 1987, Ser. No. 77,509
Int. Cl.[4] B23K *20/04;* **H01F** *1/02*
U.S. Cl. 228—235 **28 Claims**



1. An apparatus for the continuous annealing of amorphous strip, comprising:
means for substantially continuously feeding said strip at a controlled rate of movement;
means for rapidly heating said strip at a rate of substantially 10^2-10^4° C./second to an annealing temperature and producing a localized plastic deformation;
means for annealing said strip for a short period of time at said annealing temperature;
means for maintaining said strip in tension during said annealing as said strip is continuously fed from said feeding means; and
means for cooling said strip prior to winding.

16. The apparatus recited in claim 1, wherein said feeding means further comprises multiple driven feed rolls for feeding multiple strips of amorphous material to said rapidly heating means operating at a temperature and pressure sufficient to promote bonding between said multiple strips and the production of a relatively thick strip.

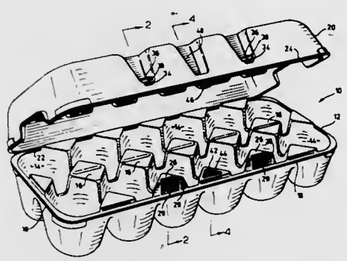
4,782,995

EGG CARTON

Roy W. Emery, 1 Donino Ct., Toronto, Ontario, Canada (M4N 2H6), and John R. Emery, 83 Ames Circle, Don Mills, Ontario, Canada M3B 3C2

Continuation of Ser. No. 551,189, Nov. 14, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 771,479
Int. Cl.[4] B65D *85/32*
U.S. Cl. 229—2.5 EC **12 Claims**

1. A moulded container for frangible articles comprising:
a tray formed with rows of cavities;
a cover hinged to the tray along a hinge line, the cavities being a lesser cross section adjacent their bottom than their top whereby the outside walls of the adjacent cavities merge in rigid hollow posts therebetween;
said tray having a continuous rim along its front edge;
said cover having a continuous rim along its front edge, the continuous rim of the cover meeting the continuous rim of the tray when the cover is closed upon the tray;
at least one of said rigid hollow posts adjacent the front edge of the tray being a locking post;
said locking post extending above the front rim of the tray and having side walls that merge with said rim of said tray and with the cavities of the tray, a front face that slopes rearwardly of the rim, and a catch opening formed in its front face;
said lid being formed with an inwardly extending latch adapted to underlie the upper edge of said catch opening



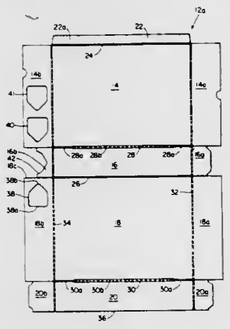
of said locking post and a support lip adapted to overlie the top of said locking post when the cover is closed upon the tray;
the latch and support lip being separated by an opening formed in the front face of the cover.

4,782,996

DISPENSING PACKAGE

Milton D. Spahni, Jr., Harrison, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 2, 1987, Ser. No. 104,203
Int. Cl.[4] B65D *39/04*
U.S. Cl. 229—125.09 **12 Claims**



1. A seal-end carton which comprises:
A. An outer major flap having a fitment mounted thereon with a portion of said fitment projecting beyond the inner surface of said outer major flap, and
B. An inner major flap having a cutout therein sized and located to receive the projecting portion of said fitment when said carton is in flattened tubular form.

4,782,997

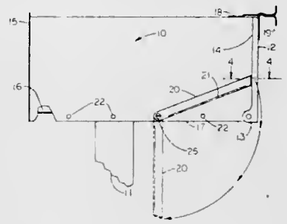
MAIL DELIVERY SIGNAL DEVICE

Thomas J. Cotton, Jr., 28091 Via Machado, Mission Viejo, Calif. 92692

Filed Oct. 13, 1987, Ser. No. 107,931
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 **3 Claims**

1. An automatic signaling device for attachment to a standard rural delivery mailbox having a sidewall, said mailbox having a door at the front end, said door having a flange bent

rearward a short distance over said sidewall and being mounted for pivotable movement about the bottom edge of said front end from open to closed positions with respect to said front end, comprising:
(a) an arm member; and
(b) fastening means connecting said arm member and said sidewall for allowing said arm member to pivot by gravity from a position extending forwardly and upwardly adjacent said side wall to a position extending downwardly below the lower boundary of said sidewall;
(c) said arm member having a length sufficient to engage said rearwardly bent flange at a position between said forwardly and upwardly extending position and said downwardly extending position, and being of a thickness sub-



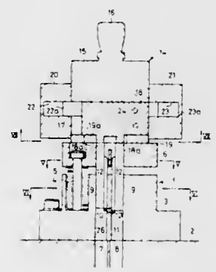
stantially greater than the distance between said sidewall and said rearwardly bent flange of said door when said door is closed, and having a front edge spaced from said fastening means which is beveled so that the surface of said arm adjacent said sidewall at said front edge is substantially flat, and that the thickness of said arm at said front edge is less than the distance between said sidewall and said rearwardly bent door flange;
(d) whereby when said door is closed and said arm member then moves downwardly from said forwardly and upwardly extending position, said beveled front edge of said arm member wedges between said sidewall and said door flange in a substantially forwardly extending position, said arm member being released to fall into said downwardly extending position when said door is opened.

4,782,998

METHOD AND APPARATUS FOR PRESS-CUTTING VARIOUS PATTERNS

Takehiko Nishikawa; Yasuo Ito; Yoshiyuki Hisamatsu, and Naoki Tani, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Jun. 17, 1986, Ser. No. 875,335
Claims priority, application Japan, Jun. 17, 1985, 60-131310
Int. Cl.[4] B21D *28/26*
U.S. Cl. 234—1 **9 Claims**



1. An apparatus for press-cutting patterns at selected ones of a total number of consecutive positions on a single workpiece, comprising:
a plurality of dies each defining a predetermined dimension at predetermined ones of the total number of positions on said workpiece, said plurality of dies being grouped into at least two groups for press-cutting the single workpiece, each group defining different ones of said consecutive positions, each die within said group of dies defining the same predetermined positions as other dies within said group and a different predetermined dimension from said other dies within said group;
a plurality of punches associated with each die for punching said workpiece at selected ones of the predetermined positions defined by each die with a selected pattern having a dimension corresponding to the dimension defined by the corresonding die;
a backing plate for each of said punches of each die, each said backing plate being positionable into an operative position for striking said associated punch and an inoperative position to prevent striking of said associated punch; and
means for selectively positioning each said backing plate into one of said operative position and inoperative position.

9. A method for press-cutting patterns at selected ones of a total number of consecutive positions on a single workpiece, comprising the steps of:
providing a plurality of dies each defining a predetermined dimension at predetermined ones of the total number of positions on said workpiece, said plurality of dies being grouped into at least two groups for press-cutting the single workpiece, each group defining different ones of said consecutive positions, each die within said group of dies defining the same predetermined positions as other dies within said group and a different predetermined dimension from said other dies within said group;
providing a plurality of punches associated with each die for punching said workpiece at selected ones of the predetermined positions defined by each die with a selected pattern having a dimension corresponding to the dimension defined by the corresponding die;
providing a backing plate for each of said punches of each die, each said backing plate being positionable into an operative position for striking said associated punch and an inoperative position to prevent striking of said associated punch; and
providing means for selectively positioning each said backing plate into one of said operative position and inoperative position.

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AIR CONDITIONING APPARATUS AND GRILLE CONTROL METHOD THEREOF

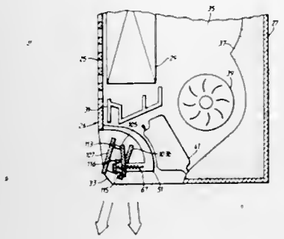
Katsushi Ishii, and Kazuki Suzuki, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 21, 1987, Ser. No. 87,794
Int. Cl.[4] F24F *13/14*
U.S. Cl. 236—49 **17 Claims**

1. An air conditioning apparatus for heating or cooling a defined space, comprising:
interior unit conditioning means having an intake port and an exhaust port for drawing intake air from the intake port and exhausting conditioned air from the exhaust port;
detecting means for outputting a detecting signal representative of the temperature in the vicinity of the apparatus;
means for determining whether the temperature in the vicinity of the apparatus is inside of a prescribed range from a desired temperature on the basis of the detecting signal from the detecting means; and
guide means for channelling the conditioned air from the exhaust port into the defined space in a first predetermined direction for conditioning the defined space, said guide means including vane means responsive to the determin-

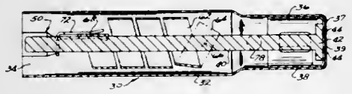
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ing means for redirecting only a portion of the conditioned air in a second direction when the temperature in



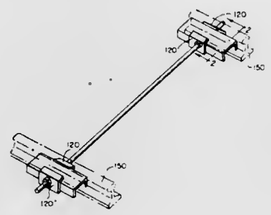
the vicinity of the apparatus is inside of said prescribed range.

4,783,000
TEMPERATURE RESPONSIVE FLOW CONTROL VALVE APPARATUS
Henry Ty, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 17, 1987, Ser. No. 98,094
Int. Cl.[4] G05D *23/08*
U.S. Cl. 236—93 R **8 Claims**



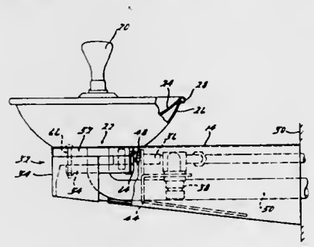
1. A vehicular automatic transmission control in which a manual valve member is movably positioned among different locations to bring selected pneumatic lines into and out of communication with each other in which the manual valve member has a passageway having a selected cross section; the passageway having an inlet and an outlet adapted to be brought into alignment with openings in the pneumatic lines, characterized in that a temperature responsive valve having at least a portion with a cross section essentially matching the cross section of the passageway is disposed in the passageway, the temperature responsive valve comprising a generally cylindrical housing having an open end and a reduced diameter side wall section, an aperture being formed in the side wall section, a cup shaped valve element disposed in the reduced diameter section, the valve element having an end wall and an integral cylindrical side wall, an aperture being formed in the side wall of the valve element disposed in alignment with the aperture in the side wall of the reduced diameter section in a direction along the longitudinal axis of the cylindrical housing, temperature responsive means including a thermostatic element coupled to the valve element and adapted to rotate the valve element to slide the side walls relative to one another and move the apertures into and out of angular alignment to form a variable orifice, the size of the orifice being based on the temperature of the temperature responsive means, the thermostatic element being configured as a helical coil, a shaft fixedly attached to the end wall of the valve element and extending along the longitudinal axis of the cylindrical housing, a bracket disposed in the open end of the cylindrical housing and being adapted to support the shaft, the helical coil having one end fixedly secured to the shaft and having a flat tab on an opposite end attached to the bracket so that the tab is fixed angularly but is free to move in a radial direction as the coil expands and contracts due to temperature changes.

4,783,001
UNIVERSAL NON-SPREADING RAILROAD TRACK HAULAGE TIE ASSEMBLY
Joseph Subrick, 2017 Revere Rd., Connellsville, Pa. 15425
Filed Sep. 8, 1987, Ser. No. 93,710
Int. Cl.[4] E01B *1/00, 11/12, 11/36, 21/04*
U.S. Cl. 238—53 **4 Claims**



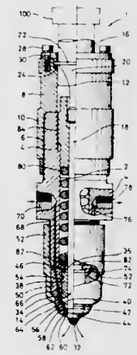
1. A railroad track haulage tie assembly for parallel rails wherein each rail has connected running and base elements, comprising:
(a) a tie rod which exceeds track co-extension laterally from rail to rail;
(b) opposed, elongated rail supporting channels, adjustably disposed relative to each said rail, each channel engaging opposite ends of the rod at the right angle thereto for seating and supporting respective rails at preselected opposed points longitudinally beneath the base of each rail, the width of each said channel being less than the width of the base of the given rail,
(c) pairs of inside and outside clips wherein respective clips are L-shaped in vertical cross-section, the angle defined by a compressive leg thereof being less than the angle defined by the sloped top of the base of the disengaged rail, said clips compressively engaging the channels and the rails sidewise, whereby to compressively mount said opposed rails in pre-set track relationship.

4,783,002
DRINKING FOUNTAIN
Doyle Raymer, Davis; Dipak J. Negandhi, Freeport, both of Ill.; Dennis J. Heyden, Browntown, and Robert L. Latzko, Wauwatosa, both of Wis., assignors to King-Seeley Thermos Company, Prospect Heights, Ill.
Filed Feb. 13, 1987, Ser. No. 14,534
Int. Cl.[4] E03B *9/20*
U.S. Cl. 239—29 **20 Claims**



20. In a drinking fountain having a water basin with a drain therein and having a water dispensing means, the improvement comprising:
a manual actuator operatively coupled to said water dispensing means for controlling the dispensing of water;
said actuator having a manually contactable actuator surface which is continuous and lies at least partially in a cylindrical plane and is disposed generally beneath said water dispensing means;
said actuator surface defining a frontally facing portion and at least one laterally facing portion;
wherein manually applied contact to either of said frontally facing portion and said laterally facing portion causes dispensing of water from said dispensing means.

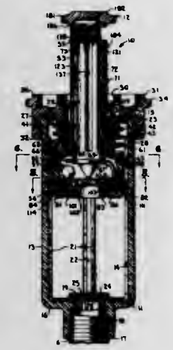
4,783,003
ULTRASONIC INJECTING METHOD AND INJECTION NOZZLE
Hideo Hirabayashi, Chiba; Masami Endo, and Kakuro Kokubo, both of Kanagawa, all of Japan, assignors to Tea Nearye Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 723,243, Apr. 15, 1985, Pat. No. 4,702,414. This application Mar. 3, 1987, Ser. No. 21,085
Claims priority, application Japan, Apr. 19, 1984, 59-77572
Int. Cl.[4] B05B *1/08*
U.S. Cl. 239—102.2 **3 Claims**



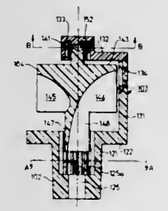
1. An article for use in an ultrasonic injection nozzle for a liquid material, comprising vibrating element means adapted to be ultrasonically vibrated, said vibrating element means having a longitudinal axis, a first end adapted to be connected to a source of ultrasonic energy and a second end opposite said first end, said second end having a multi-stepped, edged portion having at least two steps, and liquid material supplying means for supplying liquid material to said edged portion to flow in a thin film at the edges of the edged portion, an edge of each step presenting an apex substantially tangential to the flow of said liquid material and being adapted to sever and atomize said liquid material as it flows over said edge.

4,783,004
BALL DRIVE SPRINKLER
James F. Lockwood, Lenexa, Kans., assignor to Imperial Underground Sprinkler Co., Lenexa, Kans.
Continuation of Ser. No. 730,174, May 3, 1985, Pat. No. 4,687,139. This application Aug. 14, 1987, Ser. No. 85,529
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—205 **20 Claims**

1. A sprinkler, which comprises:
(a) a container including a container bore and a water inlet for admitting water to said container bore;
(b) a motor reciprocably received in said container bore and movable between retracted and extended positions, said motor including:
(1) a stator having an upper end and a stator said stator bore communicating water with said container bore; and
(2) a rotor rotatably received within said stator bore, said rotor including upper and lower ends, a vertical rotational axis and a turret having an inlet orifice communicating water with said stator bore and an outlet orifice;
(c) hydraulic drive means adapted for rotating said rotor, and
(d) enclosure means positioned above said stator upper end and rotatably and sealingly engaging said rotor, said enclosure means defining an opening adapted to communicate with said turret outlet orifice and defining an enclosed water chamber between said enclosure means and said rotor upper end, said water chamber communicating water with said stator bore but not communicating water directly to said outlet opening.



4,783,005
ROTARY SPRINKLER
Peretz Rosenberg, Moshav Beit Shearim, Israel
Filed Jun. 10, 1987, Ser. No. 60,178
Claims priority, application Israel, Jul. 1, 1986, 79297; Mar. 24, 1987, 81987
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—222.17 **6 Claims**



5. A rotary sprinkler comprising a nozzle having an inlet end connectable to a pressurized water supply and formed with a central bore having an exit end through which the water exits in the form of an axial jet, said exit end being of enlarged diameter to define a cylindrical socket; a rotor in the path of the axial jet and having an underface formed with two diametrically opposed grooves to deflect the jet laterally of the sprinkler and to impart a rotary motion to the rotor; and mounting means for floatingly mounting the rotor for axial, lateral and rotary movements with respect to the nozzle bore; said mounting means comprising a cylindrical stem depending from the underface of the rotor and of smaller outer diameter than the diameter of the socket; said cylindrical stem being formed with a single groove extending axially thereof and merging with one of the grooves formed in the underface of said rotor; said cylindrical socket in the nozzle being formed with a plurality

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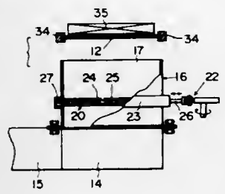
of axially-extending, circumferentially-spaced ribs defining recesses between the ribs for accumulating solid particles in the water supply, thereby decreasing the sensitivity of the sprinkler to blocking of the rotor rotation by such solid particles.

4,783,006

MIST SUPPLYING DEVICE FOR FORMING THIN FILM

Yutaka Hayashi, Ibaraki; Atuo Itoh, Tokyo; Hideyo Iida, Tokyo, and Kikuji Fukai, Tokyo, all of Japan, assignors to President of Kogyo Gijutuin and Talyo Yuden Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 30, 1987, Ser. No. 68,466
Claims priority, application Japan, Jul. 9, 1986, 61-161162
Int. Cl.[4] B05B *1/00, 1/34*
U.S. Cl. 239—380 **5 Claims**



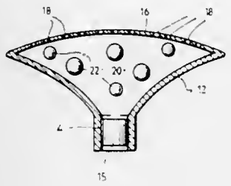
1. A mist supplying device for supplying a film-forming solution to form a thin film on a substrate, comprising:
a nozzle having an elongate outlet port;
an atomized coupled to said nozzle for atomizing a film-forming solution;
a disperser movably disposed in said nozzle between said outlet port and said atomizer and having a plurality of substantially uniformly distributed mist passages for passing the atomized film-forming solution in a first flow passage direction therethrough and forming a mist, said first flow passage direction being the direction of the mist flowed through said mist passages and said nozzle;
an air blower coupled to said atomizer for delivering the atomized film-forming solution into said nozzle; and
a driver unit coupled to said disperser for reciprocally moving said mist passages in a second flow passage direction transverse to said first flow passage direction, said second flow passage direction being the direction parallel to the direction of elongation of said elongate outlet port.

4,783,007

SPRAY DEVICE

Richard J. Schafer, 12 Roberts St., Victoria, Australia

Filed Jul. 8, 1987, Ser. No. 71,029
Claims priority, application Australia, Jul. 22, 1986, PH7070
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—381 **6 Claims**



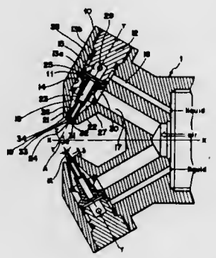
1. A spray device, said spray device having an inlet communicating with a spray chamber, said spray chamber having a plurality of apertures for enabling water to be sprayed out from said spray chamber, said spray chamber accommodating a plurality of bodies and being sufficiently large compared to the size of the bodies so that the bodies circulate randomly within said chamber as water passes through the chamber from the inlet to the plurality of apertures to randomly block apertures of said plurality of apertures to thereby disrupt the flow of water through the chamber and cause a continually changing spray pattern to be sprayed from said apertures.

4,783,008

ATOMIZER NOZZLE ASSEMBLY

Hiroshi Ikeuchi, Ashiya, and Norio Oonishi, Nishiwaki, both of Japan, assignors to H. Ikeuchi & Co., Ltd., Osaka, Japan

Filed Jun. 9, 1987, Ser. No. 60,086
Claims priority, application Japan, Jun. 9, 1986, 61-134173
Int. Cl.[4] B05B *1/26, 7/06, 7/08*
U.S. Cl. 239—421 **2 Claims**



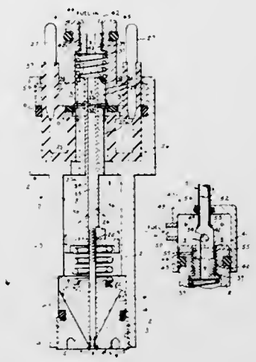
1. In an atomizer nozzle assembly for facilitating atomization of a liquid, said assembly including
a nozzle body having a longitudinal axis and a plurality of nozzle heads equally spaced apart from one another around said longitudinal axis,
each said nozzle heads having a mounting hole extending therein, a nozzle tip disposed in said mounting hole, the nozzle tip having a longitudinal axis, and an air jet passage defined therein between the inner periphery of the nozzle head and the outer periphery of said nozzle tip, said air jet passage communicable with a source of compressed air and open at a front end of the nozzle head for allowing currents of compressed air to be jetted therethrough,
the longitudinal axes of said nozzle tips extending in respective directions that converge at a point of impingement located on the longitudinal axis of said nozzle body,
the improvement comprising:
ultrafine mist producing means for enabling an ultrafine mist to be produced from the liquid when atomization of the liquid is initiated by the flow of compressed air forced under an initial pressure through said air jet passage of each said nozzle heads and for causing the ultrafine mist to be continuously produced, as said initial pressure is increased, with the liquid flowing at a flow rate that is proportional to the increase in said initial pressure,
said ultrafine mist producing means comprising respective forward end portions of each of said nozzle tips that are tapered in said respective directions, the angle of taper being in the range of 16° to 24°, and respective liquid passage holes extending in each of said nozzle tips along the longitudinal axes thereof, said liquid passage hole open between a source of the liquid and respective front faces of the forward end portions of the nozzle tips that face said point of impingement for allowing the liquid to be sucked therethrough at said flow rate by the currents of compressed air to form respective jet streams of a gas-liquid mixture that impinge upon each other at said point of impingement thereby producing the ultrafine mist.

4,783,009

CALIBRATION ADJUSTMENT OF ELECTROMAGNETIC FUEL INJECTORS

Samuel W. Coates, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 27, 1987, Ser. No. 43,146
Int. Cl.[4] B05B *1/32*
U.S. Cl. 239—580 **11 Claims**



1. An electromagnetic fuel injector for internal combustion engines, said injector comprising, in combination:
(a) a longitudinally extending housing (2) having an upstream fuel inlet portion and a downstream fuel discharge portion,
(b) electromagnetic means (25) disposed in said housing,
(c) an armature (29) disposed adjacent said electromagnetic means and with said armature being longitudinally moveable in response to actuation of said electromagnetic means,
(d) one portion of said armature normally forming a closeable working gap (33) with said housing,
(e) first biasing means (37) for urging said armature under a compressive load in a longitudinal direction to narrow said gap,
(f) an actuator (34) secured to and extending longitudinally downstream from said armature,
(g) valve means responsive to said actuator for permitting injection of fuel from said injector into an engine, said valve means including:
(1) a valve body (11) forming a valve seat (17),
(2) and a valve member (18) engageable with said seat, said valve member being connected to said actuator,
(h) second biasing means (21) for urging said valve member under a compressive load toward said seat,
(i) first adjustment means (24) to set the compressive load of said second biasing means,
(j) second adjustment means (11–13) for positioning said valve seat and valve member so that the normal width of said working gap is set through said actuator,
(k) and third adjustment means (39–41) to set the compressive load of said first biasing means.

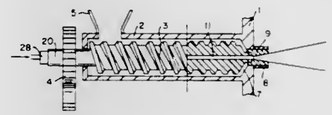
4,783,010

METHOD AND DEVICE FOR PULVERIZING A SOLID FUEL MATERIAL

Roland Kissel, Le Vesinet, France, assignor to Creusot-Loire, Paris, France

Filed Jun. 24, 1982, Ser. No. 391,740
Claims priority, application France, Jul. 3, 1981, 81 13095
Int. Cl.[4] A23J *1/00*
U.S. Cl. 241—3 **14 Claims**

1. Method of pulverizing a solid fuel material introduced inside a pressurized reaction chamber by means of a screw conveyor constituted by at least one screw rotated within a sleeve provided at an upstream end with an inlet orifice for the material in divided form and at a downstream end with at least one die having an axis and opening through an outlet orifice inside said chamber, including the steps of
(a) forming by extrusion a roll of compressed material having an axis; and



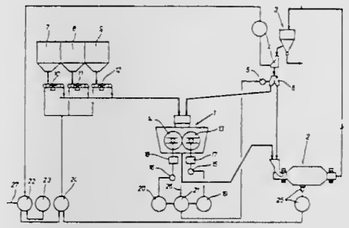
(b) injecting at least one gas jet under high pressure from the inside and into said axis of said die to disintegrate said roll, said gas being injected with sufficient momentum to form an appreciable cone centered on said axis of said roll widening from the inside of the latter, each roll comprising a hollow tube having an inner wall which crumbles as it advances into said die and assumes the shape of said jet, thereby freeing particles which are drawn into the jet and introduced with it into said chamber.

4,783,011

METHOD AND APPARATUS FOR THE TWO-STAGE CRUSHING OF BRITTLE MATERIAL FOR GRINDING

Gotthardt Blasczyk; Norbert Patzelt; Heinz-Georg Mersmann, all of Beckum; Franz J. Adrian, Lippetal, and Hardy Kropf, Oelde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Dec. 10, 1987, Ser. No. 131,035
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644341
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—24 **8 Claims**



1. In a two-stage method of crushing fresh brittle material wherein said material is delivered to a first power driven mill and crushed to form agglomerates, said agglomerates are delivered to a second power driven mill and further crushed to form an output that is delivered to a sifter and sifted to produce a finished product and grit, and said grit is separated into two streams the first of which is delivered to said first mill and the second of which is delivered to said second mill, the improvement comprising regulating the quantity of fresh material delivered to said first mill with reference to the quantity of grit delivered to said second mill so that the sum of the quantity of fresh material delivered to said first and the quantity of grit delivered to said second mill is substantially constant; and dividing the quantities of grit delivered to the first and second mills in such manner that the power consumption of said first mill is substantially constant.

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4,783,012

METHOD AND APPARATUS FOR THE TWO-STAGE CRUSHING OF BRITTLE MATERIAL FOR GRINDING

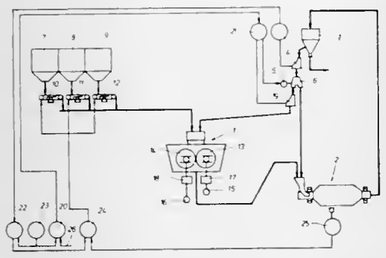
Gotthardt Blaszcyk; Norbert Patzelt; Heinz-Georg Mersmann, all of Beckum; Franz J. Adrian, Lippetal, and Hardy Kropf, Oelde, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Dec. 10, 1987, Ser. No. 130,989

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644342

Int. Cl.[4] B02C *25/00*

U.S. Cl. 241—24 6 Claims



1. A two-stage method of crushing fresh brittle material wherein said fresh material is delivered to a first mill and crushed to form agglomerates, said agglomerates are delivered to a second mill and further crushed to form an output that is delivered to a sifter and sifted to produce a finished product and grit, and said grit is separated into two streams the first of which is delivered to said first mill and the second of which is delivered to said second mill, the improvement comprising regulating the quantity of fresh material delivered to the first mill with respect to the total quantity of output from the second mill so that the sum of the quantity of fresh material and said output remains substantially constant; and regulating the quantities of grit delivered to the first and second mills so that the sum of the quantity of fresh material and the quantity of grit delivered to the first mill remains substantially constant.

4,783,013

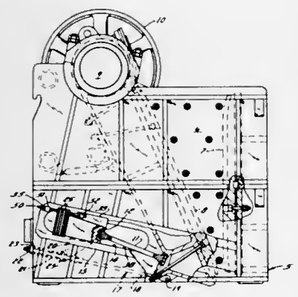
JAW CRUSHER TOGGLE BEAM LOCKING STRUCTURE

Henry H. Polzin, Brookfield, Wis., assignor to Telsmith, Inc., Milwaukee, Wis.

Filed Feb. 22, 1988, Ser. No. 158,782

Int. Cl.[4] B02C *1/04*

U.S. Cl. 241—219 9 Claims



1. A jaw crusher comprising a housing that supports a stationary jaw and has a pair of opposed upright walls between which a movable jaw is suspended and each of which defines a way slot that is elongated in directions toward and from the stationary jaw, a toggle beam extending across the housing and having opposite end portions received in said way slots and substantially confined by them to slidable shifting in said directions, a toggle plate between said toggle beam and the movable jaw for supporting the latter, a hydraulic ram having a reaction connection with the housing and a motion transmitting connection with the toggle beam for shifting the toggle beam in said directions, abutment means supported by the housing and engageable by the toggle beam for defining an adjustably variable limit of shifting thereof in one of said directions and thus providing a plurality of alternatively selectable positions of adjustment of the toggle beam, and locking means for releasably confining the toggle beam against motion in the other of said directions out of any selected one of said positions of adjustment, said jaw crusher being characterized by:

A. said toggle beam having a wedging surface thereon which
(1) extends at an inclination relative to said directions and
(2) faces obliquely in said other direction;

B. said locking means comprising a wedging member having substantially opposite force exerting surfaces
(1) which converge towards one another in said one direction,
(2) one of which opposingly engages a reaction surface on the housing that extends substantially in said directions, and
(3) the other of which opposingly engages said wedging surface on the toggle beam so that said wedging member can cooperate with the housing to wedgingly confine the toggle beam against shifting in said other direction without substantially restraining its shifting in said one direction; and

C. said motion transmitting connection comprising a link member having
(1) a pivot connection with the hydraulic ram,
(2) a second pivot connection with the toggle beam and
(3) a third pivot connection with the wedging member,
each said pivot connection providing for relative swinging of the link member about an axis which extends transversely to said directions and which is spaced from and parallel to the axis of each of the other two pivot connections.

4,783,014

DISK REFINER HAVING SLIDING RIGID MULTIPLE DISKS

Borje Fredriksson, Dalton, and Philip H. Goldenberg, Pittsfield, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

PCT No. PCT/US86/00394, § 371 Date Feb. 25, 1986, § 102(e) Date Feb. 25, 1986, PCT Pub. No. WO87/05061, PCT Pub. Date Aug. 27, 1987

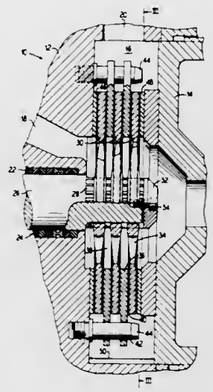
PCT Filed Feb. 25, 1986, Ser. No. 833,355

Int. Cl.[4] B02C *7/14*

U.S. Cl. 241—261.2 14 Claims

1. In a disk refiner of the type in which a plurality of first refiner disks and a plurality of second refiner disks are alternately mounted in a refining chamber within a refiner housing and each including refiner bars, the first refiner disks being mounted against rotation and the second refiner disks mounted on a rotatable shaft, the chamber located in a pulp fiber flow path, the improvement therein for lowering the intensity treatment and increasing the strength characteristics of the pulp, in combination therewith, comprising: first mounting means mounting said first refiner disks for axial movement, comprising a plurality of support elements extending from the housing into the refining chamber, a plurality of holes through each of said first refiner disks slidingly receiving respective ones of said support elements for unrestricted axial movement thereon within a limited axial distance along said support elements in response to internal refiner pressure and a central flow opening in each of said first refiner discs receiving the rotatable shaft therethrough; second mounting means mounting said second refiner disks alternately with said first refiner disks, for rotation and for unrestricted axial movement, comprising a shaped

torque transmitting section on the shaft, a central opening in each of said second refiner disks slidingly receiving said torque transmitting section therethrough for rotation with and axial movement on said shaft within a limited axial distance along said shaft responsive to internal refiner pressures, and flow



ports through each of said second refiner disks for supporting a distribution of the paper stock to the refiner bars; and loading means for controlling axial distance in which axial movement of said disks can occur along said support elements and said shaft.

4,783,015

TOILET PAPER ROLL AND METHOD OF MANUFACTURE THEREOF

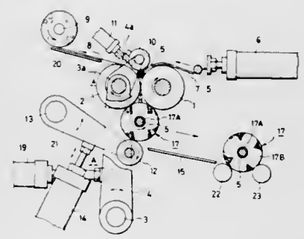
Akira Shimizu, Fuji, Japan, assignor to Shimizu Machinery Co., Ltd., Shizuoka and Hiroshi Genda, Tokyo, both of, Japan

Filed Jul. 27, 1987, Ser. No. 77,922

Claims priority, application Japan, Aug. 27, 1986, 61-199028; Aug. 27, 1986, 61-129542[U]

Int. Cl.[4] B65H *18/20, 18/28*

U.S. Cl. 242—1 3 Claims



1. A toilet paper roll comprising a core layer portion having a central circular hole and an outer layer portion continuous to said core layer portion, said core layer portion being formed tightly and having a hardness sufficient to resist deformation of said central hole during transportation and handling of said toilet paper roll to thereby maintain said central hole in an open condition permitting insertion of a support shaft of a toilet roll holder and said outer layer portion being formed less tightly than said core layer portion over said core layer portion.

4,783,016

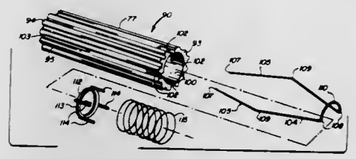
ROLL HOLDER WITH RETENTION MEMBER

Daniel L. Pool, Paradise Valley, Ariz., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 410,349, Aug. 23, 1982, Pat. No. 4,466,789, which is a division of Ser. No. 185,188, Sep. 8, 1980, Pat. No. 4,379,019. This application Mar. 30, 1987, Ser. No. 31,897

Int. Cl.[4] B65H *19/10*

U.S. Cl. 242—55.2 7 Claims



1. In an apparatus for dispensing material from a roll thereof, said apparatus including a rotatable roll holder having an outer surface, an outer end and an inner end,
said roll including a core having a bore with a generally cylindrical surface,
said bore being receivable over said surface in a direction from said outer end,
improvements therein for releaseably retaining said roll on said holder, said improvements comprising:
a retention member carried by said apparatus and extendably and retractably movable relative the surface of said holder and normally extendably biased with respect to said surface so as to engage the bore of said roll, said retention member including an elongate flexible contact element extending longitudinally of said roll holder and having a forward end, a rearward end and an outwardly projecting contact portion intermediate said ends, said contact portion being flexibly movable in directions toward and away from the surface of said holder, and the ends of said contact element movable longitudinally of said holder in response to movement of said contact portion; and
receptacle means proximate each end of said holder for movably receiving respective ends of said contact element, said receptacle means including a slot extending inwardly from the inner end of said holder, and said contact element including an inwardly directed rearward terminal portion extending through said slot.

4,783,017

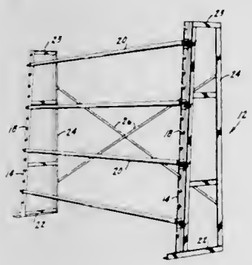
CARPET RACK

Ernest G. Ovitz, III, and Hubert D. Franks, both of Galva, Ill., assignors to John H. Best & Sons, Galva, Ill.

Filed Feb. 16, 1988, Ser. No. 156,003

Int. Cl.[4] B65H *16/06, 23/06*

U.S. Cl. 242—55.3 5 Claims



1. A carpet display rack comprising a pair of laterally spaced

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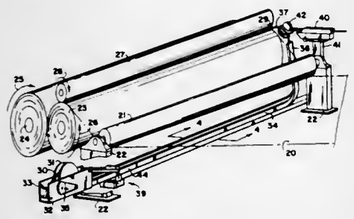
uprights having opposed, aligned notches for receiving spindles on which carpeting may be wound and unwound, the spindles having end portions extended outward of the notches and provided with flats for receiving a socket of a carpet winder, each spindle end portion having a washer fixed thereon outward of the related notch to prevent lateral displacement of the spindle along a horizontal axis, a brake plate suspended loosely on one of the projected ends of one of the spindles outward of the related washer, the brake plate having an inwardly directed lip at the lower edge thereof engagable with the outer surface of the related upright, a hand-operated brake lever having a shank terminating in a threaded stud mounted in a tapped opening in the related upright whereby upon turning the shank inward, said lip is forced against the related upright and becomes a pivot whereby the brake plate, upon further inward turning of said shank, is brought into contact with the washer enabling spindle torque to be opposed as a length of the carpet material is wound or unwound.

4,783,018

APPARATUS AND METHOD FOR CUTTING AND SPOOLING A WEB OF PAPER

Peter A. Rodriguez, Atlantic Beach, Fla., assignor to Sandar Industries, Inc., Jacksonville, Fla.

Filed Aug. 21, 1987, Ser. No. 87,874
Int. Cl.[4] B65H *19/26, 19/28*
U.S. Cl. 242—56 R **20 Claims**



13. An improved method for cutting a travelling web of paper being wound on a spool and transferring the web after cutting to an empty spool, the method including feeding a cutting tape into an elongated guideway positioned beneath and extending laterally across the web of paper, recovering the tape from the far end of the guideway and introducing it into the nip of the empty spool and the roller driving that spool to cause the tape automatically to spirally wrap around the empty spool while cutting the web of paper; wherein the improvement comprises the steps of:

(1) applying adhesive without any-covering thereon to a portion of the cutting tape at its forward end prior to feeding the cutting tape into the guideway; and

(2) receiving the cutting tape exiting the guideway and feeding the forward end into the nip with the adhesive portion contacting the empty spool.

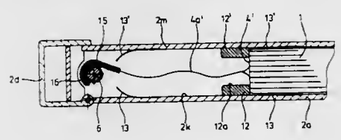
4,783,019

FILM SUPPLY MAGAZINE FOR FILM SHEET PACKS PROVIDED WITH LIGHT-SEALING SHEATHINGS

Manfred Schmidt, Kirchheim, and Johann Zanner, Unterhaching, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jan. 27, 1987, Ser. No. 7,360
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 8603910; May 13, 1986, 3616069
Int. Cl.[4] G03B *42/04;* **B65H** *75/28*
U.S. Cl. 242—74 **3 Claims**

1. A film supply magazine for receiving therein film packs, comprising a box; stop strips arranged in said box transversely to a direction of insertion of a pack for positioning the pack in said direction along a length of the pack in a respective position, each packing having a light-tight sheathing provided with at least one winding flap; an externally operated winding shaft for winding thereon of said flap so as to pull said sheathing from said pack; guiding means (**12***a*, **12***a'*, **13**, **13'**) for said winding flap, said guiding means being positioned between a pack-side edge of said stop strips and said shaft and being parallel to a central plane of the magazine and symmetrical to each other relative to said plane, said flap having two opposite surfaces and carrying at a free end thereof lugs provided at said



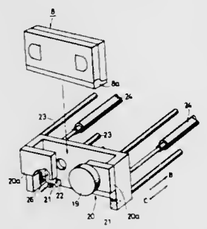
two opposite surfaces and formed of a hook and loop type fastening tape, said shaft having a further hook and loop type fastening tape secured thereon and connectable to said hook and loop type fastening tape lugs and provided in a region of said shaft to which said flap is to be secured , said box having two opposite inner faces, said guiding means comprising elastic tongues, said stop strips and tongues being positioned on said inner faces, two opposing tongues together with two opposing strips, which form a funnel therebetween, forming a slot for passing therethrough of said flap towards said shaft.

4,783,020

MAGNETIC TAPE WINDING DEVICE USING MAGNETIC EDGE ALIGNMENT

Masaaki Sakaguchi, and Kazuo Kubota, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 1, 1987, Ser. No. 55,971
Claims priority, application Japan, May 30, 1986, 61-123808
Int. Cl.[4] B65H *18/00*
U.S. Cl. 242—76 **9 Claims**



1. A magnetic tape winding device, comprising:

a tape winding structure having a hub to which a magnetic tape is attachable;

means for rotating said tape winding structure, whereby said magnetic tape is wound on said hub, said rotating means including a drive shaft insertable into said hub from a first side of said hub; and

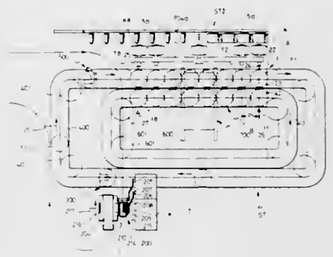
magnetic means disposed on a second side of said tape winding body opposite said rotating means and confronting an end of said drive shaft for exerting a magnetic force on said wound tape substantially along an axial direction of said drive shaft.

4,783,021

APPARATUS FOR SUPPLYING PACKAGES TO A CREEL

Isao Nagasawa, Kusatsu, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jan. 23, 1987, Ser. No. 6,705
Claims priority, application Japan, Jan. 27, 1986, 61-16451
Int. Cl.[4] B65H *49/02;* **D02H** *1/00*
U.S. Cl. 242—131.1 **21 Claims**



1. A system for supplying packages having yarn wound thereon to a warper creel, comprising:

a plurality of package supporting pegs disposed on said warper creel;

collective transferring means for transferring a plurality of packages collectively to and from a corresponding plurality of said package supporting pegs on said warper creel, wherein said collective transferring means comprises:

a first conveyor for transporting packages;

a lining means for lining up packages transported by said first conveyor in a predetermined order; and

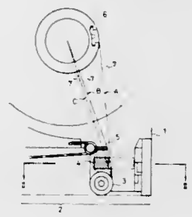
a package exchanging means, located between said lining means and said creel, for collectively transferring a plurality of packages lined up in the predetermined order at said lining means to said pegs on the creel.

4,783,022

MAGNETIC TAPE CASSETTE WITH A TAPE-END DETECTING PRISM

Shozo Onmori, and Shingo Katagiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1987, Ser. No. 65,754
Claims priority, application Japan, Jun. 24, 1986, 61-95323[U]
Int. Cl.[4] G11B *15/32, 23/08*
U.S. Cl. 242—199 **7 Claims**



1. A magnetic tape cassette, comprising:

a cassette case;

a pair of hubs rotatably disposed in said cassette case for winding a tape;

a pair of tape guide members located adjacent a front wall of said cassette case for tightly supporting said tape being would on respective ones of said hubs;

an optical prism located between one of said tape guide members and one of said hubs for detecting an end of said tape; and

a projection disposed between said tape guide member and said one hub for supporting said tape and for preventing said tape from contacting said optical prism when said tape is wound on said hub from a minimum length to a maximum length of said tape;

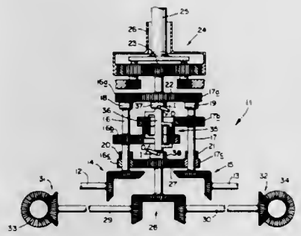
wherein said projection is dimensioned such that said tape cannot contact said projection when said tape is tangent to said hub.

4,783,023

HELICOPTER ROTOR SPEED CHANGING TRANSMISSION

Robert J. Jupe, Yeovil, England, assignor to Westland Group plc, Yeovil, England

Filed Oct. 13, 1987, Ser. No. 106,775
Claims priority, application United Kingdom, Oct. 28, 1986, 8625712
Int. Cl.[4] B64C *27/14, 27/26*
U.S. Cl. 244—6 **10 Claims**



1. A helicopter having two power sources for driving a main sustaining rotor and auxiliary propulsion means, and a transmission system selectively operable to vary the speed of rotation of the sustaining rotor and the auxiliary propulsion means, the transmission system including, for each power source, a layshaft, a first output pinion on each said layshaft connected through a freewheel device to a rotor output gear for driving said main sustaining rotor, a second output pinion on each said layshaft connected through a freewheel device to an auxiliary propulsion output gear for driving said auxiliary propulsion means, and a third output gear on each said layshaft drivingly connected to a common differential gear having a central output shaft connected through an actuatable freewheel clutch to said rotor output gear.

4,783,024

SPEEDBRAKE

Michael A. McDaniel, Bend, Oreg., assignor to Precise Flight, Inc., Bend, Oreg.

Filed Nov. 17, 1986, Ser. No. 930,919
Int. Cl.[4] B64C *9/36*
U.S. Cl. 244—113 **8 Claims**

8. A speedbrake assembly for installation in an aircraft comprising:

(a) a frame;

(b) a track which is attached to said frame;

(c) a flap having a planar surface;

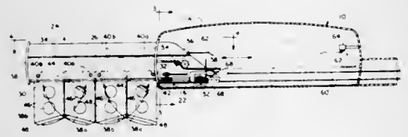
(d) means independent of the aircraft for translating said flap parallel to said planar surface between a retracted position wherein said flap is substantially adjacent to said frame and an extended position wherein said flap is substantially separated from said frame; and

(e) means for mounting said frame, track and flap as a unit

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into a faired surface of the aircraft in a manner such that said flap is enclosed within said faired surface when said



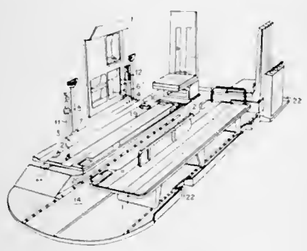


flap is in said retracted position and projects from said faired surface when said flap is in said extended position.

4,783,025
EMERGENCY MEDIAL SERVICE-INTERIOR FOR AIRCRAFT

James D. Moffett, Christiana, Pa., assignor to Atlantic Aviation Corporation, New Castle, Del.

Filed May 5, 1987, Ser. No. 46,215
Int. Cl.[4] B60P *3/26*; B64D *11/00*
U.S. Cl. 244—118.5 **3 Claims**



1. An apparatus for movably supporting a patient in an emergency medical system interiorly disposed in helicopter comprising:

(a) first and second upwardly extending elongated mounts for restraining horizontal movement of bearing blocks received thereon;

(b) a first bearing block slidably received on said first mount and a second bearing block slidably received on said second mount, said bearing blocks cooperating to support a pallet assembly;

(c) a pallet assembly attached to and supported by said first and second bearing blocks;

(d) linear actuators attached to said first and second bearing blocks, said linear actuators including an operating shaft which moves vertically so as to move each bearing block along its mount independently of the other bearing block to raise and lower said pallet assembly;

(e) a linkage arm extending horizontally from said operating shaft;

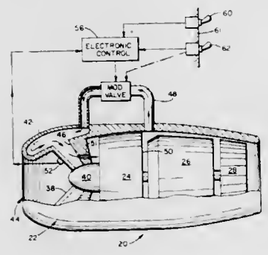
(f) a linkage rod extending vertically between said linkage arm and said bearing block, said linkage rod being associated with said linkage arm and said bearing block, so that upon vertical movement of said operating shaft, said bearing block is caused to move vertically; and

(g) a control for controlling the linear actuators and thereby the positions of each of said bearing blocks to selectively position said pallet assembly.

4,783,026
ANTI-ICING MANAGEMENT SYSTEM

Kimball J. Rumford, Fairfield, and Richard M. Norris, Stratford, both of Conn., assignors to Avco Corporation, Providence, R.I.

Filed May 22, 1987, Ser. No. 53,254
Int. Cl.[4] B64D *15/04, 15/22*
U.S. Cl. 244—134 R **12 Claims**



1. An anti-icing management system for a gas turbine engine including a compressor, a combustor, and a turbine, comprising:

structural means at the inlet of the gas turbine engine having an outer surface and air ducting therein for receiving flow therethrough of heated air to thereby prevent the formation of ice on said outer surface;

a source of heated air;

passage means enabling the flow of heated air from said source to said air ducting;

temperature sensor means on said outer surface directly in the path of incoming air for detecting the temperature of said outer surface and generating a signal proportional thereto;

modulated valve means in said passage means operable for incremental movement between fully open and fully closed positions for regulating the flow of heated air therethrough between said source and said air ducting according to the temperature of said outer surface; and

control means responsive to the signal from said temperature sensor means when the temperature of said outer surface falls to or below a predetermined value for continuously, incrementally operating said valve means as a function of the temperature of said outer surface to thereby provide only the required amount of heat to said structural means to prevent the formation of ice on said outer surface.

4,783,027
PARACHUTE RELEASE APPARATUS

Leon Jones, 16331 Rhone La., Huntington Beach, Calif. 92648

Continuation of Ser. No. 770,401, Aug. 28, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 96,679
Int. Cl.[4] B64D *17/56*
U.S. Cl. 244—149 **40 Claims**

1. In a parachute release apparatus for automatically actuating the ripcord of the parachute of an aviator upon separation from one of the aircraft and the seat, the combination comprising:

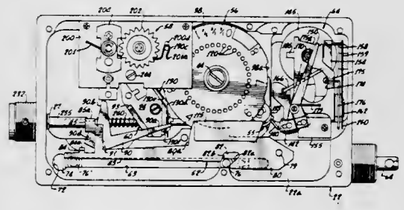
spring powered release means adapted for coupling to the ripcord means of the parachute and operable between a first position and a second position;

latch means coacting with said release means for retaining said release means in a first position against the force of the spring of said release means;

a spring powered timing mechanism;

means on said timing mechanism for preselecting a predetermined time interval;

means for winding the spring of said timing mechanism;



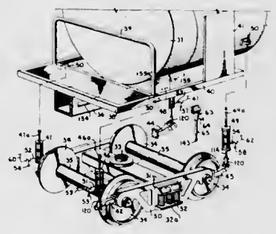
catch means interoperatively coupled to said timing mechanism and operable between a catch and a release position, said catch means being operable to said catch position upon winding said timing mechanism to store power in the spring thereof; and

other means interoperatively coupled to said catch means, said latch means and one of said aircraft and said seat for enabling actuation of said catch means to the release position and for enabling actuation of said release means to said second position after lapse of said predetermined time period after release of said catch means, whereby actuation of said release means actuates the ripcord to open the parachute.

4,783,028
DEVICES FOR APPLYING FREIGHT TRAIN AIR BRAKES ON DERAILMENT

Phillip W. Olson, 12900 W. 118th Ter., Overland Park, Kans. 66210

Filed Oct. 5, 1987, Ser. No. 104,247
Int. Cl.[4] B61L *3/00*
U.S. Cl. 246—170 **28 Claims**



3. A railroad train having a locomotive and at least two freight cars therewithin, one first said car forward and one second said car rearward in the train, each freight car having (a) a car body and car body supporting frame, (b) sets of pairs of wheels mounted on paired axles, (c) each axle carrying two wheels near the respective ends thereof, (d) truck side frames connecting pairs of said axles on opposite ends thereof, (e) opposed ones of said side frames mounting bolsters therebetween, (f) said bolsters carrying said car frame and body and (g) an air brake running the length of each said car, said first, forward freight car having:

(1) a first, normally full hydraulic chamber received in a first assembly connected at one upper end thereof to one of said car body and said car frame,

(2) a separate, second, normally empty hydraulic chamber in a second assembly also connected at one upper end thereof to one of said car frame and car body,

(3) a normally full hydraulic fluid line extending between said first and second hydraulic chambers with a one way valve thereon so that fluid forced from said first chamber will go into said line and second chamber and not return into said first chamber

(4) a piston in said first hydraulic chamber having a piston rod connected at its free end to one end of one of said truck side frames, said piston normally located at a chamber full position in said first hydraulic chamber,

(5) means associated with said second hydraulic chamber, including a radio frequency transmitter, operative to transmit a radio signal when hydraulic fluid is driven into said second, normally empty, hydraulic chamber,

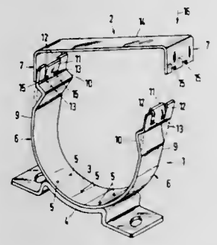
(6) said latter means including a spring loaded piston in said second chamber normally biased to the chamber empty position but operative to be driven to a chamber full position when hydraulic fluid is forced into said second chamber from said line, and

(7) the piston and piston rod of the first hydraulic chamber operating to drive hydraulic fluid from said first hydraulic chamber into said line and second hydraulic chamber when the wheel at the end of the truck side frame to which said rod is attached derails.

4,783,029
PIPE CLAMP

Helmut Geppert, Karlstein, and Kurt Strauss, Karben, both of Fed. Rep. of Germany, assignors to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,257
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611534
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.1 **19 Claims**



1. A clamp for pipes having a predetermined outer diameter, comprising a substantially C-shaped resilient holder including an arcuate intermediate portion and first and second end portions; and a substantially U-shaped confining member separably attached to said holder and including a web and first and second legs flanking said web, said first and second legs being outwardly adjacent said first and second end portions, respectively, and said legs and the respective end portions having cooperating male and female detent means, said intermediate portion storing energy in a sense to move said end portions apart so that said end portions are biased toward the respective legs to maintain the male detent means in engagement with the respective female detent means, and said confining member and said holder defining a space such that a pipe having said predetermined diameter is receivable therein with at least some

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radial play, said legs having projections which extend toward the respective end portions and constitute said male detent means, and said end portions having recesses constituting said female detent means and receiving the respective projections, said end portions also having sloping ramps along which the respective projections are slidable on their way toward penetration into the respective recesses, and each of said end portions further having guide means flanking the respective ramp and arranged to guide the projections on their way toward and into the respective recesses during attachment of the confining member to said holder.

4,783,030

APPARATUS FOR THE MECHANICAL DECOUPLING OF PIPING SYSTEMS

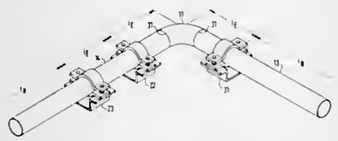
Hans Buerhop, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Müheim/Ruhr, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 30,740

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610331

Int. Cl.⁴ F16L *3/08*

U.S. Cl. 248—744 **3 Claims**



1. Apparatus for the mechanical decoupling of a piping system, the piping system including a pipe line having at least one connecting pipe section with a connecting point and straight pipe line sections connected to and protruding in different directions from the connecting point,

the apparatus comprising first holders in the form of commercially available pipe clamps firmly connected to a building and distributed at given equal spacings depending on the load-carrying capacity of the pipes exclusively for supporting the pipe lines of the piping system,

second fixed-point holders in the form of commercially available pipe clamps disposed in the vicinity of the connecting pipe section including second fixed-point holders directly adjacent the connecting point, and at least one of said second fixed-point holders being disposed at each of said respective pipe line sections adjacent said connecting pipe section and three of said second fixed-point holders including said second fixed-point holders disposed at said pipe line sections each being disposed at a respective corner of a triangle for immovably holding the pipe lines and forming a fixed-point enabling vibrations of the piping system to be calculated, and

said pipe clamps forming said second fixed-point holders being spaced apart from each other and from said connecting point by spacings, said spacings between said second fixed-point holders directly adjacent each other, and between said second fixed-point holders directly adjacent the connecting point and the connecting point, being between **9** and **11** hundredths of said given spacings between the first holders.

4,783,031

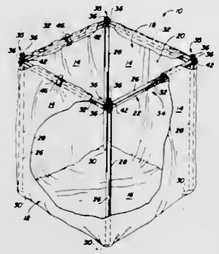
TRASH BAG ASSEMBLY AND HOLDER

Richard H. Ebentheuer, 15240 Septo St., Mission Hills, Calif. 91345

Filed Oct. 13, 1987, Ser. No. 107,020

Int. Cl.⁴ A63B *55/04*

U.S. Cl. 248—97 **20 Claims**



1. An improved adjustable trash bag holder adapted to fit inside a flexible trash bag to support said bag, said holder comprising, in combination:

(a) four about horizontal arms pivotably interconnected at opposite ends thereof for movement between a collapsed folded position wherein said arms be flat against each other and facilitate insertion thereof into a flexible trash bag and an operative position wherein said arms are at about right angles to each other to form an open centered about rectangular frame for holding the interior of a trash bag in a trash-receiving position;

(b) four about vertical legs connected to and depending from opposite ends of said arms, said legs having rounded bottoms and being adapted to support said arms in an about horizontal position within a trash bag;

(c) clamp means connected to at least some of said arms to releasably secure the top of a trash bag to said arms; and

(d) said legs being substantially straight and free of transverse structure which could interfere with the removal of the bag.

4,783,032

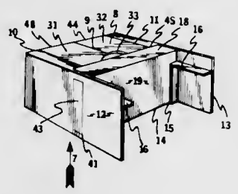
VIDEO CASSETTE WRITING AID

Lawrence E. Lodrick, Sr., 2436 Harrison Ave. N., Rochester, Mich. 48063

Filed Mar. 23, 1987, Ser. No. 28,794

Int. Cl.⁴ B65D *85/672*

U.S. Cl. 248—118.1 **18 Claims**



1. A writing aid for use with cassettes having a standard width W, length L, depth D and a writing surface, comprising:

a handrest surface having a first end, a second end and a long edge extending between said first and second ends approximately equal to the length L of a cassette; and

means for releasably supporting said cassette with said writing surface and length L of said cassette generally coplanar with and adjacent to the long edge of said handrest surface to facilitate writing on said writing surface of said cassette, wherein said releasable supporting means includes;

a first cassette-retaining member depending downwardly from said long edge of said handrest surface generally perpendicular to said handrest surface;

a second cassette-retaining member depending generally perpendicular to said first cassette-retaining member outwardly with the respect to said handrest surface and spaced vertically from said handrest surface a distance approximately equal to said depth D of said cassette, and

a third cassette-retaining member depending upwardly from and generally perpendicular to said second cassette-retaining member, spaced outwardly from and generally parallel to said first cassette-retaining member a distance approximately equal to said width W of said cassette, and terminating at a point vertically lower than the handrest surface.

4,783,033

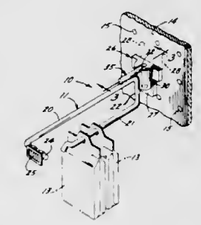
HANGER ASSEMBLY WITH U-SHAPED HANGER

Stanley C. Valiulis, Rockford, Ill., assignor to Southern Imperial, Inc., Rockford, Ill.

Filed Jul. 30, 1987, Ser. No. 79,523

Int. Cl.⁴ E04G *3/00*

U.S. Cl. 248—220.4 **6 Claims**



1. A hanger assembly adapted for attachment to an upright panel having horizontally spaced holes formed therethrough, said hanger assembly comprising a substantially U-shaped hanger having upper and lower arms adapted to project outwardly from the panel and having an upright connector extending between and joining the inner ends of the arms, said arms and said connector being disposed in a common upright plane, said hanger assembly further comprising a bracket for attaching said hanger to said panel, said bracket comprising an upright plate, a pair of horizontally spaced horns on the inner side of said plate and adapted to extend through two of said holes to attach said bracket releasably to said panel, an upright boss formed integrally with and extending outwardly from said plate, an upwardly opening socket formed in said boss, an upwardly opening notch formed in the upper end of said boss and extending outwardly from said socket to the outer side of said boss, and a member of inverted L-shaped configuration for attaching said hanger releasably to said bracket, said attaching member comprising a generally horizontal leg fastened to the upper side of said upper hanger arm and extending inwardly beyond said connector, said horizontal leg being sized to seat in the notch in said boss, and said attaching member further comprising an upright leg joined to and depending from the inner end of said horizontal leg and sized to fit into the socket in said boss.

4,783,034

SLIDE LOCK MECHANISM

Walter M. Ostrander, Bridgewater; Andrew Hornak, New Milford, both of Conn., and Gregory Sorrentino, Brewster, N.Y., assignors to General Datacomm, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 765,281, Aug. 13, 1985, abandoned. This application Feb. 11, 1987, Ser. No. 13,507

Int. Cl.⁴ F16B *1/00*

U.S. Cl. 248—223.1 **17 Claims**



1. An improved slide lock mounting plate assembly that provides secure attachment of at least two spaced components each having at least one appendage to a base plate, and which also provides for ready detachment of said components as desired, comprising:

a base plate onto which said components may be detachably mounted, said plate formed with at least one shaped mounting hole for each component;

each said mounting hole formed of a larger first hole section from which an appendage engaged in said base plate may be freely removed, and a relatively smaller size second hole section joined to the first hole section into which a shaped appendage of a component may be engaged in said mounting hole in a captive relation to said base plate;

a latch means attachable to said base plate, said latch means of a size and shape to retain a said appendage that has been engaged into a said mounting hole, in fixed nondetachable engagement to said base plate, when said latch means is attached to said base plate; wherein

the said second hole section of each of the mounting holes that are located to engage the appendages of a first individual component, is each shaped to extend from the first hole section of each said mounting hole in a direction away from the location of a second spaced component, and

said latch means is a detachable spacer means of a size and shape to restrain movement of said first individual component towards said second individual component when appendages of said first and second individual components are engaged in said second hole sections and said spacer means is attached to said base plate.

4,783,035

UNIVERSAL SUPPORT BRACKET FOR VENTILATED SHELVING

Lee Remmers, Ocala, Fla., assignor to Clairson International, Ocala, Fla.

Filed May 26, 1987, Ser. No. 53,463

Int. Cl.⁴ A47G *29/02*

U.S. Cl. 248—250 **10 Claims**

1. A shelving system comprising:

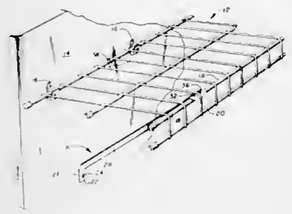
at least one shelf defining a substantially planar surface and including a plurality of spaced, parallel, transversely extending deck rod members, said rod members being coupled to and extending at least between a longitudinally extending rear support rod and a longitudinally extending front support rod of the shelf, respectively;

means for mounting a said rear support rod to an adjacent vertical support structure; and

means for supporting a said front support rod of said shelf including a support bracket having a longitudinal main body portion, a first end portion defined at a first longitudinal end of said main body portion for mounting the

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support bracket to the vertical support structure, and a second end portion defined at a second longitudinal end of said main body portion, said second longitudinal end including a stop face which defines a seat for limiting rotational movement of said front support rod relative to said means for mounting said rear support rod and means for receiving and gripping a portion of the circumference of said front support rod, said means for receiving and gripping including an arcuate portion extending in the



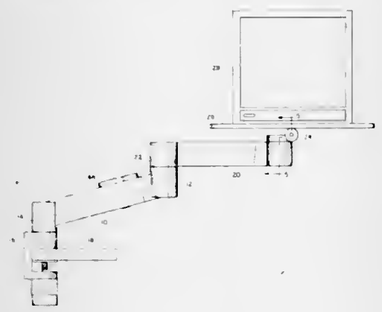
longitudinal direction of said main body portion from said stop face defining therewith an arcuate recess having a longitudinal axis coincident with a longitudinal axis of said front support rod and parallel to a plane of said vertical support structure, said arcuate portion including at least one slot means extending transversely to said longitudinal axis of said arcuate recess and receiving a said parallel deck rod member of said shelf when said means for supporting is mounted to said shelf.

4,783,036

ADJUSTABLE SUPPORT

Sohrab Vossoughi, Portland, Oreg., assignor to Anthro Corporation, Portland, Oreg.

Filed Apr. 16, 1987, Ser. No. 39,183
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—281.1 **18 Claims**



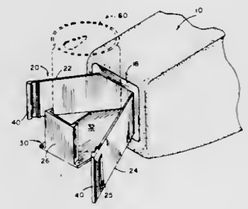
1. An adjustable support comprising:
a first pivot mechanism defining a first axis of rotation;
a second pivot mechanism defining a second axis of rotation which lies in a plane parallel to a plane containing the first axis of rotation; and
a polygonal structure connecting the first pivot mechanism to the second pivot mechanism, wherein said polygonal structure comprises:
a top member;
a bottom member
a proximal member
a distal member
means coupling the top member, bottom member, proximal member, and distal member to form an articulated parallelogram structure;
a constraint link having a first end and a second end, the first end coupled to the top member and the second end coupled to the bottom member; and
torque means for applying torque to the constraint link about an axis which is perpendicular to the plane of the parallelogram.

4,783,037

CONTAINER HOLDER FOR A VEHICLE

Carl W. Flowerday, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Aug. 10, 1987, Ser. No. 83,156
Int. Cl.[4] A47K *1/09*
U.S. Cl. 248—311.2 **23 Claims**



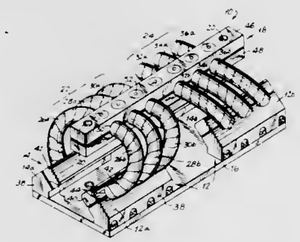
1. An adjustable container holder for a vehicle comprising:
a support member for slidably receiving a slide member;
a slide member defining in part a floor for supporting a container thereon;
a pair of arms which define sidewalls for selectively supporting sides of different sized containers, said arms pivotally mounted on said slide member; and
spring bias means coupled to said arms for urging them away from each other such that as said slide member is progressively extended from said support member said arms progressively spread apart for supporting the sides of progressively larger containers.

4,783,038

ISOLATOR APPARATUS

Chester L. Gilbert, Forest Hills; Herbert W. LeKuch, New York; Raymond E. Snaith, Jericho, and Andrew R. Ferri, Smithtown, all of N.Y., assignors to Aeroflex International Incorporated, Plainview, N.Y.

Filed Jul. 7, 1987, Ser. No. 70,838
Int. Cl.[4] F16F *3/00*
U.S. Cl. 248—570 **10 Claims**



1. An improved isolator apparatus comprising:
first and second parallel base-forming bar means affixed to a base plate for securing the apparatus to a structure subject to vibration and shock;

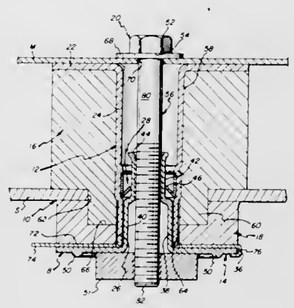
a load-supporting bar means parallel to said base-forming bar means for securing the apparatus to a structure sought to be isolated from vibration; and
first and second flexural support means supporting said load-supporting bar in a force-damping relationship above said base-forming bars, each of said flexural support means comprising a group of opposed flexural support element pairs, each of said flexural support element pairs having a first element having a first end affixed to the first base-forming bar means and a second end affixed to said load-supporting bar and a second element having a first end affixed to said second base-forming bar and a second end affixed to said load-supporting bar, the flexural support element pairs of said first and second flexural support means being located and offset in planes at acute angles from the horizontal defined by said base means, the offset of the element pairs of said first group being equal and opposite to that of said element pairs of said second group.

4,783,039

SHOCK ISOLATING MOUNT

Francis C. Peterson, Woodbury; Lorenzo Perosino, Waterbury, and Robert J. Despins, Madison, all of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

Continuation-in-part of Ser. No. 890,905, Jul. 28, 1986, Pat. No. 4,720,075. This application Aug. 27, 1987, Ser. No. 90,033
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—635 **18 Claims**



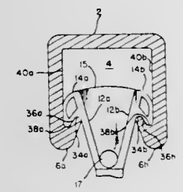
1. An assembly for securing a mounting part of structure onto a support, comprising:
a rigid spacer member having a spacer flange and a spacer tube integral with the spacer flange and projecting from said spacer flange to extend through apertures in resilient bodies and said support disposed between said bodies;
a rigid thimble member having a thimble flange and a thimble tube integral with the thimble flange and projecting from said thimble flange, said thimble tube being receivable inside and displaceable axially relative to said spacer tube, said thimble member and said spacer member having mutually engaging means for limiting rotation of either of them relative to the other;
an elongate fastening device having a shank, a head portion, and an end portion, said head portion disposed outside said spacer member and said mounting part disposed between said spacer flange and said head portion, said shank extending through said spacer tube, and said end portion and said thimble tube having cooperating means operable by manipulation of said fastening device to draw said thimble tube into said spacer tube and thereby draw said spacer and thimble flanges together and against said bodies, securely clamping said bodies and said support between said flanges, and to secure said mounting part to said support.

4,783,040

NON-METALLIC STRUT SYSTEM

Verne L. Lindberg, Everett, and Paul A. Stockinger, Tacoma, both of Wash., assignors to Aickin Development Corporation, Seattle, Wash.

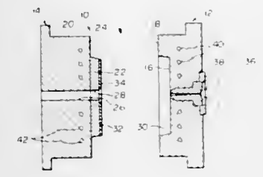
Continuation-in-part of Ser. No. 912,963, Sep. 26, 1986, Pat. No. 4,695,019, which is a continuation-in-part of Ser. No. 743,102, Jun. 10, 1985, abandoned. This application Sep. 17, 1987, Ser. No. 97,685
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.[4] F16L *3/03*
U.S. Cl. 248—74.3 **10 Claims**



1. In combination:
a. a structural beam member;
b. a fiberglass structural support element integral with said beam member, said fiberglass structural support element having sides forming a longitudinal slot;
c. longitudinal flanges inwardly projecting toward the center line of said support element along the sides of said support element, each of said longitudinal flanges having an interior surface adjacent said slot, said interior surface of said longitudinal flanges having a rounded portion where said longitudinal flanges meet the sides of said support element, said longitudinal flanges having rounded edges of a predetermined radius;
d. a pair of complemental composite thermoplastic pipe support band having bottom portions forming a natural curvature for cradling a pipe when the end of said bands are engaged, said supporting bands having a top portion, said top portion having distal flanges, said distal flanges having side portions, undersides, rounded bottom edges of a pre-determined radius, and otherwise so shaped as to allow substantially full and interlocking contact between the side portions of said distal flanges and the sides of said support element and between the undersides of said distal flanges, including their rounded edges and the interior surface of said longitudinal flanges including the rounded portions of said longitudinal flanges where said longitudinal flanges meet the sides of said support element, and the rounded edges of said longitudinal flanges when the top portion of said support bands is disposed within said longitudinal slot;
e. adjustable holding means on the bottom portion of said supporting bands for connecting and locking said support bands around a pipe.
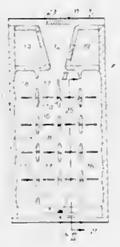
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4,783,041
MOLD FOR MOLDING OPTICAL DISC
Toshiaki Sakaida, Shiojiri; Yoshihiko Yuzawa, Ebina; Fumio Iriko, Tokyo, and Fumio Kagawa, Kasukabe, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Matsushita Electric Industrial Co., Ltd., both of, Japan
Filed Feb. 4, 1987, Ser. No. 11,205
Claims priority, application Japan, Feb. 5, 1986, 61-23594
Int. Cl.[4] B29C *33/38*
U.S. Cl. 249—103 **8 Claims**



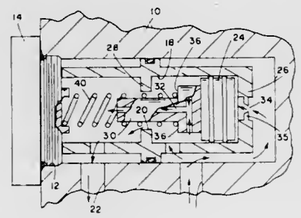
1. A mold for molding an optical disc comprising a first mold member having a first cavity surface and a second mold member movable relative to said first mold member and having a second cavity surface, said first and second cavity surfaces jointly providing a mold cavity when said first and second mold members are mated together, said second cavity surface having a flat seat surface detachably holding a disc-shaped thin stamper thereon when molding said optical disc, said flat seat surface being made of a sintered ceramic material having Rockwell hardness (A-Scale) of not less than 90.

4,783,042
FLEXIBLE MOULD FOR FREEZING SMALL BODIES OF ICE AND AN ICE-MOULDING SET WITH SUCH A MOULD
Jan Folkmar, Zurich, Switzerland, assignor to Ice-Pack Service AG, Otelfinge, Switzerland
PCT No. PCT/EP86/00448, § 371 Date Apr. 3, 1987, § 102(e) Date Apr. 3, 1987, PCT Pub. No. WO87/01183, PCT Pub. Date Feb. 26, 1987
PCT Filed Jul. 29, 1986, Ser. No. 52,081
Claims priority, application Denmark, Aug. 12, 1985, 3655/85; Aug. 20, 1985, 3781/85
Int. Cl.[4] A23G *9/00*
U.S. Cl. 249—127 **8 Claims**



1. A flexible mould for freezing small bodies of ice, said mould having the shape of a bag with a filling duct for filling the bag with a liquid, said mould further comprising opposed walls, said walls having bonding areas of a first type, said bonding areas of the first type forming boundries of said filling duct and further defining elongated connecting areas between the walls of said bag and connecting lines along the edges of the bag, the elongated connecting areas being arranged along several lines and rows dividing the bag into a plurality of compartments with channels between adjacent compartments as fluid connections between adjacent compartments, said bonding areas of the first type comprising relatively weak bonding means allowing the opposite walls to be pulled apart without destroying or damaging the walls themselves, said bonding areas of the first type being loosenable from each other over their entire connecting area to change the bag with compartments into a bag without compartments.

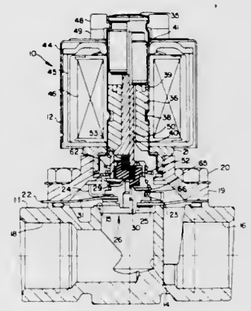
4,783,043
HYDRAULIC SNUB VALVE
David J. Koerber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed May 4, 1987, Ser. No. 46,471
Int. Cl.[4] G05D *7/01*
U.S. Cl. 251—16 **5 Claims**



1. A valve, comprising:
a piston member slidably disposed in a cylinder, said cylinder having a first end and a second end;
an inlet port of said valve;
an outlet port of said valve;
first means for providing a first flow path from said inlet port to said outlet port, said first flow path extending through said second end of said cylinder;
second means for providing a second flow path from said inlet port to said outlet port, said second flow path extending through said piston member;
third means for providing a third flow path from said inlet port to said first end of said cylinder, said third flow path extending through an opening in an orifice plate disposed at said first end of said cylinder, said piston member being configured to be movable in a direction away from said first end of said cylinder toward said second end of said cylinder in a predetermined length of time in response to a flow of fluid from said inlet into said cylinder through said opening in said orifice plate, said predetermined length of time being a function of an amount of fluid flow through said valve subsequent to a beginning of fluid flow along said first flow path; and
means for blocking said first flow path, said second flow path being configured to bypass said blocking means.

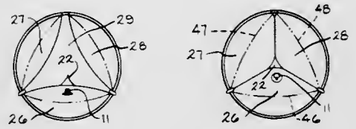
4,783,044
HUNG DIAPHRAGM SOLENOID VALVE
John E. Ellison, Mayfield Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Jun. 30, 1987, Ser. No. 68,591
Int. Cl.[4] F16K *31/385*
U.S. Cl. 251—30.02 **12 Claims**

1. A solenoid valve, comprising
a valve body having a central cylindrical bore extending along a vertical axis with an inlet port at one side of the body for receiving pressurized fluid and an outlet port at an opposing side of the body for discharging pressurized fluid,
a main valve seat in said central bore,
a diaphragm valve assembly supported in said body for movement toward and away from said main valve seat, said diaphragm valve assembly comprising a diaphragm valve, means for limiting valve movement and a pilot valve seat,
an enclosure tube vertically supported in said valve body,
a plunger assembly supported in said enclosure tube for movement toward and away from said pilot valve seat, said plunger assembly comprising a valve disc engageable with said pilot valve seat for controlling fluid flow therethrough, main spring means engaged between said



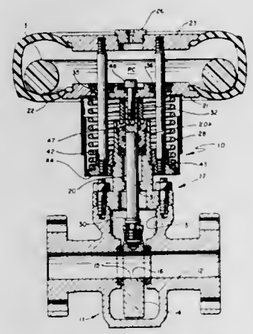
plunger assembly and said valve body for biasing said plunger assembly away from said valve seat and a plunger for moving said plunger assembly,
an electromagnet mounted on said body surrounding said enclosure tube for actuating said plunger in response to electrical current, and
a pickup spring joining said plunger assembly and said diaphragm valve assembly for providing bias force upon said diaphragm valve assembly.

4,783,045
INFLATABLE BLADDER FOR CONTROL OF FLUID FLOW
Jerry J. Tartaglino, 4911 W. Hanover, Dallas, Tex. 75209
Filed Jul. 29, 1987, Ser. No. 78,966
Int. Cl.[4] F16K *31/385*
U.S. Cl. 251—61.1 **21 Claims**



1. A fluid expansible portable bladder for insertion in a fluid flow passage for use as a damper in a fluid flow system comprising an assembly of a generally flat base layer of semi-flexible material having a shape memory,
an overlayer of fluid conformable material sealed at its edges to said base layer and
said assembly being sufficiently flexible to permit opposite edges of said assembly to be brought to each other to form a loop for flatly lining the interior surface of a fluid flow passage, the semi-flex property of said base layer being such that said loop can be manually collapsed for insertion in said fluid flow passage and having a shape memory such that upon release from a collapsed condition said assembly returns to said loop configuration to line said passage,
connection means associated with said assembly for connecting a supply of inflating fluid to said bladder,
said conformable overlayer being capable of accepting said fluid to expand the assembly,
the semi-flex property of said base layer being such that said base layer is flexed by pull forces at its edges and thereby internally stressed as said assembly expands whereby upon release of inflation pressure from the assembly said base layer exerts stress forces on said overlayer acting to return the assembly to its generally flat shape and thereby deflate said assembly.

4,783,046
PNEUMATIC VALVE ACTUATORS
Terry G. Young, and Neil H. Akkerman, both of Houston, Tex., assignors to AVA International Corporation, Houston, Tex.
Filed Apr. 24, 1987, Ser. No. 42,422
Int. Cl.[4] F16K *31/126*
U.S. Cl. 251—61.4 **10 Claims**



1. For use with a valve including a valve body having a flowway therethrough and a closure member reciprocable in the body between positions opening and closing the flowway, a pneumatic actuator comprising
a stem adapted to extend sealably into the valve body and having an inner end connectable to the closure member for reciprocating it between open and closed positions,
a first plate connected to the outer end of the stem,
a rubber tire casing having an inner edge connected to the first plate,
a second plate connected to the other inner edge of the casing to form an expandable and contractible pressure chamber within the casing and between the plates,
means extending sealably through the first plate for connecting the second plate to the valve body means forming a sliding seal between the connecting means and the first plate to prevent the loss of pressure fluid from the chamber, and
means for selectively admitting air pressure to the pressure chamber in order to move the first plate away from the second plate and thereby move the closure member to one of its positions, or exhausting air pressure therefrom to permit the first plate to be moved toward the second plate in order to move the closure member to its other position.

4,783,047
VALVE MECHANISM
George T. Baltus, and Raymond Warmuz, both of Tonawanda, N.Y., assignors to HSC Controls, Inc., Buffalo, N.Y.
Filed Feb. 9, 1987, Ser. No. 12,505
Int. Cl.[4] F16R *31/06*
U.S. Cl. 251—129.1 **7 Claims**

1. In an electromagnetic force motor operated valve for controlling the flow of fluid, the improvement comprising:
a valve member having a head portion defining a sealing surface and a bearing surface converging in a direction away from said sealing surface and towards an axis disposed to essentially centrally intersect with said sealing

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surface, and a shank portion arranged in alignment with said axis and projecting from said bearing surface in a direction away from said sealing surface;

a valve seat adapted to receive said sealing surface in fluid sealing relationship therewith;

a mounting member for mounting said valve member and being operably connected to said force motor for moving said valve member to position said sealing surface in and out of said sealing relationship, said mounting member having an opening facing towards said valve seat and sized to loosely receive said shank portion and an annular bearing edge portion bounding said opening relatively

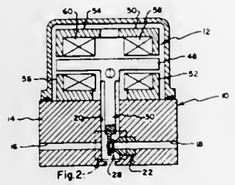


Fig. 2

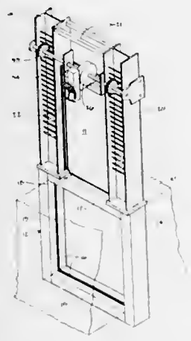
adjacent said valve seat, said bearing edge portion defining a seat for supporting said bearing surface to permit said valve member to undergo rotatable/tilting movement relative to said mounting member and to assume an adjusted position relative thereto, during initial assembly of said valve, as required to permit seating of said sealing surface in said sealing relationship with said valve seat incident to movement of said valve member towards said valve seat by said mounting member; and

retaining means operable after said initial assembly for thereafter retaining said valve member in said adjusted position relative to said mounting member.

4,783,048
SLIDE GATE DAMPER SYSTEM

Thomas W. St. Clair, 2119 Cathedral Ave., Cincinnati, Ohio 45212

Filed Dec. 17, 1987, Ser. No. 134,194
Int. Cl.[4] F16K *31/05*
U.S. Cl. 251—129.11 **12 Claims**



1. A slide gate damper system having reduced overall weight, support structure and drive components for use in a duct, comprising:

(a) a duct frame adapted for mounting in the duct with means to receive a slide gate;

(b) a gate support frame mounted outside the duct in association with the duct frame;

(c) guide rails positioned on substantially parallel members of the gate support frame;

(d) a slide gate positioned within the gate support frame such that it will ride along the guide rails;

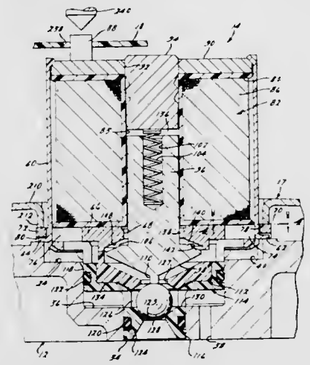
(e) a power source mounted on the slide gate and movable therewith; and

(f) a drive mechanism operably connecting the power source to the gate support frame such that actuation of the power source causes the slide gate to move along the guide rails to effect an opening or closing of the duct.

4,783,049
ELECTRICALLY OPERATED AUTOMATIC TRANSMISSION CONTROLLER ASSEMBLY

Bradley L. Northman, Southfield; Michael Slavin, Troy, and Donald J. West, Warren, all of Mich., assignors to Lectron Products, Inc., Rochester Hills, Mich.

Division of Ser. No. 843,164, Mar. 24, 1986, Pat. No. 4,678,006.
This application Apr. 13, 1987, Ser. No. 37,467
Int. Cl.[4] F15B *13/044;* **F16K** *31/06*
U.S. Cl. 251—129.14 **4 Claims**



1. A solenoid assembly, comprising:

an energization coil defining a longitudinal bore,

a pole means defining a generally flat first surface disposed in said bore,

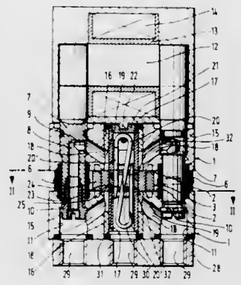
a movable armature disposed in said bore and adapted to translate in said bore along an axis in response to energization of said coil, said armature defining a generally flat second surface which confronts said first surface of said pole means, said first and second surfaces being generally perpendicular to said axis and defining a first working air gap across which magnetic fields are transferred thereby generating an attracting force between said pole means and said armature urging said armature to move in said bore along said axis, said armature further defining a conical shaped third surface,

a flux collector plate defining a conical shaped fourth surface which confronts said armature third surface, said third and fourth surfaces defining a second working air gap across which magnetic fields are transferred thereby generating an attracting force between said flux collector plate and said armature, said attracting force having a component which acts along said axis, thereby augmenting the attracting force acting across said first air gap.

4,783,050
MAGNETIC VALVE FOR LIQUID AND GASEOUS MEDIA

Klaus Hügler, Schorndorf, Fed. Rep. of Germany, assignor to ASYS GmbH, Schorndorf, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 63,879
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620818
Int. Cl.[4] F16K *31/06, 11/06, 3/02*
U.S. Cl. 251—129.16 **32 Claims**

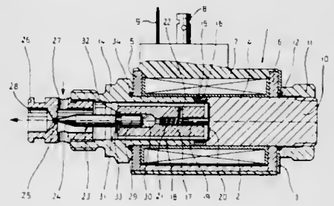


1. Magnetic valve for liquid and gaseous media having a flat-body slide valve which can slide with the aid of electromagnetic forces between two planar-parallel slide surfaces which include slide surface control openings, said flat-body slide valve comprising a core polarized by at least one stationary permanent magnet; at least one opening in said core perpendicular to said planar-parallel slide surface; a pressure chamber formed in said core and having an end wall at both sides thereof; a cover surface bordering an end wall of said pressure chamber; at least two pairs of inversely corresponding control openings; and at least one connection bore having an opening at either end thereof and in fluid communication with said pressure chamber, the edges of said connection bore openings serving to form control edges for said at least two pairs of control openings.

4,783,051
MAGNETIC VALVE

Christoph Gibas, Neunkirchen, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Gerate GmbH, Sulzbach/Saar, Fed. Rep. of Germany

PCT No. PCT/DE86/00321, § 371 Date Apr. 1, 1987, § 102(e) Date Apr. 1, 1987, PCT Pub. No. WO87/00903, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 6, 1986, Ser. No. 36,000
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528296
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.19 **3 Claims**



1. A solenoid valve, comprising:

a control magnet;

an armature mounted within said magnet for reciprocating movement;

a conical valve seat;

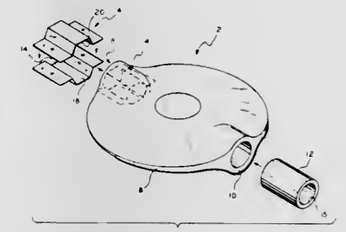
a valve member movable toward and away from said valve seat; and

coupling means for connecting said armature and said valve member such that said armature actuates movement of said valve member relative to said valve seat and for permitting limited relative axial and radial movement of said armature and said valve member, said coupling means including an annular groove in said valve member and a sliding disk fixed against said armature by a flanged, ring-like projection, said sliding disk being generally U-shaped and insertable in a radial direction into said annular groove in said valve member, said groove having axial ends defined by shoulders on said valve member, said shoulders being spaced apart by a distance greater than a thickness of said sliding disk to permit the limited relative axial movement between said armature and said valve member.

4,783,052
COMPOSITE ARTICLE HAVING INSERT

Larry J. Walden, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 13, 1987, Ser. No. 120,295
Int. Cl.[4] F16K *1/22*
U.S. Cl. 251—368 **11 Claims**



1. A valve element formed from a thermoplastic matrix containing fiber reinforcement, said valve element having a disc-like shape and an outer generally circular circumference through which extends a disc plane of symmetry and a pair of opposed bores extending generally diametrically inwardly toward the center of the disc from the outer circumference; at least one of said opposed bores being at least partly defined by an insert which is encapsulated by the thermoplastic matrix so as to form an integral part of the valve element, wherein the insert is characterized as a tube having a pair of opposed generally radially outwardly protruding fins extending generally longitudinally along an exterior surface of said tube, said opposed fins being positioned generally in the disc plane.

4,783,053
DEVICE FOR FORCE-OPENING DOORS

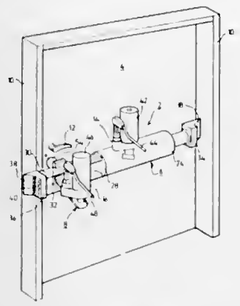
Mordechai Yirmiyahu, Ancio Sereni Street 17, Givatayim, and Benyamin Yirmiyahu, Maimon Street 52, Bnei-Brak, both of Israel

Filed Jun. 2, 1987, Ser. No. 56,697
Claims priority, application Israel, Nov. 7, 1986, 80536
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—93 R **15 Claims**

1. A device for force-opening doors, comprising: an anchoring member including two sections relatively movable from a retracted position permitting the anchoring member to be applied between the doorframe posts on opposite sides of the door, to an extended position bringing the opposite ends of the

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two sections of the anchoring member into firm engagement with the doorframe posts; each of said opposite ends of the two sections of the anchoring member including a plate having a wedge at one side for wedging the plate between the door and the respective doorframe post, and at the opposite side, a face extending transversely to the longitudinal axis of the respective section and formed with a plurality of teeth which become embedded in the respective doorframe post when the two sections are moved to their extended positions, and thereby



firmly anchor the anchoring member between the two doorframe posts; and a ram member carried by the anchoring member for engagement with the door when the anchoring member is anchored to the doorframe posts transversely across the door; said ram member including a force-multiplying device for producing a large force against the door to force-open it; said anchoring member also including a force-multiplying device for moving the two sections of the anchoring member into firm engagement with the doorframe posts.

4,783,054

PNEUMATIC DEVICE FOR FITTING CABLES IN A TUBE

Jacques Morel, Fontaine-Les-Ribouts, and Didier Morel, Favieres, both of France, assignors to Etablissements Morel - Ateliers Electromecaniques De Favieres, Chateauneuf-En-Thymerais, France

Filed Jun. 1, 1987, Ser. No. 56,064
Claims priority, application France, May 30, 1986, 86 07820
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—134.4 **10 Claims**



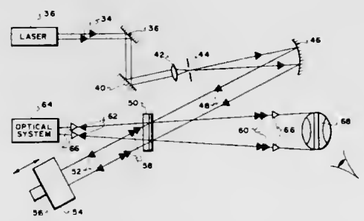
1. A pneumatic device for fitting cables in a tube (1), comprising a capsule (6) adapted to be introduced inside the tube and connected to a line (7) used to pull the cable inside the tube, a unit (9) provided with means (20) for connection to a compressed air source and a compressed air outlet connector (18) being adapted to be connected in substantially sealing-tight relationship to one of the ends of the tube (1), said unit (9) comprising means (19, 23) for distributing compressed air to the outlet connector (18), said means co-operating with means (32, 28, 29) to discharge the compressed air from the unit in the event of an excess pressure downstream of the unit outlet connector (18), wherein the unit (9) comprises a chamber (19) in which a compressed air distributor (23) is mounted slidably between two abutments, said chamber having a lateral intake port (24), one (19*a*) of the ends of said chamber communicating with the outlet connector (18) and the other end (21) of said chamber communicating with a tube (27) provided with means for closing the compressed air passage, a lateral exhaust port (28) is provided between the lateral intake port (24) to the chamber (19) and the end thereof adjacent the connector, a ring (32) is disposed inside the chamber (19) and around the distributor (23) and is slidable together with the distributor (23) into a position in which said ring and said distributor define between them a free passage (33) for the compressed air to the connector and in which the ring (32) closes the lateral exhaust port (28), and in the event of an excess pressure downstream of the chamber (19) the ring (32) can slide into a position situated upstream of the previous position in which said ring frees the lateral exhaust port (28).

4,783,055

HOLOGRAPHIC INTERFEROMETER

Kenneth C. Widen, Topanga, and Richard H. Burns, N. Hollywood, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 18, 1987, Ser. No. 98,267
Int. Cl.[4] G01B *9/021*
U.S. Cl. 356—348 **17 Claims**



13. A method for testing an optical system having an optical axis and a desired optical wavefront, comprising the steps of:

providing a hologram containing a recording of said desired optical wavefront, said hologram being located on said optical axis;

producing said desired optical wavefront, said desired optical wavefront being directed toward said optical system and retroreflected therefrom containing any aberrations of the optical system under test, the retroreflected wavefront being passed through said hologram; and

producing a reference wavefront which is substantially conjugate to said desired optical wavefront, said reference wavefront interfering with said retroreflected desired optical wavefront thereby producing an interference fringe pattern characterizing the optical system under test.

4,783,056

PROCESS FOR MAKING AN ASEPTIC VIAL AND CAP

Robert S. Abrams, 21 Marion Ave., Albany, N.Y. 12203

Filed Nov. 10, 1986, Ser. No. 928,475
Int. Cl.[4] B29C *45/04*
U.S. Cl. 264—40.5 **12 Claims**

1. A process for forming an aseptic vial with a cap, comprising the steps of:

injecting a molten material into a mold cavity defined on one side by an end mold part and an interior mold part and on the other side by a second mold part wherein said interior mold part is in contact with said second mold part;

forming from the molten material a vial and cap with annular regions for interlocking with one another, said regions including rounded transition surfaces for accommodating each other, wherein portions of the vial and cap are formed between the interior mold part and the second mold part and between the end mold part and the interior and second mold parts;

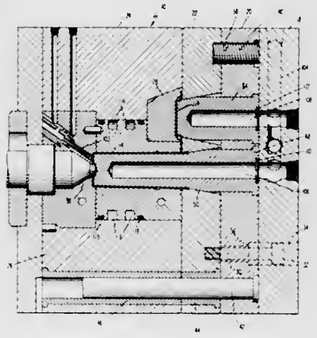
venting from the mold cavity gases that are released from the molten plastic during the injecting step;

cooling the vial and cap to about 100°-120° F.;

maintaining the interior of the vial in an aseptic condition within the mold;

retracting the end mold part from the interior mold part to separate the end mold part from the vial and cap;

pressing the interior mold part directly against the second mold part while retracting the end mold part from the interior mold part and the vial and cap to retain the vial and cap within the second mold part by holding said portions of the vial and cap between the second mold part and the interior mold part while the second mold part is in direct contact with the interior mold part;



retracting the interior mold part from the second mold part and the vial and cap;

sealing the cap on the vial by pivoting a pivotable mold part from an original position to a sealing position and back to the original position, so as to guide, by means of the rounded transition surfaces, the annular regions of the vial and cap for interlocking with one another;

sensing when the pivotable mold part is in an original position;

ejecting the vial from the mold; and

returning the end and interior mold parts to the second mold part when the pivotable mold part is in the original position.

4,783,057

METAL REFINING WITH REFRACTORY COATED PIPE

Harry P. Sullins, Blythewood, S.C., assignor to Richland Industrial, Inc. of Columbia, SC, Columbia, S.C.

Division of Ser. No. 903,794, Sep. 4, 1986, Pat. No. 4,729,548. This application Dec. 21, 1987, Ser. No. 135,214
Int. Cl.[4] C21C *5/32*; C21B *7/16*
U.S. Cl. 266—44 **29 Claims**

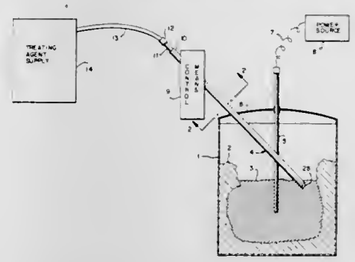
1. A method of refining a molten metal composition comprising:

mixing a dry refractory mortar with water to provide a liquid refractory mixture;

impregnating a water absorbent web of fibrous material with said mixture;

coating a surface of a metal pipe by placing at least one layer of said impregnated web on said surface as a coating;

drying said coating to remove said water from said web and said liquid refractory mixture and to cause said liquid refractory mixture to set and dry as a chemically bonded refractory composition adhered to said metal surface and having said web embedded therein, said dry refractory mortar being suitable for laying refractory brick in the lining of metal refining furnaces and for causing said liquid refractory mixture when dried to form said chemically bonded refractory composition at ambient temperature and a ceramically bonded refractory composition at a fusing temperature above said ambient temperature; and,



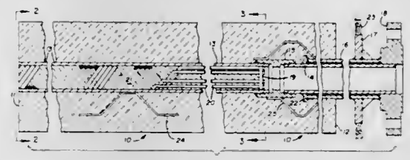
injecting a refining agent through said coated metal pipe into an area beneath the surface of a bath of said molten metal composition.

4,783,058

LANCE FOR TREATING MOLTEN METAL

Joseph A. Perri, Coraopolis, Pa., assignor to Insul Company, Inc., East Palestine, Ohio

Filed Jan. 11, 1988, Ser. No. 141,912
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—266 **7 Claims**



1. A lance for use in treating a bath of molten metal comprising an elongated tubular refractory body, a metal tube positioned axially in said elongated tubular refractory body, a plurality of smaller metal tubes positioned longitudinally in said metal tube, a portion of said plurality of smaller metal tubes being arranged in side by side relation in a spiral pattern in engagement with said metal tube throughout a section of said metal tube extending inwardly from one end thereof, an apertured partition in said metal tube, said smaller metal tubes engaging the apertures in said partition on one side thereof so as to communicate with a chamber on the other side of said partition, a refractory core in said metal tube between said partition and said one end thereof mechanically locking said plurality of smaller metal tubes in said pattern, means engaging said metal tube and extending outwardly of one end of said tubular refractory body by which said lance may be supported and connected with a source of gas to be directed therethrough.

4,783,059

TUYERE FOR TREATING MOLTEN METAL

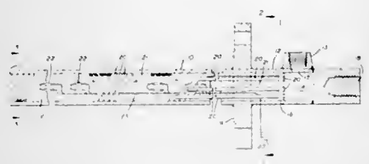
Joseph A. Perri, Coraopolis, Pa., assignor to Insul Company, Inc., East Palestine, Ohio

Filed Jan. 11, 1988, Ser. No. 141,911
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—266 **6 Claims**

1. A tuyere for use in treating a bath of molten metal comprising a tubular body member having a mounting flange mounted thereon inwardly of one end thereof and means for introducing gas into the tubular member adjacent said one end thereof, a chamber formed in said one end for receiving said gas and a plurality of small tubes communicating with said

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chamber and extending from said one end of said tubular body member to a discharge end thereof, a first portion of said small tubes being positioned in parallel relation to one another in a first portion of said tubular body member inwardly of said chamber and a second portion of said small tubes arranged in a spiral cofiguration engaging the inner surface of said tubular body member and extending to said discharge end of said



tuyere, a refractory core positioned in said tubular body member and in the area defined by said small tubes and a portion of each of said small tubes inwardly of said discharge end of said tuyere being partially flattened to form a modified oval shape whereby the ends of each of said small tubes forms an elongated narrow opening arranged to discharge gas into said molten metal bath tangentially with respect to said tuyere.

4,783,060

IMMERSION LANCE

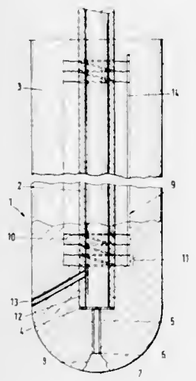
Erich Struzik, Solingen; Hans D. Hofmann, Neuwied, and Dirk Stein, Höhr-Grenzhausen, all of Fed. Rep. of Germany, assignors to Plibrico Company GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 88,419

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 8622299[U]; Jun. 13, 1987, 3719862

Int. Cl.[4] C21C *5/48*

U.S. Cl. 266—270 **10 Claims**



1. An immersion lance for the introduction of treatment media into a vessel filled with liquid metal, comprising:

an inner tube for supplying the medium and extending longitudinally in an axial direction;

a refractory monolithic ceramic jacketing; and

means for retaining said jacketing, said retaining means including a reinforcement element with at least one ribbed band spirally wound around and against said inner tube, said ribbed band having rib members extending outward in a radial direction so as to define a width that is a plurality of times wider than said rib members are thick in said axial direction, said rib members having first portions extending transversely with respect to said inner tube so as to have uniform spacings between said rib members, said rib members also having second portions spirally inclined between said first portions and which bear against said inner tube, said ribbed band being connected to said inner tube.

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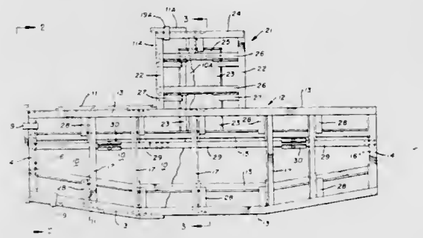
TUNDISH LINER

Michael D. LaBate, Ellwood City, and Joseph A. Perri, Coraopolis, both of Pa., assignors to Insul Company, Inc., East Palestine, Ohio

Filed Jun. 12, 1987, Ser. No. 61,158

Int. Cl.[4] C21C *5/44*

U.S. Cl. 266—281 **6 Claims**



1. A liner for a tundish for handling hot metal comprising a support frame in a configuration insertable into said tundish and extending throughout the tundish and a plurality of planar preformed inserts of combustible material positioned on said support frame so as to be held and supported in a configuration matching said support frame, said support frame having an elongated support member positioned longitudinally thereof and means on said elongated member for engagement with lifting means.

4,783,062

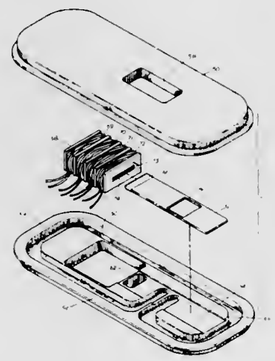
ELECTRONIC HYDRAULIC MOUNT-INTERNAL SOLENOID

James P. Hamberg, and John F. Hoying, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 1, 1987, Ser. No. 68,428

Int. Cl.[4] F16F *9/34*

U.S. Cl. 267—140.1 **1 Claim**



1. A hydraulic mount assembly providing variable damping characteristics, comprising:

a pair of mounting members;

a hollow body connected to said mounting members;

a resilient diaphragm closing said hollow body and forming therewith a closed cavity that is filled with liquid;

means for partitioning said cavity into a primary chamber and a secondary chamber enclosed by said diaphragm, said partitioning means including at least two distinct flow passages communicating between said chambers;

gate means for selectively directing a variable flow of liquid between said chambers through said passages;

track means on said means for partitioning said cavity, said gate means being adapted for sliding movement along said track means;

solenoid means on said means for partitioning said cavity, said solenoid means being adapted to positively position an opening in said gate means in alignment with a selected passage so as to provide the desired damping to said hydraulic mount assembly;

means for sensing vehicle operating conditions and resulting vibrations; and

means for controlling said solenoid means in response to said means for sensing vehicle operating conditions;

said solenoid means including a series of electrical coils connected to a voltage source responsive to said controlling means and said gate means including magnetic material so as to be magnetically responsive to the magnetic force produced by said electric coils whereby the mount assembly damping characteristics are actively tuned.

4,783,063

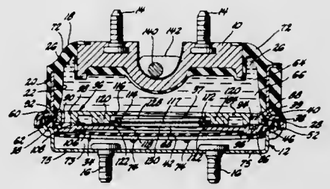
HYDRAULIC-ELASTOMERIC MOUNT DISPLACEMENT DECOUPLER

Edward P. Probst, Dayton, and Frederick C. Miller, Beavercreek, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 30, 1987, Ser. No. 8,851

Int. Cl.[4] F16M *5/00;* **F16F** *13/00*

U.S. Cl. 267—140.1 **3 Claims**



1. A hydraulic-elastomeric mount comprising a pair of mounting members, a hollow elastomeric body interconnecting said mounting members, an elastomeric diaphragm closing said elastomeric body and forming therewith a closed cavity that is filled with liquid, a rigid partition permanently sealingly mounted at and about the periphery thereof in said mount and spanning said cavity so as to divide same into a chamber enclosed by said elastomeric body and a chamber enclosed by said diaphragm, and said partition having an elongated orifice extended therethrough connecting said chambers to effect damping, characterized by said partition having a limited substantially free travel connectors with said mount below a predetermined vibration amplitude of one mounting member and an imperforate hydraulic damping decoupler means mounted in said partition between said chambers for free limited reciprocal movement in said partition in response to alternating pressure buildup in said chambers so as to effect cyclic volume change in said chambers to thereby permit relative vibration of said mounting members below a prescribed amplitude level without forcing liquid through said orifice and thus without hydraulic damping, and said decoupler means including a rigid hollow frame member centrally supporting an elastic membrane that is exposed on opposite sides to the respective chambers and operable following said free limited reciprocal movement to then flex relative to said frame in response to alternating pressure buildup in said chambers to effect additional cyclic volume change in said chambers to permit relative vibration of said mounting members without forcing a significant amount of liquid through said orifice and thus without significant-hydraulic damping supplementary to that provided by the travel of said decoupler means apart from flexing of said membrane.

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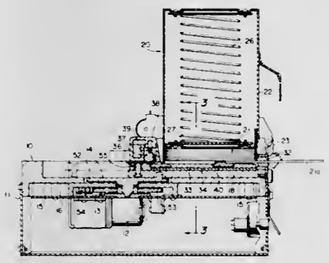
CARD FEEDING MECHANISM

Hiroshi Hayashi, Sakado, Japan, assignor to Nippon Coinco Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,821

Int. Cl.[4] B65H *3/24*

U.S. Cl. 271—131 **10 Claims**



1. A card feeding mechanism comprising: a container for storing therein a stack of cards; a slider supported to undergo reciprocating movement on a reference surface positioned below the card stack; and a picker carried on the slider and operatively engaged with an edge of the lowermost card of the card stack to feed only the lowermost card as the slider moves, said picker being formed of a rigid and hard material capable of withstanding wear, said picker having in its surface a slot extending in a direction at a right angle to the moving direction of the slider, one of two slot edges which are opposed to each other relative to the slot being arranged at a higher position than the other slot edge to define a step at a level determined relative to a thickness of the card such that the step is adapted to engage with the edge of the lowermost card, said picker having a first horizontal surface extending adjacent to said one slot edge, a second horizontal surface extending adjacent to the other slot edge, and an inclined surface adjacent to the second horizontal surface.

4,783,065

FEEDER APPARATUS FOR FEEDING SHEET MATERIAL SECTIONS

Glen L. Graves, Sr., 19806 Mueschke Rd., Tomball, Tex. 77375

Continuation-in-part of Ser. No. 528,076, Aug. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 379,701, May 19, 1982, abandoned. This application Apr. 26, 1985, Ser. No. 727,908

Int. Cl.[4] B65H *29/16*

U.S. Cl. 271—151 **30 Claims**

1. Feeder apparatus for feeding sheet material sections successively into a receiving hopper from a bundle of stacked sheet material sections, the apparatus comprising:

(a) a shingling section including a shingling conveyor for receiving such a bundle and conveying such a bundle along the shingling section, and including a shingling belt system to engage such a bundle being conveyed by the shingling conveyor, the shingling belt system and shingling conveyor operating cooperatively to contact the

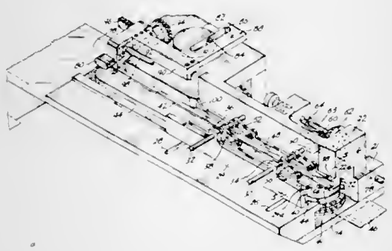
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handle and shingle the sheet material sections of such a bundle into a shingled arrangement, the shingling conveyor and shingling belt system being arranged to engage such a shingled, arrangement between them and advance such arrangement in an engaged condition along the shingling section, and



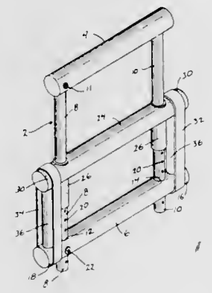
(b) a discharge section for receiving such a shingled arrangement from the shingling section, and for discharging such sheet material sections successively into a receiving hopper.

4,783,066
PHOTOGRAPHIC FILM STACKING DEVICE
Paul D. Barker, Kirkland; David L. Davis, Indianola; Allen E. Fleckenstein, Bellevue, and Hans-Ulrich Schlapfer, Seattle, all of Wash., assignors to CX Corporation, Seattle, Wash.
Filed Sep. 2, 1986, Ser. No. 903,542
Int. Cl.[4] B65H *29/44*
U.S. Cl. 271—180 **7 Claims**



1. An apparatus for stacking strips of film comprising:
a base;
first and second channel-defining members mounted on said base in spaced parallel relationship to one another defining between them a channel;
first and second shelf members rigidly mounted on and extending orthogonally from, respectively, said first and second channel-defining members and constructed and arranged to divide said channel into an upper portion and a lower portion, said first and second shelf members being spaced from one another;
first and second elongate rails parallel to one another and spaced from one another, said rails movably mounted on said channel-defining members for movement from a first position in which said rails are located above, respectively, said first and second shelf members to a second position wherein said rails are located below said shelf members;
pusher means movably mounted on said base for movement through said lower portion of said channel in a first direction from a first end to a second end;
rail guide means associated with said rails and said channel-defining members for providing a component of motion of said rails in said first direction as said rails move from their first position to their second position; and
control means associated with said rails and said pusher means for controlling the movement of said rails between said first and second positions and movement of said pusher means through said lower portion of said channel in a timed relationship to one another.

4,783,067
HAND EXERCISER DEVICE
David L. Palmer, 6606 Wallis Rd., West Palm Beach, Fla. 33413
Filed Mar. 24, 1987, Ser. No. 29,576
Int. Cl.[4] A63B *11/08, 21/14, 21/30*
U.S. Cl. 272—68 **5 Claims**

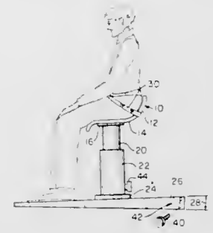


1. An exerciser device having a frame, said frame including a first hand grip rod and a second hand grip rod spaced therefrom, first and second spaced elongated members, first connecting means connecting said first elongated member to said first hand grip rod, second connecting means connecting said second elongated member to said first hand grip rod, third connecting means connecting said first elongated member to said spaced second hand grip rod, fourth connecting means connecting said second elongated member to said spaced second hand grip rod, a third hand grip rod, means mounting said third hand grip rod for slidable movement on said first and second elongated members, means biasing said third hand grip rod towards said second hand grip rod, spacer means between said second hand grip rod and third hand grip rod to limit the minimum spacing therebetween, said biasing means biasing said third hand grip rod against said spacer means, said biasing means located outside of said frame so that there is no interference with any hand grip rod, said first and second connecting means including means for readily disconnecting and connecting said first hand grip rod from said first and second elongated members so that said first hand grip rod can be removed and said second hand grip rod can be grasped by one's hand and said third hand grip rod can be grasped by one's other hand to pull said second and third hand grip rods apart against the force of said biasing means as an alternative to using the device as a single hand grip exerciser.

4,783,068
APPARATUS FOR ENHANCING VERTICAL JUMP CAPABILITY
Jaime Fahey, P.O. Box 635, 25 Edgewater Dr., Matawan, N.J. 07747
Filed Sep. 21, 1987, Ser. No. 99,016
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—144 **8 Claims**

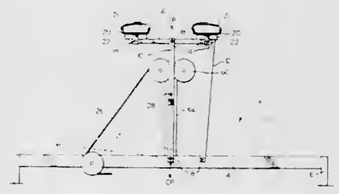
1. Apparatus for enhancing vertical jump capability, comprising:
a platform;

a chair incorporating securing means for controllably constraining a user to be seated therein;
and means for connecting said chair to said platform, with said means including connecting and resistance means



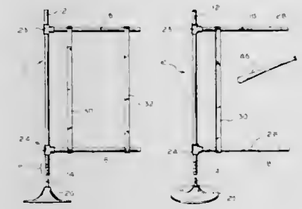
being upwardly movable in a direction from said platform towards said chair under the force of a user attempting to stand from a seated position, said resistance means including an adjustable control inorder to vary the amount of resistance.

4,783,069
SKI MACHINE
John J. Cottee, Kanata, Canada, assignor to Dryland Kinetics, Inc., Kanata, Canada
Filed Mar. 23, 1987, Ser. No. 28,776
Int. Cl.[4] A63B *69/18*
U.S. Cl. 272—97 **17 Claims**



1. An exercising and training apparatus particularly for use for training alpine skiers, the apparatus comprising:
(a) a rigid frame;
(b) a platform for the feet of a user;
(c) elongated bar means pivotably secured to and extending between the platform and the frame to permit the platform to move, during operation from side-to-side, from a central position through a convex arcuate path, to provide forced lateral motion and an accentuated degree of forced vertical motion for the user's feet, and to tilt the platform during operation to the outside as it moves through its arcuate path;
(d) biasing means comprising spring, cable and pulley means, the spring and cable means secured to the frame, the cable means secured to the spring means and extending around the pulley means and secured to the elongated bar means, the spring, cable and pulley means arranged to provide increased resistance to the motion of the platform as it moves, during operation, an increased distance sideways in either direction away from the central position and to finally stop that sideways movement and cause the platform to move in the opposite direction; and
(e) rigid user support means secured to the frame to be gripped by the user for balance during operation of the apparatus.

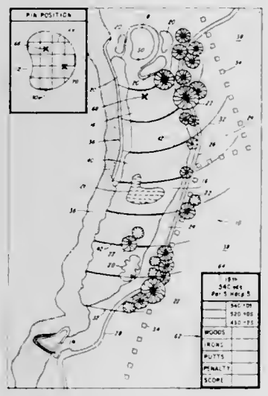
4,783,070
TARGET TEACHING AID
Ronald D. Bauer, 503 Robert Dr., Glenwood, Ill. 60425, and Jonathan E. Voyles, 2424 S. 20th Ave., Broadview, Ill. 60153
Filed Jan. 21, 1987, Ser. No. 6,388
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 A **13 Claims**



1. A baseball pitcher's practice target comprising a frame having at least one vertical and two horizontal frame members joined together to form the frame in an F shape, a pair of spaced parallel vertical boundary marker means extending between the horizontal frame members in said F shape whereby the target is defined by a window of space within the area between the horizontal frame members and the vertical marker means, means for marking a limited distance along the length of said horizontal frame members to fix and define the width between said vertical boundary marker means of said window of space forming said target area and means for supporting said target on a support surface

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4,783,071
GOLF COURSE PIN DISTANCE DETERMINATION DEVICE
Harold D. Tattershall, 3585 Rancho Vista Way, Sacremento, Calif. 95834
Filed Aug. 12, 1987, Ser. No. 84,344
Int. Cl.[4] A63B *67/02*
U.S. Cl. 273—32 H **7 Claims**

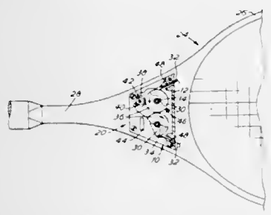


1. A golf course pin distance determination device comprising a plurality of map sheets correlated to the holes of a golf course, said map sheets including, for each hole,
a. a first map depicting an aerial representation of a golf hole;
b a first point on said first map corresponding to an established reference point on the ground

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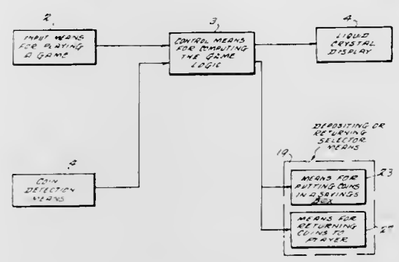
adjacent the putting green of the golf hole;
c. a plurality of concentric arcs on said first map, said arcs being centered on said first point and spaced apart predetermined radial distances scaled to the respective actual distances on the ground;
d. a second map depicting to an enlarged scale the putting green portion of said golf hole as appears on said first map;
e. a second point on said second map corresponding to said first point on said first map, said first point and said second point being located at the portion of the putting green closest to the tee of said golf hole;
f. a scaled grid on said second map; and,
g. means for indicating on said second map the present position of the pin on the putting green.

4,783,072
SPORTING EQUIPMENT
Lawrence Haar, 8519 E. Belgian Trail, Scottsdale, Ariz. 85258
Filed Aug. 20, 1987, Ser. No. 87,381
Claims priority, application Zimbabwe, Aug. 27, 1986, 173/86
Int. Cl.⁴ A63B *51/12*
U.S. Cl. 273—73 E **6 Claims**



1. A stringed sporting implement having
(a) a head having
(i) string holes therethrough,
(ii) a groove running along at least a portion of its outside periphery and communicating with at least some of the string holes, and
(iii) holding means located at least opposite the said groove;
(b) string means with which the said head is strung, the string means comprising
(i) a master string the major portion of which lies in the said groove,
(ii) a plurality of head strings that pass through the said string holes in the head, the said head strings
(A) at one end thereof having stop means which cooperate with the said holding means to retain the head strings said ends of to the head, and
(B) being connected at their other ends to the said master string; and
(c) a tensioning device comprising
(i) at least one member connected to the master string, and
(ii) means for moving the said member so as to vary the tension of the strings, and
(iv) retaining means to prevent unwanted movement of the said member.

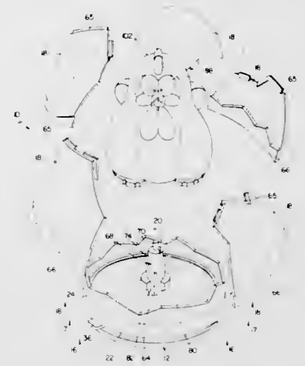
4,783,073
LIQUID CRYSTAL DISPLAY GAMING APPARATUS EQUIPPED WITH A SAVINGS BOX
Chiba Kazumi, 369-33 Honmokumotomachi Naka-ku, Yokohama-shi, Kanagawa 231, Japan
PCT No. PCT/JP84/00540, § 371 Date Aug. 22, 1986, § 102(e) Date Aug. 22, 1986, PCT Pub. No. WO86/02854, PCT Pub. Date May 22, 1986
PCT Filed Nov. 9, 1984, Ser. No. 870,277
Int. Cl.⁴ A63F *1/00, 9/00*
U.S. Cl. 273—85 CP **3 Claims**



1. A savings box gaming apparatus comprising:
a housing;
a liquid crystal display means mounted on said housing for displaying a game to be played and the results thereof;
manually operable means on said housing for playing the game;
control means within said housing connected to said display means and to said manually operable means for controlling said display means in response to the manual operation of said manually operable means according to a stored logic and determining whether the game has been won according to said stored logic;
a coin storage box within said housing;
a coin receiving slot and a coin return on the exterior of said housing;
means defining coin passage including a first path from said receiving slot to a fork, a second path leading from said fork to said coin return and a third path from said fork to said coin storage box;
means connected to said control means for detecting insertion of a coin to initiate a game;
a gate means in said housing for holding said inserted coin in said first path during the game, releasing said inserted coin into said second path when said control means determines the game has been won and into said third path when said control means determines the game has been lost.

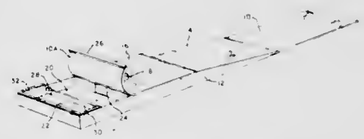
4,783,074
PUZZLE WITH TIMER CONTROLLED DISASSEMBLING MEANS
Toshio Kobayashi, Chiba, Japan, assignor to Asahi Corporation, Tokyo, Japan
Filed Aug. 5, 1987, Ser. No. 82,096
Claims priority, application Japan, Aug. 7, 1986, 61-185885
Int. Cl.⁴ A63F *9/12*
U.S. Cl. 273—157 R **11 Claims**

1. An action toy game device comprising a base, a timer on said base, puzzle means including a plurality of puzzle elements adapted to be assembled in predetermined assembled positions on said base, and disassembling means on said base responsive to said timer for disassembling any assembled puzzle elements on said base upon the expiration of a set period of time, said disassembling means including means responsive to the placement of at least one of said puzzle elements in the assembled position thereof prior to the expiration of said set period of



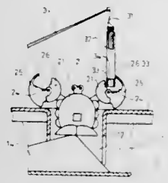
time for preventing disassembly of said puzzle elements by said disassembling means.

4,783,075
GOLF PRACTICE PUTTING DEVICE
Luther G. Simjian, Fort Lauderdale, Fla., assignor to Command Automation, Inc., Fort Lauderdale, Fla.
Filed Mar. 9, 1988, Ser. No. 165,805
Int. Cl.⁴ A63B *69/36*
U.S. Cl. 273—176 FA **10 Claims**



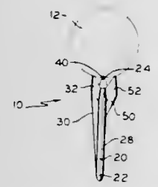
1. A golf practice putting device comprising:
a frame providing a ramp surface and an abutting elevated substantially level surface;
a first and second open top golf ball receiving receptacle located within said frame at said substantially level surface in proximity to the frame end opposite the abutment of said ramp and level surfaces;
an elongated mat covering said ramp surface and covering said abutting elevated surface including covering said first receptacle but leaving said second receptacle uncovered;
a golf ball receiving aperture disposed in said mat and frame on said elevated surface at a position forward of said receptacles in relation to a ball rolling upward on said ramp surface and over said level surface toward the position of said receptacles;
means communicating with said aperture and said first receptacle for guiding a golf ball entering said aperture into said first receptacle;
said mat being liftable from said first receptacle for exposing and retrieving golf balls disposed in said first receptacle; and
means attached to the underside of said mat in proximity to the area of said first receptacle for causing said mat to lie flat over said first receptacle;
whereby golf balls rolling over said ramp surface and said elevated surface but failing to enter said aperture roll over said first receptacle and drop into said uncovered second receptacle.

4,783,076
FISHING-CRAB TOYS
Cbing H. Lee, 14, Hsin Ping Rd., Tainan City, Taiwan
Filed Mar. 25, 1987, Ser. No. 29,814
Int. Cl.⁴ A63F *9/00*
U.S. Cl. 273—1 GG **3 Claims**



1. A fishing toy comprising;
a holder for toy crabs including a rotatable upper plate with a plurality of holes for receiving toy crabs therein, and a stationary lower plate with a raising and lowering rail for raising and lowering toy crabs which are located in said holes when the upper plate is rotated;
toy crabs for positioning in said holes, each crab having claws and associated hooked tooth members;
a fishing rod with a string and a triangular frame at a free end of the string for hooking the crabs when they are raised in the respective holes by said rail, the frame having an apex by which it is secured to the string and a base comprising to parallel rods with a space therebetween for catching the hooked tooth members of the respective toy crabs.

4,783,077
GOLF TEE
William C. Lemon, 594 Lucille Dr., Incline Village, Nev. 89450
Filed Oct. 9, 1986, Ser. No. 917,044
Int. Cl.⁴ A63B *57/00*
U.S. Cl. 273—211 **1 Claim**



1. A one-piece plastic golf tee comprising a straight elongated central pedestal with a longitudinal axis and having an elongated generally cylindrical central portion, a pointed end portion at its lower end to facilitate insertion of the golf tee into the ground and an upper, generally conical end portion having an upper transverse end surface; three flutes generally equiangularly spaced about and projecting radially outwardly from said central pedestal, the three flutes having three upper triangular end portions respectively, extending upwardly and radially outwardly from the central pedestal and having point-like vertices respectively, at the upper ends thereof, the three vertices being located in a common plane transverse to the longitudinal axis of the pedestal and above said upper end surface of the pedestal and having the same radial spacing from said longitudinal axis, the three vertices being spaced above the upper end surface of the pedestal to support a golf ball thereon directly above and in alignment with the pedestal, two of said flutes being substantially identical, relatively long, forward flutes extending from upper ends thereof downwardly and gradually tapering inwardly toward the pedestal to lower ends thereof above the lower end of the pedestal, the third of said flutes being a relatively short, rearward flute spaced evenly

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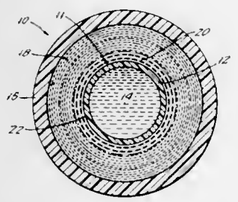
between the first and second forward flutes and extending from the upper end thereof downwardly and sharply tapering inwardly toward the pedestal to a lower end thereof substantially above the lower ends of the first and second forward flutes for use in combination with the forward flutes as a guide for positioning the golf tee with the rearward flute aligned with but extending in the opposite radial direction from the intended flight of a golf ball supported on the three flute vertices.

4,783,078

WOUND GOLF BALLS

Robert A. Brown, Mattapoisett, and John Giza, Acushnet, both of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Feb. 27, 1987, Ser. No. 19,878
Int. Cl.⁴ A63B *37/06*
U.S. Cl. 273—216 **5 Claims**



1. In a golf ball comprising a center, a cover and elastic thread wherein the elastic thread is wound around the center and positioned between the center and the cover, the improvement comprising said wound thread having the structural characteristics resulting from a two-step winding process for winding the elastic thread about the center consisting essentially of a first winding step wherein the elastic thread is wound at a constant low tension about the center for a period of time between 1½ to 18 seconds; and a second subsequent winding step wherein the elastic thread is wound at a constant high tension, the constant low tension being at least 20% below the tension of the constant high tension.

4,783,079

BOARD GAME

Randal S. Phelan, 17 Brentwood Cir., Lubbock, Tex. 79407

Filed Feb. 6, 1987, Ser. No. 11,528
Int. Cl.⁴ A63F *3/00*
U.S. Cl. 273—253 **17 Claims**



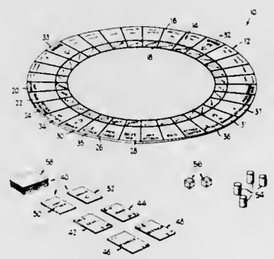
1. A space conquest board game comprising:
a planar game board having an outer perimeter;
said game board having a plurality of playing spaces grouped together by color;
each of said game board groups having a unique color selected from a plurality of different colors;
said game board having additional spaces along said outer perimeter;
said outer perimeter spaces each being marked with one of said plurality of different colors in a randomly alternating pattern;
each of said outer perimeter spaces being further marked with one of a plurality of differing random numbers
a plurality of playing markers to identify separate players;
a plurality of playing pieces for placement on said playing spaces corresponding to each of said playing markers;
said random numbers used to indicate how many of said playing pieces are to be placed on said playing spaces;
playing dice having the same number of sides and colors corresponding to said plurality of different colors; and
color wheels divided into the same number of colors corresponding to said plurality of different colors.

4,783,080

METHOD OF PLAYING A MILITARY BOARD GAME

Donald A. Rosenwinkel, Oak Park; John V. Zaruba, Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 20, 1987, Ser. No. 5,028
Int. Cl.⁴ A63F *3/00;* **A63B** *67/00*
U.S. Cl. 273—255 **6 Claims**



1. A method of playing a game including the steps of:
distributing a predetermined number of markers to each player from a supply of markers representing different types with various point values;
determining by operation of a chance device how far players are to proceed along a path of instructional spaces on a board;
challenging an opponent in accordance with instructions contained in the spaces, to a contest based on the markers held by the opposing players;
the challenging player selecting one of the different types of markers; and
determining the outcome of the contest as affected by the point values of the markers of the selected one type of marker.

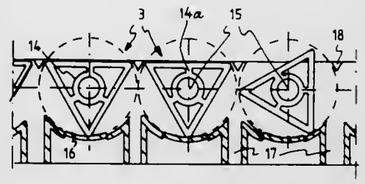
4,783,081

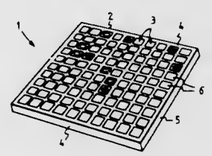
PLAYING OR GAMES BOARD ON WHICH SEVERAL GAMES CAN BE PLAYED

Albert H. Eckhardt, Dellenpartkweg 5, 8161 AP Epe, Netherlands

Filed Mar. 2, 1987, Ser. No. 20,543
Claims priority, application Netherlands, Mar. 5, 1986, 8600561
Int. Cl.⁴ A63F *3/00*
U.S. Cl. 273—281 **5 Claims**

1. A game board, comprising a substantially rectangular framework in which a plurality of elements are arranged in rows and columns so as to be rotatable about a plurality of axes of rotation which are parallel to one another, each of said elements having at least three playing faces of mutually different appearance, each of said playing faces capable of being directed outwards by rotation of said elements, said framework comprising at least one pair of parallel upright walls, between and parallel to said walls a plurality of upright partitions, equal in number to the number of rows of said elements minus one, said walls and said partitions being joined together near the top by narrow cross bar equal in number to the number of columns





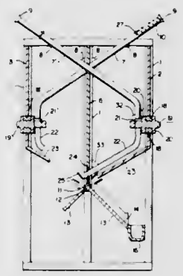
of said elements minus one so that the top plane of the board is divided by said partitions and said bars into rectangles, each of said rectangles accommodating one of said elements, each of said walls and each of said partitions being provided with a plurality of projections such that in each of said rectangles a pair of projections are situated such that said pair of projections face each other, and each of said elements being provided with a central cavity in each of the opposite side faces thereof for engagement and cooperation with said pair of said projections so as to provide for the rotatability of said elements.

4,783,082

COMPETITIVE GAME DEVICE

Chung C. Chen, Springfield, Va., assignor to Chun Nan (Ignatius) Chen, Taipei, Taiwan

Filed Nov. 12, 1987, Ser. No. 119,892
Int. Cl.⁴ A63F *7/02*
U.S. Cl. 273—357 **6 Claims**



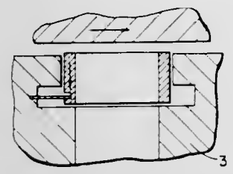
1. A competitive game device comprising:
a frame;
a plurality of balls;
a plurality of plates fixed to the frame for forming two subspaces;
a first set of tubes obliquely fastened to the frame with an upper portion of the tubes on the side of a first subspace and a lower portion thereof on the side of a second subspace;
a second set of tubes obliquely fastened to the frame with an upper portion of the tubes on the side of the second subspace and a lower portion thereof on the side of the first subspace;
at least one set of horizontal guide rails fastened to both the front side and the rear side of the frame;
at least two slidable blocks having funnel-shaped portions slidably mounted on each set of the guide rails;
at least two bellow-shaped tubes having upper ends thereof fastened to the slidable blocks and lower ends thereof penetrating through a central plate between the two subspaces and fixed on the central plate;
a supporting rod pivotably mounted on the frame;
at least two oblique collecting plates mounted on the supporting rod;
at least one basket for collecting balls removably mounted on the lower end of each of the collecting plates;
at least two source baskets for containing balls to be put into the device;
a pointer mounted on each of the two ends of the supporting rods; and
a scale for showing the result of the game.

4,783,083

FLUID PRESSURE OPERATED SEALING PROCESS AND SEALING MEANS

Felix Wankel, Fraunhoferstrasse 10, D-8990 Lindau, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,957
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626157
Int. Cl.⁴ F16J *15/46*
U.S. Cl. 277—1 **2 Claims**



1. A process for bringing about a seal between two machine parts (2,3) moveable relative to one another by means of a sealing part moveably held in one of the machine parts, in the case of changing pressures, wherein the moveable sealing part (1) is kept raised from the facing sealing surface (5) with a limited force in the differential pressure-less state and the application of sealing part (1) to sealing surface (5) takes place by a pressure reduction acting on the contact side (9) of sealing part (1) when there is a brief flow through sealing gap (8) and the unreduced pressure from the area to be sealed or the atmosphere on the thrust side (10) of sealing part (1).

4,783,084

HEAD FOR A ROTATING BLOWOUT PREVENTOR

Morris S. Biffle, 2609 Country Club Dr., Midland, Tex. 79701

Filed Jul. 21, 1986, Ser. No. 887,537
Int. Cl.⁴ E21B *33/03*
U.S. Cl. 277—9 **12 Claims**

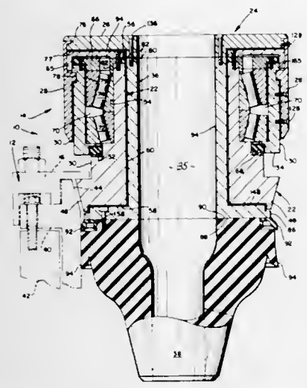
1. A rotating blowout preventor having a lower main hous-

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ing which can be attached to a wellhead, and an upper rotating head assembly removably received in supported relationship respective to said main housing, said rotating head assembly has a fixed main support body and a rotatable rubber support, a stripper rubber removably mounted at the lower end of the rubber support;

means forming a bearing chamber, journal means enclosed within the chamber by which the rotatable rubber support is rotatably mounted respective to the main support body;

said rubber support includes a cylindrical member received within the main support body; a rubber mount at one end and an upper plate member at the other of said cylindrical member means mounting said stripper rubber to said rubber mount; a cylindrical rotating skirt member concentrically arranged in spaced relationship respective to said main support body;



said main support body and said cylindrical rotating skirt member, respectively, form spaced inner and outer walls, respectively, of said bearing chamber; an annular plate member is affixed to and radiates from the upper end of said main support body and forms an upper closure member for the bearing chamber;

seal means between the lower end of the cylindrical rotating skirt member and the fixed support, seal means between the upper end of the cylindrical rotating skirt member and the outer end of the closure member, and a plurality of locking plates spaced from one another and removably affixing the cylindrical rotating skirt member to the upper plate member;

whereby the stripper rubber and rubber support of the rotating head assembly can be removed from the fixed support by removing the locking plates and upper plate member from the rotating head assembly, after the rotating head assembly has been removed from said lower main housing.

4,783,085

SEGMENTED RIGID SLIDING SEAL

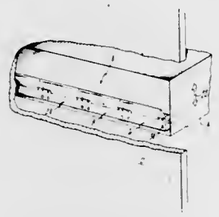
David H. Wicks, Lake Park, and Larry W. Gill, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 27, 1987, Ser. No. 30,795
Int. Cl.[4] F16J *15/04*
U.S. Cl. 277—12 **7 Claims**

1. A seal assembly disposed between a substantially planar surface in a first member and a second member movable substantially parallel thereto, comprising:

a plurality of individual seal segments disposed along a desired sealing line, each segment including:

a rigid flapper secured to the movable member and pivotable about a segment axis locally parallel to the desired sealing line, each flapper fitting closely at the axial edges thereof with the axially edges of the next adjacent flappers, and



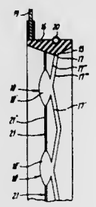
each flapper extending radially from the segment axis into sliding contact with the planar surface.

4,783,086

SEALING RING WITH TWO ROWS OF PROJECTIONS AND FOR A ROTARY SHAFT

Johan C. M. Bras, Tricht, and Hendrik W. Wevers, Goes, both of Netherlands, assignors to SKF Industrial Trading & Development Co., B.V., Nieuwegein, Netherlands

Division of Ser. No. 654,307, Sep. 25, 1984, Pat. No. 4,671,519. This application Jan. 20, 1987, Ser. No. 5,071
Claims priority, application Netherlands, Oct. 5, 1983, 83/03411
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—134 **13 Claims**



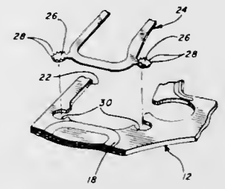
1. In a seal for a rotary shaft, for exerting a pumping effect on a lubricant on said shaft, wherein the seal comprises a substantially rigid annular supporting member and a generally annular elastic sealing member affixed coaxially to the supporting member and extending radially inwardly of the supporting member, the radially inner surface of said sealing member defining a sealing contact surface adapted to sealingly contact said shaft; the improvement wherein said sealing contact surface has a first circumferentially extending portion and a plurality of projecting portions extending axially from one side of said first portion and being circumferentially spaced apart, said first portion having a substantially constant axial width throughout its circumference and extending at an acute angle with respect to the axis of the rotary shaft, said projections having circumferentially extending edges spaced from said one side of said first portion and joined to second and third edges which extend to said one side of said first portion at acute angles thereto.

4,783,087

GASKET ASSEMBLY HAVING A SEALING INSERT MEMBER AND METHOD OF FORMING

Robert A. DeCore, Elk Grove Village, and Raymond Kartasuk, Lincolnwood, both of Ill., assignors to Fel-Pro Incorporated, Skokie, Ill.

Filed Apr. 13, 1987, Ser. No. 37,718
Int. Cl.[4] B23P *11/00;* **F16J** *15/12*
U.S. Cl. 277—166 **5 Claims**



2. A gasket assembly adapted to be positioned between a pair of surfaces to be sealed and to be compressed therebetween, said gasket assembly comprising:

a main gasket body, said main gasket body defining a plurality of openings; and

a sealing insert member positioned in at least one of said openings defined by said main gasket body, said sealing insert member including at least one deformable tab means at the outer periphery thereof positioned within said opening, said tab means being engaged with the main gasket body for retaining said sealing insert member in position within said one opening of said main gasket body,

and wherein said deformable tab means comprises a plurality of deformed projections at the periphery thereof, said one opening defined by said main gasket body including a tab-receiving aperture in which said deformable tab means is disposed to retain said sealing insert member in position within said one opening, and said tab means including a generally circular central portion, said projections extending generally radially outwardly therefrom.

3. A method of forming a gasket assembly adapted to be positioned between a pair of surfaces to be sealed and to be compressed therebetween, said method comprising the steps of:

providing a main gasket body defining a plurality of openings;

providing a sealing insert member for positioning in one of said openings defined by said main gasket body, including providing said insert member with at least one deformable tab means at the outer periphery thereof;

positioning said insert member within said one opening defined by said main gasket body so that said deformable tab means is received within said one opening defined by said main gasket body; and

deforming said deformable tab means into engagement with said main gasket body at said one opening to thereby retain said sealing insert member in position within said one opening of said main gasket body, and wherein said deformable tab means comprises a plurality of deformable projections at the outer periphery thereof, said one opening defined by said main gasket body including a tab-receiving aperture in which said deformable tab means is positioned during said positioning step, and

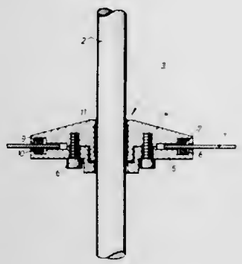
providing said deformable tab means in a generally dished configuration such that said projections extend generally upwardly from a central portion of said tab means prior to said deforming step.

4,783,088

SEALING ASSEMBLY FOR SEALING AN OPENING IN A PLATE THROUGH WHICH A SHAFT EXTENDS

Ulf Johnsson, Malmö, Sweden, assignor to AB Tetra Pak, Lund, Sweden

Filed Mar. 18, 1987, Ser. No. 27,545
Claims priority, application Sweden, Mar. 20, 1986, 86-1303
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—167.5 **7 Claims**



1. A sealing assembly for sealing an opening of a given diameter in a plate of a given thickness through which a shaft extends, the assembly comprising:

a body portion having a diameter larger than the diameter of the opening and including a hole for receiving the shaft and an annular plate receiving groove having a radially inner surface and annular side surfaces extending radially outwardly from the inner surface, the radially inner surface having a diameter smaller than the diameter of the opening and having a width larger than the thickness of the plate, the annular side surfaces including annular slots of a diameter larger than the diameter of the opening; and

sealing means for sealing the space between the plate and the annular side surfaces of the plate receiving groove and for spacing the body portion from the plate.

4,783,089

AIR SPRING CONTROL SYSTEM AND METHOD

James M. Hamilton, El Cajon; Lonnie K. Woods, Alpine, and Michael W. Godwin, San Diego, all of Calif., assignors to C & K Venture Income 1-Coast, Los Angeles, Calif.

Continuation-in-part of Ser. No. 661,196, Oct. 15, 1984, Pat. No. 4,651,838. This application Jul. 29, 1985, Ser. No. 760,141
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—6 R **14 Claims**

1. A system for leveling a mass having at least one extensible member supporting the mass, the system comprising:

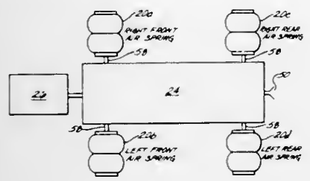
a position switch adapted to generate a signal each time and during when the mass is at or below a selected height;

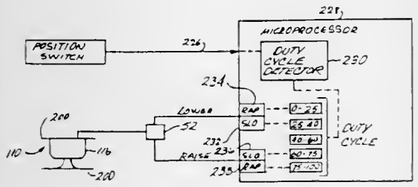
means for determining the overall duration of the signal over a predetermined time interval to establish a duty cycle for the member, the duty cycle represented as the ratio of the overall duration of the signal to the time interval, and

means for incrementally extending the member when the

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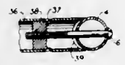
duty cycle is of a first character and to incrementally retract the member when the duty cycle is of a second





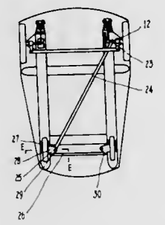
character to incrementally raise and lower the mass, respectively, for leveling of the mass.

4,783,090
TRASH BAG HOLDER
Lee A. Moulton, 5081 Keane Dr., Carmichael, Calif. 95608
Filed Jul. 2, 1987, Ser. No. 69,501
Int. Cl.[4] B65D *67/12*
U.S. Cl. 280—47.26 **19 Claims**



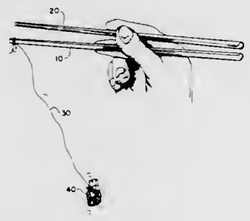
1. A holder for trash bags having a top portion including a mouth opening formed therein, the holder comprising:
- a hoop having a peripheral dimension corresponding to the mouth of the trash bag,
- a rim fixed to at least one spot of said hoop and having a peripheral dimension identical to said hoop,
- the hoop further having a top edge upon which the rim is secured and abuts for securely retaining and holding the bag in place,
- a lip having a length extending along at least a portion of the peripheral dimension of the hoop and secured thereto outwardly of the rim, the lip having a feathered edge positioned on an external edge of said hoop remote from the depending trash bag, said lip including a notch along its length and facing inwardly towards said rim to receive and retain said rim therein,
- the trash bag is received within the peripheral dimension of both the hoop and the rim, the bag having the top portion thereof looped over the rim and downwardly exteriorly of the rim, said top portion further being threaded inwardly between the rim and the top edge of the hoop, such that filling of the trash bag forces the rim downwardly thereby pinching the rim against the top edge with the top portion of the bag therebetween for securely holding the bag in place.

4,783,091
APPARATUS FOR EXERCISE AND RECREATION
Hong Chi, WuHan Hydraulic/Electric Power Int., c/o Faculty's Residence, No. 5-7, WuHan, China
Filed May 14, 1987, Ser. No. 50,306
Claims priority, application China, Dec. 30, 1986, 86210936
Int. Cl.[4] B62M *1/00*
U.S. Cl. 280—218 **6 Claims**



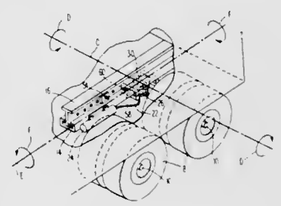
1. An apparatus for use in exercise and recreation whereby movement in a forward direction is produced by swinging or swaying of the player's body together with steering by hand, comprising first and second rows of wheels, a board supported on said wheels and a direction-control means for controlling the direction of said first row of wheels, wherein said first row of wheels comprises a first left wheel and a first right wheel which change their direction synchronously by means of a first connecting bar, wherein said second row of wheels are also direction-controllable for synchronously changing direction with the first row of wheels but in the opposite direction by means of a connecting rod operatively coupled to said direction-control means, and wherein said second row of wheels comprises a second left wheel and a second right wheel which change their direction synchronously by means of a second connecting bar.

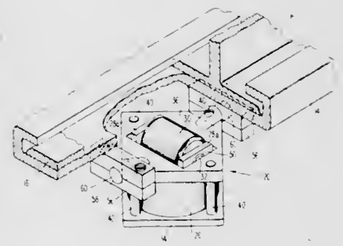
4,783,092
AMUSEMENT TOY CATCH DEVICE
Frederick S. Kandal, Columbia, Md., assignor to Nuway Distributors, Inc., Baltimore, Md.
Filed Aug. 21, 1987, Ser. No. 87,886
Int. Cl.[4] A63B *67/10*
U.S. Cl. 273—319 **4 Claims**



1. An amusement toy comprising:
- a first elongated member having a first end and a second end, said second end being adapted to be held by an individual's fingers for manipulation;
- a second elongated member having a first end and a second end, said second end being adapted to be held by an individual's fingers for manipulation;
- said first and second elongated members are separate members, unattached to each other;
- a catch object having a predetermined size; and
- securing means for securing said catch object at a predetermined distance from a first end of said first elongated member;
- wherein swinging said catch object about said first end of said elongated member and manipulating said first and second elongated members to permit said first ends to touch each other enables an individual to selectively capture said catch object between said first ends of said first and second elongated members.

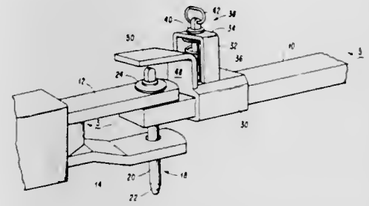
4,783,093
TRAILER BED LIFT
Kent Cusick, Richwood, and Kevin Criswell, Marion, both of Ohio, assignors to K. C. Mfg., Inc., Marion, Ohio
Filed Sep. 19, 1986, Ser. No. 909,623
Int. Cl.[4] B62D *53/06*
U.S. Cl. 280—405 A **15 Claims**





1. An improved trailer bed lift for a tractor-pulled trailer of the type having a bed for carrying a load, a first frame means for supporting the bed, and a rear wheel assembly supporting the load upon the bed, said rear wheel assembly including second frame means slidingly coupled to the first frame means for adjustably distributing the weight of the load upon the bed by selectively moving the first frame means relative to the second frame means along a longitudinal axis of the bed, wherein the trailer bed lift comprises:
- roller means, attached to the second frame means, for reducing friction caused by slidable engagement of the first frame means with respect to the second frame means, said roller means being rotatable about at least one transverse axis thereby permitting adjustment of the position of the rear wheel assembly relative to the bed along the longitudinal axis; and
- means, coupled to said roller means, for pivoting said roller means about an axis of engagement substantially parallel to the longitudinal axis.

4,783,094
SAFETY DEVICE FOR HITCH PINS
John E. Sands, R.R. 1, Box 54, Delhi, Iowa 52223
Filed Jul. 20, 1987, Ser. No. 75,419
Int. Cl.[4] B60D *1/02*
U.S. Cl. 280—515 **4 Claims**



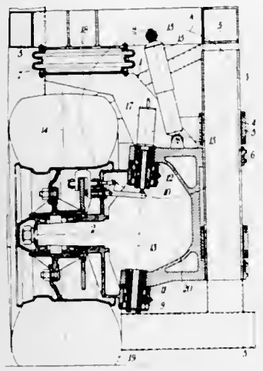
1. A safety device for use in connection with a towing vehicle having a rearwardly extending drawbar connected to the tongue of a towed vehicle by a hitch pin extending through aligned openings in the drawbar and tongue, said safety device comprising a tubular base member having a top wall and a bottom wall joined by side walls and adapted for slideable movement forwardly and rearwardly along a drawbar, the top wall having an opening extending through it, spaced-apart support members extending upwardly from the top wall of the base member and joined by an upper support member having an opening extending through it which opening is in vertical alignment with the opening in the top wall of the base member, a locking pin extending through and vertically moveable in the aligned openings in the top wall of the base member and the upper support member, means biasing said locking pin downwardly so that it normally extends through the opening in the top wall of the base member for locking engagement in an opening in a drawbar to lock the safety device in place on a drawbar, and a blocking arm extending outwardly from the safety device in a rearward direction when the device is mounted on a drawbar, said blocking arm being spaced upwardly from the top wall of the base member a sufficient distance so as to extend over the top of a hitch pin that is in place connecting the drawbar of a towing vehicle to the tongue of a towed vehicle.

4,783,095
SUSPENSION FOR MOTORED AND UNMOTORED WHEELS OF VEHICLES
Franco Rampini, and Stefano Rampini, both of Passignano sul Trasmeno, Italy, assignors to Janus Bus S.p.A., Rome, Italy
Filed Apr. 20, 1987, Ser. No. 40,312
Claims priority, application Italy, Apr. 29, 1986, 47958 A/86
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—672 **9 Claims**

1. A suspension for motored and unmotored wheels of vehicles, characterized in that it is made up of a shaped bracket member which is rigidly coupled, at the rear, to a vertical axle on which the structure of the vehicle slides, by means of the interposition of at least two bushes, and, at the top, in the front position, is coupled to the structure of the vehicle with the coupling axis as close as possible to the reaction axis of the wheel on the ground, such latter coupling being obtained by means of an elastic and hoisting member and at least a damping member, said bracket member being also provided, with a first ball joint and a first bearing as well as with a second ball joint and a second bearing, said first ball joint and first bearing and said second ball joint and second bearing arranged along an axis at 3°–10° slope to the vertical and at a position intermediate said vertical axle and the wheel, such as to allow said wheel to rotate/steer independently of the bouncing hoisting movement; said first ball joint and bearing and said second ball joint and bearing being respectively at upper and lower positions

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with respect to the axle of the wheel whereby said bracket member can be connected to a hub carrier member or a reduction gear carrier member; further said suspension being also



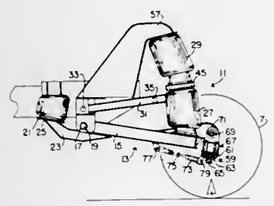
made up of a tie rod/strut member which is coupled at one end to said bracket member and, at the other end, to the structure of the vehicle.

4,783,096

STACKED AIRBAG WHEELED VEHICLE SUSPENSION SYSTEM

John E. Ramsey, Canton, and Ervin K. VanDenberg, Massilon, both of Ohio, assignors to The Boler Company, Itasca, Ill.

Filed Nov. 25, 1986, Ser. No. 936,638
Int. Cl.[4] B60J *9/10*; B60G *11/26*
U.S. Cl. 280—711 **19 Claims**



1. An axle suspension system for a frame membered, wheeled vehicle comprising as an interconnected set located on either side of said vehicle:

a first beam, a second beam, a first expandable airbag, and a second expandable airbag;

means for pivotally connecting the first beam to a frame member of the vehicle, means for connecting an axle to said first beam, and means for connecting a first expandable airbag to said first beam;

means for connecting one end of a second expandable airbag to the frame member of the vehicle;

said second airbag along located in stacked relationship with and above said first airbag such that said first and second airbags extend between said first beam and said frame member of said vehicle;

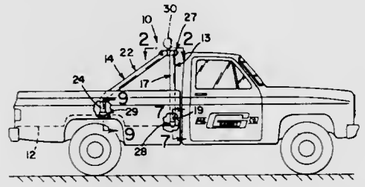
said first and second airbags being connected by a stabilizing means comprising a lateral beam means connecting said first and second airbags together interconnecting said sets on either side of said vehicle, said second beam being connected to said lateral beam connecting means, said second beam being provided with means for pivotally connecting said beam to a frame member of said vehicle.

4,783,097

DECORATIVE BAR ARRANGEMENT SIMULATING A ROLL BAR FOR INSTALLATION OF PICK-UP TRUCKS AND THE LIKE

James R. Browning, Berea, and Louis D. Carlo, Valley City, both of Ohio, assignors to Mr. Gasket Company, Cleveland, Ohio

Filed Dec. 18, 1987, Ser. No. 134,986
Int. Cl.[4] B60R *27/00*
U.S. Cl. 280—756 **49 Claims**



1. A decorative, decorative bar arrangement for installation on the bed of a pick-up truck or like vehicle to resemble a professional roll bar arrangement comprising:

(a) a first generally upright, U-shaped tubular assembly, having a bight portion positioned generally behind and in line with the roof of the cab of said vehicle, and first and second generally parallel and vertically upstanding leg portions connected to the ends of said bight portions;

(b) a second generally U-shaped tubular assembly having a bight portion and first and second generally parallel leg portions extending at an angular relationship relative to said first and second leg portions of said first tubular assembly said leg portions connected to the ends of said bight portion; and

(c) hinge-fastener clamping means for securing said first assembly to said second assembly in a fixed position including pin means extending through said bight portions of said first and second tubular assemblies for fastening said bight portions in a locked parallel spaced relationship to one another in said fixed positions and swivelling means permitting rotation of said leg portions of one assembly relative to the other assembly prior to said pin means locking said bight portions together.

4,783,098

SEAT BELT DEVICE FOR USE IN A MOTOR VEHICLE

Takahito Yokouchi, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 2, 1987, Ser. No. 69,601
Claims priority, application Japan, Jul. 7, 1986, 61-160121
Int. Cl.[4] B60R *22/26*
U.S. Cl. 280—801 **17 Claims**

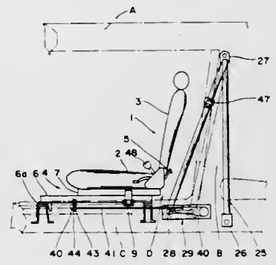
1. A seat belt device for use in a motor vehicle which is internally provided with front and rear seats and in which the getting on and off the rear seat is executed after the front seat has been shifted frontwards through operation of an operating means disposed on the front seat to shift the front seat back and forth, with a securing point where the seat belt is secured to the vehicle body being provided at the side portion of a seat cushion of the front seat, each side portion of the vehicle body being provided with an opening beside the front seat to permit getting in and out therethrough, said seat belt device comprising:

a first means for shifting said securing point of the seat belt back and forth between a front position and a rear position;

a second means for actuating said first means in response to the operation of said operating means;

said first means being actuated by said second means to shift said securing point of the seat belt backwards in response to the forward movement of the front seat by the operating means;

said seat belt extending away from the securing point and crossing the opening of the vehicle body when the securing point is located at its front position and extending along a peripheral portion of the opening of the vehicle body when the securing point is located at its rear position.

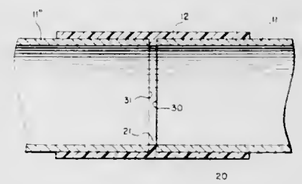


4,783,099

FLUID FLOW CONDUIT SYSTEMS

Oscar P. Muser, 1054 South Service Road East, Oakville, Ontario, Canada L6J 2X7

Filed Dec. 15, 1986, Ser. No. 941,354
Claims priority, application Canada, Dec. 17, 1985, 497,894
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—7 **6 Claims**



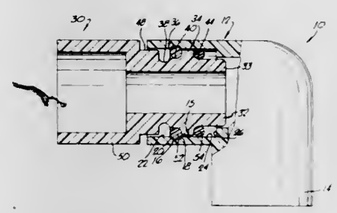
1. In or for a conduit system for central vacuum cleaning installations: at least one conduit segment, and at least one fitting having a fluid flow passage therein for attachment to an end of said conduit segment, an inwardly projecting peripheral shoulder of predetermined radial width disposed within said fitting and defining with said fluid flow passage at least one socket in said fitting for snug retention of said conduit segment end therein, said conduit segment end being adapted to continuously abut said peripheral shoulder upon full insertion of said conduit segment end into said socket, the thickness of the wall of said conduit segment end in abutment with said shoulder being substantially equal to said width of said shoulder, said conduit segment and said fitting forming a continuous fluid flow passage when said conduit segment end is received within said fitting, at least said end of said conduit segment being opaque, and at least said socket portion of said fitting being transparent, whereby to permit visual inspection of said abutting relationship between said conduit segment end and said peripheral shoulder.

4,783,100

SWIVEL JOINT

Donald J. Klein, Downey, Calif., assignor to Philips Industries, Inc., Anaheim, Calif.

Filed Apr. 20, 1987, Ser. No. 40,497
Int. Cl.[4] F16L *27/08*
U.S. Cl. 285—276 **3 Claims**



1. A swivel plumbing joint comprising a first fitting having a receptacle end;

a second fitting having a plug end positionable in said receptable end to be rotatably mounted therein, said receptacle end having an internal mating surface and said plug end having an external mating surface;

one of said mating surfaces having a circumferential locking groove including first and second portions, said first portion having a semicircular inner section and being deeper and further from the distal end of said surface than said second portion, the other of said mating surfaces having a circumferential receiving groove adjacent said locking groove with said plug end mounted in said receptacle end;

a locking ring circular in cross-section positioned in said locking groove and engageable with said circumferential receiving groove with said plug end mounted in said receptacle end, said receiving groove having a width approximately equal to the width of said locking ring.

a shoulder surface on said plug end disposed between said circumferential locking groove and the distal end of said second fitting;

a reduced diameter barrel on said plug end extending from said shoulder thereby forming a seal recess therebetween, said receptacle having a terminal shoulder extending inwardly at the internal end of said internal mating surface to bound said seal recess; and

an O-ring seal member in said seal recess and in the assembled position being spaced from said terminal shoulder and in engagement with said shoulder surface.

4,783,101

LOCKING ELEMENT

Francis C. Peterson, Woodbury, and Daniel M. Zubik, Watertown, both of Conn., assignors to Buell Industries, Inc., Waterbury, Conn.

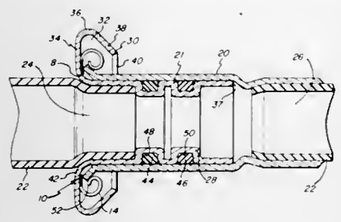
Filed May 20, 1987, Ser. No. 52,691
Int. Cl.[4] F16L *37/12*
U.S. Cl. 285—319 **16 Claims**

1. A locking element for a quick-connect tube coupling formed of an inner tubular element and an outer tubular element, with a barrel segment of the inner tubular element sized for a sealing fit inside the outer tubular element, said inner tubular element having at one end an externally projecting annular cage forming an annular chamber bounded by a flange that extends backwardly towards the other end of said inner tubular element at an angle toward the peripheral surface of said inner tube and terminates at a radial distance from said surface to form an annular cage opening, said outer tubular element having an end that has a peripheral surface that flares outwardly towards said cage and fits through said cage opening and into said cage, comprising:

an annular washer having an annular segment and a plurality

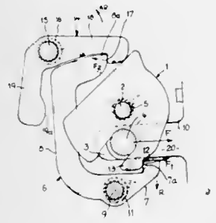
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of annularly distributed resilient curled fingers extending from said annular segment and said segment and fingers



being sized to fit inside said cage with said curled fingers facing backwardly.

4,783,102
LATCH, IN PARTICULAR FOR A MOTOR VEHICLE DOOR
Vincent Bernard, Anould, France, assignor to Rockwell-CIM, France
Filed Nov. 30, 1987, Ser. No. 126,533
Claims priority, application France, Dec. 2, 1986, 86 16819
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **1 Claim**



1. A latch for a motor vehicle door for cooperation with a keeper comprising:

a case for mounting a pivotal fork member having two branches which is adapted to receive said keeper, an intermediate catch member, and a main catch;

said keeper cooperating with said pivotal fork member for moving said fork member between an unlatching position and a latching position relative to said keeper;

a first pin for pivotally mounting said fork member;

a recess within said fork member between the two branches adapted to receive said keeper;

elastic biassing means for said fork member consisting of a spring which is coaxial with said pin which biasses said fork member to a position for unlatching the latch;

said intermediate catch having two arms, a first arm having a projection thereon, and a second arm extending perpendicularly to said first arm;

a second pin mounting said intermediate catch to said case, said second pin being located below said first pin;

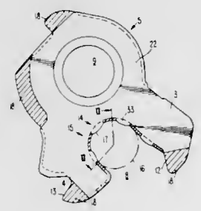
a spring wound around said second mounting pin for biassing said intermediate catch member to a position wherein the projection of the first arm engages in a peripheral notch formed in one branch of the fork member to maintain the fork member in a locked position in which the keeper is trapped in the recess of said fork member;

said main catch comprising an L-shaped member one arm of which has an abutting surface at the end thereof which bears against the end of the second arm of said intermediate catch to thereby maintain the intermediate catch in a locking position for locking the fork member;

said main catch pivotally mounted to the case by means of a third pin located at the junction of the arms of the main catch, and having a spring mounted coaxially with said third pin to bias the main catch to a position where the abutting surface engages the intermediate catch, said first pin said second pin, and said third pin all being fixed to an interior wall of said case and the spring for each of said pins having one end fixed to said case and the other end fixed to said fork member, intermediate catch and main catch respectively, so that with the keeper in the locking position, said keeper is maintained within the recess in said fork member with the intermediate catch having the projection formed on the first arm engaging the peripheral notch of the branch of said fork member so that the intermediate catch tends to hold the fork member in a fixed locking position against the return force of the spring while said main catch prevents the unlocking of the latch by means of its abutting surface engaging the second arm of the intermediate catch;

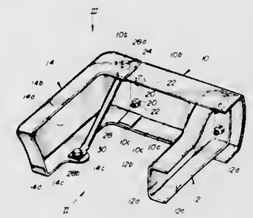
said other arm of said L-shaped main catch member having a boss at the end thereof for bearing against the second arm of the intermediate catch during the opening of the latch to positively rotate the intermediate catch in a direction in which the projection on the first arm disengages from the peripheral notch on the fork member thereby allowing the fork member to rotate to an unlocked position wherein the keeper is released.

4,783,103
VEHICLE DOOR LOCK ASSEMBLY
Christoph Schlegel, Wolnzach, Fed. Rep. of Germany, assignor to Audi AG, Fed. Rep. of Germany
Filed Feb. 20, 1987, Ser. No. 17,238
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605601
Int. Cl.[4] E05C *3/06*
U.S. Cl. 292—216 **10 Claims**



1. In a vehicle door assembly including a bolt projecting from a sidewall of a door opening in the body of a vehicle, a metallic latch having a pair of leg sections defining a bolt receiving recess, rotatably mounted on a sidewall of a door member hingedly mounted in said door assembly, means operatively interconnecting said door sidewall and said latch for rotatably biasing said latch in an unlatched position with said recess registered with said bolt, a metallic retaining pawl having a hook section engageable with contact portions of said latch leg sections when said leg sections are disposed in prelocking and fully locking positions, rotatably mounted on said door sidewall, and means operatively interconnecting said door sidewall and said retaining pawl for rotatably biasing said retaining pawl in a direction toward said latch, the improvement comprising the left receiving recess of said latch being coated with a sound absorbing material except for a plurality of spaced segments disposed along the periphery thereof.

4,783,104
BUMPER ASSEMBLY
Toshiro Watanabe, Tokyo, and Masaharu Takeda, Sagamihara, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan
Filed Feb. 12, 1987, Ser. No. 13,992
Claims priority, application Japan, Feb. 17, 1986, 61-20050[U]
Int. Cl.[4] B60R *19/04*
U.S. Cl. 293—102 **4 Claims**



1. A bumper assembly comprising, an elongated channel shaped main bumper having upper and lower side walls, a channel shaped side bumper having upper and lower side walls secured in overlapping relationship to each longitudinal end of said main bumper, a reinforced stay having a first end secured to the overlapping portions of said main bumper and said side bumper, and having a second end secured to said side bumper, said reinforced stay extending diagonally between a lower side wall of said side bumper and an upper side wall of said main bumper in a manner to serve as a diagonal beam between said bumpers.

4,783,105
SNOW FLIPPER
Steven L. Schulz, 2628 Brinker Ave., Ogden, Utah 84401
Continuation-in-part of Ser. No. 931,284, Nov. 17, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 59,655
Int. Cl.[4] A01B *1/02*; E01H *5/02*
U.S. Cl. 294—54.5 **2 Claims**

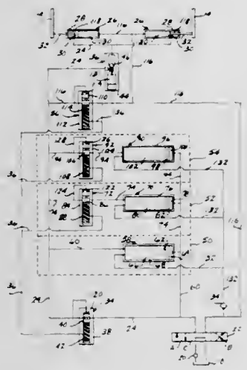


1. An improved flexible snow shovel construction comprising:

a resilient flexible snow shovel blade means comprising a main blade element having side walls and a rear wall, wherein the volume capacity of the snow shovel blade element is limited by the dimensions thereof, and the weight bearing capacity of the flexible snow shovel blade element is further restricted by the resilient material from which it is fabricated; and,

a uniformly proportioned flexible wooden handle means comprising a flexible handle member having a length "L" to diameter "d" ratio wherein the minimum value of "L" equals thirty inches and the minimum value of "d" equals sixty-three hundredths of an inch; and, wherein for every inch above the minimum value of the length "L" the value of the diameter "d" will be increased by one hundredth of an inch; whereby the flexible nature of both the blade means and the handle means will cause a flexure along the combined length of the blade and handle means when the blade element is loaded with snow and wherein the unloading of the snow from the blade element will be accompanied by a flipping action as the said flexible blade and handle means are returned to their unflexed state.

4,783,106
METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING PRESSURE IN FLUID-ACTUATED SYSTEMS
Ralph E. Nutter, 505 Belmont Ave. East, Seattle, Wash. 98102
Filed Aug. 4, 1986, Ser. No. 892,252
Int. Cl.[4] B25J *15/00*; B66C *3/16*
U.S. Cl. 294—88 **24 Claims**



6. An apparatus for automatically controlling the pressure applied by a clamp to a load, said clamp being closably actuated by the introduction of a fluid into a clamp actuator cylinder operatively coupled to said clamp, said apparatus comprising:

pressure establishment means for transferring fluid to said actuator cylinder;

an initial conduit connecting said pressure establishment means to said actuator cylinder;

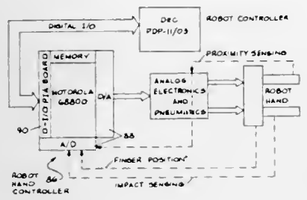
valve means for interrupting the flow of fluid in said initial conduit between said pressure establishment means and said actuator cylinder, said valve means interrupting the flow of fluid when an initial pressure in said actuator cylinder is reached;

first controllable fluid discharge means, connected to said actuator cylinder, for discharging a first predetermined volume of said fluid to said actuator cylinder when said initial predetermined pressure in said actuator cylinder is reached; and

second controllable fluid discharge means, connected to said actuator cylinder, for discharging a second predetermined volume of said fluid to said actuator cylinder when the discharge of said first volume of fluid to said actuator cylinder increases the pressure in said actuator cylinder by a predetermined amount.

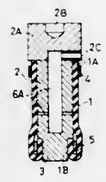
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4,783,107
METHOD AND APPARATUS FOR CONTROLLING IMPACT FORCE DURING RAPID ROBOTIC ACQUISITION OF OBJECT
Joey K. Parker, Tuscaloosa, Ala., and Frank W. Paul, Seneca, S.C., assignors to Clemson University, Clemson, S.C.
Continuation of Ser. No. 741,277, Jun. 4, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 120,755
Int. Cl.[4] B66C *1/00*
U.S. Cl. 294—88 **22 Claims**



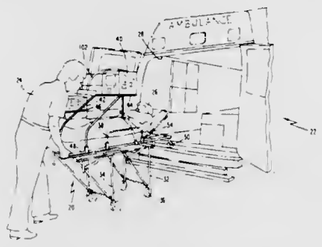
1. An apparatus for controlling the grasping of an object located within the acquisition envelope of a robot hand, the apparatus comprising:
means for contacting the object, said contacting means being carried by the robot hand and being moveable with respect to the hand so as to be able to assist in grasping the object;
means for imparting a first non-zero velocity to said contacting means in the same direction as the direction of the grasping force to be applied to grasp the object;
means for braking said first velocity to a second non-zero velocity in said grasping direction;
non-contact sensory means for sensing a point of close approach between the object and said contacting means, said non-contact sensory means actuating said braking means upon sensing said point of close approach to attain said second non-zero velocity; and
means for controlling the touch force between said contacting means and the object.

4,783,108
CATCHING HEAD OF APPARATUS FOR HANDLING PARTS SUCH AS CYLINDER BLOCKS AND THE LIKE
Hiroshi Fukuyama; Tadakazu Nishikawa; Junichi Misawa, and Yasuo Suzuki, all of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Jun. 11, 1987, Ser. No. 62,035
Claims priority, application Japan, Jun. 13, 1986, 61-137570; Oct. 27, 1986, 61-255366
Int. Cl.[4] B25J *15/00;* **B66C** *1/46*
U.S. Cl. 294—98.1 **6 Claims**



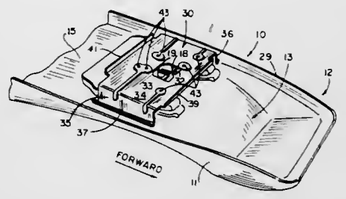
1. A catching head of an apparatus for handling work pieces, comprising a tube having first and second open ends, said tube being inflatable when supplied with a fluid, a core comprising at least one rigid member and having a base end and a free end, means hermetically fitting said first end of said tube to said base end of said core, said second end of said tube being folded back inwardly toward said first end of said tube to form a folded portion, means hermetically fitting said second end of said tube onto said free end of said core with said second end of said tube being constrained only at said folded portion and being unconstrained at its extremity remote from said first end, whereby said tube extends from said second end in a direction away from said first end, and reverses at said folded portion to extend toward said first end, and inflation of said tube increases the length of said tube by extending said extremity further away from said first end,
said core and the area of said tube from the means hermetically fitting said first end thereof to said base end of said core to said folded portion on said free end of said core defining a sealed fluid fillable closed chamber, and
a passage in said base end of said core for supplying fluid to said closed chamber,
whereby a work piece can be caught by insertion of said free end into a hole or recess of the work piece and the injection of a fluid into said passage for inflating said tube.

4,783,109
CRITICAL CARE EQUIPMENT TRANSPORT SYSTEM FOR AN AMBULANCE STRETCHER
Frank J. Bucalo, 8545 SW. 58th St., Miami, Fla. 33143
Filed Jul. 31, 1987, Ser. No. 80,263
Int. Cl.[4] A61G *1/02*
U.S. Cl. 296—20 **18 Claims**



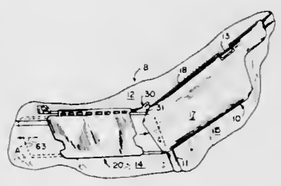
1. Apparatus mountable to a standard collapsible ambulance-type stretcher by known fittings, for securely holding elements of critical care equipment in close proximity to or connected to a patient lying on the stretcher, during transportation of the stretcher on its own wheels or inside an ambulance, the system comprising:
a framework, comprising first and second pairs of support legs and one bracing leg, each of said support legs and bracing leg having a vertical portion with a lower end attachable by said known fittings to a portion of the stretcher and each having an inclined portion with an upper end attached to a first equipment support rack, said lower ends of said first and second pairs of support legs being positioned adjacent the normal location of the feet of the patient lying on the stretcher with the upper ends of each of said pairs of support legs being located forwardly thereof, with the lower end of said bracing leg being attached to said stretcher closest to the head of said patient and on that side of the stretcher that is opposite the side from which the patient is normally transferred to or from the stretcher.

4,783,110
CONSOLE MOUNTING SYSTEM
Jack A. Beukema, and Robert L. Domke, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Filed Jan. 28, 1988, Ser. No. 149,497
Int. Cl.[4] B60R *5/00*
U.S. Cl. 296—37.7 **23 Claims**



1. A mounting bracket for mounting vehicle accessories to a vehicle, said mounting bracket accommodating at least two different mounting techniques, said bracket comprising:
a base including means for securing said base to a vehicle structural member, said base including a tang extending downwardly therefrom to define a support surface for receiving a vehicle accessory, said bracket further including a pair of sides integral with said base to define a U-shaped member, said sides including laterally extending flanges extending longitudinally on opposite outer ends of said sides, said sides being sufficiently resilient to allow the vehicle accessory to deflect the flanges for snap-fitting of vehicle accessory therein.

4,783,111
VISOR
Ronald L. Hemmeke, and Scott A. Spykerman, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.
Filed May 23, 1986, Ser. No. 866,272
Int. Cl.[4] B60J *3/02*
U.S. Cl. 296—97.8 **6 Claims**



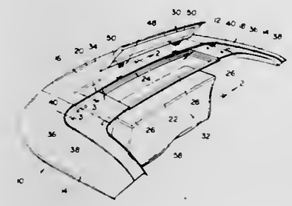
1. A visor system for a vehicle comprising:
a pair of brackets adapted to be mounted in spaced relationship above a vehicle window;
a visor including a planar body made of a rigid polymeric material and means for slidably mounting a panel to said body, said means including track means for slidably receiving a panel, and a panel made of a rigid polymeric material, said panel slidably mounted within said track means of said body for sliding movement along an axis parallel to the longitudinal axis of said visor between a stored position at least partially aligned with said body and use positions extended from a side of said body, wherein said means for slidably mounting said panel to said body further includes interlocking arm means extending from facing surfaces of said body and said panel and engaging one another to hold said panel and body together; and
means for mounting said visor between said brackets for permitting said visor to be moved between a raised stored position adjacent the vehicle roof and a lowered use position adjacent the vehicle window.

4,783,112
PICKUP TRUCK BED COVER
Olaf K. Lovaas, 90 Highland Ave. #424, Tarpon Springs, Fla. 34689
Filed Dec. 7, 1987, Ser. No. 130,094
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—100 **20 Claims**



1. A pickup truck bed cover to selectively enclose the bed of a pickup truck comprising a first and second closure panel slidably mounted between a pair of substantially parallel side panel tracks affixed to opposite side walls of the bed of the pickup truck, each said substantially parallel side panel tracks includes an intermediate and a lower track member to operatively support opposite longitudinal peripheral edges of said second and first closure panels respectively, a rear panel track affixed to the tailgate of the pickup truck and including an intermediate track member to selectively support a rear lateral peripheral edge of said second closure panel and a closure panel locking device to selectively lock said first and second closure panels relative to each other.

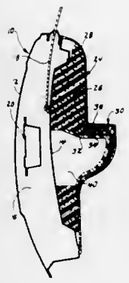
4,783,113
VEHICLE CONVERTIBLE TOP BOOT ASSEMBLY HAVING STORAGE COMPARTMENT
Craig W. Padlo, Brighton, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.
Filed Nov. 3, 1987, Ser. No. 116,406
Int. Cl.[4] B60J *7/20*
U.S. Cl. 296—136 **12 Claims**



1. A convertible top boot assembly for covering a laterally extending convertible top storage well of a convertible vehicle, the convertible top boot assembly comprising: a rigid boot that extends laterally and is securable to cover the convertible top storage well; the rigid boot including forward, rearward, and side portions that cooperatively define an access opening; a cover movable between open and closed positions with respect to the access opening; and a storage receptacle located below the opening of the boot to permit storage of articles in the receptacle by opening and closing of the cover with the boot secured over the convertible top storage well.

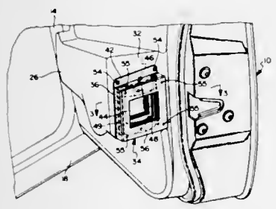
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4,783,114
VEHICLE DOOR AND ARM REST
Jeffrey A. Welch, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 5, 1987, Ser. No. 117,073
Int. Cl.[4] B60J 9/00
U.S. Cl. 296—153 6 Claims



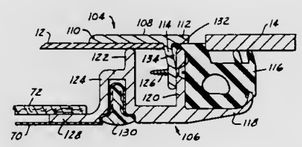
1. A vehicle door structure comprising:
a door including an outer panel and an inner panel attached together and defining a cavity therebetween;
a door trim assembly mounted on the inner panel and including a trim panel having at least a portion thereof spaced laterally inboard from the inner panel to define a space therebetween, an armrest, and means mounting said armrest in overlying relationship with the space between the inner panel and the trim panel, said mounting means being yieldable upon the imposition of a predetermined level of force against the armrest whereby the armrest collapses into the space between the trim panel and the door inner panel.

4,783,115
MOTOR VEHICLE AIR DUCT SEAL
Edmund J. Galubensky, Romeo, and Kenneth P. Adasek, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 13, 1987, Ser. No. 73,009
Int. Cl.[4] B60J 5/04; B60H 1/26
U.S. Cl. 296—208 1 Claim



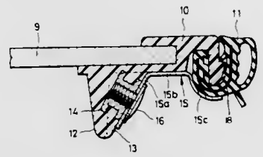
1. A motor vehicle having a door swingingly mounted on a vehicle body, an air duct on said door that aligns with an air duct on said vehicle body when the door is closed, and collapsible leaf spring biased seal means mounted between said door and vehicle body for sealingly joining said ducts when the door is closed, said seal means comprising a bellows that is sealingly fixed at one of two opposite ends thereof to said door about the air duct thereon, a leaf spring fixed to said door internal of said bellows and operative to urge the other end of the bellows toward sealing engagement with the air duct on the vehicle body, and said other end of said bellows having seal face means disposed obliquely to said one end with said door opened for slidably contacting said air duct on the vehicle body so as to gradually collapse said bellows as the door closes.

4,783,116
SUNROOF FRAME ASSEMBLY FOR VEHICLES
Louis E. Hough, St. Clair Shores, Mich., assignor to Empire Automotive, Inc., Mt. Clemens, Mich.
Continuation-in-part of Ser. No. 699,093, Feb. 7, 1985, Pat. No. 4,666,206. This application Apr. 27, 1987, Ser. No. 43,103
Int. Cl.[4] B60J 7/08, 7/195
U.S. Cl. 296—216 7 Claims



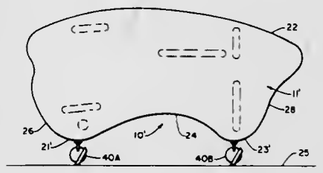
1. A frame assembly for mounting a sunroof panel in an opening of a vehicle's roof, comprising:
first and second frame portions secured together with a section of said roof interposed therebetween; and
a weatherstrip extending around said opening for engaging and forming a weather-tight seal between said frame assembly and said panel, a portion of said weatherstrip engaging said first and second frame portions and being compressed between and forming a weather-tight seal between said first and second frame portions,
said first frame portion including a first flange extending generally parallel to said roof and said second frame portion including a projection extending generally transverse to said roof and underlying said first flange, said weatherstrip portion engaging and being trapped between said first flange and said projection.

4,783,117
SUNROOF FOR AUTOMOTIVE VEHICLES
Kazuhisa Nagata, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Apr. 23, 1987, Ser. No. 41,529
Claims priority, application Japan, Apr. 28, 1986, 61-63303[U]
Int. Cl.[4] B60J 7/195
U.S. Cl. 296—216 4 Claims



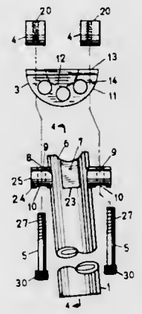
3. A sunroof for opening and closing a window formed in a stationary roof of an automotive vehicle, comprising:
a plate having a peripheral edge;
a strip fixed to the peripheral edge of said plate and, having a bottom surface and an inner peripheral edge;
a sealing member fitted onto said strip and having a thin plate embedded therein;
a downwardly projecting bead formed on said bottom surface of said strip along said inner peripheral edge; and,
a metal reinforcing plate releasably secured to said bead and underlying and supporting a bottom surface of said sealing member.

4,783,118
MULTI-PURPOSE ARTICLE OF FURNITURE FOR CHILDREN
George Ryan, and June C. Ryan, both of P.O. Box 260093, Tampa, Fla. 33685
Continuation-in-part of Ser. No. 906,369, Sep. 12, 1986, abandoned. This application Feb. 24, 1987, Ser. No. 17,492
Int. Cl.[4] A47C 13/00
U.S. Cl. 297—3 9 Claims



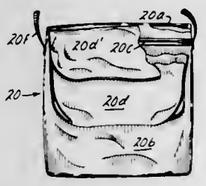
1. In a multi-purpose article of furniture for children,
having convex longitudinal edges for supporting it on an underlying surface in rocker orientation, and
having generally concave edges for supporting it on an underlying surface in inverted orientation; and
having in each orientation seat means including a seat member with front and rear edges, and a back-rest member,
the improvement comprising
a pair of back-rest members substantially vertically aligned above and below one another and the rear edge of the seat.

4,783,119
LIGHTWEIGHT ADJUSTABLE BICYCLE SADDLE MOUNT
Rodney D. Moses, P.O. Box 475, Selma, Oreg. 97538
Filed Sep. 30, 1987, Ser. No. 102,620
Int. Cl.[4] B62J 1/00
U.S. Cl. 297—195 4 Claims



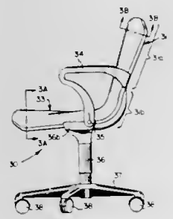
1. An adjustable saddle support mount for a bicycle or similar vehicle, consisting of:
(a) a tubular member having a semicylindrical concave recess in the top end of said tubular member, terminating in flat parallel surfaces on the surface of said tubular member perpendicular to the axis of said recess,
(c) below and perpendicular to said recess, two lugs on opposite sides of said tube having holes therein essentially parallel to the axis of said tubular member whereby bolts can be inserted therein,
(c) a semicircularly convex member conformably situated in said concave recess in said end of said tubular member, having semicircular flanges on both ends, straddling said flat surfaces on said tubular member, and said flanges being of substantially greater radius than said convex member,
(d) on the top surface of each of the said flanges a semicircular convex groove spaced whereby the saddle rails can lie therein,
(e) two clamping bars positioned above and across said tops of both of said flanges, said bars having semicircular grooves positioned conformably over said grooves in said flanges, and each having in the center, a female thread perpendicular to said grooves,
(f) two bolts passing upwardly through said holes in said bosses and engaging said female threads in said clamping bars, whereby the parts may be fastened together in a rigid assembly.

4,783,120
SEAT CUSHION
Robert J. Kiechlin, 1225 E. Boonville-New Harmony Rd., Evansville, Ind. 47711
Filed Jul. 7, 1987, Ser. No. 70,562
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—230 5 Claims



1. A seat cushion comprising a resilient body portion overlaid by a cover, where a portion of one side of said cover includes an article receiving compartment selectively detachable from said cover to leave an unobstructed seating area when said cushion is used at a seating condition.

4,783,121
IMPROVED CHAIR WITH CONVEX UPPER BACKREST AND FORWARD SEAT SURFACES
Harley E. Luyk, 4808 Summergreen La., Hudsonville, Mich. 49426, and Dewey D. Blocksma, 40 E. 27th St., Holland, Mich. 49423
Filed May 11, 1987, Ser. No. 48,084
Int. Cl.[4] A47C 3/00
U.S. Cl. 297—300 20 Claims



1. In a chair including a seat means for supporting the buttocks and upper legs of a seated person and a backrest means adjacent to the seat means for supporting the back of the per-

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son and a support means for the seat means the improvement which comprises:

(a) a seat means wherein an upwardly facing surface supporting the upper legs of the person adjacent a front portion of the seat means is convex in vertical cross section of opposite sides of a vertical midline of the chair and between the sides such that the hip joints in the buttocks of the person externally rotate downward causing the knees to tend to spread apart and the feet of the person to point outwardly; and

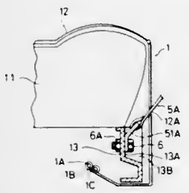
(b) a backrest means extending from a union means between the seat means and the backrest means supporting the back of the person with a forwardly facing surface near the shoulders and adjacent an upper portion of the backrest means which is convex in horizontal cross-section on opposite sides of the vertical midline of the chair and between the sides.

4,783,122

SYSTEM FOR ATTACHING THE SAFETY BELT TO THE SEAT

Minoru Komohara, Gifu, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Sep. 29, 1986, Ser. No. 912,517
Claims priority, application Japan, Sep. 30, 1985, 60-149789
Int. Cl.⁴ B60R *22/26*
U.S. Cl. 297—468 **4 Claims**



1. A system for attaching a safety belt to a seat having a seat frame and a cushion material which are covered by a trim cover, comprising:

means defining a recess in the seat frame for receiving one end of the safety belt;

means for attaching the one end of the safety belt directly to said means defining a recess wherein the one end of the safety belt is received within said recess and is directly attached to said means defining a recess; and

an opening in the trim cover through which the safety belt outwardly extends; wherein,

said means defining a recess comprises inwardly bent portions of a side of the seat frame, whereby the trim cover covers the end of the safety belt received within said recess.

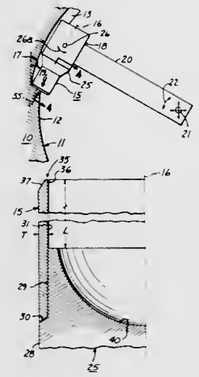
4,783,123

TOOL BIT FOR IMPACT RIPPING OF A MINE FACE

Jack B. Ottestad, 1442 Muirlands Dr., La Jolla, Calif. 92037

Filed Dec. 23, 1986, Ser. No. 946,417
Int. Cl.⁴ E21B *10/36*
U.S. Cl. 299—94 **12 Claims**

1. A tool bit to receive percussive blows for cutting into the face of a deposit to be extracted, said bit comprising: a metal body having a central axis, a base end and a cutting end, said body being a body of revolution having a outer wall; and inner wall; an outside diameter (D); an inside diameter; and a wall thickness (T); said walls being coaxial; said base end being adapted to be mounted to a percussive tool which delivers axial blows to said tool bit; said bit, along a reference length (L) extending from its cutting end to a place of lateral support being a tubular columnar structure unsupported from its side for a substantial distance from its cutting end, and physically unobstructed over substantially its entire reference length for at least about half of its side exposure; said cutting end being circular and exposed sufficiently to deliver axial scooping blows to said face; the ratio (L/D) of said reference length to said outside diameter being selected such that the bit, acting as



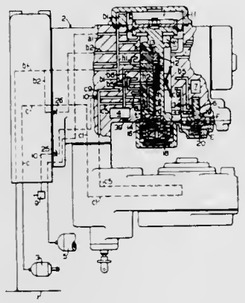
an euler column does not collapse under the axial blows in the sense of buckling or bending; the ratio (T/D) if said wall thickness to said outside diameter being sufficient to resist permanent lateral deformation along said reference length; said outer diameter increasing gradually from the cutting end for an axial distance less than said reference length; said inside diameter being substantially constant along that same axial distance.

4,783,124

FREIGHT BRAKE CONTROL VALVE DEVICE HAVING IMPROVED QUICK SERVICE FUNCTION

Edward W. Gaughan, Irwin, and Theodore B. Hill, North Versailles, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Nov. 5, 1987, Ser. No. 116,941
Int. Cl.⁴ B60T *15/30*
U.S. Cl. 303—37 **5 Claims**



1. For controlling the brakes on a railway car having a brake pipe normally charged with fluid at a certain chosen pressure, an auxiliary reservoir charged with fluid under pressure from said brake pipe, and a fluid pressure actuated brake cylinder device, there is provided a brake control valve device comprising:

(a) a service piston abutment subject opposingly to said brake pipe fluid under pressure and said auxiliary reservoir fluid under pressure;

(b) a supply passage connected to said brake cylinder device;

(c) a preliminary quick service volume;

(d) a secondary quick service volume;

(e) valve means carried by said service piston abutment for establishing a preliminary quick service connection of fluid pressure from said brake pipe to said preliminary quick service volume during initial movement of said service piston from a release position to a service position in response to a reduction of said brake pipe fluid under pressure relative to said auxiliary reservoir fluid under pressure, and during subsequent movement, cutting off said preliminary quick service connection, while concurrently establishing a service connection of said auxiliary reservoir fluid under pressure to said supply passage, and a secondary quick service connection of said brake pipe fluid under pressure to said supply passage and to said secondary quick service volume; and

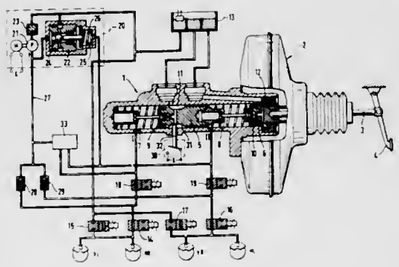
(f) quick service limiting valve means downstream of said secondary quick service volume operative in response to said brake cylinder fluid under pressure effective in said supply passage exceeding a first predetermined value for interrupting flow of said brake pipe fluid under pressure to said supply passage via said secondary quick service connection.

4,783,125

SLIP-CONTROLLED HYDRAULIC BRAKE SYSTEM

Juan Belart, Moerfelden-Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Wolfram Seibert, Pfungstadt, and Norbert Ocvirk, Offenbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 59,957
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619487
Int. Cl.⁴ B60T *8/94*
U.S. Cl. 303—92 **6 Claims**



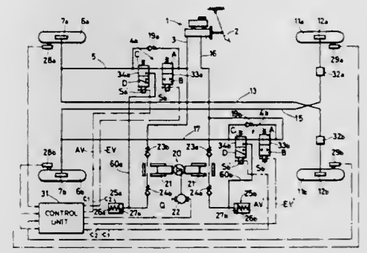
1. A slip-controlled hydraulic brake system comprising a master cylinder having at least one pressure chamber, wheel brakes connected to the master cylinder and braking pressure control valves between the master cylinder and the wheel brakes, an auxiliary-pressure supply system for introducing fluid pressure to the wheel brakes when it is detected that a wheel is slipping, means for preserving a reserve volume of pressure fluid in the pressure chamber of the master cylinder by introducing pressure fluid out of the auxiliary-pressure supply system when the quantity if pressure fluid drops below a predetermined limit value, said means being operative when the brakes are operative in response to other than detection that a wheel is slipping, further including means for monitoring the piston travel in the master cylinder and for the introduction of pressure fluid out of the auxiliary-pressure supply system when the piston travel attains a predetermined limit value.

4,783,126

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A B S, Ltd., Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,902
Claims priority, application Japan, Oct. 16, 1986, 61-247146
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.⁴ B60T *8/82, 8/64*
U.S. Cl. 303—96 **22 Claims**



1. In an anti-skid control apparatus for a vehicle braking system including:

(A) a pair of front wheels, and a pair of rear wheels;

(B) wheel speed sensors associated with said wheels, respectively;

(C) a first fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of one of said front wheels, arranged between a first fluid pressure generating chamber of a tandem master cylinder and said wheel cylinder of the one front wheel;

(D) a second fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of another of said front wheels, arranged between a second fluid pressure generating chamber of said tandem master cylinder and said wheel cylinder of the other front wheel; and

(E) a control unit receiving outputs of said wheel speed sensors for measuring or judging the skid conditions of said front and rear wheels and for generating instructions for controlling said first and second fluid pressure control valve devices; the improvements in which said control unit discriminates the low side comprising the frictionally lower one of the sides of the road on which said wheels are running, on the basis of the measuring or judging results of the skid conditions of said rear and/or front wheels, combines logically the measuring or judging results of the skid condition of the one rear wheel running on said low side of the road, with that of the one front wheel running on the same side as said low side, for generating the instruction for controlling said first or second fluid pressure control valve device for the corresponding front wheel, and generates the instruction for controlling said second or first fluid pressure control valve device for the other front wheel, on the basis of the measuring or judging result of the skid condition of the other front wheel running on the high side comprising the frictionally higher side of the road independently of those of said rear wheels.

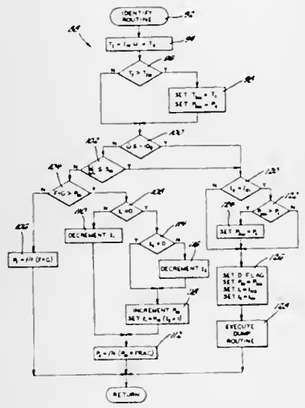
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ANTI-LOCK BRAKE CONTROL SYSTEM

Alexander Kade, Grosse Pointe Woods; Harland G. Hopkins, Sterling Heights, and Mutasium A. Salman, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 789,576, Oct. 21, 1985, Pat. No. 4,664,453. This application May 8, 1987, Ser. No. 48,096
The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.
Int. Cl.[4] B60T *8/58*
U.S. Cl. 303—100 **7 Claims**



1. A wheel lock control system for limiting the brake pressure applied to the brakes of a vehicle wheel traveling over a road surface, the system comprising:
- means for determining the tire torque tending to accelerate the wheel during the application of brake pressure;
- means for storing a valve representative of the brake pressure corresponding in time to the maximum determined tire torque;
- means for detecting an incipient wheel lockup condition resulting from the valve of slip between the wheel and the road surface exceeding a critical slip value; and
- means for establishing the brake pressure following a detected incipient wheel lockup condition at a value having a predetermined relationship to the brake pressure represented by the stored value.

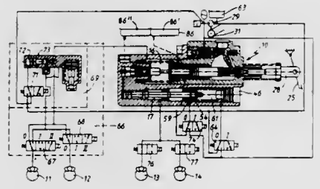
4,783,128

BRAKE PRESSURE CONTROL UNIT WITH HYDRAULIC POWER BOOSTER INCLUDING ANTILOCKING AND PROPULSION REGULATION

Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,474
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632507
Int. Cl.[4] B60T *8/44, 13/14*
U.S. Cl. 303—114 **9 Claims**

1. Brake pressure control unit for a hydraulic dual circuit brake system of a road vehicle which is equipped with a hydraulic brake power booster which comprises a constantly supercharged hydraulic pressure accumulator and a brake valve connected to said accumulator, said accumulator inputting into a drive pressure space of the brake pressure control unit when said brake system is operated a pressure which is proportional to an operating force and acts directly on a drive surface of a primary piston, said pressure imparting a longitudinal displacement on said primary piston and a longitudinal displacement on a secondary piston in the sense of a brake pressure build-up in a primary output pressure space and in a secondary output pressure space of the brake pressure control unit, respectively, said vehicle having a static brake circuit connected to each of said primary and secondary output pressure spaces, said primary piston comprising an annular piston sealed from a bore of a casing, and a plunger piston arranged displaceably in a central bore of said annular piston and sealed from said annular piston, said plunger piston having a radial driving flange against which said annular piston is supportable by its end face toward the primary output pressure space, said annular piston and said plunger piston being pressurizable by said drive pressure inputtable into said drive pressure space and jointly displaceable in the sense of said brake pressure build-up, said plunger piston remaining displaceable by pedal power alone during a failure of an auxiliary pressure source, said control unit comprising:



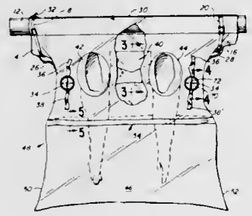
a first annular seal of said annular piston on the piston side, a flange facing the drive pressure space on which said first seal is arranged;
a second annular seal fixed to said casing and arranged on the end section facing the primary output pressure space of the casing bore guiding said annular piston,
said first and second annular seals forming an outer separating space in the shape of an annular gap;
a third annular seal arranged at an inner bore of said drive flange of said annular piston; and
a fourth annular seal arranged at said plunger piston and offset in the direction of said primary output pressure space,
said third and fourth annular seals sealing said annular piston and said plunger piston from each other.

4,783,129

HAZARDOUS WASTE GLOVE BAG REMOVAL SYSTEM

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Filed Jan. 7, 1987, Ser. No. 1,074
Int. Cl.[4] A61G *11/00*
U.S. Cl. 312—1 **17 Claims**



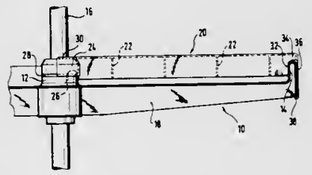
1. An improved glove bag hazardous waste removal system, adapted to be mounted onto and removed from pipes, comprising:
- a containment bag having at least one glove sleeve therein and an open top securable to a pipe by zipper means sealed to said open top for closing said top onto said pipe by manipulating at least one zipper slide thereof; and
- said bag having at least one self-sealing access sleeve means for allowing penetration of said bag by probes such as spray and/or vacuum probes inserted therethrough, while preventing waste from exiting said bag, said access means including diaphragm means having respective cross slits with a point of intersection therebetween, for forming said self-sealing access means.

4,783,130

CIRCULAR SHAPED COMPARTMENT FLOOR FOR FURNITURE

Guenter Twellmann, Spenge-Lenzinghausen, Fed. Rep. of Germany, assignor to Ninkaplast GmbH, Bad Salzuflen, Fed. Rep. of Germany

Filed Mar. 25, 1986, Ser. No. 843,749
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 8509199[U]
Int. Cl.[4] A47B *57/58*
U.S. Cl. 312—193 **16 Claims**



1. A turntable floor insert comprising a compartment floor of circular contour or of a contour in the form of a circular sector, which has at the circle center, a hub and at the outer edge, a peripheral wall projecting vertically upwardly, wherein there is at least one radial wall element which is supported at its outer end on the peripheral wall and which has at its inner end an end piece in the form of a circular arc which surrounds the hub and which engages in a continuous circumferential groove in the hub with a circumferential bottom flange projecting radially inwardly, so that the radial wall element is clamped between the hub and the peripheral wall, the radial wall element and the peripheral wall being of an elastically deformable construction to permit insertion and removal of said radial wall element.

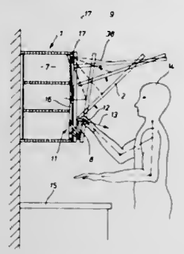
4,783,131

FITTING FOR A CUPBOARD WITH OVERHEAD OPENING DOOR

Alfred Grass, Höchst/vlbg., Austria, assignor to Alfred Grass Ges.m.b.H. Metallwarenfabrik, Höchst/vlbg., Austria

Continuation of Ser. No. 852,431, Apr. 15, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 111,247
Claims priority, application Austria, Apr. 16, 1985, 1129/85
Int. Cl.[4] E05D *15/42*
U.S. Cl. 312—276 **4 Claims**

1. A swiveling assembly for a cupboard having fixed interior side walls with forward and rearward edges, and a top, the assembly providing for pivotal movement of the door outwardly, forwardly, upwardly and over the head of a user, the assembly comprising: a door having an upper, mid, lower and side portion arranged to extend generally vertically when in a closed position and outwardly, forwardly, and generally horizontally from an upper portion of the cupboard when in an opened position; vertical guidemeans affixed near a forward edge of at least one of said interior side walls of the cupboard; slide means slidably mounted in the vertical guide means and pivotally connected with the lower portion of said door; swivel arm means pivotally connected to the center of said door at one end and pivotally connected at its other end proximate the underside of the top of the cupboard; and spring means extending from a point on said pivot arm means to a pivotal connection with the underside of the top of the cupboard to provide thrust to assist in opening said door and to counterbalance said door in its open position.

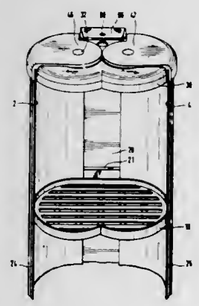


4,783,132

CUPBOARD, MORE PARTICULARLY FOR A BATHROOM

Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach-Thun, Switzerland

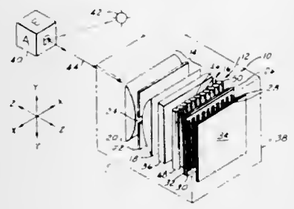
Filed Jan. 21, 1987, Ser. No. 5,869
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601614
Int. Cl.[4] A47B *96/00*
U.S. Cl. 312—324 **27 Claims**



1. A cupboard comprising:
- a housing formed from a top, a bottom and two opposed arcuate housing shells with vertically oriented longitudinal axes defining an enclosure with an opening located between two front longitudinal edges of said housing shells;
- first and second arcuate door shells arranged to pivot about first and second spaced vertical pivot axes, respectively, between a closed position in which said door shells cover said opening and an open position in which said opening is exposed;
- each of said door shells being mounted between an upper cap overlying the housing top and a lower cap underlying the housing bottom, said upper and lower caps being pivotably secured to said housing top and housing bottom, respectively, by means of upper and lower pins extending through aligned bores in the housing top and the housing bottom, respectively;
- each cap having an arcuate groove receiving, and a vertically extending arcuate surface supporting, the full length of an arcuate upper or lower axial edge of a door shell mounted therebetween.

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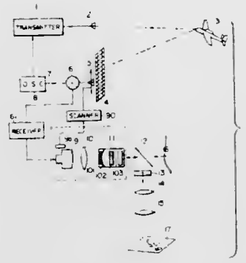
4,783,133
METHOD AND APPARATUS FOR FORMING A HOLOGRAM FROM INCOHERENT LIGHT
Hsuan S. Chen, Midland, Mich., assignor to Saginaw Valley State University, University Center, Mich.
Filed Aug. 26, 1986, Ser. No. 900,548
Int. Cl.[4] G03H *1/26;* **G03B** *35/08, 35/18*
U.S. Cl. 350—376 **41 Claims**



1 Method of forming a hologram, comprising the steps of:
(a) simultaneously creating a plurality of adjacent images on a photographic transparency, each having a sequentially differing viewpoint along an X axis of a scene illuminated by incoherent light using a camera;
(b) placing said transparency into an illumination system,
(c) directing a first beam of coherent light simultaneously through each of said images on said transparency;
(d) independently focusing said first beam in an X dimension as defined by said X axis to illuminate a holographic film so as to provide good depth of field, retaining all parallax information of said images in said X dimension;
(e) independently focusing said first beam in a Y dimension as defined by a Y axis so as to illuminate a holographic film, limiting parallax information of said images in said Y dimension;
(f) simultaneously directing a second beam of mutually coherent light with said first beam onto said holographic film at an angle relative to said first beam so as to cause an interference pattern to appear on said holographic film suitable for producing a rainbow hologram, and
(g) developing said holographic film to form of a rainbow hologram.

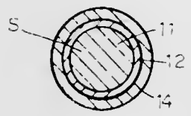
4,783,134
MICROWAVE HOLOGRAPH DEVICE
Tsutomo Hara; Yoshiji Suzuki, both of Hamamatsu, Japan, and Ming H. Wu, Middlesex, N.J., assignors to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan
Filed Jul. 21, 1986, Ser. No. 887,611
Claims priority, application Japan, Aug. 20, 1985, 60-182793
Int. Cl.[4] G02B *27/22;* **G01S** *9/00*
U.S. Cl. 350—3.64 **9 Claims**

1. A microwave holograph device, comprising:
microwave radiation means for radiating a microwave signal to an object,
microwave receiving means for receiving the microwave signal reflected from the object by spatially scanning the main lobe thereof,
mixing means for mixing the microwave signal received by the microwave receiving means with a reference signal related to said radiated microwave signal,
conversion means for converting the output of said mixing means into two-dimensional electric information synchronized with said scanning,
an electrooptic material to yield optical property changes corresponding to said two-dimensional electric information, and



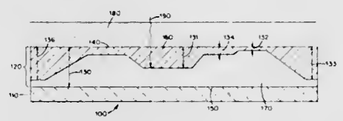
an optical system to read out the optical property changes of said electrooptic material.

4,783,135
OPTICAL FIBER CONDUCTOR AND IMAGE SCOPE USING SAME
Atsushi Utsumi; Kenzou Semimoto, and Hiroyuki Hayami, all of Itami, Japan, assignors to Mitsubishi Cable Industries, Ltd., Hyogo, Japan
Filed Jul. 21, 1987, Ser. No. 76,256
Claims priority, application Japan, Jul. 29, 1986, 61-116424[U]
Int. Cl.[4] G02B *6/16*
U.S. Cl. 350—96.3 **7 Claims**



1. An optical fiber conductor of glass type characterized in that the optical fiber conductor has a fiber-reinforcing layer which, at least in a desired region of the entire length thereof, is made of a charred material of an organic resin.

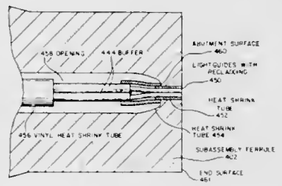
4,783,136
OPTICAL WAVEGUIDES AND METHODS FOR MAKING SAME
Boris S. Elman, Brighton; Mrinal K. Thakur, Waltham, and Robert J. Seymour, Wellesley, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed Apr. 16, 1986, Ser. No. 852,864
Int. Cl.[4] B05D *3/06;* **G02B** *6/10, 6/00*
U.S. Cl. 350—96.12 **10 Claims**



1. An optical waveguide comprising a unitary organic film having a first surface, an second surface, a thickness measured between said surfaces, a first region and a second region; said first region being a polydiacetylene film and said second region being a diacetylene monomer film; and said first region being contiguous with said second region and with said second region making up the totality of said thickness.

4. A method for making an optical waveguide comprising the following steps:
Step 1—depositing a diacetylene monomer film on a substrate, said film having a thickness and a surface; and
Step 2—polymerizing the diacetylene monomer film by ion beam bombarding the surface of said film with ions to a predetermined controlled depth less than the thickness of said film, said ion beam being characterized by an ion mass and an accelerating voltage (energy) said predetermined depth of said polymerization being controlled by said ion mass and said accelerating voltage (energy) of said ion beam being applied.

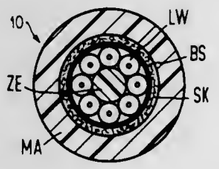
4,783,137
FIBER OPTIC COUPLING SYSTEM
Karel J. Kosman, 7218 Cardinal Ln., Longmont, Colo. 80501; Richard F. Cantwell, 3026 11th St., Boulder, Colo. 80302; Robert E. Dutton, 7621-B Olympia Dr., Bakersfield, Calif. 93309; William A. Gibson, 4091 Longhorn Dr., Lafayette, Colo. 80026; Vernon R. Hargrave, 1674 N. Western, Longmont, Colo. 80501; Matthew L. McConnell, 2156 Grove Cor. W. #8, Boulder, Colo. 80302; David W. Roecker, 137 S. Humboldt, Denver, Colo. 80209, and Jerry L. Fife, 7126 Cedarwood Cir., Boulder, Colo. 80301
PCT No. PCT/US84/01686, § 371 Date Jul. 3, 1985, § 102(e) Date Jul. 3, 1985, PCT Pub. No. WO85/02271, PCT Pub. Date May 23, 1985
Continuation-in-part of Ser. No. 552,030, Nov. 15, 1983. This PCT application Oct. 17, 1984, Ser. No. 757,987
Int. Cl.[4] G02B *6/28, 6/36;* **G02F** *1/00*
U.S. Cl. 350—96.16 **40 Claims**



1. A fiber optic coupling device for bi-directional transmission of optical signals within a range of wavelengths between a fiber optic link cable and a transmitter/receiver comprising:
receive lightguide for guiding optical input signals over said range of wavelengths to said transmitter/receiver;
transmit lightguide for transmitting optical output signals substantially within said range of wavelengths from said transmitter/receiver;
coupler/connector means, operating without wavelength multiplexing, for axially and angularly aligning said transmit and receive lightguides with said fiber optic link cable;
said coupler/connector means or said fiber optic link cable reducing the intensity of reflected optical signals
thereby allowing simultaneous distinguishable bi-directional optical communication of data within said range of wavelengths.

21. An optical fiber transmission system for simultaneous bi-directional transmission of optical signals comprising:
first transmitter/receiver means for detecting optical input signals over a range of wavelengths and generating first electrical input signals in response thereto, and for producing optical output signals in a band of wavelengths substantially within said range of wavelengths in response to first electrical output signals;
second transmitter/receiver means for detecting said optical output signals over said range of wavelengths and generating second electrical input signals in response thereto, and for producing said optical input signals substantially within said band of wavelengths in response to second electrical output signals;
fiber optic link cable for transmitting said optical input and output signals between said first and second transmitter/-receivers;
coupler/connector means at each end of said fiber optic link cable to attach said link cable to said first and second transmitter/receivers said coupler/connector or said fiber optic link cable reducing the intensity of reflected optical signals thereby allowing simultaneous distinguishable bi-directional communication of said optical input and output signals within said range of wavelengths.

4,783,138
CABLE AND METHOD OF MANUFACTURE
Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Nov. 3, 1982, Ser. No. 438,749
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144851
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **10 Claims**



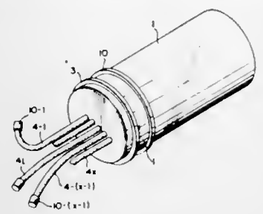
1. In an optical waveguide cable for use in a cable run, said cable having a cable core of optical transmission elements; tension relief means for supporting tension forces applied to the cable core and being composed of a spun covering of tension-proof fibers surrounding the core; and an external cladding surrounding the core and the spun covering of tension-proof fibers, the improvement comprising adhesive means for establishing a firm and stable connection between the inner surface of the cladding and the spun covering of tension-proof fiber, said adhesive means being at least one layer of an adhesive interposed between the spun covering of tension-proof fiber and the cladding, said adhesive layer being a heat-sealable glue so that during installation by pulling the cable into a cable run, the firm connection between the cladding and spun covering prevents excessive stretching of the cladding and the cable core may move relative to the cladding and covering.

4,783,139
STREAKING TUBE
Yutaka Tsuchiya, Hamamatsu, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Hamamatsu, Japan
Filed Feb. 7, 1986, Ser. No. 827,069
Claims priority, application Japan, Feb. 8, 1985, 60-22871
Int. Cl.[4] G02B *6/08*
U.S. Cl. 350—96.27 **11 Claims**

9. A streaking tube, comprising:
an envelope having a center axis, extending in a direction parallel to said axis from a first end to a second end of said envelope, said envelope being closed at said second end;
a faceplate closing said envelope at said first end, said faceplate having a surface in a plane perpendicular to said axis facing said second end and having a center intersected by said axis;
a photocathode formed on said surface;
means, responsive to electrons emitted by said photocathode, for producing an image at said second end; and

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a plurality of optical fiber cables having cable ends fixed in said faceplate in a line passing through said center of said



faceplate, said cable ends terminating in said surface of said faceplate.

4,783,140

ELASTOMERIC OPTICAL WAVEGUIDE WITH CORE AND CLADDING IMPARTED WITH ELASTICITY BY IRRADIATION OF A RADIOACTIVE RAY

Yoshitaka Osawa; Takafumi Uemiya; Shin-ichiro Niwa; Akira Nishimura, and Yutaka Shibata, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 28, 1986, Ser. No. 846,608

Claims priority, application Japan, Mar. 30, 1985, 60-67876; Feb. 21, 1986, 61-37796

Int. Cl.[4] G02B *6/16*

U.S. Cl. 350—96.34 **7 Claims**

1. An elastomeric optical waveguide comprising a core and a cladding surrounding the core in which at least the core comprising an elastomer to which elasticity is imparted by irradiation of a radioactive ray, wherein the elastomer contains no additive for enhancing or imparting elasticity.

4,783,141

ARRAY LENS

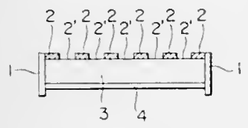
Takeshi Baba, Yokohama; Hiroyuki Imataki, Kawasaki; Masayuki Usui; Takashi Serizawa, both of Yokohama, and Hiroyasu Nose, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,720

Claims priority, application Japan, Mar. 14, 1984, 59-49574

Int. Cl.[4] G02B *15/00*

U.S. Cl. 350—167 **7 Claims**



1. An array lens comprising:

a member having a plurality of arranged openings;

an elastic member means provided in contact with said member and having its surface shape deformable by external pressure; and

means for imparting a force to said elastic member means to deform the surface shape of said elastic member means in said openings of said member.

4,783,142

RADIATION PROTECTION FILTER

Maximilian F. Mutzhas, Sonnenstr. 17/Eing. Joseph-Spital-Str. 14, D-8000 München, Fed. Rep. of Germany

PCT No. PCT/EP86/00525, § 371 Date Apr. 23, 1987, § 102(e) Date Apr. 23, 1987, PCT Pub. No. WO87/01817, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 12, 1986, Ser. No. 51,746

Int. Cl.[4] G02B *5/20*; G02C *7/10*

U.S. Cl. 350—311 **7 Claims**

1. Radiation protection filter for skin pigmentation during solar irradiation characterized by the following features:

(a) in the wavelength range between 300 and 340 nm, the mean transmittance (τ_2) of the radiation protection filter is at the very most 0.1;

(b) in the wavelength range between 340 and 400 nm, the mean transmittance (τ_3) of the radiation protection filter is between 0.35 and 0.55;

(c) in the wavelength range between 340 and 440 nm, the mean transmittance (τ_4) of the radiation protection filter is between 0.45 and 0.7;

(d) in the wavelength range between 380 and 780 nm, the light transmittance (τ_{vis}) of the radiation protection filter is such that, when the radiation filter is used, the amount of radiation in the range between 340 and 400 nm that penetrates the eye lens is, at the very most, that amount of radiation in the 340–400 nm range that penetrates the eye lens when the radiation protection filter is not used.

4,783,143

METHOD FOR SUITABLY POSITIONING LIGHT WAVEGUIDES FOR COUPLING LOCATIONS AND FOR COUPLING ELEMENTS IN A LIGHT WAVEGUIDE SWITCH

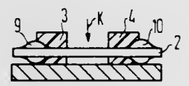
Joachim Eicher, and Lothar Kiesewetter, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 23,247

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607566

Int. Cl.[4] G02B *6/36*

U.S. Cl. 350—320 **20 Claims**



1. A method for suitably positioning light waveguides for coupling ends of function fibers at coupling locations, the coupling ends of the function fibers aligned and fixed on a carrier element, comprising:

providing a guide element on the carrier element for each function fiber;

providing a guide capillary in said guide element substantially fitted to a jacket of said function fiber;

providing a wrap-free auxiliary fiber having a diameter substantially the same as a diameter of said function fiber;

inserting said auxiliary fiber through said guide capillaries of at least two guide elements to align said guide elements on the carrier element and on either side of the coupling location;

attaching said guide elements to the carrier element;

removing said auxiliary fiber from said guide elements;

inserting the function fibers into said guide capillaries of each of said guide elements such that their coupling ends are in axial alignment at the coupling location; and

attaching the function fibers to said guide elements.

4,783,144

THIN OPTICAL MEMBRANES AND METHOD OF MAKING THE SAME

Ronald S. Hersbel, Albany, Oreg., and Ray Winn, North Hollywood, Calif., assignors to Advanced Semiconductor Products, Inc., Compton, Calif.

Continuation-in-part of Ser. No. 594,474, Mar. 28, 1984, abandoned, which is a division of Ser. No. 326,488, Dec. 2, 1981, Pat. No. 4,453,828. This application Mar. 20, 1986, Ser. No. 842,168

Int. Cl.[4] G02B *5/00*; B05D *5/00*

U.S. Cl. 350—320 **9 Claims**

1. A thin, optical membrane capable of being supported at its periphery, and capable of being removed, substantially intact, from the surface on which said membrane is formed, and having a predetermined thickness of at least about 0.5 micrometers, said membrane having a capacity to transmit at least some light incident thereon, said membrane being made by dispensing a polymer/solvent mixture onto a rotatable supporting surface bearing embossed data, spinning said rotatable surface under conditions sufficient to form said membrane from said polymer, and removing said membrane, after formation, from said rotatable surface, said membrane having said embossed data on its surface.

4,783,145

MULTIPLE GRADATION DOT-MATRIX PICTURE FORMING METHOD

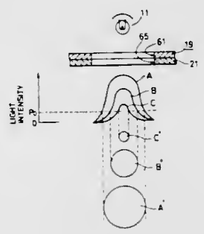
Isamu Hatanaka, and Masaaki Takimoto, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 28, 1986, Ser. No. 890,242

Claims priority, application Japan, Jul. 29, 1985, 60-167318

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—331 R **10 Claims**



1. A method for forming a dot-matrix picture, comprising the steps of:

applying light from a light source through an array of light gates to a photo-sensitive material;

controlling an intensity of said light transmitted through each of said light gates according to picture data having a spatial distribution corresponding to a spatial distribution of said array of light gates, said transmitted intensity being controlled to provide at least two levels of non-zero light intensities;

converting said transmitted light of controlled intensity to an exposed dot on said photo-sensitive material, the area of said exposed dot being related to the intensity of said transmitted light.

4,783,146

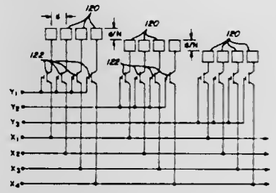
LIQUID CRYSTAL PRINT BAR

Joseph F. Stephany, Williamson; Andras I. Lakatos, Penfield; Virgil J. Hull, Perinton, and Alain E. Perreganx, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 20, 1987, Ser. No. 4,932

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—331 R **11 Claims**



1. Apparatus for projecting data on a photoreceptor surface comprising:

drive means for moving the photoreceptor surface,

a linear, optical writing station arranged transversely to the direction of travel of the photoreceptor surface including an array of liquid crystal devices mounted adjacent to the photoreceptor surface, said liquid crystal devices being arranged along two parallel lines with the location of the liquid crystal devices of the second line being staggered relative to the location of the liquid crystal devices of the first line, said array extending over a linear extent equivalent to the width of said photoreceptor surface onto which data is to be projected,

an array of thin film transistors connected to the array of liquid crystal devices for electrically driving said devices,

a source of light for projecting light onto said liquid crystal devices,

means to focus said light onto the photoreceptor surface from the liquid crystal device, and

logic means electrically connected to the array of thin film transistors for selectively pulsing said array of liquid crystal devices whereby said photoreceptor surface is selectively exposed by light from said light source.

4,783,147

ACTIVE MATRIX DISPLAY SCREEN WITHOUT SPURIOUS TRANSISTOR

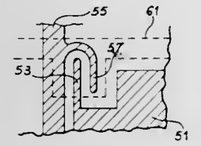
Francois Maurice, Perros-Guirec; Joseph Richard, Lannion, and Bruno Vinouze, Port-Blanc, all of France, assignors to C. N. E. T., Issy Les Moulineaux, France

Continuation-in-part of Ser. No. 007,084, Jan. 27, 1987, Pat. No. 4,738,749. This application Jul. 15, 1987, Ser. No. 73,720

Claims priority, application France, Jan. 27, 1986, 8601083

Int. Cl.[4] G02F *1/01*; G09G *3/18*; B44C *1/22*; C23F *1/02*

U.S. Cl. 350—333 **5 Claims**



1. Active matrix display screen comprising:

(a) a first insulating and transparent wall coating with:

(i) a matrix of blocks distributed in lines and columns, these blocks being of transparent conductive material

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and forming pixels, each block being connected to a first conductive segment,

(ii) a family of conductive addressing columns placed between the columns of blocks, each column being provided with at least a second conductive segment at the level of each pixel, each second segment connected to a determined column having a part which is interposed between the first segment connected to the block and the column which follows said determined column,

(iii) a family of conductive addressing lines perpendicular to the addressing columns and placed between the lines of blocks, these lines consisting of a stack of a semiconductive material, these lines covering said first segments connected to the conductive blocks and said second segments connected to the columns, a matrix of transistors thus being constituted there where the lines cover said first and second segments, each transistor of this matrix comprising a gate formed by the conductive layer of a line, a source formed by the first segment connected to the block and a drain formed by the second segment connected to a column,

(b) a second insulating and transparent wall coated with a transparent conductive layer,

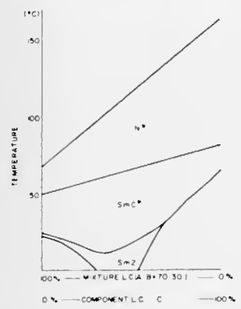
(c) a layer of liquid crystal inserted between the first and the second wall.

4,783,148

FERROELECTRIC LIQUID CRYSTAL DEVICE

Akira Tsuboyama, Segamihara; Toshiharu Uchimi, and Kenji Shinjo, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,318
Claims priority, application Japan, Sep. 20, 1986, 61-222709
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—341 **11 Claims**



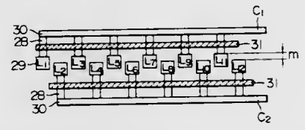
1. A ferroelectric liquid crystal device, comprising a pair of substrates, and a ferroelectric liquid crystal composition sandwiched between the substrates and showing a phase transition from isotropic phase through chiral nematic phase to chiral smectic C phase in the course of temperature decrease; the pair of substrates having, on the surfaces thereof contacting the ferroelectric liquid crystal composition, alignment control films which comprise mutually different materials.

4,783,149

TIME-SHARING DRIVE LIQUID CRYSTAL OPTICAL SWITCH ARRAY AND OPTICAL PRINTER USING THIS OPTICAL SWITCH ARRAY

Takao Umeda, Mito; Tetsuya Nagata; Yuzuru Simazaki, both of Hitachi; Tatsuo Igawa, Kitaibaraki, and Yasuro Hori, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1986, Ser. No. 916,724
Claims priority, application Japan, Oct. 9, 1985, 60-223581
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S **14 Claims**



1. A time-sharing drive optical switch array having a plurality of optical shutter units in a line, each optical shutter unit comprising:

N(n=2, 3, 4, . . .) optical shutter elements wherein each optical shutter element comprises a ferroelectric liquid crystal;

a signal electrode which is commonly connected to each optical shutter element of said optical shutter unit;

n scanning electrodes which are each connected to one of the optical shutter elements of each of said optical shutter units, wherein each optical shutter element is arranged at a position where said signal electrode and a scanning electrode cross each other so as to be sandwiched by both of said signal and scanning electrodes, a selection signal is sequentially supplied to each of said n scanning electrodes, said optical shutter elements connected to said scanning electrodes supplied with said selection signal transmit a light when a first predetermined potential is applied to said signal electrode corresponding to said optical shutter elements, and said optical shutter elements shut off the light when a second predetermined potential is applied to said signal electrode, and the scanning electrodes to which said selection signal is not supplied become substantially an open state; and

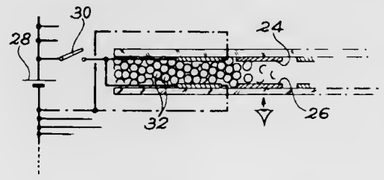
resistor means connected between a scanning electrode and an optical shutter element when said selection signal is not supplied to the scanning electrodes.

4,783,150

THERMALLY ELECTRICALLY OR MAGNETICALLY CONTROLLABLE LYOTROPIC LIQUID CRYSTAL OPTICAL DEVICES

James Tabony, Villebon/Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

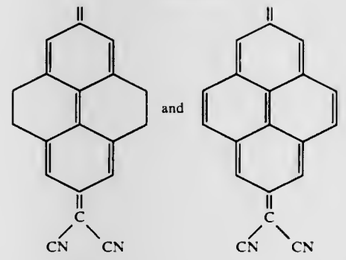
Filed Oct. 26, 1987, Ser. No. 113,288
Claims priority, application France, Nov. 7, 1986, 86 15594
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—351 **30 Claims**



1. Optical device having a liquid crystal comprising a microemulsion (**10,14,22**) which has two stable optical states, namely a transparent state and an opaque state which can be controlled, characterized in that the liquid crystal (**10,14,22**) has a lamellar structure in the transparent state and a nematic lamellar structure in the opaque state, said two states being thermally controllable and that it contains 1 to 45% by weight of a surfactant, 0 to 45% by weight of a co-surfactant, 0 to 98% by weight of oil and 1 to 99% by weight of polar liquid, the ratio of the co-surfactant mass to the surfactant mass being below 2.

5. Optical device having a liquid crystal (**39,48**) with two stable states which can be controlled, characterized in that said liquid crystal (**39,48**) is a nematic containing 1 to 45% by weight of surfactant, 1 to 45% by weight of co-surfactant, 1 to 97% by weight of oil and 1 to 97% by weight of a polar liquid, the ratio of the co-surfactant mass to the surfactant mass being below 2 and the four constituents form elongated aggregates, dispersed in a continuous liquid phase, whose length exceeds the distance separating two consecutive aggregates, the orientation of these aggregates being electrically or magnetically controllable.

-continued



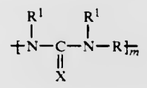
4,783,151

DEVICES UTILIZING PENDANT QUINODIMETHANE-CONTAINING POLYMERS

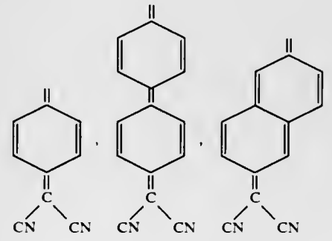
Eui W. Choe, Randolph, N.J., assignor to Hochst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 854,282, Apr. 21, 1986, Pat. No. 4,719,281. This application Mar. 30, 1987, Ser. No. 31,770
Int. Cl.[4] G02F *1/03*; H03F *7/00*; G03G *5/02*
U.S. Cl. 350—356 **9 Claims**

1. An electrooptic light modulator device with a polymeric nonlinear optical component comprising a transparent solid medium of a polymer which is characterized by a recurring structural unit corresponding to the formula:



where R is a divalent organic radical containing between about 2–20 carbon atoms; R^1 is hydrogen or a C_1–C_{20} alkyl group; m is an integer of at least 3; and X is a pendant quinoid substituent selected from

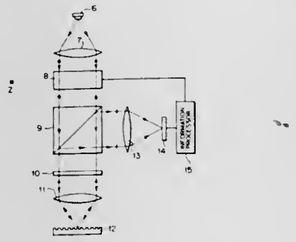


4,783,152

VARIABLE FOCAL LENGTH LENS

Yoshifumi Nishimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,777
Claims priority, application Japan, Jan. 9, 1985, 60-859
Int. Cl.[4] G02F *1/19*
U.S. Cl. 350—379 **4 Claims**



1. An optical system provided with a variable focal length lens and for being in an optical information readout apparatus, comprising:

supplying means for supplying a light beam;

a polarization beam splitter for directing a first light beam to an information recording plate, said first light beam being polarized in a first direction;

variable focal length lens means disposed in a light path between said supplying means and said beam splitter, said lens means including means for rotating a polarization plane of light and a birefringent lens for providing different focal lengths according to the polarization plane of the light from said rotating means;

control means for making the polarization plane of the light from said birefringent lens the same with that of said first light beam, irrespective of the state of the polarization plane of the light from said rotating means, and causing said first light beam to enter said beam splitter;

a λ/4 plate disposed in a light path between said beam splitter and said information recording plate, said λ/4 plate converting said first polarized light beam from said beam splitter to circularly polarized beam, and said λ/4 plate causing said first light beam to enter said information recording plate, and said λ/4 plate converting a second light beam reflected by said information recording plate to a second light beam polarized in a second direction whose polarization plane is rotated by 90° relative of that of said first light beam and directing said second light beam to said beam splitter;

a photodetector for receiving said second light beam from said beam splitter; and

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information processing means for converting a signal from said photoconductor to information.

4,783,153

VARIABLE-FOCUS OPTICAL DEVICE

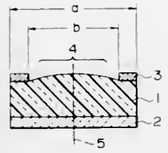
Nobuo Kushibiki, Ebina; Noriyuki Nose, Sagamibara; Takeshi Baba, Atsugi; Toshiyuki Nakajima, Atsugi, and Masahiro Okuda, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,791

Claims priority, application Japan, Dec. 24, 1985, 60-289191

Int. Cl.[4] G02B *3/00, 1/06, 15/00*

U.S. Cl. 350—409 **12 Claims**



1. A variable-focus optical device comprising: an elastomeric member having a gradient of shear modulus inside thereof along its optical axis, and a deforming member having an aperture adapted for causing projection or sinking of the elastomeric member therethrough or thereat to deform the surface of the elastomeric member.

4,783,154

IMAGE-TRANSMITTING OPTICAL SYSTEM

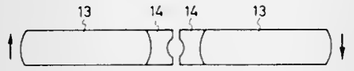
Susumu Takahashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1986, Ser. No. 888,377

Claims priority, application Japan, Jul. 25, 1985, 60-162865

Int. Cl.[4] G02B *23/00, 9/04*

U.S. Cl. 350—413 **25 Claims**



1. An image-transmitting optical system comprising two rod-like lens components having facing surfaces, said lens components being arranged so that one of said facing surfaces thereof is concave to the other facing surface, and at least one of said lens components constituting a plurality of lens elements including at least one inhomogeneous lens.

4,783,155

OPTICAL DEVICE WITH VARIABLY SHAPED OPTICAL SURFACE AND A METHOD FOR VARYING THE FOCAL LENGTH

Hiroyuki Imataki, Kawasaki; Takashi Serizawa, Yokohama; Masayuki Usui, Yokobama; Takeshi Baba, Yokohama, and Hiroyasu Nose, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,538

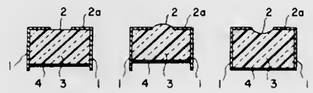
Claims priority, application Japan, Oct. 17, 1983, 58-193868; Nov. 21, 1983, 58-219113; Nov. 25, 1983, 58-222607; Nov. 25, 1983, 58-222608; Nov. 25, 1983, 58-222610; Dec. 2, 1983, 58-228693; Dec. 2, 1983, 58-228695; Jan. 26, 1984, 59-12489

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[4] G02B *15/00, 1/06*

U.S. Cl. 350—423 **27 Claims**

1. An optical device, comprising an elastomeric body and a relatively rigid member having an opening and contacting the elastomeric body to expose a part of the surface of the elastomeric body through the opening, the exposed surface part of



the elastomeric body being changeable in shape so as to form a variable optical surface by release of volumetric stress of the elastomeric body through the exposed surface part.

4,783,156

OPTICAL SYSTEM FOR ALTERING THE DIRECTION OF THE VISUAL FIELD IN ENDOSCOPES

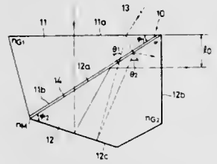
Akira Yokota, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 4, 1987, Ser. No. 45,815

Claims priority, application Japan, May 7, 1986, 61-68302[U]

Int. Cl.[4] G02B *23/02*

U.S. Cl. 350—445 **9 Claims**



1. An optical system for altering the direction of the visual field in endoscopes, comprising visual field direction altering means composed of a first prism having a first light-incidence surface normal to an optical axis of incident light and a first light-emitting surface crossing said first light-incidence surface, and a second prism having a second light-incidence surface facing, via an interface layer, said first light-emitting surface substantially in parallel, a reflection surface crossing said second light-incidence surface, and a second light-emitting surface crossing said second light-incidence surface and normal to an optical axis of an objective lens system, wherein:

said first prism is so formed that its vertical angle between said first light-incidence surface and said first light-emitting surface is set to establish the relationship

$$\theta_1 < \sin^{-1}\left(\frac{\eta_M}{\eta_{G1}}\right)$$

when the angle of incidence of an upper marginal light rays corresponding to the maximum height of an image relative to said first light-emitting surface is assumed to be θ_1, and

said second prism is so formed that its vertical angle between said second light-incidence surface and said reflection surface is set to establish the relationship

$$\theta_2 > \sin^{-1}\left(\frac{\eta_M}{\eta_{G2}}\right)$$

when the angle of incidence of said upper marginal light rays reflected at said reflection surface relative to said second light-incidence surface is assumed to be θ_2, wherein η_{G1}, η_{G2} and η_M represent the refractive indices of said first prism, said second prism and said interface layer, respectively.

4,783,157

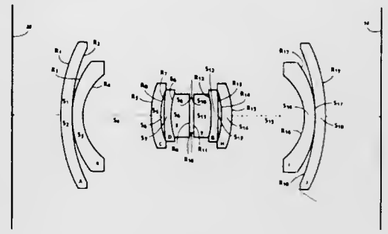
SYMMETRICAL WIDE ANGLE LENS WITH IMPROVED ILLUMINATION UNIFORMITY

Michael E. Harrigan, Webster, and Edward A. Powers, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1987, Ser. No. 44,272

Int. Cl.[4] G02B *9/64*

U.S. Cl. 350—463 **3 Claims**



1. A wide angle photocopy lens system having a semi-field angle greater than 38°, a relative aperture of F/10, said lens system consisting of the following elements symmetrically placed around a central aperture stop:

a. an outer positive element curved toward the aperture stop having a dioptric power greater than 0.2 and less than 0.3 of the overall dioptric power of the lens;

b. a second negative element curved toward the aperture stop having a dioptric power greater than −1.5 and less than −1.2 of the overall dioptric power of the lens;

c. a third positive element curved toward the aperture stop having a dioptric power greater than 1.0 and less than 1.1 of the overall dioptric power of the lens;

d. a fourth negative element whose dioptric power is greater than −2. and less than −1.8 of the overall dioptric power of the lens; and

e. a fifth positive element whose dioptric power is greater than 1.8 and less than 2.2 of the overall dioptric power of the lens.

4,783,158

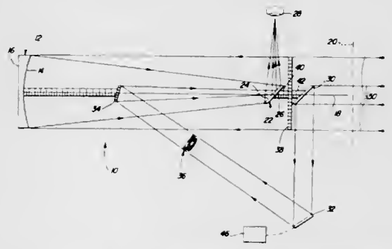
HIGH IMAGE CONTRAST REFLECTING TELESCOPE

Stanley J. Shackman, 515 Soule, Ann Arbor, Mich. 48103

Filed Sep. 14, 1987, Ser. No. 95,668

Int. Cl.[4] G02B *17/08, 23/06, 27/14*

U.S. Cl. 350—503 **11 Claims**



1. A telescope (**10,10',10''**) comprising: primary mirror means (**12,12',12''**) having a front and rear side (**14,14',14'',16,16',16''**) and defining an optical axis (**18,18',18''**) for reflecting a primary light beam (**50,50',50''**) received from an on-axis object; secondary mirror means (**22,22',22''**) having a front side (**24,24',24''**) and rear side (**26,26',26''**) for receiving the primary light beam (**50,50',50''**) reflected from said front side (**14,14',14''**) of said primary mirror means (**12,12',12''**) and reflecting the primary light beam (**50,50',50''**) to an eyepiece (**28,28',28''**), said secondary mirror means (**22,22',22''**) being disposed on said optical axis (**18,18',18''**) and obstructing a portion of the primary light beam (**50,50',50''**) received by said primary mirror means (**12,12',12''**); and characterized by intercept means for intercepting the obstructed portion of the primary light beam (**50,50',50''**) ahead of said rear side (**26,26',26''**) of said secondary mirror means (**22,22',22''**) and merging the intercepted light beam into the primary light beam (**50,50',50''**) between said front faces (**14,14',14'',24,24',24''**) of said primary and secondary mirrors (**12,12',12'',22,22',22''**) to form an unobstructed view of the on-axis object.

4,783,159

OPERATION MICROSCOPE

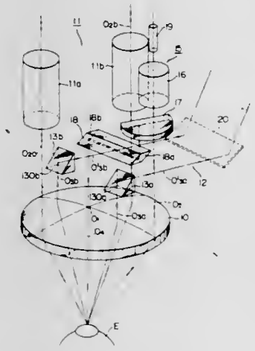
Kazutoshi Takagi, and Nobuaki Kitajima, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed Mar. 26, 1987, Ser. No. 31,523

Claims priority, application Japan, Mar. 31, 1986, 61-47963[U]

Int. Cl.[4] G02B *21/06, 21/12, 21/22*

U.S. Cl. 350—516 **5 Claims**



1. An operation microscope comprising:

a single objective lens having an optical axis;

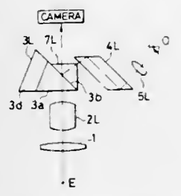
a pair of observation optical systems behind said single objective lens;

illumination means disposed behind said single objective lens for projecting illumination light flux through a part of the peripheral portion of said single objective lens; and

transmission means having an exit optical axis and disposed between said objective lens and said illumination means, said transmission means being selectively positionable in and out of said optical axis of said single objective lens and said exit optical axis of said transmission means being substantially coincident with said optical axis of said single objective lens when said transmission means is moved in line with said optical axis of said single objective lens, so that a part of the illumination light flux ejected from said illumination means is transmitted through said transmission means and projected along said optical axis of said single objective lens.

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4,783,160
STEREOSCOPIC MICROSCOPE
Shinya Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 25, 1986, Ser. No. 843,569
Claims priority, application Japan, Mar. 29, 1985, 60-67497
Int. Cl.[4] G02B *21/22*
U.S. Cl. 350—516 **8 Claims**

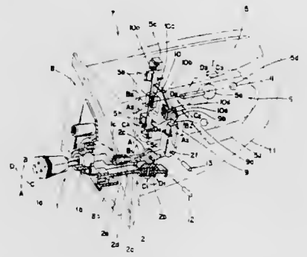


1. A stereoscopic microscope comprising:
an objective;
a pair of relay lens systems having optic axes parallel to each other;
a pair of optic axis deflecting prisms for bending the optic axes of said relay lens systems to thereby form a predetermined angle of depression, said prisms being rotatively displaced with respect to the optic axes of said relay lens systems to form a predetermined angle of convergence; and
an auxiliary prism cemented to a predetermined reflecting surface of at least one of said pair of optic axis deflecting prisms for forming a new optical path different from an optical path leading to a finder system.

7. A stereoscopic microscope comprising:
an objective;
a pair of relay lens systems having optic axes parallel to each other;
a pair of optic axis deflecting prisms for bending the optic axes of said relay lens system to thereby form a predetermined angle of depression, said prisms having an image erecting function and being fixed at a rotated position with respect to the optic axes of said relay lens systems to form a predetermined angle of convergence; and
a pair of eye width adjusting prisms positioned rearwardly of said pair of optic axis deflecting prisms.

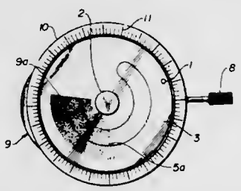
4,783,161
MIRROR ANGLE ADJUSTING DEVICE FOR DOOR MIRROR ASSEMBLY
Noriyasu Shamoto, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan
Filed Sep. 11, 1987, Ser. No. 95,163
Claims priority, application Japan, Sep. 11, 1986, 61-140213[U]
Int. Cl.[4] B60R *1/06*; G02B *7/18, 5/08*
U.S. Cl. 350—635 **6 Claims**

1. A mirror angle adjusting device for a door mirror assembly comprising:
a lever including an intermediate pivot portion pivotally supported in a door mirror case, one end portion formed as a control element which is manually pivotable in both vertical and horizontal directions, and an opposite end portion located in the door mirror case and formed as a joint, said lever extending substantially horizontally;
a first connecting member including an intermediate pivot portion supported in the door mirror case rotatably in a horizontal plane and pivotally in a vertical plane, one end portion formed as a first joint which is connected to said joint of the lever movably in the axial direction thereof and relatively bendably in both vertical and horizontal directions, and an opposite end portion formed as a second joint, said first connecting member extending substantially horizontally;
a second connecting member having a lower end portion formed as a first joint which is pivotally connected in a vertical plane to said second joint of the first connecting member, and an upper end formed as a second joint, said second connecting member extending substantially vertically; and



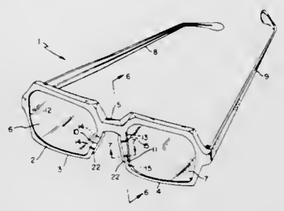
a third connecting member including a shaft portion connected to a back of a mirror holder for holding a mirror in place at either side of the center of rotation of the mirror holder, said shaft portion extending substantially vertically, and a salient portion projecting rearwardly from said shaft portion and connected to said second joint of the second connecting member rotatably about both a vertical axis and a horizontal axis.

4,783,162
SPECTACLE MOUNTED VARIABLE NEUTRAL DENSITY FILTER HOLDER
Ronald Siwoff, 901 Brown Rd., Bridgewater, N.J. 08807
Filed Feb. 2, 1987, Ser. No. 9,694
Int. Cl.[4] G02C *7/16*; A61B *3/04*
U.S. Cl. 351—49 **5 Claims**



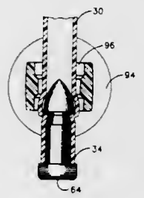
1. A variable neutral density filter assembly comprising a graduated variable neutral density filter and a filter holder, said filter assembly further comprising attachment means for attachment to spectacles, said assembly further comprising an aperture disc mounted off the central axis of the body of said filter holder, a filter holder plate comprising a scale whereby the optical density may be read directly and further comprising locater means which orients said filter, locking means to hold said filter to said plate, a ring gear the holder plate such that a small attached to the holder plate such that a small rotation of a knob rotates a gear which rotates said ring gear, holding plate and neutral density filter.

4,783,163
EYEGLASS NOSE PAD SYSTEM
Arnold R. Breault, Derby, Conn., assignor to The Spectacle, Inc., Derby, Conn.
Filed Mar. 13, 1986, Ser. No. 839,110
Int. Cl.[4] G02C *5/12*
U.S. Cl. 351—136 **18 Claims**



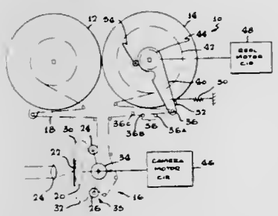
1. Eyeglass frame and nose pad assembly comprising a resiliently deformable unitary pad element including
a plate portion having an outer side for engaging the nose of the wearer and an inner side adapted for engaging the corresponding nose pad area of an eyeglass frame rim,
intermediate base means integral with and extending outwardly from the inner side of the plate portion in a direction away from the outer side of the plate portion and sized and shaped for insertion into corresponding throughbore means in the nose pad area of the eyeglasses frame rim which throughbore means open into the corresponding lens retaining internal groove of the eyeglass frame rim, and
end extension linear retaining means connected directly to and extending outwardly from the intermediate base means and defining a shoulder transition at the corresponding point of connection therebetween,
the retaining means being sized and shaped for insertion through the throughbore means for location in and disposition linearly along the internal groove of the eyeglass frame rim and adapted for deformable engagement in the groove with the adjacent periphery of the corresponding eyeglass lens upon insertion of such lens into such groove for thereby lockingly mounting the element on the corresponding frame rim without visibility of same.

4,783,164
ADJUSTABLE RETAINING STRAP FOR EYEGLASSES
Robert A. Heiberger, 1629 Canyon, Boulder, Colo. 80302
Filed Oct. 23, 1987, Ser. No. 112,822
Int. Cl.[4] G02C *3/02*
U.S. Cl. 351—156 **20 Claims**



1. An adjustable retaining strap for eyeglasses having a frame including lens-holding frames and a pair of temple pieces extending from corners of the frame rearwardly to temple ends, comprising:
an elongated tubular member having opposite tube end portions and constructed of a flexible resilient material, said tubular member having an inner tube diameter and an outer tube diameter when the tubular member is in a relaxed state;
a pair of plug members, each plug member matably received in a respective tube end portion and having an enlarged head at a leading end, a base at a trailing end and a shaft portion extending longitudinally between said head and said base, said head having a transverse dimension larger than the inner diameter of said tube and larger than the transverse dimension of said shaft portion such that each plug member may be inserted into a respective tube end portion with resilient material stretched over the enlarged head so that said enlarged head is resiliently gripped in the tube end; and
a pair of retaining sleeves, each said sleeve having a body portion having a longitudinal first passageway formed therethrough, said tubular member having opposite end portions folded into end loops each having a bight portion that is received through a respective passageway such that the tubular member passes twice through each passageway, each said passageway dimensioned to prevent the head of its respective plug member from passing therethrough whereby each end loop may be placed around a respective said temple end and constricted around the respective said temple end with each plug member engaging the passageway of its respective retaining sleeve with a central portion of the tubular member extending between said end loops.

4,783,165
RAPID START-UP CAMERA
Robert Auguste, Point Arena, Calif., assignor to Showscan Film Corporation, Culver City, Calif.
Filed Feb. 13, 1987, Ser. No. 14,309
Int. Cl.[4] G03B *21/48*
U.S. Cl. 352—180 **2 Claims**



1. In a motion picture camera which includes a camera motor that supplies substantially all power for driving a mechanism that moves film through a film gate region at full operating speed, a reel motor that can turn a reel in a direction to wind film thereon, and tension sensing means for sensing the tension of film at a tension sensing location between the film gate region and reel, the improvement comprising:
a camera motor circuit coupled to said camera motor to energize it to turn at any speed within a range from zero to a predetermined full operating speed, said camera motor circuit including means responsive to said tension sensing means during acceleration of film between zero and full operating speed for controlling camera motor acceleration to maintain film tension at said tension sensing location substantially within predetermined limits, said camera motor circuit controlling said camera motor to maintain said full operating speed when said full operating speed is reached;
a reel motor circuit coupled to said reel motor to accelerate it at a maximum acceleration during a period before said camera attains full operating speed, said reel motor circuit including means responsive to film tension at said tension sensing location for maintaining a level of reel motor

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output torque in a direction to wind up film which results in maintaining film tension at said location between predetermined limits after said camera motor is at full operating speed;

said camera motor being slaved to said reel motor during said period before said camera motor attains full operating speed, by the fact that the camera motor speed is controlled to maintain film tension between predetermined limits as the reel motor accelerates;

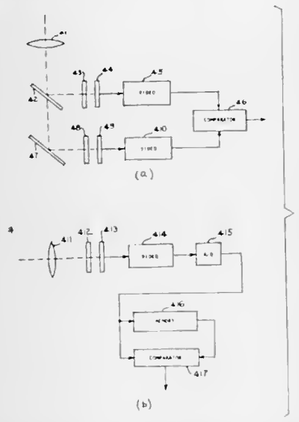
said reel motor being slaved to said camera motor after said camera motor is at full operating speed, by the fact that the reel motor speed is controlled to maintain film tension between predetermined limits as the camera motor moves film to said tension sensing location.

4,783,166

ARRANGEMENT FOR IMPROVING VISUAL DETECTION OF PAINTED AREAS RELATIVE TO SURROUNDING MATERIAL

Howard Stern, Greenlawn, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Jul. 15, 1987, Ser. No. 73,363
Int. Cl.[4] G01N *1/00, 21/64, 21/27*
U.S. Cl. 356—36 **14 Claims**



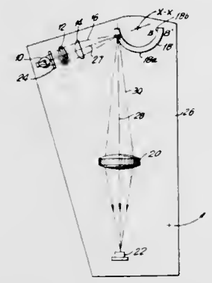
1. A method for improving detectability of a predetermined area on a surface surrounded by surfaces that may contain specular reflecting regions, comprising the steps of: coating a predetermined area on a surface with material radiating energy in a frequency band other that that of a radiation source when irradiated by said source; irradiating said surface with said radiation source; imaging a first predetermined portion of reflected and reradiated energy from said surface onto an image detection surface after passing through a first filter having low attenuation in a frequency band of radiation from said predetermined area coating and high attenuation at least in the frequency band of said radiation source; imaging a second predetermined portion of reflected and reradiated energy from said surface onto an image detection surface after passing through a second filter having low attenuation for all frequencies except those of the radiation band of the coating; subtracting the second detected image from the first detected image and forming a difference image; and automatically detecting said predetermined surface area by said difference image; said two filters being in operation at the same frequency whereby one filter is a band pass filter and the other filter is a band reject filter, so that uncertainty is prevented due to unknown selectivity of reflectance of surfaces as wavelength is changed, said predetermined surface area being detected independent of any absorption band present in said radiation source.

4,783,167

FINGER IMAGING APPARATUS USING CURVED PLATEN

Michael Schiller, Riverdale, and Daniel H. Marcus, New City, both of N.Y., assignors to Fingermatrix, Inc., North White Plains, N.Y.

Filed May 5, 1987, Ser. No. 46,906
Int. Cl.[4] G06K *9/20*
U.S. Cl. 356—71 **11 Claims**



1. In an optical fingerprint imaging system having an interrogating light beam for illuminating a finger placed against a platen to provide a modulated reflected light beam, the system having an imaging segment for imaging the reflected beam onto a photo-electric transducer, the improvement comprising:

a curved platen having a concave finger touching surface and a convex non-touching surface through which the modulated reflected light beam emerges,

the imaging segment having an axis within a zone in the platen bounded by a first plane having an angle to the normal at said touching surface equal to the critical angle and a second plane having an angle to the normal at said non-touching surface equal to the critical angle,

the interrogating light beam having an axis within the platen such that its mirror axis is outside of said zone,

the axis of said interrogating light beam intersecting said non-touching surface.

4,783,168

METHOD OF DETERMINING A PHYSICAL PROPERTY OF A MEDIUM

Onno Florisson, Leek, and Geert E. H. Joosten, Roden, both of Netherlands, assignors to N.V. Netherlandse Gasunie, Groningen, Netherlands

Filed Apr. 20, 1987, Ser. No. 39,864
Claims priority, application Netherlands, Apr. 19, 1986, 8600998
Int. Cl.[4] G01J *3/44*
U.S. Cl. 356—301 **3 Claims**

1. Method of determining the calorific value of a medium, comprising the steps of:

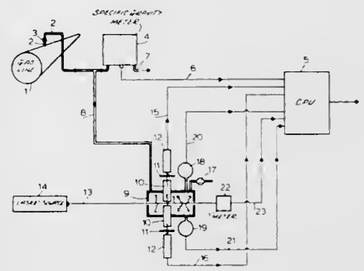
determining the specific gravity of the medium;

measuring the respective concentrations of various components and determining their identity within the medium using Raman spectrometry,

calculating the calorific value of the medium according to the equation

$$H = \sum_{i=0}^{n} C_i H_i(P_i)$$

wherein H is the calorific value of the medium in MJ/m^3, C_i is the weight fraction of a particular component in %, H_i is the calorific value of a particular component in MJ/kg, p_i is the specific gravity of a particular component in Kg/m^3, and n is the number of components.



4,783,169

CONTROL OF A RING LASER GYRO CAVITY ACCORDING TO A PRESELECTED MODEL

Anthony Matthews, Calabasas; Guy T. Varty, Woodland Hills; Jeffrey S. Darling, Chatsworth, and Steven C. Gillespie, Canoga Park, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 9, 1985, Ser. No. 764,441
Int. Cl.[4] G02F *1/09;* **H01S** *3/10*
U.S. Cl. 356—350 **33 Claims**

1. A method of controlling a ring laser gyro having a cavity with at least one control transducer associated with a reflective surface thereof and at least one parameter characteristic of cavity operation, comprising the steps of:

maintaining a preselected model of cavity operation;

sampling cavity data as a measure of said parameter;

comparing the data to the model; and

controlling the transducer so that the parameter conforms to the model.

4,783,170

READOUT FOR A RING LASER GYRO USING A PLATINUM BEAM SPLITTER

James W. Bergstrom, New Brighton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 665,414, Oct. 26, 1984, Pat. No. 4,712,917. This application May 12, 1986, Ser. No. 861,895
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] G01C *19/64;* **G02B** *27/14*
U.S. Cl. 356—350 **4 Claims**

1. An optical readout apparatus for a ring laser angular rate sensor comprising:

an optically transparent substrate member having first and second major surfaces, said second major surface including a first beam splitter means; and

a first prism element having

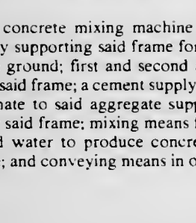
a first surface perpendicular to a second surface thereof,

a third surface being at a predetermined acute angle with respect to said first surface, a first beam reflecting means on said third surface for reflecting, back into said first prism element and toward said first surface thereof, beams entering through said second surface, passing uninterrupted through said first prism element between said second and third surfaces, and impinging on said first beam reflecting means, and

said first surface including a platinum coating thereon to provide a second beam splitter means;

a second prism element having

a first surface perpendicular to a second surface thereof, said first surface of said first prism element being positioned in contiguous juxtaposition with respect to said first surface of said second prism element, said second surface of said first prism element being coplanar with said second surface of said second prism element, said first and second prism elements being bonded together



at said first surface solely by an optical contact bond, and said coplanar second surfaces of said first and second prism elements being positioned in contiguous juxtaposition with said first major surface of said substrate member, and bonded thereto solely by an optical contact bond, said second beam splitter means being in the interface between said contiguous first surfaces of said first and second prism elements, and

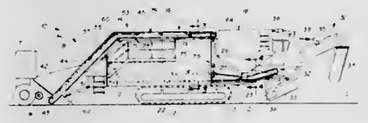
a third surface being at said predetermined acute angle with respect to said first surface, said third surface including a second beam reflecting means for reflecting, back into said second prism element toward said first surface thereof, beams entering through said second surface of said second prism element which passed through said second prism element between said second and third surfaces thereof, and impinging on said second beam reflecting means.

4,783,171

LOADING CONVEYOR FOR CONCRETE MIXER

Harold M. Zimmerman, R.D. #1, Wabash Rd., Ephrata, Pa. 17522

Filed May 23, 1986, Ser. No. 866,274
Int. Cl.[4] B28C *7/06;* **B65G** *17/06, 17/26;* **B60P** *1/36*
U.S. Cl. 366—37 **19 Claims**



1. In a mobile concrete mixing machine having a frame; means for mobilely supporting said frame for movement over the surface of the ground; first and second aggregate supply bins supported by said frame; a cement supply bin supported by said frame proximate to said aggregate supply bins; a water tank supported by said frame; mixing means for mixing aggregates, cement and water to produce concrete for discharge from said machine; and conveying means in operative commu-

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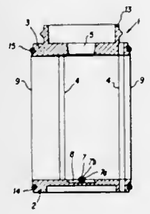
nication with said aggregate supply bins, said cement supply bin and said water tank to convey controlled amounts of materials therefrom to said mixing means, the improvement comprising:

an endless loading conveyor in operative communication with both said first and second aggregate supply bins, said loading conveyor having a load receiving portion for accepting aggregate material from an external source of supply and a delivery portion selectively operable to deliver said aggregate material alternatively to one of said aggregate supply bins, said loading conveyor being operable to convey said aggregate material received by said load receiving portion to said delivery portion for the delivery of said aggregate material to the selected one of said aggregate supply bins, said loading conveyor further having a delivery run, a return run and a floor member disposed between said delivery and return runs and cooperable with said delivery run for the conveyance of said aggregate material over said floor member, said floor member including a movable section corresponding to the delivery portion of said loading conveyor and being slidably positionable over both said first and second aggregate supply bins by a linear actuator in first and second positions to create, respectively, first and second openings in said floor member above, respectively, said first and second aggregate supply bins.

4,783,172
RESPIROMETER

Raj P. Garg, c/o Thapar Inst. of Engineering & Technology, Patiala, India

Continuation-in-part of Ser. No. 783,632, Oct. 3, 1985, abandoned, and Ser. No. 77,165, Jul. 24, 1987. This application Dec. 9, 1987, Ser. No. 130,425
Int. Cl.[4] G01N *33/18*
U.S. Cl. 366—142 **11 Claims**

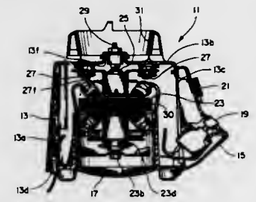


1. A respirometer, to determine the oxygen demand of a respiring liquid, comprising a closed chamber to be completely filled with the respiring liquid, said chamber having means for providing repeatability of the rate and kinetic mode of reoxygenation of the respirometer and comprising a base plate and a cover plate, a membrane permeable to oxygen held to said base and cover plates and forming the sidewall of said chamber, a plurality of supports extending between the base plate and the cover plate so as to prevent a distortion of the chamber, opening in said cover plate for supporting a dissolved oxygen probe in an air tight relationship, said opening also being an inlet for introduction of the respiring liquid and outlet for the escape of entrapped air from within the chamber, a rotor disposed within said chamber, said membrane held to the cover and base plate in an air tight relationship.

4,783,173
COMBINED WASHER AND COLLAR FOR SUPPORTING A MOTOR

Robert L. Artin, Richfield, Wis., assignor to Sunbeam Corporation, Downers Grove, Ill.

Filed Oct. 26, 1987, Ser. No. 113,542
Int. Cl.[4] B01F *7/16*
U.S. Cl. 366—314 **16 Claims**

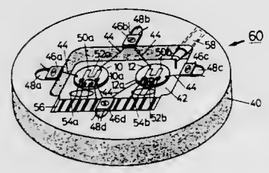


1. A blender comprising a housing having a vessel support on its uppermost portion, a motor supported within said housing and having a drive coupling which extends to the exterior of said housing for engagement with a vessel carried by said vessel support, a motor support bracket fastened rigidly to said motor and having pads disposed in a common horizontal plane with each having a top and bottom surface and an opening the axis of which is normal to said plane, a support collar in each opening having a cylindrical portion of less diameter than said opening and having retaining tabs extending from opposite ends of said cylindrical portion into engagement with the top and bottom surfaces of each said pad, and means securing said cylindrical portions to the inside of said housing with said motor and bracket being permitted limited horizontal movement.

4,783,174
DIFFERENTIAL ISOPERIBOL SCANNING CALORIMETER

Eberhard Gmelin, Leonberg; Karl Ripka, Simmozheim, and Susanne Lederer, Leingarten, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.v., Fed. Rep. of Germany

Filed Aug. 18, 1986, Ser. No. 897,530
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529489
Int. Cl.[4] G01K *17/00*; **G01N** *25/20*
U.S. Cl. 374—33 **15 Claims**



1. A method for determining the heat capacity of a sample, said method comprising the steps of:

(a) providing a measuring system including said sample and sample support means, said measuring system having a first heat capacity and a sample heat relaxation time constant;

(b) providing a reference system including a reference sample and reference sample support means, said reference system having a second heat capacity and a reference heat relaxation time constant;

(c) providing an environment of controllable temperature;

(d) coupling said measuring system to said environment through a first heat conducting path having a predetermined first heat resistance;

(e) coupling said reference system to said environment through a second heat conducting path having a predetermined second heat resistance;

(f) increasing the temperature of said environment from a predetermined initial temperature in accordance with a predetermined function of time;

(g) supplying heat energy of a predetermined first amount to said measuring system and essentially simultaneously applying heat of a predetermined second amount to said reference system, whereby the heat is applied to said systems during a first period of time which is small compared with the heat relaxation time constants resulting from the heat capacity and the heat conduction path resistance of each system;

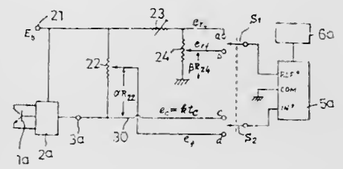
(h) determining the temperatures of said measuring and reference systems and of said environment at least during a predetermined second period of time following the application of heat energy in step (g) to measure the heat capacity of the sample, and

(i) repeating the method of steps (g) and (h) after a third period of time which is at least on the order of magnitude of said heat relaxation time constants.

4,783,175
TEMPERATURE MEASURING APPARATUS CAPABLE OF DISPLAYING MEASURED TEMPERATURES IN DIFFERENT TEMPERATURE SCALES

Hideo Sugimori, 12-2 Koaza Shimokubota, Ohaza Hokkono, Seikacho, Sohraku-gun, Kyoto 619-02, Japan

PCT No. PCT/JP86/00037, § 371 Date Dec. 30, 1986, § 102(e) Date Dec. 30, 1986, PCT Pub. No. WO87/04788, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 31, 1986, Ser. No. 12,672
Int. Cl.[4] G01K *7/00*
U.S. Cl. 374—170 **1 Claim**



1. A temperature measuring apparatus devised so as to digitally display a measured temperature selectively both in the centigrade temperature scale and in the fahrenheit temperature scale, said temperature measuring apparatus comprising:

a ratiometric A-D converter having both a signal input terminal for inputting an analog signal to be digitalized and a reference voltage input terminal;

a temperature sensing unit outputting an analog voltage proportional to a centigrade temperature sensed by a temperature sensor;

a first reference-voltage generating means for providing a first reference voltage to be inputted to said reference voltage input terminal of said ratiometric A-D converter when an output voltage from said temperature sensing unit is inputted to said signal input terminal of said ratiometric A-D converter for the purpose of displaying said centigrade temperature sensed by said temperature sensor;

a voltage difference dividing means for adjustably dividing a voltage difference between a predetermined constant voltage and an output voltage from said temperature sensing unit for the purpose of outputting an analog voltage proportional to the fahrenheit temperature corresponding to said centigrade temperature sensed by said temperature sensor; and

a second reference-voltage generating means for providing a second reference voltage to be inputted to said reference voltage input terminal of said ratiometric A-D converter when an output voltage from said voltage difference dividing means is inputted to said signal input terminal of said ratiometric A-D converter.

4,783,176
BEVERAGE CONTAINER

Tooru Ichikawa, Misato, Japan, assignor to Kabushiki Kaisha Hosokawa Yoko, Japan

Filed Jun. 11, 1987, Ser. No. 60,460
Claims priority, application Japan, Aug. 21, 1986, 61-127416[U]
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—80 **4 Claims**



1. A liquid container comprising:

(a) an envelope shaped main container body formed of a flexible sheet and having an opening at its upper end, said main body having front and rear surfaces; and,

(b) a liquid delivery unit secured to said opening upon sealing thereof for allowing said liquid to pass therethrough, said delivery unit comprising:

(1) a mouth portion positioned outside said main container body,

(2) a joining portion positioned below said mouth portion,

(3) a conduit portion extending from said joining portion toward inside said main container body,

(4) at least two flanges disposed above said joining portion, and,

(5) at least two ribs positioned between said flanges and projecting in a direction perpendicular to said front and rear surfaces, said conduit being formed with a plurality of slots positioned inside said main container body and adjacent said upper opening.

4,783,177
SEALS FOR SEALING OPENINGS FORMED BY SLITS

Norman L. Reed, Ashford, United Kingdom, assignor to Airflex Containers Ltd., Ashford, United Kingdom

Filed Jun. 18, 1987, Ser. No. 63,460
Claims priority, application United Kingdom, Jun. 18, 1986, 8614807
Int. Cl.[4] B65D *33/16*, *77/10*
U.S. Cl. 383—81 **10 Claims**

1. A seal for reusably sealing an opening formed by a slit in a sheet material portion of an envelope providing an airtight enclosure, which seal comprises an edge formation having first and second flexible members secured along respective first and second edge portions of the sit, a rigid member extending along the length of the slit and having a channel along its length for receiving and holding therein the first and second flexible members in contact with one another so as to close the opening, the channel having a mouth extending along its length and

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through which the first and second flexible members may be inserted or withdrawn, inflatable means operable upon inflation thereof to urge the first and second flexible members when so inserted into sealing engagement with one another and to



secure the first and second members within the channel of the rigid member, and retaining means for resisting withdrawal of the first and second flexible members through the mouth of the channel whilst the inflatable means is deflated.

4,783,178

METHOD OF MANUFACTURING A WEB OF PLASTIC BAGS

Kornelis Herder, Goor, Netherlands, assignor to Wavin, bv, Zwolle, Netherlands

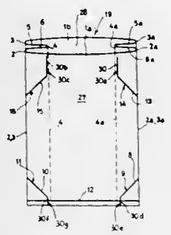
Continuation of Ser. No. 778,437, Sep. 20, 1985, which is a division of Ser. No. 381,228, May 25, 1982, Pat. No. 4,561,107, which is a continuation of Ser. No. 148,016, May 8, 1980, abandoned. This application Feb. 10, 1987, Ser. No. 13,031

Claims priority, application Netherlands, May 11, 1979, 7903733

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl.[4] B65D *33/00*

U.S. Cl. 383—120 **6 Claims**



1. A valve free rectangular plastic bag (**27**), open at one end with gusset folds formed from a tubular foil, at least comprising a central (**4**, **4***a*) and two outer longitudinal gusset fold edges (**2**, **3**, **2***a*, **3***a*) which bound a first and a second gusset fold part, said bag being open at one end opposite a transverse bottom seal (**12**) and further comprising:

(a) two lower fold part seals (**8**, **9**, **10**, **11**) at both sides of the bag, which lower fold part seals always connect an outer foil layer (**1***a*, **1***b*) with an opposite gusset fold part (**6***a*, **5***a*, **6**, **5**) said lower fold part seals extending in the region between the central (**4**, **4***a*) and outer longitudinal fold edges (**2**, **3**; **2***a*, **3***a*) in the region of said transverse bottom seal (**12**) and diverging from the region of said bottom seal (**12**) to the outer fold edges (**2**, **2***a*; **3**, **3***a*),

(b) upper fold part seals (**13**, **14**, **15**, **16**) at both sides of the bag which upper foil part seals always connect an outer foil layer (**1***a*, **1***b*) with an opposite gusset fold part (**6***a*, **5***a*; **6**, **5**) said upper fold part seals extending in the region between the central (**4**, **4***a*) and outer longitudinal fold edges (**2**, **3**; **2***a*, **3***a*) at the end of the bag remote from the transverse bottom seal of this bag, said upper fold part seals converging from the outer longitudinal fold edges (**2**, **3**; **2***a*, **3***a*) to the open end of said bag (**27**) wherein at least at both sides of the bag an additional seal (**30**) extends substantially parallel to the fold edges and in the region between inner and outer fold edges, said additional seals (**30**) being at least connected with the upper fold part seals (**13**, **14**; **15**, **16**) and extending from said upper fold part seals towards the open end of said bag (**27**), wherein the additional seals (**30**) extend near the inner fold edges (**4**, **4***a*), said additional seals (**30**) allowing to form a closing seal over the whole width of the bag in the region of the open end of the bag said closing seal intersecting the additional seals (**30**) in the regions of the bag comprising in a flat position of the bag four foil layers (**1***a*, **5**, **6**, **1***b*; **1***a*, **5***a*, **6***a*, **1***b*) and thus the seal portion formed at said intersection being stronger than the same seal portion being formed in the region between the central gusset fold edges (**4**, **4***a*).

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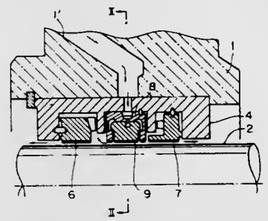
SEALING DEVICE FOR ROTARY FLUID MACHINE

Kazuso Katayama, and Yasushi Mouri, both of Hiroshima, Japan, assignors to Mitsubishi-Jukogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 839,363, Mar. 13, 1986, abandoned. This application Sep. 22, 1987, Ser. No. 99,710

Int. Cl.[4] F16C *33/72*

U.S. Cl. 384—130 **3 Claims**



1. A sealing and bearing device for a rotary fluid machine, comprising:

a shaft chamber housing having an inner surface defining a shaft chamber and having a shaft chamber housing fluid pressure supply passage conveying fluid under pressure to said shaft chamber;

a shaft positioned within said housing and mounted for rotation on at least one bearing;

a seal ring housing positioned within said shaft chamber housing defining a plurality of axially extending seal ring chambers extending around said shaft and open toward said shaft and a seal ring pressure supply passage formed in said housing wall conveying fluid under pressure from said shaft chamber housing fluid pressure supply passage to said plurality of axially extending seal ring chambers; at least one oil membrane seal ring freely slidably positioned within one of said plurality of axially extending seal ring chambers having a sealing face facing toward and spaced from said shaft;

a bearing housing positioned within one of said plurality of axially extending seal ring chambers of said bearing housing and the interior of said one of said plurality of axially extending seal ring chambers forming a first high pressure chamber and a second atmospheric pressure chamber, said first high pressure chamber being in communication with said fluid under pressure in said one of said axially extending seal ring chambers, a through hole connection formed in said seal ring housing being in communication with said atmospheric pressure chamber and connected to atmosphere via said shaft chamber, an O-ring being positioned between said bearing housing and said one of said plurality of axially extending seal ring chambers separating said first high pressure chamber from said second atmospheric

pressure chamber so that said bearing housing is urged toward said second atmospheric pressure chamber by a differential pressure, said bearing housing defining an axially extending bearing chamber extending around the periphery of said shaft and open toward said shaft, said bearing chamber being in fluid communication with said first high pressure chamber;

a plurality of oil membrane bearing members each positioned within said bearing chamber connected to said bearing housing at radially spaced locations, each said oil membrane bearing member facing said shaft, oil passing into said bearing chamber forming an oil membrane between individual oil membrane bearing members and said shaft, the urging of said bearing chamber causing the transmission of downward pressure on said shaft through said individual oil membrane bearings.

4,783,180

BEARING ASSEMBLY FOR VEHICLE

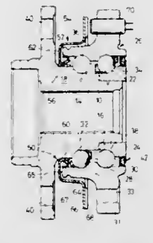
Yoshitaka Hayashi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Ksiahs, Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,670

Claims priority, application Japan, Oct. 9, 1986, 61-154408

Int. Cl.[4] F16C *19/08*

U.S. Cl. 384—448 **5 Claims**



1. A bearing assembly for a wheel including an inner race made integral with the wheel, and an outer race disposed outside and concentrically with said inner race with rolling members interposed therebetween, said inner race being adapted to rotate relative to said outer race, characterized in that

said bearing assembly includes an annular member including a fixed portion fixedly fitted to the outer peripheral surface of said outer race, an extension extending continuously to said fixed portion and extending while surrounding said outer race to form a desired seal portion between itself and said outer race, and a pulser gear portion, comprising a plurality of concave and convex portions formed on said extension and provided circumferentially at intervals, and a sensor is disposed in proximity to said pulser gear portion, whereby the number of rotations of the wheel can be detected.

4,783,181

AUTOMATIC SELF-ALIGNING ROLLER BEARING

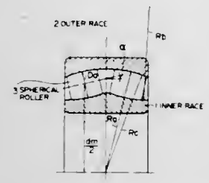
Hirotoshi Takata, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,495

Int. Cl.[4] F16C *33/36, 33/58*

U.S. Cl. 384—450 **1 Claim**

1. An automatic self-aligning roller bearing of the type including an outer race, an inner race and a plurality of rolling bodies disposed between said inner race and said outer race, wherein when a radius of track groove on the outer race is represented by Ra, a radius of each of track grooves on the inner race is represented by Rb, a radius of each of said rolling bodies at the barrel portion thereof is represented by Rc, the maximum diameter of each of the rolling bodies is represented by Da, a diameter of pitch circle of the rolling bodies is represented by dm, and a contact angle in the roller bearing is represented by α, the radius of track groove of the inner race



and the radius of track groove on the outer race have a relationship established therebetween which is represented by the following formula,

$$-0.5\gamma + 1.01 \leqq \frac{fe - 0.5}{fi - 0.5} \leqq -0.5\gamma + 1.05$$

where

$$fi = \frac{Rb}{2Re}, fe = \frac{Ra}{2Re} \text{ and } \gamma = \frac{Da}{dm} \cos \alpha$$

4,783,182

ROLLING BEARING WITH TWO ROWS OF ROLLING ELEMENTS AND EQUIPPED WITH A RETENTION PIECE FOR THE BEARING RINGS, RETENTION PIECE USABLE FOR THIS PURPOSE AND PROCESS FOR ASSEMBLING SUCH A BEARING

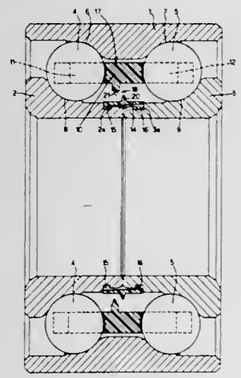
Fabrice Caron, Montigny le Bretonneux, and Herve Le Quinio, Paris, both of France, assignors to SKF France, Clamart, France

Filed Apr. 8, 1987, Ser. No. 35,840

Claims priority, application France, Apr. 14, 1986, 86 05309

Int. Cl.[4] F16C *33/38*

U.S. Cl. 384—504 **23 Claims**

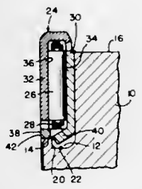


1. A roller bearing assembly comprising two rows of rolling elements, two raceways and two independent rings, each of said independent rings having one raceway, means for maintaining the relative positions of the rolling elements between the rings and means for fixing the two independent rings axially to one another, the two independent rings being fixed axially to one another by means of two parts of a retention means having, before the bearing is assembled, one or more

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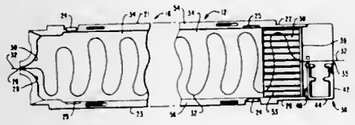
connecting zones weakened so that they are capable of breaking during assembly of said bearing, the retention means maintaining the relative positions of at least some of that rolling elements.

4,783,183
THRUST BEARING ASSEMBLY
Cameron Gardella, Woodbury, Conn., assignor to The Torrington Company, Torrington, Conn.
Filed Dec. 28, 1987, Ser. No. 138,180
Int. Cl.[4] F16C *19/30*
U.S. Cl. 384—620 **7 Claims**



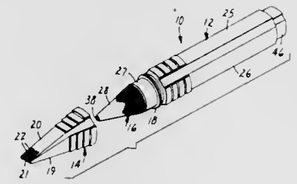
1. In combination: a rotatable member having an annular groove separating a first axial portion of the rotatable member from a second axial portion of the rotatable member having a greater diameter than the diameter of said first axial portion so that one annular side surface of the groove has a predetermined radial length and the other annular side surface of the groove provides a shaft annular radial surface of greater radial length; a thrust bearing assembly having rolling elements, and a radially extending annular race extending along the shaft annular radial surface of greater length; a flange integral with and extending axially from the race; and at least one deflective tab projecting from the flange, said deflective tab extending into said annular groove.

4,783,184
ENDLESS RIBBON CASSETTE WITH EXIT PORT RIBBON CONTROL
Joseph C. Santillo, Dublin, and James M. Seybold, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 31, 1987, Ser. No. 79,986
Int. Cl.[4] B41J *32/102*
U.S. Cl. 400—196.1 **7 Claims**



1. A ribbon cassette containing a ribbon and comprising a first portion and a second portion, said first portion and said second portion comprising identical half portions of the ribbon cassette and including side walls defining a cavity for storing said ribbon, an
entrance port and an exit port adjacent said ribbon storing cavity for travel of said ribbon into and out of said ribbon cassette,
restraining means comprising identical opposed dams positioned to connect the side walls on each of said first and second portions adjacent the exit port for restraining the ribbon between the first portion and the second portion when the ribbon is traveling through said exit port, and
means comprising identical opposed ramp structures integral with and positioned on each of said first and second portions adjacent the opposed dams and extending across the end of the ribbon storing cavity for centering the ribbon with respect to said opposed dams prior to exit of the ribbon from said cavity.

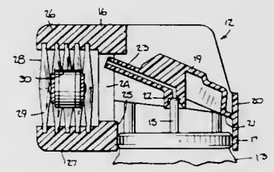
4,783,185
PEN-LIKE DISPENSER FOR APPLYING RUST CONVERTING LIQUID
David W. Erismann, Cottage Grove; David F. Serino, Maplewood, and Mark D. Sorlien, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 7, 1986, Ser. No. 882,255
Int. Cl.[4] A47L *13/34, 13/03*
U.S. Cl. 401—37 **2 Claims**



1. A pen-like dispenser for applying rust converting liquid, said dispenser comprising:
a fluid reservoir having a first end, comprising resiliently flexible walls of polymeric material and having an opening at said first end; p1 a quantity of rust converting liquid in said reservoir;
a polymeric liquid dispensing tip assembly including a housing having a through passageway between inlet and outlet ends and attached to said reservoir around said opening with said inlet end communicating with said opening, said housing including a wall defining a passageway portion adjacent said outlet end; a valve member within said passageway having a periphery adapted for sealing engagement with said wall defining said passageway portion and a tip adapted to project through said outlet end of said passageway when the periphery of said valve member is in sealing engagement with said wall defining said passageway portion, and biasing means for biasing said valve member to place the periphery of said valve member in sealing engagement with said wall defining said passageway portion while affording movement of said valve member to an open position spaced from said wall defining said passageway portion in opposition to said biasing means to afford movement of said liquid through said passageway, to which open position said valve member may be moved by pressing the tip of said valve member against a substrate to which rust converting liquid is to be applied; and
an outer abrading surface adapted to scrape loose paint and rust from a surface to which rust converting liquid is to be applied by said dispensing part, said abrading surface including a planar surface portion and a generally linear edge surface portion, and spaced parallel grooves along said planar and edge surface portions at generally a right angle to said edge surface portion.

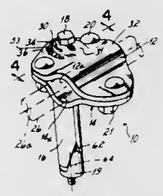
4,783,186
AEROSOL DISPENSER AND APPLICATOR ASSEMBLY FOR CLEANING AND LUBRICATING SPROCKET CHAINS
Terry Manning, 76 Ravine Ave., Wyckoff, N.J. 07481, and Pierre Chares, 101 Mawhinney Ave., Hawthorne, N.J. 07506
Filed Jan. 27, 1987, Ser. No. 7,362
Int. Cl.[4] A46B *11/02*
U.S. Cl. 401—190 **8 Claims**

1. An aerosol dispenser and applicator assembly for cleaning and lubricating the sprocket chain of a chain drive mechanism, comprising:
A. a sealed can containing a liquid lubricant and a gas propellant, a hollow stem projecting above the upper end of the can and a mounting ring on the upper end of the can surrounding the stem, the stem cooperating with a spring-biased valve disposed within the can whereby when the system is depressed, a lubricant spray is emitted therefrom; and
B. an applicator formed by a removable headpiece having a circular neck adapted to frictionally engage the mounting ring of the can to seat the headpiece of the upper end of the can, said headpiece being provided with a pair of



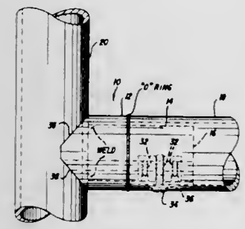
parallel jaws cantilevered therefrom and supporting respective brushes in opposed relation to define a twin brush having flexible bristles, an internal channel being formed in the twin brush which snugly accommodates the sprocket chain when the twin brush is pushed against the chain to cause the opposing bristles thereof to yield and admit the chain into the channel, said headpiece including a depressible actuator key on whose underside is a hollow socket which receives the stem when the headpiece is seated on the upper end of the can, and a nozzle communicating with the socket extending into an outlet in the headpiece leading to the twin brush, whereby when the actuator key is depressed, the twin brush is then sprayed to saturate its bristles with the lubricant.

4,783,187
BICYCLE HANDLEBAR STEM ASSEMBLY
David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.
Filed Sep. 16, 1987, Ser. No. 97,597
Int. Cl.[4] B62K *21/22*
U.S. Cl. 403—24 **17 Claims**



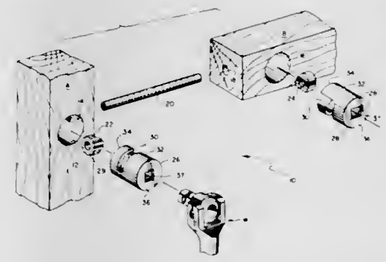
1. A bicycle handlebar stem assembly for securing a handlebar of a bicycle to the frame thereof, said assembly comprising
a top plate, a bottom plate, a barrel, and means for securing said bottom plate to the underside of said top plate,
said barrel having a top surface,
said top and bottom plates both having top and bottom surfaces and a transverse arcuate groove formed therein, said grooves being adapted to receive a bicycle handlebar therebetween,
said top plate having a stem assembly strengthening gusset pressed upwardly from the underside thereof to define a receptacle in the bottom surface of said top plate for the reception of the upper end of said barrel,
said barrel being located within said receptacle and having the top surface thereof covered by said gusset, said barrel being secured within said receptacle by a welded connection between said barrel and said top plate.

4,783,188
RAIL CONNECTOR
Thomas Souza, Jr., 145 Hekili St., Kailua, Hi. 96734
Filed Oct. 9, 1987, Ser. No. 106,275
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—190 **10 Claims**



1. A rail connector for connecting a rail to a post or the like comprising:
an elongate circular tubular member including a reduced sleeve at one end thereof which is adapted to substantially conform to an inner surface of a rail, said sleeve having a generally longitudinal slot therein which allows said sleeve to expand and contract in order to conform to the inner surfaces of rails of varying diameters and a pair of fins located on respective sides of said longitudinal slot and protruding towards the interior of said sleeve;
an adjusting means for adjusting the diameter of said sleeve by applying force to said fins along the edges of said longitudinal slot whereby the rail is held to said sleeve, said adjusting means comprising a wedge member having substantially rounded sides which engage said fins and a position means for adjusting the position of said wedge member relative to said fins in order to adjust the width of said longitudinal slot and thereby adjust the diameter of said sleeve.

4,783,189
CONNECTORS FOR ASSEMBLING STRUCTURAL MEMBERS
Stuart E. Bugg, P.O. Box 652, Winchester, Va. 22601
Filed May 20, 1987, Ser. No. 51,854
Int. Cl.[4] B25G *3/00;* **F16B** *9/00*
U.S. Cl. 403—264 **5 Claims**



1. A mechanical connector for fastening two members together where the members have aligning bore holes and circular holes, the mechanical connector comprising:

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a threaded rod element of a length to extend through said bore holes a distance into said circular holes.

a pair of nut means threaded onto the ends of said threaded rod elements, said nut means placed on said threaded rod element in said circular holes, and

a pair of cam sockets having similar shapes including a cylindrical body, an open end and a closed end, an L-shaped slot extending from said open end along said cylindrical body to fit on said threaded rod element, a cam surface means starting at said L-shaped slot and increasing in thickness on the cross section of said cylindrical body to a point at or near the opposite side of said cylindrical body from said L-shaped slot to apply increased pressure on said pair of nut means to tightly join the members together.

4,783,190

APPARATUS FOR TRANSFERRING LOAD UNITS BETWEEN TWO CARRIERS

Sten Lövgren, Svanholmsvägen 10, S-182 75 Stocksund, Sweden

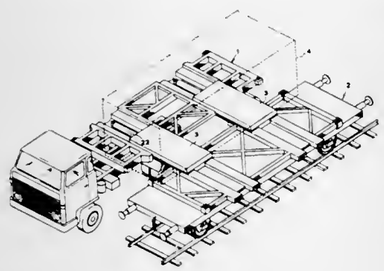
PCT No. PCT/SE85/00072, § 371 Date Oct. 19, 1985, § 102(e) Date Oct. 19, 1985, PCT Pub. No. WO85/03692, PCT Pub. Date Aug. 29, 1985

PCT Filed Feb. 13, 1985, Ser. No. 801,155

Claims priority, application Sweden, Feb. 21, 1984, 8400932

Int. Cl.[4] B65G *63/02*

U.S. Cl. 414—347 **6 Claims**



1. An apparatus for transferring a load unit across a gap between two carriers each having a top portion and at least one side portion comprising:

at least one transferring device for supporting said load unit, said at least one transferring device movable between said two carriers;

means for supporting said at least one transferring device mounted to one of said two carriers, said means for supporting comprising,

a pair of female members spaced apart to form a first channel therebetween, each of said pair of female members having a top surface extending along a generally horizontal plane defining a first support path portion for supporting said load unit on said one carrier and having a box girder cross section defining an enclosed channel,

a pair of underlayer members, each of said pair of underlayer members mounted adjacent to a respective one of said pair of female members,

means for bridging the gap between said two carriers extensible between a retracted position on said one of said two carriers and a bridging position in abutting contact with a side portion of said other of said two carriers, said means for bridging comprising, a pair of male members, each of said pair of male members having a cross section complementary with said box girder cross section and adapted to be slidably received within said enclosed channel of a respective one of said female members, said pair of male members being telescopically extensible from said enclosed channel between said retracted position and said bridging position, and said means for bridging supporting and guiding said transferring device over said gap when in said bridging position,

means for extending said pair of male members from said enclosed channel, said means for extending mounted to said one of said two carriers and cooperating with said pair of male members for slidably moving said pair of male members between said retracted position and said bridging position,

a pair of plate members, each of said pair of plate members mounted to a respective one of said pair of male members and extending along said generally horizontal plane to form a second path portion, each of said pair of plate portions supported by a respective one of said pair of underlayer members, said second path portion being adapted to support said transferring device when said means for bridging is extended in said bridging position; and

means for moving said transferring device and said load unit between said two carriers when said means for bridging is in said bridging position, said means for moving positioned in said first channel and having an end portion mounted to said one of said two carriers and another end mounted to said transferring device for moving said transferring device and said load unit along said first and second paths between said two carriers.

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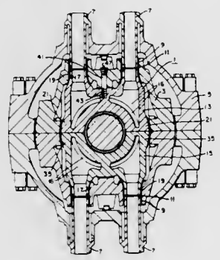
NOZZLE CHAMBER SYSTEM FOR A STEAM TURBINE

Walter Halberg; George W. Y. Chang, both of Casselberry, Fla., and David M. Parker, Steele Creek, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 765,736, Aug. 14, 1985, abandoned. This application Apr. 15, 1987, Ser. No. 39,822

Int. Cl.[4] F01D *25/26*

U.S. Cl. 415—136 **8 Claims**



1. A nozzle chamber assembly for a steam turbine having horizontally split inner and outer cylinders each having upper and lower halves, said nozzle chamber assembly comprising

unconnected upper and lower nozzle chambers, each having at least one cavity and an inlet nozzle in fluid communication with each cavity;

said nozzle chamber inlet nozzles each having a plurality of circumferential grooves disposed on the distal end thereof;

said inner cylinder having a plurality of cylindrical openings of essentially constant diameter for sealably receiving said nozzle chamber inlet nozzles;

said outer cylinder having a plurality of inlet nozzles which extend through said outer cylinder and are sealably received by said essentially constant diameter cylindrical opening in said inner cylinder;

each outer cylinder inlet nozzle having an inner distal end spaced from the distal end of an associated nozzle chamber inlet nozzle;

said outer cylinder inlet nozzles having a plurality of circumferential grooves adjacent the distal ends thereof;

ring sealing means disposed in said nozzle chamber and said outer cylinder inlet nozzle circumferential grooves to form a pressure tight seal between said inlet nozzle and said cylindrical openings in said inner cylinder whereby the only thing holding the nozzle chambers together are pressure and gravitational forces so they are free to move with respect to each other providing free expansion and eliminating possible vibratory interactions between the nozzle chambers; and

locking means cooperatively associated with each of said nozzle chambers and said inner cylinder to fix each nozzle chamber with respect to the inner cylinder and the axis of the turbine and to allow each nozzle chamber to expand and contract completely independent of the other.

4,783,192

JOINT PROSTHESIS

Boguslaw M. Wroblewski, The Coach House, Tanhouse Close, Parbold, Lancs, England WN8 7HG, and Philip Shelley, 35 Runshaw Avenue, Appleybridge, Wigan, England WN6 9JP

Filed Aug. 13, 1986, Ser. No. 896,113

Claims priority, application United Kingdom, Aug. 14, 1985, 8520360

Int. Cl.[4] A61F *2/28, 2/30*

U.S. Cl. 623—16 **12 Claims**

1. Prosthesis assembly for use in long bone joint replacement in a bone which has been resected or which has suffered bone loss in the region of the joint, comprising

a joint component for replacing at least a part of the joint and having a stem for insertion within the bone, adjacent that part of the joint being replaced, to a selective height relative to the bone, which stem is tapered over at least a part of its length, and

an associated series of disc-like annular collars correspondingly provided with respective internal circular collar openings in a range of different internal diameters, each collar having a constant internal diameter which substantially exceeds the axial extent of such collar, each collar opening forming an inner stem engaging surface, and each collar being further provided with a bottom outer bone engaging surface to lie on the resected or lost portion of the bone,

such that each collar is locatable on the bone with its outer bone engaging surface abutting the resected or lost portion of the bone, and in turn is locatable on the stem at a collar height selectively determined by the constant internal diameter of the collar opening and the taper of the stem for correspondingly determining the selective height of the inserted stem relative to the bone, the inner stem engaging surface of the internal collar opening thereby making line contact with the stem at an axial level of the stem at which the stem has the same diameter as that of the internal collar opening.



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COMPOSITION AND PROCESS FOR STRIPPING COLOR FROM SYNTHETIC POLYMER PRODUCTS

Laury Pensa, 1585 B Bergen Bldg., Leonia, N.J. 07605

Continuation of Ser. No. 743,013, Jun. 10, 1988, abandoned. This application Nov. 3, 1986, Ser. No. 925,987

Int. Cl.[4] **D06L** *3/00*

U.S. Cl. 8—102 **32 Claims**

1. A composition for decolorizing synthetic polymer materials, said decolorizing composition comprising:

(a) an alkyl halide, said alkyl halide being represented by R-X, with R being an alkyl radical with 1 to 8 carbon atoms, with X being a monohalide, or a polyhalide; and wherein said halide is selected from the group consisting of chloride, bromide and fluoride;

(b) an aqueous solution of a bleaching/oxidizing agent wherein the concentration of said bleaching/oxidizing agent is in the range of 0.05 to 40 percent by weight of the aqueous solution of said agent and wherein said agent is selected from the group consisting of alkali metal and alkaline earth metal salts of hypohalites and wherein said hypohalite is selected from the group consisting of hypochlorite, hypobromite and mixtures thereof; and

(c) an aqueous solution of an acid prepared from one or more acids selected from the group consisting of inorganic acids, mono-, di- and tri-carboxylic acids, carboxylic acid anhydrides and hydroxy carboxylic acids; and

(d) an aqueous solution of a surfactant selected from the group including nonionic and anionic surfactants

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4,783,194

PROCESS FOR THE BACTERIAL DECONTAMINATION OF TEXTILES COMPRISING UNCOMPLEXED CALCIUM

Yann Dugenet, Houilles; Pierre Isoard, Villeurbanne, and Jean-Claude Kerleaux, Trevoux, all of France, assignors to Atochem, France

Filed Apr. 6, 1987, Ser. No. 34,742

Claims priority, application France, Apr. 11, 1986, 86 05409

Int. Cl.[4] **C11D** *7/54;* **D06L** *3/02, 3/16*

U.S. Cl. 8—111 **9 Claims**

1. A process for decontaminating textiles contaminated by bacteria comprising washing said textiles with a detergent composition free of any peroxide bleaching agent, and then treating said textiles with a peroxide bleaching agent in an aqueous bath at a pH of between about 9 and 13, at a temperature of between about 40° to 70° C., in the presence of calcium, for a time sufficient to decontaminate said textiles; said calcium rendered soluble and uncomplexed and being present in an amount between about 0.001 to 1% by weight based on the weight of the bath with the source of calcium being selected from calcium oxide, calcium hydroxide, or a calcium salt whose anion is inert with respect to the peroxide bleaching agent and whose dissociation constant is above about 0.01.

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PROCESS FOR THE PREPARATION OF A CONCENTRATED AQUEOUS REACTIVE DYESTUFF SOLUTION: TRIPHENYL-DIOXAZINE DYES, LITHIUM SALTS

Werner Steinbeck, and Wolfgang Harms, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

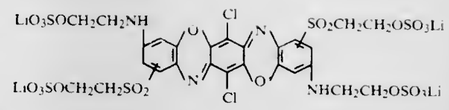
Filed Jan. 22, 1988, Ser. No. 146,885

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703732

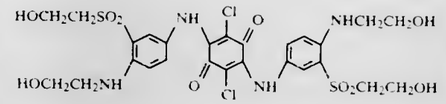
Int. Cl.[4] **C09B** *62/503, 19/02;* **D06P** *1/384, 3/66*

U.S. Cl. 8—527 **9 Claims**

1. Process for the preparation of a concentrated aqueous solution of the dyestuff of the formula



comprising sulfating the quinone derivative of the formula



to obtain a sulfated product, oxidatively cyclizing the sulfated product in oleum to form an oleum melt, diluting the melt oleum with water or sulphuric acid to a sulphuric acid concentration of 37–50% and obtaining a precipitate, separating the precipitate, and forming an aqueous solution by adding the separated precipitate to water and bringing the pH of the aqueous solution to a pH of about 2–6 with basic lithium compounds.

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HIGHLY CONCENTRATED STABLE SOLUTIONS OF COLOR-FORMING AGENTS: FOR PRESSURE-SENSITIVE RECORDING MATERIALS

Udo Eckstein, Koeln, and Hubertus Psaar, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

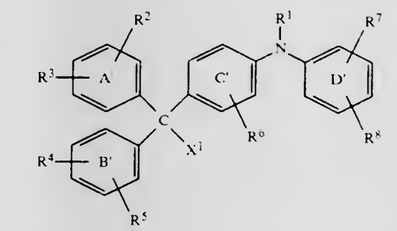
Filed Feb. 5, 1987, Ser. No. 10,932

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605552

Int. Cl.[4] **B41M** *5/16;* **C09B** *11/04, 67/44*

U.S. Cl. 8—527 **5 Claims**

1. Highly concentrated solutions of color-forming agents wherein said solutions contain a color-forming agent of the formula



wherein

X^1 denotes hydroxyl, C_1–C_{12}-alkoxy which is optionally substituted by chlorine or C_1–C_4-alkoxy, C_2–C_{12}-alkenyloxy, benzyloxy which is optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen or phenethyloxy,

R^1 denotes C_1–C_{12}-alkyl or benzyl,

R^2, R^4, R^6 and R^7 independently of one another denote hydrogen, chlorine, C_1–C_{12}-alkyl, C_1–C_{12}-alkoxy, phenoxy, benzyloxy or a radical of the formula



R^3, R^5 and R^8 independently of one another denote hydrogen, chlorine, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, C_1–C_{12}-

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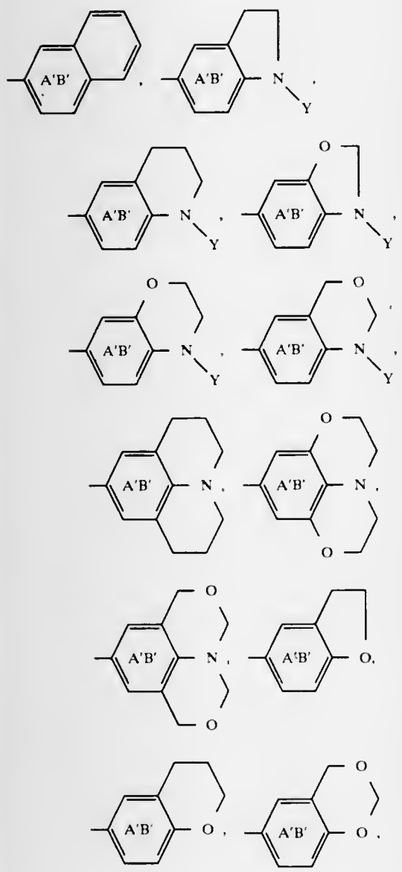
alkoxy or C_2–C_{12}-alkenyloxy, or phenyl, benzyl, phenoxy or benzyloxy which is optionally substituted by chlorine, C_1–C_{12}-alkyl or C_1–C_{12}-alkoxy, or cyclohexyloxy or cyclopentyloxy which is optionally substituted by C_1–C_{12}-alkyl, or C_1–C_{12}-alkylmercapto or a radical of the formula



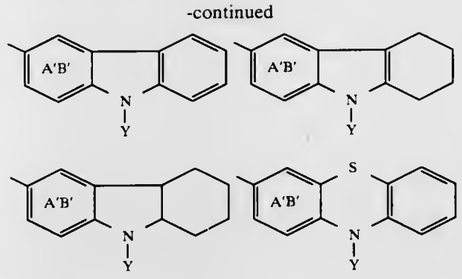
Y^1 and Y^2 independently of one another denote C_1–C_{12}-alkyl which is optionally substituted by chlorine, cyano, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy, or cyclohexyl, phenyl or benzyl, which can be substituted by chlorine, C_1–C_{12}-alkyl or C_1–C_{12}-alkoxy, or

R^2 and R^3 denote members which, together with ring A', and/or

R^4 and R^5 denote members, which, together with ring B', are necessary to complete a ring system of one of the following formulae



-continued



wherein

Y represents C_1–C_{12}-alkyl, which can be substituted by chlorine, cyano, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy, or cyclohexyl, phenyl or benzyl, which can be substituted by chlorine, C_1–C_{12}-alkyl or C_1–C_{12}-alkoxy, and

the saturated ring component can carry up to 4 radicals from the group comprising chlorine, C_1- to C_4-alkyl, C_1- to C_4-alkoxy and phenyl, or



denotes a pyrrolo, pyrrolidino, piperidino, pipecolino, morpholino, pyrazolo or pyrazolino radical which is optionally substituted by chlorine, C_1–C_4-alkyl or phenyl and water-insoluble organic solvents from the group comprising optionally chlorinated hydrocarbons, vegetable oils and phthalic acid esters.

4,783,197

COMPOSITION AND A METHOD OF CAPTURING SULPHUR

Mihkel Mathiesen, Summit, N.J., and Olle Nyström, Höganäs, Sweden, assignors to AB Carbogel, Helsingborg and Berol Kemi AB, Stenungsund, both of, Sweden

Continuation of Ser. No. 900,535, Aug. 26, 1986, abandoned, which is a continuation of Ser. No. 628,823, Jul. 9, 1984, abandoned. This application Dec. 3, 1987, Ser. No. 128,429
Claims priority, application United Kingdom, Jul. 14, 1983, 8319033
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 **8 Claims**

1. A method of capturing sulphur emanating from burning carbonaceous fuel particles, upon burning of an aqueous slurry of said carbonaceous fuel particles, consisting essentially of the steps of:

(a) providing an aqueous carbonaceous fuel composition slurry having a continuous aqueous phase which consists essentially of about 60–80% by weight of carbonaceous fuel particles with an ash content of below about 5% by weight, on a dry basis, about 0.05–2.0% by weight of a flow-enhancing chemical which includes a non-ionic dispersant, and a liquid carrier phase consisting essentially of water, and

(b) mixing into said aqueous slurry a sulphur-capturing substance, having a particle size when present in solid form of less than about 10 microns, which includes a compound of a metal with a higher affinity for sulphur than Fe and which is selected from the group consisting of hydroxides, oxides, and carbonates of calcium, magnesium, and manganese, in an amount of about 0.1 to about 5% by weight of the compound calculated as pure metal upon total solid fuel weight, thereby to provide uniform and intimate contact of such sulphur-capturing substance with said carbonaceous fuel particles in said slurry, thereby to provide conditions suitable for binding sulphur in said slurry as solid sulfide before conversion of said sulphur upon combustion into sulphur oxides, and thereafter

(c) atomizing and combusting said aqueous slurry with binding of sulphur in said slurry as solid sulfide.

4,783,198

COAL WATER SLURRY COMPOSITIONS BASED ON LOW RANK CARBONACEOUS SOLIDS

Gordon W. Hueschen, Warren, N.J., assignor to AB Carbogel, Helsingborg, Sweden

Continuation of Ser. No. 796,959, Nov. 12, 1985, abandoned. This application Nov. 12, 1987, Ser. No. 119,581
Int. Cl.[4] C10L *1/32*
U.S. Cl. 44—51 **9 Claims**

1. Coal water slurry composition based on low rank carbonaceous solid, which has a greater oxygen content than high rank carbonaceous solid, wherein the slurry, in addition to the water consists essentially of (I) said low rank carbonaceous solid (II) a minor portion of high rank carbonaceous solid, the high rank carbonaceous solid being milled to a finer average size than the lower rank carbonaceous solid, wherein the external surface area of the finer fraction is at least about 40% of the total slurry solid external surface area; and (III) an effective amount of a flow enhancing-chemical comprising a nonionic dispersant.

4,783,199

METHOD FOR PRODUCING A DEACTIVATED DRIED COAL

John C. Bixel, Washington Crossing, Pa., and Michael J. Dabkowski, Mickleton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 798,513, Nov. 15, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 45,261
Int. Cl.[4] C10L *5/00, 5/24*
U.S. Cl. 44—501 **10 Claims**

1. A method for producing a dried particulate coal fuel having a reduced tendency to ignite spontaneously comprising spraying and intimately mixing said dried coal with a deactivating composition selected from the group consisting of light cycle oil, heavy cycle oil, clarified slurry oil, and mixtures of two or more of the preceding.

4,783,200

METHOD FOR PASSIVATING LOW RANK DRIED COAL

John C. Bixel, Newtown, Pa., and Michael J. Dabkowski, Mickleton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 858,621, May 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,513, Nov. 15, 1985, abandoned, and a continuation-in-part of Ser. No. 810,116, Dec. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 798,513, Nov. 15, 1985, abandoned. This application Jun. 8, 1987, Ser. No. 59,369
Int. Cl.[4] C01L *5/00, 5/24*
U.S. Cl. 44—501 **9 Claims**

1. A method for producing a dried particulate coal fuel having a reduced tendency to ignite spontaneously comprising spraying and intimately mixing said dried coal with a deactivating composition selected from the group consisting of mixtures of about 1 to about 49 parts by volume of clarified slurry oil and about 99 to about 51 parts by volume of petroleum resid and between about 5 and about 15 parts by volume of mixtures of distillate and about 95 to 85 parts by volume of petroleum resid.

4,783,201

GAS DEHYDRATION MEMBRANE APPARATUS

Arthur W. Rice, 1733 Duello Rd., O'Fallon, Mo. 63366, and Milton K. Murphy, 666 Langton Dr., Clayton, Mo. 63105

Filed Dec. 28, 1987, Ser. No. 137,901
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 **27 Claims**

1. A gas dehydration process, comprising;

(a) contacting a feed gas containing water vapor with one side of uncoated, asymmetric membranes having controlled porosity, the membranes being formed of polymeric materials having transport selectivity for water vapor vs. the feed gas of at least about 1000% and sufficient porosity to provide adequate feed gas permeation sweep for the removal of permeated water vapor from a second side of the membrane ensuring conditions of continued dehydration;

(b) permeating a majority of the water contained in the feed gas through the membrane; and

(c) removing the resulting nonpermeate dehydrated gas from a chamber containing the membranes.

4,783,202

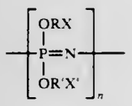
POLYPHOSPHAZENE MEMBRANE SEPARATION OF POLAR FROM NON-POLAR FLUIDS

Menahem A. Kraus, 11651 Summerhaven Dr., St. Louis, Mo. 63146, and Milton K. Murphy, 1036 Tompkins, St. Charles, Mo. 63301

Continuation-in-part of Ser. No. 566,243, Dec. 28, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 674,241
Int. Cl.[4] B01D *13/00*
U.S. Cl. 55—16 **1 Claim**

1. A process for separating polar fluids from non-polar fluids comprising:

contacting a fluid feed mixture of polar and non-polar fluids with a first surface of a separation membrane comprising polyphosphazenes having a preferential selectivity and permeability for the polar fluids and represented by the formula:



where n is an integer of from about 100 to about 70,000 and ORX and OR'X' each represent a halogenated alkoxy or halogenated aryloxy where R and R' can be the same or different with from 1 to about 25 carbon atoms and X and X' can be the same or different halogens;

maintaining a second surface of the polyphosphazene membrane at a lower chemical potential for the polar fluids than the chemical potential at the first surface;

permeating the polar fluids into and through the polyphosphazene membrane; and

removing from the vicinity of the second surface a permeated product having a greater concentration of polar fluids relative to non-polar fluids than contained in the feed mixture.

4,783,203

INTEGRATED PRESSURE SWING ADSORPTION/MEMBRANE SEPARATION PROCESS

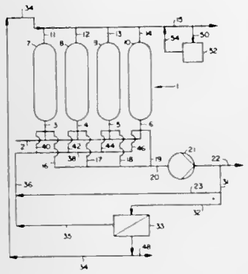
Kishore J. Doshi, Somers, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 22, 1987, Ser. No. 111,452
Int. Cl.[4] B01D *53/04, 53/22*
U.S. Cl. 55—16 **23 Claims**

1. In a pressure swing adsorption process containing at least one adsorption bed in which at least one more readily adsorb-

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able gas component is separated from at least one less readily adsorbable gas component and in which a purge effluent is obtained during the purging of said adsorption bed, and further in which a displacement gas is introduced into the absorption bed to displace the at least one less readily absorbab, gas



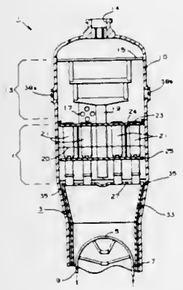
component contained within the bed, the improvement which comprises passing at least a portion of the purge effluent through a membrane separation unit to concentrate the at least one more readily adsorbable gas component to form a concentrated gas stream and using said concentrated gas stream as the displacement gas in said pressure swing adsorption process.

4,783,204

APPARATUS AND METHOD FOR DRYING STEAM

Joseph D. Roarty, Pleasant Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1986, Ser. No. 893,440
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—18 **26 Claims**



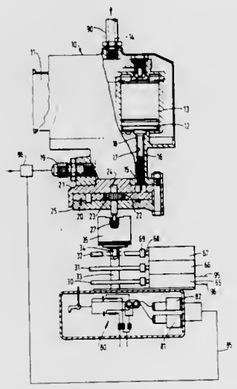
16. An improved swirl vane separator of the type having a housing with an inlet for receiving a flow of steam having water droplets entrained therein, an outlet for expelling a flow of drier steam, pitched blade means for imparting a radial component of motion in the steam flowing downstream of the blades so that a substantial portion of the water droplets assume a spiraling path that terminates against the interior of the housing, and an opening located in the interior of the housing downstream of the blade means for capturing a substantial amount of the spiraling water droplets, wherein the improvement comprises means for adjusting the spiraling path of the water droplets entrained in the steam so that a maximum amount of said droplets are captured by the opening, including means for varying the cross-sectional area of the housing outlet in combination with means for varying the position of the pitched blade means between the housing outlet and the housing inlet.

4,783,205

AIRCRAFT ON-BOARD GAS GENERATING APPARATUS

Robin H. J. Searle, Brampton, England, assignor to Normalair-Garrett (Holdings) Ltd., Yeovil, England

Filed Sep. 22, 1987, Ser. No. 99,790
Claims priority, application United Kingdom, Oct. 1, 1986, 8623605
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—161 **9 Claims**



1. Aircraft on-board gas generating apparatus comprising a gas concentrator unit having a plurality of molecular sieve beds each adapted for receiving a flow of compressed air as charge gas and delivering a flow of product gas enriched in one constituent gas, valve means operably connected with the sieve beds for cycling the sieve beds through charge/adsorption phases and purge/desorbtion phases, product gas sensor means having a connection with a delivery outlet of the concentrator unit for sensing the concentration of the enriched constituent gas in the product gas delivered by the concentrator unit, pressure intensifier means adapted for receiving a flow of air at one pressure value and delivering to the concentrator unit a flow of air at a required increased pressure value, and means driven by the pressure intensifier means for operating the valve means to cycle the sieve beds in accordance with control signals output by the sensor means, whereby the concentration value of the constituent gas in the product gas delivered by the concentrator unit is maintained within predetermined limits.

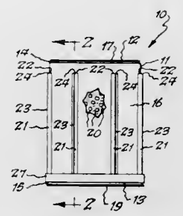
4,783,206

ADSORBENT CARTRIDGE

John S. Cullen, Buffalo, and Samuel A. Incorvia, Tonawanda, both of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Sep. 18, 1987, Ser. No. 98,158
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—387 **23 Claims**

1. An adsorbent cartridge for use in a container of pills, medicinal capsules, or the like, and which can be distinguished therefrom by feel comprising a hollow elongated body member having a wall with an outer surface and first and second ends, elongated ribs on said outer surface of said body member, an opening on at least one of said ends, a gas-permeable membrane closing said opening, adsorbent within said body member, and circumferentially extending band means formed integrally with at least one end of said body member to provide radial reinforcement to said body member to prevent separation of said gas permeable membrane therefrom in the event said body member is subjected to radial forces.

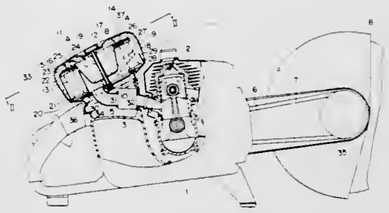


4,783,207

AIR CLEANER

Akira Nagashima, Kawasaki, and Fujio Sasaki, Mitaka, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,337
Claims priority, application Japan, Oct. 14, 1986, 61-157227
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—498 **5 Claims**



1. An air cleaner for supplying filtered air to a carburetor of an internal combustion engine via a passage connecting the air cleaner with the carburetor, comprising:

a bowl-shaped air cleaner main body having an upper end opened upwardly, a peripheral wall, at least one air intake port at a portion of the peripheral wall;

a cap member detachably mounted on said air cleaner main body for covering said opened upper end of said air cleaner main body;

a cylindrical cleaner element disposed within said air cleaner main body for purifying the air;

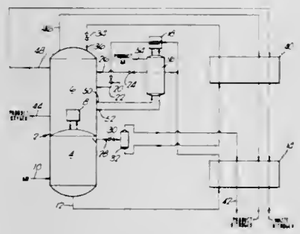
a bowl-shaped dividing member located within a space at the center of said cleaner element including a partition connected to said main body for dividing the space into an upper space and a lower space, said bowl-dividing member including an upper edge extended portion which overlaps the top of said cylindrical cleaner element, the upper space communicating with said at least one air intake port adjacent said partition and being connected to an annular chamber defined between said air cleaner main body and said partition for receiving air from said at least one intake port, and the lower space communicating with the upper space through said cleaner element for receiving air from the upper space, and with the carburetor via an outlet, such that the air sucked from said at least one air intake port passes into the upper space passes through the cleaner element, and is introduced as purified air into the lower space to be delivered to the carburetor.

4,783,208

AIR SEPARATION

Thomas Rathbone, London, England, assignor to The BOC Group plc, Windlesham, England

Filed Nov. 20, 1987, Ser. No. 123,445
Claims priority, application United Kingdom, Nov. 24, 1986, 8628018; Apr. 3, 1987, 8707994
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **18 Claims**



1. In a method of separating argon and oxygen from air comprising:

(a) passing air under pressure at low temperature into a double rectification column comprising a higher pressure column, a lower pressure column and a condenser-reboiler;

(b) forming in said higher pressure column an oxygen-rich liquid fraction and an oxygen-poor vapor fraction;

(c) condensing the oxygen-poor fraction in the condenser-reboiler a portion of the condensed vapor being utilized as reflux for the higher pressure column and the remainder being withdrawn therefrom;

(d) sub-cooling said withdrawn portion of the condensed oxygen-poor fraction and utilizing at least a portion of the resulting liquid as reflux in said lower pressure column;

(e) separating the oxygen-rich liquid fraction in the lower pressure column to form a nitrogen vapor fraction and an oxygen liquid fraction;

(f) withdrawing an argon-enriched stream from an intermediate level of the lower pressure column and separating it in a further column having thereon a condenser to form an argon-rich fraction and an oxygen fraction, said condenser being refrigerated by the oxygen-rich liquid prior to introduction thereof into the lower pressure column; and

(g) withdrawing nitrogen vapor and oxygen vapor from the lower pressure column and passing them through a heat exchanger countercurrently to the incoming air, improvement wherein refrigeration is transferred from the oxygen-poor liquid formed in step (d) to the oxygen-rich liquid formed in step (b) and a portion of said oxygen-poor liquid is vaporized and expanded in a turbine to provide refrigeration for the process.

4,783,209

CRYOGENIC AIR DISTILLATION WITH COMPANDED NITROGEN REFRIGERATION

Donald C. Erickson, 1704 So. Harbor La., Annapolis, Md. 21401

Filed Jul. 2, 1986, Ser. No. 881,230
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **20 Claims**

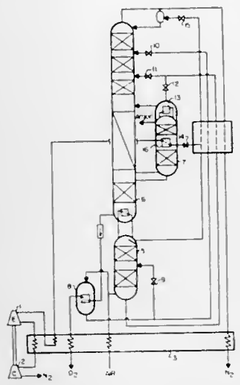
1. A process for cryogenically distilling air to produce at least oxygen in an apparatus comprised of a high pressure rectifier and a low pressure N_2 removal column wherein the improvement comprises:

(a) producing the refrigeration required for said process by work-expanding a pressurized stream of nitrogen obtained from said process to a pressure no higher than the approximate pressure of the low pressure N_2 removal column;

(b) compressing at least part of said N_2 stream supplied to the

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expander, said compression step being at approximately ambient temperature; and



(c) powering said compression by the work obtained from said expansion step.

4,783,210

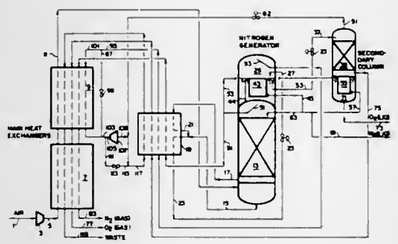
AIR SEPARATION PROCESS WITH MODIFIED SINGLE DISTILLATION COLUMN NITROGEN GENERATOR

Calvin L. Ayres, New Tripoli; Joseph M. Abrardo, Schnecksville, and Edwin C. Rogusky, Catasauqua, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 14, 1987, Ser. No. 132,534

Int. Cl.⁴ F25J *3/02*

U.S. Cl. 62—24 **2 Claims**



1. In a nitrogen generator air separation process which utilizes a cryogenic single distillation column nitrogen (nitrogen generator) and either a waste expander or an air expander for the provision of refrigeration, wherein the cryogenic single distillation column has an overhead condenser and a sump surrounding the overhead condenser, the improvement for producing a high purity oxygen co-product comprising:

(a) integrating a secondary distillation column into the process;

(b) removing a portion of oxygen-rich liquid from the sump of the nitrogen generator column overhead condenser and feeding said oxygen-rich liquid to an upper location of the secondary distillation column;

(c) providing reboil for the secondary distillation column by condensing a portion of nitrogen overhead from the nitrogen generator column in a reboiler/condenser located in the bottom of the secondary distillation column;

(d) utilizing at least a portion of the condensed nitrogen liquid from the reboiler/condenser located in the bottom of the secondary distillation column to provide reflux to the nitrogen generator column; and

(e) recovering the high purity oxygen co-product from the secondary distillation column;

whereby the high purity oxygen co-product is recovered from a waste stream normally vented to the atmosphere in the nitrogen generator process and is accomplished without additional operating power or air feed requirements.

4,783,211

APPARATUS FOR LOCALLY HEATING CONVEYED GLASS SHEETS

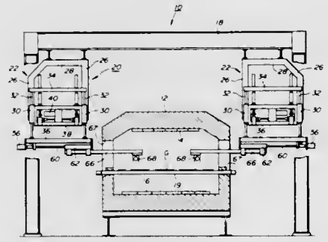
Yasuhiro Fuchigami; Atsushi Okai, and Kazuo Yamada, all of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Dec. 14, 1987, Ser. No. 132,467

Claims priority, application Japan, Dec. 15, 1986, 61-192685[U]

Int. Cl.⁴ C03B *23/02*

U.S. Cl. 65—162 **4 Claims**



1. In a glass sheet heating system including a furnace adapted to heat glass sheets to its deformation temperature, and means for conveying said glass sheets through said furnace, the improvement comprising:

one or more heaters positioned within said furnace; and

means for reciprocatingly moving said heaters in a direction transversely to the direction of conveyance of the glass sheets in a substantially synchronized relation to movement of said conveyed glass sheets, so that selected portions of the glass sheets are locally heated by said heaters.

4,783,212

MOULD ARRANGEMENT FOR USE IN A CYCLICLY OPERATING GLASSWARE FORMING MACHINE

Werner Loffler, Kleintettau, Fed. Rep. of Germany, assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 689,129, Jan. 7, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 936,914

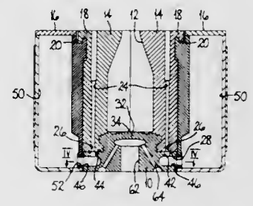
Claims priority, application United Kingdom, Jan. 12, 1984, 8400772

Int. Cl.⁴ C03B *9/14, 9/20, 9/38*

U.S. Cl. 65—265 **5 Claims**

1. A mould cooling arrangement for use in a glassware forming machine which includes a frame wall having at least one vertically extending exit opening for passage of cooling air, said mould arrangement comprising a mould including a bottom plate defining a bottom portion of a cavity of the mould in which molten glass is moulded in the operation of the machine, and two side portions defining side portions of the cavity, mnovable supports for supporting each said side portion for movement between a first position wherein the side portions are in engagement with the bottom plate and each other to define the cavity of the mould, and a second position wherein the side portions are spaced from each other to allow moulded glass to be removed, vertically extending cooling passages in each of said side portions through which air can

pass to cool the side portions, each cooling passage having an entrance in a bottom surface of a side portion and passing upwardly through that side portion, at least one plenum chamber formed in said bottom plate and having a vertically extending entrance opening, said plenum chamber extending directly underneath the entrance of the cooling passages and having at least one upwardly opening exit which communicates with the entrance of the cooling passages when the side portions are in their first position, said movable supports each having walls which with said frame wall define, when the support is at said



first position, an air chamber extending substantially from the top to the bottom of said mould, a vertically extending exit opening in said support walls which is in communication with the entrance opening of said plenum chamber when said side portions are in their first position and said exit opening in said frame comprising the air inlet to said chamber when the side portions are in their first position, whereby cooling air can pass through said frame and chamber to said plenum chamber and then to the cooling passages when said side portions are in their first position.

4,783,213

CERTAIN 2-(2-SUBSTITUTED BENZOYL)-4-(SUBSTITUTED OXY OR SUBSTITUTED THIO)-1,3-CYCLOHEXANEDIONES

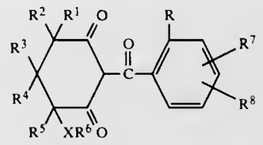
David L. Lee, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 919,280, Oct. 16, 1986, abandoned. This applicatioo Aug. 20, 1987, Ser. No. 86,268

Int. Cl.⁴ A01N *31/00*

U.S. Cl. 71—98 **26 Claims**

1. Compounds of the formula



wherein

X is oxy, thio, sulfinyl or sulfonyl;

R is halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; trifluoromethoxy; difluoromethoxy; nitro; cyano; C_1–C_2 haloalkyl; R^aSO_n— wherein n is 0 or 2 and R^a is C_1–C_2 alkyl, trifluoromethyl or difluoromethyl;

R^1 is hydrogen, C_1–C_4 alkyl, or phenyl;

R^2 is hydrogen or C_1–C_4 alkyl; or

R^1 and R^2 together are C_2–C_5 alkylene;

R^3 is hydrogen, C_1–C_4 alkyl, or phenyl with the proviso that R^1 and R^3 are not both phenyl;

R^4 is hydrogen or C_1–C_4 alkyl;

R^5 is hydrogen or C_1–C_4 alkyl;

R^6 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, or phenyl;

R^7 and R^8 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)$— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined; and their salts.

4,783,214

LOW OXYGEN CONTENT FINE SHPERICAL PARTICLES AND PROCESS FOR PRODUCING SAME BY FLUID ENERGY MILLING AND HIGH TEMPERATURE PROCESSING

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,535

Int. Cl.⁴ B22F *9/04*

U.S. Cl. 75—0.5 B **12 Claims**

1. A process comprising:

(a) reducing the size of a starting material from which said powder is to be made by fluid energy milling to produce a finer powder, essentially all of which has a particle size of less than about 20 micrometers in diameter;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet to melt at least about 50% by weight of said finer powder to form essentially fine spherical particles of said melted portion; and

(c) rapidly and directly resolidifying the resulting high temperature treated material while said material is in flight, to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends, said particles having an oxygen content of less than about 0.8% by weight, and a carbon content of no greater than the carbon content of said starting material.

4,783,215

LOW OXYGEN CONTENT IRON GROUP BASED AND CHROMIUM BASED FINE SPHERICAL PARTICLES AND PROCESS FOR PRODUCING SAME BY FLUID ENERGY MILLING AND TEMPERATURE PROCESSING

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Feb. 29, 1988, Ser. No. 161,924

Int. Cl.⁴ B22F *9/04, 9/08*

U.S. Cl. 75—0.5 B **28 Claims**

1. A process comprising:

(a) reducing the size of a starting material selected from the group consisting of iron group based materials and chromium based materials by fluid energy milling said material to produce a finer powder, essentially all of which has a particle size of less than about 20 micrometers in diameter;

(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet to melt at least about 50% by weight of said finer powder to form essentially fine spherical particles of said melted portion; and

(c) rapidly and directly resolidifying the resulting high temperature treated material while said material is in flight, to form fine spherical particles having a particle size of less than about 20 micrometers in diameter, said particles being essentially free of elliptical shaped material and

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essentially free of elongated particles having rounded ends, said particles having an oxygen content of less than about 0.8% by weight and a carbon content no greater than the carbon content of said starting material.

4,783,216

PROCESS FOR PRODUCING SPHERICAL TITANIUM BASED POWDER PARTICLES

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1986, Ser. No. 904,317

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—0.5 BB **7 Claims**

1. A process comprising:
(a) mechanically reducing the size of a titanium based material to produce a finer powder;
(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet, to melt at least about 50% by weight of said finer powder to form essentially spherical particles of said melted portion; and
(c) rapidly and directly resolidifying the resulting high temperature treated material, while said material is in flight, to form spherical particles, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends.

4,783,217

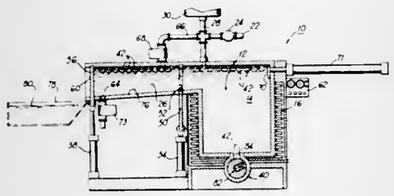
METHOD AND APPARATUS FOR PRODUCING SPHERICAL OBJECTS

Harry J. Robertson, 1113 Woodland Rd., Salisbury, Md. 21801

Filed Sep. 21, 1987, Ser. No. 99,308

Int. Cl.[4] C22C *1/04*

U.S. Cl. 75—0.5 B **18 Claims**



4. A method of producing spherical objects comprising the steps of:
(a) heating a first metal to molten condition;
(b) restricting said first metal in a confined area in its molten state;
(c) maintaining the temperature of said first metal at a prescribed level sufficient to maintain said first metal in its molten condition;
(d) heating to molten condition a second metal which has a density in a molten condition less than the density of said first metal, said second metal in its molten state being essentially nonreactive and immiscible with said first metal in its molten state, said second metal having a melting point higher than said prescribed temperature of said first metal;
(e) introducing successive measured increments of said second metal into the interior of said molten first metal while maintaining said second metal in a molten condition whereby said successive increments migrate by buoyancy upwardly in said molten first metal and are cooled from a molten state to a solid state during such period of migration to produce successive spherical objects; and
(f) removing said spherical objects from said first metal while said first metal is in its molten state.

4,783,218

PROCESS FOR PRODUCING SPHERICAL REFRACTORY METAL BASED POWDER PARTICLES

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1986, Ser. No. 904,997

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] B22F *1/00*

U.S. Cl. 75—0.5 BB **6 Claims**

1. A process comprising:
(a) mechanically reducing the size of a refractory metal based material to produce a finer powder;
(b) entraining said finer powder in a carrier gas and passing said powder through a high temperature zone at a temperature above the melting point of said finer powder, said temperature being from about 5500° C. to about 17,000° C., said temperature being created by a plasma jet, to melt at least about 50% by weight of said finer powder to form essentially spherical particles of said melted portion; and
(c) rapidly and directly resolidifying the resulting high temperature treated material, while said material is in flight, to form spherical particles, said particles being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends.

4,783,219

METHOD FOR MELTING AND REDUCING CHROME ORE

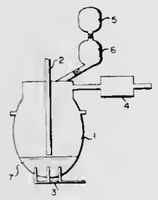
Hajime Mori; Minoru Hirano; Teruyuki Hasegawa; Yoshihiko Kawai; Yoshiteru Kikuchi, and Kenji Takahashi, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 929,171

Claims priority, application Japan, Nov. 13, 1985, 60-252635

Int. Cl.[4] C21C *5/34*

U.S. Cl. 75—62 **14 Claims**



1. A method for melting and reducing chrome ore, employing a reaction vessel including a lance disposed above molten metal in said vessel for top blowing and a tuyere disposed at the bottom of the vessel for bottom blowing through the molten metal and pressure means for decreasing pressure within said vessel, which comprises the steps of:
supplying molten metal into said vessel;
charging chrome ore into said vessel;
charging solid carbonaceous material into said vessel to substantially maintain the carbon content in the reaction vessel;
decreasing the pressure within the vessel through said pressure means to less than atmospheric pressure; and
blowing oxygen gas onto said molten metal through the lance while said molten metal is being stirred by a gas which is introduced through the tuyere at the bottom of said vessel.

4,783,220

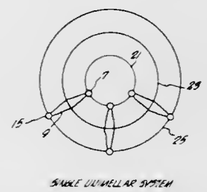
VESICLE INK COMPOSITIONS

Ronald C. Gamble, Pasadena, Calif.; Micheal C. Hair, Oakville, Canada; Sava R. Lukac, Toronto, Canada, and Michael G. Taylor, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn. and Vestar, Inc., Pasadena, Calif., part interest to each

Filed Dec. 18, 1986, Ser. No. 944,675

Int. Cl.[4] C09D *11/06*

U.S. Cl. 106—27 **38 Claims**



1. An aqueous ink composition comprising a dye soluble in the hydrocarbon bilayer of vesicles formed from surfactants selected from the group consisting of anionic, cationic, zwitterionic and nonionic molecules having a polar group and two nonpolar hydrocarbon moieties.

19. A method for preparing an ink composition suitable for use in printing systems comprising the steps of:
(a) suspending a surfactant and optionally, an antioxidant and a microbial inhibitor in water;
(b) subjecting the suspension to a shear force sufficient to generate vesicles of desired size;
(c) adding a lipid soluble dye to the sheared suspension;
(d) adjusting the pH of the solution to enhance dye incorporation;
(e) further subjecting said dye solution to shear force; and
(f) centrifuging the sheared solution, thereby obtaining dye-associated vesicles.

4,783,221

COMPOSITIONS AND PROCESS FOR PRESERVING WOOD

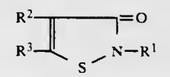
Scott L. Grove, Lakewood, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Dec. 12, 1986, Ser. No. 940,548

Int. Cl.[4] C09D *5/16*; B32B *21/04*

U.S. Cl. 106—18.22 **24 Claims**

1. A novel composition comprising
(A) at least one metal salt of an organic carboxylic acid containing at least about 6 carbon atoms
wherein the metal is selected from the group consisting of transition metals, zinc, mercury, antimony and lead,
(B) at least one isothiazolone compound represented by the structural formula



(I)

wherein R^1 is an alkyl, alkenyl or alkynyl group of 1 to about 18 carbon atoms; a cycloalkyl group having a 3 to 6 carbon atom ring and up to about 12 carbon atoms; an aralkyl or aryl group of up to about 10 carbon atoms; R^2 is hydrogen, halogen or a lower alkyl group; and R^3 is hydrogen, halogen or a lower alkyl group, and
(C) at least one solvent/diluent.

4,783,222

GLASS FIBER REINFORCED POLYEPOXIDE PRODUCTS AND METHOD FOR PRODUCING SAME

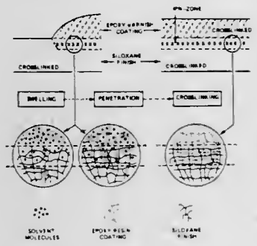
Frank Druschke, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1987, Ser. No. 102,700

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 86114395

Int. Cl.[4] C09K *3/00*; C07D *307/00*; C07F *7/10*; B32B *17/06*

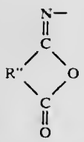
U.S. Cl. 106—287.13 **6 Claims**



1. Surface treatment composition for glass fibers coprising an aqueous solution or emulsion of an organosilane of the formula

$$(MR')_aSiY_{4-(a+b)}$$

where R is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R' is selected from divalent hydrocarbon radicals, halogenated divalent hydrocarbon radicals and secondary, tertiary amino-functional, and quaternary ammonium-functional divalent hydrocarbon radicals, Y is a hydrolyzable radical, and M is an aliphatically unsaturated isoimido radical of the formula



where R'' is an aliphatically unsaturated divalent organic radical selected from hydrocarbon radicals and halogenated hydrocarbon radicals; a is an integer from 1 to 3 inclusive and b is a whole number from 0 to 2 inclusive, and the sum of a+b is equal to 1 to 3 inclusive.

4,783,223

METHOD OF AND AN ARRANGEMENT FOR REDUCING HEAT CONSUMPTION OF BOTTLE CLEANING MACHINES

Klaus Jendrichowski, Holzwickede, and Gisbert Strohn, Herdecke, both of Fed. Rep. of Germany, assignors to Holstein & Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Apr. 4, 1986, Ser. No. 848,739

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512463

Int. Cl.[4] B67C *1/00*; F24J *3/04*

U.S. Cl. 134—30 **7 Claims**

1. A method of reducing heat consumption in a bottle cleaning machine having a plurality of lye solution preheating zones, a main lye solution bath, a plurality of spraying cells,

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and two heat pumps each having a cold side and a hot side, the method comprising the steps of withdrawing excess water from one spraying cell located before a last spraying cell; supplying the withdrawn excess water to the cold side of one heat pump and supplying the same with a reduced temperature again to the one spraying cell; passing the lye solution of at least one of the lye solution preheating zones through the hot side of said one heat pump so as to heat the same; supplying a partial stream of the thus heated lye solution to the cold side of



another heat pump and from the latter supplying the same back to the respective preheating zone; supplying a remainder of the thus heated lye solution to the respective preheating zone; and passing a partial stream from the main lye solution bath at the hot side of the other heat pump and returning the same to the main lye solution bath so that excess power from the one heat pump acts for heating the supplied lye solution to the higher temperature and the partial stream of the lye solution at the cold side of the other pump is supplied again for cooling the one preheating zone.

4,783,224

METHOD FOR HYDROPHILIC TREATMENT OF ALUMINUM USING AN AMPHOTERIC POLYMER

Ryosuke Sako, Hiratsuka; Takao Ogino, Yokohama; Motoki Kanazawa, Kanagawa; Akira Nishihara, Yokohama; Hiroshi Okita, Kanagawa, and Yoshinori Sakamoto, Sakai, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,243

Claims priority, application Japan, Dec. 29, 1986, 61-315818

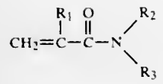
Int. Cl.[4] F28F *13/18*

U.S. Cl. 148—6.27 **9 Claims**

1. A method for forming a hydrophilic coating on an aluminum surface comprising contacting said surface with an aqueous solution comprising at least one polymer or copolymer selected from the group consisting of

(I) an amphoteric copolymer having the empirical formula $(I)_l-(II)_m-(III)_n-(IV)_o$ in which

(I) is



wherein R_1 represents H or CH_3 and R_2 and R_3 represent H, alkyl radical of C_1–C_4, benzyl radical or alkanol group of C_2–C_3

(II) is an unsaturated cationic monomer;

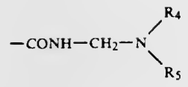
(III) is an unsaturated anionic monomer;

(IV) is a nonionic monomer capable of copolymerization; and wherein l, m, n and o represent mole % and $l+m+n+o=100$ $l \geqq 40$; $m=1$–59; $n=1$–59 and $o=0$–30

and (2) an amphoteric polymer obtained by the reaction of a homopolymer or copolymer of monomer (I) by

(i) Conversion of amide radical to carboxyl radical by hydrolysis,

(ii) Conversion of amide radical to



by Mannich reaction with



and formaldehyde wherein R_4, R_5 are alkyl radical of C_1–C_4, alkanol group of C_2–C_3 or benzyl,

(iii) Introduction of —CONH—R_6—NH_2 by the Hofmann reaction between side-chain ester radical and alkylenediamine (H_2N—R_6—NH_2), wherein R_6 is alkylene radical of C_2–C_6,

(iv) Conversion to quaternary amino compound, by alkylating the amino radical of the reaction product of (ii) or (iii),

and thereafter drying the solution on the surface.

4,783,225

WAFER AND METHOD OF WORKING THE SAME

Hisashi Maejima, Higashiyamato; Hiroshi Nishizuka, Higashikurume; Susumu Komoriya, Tokorozawa, and Etuo Egashira, Yamanashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 741,107, Jun. 4, 1985, abandoned, which is a continuation of Ser. No. 517,405, Jul. 26, 1983, abandoned. This application Feb. 19, 1986, Ser. No. 830,754

Claims priority, application Japan, Jul. 30, 1982, 57-131949

Int. Cl.[4] H01L *21/02, 29/06*

U.S. Cl. 148—33.2 **13 Claims**



1. A wafer for forming an integrated circuit thereon, the wafer comprising a substantially circular contour portion, at least one substantially flat portion for defining a crystal orientation, and connecting portions, disposed between the circular contour portion of the wafer and respective ends of the at least one substantially flat portion, and wherein the connecting portions are chamfered in a thickness direction thereof and in a plane parallel to a major surface thereof to form curvilinear contours so as to prevent a chipping of the wafer at the connecting portion during a processing thereof.

10. A method of working a wafer, the method comprising the steps of forming a substantially flat portion in a contour of the wafer, and chamfering joint regions between respective ends of the substantially flat portion of the wafer and the contour of the wafer, wherein the chamfering is performed curvilinearly along inscribed circles in an area common to said outer contour of the wafer and said substantially flat portion.

4,783,226

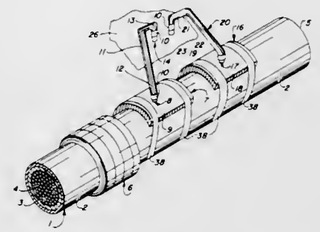
METHOD AND APPARATUS FOR TREATING CABLES

William R. Senn, Rte. 2, Box 26, Shongaloo, La. 71072

Filed Jul. 30, 1987, Ser. No. 79,510

Int. Cl.[4] H01B *13/06*

U.S. Cl. 156—48 **14 Claims**



1. In an apparatus for treating air core cables wherein an air application saddle fitting and at least one liquid application saddle fitting are attached to the cable over windows provided in the cable and air and a treatment liquid are injected into the cable, the improvement in combination therewith comprising a treatment tank for containing a quantity of treatment liquid; a liquid application pipe extending through a top surface of said tank, with one end of said liquid application pipe projecting above said top surface of said tank and the opposite end of said liquid application pipe terminating in close proximity to the bottom of said tank; an air application pipe extending through said top surface of said tank, with one end of said air application pipe projecting above said top surface of said tank and the opposite end of said air application pipe terminating below said top surface of said tank and above the surface of the treatment liquid contained in the tank; air intake means provided in said top surface of said tank; first hose means adapted for connection to said liquid application saddle fitting and said liquid application pipe for transferring treatment liquid from said tank to the cable; and second hose means adapted for connection to said air application saddle fitting and said air application pipe for pressuring said tank and selectively applying air to the cable responsive to capping of said liquid application pipe and pressuring said tank in a first step, draining of treatment liquid from said tank and applying treatment liquid to the cable responsive to capping of said air application saddle fitting and pressuring said tank in a second step and continuing the flow of air into the cable for drying the cable, in a third step.

4,783,227

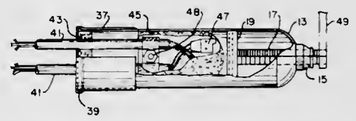
SYSTEM AND METHOD FOR SEALING A BURIED CABLE SPLICE

James H. Meador, 516 Shadowridge Dr., Ballwin, Mo. 63011

Filed Apr. 28, 1987, Ser. No. 43,338

Int. Cl.[4] H01B *13/06*

U.S. Cl. 156—49 **25 Claims**



23. A method of sealing a splice between a plurality of electrical cables such as telephone cables, cable television cables, and the like comprising:

making a splice between at least a pair of electrical cables;

reciprocatingly moving a plunger with a mixer head in a rigid tube containing two components of a settable liquid to initiate the setting of the liquid, said plunger being sealingly mounted in a relatively open end of the rigid tube to prevent the settable liquid from escaping from the rigid tube during mixing;

removing the plunger from the rigid tube to open the relatively open end of the tube; and

inserting the splice through the relatively open end of the tube and immersing the splice in the mixed settable liquid before the liquid sets, so that the settable liquid as it sets forms a seal about the splice.

4,783,228

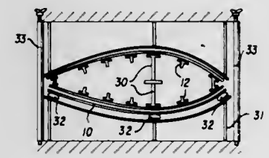
METHOD OF BONDING METAL SKINS TO INTERNAL SUPPORT STRUCTURES

Sam C. Aker, Arlington, and Pettice M. Phillips, Bedford, both of Tex., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Jul. 3, 1986, Ser. No. 881,810

Int. Cl.[4] B32B *31/06, 31/20, 31/26*

U.S. Cl. 156—64 **8 Claims**



1. A method of adhesive bonding a metal skin to an internal structure comprising the steps of:

(a) providing a pair of metal skin panels;

(b) providing means for forming said metal skin panels whereby said skin panels assume and retain a specific contour;

(c) forming a pair of contoured skin panels;

(d) assembling a lattice of discrete ribs and spars to form a rib and spar subassembly inside one of said contoured skin panels so that said rib and spar subassembly contacts the inner surface of said contoured skin panel;

(e) bonding said rib and spar subassembly to the inner surface of said contoured skin panel to form a skin-superstructure assembly;

(f) assembling a pair of said skin-superstructure assemblies; and

(g) bonding said skin-superstructure assemblies together by applying temperature and pressure thereto so that pressure is only applied to said skin-superstructure assemblies along the line of contact between said skin-superstructure assemblies.

4,783,229

CERAMIC TUBE

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 6, 1987, Ser. No. 34,504

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

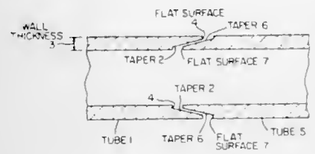
Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—89 **3 Claims**

1. The method of making an elongated alumina tube having a predetermined length comprising the steps of preparing two sintered alumina tubes each having a length shorter than said predetermined length, grinding an outside tapered surface on one end of one of said two sintered alumina tubes, grinding a mating inside tapered surface on one end of the other of said two sintered alumina tubes, thinly coating said tapered surfaces with a composition including calcium aluminate and finely powdered alumina, butting the ends of the two sintered alumina tubes together so that the tapered surfaces mate, firing

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said mated ends under a compressive longitudinal force at a high temperature to promote alumina formation at the joint



between the tapered surfaces and to form a secure joint therebetween.

4,783,230

MANUFACTURE OF PLY FABRIC FOR REINFORCED RUBBER ARTICLES

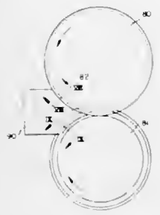
David J. B. Perkins, Liverpool, England, assignor to W & A Bates Limited a British Company, United Kingdom

Continuation of Ser. No. 764,529, Aug. 12, 1985, abandoned, which is a continuation of Ser. No. 555,989, Nov. 29, 1983, abandoned. This application Jan. 22, 1987, Ser. No. 8,136

Claims priority, application United Kingdom, Dec. 16, 1982, 8235778

Int. Cl.⁴ B32B *1/00*

U.S. Cl. 156—117 **12 Claims**



1. A method of manufacturing a layer of unreinforced elastomeric material to form part of a pneumatic tire comprising producing a warm unvolcanized elastomeric strip from an extruder, directly feeding the extrudate strip to a calender means to produce a thin unvulcanized elastomeric strip of a thickness of 0.3 mm–0.7 mm, winding the unvulcanized elastomeric strip as a progressive helical winding along a mandrel with the edges of the strip being substantially butted against one another to produce a substantially continuous uniform thin layer of said material thereon suitable to be built into a tire carcass, the disengaging the layer from the mandrels, transferring the layer in cylindrical form to the interior surface of a carrier, positioning the carrier around a tire carcass building former and transferring the layer to the tire bulilding former to constitute an inner lining for a tire carcass.

4,783,231

METHOD OF MAKING A FIBROUS WEB COMPRISING DIFFERENTIALLY COOLED/THERMALLY RELAXED FIBERS

John M. Raley, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 785,366, Oct. 7, 1985, abandoned. This application Apr. 23, 1987, Ser. No. 41,511

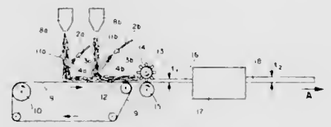
Int. Cl.⁴ D04H *3/16*; B29C *35/16*

U.S. Cl. 156—167 **11 Claims**

1. A process for forming a fibrous web, comprising the steps of:

(a) differentially cooling said fibers to produce an asymmetric, differential contraction and thermal set therein, whereby said fibers are provided with a crimped conformation;

(b) bonding said fibers to form a bonded web; and



(c) heating said crimped fibers to thermally relax the fibers to a degree sufficient to at least partially decrimp said fibers, thereby increasing the loft and decreasing the density of said web.

4,783,232

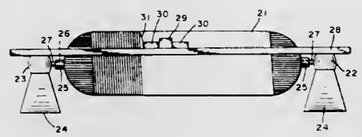
FILAMENT WINDING USING A ROTATIONALLY MOLDED INNER LAYER

Pat. J. Carbone, Maplewood; Raleigh E. Willson, Flanders, and Frank Petruccelli, Boonton, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 529,000, Sep. 2, 1983, abandoned, which is a continuation of Ser. No. 361,683, Mar. 25, 1982, abandoned. This application Jan. 12, 1987, Ser. No. 5,346

Int. Cl.⁴ B29C *41/06*; B31C *13/00*

U.S. Cl. 156—172 **10 Claims**



1. A method of filament winding a hollow, enclosed article having a polymeric inner layer having an outer surface, and a filament wound layer consisting essentially of the steps of:

rotationally molding a hollow, enclosed seamless inner layer;

rotationally molding holding means onto the hollow, enclosed seamless inner layer;

filament winding a fiber and binder composite layer on the outer surface of the inner layer; and

supporting the inner layer solely by the holding means during filament winding.

4,783,233

METALLIC CONTAINER HAVING A CIRCUMFERENTIAL BONDED PORTION AND PROCESS FOR PRODUCTION THEREOF

Hisakazu Yasumuro, Yokohama; Tsuneo Imatani, Yokosuka; Michio Watanabe, Yokohama; Hideo Kurashima, Yokosuka, and Kazuhisa Ishibashi, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Continuation of Ser. No. 550,622, Nov. 10, 1983, abandoned. This application Dec. 16, 1986, Ser. No. 941,584

Claims priority, application Japan, Nov. 16, 1982, 57-199823; Dec. 7, 1982, 57-213279; Dec. 7, 1982, 57-213351; Dec. 10, 1982, 57-215513

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.⁴ B32B *31/12*, *31/28*

U.S. Cl. 156—227 **5 Claims**

1. A process for producing a metallic container by lap-bonding a first and a second section each composed of a primer-coated metallic cup-like fabricated article at their circumferen-

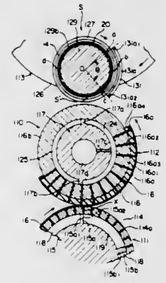
tial open end portions by means of a thermoplastic film-like adhesive, which comprises:

a fabricating step of producing the first and second sections so that the inside diameter of the open end portion of the first section becomes nearly equal to the outside diameter of the open end portion of the second section;

rotating said second section about the central axis thereof;

feeding a length of the film-like adhesive to a heat adhering site along the periphery of the open end portion of the rotating second section;

an adhering step of heat-adhering the film-like adhesive to the peripheral surface of the open end portion of the second section, said adhering step comprising a preheating step of substantially uniformly preheating the open end



portion of the second section along the circumference thereof to a temperature near the lower limit of temperatures at which the film-like adhesive can be heat-adhered, and a heat-adhering step of, immediately after the foregoing preheating step, heat-adhering the film-like adhesive to the open end portion of said second section at the heat adhering site by locally heating said open end portion of the second section by a high frequency heating coil while keeping said second section rotating about its central axis so that the open end portion of the second section at the heat-adhering site attains said temperatures at which the film-like adhesive will be heat-adhered; and

a bonding step of fitting the open end portions of the first and second sections and bonding them.

4,783,234

TUBELET PANEL AND METHOD OF AND APPARATUS FOR MANUFACTURE THEREOF

Robert D. Simonton, Fremont, Ohio, assignor to Fremont Special Machine Company, Inc., Fremont, Ohio

Filed Dec. 15, 1986, Ser. No. 941,719

Int. Cl.⁴ B32B *31/04*

U.S. Cl. 156—555 **15 Claims**

1. Apparatus for producing a panel array of parallel tubes comprising;

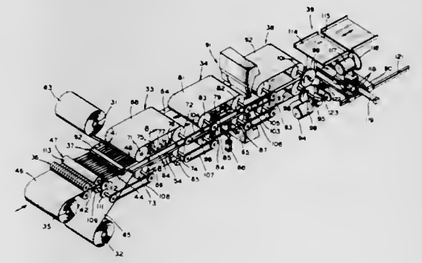
first means to engage the major faces of a plurality of strips, each having parallel longitudinal edges bordering opposed major faces and of stiff sheet material having a first melting temperature, and to support the strips with their major faces parallel and their first longitudinal edges parallel;

means to engage and to support a first facing sheet against a first longitudinal edge of each strip in a region of said apparatus in which said means to engage strips engages the strips, the sheet being of a material having a second melting temperature above the first melting temperature of the strip material;

means to apply heat and pressure to the face of the first facing sheet opposite the face adjacent the first edges of the strips at a temperature above the first melting temperature and below the second melting temperature in that region in which said first means to engage the strips is in engagement with the strips to melt the first longitudinal edges of the strips and displace the first sheet and the strips toward each other to bond the first edges to the first facing sheet without melting a preponderant portion of the major faces of the strips;

second means to engage the major faces of the plurality of strips and to support the strips with their major faces parallel and their second longitudinal edges parallel;

second means to engage and to support a second facing sheet against a second longitudinal edge of each strip in a region of said apparatus in which said second means to engage



strips engages the strips, the sheet being of a material having a third melting temperature above the first melting temperature of the strip material; and

means to apply heat and pressure to the face of the second facing sheet opposite the face adjacent the second longitudinal edge of the strips at a temperature above the first melting temperature and below the third melting temperature in the region in which said second means to engage the strips is in engagement with the strips to melt the second longitudinal edges of the strips and displace the second sheet and the strips toward each other to bond the second edges to the second facing sheet without melting a preponderant portion of the major faces of the strips.

4,783,235

METHOD FOR GROWING A SINGLE CRYSTAL OF COMPOUND SEMICONDUCTOR

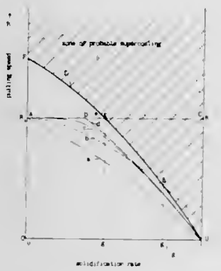
Mikio Morioka, and Atsushi Shimizu, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 748,559, Jun. 25, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 11,428

Claims priority, application Japan, Jul. 20, 1984, 59-150900

Int. Cl.⁴ C30B *15/22*, *29/42*

U.S. Cl. 156—620.2 **5 Claims**



1. A method for growing a single crystal of compound semiconductor comprising the steps of:

melting a liquid encapsulant material and compound semi-

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conductor material doped with one or more than one impurities which have a distribution coefficient less than 1 and are selected from In, B, Sb, Si, Ga, As or P;

dipping a seed crystal into the material melt covered with the liquid encapsulant; and

growing a single crystal from the melt by pulling up and rotating the seed crystal; characterized in that the pulling speed R is lowered from an initial pulling speed so as not to exceed a critical pulling speed R^* during the period of substantial crystal growth, where R^* is given by

$$R^*=(QG_l/w_0)(1-g)^{1-k}$$

where w_0 is an initial gram equivalence of impurity, G_l is the temperature gradient in the material melt, g is the fraction solidified to the initial material melt, k is the distribution coefficient of impurity, and Q is a constant value defined by

$$Q=D/227(1-k)$$

where D is the diffusion constant of the impurity in melt, and k is the equilibrium distribution coefficient of the impurity.

4,783,236

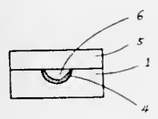
METHOD OF MAKING MEMORY DEVICES

Jiun-Tsong Wu, 446 Manzanita Ave., Sierra Madre, Calif. 91024

Division of Ser. No. 750,733, Jul. 1, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 64,751

Int. Cl.[4] G11C *13/00*

U.S. Cl. 156—633 **2 Claims**



1. The method of making an optical memory device comprising a light-transparent substrate having a plurality of void cells and a preselected amount of ablative material in each void cell only partly filling each cell such that the ablative material can be redeposited at a plurality of locations in each cell, said method comprising the steps of applying a photo resist coating on the surface of a base plate; exposing the photo resist to light of a preselected pattern; developing the photo resist to uncover areas of the base plate underneath the previously exposed pattern of photo resist or underneath the previously unexposed photo resist; etching the uncovered areas of the base plate to form pits at preselected areas in the base plate; depositing ablative material as a coating on the surface of the photo resist and on the base plate in the pits such that said ablative material fills only a portion of the volume of each of said pits; removing the photo resist and ablative layer outside of the pits by dissolving the photo resist coating and carrying with it the overlaying ablative material; and then laminating the base plate with a cover plate to form void memory cells at the pitted areas with the ablative material sealed in the void cells to thereby form said optical memory device wherein the cover plate and base plate together function as said substrate, wherein said ablative material is opaque to radiant energy and is vaporizable in response to a high intensity radiant energy beam, and the amount of ablative material supplied to each pit is limited such that the ablative material can be redeposited at a plurality of locations in said cells.

4,783,237

SOLID STATE TRANSDUCER AND METHOD OF MAKING SAME

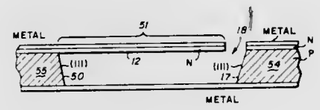
Harry E. Aine, 8601 Signal Ridge Rd., Box 304, Philo, Calif. 95466, and Barry Block, 30610 Page Mill Rd., Los Altos, Calif. 94022, assignors to Harry E. Aine and Barry Block, both of Philo, Calif.

Continuation of Ser. No. 556,833, Dec. 1, 1983, abandoned. This application Jun. 11, 1986, Ser. No. 873,854

The portion of the term of this patent subsequent to Jun. 24, 2003, has been disclaimed.

Int. Cl.[4] H01L *21/02*

U.S. Cl. 437—15 **12 Claims**



1. In a method for making flexible structures by chemical etching of a semiconductive wafer, the steps of;

providing a first etch stop layer (**12**) on a wafer (**11**) of semiconductive material;

opening said first etch stop layer in a predetermined pattern (**18**);

introducing an etchant through said patterned opening (**18**) in said first etch stop layer (**12**);

etching the semiconductive wafer (**11**) through said opening pattern (**18**) in said first etch stop layer (**12**) to undercut substantial portions (**51**) of said first etch stop layer (**12**);

said opening (**18**) being patterned to define a support structure (**54**) of said wafer (**11**) and a doubled back cantilever portion (**51**) of said first etch stop layer (**12**); and

terminating (**50**) the etch of wafer material such that one end of the undercut doubled back cantilever beam portion (**51**) is supported from the support structure (**54**) and the other end of the undercut doubled back cantilever beam portion terminates on a structure (**55**) which structure (**55**) is supported from and being movable relative to said support structure (**54**) by means of flexure of said undercut doubled back cantilever portion (**51**).

4,783,238

PLANARIZED INSULATION ISOLATION

Bruce Roesner, San Diego, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 31, 1987, Ser. No. 80,271

Int. Cl.[4] H01L *21/312*

U.S. Cl. 156—649 **9 Claims**

1. A method of processing an integrated circuit which provides for improved planarized insulation isolation, said circuit having a semiconductor substrate with mesa structures in the surface thereof which define active areas therein, said method comprising the steps of:

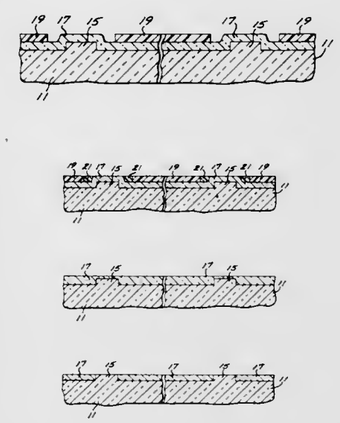
disposing an insulating layer over the surface of said substrate which covers both active and nonactive areas thereof;

disposing an undersized photoresist layer over said insulating layer substantially above the nonactive areas of the substrate such that gaps are provided between the undersized photoresist layer and the portions of the insulting layer disposed over the active areas of the substrate;

disposing photoresist material in the gaps to form a planarized photoresist layer which extends between the active areas and does not cover the portions of the insulating layer over the active areas; and

simultaneously etching the portions of the insulating layer

disposed over the active areas and the planarized photoresist layer at a rate which substantially thins the insulating



layer portions while maintaining the thickness of the insulating layer over the nonactive areas of the substrate.

4,783,239

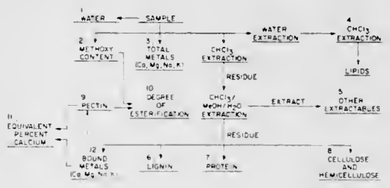
ABSORBENT VEGETABLE MATERIAL AND PROCESS FOR MAKING SAME

Thomas F. Rich, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 522,873, Aug. 11, 1983, abandoned. This application Mar. 28, 1985, Ser. No. 717,218

Int. Cl.[4] D21C *5/00*

U.S. Cl. 162—91 **13 Claims**



1. A process for preparing an absorbent material from a vegetable material containing at least about 15% pectin, comprising the steps of:

(a) comminuting the vegetable material to a particle size of from about 0.05 mm to about 3 mm;

(b) de-esterifying the pectin to a degree of esterification of less than about 45%, by alkali treatment in soft water at a pH of from about 9 to about 12;

(c) washing the vegetable material in soft water;

(d) washing the vegetable material with an organic solvent; and

(e) drying the vegetable material to a moisture content of less than 15%.

4,783,240

LIGHTWEIGHT PAPER AND PROCESS FOR PRODUCING SAME

Akio Kurokawa; Naoyuki Ifuku; Kenzo Seita, and Youzi Nagata, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,878

Int. Cl.[4] D21D *3/00*

U.S. Cl. 162—166 **5 Claims**

1. A process for producing a lightweight paper, which process comprises adding into a pulp slurry, an aluminum salt in a quantity required for forming 0.015 to 1.2% by weight based on dry pulp, of an alumina polymer and further adding a mixture of agglomerated particles of urea-formaldehyde polymer (A) and agglomerated particles of hydrated silicic acid (B) thereby forming a teraggregate of (A)/(B)/alumina polymer, said urea-formaldehyde particles having an average particle diameter of 0.1 to 0.5μ and an average agglomerated particles diameter of 1 to 15μ, and said silica acid particles having a BET specific surface area of 100 to 300 m/g, in quantities required for giving a ratio of (A):(B) in the range of 5:95 to 95:5 and 0.5 to 30% by weight based on dry pulp, or (A) and (B), followed by paper-making.

4,783,241

HEAD BOX FOR A PAPER MACHINE

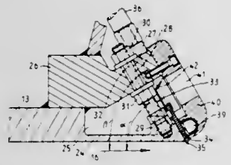
Dieter Egelhof; Albrecht Meinecke, both of Heidenheim, and Simon Juhas, Nattheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmcH, Heidenheim, Fed. Rep. of Germany

Filed Dec. 17, 1987, Ser. No. 133,996

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644454

Int. Cl.[4] D21F *1/02*

U.S. Cl. 162—347 **8 Claims**



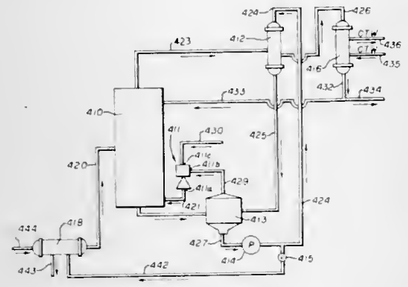
1. A head box (**10**) for a paper machine comprising a nozzle-like stock conduit (**14**) structured to provide a flow of stock in a given direction and an outlet slot having a clearance width (**15**) which extend over the machine width and are defined by a first fixed, flow-carrying wall (**11**) and a second movable, flow-carrying wall (**13**) opposite thereto, an adjustable profile bar (**35**) extending over the machine width at the stock outlet slot (**15**) and carried by the movable wall (**13**), at least two lifting devices (**21**) pivoted to the movable wall (**13**) and supported on a head box housing (**12**), which is fixed, for coarse adjustment of the clearance width of the outlet slot (**15**), and a plurality of adjustment spindles (**36**) spaced over the machine width which are structured to act upon the profile bar (**35**) for fine adjustment of the clearance width of the outlet slot (**15**) the improvement comprising:

(a) a front end section (**24**) of the movable wall (**13**) located in the region of the stock outlet slot (**15**) is of flexible construction with respect to the remaining part of said movable wall, and

(b) a plurality of adjustment units (**33**), spaced across the machine width, structured to act directly on the flexible front end section (**24**) of said movable wall in front of the stock outlet slot (**15**).

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4,783,242
DISTILLATION SYSTEM AND PROCESS
Lanny A. Robbins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed May 22, 1986, Ser. No. 866,176
Int. Cl.[4] B01D *3/06, 5/00*
U.S. Cl. 203—87 **10 Claims**



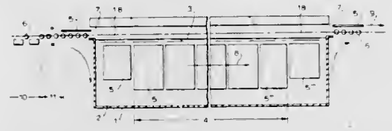
1. A distillation process for removing vaporizable components from an aqueous medium comprising:
a. introducing an aqueous medium containing vaporizable components into a distillation column for removing a portion of the vaporizable components from the aqueous medium.
b. passing through the aqueous medium a current of steam from a thermal compressor to vaporize at least a portion of the vaporizable components,
c. passing at least a portion of the vapors from the distillation column through a first space of a first condenser means having a first and second space sufficient to condense at least a portion of the vapors to a condensate.
d. passing a recirculation liquid to the second space of the condenser means and from the condenser to a separator to separate steam from aqueous liquid, and
e. passing the steam from the separator through the thermal compressor to form steam for introducing into the distillation column.

4,783,243
ARTICLES COMPRISING METAL-COATED POLYMERIC SUBSTRATES AND PROCESS
Hiei Ando, Stamford, Conn., and Dale E. Hall, Rockville, Md., assignors to American Cyanamid Company, Stamford, Conn.
Filed Dec. 18, 1986, Ser. No. 944,281
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 **10 Claims**

1. An improved article of manufacture having a polymeric substrate and at least one electrodepositable metal layer on at least a portion thereof, said improvement comprising said polymeric substrate containing a polymer and a metallic sulfide, and said metal layer being thin, uniform, and firmly adherent to said polymeric substrate.

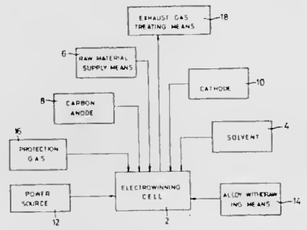
4,783,244
METHOD OF AND DEVICE FOR GUIDING PLATE-SHAPED OBJECTS
Horst Bläsing, Berlin; Thomas Kosikowski, Nürnberg; Ludwig Mankut, Altdorf, and Walter Meyer, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany
Filed Sep. 22, 1987, Ser. No. 99,764
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632378
Int. Cl.[4] C25D *7/00, 17/00*
U.S. Cl. 204—27 **8 Claims**

1. A method of guiding plate-shaped objects each having wide surface sides to be electro-plated and narrow sides, through an electro-plating bath in a container from an inlet to an outlet of said container, comprising the steps of transporting said objects to the inlet of said container in a horizontal position, pivoting said objects in said container from a horizontal position about a horizontal axis extending along a direction of transporting of said objects from said inlet to said outlet so that



said objects assume a position at least below a mirror of said bath and are positioned in said bath side by side with narrow sides of neighboring objects facing each other, then transporting said objects through an electrolysis region in said bath, then pivoting said objects back to the horizontal position and transporting said objects in said horizontal position from the container.

4,783,245
PROCESS AND APPARATUS FOR PRODUCING ALLOY CONTAINING TERBIUM AND/OR GADOLINIUM
Eiji Nakamura, Aichi; Katsuhisa Itoh; Shigeaki Sasaki, both of Nagoya; Masahiro Nishio, Tajimi, and Mikio Sakakibara, Chiryu, all of Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan
Filed Mar. 12, 1987, Ser. No. 25,272
Claims priority, application Japan, Mar. 25, 1986, 61-66164; Mar. 26, 1986, 61-67934; Mar. 26, 1986, 61-67935
Int. Cl.[4] C25C *3/36*
U.S. Cl. 204—71 **21 Claims**



1. A process of producing an alloy containing terbium and/or gadolinium, comprising the steps of:
preparing a bath of molten electrolyte which has a composition consisting essentially of 20–95% by weight of terbium fluoride and/or gadolinium fluoride, 5–80% by weight of lithium fluoride, up to 40% by weight of barium fluoride and up to 20% by weight of calcium fluoride;
effecting electrolytic reduction of said terbium and/or gadolinium fluorides in said bath of molten electrolyte, with at least one carbon anode and at least one metal cathode, so as to electrodeposit terbium and/or gadolinium on said at least one metal cathode, and alloying the electrodeposited terbium and/or gadolinium with metal of said at least one metal cathode so as to produce said alloy containing terbium and/or gadolinium in a liquid state on said at least one metal cathode;
adding said terbium and/or gadolinium fluorides to said bath of molten electrolyte so as to maintain said composition of the bath of molten electrolyte, for compensating for consumption of the terbium and/or gadolinium fluorides during production of said alloy;

dripping the liquid alloy from said at least one metal cathode into a receiver having a mouth which is open upward in a lower portion of the bath of molten electrolyte below said metal cathode, and thereby collecting said liquid alloy in the form of a molten pool in said receiver; and
withdrawing said molten pool of the liquid alloy from said receiver.

4,783,246
BIPOLAR RAPID PASS ELECTROLYTIC HYPOCHLORITE GENERATOR
Leonard E. Langeland, Houston, and Charles W. Clements, Stafford, both of Tex., assignors to ELTECH Systems Corporation, Boca Raton, Fla.
Filed Dec. 1, 1987, Ser. No. 127,122
Int. Cl.[4] C25B *1/26, 9/00, 11/10*
U.S. Cl. 204—95 **40 Claims**

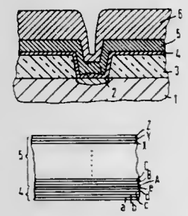


40. The method of producing electrolysis product wherein liquid electrolyte flows within a housing containing at least one bipolar electrode, said housing being comprised of a pair of casing members which close together to provide therebetween a shallow, inner electrolysis compartment, which method comprises:
connecting to a first casing member electrolyte inlet and outlet means for introducing electrolyte into and removing electrolyte and the product of electrolysis from the electrolysis compartment;
connecting to said first casing member electrical current supply and removal means for introducing current to and removing current from electrodes housed within said casing member;
securing the resulting electrolyte and electrically connected first casing member to a second casing member by hinges permitting swinging opening of said members;
securing in closed position said first and second hinged casing members by quick-release fastening means providing a liquid tight inner electrolysis compartment;
feeding liquid electrolyte to said first casing member and through said electrolyte inlet means for flowing into contact with electrodes housed in said inner electrolysis compartment; and
supplying electrical current to said first casing member through said electrical current supply means.

4,783,247
METHOD AND MANUFACTURE FOR ELECTRICALLY INSULATING BASE MATERIAL USED IN PLATED-THROUGH PRINTED CIRCUIT PANELS
Markus Seibel, Mainz, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed May 15, 1986, Ser. No. 863,569
Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517796
Int. Cl.[4] B05D *5/12, 1/36;* **B25D** *13/04*
U.S. Cl. 204—181.1 **17 Claims**

1. A method for producing an electrically insulating base material for a perforated plate-through printed circuit panel, comprising:
(a) applying a layer of first curable insulating material by electrostatically spraying said material onto a panel having perforations, said layer covering at least one surface of said panel and covering hole walls formed by said perforations;
(b) partially curing said insulating material to an extent sufficient to prevent substantial flowing of said material at an elevated temperature;
(c) applying, by means of an aqueous, electrophoretically operating dip-lacquering bath, a layer of second curable insulating material over said layer of first material, said second material being thermally curable and present in an amount sufficient to effect sealing of said layer of first material;
(d) drying and thereafter partially curing said second material by crosslinking to an extent sufficient to prevent flowing of said second material; and
(e) completely curing said layers.

4,783,248
METHOD FOR THE PRODUCTION OF A TITANIUM/TITANIUM NITRIDE DOUBLE LAYER
Armin Kohlhase, and Gerald Higelin, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Dec. 18, 1987, Ser. No. 135,043
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3704055
Int. Cl.[4] C23C *15/00;* **H01L** *21/443*
U.S. Cl. 204—192.17 **9 Claims**



1. A method for the production of consecutive layers of titanium and titanium nitride on a substrate which comprises:
depositing a titanium layer on said substrate by cathode sputtering from a titanium target in a one-chamber system in several individual layers during individual cycles of deposition,
depositing a titanium nitride layer on said substrate in the same system in the presence of nitrogen gas in several individual layers during individual cycles of deposition,
heat treating the substrate and the deposited layers between deposition of the individual layers, and
maintaining the nitrogen content in said system during the

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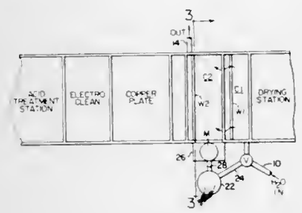
deposition of titanium nitride at a value in excess of that required to form stoichiometric titanium nitride.

4,783,249

ELECTROPLATING APPARATUS WITH SELF-CONTAINED RINSE WATER TREATMENT

Herbert Fishman, Farmington, Conn., assignor to Napco, Inc., Terryville, Conn.

Filed Jun. 26, 1987, Ser. No. 67,638
Int. Cl.[4] C25D *21/22*; C25B *15/08*
U.S. Cl. 204—237 **3 Claims**



1. In an electroplating apparatus having at least one plating station that includes at least one plating tank where workpieces are immersed in a metal bearing plating solution and said apparatus including at least one rinse tank where the plated workpieces are rinsed to remove metal bearing solution residue from the workpiece, the improvement to said rinse tank comprising water inlet means and water outlet means, said rinse tank including a portion defining a water pump receptacle, a water pump in said rinse tank receptacle, said water pump having an outlet, identical ion exchange canisters provided in series with one another and adjacent said water pump receptacle portion of said rinse tank, a first ion exchange canister in communication with said pump outlet to provide rinse tank water to said first ion exchange canister, a second ion exchange canister provided above said first canister and in comuunication with the first for receiving partially treated rinse water for further treatment, and said inlet means also including means for returning the rinse water from said second ion exchange canister and for returning the further treated water to the rinse tank whereby a compact and self-contained rinse water treatment system is provided for said electroplating apparatus.

4,783,250

IMMOBILIZED ELECTROCHEMICAL CELL DEVICES AND METHODS OF MANUFACTURE

B. Stanley Pons, 2125 South Yuma, Salt Lake City, Utah 84109, and Seyed J. Ghoroghchian, 822 Stormy Creek Cir., Sandy, Utah 84070

Continuation of Ser. No. 767,919, Aug. 21, 1919, abandoned. This application Feb. 12, 1987, Ser. No. 13,691
Int. Cl.[4] G01N *27/30*
U.S. Cl. 204—400 **4 Claims**

1. An immobilized electrochemical cell characterized in that the cell requires no self-contained electrolytic substance for ionization, the cell comprising:

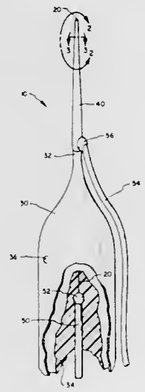
a microelectrode having a cross-section diameter of less than about twenty-five (25) microns;

a reference electrode positioned less than about three (3) millimeters from the microelectrode; and

an insulative material positioned between the microelectrode and the reference electrode so as to maintain the electrodes a substantially fixed distance apart, the insulative material being dielectric but capable of ambient ion flow at the surface thereof for forming a charged layer of ions adjacent the microelectrode when a potential difference is applied between the microelectrode and the reference electrode, wherein a high magnitude electric field is created adjacent the microelectrode in the presence of minimal ambient ions, enabling electrochemical analysis in gaseous, liquid and solid environments.

4. A method for manufacturing an immobilized electrochemical cell which requires no self-contained electrolytic substance for ionization, the method comprising the steps of:

inserting a microelectrode having a cross-sectional diameter of less than about twenty-five (25) microns into an insulative holder which comprises a tube having an outer cross-sectional diameter of less than about six (6) millimeters and which is formed of an insulative material which is dielectric but capable of ambient ion flow at the surface thereof;



sealing the microelectrode within the tube of the insulative holder; and

coating the tube of the insulative holder with a conductive material so as to form a reference electrode surrounding the microelectrode,

the cell being operable for forming a charged layer of ions adjacent the microelectrode which a potential difference is applied between the microelectrode and the reference electrode, whereby a high magnitude electric field is created adjacent the microelectrode in the presence of minimal ambient ions, enabling electrochemical analysis in gaseous, liquid and sold environments

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4,783,251

IONIC ACTIVITY MEASURING DEVICE

Osamu Seshimoto; Akira Yamaguchi, and Yoshio Saito, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 23, 1986, Ser. No. 945,644
Claims priority, application Japan, Dec. 28, 1985, 60-204699[U]; Dec. 28, 1985, 60-299274; Dec. 28, 1985, 60-299275; Mar. 18, 1986, 61-39425[U]; Mar. 18, 1986, 61-39426[U]; Mar. 19, 1986, 61-61874
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—412 **5 Claims**

1. In an ionic activity measuring device comprising:

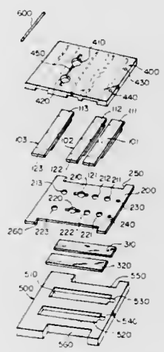
(i) at least three pairs of sheet-like ion selective electrodes provided with ion selective layers on their surfaces and electrically isolated from each other,

(ii) at least one pair of porous liquid distributing members for feeding a reference solution and a sample solution respectively to said ion selective layers of said ion selective electrodes,

(iii) a frame for housing said ion selective electrodes and said porous liquid distributing members therein and provided with a pair of liquid liquid feed holes respectively disposed above said porous liquid distributing members for feeding said reference solution and said sample solution independently of each other to said porous liquid distributing members, and

(iv) a porous bridge for achieving electrical conduction between said reference solution and said sample solution fed to said pair of the liquid feed holes,

said at least three pairs of the sheet-like ion selective electrodes being disposed to stand side by side along said porous liquid distributing members,



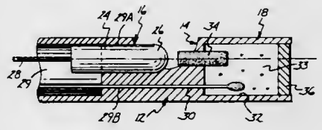
the improvement which comprises said pair of the liquid feed holes being disposed in the vicinity of the center between the ion selective electrode pair positioned at one end and the ion selective electrode pair adjacent to said ion selective electrode pair positioned at said one end, said ion selective electrode pair adjacent to said ion selective electrode pair positioned at said one end, being a potassium ion selective electrode pair.

4,783,252

LATERAL INDICATOR SENSOR

Barry W. Benton, Orange, Calif., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 2, 1987, Ser. No. 20,364
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—416 **21 Claims**



1. A sensor for sensing an electrochemical parameter of a flowing process material and providing an output representative of the parameter, the sensor comprising:

a sensor body having an indentation forming an indentation surface recessed from a side surface of the sensor body which opens to receive a portion of the process material; and

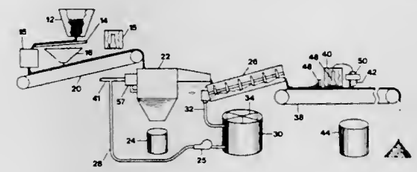
a plurality of electrodes extending from the indentation surface into the indentation to form a plurality of electrode surfaces spaced away from the indentation surface for contacting the process material in the indentation.

4,783,253

PROCESS FOR SEPARATING RADIOACTIVE AND HAZARDOUS METAL CONTAMINANTS FROM SOILS

James W. Ayres, 5633 W. Palmyra, and Alfred W. Western, 6470 W. Desert Inn Rd., both of Las Vegas, Nev. 89102

Filed Apr. 21, 1986, Ser. No. 853,995
Int. Cl.[4] B07C *5/34*; B03B *5/16*
U.S. Cl. 209—2 **10 Claims**



1. A process for treating soils for separating hazardous or radioactive metal contaminated particles from uncontaminated soil particles comprising the steps:

(a) creating a suspension of particles of said soil in a column of water,

(b) alternately forcing water upwardly into said water column from the bottom thereof thereby forcing lighter particles upwardly in said water column and allowing heavier particles to gravitationally settle to the bottom of said water column, said uncontaminated particles being generally lighter than said contaminated particles, whereby the heavier contaminated particles are collected with said heavier particles,

(c) removing said heavier particles from the bottom of said water column and directing the suspension of lighter particles in said water column to means for separating water,

(d) separating water from said suspension to form a particulate solid soil composition comprising said lighter particles, and

(e) further separating portions of said particulate solid soil composition containing hazardous or radioactive soil particles from portions of said particulate solid soil composition free from contamination, and recovering said portions, respectively.

4,783,254

CYCLONE SEPARATOR MEANS

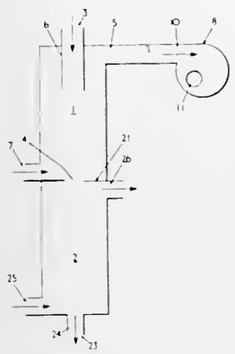
Chandulal L. Shah, Ashby-de-la-Zouch, England, assignor to Coal Industry (Patents) Limited, London, England

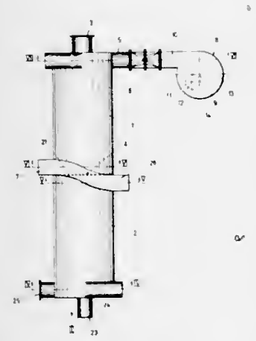
Division of Ser. No. 786,852, Oct. 11, 1985, Pat. No. 4,735,708. This application Mar. 5, 1987, Ser. No. 22,205
Claims priority, application United Kingdom, Nov. 27, 1984, 8429933
Int. Cl.[4] B03B *5/34*
U.S. Cl. 209—211 **9 Claims**

1. Cyclone separator means for treating granular solid material to derive separate fractions of different densities, comprising a treatment chamber having at least two treatment compartments for treating and further treating material, respectively, and outlet means from the treatment chamber for a relatively more dense fraction, each compartment having inlet means for material to be treated, and outlet means; the outlet means of a first compartment of said at least two compartments being for a partially treated relatively less dense fraction, and the outlet means of a second compartment being for a treated relatively less dense fraction, the outlet means for said partially treated relatively less dense fraction of said first compartment being interconnected with the inlet means for said second compartment for feeding the partially treated material from the first treatment compartment to the second treatment compartment, the separator means further comprising liquid medium inlet means connected to one of the treatment compart-

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ments the second treatment compartment having a dense fraction outlet means for the liquid medium carrying a relatively more dense fraction from the second treatment compartment





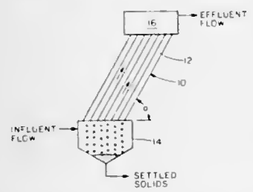
and said dense fraction outlet means being interconnected with a second inlet means in the first treatment compartment so as to further treat the relatively more dense fraction from the second treatment compartment.

4,783,255

SPLIT COUNTERCURRENT FLOW TUBE SETTLER

Eugene D. Bogusch, 1421 Bolson Dr., Downers Grove, Ill. 60516

Filed Nov. 29, 1985, Ser. No. 803,055
Int. Cl.[4] B01D *21/10*
U.S. Cl. 210—802 **4 Claims**



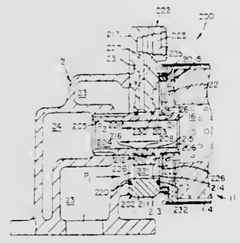
4. A method for separating by gravity settleable suspended material from a liquid, the material having a specific gravity greater than the liquid, with a tube settler having a lower influent end and an upper effluent end interconnected by a plurality of inclined tubes each defining a long tubular passage with a cross-sectional configuration approximately the shape of a boomerang consisting of a central apex of the boomerang passage directed upwardly, and a pair of collection grooves of the boomerang passage directed downwardly with each groove being symmetrically spaced on opposite sides of the central apex, comprising the steps of introducing liquid containing settleable suspended material to the influent end of said settler, flowing said liquid through said passages at a laminar rate of flow whereby said suspended material settles out on the upward facing surfaces within said passages with the settled material being collected within the collection grooves of said passages, transported downward through said settler collection grooves and discharged from said settler while said liquid is flowing therethrough, and leading said liquid away from said effluent end of said settler.

4,783,256

ADAPTER ASSEMBLY FOR FILTER ARRANGEMENT

Roydon B. Cooper, Newport Richey, Fla., and Walter A. Mordes, Jr., East Northport, N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 31, 1986, Ser. No. 891,323
Int. Cl.[4] B01D *35/14;* **G01L** *13/00*
U.S. Cl. 210—90 **4 Claims**



1. In a fluid system including a spin-on filter unit which as a base with a fluid inlet and a fluid outlet and a filter element disposed in the fluid flow path between the inlet and the outlet and which is attachable to a filter pad having an inlet chamber and an outlet chamber, an adapter assembly to allow detection of differential pressure across the filter element by a differential pressure detector, the adapter assembly comprising:

an adapter plate having a first side and a second side, and an aperture to allow fluid to flow from the inlet chamber of the filter pad to the inlet of the filter unit;

a hub detachably mounted to the adapter plate and including means for attaching the hub to the filter pad, means for retaining the first side of the adapter plate in sealed engagement with the filter pad, means for retaining the base of the filter unit in sealed engagement with the second side of the adapter plate, and a fluid channel to allow fluid to flow from the outlet of the filter unit to the outlet chamber of the filter pad;

means for connecting a differential pressure detector to the adaptor plate;

a first passage means for communicating fluid flowing through the aperture in the adapter plate to the detector connecting means; and

a second passage means for communicating fluid flowing through the channel in the hub to the detector connecting means,

said detector connecting means having a detector orifice intercepting the first and second fluid passage means,

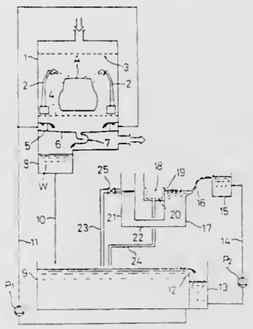
said first and second sides similarly formed so that either may sealingly engage the filter pad, sealingly engage the base of the filter unit, and cooperate with said retaining means so that said adapter plate is reversible.

4,783,257

PAINT WASTE SEPARATOR-COLLECTOR APPARATUS

Koji Morioka, and Makoto Watanabe, both of Tokyo, Japan, assignors to Taikisha Ltd., Tokyo, Japan

Filed Nov. 16, 1987, Ser. No. 120,873
Claims priority, application Japan, Dec. 10, 1986, 61-294545
Int. Cl.[4] C02F *1/24*
U.S. Cl. 210—109 **4 Claims**



1. A paint waste separator-collector apparatus, comprising:

a separator tank for receiving water containing paint waste and for causing the contained paint waste to separate and float;

a weir for causing the floating paint waste together with overflowing water from said separator tank into a collector container; and

a water level adjusting mechanism for switchably providing a paint waste accumulating condition in which a water level in said separator tank is lowered for the water not to flow over said weir thereby causing the floating paint waste to accumulate inside said separator tank and a paint waste collecting condition in which the water level in said separator tank is raised for the excess water to flow over said weir into said collector container; wherein said water level adjusting mechanism includes;

an overflowing water tank communicating with a lower portion of said separator tank for regulating by means of the overflowing water the water level at said separator tank to be a predetermined low water level for providing said paint waste accumulating condition,

a mesh type collector container for catching and separating the paint waste from the overflowing water, and

water level raising means for increasing an amount of water entering said separator tank relative to an amount of the overflowing water from said overflowing water tank so as to raise the water level at said separator tank from said predetermined low water level for providing said paint waste collecting condition.

4,783,258

FILTER CARTRIDGE WITH REUSEABLE FRAMEWORK

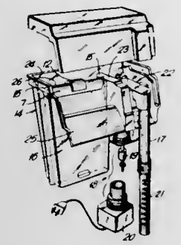
Allan H. Willinger, Wright Way, and Klaus Woltmann, Demarest, both of N.J., assignors to Willinger Bros., Oakland, N.J.

Filed Jun. 5, 1986, Ser. No. 871,106
Int. Cl.[4] B01D *21/04, 27/08*
U.S. Cl. 210—169 **21 Claims**

1. A water purifying cartridge assembly for use with a filtering mechanism for an aquarium of the type which mechanically filters the water by passing it through the filter cartridge, comprising:

(a) an envelope of filter material having at least two side walls interconnected along three edges thereby defining an inner space, a fourth edges being open to define a mouth into the inner space;

(b) a substantially rigid framework extending along the envelope removably insertable through said mouth into said inner space to support said envelope; and



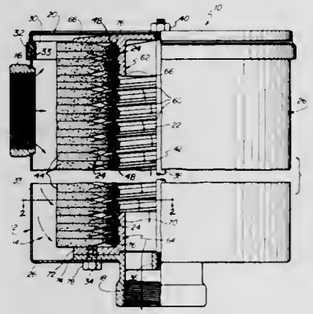
(c) means for separating the walls of the envelope to position said walls in spaced relation.

4,783,259

HELICAL COIL FILTER ELEMENT

Charles E. Wade, 22807 Chardonnay Diamond Dr. #1, Ontario, Calif. 91765

Filed Jul. 7, 1986, Ser. No. 882,400
Int. Cl.[4] B01D *29/48*
U.S. Cl. 210—169 **5 Claims**



1. A fluid filter comprising:

a helically coiled member forming an axially expandable and contractable helix,

said member having a first side facing in one axial direction of the helix and a second side facing in the opposite axial direction of the helix, a first pair of coaxial ribs substantially coextensive with and projecting axially of the helix from said first side of said member, and a single coaxial rib substantially coextensive with and projecting axially of the helix from said second side of said member,

said helix having a normal contracted configuration wherein the adjacent helix coils abut one another with the single rib along each helix coil engaging between the rib pair along an adjacent helix coil to retain the helix coils in coaxial alignment wherein the helix forms a tubular body containing an axial flow passage,

the ribs being interengaging on the adjacent helix coils and having aligned notches at intervals therealong forming a multiplicity of openings communicating said axial flow passage to the exterior of the helix,

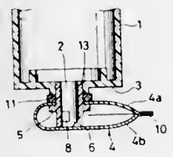
filter elements secured to said member and extending outwardly from said helix to form a myriad of filter passages communicating with said openings, and wherein

said helix is axially expandable to separate the adjacent helix

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coils and the filter elements thereon for backwashing the filter.

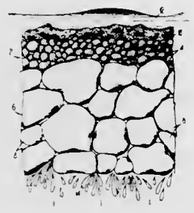
4,783,260
FILTER DEVICE IN A FUEL TANK HAVING ANGULARLY ORIENTED SUCTION PORT, AND INTEGRAL SPACERS
Kazumasa Kurihara, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Aug. 3, 1987, Ser. No. 80,832
Claims priority, application Japan, Aug. 1, 1986, 61-117512[U]
Int. Cl.⁴ B01D *35/02*
U.S. Cl. 210—232 **20 Claims**



1. A filter system for a fuel tank, comprising:
suction pump means for disposition within a fuel tank;
a mounting member having an upper end thereof mounted within a bottom portion of said suction pump means;
a filter, attached to said mounting member, comprising a net defined by means of an upper net piece and a lower net piece which are vertically overlapped with respect to each other, said upper net piece being formed with a through hole for permitting said mounting member to enter therethrough and be disposed transverse to said upper and lower net pieces, the peripheral portions of said net pieces being sealed with respect to each other so that said filter is formed as a flat, bag-shaped structure defining an inner enclosed space which is in fluidic communication with said suction pump means by means of said mounting member; and
a lowermost end portion of said mounting member having suction port means, defined within a first sidewall portion thereof inclined with respect to said lower net piece, such that when the remaining sidewall portions of said mounting member are in contact with said lower net piece, fuel may nevertheless be sucked from said fuel tank through said filter and said mounting member by said suction pump means.

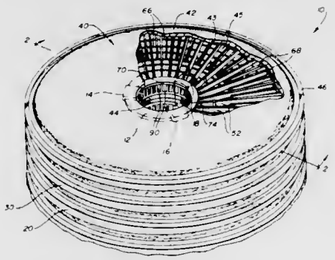
4,783,261
RIGID FILTER PLATE AND METHOD FOR PRODUCING SAME
E. Arnold Lingle, 445 Swamp Rabbit Rd., Leesville, S.C. 29070
Filed Jul. 24, 1987, Ser. No. 77,637
Int. Cl.⁴ B01D *39/20*
U.S. Cl. 210—290 **8 Claims**

1. A rigid sludge or oil separation filter plate, comprising:
(a) an upper layer of silica of $\frac{1}{8}$ to $\frac{1}{4}$ inches in size bonded together by adhesive means, and having a smaller amount by volume of sand having grains of a size of 1/400 inches to 1/12 inches homogenously interspersed therein, and bonded to said silica by said adhesive means; and



(b) a lower layer of stone of a size which is larger than that of said silica, with said stone bonded together by adhesive means.

4,783,262
SEPARATOR FOR CELL TYPE FILTER ELEMENT
Eugene A. Ostreicher, Farmington; Arto Artinyan, Southington, and Robert G. Barnes, Meriden, all of Conn., assignors to Cuno Incorporated, Meriden, Conn.
Filed Mar. 30, 1987, Ser. No. 32,405
Int. Cl.⁴ B01D *29/26*
U.S. Cl. 210—314 **16 Claims**
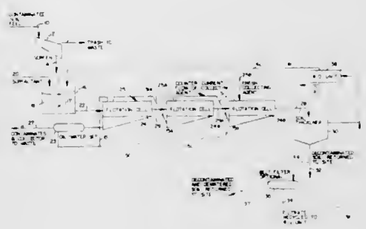


10. A spacer member for a filter cell comprising:
a plurality of spacer ribs extending from a central aperture;
a plurality of arcuate ribs connecting said spacer ribs to form a continuous web;
a plurality of stiffening members in vertically spaced relation connected with said plurality of spacer ribs; and
said plurality of stiffening members coacting with said plurality of spacer ribs to form flow passages between adjacent pairs of said spacer ribs in the central aperture of said spacer member.

4,783,263
DETOXIFICATION PROCESS
Paul B. Trost, 664 Partridge Cir., and Robert S. Richard, 9025 Blue Mountain Dr., both of Golden, Colo. 80403
Filed Jun. 17, 1986, Ser. No. 875,338
Int. Cl.⁴ B01D *11/02*
U.S. Cl. 210—638 **7 Claims**

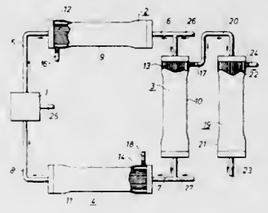
1. A process for cleaning up a solid material contaminated by an undesirable substance, said process comprising:
collecting the contaminated material;
converting the contaminated solid material to a slurry;
adding a first agent to desorb the undesirable substance from the solid material and place it in the liquid phase of the slurry;

exposing the resultant slurry to the action of a froth floatation cell; and



disposing of the resulting concentrate of the undesirable substance.

4,783,264
PROCESS AND AN APPARATUS FOR THE RECOVERY OF A COMPOUND
Ulf T. G. Nylen, and Bo G. Mattiasson, both of Lund, Sweden, assignors to Gambro Lundia AB, Sweden
Continuation of Ser. No. 041,670, Apr. 21, 1987, abandoned, which is a continuation of Ser. No. 606,167, May 2, 1984, abandoned. This application Dec. 3, 1987, Ser. No. 129,935
Claims priority, application Sweden, May 9, 1983, 8302638
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—638 **16 Claims**

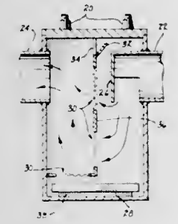


1. A process for separating a peptide-containing compound from one or more contaminants, the process comprising the steps of:
(a) forming a liquid mixture including said peptide-containing compound in solution and also including a first complex of a ligand on an insoluble solid particulate carrier so as to form in said mixture a second complex of said ligand, said peptide-containing compound and said particulate carrier;
(b) contacting said mixture containing said second complex with a first semi-permeable membrane having a top cutoff of about 1×10^6 Daltons or over permeable to said contaminants but impermeable to said particulate carrier so as to separate said contaminants from said mixture, said carrier precluding said second complex, and hence said peptide-containing compound, from passing through the pores of said first semi-permeable membrane;
(c) splitting off said peptide-containing compound from said second complex so as to provide a second liquid mixture including reformed first complex and said peptide-containing compound solution; and
(d) contacting said second liquid mixture with a second semi-permeable membrane permeable to said peptide-containing compound but impermeable to said particulate carrier so as to separate said peptide-containing compound from the reformed first complex, leaving a third liquid mixture containing said reformed first complex.

4,783,265
WATER TREATMENT
Alban Timmons, Beverley, United Kingdom, assignor to Hydro International Limited, Clevedon, United Kingdom
Continuation of Ser. No. 721,914, Apr. 11, 1985, abandoned. This application Oct. 29, 1986, Ser. No. 925,500
Claims priority, application United Kingdom, Apr. 11, 1984, 8409410
Int. Cl.⁴ C02F *1/56*
U.S. Cl. 210—666 **14 Claims**

1. A method of treating water to remove solids including organic particles suspended therein comprising
(i) adding to the water a sufficient amount of a composition to flocculate and separate said solids from the water to yield a substantially clear supernatant, the composition comprising: an electrolyte in an amount sufficient to coagulate suspended solids in the water being treated, said electrolyte being selected from the group consisting of iron (III) sulfate, iron (III) chloride, and aluminum (III) sulfate; calcium sulphate weighting agent in an amount sufficient to provide weight to suspended solids formed by the action of the electrolyte; and a cationic or anionic polyelectrolyte;
(ii) permitting said solids to flocculate and separate from the water supernatant; and
(iii) removing the separated, flocculated solids from the supernatant.

4,783,266
FILTER FOR REMOVING PARTICLES FROM A FLUID, AND METHOD THEREFORE
DuWayne E. Titch, 17022 E. El Pueblo Blvd., Fountain Hills, Ariz. 85268, and Joseph W. Titch, 17402 N. 40th Pl., Phoenix, Ariz. 85032
Filed Aug. 10, 1987, Ser. No. 83,436
Int. Cl.⁴ B01D *35/06*
U.S. Cl. 210—695 **6 Claims**



1. A method for removing particles from a fluid in a fluid circulation system, said method comprising the steps of:
passing said fluid into a housing, said housing comprising a magnetic element, a plurality of filtering screens, and a filter by-pass system;
an inlet baffle in conjunction with a by-pass baffle diverting said fluid such that said fluid circulates across said magnetic element to remove magnetic and charged or ionized particles from said fluid, and through said plurality of filtering screens to remove particles suspended in said fluid until said filtering screens becomes impermeable due to an accumulation of solid particles;
said inlet baffle and said by-pass baffle diverting said fluid to completely circulate across said magnetic element and through said filter by-pass system when said plurality of filtering screens become impermeable; and
circulating said fluid from said plurality of filtering screens and said filter by-pass system out of said housing and back into said fluid circulation system.

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4,783,267

METHOD FOR STABILIZING METAL IONS

Bennett P. Boffardi, Bethel Park, and Susan P. Rey, Coraopolis, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1987, Ser. No. 67,336
Int. Cl.[4] C02F *5/14*
U.S. Cl. 210—699 **14 Claims**

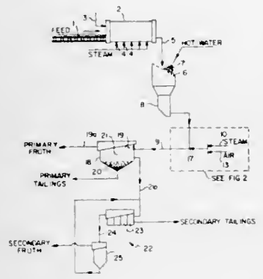
1. A method for solubilizing metal ions in an aqueous system comprising adding to said system an effective amount of 2-hydroxyphosphonoacetic acid or a salt thereof, wherein said metal ion is selected from the group consisting of Fe^{+2}, Fe^{+3}, Zn^{+2}, Al^{+3} and Mn^{+2}.

4,783,268

MICROBUBBLE FLOTATION PROCESS FOR THE SEPARATION OF BITUMEN FROM AN OIL SANDS SLURRY

Antony H. S. Leung, Sherwood Park, Canada, assignor to Alberta Energy Company, Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited, all of Calgary; Gulf Canada Resources Limited, Toronto; Her Majesty the Queen in right of the Province of Alberta, as represented by the Minister of Energy and Natural Resources, Edmonton; HBOG-Oil Sands Limited Partnership, Calgary; Pan-Canadian Petroleum Limited, Calgary and Petro-Canada Inc., Calgary, all of, Canada

Filed Dec. 28, 1987, Ser. No. 138,069
Int. Cl.[4] C10G *1/04;* B03D *1/00*
U.S. Cl. 210—703 **4 Claims**



1. In the hot water process for extracting bitumen from mined oil sand in an extraction circuit said process comprising conditioning the oil sand by admixing said oil sand with hot water and steam and an alkaline process aid and agitating the resultant slurry, diluting the so conditioned slurry with additional hot water, passing the diluted aqueous slurry to a primary separation vessel and retaining the diluted aqueous slurry in the primary separation vessel under quiescent conditions to produce an underflow stream of tailings, an overflow stream of primary froth and a suspension of middlings therebetween, the improvement which comprises:

injecting microbubbles of air into said diluted aqueous slurry after conditioning and prior to the introduction thereof into the primary separation vessel to thereby increase the recovery of primary froth,

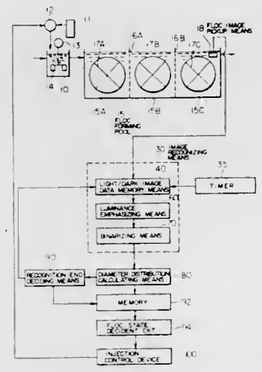
said microbubbles of air being generated by admixing a steam stream and an air stream and injecting said steam and air mixture into the diluted aqueous slurry stream whereby as the steam component condenses, residual microbubbles of air are formed.

4,783,269

INJECTION CONTROL SYSTEM OF FLOCCULATING AGENT

Kenji Baba; Shoji Watanabe; Naoki Hara, all of Hitachi; Mikio Yoda, Ibaraki; Shunji Mori, Hitachi; Shunsuke Nogita, Hitachi; Yuzi Yamasawa, Hitachiota, and Toshimitu Akiyama, Fukuoka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1987, Ser. No. 37,157
Claims priority, application Japan, Apr. 10, 1986, 61-82952; Apr. 10, 1986, 61-82953
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—709 **18 Claims**



1. An injection control system for a flocculating agent comprising:

a flocculating pool into which an inflow liquid flocculating agent is injected and which forms flocs of suspended matters in said liquid;

flocculating agent injecting means for injecting the flocculating agent into said flocculating pool;

floc image pickup means for photographing flocs in the flocculating pool and for producing electric signals that are related to luminance of the flocs to establish an image signal composed of pixels;

image recognizing means for binarizing the electrical siganls obtained from said floc image pickup means corresponding to said pixels which have a brightness value above a predetermined luminance level to produce a manifestation of the shape of flocs exceedmg a predetermined size;

means responsive to said binarized signals for calculating a characteristic amount of a diameter distribution of the flocs on the basis of the floc shape manifestations; and

injection amount control means for controlling an amount of flocculating agent which is injected from said flocculating agent injecting means responsive to said calculated characteristic amount.

4,783,270

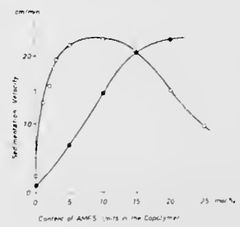
COAGULANT FOR MINUTE MINERAL PARTICLES IN SUSPENSION AND METHOD FOR COAGULATING THEREOF

Yoshikazu Murao, Machida; Shigeru Sawayama, Yokohama, and Kenji Mori, Komae, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 833,131, Feb. 24, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 115,160
Claims priority, application Japan, Feb. 27, 1985, 60-38593
Int. Cl.[4] C09K *3/00;* C02F *1/56*
U.S. Cl. 210—734 **5 Claims**

1. A method of coagulation of the minute mineral particles in suspension, which comprises adding a coagulant comprising a

copolymer of 0.5 to 10 mol % of 2-acrylamido-2-methylpropanesulfonic acid or a salt thereof, 40 to 99.5 mol % of N-hydroxymethylacrylamide and 20.3 to 59.5 mol % of acrylamide and showing a reduced viscosity of 10 to 30 dl/g in an



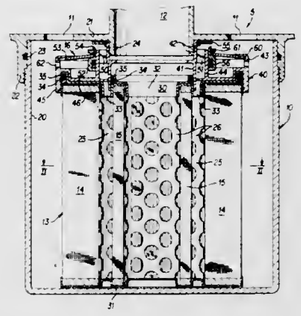
aqueous 1N solution of sodium chloride at a temperature of 25° C. and a concentration of 0.1 g/dl therein, into a netural waste water containing the minute mineral particles in a suspended state therein.

4,783,271

TEMPERATURE RESPONSIVE BYPASS FILTER ASSEMBLY

Bernard F. Silverwater, Plainview, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,308
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—742 **15 Claims**



5. A filter assembly comprising:

a housing having an inlet for admitting a fluid, an outlet for exhausting the fluid, and a fluid flow path therebetween;

upstream and downstream filtering means positioned in the housing in the fluid flow path, the upstream filtering means being spaced from the downstream filtering means and each including a porous filter medium, the mean pore diameter of the porous filter medium of the upstream filtering means being smaller than the mean pore diameter of the porous filter medium of the downstream filtering means; and

temperature-sensing means including temperature responsive valve for directing at least a portion of the fluid around the upstream filtering means and through the downstream filtering means when the temperature of the fluid is less than a predetermined temperature.

14. A process for filtering a fluid comprising:

sensing the temperature of the fluid;

passing the fluid through a first porous filter medium and then through a second porous filter medium when the temperature of the fluid is greater than a predetermined temperature, the mean pore diameter of the second filter medium being greater than the mean pore diameter of the first filter medium; and

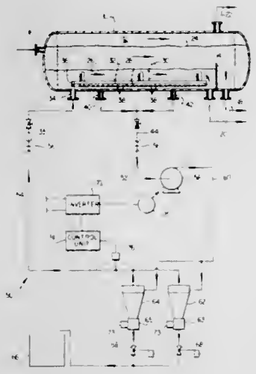
directing at least a portion of the fluid to bypass the first porous filter medium and then through the second porous filter medium when the temperature of the fluid is less than the predetermined temperature.

4,783,272

REMOVING SOLIDS FROM PROCESS SEPARATOR VESSELS

John C. Patterson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 28, 1987, Ser. No. 90,715
Int. Cl.[4] B01D *21/00, 17/038*
U.S. Cl. 210—787 **10 Claims**



1. A method for evacuating accumulated solids comprising:

providing a process separator vessel of a type which is adapted to receive a flowstream of liquid with entrained solids for separating oil from water and other liquids more dense than said oil and without substantially changing the flow rate of liquid through said vessel and wherein said vessel includes means for controlling the level of liquid in said vessel, means for accumulating said solids along a bottom portion of said vessel and in a region occupied by said more dense liquid and means for circulating liquid through said region to entrain said solids for evacuation from said vessel, a vessel inlet conduit for conducting liquid to said means for circulating and a vessel outlet conduit for discharging a mixture of liquid from said region with solids entrained therein,

providing solids separator means including motor driven pump means, first conduit means for connection to said vessel outlet conduit, a separator unit, a pump discharge conduit connected to said separator unit for conducting said mixture to said separator unit for separating solids from said mixture and second conduit means connected to said separator unit for returning solids free liquid to said vessel inlet conduit;

connecting said first and second conduit means to said vessel outlet conduit and said vessel inlet conduit, respectively;

operating said pump means to circulate liquid from said region through said separator means and back to said means for circulating wherein the liquid in said region is utilized to entrain solids accumulated along said bottom portion of said vessel, remove said solids from said vessel and return liquid substantially free of solids to said vessel while substantially maintaining constant liquid level in said vessel during evacuation of said solids.

7. In a system for separating solids from a liquid flowstream the combination comprising:

a process separator vessel including a flowstream inlet con-

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duit, a liquid discharge conduit and means for controlling the level of liquid in said separator vessel, said separator vessel including a bottom portion including means disposed along said bottom portion for circulating liquid to entrain solids accumulated in said vessel along said bottom portion, an outlet conduit for conducting a slurry of liquid and entrained solids from said separator vessel and an inlet conduit for conducting substantially solids free liquid to said means for circulating;

a pump including a pump inlet conduit and means for connecting said pump inlet conduit to said outlet conduit for conducting said slurry from said separator vessel;

motor means for driving said pump;

a separator unit connected to said pump for receiving a flowstream of said slurry from said separator vessel and for separating a substantial portion of the solids in said slurry from the liquid of said slurry;

a liquid return conduit connected to said separator unit and means for connecting said liquid return conduit to said inlet conduit for conducting substantially solids free liquid from said separator unit to said means for circulating; and

means for controlling the flow of liquid through said pump and said separator unit for evacuating solids from said separator vessel and for maintaining a substantially constant level of liquid in said separator vessel during the evacuation of solids from said separator vessel.

4,783,273

METHOD AND APPARATUS FOR SUPPLYING CONCENTRATE FOR USE IN MEDICAL TREATMENTS

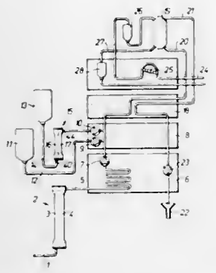
Stefan L. Knutsson, Bjarred, Sweden, and Stanley Shaldon, Montpellier, France, assignors to Gambro AB, Sweden

Filed Dec. 17, 1987, Ser. No. 133,995

Claims priority, application Sweden, Jan. 29, 1987, 8700344

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—798 **25 Claims**



1. Apparatus for the supply of concentrate to be used for medical treatment purposes comprising means for enabling substantially easy sterilization and/or disinfection of low percolation filters when and/or where said concentrate favors bacterial growth, including, a concentrate filter, said concentrate filter including an inlet side and an outlet side separated by membrane means, inlet conduit means for supplying said concentrate to said inlet side of said concentrate filter during normal use of said concentrate filter and for supplying a cleaning fluid to said inlet side of said concentrate filter during cleaning of said concentrate filter, outlet conduit means for withdrawing said filtered concentrate from said outlet side of said concentrate filter during normal use of said concentrate filter and for withdrawing a first portion of said cleaning fluid from said outlet said of said concentrate filter during cleaning of said concentrate filter, and cleaning fluid withdrawal means connected to said inlet side of said concentrate filter, said cleaning fluid withdrawal means including valve means selected to enable said cleaning fluid withdrawal means to be closed during normal use of said concentrate filter and opened in order to flush a second portion of cleaning fluid through said concentrate filter during cleaning of said concentrate filter.

4,783,274

HYDRAULIC FLUIDS

Kari V. J. Jokinen, Naantali; Heikki K. Kerkkonen, Raisio; Eero A. Leppämäki, Helsinki, and Eino I. Piirilä , Riihimäaki, all of Finland, assignors to Oy Kasviöljy-Växtolje Ab, Raisio, Finland

Continuation-in-part of Ser. No. 936,969, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 842,770, Mar. 24, 1986, abandoned, which is a continuation of Ser. No. 579,136, Feb. 10, 1984, abandoned. This application Jan. 28, 1987, Ser. No. 7,627

Claims priority, application Finland, Feb. 11, 1983, 830473

Int. Cl.[4] C10M *141/02*

U.S. Cl. 252—32.7 E **11 Claims**

1. A basic hydraulic fluid composition consisting of:

85 to 99 percent by weight of at least one natural triglyceride which is an ester of a straight-chain C_{10} to C_{22} fatty acid and glycerol, which triglyceride has an iodine number of at least 50 and not more than 128,

the balance being selected from at least two of the following groups:

Group 1: Hindered phenolics, aromatic amines, selected from the group consisting of 2,6-di-tert-butyl-4-methyl phenol; 2'2-methylenebis(4-methyl-6-tert-butylphenol); N,N'di-sec-butyl-p-phenylene-diamine; alkylated diphenyl amine; alkylated phenyl-alfa-napthylamine

Group 2: Metal salts of dithioacids, phosphites, sulfides, selected from the group consisting of zinc dialkyldithiophosphates; tris(noylphenyl)phosphite; dilauryl thiodipropionate

Group 3: Amides, non aromatic amines, hydrazines, triazols, selected from the group consisting of N,N'-diethyl-N,N'-diphenyloxamide; N,N'-disalicylidene-1,2-propenylenediamine; N,N'-bis(beta-3,5-ditertbutyl-4-hydroxyphenyl-propiono)hydrazide.

4,783,275

MODIFIED SUCCINIMIDES (IV)

Robert H. Wollenberg, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 856,618, Apr. 25, 1986, Pat. No. 4,668,246, which is a division of Ser. No. 722,882, Apr. 12, 1985, Pat. No. 4,617,138. This application May 26, 1987, Ser. No. 54,903

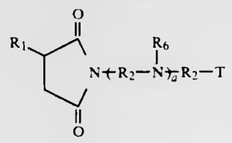
Int. Cl.[4] C10M *105/78*

U.S. Cl. 252—49.7 **18 Claims**

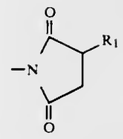
7. A product produced by the process which comprises contacting at a temperature sufficient to cause reaction:

(a) a compound selected from the group consisting of boric acid, boron oxides, boron halides and esters of boric acid; and

(b) a compound of the formula:



wherein R_1 is alkenyl or alkyl of from 10 to 300 carbon atoms; R_2 is alkylene of 2 to 10 carbon atoms; R_6 is hydrogen, lower alkyl of from 1 to 6 carbon atoms, and hydrocarbylcarbonylalkylene wherein said hydrocarbyl contains from 1 to 30 carbon atoms; said alkylene is 3- or 4- carbon alkylene group or a 3- or 4-carbonalkylene group substituted with from 1 to 3 alkyl groups of from 1 to 2 carbon atoms each; "a" is an integer of from 1 to 6; and t is $—NH_6$ and



wherein R_6 is as defined above and R_1 is as defined above and R_1 is alkenyl or alkyl of from 10 to 300 carbon atoms, with the proviso that the compound contains at least 1 R_6 which is hydrocarbylcarbonylalkylene; wherein from about 0.1 equivalents to about 10 equivalents of (a) are employed per equivalent of (b).

4,783,276

REFRIGERANT AND A MACHINE HAVING A REFRIGERATING CIRCUIT WITH REFRIGERANT

Leonardus J. M. Bohnenn, Vaassen, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Dec. 30, 1987, Ser. No. 139,454

Claims priority, application Netherlands, Feb. 19, 1987, 8700408

Int. Cl.[4] C09K *5/04*

U.S. Cl. 252—67 **4 Claims**

1. A refrigerant containing dichlorodifluoromethane and dimethyl ether, characterized in that the amount of dimethyl ether in the refrigerant is 12 to 35 percent by weight.

4,783,277

ABSORPTION-TYPE REFRIGERATOR

Yasuo Koseki, Hitachiota; Akira Yamada; Hideaki Kurokawa, both of Hitachi; Katsuya Ebara, Mito, and Sankichi Takahashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 87,023

Int. Cl.[4] C09K *5/04*

U.S. Cl. 252—69 **5 Claims**

3. A closed, cyclic absorption-type refrigerator which comprises an absorbent in an aqueous solution comprising at least one of LiBr and $BaBr_2$ taking a dihydrate form at room temperature and at least one of $MgCl_2$, $CaCl_2$, $NiCl_2$, $CoCl_2$, $MgBr_2$, $CaBr_2$, $NiBr_2$ and $CoBr_2$ taking a hexahydrate form at room temperature in a mixing ratio by mole of dihydrate to the total of the dihydrate and the hexahydrate of 0.55 to 0.9.

4,783,278

CONCENTRATED LIQUID COMPOSITIONS CONTAINING A PEROXYGEN COMPOUND

William R. Sanderson, Great Sankey Warrington, and John D. Wharne, Halton Runcorn, both of England, assignors to Interox Chemicals Limited, London, England

Filed Feb. 4, 1987, Ser. No. 10,701

Claims priority, application United Kingdom, Feb. 18, 1986, 8603961

Int. Cl.[4] C11D *1/70, 3/39, 3/395*

U.S. Cl. 252—95 **18 Claims**

1. Storable concentrated liquid washing, bleaching or disinfectant compositions in which particulate potassium-4-sulphoperoxybenzoic acid (KSPB) is dispersed in an organic liquid carrier phase which comprises a nonionic surfactant, said organic liquid carrier phase comprising at least 50% by weight of the composition based on the weight of the composition.

4,783,279

PLASTIC MIXTURE WITH ELECTROMAGNETIC SHIELDING CHARACTERISTICS

Hans J. Petermann; Klaus Wenderoth, both of Buxtehude, and Wolfram H. O. Krieger, Hamburg, all of Fed. Rep. of Germany, assignors to Lehmann & Voss & Co., Hamburg, Fed. Rep. of Germany

Filed Aug. 4, 1987, Ser. No. 81,232

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626460

Int. Cl.[4] H01B *1/06;* **C09D** *5/32*

U.S. Cl. 252—511 **4 Claims**

1. A plastic composition having electromagnetic shielding properties comprising: a quantity of ferroelectric as a first material selected from the group consisting of semicarbazide-hydrochloride, 3,4-dihydroxy-3-cyclobutene-1,2-dione, triglycine sulphate, barium-strontium titanate and antimony iodide sulphide and a quantity of a second material of electrically conductive and ferromagnetic fillers selected from the group consisting of nickel, iron, cobalt, carbon black and carbon fibers, said first material has a Curie point or a phase transition range from the ferroelectric state into the paraelectric phase covering the Curie point which is in the range of the temperature of use of the said shielding of the electromagnetic shielding material of 40° to +98° C. said first material quantity is between 1 to 20 vol. percent of the total plastic composition and the said second material quantity is between 5 to 15 vol. percent, the remainder being a polymeric material.

4,783,280

LIQUID CRYSTAL MIXTURE

Martin Petrzilka, Kaiseraugst; Martin Schadt, Seltisberg, and Alois Villiger, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 606,329, May 2, 1984, abandoned, which is a division of Ser. No. 387,108, Jun. 10, 1982, Pat. No. 4,460,770. This application May 20, 1987, Ser. No. 53,601

Claims priority, application Switzerland, Jun. 18, 1981, 4038/81; Feb. 26, 1982, 1883/82

The portion of the term of this patent subsequent to Jun. 2, 2001, has been disclaimed.

Int. Cl.[4] G02F *1/13;* **C09K** *19/34, 19/30, 19/12*

U.S. Cl. 252—299.61 **13 Claims**

3. A liquid crystalline mixture comprising three components A, B and C, each of which have one or more compounds, component A amounting to at least about 30 wt. % of the total mixture, and having a viscosity of at most about 40 cp, a clearing point of at least about 40° C. and a dielectric anisotropy between about −2 and +1 both above and below the cross-over frequency of the total mixture; component B being about 3-40 wt. % of the total mixture, and having a dielectric anisotropy below about −2 both above and below the cross-over frequency of the total mixture; and a component C being about 5-40 wt. % of the total mixture, and having a dielectric anisotropy above about +10 at a frequency below the cross-over frequency and a negative dielectric anisotropy above the cross-over frequency and, a clearing point of at least about 100° C. and said resulting liquid crystalline mixture having a cross-over frequency of at most about 15 kHz at 20° C.

4,783,281

DETERGENT POWDER AND PROCESS FOR ITS PREPARATION

David P. Bishop; Peter J. Russell, and Peter C. Knight, all of Merseyside, United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 8, 1986, Ser. No. 816,930

Claims priority, application United Kingdom, Jan. 28, 1985, 8502032

Int. Cl.[4] C11D *7/12, 7/14*

U.S. Cl. 252—135 **10 Claims**

1. A process for the preparation of a spray-dried detergent

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powder, which comprises forming an aqueous crutcher slurry and spray-drying it to a powder comprising:

(a) from 15 to 40% by weight of anionicsurfactant;

(b) from 20 to 70% by weight of sodium carbonate;

(c) from 5 to 20% by weight of sodium silicate;

(d) from 1 to 7.5% by weight of sodium bicarbonate;

the weight ratio of sodium bicarbonate to sodium silicate being within the range of from 0.25:1 to 0.40:1, all percentages being based on the final product.

4,783,282

DETERGENTS CONTAINING POLYETHER CARBOXYLIC ACID DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION

Jacob K. Smid, Doetinchem, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 15, 1986, Ser. No. 907,356

Claims priority, application Netherlands, Sep. 20, 1985, 8502587

Int. Cl.⁴ C11D *1/10, 1/83*

U.S. Cl. 252—546 **7 Claims**

1. Process for the preparation of a composition containing one or more compounds having the formula $RCONH(C_2H_4O)_nCH_2COOH$, salts glycerol, ethoxylated glycerol, carboxymethylated glycerol, or carboxymethyl ethoxylated glycerol and mixture thereof, where R represents a linear or branched aliphatic hydrocarbon group with 5–21 carbon atoms and n is a number from 1–20, comprising the following steps:

(a) aminolysing oil or fat starting materials in the presence of an alkaline (earth) metal alkylate resulting in a mixture including amides of fatty acids having the formula RCOOH, where R represents a linear or branched aliphatic hydrocarbon group with 5–21 carbon atoms, and glycerol;

(b) ethoxylating the product resulting from step (a);

(c) carboxymethylating the product resulting from step (b); and

(d) processing the reaction mixture resulting from step (c) into a product which contains aminolysed, ethoxylated and carboxymethylated compounds resulting from steps (a), (b) and (c) and/or salts thereof.

4,783,283

CLEANING COMPOSITIONS

Barry Stoddart, Gateshead, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 23, 1986, Ser. No. 866,851

Claims priority, application United Kingdom, May 28, 1985, 8513293

Int. Cl.⁴ C11D *1/22, 1/37*

U.S. Cl. 252—547 **15 Claims**

1. A thickened aqueous cleaning composition consisting essentially of

(a) from about 0.1% to about 5% by weight of a tertiary amine oxide of formula $R_1R_2R_3N\rightarrow O$ wherein R_1 is a C_{12}–C_{15} linear or branched alkyl group and R_2 and R_3 are independently selected from C_1–C_4 alkyl groups and C_2–C_4 hydroxyl alkyl groups;

(b) from about 0.05% to about 0.5% by weight of an alkali metal or alkaline earth metal mono or polyalkylated benzene or naphthalene sulfonate in which the alkyl groups contain from 1 to 4 carbon atoms;

(c) from 0% to about 25% by weight of ionisable non surface active organic, or inorganic compounds; the weight ratio of a:b lying in the range from about 2.5:1 to about 10:1, said composition exhibiting a zero shear viscosity of at least about 500 mPa.sec at 10° C., a Brookfield viscosity of less than about 500 mPa sec using a No. 3 spindle at 20° C., and a modal relaxation time of about 0.5 seconds maximum at 10° C.

4,783,284

PROCESS FOR THE PREPARATION OF ALKYL-5,6,7,8-TETRAHYDROANTHRAHYDROQUINONES

Dietolf Simon, Bad Hönningen, Fed. Rep. of Germany, assignor to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Sep. 16, 1986, Ser. No. 907,898

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3534014

Int. Cl.⁴ C07C *50/18*

U.S. Cl. 260—369 **16 Claims**

1. A process for the preparation of an alkyl-5,6,7,8-tetrahydroanthrahydroquinone, comprising hydrogenating an alkylanthraquinone with a catalyst which consists of an organic polymer to which a metal of the noble metal or platinum group is bound coordinately or covalently and wherein said polymer-bound metal is present in a dissolved form.

4,783,285

PROCESS FOR THE NUCLEOPHILIC SUBSTITUTION OF UNACTIVATED AROMATIC AND HETEROAROMATIC SUBSTRATES

Alden D. Josey, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 773,633, Sep. 9, 1985, Pat. No. 4,683,091. This application Feb. 3, 1987, Ser. No. 10,430

Int. Cl.⁴ C07C *143/00*

U.S. Cl. 260—543 R **20 Claims**

1. A process for achieving nuleophilic substitution upon an unactivated optionally substituted aromatic or heteroaromatic substrate selected from benzene, naphthalene pyridine, pyrimidine, thiophene furan, quinoline and a 5-membered aromatic heterocycle containing two nitrogens, said substrate also bearing a leaving group selected from halogen, nitro, sulfonates, phosphonates and phosphates comprising catalyzing with 1–50% by weight based on the weight of the mercaptide of a cyclic or acyclic polyether catalyst the substitution of said leaving group by an alkyl, aryl or aralkyl mercaptide in the presence of a solvent compatible with the mercaptide at a temperature of 100°–200° C.

4,783,286

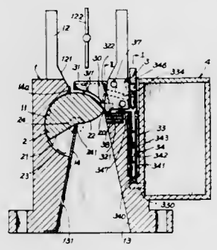
ROTOR-ACTUATING CARBURETOR WITH VARIABLE VENTURI TUBE

Tien-Chu Lee, P.O. Box 10160, Taipei, Taiwan

Filed Dec. 23, 1987, Ser. No. 137,363

Int. Cl.⁴ F02M *9/08*

U.S. Cl. 261—23.2 **8 Claims**



1. A carburetor with variable venturi tube comprising:

an induction casing including a cylindrical rotor chamber longitudinally formed on a central portion of said casing, an air inlet formed on an upper portion of said casing having a contraction portion formed on an lower portion of said inlet duct communicated with said cylindrical rotor chamber, an air outlet duct formed on a lower portion of said casing having an expansion portion formed on an upper portion of said outlet duct communicated with an engine cylinder, and a pair of rotor holes formed at two opposite ends of said rotor chamber of said casing;

a throttling rotor including a semi-circular cylinder portion longitudinally formed on a central portion of said rotor, a pair of side wheels formed on two opposite ends of said semi-circular cylinder portion rotatably mounted in said pair of rotor holes of said casing, and a driving shaft formed on two ends of said rotor operatively driven by a wire connected to an accelerator pedal;

a fuel injecting means mounted on a right portion of said casing having an air-drafting surface formed as a generally vertical plane and facing oppositely to said semi-circular cylinder portion of said rotor, a primary nozzle protruding leftwardly from the air-drafting surface to circumferentially dispose above said semi-circular cylinder portion, a secondary nozzle having a V-shaped slit longitudinally formed on the air-drafting surface of said fuel injecting means, a primary mixer fluidically communicated between the primary nozzle and a flat chamber mounted on a right side of said casing, a secondary mixer fluidically communicated with the secndary nozzle and the float chamber, said semi-circular cylinder portion of said rotor operatively defining a throat section of a carburetor venturi tube with said primary nozzle and said secondary nozzle when rotated along a longitudinal axis of said rotor; and

said float chamber filled with fuel oil secured on a right side of said casing, whereby upon a draft of an air stream flowing through said inlet duct, the throat section defined between said rotor and said nozzles to said outlet duct, a suction force is developed at the throat section to adjustably suck fuel oil from said float chamber through said secondary nozzle on through both said primary and secondary nozzles, depending upon an engine running speed.

4,783,287

METHOD FOR THE CONTINUOUS PRODUCTION OF FOAM MATERIAL

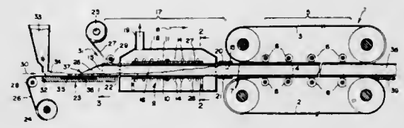
Walter Eichberger, Perchtoldsdorf; William Valenta, and Heinz Stampfer, both of Maria Enzersdorf, all of Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Continuation of Ser. No. 673,743, Oct. 9, 1984, abandoned. This application Dec. 8, 1986, Ser. No. 939,046

Claims priority, application Austria, Nov. 2, 1983, 470/83

Int. Cl.⁴ B29C *65/04, 39/12;* **C08G** *8/10;* **C08J** *9/06*

U.S. Cl. 264—26 **8 Claims**



1. A method for the continuous production of foam materials comprising feeding a layer of starting material containing a novolac, an aldehyde donor, a foaming agent and a catalyst within a sheath of flat material having spaced upper and lower walls, then heating the layer with dielectric heat by conveying said layer within said sheath through an electromagnetic high frequency condenser field produced between plate-shaped electrodes to effect a gradual rising wedge-like foaming of the layer as it passes between the electrodes and then passing the foamed layer within said sheath through a pressure zone defined by pressure bands of a continuous press without an electromagnetic high frequency field, wherein any additional heat which is required for the foaming and to prevent or delay surface cooling of the foaming and foamed layer, is supplied by heating of at least one of the said electrodes and at least one of the pressure surfaces of the press.

4,783,288

METHOD FOR THE PRODUCTION OF SHAPED SYNTHETIC MEMBERS

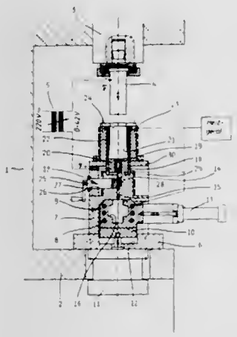
Karl Göhring, Leonorenstr. 11, 7000 Stuttgart 70, and Hermann Kress, Schubertweg 1, 7024 Filderstadt 1, both of Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 34,534

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1986, 3611687

Int. Cl.⁴ B29C *43/18, 67/04, 45/00, 43/02*

U.S. Cl. 264—27 **12 Claims**



1. A method for the production of a shaped synthetic member which comprises

(a) coating synthetic granulated particles with a mixture of a conducting powder and a synthetic powder,

(b) passing an electric current through the coating of said coated granulated particles in a first zone whereby the surfaces of the granulated particles are plastified.

(c) sintering the coated granulated particles to a preform in said first zone under the action of pressure; and

(d) extruding the preform from said first zone into a moulding cavity to thus form a shaped synthetic member.

4,783,289

PROCESS FOR MOLDING SILICONE RUBBER COMPOSITIONS

Koji Shimizu, and Mitsuo Hamada, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,520

Claims priority, application Japan, Apr. 1, 1986, 61-74560; May 26, 1986, 61-120766; Aug. 28, 1986, 61-201951; Aug. 29, 1986, 61-204066

Int. Cl.⁴ B29C *47/78*

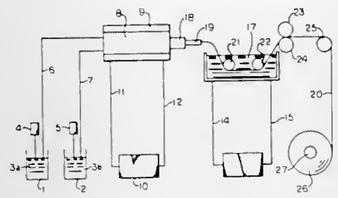
U.S. Cl. 264—28 **10 Claims**

1. A method for fabricating an extruded shaped article from a curable liquid silicone rubber composition, said method comprising the following sequence of steps:

1. combining and blending to homogeniety the ingredients of

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said composition at a temperature of from −60 to +5 degrees C.,



II. extruding the composition into a water bath maintained at a temperature of at least 25 degrees C., to fabricate and cure said article and

III. removing the cured shaped article from the water bath.

4,783,290

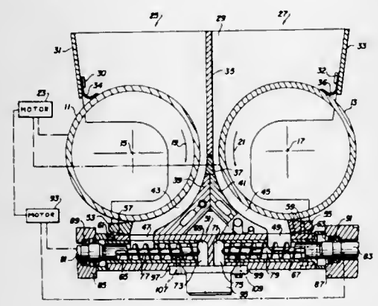
METHOD OF CHANGING DIE HEAD FOR CONVERTING A CO-EXTRUSION APPARATUS

William J. Simelunas, Glen Rock, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 738,035, May 24, 1985, abandoned. This application Feb. 18, 1986, Ser. No. 830,638

Int. Cl.⁴ B29C *47/12*

U.S. Cl. 264—39 **8 Claims**



1. A method for using a co-extrusion apparatus including a first hopper for containing a supply of a first material and a second hopper for containing a supply of a second material, said co-extrusion apparatus further including first means for feeding said first material from said first hopper to a first outlet and second means for feeding said second material from said second hopper to a second outlet proximate to said first outlet, said method comprising the steps of:

providing a co-extrusion die having an inner nozzle and an outer nozzle surrounding said inner nozzle;

detachably fastening said co-extrusion die to the co-extrusion apparatus so that said inner nozzle communicates with the first outlet and said outer nozzle communicates with the second outlet;

operating said co-extrusion apparatus to produce a rope-like co-extrudate having a core formed of the first material and a tube-like outer layer formed of the second material and surrounding said core;

removing said co-extrusion die from said co-extrusion apparatus;

providing a simple extrusion die with a single nozzle;

removably attaching said simple extrusion die to said co-extrusion apparatus so that said single nozzle communicates with one of said first and said second outlet and so that said simple extrusion die blocks the other of said first and said second outlet to prevent the passage of the respective material therethrough;

operating said co-extrusion apparatus to produce a rope-like simple extrudate formed of a single material contained in the hopper associated with said one of said first and said second outlet;

cleaning the hopper and the means for feeding associated with said other of said first and second outlet, said step of cleaning being performed at least in part during execution of said step of operating said co-extrusion apparatus to produce a rope-like simple extrudate.

4,783,291

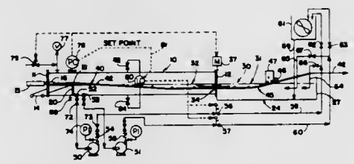
METHOD AND APPARATUS FOR FOAM EXTRUSION INTO A VACUUM CHAMBER HAVING A LIQUID BAFFLE WITH CONTROL OF THE LIQUID LEVEL

Rafael Pagan, Seven Hills, Ohio, assignor to U.C. Industries, Inc., Parsippany, N.J.

Filed Aug. 3, 1987, Ser. No. 80,680

Int. Cl.⁴ B29C *67/22, 47/92*

U.S. Cl. 264—40.4 **24 Claims**



1. A method of preparing foam plastic comprising the steps of extruding a foamable plastic melt into a vacuum chamber, passing the foaming extrudate into a body of liquid which is partially within and partially without such chamber to exit the chamber through such body of liquid, and controlling the level of that portion of the body of liquid within such chamber by extracting liquid from that portion of the body of liquid within such chamber.

4,783,292

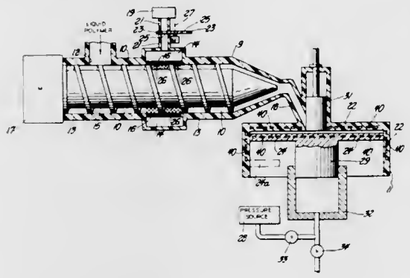
METHOD OF INJECTION MOLDING A FOAMED PLASTIC ARTICLE USING A RELATIVELY LIGHT GAS AS A BLOWING AGENT

Roy K. Rogers, 26575 Barns, Roseville, Mich. 48066

Filed Jun. 15, 1987, Ser. No. 61,982

Int. Cl.⁴ C08J *9/30;* **B29C** *45/56, 45/78, 45/80*

U.S. Cl. 264—40.6 **12 Claims**



1. A method of forming a foamed plastic article, comprising the steps of:

(a) injecting gaseous bubbles at a pressure between 700 psi and 1200 psi into a matrix of heated liquid plastic;

(b) providing a mold having a variable volume cavity and an expansion wall bounding one side of the the cavity, the wall movable to a first position wherein the cavity has a relatively lower volume, the mold having a compressing means to urge the wall toward the first, lower-volume position;

(c) introducing the heated liquid plastic with entrained gas bubbles into the variable-volume mold cavity without expanding the bubbles;

(d) permitting the gaseous bubbles to expand so as to force the moveable wall at a gradual, selected rate to a second, relatively higher volume position in the mold cavity;

(e) controlling the rate of bubble expansion by gradually reducing the force which the compression means applies to the moveable wall of the mold;

(f) controlling the temperature of the mold cavity surfaces to maintain the plastic material in a viscous state during at least a major part of the bubble expansion process.

4,783,293

PROCESS FOR MANUFACTURING AN INNER CONICAL RECESS FOR RECEIVING AN AMPUTATED EXTREMITY

Ulf Wellershaus, and Otto Fruzinsky, both of Duderstadt, Fed. Rep. of Germany, assignors to Otto Bock Orthopaedische Industrie Besitz-und Verwaltungs-Kommanditgesellschaft, Duderstadt, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 867,955

Claims priority, application European Pat. Off., May 29, 1985, 85106563.1

Int. Cl.⁴ B29C *61/02*

U.S. Cl. 264—40.6 **4 Claims**



1. A process for manufacturing an inner conical recess fitting which is attachable to a prosthesis for receiving a stump of an amputated extremity of an amputee, comprising the steps of:

providing a generally conically-shaped hollow molded part comprised of a polymer material which is selectively shrinkable in response to application of an external effect, said molded part being open at its base and being larger in size than the inner conical recess fitting to be produced;

placing the molded part directly on the stump of an amputated extremity;

applying to selected local portions of the molded part an external effect suitable to produce shrinkage of the plastic material, said effect being applied in an amount sufficient to produce a degree of shrinkage so that the molded part conforms with the shape of the stump to produce the inner conical recess fitting;

and obtaining a desired fit of the fitting on the stump through indication by the amputee when a desired fit is obtained.

4,783,294

PROCESS FOR PREPARING FOAMED ARTICLE OF VINYL CHLORIDE RESIN CONTAINING A LARGE AMOUNT OF INORGANIC PARTICLES

Yoshihiro Kimura, Osaka; Hisao Shimazu, Settsu, and Tadayuki Saito, Osaka, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 13, 1985, Ser. No. 744,174

Claims priority, application Japan, Jun. 14, 1984, 59-122715; Jun. 4, 1985, 60-120791

Int. Cl.⁴ C08J *9/04;* **B29C** *67/22*

U.S. Cl. 264—45.3 **7 Claims**



1. A process for preparing a foamed article of a vinyl chloride resin containing a large amount of particles of an inorganic material, which comprises the steps of,

(1) preparing a foamable composition by kneading a mixture comprising a vinyl chloride resin, particles of an inorganic material, a blowing agent and a solvent at normal temperature under normal pressure,

(2) filling a closable mold having an opening with the foamable composition,

(3) closing the mold with a cover,

(4) heating the foamable composition and the mold while the cover is mechanically pressed to melt the vinyl chloride resin and to decompose the blowing agent,

(5) cooling the mold to maintain the temperature of the foamable composition within the range of 50° C. to 170° C., and

(6) opening the mold at a temperature of not less than a softening temperature of the vinyl chloride by reducing the mechanical pressure to expand the foamable composition.

4,783,295

PROCESS FOR PREPARING MOLDED MICROCELLULAR ELASTOMERS

James D. Kearns, Charleston, W. Va., and Ronald J. Stapleton, Ypsilanti, Mich., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 17, 1985, Ser. No. 809,728

Int. Cl.⁴ C08J *9/30;* **C08G** *18/14;* **B29B** *7/04;* **B29C** *45/00*

U.S. Cl. 264—50 **15 Claims**

1. A process for producing a molded microcellular elastomer with a reduced number of large voids from at least two liquid reactants and a gas which process consists essentially of:

(a) introducing a gas into at least one of the liquid reactants to form a gas-liquid reactant admixture;

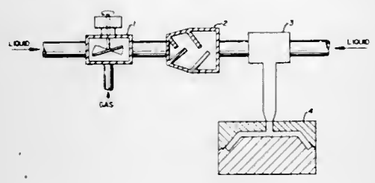
(b) passing the admixture through a static mixer at superatmospheric pressure;

(c) within about one second after step (b) mixing the admixture with an additional liquid reactant or reactants at about said superatmospheric pressure to form a reaction mixture;

(d) within about one second after step (c) introducing the

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reaction mixture into a mold in which the pressure is substantially below the pressure in (c); and



(e) curing the reaction mixture in the mold to produce a molded microcellular elastomer with a reduced number of large voids.

4,783,296

PROCESS FOR PRODUCING ARTICLES MADE FROM POLYURETHANE FOAM AND ADDITIVE FOR PERFORMING THIS PROCESS

Wolfgang Fischer, Morlenbach; Thomas Hattich; William Krug, both of Heidelberg, and Gerhard Schuster, Nuremberg, all of Fed. Rep. of Germany, assignors to Teroson GmbH, Heidelberg, Fed. Rep. of Germany

Filed Nov. 6, 1986, Ser. No. 927,896

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541513

Int. Cl.⁴ B29C *67/22, 39/36*

U.S. Cl. 264—51 **11 Claims**

1. A process for producing polyurethane foam articles in a mould, comprising applying to the mould a release agent composition comprising (a) an aqueous emulsion or dispersion of natural or synthetic wax, (b) an alkali metal or ammonium salt of a C_{18}-C_{30}-fatty acid and (c) a C_4-C_{26}-alcohol.

4,783,297

METHOD OF PRODUCING CERAMIC PARTS

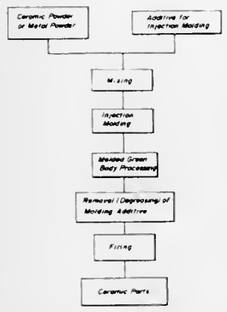
Shigenori Ito, Kasugai, and Takeyuki Mizuno, Toyohashi, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 608,248, May 8, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 873,487

Claims priority, application Japan, May 13, 1983, 58-82513

Int. Cl.⁴ C04B *35/64*

U.S. Cl. 264—63 **7 Claims**



1. A method of producing ceramic parts, comprising, adding a molding additive selected from the group consisting of a thermoplastic resin, wax and a lubricant to a ceramic powder to form a mixture thereof, injection molding the mixture so as to form an injection molded body of a desired shape having at least one thick portion and containing the molding additive, finishing machining the injection molded body to reduce at least said at least one thick portion in size to a substantially final configuration, removing the molding additive from the machined body by heating at a temperature not exceeding 500° C. without reacting the ceramic powder to yield a machined and degreased body, and firing the machined and degreased body to sinter the same, whereby a ceramic part having a complicated configuration with different thicknesses in different portions can be produced and whereby the formation of cracks in the ceramic part is prevented.

4,783,298

IN-MOLD COATING METHOD AND APPARATUS

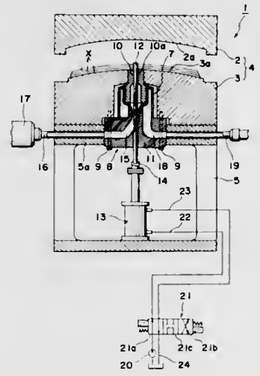
Masamitsu Oda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 30, 1986, Ser. No. 947,874

Claims priority, application Japan, Jan. 8, 1986, 61-2477

Int. Cl.⁴ B29C *41/20, 41/22, 45/14, 45/16*

U.S. Cl. 264—155 **7 Claims**



1. A method for forming a coating layer on a molded product formed in a split-type mold assembly, which assembly comprises first and second dies supported for movement relative to each other, and an injector means for injecting a fluidized coating material, said injector means including a valving rod slidably extending through a supply passage means, defined in the first die, for movement between projected and retracted positions, said injector means being positioned on one side of the first die remote from the second die, said valving rod having first and second ends opposite each other, the first end of said valving rod being coupled with a drive source and the second end of said valving rod confronting the second die through the passage means, said second end of the valving rod being, when the valving rod is moved inwardly of the first die to the retracted position, clear of the passage means to permit the latter to be opened, said valving rod adapted to close the passage means after the valving rod has been moved a predetermined distance from the retracted position toward the projected position, which method comprises the steps of:

moving the valving rod to the projected position with the second end of said valving rod piercing through the molded product to form a perforation in said molded product during the formation of the molded product within a molding cavity defined between the first and second dies, said molded product having first and second surfaces opposite each other, the first surface of said molded product resting on the first die;

separating the second die from the second surface of the molded product to provide a coating space between the second die and the second surface of the molded product;

moving the valving rod to the retracted position with the second end of the valving rod clear of the passage means to permit the passage means to communicate with the coating space through the perforation in the molded product;

injecting the coating material into the coating space through the passage means and then through the perforation in the molded product;

moving the valving rod in the retracted position toward the projected position to close the passage means; and

moving one of the first and second dies close to the other of the first and second dies to form the coating layer on the second surface of the molded product.

4,783,299

METHOD AND APPARATUS FOR EXTRUSION OF PLASTIC PIPES WITH COMPOSITE WALLS

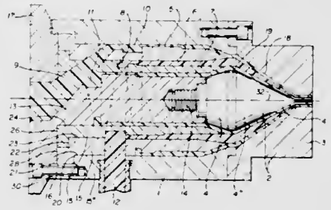
Bernard Prevotat, Le Chesnay, France, assignor to Alphacan, France

Filed Dec. 16, 1986, Ser. No. 942,195

Claims priority, application France, Dec. 18, 1985, 85 18800

Int. Cl.⁴ B29C *47/22*

U.S. Cl. 264—173 **14 Claims**



1. Apparatus for extrusion of plastic pipe with a composite structure forming a multiple layer wall comprising:

a. a base portion,

b. a central body portion of generally cylindrical shape integrally formed with and rigidly extending from said base portion and having a mandrel at the outer end,

c. a first concentric cylinder encircling said central body portion so as to create a first annular space between at least a part of said central body portion and said first cylinder, one end of said first cylinder abutting said base portion for rigid support,

d. a second concentric cylinder encircling said first cylinder so as to create a second annular space between at least a part of said first cylinder and said second cylinder, one end of said second cylinder interlocking said one end of said first cylinder and engaging said base portion for rigid support,

e. an outer body portion having a cylindrical cavity encircling said second concentric cylinder so as to create a third annular space between at least a portion of said second cylinder and said outer body portion cavity,

f. means on said outer body portion for interlocking with said one end of said second cylinder and for abutting attachment to said base portion for rigid support of said first and second cylinders and said outer body portion in said spaced relationship,

g. first channel means for enabling said first and third annular spaces to receive a molten material from a first source and a second channel means for enabling said second annular space to receive molten material from a second source, and

h. means for attaching a die to the outer end of said outer body portion in spaced relationship with said mandrel to shape said extruded material into a pipe having a multi-layered wall.

7. A method for extrusion of plastic pipes with a composite structure forming a multi-layered wall comprising the steps of:

a. forming a base portion,

b. integrally forming a central body portion of generally cylindrical shape with, and rigidly extending from, said base portion,

c. attaching a mandrel to the outer end of said central body portion,

d. encircling said central body portion with a first concentric cylinder so as to create a first annular space between at least a part of said central body portion and said first cylinder, one end of said first cylinder abutting said base portion for rigid support,

e. encircling said first cylinder with a second concentric cylinder so as to create a second annular space between at least a part of said first cylinder and said second cylinder, one end of said second cylinder interlocking said one end of said first cylinder and engaging said base portion for rigid support,

f. encircling said second concentric cylinder with an outer body portion having a cylindrical cavity so as to create a third annular space between at least a portion of said second cylinder and said outer body portion cavity, one end of said outer body portion interlocking with said one end of said second cylinder,

g. attaching said interlocked end of said outer body portion to said base portion in an abutting relationship for rigid support of said first and second cylinders and said outer body portion in said spaced relationship,

h. providing a first channel for enabling said first and third spaces to receive a molten material from a first source and a second channel for enabling said second space to receive molten material from a second source and

i. attaching a die to the outer end of said outer body portion in spaced relationship with said mandrel to shape said extruded plastic into a pipe having a multi-layered wall.

4,783,300

VIBRATING DAMPING MATERIALS AND METHOD FOR CONTINUOUS PRODUCTION

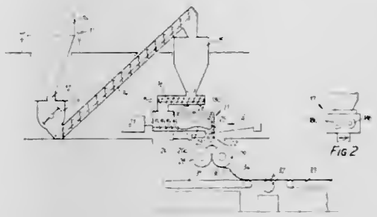
Walter Grunwell, Skipton, England, assignor to Wardle Storeys PLC, Lancashire, England

Continuation-in-part of Ser. No. 778,509, Sep. 20, 1985, which is a continuation-in-part of Ser. No. 701,505, Feb. 14, 1985. This application Apr. 4, 1986, Ser. No. 848,348

Claims priority, application United Kingdom, Sep. 22, 1984, 8424048; May 13, 1985, 8512085

Int. Cl.⁴ B29C *43/24*

U.S. Cl. 264—175 **7 Claims**



1. A method of manufacturing a polymeric, profiled sheet for vibration damping and sound insulation, comprising the steps of:

(a) feeding continuously to a continuous mixer a polymer material consisting of a vinyl acetate homopolymer, together with a plasticiser, and a mineral filler material in an amount up to 80% by weight of the total composition;

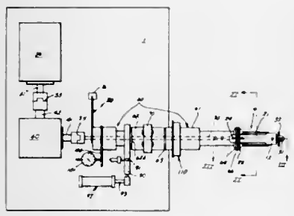
(b) passing said vinyl acetate polymer material, said filler, and said plasticiser continuously through said continuous mixer to produce a homogeneous mixture thereof wherein said materials are well dispersed in said homogeneous mixture;

(c) heating said mixture to a temperature of from 170° C. to

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190° C. as said mixture passes through said continuous mixer;
(d) continuously delivering said heated mixture from said continuous mixer to heated sheet forming means, said sheet forming means comprising a pair of calender rolls heated to a temperature of from 60° C. to 120° C.; and
(e) forming a profiled sheet continuously from said mixture in said heated sheet forming means.

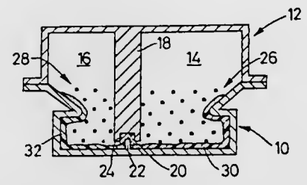
4,783,301
POLYBUTENE MOLDED ARTICLE AND METHOD FOR MAKING SAME
Kuo Z. Hong, Buffalo Grove, Ill., assignor to The Dow Chemical Company, Midland, Mich.
Filed Oct. 30, 1986, Ser. No. 925,352
Int. Cl.[4] B29C *47/24, 47/86*
U.S. Cl. 264—209.2 **17 Claims**



1. A method for producing a polybutene-1 polymer product comprising:
forming a melt of polymeric material comprising polybutene-1 at a temperature above the melting point of polybutene-1;
introducing said melt of polymeric material comprising polybutene-1 into a form defining the desired shape;
cooling said melt of polymeric material comprising polybutene-1 to a temperature in the range from just above the melting point to just below the melting point of said polybutene-1 polymer;
subjecting said melt of polymeric material to a generally uniform and constant rotational shear in said form within said temperatrure range from just above to just below the melting point of said polybutene-1 polymer to induce crystallization thereof;
discontinuing rotational shear while said melt of polymeric material is at a temperature within said range of temperature; and
allowing said polymeric material to harden.

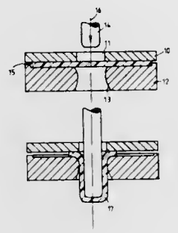
4,783,302
MANUFACTURING METHOD OF SURFACE MATERIALS HAVING PARTIALLY DIFFERENT MATERIALS
Kazunori Kurimoto, Miyada Konan, Japan, assignor to Sheller-Globe Corporation, Toledo, Ohio
Filed Oct. 22, 1986, Ser. No. 922,089
Claims priority, application Japan, Apr. 24, 1985, 60-88140
Int. Cl.[4] B28B *1/20*; B29C *39/10, 39/12, 41/04*
U.S. Cl. 264—251 **1 Claim**

1. A method of making a molded product in a mold which is separable and includes a material containing mold part, a forming mold part, a partition means for dividing said material containing mold part into at least two different molding volumes, a groove means extending generally across at least one end of said partition means operative to accommodate a resin body, and a projection means on the inside of said forming mold part and cooperating with said groove means and said resin body to assist in providing said different molding volumes, comprising the steps of:
placing said resin body in said groove means;
placing moldable resin materials of different kinds into said molding volumes;
heating said mold;
placing said material containing mold part against said forming mold part to close said mold and to melt said resin body into said groove means by heat produced by said



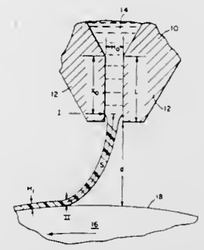
projection means to allow the entry of said projection means into said resin body;
at least partially rotating said mold such that said different kinds of resin materials are placed against said forming mold part and whereby said different kinds of resin materials are bonded through said melted resin body; and
separating said mold parts and removing said molded product.

4,783,303
METHOD OF PROCESSING SEMIFINISHED PRODUCTS MADE OF CROSS-LINKED PLASTIC MATERIAL
Friedrich Imgram, Heusenstamm, Fed. Rep. of Germany, assignor to Wirsbo Pex Platzer Schwedenbau GmbH, Fed. Rep. of Germany
PCT No. PCT/EP86/00141, § 371 Date Nov. 4, 1986, § 102(e) Date Nov. 4, 1986, PCT Pub. No. WO86/05440, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 14, 1986, Ser. No. 23,041
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509119
Int. Cl.[4] B29C *49/00, 65/02*
U.S. Cl. 264—535 **7 Claims**



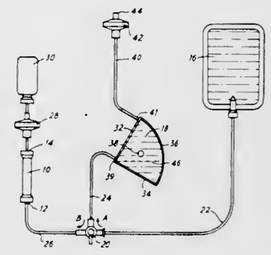
1. A method of processing thermoelastic cross-linked polyolefin, comprising the steps of:
selecting a tube made of a thermoelastic cross-linked polyolefin and heating said tube to a predetermined temperature range above the crystallite melting point of said thermoelastic cross-linked polyolefin;
shaping said heated tube and thereby imparting a preselected profile to said heated tube in said predetermined temperature range above said crystallite melting point of said thermoelastic cross-linked polyolefin; and
cooling said heated and profiled tube to a temperature below said crystallite melting point of said thermoelastic cross-linked polyolefin.

4,783,304
VACUUM PINNING PROCESS
David E. Heyer, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jun. 17, 1987, Ser. No. 63,217
Int. Cl.[4] B29C *39/42*
U.S. Cl. 264—556 **11 Claims**



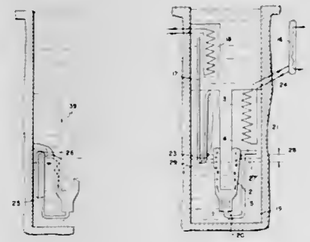
1. In a process for preparing thermoplastic polymeric film comprising extruding a web of polymeric material in melt form from an extrusion die lip opening and casting the web onto the surface of a quench roll having a surface roughness of at least three microinches (0.08 micrometer) using pinning techniques, the improvement in casting webs of less than about 5 mils (127 micrometers) in thickness by drawing the melt to a melt drawdown ratio of less than about 25 and spacing the extrusion die lip opening from the quench roll surface at less than about 120 mils (3 mm).

4,783,305
GENERATOR FOR RADIONUCLIDE
Terence R. F. Forrest, Pinner, England, assignor to Amersham International plc., Buckinghamshire, England
Continuation of Ser. No. 576,405, Feb. 2, 1984, abandoned. This application Mar. 11, 1987, Ser. No. 23,897
Claims priority, application United Kingdom, Feb. 9, 1983, 8303558
Int. Cl.[4] G01N *23/12*; B67D *5/00*
U.S. Cl. 376—186 **7 Claims**



1. A generator of radionuclides comprising a generator column containing the radionuclide and provided with an inlet and outlet for eluent; a first reservoir containing a supply of eluent; a second reservoir of fixed volume for supplying to the column an adjustable predetermined volume of eluent; means connecting the first and second reservoirs whereby the second reservoir can be filled up from the first; means including valve means connecting an outlet of the second reservoir to the column inlet; means for rotatably mounting said second reservoir about a horizontal axis; and adjustment means for adjusting the angular position of said second reservoir about said axis to thereby vary the proportion of the total volume which lies above the outlet of the reservoir, to thus determine the amount of liquid dispensed from the reservoir when said valve means is opened, whereby a predetermined volume of the eluent can be caused to pass from the second reservoir through the column so as to elute the radionuclide therefrom under sterile conditions.

4,783,306
METHOD AND DEVICE FOR PASSIVE TRANSFER OF HEAT FROM NUCLEAR REACTORS TO A PUBLIC UTILITY NETWORK, WITH AUTOMATIC REGULATION OF REACTOR POWER AND AUTOMATIC EMERGENCY SHUTDOWN AND SWITCHOVER TO EMERGENCY COOLING
Georg Vecsey, Haselweg 7, CH-5200 Windisch, and Pal G. Doroszlai, Hirschengasse 21, CH-5416 Kirchdorf, both of Switzerland
PCT No. PCT/CH85/00123, § 371 Date May 5, 1986, § 102(e) Date May 5, 1986, PCT Pub. No. WO86/01632, PCT Pub. Date Mar. 13, 1986
PCT Filed Aug. 23, 1985, Ser. No. 870,280
Claims priority, application Switzerland, Sep. 5, 1984, 4247/84; Nov. 8, 1984, 5357/84; Dec. 21, 1984, 6093/84
Int. Cl.[4] G21D *9/00*; G21C *15/00*
U.S. Cl. 376—213 **29 Claims**



1. A method for generating low-temperature heat from a nuclear reactor, said nuclear reactor being disposed in a basin of a liquid containing a neutron absorbing material, comprising the steps of
cooling water in a primary cooling loop thermally isolated at least in part from said basin, to flow out of a plenum underneath a core of said reactor, through said reactor and into an ascending pipe, wherein decreasing hydrostatic pressure in the ascending pipe causes formation of steam,
separating the steam from the water at the upper end of the ascending pipe and removing the heat content of the steam as useful heat in a condenser to form a condensate,
collecting said condensate and any of said water in a condensate collecting basin and returning the mixture via a downpipe to the plenum underneath the reactor, in such a way that a difference in specific gravities of the liquid and steam in the ascending pipe and of the liquid and condensate in the downpipe maintains natural circulation of said primary cooling loop, and
equalizing the pressure between the primary cooling system and the basin at a level of the condensate collecting basin in such a manner that, in the primary loop below this level to the plenum underneath the reactor, the hydrostatic pressure increases continuously, while above this level a constant condensation pressure prevails, wherein said level of said collecting condensate basin is free to vary.

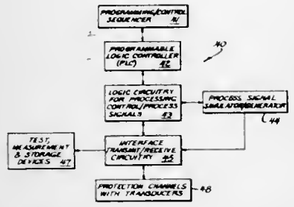
VOL 1096 ISS 2 NO 8 1988 UMI

4,783,307

REACTOR CONTROL SYSTEM VERIFICATION

James J. Galligan, Joliet; Harry W. Quinlan, Frankfort, and Steven J. Hedden, Morris, all of Ill., assignors to Commonwealth Edison Company, Chicago, Ill.

Filed Mar. 5, 1987, Ser. No. 22,947
Int. Cl.[4] G21C 7/36
U.S. Cl. 376—217 74 Claims



1. An arrangement for verifying the in-place operation of a protection system, wherein said protection system monitors and controls the operation of an operating system and includes an instrument loop responsive to a time dependent state variable signal and having a characteristic response time, wherein said time dependent state variable signal represents a first operating parameter of the operating system for providing an operating system control signal, said arrangement comprising:

user responsive input means for generating first control signals;

programmable control means coupled to said instrument loop and to said user responsive input means and responsive to said first control signals for generating second control signals;

variable signal generating means coupled to said instrument loop and to said programmable control means and responsive to said second control signals for generating a simulated time dependent state variable signal and providing said simulated time dependent state variable signal to said instrument loop in response to which said instrument loop outputs said operating system control signal, wherein said simulated time dependent state variable signal does not compensate for the response time of the instrument loop and said operating system control signal is a shutdown signal for terminating operation of the operating system when said simulated time dependent state variable signal exceeds a predetermined limit;

display/test means coupled to said instrument loop and responsive to said operating system control signal for providing a visual display of said operating system control signal in verifying operation of the protection system; and

detection means coupled to said instrument loop and responsive to a reset signal therefrom for verifying the resetting of said protection system whereupon operation of said operating system may be re-initiated when said simulated time dependent state variable signal no longer exceeds said predetermined limit.

4,783,308

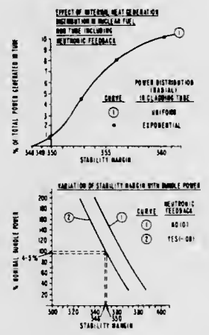
BOILING WATER REACTOR FUEL ROD

Rusi P. Taleyarkhan, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 746,818, Jun. 20, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 20,159
Int. Cl.[4] G21C 3/06, 3/30
U.S. Cl. 376—370 8 Claims

1. In a boiling water nuclear reactor (BWR) having a plurality of BWR fuel assemblies, each of said fuel assemblies including a plurality of fuel rods, each fuel rod being composed of a cladding tube and a nuclear fuel contained therein, said fuel assemblies defining a given bundle power output with a corresponding power margin and stability margin for said BWR, the improvement which comprises:

said cladding tubes and said nuclear fuel of said BWR fuel assemblies of said BWR each being sources for generating the power output of said BWR, a characteristic of said cladding tubes being preset to define a distribution of total power output of said BWR between said cladding tubes and said nuclear fuel of from 1.7 to 6.7 percent of the total



power output to be generated by said cladding tubes and the remainder generated by said nuclear fuel, said distribution of the source of generation of power output permitting an increase in the power margin to take place without a corresponding decrease in the stability margin or an increase in the stability to take place without a corresponding decrease in the power margin thereby providing enhanced transient response and system stability of said BWR.

4,783,309

DOUBLE CONTAINER SYSTEM FOR TRANSPORTING AND STORING RADIOACTIVE MATERIALS

Franz-Wolfgang Popp, Wedemark; Bernd Pontani, Alzenau, and Erich Ernst, Oftersheim, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 61,688
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620737
Int. Cl.[4] G21F 5/00
U.S. Cl. 376—272 10 Claims

1. A double container system for transporting and storing radioactive material such as irradiated nuclear fuel, the double container system comprising:

an inner storage container made of steel for holding the radioactive material to be stored;

an outer shielding container defining a cavity for accommodating said storage container therein;

said shielding container having an inner surface and said storage container having an outer surface, said inner surface and said outer surface conjointly defining an annular gap therebetween;

a neutron moderator assembly mounted in said annular gap, said moderator assembly including:

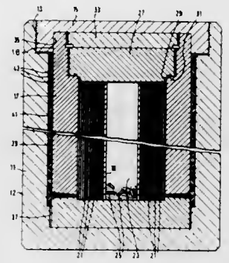
a plurality of individual annular hydrogenous members made of hydrogenous material and stacked in said gap one above the other, each one of said annular hydrogenous members having two lateral sides facing said inner and outer surfaces, respectively;

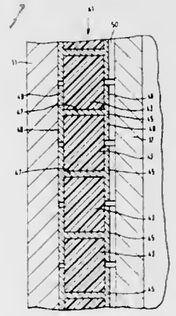
a plurality of mutually separate heat-conducting annular metal members having respective H-profiles when viewed in radial section;

each of said annular metal members being disposed and

stacked between each two mutually adjacent ones of the annular hydrogenous members; and,

each of said metal having a horizontal web and four legs extending therefrom to define said H-profile and being





placed between said mutually adjacent stacked annular hydrogenous members so as to cause said legs to at least partially enclose said lateral sides of said hydrogenous members.

4,783,310

HEAT BARRIER FOR USE IN A NUCLEAR REACTOR FACILITY

Charles P. Keegan, South Huntingdon Twp., Westmoreland County, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 27, 1986, Ser. No. 923,232
Int. Cl.[4] G21C 11/08
U.S. Cl. 376—288 20 Claims

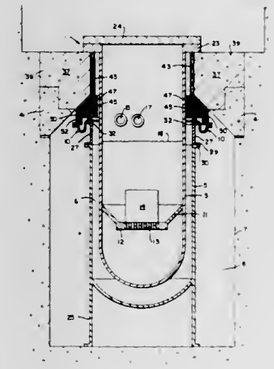
20. A thermal barrier for insulating the reactor cavity structure of a nuclear reactor plant which includes a reactor vessel, and a guard vessel, and a reactor cavity structure, wherein a first annular space is defined between the walls of the reactor vessel and the guard vessel, and a second annular space is defined between the walls of the guard vessel and the reactor cavity structure, and said first and second annular spaces communicate via an annular opening having a first edge defined by an edge of the guard vessel, and a second edge defined by an edge of another component in the reactor plant, and wherein heat generated by the reactor vessel creates convection currents in the first annular space, comprising:

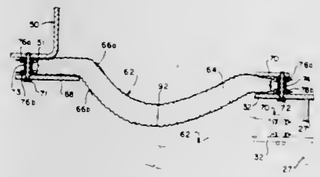
an annular web including a flexible, gas permeable blanket having an inner edge and an outer edge and formed from fibers of alumina-silica wrapped in fabric formed from woven stainless steel yarn, said web having at least one securing seam for securing the blanket to the surrounding stainless steel fabric,

a set of inner clamping bars for clamping the inner edge of the annular web to one edge of the opening between the two annular spaces,

a set of outer clamping bars for clamping the outer edge of the annular web to the other edge of said opening so that the web is completely and continuously disposed between said convection currents and said second annular space,

wherein the distance between said inner and outer edges of





said web is larger than the distance between the edges of the opening so that sufficient slack is present in the web both around the web and between the inner and outer edges of the web so that said web will accommodate all dimensional changes occurring between the guard vessel and the other component of the reactor plant resulting from thermal differential expansion without being pulled taut, said web being uniformly gas permeable along substantially each point of its area to facilitate a uniform bleed-off of any pressurized gas present in said first annular space.

4,783,311

PELLET-CLAD INTERACTION RESISTANT NUCLEAR FUEL ELEMENT

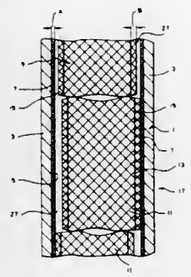
Harry M. Ferrari, Edgewood, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 919,943, Oct. 17, 1986, abandoned. This application Jul. 15, 1987, Ser. No. 73,560
Int. Cl.[4] G21C 3/20
U.S. Cl. 376—417 16 Claims

1. A nuclear fuel element comprising: a metallic tubular cladding composed of a metal selected from zirconium or a zirconium alloy, containing a plurality of nuclear fuel pellets and having end sealing means for hermetically sealing said nuclear fuel pellets within said metallic tubular cladding, wherein a layer of a lubricant is provided on the inner surface of said metallic tubular cladding to provide the lubricity which

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will prevent high clad stresses on the cladding, and said plurality of fuel pellets are comprised of enriched uranium and have on the circumferential surface thereof a coating of a coating material of a thickness sufficient to absorb fission products emanating from said enriched uranium dioxide, and sufficiently chemically and thermally compatible with said enriched uranium dioxide to prevent flaking off of said coating, portions of said coating contacting portions of said layer, absorption of the fission products by said coating acting to prevent reaction between the fission products and said lubricant layer to extend the effectiveness of said lubricant layer to a longer burnup time.



4,783,312

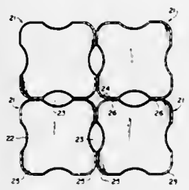
RADIAL NEUTRON REFELECTOR

Robert K. Gjertsen, Monroeville Boro, and John F. Wilson, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 634,337, Jul. 25, 1984, abandoned. This application Aug. 8, 1986, Ser. No. 894,095

Int. Cl.[4] G21C *11/06*

U.S. Cl. 376—458 **7 Claims**



1. A high solid to void ratio radial neutron reflector for a nuclear reactor, said nuclear reactor comprising a nuclear core positioned within a reactor pressure vessel, said nuclear core comprising an array of fuel assemblies having a square cross-sectional configuration, said fuel assemblies being stacked side by side and having an irregularly shaped outer periphery, a cylindrical core barrel surrounding said nuclear core, a resulting irregularly shaped space between said core periphery and said core barrel, said radial neutron reflector substantially filling said irregularly shaped space and comprising a plurality of enclosures, stacked side by side, each enclosure being fitted with a plurality of side by side stacked clad reflector rods having a substantially square cross-sectional shape with at least one groove in each side thereof extending the length of said rods, said cladding being in substantially abutting contact with the reflector rods therein and being substantially wrinkle free at the flat surfaces thereof and said side-by-side clad reflector rods each being in abutting contact with adjacent clad reflector rods, whereby any interstitial spaces between said abutting side-by-side stacked clad reflector rods are substantially eliminated.

4,783,313

ENHANCING BODY DEFENSE MECHANISMS

Jack G. Makari, 88 Everett Rd., Demarest, N.J. 07627

Division of Ser. No. 888,261, Jul. 17, 1986, Pat. No. 4,705,677, which is a continuation-in-part of Ser. No. 793,294, May 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 159,473, Jul. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 535,364, Mar. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 421,683, Dec. 28, 1964, abandoned, which is a continuation-in-part of Ser. No. 75,454, Aug. 6, 1959, abandoned. This application Nov. 6, 1987, Ser. No. 118,275

Int. Cl.[4] A61K *43/00*

U.S. Cl. 424—1.1 **3 Claims**

1. A method of enhancing the defense mechanisms of the body of a mammal against either or each of malignant tumor incipience and such tumor development, which method comprises administering to said mammal a tumor-antibody-stimulating effective dosage of

(a) the tritiated form of a glyco-protein-polysaccharide-like antigenic substance derived from cancerous tissue and which disperses readily and is stable in cold to boiling water and in aqueous solution, non-dialyzable at a molecular weight cut-off point of 3500, inert to alkali and to isotonic phosphate buffered saline solution, precipitated from aqueous medium by isopropanol and insoluble in isopropanol ether, chloroform, and butanol, gives a positive Molisch test and negative Dische test, and on hydrolysis with dilute sulfuric acid at about 100° C., followed by deionization, yields a hydrolysate containing identifiable sugars, and on finite analysis shows trace amounts of amino acids typical of N-glycoproteins; which substance when in an aqueous vehicle and on therein being admixed with blood serum yields a preparation which when injected intra-dermally into a subject to be tested, produces an erythema about the injection site; and

(b) malignant tumor-derived deoxyribonucleic acid; at an adequate regimen, to develop an improved level of defense against either or each of said malignant tumor incipience and development.

2. A method of enhancing the defence mechanisms of the body of a mammal bearing a malignant tumor against development of said malignant tumor, which method comprises administering to said mammal a tumor-antibody-stimulating effective dosage, of

(a) the tritiated form of a glycoprotein-poly-saccharide-like antigenic substance derived from cancerous tissue and which disperses readily and is stable in cold to boiling water and in aqueous saline solution, non-dialyzable at a molecular weight cut-off point of 3500, inert to alkali and to isotonic phosphate buffered saline solution, precipitated from aqueous medium by isopropanol and insoluble in isopropanol ether, chloroform, and butanol, gives a positive Molisch test and negative Dische test, and on hydrolysis with dilute sulfuric acid at about 100° C., followed by ionization, yields a hydrolysate containing identifiable sugars, and on finite analysis shows trace amounts of amino acids typical of N-glycoproteins; which substance when in an aqueous vehicle and on therein being admixed with blood serum yields a preparation which when injected intra-dermally into a subject to be tested, produces an erythema about the injection site; and

(b) malignant tumor-derived deoxyribonucleic acid; at an effective regimen, to develop an improved level of defense against said malignant tumor development.

4,783,314

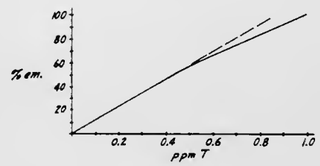
FLUORESCENT TRACERS - CHEMICAL TREATMENT MONITORS

John E. Hoots, Naperville, and Barry E. Hunt, Aurora, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Feb. 26, 1987, Ser. No. 19,454

Int. Cl.[4] G01N *21/64*

U.S. Cl. 422—3 **18 Claims**



1. In an industrial or municipal water system involving equipment through which is a moving body of water containing impurities and containing a quantified dosage of a water treating component having the role of being consumed while removing or neutralizing impurities in the body of water, a method of monitoring the system to determine if the level of treating component subscribes to an acceptable parts-component: liquid volume proportion under operating conditions comprising the steps of:

(A) adding to the body of water a water soluble fluorescent tracer in an amount proportioned to the amount of treating component in the system, the fluorescent tracer being inert to water, inert to the equipment and inert to the treating component;

(B) withdrawing from the system a sample of the body of water containing both the component and tracer and subjecting the withdrawn sample to an analysis which consists essentially of the step of comparing the tracer concentration thereof to a standard on an emissivity basis to determine the concentration of tracer in the sample; and, if the operating concentration is outside an acceptable operating range,

(C) changing the volume of water or the dosage of treating component until an acceptable operating range of concentration for the treating component is attained.

4,783,315

ANALYSIS MATERIAL SHEET

Fuminori Arai; Kenichiro Yazawa; Hideaki Takeuchi, and Masao Kitajima, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 554,655, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 310,257, Oct. 9, 1981, abandoned. This application Jul. 23, 1985, Ser. No. 758,562

Claims priority, application Japan, Oct. 9, 1980, 55-140532

Int. Cl.[4] G01N *31/22*

U.S. Cl. 422—56 **22 Claims**

1. An analysis material sheet, comprising:

a water-impermeable support; and

a fabric layer comprising a fabric including about 10% or more of a polyethyleneterephthalate synthetic hydrophobic organic polymer fiber and the remainder being natural fiber provided on said support, said fabric layer containing a reagent and being physically activated on at least one surface thereof to render the fabric layer hydrophilic and provide increased adhesiveness, with said physically activated surface being adhered to said support to form an integral structure, wherein said physical activation is conducted by a treatment selected from the group consisting of a glow discharge treatment, plasma discharge and a corona discharge treatment.

4,783,316

COLORIMETRIC GAS DOSIMETER

Karl-Heinz Pannwitz, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk AG, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,750

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534934

Int. Cl.[4] G01N *31/22*

U.S. Cl. 422—58 **11 Claims**



1. A colorimetric gas dosimeter comprising a closed transparent hollow longitudinally and elongated unit having frangible means at an end thereof for detaching said end, a gas permeable wall structure subdividing said hollow unit into a plurality of chambers extending along its longitudinal axis, at least one of said chambers being filled with a granular indicator and at least one adjacent chamber being free of filling material, said chamber which is filled with indicator material defining a zone of changeable color of said indicator material extending along said tube and said filling material free chamber defining a gas diffusion chamber extending along said tube.

4,783,317

APPARATUS FOR THE MONITORING AND REGULATION OF MATERIAL CONCENTRATIONS IN CHEMICAL PROCESSES (II)

Karl Kuerzinger, Hanau, and Peter Wachendoerfer, Frankfurt, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 903,624

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 8527072

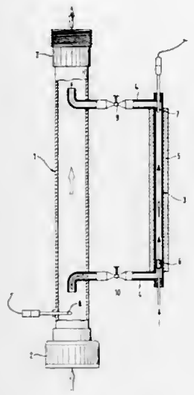
Int. Cl.[4] G01N *27/00, 25/20*

U.S. Cl. 422—68 **6 Claims**

1. An apparatus for the monitoring and regulation of material concentrations in a reaction medium by measuring the temperature rise of the reaction medium in an exothermal reaction with a substance which chemically reacts with the reaction medium upon contact, comprising: a first pipe section of a certain diameter; mounting means provided at each end of said first pipe section for mounting said first pipe section at one of its ends to a delivery line conveying the reaction medium and at its other end to a discharge line, the delivery line having a diameter approximately equal to the diameter of said first pipe section; a second pipe section including a center section, a first arm section and a second arm section, said first arm section having a first free and open end and a second end integrally secured to one end of said center section, the second arm section having a first free and open end and a second end integrally secured to the other end of said center section, said center section being disposed externally adjacent said first pipe section and in axial alignment therewith, said first and second arm sections extending away from said center section such that the free and open end of each of said arm sections extends into said first pipe section, the free and open end of each of said arm

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sections being bent away from said center section within said first pipe section; said apparatus further comprising thermal insulation encompassing the center section of said second pipe section; a supply line for the substance which chemically reacts with the reaction medium upon contact and a first and second temperature sensor, said supply line and said first temperature sensor both connected to said second pipe section, said first



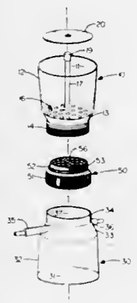
temperature sensor positioned and arranged to measure the temperature of the reaction medium after the reaction medium comes in contact with the substance which chemically reacts with it, and said second temperature sensor positioned and arranged to measure the temperature of the reaction medium before the reaction medium comes in contact with the substance which chemically reacts with it.

4,783,318

APPARATUS FOR ENVIRONMENTAL LEACHING TESTING

Kim A. Lapakko, Minneapolis, Minn., assignor to The State of Minnesota, St. Paul, Minn.

Filed Oct. 2, 1987, Ser. No. 103,757
Int. Cl.[4] B01P *29/04*
U.S. Cl. 422—101 **6 Claims**



1. Apparatus for separating solids from an effluent, said apparatus comprising in combination:

an upper receiver having a substantially flat base to provide for free-standing and having an open top, a generally upright cylindrical receiver sidewall, a perforated plate secured at its perimeter to a bottom portion of the receiver sidewall, and a standpipe secured at one end to the perforated plate and projecting generally upwardly therefrom;

a bottom receptacle having a closed bottom, an open top, a generally upright cylindrical receptacle sidewall, and a passage means for connection to a vacuum means, and creating a communicating passage between the vacuum means and the interior of the bottom receptacle;

an intermediate coupler, first means for removably securing the intermediate coupler to the bottom portion of the upper receiver, and second means for securing the intermediate member to a top portion of the bottom receptacle so that the intermediate member forms a communicating passage between the upper receiver and the bottom receptacle;

said intermediate coupler including a filter supporting base, said first means supporting said filter supporting base and said perforated plate in generally parallel and spaced apart relation when the intermediate coupler is secured to said upper receiver whereby said filter supporting base, coupler and perforated plate define a chamber, with said standpipe open to said chamber; and

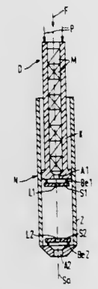
a first filter, removably supported on said filter supporting base, for substantially preventing the flow of a rinsing liquid by gravity from said chamber to said bottom receptacle, but readily permitting the passage of a liquid responsive to the application of a vacuum through said passage means to at least partially evacuate said bottom receptacle.

4,783,319

APPARATUS FOR MIXING REACTION RESIN COMPOUNDS AND FOR KEEPING THE PRESSURE OF SAID REACTION RESIN COMPOUNDS CONSTANT

Reiner Habrich, Kirchheim, and Manfred Bauer, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 824,457, Jan. 31, 1986, abandoned. This application Jul. 29, 1987, Ser. No. 80,212
Int. Cl.[4] B01F *5/12*
U.S. Cl. 422—135 **8 Claims**



1. An apparatus for mixing reaction resin compounds and for keeping the pressure of said reaction resin compounds substantially constant comprising:

a cylinder having a longitudinal axis;

a piston having a termination floor within said cylinder and movable within said cylinder along said longitudinal axis to keep the pressure of said reaction resin compounds in said cylinder constant;

cylinder discharge means in said cylinder for ejecting said reaction resin compounds from said cylinder;

a flow-through mixer for said reaction resin compounds integrated in said piston and terminating in a piston discharge means through said piston termination floor for ejecting said reaction resin compounds into said cylinder; and

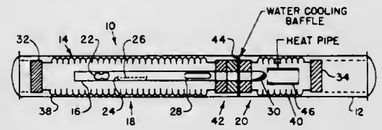
means carried on said piston and positioned with respect to said cylinder so as to confine reaction resin compounds ejected from said piston discharge means in a volume between the termination floor of said piston and said cylinder discharge means prior to being discharged through said cylinder discharge means.

4,783,320

RAPID SYNTHESIS OF INDIUM PHOSPHIDE

Joseph A. Adamski, Framingham, and Brian S. Ahern, Boxboro, both of Mass., assignors to The United States of America as represented by the Secretary of the Air force, Washington, D.C.

Filed Nov. 25, 1985, Ser. No. 801,348
Int. Cl.[4] C30B *25/08, 25/16*
U.S. Cl. 422—245 **1 Claim**



1. A semiconductor crystal apparatus comprising:

a pressure chamber, said pressure chamber having pressure monitoring means operably connected thereto, pressure adjusting means operably connected thereon, a source of pressurized gas operably connected thereto, temperature measuring means operably connected thereto, viewing ports connected thereon, water circulation ports operably connected thereon, and electrical feed-through ports operably connected therethrough, said pressure chamber having a cylindrical longitudinal cavity therethrough;

a first heating means, said first heating means being at least one heating coil about a reaction zone within said cavity, said heating coil having an insulating cap on a first end in close proximity to said heating coil;

a first insulating means, said first insulating means being at least one insulating ring, said at least one insulating ring being positioned near a second end of said first heating means, said insulating ring being in close proximity to a wall of said pressure chamber to impede the flow of gases thereby, said at least one insulating ring having a cylindrical hole through the center thereof;

a baffle for controlling temperature and pressure, said baffle being positioned adjacent to said at least one insulating ring on a side opposite to said first heating means, said baffle being in close proximity to said wall of said pressure chamber to impede the flow of gases thereby, said baffle having a cylindrical hole through the center thereof, said baffle preventing the flow of pressurized heated gas thereby so that independently heated zones are established on opposite sides of said baffle, said baffle furthering comprising:

a pair of circular plates, each of said circular plates having a centrally located hole therethrough for an ampoule, said plates further having means for securing said plates together, and

a cooling coil, said cooling coil being a flat coil of tubing for conducting cooling fluid therethrough, said flat coil being held between said circular plates, said cooling coil having an input end and an output end, said ends being connected to said water circulation ports of said pressure chamber;

a second insulating means, said second insulating means being on the opposite side of said baffle than said first insulating means, said second insulating means being an insulating ring in close proximity to said wall and having a cylindrical hole through the center thereof;

a second heating means, said second heating means being a heating coil about a volatile zone, a first end of said second heating means being in close proximity to said second insulating means, a second end of said second heating means having an insulating cap thereon;

a heat pipe, said heat pipe positioned in said voltile zone to insure a constant temperature profile therein;

an ampoule, said ampoule being positioned within said reaction zone, in said holes of said first and said second insulating means, in said hole of said baffle, and within said volatile zone, said ampoule having a closed end and a sealable open end, said sealable open end being sealed by a sealing plug positioned therein, said closed end being positioned near said heat pipe and having a first semiconductor material placed therein within said volatile zone, said ampoule substantially impeding the flow of heated gases through said holes; and

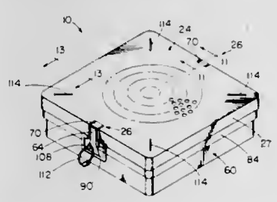
a boat, said boat holding a second semiconductor material, said boat being selectively positioned within said ampoule in said reaction zone.

4,783,321

STERLIZATION CONTAINER SYSTEM

Jerry L. Spence, Redmond, Wash., assignor to Instrumed, Inc., Kirkland, Wash.

Continuation-in-part of Ser. No. 684,745, Dec. 18, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,288
Int. Cl.[4] A61L *2/06, 2/20*
U.S. Cl. 422—300 **10 Claims**



6. A sterilization container system adapted to hold at least one object while the at least one object is being sterilized by a sterilizing fluid medium, wherein said sterilization container system comprises:

a base means;

a lid means;

latch means for releasably securing said lid means to said base means;

a sterilizing chamber means defined within said lid means and said base means when said lid means and said base means are secured together, wherein said chamber means are for holding the at least one object to be sterilized therein;

vent means in at least one of said lid means and said base means, wherein each said vent means is for permitting the sterilizing fluid medium to flow through said sterilizing chamber means to sterilize the at least one object which is held therein;

a respective vent filter means for each said vent means, wherein said respective vent filter means is for preventing microorganisms from reaching the at least one object held in said chamber means through a respective said vent means, and wherein said respective vent filter means includes a respective filter means which is pervious to the sterilizing fluid medium and which is impervious to microorganisms; and

a chamber seal means for providing a microorganism proof seal between said lid means and said base means when said lid means and said base means are secured together by said latch means;

wherein said base means comprises:

a base member;

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a peripheral base inner side wall means which extends upwardly from said base member and which has an upper edge; and

a peripheral base outer protective side wall means formed integrally with said base inner side wall means and having an upper edge, wherein said upper edge of said base outer protective side wall means is spaced away from said upper edge of said base inner side wall means, wherein said base outer protective side wall means is supported by said base inner side wall means;

wherein said chamber seal means comprises a peripheral gasket carried by said lid means; wherein when said lid means and said base means are assembled together said gasket is constructed and arranged to seal against said upper edge of said base inner side wall means;

wherein said lid means includes a lid outer protective side wall means which extends laterally outwardly past said base outer protective side wall means, and wherein a lower edge of said lid outer protective side wall means extends down past said upper edge of said base outer protective side wall means to enable said lid outer protective side wall means to protect an upper edge portion of said base outer protective side wall means; and

wherein said base outer protective side wall means extends at least substantially around said base inner side wall means to help protect said upper edge of said base inner side wall means from being contaminated when said lid means is removed from said base means.

4,783,322

METHOD FOR FLUORINATION OF ACTINIDE FLUORIDES AND OXYFLUORIDES THEREOF USING O_2F_2

Phillip G. Eller, Los Alamos, N. Mex.; John G. Malm, Naperville, Ill., and Robert A. Penneman, Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 1, 1984, Ser. No. 636,656

Int. Cl.[4] C01G *43/06, 56/00*

U.S. Cl. 423—19 **10 Claims**

10. A method for removal of actinides and actinide-containing compounds from actinide-contaminated articles, which comprises the steps of:

a. introducing O_2F_2 into the region of the articles of interest;

b. permitting contact with said O_2F_2 for a time period such that the actinides and actinide-containing compounds fluorites and oxyfluorites thereof are substantially removed from the actinide-contaminated articles as result of a chemical reaction with said O_2F_2, whereby actinide hexafluorides are produced; and

c. removing said actinide hexafluorides from the region of the actinide-contaminated articles.

4,783,323

Patent Not Issued For This Number

4,783,324

PREPARATION OF PURE TITANIUM TETRACHLORIDES AND SOLUTIONS OF TITANIUM TETRACHLORIDES

Larry L. Walters, and Bruce M. Anderson, both of Savannah, Ga., assignors to Kemira, Inc., Savannah, Ga.

Filed Feb. 3, 1987, Ser. No. 10,228

Int. Cl.[4] C01G *23/02*

U.S. Cl. 423—70 **5 Claims**

1. A method for removing metallic impurities from titanium tetrachloride, comprising the steps of:

providing titanium tetrachloride containing metallic impurities;

contacting said titanium tetrachloride with activated carbon;

removing at least a portion of said metallic impurities from said titanium tetrachloride by means of said activated carbon, thereby producing purified titanium tetrachloride; and

recovering said purified titanium tetrachloride by separation from said activated carbon.

4,783,325

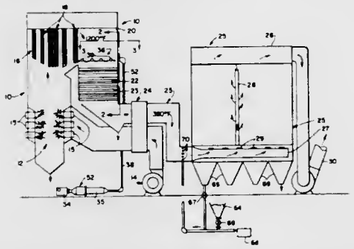
PROCESS AND APPARATUS FOR REMOVING OXIDES OF NITROGEN AND SULFUR FROM COMBUSTION GASES

Dale G. Jones, 2420 E. Hillcrest Ave., Visalia, Calif. 93277

Filed May 14, 1985, Ser. No. 734,393

Int. Cl.[4] C01B *21/00*

U.S. Cl. 423—235 **112 Claims**



1. A method for converting NO to NO_2 comprising the steps of contacting an NO containing gas stream with an injection gas, the injection gas comprising a peroxyl initiator other than hydrogen or hydrogen peroxide and sufficient oxygen to provide for conversion of NO to NO_2.

110. A method for removing nitrogen oxides and sulfur oxides from a gas stream, the process comprising the steps of:

(a) in a conversion zone, contacting a first gas stream containing nitrogen oxides and sulfur oxides, including NO and NO_2 at a first NO/NO_2 molar ratio with an injection gas comprising methanol and oxygen present in an amount sufficient to convert NO to NO_2 to thereby provide a second gas stream exiting the conversion zone wherein the NO/NO_2 molar ratio of the second gas stream is less than the NO/NO_2 molar ratio of the first gas stream;

(b) in a first section of an absorption zone, contacting the second gas stream with a particulate absorbent for oxides of nitrogen and sulfur to thereby remove oxides of nitrogen and sulfur from the gas stream to thereby form a third gas stream; and

(c) passing the third gas stream and particulate sorbent entrained in the third gas stream into a second section of the absorption zone wherein the third gas stream and particulate sorbent contact a liquid sorbent for NO_2 and sulfur oxides, so that said liquid sorbent removes NO_2 and sulfur oxides not removed by the particulate sorbent and also removes the particulate sorbent.

4,783,326

PROCESS FOR THE REMOVAL OF POLLUTANTS FROM HOT GASES

Franz-Gerhard Srednicki, Brunswick, Fed. Rep. of Germany, assignor to ERA GmbH, Brunswick, Fed. Rep. of Germany

PCT No. PCT/EP85/00048, § 371 Date Oct. 9, 1986, § 102(e) Date Oct. 9, 1986, PCT Pub. No. WO86/04519, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 9, 1985, Ser. No. 932,505

Int. Cl.[4] C01B *17/00, 21/00;* **B01D** *47/00;* **B01J** *8/00*

U.S. Cl. 423—242 **11 Claims**

1. A process for the removal of pollutants from hot gases, said pollutants including at least sulfur oxides and one member selected from the group consisting of nitrogen oxides, hydrochloride and heavy metals, comprising the steps of:

adjusting the content of free oxygen in the gas at a temperature between 100° C. and 150° C. to at least 5% by volume;

adjusting the water content of the gas to 85–120 g/m^3 when it enters the purification plant;

thereafter adding an oxidizing agent to the gas in measured amounts such that a stoichiometric ratio <0.5, referred to the sulfur content of the gas is produced;

cooling the gas to a temperature of approx. 90° C. and drawing off condensed sulfuric acid; and

cooling the gas in at least one further stage below the saturation point of water vapor and drawing off condensate with pollutant.

4,783,327

SULFUR DIOXIDE REMOVAL FROM GAS STREAMS USING HYDROXYALKYL SUBSTITUTED PIPERAZINONES

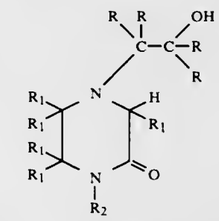
Duane S. Treybig; James L. Potter; Mark B. Jones, and John M. Motes, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1987, Ser. No. 85,432

Int. Cl.[4] C01B *17/00;* **B01D** *19/00*

U.S. Cl. 423—243 **18 Claims**

1. In a method for removing sulfur dioxide from gas streams containing the same which comprises (a) contacting said stream with an aqueous solution of an absorbent for said sulfur dioxide, (b) subsequently thermally desorbing said sulfur dioxide and (c) recovering said sulfur dioxide, the improvement which comprises employing as the absorbent a compound having the formula



wherein R is hydrogen or an alkyl group having 1 or 2 carbon atoms, R_1 is hydrogen, an alkyl group having 1 to 6 carbon atoms or an aryl or an aralkyl group having from 6 to 12 carbon atoms and R_2 is hydrogen, an alkyl or hydroxyalkyl group having from 1 to 6 carbon atoms or an aryl or aralkyl group having from 6 to 12 carbon atoms.

4,783,328

UTILIZATION OF PHOSPHOURUS CONTAINING BY-PRODUCTS

Joseph H. Finley, Metuchen, and Richard E. Hall, Trenton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 14, 1987, Ser. No. 132,758

Int. Cl.[4] C01B *25/01*

U.S. Cl. 423—323 **9 Claims**

1. A process of utilizing by-products containing phosphorus values from the nodule fines (calcined calcium phosphate) and wet acid raffinate by recovering phosphorus from said by-products in an electric phosphorus furnace comprising the steps of:

(1) forming a homogeneous compactible blend of the nodule fines and raffinate;

(2) compacting the blend into "green" shapes;

(3) heating the "green" shapes to curing temperatures;

(4) charging the cured shapes into the electric phosphorus furnace in the presence of sufficient coke reductant and fluxing agent to effect reduction of the phosphate values in said cured shapes to elemental phosphorus, and

(5) recovering the phosphorus produced from the by-products along with the principal phosphorus output of the furnace.

4,783,329

HYDRIDING SOLID SOLUTION ALLOYS HAVING A BODY CENTERED CUBIC STRUCTURE STABILIZED BY QUENCHING NEAR EUCTECTOID COMPOSITIONS

Arnulf J. Maeland, Succasonna; George G. Libowitz, Brookside, and George Rak, Pinebrook, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation of Ser. No. 807,906, Dec. 11, 1985, abandoned. This application Aug. 19, 1987, Ser. No. 88,479

Int. Cl.[4] C01B *6/24*

U.S. Cl. 423—644 **6 Claims**

1. A method of producing a metal hydride which comprises reacting hydrogen gas at a temperature between about 0° C. and about 100° C. with a solid solution alloy having a body-centered cubic phase structure, said alloy comprising titanium and a metal capable of producing a stable body-centered cubic phase structure in titanium at less than 100° C., said metal being selected from the group consisting of zirconium, rhenium, manganese and iron and having dissolved therein, when said metal is zirconium or rhenium, at least about 1 atom percent of another metal selected from the group consisting of aluminum, cobalt, chromium, iron, manganese, nickel, copper, silicon, germanium, gallium and mixtures thereof, a constituent of said solid solution alloy having an atomic radius at least about 5less than the atomic radius of the body-centered cubic phase material.

4,783,330

MONOCLONAL ANTIBODIES TO ACTIVATED PLATELETS

Bruce E. Furie, and Barbara C. Furie, both of Wellesley, Mass., assignors to New England Medical Center Hospitals, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 671,759, Nov. 15, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 796,621

Int. Cl.[4] A61K *37/47, 37/52, 49/02;* **G01N** *33/577*

U.S. Cl. 424—1.1 **18 Claims**

1. A monoclonal antibody reactive with activated human platelets, and substantially unreactive with resting human platelets and with the azurophilic granules of monocytes and neutrophilic granulocytes.

4,783,331

METHOD FOR SOLUBILIZATION OF ASPARTAME IN EFFERVESCENT AQUEOUS SYSTEMS; AND COMPOSITION

Thomas A. Alexander, South Bend, and Lawrence J. Daher, Elkhart, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Jun. 29, 1987, Ser. No. 66,951

Int. Cl.[4] A61K *9/46, 9/62, 33/10*

U.S. Cl. 424—44 **35 Claims**

13. An effervescent tablet for providing an aspartame-sweetened, calcium ion-containing solution upon dissolution in aqueous media; said tablet compri(a)

(a) about 10–90% calcium carbonate;

(b) about 10–90% of an organic acid component wherein the organic acid component includes at least about 80% citric acid;

(c) about 2–20% of a compression-enhancing vehicle;

(d) about 0.03–3.3% aspartame, and

(e) a nonionic surfactant including a block copolymer of propylene oxide and ethylene oxide; the block copolymer having an average molecular weight of about 2,000–4,000; wherein the amount of said nonionic surfactant is effective to prevent substantial film formation and foaming during solubilization of the calcium carbonate and the aspartame.

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4,783,332

NOVEL SKIN TANNING COMPOSITION

J. C. P. Schreuder, Van Reenenlaan, Netherlands, assignor to Chemisch Adviesbureau Drs. J.C.P. Schreuder B.V., Baarn, Netherlands

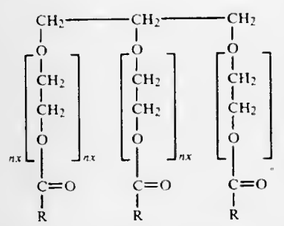
Filed Jun. 19, 1987, Ser. No. 64,331

Claims priority, application Netherlands, Jul. 7, 1986, 8601767

Int. Cl.[4] A61K *7/021, 7/42, 9/10*

U.S. Cl. 424—59 10 Claims

1. A skin tanning composition comprising (a) 5 to 50% by weight of an oil fraction of straight or branched paraffinic oils of 10 to 30 carbon atoms with a boiling range of 100° to 500° C. at atmospheric pressure and a viscosity of at most 35 centistokes at 25° C. containing 0 to 6% by weight of esters of saturated or unsaturated higher natural fatty acids and saturated or unsaturated natural aliphatic alcohols of up to 20 carbon atoms, (b) 1 to 10% by weight of an emulsifying system comprising (1) 1 to 10% by weight of mono and/or diglycerides of higher saturated or unsaturated natural fatty acids and (2) ethoxylated glycerides esterified with fatty acids of the formula



wherein n is an integer from 5 to 20 and the R's are individually a saturated or unsaturated fatty acid residue derived from animal or vegetable oils with a ratio of 10 to 100 parts by weight of (1) per part by weight of (2), (c) 1.0 to 5% by weight of a mixture of 2:1 to 1:3 of tyrosine or tyrosine precursor to panthenol, (d) sufficient alkali to maintain the pH of the aqueous phase at 4 to 7, (e), 0.2 to 4% by weight of a montmorillonite stabilizer with free oxygen sites occupied by quaternary groups, (f) 0.05 to 1.0% by weight of a preservative for the formed continuous oily phase and the dispersed aqueous phase and (g) water to make up 100% by weight, the weights being based on the weight of the entire composition.

4,783,333

COSMETIC CONTAINING COLOR PARTICLES

Clara Mercado, Aberdeen, and Debra Verdon, Leonardo, both of N.J., assignors to Charles of the Ritz Group, Ltd., New York, N.Y.

Continuation of Ser. No. 840,223, Mar. 17, 1986, abandoned. This application Jan. 27, 1988, Ser. No. 149,909

Int. Cl.[4] A61K *7/021, 31/74, 7/04*

U.S. Cl. 424—63 10 Claims

1. A stone eye shadow formulation prepared by the method which comprises providing color-coated titanated mica particles, mixing the color-coated titanated mica particles with a dry binder intermediate, coating particles of the above mixture with wet binder intermediate, adding feel enhancer to form color-coated pearls, sifting the color-coated pearls and mixing together color-coated pearls of different color and then pressing the so-formed color-coated pearls to form a contiguous solid body of eye shadow containing particles of color dispersed therein.

4,783,334

STABLE SOLID PREPARATION OF THIOL ESTER DERIVATIVE

Heiji Ikushima, Saitama, Japan, assignor to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

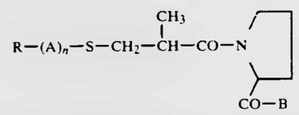
Filed Jan. 16, 1987, Ser. No. 4,144

Claims priority, application Japan, Jan. 21, 1986, 61-10706; Jun. 2, 1986, 61-125901

Int. Cl.[4] A61U *31/40, 31/79, 33/20*

U.S. Cl. 424—78 4 Claims

1. A stable solid thiol ester derivative preparation which contains as an active ingredient a therapeutically effective amount of thiol ester derivative of the formula I or a salt thereof:



[1]

wherein R is hydrogen or any acyl group; A is a residue of glycine, sacrosine or alpha-D-amino acid, the alpha-carbonyl group of which forms a thiol ester linkage with the sulfur atom; n is an integer 0 or 1;.and B is a hydroxyl group or an amino acid residue;

a water-soluble wax selected from the group consisting of a polyethylene glycol, a polyethylene propylene glycol, a polyethylene nonyl phenol ether and a polyoxyethylene higher alcohol ester in an amount of 1–50% by weight;

and a substance selected from the group consisting of sodium carboxymethyl starch, sodium chloride, potassium chloride, sodium bromide, lithium chloride and sodium nitrate, or mixtures thereof in an amount of at least 0.01% by weight.

4,783,335

CONTROLLED TOPICAL APPLICATION OF BIOACTIVE REAGENT

Harold M. Lipshitz, Carlisle, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 799,037, Nov. 18, 1985, abandoned. This application Sep. 5, 1986, Ser. No. 904,764

Int. Cl.[4] A01N *25/24;* A61K *31/78*

U.S. Cl. 424—407 27 Claims

1. A novel composition for applying a substantially water-insoluble bioactive reagent to the skins of animals, comprising an emulsion having a polymer containing said bioactive reagent, said polymer comprising particles which can agglomerate or coalesce upon evaporation of solvent for said emulsion, said polymeric particles being swellable upon contact with the skin oils of said animal, whereby said composition is adaptable for the controlled release of effective amounts of said bioactive reagent over an extended period of time.

4,783,336

POLYACROLEIN-TYPE MICROSPHERES

Shlomo Margel, and Uzi Beitler, both of Rehovot, Israel, assignors to Yeda Research and Development Company, Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 330,451, Dec. 14, 1981, Pat. No. 4,552,812. This application Sep. 4, 1985, Ser. No. 772,387

Claims priority, application Israel, Jul. 1, 1981, 63220

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] A61K *9/58;* B01J *13/02;* C08F *16/34;* C12N *11/08*

U.S. Cl. 424—462 13 Claims

1. A polyacrolein-type microsphere produced by subjecting an aqueous mixture of a polymerizable acrolein-type monomer to polymerization in the presence of an effective amount of a suitable ionic surfactant which promotes uniform microsphere formation upon polymerization of the monomer so as to form a polyacrolein-type microsphere, the polymerization being effected at a pH between 8.0 and 13.7, and recovering the resulting microsphere and purifying the microsphere so recovered, the microsphere having an aldehyde content of about 2.9 mmol/gram of microspheres, a double-bond content of about 10.9 mmol/gram of microspheres and a carboxyl content of about 0.34 mmol/gram of microspheres.



6. A polyacrolein-type microsphere of claim 1 to which a compound containing at least one primary amine group is bound.

7. A polyacrolein-type microsphere of claim 6, wherein the compound is a drug, antibody, antigen, enzyme or other protein.

4,783,337

OSMOTIC SYSTEM COMPRISING PLURALITY OF MEMBERS FOR DISPENSING DRUG

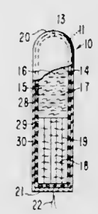
Patrick S.-L. Wong, Hayward; Brian L. Barclay, Sunnyvale; Joseph C. Oeters, Mountain View, and Felix Theeuwes, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 685,687, Dec. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 493,760, May 11, 1983, abandoned. This application Sep. 29, 1986, Ser. No. 912,712

The Portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] A61K *9/22;* A61M *31/00*

U.S. Cl. 424—468 79 Claims



1. An osmotic device for the oral administration at a controlled rate a beneficial angiotensin converting enzyme inhibitor to an enviromment of use, the osmotic device comprising:

(a) a wall comprising at least in part a composition permeable to the passage of an exterior fluid present in the environment of use, the wall surrounding and forming:

(b) a compartment;

(c) a first composition in the compartment, said first composition comprising a dosage amount of an angiotensin converting enzyme inhibitor and an osmopolymer that exhibits an osmotic pressure gradient across the wall aganist an external aqueous fluid, which osmopolymer imbibes and absorbs aqueous fluid that enters the compartment to form a dispensable composition comprising the angiotension converting enzyme inhibitor;

(d) a second composition in the compartment, said second composition comprising an osmopolymer that exhibits an osmotic pressure gradient across the wall against an external fluid; and,

(e) at least one passageway in the wall connecting the exterior of the device with the interior of the device for delivering the composition comprising the angiotensin converting enzyme inhibitor from the osmotic device.

4,783,338

METHOD OF PRODUCING FILLING MATERIAL-CONTAINING BREAD

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Japan

Continuation of Ser. No. 831,587, Feb. 21, 1986. This application Jan. 29, 1988, Ser. No. 149,921

Claims priority, application Japan, Feb. 24, 1985, 60-34847

Int. Cl.[4] A21D *13/00;* A21C *15/00*

U.S. Cl. 426—94 4 Claims

1. A method of producing filling material-containing bread, comprising forming a dough sheet comprising layers of dough and layers of fats and oils, cutting said dough sheet in desired dimensions, winding up said cut dough sheet, and baking the wound sheet, thereby preparing a loaf of multi-layered crust layers in a spiral form about an axis of the bread; said method further comprising the steps of inserting a pipe into said bread to make a bore along said axis, and introducing a filling material containing solid food into said bore of said bread through said pipe, thereby producing the filling material-containing bread.

4,783,339

PROCESS FOR MAKING INSTANT COOKING NOODLE PRODUCTS

Leonard W. Horner, Sewell, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Dec. 20, 1985, Ser. No. 811,284

Int. Cl.[4] A23P *1/14;* A23L *1/16*

U.S. Cl. 426—557 23 Claims

1. A method of producing non-fried oil-free instant cooking dry noodle products comprising:

(a) partially gelatinizing a noodle dough;

(b) forming said partially gelatinized noodle dough into discrete pieces of the desired shape having a moisture content less than about 23 wt % based on the weight of said pieces; and

(c) subjecting said pieces to fluidization in hot gases or to explosion puffing to suddenly expand the interior portions of said pieces and create a porous structure by vaporizing moisture therein, said expanded pieces having an alpha-conversion of less than about 80% of any starches present.

4,783,340

TWO-PACKAGE CO-SPRAYABLE FILM-FORMING SANITIZER

James A. McDonell, St. Paul, and Richard B. Greenwald, Eagan, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Apr. 29, 1987, Ser. No. 43,948

Int. Cl.[4] B05D *5/00, 1/02*

U.S. Cl. 427—2 20 Claims

1. A method of forming in situ a continuous sanitizing film on a surface, from a cosprayable two-package sanitizer composition, which method comprises the steps of

(i) forming a finely divided spray containing an antimicrobial quat solution and an acid polymer solution, wherein:

(a) said quat comprises a 0.01 to 10 wt-% aqueous solution of a quaternary ammonium salt compound; and

(b) said acid polymer solution comprises a 0.01 to 10 wt-% aqueous solution of a substantially neutralized acid functional polymeric compound; the sanitizing film having a ratio of quaternary ammonium salt to polymeric compound sufficient to effectively sanitize the treatment surface;

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(ii) depositing the spray upon the surface to be sanitized so as to form a sanitizing film; and

(iii) continuously exposing the film to the environment such that the film can provide prolonged sanitizing properties to the exposed surface.

4,783,341

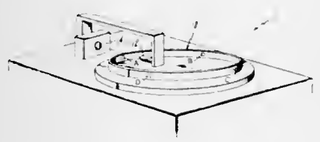
METHOD AND APPARATUS FOR MEASURING THE DENSITY AND HARDNESS OF POROUS PLASMA SPRAYED COATINGS

Louis L. Packer, Enfield, and Glenn T. Janowsky, Coventry, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 4, 1987, Ser. No. 45,341

Int. Cl.[4] B05D *1/10*

U.S. Cl. 427—8 **7 Claims**



1. A method for fabricating an annular component having a porous metal abradable seal thereon and for measuring the surface hardness of the seal, comprising the steps of rotating the component relative to a sprayed stream of metal and polymer powder particles, wherein the metal and polymer powder particles are deposited onto the surface of the component; heating the metal and polymer power deposit to remove the polymer particles therefrom to form a porous metal abradable seal; and prior to said heating step, measuring the surface hardness of the porous metal abradable seal using gamma radiation transmission techniques.

4,783,342

POLYMERIC FILM COATING METHOD FOR PROTECTING PLANTS, VEGETABLES AND FRUIT FROM DROUGHT

Walter Polovina, P.O. Box 06254, Fort Myers, Fla. 33906

Filed Jul. 31, 1987, Ser. No. 80,094

Int. Cl.[4] A01G *5/06*

U.S. Cl. 427—4 **21 Claims**

1. A method of preserving the life of a growing living plant, planted in soil or other growth media, comprising coating at least a portion of the growing, living plant with a non-phytotoxic film consisting essentially of an acrylic latex and from 1% to 45% by dry weight, based on dry weight of acrylic polymer, of a water soluble or dispersible polymer, the film having a moisture vapor transmission rate of from 5 grams per square meter per 24 hours to about 3000 grams per square meter per 24 hours.

4,783,343

METHOD FOR SUPPLYING METAL ORGANIC GAS AND AN APPARATUS FOR REALIZING SAME

Kazuo Sato, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 19, 1987, Ser. No. 52,241

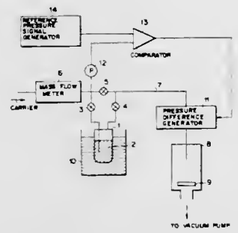
Claims priority, application Japan, May 21, 1986, 61-116913

Int. Cl.[4] C23C *16/52*

U.S. Cl. 427—8 **6 Claims**

4. In a reduced pressure gaseous phase thin film growth method, in which an organo-metallic compound gas is supplied from a carrier gas passed through a bubbler containing an organo-metallic compound and thereafter passed through a pressure difference generator to a reactor, the improvement wherein said method comprises;

the step of detecting the pressure within said bubbler; and



the step of controlling said pressure difference generator responsively to the value of the pressure thus detected, so that the pressure within said bubbler is kept constant.

4,783,344

PROCESS AND DEVICE FOR SPRAYING A REACTION MIXTURE CAPABLE OF FORMING A TRANSPARENT PROTECTIVE LAYER OF HIGH OPTICAL QUALITY

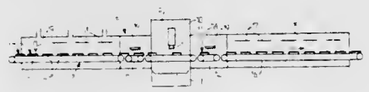
Jean-Louis Bravet, Thourotte; Francois Toytot, Thourotte; Gerd Leyens, Aachen; Siegfried Pikhardt, Roetgen, and Herbert Bayer, Aachen, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 729,572, May 2, 1985, abandoned. This application Jan. 2, 1987, Ser. No. 4,240

Claims priority, application France, May 2, 1984, 84 06783

Int. Cl.[4] B05D *1/04*

U.S. Cl. 427—31 **9 Claims**



1. A process for coating a transparent plastic article of high optical quality, which consists essentially of spraying a homogeneous polymerizable mixture of reaction components on a transparent plastic article to form a homogeneous coating layer of high optical quality, wherein the reaction components forming the mixture each have a different viscosity and are each supplied to bowl spray head, and the mixture thus formed is directly mixed in the bowl spray head, and wherein the mixture is sprayed by high-speed centrifugal spraying with the spray head revolving at a speed between about 1000 and 80,000 rpm, and polymerizing the resultant layer and wherein a pretreatment of the plastic article to be coated is effected, said pretreatment being a heat treatment comprising maintaining the plastic article at a temperature between about 60° C. and 120° C. for a period of about 10 minutes to about an hour.

4,783,345

METHOD FOR THE MANUFACTURE OF PREPREGS AND THEIR USE

Wolfgang Kleeberg, Erlangen; Heinz Hacker, Nuremberg; Jürgen Huber, Erlangen, and Dieter Wilhelm, Forchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,404

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1986, 3642778

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 **14 Claims**

1. A method for the manufacture of prepregs, comprising: impregnating a reinforcement material with a solution of an aromatic and/or heterocyclic polyepoxy resin and an aromatic polyamine as hardener in an organic solvent and subsequently drying at elevated temperature, the hardener being 1,3,5-tris(3-amino-4-alkylphenyl)-2,4,6-trioxohexahydrotriazine having 1 to 4 carbon atoms in the alkyl radical.

4,783,346

PROCESS FOR PREPARING COMPOSITE MEMBRANES

Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1987, Ser. No. 131,379

Int. Cl.[4] B01D *25/04, 29/40;* **B05D** *5/00*

U.S. Cl. 427—244 **7 Claims**

1. A process comprising applying a solution of 1 to 10 weight percent of an aromatic amine having 1 to 2 aromatic rings, containing 6 to 14 carbon atoms and having 2 to 3 amino groups in a first solvent to a microporous substrate, applying a solution of acyl chloride containing on average from 2.2 to 4 acyl chloride groups having aromatic rings, a cyclohexane ring, or mixtures thereof and containing from 8 to 16 carbon atoms in a solvent which is immiscible with said first solvent to said substrate for from 5 to 90 seconds; and applying a second different solution of acyl chloride having an average number of acyl chloride groups of from 2 to 4 attached to either an aromatic nucleus containing 6 to 14 carbon atoms, a cyclohexane nucleus, an alkylene group of 6 to 12 carbon atoms; or a bis-chloroformate; or mixtures thereof, for 1 to 120 seconds.

4,783,347

METHOD FOR PRIMERLESS COATING OF PLASTICS

James E. Doin, Hoosick Falls, and Howard A. Vaughn, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 326,197, Dec. 1, 1981, abandoned. This application Oct. 9, 1985, Ser. No. 786,170

Int. Cl.[4] B05D *3/02;* **B32B** *27/08, 27/36*

U.S. Cl. 427—379 **14 Claims**

4. A method for adhering a silicone resin coating composition to an unprimed plastic substrate, comprising:

(i) applying a silicone resin coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, wherein at least 70 weight percent of the silanol is $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, said composition further containing from 0.1 to 1.0 weight percent of a thickening agent, and said compositions having a pH of from 7.1 to 7.8, to the unprimed plastic substrate; and

(ii) shock curing said silicone resin coating composition on the substrate at a temperature not substantially below 140° C. and up to 150° C. for at least about ten minutes to promote adhesion of the silicone resin coating composition to the substrate.

5. The method of claim **4**, which includes the preliminary curing step of partially curing said silicone resin coating composition on said substrate at a temperature below 140° C.

4,783,348

METHOD AND APPARATUS FOR DEPOSITING MONOMOLECULAR LAYERS ON A SUBSTRATE

Otto Albrecht, Torrance; Meir Bartur, Los Angeles, and Vladimir Rodov, Redondo Beach, all of Calif., assignors to Daleco Research Development, Newport Beach, Calif.

Continuation-in-part of Ser. No. 06/815,512, Jan. 2, 1986, Pat. No. 4,722,856. This application Nov. 24, 1986, Ser. No. 934,426

Int. Cl.[4] B05D *1/18, 1/36, 7/00*

U.S. Cl. 427—402 **6 Claims**



6. A method for improving the quality of monomolecular layers of amphiphilic molecules deposited onto substrates, the method including:

continuously flowing uncontaminated liquid into a tank;

continuously spreading a solution of amphiphilic molecules onto the surface of the liquid in the tank;

continuously forming monomolecular layers on the surface of the liquid in the tank;

continuously introducing substrates into the tank after monomolecular layers are formed; and

regulating the flow and drain rate so that the liquid surface level in the tank is maintained constant.

4,783,349

PROCESS FOR MAKING FIBRE REINFORCED PRODUCTS

Frederic N. Cogswell, Guisborough; Geoffrey Cowen, Eaglescliff; Eric Nield, Guisborough, and Roger M. Turner, Whitby, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Feb. 19, 1985, Ser. No. 702,726

Claims priority, application United Kingdom, Mar. 6, 1984, 8405844

Int. Cl.[4] B05D *1/36, 1/18*

U.S. Cl. 427—407.3 **6 Claims**

1. A method of impregnating a fibrous structure, comprising continuous fibres with a polymer to provide a thermoformable fibre-reinforced composite comprising introducing the fibres into molten polymer to provide the polymer matrix of the composite chracaterised in that the filaments of the fibrous structure prior to introduction into the molten polymer are provided with a coating material selected from the group consisting essentially of:

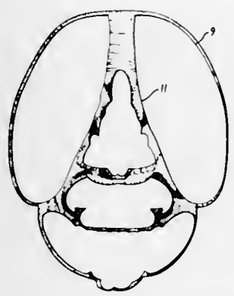
(a) a plasticiser which is capable of plasticising said impregnating polymer when the polymer is molten;

(b) a mixture of a plasticiser which is capable of plasticising the impregnating polymer and up to 20% by weight of the plasticiser of a polymer miscible with said plasticiser and which polymer may be the same or different from the impregnating polymer; and

(c) a coating resulting from coating the filaments with the composition of mixture (b) and removing the plasticiser to provide a polymer coated fibre.

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4,783,350
FULL FACE DECORATIVE APPLIQUE
Dawn DeMatteo, Lake Hiawatha, N.J., and David Mamberg, Scarsdale, N.Y., assignors to Cosrich, Incorporated, Perth Amboy, N.J.
Filed Jul. 20, 1987, Ser. No. 75,102
Int. Cl.[4] A41G 7/00; B41M 3/12
U.S. Cl. 428—16 3 Claims



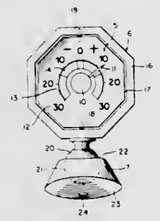
1. A full face decorative applique comprising:
a full face image preprinted on adhesive paper backed by easy release paper, precut and prescored into at least five separate facial area sections including at least two eye sections, a nose section, a lip section and a chin section interconnected by printed adhesive paper.

4,783,351
TREATED SUBSTRATES
Marion A. Baker, 18161 Windsor Ave., Orange, Calif. 92667
Filed Sep. 4, 1987, Ser. No. 93,796
Int. Cl.[4] A01N 3/00
U.S. Cl. 428—17 35 Claims

1. The process of obtaining preserved flower blooms and other natural predominantly carbohydrate products such as flower stems, leaves and vegetables which are free standing and have a natural fresh and/or esthetically attractive appearance maintained over prolonged periods which comprises removing most or substantially all of the water present in the substrate, and exposing the substantially dried substrate to a thermoplastic elastomeric polystyrene/polymonoolefin or polydiolefin block copolymer capable of forming non-chemically bonded links with itself, or a thermoplastic elastomeric polydiolefin or styrene-diolefin random copolymer capable of forming sparingly chemically links with itself and wherein said thermoplastic elastomeric polydiolefin or styrenediolefin random copolymer is springly cross linked.

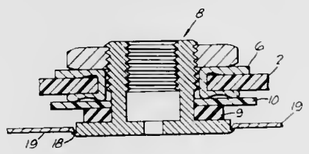
4,783,352
THERMOMETER HOOD ORNAMENT
Elmar Kaiser, Jr., 6 Route de Meyrin, CH-1202, Geneva, Switzerland
Filed Sep. 25, 1987, Ser. No. 100,898
Claims priority, application World Int. Prop. O., Sep. 29, 1986, 007 540; France, Mar. 11, 1987, 87 03592
Int. Cl.[4] B60R 13/04
U.S. Cl. 428—31 9 Claims

1. A thermometer for showing the driver of an automobile the outside temperature, said thermometer comprising:
a case including measuring means for measuring air-temperature and a temperature dial display,
a support including a frame surrounding said case and a pedestal located below said frame,
means for supporting and separating said case from said frame to form a gap for permitting passage of air therebetween and to impede transmission of heat between said frame and said case, said means pivotably mounting said case with respect to said frame for rotation of said case, and
fastening means for fastening said case onto the exterior of a



hood of an automobile, said fastening means including a base having a flat lowermost surface equipped to be fastened onto the exterior of the automobile, and said pedestal being movably mounted on said base so that said temperature dial display is movable to an erect position with respect to said lower surface and for movement to prevent damage in the event of a shock.

4,783,353
RECOVERABLE ARTICLE
Erwin De Bruycker, Linden; Henri Van Emelen, Kessel-lo, and Robert Vanhentenrijk, Winksele - Herent, all of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.
Filed Apr. 29, 1987, Ser. No. 43,794
Claims priority, application United Kingdom, Apr. 29, 1986, 8610486
Int. Cl.[4] H02G 15/18; B32B 3/10
U.S. Cl. 428—34.9 6 Claims



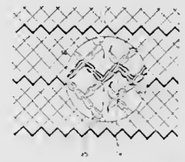
1. A cover suitable for enclosing a substrate, comprising:
(i) a recoverable fabric which has a recovery ratio of at least 2:1 and which contains an aperture; and
(ii) a clamping member comprising a rivet which is to be secured around the edge of the aperture to prevent pull-out of the fabric fibers on recovery of the fabric.

4,783,354
ADHERABLE, YET REMOVABLE SHEET MATERIAL
Joseph P. Fagan, Holmdel, N.J., assignor to Coated Sales, Inc., Laurence Harbor, N.J.
Filed Dec. 15, 1986, Ser. No. 941,398
Int. Cl.[4] A61F 13/02; C09U 7/02; C09J 7/02
U.S. Cl. 428—40 15 Claims

1. An adherable, yet removable sheet material which comprises a base sheet coated on its inner surface with a modified adhesive comprised of a pressure sensitive adhesive and wax, wherein the wax and pressure sensitive adhesive are used in relative amounts effective to maintain the adherable, yet removable nature of the sheet material over an extended period of time, the weight ratio of pressure sensitive adhesive to wax

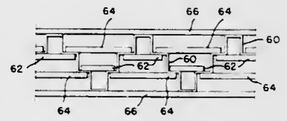
ranges from about 10:1 to about 30:1, and wherein the modified adhesive has been dried and/or cured as required to render the adhesive adherably viscous.

4,783,355
TEXTILE WEB MADE OF WOVEN OR KNITTED FABRIC
Peter Mueller, Richard-Wagner Str. 2, D- 5276 Wiehl, Fed. Rep. of Germany
Filed Feb. 28, 1986, Ser. No. 834,714
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3508864
Int. Cl.[4] B65D 65/28
U.S. Cl. 428—43 2 Claims



1. A web of partially ready-made or fully ready-made garments consisting of woven or knitted threads,
said garments separated from each other by an integral web section made at least in part of bi-component fibers,
said fibers having a portion which remains intact under localized heat, and a portion which disintegrates under said localized heat,
said web remaining intact but weakened when one portion of said fiber is disintegrated by heat.

4,783,356
VACUUM-TYPE INSULATION ARTICLE HAVING AN ELASTIC OUTER MEMBER AND A METHOD OF MANUFACTURING THE SAME
Franz J. Kugelmann, Sr., Juneau, Ak., assignor to Nudvuck Enterprises, Juneau, Ak.
Filed Mar. 20, 1986, Ser. No. 841,855
Int. Cl.[4] B32B 1/04, 3/02
U.S. Cl. 428—69 1 Claim

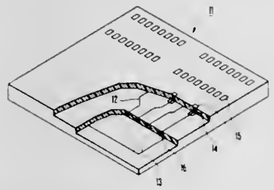


1. An article of insulation, comprising:
a base element comprising a relatively rigid, deformable, elastic material having a cross-sectional configuration which defines successive peaks and valleys; and
at least two outer elements on each side of the base element, wherein at least one of the outer elements on each side is an outermost outer element and wherein the outer elements other than the outermost outer elements are positioned between the outermost outer elements and the base element, wherein the outer elements positioned between the base element and the outermost outer elements are segmented and arranged in a selected manner such that there is contact between the base element and the outermost outer elements, as well as contact between the base element and the remaining outer elements, said outer elements secured to the base element in such a manner as to define unbonded areas on the base element and the outer elements, the outer elements comprising a deformable elastic material, wherein the article is further characterized by a partial vacuum in the voids defined by adjacent peaks of said base element and said outer element.

4,783,357
SYNTHETIC RESIN PLATE COMPRISING A COEXTRUDED SYNTHETIC RESIN FOAM LAYER
Frits A. van Dijk, Putte, Netherlands, and Henri M. A. Verhaert, Poederlee, Belgium, assignors to General Electric Company, Pittsfield, Mass.
Filed Apr. 20, 1987, Ser. No. 40,016
Claims priority, application Netherlands, May 13, 1986, 8601196
Int. Cl.[4] B32B 3/00; B29C 47/00
U.S. Cl. 428—119 6 Claims

1. A synthetic resin plate built up from at least two synthetic resin layers one of which (the main layer) comprises continuous hollow ducts, characterized in that the second layer is built up from a synthetic resin foam layer coextruded with the main layer.

4,783,358
CERAMIC WIRING SUBSTRATE
Teruyuki Ikeda, and Kazuaki Utsumi, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Feb. 10, 1987, Ser. No. 13,018
Claims priority, application Japan, Feb. 14, 1986, 61-31184
Int. Cl.[4] B32B 3/10, 3/00
U.S. Cl. 428—138 5 Claims



1. A ceramic wiring substrate comprising:
a first layer having an electrode formed across an entire upper surface thereof;
a plurality of layers sequentially stacked on said electrode;
a plurality of signal lines formed on an upper surface of an uppermost one of said plurality of layers;
an insulating layer formed on the upper surface of said uppermost layer and said plurality of signal lines;
a plurality of pads formed on an upper surface of said insulating layer, said plurality of pads being connected to said plurality of signal lines via a plurality of through holes formed in said insulating layer;
a plurality of cavities formed between each of said plurality of signal lines and said electrode so as to be stacked in a vertical direction, each of said plurality of cavities extending along an entire length of the corresponding one of said plurality of signal lines and having a width in a horizontal direction which is greater than the width of said signal line.

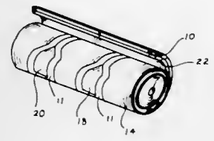
4,783,359
ELECTRONIC SIGNAL TIME DEALY DEVICE AND METHOD OF MAKING THE SAME
Cathy A. Fleischer, Thompson, and Richard T. Traskos, Brooklyn, both of Conn., assignors to Rogers Corporation, Rogers, Conn.
Filed Nov. 18, 1986, Ser. No. 932,180
Int. Cl.[4] B32B 3/00; H05K 1/00; H02H 5/04
U.S. Cl. 428—209 15 Claims

1. An electronic signal time delay device for use in a circuit pattern comprising:

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coplanar flexible circuit means, said flexible circuit means including a nonconductive polymeric substrate having opposed surfaces, said substrate including electrically conductive material disposed on one of said opposed surfaces;

said conductive material comprising a ground plane with a signal line therein, said signal line being separated from said ground plane via a gap on both sides of said signal line;



a bonding layer disposed on at least one of said opposed surfaces, said bonding layer comprising a polymeric material having a softening temperature which is less than the softening tempurature of said polymeric substrate;

said coplanar flexible circuit means and bonding layer having a longitudinal dimension and being rolled along said longitudinal dimension; and

said bonded layer being heated above its softening temperature but below the softening temperature of said substrate wherein said bonding layer will flow to thereby seal and bond said rolled coplanar flexible circuit means together.

4,783,360

THERMAL TRANSFER MATERIAL

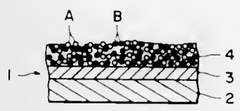
Masato Katayama; Kazumi Tanaka, both of Yokohama, and Hiroshi Sato, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1986, Ser. No. 885,657

Claims priority, application Japan, Jul. 22, 1985, 60-160326; Jul. 22, 1985, 60-160327; Jul. 22, 1985, 60-160328; Jul. 23, 1985, 60-161050; Jul. 23, 1985, 60-161051; Jul. 23, 1985, 60-161052; Sep. 2, 1985, 191847

Int. Cl.[4] **B41M** *5/26*

U.S. Cl. 428—212 **11 Claims**



1. A thermal transfer material, comprising:

a support and a first ink layer and a second ink layer, said ink layers disposed on the support in the order named, each of said first and second ink layers containing a heat-fusible material, wherein said second ink layer comprises domains of at least two species of heat-fusible material in the form of particles.

4,783,361

COATED LENSES

Stanford R. Ovshinsky, Bloomfield Hills, and James D. Flasck, Rochester, both of Mich., assignors to Ovonic Synthetic Materials Company, Inc., Troy, Mich.

Continuation of Ser. No. 774,315, Sep. 10, 1985, abandoned, Continuation-in-part of Ser. No. 649,324, Sep. 10, 1984, Pat. No. 4,663,183. This application Feb. 24, 1988, Ser. No. 163,135

Int. Cl.[4] **G02B** *1/10, 1/12, 5/22;* **G02C** *7/10*

U.S. Cl. 428—217 **25 Claims**

1. A coated lens comprising:

an optical substrate; and

a wear, scratch and abrasion resistant, hard, transparent solid coating over at least a portion of the optical substrate, said coating consisting essentially of carbon and hydrogen and being substantially transparent to electromagnetic radiation in the red to blue spectrum, said coating being capable of filtering electromagnetic radiation in the range of ultraviolet to about 450 nanometers, said coating having a composition on an atomic basis in the range of from about 40–95% carbon and 5–60% hydrogen.

4,783,362

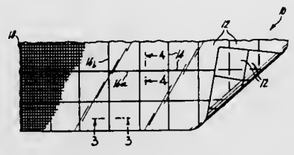
PEEL PLY MATERIAL

Peter B. Thornton, Bronxville; Stanley H. Cone, and George W. Booz, both of Hornell, all of N.Y., assignors to Stern & Stern Industries, Inc., New York, N.Y.

Filed Sep. 30, 1987, Ser. No. 103,226

Int. Cl.[4] **D03D** *13/00*

U.S. Cl. 428—224 **17 Claims**



1. A peel ply material of high visual discernibility for use during curing of a resin-coated substrate comprising:

(A) a base fabric characterized by a high level of wet out when disposed on a cured resin-coated substrate; and

(B) tracers of a color affording high visual discernibility against the cured resin-coated substrate woven into said base fabric in spaced lines comprising yarn characterized by (a) a low level of wet out, (b) substantially the same heat shrinkage properties as said fabric, and (c) a substantaillly zero transfer level to the resin-coated substrate.

4,783,363

CURABLE COMPOSITIONS CONTAINING A POLYEPOXIDE AND A HALOGENATED BISPHENOL

Jody R. Berman, Lake Jackson, Tex., and Abel Mendoza, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 911,267, Sep. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 832,428, Feb. 24, 1986, abandoned. This application Mar. 11, 1987, Ser. No. 24,651

The portion of the term of this patent subsequent to Aug. 2, 2003, has been disclaimed.

Int. Cl.[4] **B05D** *3/00;* **C08G** *65/08*

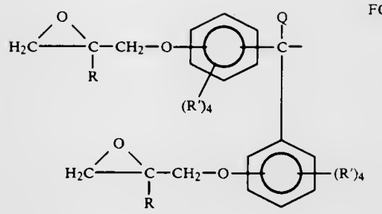
U.S. Cl. 428—285 **39 Claims**

1. In a composition comprising

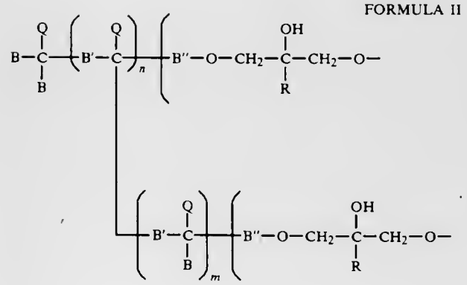
(A) at least one of

(1) at least one epoxy resin represented by the following formulas I, II, III, IV, V or VI

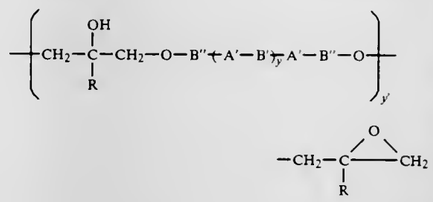
FORMULA I



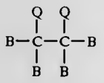
FORMULA II



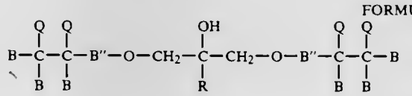
FORMULA III



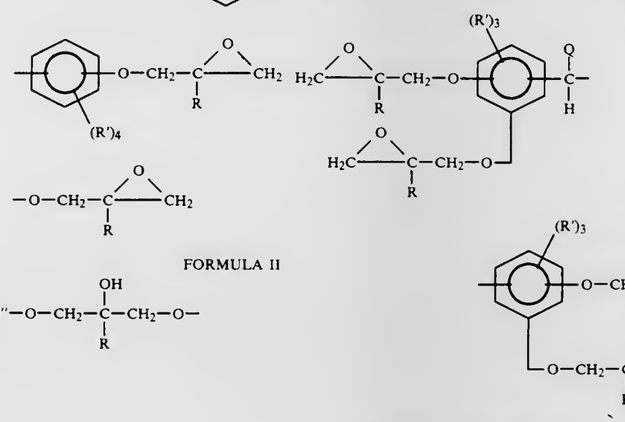
FORMULA IV



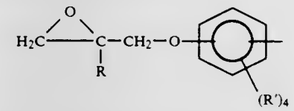
FORMULA V



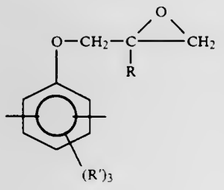
FORMULA VI



wherein each A′ is independently a divalent hydrocarbyl group having from 1 to about 12 carbon atoms, —S—, —S—S—, —SO—, —SO$_2$—, —CO— or —O—; each B is represented by the formula

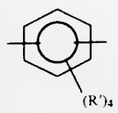


each B′ is represented by the formula



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each B'' is represented by the formula



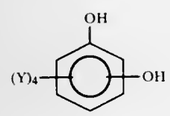
each R is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each Q is independently hydrogen or a hydrocarbyl group having from 1 to about 10 carbon atoms; each R' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms or a halogen; m has a value of n − 1; m' has a value of n' − 1; m'' has a value of n'' − 1; each n, n' and n'' independently has a value from zero to about 3; q has a value from zero to about 4; each y independently has an average value from 1 to about 5; y' has an average value of from zero to about 3 and each z and z' independently has a value from zero to about 3;

(2) the reaction product of

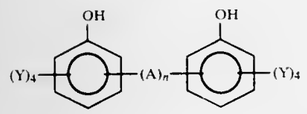
(a) at least one epoxy resin as defined in component (A-1) and

(b) at least one dihydric phenol represented by the following formulas VII, VIII or IX

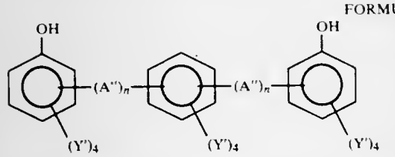
FORMULA VII



FORMULA VIII



FORMULA (IX)

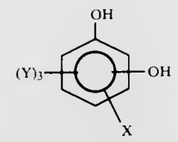


wherein A is a divalent hydrocarbon group having from 1 to about 12 carbon atoms, —O—, —S—, —S—S—, —SO—, $—SO_2—$, or —CO—; each A'' is independently a divalent hydrocarbon atom having from 1 to about 6 carbon atoms; each Y is independently hydrogen, a halogen or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; each Y' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10, preferably from 1 to about 4 carbon atoms, a halogen atom or a hydroxyl group; each n has a value of 0 or 1; and wherein components (A-2-a) and (A-2-b) are present in quantities such that the ratio of phenolic hydroxyl groups to epoxide groups is from about 0.01:1 to about 0.5:1; or

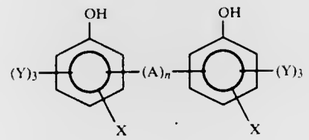
(3) mixtures thereof;

(B) at least one halogenated dihydric phenol represented by the following formulas X, XI or XII

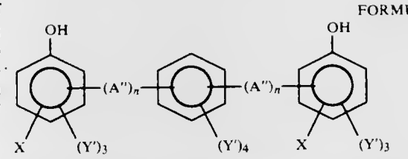
FORMULA X



FORMULA XI



FORMULA XII



wherein A, Y, Y' and n are as defined above; each X is a halogen; and with the proviso that at least one X or Y in formula XI and at least one X or Y' in formula XII is a halogen

wherein components (A) and (B) are present in quantities such that the ratio of phenolic hydroxyl groups to epoxide groups is from about 0.7:1 to about 1.1:1; the improvement which comprises employing as at least a portion of component (B) a halogenated dihydric phenol wherein at least about 5 weight percent of the halogen atoms present in component (B) are in the meta position with respect to the hydroxyl groups.

4,783,364

POLYESTER FIBERFILL AND PROCESS

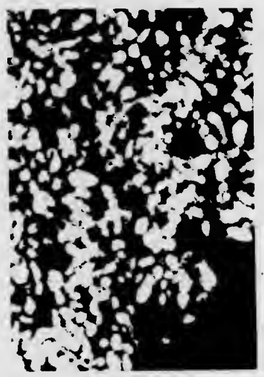
Marcus Ilan, Versoix, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 734,423, May 15, 1985, Pat. No. 4,618,531. This application Oct. 21, 1986, Ser. No. 921,661

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—288 **19 Claims**



1. Refluffable fiberballs of average dimension 1 to 15 mm, consisting essentially of randomly-arranged, entangled, Ω-crimped polyester fiberfill having a cut length of about 10 to about 60 mm, and having a cohesion measurement as defined of less than 6 Newtons (N).

4,783,365

MICA PRODUCT

Dennis J. Sklarski, Deerfield, and Arthur F. Doyle, Portsmouth, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 935,364, Nov. 26, 1986, abandoned, which is a division of Ser. No. 849,936, Apr. 9, 1986, Pat. No. 4,683,162. This application Nov. 20, 1987, Ser. No. 124,350

Int. Cl.[4] B32B *31/26*

U.S. Cl. 156—307.7 **2 Claims**

1. A method of making a flexible mica insulation comprising: individually impregnating at least one mica paper with about 5 percent to about 25 percent by weight of a flexible polysiloxane binder containing about 1 percent to about 4 percent by weight of a monoalkoxy or a neoalkoxy titanate and about 0.5 percent to about 2 percent by weight of a naphthenate based on polymer solids in an aromatic solvent, removing the solvent, densifying the impregnated paper and B-staging the resin binder under heat and pressure.

4,783,366

SHOCK ABSORBING MATERIAL

Kenzo Shimogo; Osamu Kito, both of Toyota, and Atsunobu Fujikawa, Okazaki, Samu Sano; Haruhisa Suswkia both of Toyota. Hiroshi Toriij, Hekinan; Haruji Shibata, Okazaki, all of Japan, assignors to Aisin Kako Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Toyota, Japan

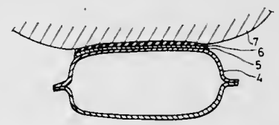
PCT No. PCT/JP85/00598, § 371 Date Jun. 27, 1986, § 102(e) Date Jun. 27, 1986, PCT Pub. No. WO86/02657, PCT Pub. Date May 9, 1986

PCT Filed Oct. 29, 1985, Ser. No. 882,940

Claims priority, application Japan, Oct. 30, 1984, 59-164521

Int. Cl.[4] B32B *3/36;* C08L *21/00;* B05D *1/02*

U.S. Cl. 428—315.5 **7 Claims**



1. A thermoplastic shock absorbing material placed between two objects for buffering impact shocks, wherein the shock absorbing material is joined to at least one surface of the two objects by fusion thereto, and which consists essentially of:

(a) from about 10–60 parts by weight of one or more uncured viscous polymeric materials selected from the group consisting of styrene-butadiene rubber, butyl rubber, nitrile rubber, chloroprene rubber, natural rubber, and a diene block polymer;

(b) from about 10–50 parts by weight of one or more softening agents selected from the group consisting of vegetable oil, fatty oil, petroleum oil, coal tar and synthetic resins; and

(c) from about 10–60 parts by weight of one or more tackifiers selected from the group consisting of xylene resin, phenol resin, cumarone resin, hydrogenated rosin ester, terpene resin, polyisobutylene and polymeric was.

4,783,367

FIBERS AND YARNS FROM A BLEND OF AROMATIC POLYAMIDES

Hendrik Maatman, Arnhem; Bernardus M. Koenders, Westervoort, and Franciscus A. M. Schenkels, Dieren, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Apr. 27, 1987, Ser. No. 42,785

Claims priority, application Netherlands, May 6, 1986, 8601159

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—364 **5 Claims**

1. Fibers consisting essentially of a blend of poly-p-phenylene terephthalamide and another aromatic polyamide, wherein the other polyamide is a copolyamide derived from p-phenylene diamine, terephthalic acid and at least one other monomer selected from the group consisting of naphthalene dicarboxylic acids and naphthalene diamines having the acid and amine groups separated by at least two substitutable carbon atoms in the naphthalene nucleus, the blend containing 2 to 50% by weight of the copolyamide.

4,783,368

HIGH HEAT CONDUCTIVE INSULATED SUBSTRATE AND METHOD OF MANUFACTURING THE SAME

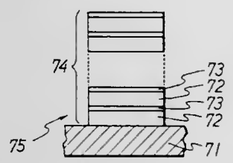
Kenji Yamamoto; Takehisa Nakayama, and Yoshihisa Tawada, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 5, 1986, Ser. No. 927,211

Claims priority, application Japan, Nov. 6, 1985, 60-249534; Dec. 26, 1985, 60-295434; Jan. 22, 1986, 61-11647; Mar. 31, 1986, 61-75310; Apr. 7, 1986, 61-79875

Int. Cl.[4] B32B *9/04, 7/00*

U.S. Cl. 428—408 **61 Claims**



1. An insulated substrate having high thermal conductivity, comprising a metal substrate having a heat conductivity of not less than 50 W/m.k., and at least one insulating layer having a high thermal conductivity coated on the substrate, wherein said insulating layer has a thermal conductivity of not less than 50 W/m.k. and is selected from the group consisting of hard carbon material containing 0.01 to 20 atomic % of at least one element of group IVA deposited on the metal substrate by a plasma method or ion deposition method.

4,783,369

HEAT-GENERATING RESISTOR AND HEAT-GENERATING RESISTANCE ELEMENT USING SAME

Masao Sugata, Yokohama, Japan; Tatsuo Masaki, deceased, late of Yokohama, Japan (by Yoshiko Masaki, legal representative); Hirokazu Komuro; Shinichi Hirasawa, both of Hiratsuka, and Yasuhiro Yano, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1986, Ser. No. 842,118

Claims priority, application Japan, Mar. 23, 1985, 60-58842; Mar. 25, 1985, 60-58523; Mar. 25, 1985, 60-58524; Mar. 25, 1985, 60-58525; Mar. 25, 1985, 60-58526; Mar. 26, 1985, 60-59384; Mar. 26, 1985, 60-59385; Mar. 26, 1985, 60-59386; Mar. 26, 1985, 60-59387; Mar. 27, 1985, 60-60534

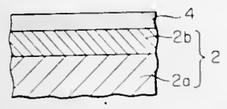
Int. Cl.[4] B32B *9/00;* H01C *1/012;* H05B *3/10*

U.S. Cl. 428—408 **29 Claims**

1. A heat-generating resistor, having a functional thin film

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comprising an amorphous material containing halogen atoms and hydrogen atoms in a matrix of carbon atoms formed on a



substrate, wherein said halogen atoms and/or hydrogen atoms are distributed nonuniformly in the film thickness direction in said functional thin film.

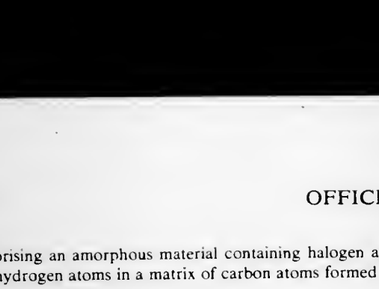
4,783,370

RECORDING MEDIA CONTAINING ALKYL ACRYLATE COPOLYMERS

John G. Chernega, Stillwater; John A. Martens, North Oaks; Roger A. Olsen, Woodbury, and Auburn B. Cottinham, deceased, late of Lake Elmo, all of Minn. (by Sue Ellen Cottingham, administrator), assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 28, 1986, Ser. No. 868,134
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—425.9 **9 Claims**

1. A magnetic recording medium comprising a substrate coated with a magnetizable pigment dispersed in a binder wherein the binder comprises a cured polymer derived from an electron beam curable polymer of at least one hydroxy functional alkyl acrylate and at least one polyvinyl chloride having the formula

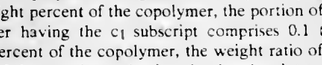


wherein

the portion of the copolymer having the a subscript comprises 50 to 97 weight percent of the copolymer, the portion of the copolymer having the b subscript comprises 0 to 30 weight percent of the copolymer, the portion of the copolymer having the c_1 subscript comprises 0.1 to 7 weight percent of the copolymer, the weight ratio of the portion of the copolymer having the d_1 subscript to the portion having the c_1 subscript is from 0.2 to 4.0,

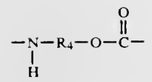
R_1 is an alkyl group selected from $-CH_3$ and $(CH_2)_{n1}CH_3$ wherein n1 = 1-10,

R_2 is an alkylene group selected from $(CH_2)_{n1}$ and

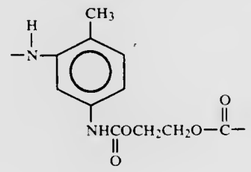


wherein n2 = 1-4 and n3 = 0-4,

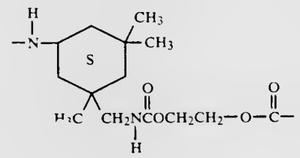
R_3 is selected from the group consisting of —H, $-CH_3$ and $(CH_2)_{n4}CH_3$, wherein n4 = 0-4, n5 = 0 or 1, and X is a linking group which is stable under electron beam irradiation and is selected from the group consisting of



wherein R_4 is selected from the group consisting of alkylene moieties having 1-6 carbon atoms and cycloalkylene moieties having 5-8 carbon atoms:



and

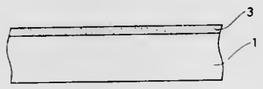


4,783,371

PHOTOMASK MATERIAL

Yaichiro Watakabe, and Shuichi Matsuda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,356
Claims priority, application Japan, Aug. 30, 1985, 60-192814
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—432 **11 Claims**



1. A photomask material suitable for use in manufacturing a semiconductor device, comprising:

a transparent substrate; and

a silicide film of oxidized transition metal formed on said transparent substrate.

4,783,372

HOMOPOLYMERS, COPOLYMERS AND COATED MATERIAL AND ITS USE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 732,334, May 10, 1985, Pat. No. 4,680,195. This application Apr. 22, 1987, Ser. No. 41,889
Claims priority, application Switzerland, May 17, 1984, 2417/84
Int. Cl.[4] C08G *73/10*
U.S. Cl. 428—435 **6 Claims**

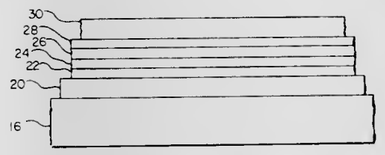
1. A photocrosslinkable polymer, soluble in polar organic solvents, which comprises a homoplyimide or a copolyimide containing 5 to 100 mole % of structural elements of formula I, formula II or a mixture thereof

4,783,373

ARTICLE WITH THIN FILM COATING HAVING AN ENHANCED EMISSIVITY AND REDUCED ABSORPTION OF RADIANT ENERGY

Philip W. Baumeister, Loomis, and Matthew E. Krisl, Santa Rose, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Apr. 18, 1986, Ser. No. 853,567
Int. Cl.[4] B32B *9/04, 17/06;* **G02B** *5/22;* **H01L** *31/00*
U.S. Cl. 428—446 **22 Claims**



1. An article for use in enhancing emissivity of a solar cell comprising:

a substrate having a predetermined reststrahlen band which exhibits a peak of reflectance of substantially over 40%;

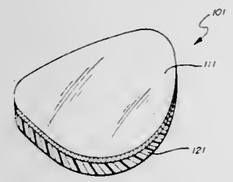
a coating formed as a single layer on said substrate, said single layer comprising at least two materials that are coevaporated in a vacuum chamber in a predetermined ratio so that the reststrahlen reflection of the individual materials is reduced while retaining substantial transparency across the solar spectrum, said layer having a predetermined thickness and serving to reduce the reflectance of the substrate so that it is substantially below 40% reststrahlen band, so that emissivity of said substrate is effectively enhanced.

4,783,374

COATED ARTICLE AND METHOD OF MANUFACTURING THE ARTICLE

Russell C. Custer, Clawson; Arnold Register, Lake Orion; Annette Johncock, Highland; Stephen J. Hudgens, Southfield; Robert Burkhardt, Sterling Heights, and Kevin Dean, Pontiac, all of Mich., assignors to Ovonic Synthetic Materials Company, Troy, Mich.

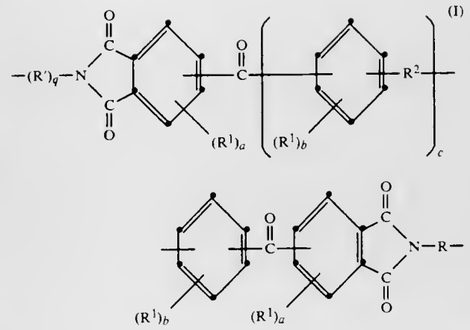
Filed Nov. 16, 1987, Ser. No. 121,019
Int. Cl.[4] B05D *3/06;* **B32B** *7/16*
U.S. Cl. 428—447 **14 Claims**



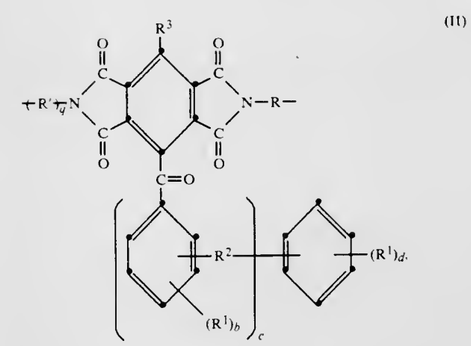
1. A coated article comprising:

(a) a substrate; and

(b) an adherent, abrasion resistant transparent coating thereon substantially amorphous and consisting essentially of a plasma assisted chemical vapor deposition deposited alkene-silane plasma reaction product of a silane, an alkene, and an oxygen source.

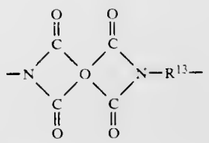


(I)



(II)

in which R^1 is halogen, nitro or C_1-C_6-alkyl, C_1-C_6-alkoxy or C_1-C_6-alkylthio, each of which can be substituted by phenyl, or is phenyl, phenoxy or phenylthio, R^2 is a direct bond, —O—, —S—, $-CH_2-$, ethylidene, 2,2-propylidene or —CO—, R^3 is a hydrogen atom or aroyl or is as defined for R^1, a is 0, 1, 2 or 3, b is 0, 1, 2, 3 or 4, c and d are 0, 1, 2, 3, 4 or 5 and q is 0 and R is an aromatic radical which is substituted in the two ortho-positions relative to at least one N atom by alkyl, cycloalkyl, alkoxy, alkoxyalkyl, alkylthio, alkylthioalkyl or aralkyl, or two adjacent C atoms of the aromatic radical are substituted by alkylene, and containing 0 to 95 mole % of structural elements of the formula III



(III)

in which Q is a tetravalent organic radical and R^{13} is a divalent organic radical and R^{13} is as defined for R.

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4,783,375

HEAT-SENSITIVE RECORDING MATERIAL

Ken Hashimoto, and Torigoe, Nobuyuki, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 855,283, Apr. 24, 1986. This application Jul. 11, 1986, Ser. No. 884,581
Claims priority, application Japan, Jul. 11, 1985, 60-151231; Jul. 11, 1985, 60-151232
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—480 15 Claims

1. A heat-sensitive hot-melt transfer image recording material comprising a support and a transfer layer which comprises an amorphous polyester having a glass transition temperature of from about 50° C. to 80° C. and a number average molecular weight of not more than about 5,000 and a weight average molecular weight of not more than about 10,000 and a coloring material as main components, said amorphous polyester being present in an amount of at least 50% by volume based on solid components of the transfer layer.

4,783,376

LIGHT-TRANSMISSIVE RECORDING MEDIUM AND IMAGE FORMATION METHOD USING THE SAME

Mamoru Sakaki; Ryuichi Arai, both of Sagamihara; Kenji Hasegawa, Isehara; Takahiro Mori, Ebina; Takashi Akiya, Yokohama; Hidemasa Mouri, Yokohama; Michiaki Tobita, Yokohama, and Masahiko Ishida, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,726
Claims priority, application Japan, Dec. 18, 1985, 60-285284; Apr. 3, 1986, 61-75457
Int. Cl.[4] G01D *15/34;* B32B *5/16*
U.S. Cl. 428—511 30 Claims

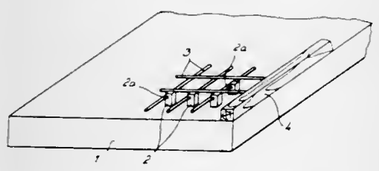
1. A light-transmissive recording medium, comprising a coating layer which contains a modified product of a water-soluble polymer having been made water-insoluble and has a surface electric resistance of not more than $10^{14}\Omega/cm^2$, and has a water resisting property and a property of trapping a recording agent which is soluble and/or dispersible in a water-based medium.

4,783,377

TUNDISH LID

Hermann Kreth, Wiener Neustadt, Austria, assignor to Fa.Dipl.-Ing.Bela Tisza & Co. vormals Muhlen-Industries fur Zerkleinerung und Aufbereitung Gesellschaft mbH, Vienna, Austria

Filed Apr. 2, 1979, Ser. No. 26,017
Claims priority, application Austria, Apr. 4, 1978, 2371/78
Int. Cl.[4] B21D *39/00;* C21B *7/22*
U.S. Cl. 428—594 7 Claims



1. A tundish lid, comprising a baseplate, a lattice positively held in spaced relation from a surface of said baseplate, and a refractory insulating layer which is disposed on said surface and within which said lattice is embedded.

4,783,378

STEEL SHEETS FOR DRAWING AND IRONING WORKED CANS

Tsuneyoshi Wakui; Takeo Ohnishi; Yuji Shimoyama, and Toshio Akizuki, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jun. 23, 1987, Ser. No. 65,561
Claims priority, application Japan, Jun. 30, 1986, 61-153287
Int. Cl.[4] B21D *53/00*
U.S. Cl. 428—600 1 Claim



1. A steel sheet for drawing and ironing worked cans, characterized in that a center-line average surface roughness Ra of said steel sheet is within a range of 0.1～4.0 μm, and a microscopic shape constituting said surface roughness is comprised of trapezoidal mountain portions having a flat top surface, groove-like valley portions formed so as to surround a whole or a part of the mountain portion and middle flat portions formed between the mountain portions outside the valley portion so as to be higher than the bottom of the valley portion and lower than or equal to the top surface of the mountain portion and satisfies the following relations:

$$1.0 \leqq Sm/D \leqq 1.7$$

$$30 \leqq d \leqq 500\ (\mu m)$$

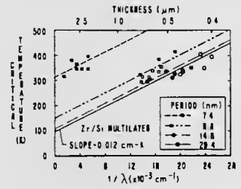
, wherein Sm is a mean center distance between the adjoining mountain portions, D is a mean diameter in the outer periphery of the valley portion and d is a mean diameter in the flat top surface of the mountain portion.

4,783,379

EXPLOSIVE CRYSTALLIZATION IN METAL/SILICON MULTILAYER FILM

Charles E. Wickersham, Columbus, and John E. Poole, Grove City, both of Ohio, assignors to Tosoh SMD, Inc., Grove City, Ohio

Filed Apr. 17, 1987, Ser. No. 40,455
Int. Cl.[4] H01L *21/40, 21/90;* C23C *11/04*
U.S. Cl. 428—607 11 Claims



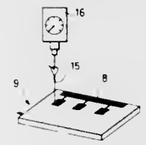
1. A film capable of undergoing explosive crystallization when subjected to an energy impulse at a temperature equal to or greater than its critical temperature for explosive crystallization said film comprising a plurality of alternate layers of amorphous silicon and a metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, iron, cobalt, nickel, ruthenium, rhodium, lead, osmium, iridium, and platinum, said film having a multilayer period of about 5 to 30 nm and having a critical temperature for explosive crystallization of from about 25° to 125° C.

4,783,380

METALLIZING COMPOSITION ON ALUMINA PORCELAIN

Yukito Nakayama; Masaaki Ito, and Minato Ando, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Japan

Filed Sep. 4, 1987, Ser. No. 93,289
Claims priority, application Japan, Sep. 5, 1986, 61-209214
Int. Cl.[4] H01B *1/06*
U.S. Cl. 428—702 3 Claims



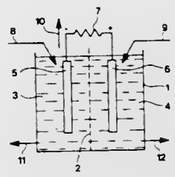
1. A metallizing composition consisting of 100 parts by weight of tungsten as a main component, from 2 to 12 parts by weight of Al_2O_3, from 0.1 to 0.8 part by weight of Ta_2O_5, from 0.3 to 1.5 parts by weight of SiO_2, and from 0.1 to 0.5 part by weight in total of CaO and MgO as an additive.

4,783,381

PROCESS FOR THE PRODUCTION OF ELECTRICITY IN A FUEL CELL, AND FUEL CELL

Daniel Tytgat, Brussels; Marianne Reignier, Nivelles, and Francois Dujardin, Brussels, all of Belgium, assignors to Interox (Société Anonyme), Brussels, Belgium

Filed Jul. 9, 1987, Ser. No. 71,494
Claims priority, application France, Jul. 9, 1986, 86 10144
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—15 12 Claims



1. Process for the production of electricity according to which a fuel and an oxidising agent are introduced into a fuel cell respectively at the interface of an anode and an alkaline anolyte of the cell and at the interface of a cathode and an acid catholyte isolated from the alkaline anolyte by a separator which is permeable to ions, characterised in that hydrogen peroxide is used as the fuel.

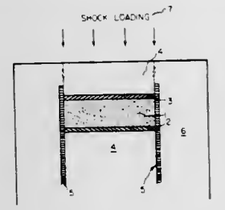
4,783,382

SHOCK-ACTIVATED ELECTROCHEMICAL POWER SUPPLIES

William B. Benedick, Albuquerque; Robert A. Graham, Los Lunas, and Bruno Morosin, Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1987, Ser. No. 39,853
Int. Cl.[4] H01M *6/20*
U.S. Cl. 429—52 5 Claims

1. A method of initiating a thermal battery, which comprises an inactive electrolyte material capable of being rendered electrochemically active by a high pressure shock wave, com-



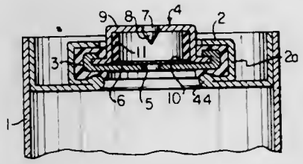
prising subjecting said electrolyte to a high pressure shock wave generated by a laser beam or an electron beam.

4,783,383

SEALED TYPE BATTERY PROVIDED WITH SAFETY VALVE MEANS AND METHOD OF MANUFACTURING SAME

Toyoji Machida; Satoshi Narukawa; Akiyoshi Sakai, all of Sumoto; Nobuhiro Nagao, Mibara; Yoshihiro Tobita, Sumoto; Kanji Urushihara, Sumoto, and Hitoshi Nakashima, deceased, late of Sumoto, all of Japan (by Kayoko Nakashima, executor), assignors to Sanyo Electric Co., Ltd., Japan

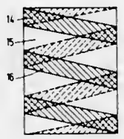
Filed Nov. 25, 1987, Ser. No. 125,641
Claims priority, application Japan, Dec. 2, 1986, 61-185904[U]; Apr. 16, 1987, 62-93702; Jun. 30, 1987, 62-10146[U]
Int. Cl.[4] H01M *2/12*
U.S. Cl. 429—56 10 Claims



1. A sealed type battery provided with a safety valve, characterized by comprising
an exterior which can includes a generator element and serves as a terminal of one polarity,
a metallic cover provided with a hole at a central portion thereof, with an extension formed in an axial direction along said hole and an edge portion fixedly mounted on said exterior can in an electrically conductive manner to close an opened portion of said exterior can at a middle portion between the extension and the edge portion,
a mouth-sealing plate which is provided with a safety valve and serves as a terminal of the other polarity and
an insulating member being put in the hole of said metallic cover between the extension of the metallic cover and the mouth-sealing plate,
and said extension of the metallic cover being cramped to said insulating member to fix said mouth-sealing plate.

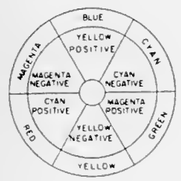
VOL 1096 ISS 2 NO 8 1988 UMI

4,783,384
ELECTROCHEMICAL CELL
Johann R. G. C. M. Van Beek, and Gerrit Frens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 7, 1987, Ser. No. 106,309
Claims priority, application Netherlands, Jul. 28, 1987, 8701778
Int. Cl.[4] H01M *4/58, 4/74, 4/82*
U.S. Cl. 429—218 **3 Claims**



1. An electrochemical cell comprising a positive electrode and a negative electrode, said negative electrode being formed of a substrate made of a porous metal impregnated according to a pattern with an intermetallic compound capable of forming a hydride with hydrogen in a manner such that a portion of the surfaces of the substrate is non-impregnated.

4,783,385
PHOTOGRAPHIC MASKS FOR TONAL CORRECTION
Gerhard F. Duesdieker, Herford, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 31, 1987, Ser. No. 32,374
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614684
Int. Cl.[4] G03F *9/00*
U.S. Cl. 430—7 **6 Claims**



1. Process for the production of photographic masks for tonal correction by dry dot etching comprising (A) exposing a silver halide photographic mask film behind a film combination, bound in accurate register, of a half-tone positive and half-tone negative of a color separation set and diffusion sheets, characterized in that the film combination comprises at least one pair of a positive and a negative of the same color separation, whereby the positive and negative are separated from one another by a film taken from the group consisting of spacer film and color separation film, and (B) developing the mask film.

4,783,386
USE OF ANTHRACYANINE AND PHENANTHRACYANINE CHROMOPHORES IN OPTICAL INFORMATION MEDIA
David E. Nikles, Colonia; R. Sidney Jones, Jr., Randolph, and James E. Kuder, Fanwood, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.
Filed Jan. 12, 1987, Ser. No. 2,345
Int. Cl.[4] G03C *3/66, 1/72;* **G11B** *7/24*
U.S. Cl. 430—19 **34 Claims**

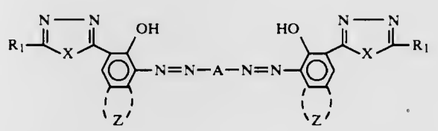
1. An optical information storage medium comprising an information recording layer which is a smooth, optical quality light absorptive layer in which detectable changes can be induced when using a laser upon the surface of the layer, wherein the information recording layer comprises an anthracyanine or phenanthracyanine chromophore.

19. A method of recording information in a thin film deposited on a relatively thick substrate by irradiating the film with a laser beam in accordance with said information to form deformations in the film, the improvement which comprises said film being comprised of an anthracyanine or phenanthracyanine chromophore.

20. A method of erasing a deformation information pattern of an information medium, which deformation patter is formed in a film deposited on a substrate and with said erasing being achieved by heating or imparting energy to said film, the improvement which comprises said film being comprised of an anthracyanine or phenanthracyanine chromophore.

4,783,387
PHOTOSENSITIVE MEMBER COMPRISING DISAZO PIGMENT
Hideaki Ueda, Kawanishi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Oct. 7, 1987, Ser. No. 105,249
Claims priority, application Japan, Oct. 9, 1986, 61-240704
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—76 **7 Claims**

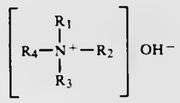
1. A photosensitive member having a photosensitive layer on an electroconductive substrate, said photosensitive layer containing a disazo pigment which is expressed by the following general formula (I)


(I)

wherein: A represents an aromatic hydrocarbon group or heterocyclic group, which can be formed in a bond by means of a bonding group; Z represents a residual group which forms a polycyclic bond group/heterocyclic group by condensation with a benzene ring and which can have a substitution group; R_1 represents an alkyl group, aryl group or heterocyclic group, each of which can have a substitution group; and X represents a nitrogen atom which can have oxygen, sulfur, and/or a substitution group.

4,783,388
QUATERNARYAMMONIUM HYDROXIDE AS ADJUVANT FOR LIQUID ELECTROSTATIC DEVELOPERS
Lyla M. El-Sayed, West Chester, Pa., and James R. Larson, Greenville, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jun. 17, 1987, Ser. No. 63,219
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—115 **17 Claims**

1. A negative-working electrostatic liquid developer having improved charging characteristics consisting essentially of
A. a nonpolar liquid having a Kauri-butanol value of less than 30, present in a major amount;
B. thermoplastic resin particles having an average by area particle size of less than 10 m;
C. a nonpolar liquid soluble ionic or zwitterionic compound; and
D. a quaternaryammonium hydroxide compound of the formula:



wherein R_1, R_2, R_3 and R_4 represent aliphatic or aromatic hydrocarbon groups, said compound being dispersed throughout the liquid developer and soluble in an amount of at least 0.5 part per million by weight in the nonpolar liquid, components (C) and (D) being present in an amount of 1 to 1000 mg/g developer solids and 0.0005 to 100 mg/g total developer, respectively.

4,783,389
PROCESS FOR PREPARATION OF LIQUID ELECTROSTATIC DEVELOPERS
Torence J. Trout, and James R. Larson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 27, 1987, Ser. No. 30,993
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—137 **36 Claims**

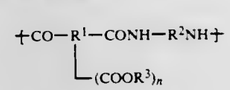
1. A process for the preparation of toner particles for liquid electrostatic imaging comprising
A. mixing a thermoplastic resin and a nonpolar liquid at a temperature sufficient to plasticize and liquify the resin and below that at which the nonpolar liquid boils and the resin decomposes;
B. cooling the mixture to form particles of the resin in the nonpolar liquid;
C. reducing the size of the resin particles to below about 30 μm by passing the mixture of resin particles and nonpolar liquid through at least a plurality of nozzles within a liquid jet interaction chamber at a liquid pressure of at least 1000 p.s.i.

4,783,390
MULTICOLOR DIAZO IMAGE-FORMING MATERIAL
Hisashi Mino, Saitama; Norio Yabe, and Takeshi Iijima, both of Higashimatsuyama, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan
Division of Ser. No. 738,720, May 29, 1985, Pat. No. 4,670,371. This application Apr. 1, 1987, Ser. No. 32,687
Claims priority, application Japan, Aug. 1, 1983, 58-140912
Int. Cl.[4] G03C *1/60, 1/56, 7/00, 7/26*
U.S. Cl. 430—156 **1 Claim**

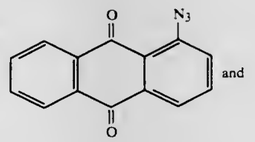
1. A multi-color image forming material comprising multiple layers on a support, and having, at least two photosensitive layers, the farthest layer from the support being the uppermost photosensitive layer, the photosensitive layers being formed from a water-soluble resin having photocrosslinking ability with diazo resin, a photosensitive water soluble, organic solvent insoluble diazo resin, and a water dispersible coloring agent which can produce a color tone, each photosensitive layer having a coloring agent which can produce a different color tone; and at least one intermediate layer, each intermediate layer being positioned between each photosensitive layer and the next adjacent photosensitive layer, the intermediate layer being formed from a hydrophobic, water-resistant, organic solvent softenable resin.

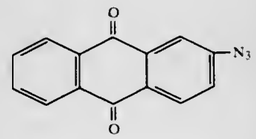
4,783,391
RADIATION-SENSITIVE POLYAMIDE POLYMER COMPOSITION WITH ANTHRAQUINONE MONOAZIDE
Gentaro Ohbayashi, Kusatsu; Susumu Umemoto, Yokohama, and Hiroo Hiramoto, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan
Division of Ser. No. 640,664, Aug. 14, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 934,653
Claims priority, application Japan, Aug. 17, 1983, 58-149169
The portion of the term of this patent subsequent to Aug. 26, 2003, has been disclaimed.
Int. Cl.[4] G03C *1/71, 1/72, 1/52, 1/70*
U.S. Cl. 430—196 **18 Claims**

1. A radiation-sensitive composition comprising a mixture of:
(1) a polymer containing repeating units (A) represented by the following formula:


(A)

wherein R^1 is a trivalent or tetravalent aromatic or heteroaromatic organic group having 6 to 30 carbon atoms, R^2 is a divalent aromatic or heteroaromatic organic group having 6 to 30 carbon atoms, R^3 is a hydrogen atom or an ammonium ion, n is an integer of 1 or 2, and $COOR^3$ is located in an ortho or peri position with respect to the amide linkage,
(2) 0.05 to 2 equivalents, to the whole carboxyl or carboxylate groups of the polymer [I], to an organic compound [II] having a radiation-dimerizable or radiation-polymerizable olefinic double bond and an amino radical or a quaternary ammonium salt, and
(3) 0.1 to 30% by weight, based on the weight of the polymer [I], of an aromatic monoazide compound [III] having an aromatic component selected from the group consisting of:


and



said monoazide compound having no substituent or having a neutral or acidic substituent directly attached to the aromatic ring of the monoazide compound, and having 6 to 30 carbon atoms.

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4,783,392
METHOD FOR FORMING AN DYE TRANSFER IMAGE WITH OIL IN SEPARATING LAYER

Toshiaki Aono; Takeshi Shibata; Yasuo Aotsuka; Kazuma Takeno, and Masakazu Yoneyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 17, 1987, Ser. No. 39,267
Claims priority, application Japan, Apr. 18, 1986, 61-89501
Int. Cl.⁴ G03C *5/54*
U.S. Cl. 430—203 **18 Claims**

1. A method for forming an image comprising developing a photosensitive element which comprises a support provided thereon a photosensitive layer containing at least a photosensitive silver halide, a binder, and a dye providing substance which forms or releases a diffusible dye by developing after or simultaneously with imagewise exposure thereof, transferring the thus-formed or released diffusible dye to a dye fixing layer of a dye fixing element, and thereafter separating said photosensitive element and said dye fixing element from each other, the improvement wherein at least one non-photosensitive layer constituting said photosensitive element and said dye fixing element and which layer is present between said dye fixing layer and said photosensitive layer upon transferring said diffusible dye, and which constitutes a surface layer after said photosensitive element and said dye fixing element are separated contains an oil component.

4,783,393
DYE MIXTURES AND OPTICAL RECORDING ELEMENTS CONTAINING SAME

John C. Brazas, Jr.; Harold T. Thomas, both of Rochester; Neil F. Haley, Fairport, and Michael W. Fichtner, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 27, 1986, Ser. No. 923,051
Int. Cl.⁴ G03C *1/72;* **G11B** *7/24*
U.S. Cl. 430—270 **3 Claims**

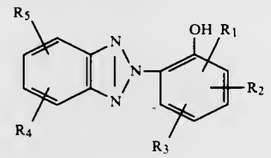
1. An optical recording element comprising a support and an optical recording layer of an amorphous binderless coating of a dye mixture comprising at least two different unsymmetrical alkyl or alkoxy substituted bis[1,2-diphenyl-1,2-ethanedithiolato(2⁻)-S,S']platinum compounds.

4,783,394
COLOR IMAGE FORMING PROCESS

Takeshi Hirose; Kiyoshi Nakazyo, and Hideaki Naruse, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 10, 1987, Ser. No. 37,288
Claims priority, application Japan, Apr. 10, 1986, 61-82501
Int. Cl.⁴ G03C *7/30, 1/84*
U.S. Cl. 430—380 **22 Claims**

1. A color image forming process comprising developing an imagewise exposed silver halide color photographic material with a color developer containing an aromatic primary amine developing agent and benzyl alcohol in an amount of 0.5 ml/or less for a period of up to about 2 minutes and 30 seconds, wherein said silver halide color photographic material comprises a reflective support having thereon a blue-sensitive silver halide emulsion layer containing a yellow color-forming coupler, a green-sensitive silver halide emulsion layer containing a magenta color-forming coupler, and a red-sensitive silver halide emulsion layer containing a cyan color-forming coupler in this order said material further containing light-insensitive hydrophilic colloid layers between the blue-sensitive silver halide emulsion layer and the green-sensitive silver halide emulsion layer and between the green-sensitive silver halide emulsion layer and the red-sensitive silver halide emulsion layer and at least one light-insensitive hydrophilic colloid layer on the red-sensitive silver halide emulsion layer, the volume ratio of an oil component to the hydrophilic colloid in each of the light-insensitive layers being at most about 0.2 and both the light-insensitive layer between the green-sensitive silver halide emulsion layer and the red-sensitive silver halide emulsion layer and the light-insensitive layer on the red-sensitive silver halide emulsion layer each contains at least one ultraviolet absorbent compound represented by formula (F):



(F)

wherein R_1, R_2, R_3, R_4 and R_5, which may be the same or different, each represents a hydrogen atom or a substituent, and said R_4 and R_5 may bond together to form a 5-membered or 6-membered aromatic ring.

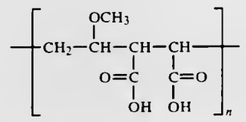
4,783,395
DESENSITIZING SOLUTION FOR LITHOGRAPHIC PRINTING PLATES

Shane Hsieh, Bridgewater, and Wayne A. Mitchell, Bound Brook, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 14,968, Feb. 17, 1987, Pat. No. 4,728,597. This application Nov. 5, 1987, Ser. No. 117,591
Int. Cl.⁴ G03C *7/02*
U.S. Cl. 430—331 **10 Claims**

1. An organic solvent free, phosphate free, lighographic desensitizing composition which comprises:

(a) from about 0.1% to about 20.0% by weight of the composition of a copolymer of polymethyl vinyl ether and maleic acid having the formula



which has a molecular weight in an amount of from about 20,000 to about 70,000; and

(b) from about 0.1% to about 20.0% by weight of the composition of a desensitizing component comprising one or more hydroxy carboxylic acids or salts; and

(c) sufficient water to formulate a desensitizing composition; and

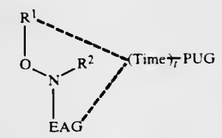
(d) sufficient base to adjust the pH of the composition into the range of from about 6.5 to about 7.5.

4,783,396
SILVER HALIDE PHOTOGRAPHIC MATERIALS

Koki Nakamura, and Sahigeru Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Oct. 30, 1986, Ser. No. 925,350
Claims priority, application Japan, Oct. 31, 1985, 60-244873; Apr. 17, 1986, 61-88625
Int. Cl.⁴ G03C *5/54, 7/26, 1/06, 1/34*
U.S. Cl. 430—353 **22 Claims**

1. A silver halide photographic material containing a compound of the following general formula (I):



(I)

wherein EAG represents a group which accepts an electron from a reducing substance; N and O each represents nitrogen atom and an oxygen atom, respectively; R^1 and R^2 each represents a substituent other than a hydrogen atom, and when R^1 or R^2 is bonded to —(Time)$_t$PUG, R^1 or R^2 is a mere bond or a substituent other than a hydrogen atom, and R^1 and R^2 may be bonded to each other to form a ring; Time represents a group for releasing PUG via the subsequent reaction as triggered off by the cleavage of the nitrogen-oxygen single bond in the compound of general formula (I); PUG represents a photographically useful group; t is an integer of 0 or 1; the full lines in the formula each mean a bond; and the dotted lines therein mean that at least one of the dotted lines is a bond, wherein the single bond between the N atom and the O atom is cleaved when EAG accepts an election.

10. The silver halide halide photographic material as claimed in claim 1, wherein the material further contains a reducing substance.

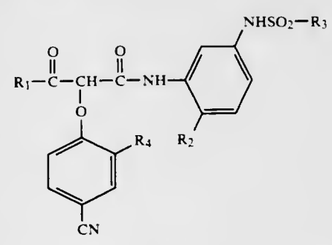
12. A method for the formation of photographic images, wherein the silver halide photographic material as claimed in claim 10 is developed by heating after imagewise exposure thereof or simultaneously with imagewise exposure thereof.

4,783,397
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING A COUPLER FOR FORMING A YELLOW DYE, AND A PROCESS FOR PRODUCING YELLOW IMAGES USING THE SAME

Akira Ogawa, and Toshiyuki Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 29, 1986, Ser. No. 947,302
Claims priority, application Japan, Dec. 27, 1985, 60-295893
Int. Cl.⁴ G03C *7/36*
U.S. Cl. 430—389 **7 Claims**

6. A process for forming yellow images comprising developing an imagewise exposed silver halide color photographic material comprising a support having coated thereon at least one light-sensitive silver halide emulsion layer containing a yellow coupler represented by formula (I):



(I)

wherein R_1 represents a substituted or unsubstituted tertiary alkyl or aryl group; R_2 represents a chlorine atom or an alkoxy group; R_3 represents a substituted or unsubstituted alkyl or aryl group; R_4 represents a chlorine atom when R_1 represents a tertiary alkyl group or represents a hydrogen atom or a chlorine atom when R_1 represents an aryl group, wherein said material is developed in the absence of benzyl alcohol.

4,783,398
PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING TABULAR GRAINS OF HIGH CHLORIDE CONTENT

Shunji Takada; Hiroyuki Mifune, and Tadashi Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 22, 1987, Ser. No. 64,974
Claims priority, application Japan, Jun. 20, 1986, 61-144228
Int. Cl.⁴ G03C *1/02, 1/08, 7/26, 7/32*
U.S. Cl. 430—567 **13 Claims**

1. A photographic silver halide emulsion comprising high silver chloride content tabular grains wherein at least 50 mol% of the silver halide is a chloride and at least 50%, based on the total projected area of emulsion grains, are the tabular grains having a ratio of diameter corresponding to a circle of the projected area to thickness of from 3/1 to 8/1.

4,783,399
DIAGNOSTIC SYSTEM FOR THE DETECTION OF CYTOMEGALOVIRUS

Michael B. A. Oldstone, La Jolla, Calif., and George Rice, London, Canada, assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 607,387, May 4, 1984. This application Apr. 29, 1985, Ser. No. 726,454
Int. Cl.⁴ G01N *33/569, 33/577*
U.S. Cl. 435—5 **44 Claims**

1. A mammalian monoclonal receptor produced by a hybridoma formed by fusion of cells from a myeloma line and lymphocytes that produce antibodies that react with a viral antigen induced in a mammal by a cytomegalovirus.

9. A diagnostic system for assaying for the presence of cytomegalovirus, said system including in at least one container as an active ingredient an effective amount of a mammalian monoclonal receptor produced by a hybridoma formed by fusion of myeloma cells and lymphocytes that produce antibodies that react with a viral antigen induced in a mammal by a cytomegalovirus.

4,783,400
HOMOGENEOUS ENZYME IMMUNOASSAY SYSTEM AND METHOD

Eleanor Canova-Davis, South San Francisco; Viola T. Kung, Menlo Park, and Carl T. Redemann, Walnut Creek, all of Calif., assignors to Cooper Lipotech, Menlo Park, Calif.

Continuation-in-part of Ser. No. 699,860, Feb. 8, 1985, Pat. No. 4,622,294. This application Aug. 20, 1986, Ser. No. 898,440
Claims priority, application Canada, Feb. 7, 1986, 501398; PCT Int'l Appl., Feb. 7, 1986, PCT/US86/00279
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.⁴ G01N *33/53*
U.S. Cl. 435—7 **6 Claims**

1. A homogeneous enzyme immunoassay system for determination of a serum analyte, comprising

anti-analyte antibody,

an assay reagent composed of a suspension of oligolamellar vesicles encapsulating glucose-6-phosphate dehydrogenase at a specific activity of between about 1–15 units/-μmole vesicle lipid, and glucose-6-phosphate, at a concentration of between about 5–50 mM, and carried on each vesicle, a surface array of ligand molecules adapted to compete with the analyte for binding to the anti-analyte antibody,

complement adapted to react with the vesicles to effect vesicle lysis and release of encapsulated glucose-6-phosphate dehydrogenase, in proportion to the amount of anti-analyte antibody bound to the vesicle surfaces, and present in an amount which is severalfold in excess of the minimum amount needed to obtain a maximum degree of

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complement-mediated vesicle lysis in the presence of a given amount of anti-analyte antibody, and

a reporter system adapted to react with released glucose-6-phosphate dehydrogenase, to produce a detectable spectral change, in proportion to the amount of enzyme released.

4,783,401

VIABLE CELL LABELLING

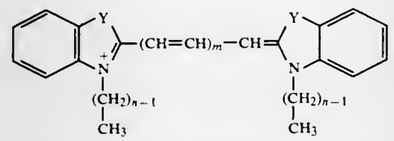
Paul K. Horan, West Chester; Bruce D. Jensen, King of Prussia, and Sue E. Slezak, Downingtown, all of Pa., assignors to SmithKline Beckman Corporation, Pbiladelphia, Pa.

Filed Oct. 31, 1986, Ser. No. 925,192

Int. Cl.[4] C12Q *1/04, 1/16*

U.S. Cl. 435—34 **26 Claims**

1. A method for labelling viable cells with a cyanine dye that comprises contacting the cell with a cyanine dye of the structure:



in which:

Y is oxygen, sulfur, methylene, or alkylsubstituted methylene;

m is 0–3; and

n is 12–22 in medium containing an osmolarity regulating agent that does not significantly affect cell viability and that provides for reproducible cell labelling, said agent being selected from the group consisting of a sugar, a sugar-alcohol, an amino acid, a Good's buffer and a combination thereof.

4,783,402

PRODUCTION OF PRIMARY OR SECONDARY ALCOHOL DERIVATIVES OF PHOSPHOLIPIDS BY THE ENZYMATIC TECHNIQUE

Yoshitaka Kokusho, Kunitachi; Shigeaki Kato, and Haruo Machida, both of Hino, all of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Aichi, Japan

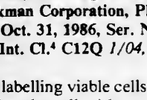
Filed Apr. 10, 1984, Ser. No. 598,697

Claims priority, application Japan, Apr. 11, 1983, 58-63304; Apr. 11, 1983, 58-63305

Int. Cl.[4] C12P *33/00, 19/40, 19/30, 9/00*

U.S. Cl. 435—52 **5 Claims**

1. A process for producing a primary or secondary alcohol derivative of a phospholipid represented by the following formula (I)



(I)

wherein A and R are as defined below,

which comprises reacting a phospholipid represented by the following formula (II)

(II)

wherein A is a moiety represented by the following formula (i)



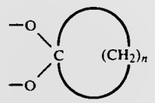
(i)

or the following formula (ii)



(ii)

in which R_1 and R_2 both represent —O—COR_{11} or —O—R_{12}, or R_1 and R_2 in formula (i) together represent



in which n represents a number of from 11 to 19, and R_{11} and R_{12} are identical or different and each represents a saturated or unsaturated saturated aliphatic hydrocarbon group having 7 to 21 carbon atoms, and

B represents the group $—(CH_2)_2N^+(CH_3)_3$, $—(CH_2)_2NH_2$, $—CH_2CH(NH_2)COOH$, $—CH_2CH_2NH(CH_3)$, $—CH_2CH_2N(CH_3)_2$, $—CH_2CHOHCH_2OH$ or $—(CH_2)_mH$ in which m represents a number of from 1 to 5,

with a primary or secondary alcohol selected from the group consisting of

(1) primary alcohols containing a residue R of a saturated or unsaturated aliphatic or aromatic hydrocarbon having 6 to 26 carbon atoms said hydrocarbon residue residue being unsubstituted or substituted by a substituent selected from the group consisting of halogen, amino, acetyl, carboxyl and hydroxyl, provided that when the residue R is a residue of a saturated aliphatic hydrocarbon having 6 carbon atoms, the residue is substituted by a said substituent, or a residue R of said aliphatic or aromatic hydrocarbon having in the molecule a linkage selected from ether, ester and amide linkages,

(2) primary alcohols having a residue R of a pregnane-type steroidal compound,

(3) primary alcohols having a residue R of a heterocyclic compound selected from the group consisting of a galactono-gamma-lactone, N-(2-hydroxyethyl)-phthalimide, 2-(3-indole)ethanol, 2-(2-hydroxyethyl)pyridine, pyridoxine, N-(2-hydroxethyl)morpholine, 5-hydroxymethylcytosine, cytidine, uridine, arabinocytidine, thiamine, 2-(2-hydroxyethyl)piperazine, adenosine, guanosine and cyclocytidine, and

(4) secondary alcohols having a C_3–C_{10} linear or branched alkyl group R which may be substituted by a substituent selected from the group consisting of halogen, amino, acetyl, hydroxyl, mono- or di-alkylamino of not more than 3 carbon atoms and phenyl, or a C_4–C_8 alicyclic hydrocarbon group R which may be substituted by said substituent,

in the presence of phospholipase DM, said phospholipase DM having the ability to catalyze the formation of a phospholipid-primary alcohol derivative from lecithin and geraniol and the formation of a phospholipid-secondary alcohol derivative from lecithin and 2-butanol, and recovering the reaction product formed.

4,783,403

PROCESS FOR PRODUCING L-PHENYLALANINE

Kazumi Araki, Machida; Toshitsugu Ozeki; Yukiyoshi Ito, both of Yokkaichi; Shuichi Ishino, Machida; Hideharu Anazawa, Tokyo, and Shigeru Kamimori, Matsusaka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1985, Ser. No. 697,470

Claims priority, application Japan, Feb. 8, 1984, 59-21400; Jun. 29, 1984, 59-134535

Int. Cl.[4] C12P *13/22;* **C12N** *9/10;* **C12R** *1/01*

U.S. Cl. 435—108 **14 Claims**

1. A process for producing L-phenylalanine which comprises culturing a microorganism belonging to the species *Citrobacter freundii, Erwinia herbicola, Enterobacter cloacae, Klebsiella oxytoca, Salmonella typhimurium,* or *Flavobacterium suaveolens* and having the ability to convert phenylpyruvic acid into L-phenylalanine in the presence of an amino group donor, in a culture medium containing phenylpyruvic acid and an amino group donor, forming L-phenylalanine in the resultant culture broth and recovering L-phenylalanine therefrom.

4,783,404

L-AMINOACID OXIDASE FROM YEASTS OF THE GENUS CRYPTOCOCCUS, THEIR PREPARATION AND USE

Werner Aretz, Kelkheim, and Klaus Sauber, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,638

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1983, 3333453

Int. Cl.[4] C12P *7/62, 7/40, 7/44;* **C12N** *9/06, 1/16*

U.S. Cl. 435—135 **11 Claims**

1. L-Aminoacid oxidase isolated from a yeast of the genus cryptococcus and having the ability to convert L-alpha-aminoadipic acid and L-cephalosporin C into the corresponding alpha-keto acids.

4,783,405

RECOMBINANT DNA EXPRESSION VECTORS USEFUL IN BACILLUS AND OTHER HOST CELLS

Steven Kovacevic; James R. Miller, and Hansen M. Hsiung, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 458,792, Jan. 18, 1983, abandoned. This application Sep. 26, 1984, Ser. No. 654,437

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 1/20, 1/00;* **C07H** *21/00*

U.S. Cl. 435—68 **87 Claims**

1. A novel recombinant DNA expression vector which comprises

(1) the ribosome binding site-containing DNA sequence



wherein

A is deoxyadenyl,

G is deoxyguanyl,

C is deoxycytosyl,

T is thymidyl,

R is G or C, and

R^1 is G or C,

(2) the veg promoter of *Bacillus subtilis,* and

(3) a gene that encoes a functional polypeptide, subject to the limitation that R and R^1 are not simultaneously the same deoxyribonucleotide and subject to the further limitation that said vector is selectable and that said promoter and said DNA sequence direct transcription and expression of said gene in a host cell transformed by said vector.

4,783,406

METHOD AND COMPOSITIONS FOR USE IN THE TREATMENT OF FIREBLIGHT

Peter A. Vandenbergh, Sarasota, Fla., and Anne K. Vidaver, Lincoln, Nebr., assignors to Microlife Technics, Inc., Sarasota, Fla.

Division of Ser. No. 662,065, Oct. 18, 1984, Pat. No. 4,678,750. This application Oct. 20, 1986, Ser. No. 920,754

Int. Cl.[4] C12N *9/24;* **A61K** *37/48*

U.S. Cl. 435—200 **5 Claims**

1. A purified enzyme preparation which comprises a depolymerase for a polysaccharide produced by *Erwinia amylovora,* the depolymerase being derived from a phage which lyses the *Erwinia amylovora,* and having a molecular weight of about 21,000 and an optimal depolymerase activity at pH 6 and independently an optimal depolymerase activity at 30° C.

4,783,407

GROWTH OF HEPATITUS A VIRUS IN VERO CELLS

Philip J. Provost, Harleysville; Paula A. Giesa, Lansdale, and William J. McAleer, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 30, 1985, Ser. No. 781,830

Int. Cl.[4] C12N *7/00;* **A61K** *39/29*

U.S. Cl. 435—235 **8 Claims**

1. A method of growing hepatitis A virus in cell culture comprising growth of infective virus by passaging at temperatures no higher than 33° C. in Vero cells that have been exposed to an inoculum containing hepatitis A virus until there is a sufficient concentration of virus for vaccine production.

4,783,408

METHOD FOR THE PREPARATION OF A FUNGAL BODY AND A LIPID RICH IN Y-LINOLENIC ACID THEREFROM

Osamu Suzuki, Tsuchiura, and Toshihiro Yokochi, Sakura, both of Japan, assignors to Director-General of the Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 653,063, Sep. 21, 1984. This application Nov. 10, 1986, Ser. No. 929,601

Claims priority, application Japan, Feb. 9, 1984, 59-22394; Jun. 5, 1984, 59-115162

Int. Cl.[4] C12P *7/64*

U.S. Cl. 435—134 **5 Claims**

1. A method which comprises the steps of:

(a) culturing with agitation under aerobic conmditions a fungus of the species Mortierella selected from the group consisting of *M. isabellina* IFO 7824, 7873, 7884, 8183, 8308 or 8309; *M. vinacea* IFO 6738; *M. ramanniana* IFO 8287; *M. ramanniana* var *agulispora* IFO 6744 or 8187 and *M. nona* IFO 8794 at a pH of from 4 to 6 in an aqueous liquid culture medium containing carbohydrate as the carbon source in a concentration from 100 to 400 g/liter, and additionally containing acetic acid or an alkali acetate in a concentration of from 0.1 to 20 g/liter to grow a fungal body containing from 35% to 70% lipid on a total dry weight basis having a γ-linolenic acid content of from 3% to 11%; and (b) extracting the lipid from the fungal body.

4,783,409

IMMOBILIZED ENZYME HAVING REVERSIBLE SOLUBILITY

Tetsuya Tosa, Kyoto; Takao Mori, Takatsuki, and Motoki Fujimura, Ibaragi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed May 8, 1986, Ser. No. 861,158

Claims priority, application Japan, May 17, 1985, 60-106728

Int. Cl.[4] C12N *11/08, 11/02*

U.S. Cl. 435—180 **6 Claims**

1. An immobilized enzyme having reversible solubility which comprises an enzyme attached to a copolymer selected

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from the group consisting of a methacrylic acid-alkyl methacrylate-alkyl acrylate copolymer, a methacrylic acid-alkyl methacrylate copolymer, an alkyl acrylate-methacrylic acid copolymer, an alkyl acrylate-methacrylic acid-alkyl acrylate copolymer, an alkyl acrylate-methacrylic acid-2-methyl-5-vinylpyridine copolymer and a dialkylaminoalkyl methacrylate-alkyl methacrylate copolymer.

4,783,410

CYTOTOXIC T LYMPHOCYTE SERINE ESTERASE AND METHOD FOR STIMULATION AND INHIBITION

Mark S. Pasternack, Boston, and Herman N. Eisen, Waban, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 28, 1985, Ser. No. 750,323

Int. Cl.⁴ C12N *9/16, 9/48, 9/76*

U.S. Cl. 435—196 **4 Claims**

1. A serine esterase produced by cytotoxic T lymphocytes wherein said esterase has an apparent molecular weight of approximately 28,000 daltons as determined by SDS gel electrophoresis under reducing conditions and trypsin-like esterase activity not inhibited by N-α-tosyl lysyl chloromethyl ketone at a concentration inhibiting the cytotoxicity of the cytotoxic T lymphocytes.

4,783,411

INFLUENZA-A VIRUS VACCINE FROM FISH CELL CULTURES

Janis Gabliks, 103 Cabot St., Newton, Mass. 02158

Filed Oct. 22, 1984, Ser. No. 663,322

Int. Cl.⁴ C12N *7/08;* **A61K** *39/145*

U.S. Cl. 435—237 **3 Claims**

1. A method for preparing an attenuated influenza-A virus vaccine for the immunization of mammals, comprising passaging said influenza-A virus at least two times in a goldfish cell culture.

4,783,412

HYBRID DNA SYNTHESIS OF EPIDERMAL GROWTH FACTOR

Graeme I. Bell, San Francisco, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 821,873, Jan. 24, 1986, abandoned, which is a continuation of Ser. No. 511,372, Jul. 5, 1983, abandoned. This application Jun. 3, 1987, Ser. No. 58,706

Int. Cl.⁴ C12N *5/00, 15/00;* **C12P** *21/02, 19/34*

U.S. Cl. 435—240.1 **5 Claims**

1. A composition comprising DNA molecules containing a nucleotide sequence encoding human epidermal growth factor (EGF) and substantially free of DNA molecules that do not contain said nucleotide sequence, said EGF-encoding nucleotide sequence comprising:

5'-AAT	AGT	GAC	TCT	GAA	TGT	CCC
CTG	TCC	CAC	GAT	GGG	TAC	TGC
CTC	CAT	GAT	GGT	GTG	TGC	ATC
TAT	ATT	GAA	GCA	TTG	GAC	AAG
TAT	GCA	TGC	AAC	TGT	GTT	GTT
GGC	TAC	ATC	GGG	GAG	CGA	TGT
CAG	TAC	CGA	GAC	CTG	AAG	TGG
TGG	GAA	CTG	CGC—3'			

4,783,413

APPARATUS FOR SUPPLYING A MEDIUM TO A REACTION CHAMBER

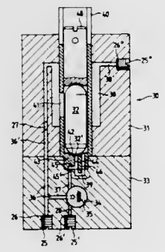
Robert N. Suter, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed May 14, 1987, Ser. No. 49,436

Claims priority, application Switzerland, Jul. 30, 1986, 03058/86

Int. Cl.⁴ C12M *13/00*

U.S. Cl. 435—284 **8 Claims**



1. An apparatus for supplying a fluid medium to a reaction chamber, comprising:

at least two chambers defining a first chamber and a second chamber;

said first chamber comprising a reaction chamber for receiving a reaction medium;

an osmotic pump containing the reaction medium and for supplying the reaction medium to said reaction chamber;

at least one other chamber of said at least two chambers defining said second chamber located adjacent to said osmotic pump and containing an operating medium for operating said osmotic pump;

a channel system containing a plurality of channels rheologically interconnecting said at least two chambers for supplying the reaction medium from said osmotic pump to said reaction chamber and removing expended reaction medium from said reaction chamber;

said second chamber, said osmotic pump, said reaction chamber and at least a portion of said channels of said channel system forming a closed system;

a control sleeve having a longitudinal axis and being mounted for rotation about its longitudinal axis;

said control sleeve being arranged in flow communication with said osmotic pump;

said plurality of channels including a channel leading from said control sleeve to said reaction chamber and a bypass channel bypassing said reaction chamber and leading from said control sleeve to said second chamber; and

said control sleeve, depending upon its rotational position, selectively providing flow communication between said control sleeve and either one of (i) said channel leading to said reaction chamber or (ii) said bypass channel.

4,783,414

GERMINATION FLOOR SYSTEMS

Norman H. Andreasen, 1520 Norwood Ave., Itasca, Ill. 60143

Division of Ser. No. 687,598, Dec. 31, 1984, Pat. No. 4,698,309. This application Oct. 2, 1987, Ser. No. 103,667

Int. Cl.⁴ C12C *1/06, 1/00*

U.S. Cl. 435—302 **2 Claims**

1. A germination floor assembly comprising at least one horizontal support shaft;

a floor having a plurality of generally horizontal tray assemblies, said tray assemblies being mounted for pivotal movement about said horizontal support shaft;

said at least one horizontal support shaft being formed by at

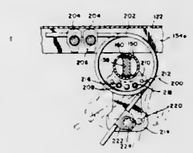
least one section having a cylindrical tubular configuration;

said section having a bar extending substantially the length of said section within said section for reinforcement thereof; said bar being disposed in spaced relationship to said section,

shim means disposed on said bar within said section and in contact with a on inner wall portion of said section and said bar,

means for affixing said section to said shim means and said bar,

said bar has a solid rectangular configuration, said shim means being mounted on opposed surfaces of said bar,



said shim means includes a pair of elongated members extending in parallel relationship to said bar and having a modified U-shaped configuration matching the outer configuration of a part of said rectangular bar, said U-shaped configuration further forming tube contacting portions, said tube contacting portions having a radius of curvature approximating the internal diameter of said tube, and

said U-shaped configuration of said shim means having a pair of legs and a base, both of said pair of legs of each of said shim means being disposed in surface contacting relationship with said part of said rectangular bar.

4,783,415

GENE CODING FOR SIGNAL PEPTIDES AND UTILIZATION THEREOF

Shigeru Hoshiko, Yokohama; Osamu Makabe; Shunzo Fukatsu, both of Tokyo, and Kozo Nagaoka, Yokohama, all of Japan, assignors to Meiji Seika Kabushiki Kaisha, Kyobashi, Japan

Filed Mar. 27, 1985, Ser. No. 716,495

Int. Cl.⁴ C12N *15/00, 1/20;* **C12P** *21/00, 21/02, 21/04, 19/34;* **C07H** *21/04*

U.S. Cl. 435—320 **8 Claims**

1. A DNA molecule comprising a DNA segment coding for a signal polypeptide having the sequence

MetGlnGlnArgSerArg
ValLeuGlyGlyThrLeuAlaGlyIleValAlaAla
AlaAlaAlaThrValAlaProTrpProSerGlnAla

4,783,416

ANALYTICAL METHOD TO DETERMINE THE UNWASHED GUM CONTENT IN A GASOLINE BOILING HYDROCARBON

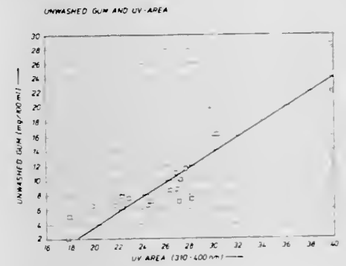
Jitendra G. Patel, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 8, 1987, Ser. No. 47,951

Int. Cl.⁴ G01N *33/22, 33/30*

U.S. Cl. 436—60 **5 Claims**

1. A method of determining the potential unwashed gum content of a distillate hydrocarbon which comprises sampling said hydrocarbon and subjecting said sample of said hydrocarbon to UV spectrophotometric analysis and integrating peak absorptions in the range of from 310 to 400 nm and thereby attaining a peak absorption area and comparing said peak



absorption area to a predetermined standard, thereby attaining said unwashed gum content.

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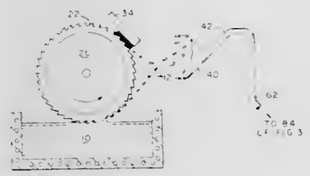
SYSTEM FOR ON-LINE MOLTEN METAL ANALYSIS

John L. Genna, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 826,988

Int. Cl.⁴ G01N *1/10, 21/62, 33/20*

U.S. Cl. 436—73 **6 Claims**



1. A method for analyzing molten metal in an integrated system comprising:

(a) removing sample metal as a solid from a source of molten metal by immersing serations of a rotating disc into said source of molten metal;

(b) transporting the sample metal by suction from the disc directly to a dissolution zone;

(c) dissolving a measured quantity of the sample metal in a solvent in said dissolution zone to form a dissolved sample;

(d) passing the dissolved sample from the dissolution zone to an emission spectrometer;

(e) vaporizing said dissolved sample in the spectrometer to form a vaporized sample;

(f) producing an emission spectra from said vaporized sample; and

(g) comparing the emission spectra of the vaporized sample to an emission spectra of a known amount of a known alloy of the same metal as the sample metal to determine the composition of the sample metal.

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4,783,418
METHOD OF DETERMINING THE NICOTINE CONTENT OF TOBACCO

Terence M. Long, Yatton; Joseph C. Jobason, Frampton Cotterell, and Maurice Naylor, Backwell, all of England, assignors to Imperial Tobacco Limited, Bristol, England

Filed Jan. 13, 1987, Ser. No. 2,931
Claims priority, application United Kingdom, Jan. 13, 1986, 8600680
Int. Cl.⁴ G01N *33/00*
U.S. Cl. 436—96 **8 Claims**

1. A method of determining on a discrete analyzer the nicotine content of tobacco or a smoking-related product wherein the discrete analyzer includes a container for cyanogen bromide made of a polymeric material, the method including a prior step of passivating the container to cyanogen bromide by allowing a cyanogen bromide solution of high concentration to contact the interior of the container for a period of at least 24 hours before the first use of the container in the method, and including the further steps of,

(a) preparing a first aqueous extract of a sample of tobacco or smoking-related product,

(b) pre-reacting the extract with an acidic buffered solution of pH not more than 6 for at least two minutes,

(c) reacting the pre-reacted extract in the discrete analyzer with aniline and with cyanogen bromide from the passivated container,

(d) measuring the intensity of yellow coloration generated by step (c) and generating a first signal proportional to said intensity of coloration of said sample extract,

(e) preparing a second aqueous extract of a nicotine standard of known nicotine content,

(f) carrying out steps (b) and (c) on the extract of step (e),

(g) measuring the intensity of yellow coloration produced by step (c) during the performance of step (f) and generating a second signal proportional to said intensity of said standard extract, and

(h) comparing said first and second signals to determine the nicotine content of said sample.

4,783,419
EXAMINING CELLS BY ELECTROPHORESIS

Haruhisa Hayashi; Yoshiharu Oguchi; Kenichi Matsuoaga, all of Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureba Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,453
Claims priority, application Japan, Mar. 30, 1984, 59-62446
Int. Cl.⁴ G01N *33/554, 33/561*
U.S. Cl. 436—516 **15 Claims**

1. A method for examining cells, comprising:

subjecting specimen cells to an antigen-antibody reaction treatment;

measuring a pattern of the electrophoretic mobility of the treated specimen cells in a physiological medium having an ionic strength of 0.11 to 0.21 moles/l; and

comparing the electrophoretic mobility of the treated specimen cells under examination with the electrophoretic mobility of control cells.

4,783,420
IMMUNOASSAY FOR CARBOHYDRATE ANTIGENIC DETERMINANT

Bert C. DelVillano, Jr., Berwyn, and Yu-Sheng V. Liu, Malvern, both of Pa., assignors to Centocor, Inc., Malvern, Pa.

Continuation of Ser. No. 600,551, Apr. 6, 1984, abandoned. This application Oct. 20, 1986, Ser. No. 919,569
Int. Cl.⁴ G01N *33/543, 33/574*
U.S. Cl. 436—518 **6 Claims**

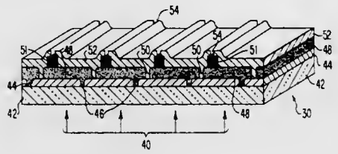
4. In a forward immunometric assay for the carbonhydrate antigenic determinant CA 19-9, comprising the steps of incubating a liquid sample with a solid phase immunoadsorbent containing monoclonal antibody 1116-NS-19-90 for a period sufficient to allow CA 19-9 antigen in the sample to bind to the antibody; separating the immunoadsorbent from the sample; incubating the immunoadsorbent with a labeled antibody 1116-19-9 which binds CA 19-9 antigen; separating the immunoadsorbent from the labeled antibody and quantitating label associated with the immunoadsorbent to obtain measure of the amount of CA 19-9 in the sample;

the improvement wherein the incubation steps are carried out at an acidic pH.

4,783,421
METHOD FOR MANUFACTURING ELECTRICAL CONTACTS FOR A THIN-FILM SEMICONDUCTOR DEVICE

David E. Carlson, Yardley, Pa.; Charles R. Dickson, Pennington, and Robert V. D'Aiello, East Brunswick, both of N.J., assignors to Solarex Corporation, Rockville, Md.

Continuation of Ser. No. 723,290, Apr. 15, 1985, abandoned. This application Jun. 29, 1987, Ser. No. 68,753
Int. Cl.⁴ H01L *31/18*
U.S. Cl. 437—4 **18 Claims**



18. A method of fabricating a multi-cell photovoltaic module, comprising the steps of:

a. forming a film of transparent conductive oxide on a flat, transparent superstrate;

b. scribing said conductive oxide film with a laser to form a plurality of first grooves separating said conductive oxide film into a plurality of transparent front contacts;

c. fabricating a film of photovoltaic amporphous silicon on said conductive oxide layer, said amorphous silicon filling said first grooves to electrically insulate adjacent front contacts;

d. scribing said amorphous silicon film with a laser parallel and ajdacnet to said first grooves to form a plurality of second grooves separating said amorphous silicon film into a plurality of photovoltaic elements;

e. forming strips of electrically non-conductive black silkscreen resist ink on said photovoltaic elements parallel and adjacnet to said second grooves;

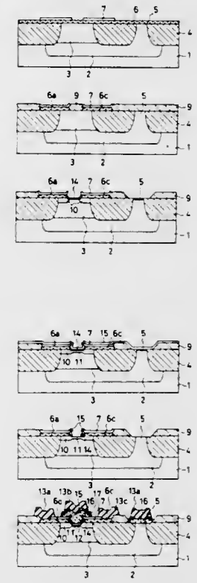
f. forming a film of aluminum substantially covering said photovoltaic elements and said ink stirps, said aluminum filling said second grooves to form electrical connections with said front contacts; and

g. scribing portions of said aluminum film overlying said ink strips with a laser without contacting said photovoltaic elements to form a plurality of third grooves separating said aluminum film into a plurality of back contacts electrically connected to adjacent ones of said front contacts.

4,783,422
PROCESS FOR FABRICATING A BIPOLAR TRANSISTOR UTILIZING SIDEWALL MASKING OVER THE EMITTER

Akira Kawkatsu, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1987, Ser. No. 108,796
Claims priority, application Japan, Oct. 24, 1986, 61-252063
Int. Cl.⁴ H01L *21/385, 21/425*
U.S. Cl. 437—31 **6 Claims**



1. A process for fabricating a semiconductor integrated circuit device comprising:

(a) a step of selectively oxidizing a polysilicon layer deposited on the working surface of a silicon substrate;

(b) a step of partially removing the polysilicon oxide layer to form an opening;

(c) a step of forming a chemical vapor deposition layer on the entire surface; and

(d) a step of anisotropic etching of said chemical vapor deposition layer to leave the chemical vapor deposition layer on the sidewall of the opening.

4,783,423
FABRICATION OF A SEMICONDUCTOR DEVICE CONTAINING DEEP EMITTER AND ANOTHER TRANSISTOR WITH SHALLOW DOPED REGION

Tunenori Yamauchi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

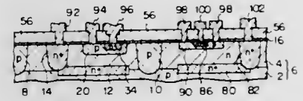
Continuation of Ser. No. 677,140, Nov. 30, 1984, abandoned. This application Aug. 26, 1987, Ser. No. 90,419
Claims priority, application Japan, Nov. 30, 1983, 58-227261
Int. Cl.⁴ H01L *27/04*
U.S. Cl. 437—33 **27 Claims**

2. A process for fabricating a semiconductor device which includes, in the same semiconductor bulk, a bipolar transistor comprising a base region and an emitter region shallower than said base region, said emitter region being formed in said base region, and a junction field effect transistor comprising a channel region and a gate region shallower than said channel region, said gate region being formed in said channel region, said gate region being substantially shallower than said emitter region, said process comprising the steps of:

introducing a first dopant for forming said gate region and having a first diffusion coefficient into a region where said gate region is to be formed in said semiconductor bulk, said first dopant having a first conductivity type for said semiconductor;

introducing a second dopant into a region where said channel region is to be formed in said semiconductor bulk, said second dopant having a second conductivity type opposite to said first conductivity type;

introducing a third dopant into a region where said base region is formed in said semiconductor bulk, said third dopant having the second conductivity type;



after said three introducing steps, forming an insulating film on said semiconductor bulk including said channel region, gate region, and base region;

forming a window in said insulating film on a region where said emitter region is to be formed;

after said three introducing steps and said window forming step diffusing a fourth dopant having a diffusion coefficient substantially larger than that of said first dopant into the semiconductor substrate by a heat diffusion process to form said emitter region to a depth substantially deeper than said gate region, said first and second dopants thereby also being diffused into said semiconductor bulk to form said gate region and said channel region, respectively, the final depths of each of said regions being substantially determined by said heat diffusion process;

after that, forming contact windows in the insulating film for said gate region, channel region and a base region; and

forming electrodes for the emitter, base, gate, and channel regions in said windows of the insulating film.

4,783,424
METHOD OF MAKING A SEMICONDUCTOR DEVICE INVOLVING SIMULTANEOUS CONNECTION AND DISCONNECTION

Jun-ichi Ohno, Yokohama, and Satoshi Konishi, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 763,088, Aug. 6, 1985, Pat. No. 4,608,668, which is a continuation of Ser. No. 409,613, Aug. 19, 1982, abandoned. This application Feb. 21, 1986, Ser. No. 834,101
Claims priority, application Japan, Sep. 3, 1981, 138829; Apr. 12, 1982, 60537
Int. Cl.⁴ H01L *21/265*
U.S. Cl. 437—40 **2 Claims**

1. A method of producing a semiconductor device having first, second, third and fourth circuit means and capable of structurally switching conductivity between said first and second circuit means and between said third and fourth circuit means, comprising the steps of:

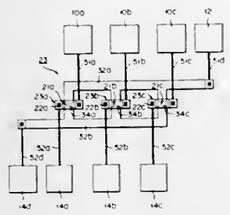
introducing an impurity for generating crystal lattice defects in a semiconductor substrate;

producing an N+-semiconductor region by doping said semiconductor substrate with an N-type impurity;

depositing a first silicon oxide film on said semiconductor substrate;

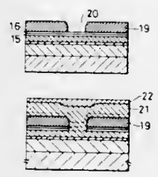
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forming a polycrystalline silicon layer on said first silicon oxide film;
selectively etching said first silicon oxide film and said polycrystalline silicon layer;
forming a pair of P+-semiconductor regions having a predetermined distance therebetween which comprises a first conductor means said polycrystalline silicon layer comprising a second conductor means, said first conductor means being connected between said first and second circuit means, and said second conductor means being connected between said third and fourth circuit means;



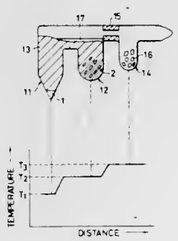
forming a second silicon oxide film having contact holes on said semiconductor substrate, said contact holes extending to said respective P+-semiconductor regions;
depositing metal on said second silicon oxide film to form electrodes connecting to said respective P+-semiconductor regions through said contact holes; and
radiating electromagnetic energy at a predetermined portion of said semiconductor to fuse the polycrystalline silicon layer and to combine the P+-semiconductor regions simultaneously with said fusing to cause said first conductor means to be conductive and said second conductor means to be nonconductive.

4,783,425
FABRICATION PROCESS OF SEMICONDUCTOR LASERS
Tadashi Fukuzawa; Yuichi Ono; Shinichi Nakatsuka, and Takashi Kajimura, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 30, 1986, Ser. No. 924,774
Claims priority, application Japan, Nov. 6, 1985, 60-247019; Dec. 18, 1985, 60-282854
Int. Cl.[4] H01L *21/205, 21/225, 21/265*
U.S. Cl. 437—46 **26 Claims**



22. A fabrication process of a semiconductor laser comprising:
a first step of growing first semiconductor layers on a substrate, said first semiconductor layers including an active layer;
a second step of growing second semiconductor layers on said first semiconductor layers, the second semiconductor layers including a second sub-layer;
a third step of forming a striped groove in the second semiconductor layers, a part of the second sub-layer being exposed at the striped groove;
a fourth step of growing a fifth semiconductor layer on the exposed part of the second sub-layer, so as to form a hetero-structure with the exposed part of the second sub-layer, the fifth layer being provided with impurities; and
a fifth step of diffusing impurities provided in the layer so as to smear the hetero-structure.

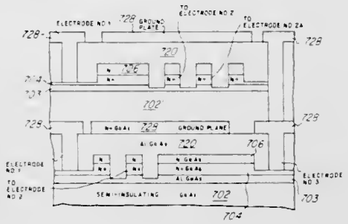
4,783,426
METHOD OF MAKING A GROUP II-VI COMPOUND SEMICONDUCTOR DEVICE BY SOLUTION GROWTH
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan
Division of Ser. No. 814,151, Dec. 23, 1985, abandoned, which is a continuation of Ser. No. 424,301, Sep. 27, 1982, abandoned. This application Nov. 19, 1987, Ser. No. 124,390
Claims priority, application Japan, Oct. 9, 1981, 56-161837
Int. Cl.[4] H01L *21/368*
U.S. Cl. 437—81 **12 Claims**



1. A method of making a semiconductor device made of a Group II-VI compound semiconductor comprised of one of Zn and Cd selected from Group II elements and one of S and Se selected from Group VI elements, and containing therein at least one p-n junction formed of a single crystal, by employing a solution growth process using a solvent comprised of one of said Group II or Group VI elements having a higher vapor pressure in said Group II-VI compound semiconductor and by controlling the vapor pressure of the other element having a lower vapor pressure and by doping, in said solvent, a p type impurity selected from Group Ia and Ib element in an amount ranging from 1×10^{-3} to 5×10^{-1} mol% to obtain a p type semiconductor crystal in said single crystal.

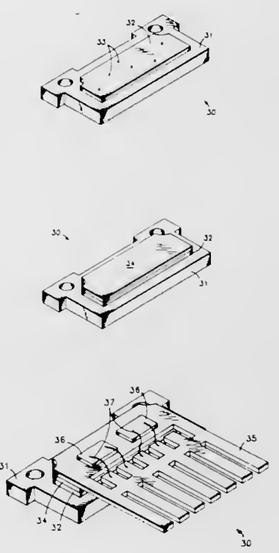
4,783,427
PROCESS FOR FABRICATING QUANTUM-WELL DEVICES
Mark A. Reed, Dallas, and Robert T. Bate, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Feb. 18, 1986, Ser. No. 830,775
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] H01L *29/203, 29/205, 21/205, 21/306*
U.S. Cl. 437—90 **13 Claims**

1. A process for fabricating quantum-well devices, comprising the steps of:
(a) providing a substrate;
(b) providing M epitaxial layers of semiconductor materials on said substrate, at least one of said layers of quantum-well thickness;
(c) anisotropically etching first trenches in a first pattern through the top **N** of said layers but not through the bottom M-**N** of said layers;
(d) epitaxially growing a layer of a wide bandgap semiconductor material with a bandgap wider than those of all of the semiconductor materials of said M layers, said growing to substantially fill said first trenches;
(e) anisotropically etching second trenches in a second pattern through both said M layers and said wide bandgap layer, said first and second trenches jointly define a plurality of quantum wells;



(f) epitaxially growing a second layer of said wide bandgap material to substantially fill said second trenches; and
(g) forming contacts to configure desired circuit functions from said quantum wells to yield said quantum-well devices.

4,783,428
METHOD OF PRODUCING A THERMOGENETIC SEMICONDUCTOR DEVICE
Martin A. Kalfus, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.
Filed Nov. 23, 1987, Ser. No. 124,212
Int. Cl.[4] H01L *23/02*
U.S. Cl. 437—209 **11 Claims**



1. A method of producing a thermogenetic semiconductor device comprising the steps of:
providing a heatsink;
depositing a first layer of epoxy on said heatsink;
curing said first layer of epoxy;
depositing a second layer of epoxy on said first layer of epoxy;
depositing a leadframe on said second layer of epoxy; and
curing said second layer of epoxy.
6. A method of producing a thermogenetic semiconductor device comprising the steps of:
providing a heatsink;
depositing a first layer of thermally conductive epoxy on said heatsink;
curing said first layer of thermally conductive epoxy;
depositing a second layer of thermally conductive epoxy on said first layer of thermally conductive epoxy;
depositing a leadframe on said second layer of thermally conductive epoxy; and
curing said second layer of thermally conductive epoxy.
10. A method of producing a thermogenetic semiconductor device comprising the steps of:
providing a heatsink;
depositing a first layer of thermally conductive epoxy on said heatsink;
curing said first layer of thermally conductive epoxy;
depositing a second layer of thermally conductive epoxy on said first layer of thermally conductive epoxy;
depositing a leadframe having a thermogenetic semiconductor die coupled thereto on said second layer of thermally conductive epoxy;
curing said second layer of thermally conductive epoxy; and
encapsulating said heatsink, first and second layers of thermally conductive epoxy, leadframe, and thermogenetic semiconductor die in a package.

4,783,429
NO ALKALI CONTAINING BIOCOMPATIBLE GLASS CERAMIC WITH APATITE, WOLLASTONITE AND DIOPSIDE CRYSTALS MIXED
Takehiro Shibuya, Shiga; Yoshinori Morita, and Akira Matsui, both of Kyoto, all of Japan, assignors to Nippon Electric Glass Company, Limited, Shiga, Japan
Filed Apr. 2, 1987, Ser. No. 33,995
Int. Cl.[4] C03C *10/02, 10/04, 10/16*
U.S. Cl. 501—5 **3 Claims**

1. A high-strength biocompatible glass ceramic substantially free of alkali having a composition consisting essentially, by weight, of 7.2-16% MgO, 20-45% CaO, 41.5-50% SiO_2, 8-30% P_2O_5, 0-5% B_2O_3, 0-5% F_2, and 0-10% Al_2O_3, a total content of MgO, CaO, SiO_2, and P_2O_5 being 90% or more, said glass ceramic being substantially non-porous and having a mechanical strength of 2,000 Kg·f/cm^2 or more and a crystal structure where a number of fine crystals are densely dispersed in a glass phase, said fine crystals comprising apatite, wollastonite, and diopside crystals extending to interlace with one another in a complicated form.

4,783,430
PROCESS OF MAKING HIGH PURITY ALUMINUM NITRIDE
Sophia R. Su, Weston, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Apr. 25, 1986, Ser. No. 856,067
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—96 **7 Claims**

6. A method of making high purity aluminum nitride comprising the following steps:
Step 1—contacting $Al(CH_3)_{3(g)}$ with $NH_{3(l)}$ forming a precipitate and generating heat;
Step 2—removing the heat generated in step 1 by cooling the $NH_{3(l)}$;
Step 3—redissolving the precipitate formed from step 1;
Step 4—evaporating the $NH_{3(l)}$ with a nitrogen stream to form a white crystalline material; and
Step 5—pyrolyzing the white crystalline material from step

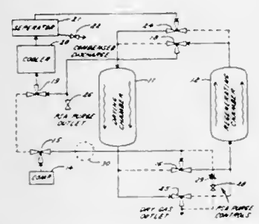
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4 in an inert atmosphere to form high purity aluminum nitride.

4,783,431
INSULATIVE CERAMIC COMPOSITION
Kenichi Hoshi; Shoichi Tosaka, and Takashi Yoshimi, all of Tokyo, Japan, assignors to Taiyo Yuden Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 9, 1987, Ser. No. 71,642
Int. Cl.[4] C04B *35/10*
U.S. Cl. 501—153 **6 Claims**

1. An insulative ceramic material made by sintering at from 850° C. to 1000° C., a composition consisting essentially of, calculated as the oxides, from 25 to 60 wt. % of Al_2O_3, from 10 to 40 wt. % of SiO_2, from 3 to 30 wt. % of B_2O_3, from 1 to 15 wt. % of MgO, from 0.2 to 10 wt. % of Cr_2O_3, from 0.1 to 3 wt. % of Li_2O and from 1 to 20 wt. % of at least one oxide selected from the group consisting of CaO, SrO and BaO, said ceramic material having a coefficient of linear expansion of from 3.0 to 6.0×10^{-6}/°C., a specific inductive capacity of from 5 to 8, a Q value of from 1000 to 2000 and a resistivity of from 1×10^{14} to 3×10^{15} ohms-cm, said ceramic material having a light-shielding property such that a wiring pattern placed inside said ceramic composition cannot be seen.

4,783,432
DRYER REGENERATION THROUGH HEAT OF COMPRESSION AND PRESSURE SWING DESORPTION
Bernard W. Settlemyer, Ocala, Fla., assignor to Pall Corporation, Glen Cove, N.Y.
Filed Apr. 28, 1987, Ser. No. 43,631
Int. Cl.[4] B01J *20/34*; B01D *53/04*
U.S. Cl. 502—34 **5 Claims**



1. A method of regenerating a bed of adsorbent material having water adsorbed thereon to a desired moisture content comprising:

a first pressurized regeneration phase using heat present in the heated feed gas from the discharge of a feed gas compressor to desorb a portion of the moisture from the regenerating desiccant chamber, the temperature of the feed gas being maintained at less than that necessary to regenerate the adsorbent to the desired moisture content and a second regeneration phase utilizing a portion of a product gas as a low-pressure purge gas to desorb additional moisture from said desiccant, the low pressure regeneration being continued until a sufficient volume of product gas has passed through the bed to reduce the moisture content of the bed to the desired moisture content.

4,783,433
SELECTIVE ADSORBENT FOR CO AND METHOD OF MANUFACTURING THE SAME
Kazuo Tajima, and Yo Osada, both of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1986, Ser. No. 929,089
Claims priority, application Japan, Nov. 19, 1985, 60-257820; Nov. 19, 1985, 60-257821; Oct. 2, 1986, 61-233349
Int. Cl.[4] B01J *20/18*
U.S. Cl. 502—74 **20 Claims**

1. An adsorbent, for selectively adsorbing carbon monoxide from a gas mixture containing at least carbon monoxide and carbon dioxide, comprising mainly Cu (I), ion-exchanged and carried in a cation exchange site of a zeolite at an ion exchange ratio of not less than 50%, the zeolite having a silica/alumina ratio of not more than 10; and a salt of at least one metal selected from the group consisting of Cu(I), Fe, Zn, Ni, and Mg, the metal salt being dispersed and carried in pores of the zeolite.

4,783,434
PROCESS FOR LOADING A CARRIER WITH A CATALYTICALLY ACTIVE MATERIAL OR WITH A PRECURSOR OF A CATALYTICALLY ACTIVE MATERIAL, AND THE CATALYST PRODUCED BY SAID PROCESS
Johannes M. Wigman, Philippine; John W. Geus, Bilthoven, both of Netherlands; Jacobus E. Bongaarts, Destelbergen, Belgium, and Garmt R. Meima, Amersfoort, Netherlands, assignors to The Dow Chemical Company, Midland, Mich.
Filed Oct. 31, 1986, Ser. No. 925,193
Int. Cl.[4] B01J *31/04, 31/22*
U.S. Cl. 502—167 **15 Claims**

1. A process for preparing a carrier for loading with a catalytically active composition or with a precusor of a catalytically active composition, which process comprises (1) impregnating a carrier having a surface area less than about 20 m^2/g with a solution of a complex of tin or iron and citric acid, formic acid, lactic acid or ethylenediamine tetraacetic acid in a solvent, the viscosity of which solution is not decreased upon heating or evaporation of the solvent, (2) subsequently removing the solvent, and (3) decomposing the complex, thereby providing a uniform distribution of the decomposed complex over the interior and exterior surfaces of the carrier.

4,783,435
SILICA CATALYST SUPPORTS
John A. Dreibelbis, Wattsburg, Pa., assignor to Mallinckrodt, Inc., St. Louis, Mo.
Continuation of Ser. No. 866,444, May 23, 1986, abandoned, which is a division of Ser. No. 756,580, Jul. 19, 1985, Pat. No. 4,617,060, which is a continuation of Ser. No. 603,262, Apr. 28, 1984, abandoned, which is a continuation of Ser. No. 383,616, Jun. 1, 1982, abandoned, which is a continuation of Ser. No. 82,530, Oct. 10, 1979, abandoned. This application Aug. 25, 1987, Ser. No. 89,939
Int. Cl.[4] B01J *27/182*
U.S. Cl. 502—214 **2 Claims**

1. A catalyst comprising phosphoric acid and a silica catalyst support having about 96 or more weight percent silica, a surface area in the range of about 30 to about 125 square meters per gram; an average pore diameter of about 100 to about 5,000 Angstroms, and a bulk density in the range of about 0.3 to 0.6 gram per cubic centimeter, said support being made by calcining a composite comprised predominantly of precipitated amorphous silica powder having an average size consisting essentially of about 10 to about 50 millimicrons.

4,783,436
CARRIER MATERIAL FOR CATALYSTS METHOD FOR PRODUCING IT AND PLATINUM GROUP METAL CATALYST SUPPORTED ON THE CARRIER
Helmut Brandis, Forstwaldstr. 694; Günter Lehnert, Breitendyk 145 b, and Peter Schüler, Forstwaldstr. 707, all of 4150 Krefeld, Fed. Rep. of Germany
Filed Jul. 16, 1987, Ser. No. 74,061
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1987, 3625330
Int. Cl.[4] B01J *21/04, 23/89, 32/00*
U.S. Cl. 502—327 **7 Claims**

1. A method of producing a carrier for catalyst, the carrier having a metallic base and a sintered metallic coating for supporting a reactive oxide layer or a catalytically acting material, the method comprising (1) forming a coating mixture by compounding a metallic powder consisting essentially of FeAl with a volatile powdered substance which evaporates without a residue at an elevated temperature to form macroscopic pores in the sintered metallic coating, (2) coating a metallic base with said coating mixture, and (3) heating the coated carrier to solid-phase sintering temperature.

4,783,437
SILVER-CONTAINING ETHYLENE OXIDE CATALYST AND A PROCESS FOR ITS PREPARATION
Gosse Boxhoorn, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Jun. 25, 1987, Ser. No. 66,171
Claims priority, application United Kingdom, Jul. 28, 1986, 8618325
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] B01J *21/04, 23/04, 23/14, 23/50*
U.S. Cl. 502—348 **19 Claims**

1. A process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide which comprises

(a) mixing alumina with water, a tin compound and with an alkali metal compound,

(b) calcining the mixture to obtain an alkali-enriched and tin-containing alumina carrier,

(c) applying a solution of a silver compound to the alumina carrier and converting said silver compound to metallic silver.

15. A silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide comprising

(a) from 1 to 25 percent by weight of silver, calculated on the weight of the total catalyst, on the surface of the carrier

(b) an alkali enriched and tin modified alpha-alumina carrier.

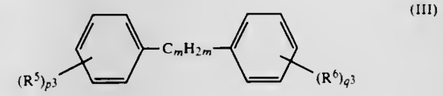
4,783,438
PARTIALLY PRESSURE-SENSITIVE RECORDING PAPER
Yoshio Okada, Matsudo; Yuriko Igarashi, and Yutaka Igari, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1987, Ser. No. 17,585
Claims priority, application Japan, Mar. 3, 1986, 61-45637
Int. Cl.[4] B41M *5/22*
U.S. Cl. 503—206 **5 Claims**

1. A partially pressure-sensitive recording paper, comprising:

a sheet of paper on a surface of which is partially applied a mixture of a thermally melting solid substance and an organic solvent having a mean boiling point of from 250° to 350° C. whose composition is such that the number of aromatic ring carbon atoms relative to the number of all carbon atoms in the molecules of said solvent is not less than 25%, said mixture having dispersed therein microcapsules containing a solution of an electron-donating dyestuff as the core material, the weight ratio of the organic solvent to the thermal melting solid substance ranging from 0.125 to 2.5 and the weight ratio of the thermally melting solid substance to the dispersed microcapsules ranging from 0.5 to 1.5.

4,783,439
HEAT-SENSITIVE RECORDING MATERIAL
Toshimasa Usami; Toshiharu Tanaka, and Masataka Kiritani, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 11, 1985, Ser. No. 786,567
Claims priority, application Japan, Oct. 12, 1984, 59-213958
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—213 **8 Claims**

1. A heat-sensitive recording material comprising a support having provided on the same surface thereof microcapsules containing a basic colorless dye and an organic solvent, and a developer capable of reacting with the basic colorless dye to develop a color, the capsule walls of said microcapsules being impermeable to said basic colorless dye and said developer at room temperature but becoming permeable to said basic colorless dye and/or said developer upon application of heat with a thermal head to thereby provide a color image, wherein said organic solvent is a compound containing at least two benzene rings, and said organic solvent may further contain at least one hetero atom selected from the group consisting of nitrogen, sulfur, oxygen and phosphorous atoms, the total number of hetero atoms constituting less than ten percent of the total number of carbon atoms of said organic solvent, said organic solvent being selected from the group consisting of compounds represented by formula (III):


(III)

wherein R^5 and R^6, which may be the same or different, each represents a hydrogen atom or an alkyl group having from 1 to 18 carbon atoms; m is 2; and p^3 and q^3 each represents an integer of from 1 to 3, with the proviso that the total number of alkyl groups does not exceed 3.

4,783,440
Patent Not Issued For This Number

4,783,441
AQUEOUS PROTEIN SOLUTIONS STABLE TO DENATURATION
Horst Thurow, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Continuation of Ser. No. 263,720, Jun. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 144,040, Apr. 28, 1980, abandoned. This application Dec. 21, 1983, Ser. No. 564,346
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917535; Dec. 22, 1979, 2952119
Int. Cl.[4] A61K *37/00, 37/26*
U.S. Cl. 514—3 **8 Claims**

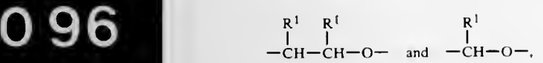
1. A method for stabilizing an aqueous solution of a water soluble biologically active protein to motion conditions, said solution having a pH between 6.8 and 8, which method comprises adding to said solution from 2 to 500 ppm of a surface active compound of the formula

$$R^2Y—X_n—R^3$$

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wherein

X_n is a chain of n members selected from the group of members having the formulas



in any sequence,

n is 2 to 80,

Y is —O— or —NH—,

R^1 is —H, —CH_3, or —C_2H_5, and may be the same or different but is such that at least one-half of the members of the chain X_n contains —CH_3 or —C_2H_5, and

R^2 and R^3 are each members independently selected from the group consisting of hydrogen, alkyl having 1 to 20 carbon atoms, carboxyalkyl having 2 to 20 carbon atoms, and alkylphenyl having 1 to 10 carbon atoms, but wherein R^2 may only be such alkyl if Y is —NH—.

4,783,442

B-CELL DIFFERENTIATING PEPTIDES

Tapan Audhya; Daniel J. Kroon, both of Bridgewater; George Heavner, Flemington and Gideon Goldstein, Short Hills, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 681,971, Jan. 31, 1985, Pat. No. 4,584,284. This application Apr. 21, 1986, Ser. No. 855,011

The portion of the term of this patent subsequent to Apr. 22, 2003, has been disclaimed.

Int. Cl.[4] A61K *37/02;* **C07K** *5/08*

U.S. Cl. 514—18 **8 Claims**

1. A peptide of formula R-HIS-GLY-NH_2 and the pharmaceutically acceptable acid-addition salts thereof, wherein R is selected from the group consisting of desamino LYS, formyl-LYS, and loweralkanoyl-LYS.

4,783,443

AMINO ACYL CEPHALOSPORIN DERIVATIVES

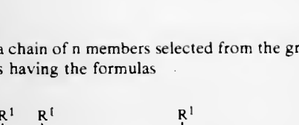
Michael A. Johnston, and Shahrair Mobashery, both of Chicago, Ill., assignors to The University of Chicago, Chicago, Ill.

Filed Mar. 3, 1986, Ser. No. 835,280

Int. Cl.[4] C07D *501/46;* **A61K** *31/545*

U.S. Cl. 514—19 **11 Claims**

1. Cephalosporin compounds of the Formula (I):



(I)

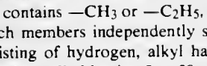
wherein

W is a pharmaceutically acceptable salt or a carboxyl-protecting group;

n is an integer from 1 to 2;

—X— is —X^1— where

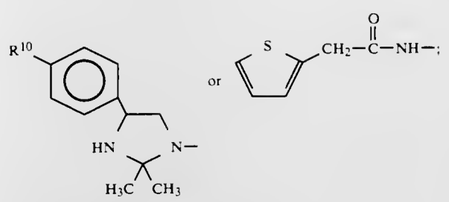
the X^1 moieties are the same or different and selected from the group consisting of (D) or (L)



Z is Z^1;

Y is —O—;

R^1 is selected from the group consisting of



wherein Q^1, Q^2, and Q^3 are the same or different and selected from the group consisting of H, F, Cl, or Br;

R^5 is F, Cl, or Br; and

Z^1 is H or an amino protecting group.

4,783,444

ANTIGLAUCOMA COMPOSITIONS AND METHODS

Robert Watkins, Great Meadows; Ronald J. Doll, Maplewood; Bernard R. Neustadt, West Orange; Elizabeth M. Smith; Charles V. Magatti, both of Verona, and Elijah H. Gold, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 651,378, Sep. 17, 1984, which is a continuation of Ser. No. 500,494, Jun. 2, 1983, abandoned. This application Apr. 4, 1986, Ser. No. 849,072

Int. Cl.[4] A61K *37/02*

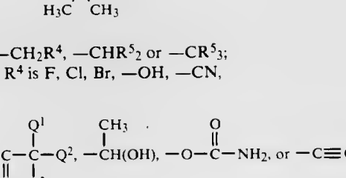
U.S. Cl. 514—19 **41 Claims**

1. A method of reducing intraocular pressure in a mammal which comprises topically administering to an eye of said mammal in need of such treatment a composition comprising an intraocular pressure reducing effective amount of a compound represented by formula I:

I

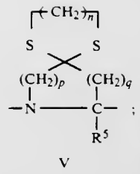
wherein W is

II



III IV

-continued



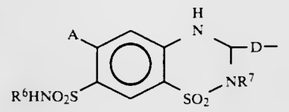
V

n is 0 or 1; m is 0 to 2;

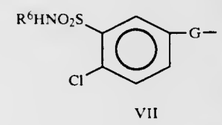
p and q are each 0, 1 or 2, provided that the sum of p and q is 1 or 2, and that in formula V, p is not 0;

Y is —CH_2—, —CH_2O—, or —CH_2S—, attached at the 2 or 4 position of phenyl group;

Z is



VI

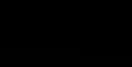


VII

wherein

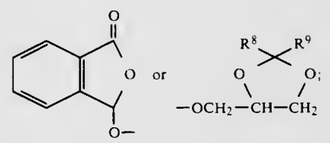
A is Cl or CF_3;

D is —$(CH_2)_u$— (wherein u is 1 or 2), —CH_2O—, —CH_2S—,



G is —$CONR^7(CH_2)_t$—, or —$SO_2NR^7(CH_2)_t$—; t is 0 or 1;

R^1 and R^4 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, K—X_r—$(CH_2)_s$—O—, wherein K is phenyl, substituted phenyl, 1- or 2-naphthyl, X is oxygen or sulfur, r is 0 or 1 and s is 0 to 4, (provided that when s is 0, r is 0) and wherein the substituents on the phenyl are chosen from group M, wherein M is halogen, hydroxy, trifluoromethyl, alkoxy having 1 to 6 carbon atoms, 2- and 3-furanyl, 2- and 3-thienyl, phenyl not substituted, phenyl substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having form 1 to 6 carbon atoms, —OCH_2OCO—alkyl wherein the alkyl has from 3 to 8 carbon atoms, —OCH_2CO—phenyl, wherein the phenyl substituted with group M, 1-glyceryl,



R^2, R^5, R^6 and R^9 are hydrogen or lower alkyl;

R^3 is hydrogen, lower alkyl or amino lower alkyl;

R^7 is hydrogen, lower alkyl or phenyl(lower)alkyl and

R^8 is hydrogen, lower alkyl, phenyl, or phenyl substituted by group M;

or a pharmaceutically acceptable salt thereof.

4,783,445

SOLUBLE EPOXIDE/CARBON DIOXIDE COPOLYMERIZATION CATALYSTS

Hsiang-Ning Sun, Media, Pa., assignor to Arco Chemical Company, Newtown Square, Pa.

Filed Dec. 14, 1987, Ser. No. 132,097

Int. Cl.[4] B01J *31/04*

U.S. Cl. 502—170 **7 Claims**

1. A process for preparing soluble zinc catalysts for the copolymerization of epoxides and carbon dioxide to form polycarbonates comprising reacting, at a temperature of from 0° to 150° C. for a time of 1 to 24 hours, a mixture of a zinc compound selected from the group consisting of zinc oxide and zinc salts and a dicarboxylic acid, anhydride thereof or monoester thereof in a suitable solvent and subsequently removing the volatile components by distillation under vacuum.

4,783,446

METHOD FOR THE TREATMENT OF AIDS VIRUS AND OTHER RETROVIRUSES

Michael Neushul, Goleta, Calif., assignor to Neushul Mariculture Incorporated, Goleta, Calif.

Continuation-in-part of Ser. No. 801,115, Nov. 22, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 18,889

Int. Cl.[4] A61K *31/715*

U.S. Cl. 514—54 **10 Claims**

1. A method of treating retrovirus infections in humans and animals which comprises treating a retrovirus-infected human or animal host with an anti-retroviral effective amount of a carrageen, or a mixture of carrageenans.

4,783,447

PROCESS FOR PRODUCING NATURAL HEPARAN SULPHATE AND DERMATAN SULPHATE IN SUBSTANTIALLY PURE FORM, AND THEIR PHARMACEUTICAL USE

Rinaldo Del Bono, Milan; Luigi De Ambrosi, Santbia; Piergiuseppe Pagella, Isola S. Antonio, and Gianni Ferrari, Milan, all of Italy, assignors to Mediolanum Farmaceutici Srl, Milan, Italy

Filed Mar. 10, 1986, Ser. No. 838,133

Claims priority, application Italy, Mar. 13, 1985, 19885 A/85

Int. Cl.[4] A61K *31/725;* **C08B** *37/10*

U.S. Cl. 514—56 **12 Claims**

1. A process for producing natural heparan sulphate and dermatan sulphate is substantially pure form from mixtures of proteoglycans of animal tissues from the aorta, myocardium and vascularized organs, characterized by the following stages:

extracting the proteoglycans from said tissues in finely micronized form by treatment with a solution of a compound selected from the group consisting of urea, quanidine, thiourea and potassium thiocyanate;

filtering and clarifying the solution, and partially eliminating the solution of a compound selected from the group consisting of urea, quanidine, thiourea and potassium thiocyanate;

splitting the bond between the mucopolysaccharides and proteins;

precipitating the proteins and filtering

eliminating the nucleic acid traces;

precipitating the mucopolysaccharides;

fractionating the heparan sulphate and dermatan sulphate and purifying them.

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4,783,448

METHOD FOR CLEANSING AN INFECTED SORE

Olof J. A. Johansson, Olofström, Sweden, assignor to Perstorp AB, Perstorp, Sweden

Filed Jun. 7, 1983, Ser. No. 501,780
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—57 **13 Claims**

1. A method for cleansing a fluid-discharging infected sore located on the exterior of the body by avoiding the formation of an escar on the sore, which method comprises applying to the sore an iodine-free particulate mass of dry water-absorbing, water-insoluble but swellable polymer particles consisting essentially of dextran, starch, cellulose, or derivatives thereof, cross-linked into a three-dimensional network by means of bridges connected to the molecules of said polymer by ether bonds, wherein the polymer contains anionic groups selected from sulphonic acid groups, carboxylic acid groups, and phosphoric acid groups in acid form, one gram of which polymer swells in the presence of water to absorb at least one gram of water, maintaining said particulate mass in contact with said sore for a sufficient length of time to permit fluid discharged from the sore to be absorbed by the polymer particles and avoiding the escar formation by precipitation of the fibrinogen at the surface of the sore and thus preventing the normal coagulation process by means of the action of said anionic groups in acid form on the fibrinogen in said fluid discharged from the sore, and removing the particulate mass and materials absorbed from the sore.

4,783,449

HYDROSOLUBLE PHARMACEUTICAL COMPOSITIONS CONTAINING SALTS OF (−)CIS-1,2-EPOXYPROPYLPHOSPHONIC ACID WITH AMINOACIDS

Stefania Meola, Milan, Italy, assignor to Istituto Gentili S.p.A., Pisa, Italy

Filed Oct. 3, 1985, Ser. No. 783,747
Claims priority, application Switzerland, Oct. 5, 1984, 4791/84
Int. Cl.[4] A61K *31/685, 31/665*
U.S. Cl. 514—76 **2 Claims**

1. A pharmaceutical composition having antibiotic properties comprising a salt of (−)cis-1,2-epoxypropylphosphonic acid with arginine together with an aminoalcohol selected from the group consisting of 1,1-dimethyl-2-aminoethanol, 2-aminobutanol and 2-amino-2-hydroxymethyl-1,3-propandiol in a molar ratio of 0.4–0.8 to increase the water solubility of said salt.

4,783,450

USE OF COMMERCIAL LECITHIN AS SKIN PENETRATION ENHANCER

Mahdi B. Fawzi, Flanders; Uma R. Iyer, Mendham, and Majid Mahjour, Netcong, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 13, 1987, Ser. No. 37,671
Int. Cl.[4] A61V *31/685*
U.S. Cl. 514—78 **6 Claims**

1. A process for enhancing penetration of a drug through the skin or other biological membranes which comprises administering to the skin or other biological membrane of a host in need thereof a pharmaceutical composition containing an effective amount of procaterol and an effective amount of commercial lecithin.

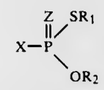
4,783,451

ORGANOPHOSPHORUS, COMPOUNDS AND INSECTICIDAL, MITICIDAL, NEMATICIDAL OR SOIL PESTICIDAL COMPOSITIONS CONTAINING THEM

Takahiro Haga, Kusatsu; Tadaaki Toki, Otsu; Toru Koyanagi, Kyoto; Hiroshi Okada, Kusatsu; Kiyomitsu Yoshida, Kusatsu, and Osamu Imai, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

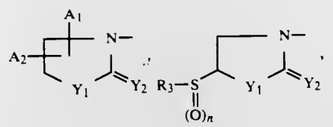
Filed Jun. 25, 1986, Ser. No. 878,266
Claims priority, application Japan, Jun. 25, 1985, 60-138133; Jun. 27, 1985, 60-141352; Jun. 27, 1985, 60-141353; Nov. 5, 1985, 60-247470; Feb. 25, 1986, 61-039552
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] A01K *57/16;* C07F *9/40*
U.S. Cl. 514—92 **31 Claims**

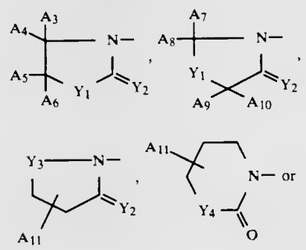
1. An organophosphorus compound having the formula:

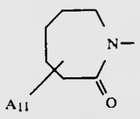


(I)

wherein X is







wherein each of A_1, A_3 and A_5 is a hydrogen atom or an alkyl group, A_2 is a thienyl group which may be substituted by halogen, or a phenyl group which is substituted by alkyl or alkoxy, each of Y_1 and Y_2 is an oxygen atom or a sulfur atom, R_3 is an alkyl group which may be substituted by halogen, a phenyl group which may be substituted by halogen, or $—CH_2CO_2R_4$ (wherein R_4 is an alkyl group), n is an integer of 0, 1 or 2, each of A_4 and A_6 is a hydrogen atom, a cyano group or $—CH_2Q$ (wherein Q is a phenylsulfinyl group, an alkylsulfonyloxy group, a dialkylamino group, an acyloxy group or a dialkoxydithiophosphono group), provided one of A_4 and A_6 is a cyano group or $—CH_2Q$, each of A_7 to A_{10} is a hydrogen atom, an alkyl group, an alkenyl group, a methoxymethyl group, a thienyl group which may be substituted by halogen, or a phenyl group which may be substituted by halogen, alkyl or alkoxy, A_{11} is a hydrogen atom, an alkyl group or an alkoxycarbonyl group, Y_3 is an oxygen atom,



(wherein R_5 is a hydrogen atom, an alkyl group or $—CO_2R_7$ wherein R_7 is a hydrogen atom or an alkyl group) or



(wherein R_6 is a phenyl group which may be substituted by halogen, alkyl or alkoxy), Y_4 is an oxygen atom, a sulfur atom or $—CH_2—$, Z is an oxygen atom or a sulfur atom, and each of R_1 and R_2 is an alkyl group which may be substituted by halogen, alkoxy or alkylthio.

28. An insecticidal, miticidal, nematicidal or soil pesticidal composition comprising an insecticidally, miticidally, nematicidally or soil pesticidally effective amount of an organophosphorus compound of the formula I as defined in claim 1 and, if necessary, a carrier.

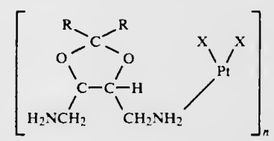
4,783,452

PLATINUM COORDINATION COMPOUNDS

Alan H. Haines, Norwich, and Christopher Morley, Nottingham, both of United Kingdom, assignors to Johnson Matthey Public Limited Company, London, England

Filed Oct. 20, 1986, Ser. No. 920,541
Claims priority, application United Kingdom, Oct. 18, 1985, 8525689
Int. Cl.[4] C07F *15/00;* A61K *31/555*
U.S. Cl. 514—184 **4 Claims**

1. A compound having the formula



in which the X groups are either both chloride or both bromide, the R groups are either both methyl or one is hydrogen and the other is phenyl, and n is 1.

4. A composition having anti-tumour activity against implanted ADJ/PC6 comprising a compound according to claim 1 as the active ingredient in association with a pharmaceutically acceptable carrier, diluent or excipient.

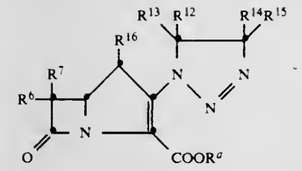
4,783,453

2-AZA-SUBSTITUTED 1-CARBADETHIAPEN-2-EM-3-CARBOXYLIC ACIDS

Burton G. Christensen, Cliffside Park; Ronald W. Ratcliffe, Matawan, and John C. Chabala, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 743,199, Jun. 10, 1985, abandoned.
This application Sep. 8, 1987, Ser. No. 97,348
Int. Cl.[4] C07D *487/04;* A61K *31/40*
U.S. Cl. 514—210 **8 Claims**

1. A compound of the formula:



wherein R^{16} is H or methyl; R^7 and R^6 are chosen from hydrogen, linear, branched or cyclic C_1–C_5 alkyl, which can be substituted with fluoro, hydroxy, protected hydroxy; sulfoxy, amino, protected amino, wherein R^6 and R^7 taken together can also be C_2–C_4 alkylidene, optionally substituted by the above substituents with the proviso that both R^6 and R^7 are not unsubstituted alkyl, and R^a is hydrogen, or pharmaceutically acceptable salt cation or ester group; wherein R^{12}, R^{13}, R^{14} and R^{15} are independently chosen from H, alkyl, which can be substituted with OH, alkoxyl, acyloxy, amino, mono- and dialkylamino, or $NR^{11}C(X)R^{11}$; and wherein R^{12}, R^{13}, R^{14}, and R^{15}, can also be phenyl, benzyl, pyridyl, pyridylmethyl, thienyl, or thienylmethyl which can be substituted with up to 2 or halo, OR^{11}, NR_2^{11}, OCO^{11}, or $NR^{11}C(X)R^{11}$; and further wherein R^{12} and R^{14} can be joined to form a cis-fused ring of 5 or 6 atoms containing up to 2 heteroatoms, selected from O, N, S, SO, or SO_2.

4,783,454

PROCESS FOR PRODUCING HARRINGTONINE AND HOMOHARRINGTONINE

Yaguang Liu, 67-08 168th St., Fresh Meadows, New York, N.Y. 11365

Division of Ser. No. 737,949, May 28, 1985, Pat. No. 4,675,318.
This application May 14, 1987, Ser. No. 50,852
Int. Cl.[4] A61K *31/55*
U.S. Cl. 514—214 **4 Claims**

1. A process for producing harringtonine comprising:
(a) extracting a ground plant selected from the group consisting of *Cephalotaxus fortunei Hook, C. sinensis Li, C. hainanensis* and *C. wilsoniana,* with 90% ethanol at room temperature for 24 hours;
(b) filtering the above mixture and separating a filtrate A from a filtercake;
(c) percolating the filtercake with ethanol and collecting a filtrate B;
(d) combining filtrates A and B and distilling them under reduced pressure to recover ethanol and an aqueous residue;
(e) adjusting the pH of the residue to 2.5;
(f) separating solids from the resulting mixture by filtration to yield a filtrate;
(g) adjusting the pH of the filtrate to pH 9.5;
(h) extracting the alkaline solution of step (g) with chloroform, and distilling the chloroform extract to recover alkaloids;
(i) dissolving the alkaloids in citric acid, and adjusting pH of two equal portions of the acid solution portions to 8, and 9;
(j) extracting the portions of pH 8 and 9 with chloroform;
(k) distilling the chloroform extract to yield raw harringtonine; and
(l) purifying said harringtonine by recrystallizing the same in pure ethanol and recrystallizing the same in diethyl ether.

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4,783,455

SUBSTITUTED PYRIMIDOINDOLES AND DIAZEPINOINDOLES USEFUL AS HYPOGLYCAEMICS

Ian A. Cliffe, Cippenham, England, assignor to John Wyeth and Brother Ltd., Maidenhead, England

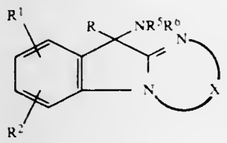
Filed May 22, 1987, Ser. No. 53,444

Claims priority, application United Kingdom, Jun. 11, 1986, 8614246

Int. Cl.⁴ A61K *31/505, 31/55;* **C07D** *487/04*

U.S. Cl. 514—220 **16 Claims**

1. A compound of the formula:



in which

R is alkyl of 1 to 6 carbon atoms or substituted or unsubstituted phenyl, in which the substituents are hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

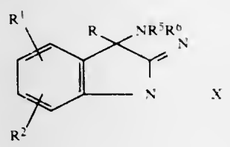
R^1 and R^2 are, independently, hydrogen, hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

X is $—CH_2—CR^3R^4—CH_2—$ or $—(CH_2)_4—$ where R^3 and R^4, independently, are hydrogen or alkyl of 1 to 6 carbon atoms, and, when taken together with the carbon atom to which they are attached, R^3 and R^4 complete a cyclopentane, cyclohexane or cycloheptane ring;

R^5 and R^6, independently, are hydrogen or alkyl of 1 to 6 carbon atoms, or R^6 is hydrogen and R^5 is alkylcarbonyl, where the alkyl group is of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

16. A method of treating diabetes which comprises administering to a mammal in need thereof, a hypoglycemically effective amount of a compound of the formula:



in which

R is alkyl of 1 to 6 carbon atoms, or substituted or unsubstituted phenyl, in which the substituents are hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

R^1 and R^2 are, independently, hydrogen, hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

X is $—CH_2—CR^3R^4—CH_2—$ or $—(CH_2)_4—$ where R^3 and R^4, independently, are hydrogen or alkyl of 1 to 6 carbon atoms, and, when taken together with the carbon atom to which they are attached, R^3 and R^4 complete a cyclopentane, cyclohexane or cycloheptane ring;

R^5 and R^6, independently, are hydrogen or alkyl of 1 to 6 carbon atoms, or R^6 is hydrogen and R^5 is alkylcarbonyl, where the alkyl group is of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,783,456

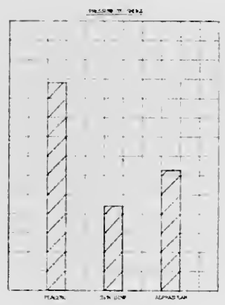
METHOD OF PREVENTING WITHDRAWAL SYMPTOMS ASSOCIATED WITH THE CESSATION OR REDUCTION OF TOBACCO SMOKING

Alexander H. Glassman, Teaneck, N.J., assignor to Research Foundation for Mental Hygiene, Inc., New York, N.Y.

Division of Ser. No. 852,650, Apr. 16, 1986, Pat. No. 4,683,231, which is a division of Ser. No. 585,900, Mar. 2, 1984, Pat. No. 4,588,739. This application Jun. 12, 1987, Ser. No. 62,129

Int. Cl.⁴ A61K *31/54, 31/135*

U.S. Cl. 514—214 **8 Claims**



1. A method of reducing, in a human subject accustomed to the regular or habitual smoking of tobacco, the withdrawal symptoms associated with the cessation or reduction of tobacco smoking which comprises administering to the subject an effective symptom-preventing amount of a compound selected from the group consisting of guanabenz acetate, guanfacine, azepexole, 6-allyl-2-amino-5, 6, 7, 8-tetrahydro-4H-thiazolo[4,5-d]-azepine di HCl or analogs thereof.

4,783,457

PEST CONTROLLING AGENTS

James A. Nathanson, Wellesley, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Continuation of Ser. No. 605,847, May 1, 1984, Pat. No. 4,678,775. This application Mar. 17, 1987, Ser. No. 26,968

Int. Cl.⁴ A01N *43/84, 43/54, 43/78, 43/76*

U.S. Cl. 514—227.2 **7 Claims**

1. An invertebrate pest controlling composition comprising an invertebrate pest-controlling amount of a non-formamidine octopamine agonist having substantial activity toward an octopamine receptor present in an invertebrate pest and a pesticidially inert carrier.

4,783,458

METHOD OF COMBATING FUNGI

Paul A. Worthington, Maidenhead; Brian K. Snell, Reading; Paul De Fraine, Wokingham, and Vivienne M. Anthony, Maidenhead, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 10, 1986, Ser. No. 872,685

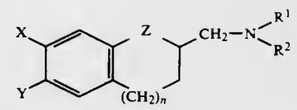
Claims priority, application United Kingdom, Jun. 18, 1985, 8515387

Int. Cl.⁴ A01N *43/40, 43/84*

U.S. Cl. 514—239.5 **6 Claims**

1. A method of combatting fungi which comprises applying to a plant, to seed of a plant, or to the locus of a plant or seed, a fungicidal composition comprising as an active ingredient (a) a compound having the general formula:

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or a stereoisomer thereof, wherein one of X and Y is hydrogen and the other represents the group



where R is hydrogen, methyl or ethyl; Z represents a group $—CR^3R^4—$ or $—CR^3OH$ in which R^3 and R^4 are hydrogen or alkyl groups; R^1 and R^2 together with the adjacent nitrogen atom constitute a morpholine or piperidine ring optionally substituted by alkyl of 1–4 carbon atoms, aryl, hydroxy, alkoxy, aryloxy or aralkyl; and n is 1; or (b) an acid addition salt of such a compound.

4,783,459

ANILINOPYRIMIDINE FUNGICIDES

Ulrich Buhmann; Jurgen Westermann; Dietrich Baumert; Ernst Pieroh, all of Berlin, Fed. Rep. of Germany; Geoffrey R. Cliff, Whittlesford, and Ian C. Richards, Haverhill, both of England, assignors to Schering Agrochemicals Ltd., United Kingdom

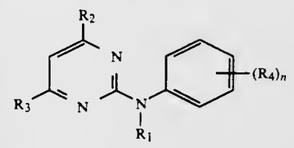
Filed Apr. 23, 1987, Ser. No. 41,706

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3614060

Int. Cl.⁴ C07D *239/02, 401/00, 413/00;* **C07F** *5/02*

U.S. Cl. 514—235.8 **17 Claims**

1. A compound of formula I



(I)

in which

n is 0, 1 or 2;

R_1 is

(a) the group $—CXR_5$, where X is oxygen or sulphur and R_5 is hydrogen, a nitrogen or sulphur containing heterocyclic selected from the group consisting of pyridyl, imidazolyl, pyrazolyl, thienyl, pyridyl, triazolyl, tetrazolyl, benzimidazolyl, thiazolyl, morpholino, piperidino, and succinimido; C_{2-4}-alkenyl, (optionally substituted by phenyl), C_{1-4}-alkanoyl, C_{1-7}-alkoxycarbonyl, C_{1-7}-alkyl substituted by phenoxy (optionally substituted by halogen), or amino substituted by mono- or di-C_{1-7}-alkyl; or R_5 is the group $—NHR_6$, where R_6 is amino substituted by mono- or di-C_{1-7}-alkyl, carbamoyl substituted by phenyl (optionally halo substituted), C_{1-7}-alkylsulphonyl or phenylsulphonyl (optionally halo substituted), and when n is 0 or when X is sulphur, R_5 can also be C_{1-7} alkyl, halo-C_{1-7}-alkyl, phenyl, aralkyl, C_{1-7}-alkoxycarbonyl-C_{1-7}-alkyl or phenylamino;

(b) cyano or the group $—CXYR_7$, where X and Y arethe same or different and are oxygen, sulphur and R_7 is C_{1-7}-alkyl (optionally subsituted by halogen, C_{1-4}-alkoxy, C_{1-7}-alkylamino, cyano, tri-C_{1-7}-alkylsilyl, phenyl, furyl, pyridyl, imidazolyl, pyrazolyl, thienyl, pyridyl, triazolyl, tetrazolyl, benzimidazolyl, thiazolyl, morpholino, piperidino or succinimido), phenyl, furyl, pyridyl, imidazolyl, pyrazolyl, thienyl, pyridyl, triazolyl, tetrazolyl, benzimidazolyl, thiazolyl, morpholino, piperidino or succinimido; or

(c) when n is 1 or 2 and at least one R_4 group is halo-C_{1-7}-alkoxy, R_1 can be hydrogen;

R_2 and R_3 are the same or different and are C_{1-7}-alkyl, and R_4 is C_{1-7}-alkyl, C_{1-7}-alkoxy, halogen, halo-C_{1-7}-alkyl, halo-C_{1-7}-alkoxy, nitro or cyano.

4,783,460

MORPHOLINE DERIVATIVES, COMPOSITIONS AND MEDICINAL USES

Barrie C. C. Cantello, Coulsdon, England, assignor to Beecham Group p.l.c., Brentford, England

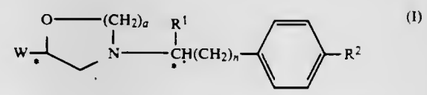
Division of Ser. No. 865,348, May 21, 1986, Pat. No. 4,665,072, which is a division of Ser. No. 666,818, Oct. 31, 1984, Pat. No. 4,607,033. This application Mar. 17, 1987, Ser. No. 26,893

Claims priority, application United Kingdom, Nov. 2, 1983, 83 29247; Feb. 16, 1984, 84 04047

Int. Cl.⁴ A61K *31/535;* **C07D** *265/30, 413/04*

U.S. Cl. 514—233.5 **7 Claims**

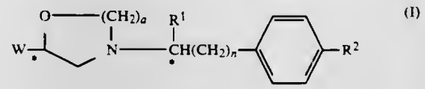
1. A compound of formula (I):



(I)

or a salt thereof, in which W is phenyl optionally substituted by halogen or trifluoromethyl, or a benzofuran-2-yl group, R^1 is hydrogen or methyl, a=2, R^2 is a group O—E—OR^5, wherein and R^5 represents hydrogen or C_{1-6} alkyl, n is 1 or 2, and E is a C_{2-7} straight or branched alkylene chain with at least two carbon atoms separating the two heteroatoms in the group R^2.

6. A method for treating hyperglycaemia in a human or non-human animal which method comprises administering an effective, non-toxic amount of a compound of formula (I):



(I)

in which W is phenyl optionally substituted by halogen or trifluoromethyl, or a benzofuran-2-yl group, R^1 is hydrogen or methyl, a=2, R^2 is a group O—E—OR^5, wherein R^5 represents hydrogen or C_{1-6} alkyl, n is 1 or 2, and E is a C_{2-7} straight or branched alkylene chain with at least two carbon atoms separating the two heteroatoms in the group R^2; or a pharmaceutically acceptable salt thereof to a hyperglycaemic human or non-human animal.

4,783,461

3,6-DISUBSTITUTED TRIAZOLO [3,4-A]PHTHALAZINE DERIVATIVES

Emilio Occelli, Parabiago, and Giorgio Tarzia, Milan, both of Italy, assignors to Gruppo Lepetit S.p.A., Gerenzano, Italy

Filed Jul. 11, 1984, Ser. No. 629,658

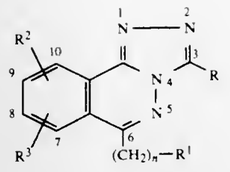
Claims priority, application Italy, Jul. 12, 1983, 22014 A/83

Int. Cl.⁴ A61K *31/50, 31/55;* **C07D** *487/04*

U.S. Cl. 514—248 **7 Claims**

1. A 1,2,4-triazolo[3,4-a]phthalazine of formula

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I

wherein

R represents phenyl or substituted phenyl wherein the phenyl ring is substituted with one, two or three substituents independently selected from (C_1-C_4)alkyl, (C_1-C_4)alkoxy, halogen, phenyl, hydroxy, amino, mono- and di-(C_1-C_4)alkylamino, (C_2-C_4)alkanoylamino and trifluoromethyl; n is 1 or 2;

R^1 is selected from an amino group of formula NR^4R^5 wherein R^4 and R^5, each independently, represents hydrogen, (C_1-C_4)alkyl, (C_2-C_4)alkenyl, (C_1-C_4)alkyl substituted with one or two groups independently selected from hydroxy, (C_1-C_4)alkoxy, halogen, carboxy and (C_1-C_4)alkoxycarbonyl; a (C_1-C_4)alkyl or unsubstituted phenyl-(C_1-C_4)alkyl group wherein the alkyl portion may be substituted as defined above and the phenyl portion may be substituted with 1, 2 or 3 substituents selected from (C_1-C_4)alkyl, (C_1-C_4)alkoxy, halogen, phenyl, hydroxy, amino, mono- and di-(C_1-C_4)alkylamino, (C_1-C_4)alkanoylamino, and trifluoromethyl, or R^4 and R^5 taken together with the adjacent nitrogen atom may represent a saturated 4, 5, 6 or 7-membered heterocyclic ring which may have one additional heteroatom selected from nitrogen, oxygen and sulfur and optionally bear one or two substituents independently selected from (C_1-C_4)alkyl, phenyl, substituted phenyl, hydroxy, and carbo-(C_1-C_4-)alkoxy, or R^1 represents an alkoxy or cycloalkoxy group of formula —OR^6 wherein R^6 stands for a (C_1-C_6)alkyl group substituted with one or two groups independently selected from hydroxy, amino, mono- or di-(C_1-C_4)alkylamino, (C_1-C_4)alkoxy, halogen, oxo, carboxy, and (C_1-C_4)alkoxycarbonyl, or R^6 is a (C_5-C_8)cycloalkyl group optionally substituted with one or more hydroxy or (C_1-C_4)alkoxy groups and

R^2 and R^3, each independently, represents hydrogen, halogen, (C_1-C_4)alkyl or (C_1-C_4)alkoxy,

and the pharmaceutically acceptable acid-addition salt thereof.

4,783,462

3(2H)PYRIDAZINONE, AND ANTI-ALLERGIC AGENT CONTAINING IT

Motoo Mutsukado, Sakura; Keizo Tanikawa, Tokyo; Ken-ichi Shikada, Kuki, and Ryozo Sakoda, Kashiwa, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

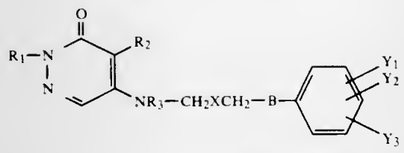
Filed Feb. 27, 1986, Ser. No. 833,607

Claims priority, application Japan, Feb. 27, 1985, 60-038559

Int. Cl.[4] C07D *237/06;* **A61K** *31/50*

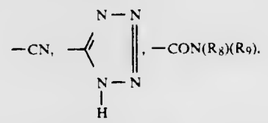
U.S. Cl. 514—249 **29 Claims**

1. A 3(2H)pyridazinone of the formula:

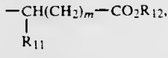


(I)

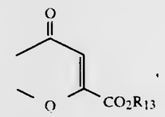
wherein R_1 is hydrogen or C_1-C_5 alkyl; R_2 is hydrogen, C_1-C_8 alkyl, chlorine or bromine; R_3 is hydrogen or C_1- C_4 alkyl; X is —$(CH_2)_n$—, wherein n is an integer of 1 to 4, —$CH(OH_4)$—, wherein R_4 is hydrogen or C_1-C_4 alkyl. —CO— or a single bond; when X is —$(CH_2)_n$—, wherein n is as defined above or a singel bond, B is —O—, —S—, —NH—, —OSO_2—, or —OCO— or a single bond; when X is —$CH(OR_4)$—, wherein R_4 is as defined above, B is —O—, —S—, —NH— or —OSO_2—; and when X is —CO—, is —O— or —S—; and each or Y_1, Y_2 and Y_3, which may be the same or different, is hydrogen, C_1-C_8 alkyl, C_2-C_8 alkenyl, halogen, —OR_5, wherein R_5 is hydrogen or C_1-C_4 alkyl, —CO_2R_6, wherein R_6 is hydrogen or C_1-C_4 alkyl, —$CH{=}CHCO_2R_7$, wherein R_7 is hydrogen or C_1-C_4 alkyl,



wherein each of R_8 an R_9, which may be the same or different, is hydrogen or C_1-C_4 alkyl, —COR_{10}, wherein R_{10} is hydrogen, C_1-C_5 alkyl or



with m being an integer of 0 to 3, R_{11} being hydrogen or C_1-C_3 alkyl, and R_{12} being hydrogen or C_1-C_4 alkyl, or any two, of Y_1, Y_2 and Y_3 together forming



wherein R_{13} is hydrogen or C_1-C_4 alkyl, provided that when R_3 is hydrogen and both X and B are single bonds, Y_1, Y_2 and Y_3 are not simultaneously hydrogen, and a pharmaceutically acceptable salt thereof.

4,783,463

PYRIDYL-PYRIDAZINONE AND PYRIDYL-PYRAZOLINONE COMPOUNDS AND THEIR USE IN THE TREATMENT OF CONGESTIVE HEART FAILURE

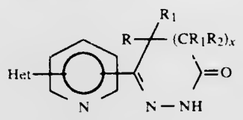
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale; William L. Studt, Harleysville, and William C. Faith, Ambler, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Oct. 23, 1985, Ser. No. 790,426

Int. Cl.[4] E07D *401/14;* **C07D** *413/14;* **A61K** *31/50, 31/44*

U.S. Cl. 514—252 **14 Claims**

1. A pyridazinone compound of the formula:



wherein:

Het is imidazol-1-yl or 1,2,4-triazol-1-yl;

R and R_2 are H or alkyl;

R_1 is H, alkyl or vicinal R_1 groups from a C—C double bond; and x is 1;

or a pharmaceutcially acceptable salt thereof.

7. A method for increasing cardiotonic contractility in a patient requiring such treatment which comprises administering to such patient an effective amount of compound according to claim 1.

4,783,464

N-SUBSTITUTED ERGOLINE- AND 9,10-DIDEHYDRO-ERGOLINE-8-CARBOXAMIDE-AND-8-AMINOMETHYL-DERIVATIVES, THEIR PRODUCTION AND THEIR PHARMACEUTICAL COMPOSITION

René Ziegler, Basle, Switzerland, and Peter Stütz, Vienna, Austria, assignors to Sandoz Ltd., Basle, Switzerland

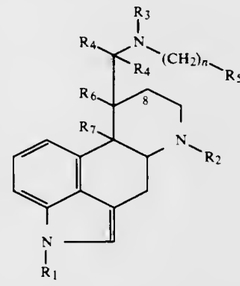
Continuation of Ser. No. 438,449, Nov. 12, 1982, abandoned. This application Nov. 19, 1987, Ser. No. 123,016

Claims priority, application Switzerland, Nov. 4, 1981, 7056/81

Int. Cl.[4] A61K *31/495;* **C07D** *457/02, 457/06*

U.S. Cl. 514—253 **26 Claims**

1. A compound of formula I



I

wherein

R_1 is H, (C_{1-4}alkyl, —CH_2OH or (C_{1-4})alkoxymethyl

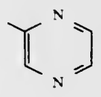
R_2 is H or (C_{1-6})alkyl

R_3 is H or (C_{1-4})alkyl

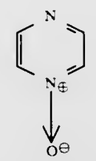
the two

R_4's both represent H or together represent an oxo-group

R_5 is the group



or is the group



R_6 and R_7 both represent H or together represent a bond and n is 0, 1 or 2

in free base form or in pharmaceutically acceptable acid addition salt form.

4,783,465

COUGH/COLD MIXTURES COMPRISING NON-SEDATING ANTIHISTAMINE DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Continuation-in-part of Ser. No. 887,205, Jul. 24, 1986, Pat. No. 4,738,960, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Apr. 24, 1987, Ser. No. 42,120

Int. Cl.[4] A61K *31/19, 31/44, 31/445, 31/495, 31/505*

U.S. Cl. 514—255 **32 Claims**

1. A pharmaceutical composition of matter for use in the treatment of cough, cold, cold-like and/or flu symptoms and the discomfort, pain, fever, and general malaise associated therewith, in a mammalian organism, and adapted for unit dosage oral administration, said composition comprising (i) an analgesically and anti-inflammatory effective amount of at least one of the propionic acid NSAIDs, ibuprofen, naproxen, benoxaprofen, flubiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, tioxaprofen, alminoprofen, tiaprofenic acid, fluprofen and bucloxic acid or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) an antihistaminally effective amount of at least one of the non-sedating antihistamines, acrivastine, astemizole, azatadine, cetirizine, ketotifen, loratidine, temelastine, terfenadine, or pharmaceutically acceptable salt thereof.

4,783,466

NOVEL PYRIDINYLPYRIMIDINE DERIVATIVES, METHOD FOR PRODUCTION THEREOF AND A PLANT DISEASE PROTECTANT CONTAINING THEM AS THE ACTIVE INGREDIENT

Tsuguhiro Katoh, Osaka; Kiyoto Maeda; Masao Shiroshita, both of Hyogo; Norihisa Yamashita, Osaka; Yuzuru Sanemitsu, and Satoru Inoue, both of Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

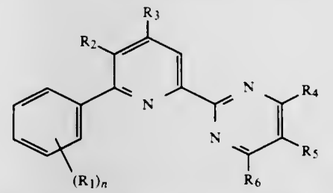
Filed Sep. 8, 1987, Ser. No. 93,835

Claims priority, application Japan, Sep. 5, 1986, 61-210010; Dec. 3, 1986, 61-288349; Feb. 6, 1987, 62-26762

Int. Cl.[4] A61K *31/505;* **C07D** *239/20, 239/72*

U.S. Cl. 514—256 **17 Claims**

17. A method for controlling plant pathogenic fungi which comprises applying to plant pathogenic fungi an effective amount of the pyridinylpyrimidine derivative of the formula:



or a salt thereof, wherein R_1 may be the same or different and is lower alkyl, lower alkoxy, lower haloalkyl or halogen; n is 0, 1, 2, 3, 4 or 5; R_2 and R_3, which may be the same or different, each represent hydrogen or lower alkyl; R_4 is hydrogen or lower alkyl; R_5 is hydrogen, lower alkyl or halogen, or R_4 and R_5 together represent a polymethylene group of the formula: —$(CH_2)_m$ in which m is 3 or 4; and R_6 is hydrogen, lower alkyl, lower alkoxy or lower alkylthio.

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4,783,467

TETRAHYDROIMIDAZOQUINAZOLINONE INOTROPIC AGENTS

Simon F. Campbell, Deal, and David A. Roberts, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

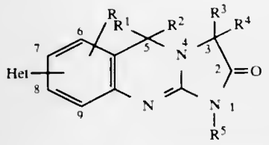
Filed May 22, 1986, Ser. No. 865,693

Claims priority, application United Kingdom, Jun. 5, 1985, 8514207; Nov. 5, 1985, 8527208

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—267 **21 Claims**

1. A tetrahydroimidazoquinazolinone compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein

"Het" is a pyrrolyl, imidazolyl, pyrazolyl, triazolyl, tetrazolyl, pyridyl, pyrazinyl, pyrimidinyl, pyridazinyl, oxazolyl, isoxazolyl, thiazolyl, isothiazolyl, furyl, thienyl or oxadiazolyl group attached to the 6-, 7-, 8- or 9-positions of said 1,2,3,5-tetrahydroimidazo(2,1-b)quinazolin-2-(1H)-one ring, including the N-oxide derivatives of those groups which are nitrogen-containing, with all of said groups being optionally substituted with up to three substituents each independently selected from C_1-C_4 alkyl, C_1-C_4 alkoxy, hydroxy, hydroxymethyl, cyano, halogen, trifluoromethyl, (C_1-C_4 alkoxy)carbonyl, nitro, $—NR^6R^7$, $—CONR^6R^7$, $—SO_2NR^6R^7$ and $—S(O)_m(C_1$-C_4 alkyl) wherein R^6 and R^7 are each independently hydrogen or C_1-C_4 alkyl and m is zero, one or two;

R is hydrogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, hydroxy, hydroxymethyl, halogen or trifluoromethyl attached to the 6-, 7-, 8- or 9-positions of said 1,2,3,5-tetrahydroimidazo(2,1-b)quinazolin-2-(1H)-one ring; and

R^1, R^2, R^3, R^4 and R^5 are each hydrogen or C_1-C_4 alkyl.

14. A pharmaceutical composition comprising a pharmaceutically carrier or diluent and an effective cardiac-stimulating amount of a compound as claimed in claim **1**.

18. A method for stimulating cardiac activity in the treatment of a subject afflicted with congestive heart failure, which comprises administering to said subject an effective cardiac-stimulating amount of a compound as claimed in claim **1**.

4,783,468

INSECTICIDAL 5-PYRIMIDINE CARBONITRILES

Haukur Kristinsson, Basel, and Odd Kristiansen, Möhlin, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

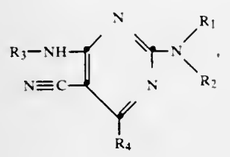
Filed Apr. 22, 1987, Ser. No. 41,163

Claims priority, application Switzerland, Apr. 30, 1986, 1772/86-6

Int. Cl.[4] A01N *43/54;* **C07G** *239/46*

U.S. Cl. 514—275 **13 Claims**

1. A compound of formula


(I)

wherein

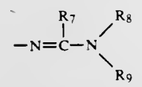
R_1 is hydrogen, C_1-C_6alkyl, C_2-C_6alkenyl or C_2-C_6alkynyl,

R_2 is hydrogen, C_1-C_{10}alkyl or C_3-C_6cycloalkyl, or

R_1 and R_2, when taken together, are a radical selected from the group consisting of $—(CH_2)_3—$, $—(CH_2)_4$ and $—(CH_2)_5$,

R^3 is hydrogen or a radical $—CO—R_5$ or $—SO_2—R_6$,

R_4 is a radical selected from the group consisting of $—NH_2$, $—NH—CO—R_5$, $—NH—SO_2—R_6$,



or $—NH—CH=N—R_{10}$;

R_5 is hydrogen, C_1-C_{12}alkyl, C_3-C_6cycloalkyl, C_1-C_6alkoxy, perhalogenated C_1-C_3alkyl or the radical

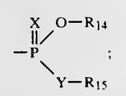


R_6 is C_1-C_6alkyl,

R_7 is hydrogen or C_1-C_6alkyl,

R_8 and R_9 are each independently of the other hydrogen or C_1-C_6alkyl or, when taken together, are a radical selected from the group consisting of $—(CH_2)_3—$, $—(CH_2)_4—$ and $—(CH_2)_5$,

R_{10} is a radical $—SO_2—R_{13}$ or



R_{11} and R_{12} are each independently of the other hydrogen or C_1-C_6alkyl or, when taken together, are a radical selected from the group consisting of $—(CH_2)_3—$, $—(CH_2)_4—$ and $—(CH_2)_5$,

R_{13} is C_1-C_{10}alkyl which is substituted by up to 10 halogen atoms, or is C_3-C_6cycloalkyl

R_{14} and R_{15} are each independently of the other C_1-C_{10}alkyl; and

X and Y are each independently of the other oxygen or sulfur, or a salt thereof.

10. A method according to claim **1**, of controlling insects and representatives of the order Acarina in animals or plants.

4,783,469

METHOD OF INHIBITING BODY FAT STORES

Albert H. Meier, 6165 Chandler Dr., Baton Rouge, La. 70808, and Anthony H. Cincotta, 3250 Carlotta St., No. 1, Baton Rouge, La. 70802

Continuation-in-part of Ser. No. 40,188, Apr. 17, 1987, which is a continuation-in-part of Ser. No. 837,148, Apr. 17, 1986, Pat. No. 4,659,715. This application Aug. 13, 1987, Ser. No. 84,903

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—288 **2 Claims**

1. A method for treating a vertebrate animal to reduce its body fat stores with concomintant loss in its body weight, which method comprises administering to a vertebrate animal in need of such treatment an effective dosage of an ergot-related prolactin-inhibiting compound, which dosage level is less than that required to stimulate growth hormone, said administration being carried out for a period sufficient for animal to obtain a predetermined body weight which is less than its pretreatment body weight.

4,783,470

HEMATIN DERIVED ANTICOAGULANT

Robert L. Jones, New York, N.Y., assignor to The Rockefeller University, New York, N.Y.

Filed Jan. 14, 1986, Ser. No. 818,712

Int. Cl.[4] A61K *31/66, 35/14*

U.S. Cl. 514—185 **7 Claims**

1. An orally active anticoagulant isolated from hematin and characterized by the following properties:

a. activity is inhibited by freshly prepared hematin,

b. activity is inhibited by tin protoporphyrin IX,

c. activity is inhibited by imidazole,

d. activity is inhibited by desferrioxamine,

e. the inhibition by imidazole is reversed by ferric citrate,

f. activity is stable in the presence of ferrioxamine,

g. activity is stable in the presence of protoporphyrin IX, and

h. active in presence of iron.

4,783,471

N-ARALKYL PIPERIDINE METHANOL DERIVATIVES AND THE USES THEREOF

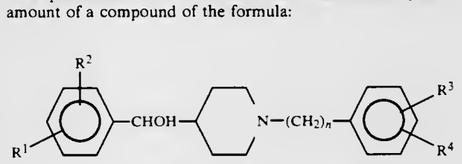
Albert A. Carr, and Norbert L. Wiech, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 867,122, May 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 751,419, Jul. 2, 1985, abandoned. This application Jul. 7, 1987, Ser. No. 71,524

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—317 **9 Claims**

1. A method for the treatment of cardiac arrhythmias comprising administering to a patient in need thereof, by an enteral or a parenteral route of administration, an antiarrhythmic amount of a compound of the formula:



the optical isomers thereof, and the pharamaceutically acceptable salts thereof, wherein n is 2, 3, or 4, each of R^1, R^2, R^3, and R^4 is independently selected from the group consisting of hydrogen, halogen, trifluoromethyl, $C_{1\text{-}6}$ alkyl, $C_{1\text{-}6}$ alkoxy, hydroxy and amino.

4,783,472

1H,3H-PYRROL[1,2-c]THIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jean-Louis Fabre; Claude James, and Daniel Lavé, all of Paris, France, assignors to Rhone-Poulenc Sante, Courbevoie, France

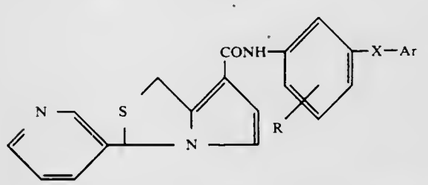
Filed Jul. 2, 1987, Ser. No. 69,520

Claims priority, application France, Jul. 4, 1986, 86 09728

Int. Cl.[4] C07D *409/00, 401/00, 217/00, 215/04*

U.S. Cl. 514—338 **18 Claims**

1. A compound of the general formula I;


(I)

in which R is hydrogen or a halogen or an alkyl, alkyloxy amino, alkylamino or dialkylamino group, X is oxygen or sulphur or an imino, carbonyl, carbonylmethylene, or vinylenecarbonyl group, or X represents a valency bond or a straight-chain alkylene group containing 1 to 4 carbon atoms and Ar is a phenyl, naphthyl, pyridyl, or thienyl group, it being possible for the group Ar to be unsubstituted or substituted with one or more halogen or alkyl, alkyloxy, amino, alkylamino, dialkylamino, carboxy or alkyloxycarbonyl group;

each alkyl moiety containing 1 to 4 carbon atoms in a straight or branched chain; the compound being in separate enantiomeric form or mixtures thereof or a pharmaceutically acceptable salt thereof.

15. A method of treatment of undesirable effects of P.A.F.-acether comprising administering to a subject suffering therefrom or liable thereto, an effective dose of a compound as claimed in claim **1**.

4,783,473

GEMINALLY SUBSTITUTED CYCLIC ETHER CARBOXYLIC ACIDS, DERIVATIVES THEREOF, COMPOSITIONS CONTAINING SAME AND METHOD OF USE

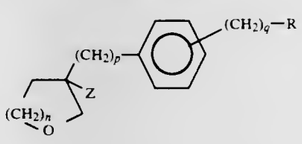
Steven E. Hall, Ewing Township, Mercer Co., and Philip M. Sher, Plainsboro, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 2, 1987, Ser. No. 92,247

Int. Cl.[4] A61K *31/34, 31/35;* **C07D** *307/16, 309/06*

U.S. Cl. 514—382 **13 Claims**

1. A compound of the structure

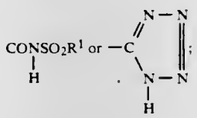


wherein

Z is aryl, which may be optionally substituted with one or more of halo, lower alkyl, lower alkoxy, hydroxy, lower alkylamino, phenyl or carbo-lower alkoxy



R is COOH, COO alkali metal, COO lower alkyl,



R^1 is lower alkyl or aryl;

n is 1 or 2;

p is 2 to 5; and

q is 1 to 4;

and the $(CH_2)_n$, $(CH_2)_p$ and/or $(CH_2)_q$ groups may be unsubstituted or substituted with one or two lower alkyl groups and/or are one or two lower alkoxy groups.

8. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

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4,783,474

HALOGENOALKYL-, ALKENYL- AND ALKINYL-AZOLES

Udo Kraatz, Leverkusen; Wolfgang Behrenz, Overath, and Carl Fedtke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

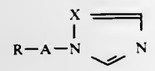
Continuation-in-part of Ser. No. 885,046, Jul. 14, 1986, abandoned. This application Oct. 2, 1987, Ser. No. 104,710

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525978; Jan. 14, 1987, 3700916

Int. Cl.[4] **C07D** *249/08, 233/54;* **A01N** *43/653, 43/50*

U.S. Cl. 514—383 **9 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of an insecticide and a synergistically effective amount of a halogenoalkyl-, alkenyl- or alkinyl-azole of the formula

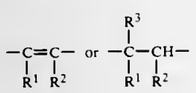


in which

X represents a nitrogen atom or a CH grouping,

R represents optionally halogen-substituted tert.-alkyl having 4 to 8 carbon atoms, or cycloalkyl having 3 to 6 carbon atoms, which is optionally substituted by alkyl having 1 to 4 carbon atoms and/or by halogen, and

A represents one of the groupings —C≡C—,



in which

R^1 represents halogen, alkoxy having 1 to 4 carbon atoms, or trimethylsilyloxy,

R^2 represents hydrogen or halogen, and

R^3 represents halogen,

or an acid or metal salt addition product thereof.

4,783,475

COMPOSITIONS CONTAINING α-(1-CYCLOPROPYLETHYL)-α-(P-CHLOROPHENYL)-1H-1,2,4-TRIAZOLE-1-ETHANOL AND A GUANIDINE COMPOUND AND FUNGICIDAL USE THEREOF

Hans Wiedmer, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jul. 17, 1987, Ser. No. 74,797

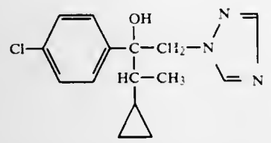
Claims priority, application United Kingdom, Jul. 21, 1986, 8617780

Int. Cl.[4] **A01N** *37/52, 43/64*

U.S. Cl. 514—383 **12 Claims**

1. A method of combatting a fungus disease selected from the group consisting of Erysiphe, Pyrenophora, Septoria and Pseudocercosporella in crop plants sensitive to such a fungus comprising applying to the plants in a crop locus, in admixture or separately, a fungicidal effective total amount of

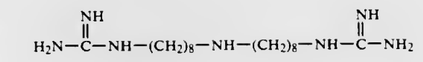
(a) the compound of the formula I



I

and

(b) the compound of the formula II



II

said compounds of the formulae I and II independently being in free base or acid addition salt form and the weight ratio of the compound of the formula I to the compound of the formula II in such application being in the range equivalent to 2:1 to 1:2 on the basis of the compound of the formula I in free base form and the compound of the formula II in triacetate acid addition salt form.

4,783,476

3-PHENOXY (OR PHENYLTHIO)-CYCLOPENTANECARBONYLAMINO ACID ANALOGUES

Katsuhiro Imaki, Kyoto; Tadao Okegawa, Yawata, and Yoshinobu Arai, Osaka, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

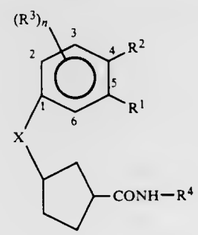
Filed Dec. 16, 1986, Ser. No. 942,109

Claims priority, application Japan, Dec. 16, 1985, 60-281203

Int. Cl.[4] **A61K** *31/415*

U.S. Cl. 514—394 **6 Claims**

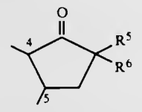
1. A derivative of 3-phenoxy (or phenylthio) cyclopentanecarbonylamino acid of the general formula:



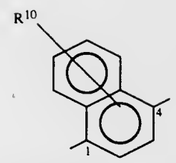
(I)

wherein R^1 and R^2 are:

(i) R^1, R^2 and carbon atoms to which R^1 and R^2 are linked, together represent the group of the general formula:



(wherein R^5 and R^6 represent a hydrogen atom, an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, a cycloalkyl-alkyl group of 4 to 7 carbon atoms or a phenyl group, independently, with the proviso that R^5 and R^6 do not represent hydrogen atoms at the same time), R^3 represents a hydrogen atom, a halogen atom, an alkyl group of 1 to 4 carbon atoms or two of R^3 and a phenyl group to which two of R^3 are linked, together represent a naphthyl group of the general formula:



(wherein R^{10} represents a hydrogen atom, a halogen atom or an alkyl group of 1 to 4 carbon atoms), with the proviso that when R^1 represents a hydrogen atom, the hydrogen atom may be replaced by R^3, and n represents an integer of 1 to 3, with the proviso that when n represents an integer of two or more, plural R^3s may be different each, X represents an oxygen atom or a sulfur atom and R^4 represents an amino acid-residue selected from the group consisting of alanine, β-alanine, asparagine, 4-aminobutyric acid (GABA), glycine, glutamine, serine, phenylalanine, cysteine, 4-amino-3-hydroxybutyric acid (GABOB), tryptophane, leucine, isoleucine, threonine, methionine, proline, valine, glutamic acid, asparaginic acid, lysine, arginine and histidine, or a non-toxic salt thereof.

4,783,477

ANXIOLYTIC COMPOSITION

Risto Lammintausta, Turku, and Raimo Virtanen, Rusko, both of Finland, assignors to Farmos-Yhtyma Oy, Turku, Finland

Filed Nov. 9, 1987, Ser. No. 117,876

Claims priority, application Finland, Nov. 11, 1986, 864570

Int. Cl.[4] **A61K** *31/415*

U.S. Cl. 514—396 **3 Claims**

1. Method for the treatment of an anxiety disorder which comprises administering to a subject suffering from such a disorder an effective amount of medetomidine.

4,783,478

TREATMENT OF EMESIS, NAUSEA AND VOMITING

Gordon Wootton, and Gareth J. Sanger, both of Sawbridgeworth, England, assignors to Beecham Group p.l.c., Brentford, England

Division of Ser. No. 838,904, Mar. 12, 1986, Pat. No. 4,721,720. This application Jul. 9, 1987, Ser. No. 71,424

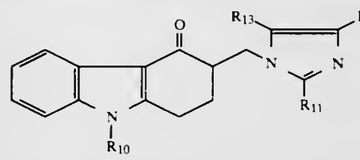
Claims priority, application United Kingdom, Mar. 14, 1985, 8506642; Apr. 9, 1985, 8509039; Dec. 23, 1985, 8531614

Int. Cl.[4] **A61K** *31/415*

U.S. Cl. 514—397 **9 Claims**

1. A method of treatment of emesis, and/or IBS in mammals, including humans, which method comprises administering to a mammal in need of such treatment an effective amount of a compound of formula

(II) or a pharmaceutically acceptable salt thereof:



(II)

where R_{10} is hydrogen, C_{1-10} alkyl, C_{3-7} cycloalkyl, C_{3-6} alkenyl, phenyl or phenyl-C_{1-3} alkyl; and one of the groups represented by R_{11}, R_{12} and R_{13} is hydrogen, C_{1-6} alkyl, C_{3-7} cycloalkyl, C_{2-6} alkenyl or phenyl-C_{1-3} alkyl and each of the other groups, which may be the same or different, is hydrogen or C_{1-6} alkyl.

4,783,479

SUBSTITUTED FUSED TETRAHYDROCARBAZOLE ACETIC ACID DERIVATIVES, COMPOSITIONS AND USE

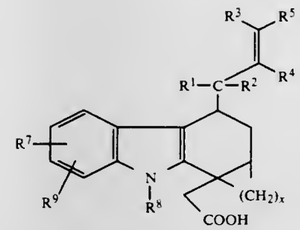
Dominick Mobilio, Franklin Park, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 21, 1988, Ser. No. 184,468

Int. Cl.[4] **A61K** *31/40;* **C07D** *209/80, 209/82*

U.S. Cl. 514—410 **8 Claims**

1. A compound of formula (I)



(I)

wherein R^1, R^2, R^3, R^4 and R^5 are independently hydrogen or lower alkyl containing 1 to 6 carbon atoms; or R^1 and R^3 are joined together to form $(CH_2)_m$; or R^4 and R^5 are joined together to form

—CH=CH—CH=CH—, or $(CH_2)_n$

R^7 is hydrogen, lower alkyl containing 1 to 6 carbon atoms or halogen; R^8 is hydrogen or lower alkyl containing 1 to 6 carbon atoms; R^9 is hydrogen, lower alkyl containing 1 to 6 carbon atoms, halogen, or acetyl; m is 2 to 3; n is 2 to 4, and x is 1 to 5; and the pharmaceutically acceptable salts thereof.

8. A method for treating inflammatory, painful or allergic conditions in a mammal which comprise the administration to said mammal of an effective amount of a compound selected from those of formula (I), or a pharmaceutically acceptable salt thereof, as claimed in claim **1**.

4,783,480

6-KETO-PROSTAGLANDIN E_1 DERIVATIVES

Hirohisa Wakatsuka, Takatsuki; Tadao Okegawa, Yawata, and Yoshinobu Arai, Osaka, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

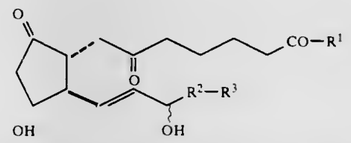
Filed Jan. 28, 1987, Ser. No. 7,657

Claims priority, application Japan, Jan. 30, 1986, 61-16722

Int. Cl.[4] **C07C** *177/00;* **A01K** *31/557*

U.S. Cl. 514—423 **10 Claims**

1. A 6-keto-prostaglandin E_1 derivative of the general formula:



(wherein R^1 represents an amino acid or amino alcohol residue attached to the CO-group by its amino group and selected from the group consisting of glycine, alanine, valine, isoleucine, leucine, serine, threonine, proline, asparagine, glutamine, methionine, phenylalanine, tyrosine, aspartic acid, glutamic acid and alkyl esters thereof of from 1 to 8 carbon atoms in the esterifying alkyl group and the corresponding amino alcohols in which the carboxy groups are replaced by hydroxymethyl groups, R^2 represents a single bond or an alkylene group of from 1 to 4 carbon atoms, R^3 represents (i) an alkyl group of

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from 1 to 8 carbon atoms, (ii) a cycloalkyl group of from 4 to 7 carbon atoms, which is unsubstituted or substituted by at least one alkyl group of from 1 to 8 carbon atoms or (iii) a phenyl or phenoxy group, which is unsubstituted or substituted by at least one chlorine atom, trifluoromethyl group or alkyl group of from 1 to 3 carbon atoms with the proviso that when R^2 represents a single bond R^3 does not represent a phenoxy group) or a cyclodextrin clathrate thereof or a salt thereof.

4,783,481

RODENTICIDES

Harry Swaine, Berkshire, England, assignor to Imperial Chemical Industries PLC, London, England

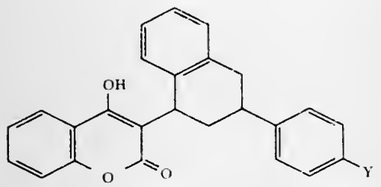
Continuation of Ser. No. 675,402, Nov. 27, 1984, abandoned. This application Aug. 18, 1986, Ser. No. 896,579

Claims priority, application United Kingdom, Dec. 14, 1983, 8333334

Int. Cl.⁴ A01N *43/16*

U.S. Cl. 514—457 **3 Claims**

1. An improved rodenticidal bait composition consisting essentially of an edible solid carrier material and a rodenticidally effective amount of a rodenticide consisting essentially of the trans isomer of the 3-substituted-4-hydroxy coumarin compound of the formula:



wherein Y is 4-bromophenyl, said trans isomer, when compared with the cis isomer of said 3-substituted-4-hydroxycoumarin compound being significantly less persistently retained in the tissues of non-rodent mammalian or avian species likely to consume either rodentical bait or poisoned rodent carcasses, said composition being substantially free of the cis isomer whereby the risk to non-target species arising from accidental ingestion of the rodenticide is minimized.

4,783,482

BIS(THIOCYANATO)PALLADIUM(II)COMPLEXES

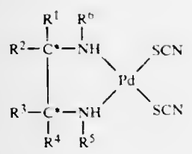
Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Edison, N.J.

Division of Ser. No. 642,315, Aug. 20, 1984, Pat. No. 4,578,491, which is a continuation of Ser. No. 392,816, Jun. 28, 1982, abandoned. This application Nov. 14, 1985, Ser. No. 798,034

Int. Cl.⁴ A61K *31/28, 31/555*

U.S. Cl. 514—492 **19 Claims**

14. A method of treating malignant animal tumor cells sensitive to a compound of the formula:

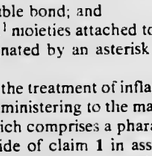


wherein

R^1 and R^4 are hydrogen or C_{1-6} alkyl;

R^2 and R^3 are hydrogen, C_{1-6} alkyl, hydroxymethyl or, taken together, R^2 and R^3 represent C_{2-6} alkylene;

R^1–R^4, taken together with the carbon atoms to which they are attached, represent naphtylene or a phenylene of the formula:



wherein

R^7 and R^8 represent hydrogen, C_{1-6} alkyl, hydroxy or carboxy; and

R^5 and R^6 are hydrogen, C_{1-6} alkyl, hydroxymethyl or carboxymethyl which comprises administering said compound, or a mixture of said compounds, to an animal afflicted with said tumor cells in an amount sufficient to cause regression of same.

4,783,483

EPOXIDES USEFUL AS ANTIALLERGIC AGENTS

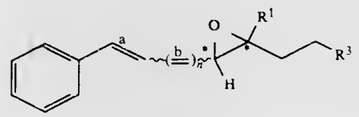
Michael P. Ferro, Somerville, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 783,976, Oct. 3, 1985, Pat. No. 4,665,092. This application Dec. 29, 1986, Ser. No. 947,223

Int. Cl.⁴ A61K *31/335;* **C07D** *303/04, 303/12*

U.S. Cl. 514—475 **14 Claims**

1. An epoxide of the following formula (II):



(II)

wherein

R^1 is hydrogen or methyl;

R^3 is $—CH_2CH_2OH$, $—CH_2CH_2O$(2-tetrahydropyranyl), $—CH{=}C(CH_3)_2$ or $—CH(OR^5)_2$;

R^5 is lower alkyl;

n is 0 or 1;

a is a Z or E double bond when n is 0 and when n is 1, a is E;

b is a Z or E double bond; and

the hydrogen and R^1 moieties attached to the respective epoxy carbon atoms designated by an asterisk (*) are trans to each other.

14. A method for the treatment of inflammation in a mammal which comprises administering to the mammal, a pharmaceutical composition which comprises a pharamceutically-effective amount of an epoxide of claim **1** in association with a pharmaceutically-acceptable diluent or carrier.

4,783,484

PARTICULATE COMPOSITION AND USE THEREOF AS ANTIMICROBIAL AGENT

Michael R. Violante, Rochester, and Roy T. Steigbigel, Miller Pl., both of N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Oct. 5, 1984, Ser. No. 658,153

Int. Cl.⁴ A61K *31/24*

U.S. Cl. 514—535 **29 Claims**

1. A pharmaceutical composition suitable for treating a microbial infection of a patient which comprises a physiologically acceptable carrier in combination with an effective amount of substantially uniformly sized particles which are essentially comprised of an organoiodide or organobromide which is solid at physiological temperatures and has a solubility in blood serum of less than one part per ten thousand, and wherein the mean particle diameter is from about 0.01 microns to about 4 microns.

4,783,485

BENZOYLUREA COMPOUNDS, AND INSECTICIDAL AND ACARICIDAL COMPOSITIONS COMPRISING SAME

Marius S. Brouwer; Arnoldus C. Grosscurt, and Roelof Van Hes, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation of Ser. No. 753,042, Jul. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 572,142, Jan. 19, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 912,169

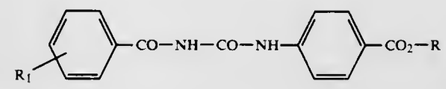
Claims priority, application Netherlands, Jan. 24, 1983, 8300239; Jul. 5, 1984, 8402137

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.⁴ A01N *47/36, 47/34;* **C07C** *127/22*

U.S. Cl. 514—535 **2 Claims**

1. A composition having insecticidal and acaricidal activity characterized in that, in addition to a liquid or solid inert carrier material, the composition comprises a compound of the formula IV in an effective amount, said compound of formula IV being a benzoylurea compound of the formula



wherein

R_1 is a hydrogen atom or represents 1 or 2 halogen atoms; and

R is a cyclohexyl group, a cyclododecyl group, a cyclohexenyl group or a bicycloheptenyl group, any of which groups may be substituted with 1–3 substituents selected from the group consisting of C_1–C_6 alkyl and C_2–C_6 alkenyl;

with the proviso, that if R is a cyclohexyl group, then said cyclohexyl group is substituted with 1 or 2 substituents selected from the group consisting of methyl and isopropyl, at least one isopropyl group being positioned in the ortho position.

4,783,486

TOLRESTAT FOR HEARING IMPAIRMENT

Ronald R. Notvest, Woodbrige Middlesex, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Jan. 16, 1987, Ser. No. 4,007

Int. Cl.⁴ A61K *31/195*

U.S. Cl. 514—562 **5 Claims**

1. A method for improving hearing by alleviating auditory nerve dysfunction in a diabetic human in need of treatment therefore, which comprises administering to the diabetic human an effective amount of tolrestat or a therapeutically acceptable salt thereof.

4,783,487

N-(1-CARBOXY-2-HYDROXY-5-PHENYL)-2-(6-METHOXY-2-NAPHTHYL)PROPIONAMIDE AND ANTI-INFLAMMATORY USE THEREOF

Kay Brune, Marloffstein-Rathsberg, Fed. Rep. of Germany, assignor to Smith Kline Dauelsberg GmbH, Göttingen, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,255

Int. Cl.⁴ C07C *101/74;* **A61K** *31/05*

U.S. Cl. 514—563 **5 Claims**

1. N-(1-carboxy-2-hydroxy-5-phenyl)-2-(6-methoxy-2-naphthyl)propionamide or a pharmaceutically acceptable salt thereof.

5. A method of producing anti-inflammatory activity which comprises administering to a subject requiring said activity an amount sufficient to product said activity the compound of claim **1**.

4,783,488

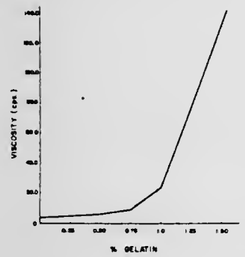
CONTACT LENS WETTING SOLUTION

Lai Ogunbiyi, Fairport, and Francis X. Smith, Walworth, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 825,721, Jan. 31, 1987, abandoned. This application Aug. 25, 1987, Ser. No. 90,436

Int. Cl.⁴ A01N *37/52;* **A61N** *31/155;* **B01F** *17/30*

U.S. Cl. 514—635 **2 Claims**



1. An aqueous contact lens wetting solution containing gelatin as a first demulcent, in an amount of at least 0.01% by weight but less than 0.75% by weight, collagen as a second demulcent, boric acid and sodium borate as buffering agents, the amount of buffering agent being within the range of 0.05 to 2.5% by weight, sodium chloride and potassium chloride as tonicity agents so that the osmotic pressure of the solution approximates normal lacrimal fluids, and a microbicidally effective amount of a biguanide as a germicide, the viscosity of the solution being less than 15 CPS at 25° C.

4,783,489

MANUFACTURING PROCESS OF POROUS RESIN MOLD CONTAINING CONTINUOUS HOLES AND CASTING MOLD

Saihachi Inoue; Shigeru Kiriyama, and Kazuhiro Imada, all of Osaka, Japan, assignors to Inax Corp., Aichi and IN Technical Lab Co., Ltd., Osaka, both of, Japan

Filed Feb. 6, 1986, Ser. No. 826,547

Claims priority, application Japan, Feb. 13, 1985, 60-27239

Int. Cl.⁴ C08G *59/18;* **C08J** *9/28;* **C08K** *5/10*

U.S. Cl. 521—63 **8 Claims**

1. A casting mold containing continuous pores, used for slip discharge casting, said casting mold comprising a molded material produced from a molding mixture which includes

(a) an epoxy compound having one or more epoxy groups in each molecule,

(b) a hardener which reacts with and hardens the epoxy compound,

(c) an emulsifier capable of preparing an epoxy emulsion, which emulsifier comprises at least two nonionic emulsifiers selected from the group consisting of a sorbitan aliphatic acid ester having a hydrophile-lipophile balance value of about 4–8, a polyoxyethylene oleylether having a hydrophile-lipophile balance value of about 8–17, and a polyoxyethylene sorbitan aliphatic acid ester having a hydrophile-lipophile balance value of about 11–15.6,

(d) water, and

(e) filler, the components being present at a ratio of 20–50 parts by weight of hardener to 100 parts by weight of epoxy compound, 30 parts by weight or less of emulsifier to 100 parts by weight of total epoxy compound and hardener, 1–200 parts by weight of water, and 30–75wt% of filler in the mixture of molding.

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4,783,490

RADIATION ACTIVE SILICON COMPOUNDS HAVING AMIDE LIMITED MERCAPTAN FUNCTIONAL GROUPS

Richard P. Eckberg, Saratoga Springs, and Karen D. Riding, Clifton Park, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 31, 1987, Ser. No. 80,724

Int. Cl.⁴ C08F *2/50;* **C08G** *75/04, 77/20, 77/28*

U.S. Cl. 522—99 **8 Claims**

1. A UV curable silicon composition comprising:

(a) a mercapto substituted silicon compound comprising UV active moieties of the formula:

$$\equiv Si—R—NHCO—R^4—SH$$

where R and R^4 are independently divalent substituted or unsubstituted hydrocarbon radicals of from 1 to about 12 carbon atoms;

(b) an effective amount of a free radical type photoinitiator; and

(c) a reactive co-compound having $—CR^1{=}CR_1H$ groups where R^1 is hydrogen or a substituted or unsubstituted alkyl group of from 1 to 4 carbon atoms.

4,783,491

DENTAL MATERIALS HAVING X-RAY CONTRASTABILITY

Masayoshi Tsunekawa, Toyonaka, and Masaya Ishibashi, Yao, both of Japan, assignors to Sankin Kogyo Kabushiki Kaisha, Osaka, Japan

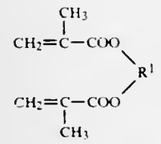
PCT No. PCT/JP84/00587, § 371 Date Jun. 26, 1985, § 102(e) Date Jun. 26, 1985, PCT Pub. No. WO86/03404, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 12, 1984, Ser. No. 756,974

Int. Cl.⁴ A61K *6/08;* **A61C** *8/00*

U.S. Cl. 523—117 **7 Claims**

1. A dental material having X-ray contrastability which comprises a polymerizable monomer having a bromine content of 20 to 60 wt percent and is of the formula



(I)

where R^1 is $—A^1—OOC—R^2—COO—A—A^2—$, wherein R^2 represents a bivalent aromatic residue substituted by bromine and A^1 and A^2 each represents a same or different bivalent hydrocarbon residue, or $—A^4—O—R^3—A^3—R^4—O—A^5—$, wherein A^3 represents a bivalent hydrocarbon residue, R^3 and R^4, which are same or different, each represents a bivalent aromatic hydrocarbon residue substituted by bromine, A^4 and A^5, which are same or different, each represent a bivalent hydrocarbon residue a bivalent residue consisting of hydrocarbon residues linked by oxygen, and the said hydrocarbon residues may have a hydroxyl group as a substituent.

4,783,492

CONTINUOUS PERMEABILITY REDUCTION IN SUBTERRANEAN RESERVOIRS

Hoai T. Dovan, Brea, and Richard D. Hutchins, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 559,920, Dec. 9, 1983, Pat. No. 4,534,412. This application Apr. 24, 1985, Ser. No. 726,805

Int. Cl.⁴ C09K *7/00*

U.S. Cl. 523—130 **14 Claims**

1. A composition for reducing the higher permeability zones of a subterranean reservoir having heterogeneous permeability penetrated by at least one well comprising an aqueous liquid containing (1) a water-soluble or water-dispersible polymer selected from the group consisting of acrylic acid acrylamide copolymers, polyacrylamides, partially hydrolyzed polyacrylamides, polyalkyleneoxides, carboxyalkylcelluloses, carboxyalkylhydroxyethylcelluloses, hydroxyethylcelluloses and heteropolysaccarides obtained by the fermentation of starch-derived sugar, (2) a crosslinking agent for the polymer comprising a water-soluble alkali metal aluminate reactive for cross-linking the polymer at an alkaline pH, (3) an amount of water-soluble alkaline material sufficient to raise the pH of the overall aqueous liquid to a value at which the crosslinking agent is substantially unreactive with the polymer, and (4) an amount of a water-soluble temperature-activated acidic material selected from the group consisting of polyethylene glycol esters, ethyl acetate esters, acrylate copolymers, and mixtures of dimethyl esters comprising dimethyl succinate, dimethyl glutarate, and dimethyl adipate dissolved in the aqueous liquid in an amount sufficient to accelerate the lowering of the PH of said liquid to a value at which said crosslinking agent becomes a polyvalent cation reactive for crosslinking when said liquid is subjected to an elevated temperature.

4,783,493

THERMOPLASTIC RESINS WITH CELLULOSIC FILLER

Tsutomu Motegi, Sodegauramachi; Kazuo Aoki, Chibashi, and Kazuhiro Kimura, Ichiharashi, all of Japan, assignors to Chisso Corporation, Japan

Division of Ser. No. 804,142, Dec. 3, 1985, Pat. No. 4,687,793. This application May 22, 1987, Ser. No. 52,890

Claims priority, application Japan, Dec. 25, 1984, 59-275429

Int. Cl.⁴ C08K *5/07;* **C08L** *1/00*

U.S. Cl. 524—13 **1 Claim**

1. A polyolefin resin composition obtained by blending a polyolefin resin selected from the group consisting of polypropylene, crystalline propylene-ethylene copolymer, crystalline propylene-ethylene-butene-1 terpolymer, polyethylene, ABS resin, polystyrene and mixtures thereof, 10 to 65% by weight of an untreated cellulosic filler, based on the weight of said polyolefin resin composition, said untreated cellulosic filler selected from the group consisting of wood flour, wood chips, rice hulls, used paper, pulp, cellulose powder and mixtures thereof and 0.5 to 12% by weight of glyoxal based on the weight of said untreated cellulosic filler, followed by mixing these materials with heating and subjecting them to melt-kneading treatment.

4,783,494

THERMOPLASTIC COMPOSITIONS OF POLYCARBONATE RESIN AND COPOLYMERS OF ETHYLENE AND ACRYLIC OR METHACRYLIC ACID

Richard B. Allen, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 779,588, Sep. 24, 1985, abandoned. This application May 26, 1987, Ser. No. 54,379

Int. Cl.⁴ C08L *69/00*

U.S. Cl. 524—139 **13 Claims**

1. A thermoplastic composition, consisting of

(a) a poly(bisphenol-A carbonate) homopolymer resin; and

(b) a copolymer, ionomeric or non-ionomeric, of ethylene and a comonomer selected from the group consisting of acrylic acid and methacrylic acid, alone or in combination with a stabilizer, a flame retadant agent or a drip suppressant.

4,783,495

(HYDROXYPHENYL) SILANE STABILIZERS

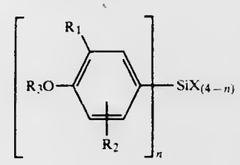
Stephen D. Pastor, Basle, Switzerland, and Edward T. Hessell, Rochester, N.Y., assignors to Ciba-Geigy Corporation. Ardsley, N.Y.

Filed Nov. 20, 1987, Ser. No. 123,470

Int. Cl.⁴ C07F *7/18, 7/12, 7/08;* **C08K** *5/54*

U.S. Cl. 524—263 **20 Claims**

1. A compound of the formula



wherein

n is an integer from 2–4;

R_1, R_2 and X are independently hydrogen, C_1–C_{18} alkyl, C_5–C_{12} cycloalkyl, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, C_7–C_9 aralkyl or said aralkyl substituted by alkyl of 1 to 18 carbon atoms; and X is also halogen or hydroxy; and

R_3 is hydrogen or $—Si(R_4)(R_5)(R_6)$ with R_4, R_5 and R_6 being independently C_1–C_4 alkyl or phenyl.

16. A composition of matter comprising an organic material subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of claim 1.

4,783,496

SHAPED BODIES OF PLASTIC MATERIAL HAVING HIGH ELASTICITY AND HIGH ADHESIVE CHARACTERISTICS

Wilhelm Simon, Zollikon, and Urs Oesch, Uster, both of Switzerland, assignors to Willi Möller, Zürich, Switzerland

Filed Oct. 2, 1986, Ser. No. 914,390

Claims priority, application Switzerland, Oct. 4, 1985, 4306/85

Int. Cl.⁴ C08K *5/09;* **C08L** *27/00;* **C08F** *10/00*

U.S. Cl. 524—292 **19 Claims**

1. A shaped body of plastic material having a high elasticity and high adhesive characteristics which shaped body contains per 10 parts by weight of a plastic material, 7 parts by weight to 90 parts by weight of an elastifying component comprising a benzophenonetetracarboxylic acid tetraester, the alcohol moieties of which tetraester are selected from the group consisting of alkanols having 4–24 carbon atoms, alkenols having 4–24 carbon atoms, and alkynols having 4–24 carbon atoms, and wherein in said tetraester the phenyl nuclei and alcohol moieties are either unsubstituted or substituted with nonionic substituents, with the provision that if the plastic material of said shaped body contains a vinyl chloride homopolymer or vinyl chloride copolymer, there must be present per 10 parts by weight of said plastic material at least 15 parts by weight of the benzophenonetetracarboxylic acid tetraester.

4,783,497

WATER-BASED POLYESTER COATING COMPOSITIONS CONTAINING AN ALKYLATED AMINO RESIN

Gerald L. Thompson, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Dec. 16, 1985, Ser. No. 809,260

Int. Cl.⁴ C08K *5/05;* **C08L** *77/12*

U.S. Cl. 524—391 **11 Claims**

1. A coating composition consisting essentially of from about 10 to about 50 percent by weight of a polyester or polyester amide derived from monomer components which include dicarboxylic acid, hydroxycarboxylic acid, aminocarboxylic acid, aminoalcohol, glycol, diamine or combinations of such monomer components, wherein at least a part of the total of all such monomer components is a poly(ethylene glycol), and at least a part of said total is one or more of said monomer components substituted with one or more sulfonate metal salt groups, from about 1 to about 15 percent by weight of an alkylated amino resin and from about 50 to about 90 percent by weight water.

4,783,498

AQUEOUS LATEX COPOLYMER COMPOSITIONS

John C. Padget, Frodsham, and Donald H. McIlrath, Liverpool, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 21, 1985, Ser. No. 800,213

Claims priority, application United Kingdom, Dec. 6, 1984, 8430858; Feb. 21, 1985, 8504456; Apr. 15, 1985, 8509560; May 20, 1985, 8512685; Jul. 31, 1985, 519224

Int. Cl.⁴ C08L *27/00*

U.S. Cl. 524—519 **25 Claims**

1. An aqueous latex composition comprising at least one copolymer A and at least one copolymer B, wherein:

A is an amorphous copolymer comprising 10 to 70 weight % of polymerised units of vinylidene chloride, 30 to 90 weight % of polymerised units of said at least one internally plasticising comonomer, 0 to 20 weight % of polymerised units of vinyl chloride, and 0 to 10 weight % of polymerised units of at least one copolymerisable ethylenically unsaturated acid and which copolymer A has a Tg in the range $-50°$ to $<0°$ C.; and

B is an amorphous copolymer comprising 10 to 70 weight % of polymerised units of vinylidene chloride; 2 to 90 weight % of polymerised units of at least one comonomer selected from alkyl acrylates and methacrylates having 1 to 12 carbon atoms in the alkyl group, alkoxyalkyl acrylates and methacrylates having 1 to 12 carbon atoms in the alkyl groups, styrene, acrylonitrile, vinyl acetate and vinyl ethyl ether; 0 to 50 weight % of polymerised units of vinyl chloride; and 0 to 10 weight % of polymerised units of at least one ethylenically unsaturated acid; and which copolymer B has a Tg in the range from 0° to 80° C.

and wherein the dry weight ratio of the at least one copolymer A: the at least one copolymer B is from 95:5 to 10:90;

and wherein said at least one copolymer A has a modal molecular weight Mp (as herein defined) within the range 100,000 to 700,000;

and wherein said composition provides contactable layers after drying.

4,783,499

VINYLIDENE CHLORIDE POLYMER AQUEOUS LATEX COMPOSITIONS

John C. Padget, Frodsham, and Donald H. McIlrath, Liverpool, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 21, 1985, Ser. No. 800,212

Claims priority, application United Kingdom, Dec. 6, 1984, 8430858; Feb. 21, 1985, 8504456; Apr. 15, 1985, 8509560; Jul. 31, 1985, 8519224

Int. Cl.⁴ C08L *27/00*

U.S. Cl. 524—519 **22 Claims**

11. An aqueous latex composition according to claim 1 characterised in that said at least vinylidene chloride copolymer contained therein has Mp in the range of from 100,000 to 500,000.

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4,783,500

"LIVING" POLYMERS AND PROCESS FOR THEIR PREPARATION

Owen W. Webster, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 660,588, Oct. 18, 1984, Pat. No. 4,711,942, which is a continuation-in-part of Ser. No. 549,409, Nov. 7, 1983, Pat. No. 4,508,880, which is a continuation-in-part of Ser. No. 389,110, Jun. 17, 1982, Pat. No. 4,417,034, which is a continuation-in-part of Ser. No. 279,025, Jun. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 549,408, Nov. 7, 1983, Pat. No. 4,524,196, which is a continuation-in-part of Ser. No. 389,111, Jun. 17, 1982, Pat. No. 4,414,372. This application Nov. 25, 1986, Ser. No. 934,826

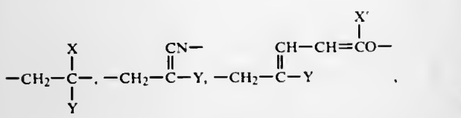
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

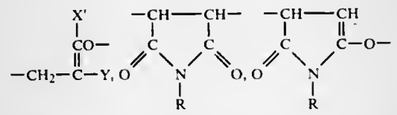
Int. Cl.[4] C08L *39/00*; **C08F** *4/44, 8/18*

U.S. Cl. 524—555 **27 Claims**

1. A "living" polymer of the formula $(R^1)_2M(Q\overline{P}Z'')_2$ or $O[M(R^1)_2Q\overline{P}Z'']_2$ wherein:

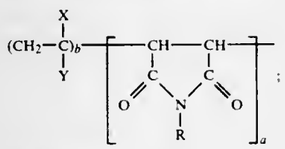
Q is the divalent radical selected from the group consisting of





and mixtures thereof;

$\overline{P}$ is a divalent polymeric radical of the formula



Z'' is $-C(R^2)(R^3)-C(O)X'$;

X is —CN, —CH=CHC(O)X' or —C(O)X';

Y is —H, $—CH_3$, —CN or $—CO_2R$, provided, however, when X is —CH=CHC(O)X', Y is —H or $—CH_3$;

X' is $—OSi(R^1)_3$, —R, —OR or —NR'R'';

R is:

(a) hydrocarbyl of up to 20 carbon atoms;

(b) hydrocarbyl of (a) containing one or more ether oxygen atoms within aliphatic segments thereof; or

(c) hydrocarbyl of (a) or (b) containing one or more functional substituents that are unreactive under polymerizing conditions;

each R^1, independently, is hydrocarbyl of up to 20 carbon atoms;

each of R^2 and R^3 is independently selected from:

(a) H;

(b) hydrocarbyl of up to 20 carbon atoms;

(c) hydrocarbyl of (b) containing one or more ether oxygen atoms within aliphatic segments thereof; or

(d) hydrocarbyl of (b) or (c) containing one or more functional substituents that are unreactive under polymerizing conditions;

each of R' and R'' is independently selected from C_{1-4} alkyl;

each of a and b is independently selected from 0 or a number in the range 1 to about 100,000, provided, however, (a+b) is at least 3; and

M is Si, Sn or Ge.

4,783,501

METHOD FOR PREPARING A POLYMERIC COMPOSITION

Isao Sasaki, Hiroshima; Nobuhiro Mukai, and Hitoshi Ige, both of Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

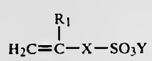
Filed Aug. 21, 1986, Ser. No. 898,496

Claims priority, application Japan, Aug. 29, 1985, 60-188642; Aug. 29, 1985, 60-188643

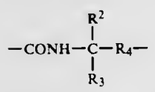
Int. Cl.[4] C08K *3/02*

U.S. Cl. 524—701 **8 Claims**

1. A method for preparing a polymeric composition having an inorganic compound firmly consolidated thereinto, which comprises polymerizing at least one radical polymerizable vinyl monomer using a peroxide or azo compound radical initiatior in an aqueous polymerization medium, which medium comprises an inorganic compound dispersed in the presence of an organic acid monomer or organic acid salt monomer, wherein said inorganic compound is selected from the group consisting of a carbide, nitride and boride of silicon and ziroconium, and zirconium oxide; and wherein said organic acid monomer and organic acid salt monomer is a sulfonic acid monomer or sulfonate monomer of the formula:



wherein R_1 is a hydrogen atom, a C_1–C_{20} alkyl group or a halogen atom; X is —CONH— or



wherein each of R_2 and R_3 is a hydrogen atom or a C_1–C_{15} alkyl group; and R_4 is a C_1–C_{15} alkylene group, $—COO(CH_2)_m$, wherein m is an integer of 1 to 20 or CH_{2n}, wherein n is an integer of 0 to 20; and Y is a hydrogen atom, an ammonium radical or an alkali metal atom.

4,783,502

STABLE NONAQUEOUS POLYURETHANE MICROPARTICLE DISPERSION

Dennis L. Faler, Glenshaw; Gregory J. McCollum, Gibsonia; James B. O'Dwyer, Valencia, and Marvis E. Hartman, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 3, 1987, Ser. No. 128,353

Int. Cl.[4] C08L *75/00*

U.S. Cl. 524—871 **16 Claims**

1. A stable, nonaqueous polyurethane microparticle dispersion is characterized in that less than 20 percent of the polymer microparticles have a mean diameter greater than 5 microns, further characterized in that at a total solids content of 60 percent the Brookfield viscosity is less than 1000 centipoise measured at 50 RPM using a number 3 spindle at 25° C., the polyurethane being prepared from reactants which are substantially free of acrylic polymer and the polyurethane being further characterized in that it is substantially free of unreacted polyisocyanate monomer.

4,783,503

IMPACT RESISTANT BLENDS OF THERMOPLASTIC POLYAMIDES AND MODIFIED BLOCK COPOLYMERS

William P. Gergen, Houston, and Robert G. Lutz, Spring, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1985, Ser. No. 766,215

Int. Cl.[4] C08L *77/00, 77/02, 77/06*

U.S. Cl. 525—66 **23 Claims**

1. Impact resistant polymeric composition comprising

(a) from 50 to 97 percent by weight of a polyamide having a number average molecular weight of a least 5000; and

(b) from 3 to 50 percent by weight of a functionalized selectively hydrogenated block copolymer of the formula B_n-$(AB)_o$-A_p where n=0 or 1, O=1-50, p=0 or 1, each A is predominantly a polymerized monoalkenyl aromatic or vinyl arene hydrocarbon block and each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block, to which has been grafted at least one graftable functional molecule selected from the group consisting of an electrophilic graftable molecule containing a carboxyl functional group and an electrophile, wherein said electrophile is carbon dioxide, wherein substantially all of said electrophilic graftable molecules or electrophiles are grafted to the block copolymer in the monoalkenyl aromatic or vinyl arene block and said carboxyl functional groups are carboxylic acids, their salts and esters.

4,783,504

HOT MELT ADHESIVE CONTAINING A SILANE GRAFTED HYDROGENATED BLOCK POLYMER

David J. St. Clair, and Steven S. Chin, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 28, 1986, Ser. No. 835,090

Int. Cl.[4] C08L *51/00, 53/02*

U.S. Cl. 525—72 **15 Claims**

1. A hot melt adhesive composition having no added solvents comprising:

(a) 100 parts by weight of a silane functionalized polymer component which is prepared by grafting enough silane of the general formula RR'_nSiY_{3-n} (where n equals 0, 1 or 2 and where R is a non-hydrolyzable organic group which is capable of grafting onto the polymer, R' is a non-hydrolyzable organic group incapable of grafting onto the polymer and Y is a hydrolyzable organic group) onto a polymer component to thereby functionalize the polymer component for use in a solventless hot melt adhesive composition having adhesion which is resistant to deterioration in the presence of water;

said polymer component comprising an A'B' block copolymer, a multiblock copolymer having at least two end blocks A and at least one midblock B, or mixtures of an A'B' block copolymer and the multiblock copolymer wherein:

the A' and A blocks comprise monoalkenyl arene blocks and the B' and B blocks comprise substantially completely hydrogenated conjugated diene polymer blocks, and the average molecular weight of the A and A' blocks is greater than the minimum molecular weight needed to obtain microphase separation and domain formation of the A and A' blocks, and is less than the maximum molecular weight which would render the polymer incapable of being melt processed;

the multiblock copolymer comprises a monoalkenyl arene content which is no more than the maximum weight percent needed to retain a modulus suitable as a hot melt adhesive composition and no less than the minimum weight percent needed to obtain the desired phase separation and the desired minimum cohesive strength; and

(b) an amount of a midblock compatible component wherein said midblock compatible component is at a concentration to maintain the resultant solventless hot melt adhesive composition in a pliable condition at room temperature and to maintain the glass transition temperature of the resultant composition below 10° C.

4,783,505

METHYLMETHACRYLATE/PHENYLMALEIMIDE COPOLYMER AND STYRENE/MALEIC ANHYDRIDE COPOLYMER CONTAINING POLYMER ALLOYS

Barry D. Dean, Springfield, Pa., assignor to ARCO Chemical Company, Newtown Square, Pa.

Division of Ser. No. 718,594, Apr. 1, 1985, Pat. No. 4,663,390, which is a division of Ser. No. 538,243, Oct. 3, 1983, Pat. No. 4,514,543. This application Nov. 14, 1986, Ser. No. 930,619

Int. Cl.[4] C08L *37/00, 39/04, 51/00*

U.S. Cl. 525—73 **1 Claim**

1. A polymer alloy comprising a first polymer, a graft second polymer, and a third polymer, wherein

(a) the firt polymer is a random copolymer consisting essentially of recurring units of methylmethacrylate and recurring units of N-phenylmaleimide,

(b) the graft second polymer is random polymer chemically grafted to a rubber wherein the random polymer is selected from the group consisting essentially of a random copolymer of recurring units of styrene and from about 9.5 to about 12.5 weight percent recurring units of maleic anhydride and a random terpolymer of recurring units of styrene, from about 6 to about 9 weight percent recurring units of maleic anhydride and from about 3 to about 8 weight percent recurring units of N-phenylmaleimide, and

(c) the third polymer is selected from the group consisting essentially of a random copolymer of recurring units of styrene and recurring units of acrylonitrile and a random terpolymer of recurring units of styrene, recurring units of acrylonitrile and recurring units of N-phenylmaleimide;

wherein the first polymer is present in an amount of at least 30 weight percent based on the polymer matrices.

4,783,506

DAMAGE TOLERANT COMPOSITES CONTAINING INFUSIBLE PARTICLES

Irena Gawin, Sandy, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 884,139, Jul. 9, 1986. This application Mar. 30, 1987, Ser. No. 31,959

Int. Cl.[4] C08L *63/00*

U.S. Cl. 525—109 **19 Claims**

1. An epoxy resin composition comprising a polyepoxide component, a reactive oligomer, a curing agent and a rubber polymer, said resin composition exhibiting phase separation upon cure and made by a process comprising combining:

100 parts by weight of a polyepoxide component comprising a polyepoxide compound having a glass transition below 50° C. and having at least about two epoxide groups per molecule;

between about 10 and 200 parts by weight of a reactive aromatic oligomer component comprising a crosslinkable oligomer having at least about two crosslinkable groups per molecule and a molecular weight (number average) between about 2000 and 10,000;

between about 5 and 100 parts by weight of a curing agent for crosslinking said epoxy composition and having a molecular weight below about 1000; and

a crosslinkable rubber polymer at a level between about 1 and 15% by weignt of said epoxy resin composition, an amount of said polymer being contained within infusible particles that are dispersed throughout said resin composition and have lower modulus than the matrix of said epoxy resin composition that is cured in absence of said infusible particles, said infusible particles having a median size between 10 microns and 75 microns.

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4,783,507

NOVEL POLYETHYLENE SYNTHETIC PULP

Teruo Tokunaga, and Masahiro Sugi, both of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 538,010, Sep. 30, 1983, abandoned. This application Sep. 12, 1984, Ser. No. 651,508

Claims priority, application Japan, Sep. 30, 1982, 57-172976

Int. Cl.⁴ C08L *23/06*

U.S. Cl. 525—240 **2 Claims**

1. A novel polyethylene synthetic pulp comprising fibers of polyethylene having an MFR, Melt Flow Ratio, of 0.5 to 500 g/10 min. and at least 20% by weight of said polyethylene fibers having a low melting point which melts at a temperature of 95° C. or lower when measured with a DSC, Differential Scanning Calorimeter, the remainng portion, if any, being less than 80% by weight of the synthetic pulp, having a higher melting point than 95° C. when meansured with a DSC.

4,783,508

EMULSION PROCESS FOR PREPARATION OF OCCLUDED RUBBER STRUCTURE

Eugene R. Moore, and Thomas D. Traugott, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 26, 1987, Ser. No. 19,266

Int. Cl.⁴ C08F *279/04, 279/02, 279/06*

U.S. Cl. 525—310 **6 Claims**

1. A process for preparing highly occluded rubbery polymers comprising:

(a) contacting an emulsion comprising a rubbery polymer with at least one addition polymerizable, graft producing monomer under conditions such that the rubber emulsion particles imbibe the monomer but substantially no monomer polymerization occurs;

(b) initiating free radical polymerization of the monomer; and

repeating steps (a) and (b) at least once more employing the product of step (b) as the rubbery polymer in step (a) to thereby result in preparation of occluded and grafted rubbery particles.

4,783,509

NON-THERMOSET THERMALLY STABLE CAPPED EPOXY RESIN COMPOSITIONS

Michael B. Cavitt, Lake Jackson, Tex., and Christopher V. Beasley, Chicago, Ill., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 899,455, Aug. 22, 1986, Pat. No. 4,712,743, which is a continuation-in-part of Ser. No. 715,305, Mar. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,781, Dec. 4, 1984, abandoned. This application Nov. 10, 1987, Ser. No. 119,503

Int. Cl.⁴ C08L *63/00, 63/02*

U.S. Cl. 525—527 **8 Claims**

1. A thermally stable, non-thermoset resin having a Mettler softening point of from about 75° C. to about 110° C. and a Brookfield Thermosel viscosity at 450° F. of from about 150 cps to about 260 cps prepared by reacting in the presence of an effective quantity of a suitable catalyst

(A) a mixture comprising

(1) from about 65 to about 80 percent by weight of a relatively high molecular weight epoxy resin having an average of more than one vicinal epoxide group per molecule and an epoxide equivalent weight (EEW) of from about 1600 to about 2300; and

(2) from about 35 to about 20 percent by weight of a relatively low molecular weight epoxy resin having an average of more than one vicinal epoxide group per molecule and an EEW of from about 180 to about 225; wherein the equivalent weights of components (1) and (2) are calculated on the basis that the epoxy resin contains only carbon, oxygen and hydrogen atoms even though it may contain other atoms; with

(B) at least one monofunctional material selected from monohydric phenols, aliphatic alcohols having from about 3 to about 8 carbon atoms, aliphatic monocarboxylic acids having from about 12 to about 20 carbon atoms, anhydrides of aliphatic monocarboxylic acids, said anhydrides having from about 4 to about 8 carbon atoms, aromatic substituted aliphatic monocarboxylic acids having from about 8 to about 10 total carbon atoms or combinations thereof; and

wherein components (A) and (B) are employed in quantities which provide an equivalent ratio of component (B) to component (A) of from about 0.87:1 to about 1.1:1 except that when component (B) is an aliphatic alcohol, then the equivalent ratio of component (B) to component (A) is from about 3.5:1 to about 20:1; with the proviso that the amount of components (A-1) and (A-2) and the ratio of components (A) and (B) are such that the desired Mettler softening point and Brookfield Thermosel viscosity are obtained.

4,783,510

PROCESS FOR IMPROVING A WATER ABSORBENT POLYACRYLIC ACID POLYMER AND AN IMPROVED POLYMER PRODUCED BY SAID PROCESS

Kazuo Saotome, Tokyo, Japan, assignor to Taiyo Fishery Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 57,193

Claims priority, application Japan, Jun. 4, 1986, 61-130560; Feb. 24, 1987, 62-040834

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—329.7 **50 Claims**

1. A process for improving a water absorbent polyacrylic acid polymer with respect to absorption characteristics thereof which comprises the steps of:

(1) contacting with the surface of a water absorbent polyacrylic acid polymer an aqueous solution containing a water soluble peroxide radical initiator, the weight ratio of the water in said aqueous solution to said polymer being from 0.01 to 0.5, thereby causing said polymer substantially only at its surface portion to have said solution absorbed therein; and

(2) heating the resulting polymer with its surface portion having said solution absorbed therein at a temperature such that said initiator is decomposed but said polymer is not decomposed, thereby causing said polymer at its surface portion to undergo crosslinking by the action of said initiator while leaving the remaining core portion of said polymer substantially intact.

4,783,511

PROCESS FOR PREPARING MOULDED BODIES FROM MODIFIED THERMOPLASTIC POLYAMIDES

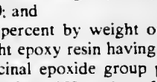
Eduard Schmid, Bonaduz, Switzerland, assignor to Ems-Inventa AG, Domat, Switzerland

Continuation of Ser. No. 841,934, Mar. 20, 1986, abandoned. This application Jun. 11, 1987, Ser. No. 62,350

Int. Cl.⁴ C08L *77/00*

U.S. Cl. 525—431 **16 Claims**

1. In a process for the preparation of molded bodies of thermoplastic polyamides comprising intensively mixing a polyamide with a masterbatch containing at least 5% by weight of a silane of the formula



wherein n is 0, 1 or 2; A is a hydrolyzable radical, the As being the same or different or two A's forming a divalent radical when n is 0 or 1, Z is an inert organic radical, the Zs being the same or different when n is 2 and Y is an organic radical having a functional group capable of reacting with an amino and/or carboxyl and/or amide groups in the polyamide chain to form a bond, converting the mixture by thermoplastic processing to molded bodies and conditioning the bodies before use by exposure to naturally ambiant moisture or briefly water, the improvement comprising adding the silane to the polyamide in the form of a materbatch selected from the group consisting of (1) a granulate of a melt of a polyolefin and the silane, (2) a silane swellable material containing the silane, and (3) a nonswellable thermoplast sponge with open pores filled with the silane.

4,783,512

PROCESS FOR POLYMERIZING OLEFINS IN THE PRESENCE OF A CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, ORGANIC HYDROXYL-CONTAINING COMPOUND, REDUCING HALIDE SOURCE AND TRANSITION METAL COMPOUND

Donald E. Gessell, Ponca City, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 736,209, May 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 604,350, Apr. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 416,422, Sep. 9, 1982, abandoned. This application Apr. 8, 1987, Ser. No. 36,045

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.⁴ C08F *4/64, 10/00*

U.S. Cl. 526—142 **7 Claims**

1. In a process for the polymerization of one or more polymerizable ethylenically unsaturated monomers containing one or more polymerizable α-olefins under Ziegler polymerization conditions wherein the polymerization is conducted in the presence of a transition metal-containing catalyst and at least one aluminum cocatalyst or activator compound represented by the formula $Al(R^3)_{3-a}(X')_a$ wherein R^3 is independently a hydrocarbyl group; X' is a halogen; and a has a value of from zero to 2; the improvement which comprises employing as the transition metal-containing catalyst an unseparated catalytic product resulting from

(I) admixing in an inert hydrocarbon diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium material represented by the formula $R_2Mg.xAl(R')_3$ wherein each R is independently a hydrocarbyl group having from 1 to about 20 carbon atoms, each R' is independently hydrogen or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms; and x has a value zero to about 2; and

(B) at least one organic hydroxyl-containing material represented by the formula ROH wherein R is a hydrocarbyl group having from 1 to about 20 carbon atoms thereby forming a complex or reaction product and subsequently adding:

(C) at least one reducing halide source represented by the formula $Al(R^3)_{3-m}X_m$ wherein each R^3 is independently hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms, X is a halogen and m has a value from 1 to 2; and

(D) at least one Titanium (Ti) compound represented by the formula $Ti(OR'')4$; R'' is hydrogen or a hydrocarbyl group having from 1 to about 20 carbon atoms; and

(II) heating the resultant mixture at a temperture of from about 35? C. up to the boiling point of the inert hydrocarbon diluent, for a time to permit substantial reaction of the resultant mixture as indicated by a change in color of the mixture; and wherein

(1) the components are added in the order (A + B), (C) and (D) or (A + B), (D) and (C); and

the components are employed in quantities so as to provide the following atomic ratios Mg:Ti of from about 3:1 to about 50:1; Cl:Mg of from about 2:1 to about 5:1; and the OH:total number of hydrocarbyl groups attached to a metal atom in component (A) is from about 0.8:1 to about 1.2:1;

4,783,513

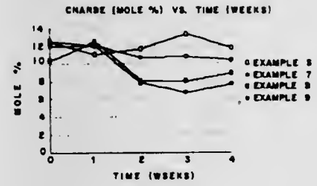
NOVEL WATER SOLUBLE CATIONIC ACRYLAMIDE POLYMERS HAVING RELATIVELY UNIFORM CATIONIC QUATERNARY AMINE FUNCTIONAL UNIT DISTRIBUTION

Jeffrey S. Cadel, Camillus, and Eric H. Larson, Marcellus, both of N.Y., assignors to Allied-Signal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 761,089, Aug. 2, 1985, Pat. No. 4,668,747, which is a continuation-in-part of Ser. No. 653,253, Sep. 24, 1984, abandoned. This application Apr. 10, 1987, Ser. No. 36,624

Int. Cl.⁴ C08F *2/32, 220/60*

U.S. Cl. 526—216 **18 Claims**



1. A water soluble cationic acrylamide polymer having relatively uniform cationic quaternary amine functional unit distribution comprising a polymer of a monomer of the formula

$$CH_2=RC—CONH_2 \quad (a)$$

wherein R is H or CH_3 and a monomer having quaternary amine units and having the formula

$$CH_2=CHR_1COO(CH_2)_nN(CH_3)^+R_2^- \quad (b)$$

where R_1 is H or CH_3, n is 2 or 3 and R_2 is Cl^- or $CH_3OSO_3^-$, wherein said polymer is formed by acidifying said monomer (a) with an acid containing carboxylate groups having a pKa greater than 1 to provide a pH in the range of between about 2.0 and 4.5, and polymerizing with monomer (b), wherein the weighted standard deviation of the charge distribution as calculated from measurements of the disappearance rates of the monomers is less than about 0.6.

4,783,514

POLYMERIC MONOARYLCYCLOBUTANE COMPOSITIONS

Robert A. Kirchhoff; Alan K. Schrock, and Stephen F. Hahn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 835,013, Feb. 28, 1986, Pat. No. 4,724,226, which is a continuation-in-part of Ser. No. 644,849, Aug. 27, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 872,372

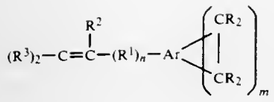
The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.⁴ C08F *10/00*

U.S. Cl. 526—281 **18 Claims**

1. A polymeric composition comprising, in polymerized form, a monomer represented by the formula:

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wherein
Ar is an aryl moiety;
R, R^2 and R^3 are separately and independently in each occurrence hydrogen, an electron-donating moiety or an electron-withdrawing moiety, provided at least one R^3 is an aryl moiety;
R^1 is a polyvalent organic moiety or a polyvalent inorganic moiety;
m is an integer of at least 1; and
n is an integer of zero or 1.

4,783,515
COPOLYMERS CONTAINING ETHYLENE AND α-CYANOACRYLATES
Helmut Waniczek, Cologne; Herbert Bartl, Odenthal, and Jens Herwig, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Aug. 14, 1987, Ser. No. 85,146
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1986, 3628903
Int. Cl.⁴ C08F *20/42*
U.S. Cl. 526—297 **8 Claims**

1. A copolymer of (1) and (2) where
(1) is (a) ethylene and
(2) is (b) at least one α-cyanoacrylate or mixture of (b) with (c) up to 20% mol % of one or more monomers which are copolymerizable with ethylene and α-cyanoacrylates, by a free-radical mechanism, based on the total weight of (b) and (c),
where the molar ratio of (1):(2) is from 2:1 to 200:1.

4,783,516
POLYSILANE PRECURSORS CONTAINING OLEFINIC GROUPS FOR SILICON CARBIDE
Curtis L. Schilling, Jr., Croton-On-Hudson, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Continuation-in-part of Ser. No. 480,700, Mar. 31, 1983, abandoned. This applicatioo Nov. 22, 1983, Ser. No. 554,291
Int. Cl.⁴ C08G *77/06*
U.S. Cl. 528—14 **27 Claims**

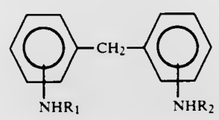
1. A largely linear thermoplastic polysilane which consists essentially of units of the formula:

$$[R_xR'_ySi+_a$$

wherein
R is hydrogen or an alkyl, aryl or aralkyl group containing from one to ten carbon atoms, R′ is an alkenyl group containing from two to eight carbon atoms, the sum of x+y is two or three, and a is equal to or greater than 5, and wherein R, R′, x and y may vary unit to unit within the polysilane and at least 5% of the silicon valences of the thermoplastic silane are satisfied by the group R′.

4,783,517
POLYUREAS AS COATINGS
Ray V. Scott, Jr., Addison, and David W. House, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 855,991, Apr. 25, 1986, Pat. No. 4,663,201. This application Apr. 17, 1987, Ser. No. 39,242
Int. Cl.⁴ C08G *18/08*
U.S. Cl. 528—52 **12 Claims**

1. A polyurea resulting from the reaction of a polyisocyanate having at least three isocyanate moieties with from about 0.8 to about 1.2 equivalents of a secondary aromatic diamine of the structure,



where each alkyl group, R_1 and R_2, contains from 4 to about 20 carbon atoms.

4,783,518
RAPID CURING EPOXY COMPOSITIONS
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.
Filed Sep. 28, 1987, Ser. No. 101,718
Int. Cl.⁴ C08G *59/68*
U.S. Cl. 528—90 **20 Claims**

1. A rapid curing composition comprising a mixture of (A) a polyepoxide and an amine curing agent and (B) a thiocyanate salt of the reaction product of an alkylene polyamine and a bicyclic amide acetal.

4,783,519
HIGH FUNCTIONALITY; LOW MELT VISCOSITY, FLAKABLE SOLID EPOXY RESIN WITH GOOD HEAT RESISTANCE
Patrick H. Martin, Danville; Theodore L. Parker, Lafayette, and Paul G. Schrader, Antioch, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 663,295, Oct. 22, 1984. This application Jan. 22, 1988, Ser. No. 146,899
Int. Cl.⁴ C08G *59/02, 59/32*
U.S. Cl. 528—98 **9 Claims**

1. An epoxide having an average oxirane functionality of about 2 or more and comprising at least 5 weight % of oligomeric molecules each of which is a reaction product of a diepoxide having an EEW of about 300 or less with a 1,1,1-tri(hydroxyphenyl)alkane or -alkene wherein the alkane or alkene moiety contains from 1 to 11 carbons, the mole ratio of said diepoxide to said triphenol, in each of said molecules, being—independently—within the range of from 2:2 to 3:1.

4,783,520
PRODUCTION OF AROMATIC AMORPHOUS THERMOPLASTIC POLY ARYL ETHER FROM ALIPHATIC-AROMATIC DIOL AND WHOLLY AROMATIC DIOL
Donald R. Kelsey, Hillsborough; Bernard Cooker, Piscataway; Robert A. Clendinning, New Providence; Robert Barclay, Jr., Trenton, and George T. Kwiatkowski, Green Brook, all of N.J., assignors to Amoco Corporation, Chicago, Ill.
Filed Jul. 1, 1987, Ser. No. 68,973
Int. Cl.⁴ C08G *65/40*
U.S. Cl. 528—174 **19 Claims**

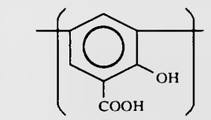
1. The method of preparing a thermoplastic polyarylether polymer which comprises reacting a first monomer composition comprising an activated dihalobenzenoid compound and a dihydroxydiphenyl aliphatic monomer in a molar ratio of dihalobenzenoid compound to dihydroxybenzenoid compound of at least 1.2 to 1, adding to the resultant reaction product a second monomer composition comprising a dihydroxybenzenoid compound comprising al least one compound which is free of aliphatic moieties and polymerizing, wherein the aliphatic moiety of said dihydroxydiphenyl aliphatic monomer has the structure:

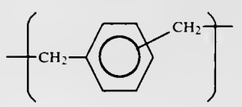


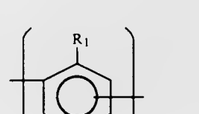
wherein R_1 and R_2 are independently hydrogen, aryl of 6 to 12 carbon atoms, C_1 to C_9 alkyl or form an alicyclic ring of 3 to 9 carbon atoms.

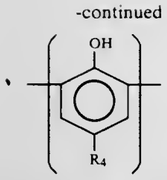
4,783,521
LINEAR SALICYLIC ACID COPOLYMERS AND THEIR METAL SALTS, PRODUCTION PROCESS THEREOF, COLOR-DEVELOPING AGENTS COMPRISING METAL-RESINS OF THE COPOLYMERS
Akihiro Yamaguchi, Kamakura; Keizaburo Yamaguchi, Kawasaki; Yoshimitsu Tanabe; Makoto Asano, both of Yokohama, and Masaru Wada, Oomuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Filed Jan. 16, 1987, Ser. No. 4,323
Claims priority, application Japan, Jan. 17, 1986, 61-6482; Jan. 31, 1986, 61-18027; Feb. 3, 1986, 61-20250; Feb. 3, 1986, 61-20251; Feb. 3, 1986, 61-20252; Dec. 23, 1986, 61-305332; Dec. 24, 1986, 61-306207; Dec. 25, 1986, 61-308026
Int. Cl.⁴ C08G *63/06*
U.S. Cl. 528—206 **22 Claims**

1. A linear copolymer comprising 5 to 60 mole percent of individual structural units (I), 30 to 50 mole percent of individual structural units (II), 0 to 60 mole percent of individual structural units (III) and 0 to 60 mole percent of individual structural units (IV) and having a weight average molecular weight of 500 to 30,000, each individual structural unit (I), (III), or (IV) being coupled with an individual structural unit (I), (III), or (IV) via a structural unit (II), if said structural units (III) or said structural units (IV) is 0 mol percent, then the two terminal bonds of each individual structural unit II are not bonded to the same individual structural unit I, and said structural units (I), (II), (III) and (V) being represented respectively by the following formulae (I), (II), (III) and (IV):

(I)


(II)


(III)


(IV)


wherein R_1, R_2 and R_3 are an alkyl group having 4 or fewer carbon atoms and R_4 denotes an alkyl, Cycloalkyl, aralkyl or phenyl group; or a multivalent metal salt thereof in which the multivalent metal forms the multivalent metal salt between carboxyl groups within the safe molecule of the copolymer or between different molecules of the copolymer.

4,783,522
AROMATIC POLYTHIOETHERIMIDE
Mitsutoshi Aritomi, and Makoto Terauchi, both of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan
Filed Jul. 11, 1986, Ser. No. 884,603
Claims priority, application Japan, Jul. 15, 1985, 60-155778
Int. Cl.⁴ C08G *73/10*
U.S. Cl. 528—352 **1 Claim**

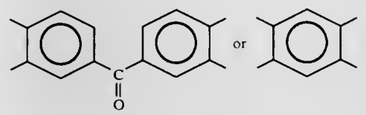
1. An aromatic polythioetherimide having a recurring unit of the following general formula (II):

(II)

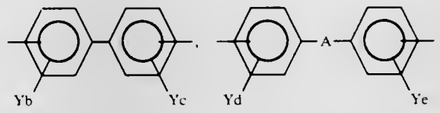
wherein —Ar—, which is the same or different in the polymer, each represents a divalent aromatic residue and



which is the same or different in the polymer, each represents



and wherein said divalent aromatic residue has the following general formula:



wherein A represents —O—, —CO—, —SO—, —SO_2— or —C_gH_{2g}— in which g is an integer of from 1 to 10, Y represents an alkyl group having 1 to 20 carbon atoms, an aralkyl

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group having 7 to 20 carbon atoms, a cycloalkyl group having 3 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, halogen or a nitro group and, b, c, d and e each is 0 or an integer of from 1 to 4.

4,783,523

TEMPERATURE CORRELATED FORCE AND STRUCTURE DEVELOPMENT OF ELASTIN POLYTETRAPEPTIDES AND POLYPENTAPEPTIDES

Dan W. Urry, 2423 Vestavia Dr., Birmingham, Ala. 35216, and K. U. M. Prasad, 310 Cedar Path Dr., Birmingham, Ala. 35209

Filed Aug. 27, 1986, Ser. No. 900,895
Int. Cl.[4] C07K *5/02;* **D02G** *3/00*
U.S. Cl. 530—323 **24 Claims**

1. A bioelastomer containing repeating units selected from the group consisting of elastomeric tetrapeptide, or pentapeptide or units thereof modified by hexapeptide repeating units and mixtures thereof, wherein said repeating units comprise amino acid residues selected from the group consisting of hydrophobic amino acid and glycine residues, wherein said repeating units exist in a conformation having a β-turn which comprises a polypentapeptide unit of the formula:

$$-X^1-(tPGVG)_n-Y^1-$$

wherein
I is a peptide-forming residue of L-isoleucine;
P is a peptide-forming residue of L-proline;
G is a peptide-forming residue of glycine;
V is a peptide-forming residue of L-valine; and
wherein X^1 is PGVG, GVG, VG, G or a covalent bond; Y^1 is IPGV, IPG, IP, I or a covalent bond; and n is an integer from 1 to 200, or n is 0, with the proviso that X^1 and Y^1 together constitute at least one of said pentameric unit in an amount sufficient to adjust the development of elastomeric force of the bioelastomer to a predetermined temperature.

4,783,524

GROWTH FACTORS

Brent R. Larsen, St. Charles, Mo.; Ned R. Siegel, Belleville, Ill.; Claire E. Kotts, St. Louis, Mo.; Michael F. McGrath, Chesterfield, Mo.; Sharon D. Ogden, St. Louis, Mo.; Gwen G. Krivi, Olivette, Mo., and John C. Minnerly, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 777,117, Sep. 17, 1985, abandoned. This application Jul. 31, 1986, Ser. No. 888,996
Int. Cl.[4] C07K *13/00*
U.S. Cl. 530—350 **6 Claims**

1. A peptide consisting essentially of the following sequence of amino acids, reading from the amino end to the carboxy end of said sequence:

Ala-Tyr-Arg-Pro-Ser-Glu-Thr-Leu-Cys-Gly-Gly-Glu-Leu-Val-Asp-Thr-Leu-Gln-Phe-Val-Cys-Gly-Asp-Arg-Gly-Phe-Tyr-Phe-Ser-Arg-Pro-Ser-Ser-Arg-Ile-Asn-Arg-Arg-Ser-Arg-Gly-Ile-Val-Glu-Glu-Cys-Cys-Phe-Arg-Ser-Cys-Asp-Leu-Ala-Leu-Leu-Glu-Thr-Tyr-Cys-Ala-Thr-Pro-Ala Lys-Ser-Glu,

said peptide being essentially free from other peptides of bovine origin.

4,783,525

PREPARATION OF REAGENT FOR IMMUNE COMPLEX ISOLATION

Thomas L. McDonald, Omaha, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Continuation-in-part of Ser. No. 441,060, Nov. 12, 1982, abandoned. This application Jan. 9, 1986, Ser. No. 816,700
Int. Cl.[4] A61K *35/14;* **C07K** *7/00*
U.S. Cl. 530—418 **9 Claims**

1. A method of syntehsizing a reagent for the separation of immune complex comprising the steps of:

obtaining blood from a mammal wherein serum of the mammal is obtained in the blood;

adjusting the pH of at least one of the constituents of the blood while the constitutent is in liquid form and contains serum to between 5.0 and 6.5, whereby a precipitate is formed; and

purifying the precipitate by removing glycoproteins and lipids until the reagent has less than 25 percent by weight of contaminants; wherein a reagent is obtained having properties of combining with the Fc region of complexed antiboides without binding to monomeric immuoglobulin.

4,783,526

CHLORINATION OF CARBOHYDRATES AND OTHER ALCOHOLS

Eleanor A. O'Brien; Thomas O'Connor; Mathew R. J. Tuite, all of Dublin, Ireland, and Leroy B. High, Cranbury, N.J., assignors to McNeilab, Inc., Spring House, Pa.

Filed Oct. 20, 1986, Ser. No. 921,293
Claims priority, application United Kingdom, Oct. 21, 1985, 8525954
Int. Cl.[4] C07H *3/04, 1/00, 5/02*
U.S. Cl. 536—18.5 **6 Claims**

1. In a process for the preparation of 1,6-dichloro-1,6-dideoxy-β-D-fructofuranosyl-4-chloro-4-deoxy-α-galactopyranoside comprising the steps of:

(a) reacting sucrose with a tritylating agent;

(b) acetylating the tritylated reaction product with an acetylating agent to obtain 6,1',6'-tri-O-tritylsucrose penta-acetate;

(c) detritylating the 6,1',6'-tri-O-tritylsucrose penta-acetate to obtain 2,3,4,3',4'-penta-O-acetylsucrose;

(d) isomerizing the 2,3,4,3',4'-penta-O-acetylsucrose to obtain 2,3,6,3',4'-penta-O-acetylsucrose;

(e) chlorinating 2,3,6,3',4'-penta-O-acetylsucrose with a chlorinating reagent to obtain 4,1',6'-trichloro-4,1',6'-trideoxygalactosucrose pentaacetate; and

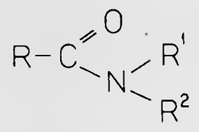
(f) deacetylating the chlorinating product; the improvement comprising effecting the chlorinating step utilizing a chlorinating reagent selected from the group consisting of triphenylphosphine oxide/thionyl chloride, triphenylphosphine oxide/phosgene, triphenylphosphine sulfide/thionyl chloride and triphenylphosphine sulfide/-phosgene in the presence of an aromatic hydrocarbon solvent at a temperature up to about 120° C.

4,783,527

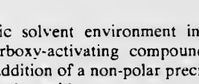
AMIDES OF AMPHOTERIC POLYENE MACROLIDE ANTIBIOTICS

Leonard S. Falkowski; Andrzej B. Jarzebski, both of Gda sk; Barbara J. Stefa ska; Elzbieta Troka, both of Gda sk-Oliwa, and Edward Borowski, Gdansk-Wrzeszcz, all of Poland, assignors to Politechnika Gdanska, Poland

Continuation of Ser. No. 138,356, Apr. 8, 1980, abandoned. This application Jun. 23, 1981, Ser. No. 276,462
Claims priority, application Poland, Apr. 9, 1979, 214802
Int. Cl.[4] C07H *17/08*
U.S. Cl. 536—53 **11 Claims**

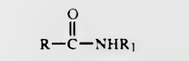


1. An amide of an amphoteric polyene macrolide of the formula



wherein
R is the residue of an amphoteric polyene carboxylic macrolide;
R_1 is selected from the group consisting of isopropyl, n-butyl, isobutyl, hexyl, cyclohexyl, n-octyl, n-dodecyl, n-octadecyl, benzyl, phenyl, 2-hydroxyethyl, 3-hydroxypropyl, 3-aminopropyl, 3-carbomethoxypropyl, carbamoylmethyl, 3-(N,N-dimethylamino)-isopropyl, 3-diethylphosphonylpropyl,;
derivatives of said polyene macrolides in which the aliphatic amino groups of the residue is substituted by N,N-dimethylaminomethyl, 3-carboalkoxy-propenyl-2, 4-oxopentanyl-2, glycosyl, or acyl;
and the salts thereof.

4. A process for the preparation of the amides of amphoteric polyene macrolide having an activated carboxylic group in the base residue of the formula



wherein
R is the residue of an amphoteric polyenecarboxylic macrolide;
R_1 is selected from the group consisting of isopropyl, n-butyl, isobutyl, hexyl, cyclohexyl, n-octyl, n-dodecyl, n-octadecyl, benzyl, phenyl, 2-hydroxyethyl, 3-hydroxypropyl, 3-aminopropyl, 3-carbomethoxypropyl, 3-carbamoylmethyl, 3-(N,N-dimethylamino propyl, 3-(N-isopropylamino)propyl, 1-(N,N-dimethylamino)-isopropyl, 3-diethylphosphonyl propyl;
which comprises the steps of reacting the amphoteric polyene macrolide of the formula:

R—COOH

with an amine of the formula:

$H-N-HR_1$

in a polar organic solvent environment including proton-accepting and carboxy-activating compounds; precipitating the amide by the addition of a non-polar precipitating solvent; and then purifying the amide.

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STEROIDAL LARIAT ETHERS

George W. Gokel, Miami, Fla., assignor to University of Miami (Department of Chemistry)

Filed Jun. 5, 1987, Ser. No. 58,774
Int. Cl.[4] A61K *31/56;* **C07J** *9/00*
U.S. Cl. 540—113 **7 Claims**

1. Cholestanyloxymethyl-15-crown-5.

4,783,529

RAPID SYNTHESIS OF RADIOLABELED PORPHYRIN COMPLEXES FOR MEDICAL APPLICATION

David K. Lavallee, Croton-On-Hudson, N.Y.; Daniel Mansuy, Paris, and Jean-Paul Battioni, Massy; both of France, assignors tn Research Corporation Technologies, New York, N.Y.

Filed Dec. 3, 1985, Ser. No. 804,218
Int. Cl.[4] C07D *487/22*
U.S. Cl. 540—145 **16 Claims**

8. A process for the preparation of N-benzylporphyrins which comprises contacting a naturally derived porphyrin with a benzyl diphenylsulfonium compound in the presence of an inert organic solvent.

12. N-benzylhematoporphyrin.

15. N-benzyl5,10,15,20-tetrakis(p-carboxyphenyl)porphyrin.

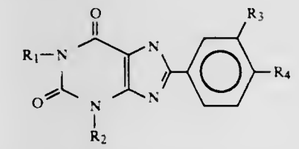
4,783,530

8-ARYLXANTHINES

Waclaw J. Rzeszotarski, Millersville; Rickey P. Hicks, Columbia, and Ronald H. Erickson, Baltimore, all of Md., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 931,620, Nov. 13, 1986, abandoned. This application Oct. 1, 1987, Ser. No. 108,990
Int. Cl.[4] C07D *239/36;* **A61K** *31/52*
U.S. Cl. 544—267 **8 Claims**

1. A compound of the formula



wherein
R_1 and R_2 are independently selected from alkyls of one to six carbons;
R_3 is selected from hydrogen, dimethylaminomethyl and 2,3-dihydroxypropyloxy;
R_4 is selected from hydroxy, cyano, $-NHCON(R_5)_2$, $-C(=NH)N(R_5)_2$, and $-NHC(=NH)N(R_5)_2$, wherein each R_5 is independently hydrogen or an alkyl group of one to three carbons, with the provisos that when R_3 is hydrogen, R_4 may not be hydroxy, when R_3 is dimethylaminomethyl, R_4 is hydroxy and when R_3 is 2,3-dihydoxypropyloxy, R_4 is hydrogen
and pharmaceutically acceptable salts of such compounds.

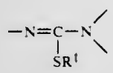
4,783,531

PRODUCTION OF S-SUBSTITUTED ISOTHIOUREAS

Dennis E. Jackman, Prarie Village; Dietmar B. Westphal, Lenexa, both of Kans., and Thomas Schmidt, Haan, Fed. Rep. of Germany, assignors to Mobay Corporation, Pittsburgh, Pa. and Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

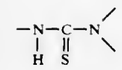
Division of Ser. No. 632,132, Jul. 18, 1984, Pat. No. 4,659,819. This application Apr. 7, 1987, Ser. No. 35,528
The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.
Int. Cl.[4] C07D *253/06, 251/38, 239/38*
U.S. Cl. 544—182 **5 Claims**

1. A process for the production of an S-substituted isothiourea group of the formula



in which
R^1 is an alkyl, alkenyl, aryl or aralkyl radical and the S-substituted thiourea group is contained in the ring of a heterocycle selected from the group consisting of substituted pyrimidines and substituted triazines,
comprising
(a) reacting a substituted pyrimidine or triazine containing a thiourea group of the formula

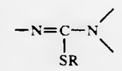
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with an etherifying agent which carries the radical R in which

R is an alkyl, alkenyl, aryl or aralkyl radical different from R^1

to convert said thiourea group to the ether group of the formula



and

(b) in a second step reacting the substituted pyrimidine or triazine containing this ether with a compound of the formula R^1SH.

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PROCESS FOR PREPARING GRISEOLIC ACID DERIVATIVES

Masakatsu Kaneko; Misako Kimura, and Yoshinobu Murofushi, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

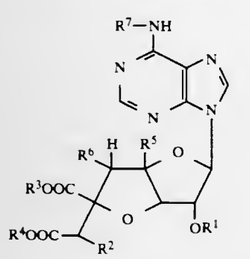
Continuation-in-part of Ser. No. 664,866, Oct. 25, 1984, Pat. No. 4,634,706. This application Apr. 25, 1986, Ser. No. 856,586

Claims priority, application Japan, Oct. 28, 1983, 58-202362; Apr. 27, 1985, 60-91989

Int. Cl.[4] C07D *47/34;* **A61K** *31/52*

U.S. Cl. 544—277 **26 Claims**

1. A process for preparing compounds of formula (I):



(1)

wherein:

R^1 represents a hydrogen atom or a hydroxy-protecting group selected from the group consisting of C_2-C_6 aliphatic acyl; benzoyl; benzoyl having a halogen, C_1-C_4 alkyl, C_1-C_4 alkoxy, benzoyl, C_1-C_4 haloalkyl, C_2-C_5 alkoxycarbonyl, CN or NO_2 substituent; tetrahydropyranyl; tetrahydropyranyl having a C_1-C_4 alkoxy or halogen substituent; tri-(C_1-C_4 alkyl)silyl; C_1-C_6 alkyl; mono- or di- C_1-C_4 alkoxymethyl; mono- or di- C_1-C_4 alkoxymethyl having a C_1-C_4 alkoxy or halogen substituent; benzyl; benzyl having a C_1-C_4 alkyl, C_1-C_4 alkoxy, halogen, NO_2 or CN substituent; C_2-C_7 alkoxycarbonyl, C_2-C_7 alkoxycarbonyl having a halogen or tri-(C_1-C_4 alkyl)silyl substituent; benzyloxycarbonyl; benzyloxycarbonyl having a C_1-C_4 alkoxy or NO_2 substituent; and C_2-C_6 aliphatic acyloxy-, benzoyloxy- or substituted benzoyloxy-methoxycarbonyl;

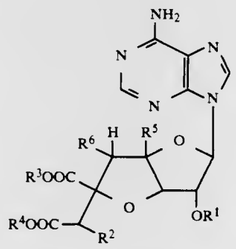
R^2 represents a hydrogen atom, a hydroxy group or a protected hydroxy group selected from the hydroxy-protecting group specified for R^1;

R^3 and R^4 are independently selected from the group consisting of hydrogen atoms and carboxy-protecting groups selected from the group consisting of C_1-C_6 alkyl; C_1-C_6 haloalkyl; mono-, di- or tri- C_6-C_{14} arylmethyl; mono-, di- or tri- C_6-C_{14} arylmethyl having aryl moiety substituted with a C_1-C_4 alkoxy, C_1-C_4 alkyl, halogen or C_{1-2} alkylenedioxy substituent; C_2-C_6 aliphatic acyloxymethyl; C_1-C_6 alkoxymethyl; C_1-C_6 alkoxymethyl having a C_1-C_4 alkoxy substituent; 1-(C_1-C_6 alkoxy)carbonyloxyethyl; phthalidyl; and (2-oxo-5-methyl-1,3-dioxolen-4-yl)methyl;

R^5 and R^6 each represent hydrogen atom or together represent an extra carbon-carbon bond between the carbon atoms to which they are attached; and

R^7 represents an alkyl group or an aralkyl group;

which process comprises reacting a compound of formula (II):



(II)

with a compound of formula (III):

$$R^7—X \qquad \text{(III)}$$

to bond said R^7 group to the No. 1 ring nitrogen atom of the compound and contacting said compound having the R^7 group bonded to the No. 1 nitrogen atom with a liquid having a pH of at least 4 whereby the aminopyrimidine ring containing said No. 1 nitrogen atom is cleaved, rearranged and reformed thereby removing the R^7 group from the No. 1 ring nitrogen atom and bonding it to the N^6 nitrogen atom.

4,783,533

[OXO-4-4H-[1]-BENZOPYRAN-8-YL]ALCANOIC ACIDS, SALTS AND DERIVATIVES, THEIR MANUFACTURE AND MEDICINES CONTAINING THEM

Philippe Briet, Lyons; Jean-Jacques Berthelon, Decines Charpieu, and Francois Collonges, Beynost Miribel, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

Continuation of Ser. No. 669,037, Nov. 6, 1984, Pat. No. 4,602,034, which is a continuation of Ser. No. 442,191, Nov. 15, 1982, abandoned. This application May 29, 1986, Ser. No. 872,381

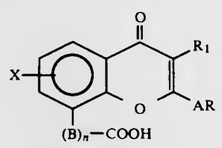
Claims priority, application France, Nov. 25, 1981, 81 22020

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/35;* **C07D** *311/26*

U.S. Cl. 514—456 **9 Claims**

1. (Oxo-4-4H-(1-benzopyran-8-yl)alkanoic acid, described by the formula



in which AR is a phenyl radical, phenyl substituted by lower alkyl, or lower alkoxy, B is a lower linear or branched alkylene or alkenylene radical; R_1 is hydrogen or a phenyl radical, X is hydrogen or a lower alkyl or alkoxy radical and n = 1, or an alkali metal salt thereof.

4,783,534

N-ALKYLNORSCOPINES AND ACID ADDITION SALTS THEREOF

Rolf Banholzer, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

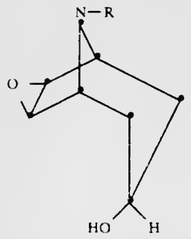
Continuation of Ser. No. 872,123, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 626,692, Jul. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 485,161, Apr. 15, 1983, abandoned. This application Mar. 31, 1987, Ser. No. 32,762

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215493

Int. Cl.[4] C07D *451/06*

U.S. Cl. 546—91 **5 Claims**

1. A compound of the formula



(I)

wherein R represents a linear or branched alkyl having from 2 to 10 carbon atoms, or an acid addition salt thereof.

4,783,535

CHEMICAL INTERMEDIATES IN THE PREPARATION OF AROMATIC-1,4-OXAZEPINONES AND THIONES

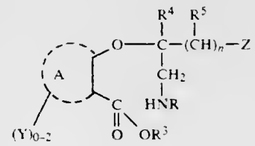
Young S. Lo, Richmond, and Albert D. Cale, Jr., Mechanicsville, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 652,017, Sep. 19, 1984, Pat. No. 4,610,819. This application Mar. 18, 1986, Ser. No. 840,811

Int. Cl.[4] C07D *213/80, 213/82, 231/12, 233/06*

U.S. Cl. 546—316 **5 Claims**

1. A compound selected from the group having the formula:



wherein A represents an aromatic ring selected from benzene, naphthalene, pyridine or quinoline, any of the rings optionally substituted by one or two Y radicals selected from halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro or trifluoromethyl;

R is selected from the group consisting of hydrogen, loweralkyl, cycloalkyl containing from 3–9 carbon atoms or phenyl-loweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro or trifluoromethyl;

n is 1, 2 or 3;

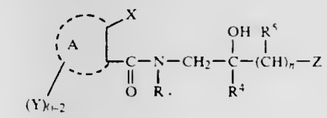
R^3 is selected from hydrogen, alkali metal ion or an esterifying group;

R^4 and R^5 are selected from hydrogen or loweralkyl (1–5 C);

Z is selected form the group consisting of $—NR^1R^2$, 1H-pyrazol-1-yl, 1H-imidazol-1-yl, 1H-imidazol-2-yl or 4,5-dihydro-1H-imidazol-2-yl,

R^1 and R^2 are selected from the group consisting of loweralkyl, cycloalkyl containing from 3–9 carbon atoms or phenyl-loweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro, trifluoromethyl or cyano, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-azetidinyl, 1-pyrrolidinyl, 2,5-dimethylpyrrolidin-1-yl, 2-methylpyrrolidin-1-yl, 1-piperidinyl, 4-substituted-piperidin-1-yl, 4-[bis(4-fluorophenyl)methyl]-piperidin-1-yl, 4-morpholinyl, 1-piperazinyl, 4-substituted-piperazin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 2,5-dihydro-1H-pyrrol-1-yl or 1H-pyrrol-1-yl, and the acid addition salts thereof.

3. A compound selected from the group having the formula:



wherein A represents an aromatic ring selected from benzene, naphthalene, pyridine or quinoline, any of the rings optionally substituted by one or two Y radicals selected from halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro or trifluoromethyl;

X is halo;

R is selected from the group consisting of hydrogen, loweralkyl, cycloalkyl containing from 3–9 carbon atoms or phenyl-loweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro or trifluoromethyl;

n is 1, 2 or 3;

R^4 and R^5 are selected from hydrogen or loweralkyl (1–5 C);

Z is selected form the group consisting of $—NR^1R^2$, 1H-pyrazol-1-yl, 1H-imidazol-1-yl, 1H-imidazol-2-yl or 4,5-dihydro-1H-imidazol-2-yl;

R^1 and R^2 are selected from the group consisting of loweralkyl, cycloalkyl containing from 3–9 carbon atoms or phenyl-loweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro, trifluoromethyl or cyano, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-azetidinyl, 1-pyrrolidinyl, 2,5-dimethylpyrrolidin-1-yl, 2-methylpyrrolidin-1-yl, 1-piperidinyl, 4-substituted-piperidin-1-yl, 4-[bis(4-fluorophenyl)methyl]-piperidin-1-yl, 4-morpholinyl, 1-piperazinyl, 4-substituted-piperazin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 2,5-dihydro-1H-pyrrol-1-yl or 1H-pyrrol-1-yl, and the acid addition salts thereof.

4,783,536

SELECTIVE REDUCTION OF PENTACHLOROPYRIDINE TO 2,3,5,6-TETRACHLOROPYRIDINE WITH ZINC DUST IN BASIC MEDIA

Theodore J. Sobieralski, Antioch, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 7, 1985, Ser. No. 699,273

Int. Cl.[4] C07D *213/61*

U.S. Cl. 546—345 **10 Claims**

1. The process of preparing 2,3,5,6-tetrachloropyridine

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which comprises reducing pentachloropyridine with metallic zinc at a temperature of up to about 55° C. and in a basic aqueous medium comprising a dispersion of the pentachloropyridine in a liquid halocarbon having the essential character of perchloroethylene or methylene chloride.

4,783,537

α-(AMINOALKYL)-ARYLACETIC ACID DERIVATIVES

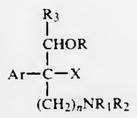
Robert J. Murray, Penfield, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 13, 1985, Ser. No. 797,590

Int. Cl.⁴ C07D *295/18, 295/14. 213/56, 213/55*

U.S. Cl. 546—234 **24 Claims**

1. A compound of the formula



wherein

R is hydrogen or lower alkanoyl,

R_1 and R_2 are independently hydrogen, lower alkyl or lower cycloalkyl, or R_1 and R_2 together with their adjacent nitrogen atom form a heterocyclic ring selected from the group of pyrrolidino, piperidino, morpholino, piperazino and 1H-hexahydroazepino;

R_3 is phenyl, substituted phenyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, or lower cycloalkyl;

Ar is phenyl, substituted phenyl, or 2-pyridyl;

X is CO_2R_4, or $CONR_5R_6$;

R_4 is hydrogen or lower alkyl;

R_5 and R_6 are independently hydrogen or lower alkyl, or R_5 and R_6 together with their adjacent nitrogen atom form a heterocyclic ring selected from the group of pyrrolidino, piperidino, morpholino, piperazino and 1H-hexahydroazepino;

substituted phenyl is phenyl that is either monosubstituted or disubstituted and each substituent is selected from the group consisting of halogen, lower alkyl, lower alkoxy, amino, nitro, or hydroxy, such that substitution can occur at the ortho, meta or para positions; and

n is 2 or 3, including all enantiomers thereof and mixtures of enantiomers thereof.

4,783,538

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE AZOLYL-CARBINOL DERIVATIVES, OPTICALLY ACTIVE 2-(4CHLORO-PHENOXYMETHYL)-3,3-DIMETHYL-1-(1,2,4-TRIAZOL-1-YL)-2-BUTANOL, PREPARED BY THIS PROCESS AND ITS USE AS AN ANTIMYCOTIC

Udo Kraatz, Leverkusen; Graham Holmwood; Dieter Berg, both of Wuppertal, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

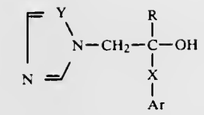
Filed Oct. 25, 1985, Ser. No. 791,237

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1984, 3440118; Nov. 2, 1984, 3440112

Int. Cl.⁴ C07D *249/08, 233/60*

U.S. Cl. 548—262 **8 Claims**

1. Process for the preparation of an optically active azolyl-carbinol derivative of the formula



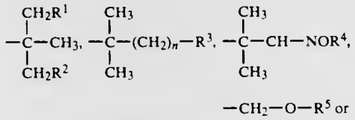
in which

Ar is phenyl optionally mono-, di- or tri-substituted, identically or differently by halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, nitro, and halogenoalkyl, halogenalkoxy and halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 3 identical or different halogen atoms, or phenyl, phenoxy, benzyl or benzyloxy, each of which is optionally substituted by halogen and/or alkyl with 1 or 2 carbon atoms, or the —CH=NOZ radical,

wherein

Z represents hydrogen, straight-chain or branched alkyl with 1 to 6 carbon atoms, alkenyl or alkynyl with in each case 2 to 6 carbon atoms, or benzyl which is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising halogen and alkyl with 1 or 2 carbon atoms;

R is



—CH_2—O—R^5 or —CH_2—S—R^5

or is cycloalkyl which has 3 to 7 carbon atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms, or is cyclopropyl which is substituted by triazolyl or imidazolyl, or is phenyl which is optionally substituted by substituents on the phenyl, these being the substituents on phenyl which have already been mentioned for Ar;

wherein

R^1 is hydrogen, fluorine, chlorine or bromine;

R^2 is fluorine, chlorine or bromine;

R^3 is alkyl, alkoxy or alkylthio with in each case 1 to 4 carbon atoms, halogenoalkoxy or halogenoalkylthio with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkenyl with 2 to 6 carbon atoms, alkoxycarbonyl with 1 to 6 carbon atoms in the alkyl part, or cyano, or is phenyl, phenoxy, phenylthio, benzyloxy or benzylthio, each of which is optionally substituted on the phenyl by halogen, alkyl with 1 to 4 carbon atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, halogenoalkyl, with in each case 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, dialkylamino with 1 to 4 carbon atoms in each alkyl part, nitro, cyano, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part, and phenyl which is optionally substituted by halogen;

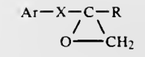
n is 0, 1 or 2;

R^4 is alkyl with 1 to 6 carbon atoms or alkenyl or alkynyl with in each case 2 to 6 carbon atoms, or is phenylalkyl which has 1 or 2 carbon atoms in the alkyl part and is optionally substituted by substituents on the phenyl, these being the substituents on phenyl which have already been mentioned for Ar,

R^5 is alkyl with 1 to 4 carbon atoms; and

X is a group selected from —OCH_2—, —SCH_2—, —CH_2CH_2—, —CH=CH— and —C≡C— or a direct bond; and

Y is a nitrogen atom or the —CH-group, characterized in that, in a first reaction step, an oxirane of the formula



in which

Ar, R and X having the abovementioned meaning, are reacted with a strong optically active sulphonic acid, or with 1,1'-binaphthyl-2,2'-diylphosphate if appropriate in the presence of a solvent, the diasteriomeric ester mixture formed is separated into the diastereomerically pure components and these are reacted, in a second reaction step, with 1,2,4-triazole or imidazole in the presence of a base.

4,783,539

METHACRYLOXY CONTAINING COMPOUNDS

George E. Abboud, Ajax, Canada; Christopher H. Such, Mount Eliza, Australia; Susan M. Horley, Loudwater, and Julian A. Waters, Goring-On-Thames, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

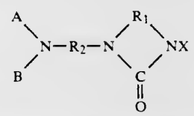
Continuation of Ser. No. 436,355, Oct. 25, 1982, abandoned. This application Jan. 2, 1986, Ser. No. 815,313

Claims priority, application United Kingdom, Oct. 23, 1981, 8132086; Apr. 30, 1982, 8212639

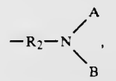
Int. Cl.⁴ C07D *233/36, 239/10*

U.S. Cl. 548—320 **5 Claims**

1. A polymerisable monomer of structure



wherein R_1 and R_2 are alkylene groups containing 2 or 3 carbon atoms, the same or different; one of A or B is a C_2–C_{18} alkyl group substituted by at least one hydroxy group and the other is a methacryloxy C_2–C_{18} alkyl group the alkyl portion being optionally substituted by a hydroxy group; and X=H, $C_{1\text{-}18}$ alkyl or



the said monomer being substantially free from non-polymerisable water-soluble contaminants.

4,783,540

SOLID SOLUTIONS OF PYRROLO-(3,4-C)-PYRROLS

Fridolin Bäbler, Marly, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

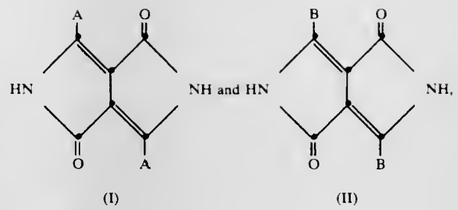
Filed Jul. 29, 1987, Ser. No. 79,057

Claims priority, application Switzerland, Aug. 7, 1986, 3171/86

Int. Cl.⁴ C07D *487/04*

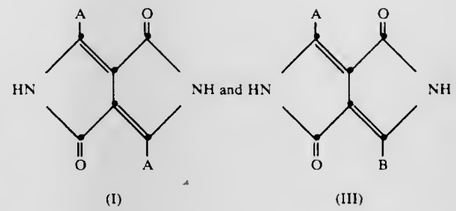
U.S. Cl. 548—453 **6 Claims**

1. A solid solution of 1,4-diketo-pyrrolo-[3,4-c]-pyrrols consisting of two different compounds having the formulae



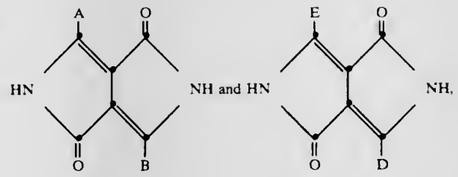
(I) (II)

the formulae



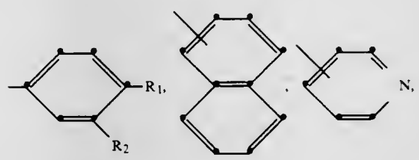
(I) (III)

or the formulae

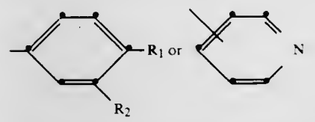


(III) (IV)

in which A is a group selected from



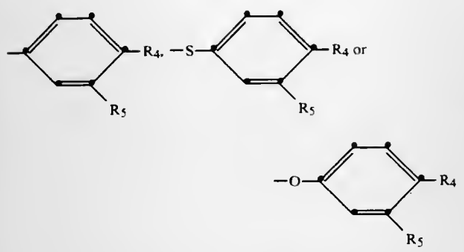
and B, E and D are each independently a group



where R_1 and R_2 are each independently hydrogen, halogen,

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C_1-C_5-alkyl, C_1-C_5-alkoxy, $-SR_3$, $-N(R_3)_2$, $-CF_3$, $-CN$ or a group of the formulae



R_3 is C_1-C_5-alkyl and R_4 and R_5 are independently hydrogen, halogen, C_1-C_5-alkyl, C_1-C_5-alkoxy, $-SR_3$ or CN, in which the X-ray diffraction patterns of the solid solutions differ from the sum of the X-ray diffraction patterns of the individual components.

4,783,541

PROCESS FOR ISOMERIZING ALKYLTHIOPHENES

Klaus Eichler, Eschborn, and Ernst I. Leupold, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 040,759, Apr. 16, 1987, abandoned, which is a continuation of Ser. No. 919,548, Oct. 15, 1986, abandoned, which is a continuation of Ser. No. 774,936, Sep. 11, 1985, abandoned. This application Dec. 18, 1987, Ser. No. 135,504

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433813

Int. Cl.[4] **C07D** *333/08*

U.S. Cl. 549—83 **5 Claims**

1. A process for isomerizing alkylthiophenes, which process is carried out in the gaseous phase at temperatures from about 300°-450° C., which comprises contacting an alkylthiophene or a mixture of alkylthiophenes with an acid zeolyte catalyst of the pentasil type.

4,783,542

SILICONE COMPOUNDS

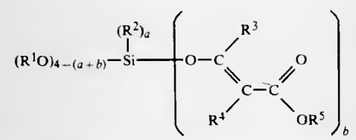
Rack H. Chung, deceased, late of Saratoga County, N.Y., and by Betsy A. Chung, executor, Clifton Park, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed May 25, 1983, Ser. No. 497,954

Int. Cl.[3] **C07F** *7/08, 7/18*

U.S. Cl. 556—437 **31 Claims**

1. A composition of matter having the general formula:



where R^1 is a monovalent hydrocarbon radical having 1 to 8 carbon atoms; R^2, R^3 and R^5 are monovalent hydrocarbon radicals having 1 to 13 carbon atoms; R^4 is hydrogen or a monovalent hydrocarbon radical having 1 to 13 carbon atoms; a is an integer equal to 0 to 3; b is an integer equal to 1 to 4; and the sum of a+b equals 1 to 4.

4,783,543

PROCESS TO PRODUCE SILYL KETENE ACETALS

William J. Schulz, Jr., and John L. Speier, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 23, 1987, Ser. No. 123,850

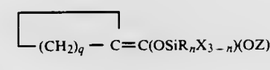
Int. Cl.[4] **C07F** *7/18*

U.S. Cl. 556—446 **23 Claims**

1. A process for preparing silyl ketene acetals having the formula,

$$R_2C{=}C(OSiR_{3-n}X_n)(OZ)$$

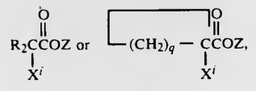
or



wherein each R is independently selected from a group consisting of alkyl, alkenyl, aryl, aralkyl, or organosilyl; X is a halogen atom; Z is selected from a group consisting of alkyl, alkenyl, aryl, organosilyl, or haloorganosilyl; n has a value of 1, 2, or 3; and q has a value of 2 to 22, inclusive,

said process comprising

(A) contacting an alpha-ester of a carboxylic acid with an alkali metal in the presence of an excess of an organohalosilane, wherein the alpha-ester has the formula,



wherein the organohalosilane has the formula,

$$R_nSiX_{4-n},$$

wherein R, X, Z, n, and q are defined above; and wherein X^i is selected from a group consisting of halogen atoms and alkoxy groups; and

(B) facilitating reaction among the alpha-ester, the alkali metal, and the organohalosilane to form the silyl ketene acetal and an alkali metal halide of an alkali metal alkoxide.

4,783,544

DI-(METH)ACRYLIC ACID ESTER, RESIN COMPOSITION COMPRISING THE SAME AND COATING AGENT COMPRISING THE SAME

Minoru Yokoshima, Asa; Tetsuo Ohkubo, Ube, and Masayuki Kiyomoto, Asa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

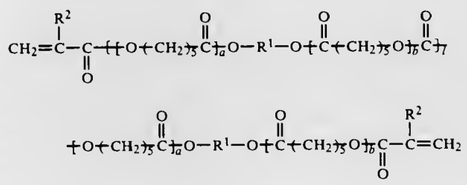
Filed Jun. 17, 1986, Ser. No. 875,064

Claims priority, application Japan, Jun. 19, 1985, 60-131631; Jun. 19, 1985, 60-131632; Sep. 6, 1985, 60-195725

Int. Cl.[4] **C08F** *2/50, 218/00*

U.S. Cl. 558—267 **3 Claims**

1. A di-(meth)acrylic acid ester represented by the formula:



---

wherein R^1 represents an alkylene group having 4 to 10 carbon atoms; R^2 represents a hydrogen atom or a methyl group, the mean values of a and b are respectively 0 to 5; the sum value of a plus b is 0.5 to 5 and the mean value of l is 1 to 10.

4,783,545

METHOD FOR AMMOXIDATION OF PARAFFINS AND CATALYST SYSTEM THEREFOR

Linda C. Glaeser, Cleveland Heights; James F. Brazdil, Jr., Mayfield Village, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 50,268, May 15, 1987, which is a continuation-in-part of Ser. No. 887,478, Jul. 21, 1986, which is a continuation-in-part of Ser. No. 811,842, Dec. 20, 1985, abandoned. This application Dec. 23, 1987, Ser. No. 137,316

Int. Cl.[4] **C07C** *120/14*

U.S. Cl. 558—319 **13 Claims**

1. A process for the ammoxidation of a paraffin selected from propane and isobutane to acrylonitrile or methacrylonitrile which comprises contacting in a reaction zone said paraffin in the vapor phase in admixture with ammonia, molecular oxygen, and optionally an inert gaseous diluent, with an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said feed to the reaction zone containing a mole ratio of paraffin:NH_3 in the range from 2 to 16 and a mole ratio of paraffin to O_2 in the range from 1 to 10,

said first catalyst composition being 10–99 weight percent of a diluent/support and 90–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

$$VSb_mA_aG_bJ_cT_tO_x, \qquad \text{formula (1)}$$

where

A is one or more of W, Sn, Mo, B, P and Ge;

G is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Te, Ga, In and As;

J is one or more of an alkali metal and Tl;

T is one or more of Ca, Sr and Ba; and where m is from 0.01 and up to 20; a is 0.2–10; b is 0–20; c is 0–1; t is 0–20; the ratio (a+b+c+t):(1+m) is 0.01–6; wherein x is determined by the oxidation state of other elements, and wherein the antimony has an average valency higher than +3 and the vanadium has an average valency lower than +5,

said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

$$Bi_nCe_pD_dE_eL_fMo_{12}W_gO_y \qquad \text{formula (2)}$$

where

D is one or more of Fe, Mn, Pb, Co, Ni, Cu, Sn, P, Cr, Y, Mg, Ca, Sr, Ba and rare earths other than Ce and Sm;

E is one or more of Sb, Ge, As, Se, Te and V

L is one or more of an alkali metal, Tl, Ag and Sm and where n is 0.01–24, p is 0.01–24, (n+p) is 0.1–24, d is 0–10, e is 0–10, f is 0–6, g is 0–8, and y is determined by the oxidation state of the other elements, wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

4,783,546

PREPARATION OF 4-PENTENENITRILE BY ISOMERIZATION

Patrick M. Burke; Norman Herron, and Francis J. Waller, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 2, 1987, Ser. No. 57,433

Int. Cl.[4] **C07C** *121/30*

U.S. Cl. 558—355 **2 Claims**

1. A process for the preparation of 4-pentenenitrile which comprises isomerizing 3-pentenenitrile by contacting 3-pentenenitrile at a temperature in the range of about 50° to 150° C. at a pressure of 0.01 to 50 atmospheres with a heterogeneous catalyst selected from the group consisting of, acidic amorphous silica aluminates promoted with palladium in an oxidation state of at least +2 in an amount of 0.1% to 4% by weight of the catalyst, acid Y-zeolites promoted with palladium in an oxidation state of at least +2 in an amount of 0.1% to 4% by weight of the catalyst, and perfluorinated sulfonic acid ion-exchange polymers promoted with palladium or platinum in an oxidation state of at least +2.

4,783,547

POLYFLUOROAROMATIC NITRILES

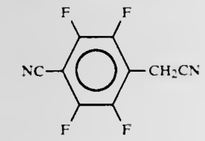
Ludwig A. Hartmann, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 18, 1986, Ser. No. 853,448

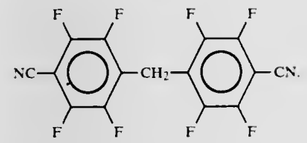
Int. Cl.[4] **C07C** *121/52, 121/60*

U.S. Cl. 558—388 **2 Claims**

1. The compound of the formula



2. The compound of the formula:



4,783,548

PROCESSES FOR PREPARING 3,4-DIHYDRO 2-NAPHTHANOIC ACID AND 2-NAPHTHANOIC ACID AND ESTERS THEREOF

Joseph R. Zoeller, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 16, 1987, Ser. No. 97,021

Int. Cl.[4] **C07C** *149/40, 67/30*

U.S. Cl. 560—10 **8 Claims**

1. A process for preparing a 3,4-dihydro 2-naphthanoic acid or an ester thereof, comprising

heating an alpha-vinyl cinnamic acid or a (C_1-C_{12})alkyl, (C_6-C_{12})aryl, (C_6-C_{12})alkylaryl or (C_6-C_{12})aralkyl ester thereof at a temperature effective to cyclize said acid or ester thereof and obtain the corresponding 3,4-dihydro 2-naphthanoic acid or ester thereof.

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4,783,549

BENZONORBORNENE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND MEDICINAL AND COSMETIC COMPOSITIONS CONTAINING THEM

Gérard Lang, Saint-Gratien; Jean Maignan, Tremblay les Gonesse; Serge Restlé, Aulnay sous Bois, and Braham Shroot, Antibes, all of France, assignors to L'Oreal, Paris, France

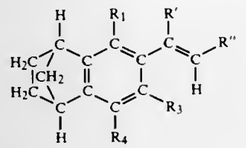
Filed Sep. 4, 1985, Ser. No. 772,525

Claims priority, application Luxembourg, Sep. 5, 1984, 85531; Dec. 20, 1984, 85700

Int. Cl.⁴ C07C *69/16*

U.S. Cl. 560—104 **10 Claims**

1. A process for the preparation of a benzonorbornene derivative of formula (I), or an isomer or salt thereof, wherein formula (I) is

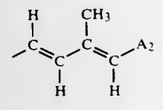


(I)

wherein

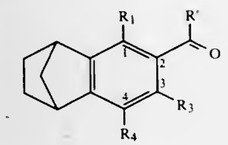
R_1, R_3 and R_4 each independently represent hydrogen, C_1-C_8 alkyl, C_1-C_8 alkoxy, halogen, C_1-C_8 acyloxy or hydroxyl,

R′ is hydrogen or C_1-C_6 alkyl, and R″ is a polyene having formula (II)



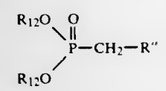
(II)

wherein A_2 is CH_2OR_6 wherein R_6 is hydrogen or C_1-C_6 alkyl, or —COR_7 wherein R_7 is hydrogen, C_1-C_6 alkoxy, aryloxy, benzyloxy, a sugar residue, substituted or unsubstituted amino, C_1-C_6 alkyl or hydroxyl, said process comprising reacting a substituted or unsubstituted 2-acyl benzonorbornene of formula (VII)



(VII)

wherein R′, R_1, R_3 and R_4 are defined above with a dialkyl phosphonate of formula (VIII)



wherein

R_{12} is C_1-C_6 alkyl and

R″ is defined above, or with a triphenylphosphonium salt of formula (IX)

$$(C_6H_5)_3P^{\oplus}—CH_2—R''X^{\ominus} \quad \text{(IX)}$$

wherein

R″ is defined above and

$X^{\ominus}$ is a halide, and

the resulting product is isomerized and/or salified if necessary.

4,783,550

PROCESS FOR OXIDATION OF BENZENE TO PHENOL PRECURSOR

Robert DiCosimo, Shaker Heights, and Hsiao-Chiung Szabo, Mentor, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 1, 1985, Ser. No. 750,552

Int. Cl.⁴ C07C *67/05*

U.S. Cl. 560—145 **4 Claims**

1. A process for the catalytic reaction of benzene which comprises contacting benzene with

(a) perfluoroperoxyacetic acid oxidant;

(b) a solvent which is a perfluoroalkylmonocarboxylic acid having 2-6 carbon atoms and zero to 20 volume percent of an anhydride of such a perfluoro acid, based on the volume of the anhydride plus the perfluoro acid used;

(c) as catalyst a Co(II) or Co(III) salt of an organic acid which is soluble in said solvent,

said reaction being effected (1) under substantially anhydrous conditions and (2) at a temperature in the range zero to 50° C.;

thereby forming the phenyl ester of said perfluoromonocarboxylic acid.

4,783,551

POTASSIUM ACETYLSALICYLATE ADDITION COMPOUND AND PROCESS OF PREPARING

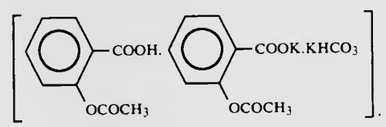
Alexander Galat, 1950 S. Ocean Dr., Hallandale, Fla. 33009

Filed May 20, 1986, Ser. No. 868,325

Int. Cl.⁴ C07C *69/03*

U.S. Cl. 560—143 **12 Claims**

1. A compound of the formula



4,783,552

BIS(2-METHOXYISOPROPYL) MALEATE

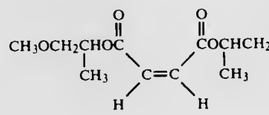
Peter Y. K. Lo; LeRoy E. Thayer, both of Midland, and Antony P. Wright, Mills Township, Midland County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 685,507, Dec. 24, 1984, Pat. No. 4,562,096. This application Aug. 26, 1985, Ser. No. 769,228

Int. Cl.⁴ C07C *69/60*

U.S. Cl. 560—198 **1 Claim**

1. A hydrocarbonoxyalkyl maleate having the formula



4,783,553

PROCESS FOR ISOLATING DIARYLGUANIDINES

Alfred Nierth, Dormagen, and Hans Müller, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,297

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610594

Int. Cl.⁴ C07C *128/00*

U.S. Cl. 564—232 **4 Claims**

1. Process for isolating diarylguanidines from the crude melt obtained from reacting arylamines and cyanogenchloride, characterized in that the hot melt is dissolved in water and the resulting solution is extracted with aliphatic, cycloaliphatic or aromatic chlorohydrocarbons having a boiling point between 80° and 200° C. at a temperature between 20° C. and 90° C. and within a pH range of 5.0 to 7.0, and then precipitating diarylguanidine from the extraction-purified aqueous solution by mixing the solution with alkali metal hydroxide.

4,783,554

ALKYLATION OF AMINE COMPOUNDS

Kuo-Hua Chao, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1986, Ser. No. 940,385

Int. Cl.⁴ C07C *85/00*

U.S. Cl. 564—463 **9 Claims**

1. A process for the oligomerization of alkylamines to produce longer carbon chain alkylamines which process comprises contacting said alkylamines at a temperature of from about 50° C. to about 300° C. with a catalyst mixture comprising aluminum chloride and a component selected from a ruthenium carbonyl, a ruthenium-containing compound capable of being converted to a carbonyl under oligomerization conditions and mixtures thereof.

4,783,555

PROCESS FOR THE PRODUCTION OF A HYDRATION PRODUCT FROM AN OLEFINIC FEEDSTOCK

Martin P. Atkins, Sunbury-on-Thames, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jul. 11, 1986, Ser. No. 884,411

Claims priority, application United Kingdom, Jul. 17, 1985, 8518026

Int. Cl.⁴ C07C *41/01*

U.S. Cl. 568—695 **10 Claims**

1. A process for the production of a hydration product from an olefinic feedstock which process comprises contacting the olefinic feedstock with water under hydration conditions in the presence as catalyst of a unidimensional medium pore crystalline zeolite,

said zeolite being Theta-1, ZSM-22, or NU-10.

10. A process for the production of a hydration product from an olefinic feedstock which comprises contacting the olefinic feedstock with water under hydration conditions in the presence of a catalyst consisting essentially of a unidimensional medium pore ZSM-23 crystalline zeolite.

4,783,556

TETRABROMOBISPHENOL-A PROCESS

Olan W. Mitchell, Magnolia, Ark., and Bonnie G. McKinnie, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 870,813, Jun. 5, 1986, which is a continuation-in-part of Ser. No. 778,710, Sep. 23, 1985, Pat. No. 4,628,124. This application Nov. 27, 1987, Ser. No. 125,931

Int. Cl.⁴ C07C *39/16, 39/367*

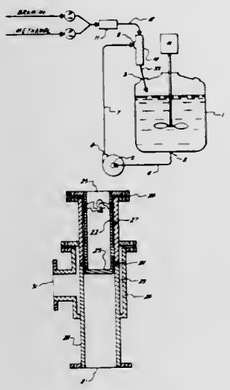
U.S. Cl. 568—726 **14 Claims**

1. A process for making tetrabromobisphenol-A in high yield and high purity, said process comprising:

(A) feeding a first stream comprising bromine dissolved in methanol to an improvement mixer;

(B) impinging a second stream with said first stream in said impingement mixer to rapidly mix said streams and to form a reaction mixture thereof, said second stream, at process initiation, comprising bisphenol-A dissolved in methanol and, after at least one cycle of said process, comprising brominated bisphenol-A;

(C) conducting said reaction mixture to a reaction vessel which holds reactor contents which, at process initiation,



comprise bisphenol-A dissolved in methanol and, after at least one cycle of said process, comprise brominated bisphenol-A;

(D) removing a portion of said reactor contents from said reaction vessel to form said second stream; and

(E) continuing steps (A), (B), (C) and (D) until the desired amount of bromine has been fed.

4,783,557

PROCESSES FOR PREPARING HYDROXYNAPHTHALENES

Yutaka Haneda, Osaka; Sadao Yoshimoto; Hisaya Miki; Masaaki Yasuda; Shintarou Araki, all of Yamaguchi, and Masatoshi Nitabaru, Hiroshima, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 94,883

Claims priority, application Japan, Sep. 12, 1986, 61-215160; Apr. 2, 1987, 62-79734; Jun. 12, 1987, 62-146445

Int. Cl.⁴ C07C *37/08*

U.S. Cl. 568—741 **5 Claims**

1. A process for preparing hydroxynaphthalene which comprises subjecting secondary alkyl-substituted naphthalenes to liquid phase oxidation with molecular oxygen to form hydroperoxides and/or carbinols at a temperature ranging from 80°-150° C. and then obtaining the hydroxynaphthalene from the hydroxyperoxides and/or carbinols by an acid decomposition reaction at a temperature ranging from 0° to 100° C., wherein the oxidation reaction is carried out by dissolving in the reaction mixture of the secondary alkyl-substituted naphthalenes, at least 0.5 ppm in terms of metal, based on the starting secondary alkyl-substituted naphthalenes, of at least one compound of metal selected from the group consisting of palladium and gold, said metal compound being soluble in the reaction mixture of the secondary alkyl-substituted naphthalenes and alkaline water.

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4,783,558

FLAVORING AND PERFUME COMPOSITIONS, FLAVORED FOODSTUFFS AND LUXURY CONSUMABLES AND PERFUMED PRODUCTS WHICH CONTAIN ONE OR MORE SPATHULENOLS AS THE BASE MATERIAL, A SPATHULENOL DERIVATIVE AND A PROCESS FOR THE PREPARATION OF SPATHULENOLS

Leendert M. van der Linde; Franciscus P. van Lier, and Antonius J. A. van der Weerdt, all of Huizen, Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Continuation of Ser. No. 675,197, Nov. 27, 1984. This application Apr. 10, 1987, Ser. No. 36,968

Claims priority, application Netherlands, Nov. 28, 1983, 8304073

Int. Cl.[4] C07C *35/22*

U.S. Cl. 568—817 2 Claims

1. (+)-4a-Allospathulenol.

4,783,559

PROCESS OF REDUCTION OF ALDEHYDES AND KETONES

Hajime Matsushita, Yokohama; Kyoko Takahashi, Tokyo, and Makoto Shibagaki, Kawasaki, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 30,155

Claims priority, application Japan, Apr. 1, 1986, 61-72569

Int. Cl.[4] C07C *29/14*

U.S. Cl. 568—862 6 Claims

1. A process of reduction of aldehydes or ketones comprising reacting aldehydes or ketones with alcohols, in the presence of a catalyst, to produce alcohols which correspond to said respective aldehyde or ketone, wherein said catalyst is a solid of one or more partially dehydrated metal hydroxides whose metal is selected from the group consisting of titanium, tin, iron, aluminum, cerium and niobium; said aldehydes or ketones are selected from the group of cyclohexanone, methyl phenyl ketone, benzaldehyde and methyl isopropyl ketone; and the reaction temperature is within the range of 70° C. to 200° C.

4,783,560

STABILIZED COMPOSITIONS OF 1,1,1-TRICHLOROETHANE

Michel Servais, Kraainem, and Jean Verbeyst, Zellik, both of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Jul. 24, 1986, Ser. No. 888,901

Claims priority, application France, Jul. 25, 1985, 85 11531

Int. Cl.[4] C07C *17/42, 19/05*

U.S. Cl. 570—110 9 Claims

1. Stabilized compositions of 1,1,1,-trichloroethane characterized in that they contain at least two dialkoxyalkanes and at least one epoxidated compound, wherein each dialkoxyalkanes is present in quantities of between 0.1 and 100 g per liter of 1,1,1-trichloroethane and the at least one epoxidated compound is present in quantities of between 0.01 and 50 g per liter of 1,1,1-trichloroethane, wherein the at least two dialkoxyalkanes have the general formula $R_2—O—R_1—O—R_3$ in which R_1, R_2 and R_3 represent, independently from one another, saturated aliphatic radicals containing from 1 to 4 carbon atoms, wherein R_1 represents a saturated aliphatic radical of formula $—(CH_2)_n$ in which n is an integer of 1 to 4 and R_2 and R_3 represent saturated aliphatic radicals of formula $—(CH_2)_rCH_3$ in which r is an interger of 0 to 3, and wherein the at least one epoxidated compound is a saturated aliphatic epoxide containing from 3 to 6 carbon atoms.

6. Compositions according to claim 1, characterized in that they additionally contain at least one nitrated derivative.

7. Compositions according to claim 6, characterized in that the at least one epoxidated compound is selected from 2-methyl-2,3-epoxybutane and 1,2-epoxybutane and that the at least one nitrated derivative is selected from nitromethane and nitroethane.

4,783,561

PROCESS FOR THE PREPARATION OF HALOGENATED (2,2)-PARACYCLOPHANES AND MIXTURES OF RESULTANT HALOGENATED (2,2)-PARACYCLOPHANES

Gian Franco Pregaglia; Maurizio A. Beretta, and Alessandro Malacrida, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

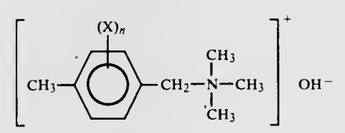
Filed Oct. 29, 1986, Ser. No. 924,275

Claims priority, application Italy, Oct. 30, 1985, 22668 A/85

Int. Cl.[4] C07C *21/24, 25/18*

U.S. Cl. 570—183 11 Claims

1. A process for preparing halogenated isomers of (2,2)-paracyclophane by Hofmann elimination, in an alkaline aqueous solution, from p.methylbenzyltrimethylammonium hydroxide halogen-substituted in the nucleus, of formula:



(III)

in which X is a halogen atom, and n is an integer from 1 to 4, in which the concentration of the alkaline hydroxide in the aqueous solution is maintained lower than 40% by weight during the Hofmann elimination reaction.

4,783,562

PROCESS FOR THE PREPARATION OF TRICHLOROMETHYL-SUBSTITUTED AROMATIC COMPOUNDS, AND TRICHLOROMETHYL-SUBSTITUTED AROMATIC COMPOUNDS OBTAINED IN THIS PROCESS

Albrecht Marhold, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

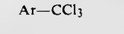
Filed Feb. 25, 1982, Ser. No. 352,494

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 3109966

Int. Cl.[4] C07C *17/22, 21/24*

U.S. Cl. 570—196 6 Claims

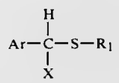
1. A process for the preparation of a trichloromethyl-substituted aromatic compound of the formula



wherein

Ar is a member of the group consisting of unsubstituted aryl radicals having 6 to 14 C-atoms and aryl radicals having 6 to 14 C-atoms substituted independently from each other by 1 to 3 radicals of the group consisting of fluorine-, chlorine-, bromine-, isocyanate-, cyano-, nitro-, C_1- to C_4-carboxylate-, C_1- to C_4-alkoxy-, C_1- to C_4-alkyl-, benzyl, naphthyl- and phenyl groups,

which comprises contacting a thioether of the formula



wherein

Ar has the above mentioned meaning,

X is selected from the group consisting of hydrogen and halogen, and

R_1 is Ar as defined above, with chlorine, at a temperature in the range of −20° C. to +125° C.

4,783,563

PREPARATION OF HEXABROMOCYCLODODECANE

Akira Taniuchi, Kyoto; Takuji Nakano, Kusatsu, and Setsuo Nishibori, Otsu, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 28, 1988, Ser. No. 149,339

Claims priority, application Japan, Jan. 29, 1987, 62-019288

Int. Cl.[4] C07C *17/02*

U.S. Cl. 570—246 6 Claims

1. A method for preparing hexabromocyclododecane which comprises the steps of reacting 1,5,9-cyclododecatriene with bromine in a C_4-C_8 saturated aliphatic alcohol in the presence of a catalytically effective amount of a boron trifluoride complex, neutralizing the reaction mixture with a non-aqueous base, and recovering the resulting crystals of hexabromocyclododecane.

4,783,564

METHOD FOR THE PREPARATION OF 1,2-DICHLOROETHANE

Bernhard Piotrowski, Lohmar; Roland Schildhauer, Niederkassel; Kurt Deselaers, and Wolfgang Merkel, both of Troisdorf, all of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 808,010, Dec. 11, 1985, abandoned. This application Sep. 25, 1987, Ser. No. 102,291

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 3445896

Int. Cl.[4] C07C *17/02*

U.S. Cl. 570—254 17 Claims

1. A method for the preparation of 1,2-dichloroethane comprising:

absorbing chlorine, at a temperature above 90° C., a pressure greater than 4 bars and at an average residence time of less than 120 seconds, in a circulating hot pressurized liquid stream to form a solution containing less than 3% chlorine by weight, said stream consisting of chlorinated hydrocarbons and a catalyst of a metal chloride or a metal chloride containing compound;

pressurizing said solution to a pressure of about 2.5 bars above the pressure of a reactor; said reactor being operated at a pressure of 7 to 20 bars;

introducing the solution and gaseous ethylene into the reactor to produce a dispersion having a phase boundary surface, at an energy dissipation density of 0.05 to 1000 kilowatts per cubic meter at a temperature of 90° to 200° C. wherein reaction between ethylene and chlorine takes place in a mixing zone in said reactor to form the 1,2-dichloroethane; and

separating the 1,2-dichloroethane from a circulating stream from the reactor.

4,783,565

SELECTIVE PREPARATION OF CIS-PERHYDROACENAPHTHENE

Yoshihiro Naruse, and Toshihide Suzuki, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

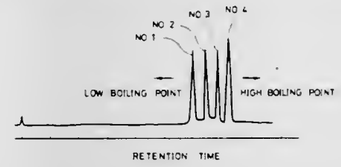
Filed May 4, 1987, Ser. No. 45,578

Claims priority, application Japan, May 12, 1986, 61-107969

Int. Cl.[4] C07C *5/10*

U.S. Cl. 585—268 7 Claims

1. A process for selectively preparing cis-perhydroacenaphthene by hydrogenating acenaphthene, characterized by effecting the hydrogenation reaction at a temperature of 80° to 200° C. in the presence of a metallic Rh catalyst supported on a carrier, producing a cis-isomer having the highest boiling point as a major product.



4,783,566

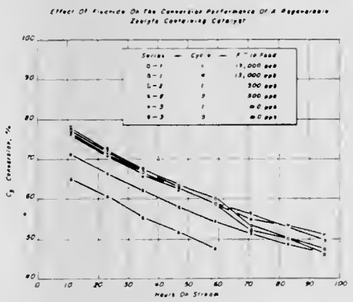
HYDROCARBON CONVERSION PROCESS

Joseph A. Kocal, Gurnee; David C. Martindale, Roselle, and Paul J. Kuchar, Hinsdale, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 28, 1987, Ser. No. 90,480

Int. Cl.[4] C07C *12/00, 12/02*

U.S. Cl. 585—415 11 Claims



5. A hydrocarbon conversion process comprising the steps of:

(a) subjecting a hydrocarbon feed with a fluoride content greater than 500 ppb and comprising C_1-C_6 aliphatic hydrocarbons to a fluoride removal step to reduce the concentration of fluoride in said feed to below 100 ppb;

(b) catalytically dehydrocyclodimerizing the aliphatic hydrocarbon feed having a fluoride concentration of below 100 ppb in the presence of a dehydrocyclodimerization catalyst comprising a crystalline zeolite, and recovering aromatic hydrocarbons; and

(c) regenerating said zeolite-containing catalyst which has been deactivated by the deposition of carbonaceous material thereon by a procedure which comprises exposing said deactivated zeolite-containing catalyst to an oxygen-containing gas at catalyst regeneration conditions.

4,783,567

HF ALKYLATION PROCESS

Joseph A. Kocal, Gurnee, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 23, 1987, Ser. No. 123,828

Int. Cl.[4] C07C *2/68, 2/58*

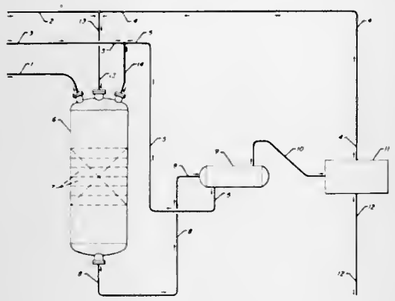
U.S. Cl. 585—464 11 Claims

1. A process for the liquid phase alkylation of an olefin acting agent with a hydrocarbon substrate in the presence of a liquid acid alkylation catalyst which comprises the steps of:

(a) introducing reactants comprising an olefin acting agent, a

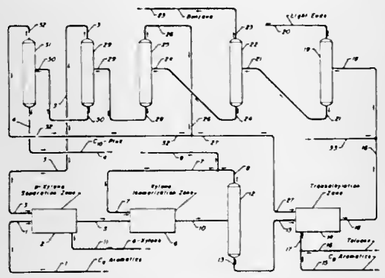
VOL 1096 ISS 2 NO 8 1988 UMI

hydrocarbon substrate, and a liquid acid alkylation catalyst into an alkylation reaction zone operating at alkylation reaction conditions and containing a fixed bed of activated carbon to create a reaction mixture;
(b) passing the reaction mixture through the fixed bed of activated carbon in the alkylation reaction zone, and out of the reaction zone and into a separator;



(c) separating the acid alkylation catalyst from the product and unreacted feed hydrocarbons;
(d) withdrawing the hydrocarbons from the separator and purifying and recovering the product hydrocarbons and the unreacted hydrocarbons of the liquid phase alkylation reaction; and
(e) recycling at least a portion of the separated acid alkylation catalyst back to the alkylation reactor inlet.

4,783,568
XYLENE PRODUCING PROCESS HAVING STAGED CATALYTIC CONVERSION OF ETHYLBENZENE
Robert J. Schmidt, Rolling Meadows, Ill., assignor to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 12,401, Feb. 9, 1987, Pat. No. 4,697,039, which is a continuation-in-part of Ser. No. 775,982, Sep. 13, 1985, Pat. No. 4,642,406. This application Sep. 25, 1987, Ser. No. 101,220
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.[4] C07C *5/22*
U.S. Cl. 585—477 **17 Claims**



1. A process for the production of a desired xylene isomer which comprises the steps:
(a) passing a first feed stream, which comprises ethylbenzene and at least two xylene isomers including the desired xylene isomer, and a hereinafter characterized first process stream, which comprises an admixture of xylene isomers, into a xylene separation zone, withdrawing a product stream comprising the desired xylene isomer from the xylene separation zone and also withdrawing a raffinate stream, which comprises ethylbenzene and an undesired xylene isomer, from the xylene separation zone;
(b) passing the raffinate stream into a catalytic xylene isomerization zone, wherein ethylbenzene is partially converted to xylenes, and producing a xylene isomerization zone effluent stream comprising all three xylene isomers;
(c) passing a second process stream, which stream comprises substantially all of the xylenes and ethylbenzene present in the isomerization zone effluent stream, and C_9 aromatic hydrocarbons, toluene, and a recycle stream comprising toluene into a catalytic transalkylation zone containing a nonmetal transalkylation catalyst comprising a ZSM-5 zeolite and mordenite and operated at high severity. conditions including a temperature over 426 degrees Celsius wherein ethylbenzene is partially converted primarily to benzene, and forming a transalkylation zone effluent stream which comprises benzene, toluene, C_9 aromatic hydrocarbons and all of the xylene isomers;
(d) separating the transalkylation zone effluent stream by fractional distillation and producing a benzene-rich process stream, which is withdrawn from the process as a product stream, a toluene-rich process stream, a xylene-rich process stream, and a third process stream, which comprises C_9 aromatic hydrocarbons;
(e) passing at least a portion of the toluene-rich process stream into the transalkylation zone as said recycle stream; and,
(f) passing at least a portion of the xylene-rich process stream into the xylene separation zone as said first process stream.

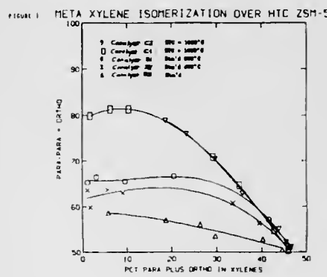
4,783,569
SELECTIVE GAS-PHASE ISOMERIZATION OF DIMETHYLNAPHTHALENE: 2,6-DMN TRIAD
Gregory P. Hussmann, Batavia, and Patrick E. Mc Mahon, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed May 26, 1987, Ser. No. 53,796
Int. Cl.[4] C07C *5/22*
U.S. Cl. 585—481 **12 Claims**

1. A gas-phase process to isomerize at an elevated temperature a feed containing one or more members of the 2,6-DMN triad over a catalyst composition comprising a supported crystalline borosilicate molecular sieve or a supported crystalline aluminosilicate molecular sieve, said aluminosilicate molecular sieve having a silica/alumina ratio of between about 50/1 and about 150/1, to an isomerized product such that each of the 1,5-, 1,6- and 2,6-DMN concentrations in said isomerized product is about its thermodynamic equilibrium value at said temperature, and wherein said isomerized product contains less than about ten (10) weight percent, based upon the amount of said one or more members of the 2,6-DMN triad present in said feed, of other reaction products.

4,783,570
SELECTIVE GAS-PHASE ISOMERIZATION OF DIMETHYLNAPHTHALENE: 2,7-DMN TRIAD
Gregory P. Hussmann, Batavia, and Patrick E. McMahon, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.
Filed May 26, 1987, Ser. No. 53,797
Int. Cl.[4] C07C *5/22*
U.S. Cl. 585—481 **12 Claims**

1. A gas-phase process to isomerize at an elevated temperature a feed containing one or more members of the 2,7-DMN triad over a catalyst composition comprising a supported crystalline borosilicate molecular sieve or a supported crystalline aluminosilicate molecular sieve, said aluminosilicate molecular sieve having a silica/alumina ratio of between about 50/1 and about 150/1, to an isomerized product such that each of the 1,7-, 1,8- and 2.7-DMN concentrations in said isomerized product is about its thermodynamic equilibrium value at said temperature, and wherein said isomerized product contains less than about ten (10) weight percent, based upon the amount of said one or more members of the 2,7-DMN triad present in said feed, of other reaction products.

4,783,571
CATALYTIC CONVERSION OVER DEHYDROXYLATED ZEOLITE
Clarence D. Chang, Princeton; Stuart D. Hellring, and Richard F. Socha, both of Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 944,629, Dec. 19, 1986, Pat. No. 4,724,270, which is a continuation-in-part of Ser. No. 783,269, Oct. 4, 1985, abandoned, which is a continuation of Ser. No. 603,049, Apr. 23, 1984, abandoned. This application Feb. 8, 1988, Ser. No. 153,393
Int. Cl.[4] C07C *5/22*
U.S. Cl. 585—481 **12 Claims**



1. A process for isomerizing a feedstock comprising a di-alkyl-substituted aromatic compound to a product containing a higher proportion of the para-di-substituted isomer, which comprises contacting the feedstock with a solid, porous catalyst comprising a crystalline aluminosilicate zeolite having a Constraint Index of 1 to 12, a silica:alumina ratio of at least 12:1 which has been heat treated to a temperature of at least 725° C. in an essentially water-free atmosphere to reduce its acidity to an alpha value below 100.

4,783,572
PROCESS FOR THE PREPARATION OF ETHYLENE-ETHANE MIXTURES
Klaus Wohlfahrt, Obernburg; Manfred Bergfeld, Erlenbach-Mechenhand, and Hans-Georg Zengel, Kleinwallstadt, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands
Filed Mar. 6, 1986, Ser. No. 836,984
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1985, 3508571
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 **13 Claims**

1. A process for the preparation of ethane and ethylene, comprising oxidizing methane with oxygen or an oxygen-containing gas at a temperature of 600° to 900° C. in the presence of a catalyst consisting essentially of lead (II) oxide in a form selected from the group consisting of:
(a) dispersed on a carrier comprising at least one member selected from the group consisting of pumice, silicon carbide, zinc oxide, zirconium dioxide and oxides of alkaline-earth elements;
(b) in a mixture with manganese (II) oxide dispersed on a carrier comprising at least one member selected from the group consisting of pumice, silicon carbide, silicon dioxide, titanium dioxide, zirconium dioxide, zinc oxide and oxides of alkaline-earth elements; and
(c) in a mixture with sodium silicate alone or in combination with at least one member selected from the group consisting of silicon dioxide, titanium dioxide, zirconium dioxide, manganese (II) oxide, zinc oxide and oxides of alkaline-earth elements.

4,783,573
PROCESS FOR PREPARING LINEAR α-OLEFINS
Yasushi Shiraki; Shinichi Kawano, and Kunio Takeuchi, all of Tokuyama, Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan
Filed Dec. 24, 1986, Ser. No. 946,218
Claims priority, application Japan, Apr. 17, 1986, 61-88863; Aug. 6, 1986, 61-184700
Int. Cl.[4] C07C *2/02*
U.S. Cl. 585—523 **6 Claims**

1. A process for preparing a linear α-olefin having from 6 to 18 carbon atoms comprising polymerizing ethylene or an ethylene containing α-olefin in the presence of a catalyst consisting of a zirconium halide, an organoaluminum compound and a Lewis base in an inert solvent and terminating the polymerization by adding a catalyst deactivating agent to the resulting reaction mixture, wherein said catalyst contains a zirconium component comprising a zirconium halide represented by formula (I):

$$ZrX_aA_{4-a} \quad (I)$$

wherein X and A may be the same or different and each represents chloride, bromide atom or iodide and a is 0 or an integer of 1–4; and aluminium component comprising an alkylaluminum compound represented by formula (II):

$$AlR^1_{1.5}Q^1_{1.5} \quad (II)$$

wherein R^1 represents an alkyl group of 1–20 carbon atoms, Q represents chloride, bromide or iodide atom and said formula (II) may also be represented by $Al_2R^1_3Q^1_3$ and an alkylaluminum compound represented by formula (III):

$$AlR^2_bQ^2_{3-b} \quad (III)$$

wherein R^2 and Q^2 have the same meanings as R^1 and Q^1 above and b is an integer of 1–3; said catalyst being mixed at a molar ratio (Al/Zr) of said zirconium component and aluminum component of 3–15 and at a molar ratio ($AlR^1_{1.5}Q^1_{1.5}/AlR^2_bQ^2_{3-b}$) of the components represented by formulae (II) and (III) of 2–10; and said catalyst further contains at least one Lewis base selected from the group consisting of thiophene, methyl disulfide, thiourea triphenylphosphine and trioctylphosphine.

4,783,574
PROCESS FOR HYDROCARBON CONVERSION
Peter H. Barnes, HR The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.
Filed Oct. 27, 1987, Ser. No. 112,980
Claims priority, application United Kingdom, Dec. 2, 1986, 8628839
Int. Cl.[4] C07C *5/13*
U.S. Cl. 585—738 **4 Claims**

1. A process for the catalytic conversion of a hydrocarbon feed stream, at hydrocarbon conversion conditions, in a reactor-separation sequence comprising at least two outer adsorbent beds and at least one central catalyst bed containing a hydrocarbon conversion catalyst, said adsorbent and catalyst beds being arranged in stacked configuration, wherein said central catalyst bed has two feed stream inlets which operate only one at a time wherein said inlets are situated in an upper part and a lower part of said catalyst bed, said process comprising the steps of:
a. passing said hydrocarbon feed stream through said feed inlet in said lower part of said catalyst bed and through at least part of said catalyst bed to form a first isomerization

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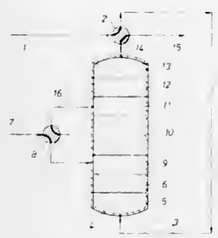
zone effluent stream comprising converted and unconverted hydrocarbons;

b. passing said first isomerization zone effluent stream through a first adsorption zone containing an adsorbent capable of adsorbing said unconverted hydrocarbons in said first isomerization zone effluent stream, said first adsorption zone being situated next to said catalyst bed and proceeding with this pasage step for a period of time sufficient to permit said adsorption of said unconverted hydrocarbons in said adsorption zone;

c. sequentially passing a sweep fluid through at least a portion of said catalyst bed and said first adsorption zone in the same direction of flow as said hydrocarbon feed stream passage of step (a) and said first isomerization zone effluent stream passage of step (b) for a period of time sufficient to desorb and recover said adsorbed unconverted hydrocarbons;

d. recycling for conversion said desorbed and recovered unconverted hydrocarbons derived from step (c) to said catalyst bed through either said feed inlet in said upper part or said lower part of said catalyst bed;

e. passing, at a time after cessation of passage of said hydrocarbon feed stream to said feed inlet in said lower part of said catalyst bed, said hydrocarbon feed stream through said feed inlet in said upper part of said catalyst bed and passing said hydrocarbon feed stream through at least part



of said catalyst bed to form a second isomerization zone effluent stream comprising converted and unconverted hydrocarbons;

f. passing said second isomerization zone effluent stream of step (e) through a second adsorption zone containing an adsorbent capable of adsorbing said unconverted hydrocarbons in said second isomerization zone effluent stream, said second adsorption zone being situated next to said catalyst bed and proceeding with this passage step for a period of time sufficient to permit said adsorption of said unconverted hydrocarbons in said second adsorption zone;

g. sequentially passing a sweep fluid through at least a portion of said catalyst bed and said second adsorption zone in the same direction of flow as said hydrocarbon feed stream passage of step (e) and passage of said second isomerization zone effluent stream of step (f) for a period of time sufficient to desorb and recover said adsorbed unconverted hydrocarbons;

h. recycling for conversion said desorbed and recovered unconverted hydrocarbons derived from step (g) to said catalyst bed through either said feed inlet in said upper or said lower part of said catalyst bed; and

i. continuing with said process sequence of steps (a) through (d) while not performing steps (e) through (h) and continuing with said process sequence of steps (e) through (d) while not performing steps (a) through (h).

4,783,575

ISOMERIZATION WITH CYCLIC HYDROCARBON CONVERSION

Robert J. Schmidt, Rolling Meadows, and Laurence O. Stine, Western Springs, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 17, 1987, Ser. No. 134,622
Int. Cl.[4] C07C 5/13
U.S. Cl. 585—748 **6 Claims**

1. A process for the isomerization of a feedstream comprising C_4-C_6 isomerizable hydrocarbons and at least 2 wt.% cyclic hydrocarbons, said process comprising:

(a) passing said feedstream to a reaction zone and contacting said feedstream with a catalyst comprising alumina, from 0.1 to 0.25 wt.% platinum, and from 2 to 10 wt.% of a chloride component at isomerization conditions including a temperature in the range of from 20°-260° C. (105°-500° F.), a pressure of from 7 to 60 barsg and a liquid hourly space velocity of from 0.5 to 12;

(b) maintaining a chloride concentration of from 30 to 300 ppm, a sulfur concentration of less than 0.5 ppm, and an oxygenate concentration of less than 1 ppm in said reaction zone; and

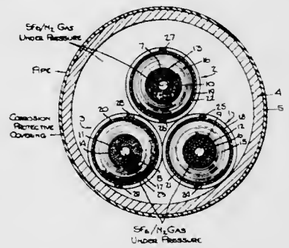
(c) recovering an effluent from said reaction zone having a weight percent concentration of cyclic hydrocarbons at least 40% lower than that of said feedstream.

4,783,576

HIGH VOLTAGE GAS FILLED PIPE TYPE CABLE

David A. Silver, Livingston, and William G. Lawson, Summit, both of N.J., assignors to Pirelli Cable Corporation, Union, N.J.

Filed Oct. 1, 1987, Ser. No. 103,826
Int. Cl.[4] H01B 7/02
U.S. Cl. 174—25 R **16 Claims**



1. A high voltage electrical cable comprising:

an insulated conductor comprising a conductor encircled by a plurality of overlapping layers of insulating tape impregnated with an insulating oil, a gas passageway inside the inner surface of said layers of tape and an insulating gas under pressure above atmospheric pressure in said passageway, said insulated conductor being free of a gas impermeable layer intermediate said gas passageway and said inner surface of said layers of tape and exteriorly of the outer surface of said layers of tape;

a gas impermeable pipe having an interior surface cross-sectional dimension greater than the cross-sectional dimension of the exterior surface of said insulated conductor to provide a gas receiving space between said interior surface of said pipe and said exterior surface of said insulated conductor; and

an insulating gas under a pressure of at least 200 psig in said space;

whereby insulating gas under pressure is applied to said layers of insulating tape at both the interior and exterior surfaces thereof.

13. A method of manufacturing a high pressure, gas filled pipe type electrical cable which comprises:

impregnating insulating tape with an insulating oil and permitting such tape to drain to remove excess oil;

wrapping said insulating tape around a gas permeable tubular conductor in a plurality of overlapping layers;

wrapping further layers of tape around the wrapped said insulating tape;

inserting a plurality of so-wrapped conductors in a gas impermeable pipe without a gas impermeable layer thereabout; and

supplying an insulating gas under pressure above atmospheric pressure to both the interior of said pipe and to the bore of said tubular conductor.

4,783,577

THREE SERVICE RECESSED AFTERSET

Gregory L. Mohr, Marietta, Ohio, assignor to Butler Manufacturing Company, Kansas City, Mo.

Continuation of Ser. No. 944,013, Dec. 22, 1986, abandoned.
This application Sep. 22, 1987, Ser. No. 99,720
Int. Cl.[4] H02G 3/12
U.S. Cl. 174—48 **8 Claims**

1. A base for a triple service recessed afterset insert to be inserted in a bore in a concrete floor and connected to a cellular raceway having a center power cell and communication cells on opposite sides of the power cell, the base comprising:

a main ring;

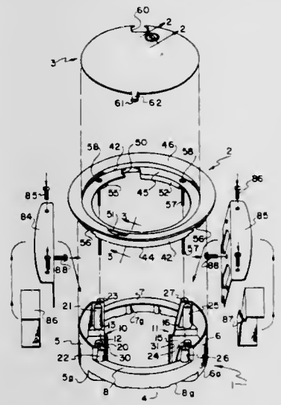
a pair of extensions diametrically disposed on opposite sides of the ring and extending inwardly of the main ring;

each said extension including a foot section adjacent the bottom of the main ring and a pair of side sections on opposite sides of the foot section;

a power aperture formed in each said foot section for use in receiving power conductors from a power cell;

a locking tab on the underside of each said foot section for securing the base assembly to said power cell;

for each said locking tab, a screw located adjacent the power aperture in its foot section, the head of the screw bearing



on the top side of its foot section and the bottom of the screw being joined to the locking tab whereby the screw can rotate the tab in opposite directions for use in engaging the tab with the underside of said power cell;

in each foot section, an elongated slot adjacent the inner edge of the foot section for receiving an edge of a receptacle bracket;

for each foot section, abutment means on the underside of the foot section to limit the rotation of the tab in said opposite directions; and

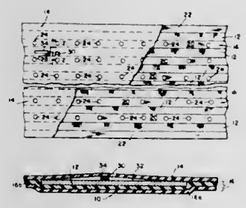
adjacent each said side section means for receiving an adjusting screw for supporting an adjusting ring.

4,783,578

MULTI-CONDUCTOR CABLES

Paul Bodensiek, Brighton; John A. Marstiller, Marston Mills, and Frederick G. J. Grise, Osterville, all of Mass., assignors to Flexwatt Corporation, Canton, Mass.

Filed Aug. 22, 1986, Ser. No. 899,494
Int. Cl.[4] H01B 7/08
U.S. Cl. 174—117 F **24 Claims**



1. A flat, multi-cable assembly comprising:

first and second sheets of electrically-insulating organic plastic; and

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a plurality of strip conductors of electrically conductive metal positioned between said first and second sheets and extending longitudinally of said assembly, said strip conductors being arranged parallel to and spaced apart from each other,

the portions of said first and second sheets (i) intermediate respective ones of said strip conductors and (ii) between said strip conductors and the outer side edges of said assembly being adhered to each other,

said assembly being characterized in that

said first sheet comprises a co-laminate of at least two layers and overlies the surfaces of said strip conductors facing said first sheet, the one of said layers most closely adjacent said conductors comprising a hot melt adhesive and being adhered to the said conductors, and

said second sheet overlies but is not adhered to the opposite surfaces of said strip conductors,

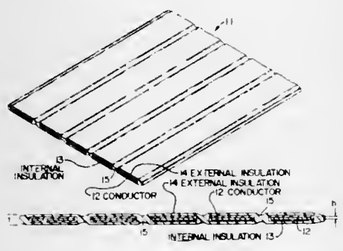
whereby said second sheet may easily be stripped back from said strip conductors or an electrical connection interposed between said second sheet and a selected one of said strip conductors.

4,783,579

FLAT MULTI-CONDUCTOR POWER CABLE WITH TWO INSULATING LAYERS

Henry E. Brandolf, Miller Place, N.Y.; Paul C. Schubert, Jr., and Axel V. Walsen, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 29, 1986, Ser. No. 857,211
Int. Cl.[4] H01B *17/08, 13/14*
U.S. Cl. 174—117 FF **29 Claims**



1. A flat multi-conductor power cable comprising:

a plurality of continuous, generally parallel, spaced apart metal conductors having flat upper and lower surfaces and generally lie in the same plane;

an internal layer of a first insulating material extruded around each of said flat conductors, said internal layer being intimately joined to and completely surrounding each of said conductors and extending continuously therealong, said first material being selected to have the property of adhesively joining to the metal of flat conductors; and

an external layer of a second insulating material extruded around said first insulating layer, said external layer being intimately joined to and completely surrounding all of the internal layers and extending continuously therealong, said second insulating material being selected to have the properties of being moisture resistant and of being intimately joined to the first material, said second insulating material being a thermoplastic vulcanizate comprising rubber particles dispersed in a continuous matrix of a thermoplastic resin; whereby said cable is especially adapted to be used in undercarpet applications.

7. A method for making a flat multi-conductor power cable comprising:

providing a plurality of continuous, generally parallel, spaced apart metal conductors having flat upper and lower surfaces and generally lie in the same plane;

moving said flat conductors through extruding means;

extruding an internal layer of a first insulating material directly onto each flat conductor, said internal layers being intimately joined to and made to surround each flat conductors and extending continuously therealong, said first material being selected to have the property of adhesively joining to the metal of said flat conductors; and

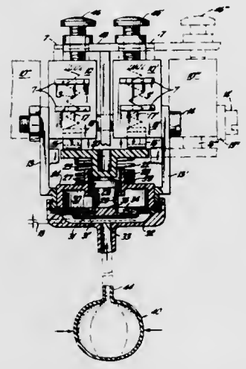
extruding a single external layer of a second insulating material around all of the internal layers, the external layer being intimately joined to the internal layers and extending continuously therealong, said second insulating material being selected to have the properties of being moisture resistant and of being intimately joined to the first material, said second insulating material being a thermoplastic vulcanizate comprising rubber particles dispersed in a continuous matrix of a thermoplastic resin.

4,783,580

FLUID ACTUATED CONTROL DEVICE

Gilbert Bassin, 457 Marmaroneck Rd., Scarsdale, N.Y. 10583

Filed Oct. 28, 1987, Ser. No. 114,443
Int. Cl.[4] H01C *35/34*
U.S. Cl. 200—81.4 **14 Claims**



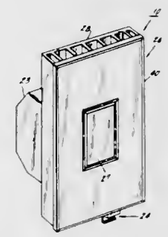
1. A Fluid actuated control mechanism comprising a member displaceable by fluid having a discernible pressure from an initial position to a displaced position; a movable actuator member in communication with said displaceable member so as to move in one direction when said displaceable member moves to said displaced position, said actuator member having an actuator surface; a plurality of control devices engageable by said actuator surface when said displaceable member is in said displaced position thereby to cause said control devices to be in one of an on or off position wherein said actuator surface comprises a plurality of control actuating segments, each of said segments being movably engageable with one of said control devices when said actuator member moves in said one direction, at least one of said control actuating segments is closer to its associated one of said control devices than the other of said segments so as to contact said associated one of said control devices before the others of said control devices are contacted when said actuator member moves in said one direction; means for providing a first force tending to return said displaceable member to said initial position; and means for providing a second force tending to urge said actuator member in said one direction, said second force being adequate to overcome said first force to permit said displaceable member to move to said displaced position in the presence of said discernible pressure of said fluid.

4,783,581

AIR GAP SWITCH ASSEMBLY

Woodie Flowers, Weston, Mass.; Joel S. Spira, Coopersburg, and Elliot G. Jacoby, Glenside, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Oct. 29, 1985, Ser. No. 792,475
Int. Cl.[4] H01H *9/16, 3/04, 3/12*
U.S. Cl. 200—332 **28 Claims**



1. An air gap switch assembly, commprising:

a housing;

an air gap switch coupled to said housing and being moveable between an open and closed position;

a control lever extending from a position inside said housing to a position outside said housing and moveable relative to said housing so that the distance that said lever extends outside said housing varies as a function of the position of said lever relative to said housing; said control lever being moveable between an ON position wherein it causes said switch to be in said closed position and an OFF position wherein it causes said switch to be in said open position; at least a portion of said lever extending outside said housing in both the ON and OFF positions, the entire portion of said lever which extends outside said housing being formed of a transparent material which makes said portion difficult to see in both said ON and OFF positions; and

a status indicator located on said lever at a position which is located outdside said housing when said lever is in one of said ON and OFF positions and which is located inside said housing when said lever is in the other of said ON and OFF positions, said status indicator being highly visible relative to said transparent material.

4,783,582

MICROWAVE HEATING APPARATUS FOR USE IN AUTOMATIC VENDING MACHINE

Kikuo Wada, Hoya, and Toyosi Maeda, Kadoma, both of Japan, assignors to Daito Manufacturing Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of Tokyo, Japan

Filed Oct. 14, 1987, Ser. No. 108,121
Claims priority, application Japan, Jan. 22, 1987, 62-11446
Int. Cl.[4] H05B *6/78*
U.S. Cl. 219—10.55 R **2 Claims**

1. In an automatic vending machine, a microwave heating apparatus comprising:

(a) a heating room defined by top, bottom, front, rear, and side walls and provided therein with a magnetron for generating high-frequency waves, said top wall having an opening formed therein and said front walls having a window for viewing the interior of said heating room;

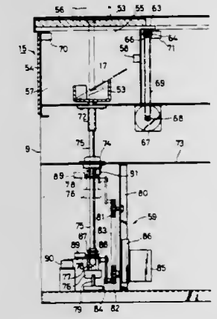
(b) a support shaft penetrating said bottom wall of said heating room and being rotatable and movable up and down;

(c) a receptacle mounted on the upper end of said support shaft for receiving a commodity package thereon, said receptacle being raised out of said heating room through said opening by the upward movement of said support shaft and being located at a heating position within said heating room by the downward movement of said support shaft;

(d) a raising/lowering and rotating mechanism connected to the lower end of said support shaft for rotating and moving up and down said support shaft;

(e) position detecting means mounted on said support shaft for detecting raised and lowered positions of said receptacle;

(f) means mounted on said support shaft for stopping the rotation of said support shaft by said raising/lowering and



rotating mechanism so that said receptacle is directed in a predetermined direction when the rotation of said support shaft has been stopped;

(g) a cover provided on said top wall for opening and closing said opening; and

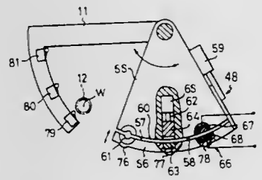
(h) means for actuating said cover to open and close said opening so that said cover opens to permit said receptacle to be raised out of said heating room and closes when said receptacle is moved to the heating position within said heating room.

4,783,583

ELECTRIC DISCHARGE MACHINING APPARATUS OF WIRE-CUTTING TYPE

Haruki Obara, Sagamihara; Toshiyuki Aso, Hino; Hiroshi Kinoshita, and Tamotsu Ishibashi, both of Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP86/00372, § 371 Date May 19, 1987, § 102(e) Date May 19, 1987, PCT Pub. No. WO87/00467, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 18, 1986, Ser. No. 31,071
Claims priority, application Japan, Jul. 19, 1985, 60-158348
Int. Cl.[4] B23H *7/02, 7/10*
U.S. Cl. 219—69 W **15 Claims**



1. An electric discharge machining apparatus of the wire-cutting type, which comprises a work table for holding a workpiece thereon, upper and lower wire guide members arranged above and below the work table, each having a wire passage formed therethrough in the vertical direction, means for supplying a wire electrode to be passed through the wire

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passages of the upper and lower guide members, a wire feed device disposed above the upper wire guide member to provide downward and upward feeding movement to the wire electrode, spray liquid feed means for feeding a spray liquid into the wire passage of the upper wire guide member, and further comprising:

a wire treating unit movable in the horizontal direction relative to the upper guide member and the work table to traverse the wire electrode extending downward from the wire passage of the upper wire guide member,

said wire treating unit comprising a base block and a movable block provided with means for moving the block so as to approach to and separate from the base block closed between said two blocks,

the slit having formed therein a nozzle hole which can be connected to the lower end of wire passage of the upper wire guide member by vertical movement of the wire treating unit so that the spray liquid supplied in the wire passage of the upper wire guide member is injected toward said nozzle hole for directing the end of a wire electrode thereinto,

the wire-treating unit further comprising wire detecting means for detecting the ned of the wire electrode extending downward from the wire passage of the upper wire guide member between the base block and the movable block, and wire cutting means for cutting the wire electrode between the base block and the movable block, and

means for controlling said horizontal traverse of said wire-treating unit to selectively position each of said nozzle hole, said wire detecting means and said wire cutting means in alignment with said wire electrode.

4,783,584

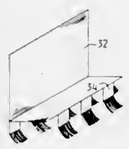
APPARATUS FOR IMPROVING VISION SYSTEMS IN MANUFACTURING ENVIRONMENTS

Joel Hecker, Port Jefferson Station, N.Y., assignor to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Oct. 2, 1984, Ser. No. 656,870

Int. Cl.[4] B23K *9/32*

U.S. Cl. 219—130.01 **3 Claims**



1. An arrangement for reducing light, particle and moving material interference with vision systems used in automated material processing where said interference is generated by said material processing, comprising: material processing means producing light and moving materials within an environment contaminated by said moving materials; vision means for sensing predetermined visual characteristics of the material processing, sectioned flexible barriers arranged in at least two rows; openings between said sections for improved air flow; said openings being staggered to block linear light paths between the material processing means and the vision means.

4,783,585

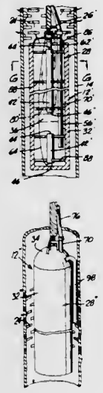
DOWNHOLE ELECTRIC STEAM OR HOT WATER GENERATOR FOR OIL WELLS

Robert L. Meshekow, Los Angeles, Calif., assignor to Meshekow Oil Recovery Corp., Beverly Hills, Calif.

Filed Jun. 26, 1986, Ser. No. 878,815

Int. Cl.[4] E21B *43/24;* **F22B** *1/30;* **H05B** *3/60;* **F24H** *1/10*

U.S. Cl. 219—278 **5 Claims**



1. A downhole heating generator for use in an oil well bore for the heating of water or the vaporization of water to steam wherein there is a cylindrical tube string within said bore which extends between the surface and the bottom of the bore, and there are cable mean adapted to be secured to the generator to raise and lower the generator within the tube string to an area where it is desired to either apply boiling water to steam directly to openings in the tube string or to a geological formation adjacent the tube string comprising:

a hollow elongated cylindrical housing adapted to be inserted into the tube string of a well and having a diameter less than that of the tube string and including a cylindrical vertical side wall and a closed bottom forming therewith a container adapted to receive and hold a quantity of water and at least one exit opening at the upper end of said housing for discharge of steam or boiling water, said upper end coupled to said cable means;

an electric heater within said housing said heater including a single pair of non-concentric electrodes in electrically insulated spaced relationship one from the other, said electrodes each including at least some portions adapted to be submerged in and surrounded by water adapted to be received in said container;

electrical coupling means on said housing for electrically connecting said electrodes to an electric cable adapted to extend through the tube string to an electrical transformer adapted to be located at the surface;

water supply means associated with said housing terminating in a discharge means in said housing and adapted to carry water from the surface to assure a continual flow of water into said housing during the heating of said water by said heater; and wherein said electrodes are upper and lower rods mounted within said housing in end to end spaced aligned relationship one from the other at a distance sufficient to prevent arcing applied at voltages necessary to heat a continuous volume of water therearound.

4,783,586

HEATING ELEMENT MADE OF CARBON

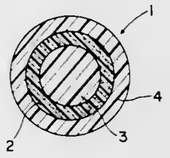
Junichi Takeda, Hirakatashi, Japan, assignor to Uniheat Co. Ltd., Osaka and Nakabishi Kensetsu Co. Ltd., Sapporo, both of, Japan

Continuation of Ser. No. 836,407, Mar. 5, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 96,238

Claims priority, application Japan, Mar. 6, 1985, 60-044250

Int. Cl.[4] H05B *3/10;* **H01C** *1/012, 1/02;* **B32B** *9/00*

U.S. Cl. 219—544 **5 Claims**



1. A heating element of carbon, comprising a heating member formed of carbon powder and an insulating resin kneaded together, wherein a core member formed of an insulating engineering plastic having a fusing point higher than that of said heating member is extruded under a fused or half-fused condition thereof integrally with said heating member and is inserted into a center portion of said heating member.

4,783,587

SELF-REGULATING HEATING ARTICLE HAVING ELECTRODES DIRECTLY CONNECTED TO A PTC LAYER

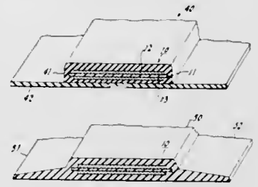
Kazunori Ishii; Seishi Terakado, both of Nara; Yasutomo Funakoshi, and Tadashi Sakairi, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1985, Ser. No. 809,966

Claims priority, application Japan, Dec. 18, 1984, 59-266640; Dec. 18, 1984, 59-266641; Dec. 18, 1984, 59-266647; Dec. 18, 1984, 59-266649; Dec. 18, 1984, 59-266664; Dec. 18, 1984, 59-266665; Dec. 18, 1984, 59-266666; Dec. 18, 1984, 59-266668; Dec. 18, 1984, 59-266669; Oct. 18, 1985, 60-233618

Int. Cl.[4] H05B *3/10*

U.S. Cl. 219—548 **3 Claims**



1. A self-regulating heating article comprising:

a first elongate layer comprising a crystalline polymeric composition of high crystallinity and conductive particles dispersed in said polymeric composition to exhibit a positive temeperature coefficient of resistance, a thickness of said first layer being 3 millimeters or less;

a pair of second conductive elongate layers adapted for connection to a power supply, said second layers being secured one on each surface of said first layer to develop a potential in the direction of thickness of the first layer, said second layers having a creeping distance therebetween along peripheral edges, said creeping distance being greater than the thickness of said first layer such that said first layer has a portion protruding outwardly beyond a perpendicular dropped from a peripheral edge of one of said second layers on the other of said second layers, said outwardly protruding portion being provided along the entire peripheral edge of one of said second layers where the other of said second layers is present;

an insulative layer enclosing said first layer and second layers; and

a flexible layer attached to said insulative layer, said flexible layer having a transverse dimension greater than a transverse dimension of said first layer.

4,783,588

SYSTEM FOR CHARGING AND/OR DISCHARGING X-RAY FILM SHEETS INTO AND/OR FROM CASSETTE, AND A CASSETTE FOR USE IN THE SYSTEM

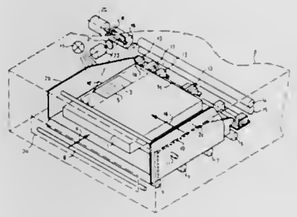
Manfred Schmidt, Kirchheim, and Herbert Gebele, Sauerlach, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,913

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3533953

Int. Cl.[4] G03B *42/04*

U.S. Cl. 235—467 **4 Claims**



1. A system for charging and/or discharging X-ray film sheets into and/or from cassettes of different formats, comprising an automatically operated apparatus for charging and/or discharging an X-ray film sheet into and/or from a cassette, the apparatus including a cassette intake compartment provided with means for advancing the cassette in a feeding direction, a lateral guiding wall, means for stopping the cassette in the feeding direction, and means for shifting the cassette into a fixed end position in engagement with said guiding wall and said stopping means; an electrooptical bar code reader arranged at a fixed location above said intake compartment and including a rotary scanning mirror for reflecting light rays from a predetermined scanning region extending along said guiding wall, and a device for illuminating said scanning region; an X-ray film cassette of a flat rectangular configuration insertable into said intake compartment and including a removable flat top wall having a lateral guiding edge and a leading edge; said top wall being provided with a bar code label containing information about the cassette and film sheet format, said label being fixed at a location which is within the bounds of said scanning region when the cassette is in said fixed end position; and said stopping means including a switch for activating said illumination device and said scanning mirror when the cassette reaches said fixed end position.

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4,783,589

FOCUS AND TRACKING DETECTION APPARATUS FOR OPTICAL HEAD EMPLOYING LIGHT GUIDE MEANS HAVING DIFFERENT RADII OF CURVATURE

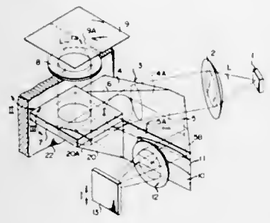
Hideo Ando, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 26, 1986, Ser. No. 935,348

Claims priority, application Japan, Nov. 30, 1985, 60-269649; Jan. 16, 1986, 61-6911

Int. Cl.⁴ G11B *5/09;* **250** *201 DF, 204, 216, 570*

U.S. Cl. 250—201 **20 Claims**



1. An optical system for focusing a light beam onto an optical memory, comprising:

means for generating a light beam;

means for converging the generated light beam toward the optical memory, said converging means having an optical axis and being movable along the optical axis, the generated light beam being focused on the optical memory when said converging means is in a focusing state, and the light beam being defocused on the optical memory when said converging means is in a defocusing state;

means for guiding a light beam reflected from the optical memory and for separating the reflected light beam into first and second light beams, said reflected light beam guiding and separating means including first and second light beam emerging surfaces having different radii of curvature, the first and second light beams emerging from the emerging surfaces along first and second optical paths, respectively;

means for detecting one of the first and second light beams to generate a focusing signal which indicates whether said converging means is in the focusing state or in the defocusing state; and

means for driving said converging means in response to the focusing signal to maintain said converging means in the focusing state.

4,783,590

ERROR SIGNAL PRODUCING DEVICE HAVING IMPROVED LINEARITY

Shigeru Aoi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1986, Ser. No. 896,195

Claims priority, application Japan, Aug. 30, 1985, 60-189435

Int. Cl.⁴ G05B *1/00*

U.S. Cl. 250—202 **5 Claims**

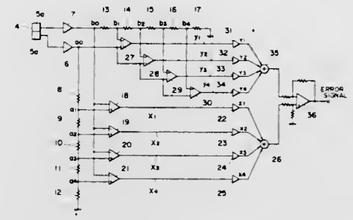
1. An error signal detecting device for producing a signal representing a positional error of a spot formed by irradiating an object with a light beam concentrated with lens means, the error being measured with respect to the surface of said object at least in one of the direction of the optical axis and the direction perpendicular to said optical axis, said device comprising:

means for irradiating the surface of said object with a concentrated light beam;

a photosensor having a photoreceptor face divided into plural portions including a first portion and a second portion and adapted to receive the light reflected or transmitted by the surface of said object;

first means for providing a first set of plural outputs from a first output of said first portion of said photoreceptor face, each of said plural outputs being related to said first output by different ratios;

second means for providing a second set of plural outputs from a second output of said second portion of said photoreceptor face, each of said plural outputs being related to said second output by different ratios;



first comparator means for comparing each of said plural outputs of said first set with said second output;

second comparator means for comparing each of said plural outputs of said second set with said first output; and

means for deriving said signal representative of positional error from outputs of said first and second comparator means.

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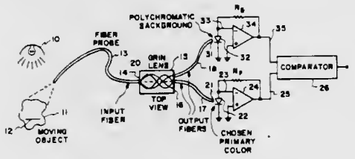
COLOR MARK SENSOR

Charles T. Sullivan, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 9, 1987, Ser. No. 118,586

Int. Cl.⁴ G06K *7/015*

U.S. Cl. 250—227 **7 Claims**



1. A color mark sensor for detecting the presence of a color mark on an object being observed, the color mark sensor system comprising:

optical path means having an input positioned to view an object to be observed and transmit polychromic light received therefrom to a path means output, the light emanating from said output as a polychromatic point source;

a planar gradient-index (GRIN) lens having an optical axis and an input face connected and axially aligned with said point source to receive said polychromatic point source of light, said planar GRIN lens being sufficiently extended in length whereby its cumulative chromatic aberration obtains primary color separation at an output face, said GRIN lens being terminated in length at the focal point plane of the chosen primary color to be sensed, the chosen primary color emanating from the output face at said axis and background color emanating elsewhere on said face;

first means including photodetector means positioned for receiving chosen primary color light form said GRIN lens output face and providing an output signal indicative thereof;

second means including photodetector means positioned for receiving background color light from said GRIN lens output face and providing an output signal indicative thereof;

and comparator means receiving the signals from said first and second means.

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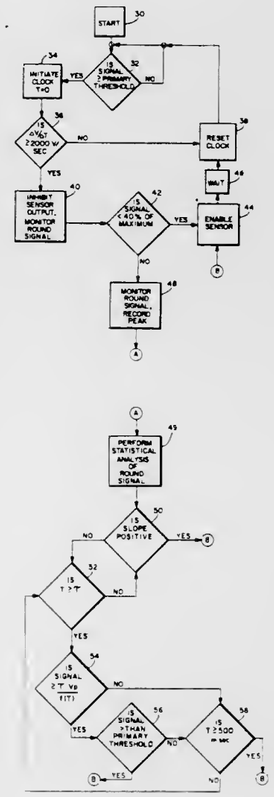
REAL TIME ADAPTIVE ROUND DISCRIMINATION FIRE SENSOR

Danny G. Snider, Channel Islands, and Robert J. Cinzori, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 2, 1987, Ser. No. 115,948

Int. Cl.⁴ G08B *17/12;* **G01J** *1/00*

U.S. Cl. 250—342 **21 Claims**



1. An adaptive round discrimination fire sensor system comprising:

means for detecting the occurrence of a fire, said fire detecting means having an output signal for activating a fire suppressant system when a fire is detected, said output signal being switchably coupled to said fire suppressant system by a switching means operable for connecting and disconnecting said output signal to said fire suppressant system;

means for detecting the energy output of a fire initiating device, said device detecting means having an output signal expressive of a magnitude of thermal energy associated with the device; and

means for controlling the operation of said switching means, said controlling means being operatively coupled to said device detecting means output signal for determining the magnitude of the device thermal energy, said controlling means further being operatively coupled to said switching means for disconnecting said fire suppressant activation signal when the rate of change of the magnitude of the thermal energy exceeds a given threshold value, said controlling means further being operable, after a given interval of time, for reconnecting said fire suppressant activation signal when the magnitude of the thermal energy has a value which is less than a given percentage of a value of a maximum magnitude attained, during the given interval of time, by the thermal energy.

4,783,593

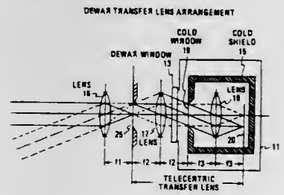
OPTICAL SYSTEM FOR WIDE ANGLE IR IMAGER

Milton L. Noble, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Dec. 26, 1985, Ser. No. 813,385

Int. Cl.⁴ G01J *1/42*

U.S. Cl. 250—352 **6 Claims**



1. In an IR sensor head containing an IR detector array installed within a cryogenic enclosure, said sensor head exhibiting a wide field of view, high optical performance and high cold shielding efficiency, the combination comprising:

(A) a first objective lens having a focal length (f1) installed on said optical axis for imaging the object field into a primary image plane,

(B) an evacuated cryogenic, cold shielding enclosure, including

(1) an aperture in the cold shield installed on said optical axis for admission of IR image radiation and for stopping unfocused IR background illumination, and

(2) cooling means

(C) an IR detector array installed in said enclosure on said optical axis and cooled by said cooling means, and

(D) a telecentric lens arrangement comprising

(1) a second lens having a focal length (f2) installed outside said enclosure on said optical axis at a distance from said primary image plane for collimating the ray bundles of said primary image points,

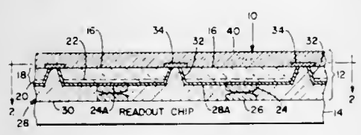
(2) a third lens having a focal length (f3) installed within said enclosure on said optical axis at a distance from said IR detector array for focusing said collimated ray bundles of said image points into a secondary image plane on said IR detector array,

said cold shield aperture being spaced between said second and third lenses, and of minimum size for intercepting said collimated ray bundles for maximum aperture efficiency,

said arrangement permitting correction of inaccuracy in the positioning of said third lens in relation to said IR detector array by a compensatory repositioning of said objective lens in relation to said telecentric lens arrangement without a significant loss in optical performance.

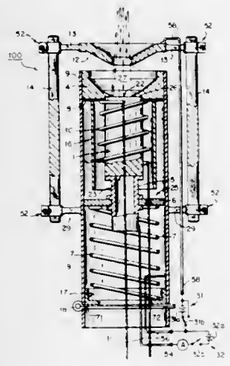
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4,783,594
RETICULAR DETECTOR ARRAY
Eric F. Schulte, Santa Barbara, and Ichiro Kasai, Solvang, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Filed Nov. 20, 1987, Ser. No. 123,426
Int. Cl.[4] H01L *25/00*; G01T *1/22, 1/24*
U.S. Cl. 250—370.08 19 Claims



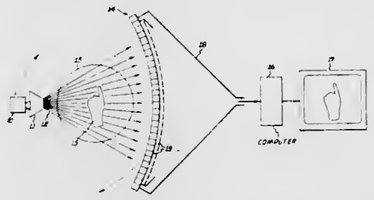
1. A radiation detector assembly comprising:
an array of detectors disposed in spaced-apart relation along a front side of said assembly for receiving radiation incident on a front side of said detector array;
a readout chip spaced apart from a back side of said detector array;
a resilient electrically insulating support disposed as a layer between said array and said chip, and extending forward as a set of walls between detectors to a front side of said array;
a plurality of electrical contacts extending through said support from individual ones of said detectors to said chip; and
an electrically conductive grid disposed on a front surface of said array for conducting signals between said detectors and said chip, arms of the grid overlaying said support walls and extending over edge portions of said detectors to make electrical contact therewith, resilience of said support permitting a thermally induced displacement of the detectors relative to each other.

4,783,595
SOLID-STATE SOURCE OF IONS AND ATOMS
Milos Seidl, Wayne, N.J., assignor to The Trustees of the Stevens Institute of Technology, Hoboken, N.J.
Filed Mar. 28, 1985, Ser. No. 716,896
Int. Cl.[4] H01J *27/00*
U.S. Cl. 250—423 R 28 Claims



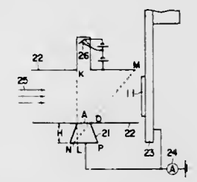
1. A solid-state source of positive ions or atoms comprising:
(a) an essentially unitary ion-emission pellet capable of emitting positive ions at an ion-emission temperature, said pellet consisting essentially of an alkali or alkali-earth electrolyte that is solid at said ion-emission temperature, said pellet having a generally smooth ion-emission surface defined thereon from which ions can be emitted;
(b) a beam forming electrode for imposing an electrical potential on said ion-emission surface, the beam forming electrode having at least one passageway extending through it to define a beam-transmission channel through which an atom or ion beam can pass, the beam forming electrode being made of an electrically-conductive material which is mechanically stable at the ion-emission temperature;
(c) a pellet holder adapted to removably compressively mechanically hold said ion-emission pellet at a position and orientation such that the ion-emission pellet is in contact with the beam forming electrode at the ion-emission surface; and
(d) heating means for heating said ion-emission pellet to said ion-emission temperature, so that when said pellet is heated to said ion-emission temperature by said heating means, positive ions are emitted from said ion-emission surface into the beam-transmission channel of the beam forming electrode and transmitted from the source as a beam of unneutralized positive ions or neutralized atoms.

4,783,596
SOLID STATE SCINTILLATOR AND TREATMENT THEREFOR
Robert J. Riedner, Waukesha; Erdogan O. Gürmen, Milwaukee, both of Wis.; Charles D. Greskovich, and Dominic A. Cusano, both of Schenectady, N.Y., assignors to General Electric Company, Milwaukee, Wis.
Filed Jun. 8, 1987, Ser. No. 59,426
Int. Cl.[4] C09K *11/78*
U.S. Cl. 250—483.1 17 Claims



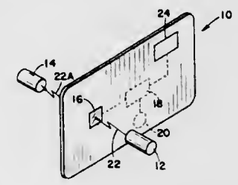
1. A polycrystalline X-ray stimulable scintillator body comprising a sintered rare earth doped gadolinia and yttria ceramic having a cubic crystal structure which has received a controlled oxidation anneal to reduce radiation damage otherwise occurring when said scintillating body is exposed to X-ray radiation during conversion of said X-ray radiation to a display image, the composition of said ceramic comprising from about 5 mole percent to about 50 mole percent Gd_2O_3, between about 0.5 and 12 mole percent of a rare earth activator oxide selected from the group consisting of Eu_2O_3 and Nd_2O_3, and between about 0.0001 and 0.5 mole percent of at least one afterglow reducer selected from the group of Pr_2O_3 and Tb_2O_3, the remainder of said composition being Y_2O_3, said controlled oxidation anneal being effected from about 1000° C. up to about 1500° C. at an oxygen partial pressure in the range from about 10^{-4} up to about 10^{-2} atmosphere, said scintillator body exhibiting a smaller efficiency loss when exposed to X-ray radiation than said body absent said controlled oxidation anneal.

4,783,597
ION IMPLANT APPARATUS
Hisamori Misawa, Tokyo; Hidetaro Nishimura, Kawasaki; Takaya Tsujimaru, Yokohama; Shuji Kikuchi, Kumamoto; Nobuyuki Abe, Yokohama, and Kouichi Mori, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 29, 1986, Ser. No. 924,370
Claims priority, application Japan, Oct. 29, 1985, 60-242243
Int. Cl.[4] H01J *37/317*
U.S. Cl. 250—492.2 12 Claims



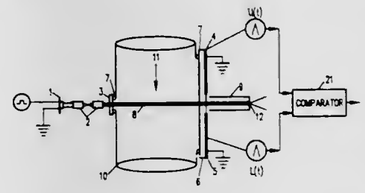
1. An ion implant apparatus which forms ions from an ion source into an ion beam to implant the ions into a target to be ion-implanted through an ion beam introduction tube,
said ion implant apparatus comprising:
means for radiating an electron beam, said radiating means fixed on said ion beam introduction tube; and
a target radiated by said electron beam, said electron beam target reflecting said electron beam in a reflectance beam, said electron beam causing a secondary electron beam to be emitted from said electron beam target,
said electron beam target being formed so as to prevent said reflectance beam and said secondary electron beam from being directly radiated on said target to be ion-implanted.

4,783,598
OPTICALLY COUPLED INTERFACE FOR PORTABLE SEMI-CONDUCTOR DATA MEDIA
Charles K. McAdams, Jr., Raleigh, N.C., assignor to Teles Computer Products, Inc., Tulsa, Okla.
Filed Sep. 10, 1986, Ser. No. 905,552
Int. Cl.[4] B42D *15/00*
U.S. Cl. 250—566 7 Claims



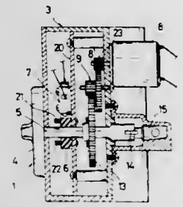
1. An optically coupled data interface comprising:
a host device having means to receive data in optical format and having means to impart optical data initiating signals;
a portable module having means to optically interface with said host device and having an optically responsive window (adapted to receive) for receiving optical (data initiating) signals from said host device; and
means self contained in said portable module for controlling said optically responsive window to impart data onto optical signals receivable by said host device.

4,783,599
PARTICLE DETECTOR FOR FLOWING LIQUIDS WITH THE ABILITY TO DISTINGUISH BUBBLES VIA PHOTODIODES DISPOSED 180° APART
Peter G. Borden, Palo Alto, Calif., assignor to High Yield Technology, Mountain View, Calif.
Filed Feb. 10, 1987, Ser. No. 12,976
Int. Cl.[4] G01N *15/07*
U.S. Cl. 250—574 11 Claims



1. A system for detecting contaminant particles in a liquid and for distinguishing bubbles from the contaminant particles comprising:
means for providing a flow of liquid to be monitored;
means for directing a light beam along an optical axis path through said liquid so that light is scattered when said beam impinges on a particle or a bubble in said liquid;
means for detecting said scattered light comprising first and second photodiodes that are disposed symmetrically about said optical axis path about 180° relative to each other, respectively on each side of said light beam path, said photodiodes being equally spaced from the path of said light beam for generating respective signals representing the intensity of the scattered light detected by said photodiodes; and
means for comparing said signals so that a difference signal is produced which is indicative of the presence of contaminant particles, and the signals generated by detecting bubbles in said liquid are effectively negated.

4,783,600
AUTOMATIC CONTROLLER OF THE MASTER GAS SWITCH
Shui-Chang, 3F., No. 1, Alley 16, Lane 428, Lien-Cheng Rd., Chungho City, Taipei Hsien, Taiwan
Filed Oct. 6, 1986, Ser. No. 915,740
Int. Cl.[4] H01H *35/00*; F23N *5/00*
U.S. Cl. 307—116 3 Claims



1. An automatic controller for a master gas switch, comprising:
a valve for controlling the level of gas flow from a gas source to a gas burner, the valve having open and closed positions;
an electrical rotary motor coupled to the valve for rapidly closing the valve;

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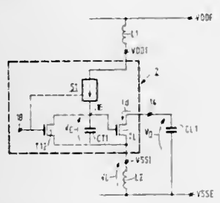
power supply means for supplying electrical power to energize the motor;
flame-responsive circuit means for connecting the motor to the power supply means when a flame of the gas burner stops;
time-responsive circuit means for connecting the motor to the power supply means at the end of a user-selectable burner-on cycle;
motor stop means for inactivating the power supply means after the motor closes the valve to thereby stop the motor;
the stopper means includes:
a drive shaft coupling the motor and the valve;
a compressive wheel affixed to the drive shaft and having a notch on its circumference; and
a touch switch cooperating with the compressive wheel and having a release button arranged to move into the notch when the motor has rotated the drive shaft sufficiently to close the valve.

4,783,601

INTEGRATED LOGIC CIRCUIT HAVING A CONTROL CIRCUIT FOR GENERATING A TIME-DEPENDENT WAVEFORM

Cornelis D. Hartgring; Reelof H. W. Salters; Cormac M. O'Connell, and Joannes J. M. Koomen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1987, Ser. No. 9,428
Claims priority, application Netherlands, Jun. 17, 1986, 8601558
Int. Cl.⁴ H03K *17/56, 3/01, 17/681, 5/13*
U.S. Cl. 307—246 **9 Claims**



1. An integrated logic circuit comprising a first and a second supply terminal for receiving a supply voltage, an output insulated gate field effect transistor and at least one data output having an output circuit in which the conductivity channel of said output insulated gate field effect transistor connects said data output to one of said two supply terminals, the output circuit further comprising a control circuit for generating a time-dependent control voltage at the control electrode of said output insulated gate field effect transistor, characterized in that said control circuit, at least during an initial period after switching on, generates a control voltage which varies at least approximately proportionally to the square root of time.

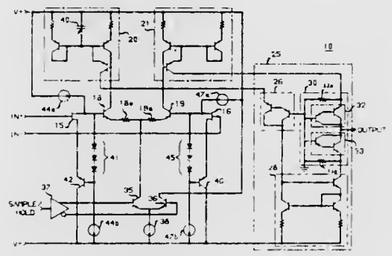
4,783,602

OPERATIONAL TRANSCONDUCTANCE AMPLIFIER FOR USE IN SAMPLE-AND-HOLD CIRCUITS AND THE LIKE

Tandur L. Viswanathan, Wyomissing Hills Township, Berkes County, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 26, 1987, Ser. No. 67,331
Int. Cl.⁴ G11C *27/02;* **H03F** *3/45*
U.S. Cl. 307—353 **27 Claims**

1. In an integrated circuit, an operational transconductance amplifier (OTA) (**10**) having:
a differential input stage (**15, 16, 18, 19**) having inverting and noninverting differential inputs, a common output and first and second differential outputs;
a first current mirror (**20**) responsive to the first differential output of the differential input stage and coupling to a first voltage source;
a second current mirror (**21**) responsive to the second differential output of the differential input stage and coupling to the first voltage source; and,
a third current mirror (**28**) responsive to the first current mirror and coupling to a second voltage source;



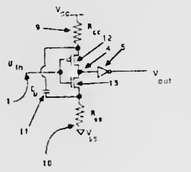
a first bipolar transistor network (**26**) coupling between the first and third current mirrors, having an intermediate node coupling to a third voltage source;
a second bipolar transistor network (**32, 33**) coupling between the second and third current mirrors, having an intermediate node coupling to the third voltage source, for providing an output signal from a high-impedance output node;
wherein the third voltage source has a voltage between that of the first and second voltage sources.

4,783,603

TTL TO MOS CONVERTER WITH POWER SUPPLY NOISE REJECTION

Joseph M. Goforth, San Jose, and Elvan S. Young, Santa Clara, both of Calif., assignors to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Jan. 8, 1987, Ser. No. 1,354
Int. Cl.⁴ H03K *17/16, 19/03, 19/092*
U.S. Cl. 307—443 **3 Claims**



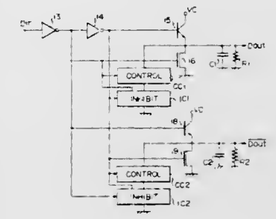
1. An input buffer for a CMOS circuit, said input buffer having an input and an output comprising:
a CMOS inverter circuit having an input being coupled to the input of said input buffer and having a p-channel MOS transistor and an n-channel MOS transistor, said p-channel MOS transistor having a gate, a source and a drain, said n-channel MOS transistor having a gate, a source and a drain, the gates of said p-channel and said n-channel MOS transistors being coupled together and to the input of the CMOS inverter circuit, and the drains of said MOS transistors being coupled together and to an output of said CMOS inverter circuit;
a capacitor having two charge carrying plates, one of said plates of said capacitor coupled to the source of said p-channel MOS transistor and the other of said plates of said capacitor coupled to the source of said n-channel MOS transistor;
a first resistor means coupling the source of said p-channel MOS transistor to a first reference voltage source;
a second resistor means coupling the source of said p-channel MOS transistor to a second reference voltage source; and
an inverter circuit having an input coupled to the output of said CMOS inverter circuit, said output of said CMOS inverter circuit being coupled to the drains of said MOS transistors, said inverter circuit having an output coupled to an output of said input buffer, whereby an improved input buffer having greater tolerance for noise is obtained.

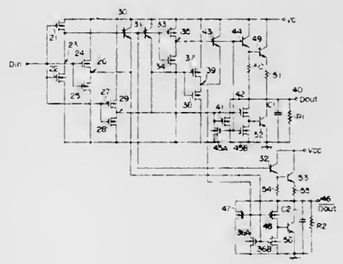
4,783,604

BUFFER CIRCUIT FOR OUTPUTTING SIGNALS OF DIFFERENT POLARITIES

Masaji Ueno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 17, 1987, Ser. No. 15,038
Claims priority, application Japan, Mar. 31, 1986, 61-72904
Int. Cl.⁴ H03K *6/02, 3/353, 17/10, 17/687*
U.S. Cl. 307—446 **10 Claims**





1. A buffer circuit comprising:
first and second power source terminals and first and second output nodes;
a first delay circuit for receiving on input signal and generating an inverted signal of said input signal from first, second and third output terminals;
a second delay circuit for receiving the signals from said first and third output terminals of said first delay circuit and generating inverted signals of these signals from first and second output terminals;
first and second bipolar transistors having bases commonly connected to the first output terminal of said first delay circuit and which are connected at one end to the first power source terminal and respectively connected at the other end to the second and third output terminals of said first delay circuit.
a third bipolar transistor having a base connected to the first output terminal of said second delay circuit and which is connected at one end to the first power source terminal and connected at the other end to the second output terminal of said second delay circuit;
first and second bipolar transistor circuits which are respectively connected between said first power source terminal and the first and second output nodes and are controlled to be set into opposite conduction states in response to the output signals from the first output terminal of said second delay circuit and from the first output terminal of the first delay circuit, respectively;
first and second MOS transistors which are respectively connected between the first and second output nodes and said second power source terminal and are controlled to be set into the opposite conduction states in response to the output signals from the third output terminal of said first delay circuit and from the second output terminal of said second delay circuit, respectively; and
third and fourth MOS transistors which are respectively connected between the gates of said first and second MOS transistors and said second power source terminal and are respectively controlled to be set into the opposite conduction states in response to the output signals from the first output terminal of said second delay circuit and from the second output terminal of said first delay circuit.
wherein output signals in the inversion relation are generated from said first and second output nodes in response to said input signal.

4,783,605

LOGIC CIRCUIT MADE OF BIOMATERIALS SUCH AS PROTEIN FILMS

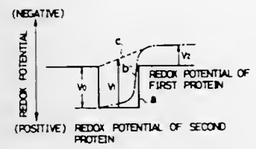
Osamu Tomisawa, and Satoru Isoda, both of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

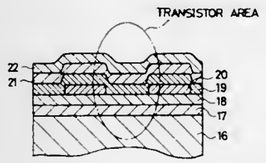
Filed Jul. 2, 1987, Ser. No. 69,319
Claims priority, application Japan, Jul. 11, 1986, 61-164181
Int. Cl.⁴ B32B *9/00, 15/04;* **H01L** *29/28;* **G01N** *27/22*
U.S. Cl. 307—450 **6 Claims**

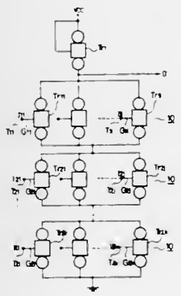
1. A logic circuit having an output terminal and at least one input terminal, which comprises:
a first electron transmission protein film made of a first electron transmission protein;
a second electron transmission protein film made of a second electron transmission protein having a redox potential different from that of said first electron transmission protein and joined on top of said first electron transmission protein film;
a third electron transmission protein film made of a third electron transmission protein having a redox potential different from that of said second electron transmission protein and joined on top of said second electron transmission protein film;
a source electrode connected to said first electron transmission protein film;
a gate electrode having an electrical influence on said second electron transmission protein film;
a drain electrode connected to said third electron transmission protein film;
said first, second, and third electron transmission films being coupled so as to form a driving transistor network in which a series connection of at least one circuit group consisting of at least one transistor with its drain and source connected in parallel to a pair of common drain and source terminals;
said common drain terminal of the first circuit group in said series connection being connected to said output terminal;
said common source terminal of the last circuit group in said series connection being connected to a second power supply having a potential lower than that of said first power supply;

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the gate of said transistor in said circuit group being connected to said input terminal;
said load transistor and said driving transistor network being of the same type; and



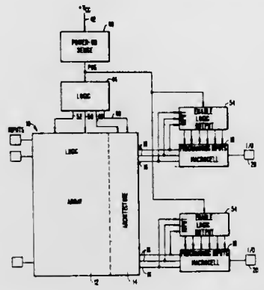




threshold voltages of said load and driving transistor network being substantially the same.

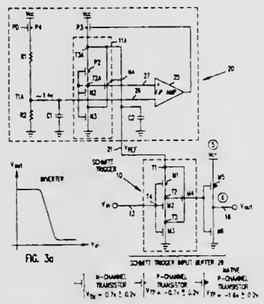
4,783,606
PROGRAMMING CIRCUIT FOR PROGRAMMABLE LOGIC ARRAY I/O CELL
Erich Goetting, 19882 Portal Pl., Cupertino, Calif. 95014
Filed Apr. 14, 1987, Ser. No. 38,101
Int. Cl.[4] H03K *19/177*
U.S. Cl. 307—465 **13 Claims**

1. A programmable logic array circuit comprising:
an array of programmable memory elements;
at least one output cell coupled to at least a portion of said array for providing an output from said array to an output terminal, said output cell having at least one programmable circuit with a programming input;
means for generating an architecture programming signal; and
means, coupled between said means for generating and at least a first one of said memory elements and responsive to said architecture programming signal, for providing an



output of said array to said programming input of said programmable circuit.

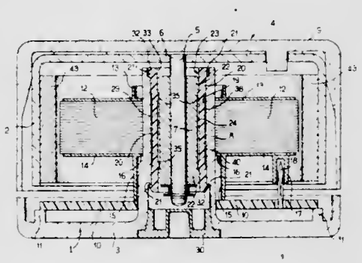
4,783,607
TTL/CMOS COMPATIBLE INPUT BUFFER WITH SCHMITT TRIGGER
Hung-Cheng Hsieh, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.
Filed Nov. 5, 1986, Ser. No. 927,289
Int. Cl.[4] H03K *19/094, 19/092, 3/356*
U.S. Cl. 307—475 **4 Claims**



1. A TTL/CMOS compatible input buffer network comprising:
a reference voltage generator for providing a reference voltage at a coupling electrical lead;
a Schmitt trigger input buffer coupled to said electrical lead;
said reference voltage generator comprising a reference input buffer stage having a first P-channel enhancement transistor, and first, second and third N-channel enhancement transistors;
an operational amplifier having a noninverting input terminal, an inverting input terminal, and an output lead;
a large P-channel enhancement transistor having gate, source and drain electrodes, the gate electrode of said large P-channel transistor being coupled to the output lead of said operational amplifier, and the drain electrode of said large P-channel transistor being coupled to said coupling electrical lead and to said P-channel transistor of said reference input buffer stage;
said operational amplifier, large P-channel transistor, and first P-channel transistor forming a negative feedback loop;

means for applying a fixed reference voltage to said inverting terminal of said operational amplifier;
means for connecting said noninverting terminal of said operational amplifier to the gate electrodes of said transistors of said reference input buffer stage;
said Schmitt trigger input buffer comprising a Schmitt trigger having a first P-channel enhancement transistor, and first, second and third N-channel enhancement transistors; and an output stage having a native P-channel enhancement transistor and a fourth N-channel enhancement transistor, the gates of said native P-channel transistor and fourth N-channel transistor being connected to a node between said first P-channel enhancement transistor and said first N-channel enhancement transistor of said Schmitt trigger.

4,783,608
ELECTRIC MOTOR WITH AN IMPROVED BEARING
Francois Gruber, Monroe, N.C., and Andrë Renaud, Fontenay-Le-Fleury, France, assignors to Etudes Techniques Et Representations Industrielles E.T.R.I., Neuilly sur Seine, France
Filed Jun. 25, 1987, Ser. No. 67,630
Claims priority, application France, Jun. 27. 1986, 86 09360
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 **5 Claims**



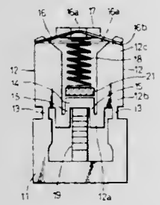
1. An electric motor, having a stator (**1**) supported by a mounting frame (**3**) and a rotor (**4**) rigidly secured to a shaft (**5**) which is rotatably mounted within a plain bearing (**7**). said plain bearing being disposed within a tubular support (**8**) which is rigidly fixed to said stator (**1**), and a sleeve (**23**) composed of material having a sufficient degree of elastic deformability to absorb vibrations interposed between the outer face (**24**) of the bearing (**7**) and the inner face (**19**) of said tubular support (**8**). the outer face (**40**) of said sleeve (**23**) having longitudinal splines (**27, 28**) thereon.

4,783,609
ROTATION DETECTING APPARATUS FOR USE WITH COMPRESSOR
Seiji Sugiyama; Yoichiro Kashiwagi; Hiroya Kono, all of Kariya, and Kazuhito Sakashita, Uji, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan
Filed Jul. 9. 1987, Ser. No. 71,392
Claims priority, application Japan, Jul. 11, 1986, 61-164468
Int. Cl.[4] H02K *29/12;* **F04B** *42/06;* **G01R** *33/02*
U.S. Cl. 310—168 **8 Claims**



1. A rotation detecting apparatus for use with a compressor comprising a plurality of magnetism detecting elements disposed adjacent and in parallel with each other attached to the outer periphery of an airtight casing of said compressor in correspondence with a rotational orbit of a magnet disposed on a rotor within said airtight casing, said magnetism detecting elements each having a core made up of amorphous alloy and a separate coil wound around the outer periphery of each said core, said coils being connected in series aiding relationship.

4,783,610
PIEZOELECTRIC ACTUATOR
Hitoshi Asano, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan
Filed Mar. 23, 1988, Ser. No. 172,265
Claims priority, application Japan, Apr. 20, 1987, 62-59656[U]
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **6 Claims**



1. In a piezoelectric actuator including a piezoelectric element, a pair of lever arms arranged on opposite sides of said piezoelectric element and a flexible member mounted between free ends of said lever arms, wherein deformation of said piezoelectric element is magnified to greatly displace said flexible member at a central position thereof; the improvement wherein said flexible member comprises a loop member and further comprising a support member for supporting said flexible member located at the central position of said flexible member in such a manner that opposite portions at the central position of said flexible member between said lever arms are outwardly expanded, whereby said flexible member has a substantially diamond shape in plan with a diagonal defined by a center line connecting said lever arms.

4,783,611
HIGH-PRESSURE GAS DISCHARGE LAMP WITH ELECTRODES HAVING DOUBLE LAYER COIL
Anthonius B. P. Vogels, and Peter L. F. J. Marks, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.
Filed Dec. 2, 1987, Ser. No. 127,860
Claims priority, application Netherlands, Dec. 12, 1986, 8603165
Int. Cl.[4] H01J *61/073, 61/30*
U.S. Cl. 313—25 **12 Claims**



7. A discharge lamp discharge electrode, comprising:
an electrode rod defining a tip end of said electrode and an electrode coil having a first layer of turns with a first winding sense surrounding the electrode rod and a second layer of turns surrounding said first layer with a winding

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sense opposite the first winding sense, said first layer comprising a first length of wire having a first nominal diameter and said second layer comprising a second length of wire having a second nominal diameter,

said first layer of turns comprising a first high-pitched turn having a pitch P at least equal to said first nominal diameter plus said second nominal diameter and said second layer of turns having a second high-pitched turn with a pitch corresponding to pitch P, said second high-pitched turn crossing said first high-pitched turn at diametrically opposite contact areas and gripping said first high-pitched turn to secure said second layer to said first layer, and said second high-pitched turn engaging said electrode rod with a clamping fit between said diametrically opposite contact areas to secure said first and second layers to said electrode rod.

4,783,612

LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMP WITH PROTECTIVE GLASS LAYER ON ELECTRODE LEAD-THROUGHS

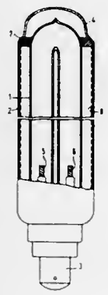
Leo M. Sprengers, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 4, 1984, Ser. No. 617,005

Claims priority, application Netherlands, Jun. 15, 1983, 8302128

Int. Cl.⁴ H01J *5/50*

U.S. Cl. 313—331 **6 Claims**



1. In a low-pressure sodium vapor discharge lamp of the type having an envelope, a discharge electrode within said envelope, and a conductive lead-through extending through and into said envelope and connected to said discharge electrode for allowing electrical connection to said discharge electrode from outside said envelope, the improvement comprising: a layer of glass covering said lead-through and having a composition and thickness that varies according to the location on said lead-through, said layer of glass comprising a first portion comprised of a glass resistant to sodium and extending over the part of said lead-through within said envelope and a portion of the part of said lead-through embedded within the wall of said envelope, and said layer of glass comprising a second portion extending from said first portion over the remainder of the part of said lead-through embedded within said envelope wall and having a glass composition different from that of said first portion and a thickness greater than that of said first portion.

4,783,613

IMPREGNATED CATHODE

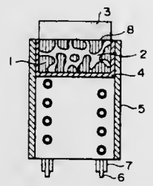
Shigehiko Yamamoto, Tokorozawa; Isato Watanabe, Hachioji; Sadanori Taguchi, Tokyo, and Susumu Sasaki, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,035

Claims priority, application Japan, May 28, 1986, 61-121005; Oct. 3, 1986, 61-234569

Int. Cl.⁴ H01J *19/02, 19/06*

U.S. Cl. 313—346 R **15 Claims**



1. An impregnated cathode which comprises a refractory porous body whose pore parts are impregnated with an electron emissive material including barium, and a thin film layer comprising tungsten and at least one member selected from the group consisting of scandium and an oxide of scandium, deposited on the surface of the refractory porous chathode, the thin film layer further containing at least one oxide selected from the group consisting of an oxide of tungsten and an oxide containing tungsten and scandium.

4,783,614

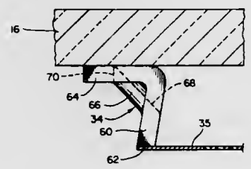
L-SHAPED SUPPORT STRUCTURE FOR TENSIONED SHADOW MASK

James L. Kraner, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 28, 1986, Ser. No. 923,934

Int. Cl.⁴ H01J *29/07*

U.S. Cl. 313—404 **22 Claims**



22. A front assembly for a color cathode-ray tube having a funnel, comprising a faceplate having on its inner surface a centrally disposed phosphor screen surrounded by a peripheral area adapted to mate with the funnel, a flat shadow mask, a shadow-mask support structure secured directly to said faceplate inner surface and having members forming a continuous ring around the screen, the members of the support structure being generally L-shaped in cross section and having a first leg projecting from the faceplate and defining a planar ridge to which the flat shadow mask is secured so that the support structure directly supports the flat shadow mask in tension and spaces the flat shadow mask from the screen, and having a second leg securing the support structure to said faceplate inner surface.

4,783,615

ELECTRODELESS HIGH PRESSURE SODIUM IODIDE ARC LAMP

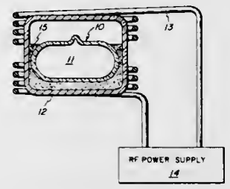
James T. Dakin, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 26, 1985, Ser. No. 749,025

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.⁴ H01J *17/20;* **H05B** *41/16*

U.S. Cl. 315—248 **10 Claims**



1. In an electrodeless metal halide arc lamp having an arc tube for containing an arc discharge, an arc tube fill for producing high luminous efficacy, said fill consisting essentially of:

sodium iodide present in a quantity which provides a reservoir of sodium iodide condensate during lamp operation;

xenon in a sufficient quantity to provide a partial pressure in the range of about 100 torr and higher at room temperature and to limit the chemical transport of energy from said arc discharge to the walls of said arc tube; and

mercury iodide in a quantity less than the quantity of said sodium iodide and in a sufficient quantity to provide an amount of free iodine near said arc tube walls during lamp operation.

4,783,616

DEVICE FOR SLOWING DOWN THE ROTATIONAL SPEED OF THE SHEET TRANSFER AND PRINTING CYLINDER FOR SINGLE-SHEET SILK SCREEN PRINTING MACHINES

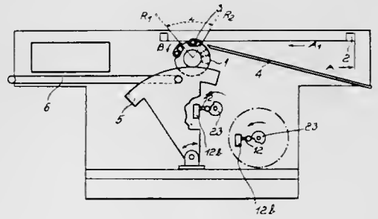
Umberto Brasa, Milan, Italy, assignor to Siasprint Group S.r.l., Italy

Filed Mar. 24, 1987, Ser. No. 29,623

Claims priority, application Italy, Mar. 27, 1986, 19904 A/86

Int. Cl.⁴ H02P *5/08*

U.S. Cl. 318—329 **3 Claims**



1. A device for slowing down the rotational speed, in its return stroke, of a transfer cylinder in a single-sheet fed silk-screen printing machine, said cylinder being operatively connected to a circular sector which is driven in an oscillatory motion by a motor, comprising:

(a) a motor control board;

(b) a twin potentiometer having two moving elements on a single driving shaft, the first one of said moving elements being electrically connected to said motor control board to provide a motor speed reference signal of a set polarity, said motor speed reference signal being variable by setting said twin potentiometer;

(c) a microswitch;

(d) a cam driven by said motor and operatively coupled to said microswitch;

(e) a computer electrically connected to said motor control board, said computer having an output electrically connected to an input of said control board upon closure of said microswitch, said second moving element of said potentiometer being connected to said computer to provide said computer with a computer reference signal; and

(f) means under the control of said computer for converting said computer reference signal into a signal of opposite polarity with respect to said motor reference signal, said opposite polarity signal being proportional to said motor reference signal and to said computer reference signal, said opposite polarity signal being input to said motor control board through closure of said microswitch, so that when said microswitch is closed said opposite polarity signal is added to said motor reference signal to slow down the rotation of said motor.

4,783,617

METHOD OF RESTORING A ROTARY AXIS TO A REFERENCE POINT

Nobuyuki Kiya, Tokyo, Japan, assignor to Fanuc Ltd, Yamanashi, Japan

PCT No. PCT/JP85/00586, § 371 Date Jun. 16, 1986, § 102(e) Date Jun. 16, 1986, PCT Pub. No. WO86/02470, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 18, 1985, Ser. No. 881,023

Claims priority, application Japan, Oct. 20, 1984, 220844/1984

Int. Cl.⁴ G05B *19/10*

U.S. Cl. 318—567 **7 Claims**



1. A method of restoring a rotary axis to a reference point in which a rotational direction workpiece coordinate system serving as a programming reference with respect to a rotational direction machine coordinate system is decided, data specifying an angle r between an origin of the workpiece coordinate system and a reference point in the machine coordinate system are commanded by a program, a rotary axis is positionally controlled by numerical control program data created based on the workpiece coordinate system, and the rotary axis is restored to the reference point in the machine coordinate system by a reference point restoration command, said method comprising the steps of:

updating present positions Pm, Pw in the machine and workpiece coordinate systems, respectively, in dependence upon rotation of said rotary axis and, in response to the reference point restoration command, obtaining an angle a that satisfies the equations

$$Pm = 360.\ n + a.\ Pw = 360.\ n + a - r$$

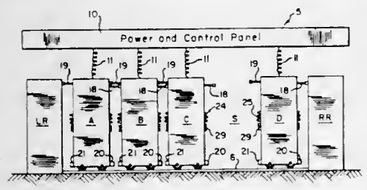
where n represents a quotient and a represents a remainder of a°, the angle a resulting from dividing the present position Pm by 360°;

(b) rotating the axis by a° to return the rotary axis to the reference point in the machine coordinate system; and

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(c) updating the present positions Pm, Pw in the machine and workpiece coordinate systems, respectively, in such a manner that relations Pm=0, Pw=−r are established.

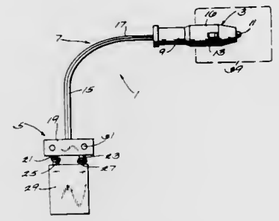
4,783,618
APPARATUS AND METHOD FOR CONTROLLING APPARATUS INCLUDING A PLURALITY OF GUIDED UNITS
Floyd M. Artrip, Ivy, Va., assignor to Acme Visible Records, Inc, Crozet, Va.
Continuation-in-part of Ser. No. 657,282, Oct. 3, 1984, abandoned, which is a continuation of Ser. No. 453,173, Dec. 27, 1982, abandoned. This application Nov. 15, 1985, Ser. No. 799,188
Int. Cl.⁴ G05D *1/08*
U.S. Cl. 318—587 **12 Claims**



1. In a storage system of ranges mounted in parallel relationship to each other, support guide means for supporting and guiding the ranges as they move on the support guide means, each movable range having motor means for moving the ranges right or left the improvement comprising:
(a) a stationary power and control bus means positioned near the system to serve each range;
(b) flexible cable means connecting each range to said bus means;
(c) motor means on each range for driving its range right or left;
(d) control means on each range;
(e) circuit means connecting the control means of each range through said flexible cable and said bus means;
(f) right and left sensor means on each range for sensing by heat, capacitance or reflected electromagnetic wave the presence of an object adjacent the sensor an object sending a signal to its control means which means in turn sends appropriate signals to other range control means to move ranges left or right in accordance with the selection of the operation.

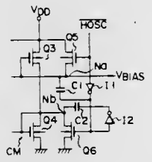
4,783,619
METHOD AND APPARATUS FOR MAINTAINING AUTO VOLTAGE
Mattbew C. Herman, Racine, Wis., assignor to A & E Manufacturing Company, Racine, Wis.
Filed Sep. 21, 1987, Ser. No. 98,848
Int. Cl.⁴ B62D *45/00*
U.S. Cl. 320—2 **13 Claims**

1. A method of providing auxiliary electric power to a motor vehicle comprising the steps of:
a. providing an auxiliary nine-volt battery;
b. providing a power supply back-up device having first contacts for engaging said auxiliary battery and second contacts for connecting with a cigar lighter receptacle in a motor vehicle electrical circuit;
c. connecting the auxiliary battery to the power plug;
d. inserting the power plug into the motor vehicle cigar lighter receptacle; and



e. disconnecting the motor vehicle storage battery from the vehicle electrical circuit.

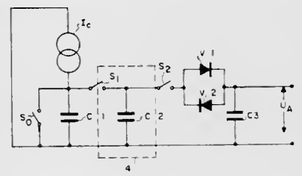
4,783,620
CONSTANT VOLTAGE CIRCUIT HAVING AN OPERATION-STOP FUNCTION
Nobutaka Kitagawa, Kawasaki; Akihiro Sueda, Yokohama, and Takesi Suyama, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 8, 1987, Ser. No. 71,176
Claims priority, application Japan, Jul. 11, 1986, 61-163121
Int. Cl.⁴ G05F *3/24*
U.S. Cl. 323—313 **10 Claims**



1. A constant voltage circuit having an operation-stop function, comprising:
a first capacitor element connected between one end of a first operation-stop control MOS transistor controlled by an operation-stop control signal and an output terminal of a first inverter for inverting said operation-stop control signal to produce an inverted operation-stop control signal; and
a second capacitor element connected between one end of a second operation-stop control MOS transistor controlled by the inverted operation-stop control signal and an output terminal of a second inverter for inverting said inverted operation-stop control signal.

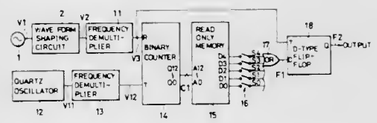
4,783,621
APPARATUS FOR EVALUATING THE DISTANCE OF AN OBJECT
Dieter Drefahl, Hanau, Fed. Rep. of Germany, assignor to Honeywell GmbH, Regelsysteme, Fed. Rep. of Germany
Filed Apr. 1, 1987, Ser. No. 32,669
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614850
Int. Cl.⁴ G01S *13/46*
U.S. Cl. 324—60 CD **7 Claims**

1. An apparatus for evaluating the distance of an object from a transmitter/receiver by transmitting a signal to the object and measuring the elapsed time until reception of a reflected signal from the object, whereby the elasped time is proportional to the distance to the object comprising
a constant current source,
a first capacitor chargeable from said source with the charge stored between the signal transmission and reception being a measure of the distance to the object from the transmitter/receiver,
a first switch for discharging said capacitor in predetermined time intervals,
a second capacitor, and



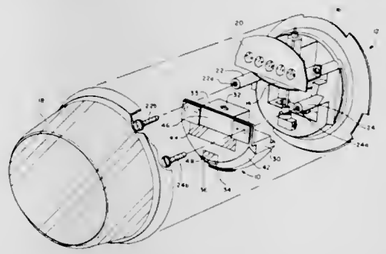
a second switch for transferring the stored charge of said first capacitor to said second capacitor by connecting said second capacitor in parallel to said first capacitor, said second capacitor forming part of a low pass filter having a resistance dependent on the applied voltage.

4,783,622
FREQUENCY ABNORMALITY DETECTING CIRCUIT
Kenji Honjo, and Tooru Nakamura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 24, 1987, Ser. No. 42,249
Claims priority, application Japan, Apr. 25, 1986, 61-94794
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—78 D **7 Claims**



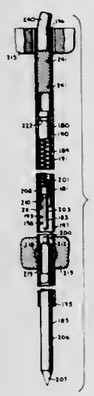
1. A frequency abnormality detecting circuit, comprising:
waveform shaping means for shaping an output waveform of an AC power source, which is a detection object of frequency abnormality;
reference oscillation means for producing a reference output;
frequency-demultiplying means for frequency-demultiplying an output of said waveform shaping means at least by one period of said waveform;
counting means for counting the output pulse of the reference oscillation means by the leading edge of an output pulse of the frequency-demultiplying means;
storing means for storing bit data using output data of the counting means as an address;
OR means for performing an OR operation of an output of said storing means;
switch means provided between the storing means and the OR means for inputting said output of the storing means to the OR means; and
bistable means for operation in synchronism with an output of said demultiplying means using an output of the OR means as data input.

4,783,623
DEVICE FOR USE WITH A UTILITY METER FOR RECORDING TIME OF ENERGY USE
Cree A. Edwards, Belmont, and Larsh M. Johnson, San Francisco, both of Calif., assignors to Domestic Automation Company, Foster City, Calif.
Filed Aug. 29, 1986, Ser. No. 902,199
Int. Cl.⁴ G01R *1/20*
U.S. Cl. 324—156 **26 Claims**



1. A device for use with an electric meter having a rotatable disc for recording energy use, comprising:
a housing configured to fit within the meter below the disc, said housing containing circuit means for recording energy use;
a series of mouting holes formed in said housing for mounting said housing within the meter, said holes arranged such that said housing may be mounted in any standard electric meter.

4,783,624
CONTACT PROBE DEVICES AND METHOD
Eugene R. Sabin, Prairie Village, Kans., assignor to Interconnect Devices, Inc., Kansas City, Kans.
Filed Apr. 14, 1986, Ser. No. 851,783
Int. Cl.⁴ G01R *1/073, 1/067*
U.S. Cl. 324—158 P **4 Claims**



4. An electrical contact testing spring probe for insertion in a test fixture and comprising:
(a) an elongate, cylindrical barrel having first and second ends, with said second end including means for connection to an electrical conductor;
(b) a probe assembly inserted into said receptacle and including:

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(i) a cylindrical barrel inserted within said receptacle and having an open end and a closed end so that said barrel open end is spaced inwardly of said receptacle first end with said receptacle extending axially beyond said barrel;

(ii) a probe shaft extensibly protruding from said barrel and having: a plunger shaft protruding from said receptacle first end and terminating in a contact tip; said plunger shaft being of a diameter substantially the same as the inside diameter of said receptacle for secure, sliding travel therethrough; a shaft head at an opposite termination of said plunger shaft and means trapping said shaft head within said barrel; and a reduced diameter portion of said probe shaft extending outwardly of said barrel open end and joined to said plunger shaft;

(iii) a spring received within said barrel and extending between said probe shaft head and said barrel closed end and urging said probe shaft outwardly;

(c) whereby said plunger shaft is slidably support by said receptacle for pointing accuracy.

4,783,625

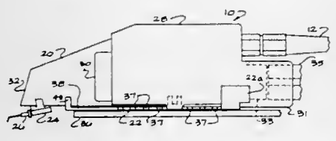
WIDEBAND HIGH IMPEDANCE CARD MOUNTABLE PROBE

Emory J. Harry, Aloha, Oreg.; Matthew J. Hadwin, Battleground, and John D. Garcia, Vancouver, both of Wash., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 898,477, Aug. 21, 1986. This application Mar. 14, 1988, Ser. No. 170,606

Int. Cl.[4] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **4 Claims**



1. A high impedance wideband probe for an electronic test instrument comprising:

(a) a rigid thin supporting substrate having an electrical circuit imprinted thereon for providing said probe with a high input impedance;

(b) a probe card;

(c) a clip mounted to said probe card, said clip including a flanged portion resting on said probe card and an upright support portion, said upright support portion extending at a right angle to said flanged portion for holding said substrate in a substantially vertical orientation relative to said probe card, wherein said flanged portion includes mounting lugs for attachment to said probe card; and

(d) probe tip means, disposed at a forward end of said substrate, connected electrically to said circuit, for making electrical contact with the device under test and including a probe tip receptacle for receiving a selectively replaceable probe tip.

4,783,626

DISPLACEMENT DETECTOR WITH THREE SECONDARY COILS, ONE OF WHICH PROVIDES A CONSTANT BIAS OUTPUT

Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1987, Ser. No. 27,590

Claims priority, application Japan, Mar. 18, 1986, 61-59816

Int. Cl.[4] G01B *7/14;* **G08C** *19/08;* **B62D** *5/04*

U.S. Cl. 324—208 **11 Claims**

1. A displacement detector comprising:

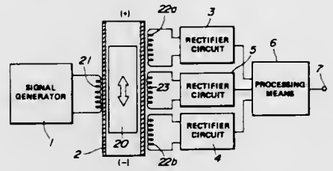
a movable member of a magnetic material movable as a function of the displacement of an object which is to be detected;

an AC signal source;

a primary coil energizable by an AC signal supplied by said AC signal source for producing a magnetic field oriented along the path in which said movable member is movable;

secondary coils located in at least two positions, respectively, spaced along and disposed around the path of movement of said movable member, whereby currents are inducted through said secondary coils dependent on the movement of said movable member under the magnetic field produced by said primary coil;

a third coil located within a range of movement of said movable member, whereby a constant current is induced



through said third coil irrespective of the movement of said movable member;

first, second, and third rectifier circuits connected respectively to said secondary coils and said third coil, whereby the respective induced currents are rectified as the respective rectified outputs;

a processing circuit for processing the respective rectified outputs supplied from said first and second rectifier circuits along with a rectified constant bias output supplied from said third rectifier circuit to provide an output signal indicative of the displacement of said object, wherein the difference between the respective rectified outputs is of a large magnitude while the absolute average value of said output signal is of a low magnitude.

4,783,627

APPARATUS FOR DETECTING THE ROTATIONAL POSITION OF THE CRANKSHAFT OF AN INTERNAL COMBUSTION ENGINE

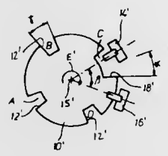
Ernst-Olav Pagel, Boehmfeld; Wilhelm Bois, Gaimersheim, and Peter Duba, Wettstetten, all of Fed. Rep. of Germany, assignors to Audi AG., Ingolstadt, Fed. Rep. of Germany

Filed Jan. 27, 1987, Ser. No. 6,998

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602292

Int. Cl.[4] G01B *7/30;* **F02P** *7/06*

U.S. Cl. 324—208 **13 Claims**



1. Apparatus for detecting the rotational position of the crank shaft in an internal combustion engine having a plurality of cylinders, comprising:

trigger wheel means mounted for rotation at a speed proportional to the rotation of said crank shaft;

a plurality of marker means and an additional reference means respectively associated with one of said cylinders and provided on said trigger wheel means at predetermined spacings from each other for movement therewith, each of said marker means being of a first length and said reference means being of a second length greater than said first length, said first and second lengths relating to predetermined angular displacements of said crank shaft;

first sensing means responsive to said marker means and said reference means during movement of said trigger means for providing first marker means signals and first reference means signals;

second sensing means positioned from said first sensing means by a distance less than said predetermined spacings and less than said second length and responsive to said marker means and said reference means during movement of said trigger wheel means for providing second marker means signals and second reference means signals identical to but out of phase with said first marker means signals and reference means signals; and

signal processing means comprising first and second input terminals connected to said first and second sensing means, respectively, a first output terminal for passing said first marker means signal from said first sensing means, means for combining said first and second reference means signals, and a second output terminal for passing said combined reference means signal from said combining means.

4,783,628

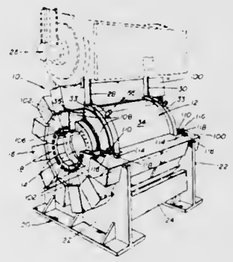
UNITARY SUPERCONDUCTING ELECTROMAGNET

Frederick R. Huson, The Woodlands, Tex., assignor to Houston Area Research Center, The Woodlands, Tex.

Filed Aug. 14, 1987, Ser. No. 85,649

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—320 **25 Claims**



1. A unitary superconducting electromagnetic structure particularly adapted for use with magnetic field intensities greater than the magnetic saturation of iron and comprising:

an inner generally cylindricl elongate body having dimensions conforming generally to a magnetic field and defining a central bore therethrough for receiving objects to utilize the magnetic field, said inner body having inner and outer concentric shells and containing a plurality of coils arranged in a circular pattern between said inner and outer concentric shells about the magnetic field and positioned generally symmetrically to said inner body, said coils being formed of superconducting wire and adapted for utilization with different predetermined electrical currents; and

a passive magnetic field control means which functions at magnetic field intensities below, at and substantially above the magnetic saturation level of iron utilized in said control means, said control means comprising

an outer magnetic iron body extending about said inner body and about that portion of said magnetic field existing at least within the central bore, and aiding in providing a desired shape and intensity of the magnetic field,

said magnetic iron body providing a passive containment means which functions substantially to shape said magnetic field produced by said electromagnet so as substantially to confine said magnetic field generated by said electromagnet during operation of said electromagnet to the region enclosed by said outer magnetic iron body, and further providing a closed magnetic path for redirecting the magnetic field for increasing the intensity of the magnetic field at magnetic field intensities substantially above the saturation of the magnetic iron in said outer magnetic iron body.

4,783,629

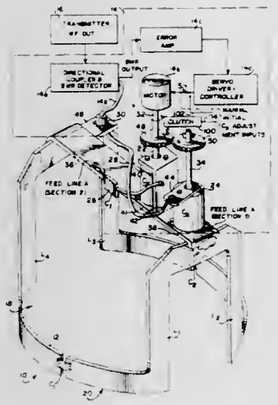
RF COIL FOR MRI WITH SELF-TRACKING GANGED COUPLING CAPACITORS

Mitsuaki Arakawa, Hillsborough, and Lawrence E. Crooks, Richmond, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 7, 1987, Ser. No. 105,737

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—322 **12 Claims**



1. Magnetic resonance imaging apparatus including:

an RF coil extending axially and circumferentially about a volume to be imaged, said coil having an open end through which objects to be imaged may be inserted;

a source and/or detector of fixed-frequency RF signals; and

a matching network, connected between said source/detector and said coil, for coupling said RF signals between said coil and said source/detector, for tuning out the inductive reactance of said coil, and for matching the impedance of said coil with the impedance of said source/detector, said matching network including adjusting means for adjusting the ratio of a capacitance in series with said coil to a capacitance in parallel with said coil while keeping the sum of said series and parallel capacitances substantially constant.

4,783,630

METAL DETECTOR WITH CIRCUITS FOR AUTOMATICALLY SCREENING OUT THE EFFECTS OF OFFSET AND MINERALIZED GROUND

Donald K. Shoemaker, Sweet Home, Oreg., assignor to White's Electronics, Inc., Sweet Home, Oreg.

Filed Mar. 27, 1986, Ser. No. 844,797

Int. Cl.[4] G01V *3/11;* **G01R** *33/00*

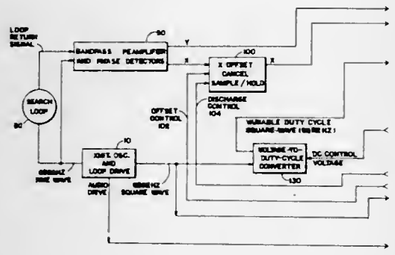
U.S. Cl. 324—329 **6 Claims**

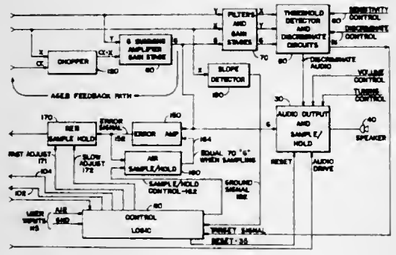
1. In an induction balance transmit/receive type of portable

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metal detector having an oscillator, a search head with a transmit coil driven by said oscillator to produce a magnetic field and a receive coil producing as an output a loop return signal responsive to changes in said magnetic field caused by the nearby environment, a pair of phase detectors receiving said loop return signal and producing a pair of component signals in quadrature, means for adding said component signals together to produce a phase detection signal, and indicator means responsive to the amplitude of said phase detector signal, the improvement comprising:

(a) air balance circuit means, responsive to said phase detector signal when said search head is held away and remote from the ground, for automatically adjusting said phase detection signal level so as to cancel out offsets occurring in said loop return signal;





(b) static ground balance circuit means for screening out on a one-time, user-actuatable basis ground effects, said ground effects being the effects on said loop return signal of the mineralization content of the ground in the vicinity of said metal detector;

(c) dynamic ground balance circuit means for screening out on a continuing, repetitive basis said ground effects; and

(d) user-selectable switch means for transferring said metal detector being two modes of operation, the first mode utilizing said air balance circuit means to adjust said phase detection signal to an air balance level of said detector, and the second mode utilizing said static and said dynamic ground balance circuit means to provide a screening out from said phase detection signal of said ground effects.

4,783,631

APPARATUS FOR DETECTING DISCONNECTION OF A SPEED SENSOR AND ELIMINATING OXIDE FILM FROM THE SENSOR'S CONNECTORS

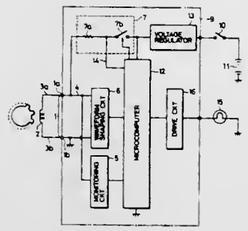
Noriyuki Nakashima, Nagoya; Kimio Tamura, Anjo; Nobuhiko Makino, Kariya, and Kunimi Masuto, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 13, 1986, Ser. No. 896,006

Claims priority, application Japan, Aug. 16, 1985, 60-180194

Int. Cl.[4] G01R *31/04*; G01P *3/00*

U.S. Cl. 324—538 **9 Claims**



1. An apparatus for detecting a disconnection of a sensor which is connected through a connector, comprising:

a microcomputer; first means, coupled to a signal-carrying line receiving an output signal of said sensor through said connector, for detecting in combination with said microcomputer, a presence or absence of said output signal of said sensor;

second means coupled to said signal-carrying line, for causing a large current to flow through said connector to said sensor for a predetermined time period, in combination with said microcomputer and in response to said absence of said output signal of said sensor, said large current being greater than a current of said output signal of said sensor, and of a magnitude to cause elimination of an oxide film produced on said connector; and

third means, coupled to said signal-carrying line, for monitoring a signal in said signal-carrying line and determining, in combination with said microcomputer, a disconnection of said sensor in accordance with the result of said monitoring.

4,783,632

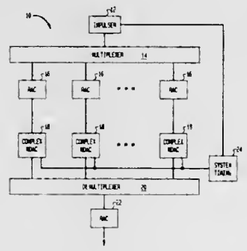
MULTI-ARM FREQUENCY SWEEP GENERATOR

Rex J. Crookshanks, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 3, 1986, Ser. No. 881,742

Int. Cl.[4] H03B *1/04, 23/00*

U.S. Cl. 328—103 **7 Claims**



1. A frequency sweep generator comprising:

a source of a series of pulses;

plural dispersion means for introducing delays into a pulse as a function of frequency to produce a frequency sweep which includes at least some deviations from a desired, preselected frequency sweep;

means for distributing said pulses among said plural dispersion means;

sweep correction means associated with each dispersion means for applying predetermined corrections to the output of the associated dispersion means to correct the deviations in the frequency sweep produced by said plural disperion means whereby to obtain said desired frequency sweep; and

summing means for combining the outputs of said plural dispersion means.

4,783,633

PULSE-EDGE COINCIDENCE DETECTOR AND USE OF SAME FOR SELECTING A SAMPLING SIGNAL

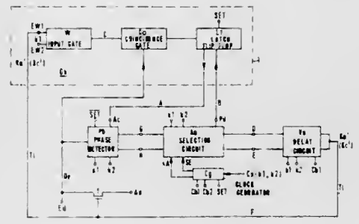
Brian Woods, Denzlingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 19, 1987, Ser. No. 51,432

Claims priority, application European Pat. Off., May 23, 1986, 86107040.7

Int. Cl.[4] H03K *5/22, 5/00, 19/20*

U.S. Cl. 328—110 **10 Claims**



1. An integrable circuit arrangement for use with a data signal and with sampling signals present on a clock line, said data signal and said sampling signals comprising pulses having rising edges and falling edges that define said pulses, said integrable circuit deriving coincidence pulses on coincidences of said falling edges of said pulses of said data signal with said falling edges of pulses of said sampling signals, said sampling signals derived from a two-phase system clock for the purpose of controlling a digital data processing system, said integrable circuit arrangement comprising:

an input gate comprising a first NOR gate and a second NOR gate, each of said first and said second NOR gates introducing a respective delay to signals gated therethrough, said first and second NOR gates being cross-coupled, a first input of said input gate being connected to a clock line to receive a first sampling signal and a second sampling signal and a second input of said input gate being supplied with a first clock signal of a two-phase system clock, the delay introduced by said first NOR gate being longer than the delay introduced by said second NOR gate,

the output of said second NOR gate being coupled to a first input of a three-input third NOR gate through an inverter, a second input of said third NOR gate being supplied with a data signal, and a third input of said third NOR gate being connected to an output of an inverting delay element, said inverting delay element having an input supplied with said data signal.

4,783,634

SUPERCONDUCTING SYNCHROTRON ORBITAL RADIATION APPARATUS

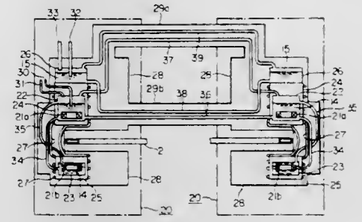
Yuuichi Yamamoto, Kobe; Masatami Iwamoto, Amagasaki; Tadatoshi Yamada, Amagasaki, and Akinori Ohara, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 25, 1987, Ser. No. 18,394

Claims priority, application Japan, Feb. 27, 1986, 61-43838; May 14, 1986, 61-71274[U]; May 14, 1986, 61-71275[U]

Int. Cl.[4] H05H *13/04*

U.S. Cl. 328—235 **10 Claims**



1. A superconducting synchrotron orbital radiation (SOR) apparatus comprising:

a loop-shpaed vacuum chamber through which charged particles pass;

convergence means for making said charged particles converge as they pass through said vacuum chamber;

acceleration means for accelerating said charged particles within said vacuum chamber;

a plurality of deflecting electromagnets, each including a first and a second superconducting coil disposed so as to confront one another from opposite sides of said vacuum chamber and a first and second helium tank containing liquid helium in which said first and second superconducting coils, respectively, are immersed, said first helium tank of one of said deflecting electromagnets having a liquid helium supply port through which liquid helium can be charged and a helium gas exhaust port through which helium gas can be removed;

liquid helium connecting means including pipes connected between said helium tanks for connecting all of said helium tanks so that liquid helium can flow from said first helium tank which is equipped with said supply port and said exhaust port to all other helium tanks; and

helium gas connecting means including pipes connected between said helium tanks for connecting all of said helium tanks so that helium gas can flow from the other helium tanks to said first helium tank which is equipped with said supply port and said exhaust port.

4,783,635

LOW PASS FILTER CIRCUIT

Nello Sevastopoulos, San Jose, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Sep. 22, 1986, Ser. No. 909,973

Int. Cl.[4] H03F *1/34*

U.S. Cl. 330—107 **4 Claims**

1. A low pass filter circuit for filtering out high frequency AC components from an electric signal including a DC component and possibly low frequency AC components, said circuit comprising:

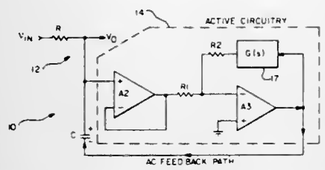
(a) first circuit means, free of any active elements, for receiving said signal at an input and passing said entire DC component and any low frequency AC components present in the signal to an output; and

(b) second circuit means and means for connecting said second circuit means with said first circuit means, said

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second circuit means including at least some active components acting on said electric signal for preventing high frequency components of said signal from reaching said output, said second circuit means cooperating with said first circuit means so that the operation of its active elements does not act on the DC component of said signal and therefore does not affect the amplitude of the DC component of the signal as it appears at the output;

(c) said connecting means consisting of means for AC coupling and said second circuit means with said first circuit means for isolating the input of said second circuit means from said DC component, whereby the DC component amplitude can be greater than the ratings of the elements



of said second circuit means without damaging the last mentioned elements;

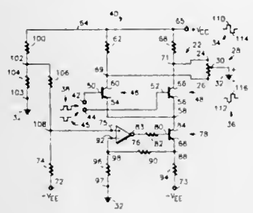
(d) said second means including means for maintaining the amplitude of any low frequency AC components of said signals at said output substantially equal to the amplitude of said DC component while filtering out the high frequency components over a predetermined, relatively narrow roll-off band, said amplitude maintaining means including a feedback network having means including a feedback network having means defining a predetermined transfer function G(s) for providing said predetermined roll-off band, said transfer function being of the fourth order and said roll-off band being of the fifth order.

4,783,636

AMPLIFIERS PROVIDING BALANCED OUTPUT SIGNALS

Charles Gerston, and Edmund C. Golbeck, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 2, 1987, Ser. No. 103,880
Int. Cl.[4] H03F *3/45, 3/04*
U.S. Cl. 330—252 **11 Claims**



1. An amplifier circuit having an electron control means for providing a constant magnitude signal in response to a drive signal, said electron control means being adapted to receive a first power supply potential which has a varying magnitude that tends to change the drive signal, the amplifier circuit providing an output signal having a magnitude which tends to be adversely effected by variations in the magnitude of the constant magnitude signal, wherein the improvement comprises:

amplifying means having an inverting input terminal and an output terminal, said amplifying means inverting control signals applied to said inverting input terminal thereof and providing these inverted signals at the output terminal thereof, said output terminal being coupled to the electron control means;

feedback means coupled between the electron control means and said inverting input terminal of said amplifying means, said feedback means being further adapted to couple a control signal which varies with the first power supply potential to said inverting input terminal of said amplifying means; and

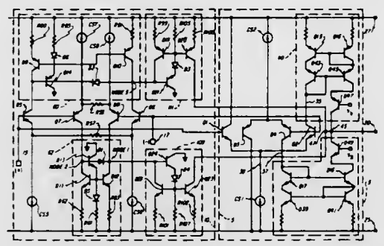
said amplifying means being responsive to said control signals applied thereto through said feedback means to increase the drive to the electron control means in response to variations in the first power supply potential which tend to decrease the drive to the electron control means and to decrease the drive to the electron control means in response to variations in the first power supply potential which tend to increase the drive to the electron control means so that the electron control means provides the constant magnitude signal while being subjected to the variations in the magnitude of the first power supply potential so that the output signal of the amplifier is not adversely effected by the variation of the first power supply potential.

4,783,637

FRONT END STAGE OF AN OPERATIONAL AMPLIFIER

Gerald M. Cotreau, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation-in-part of Ser. No. 782,690, Oct. 1, 1985, Pat. No. 4,636,743. This application Oct. 7, 1986, Ser. No. 917,441
Int. Cl.[4] H03F *3/45, 3/68*
U.S. Cl. 330—295 **16 Claims**



1. In an amplifier circuit having an input and output stage, said circuit comprising:

a small signal stage arranged in said input stage and having a transconductance for providing an output current in response to a small signal differential input voltage;

a large signal stage arranged in said input stage and connected electrically in parallel with said small signal stage for providing additional current when said differential input voltage reaches a selected threshold, said large signal stage having a transconductance which is substantially the same in magnitude as the transconductance of said small signal stage; and

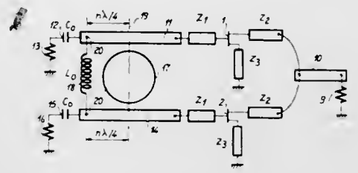
summing means coupled between the outputs of said small signal stage and said large signal stage for providing a combined output current to said output stage of said amplifier circuit.

4,783,638

FREQUENCY DOUBLING OSCILLATOR WORKING AT ULTRA-HIGH FREQUENCIES

Marguise Mamodaly; Pascal Colin, both of Paris; Alain Bert, Gif Sur Yvette, and Juan Obregon, Taurion, all of France, assignors to Thomson-CSF, Paris, France

Filed Jun. 10, 1987, Ser. No. 60,162
Claims priority, application France, Jun. 13, 1986, 86 08584
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—99 **6 Claims**



1. A Frequency-doubling oscillator, working at ultra-high frequencies, comprising:

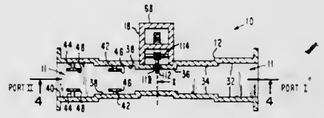
two field-effect transistors in a push-push assembly, working in parallel, with their source and drain electrodes connected to impedances, the working load being connected to a point common to the impedances of the output electrodes of both transistors, the gate of each transistor being connected, by an impedance, to a first end of a microstrip line, the second end of which is grounded by a resistor, a dielectric resonator being placed between the two microstrip lines at a point such that oscillation is obtained; wherein, in order to reduce the low-frequency noise in the load near the main frequency, known as the carrier frequency, the noise sources attributable to the transistors are isulated from the ground for direct current and loaded with a low-frequency impedance of infinite value by two high-value capacitances, each of these two capacitances being interposed between the second end of a microstrip line and its grounding resistor.

4,783,639

WIDEBAND MICROWAVE DIPLEXER INCLUDING BAND PASS AND BAND STOP RESONATORS

Thomas Hudspeth, Malibu, and Fritz Steinberg, Culver City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 21, 1985, Ser. No. 800,241
Int. Cl.[4] H03H *7/46*
U.S. Cl. 333—126 **20 Claims**



2. A microwave diplexer comprising:

a waveguide section characterized by a longitudinal dimension and having a substantially rectangular cross-section, said waveguide section including opposed parallel broad walls and opposed parallel narrow walls and defining first and second longitudinally spaced ports for propagating microwave power substantially within a first lower frequency band between said first port and said second port;

coupling resonator means disposed between said first and second ports for coupling microwave power substantially within a second higher frequency band between said waveguide section and a coaxial transmission line;

a portion of said waveguide section adjacent to said coupling resonator means defining a reduced height section having a reduced spacing between said broad walls, said spaced being substantially less than that required for propagation of selected unwanted modes of microwave power in the second frequency band; and

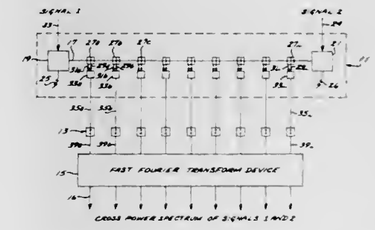
band stop filter means adjacent said second port for substnatially preventing microwave power substantially within the second higher frequency band from propagating to said second port.

4,783,640

SIMULTANEOUS-DELAY CORRELATOR APPARATUS

Samuel C. Reynolds, Hawthorne, and Donald C. D. Chang, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 28, 1987, Ser. No. 138,541
Int. Cl.[4] H01P *9/00, 5/12;* **H03P** *15/00*
U.S. Cl. 333—156 **6 Claims**



1. Autocorrelation apparatus for operating on a time-varying input signal, comprising:

a transmission line having a first input terminal at one end, a second input terminal at an opposite end, and a plurality of taps at spaced locations along its length;

means for connecting a time-varying input signal to both the first input terminal and the second input terminal of the transmission line, such that the signal propagates simultaneously in opposite directions along the line, from the first terminal to the second terminal and from the second terminal to the first terminal;

wherein each of the plurality of taps along the transmission line outputs predetermined fractions of both the input signal propagating from the first input terminal and the input signal propagating from the second input terminal, each delayed by a separate predetermined amount; and

correlation means for correlating the two delayed signals output by each of the plurality of taps, to produce a plurality of correlation signals representing an autocorrelation of the input signal.

4,783,641

NMR RADIO FREQUECNY FIELD COIL WITH DISTRIBUTED CURRENT

Cecil E. Hayes, Wauwatosa; Thomas K. F. Foo; William H. Perman, both of Madison, all of Wis.; Paul R. Moran, Winston-Salem, N.C., and Paul A. Bottomley, Clifton Park, N.Y., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 13, 1987, Ser. No. 84,774
Int. Cl.[4] H01P *7/00;* **G01R** *33/20*
U.S. Cl. 333—219 **14 Claims**

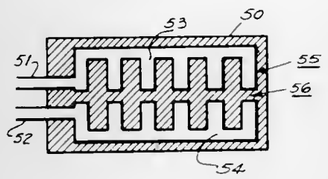
1. An RF surface coil apparatus comprising:

a plurality of mutually disposed, non-closed inductive line elements;

a plurality of non-closed capacitive line elements joining said inductive line elements; and

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input/output means coupled across one of said capacitive line elements;



said coil being operable in both of at least either a first order resonant mode or a second order resonant mode to carry a spatial current distribution approximating a uniform distribution having amplitudes of a standard wave.

4,783,642

HYBRID INTEGRATED CIRCUIT SUBSTRATE AND METHOD OF MANUFACTURING THE SAME

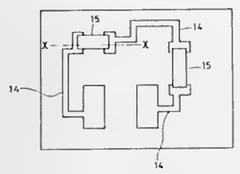
Mitsuyuki Takada; Yoshiyuki Morihiro, and Hayato Takasago, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 636,675, Aug. 1, 1984, Pat. No. 4,685,203. This application May 13, 1987, Ser. No. 49,261

Claims priority, application Japan, Sep. 13, 1983, 58-169702; Sep. 13, 1983, 58-169703

Int. Cl.⁴ H01C *1/012*

U.S. Cl. 338—309 **7 Claims**



1. A hybrid integrated circuit substrate comprising:
an insulating substrate;
resistors formed on predetermined positions of the upper surface of said insulating substrate;
activation layers formed in predetermined positions on the upper surface of said insulating substrate to be in contact with ends of said resistors; and
conductor layers formed on predetermined positions of the upper surfaces of said activation layers to be electrically connected with the ends of said resistors.

4,783,643

IMPEDANCE TRANSFORMING CIRCUIT FOR MULTIBIT PARALLEL DIGITAL CIRCUITS

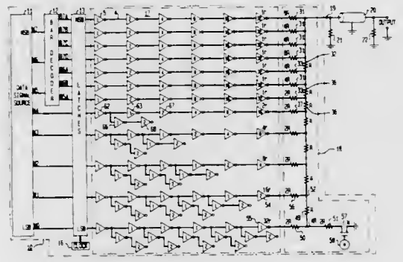
Andrew G. F. Dingwall, Princeton Township, Mercer County, N.J., assignor to GE Company, Fairfield, Conn.

Filed Oct. 5, 1987, Ser. No. 104,405

Int. Cl.⁴ H03M *1/06*

U.S. Cl. 341—154 **13 Claims**

1. An impedance transforming circuit for multibit digital word signals in separate transmission paths and comprising:
an input connection circuit of a first output impedance for each of said bit transmission paths;
an output connection circuit to which said paths each presents a second, much lower, output impedance;
in each of said transmission paths, a chain of tandem connected electrical switches the states of which are controlled by the binary signal state of a digital signal applied thereto in such path;
means for coupling said chains of switches between said input connection circuit and said output connection circuit;
each of said chains includes an equal number of said switches in its tandem connected switch, transmission path for



transmitting signals with substantially the same propagation delay; and
said tandem connected switches of said each chain have the real portions of their switch output impedances substantially uniformly scaled along such chain to accomplish said impedance transformation between said first and second output impedances.

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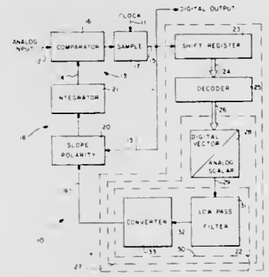
CONTINUOUSLY VARIABLE SLOPE DELTA MODULATION USING DIGITAL VECTOR FOR SLOPE CONTROL

Martin F. Kilcbsperger, Islington, Canada, assignor to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 722,242, Apr. 11, 1985, abandoned. This application Aug. 7, 1987, Ser. No. 83,872

Int. Cl.⁴ H03M *3/02*

U.S. Cl. 341—166 **7 Claims**



1. An apparatus responsive to a clock signal having serial clock cycles for digital encoding of a first analog signal, comprising:
comparator means for comparing the first analog signal to a reconstructed analog signal and generating, during clock cycles, digital outputs having a first value when the analog signal is greater than the reconstructed first analog signal and a second value when the first analog signal is less than the reconstructed analog signal;
integrating means, responsive to a slope control signal and the digital outputs, for generating the reconstructed analog signal; and
slope control means, responsive to the digital outputs, for generating the slope control signal in a given clock cycle, including
means, responsive to n digital outputs B_i, for i = 1 to n, in serial clock cycles, for generating a m-dimensional digital vector signal, where n and m are integers greater than one, and where said m-dimensional digital vector signal is defined as C_j, for j = 1 to (n − m), wher C_j is true when B_1 through B_{m+j} are equivalent, and n − 2 is greater than or equal to m, and
means, responsive to the m-dimensional digital vector signal, for generating the slope control signal for the given clock cycle, including
means for storing an m-dimensional weighting vector;
means for generating a scalar product signal indicating a scalar product of said m-dimensional digital vector signal and said m-dimensional weighting vector during the given clock cycle, and
filter means for low pass filtering the scalar product signal to generate a filtered scalar product signal, and
converter means for logarithmically converting the filtered scalar product signal to generate the slope control signal.

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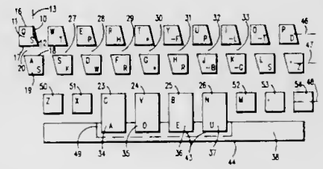
QUASI-STENO KEYBOARD FOR TEXT ENTRY INTO A COMPUTER

Eric Goldwasser, and Dorothy Goldwasser, both of 993 Barberry Rd., Yorktown Heights, N.Y. 10598

Filed Apr. 2, 1985, Ser. No. 719,060

Int. Cl.⁴ H04L *1/00*

U.S. Cl. 340—365 R **20 Claims**



1. In apparatus for entering text into a computer, comprising a standard "QWERTY" keyboard having a plurality of keys arranged in at least three parallel rows, there being at least ten keys in a first row, at least ten keys in a second row and at least seven keys in a third row, said first, second and third rows being oriented successively closer to the position of the keyboard user,
the improvement wherein the tops of said keys in said first and second rows are substantially coplanar and the tops of at least four keys in said third row are coplanar and are lower than said tops of the keys in said first and second rows,
whereby the configuration of keys corresponds both to a standard "QWERTY" keyboard and to a standard stenotyping keyboard, whereby said keys in said first and second rows may be actuated by fingers, either individually or by pressing plural keys together, and said four keys in said third row may be actuated either by thumbs or fingers.

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STOLEN ARTICLE DETECTION TAG SHEET, AND METHOD FOR MANUFACTURING THE SAME

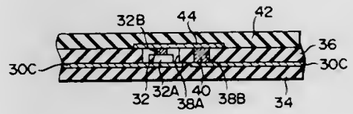
Kazuhiro Matsuzaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 4, 1987, Ser. No. 21,701

Claims priority, application Japan, Mar. 7, 1986, 61-49911; Aug. 12, 1986, 61-189010

Int. Cl.⁴ G08B *13/18*

U.S. Cl. 340—572 **16 Claims**



1. A stolen article detection tag sheet comprising:
an insulating body having a through-hole section;
a first conductive pattern formed in said insulation body and including a transmitting antenna section, a receiving antenna section, and an inductor section connected in series between said receiving and transmitting antenna sections;
a semiconductor diode chip housed in a through-hole of said through-hole section and having a semiconductor substrate mounted on and electrically connected to a first portion of said inductor section of said conductive pattern and a Schottky barrier electrode formed on the top of said semiconductor substrate; and
a wiring means including a conductive member formed on a second portion of said inductor section for connecting said Schottky barrier electrode to said conductive pattern, thereby causing said semiconductor diode chip and conductive pattern to constitute an LC resonator in cooperation with said wiring means.

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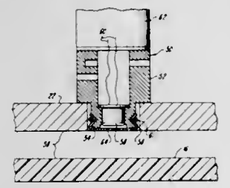
SHEET MATERIAL MANUFACTURING

David F. Wood, Acton, Mass., assignor to Aeonic Systems, Inc., Billerica, Mass.

Filed Dec. 20, 1985, Ser. No. 811,888

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—675 **14 Claims**



1. In a system for monitoring the thickness of a web which includes a signal source assembly and a signal detector assembly arranged to be positioned on opposite sides of said web, the signal source and signal detector assemblies including a pair of generally parallel plates spaced apart from each other and forming a gap through which the web passes, and the system including means for monitoring the temperature of the air in gaps between the signal source and the signal detector assemblies, that improvement comprising:
a thin sheet of material having a low thermal conductivity and a low thermal capacity mounted within or closely adjacent the gap between said web and the plate of one of the signal source and signal detector assemblies and exposed to air within said gap; and,
means arranged for monitoring changes in the temperature of the sheet.

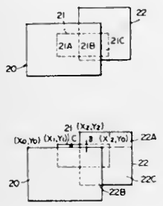
VOL 1096 ISS 2 NO 8 1988 UMI

4,783,648

DISPLAY CONTROL SYSTEM FOR MULTIWINDOW

Nobuyuki Homma, Yokohama, and Masayuki Satta, Kawasaki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,621
Claims priority, application Japan, Jul. 1, 1985, 60-142461
Int. Cl.[4] G06F 3/00
U.S. Cl. 340—724 **9 Claims**



1. A display control method for a multiwindow system in which a plurality of windows are displayed on one display screen at positions such that said windows partially overlap and a display control for each of said windows is executed on the basis of window management data indicative of position, size and display priority of each window, said method comprising the steps of:

generating a command to change the display priority of a first one of said windows;

detecting, on the basis of said window management data, a second window existing at a position where it will be completely covered by at least said first window and will disappear from the screen if the display priority of said first window is changed as instructed by said command;

automatically correcting said window management data for said second window such that at least a part of said second window is displayed at a position where it can be seen on the display screen after the display priority has been changed as instructed by said command;

changing the window management data for said first window in accordance with the display priority instructed by said command subsequent to said detecting step; and

updating the display screen to the state corresponding to said changed window management data.

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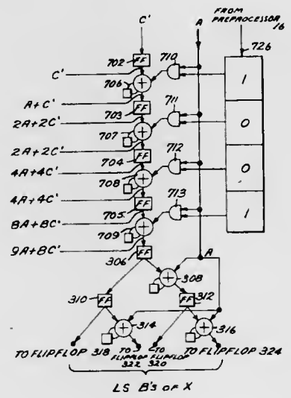
VLSI GRAPHICS DISPLAY IMAGE BUFFER USING LOGIC ENHANCED PIXEL MEMORY CELLS

Henry Fuchs, Pittsboro, and John W. Poulton, Durham, both of N.C., assignors to University of North Carolina, Chapel Hill, N.C.

Filed Aug. 13, 1982, Ser. No. 408,045
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—747 **7 Claims**

1. An image buffer for a graphics display apparatus which displays an image formed from an inputted image description representing a plurality of component surfaces of said image as intensity values of respective pixels, comprising:

a serial multiplier tree circuit for evaluating an expression of the form $AX+BY+C$, where A, B and C are first, second and third coefficient values, respectively, X is a coordinate of a corresponding pixel in a matrix of the pixels of said graphics display apparatus, and Y is another coordinate, perpendicular to X, of the corresponding pixel in the matrix of the pixels of said graphics display apparatus, said expression including representations of respective aspects of each component surface of the inputted image description including representations of at least one of the projection of an inputted component surface, the depth of said inputted component surface with respect to other component surfaces of said image, and the color of said inputted component surface, said tree circuit including: (a) at least one leading multiplier comprising a plurality of respective adders which receive at first and second inputs thereof coefficients B and C, respectively, said leading multiplier producing respective first serial output signals at a plurality of outputs thereof representing an expression $BY+C$, and (b) a plurality of subsequent multipliers respectively connected to respective outputs of said leading multiplier, each subsequent multiplier including a plurality of respective adders which receive a respective first serial output signal from said leading multiplier at a first input and coefficient A at a second input thereof for producing



respective second serial output signals as said expression $AX+BY+C$ at a plurality of outputs thereof; and

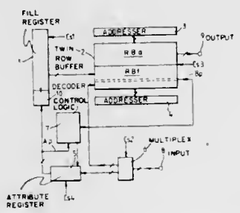
a plurality of memory cells responsive to said respective second serial output signals for determining in parallel, at each cell, the value of said expression $AX+BY+C$ at the positions of the memory cells corresponding to each said pixel, and for selectively storing intensity values of said respective aspects of each component surface of the inputted image description in each cell corresponding to a pixel within the component surface of said inputted image description.

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DATA DISPLAY ARRANGEMENT

Richard E. F. Bugg, Coulsdon, England, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 643,339, Aug. 22, 1984, abandoned. This application Feb. 27, 1987, Ser. No. 21,560
Claims priority, application United Kingdom, Sep. 1, 1983, 8323402
Int. Cl.[4] G09G 1/24
U.S. Cl. 340—748 **4 Claims**



1. A data display apparatus for displaying on the screen of a

raster scan display device data represented by digital codes, the displayed data being composed of discrete characters arranged in character rows each including a number of character positions, said digital codes representing both character data which identifies character shape and attribute data which identifies at least one attribute to be applied to displayed characters, the apparatus comprising:

means for selectively displaying characters with their attributes in accordance with the received data, said selective character display means including attribute converter means for converting attribute data which relates to serial and non-spacing attributes into fully explicit attribute data in respect of each character position, the attribute data for a given character position in a row having one or more items which pertain(s) to the character at that position and to each successive position in said row until either a contradictory attribute is set at a subsequent character position in said row or until the end of said row, said attribute converter means including a row buffer which is connected to receive the character data and which has a capacity for holding the entire character data for all the character positions of a row of characters;

wherein said attribute data, prior to conversion, is in stack-coded form and the capacity of said row buffer is sufficient for additionally holding the explicit attribute data for all the character positions of the row; and

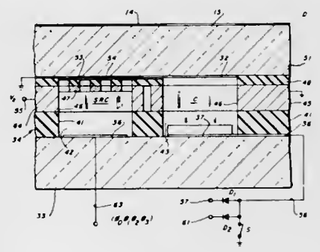
wherein said attribute converter means additionally includes: an attribute register connected to receive the stack-coded attribute data; a fill register which can hold all the explicit attribute data that may be required at a character position; and control logic means which controls said fill register to receive each group of stack-coded attribute data in turn from said attribute register, each item of a group of stack-coded attribute data fed to said fill register from said attribute register including a control bit for signifying whether there is another item of said group still remaining in said attribute register; said control logic means being responsive to the control bit of each item of said group so that when such control bit signifies a remaining item said control logic means causes said fill register to receive a remaining item of said group from said attribute register.

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LINEAR D.C. GAS DISCHARGE DISPLAYS AND ADDRESSING TECHNIQUES THEREFOR

Dieter Fischer, Frankfurt, and Karl-Heinz Vatterott, Duderstadt, both of Fed. Rep. of Germany, assignors to Ta Triumph-Alder Aktiengesellschaft, Nuremburg, Fed. Rep. of Germany

Continuation of Ser. No. 538,323, Oct. 3, 1983, abandoned. This application May 5, 1987, Ser. No. 45,240
Int. Cl.[4] G09G 3/06
U.S. Cl. 340—771 **3 Claims**



1. A display device comprising

two gas discharge spaces defined between two insulating substrates to extend in parallel,

a plurality of shift register electrodes on a first of said insulating sustrates, arranged in sequence in a first of said gas discharge spaces,

a plurality of first thin film resistors on the second of said insulating substrates and extending respectively opposite said shift register electrodes,

an insulating layer on said second insulating substrate with said first thin film resistors, said insulating layer having apertures therein adjacent said first gas discharge space opposite each said shift register electrode and adjacent the second gas discharge space,

a plurality of conducting layers respectively covering said first thin film resistors in said apertures, each said conducting layer extending on said second insulating substrate into the second gas discharge space to provide a respective ignition electrode for said second gas discharge space,

a common electrode layer on said insulating layer and between said insulating layer and first insulating substrate, with apertures in common with said apertures of said insulating layer, said common electrode layer providing two separate common electrodes for said two gas discharge spacers, respectively,

a plurality of second thin film resistors extending on said first insulating substrate adjacent said second gas discharge space opposite respective ones of said ignition electrodes,

a plurality of discharge electrodes in said second gas discharge space on respective ones of said second thin film resistors, for providing a respective plurality of discharge cells with the common electrode of the second gas discharge space,

each said thin film resistor having an end extending on the respective one of said insulating substrates a distance from the respective gas discharge space, and

voltage means for holding said common electrode for said first gas discharge space at a first potential, for holding said end of each first thin film resistor and said common electrode of said second gas discharge space at a second potential, for applying predetermined switch pulses to said shift electrodes, and for applying in common to said ends of said second thin film resistors a serial train of selective video pulses,

wherein said predetermined switch pulses are syncronized with said serial train so that the ignition electrode of each said discharge cell is brought to said second potential when a respective one of said selected video pulses is applied in common to said ends of the second thin film resistors, so that only a respective one of said discharge cells in selected to be ignited for each said selected video pulse.

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RASTER DISPLAY CONTROLLER WITH VARIABLE SPATIAL RESOLUTION AND PIXEL DATA DEPTH

Leon Lumelsky, Stamford, Conn., assignor to International Business Machines Corporation, Armon, N.Y.

Filed Aug. 25, 1986, Ser. No. 900,014
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—801 **12 Claims**

1. A display control apparatus for storing image data representing an image to be displayed and for providing display control data to a display means for displaying said image, said display control apparatus comprising:

storage means for storing said image data in a plurality of storage locations each having K bits;

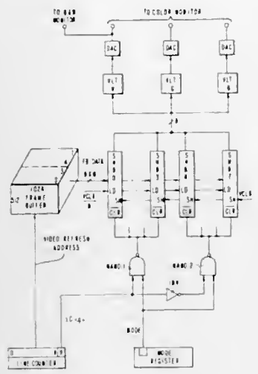
reading means for reading said image data out of said storage means;

translation means for translating said image data into said display control data;

a plurality of shift register means for receiving the image

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data from said storage means and for providing said image data to said translation means when enabled; and



control means for selectively enabling and disabling ones of said shift register means at a rate not exceeding K times per frame in accordance with a desired image resolution.

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LOW DRIVE VOLTAGE DISPLAY DEVICE

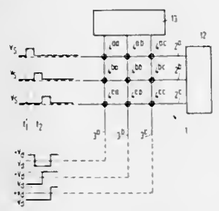
Theodorus L. Welzen, and Adrianus J.S.M. De Vaan, both of Heerlen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 20, 1986, Ser. No. 921,927

Claims priority, application Netherlands, Nov. 4, 1985, 8503007

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—805 **3 Claims**



1. A display device comprising two support plates spaced at a defined distance from each other and having surfaces facing each other between which a layer of liquid crystal material is provided, a pattern of N row electrodes being provided on one surface and a pattern of column electrodes being provided on the other surface, said row electrodes crossing the column electrodes so that the crossover regions form a matrix of display cells which can be switched from a first condition to a second condition optically different therefrom by means of a row-scanning circuit periodically scanning the row electrodes with a row selection pulse of the magnitude V_s, and a column-selection circuit applying data voltages of the magnitude $\pm V_d$ to the column electrodes during a period when a row electrode is scanned such that the optical condition produced in a display cell is determined by the RMS-voltage value across the relevant cell, said RMS-voltage value for the selected display cells, i.e. the display cells in the on-condition, being given by

$$V_1 = \left[\frac{(V_s + V_d)^2}{N} + \frac{(N-1)}{N} V_d^2 \right]^{\frac{1}{2}}$$

and for the non-selected display cells, i.e. the display cells in the off-condition, being given by

$$V_2 = \left[\frac{(V_s - V_d)^2}{N} + \frac{(N-1)}{N} V_d^2 \right]^{\frac{1}{2}}$$

wherein the ratio V1/V2 in the transmission voltage characteristic curve of the optical effect associated with the liquid crystal material is of such a nature that not more then N_{max} row electrodes can be used for a selected contrast ratio between selected and non-selected display cells in accordance with the Alt & Pleshko RMS multiplex drive mode, characterized in that for $N < N_{max}$ the voltage ratio Vs/Vd is defined by the relation:

$$\sqrt{N_{max}} \left[1 - \sqrt{1 - N/N_{max}}\right] \leqq \frac{V_s}{V_d} < \sqrt{N}.$$

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RADIO PAGING SYSTEM CAPABLE OF TRANSMITTING COMMON INFORMATION AND RECEIVER THEREFOR

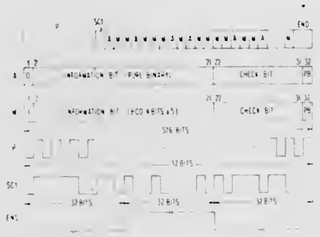
Yoshio Ichikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,642

Claims priority, application Japan, Jan. 14, 1985, 60-4726

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 340—825.44 **11 Claims**



1. A radio paging system comprising:

paging terminal means including an encoder for producing, as an output thereof, one of a first code, followed by a string of address codes and message codes, and a second code followed by a string of information codes, said first and second codes being different from each other and positioned at regular time intervals;

a transmitter for transmitting a signal including the output of said encoder; and

a paging receiver for receiving said transmitted signal, and for establishing signal reception synchronization in response to a portion of said transmitted signal including said one of said first and second codes, said receiver comprising;

means for detecting said first code;

means for comparing said address codes with an address code assigned to said receiver;

means for producing an alarm signal and for displaying said message codes in response to the detection of said first code and the detection of coincidence between said address code and said address code assigned to said receiver;

means for detecting said second code; and

means responsive to detection of said second code for effecting the display of said information codes.

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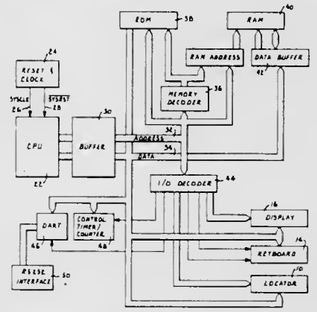
ARTICLE MONITORING SYSTEM WITH PRINTING CAPABILITY

Richard G. Cobb, 605 S. First, Apt #1, Norfolk, Nebr. 68701, and S. Keith Chesterton, Norfolk, Nebr., assignors to Richard G. Cobb, Norfolk, Nebr.

Continuation-in-part of Ser. No. 680,081, Dec. 10, 1984, Pat. No. 4,595,922. This application Mar. 24, 1986, Ser. No. 842,794

Int. Cl.[4] G06F *7/04*; G08B *5/22*

U.S. Cl. 340—825.49 **4 Claims**



1. Apparatus for storing and monitoring articles and maintaining a record of the articles, said apparatus comprising:

a plurality of article holders each holding one article and each having a unique identification code which identifies the article held thereby;

a storage member having a plurality of discrete storage locations for the articles, each storage location having a unique address and each storage location being adapted to receive and store the article holders one at a time;

means for accepting and recording valid user codes assigned to authorized users;

means for polling said storage locations to determine and update the identification code of the article holder at each location

an indicator on said storage member for each storage location, each indicator having an energized condition and a deenergized condition;

means for accepting coded requests corresponding to the identification codes of the article holders when the coded requests are accompanied by a valid user code;

means for energizing the indicator which corresponds to the storage location of each article holder whose identification code corresponds to an accepted coded request, thereby indicating the storage location of the article holder to which each coded request corresponds if the article holder is present on the storage member;

means for recording the user code accepted at the time each article holder is removed from the storage member;

means for displaying the user code accepted at the time an article holder was removed from the storage member if the article holder is not present on the storage member thereby identifying the user responsible for removing the article holder from the storage member;

printing means selectively operable to print a written record of the user codes accepted at the time one or more selected articles were removed from the storage member; and

means for weighing and recording the weight of each article holder before its removal from the storage member and prior to its return to the storage member, thereby recording the weight of material removed from the article holder while it was removed from the storage member.

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INTRA-ORAL CONTROL UNIT AND SYSTEM

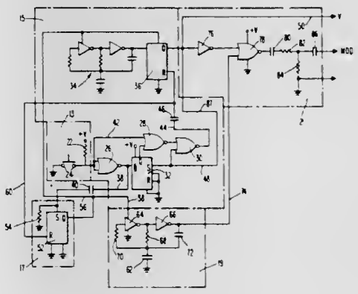
Philip Katz, Princeton Junction, N.J., and Harold Schwartz, King of Prussia, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 771,275, Aug. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 526,699, Aug. 26, 1983, Pat. No. 4,605,927. This application Nov. 4, 1986, Ser. No. 926,875

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.[4] H04B *1/034*; G08B *21/00*; H04Q *9/00*

U.S. Cl. 340—825.190 **6 Claims**



1. An environmental control unit comprising:

an intra-oral power supply;

at least one intra-oral lingually operated switching means, said switching means including

a control means including a timing portion;

a demand power supply;

a first oscillating means, responsive to said demand power supply, for generating a first relatively low frequency modulating signal; and

transmitter enabling means, responsive to both said control means and to said first oscillating means for outputting said modulating signal if said switching means has been continuously activated for a predetermined time; and;

an intra-oral transmitter responsive to said switching means and to said modulating signal for transmitting control signals from the intra-oral cavity of a patient to a position external to said patient.

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PROCESSOR INTERCOMMUNICATION NETWORK

Stanley F. Bouchard, Wappingers Falls; Paul R. Heintz, Poughkeepsie, both of N.Y., and Paul H. Tracy, North Plainfield, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 10, 1986, Ser. No. 828,103

Int. Cl.[4] H04Q *9/00, 11/00*

U.S. Cl. 340—825.520 **4 Claims**

1. A communication network for interconnecting N processors in a mutiprocessing system for transmission of binary encoded orders between any two of the N processors comprising:

a separate multi-line path between each two of the N processors for carrying an order signal in either direction between said each two of the N processors so that there are N−1 paths to and from each of the N processors;

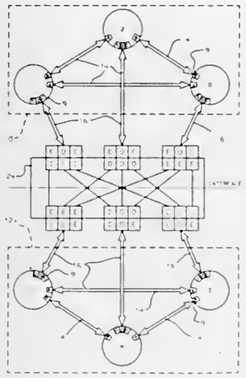
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N identical sending and receiving means, one in each of the N processors, for routing an order through the appropriate path to one of the other N−1 processors, each said sending and receiving means including;

ID means for receiving an M-digit binary address identifying the processor containing the particular sending and receiving means;

order means for receiving a G-digit binary coded order for another processor and an M digit binary address of that other processor;

N−1 terminal means each one connecting the processor containing the sending and receiving means to one of the multi-line paths;



N−1 gate means, one assoicated with each of the N−1 terminal means, for controlling the transfer of the G-digit binary coded order to and from the associated gate means and;

logic means responsive to both the M-digit ID means of a sending processor and the M-digit address of a receiving processor in said other means for generating gate signals to gate only the G-Digit binary coded orders from the processor containing the particular sending and receiving means to the correct one of the N−1 terminals specified by the M binary address of that other processor in the order means and as a function of the M digit binary address in the ID means.

4,783,658

METHOD AND SYSTEM FOR DETECTING ENCODED RADIO SIGNALS

Kinichiro Nakano; Mikio Takeuchi, both of Zama; Takahisa Tomoda, Sagamihara, and Motoki Hirano, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 11, 1986, Ser. No. 895,369
Claims priority, application Japan, Aug. 12, 1985, 60-177293
Int. Cl.[4] H04Q *7/02;* **H04B** *17/00*
U.S. Cl. 340—825.540 **13 Claims**

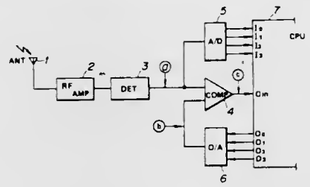
5. A method for detecting an encoded radio signal comprising the steps of:

receiving radio signals and generating an analog signal having a value varying with the amplitude of the received radio signal;

detecting the signal-component amplitude and the noise-component amplitude in the received signal and deriving the difference between said signal-component and noise-component amplitudes;

deriving a threshold value based on said difference between said signal-component and said noise-component amplitudes; and

comparing said analog signal value with said threshold value in order to detect the presence and absence of said encoded radio signal and producing a binary signal varying



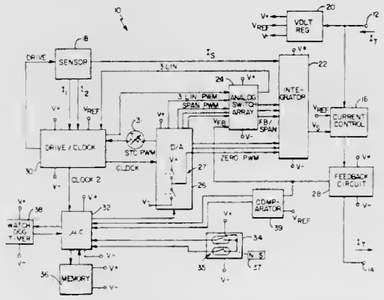
between HIGH and LOW values depending upon the presence and absence of the encoded radio signal.

4,783,659

ANALOG TRANSDUCER CIRCUIT WITH DIGITAL CONTROL

Roger L. Frick, Chanhassen, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation of Ser. No. 899,378, Aug. 22, 1986, abandoned.
This application Dec. 24, 1987, Ser. No. 137,862
Int. Cl.[4] G08C *19/10, 19/12*
U.S. Cl. 340—870.37 **36 Claims**



1. A transmitter for providing an analog output signal representative of a sensed parameter and representative of an input adjustment signal, comprising:

digital means coupled to receive the input adjustment signal for calculating and providing a control signal representative of an adjustment to the analog output signal;

analog means responsive to the sensed parameter for providing the analog output signal as a continuous function of the sensed parameter; and

control means coupled to the analog means and controlled by the control signal for controlling adjustment of the analog output signal by the analog means such that continuity of the analog output signal is undisturbed by calculation in the digital means.

4,783,660

SIGNAL SOURCE DISTORTION COMPENSATOR

John N. Pierce, Lexington, Mass., assignor to Signatron, Inc., Lexington, Mass.

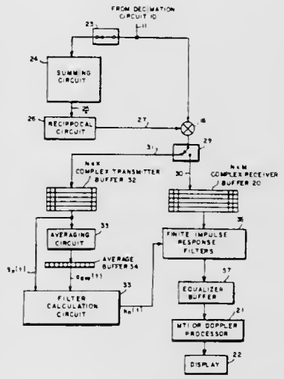
Filed Sep. 29, 1986, Ser. No. 913,072
Int. Cl.[4] G01S *7/30*
U.S. Cl. 342—101 **21 Claims**

1. A signal processing system for use in a transmitter/-receiver system, the transmitter of which includes a transmitter pulse source for providing transmitted pulse signals that may have undesired amplitude, frequency or phase distortions

,which vary from transmitter pulse to transmitter pulse, and the receiver of which receives returned pulse signals which include said distortions, said receiver including:

digitizing means responsive to said transmitted and to said returned pulse signals for providing a sequence of complex digitized samples of said transmitted and returned pulse signals having in-phase and quadrature components thereof;

averaging means responsive to a plurality of sequential transmitted pulse signals, each comprising a plurality of complex digitized samples thereof, for providing an average signal representing the average of said sequential pulse signals;



means responsive to said average signal and to said sequence of complex digitized samples of said plurality of sequential transmitted pulse signals for determining a plurality of filter coefficients for use with the returned pulse signal samples corresponding to said transmitted pulse signal samples;

filter means responsive to a plurality of sequential returned pulse signals, each comprising a plurality of complex digitized samples thereof, and to said plurality of corresponding filter coefficients for providing returned output signals in which said distortions are reduced.

4,783,661

DUAL-BAND CIRCULARLY POLARISED ANTENNA WITH HEMISPHERICAL COVERAGE

Martin S. Smith, Chelmsford, Great Britain, assignor to STC Plc, London, England

Filed Sep. 30, 1987, Ser. No. 102,715
Claims priority, application United Kingdom, Nov. 29, 1986, 8628599
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS **3 Claims**

1. A circularly polarised dual frequency antenna structure comprising:

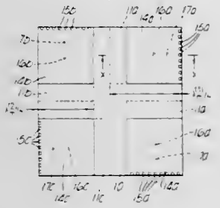
a first microstrip crossed slot antenna composed of four identical rectangular patches of electrically conductive material arranged symmetrically and dimensioned to operate at a first frequency,

a second microstrip crossed slot antenna composed of four identical rectangular patches of electrically conductive material arranged symmetrically and dimensioned to operate at a second, higher frequency,

a conductive ground plane, wherein said first antenna is parallel to and spaced from said ground plane by dielectric material and said second antenna is parallel to and spaced from said first antenna by dielectric material, said second antenna lying atop said first antenna, the slots of said first and second antennae being aligned,

individual coaxial feed means for each of the patches in said first antenna, said feed means for the first antenna having outer conductors electrically connected to the ground plane and inner conductors electrically connected to the respective patches of the first antenna,

individual coaxial feed means for each of the patches in said second antenna, said feed means for the second antenna having outer conductors passing through the ground



plane and electrically connected to both the ground plane and the corresponding patches of the first antenna and inner conductors electrically connected to the respective patches of the second antenna, and

shorting means arranged to short a corresponding one edge of each patch of both first and second antennae to the ground plane, said corresponding edges of the patches of the second antenna being aligned with the corresponding edges of the first antenna, said corresponding edges being remote from the radiating edge defining the crossed slots

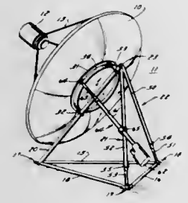
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4,783,662

POLAR MOUNT FOR SATELLITE DISH ANTENNA

Gustav W. Wirth, Jr.; Jerome Dubiel; Robert G. Rowland, and Michael Szabo, all of Cedarburg, Wis., assignors to Delta Satellite Corportion, Cedarburg, Wis.

Filed Feb. 18, 1986, Ser. No. 830,342
Int. Cl.[4] H01Q *1/12*
U.S. Cl. 343—757 **11 Claims**



1. A polar mount for a dish antenna, the dish having a concave side and corresponding convex side on a common axis that is to be selectively directed toward any of a plurality of geostationary satellites in the Clark oribt, said mount comprising:

a plurality of elongated structural members joined together to form a base,

first and second elongated extensible and contractible leg membrs having corresponding nominally lower ends connected to said base in spaced apart relationship and opposite corresponding nominally upper ends connected at a common point, said leg members being pivotable jointly on said base,

a polar axis shaft having a nominally lower end mounted to

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said base in spaced relationship with both of the lower ends of said leg members for all of said lower ends to be arranged in a triangle, and a nominally upper end of said shaft being joined with said upper ends of the leg members at said common point, said polar axis shaft being swingable about a vertical axis to enable the polar axis of the mount to align with the polar axis of the earth and being inclinable to an angle with respect to horizontal corresponding to the degrees of latitude at which the antenna is installed, applying a laterally directed shifting force to said joined leg members and shaft causing one of said leg members to extend and the other to contract to accommodate movement of said shaft in respect to the direction of the pole of the earth,

bearing means and means for mounting said bearing means to said dish on its convex side, said polar axis shaft being journaled in said bearing means such that said dish can rotate on said polar axis shaft through a range of look angles, and

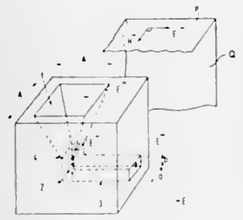
means for locking said leg members in their existing state of extension and contraction when said polar axis shaft is pointed to the true pole of the earth and is inclined at said angle of the latitude.

4,783,663

UNIT MODULES FOR A HIGH-FREQUENCY ANTENNA AND HIGH-FREQUENCY ANTENNA COMPRISING SUCH MODULES

Emmanuel Rammos, Creteil, and Bernard M. Byzery, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,675
Claims priority, application France, Jun. 4, 1985, 85 08399
Int. Cl.[4] H01Q *3/26*
U.S. Cl. 343—778 **9 Claims**



1. A thin unit module for a high-frequency antenna for rectilinearly-polarized waves, said unit module comprising:

(a) four adjacent horns disposed in a frontal portion of the module, said horns having respective rectangular apertures lying in a first common plane and having respective rectangular throats lying in a second common plane parallel to said first common plane;

(b) an internal power divider network disposed in a portion of the module behind the frontal portion and including a plurality of T-shaped power dividers comprising rectangular waveguide sections each extending longitudinally in a direction parallel to the first and second common planes, said power divider network including:

(1) a first T-shaped power divider comprising a base portion and a cross-bar portion, said base portion having a free end for facilitating coupling of signals into or out of the module, and said cross-bar portion having first and second ends;

(2) a second T-shaped power divider comprising a base portion coextensive with the first end of the cross-bar portion of the first T-shaped power divider and comprising a cross-bar portion having two respective ends for coupling to respective first and second ones of the four adjacent horns;

(3) a third T-shaped power divider comprising a base portion coextensive with the second end of the cross-bar portion of the first T-shaped power divider and comprising a cross-bar portion having two respective ends for coupling to respective third and fourth ones of the four adjacent horns;

(c) four elbow-shaped rectangular waveguide sections, each having a first end coupled to the throat of one of the horns and having a second end coextensive with a respective end of one of the cross-bar portions of the second and third T-shaped power dividers;

the length of each of said horns and waveguide sections being dimensioned to effect equalization of the length of respective signal propagation paths between the horn apertures and the free end of the first T-shaped power divider;

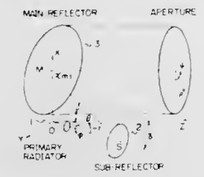
at least one of the waveguide sections including a longitudinally-extending fin disposed on an inner surface of a side of said section.

4,783,664

SHAPED OFFSET-FED DUAL REFLECTOR ANTENNA

Masahiro Karikomi, and Kenichi Kagoshima, both of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,994
Claims priority, application Japan, Feb. 24, 1984, 59-32569
Int. Cl.[4] H01Q *19/14*
U.S. Cl. 343—781 P **6 Claims**



1. A shaped offset-fed dual reflector antenna, comprising:

a main reflector;

a sub-reflector;

a primary radiator;

wherein said sub-reflector and said primary radiator, positioned not to block a wavepath from said main reflector, are determined such that the following conditions are satisfied:

(a) the surface of said main reflector and said sub-reflector are determined so that an optical path length between the phase center of the primary radiator and any pointed on an aperture plane is constant,

(b) the law of reflection at the sub-reflector is satisfied,

(c) the field distribution on an aperture plane of the antenna has axis-symmetry, and

(d) the field distribution has a desired value at any point in the radial direction;

wherein a profile of surface of said sub-reflector and said main reflector is calculated for each slant angle of said primary radiator, where the slant angle is the angle between a line parallel to a boresight axis of the antenna and the axis of said primary radiator, a directional error of the antenna from a boresight axis of a transmission ray from the primary radiator through said sub-reflector and said main reflector is calculated for each slant angle, and said primary radiator is positioned so that it is slanted according to the slant angle which gives a minimum value of said directional error;

wherein the absolute value of the slant angle is in the range between 10° and 40°; and

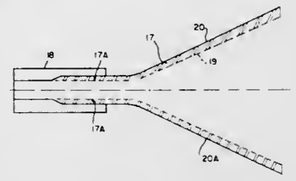
wherein said sub-reflector has a non-quadratic reflector surface.

4,783,665

HYBRID MODE HORN ANTENNAS

Erik Lier, Myrtunet 28B, N-7078 Saupstad, Norge, and Tor Schaug-Pettersen, Dalen Hageby 1, N-7000 Trondheim, Norge, both of Norway

PCT No. PCT/NO86/00022, § 371 Date Nov. 12, 1986, § 102(e) Date Nov. 12, 1986, PCT Pub. No. WO86/05327, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 28, 1986, Ser. No. 931,445
Claims priority, application Norway, Feb. 28, 1985, 850808
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—786 **10 Claims**



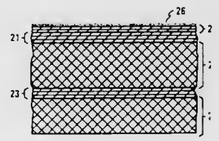
1. An antenna for radiating or receiving polarized electromagnetic waves including a linear portion and an expanding horn-shaped portion, the expanding horn-shaped portion including a wall having at least one grid of electrically conductive material spaced along the horn wall, and a dielectric material having an outer surface situated on the inside of the grid for creating an anisotropically reacting wall, and wherein the at least one grid comprises discontinuous metalized deposits disposed on portions of the outer surface of the dielectric material.

4,783,666

PROTECTIVE SHIELD FOR AN ANTENNA ARRAY

Harry C. Ast, Camillus, and John D. Reale, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed May 21, 1987, Ser. No. 52,728
Int. Cl.[4] H01Q *1/42*
U.S. Cl. 343—872 **6 Claims**



1. A protective shield for an array consisting of a plurality of like dipole elements projecting from a ground plane, said shield having a minimum effect upon the radiation pattern and active impedance of the array, and comprising:

(A) a first layer of a fiberglass reinforced material, teflon filled on one surface to reduce wetting or surface contamination, and resin filled on the other surface, bonded to one surface of a second layer;

(B) a second layer of a fiberglass reinforced resin filled material;

(C) a third layer of foam material having one surface bonded to the other surface of said second layer;

(D) a fourth layer of a fiberglass reinforced resin filled material having one surface bonded to the other surface of said third layer, and

(E) a fifth layer of foam material having one surface bonded to the other surface of said fourth layer, and in substantial contact with said dipole elements when said shield is in position to provide distributed support to said shield, said fifth layer having a thickness that displaces said fourth layer from said dipole elements by the distance that minimizes the mutual coupling between dipole elements by the distance that minimizes the mutual coupling between dipole elements to reduce the affect of the presence or absence of said shield upon the radiation patterns and active impedances of the array.

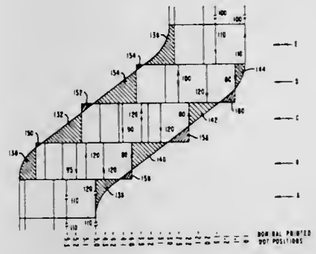
said first, second and fourth layers being thin relative to said third and fifth layers, said layers having thicknesses selected to minimize reflective loss at specified frequency bands.

4,783,667

PRINTING OF ANGLED AND CURVED LINES USING THERMAL DOT MATRIX PRINTER

Ralf M. Brooks, Waterloo, Canada, assignor to NCR Canada LTD - NCR Canada LTEE, Mississauga, Canada

Filed Jul. 17, 1987, Ser. No. 74,796
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **22 Claims**



1. A method for thermal printing of characters having diagonal or curved portions, comprising the following steps:

stepping a thermal printhead having a plurality of individual printhead elements with respect to a record member to be printed upon, taking incremental overlapping steps which are in length a fraction of the length of the printhead elements to minimize voids and staircase corners which would otherwise occur when a diagonal or curved line is printed with said print elements; and

applying varying amounts of energy to each print element as appropriate during each incremental overlapping step to enlarge or reduce the area of the element impression on the record member to further aid in minimizing the occurrence of voids and staircase corners during printing of a diagonal or curved line.

4,783,668

THERMAL PRINTING APPARATUS

Toshinori Takahashi, No. 386-2, Imainaka-Cho, Nakahara-Ku, Kawasaki-Shi, Kanagawa-Ken, and Hideshi Tanaka, No. 15-30, Nagahama, Kanazawa-Ku, Yokohama-Shi, Kanagawa-Ken, both of Japan

Filed Apr. 8, 1986, Ser. No. 849,495
Claims priority, application Japan, Apr. 12, 1985, 60-77761
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—76 PH **7 Claims**

1. A thermal printing apparatus comprising:

an input terminal supplied with an analog picture signal;

analog-to-digital converting means for converting said analog picture signal into a parallel digital gradation datum;

signal generating means for generating a reference compari-

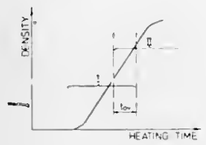
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son datum which has a constant period and successively increases in value;

comparing means comprising n comparators, where n is larger than or equal to two, each of said n comparators comparing said digital gradation datum and said reference comparison datum for producing output signals in accordance with a result of the comparison;

gate means for time divisionally and selectively passing said output signals of said n comparators to produce a serial datum; and

thermal head circuit means supplied with said output serial datum of said gate means;



said thermal head circuit means comprising a thermal printing head and head driving means for controlling application of a constant current to said thermal printing head depending on the output serial datum of said gate means, said thermal printing head comprising n heating elements, one picture element being printed by use of said n heating elements,

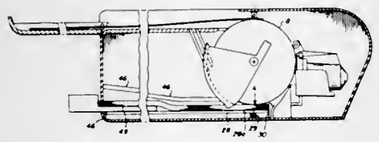
said gate means time divisionally and selectively passing said output signals of said n comparators to said n heating elements so that a time period in which the constant current is applied to one of said n heating elements partly overlaps a time period in which the constant current is applied to another of said n heating elements.

4,783,669

COMPACT PRINTER WITH CASSETTE-DRAWER SHEET FEEDER

Michael J. Piatt, Enon; Scott D. Lehman, and Timothy P. Grayson, both of Dayton, all of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1987, Ser. No. 20,409
Int. Cl.[4] G01D *15/28;* **G03G** *15/00;* **B65H** *1/10*
U.S. Cl. 346—134 **21 Claims**



1. In a compact printer of the type having: (i) a housing, including top, bottom and side walls, and (ii) a feed/transport member rotatably mounted within said housing and adapted to sequentially move sheets from a supply location proximate the bottom wall of said housing, through a print zone and out an egress in the top wall of said housing, a sheet supply station comprising:

(a) drawer means, including a drawer face and a drawer bottom, constructed to support a sheet stack and being sized and mounted for sliding movement in and out of the rear side wall of said printer between: (i) a withdrawn position enabling stack insertion, (ii) a feed position wherein a sheet stack is positioned for sheet feeding and (iii) a closed position wherein the drawer face is approximately flush with said rear side wall;

(b) side guide means, formed on the interior sides of said housing, for engaging and centering a sheet stack supported on said drawer bottom during drawer means movement into said feed position from said withdrawn position; and

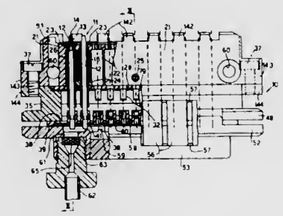
(c) an indexing wall coupled to said housing and located transverse to the drawer path to accurately position a supported sheet stack in the proper feed position beneath said feed/transport member.

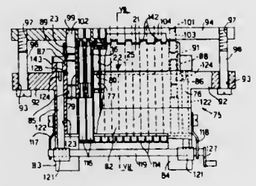
4,783,670

INK JET PRINT HEAD AND MANUFACTURE THEREOF

Renato Conta, Ivrea, and Vincenzo Perucca, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 26, 1987, Ser. No. 19,198
Claims priority, application Italy, Feb. 26, 1986, 67150 A/86
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **13 Claims**





1. A multi-nozzle ink jet print head having a plurality of capillary tubes of substantially rigid material, each one of said capillary tubes terminating at one end with a nozzle for ejecting ink droplets, a plurality of sleeve-type piezoelectric transducers each one fitted on an associated one of said capillary tubes, a hollow body for carrying a first portion of said transducers fitted on said capillary tubes, said first portion being adjacent to said one end and being enclosed in a single resin block capable of holding said transducers in a fixed position with respect to said hollow body, a second portion on each one of said transducers located adjacent the end of each capillary tube opposite said nozzle, and a plurality of pairs of conducting terminals associated with said transducers, each pair being located on the outside surface of said second portion and being electrically connected to a pair of electrically conducting layers provided on the inner surface and the outer surface of said first portion of the associated transducer, wherein the improvement comprises a hollow block for housing said second portion of said transducers outside said resin block, said block being capable of protecting said second portion of the transducers, a flexible printed circuit having a plurality of pairs of electrically conducting areas associated with said pairs of conducting terminals, said printed circuit having a plurality of apertures for being entered by the second portion of said transducers, the areas of each one of said pairs on said printed circuit being located on two opposite edges of a corresponding one of said apertures and being soldered to the associated pair of conducting terminals of the associated transducer, said printed circuit being gripped between said hollow body and said hollow block.

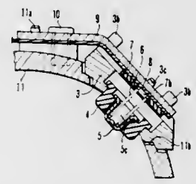
9. Apparatus for manufacturing a multi-nozzle ink jet print head in which each nozzle is carried by a capillary tube of substantially rigid material on which a sleeve-type piezoelectric transducer is fitted, said head comprising a hollow body for carrying the capillary tubes, in which a first portion of the transducers is to be enclosed in a resin for holding the nozzles in a fixed position with respect to the hollow body, a flexible printed circuit having a series of pairs of areas soldered to two conducting terminals disposed on the outside surface of another portion of the transducers, and being gripped between the hollow body and a hollow block protecting the said other portions of the transducers, the body comprising a series of cylindrical seats for the transducers, each seat having a contacting portion substantially in contact with the end of the transducer adjacent the cylindrical seat at the end opposite to the nozzle, the body being provided with a single hole disposed with its axis perpendicular to that of one of the seat substantially in line with the respective communicating conduits, wherein said apparatus comprises a frame (**76**) having reference means (**87**, **88**, **89**, **91**) for positioning the hollow body (**21**), the frame being capable of accommodating a sealing means (**79**) for closing the ends of the seats (**22**) of said hollow body which are opposite to the contact portions (**23**), the sealing means comprising a series of holes (**80**) for accommodating the said other portions (**27**) of the transducers (**16**), a transverse member (**94**) removably fixed to the frame to lock the hollow body to said frame and provided with a series of conical reference holes (**109**) for the end of the capillary tubes (**12**) carrying the nozzles (**14**).

4,783,671

FILM INFORMATION READING DEVICE FOR CAMERA

Shosuke Haraguchi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 18,081
Claims priority, application Japan, Feb. 26, 1986, 61-025661[U]; Feb. 26, 1986, 61-025662[U]
Int. Cl.[4] G03B *7/24*
U.S. Cl. 354—21 **13 Claims**



1. A film information reading device comprising at least one contact member arranged to make contact with a film information pattern formed on an outside peripheral surface of a film cartridge to read out the film information pattern, in which:

(a) said contact member is formed as a cap-shaped member having a contact surface arranged to make contact with said film information pattern, said contact surface having a projection at its end surface, whereby said projection is formed in the shape of an annular projection; and

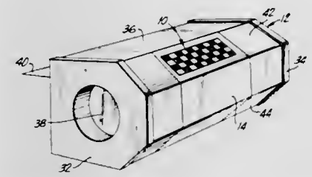
(b) a spring member is arranged to cause the contact surface of said contact member to make contact with said film information pattern.

4,783,672

METHOD AND APPARATUS FOR CODING PHOTOGRAPHIC MATERIALS

John S. Wirtz, Henrietta, and David C. Nellis, Victor, both of N.Y., assignors to Itek Graphix Corp., Waltham, Mass.

Filed Oct. 7, 1987, Ser. No. 105,886
Int. Cl.[4] G03B *7/24*
U.S. Cl. 354—21 **20 Claims**



1. An apparatus for coding photosensitive material comprising:

an optical code pattern disposed on a cassette containing a supply of photosensitive material, said code pattern defining a tertiary code;

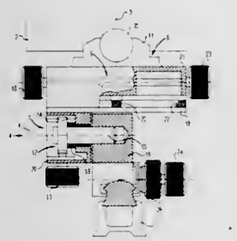
an optical code reading unit associated with a photographic apparatus adapted to receive said cassette, said code reading unit reading said code pattern when said cassette is inserted into said photographic apparatus to determine the type of photosensitive material contained in said cassette.

4,783,673

HOLDING APPARATUS FOR AN IMAGE FRAME OR OBJECTIVE FRAME OF A PROFESSIONAL CAMERA

Philippe Vogt, Frohalp-Str. 85, CH-8038 Zürich, Switzerland

Filed Aug. 13, 1986, Ser. No. 896,608
Claims priority, application Switzerland, Aug. 14, 1985, 03486/85
Int. Cl.[4] G03B *5/02*
U.S. Cl. 354—189 **11 Claims**



1. In a professional camera having a camera base, an objective frame and image frame, and a holding device arranged on the camera base for adjusting independently the objective frame and the image frame about a first and a second swivelling axis intersecting each other at a right angle; said holding device comprising:

a top part and a bottom part shiftable on the camera base;

first swivelling means accommodated in said top part and provided with a first actuating mechanism for adjustment about said first swivelling axis; and

second swivelling means arranged below said first swivelling means for adjustment about said second swivelling axis which extends perpendicular to and in vicinity of said camera base, said second swivelling means including a worm gear with a worm wheel axle mounted in said bottom part in non-rotational manner and rotatably sup-

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porting said top part, said worm wheel axle defining said second swivelling axis, a worm wheel fixedly arranged on said worm wheel axle, and a worm mounted in said top part and meshing with said worm wheel for providing adjustment about said second swivelling axis.

4,783,674

PHOTOGRAPHIC CAMERA WITH BUILT-IN E2PROM

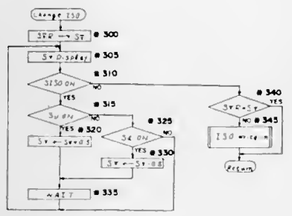
Norio Ishikawa, Osaka; Masaaki Nakai, Kawachinagano; Manabu Inoue, Kobe; Toshihiko Ishimura, Habikino; Hiroshi Ootsuka, and Akihiko Fujino, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 13, 1987, Ser. No. 106,774

Claims priority, application Japan, Oct. 13, 1986, 61-242806; Oct. 13, 1986, 61-242807

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—289.1 **4 Claims**



1. A data rewriting apparatus for a photographic camera, which comprises:

a first manipulating means for selectively setting the camera in a first mode in which change of the film speed is permitted and a second mode in which the change of the film speed is inhibited;

a mode discriminating means for discriminating which one of the first and second modes is set by the first manipulating means;

a first storage means including a random access memory for the storage of the film speed;

a second manipulating means mutually operable for the change of the film speed;

a changing means for changing the film speed when the second manipulating means is operated so long as the mode discriminating means discriminates that the camera is set in the first mode;

a first rewriting means for rewriting a value stored in the first storage means to the film speed changed by the changing means;

a second storage means including an electrically erasable and programmable read only memory for the storage of the film speed; and

a second rewriting means for rewriting a value stored in the second storage means to a value stored in the first storage means when the change from the first mode to the second mode has been discriminated by the mode discriminating means.

4,783,675

IMAGE RECORDING METHOD

Minoru Saito, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1986, Ser. No. 920,011

Claims priority, application Japan, Oct. 18, 1985, 60-233062

Int. Cl.[4] G03C *5/00*

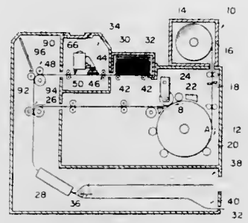
U.S. Cl. 354—303 **21 Claims**

1. An image recording method wherein an image recorded on a thermal developing photosensitive material is transferred to an image-receiving material in the presence of an image forming solvent so as to be formed on the image-receiving material, comprising:

(a) the step of applying said image forming solvent to only the whole or a part of that portion of either said thermal developing potosensitive material or said image-receiving material which is to be laid on the other; and

(b) the step of laying said thermal developing photosensitive material and said image-receiving material one upon the other, thereby effecting said transfer of the image,

whereby by transport means for transporting said thermal developing photosensitive material and/or said image-receiving material can be prevented from being stained with said image forming solvent which might otherwise be applied in surplus;



said application of said image forming solvent is effected by moving an applicator member having water absorbing properties and either said thermal developing photosensitive material of said image-receiving material relative to each other and allowing the former to come in and out of contact with the latter;

(c) the step of inverting either said thermal developing photosensitive material or said image-receiving material, which is coated with said image forming solvent, said inverting step being carried out between said steps (a) and (b),

(d) the step of separating said thermal developing photosensitive material and said image-receiving material from each other, after said step (b).

4,783,676

LENS DRIVE DEVICE FOR A CAMERA

Yoshihiko Aihara, Yokohama; Nobuhiko Shinoda, Tokyo; Etsuro Furutsu, Kawasaki, and Kazuhiro Izukawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 33,080

Claims priority, application Japan, Apr. 3, 1986, 61-77075; Jan. 19, 1987, 62-9443

Int. Cl.[4] G03B *3/00*

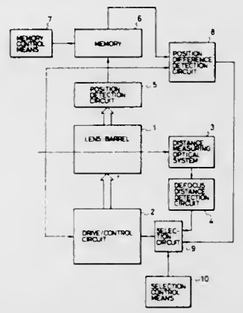
U.S. Cl. 354—400 **13 Claims**

1. An auto-focus camera system for driving a lens of a lens barrel to an in-focus position on the basis of a signal from a focus adjusting circuit, comprising:

(a) setting means for setting arbitrary position information;

(b) a driving circuit operating in a first mode for driving the lens to the in-focus position on the basis of a signal from the focus adjusting circuit, and operating in a second mode for driving the lens to a position in accordance with the position information set by said setting means;

(c) selecting means for manually selecting the modes of said driving circuit; and



(d) speed control means for controlling the driving speed of the lens so that the driving speed of the lens in said second mode is greater than in said first mode.

4,783,677

AUTOMATIC FOCUS CONTROL DEVICE

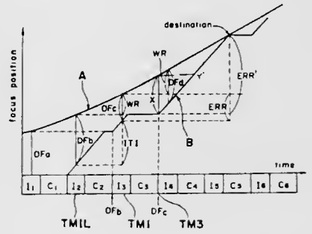
Masataka Hamada, Osaka; Kenji Ishibashi, Sakai, and Tokuji Ishida, Daito, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1987, Ser. No. 65,047

Claims priority, application Japan, Jun. 21, 1986, 61-145474; Jun. 23, 1986, 61-147686; Jun. 23, 1986, 61-147687; Jun. 25, 1986, 61-150480

Int. Cl.[4] G03B *3/00, 7/08*

U.S. Cl. 354—402 **25 Claims**



1. An automatic focus control device for use in a camera, comprising:

measuring means for measuring a position of an object to be photographed with reference to the camera to produce a measurement value;

first calculation means for repeatedly calculating a lens defocus value of a photographic lens based on the measurement value of the measuring means;

judging means for judging whether the object is moving on the basis of the repeatedly calculated lens defocus value of the first calculation means;

second calculation means, responsive to an affirmative judgment of the judging means and based on the repeatedly calculated lens defocus value, for calculating an estimated defocus value of the photographic lens, the estimated defocus value corresponding to a condition of the photographic lens with respect to the moving body at a time when the second calculation means is finished calculating; and

lens driving means for driving the photographic lens on the basis of the estimated defocus value.

4,783,678

RECORDING APPARATUS

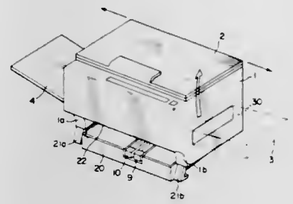
Hiroyuki Honda, Hachioji; Takashi Tamura, Higashimine, and Takayoshi Hashimoto, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

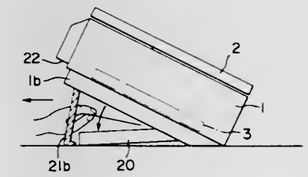
Filed Jul. 24, 1986, Ser. No. 890,061

Claims priority, application Japan, Jul. 27, 1985, 60-166188; Aug. 29, 1985, 60-190384

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 SH **11 Claims**





1. A recording apparatus having a body frame with a top portion, a bottom portion, and side walls forming a rectangular enclosure, a document exposure section for exposing a document, a photosensitive section for forming a latent image of an exposed document, and a developer section for developing a latent image formed on the photosensitive section, all of the above-mentioned sections being mounted within the enclosure to the side walls of the body frame,

said apparatus further having a paper feed section in the body frame for feeding a paper sheet along a conveyance path in a longitudinal direction of the body frame, a transfer section for transferring a developed latent image on the photosensitive section to a paper sheet in contact with the photosensitive section, a separating section for separating a paper sheet having a transferred image thereon from the photosensitive section, a fixing section for fixing a transferred image on a paper sheet conveyed thereto, and a discharge section for discharging a paper sheet having a copy image fixed thereon through one side wall of the body frame,

wherein the improvement comprises:

said side walls of the body frame including a front side wall and rear side wall, which are disposed on opposite sides from each other along a facing direction perpendicular to the longitudinal direction, and means for holding the apparatus which is upwardly pivotted along a fulcrum formed by a bottom edge of said rear wall, said means being pivotably mounted to a front bottom part of said body frame.

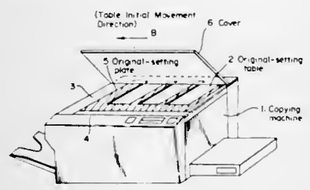
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4,783,679

COPYING MACHINE FOR COPYING A PLURALITY OF SMALL ORIGINALS IN A SINGLE OPERATION

Shunju Anzai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,633
Claims priority, application Japan, Mar. 7, 1985, 60-47081
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—7 **3 Claims**



1. An electrophotographic copying machine provided with an original-setting table and copy-paper feeding means comprising:

an original-setting plate having a plurality of openings formed therein and overlaying said original setting table for allowing a plurality of originals to be mounted on said original-setting table according to said plurality of window openings;

a plurality of timing detection marks provided on said said original setting plate at predetermined positions between each said plurality of window openings for automatically defining a number of said plurality of originals to be copied;

means for generating a plurality of timing signals matching the predetermined positions of each said plurality of timing detection marks defining said plurality of originals mounted together with said original-setting plate on said original-setting table; and

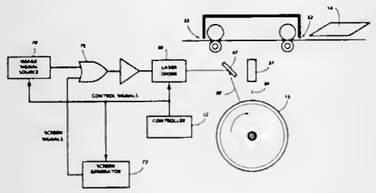
means for sequentially feeding a plurality of said copy papers in response to each of said plurality of timing signals, whereby each of said plurality of originals is copied onto a corresponding one of said plurality of copy papers in a single copying operation.

4,783,680

HALFTONE SCREENING SYSTEM FOR PRINTER/COPIER

Thomas O. Maloney, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1987, Ser. No. 103,007
Int. Cl.[4] G03G *15/22*
U.S. Cl. 355—8 **6 Claims**



1. In a copier/printer having a movable recording member on which images are created, developed, and transferred to copy sheets to provide copies and prints, the combination of:

(a) a raster output scanner for scanning said recording member to write images thereon in accordance with an image signal input,

said raster output scanner including a beam of high intensity radiation, means for sweeping said beam across said recording member to write said images line by line, and means to modulate said beam in accordance with said image signal input;

(b) a light/lens system for scanning said recording member to copy the image from an image bearing document thereon,

said light/lens system including an exposure slit, means for transporting the document across said exposure slit, illumination means for illuminating said exposure slit and the portion of the document thereover, and means for conducting image rays of said document to said recording member;

(c) a source of image signals which provide an image in the form of a dot matrix screen pattern; and

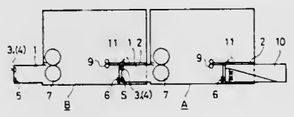
(d) control means for actuating both said raster output scanner and said light/lens system in predetermined order so that said raster output scanner writes said dot matrix screen pattern from said image signal source on said recording member and said light/lens system copies said document image on said recording member in overlapping relation to one another whereby to provide a screened copy of said document image.

4,783,681

IMAGE PROCESSING SYSTEM

Sohei Tanaka, Yokohama, and Toshio Honma, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 565,190, Dec. 23, 1983, abandoned. This application Feb. 9, 1987, Ser. No. 12,606
Claims priority, application Japan, Dec. 28, 1982, 57-227639; Dec. 28, 1982, 57-227640; Dec. 28, 1982, 57-227641; Dec. 28, 1982, 57-227642; Dec. 28, 1982, 57-227643
Int. Cl.[4] G03G *15/00, 21/00*
U.S. Cl. 355—14 R **29 Claims**



1. An image processing system comprising:

first recording apparatus means having a manually operable first operation unit, for recording a first image on a first recording material in accordance with an operation instruction from said first operation unit;

second recording apparatus means having a manually operable second operation unit for recording a second image on a second recording material which is different from the first recording mateial in accordance with an operation instruction from said second operation unit; and

means for coupling said first and second recording apparatus means so as to record the first and second images on a single recording material by combination of said first and second recording apparatus means;

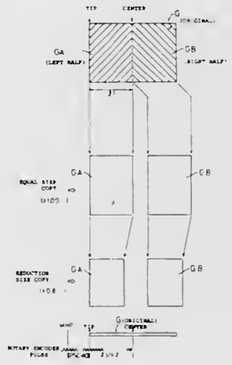
wherein in the event that said first and second recording apparatus means are coupled by said coupling means, said first and second recording apparatus means are operable to perform the imagre recording in response to the operation instruction from a single one of said first and second operation units.

4,783,682

COPY PAPER DELIVERY TIMING CONTROL DEVICE

Shigebaru Maehara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1986, Ser. No. 835,743
Claims priority, application Japan, Mar. 4, 1985, 60-43294
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 SH **2 Claims**



1. A copy paper delivery timer control device in an electrophotographic copying machine comprising:

scanner means for optically scanning an original document at variable speeds according to a selected magnification ratio, said scanner means being movable from a home position past leading and trailing edges of the original document, said document having first and second portions defined by a dividing line intermediate said leading and trailing edges, wherein said first portion extends from said leading edge to said dividing line and said second portion extends from said dividing line to said trailing edge;

home position sensing means for detecting when said scanner means is in said home position;

pulse generating means for generating a predetermined number of pulses representing the travelling distance of said scanner means from said home position to said leading edge and from said home position to said dividing line intermediate said leading and trailing edges, respectively;

counter means for counting said predetermined number of pulses produced by said pulse generating means from said home position to said leading edge and from said home position to said dividing line;

copy paper delivery means for delivering copy paper from a paper feed location to an image transfer location, wherein said image transfer location begins the point at which either a first or second portion of an optically scanned original document image is transferred to said copy paper;

timer means, independently operable of said counter means, for determining an amount of time required for said document image to reach said image transfer location and for separately determining an amount of time required for said copy paper to reach said image transfer location from said paper feed location;

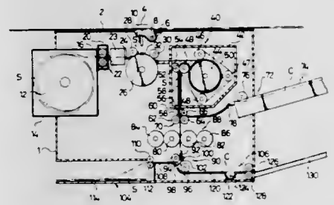
means for aligning a tip position of said first document image portion with a tip position of said copy paper at said image transfer location, wherein the amount of time required for said copy paper to reach said image transfer location is substracted from the amount of time required for said document image to reach said image transfer location subsequent to counting said predetermined number of pulses generated by said scanning means from said home position to said leading edge.

4,783,683

IMAGE RECORDING APPARATUS

Akihiko Nagumo; Minoru Ishikawa, and Ken Kawada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 1, 1987, Ser. No. 32,678
Claims priority, application Japan, Apr. 3, 1986, 61-77197; Oct. 20, 1986, 61-248972; Oct. 20, 1986, 61-248973; Oct. 20, 1986, 61-248975
Int. Cl.[4] G03B *27/52*; G03C *5/16*
U.S. Cl. 355—27 **19 Claims**



1. An image recording apparatus which employs a photo- and pressure-sensitive heat-developable material having a substrate and a layer formed on said substrate from a material which is photosensitive and heat-developable and which enables the developed image to be fixed by a pressure, at least part of said photosensitive and heat-developable material being contained in common microcapsules, and an image receiving material, said photosensitive material and said image receiving material being adapted to be superposed one on the other and pressed to each other so as to transfer the image from said photosensitive material to said image receiving material, said apparatus comprising:

a pair of pressing rolls for nipping said photosensitive material and said image receiving material therebetween; and means for applying a uniform contact pressure between said pair of pressing rolls; said means comprising,

back-up roll means having an axial length smaller than that of said pressing rolls and adapted for acting on at least one of said pressing rolls; and

back-up roll pressing means capable of independently adjusting the pressure exerted by said back-up roll means on said pressing rolls.

4,783,684

COLOR COPYING METHOD AND APPARATUS

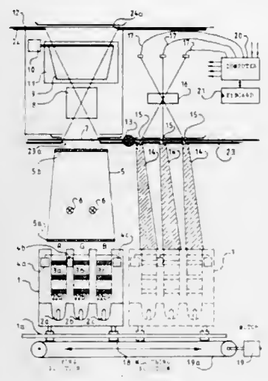
Hans-Jürgen Rauh, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,379
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1986, 3641635
Int. Cl.[4] G03B *27/72, 27/76, 27/32*
U.S. Cl. 355—38 **18 Claims**

1. A method of copying a colored original on one of a plurality of different copy materials each having respective spectral sensitivities in the three primary colors which differ from the corresponding spectral sensitivities of the other copy materials so that said copy materials define a family of sensitivity curves in each primary color, said method comprising the steps of measuring a characteristic of said original by directing measuring light at said original; and copying said original on said one copy material based on the results of the measuring step by directing copy light of each primary color at said original, the copy light in the different primary colors being directed at said

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original from respective sources, and the emission spectrum of each source rising no higher than the lowest curve of the



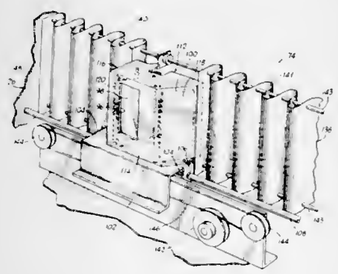
family of spectral sensitivity curves for the corresponding primary color.

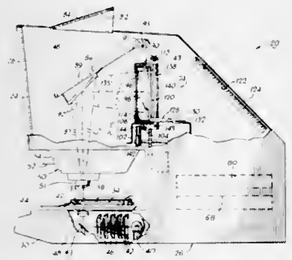
4,783,685

READER-PRINTER

Todd Kahle, Hartford, Wis., assignor to Xidex Corporation, Palo Alto, Calif.

Filed Oct. 2, 1987, Ser. No. 104,358
Int. Cl.[4] G03B *13/28*
U.S. Cl. 355—45 **48 Claims**





1. A viewing and slit exposure type image recording apparatus for recording a two-dimensional microimage having a major axis and a minor axis on a microform onto a recording medium, said apparatus also having a viewing plane, said apparatus comprising:

means defining an object plane generally perpendicular to said viewing plane for receiving said microform;

means for recording said microimage onto a recording medium including a drum for carrying said recording medium, said drum being rotatably mounted about an axis generally parallel to said object plane and generally perpendicular to said major axis; and

means for selectively projecting said microimage onto said viewing plane or onto said drum by scanning consecutive portions of said microimage along an axis generally perpendicular to the axis about which said drum rotates and parallel to said viewing plane;

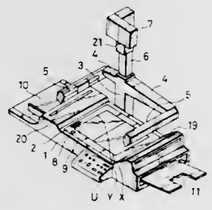
wherein said projecting means includes at least one elongated mirror having a longitudinal axis, the longitudinal axis of said mirror being perpendicular to the axis of rotation of said drum.

4,783,686

MICROCAMERA

Kenjiro Ishii; Fumio Fukumoto, both of Sagamihara; Akira Shibata, Yokohama; Eiichi Uchijima, and Shizuo Suzuki, both of Tokyo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1987, Ser. No. 51,645
Claims priority, application Japan, May 21, 1986, 61-116744; Nov. 27, 1986, 61-283960
Int. Cl.[4] G03B *27/32, 27/52*
U.S. Cl. 355—64 **12 Claims**



1. A microfilm camera comprising:

an original board for supporting an original document;

a supply reel for supplying a film to be used for recording an image of the original document;

a takeup reel for taking up the film on which the image of the original document is recorded;

optical means for projecting the image of the original document on a reduced scale to the film extending between said supply reel and said takeup reel;

setting means, disposed on a projecting optical path between said original board and said film, for defining an image area of the original document projected on the film by said optical means;

varying means for varying a width, in a direction of movement of the film, of said image area defined on the film by said setting means, said varying means being operable to vary said width by taking an end of said area adjacent said takeup reel for reference;

detecting means for detecting the size of the original document; and

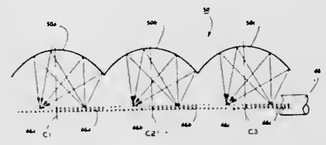
control means for controlling the varying means in accordance with the size of the original document which is detected by said detecting means.

4,783,687

SEGMENTED FILAMENT LIGHT SOURCE WITH IMPROVED ILLUMINATION OUTPUT UNIFORMITY

James D. Rees, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 14, 1986, Ser. No. 885,128
Int. Cl.[4] G03B *27/54*
U.S. Cl. 355—67 **5 Claims**



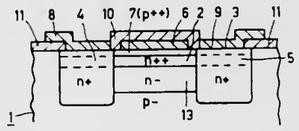
1. An imaging system comprising, in combination a linear, short focal length lens array, a segmented filament lamp, a linear positioned adjacent said lamp, said reflector comprising a series of spherical segments arranged along the length of the reflector, each segment positioned with respect to the filament segments of said lamp so as to focus an image of each filament segment into the spaces adjacent the filament segments, and an addressable image bar placed between said lamp and said array.

4,783,688

SCHOTTKY BARRIER FIELD EFFECT TRANSISTORS

John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 326,467, Dec. 2, 1981. This application Jul. 26, 1984, Ser. No. 634,740
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.
Int. Cl.[4] H01L *29/64*
U.S. Cl. 357—15 **3 Claims**



1. A Schottky barrier field effect transistor comprising:

a semiconductor body portion of a first conductivity type,

a region of a second conductivity type located at a surface of said semiconductor body portion between a source region and a drain region,

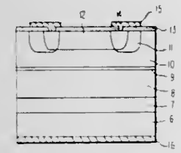
said region of said second conductivity type including a first semiconductor layer of said second conductivity type in contact with said semiconductor body portion and having a high doping, and a metallic gate electrode extending over at least a part of said first semiconductor layer, said first semiconductor layer having a thickness sufficiently thin to support without breakdown an electric field in excess of a critical field for avalanche breakdown of said first semiconductor layer, said thickness being less than 100 nm, and said first semiconductor layer providing at least a part of a channel of the transistor, and a second semiconductor layer of said first conductivity type lying between said first semiconductor layer and a gate electrode, said second semiconductor layer forming a surface-adjoining region being so shallow that it is substantially depleted of charge carriers in a zero gate bias condition, said surface-adjoining region having a thickness between 3 nm and 50 nm, wherein a Schottky barrier is formed between said gate electrode and said semiconductor body portion, said Schottky barrier having an effective height raised by said second semiconductor layer, wherein another layer of said second conductivity type lies between said first layer of said second conductivity type and said semiconductor body portion, said another layer being more lightly doped than said first layer of said second conductivity type, and wherein said another semiconductor layer has a doping concentration of less than 10^{15} atoms cm^{-3}.

4,783,689

PHOTODIODE HAVING HETEROJUNCTION

Katsuhiko Nishida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 553,943, Nov. 21, 1983, abandoned. This application Dec. 4, 1986, Ser. No. 938,353
Claims priority, application Japan, Nov. 19, 1982, 57-203172
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **1 Claim**



1. A semiconductor photodiode having a semiconductor heterojunction and a PN junction, comprising:

a semiconductor substrate of a first conductivity type;

a light absorbing region of the first conductivity type formed over a surface of the substrate, for absorbing light to thereby generate photocarriers;

an avalanche multiplying region of the first conductivity type formed over the light absorbing region for avalanche-multiplying injected carriers from said light absorbing region; and

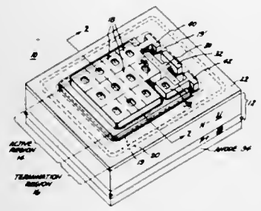
a semiconductor region of a second conductivity type formed over the avalanche multiplying region, and having a wider bandgap than that of the light absorbing region and constituting a PN junction together with the avalanche multiplying region;

wherein the avalanche multiplying region includes a first semiconductor layer and a second semiconductor layer arranged in this order over the light absorbing region, the second semiconductor layer having a wider bandgap than that of the absorbing region, the first semiconductor layer of the first conductivity type having a thickness of less than 0.1 micron and an impurity concentration equal to or above 5×10^{16} cm^{-3} which is larger than that of the second semiconductor layer and a bandgap of the first semiconductor layer being not larger than that of the second semiconductor layer;

said photodiode further comprising a third semiconductor layer of the first conductivity type formed between the light absorbing region and the first semiconductor layer to constitute a heterojunction together with the first semiconductor layer and having a thickness of less than 0.1 micron and a larger impurity concentration than that of the absorbing region, and a bandgap of the third semiconductor layer being smaller than that of the first semiconductor layer.

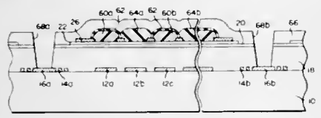
VOL 1096 ISS 2 NO 8 1988 UMI

4,783,690
POWER SEMICONDUCTOR DEVICE WITH MAIN CURRENT SECTION AND EMULATION CURRENT SECTION
John P. Walden, Schenectady, and Eric J. Wildi, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 529,240, Sep. 6, 1983, abandoned. This application Jul. 31, 1986, Ser. No. 892,739
Int. Cl.[4] H01L *29/72, 29/78, 23/56;* **H02H** *3/00*
U.S. Cl. 357—23.4 **18 Claims**



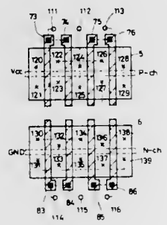
1. A power semiconductor device comprising:
an active region having a perimeter and including a plurality of active region cells, a first subset of said cells constituting a main current section and a second subset of said cells constituting an emulation current section, each of said subsets including more than one of said cells;
a common anode contacting said main current section and said emulation current section;
a first cathode contacting each of said cells of said first subset and none of said cells of said second subset;
a second cathode separate from said first cathode contacting each of said cells of said second subset and none of said cells of said first subset;
a common device termination region surrounding said active region; and
said cells of said second subset being distributed at various distances from said perimeter, with a larger number of said second cells being disposed at relatively small distances from said perimeter than are disposed at relatively large distances from said perimeter whereby the current level in said emulation current section is closely proportional to the current level in said main current section during device turn-on and turn-off.

4,783,691
COLOR SOLID-STATE IMAGE SENSOR
Nozomu Harada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 16, 1986, Ser. No. 864,156
Claims priority, application Japan, Jun. 21, 1985, 60-135315
Int. Cl.[4] H01L *27/14, 29/78*
U.S. Cl. 357—30 **5 Claims**



1. A color solid-state image-pickup device comprising:
a semiconductor substrate having first and second surface areas on one side of said substrate;
a matrix array of picture elements cells formed in the first surface area of said substrate;
a wiring pattern formed in the second surface area of said substrate and including a bonding pad pattern;
a photoconductive layer formed over said substrate to cover said picture element cells, said photoconductive layer functioning as an optoelectro-converting area;
a transparent electrode layer formed on said photoconductive layer such that it is positioned above said picture element cells;
a color filter layer for said picture element cells formed on said transprent electrode layer; and
a protective layer formed on said photoconductive layer to cover said color filter layer;
wherein an opening is formed, as a contact hole, in said protective layer and said photoconductive layer to expose the bonding pad pattern which is located on said substrate.

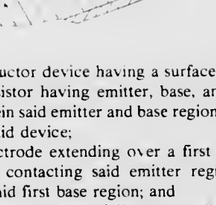
4,783,692
CMOS GATE ARRAY
Munehiro Uratani, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 648,283, Sep. 7, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 859,208
Claims priority, application Japan, Sep. 20, 1983, 58-174984
Int. Cl.[4] H01L *27/10*
U.S. Cl. 357—45 **6 Claims**



1. A basic cell forming part of a gate array, said gate array having a plurality of cells from which a desired circuit may be constructed, and having only a pair of input lines and a single output line associated with each said cell, the number of transistors in said cell being limited by the number of cell input and output lines, said basic cell comprising:
a P-type semiconductor region and an N-type semiconductor region;
four gate electrodes extending across each said semiconductor region, said gate electrodes of said cell being commonly connected into gate electrode pairs to form single transistors to thereby increase the effective gate width of each said transistor while better utilizing the area of said cell.

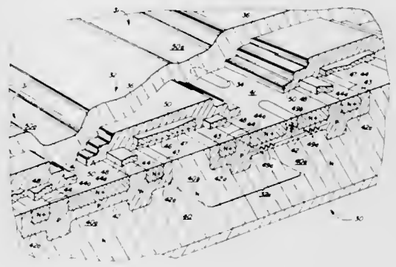
4,783,693
DRIVER ELEMENT FOR INDUCTIVE LOADS
Angelo Alzati, Bollate, and Flavio Villa, Milan, both of Italy, assignors to SGS Microelettronica SpA, Catania, Italy
Filed Jul. 14, 1986, Ser. No. 885,503
Claims priority, application Italy, Jul. 16, 1985, 21578 A/85
Int. Cl.[4] H01L *29/72, 29/48, 27/10*
U.S. Cl. 357—46 **2 Claims**

1. A driver element for inductive loads, comprising:
an epitaxial layer of the N conductivity type defining at least one element major surface;
a first region of the P conductivity type extending in said epitaxial layer from said element major surface;
a second region of the N conductivity type extending from said element major surface within said first region and being surrounded thereby;
a plurality of epitaxial portions of the N conductivity type, extending within and being surrounded by said first and second regions from said epitaxial layer to said element major surface, and
a metal layer extending on said element major surface on and in contact with said second region and said epitaxial portions,



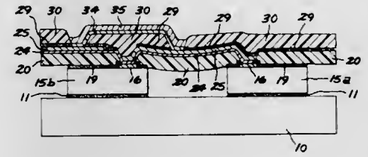
said epitaxial layer, said first region and said second region respectively forming collector, base and emitter regions of an NPN transistor and said epitaxial portions and said metal layer forming respectively cathode and anode regions of Schottky diodes.

4,783,694
INTEGRATED BIPOLAR-MOS SEMICONDUCTOR DEVICE WITH COMMON COLLECTOR AND DRAIN
Perry L. Merrill, Mesa, and Rodney R. Stoltenburg, Phoenix, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Mar. 16, 1984, Ser. No. 590,235
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 **9 Claims**



1. A semiconductor device having a surface, comprising:
a bipolar transistor having emitter, base, and collector regions, wherein said emitter and base regions extend to said surface of said device;
an emitter electrode extending over a first portion of said surface and contacting said emitter region and a first portion of said first base region; and
an MOS transistor, substantially surrounding said bipolar transistor, and having source, drain, and channel regions extending to said surface, and having a gate electrode extending above said channel region, wherein said source and channel regions are formed in a second portion of said base region extending from the periphery of said emitter region and wherein said drain and collector regions are common.

4,783,695
MULTICHIP INTEGRATED CIRCUIT PACKAGING CONFIGURATION AND METHOD
Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Sep. 26, 1986, Ser. No. 912,456
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—65 **10 Claims**



1. A multichip integrated circuit package comprising:
a substrate;
a plurality of integrated circuit chips disposed on said substrate, said integrated circuit chips having interconnection pads thereon;
a polymer film overlying and bridging said integrated circuit chips, said polymer film having a plurality of via openings therein, said openings being aligned with at least some of said interconnection pads; and
a pattern of interconnection conductors disposed on top of said polymer film so as to extend between at least some of said openings and so as to provide electrical connection between at least some of said interconnection pads through said openings.

4,783,696
COLOR IMAGE INPUT APPARATUS WITH VARIOUS ELEMENTS HAVING MATCHED APERTURES
Hans D. Neumann, Los Altos, and Anatoly Rabinovich, Mtn. View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 5, 1986, Ser. No. 938,546
Int. Cl.[4] G03F *3/08;* **H04N** *1/46*
U.S. Cl. 358—75 **13 Claims**



1. A color image input apparatus comprising:
a light source;
sensor means including a first photosensitive means, a second photosensitive means, and a third photosensitive means;
platen means disposed proximate said light source, said platen means being adapted to support an item having a color image provided on a surface thereof;

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beam forming means located between said platen means and said sensor means and adapted to develop a first beam, a second beam, and a third beam from light from a portion of said color image illuminated by said light source, wherein said first beam includes light which is primarily in a first frequency range, said second beam includes light which is primarily in a second frequency range, and said third beam includes light which is primarily in a third frequency range, said beam forming means including reflective means and filtering means, wherein said reflective means is located between said platen means and said filtering means and includes a pair of mirrors, each of which produces a virtual image of said portion of said color image, wherein said filter means includes three filter windows associated with said first beam, said second beam, and said third beam, respectively; and

projection means located between said beam forming means and said sensor means for projecting said first beam onto said first photosensitive means, said second beam onto said second photosensitive means, and said third beam onto said third photosensitive means, wherein apertures of said filter windows and said projection means subtend substantially the same angle.

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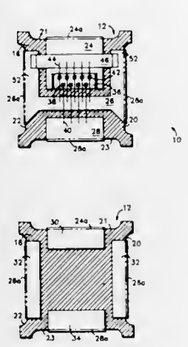
LEADLESS CHIP CARRIER FOR RF POWER TRANSISTORS OR THE LIKE

Robert Benenati; Joseph Desjardins, both of Tamarac, Fla.; James E. Mitzlaff, Carpentersville, Ill.; Scott D. Beutler, Des Plaines, Ill.; Mike M. Albert, Chicago, Ill., and Vernon L. Brown, Barrington, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 689,411, Jan. 7, 1985, abandoned. This application Sep. 2, 1986, Ser. No. 902,901

Int. Cl.⁴ H01L *39/02;* **H02G** *13/08*

U.S. Cl. 357—80 **24 Claims**



1. A leadless chip carrier suitable for a power semiconductor device having a plurality of terminals, said carrier comprising in combination:

a substantially planar substrate of insulating material having two major surfaces and a thickness;

a conductive pattern on one of said major surfaces having at least a first, second, and third pad for receiving a semiconductive device on one pad thereof;

a contact pattern on the other of said major surfaces having at least a first, second, and third area; and

distributed interconnecting portions for electrically connecting the first, second, and third pads of the conductive pattern with their associated first, second, and third areas of the contact pattern, whereby said contact pattern permits leadless electrical connection of the chip carrier to accompanying external circuitry, and said distributed interconnecting portions provide wide paths for currents flowing between said conductive pattern and said contact pattern.

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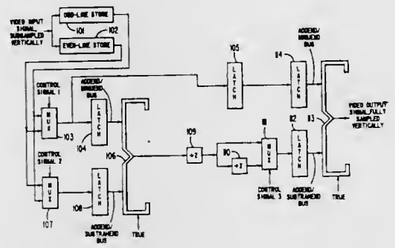
INTERPOLATOR FOR COMPRESSED VIDEO DATA

Kevin Harney, Brooklyn, N.Y., assignor to Technology Inc., 64, Princeton, N.J.

Continuation-in-part of Ser. No. 038,096, Apr. 13, 1987, abandoned. This application Dec. 4, 1987, Ser. No. 128,748

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—133 **16 Claims**



1. An interpolator for compressed video data representing every pixel in every n^{th} line of a raster of consecutively numbered successive line trace intervals therein throughout display field scan, p being a positive integer and n being an integer at least two, said interpolator comprising:

first and second line-storage memories, capable of being serially read without loss of data;

means for writing the odd-numbered lines of compressed video data into first line-storage memory, each odd-numbered line of compressed video data being written into said first line-storage memory within a respective one of a first set of windows in time, the first line of compressed video data being written into said first line-storage memory during the first window of said first set of windows in time which window is previous to the first line trace interval in the display field, the third line of compressed video being written into said first line-storage memory within the second window of said first set of windows in time which window includes the $(n+1)^{th}$ line trace interval and the line retrace intervals which flank it in time, and the remaining odd-numbered lines of compressed video data being written into said first line-storage memory within respective remaining ones of said first set of windows in time occurring at times that are multiples of 2n line later in time than the second window in said first set of windows;

means for writing the even-numbered lines of compressed video data into said second line-storage memory, each even-numbered line of compressed video data being written into said second line-storage memory within a respective one of a second set of windows in time, the second line of compressed video data being written into said second line-storage memory during the first window of said second set of windows in time, which window is previous to the second line trace interval in the display field, the fourth line of compressed video data being written into said second line-storage memory within the second window of a second set of windows in time which window includes the $(2n+1)^{th}$ line trace interval and the line retrace intervals which flank it in time, and the remaining even-numbered lines of compressed video data being written into said second line-storage memory within respective remaining ones of said second set of windows in time occurring at times that are multiples of 2n lines later in time than the second window in said second set of windows;

means for serially reading respective streams of compressed video data from said first and second line storage means at 1/p pixel scan rate during each line trace interval;

a first multiplexer having a first input connection for receiving compressed video data read from said first line-storage memory, having a second input connection for receiving compressed video data read from said second line storage memory, and having an output connection for supplying the data received at one of its input connections as determined by a first multiplexer control signal;

a second multiplexer having a first input connection for receiving compressed video data from said first line-storage memory, having a second input connection for receiving compressed video data from said second line-storage memory, and having an output connection for supplying the data received at one of its input connections as determined by a second multiplexer control signal;

a first subtractor having a minuend input connection to which compressed video data selected to the output connection of said first multiplexer is applied, having a subtrahend connection to which compressed video data selected to the output connection of said second multiplexer is applied, and having a difference output connection;

a second subtractor having a minuend input connection to which compressed video data selected to the output connection of said first multiplexer is applied, having a subtrahend input connection, and having difference output connection from which video data no longer compressed in the direction perpendicular to line trace is supplied;

first weighting means for weighting, in a prescribed pattern, the difference output from said first subtractor to supply data to the subtrahend input connection of said second subtractor; and

control apparatus responsive to the selection of n for generating said first multiplexer control signal, said second multiplexer control signal and said first weighting means control signal.

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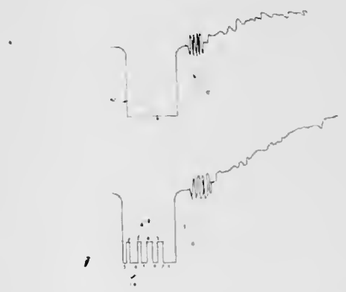
APPARATUS AND METHOD FOR TRANSMITTING INFORMATION BY MODULATED VIDEO SIGNAL

Albert D. DePaul, 407 W. 40th St., New York, N.Y. 10018

Continuation-in-part of Ser. No. 760,874, Jul. 31, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,104

Int. Cl.⁴ H04N *7/08, 7/093*

U.S. Cl. 358—142 **22 Claims**



11. A binary method of encoding a television signal for the purpose of transmitting two differing forms of electronic information simultaneously between at least two locations, comprising the step of encoding information upon a video signal by amplitude modulating horizontal synchronizing pulses of said video signal without alteration or degradation of said video signal during an active scan portion of a video field.

4,783,700

IMAGE SENSOR UNIT AND IMAGE READING APPARATUS HAVING THE UNIT

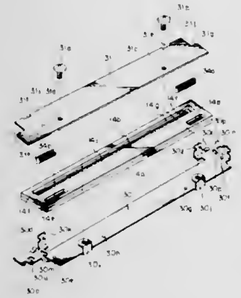
Hiromichi Nagane, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1987, Ser. No. 60,055

Claims priority, application Japan, Jun. 10, 1986, 61-132862; Jun. 10, 1986, 61-132863; Jun. 10, 1986, 61-132864; Jun. 10, 1986, 61-132867; Sep. 5, 1986, 61-208039

Int. Cl.⁴ H04N *5/335*

U.S. Cl. 358—213.11 **15 Claims**



6. A sensor unit comprising:

a sensor substrate having a light receiving element array having a plurality of light receiving elements; and

a circuit substrate and supporting plate for said light receiving elements,

said sensor substrate being supported on said supporting plate by said circuit substrate through a connection member having an elastic characteristic and used for performing electrical connection between said sensor substrate and said circuit substrate.

4,783,701

FOCUS CONDITION DETECTING DEVICE FOR USE IN A CAMERA

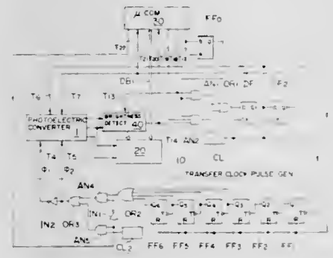
Tokuji Ishida, Osaka, and Toshio Norita, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 763,338, Aug. 6, 1985, Pat. No. 4,660,995, which is a continuation of Ser. No. 669,107, Nov. 7, 1984, abandoned. This application Sep. 9, 1986, Ser. No. 905,686

Claims priority, application Japan, Nov. 8, 1983, 58-210664; Nov. 17, 1983, 58-217391; Dec. 5, 1983, 58-230372; Dec. 12, 1983, 58-234551; May 15, 1984, 59-98367

Int. Cl.⁴ H04N *3/14*

U.S. Cl. 358—213.19 **16 Claims**



1 An image sensing system comprising.

image sensing means for sensing an image formed thereon,

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said image sensing means including a plurality of photosensitive elements adapted to accumulate electric charges at a speed dependent upon the intensity of light being incident thereon, respectively;

serial output means for serially outputting electrical signals being indicative of the quantity of the electric changes accumulated in said photosensitive elements when the electric charges accumulated in said photosensitive elements are shifted thereto;

clear pulse producing means for producing a clear pulse which causes said image sensing means to clear the electric charges accumulated in said photosensitive elements;

photosensitive means for sensing the luminance of said image;

a first accumulator having a charge accumulation path through which it accumulates electric charges at a speed dependent upon the luminance of said image sensed by said photosensitive means and adapted to produce an output voltage indicative of the quantity of the electric charges accumulated therein;

a second accumulator having no charge accumulation path through which it accumulates electric charges at a speed dependent upon the luminance of said image sensed by said photosensitive means and adapted to produce an output voltage indicative of the electric charges accumulated therein;

first and second charge clearing means for clearing the electric charges accumulated in said first and second accumulators in response to said clear pulse for restoring the output voltages thereof to a given initial voltage level, respectively;

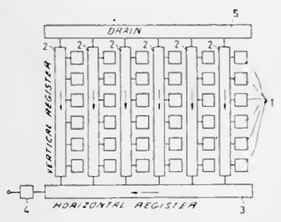
charge shifting means for shifting the electric charges accumulated in each of said photosensitive elements to said serial output means when said output voltage of said first accumulator represents a given relationship with respect to said output voltage of said second accumulator.

4,783,702

METHOD OF THROWING AWAY UNNECESSARY SIGNAL CHARGES IN SOLID STATE IMAGE SENSING DEVICE

Yoshiaki Sone, Settsu, and Takao Kuroda, Ibaraki, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Oct. 22, 1986, Ser. No. 921,493
Claims priority, application Japan, Oct. 22, 1985, 60-236062
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.19 **8 Claims**



1. A method for driving a solid state image sensing device, comprising the steps of:

photoelectrically converting light energy to signal charges of electrical energy using plural photoelectric conversion devices disposed in a matrix pattern,

transferring signal charges accumulated in said photoelectric conversion devices to respective plural vertical transferring means disposed beside said photoelectric conversion devices,

transferring said signal charges to horizontal transferring means from said plural vertical transferring means,

transferring said signal charges from said horizontal transferring means to signal detecting means,

detecting said signal charges transferred from said horizontal transferring means and issuing video signals by said signal detecting means,

transferring unnecessary signal charges among said signal charges to said vertical transferring means based on reception of a first charge pulse in a vertical blanking period,

transferring said unnecessary signal charges to throw-away means disposed at a side opposite to said horizontal transferring means with regard to said vertical transferring means, from said vertical transferring means,

throwing away said unnecessary signal charges by said throw-away means, and

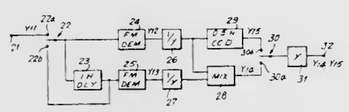
transferring, based on a second charge pulse, necessary signal charges which are accumulated in said photoelectric conversion devices in such period between said first charge pulse and said second charge pulse to said vertical transferring means, and further transferring said necessary signal charges through said vertical transferring means and said horizontal transferring means to said signal means.

4,783,703

TELEVISION FLICKER PREVENTING CIRCUIT WITH GAMMA VALUE CONVERSION PRIOR TO FIELD-TO-FRAME CONVERSION

Makoto Murakoshi; Hitoshi Hirobe, both of Kanagawa, and Hiromasa Hino, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 31, 1986, Ser. No. 846,310
Claims priority, application Japan, Apr. 10, 1985, 60-74503
Int. Cl.[4] H04N *9/80, 5/92*
U.S. Cl. 358—313 **9 Claims**



1. A flicker preventing circuit for television, comprising:

degamma circuit means provided in a a front stage of arithmetic mean circuit means of a field to frame conversion system in which a field signal recorded on a track of a recording medium is repeatedly reproduced, a field signal delayed by one-half horizontal scanning duration and a directly provided through field signal are alternately selected by switching means at each vertical scanning duration, and one of the field signals is formed by an arithmetic mean of a field signal delayed by one horizontal scanning duration and an otherwise through field signal, to provide a frame signal, said degamma circuit means changing a gamma value of the reproduced field signal to one; and

gamma circuit means provided in a rear stage of said arithmetic mean circuit means for returning the gamma value to its original value.

4,783,704

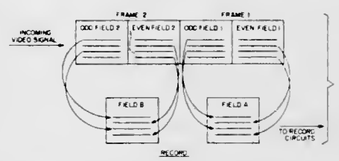
SKIP-FIELD VIDEO RECORDER WITH HIGH TEMPORAL SAMPLING RATE

David L. Funston, Batavia, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1986, Ser. No. 940,135
Int. Cl.[4] H04N *5/78, 5/91*
U.S. Cl. 360—11.1 **15 Claims**

14. In a skip-field video recorder and playback device, the improvement comprising a circuit adapted to construct, from

each video frame of an incoming video signal, a composite video field of which alternate horizontal lines comprise alternate lines of the odd video field of said incoming frame, and of which the remaining horizontal video lines comprise alternate



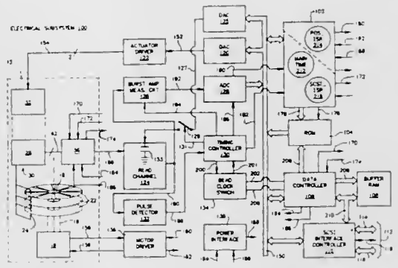
horizontal lines of the even field of said incoming frame, wherein said recorder records said composite video field, and further comprising playback means for playing back a signal recorded by said recorder.

4,783,705

HIGH CAPACITY DISK FILE WITH EMBEDDED SECTOR SERVO AND SCSI INTERFACE

Ronald R. Moon, Santa Clara; Michael G. Machado, San Jose; Thomas G. Cooper, Palo Alto; Patrick M. Weiher, Los Altos; Curtis H. Bruner, Los Gatos; Mark E. Strysko, Sunnyvale; Gregg J. Uhlendorf, San Jose; Steven G. Campbell, San Jose; Tuong T. Quan, San Jose, and Hoa V. Luong, Milpitas, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 834,009, Feb. 27, 1986, Pat. No. 4,669,004. This application May 19, 1987, Ser. No. 52,012
Int. Cl.[4] G11B *5/596, 5/55;* **G06F** *13/00*
U.S. Cl. 360—77 **8 Claims**



1. A high performance, low cost rotating disk data storage subsystem, the subsystem including:

a head and disk assembly comprising a storage disk rotatable at a controlled angular velocity and having at least one storage surface defining a series of preformatted concentric data tracks having a plurality of sectors in the data tracks including a servo portion embedded at the beginning of each sector, head means being moveable relative to said tracks for reading data on said disk including servo information recorded in each said servo portion, and voice coil mover means for moving said head means in response to electrical position control drive signals,

an internal time shared bidirectional address/data control bus,

an internal data block bus,

data block buffer memory means connected to said data block bus for temporarily storing blocks of data passing to and from the storage surface of the disk,

programmed microcontroller supervisor means connected to said control bus for receiving operational data storage and retrieval commands via the bus and for controlling the position of the head means during track seeking and following operations in response to servo information sampled form each servo portion and further in response to the commands,

SCSI interface controller means connected to said control bus and to said data block bus and operating under the supervision of said microcontroller supervisor, said SCSI interface controller means for receiving said commands from a host system and sending them on to the microcontroller supervisor means via the control bus, and for relaying status words from the microcontroller supervisor to the host system, for receiving data blocks from the host and storing them temporarily in the data block buffer memory means via the data block bus and for sending data blocks temporarily stored in the data block buffer memory means to the host computer,

data sequencer and memory controller means connected to said control bus and to said SCSI interface controller means and operating under the supervision of said microcontroller supervisor for managing flow of data blocks to and from the disk via the head, said data block buffer memory means, and said data block bus, and for encoding data for storage and retrieval, and for verifying the integrity of, and correcting errors in data retrieved from the disk,

first digital to analog converter means connected to said control bus for converting digital head position data received from the programmed microcontroller supervisor means via the bus into electrical position control signals, and

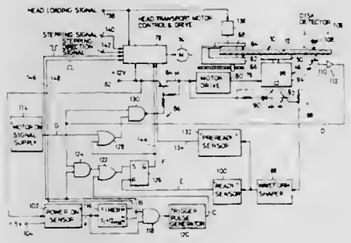
amplifier means connected to said digital to analog converter means for amplifying said electrical position control signals into said electrical position control drive signals and for supplying said drive signals to said voice coil mover means.

4,783,706

CIRCUIT ARRANGEMENT AND METHOD FOR SAVING POWER IN MAGNETIC DISK APPARATUS WITHOUT HEAD DISPLACEMENT

Makoto Shoji, Fussa; Hiroshi Tsuyuguchi, Tokyo; Shozo Toma, Kokubunji; Kazuhiro Hiraki, Mitaka, and Tsutomu Morita, Musashino, all of Japan, assignors to Teac Corporation, Tokyo, Japan

Continuation of Ser. No. 699,061, Feb. 7, 1985. abandoned. This application Mar. 27, 1987, Ser. No. 32,983
Claims priority, application Japan, Feb. 10, 1984, 59-24011
Int. Cl.[4] G11B *5/55, 19/02, 21/02*
U.S. Cl. 360—78 **5 Claims**



1. A method of operation for a data tranfer apparatus for use with a replaceable disklike record medium such as a flexible magnetic disk which has data storage tracks thereon and which is to be loaded into the data tranfer apparatus for data transfer and to be unloaded therefrom upon completion of data transfer, with the data transfer apparatus including a disk drive motor for imparting rotation to the record medium, and a head transport motor for transporting a transducer head radially of the record medium so as to enable the transducer head to

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access the individual data storage tracks on the record medium for data transfer therewith, which method comprises:

(a) supplying power to the apparatus at an initial moment (t23);

(b) subsequently loading a record medium into the apparatus at a second moment (t24);

(c) sensing the loading of the record medium in the apparatus;

(d) setting the disk drive motor into rotation upon sensing of the loading of the record medium;

(e) determining a "preready" moment (t26) intermediate the moment (t24) the disk drive motor is set into rotation and a following moment (t27) when the record medium is rotating sufficiently fast for data transfer;

(f) impressing a first supply voltage to the head transport motor at least for a prescribed period of time (t26–t28) following the "preready" moment (t26), the first supply voltage being sufficiently high for the head transport motor to correct the transducer head position on the record medium; and

(g) impressing a second supply voltage, lower than the first supply voltage, to the head transport motor at least during the period (t23–t24) when, with the data transfer apparatus held powered on, the record medium is absent from the data transfer apparatus.

4,783,707

AUTOMATIC CONTROL MEANS FOR A PICTURE IMAGE RECORDING DEVICE

Takayuki Nemoto; Kuniyoshi Suzaki, both of Tokyo; Masanori Uchidoi, Kanagawa, and Akihiko Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 331,795, Dec. 17, 1981, abandoned, which is a continuation of Ser. No. 30,930, Apr. 17, 1979, abandoned. This application May 6, 1985, Ser. No. 731,157

Claims priority, application Japan, Apr. 13, 1978, 53-48013; Apr. 23, 1978, 53-48012; Apr. 23, 1978, 53-48014

Int. Cl.⁴ G11B *5/54, 3/12;* **H04N** *5/78*

U.S. Cl. 360—105 **22 Claims**



1. A signal recording apparatus comprising:

(A) means forming a chamber for accommodating a recording medium therein;

(B) openable cover means for closing the chamber;

(C) recording head means for recording signals on the recording medium, said head means having a predetermined reset position and being movable along a recording surface of the medium to change the recording position on the recording surface of the medium;

(D) moving means for moving said head means along the recording surface of the medium to change the recording position of the head means on the recording surface of the medium;

(E) reset means for resetting said head means to said predetermined reset position along the recording surface of said recording medium; and

(F) enabling means for enabling said reset means in response to a operation for opening said cover means, wherein said moving means includes a ratchet mechanism for intermittently advancing said head means along the recording surface of the recording medium; said reset means includes a spring member for urging said head means towards said reset position; and said enabling means includes a release member for releasing said ratchet mechanism in response to the operation for opening said cover means.

4,783,708

GUIDE MECHANISM INCORPORATING A CYLINDRICAL BEARING

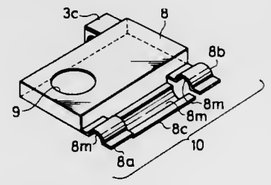
Tadashi Hasegawa, Fukushima, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1986, Ser. No. 838,731

Claims priority, application Japan, Mar. 11, 1985, 60-47672; Mar. 25, 1985, 60-59754

Int. Cl.⁴ G11B *21/08, 5/55;* **F16C** *19/00*

U.S. Cl. 360—106 **4 Claims**



1. A guide mechanism, comprising:

a cylindrical bearing;

a guide rod passing slidably through said bearings;

a movable base;

and means for holding said cylindrical bearing to said movable base, said holding means comprising a plurality of fingers projecting from said movable base with bearing engagement surfaces encompassing not substantially more than one-half of a circumference of said cylindrical bearing each, said fingers each being comprised of a thin metal member having a semi-circular shape in cross section, said fingers being alternatingly interdigitated such that each of said fingers stands physically unopposed by others of said fingers, said fingers together sandwiching and clamping said cylindrical bearing.

4,783,709

MAGNETIC HEAD SUPPORTING MECHANISM FOR TAPE RECORDER

Satoru Koizumi, and Susumu Chono, both of HigashiHiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1986, Ser. No. 917,774

Claims priority, application Japan, Dec. 13, 1985, 60-281785; Dec. 13, 1985, 60-281786

Int. Cl.⁴ G11B *5/56, 21/24*

U.S. Cl. 360—109 **4 Claims**

1. A magnetic head supporting mechanism which comprises

a plurality of magnetic heads having front and rear sides, said front sides being adapted to face respective cassette tapes,

rotary shafts integral with and extending from the rear sides of each of said magnetic heads and

a synchronous rotary mechanism interconnected with said rotary shafts whereby the magnetic heads facing the multiple cassette tapes are simultaneously rotated at the same angle around the rotary shafts.



4,783,710

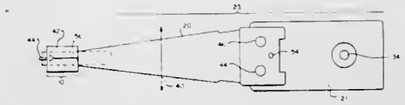
FLEXURE MOUNT FOR A DISC DRIVE ACTUATOR

Steven R. Salyer, Santa Cruz; Jonathan F. Toor, and Matthew J. Giluso, both of Santa Clara County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Oct. 2, 1986, Ser. No. 915,687

Int. Cl.⁴ G11B *5/48*

U.S. Cl. 360—104 **5 Claims**



1. A device for supporting a transducer in operating position over a recording medium, said device comprising

a slider having a transducer affixed thereto;

an arm assembly movable about a pivot, means for holding said slider on said arm assembly, said arm assembly comprising a carriage arm supported at said pivot, and a flexure connected to an end of said carriage arm distal from said pivot and extending to said slider, said carriage arm and flexure being formed of different materials having different rates of thermal expansion to effectively form a bimetallic strip, and means for connecting said carriage arm and said flexure wherein said flexure and said carriage arm each include a single hole, said single holes being superposed at the connection of the flexure and carriage arm and a rivet extending through said holes to maintain said carriage arm and said flexure between opposed head portions of said rivet, one of said holes in said carriage arm or flexure including features in the edges of the hole, said rivet being deformed to fit the features in said hole to prevent relative movement of said arm and said flexure while allowing the carriage arm and flexure to differentially expand to relieve motion of the flexure relative to the recording medium due to the stresses caused by differential thermal expansion of the materials of the carriage arm and flexure.

4,783,711

MAGNETORESISTIVE SENSOR HAVING MAGNETIC SHIELDS OF FERRITE

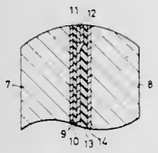
Masahiro Kitada, Tokyo; Hideo Tanabe, Higashimurayama; Noboru Shimizu, Tokorozawa; Hitoshi Nakamura, Hachiouji; Kazuhiro Momata, Chigasaki; Shigeyoshi Kato, Hatno; Tooru Takeura, Odawara, and Tetsuo Kobayashi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1986, Ser. No. 879,567

Claims priority, application Japan, Jul. 12, 1985, 60-152213; Nov. 6, 1985, 60-247020

Int. Cl.⁴ G11B *5/00, 5/33, 5/39*

U.S. Cl. 360—113 **14 Claims**



1. In a magnetoresistive sensor in which a magnetoresistive effect element having a magnetoresistive film is held between two magnetic shields formed of high permeability magnetic ferrite, with insulating layers interposed between the element and the shields, a magnetoresistive sensor characterized in that, between each of the magnetic shields formed of said high permeability magnetic ferrite and said insulating layer, a ferromagnetic metal film having a higher thermal conductivity than that of said high permeability magnetic ferrite is formed adherently to said ferrite.

4,783,712

Patent Not Issued For This Number

4,783,713

FULL AUTOMATIC ELECTRIC SHOCK PROTECTOR APPARATUS

Cezhan Chen, Room 305, 116 Qu Qi Road, Shanghai, China

Filed Mar. 6, 1987, Ser. No. 22,976

Claims priority, application China, Aug. 29, 1986, 86105323

Int. Cl.⁴ H02H *5/12, 3/52*

U.S. Cl. 361—48 **11 Claims**



1. An electric shock protector apparatus comprising:

a. separatable contacts connecting a power source to power lines;

b. means for separating said contacts to disconnect said power source from said power lines;

c. means for detecting a current passing through said contacts and outputting a voltage representative thereof;

d. means for amplifying the output voltage of said means for detecting;

e. means for adding the amplified output voltage to a phase-shifted voltage formed from said amplified output voltage after a 180° phase shift;

f. means for producing a positive half-cycle electric shock operation signal in response to the output of said means for adding occurring as a result of a human or animal coming into contact with said power lines;

g. means for producing a negative half-cycle electric shock operation signal in response to the output of said means for

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adding occurring as a result of a human or animal coming into contact with said power lines; and

h. an OR logic gate having a first input terminal connected to receive said positive half-cycle electric operation signal, a second input terminal connected to receive said negative half-cycle electric shock operation signal and an output terminal connected to said means for separating;

whereby when said current is an electric shock current having a frequency higher than a frequency of said power source, said means for separating said contacts is operated to interrupt the power supply.

4,783,714

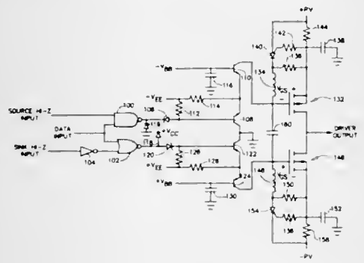
SWITCHING LOGIC DRIVER WITH OVERCURRENT PROTECTION

Roger J. Kalina, San Diego, Calif., assignor to General Dynamics Electronics Division, San Diego, Calif.

Filed Mar. 23, 1987, Ser. No. 28,729

Int. Cl.[4] H02H *3/093*

U.S. Cl. 361—101 **16 Claims**



1. A logic driver for providing output power, received as input power from an external power source, said output power switched between two voltage levels in response to an input bistate data bit, comprising:

input means for receiving an input bistate data bit and generating a control command corresponding to the state of an input bistate data bit said input means comprising,

(a) input control means for receiving an input bistate data bit, for performing predetermined boolean logic operations on an input bistate data bit, and for providing a corresponding pair of output bistate logic signals, and

(b) interface means for receiving said pair of output bistate logic signals and converting the state of each logic signal to a corresponding analog signal with each pair of converted logic signals forming said control command;

switch means for receiving input power, said switch means responsive to said control command for, providing output power to an output at a first predetermined voltage level when an input bistate data bit is of a first state and at a second predetermined voltage level when an input bistate data bit is of a second state;

sense means coupled to said switch means for detecting a level of current in said input power and providing a corresponding current level indication; and

overcurrent means, responsive to said current level indication, for generating an overcurrent command when said current level indication exceeds a predetermined level, said switch means being further responsive to said overcurrent command for disabling the providing of output power at the corresponding predetermined voltage level.

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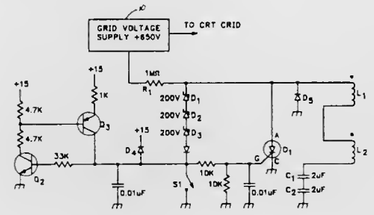
AUTOMATIC HIGH-SPEED COLOR CRT DEGAUSSING SYSTEM

Steven F. Liepe, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 18, 1988, Ser. No. 182,651

Int. Cl.[4] H01F *13/00;* **H01J** *29/06*

U.S. Cl. 361—150 **8 Claims**



1. A degaussing system for a CRT comprising:

(a) a switchable voltage source;

(b) tank circuit means comprising degaussing coil means and capacitor means coupled to said voltage source;

(c) voltage sensing network means for sensing the voltage across said capacitor means and for providing an actuating signal when a predetermined threshold voltage has been reached; and

(d) latching switch circuit means responsive to said actuating signal for enabling a switch, said switch connecting said tank circuit to ground, and including means for maintaining said switch in an on position until said switchable voltage source is turned off.

4,783,716

CHARGING OR DISCHARGING DEVICE

Yukio Nagase, Tokyo; Hiroshi Satomura, Hatogaya; Hidemi Egami, Zama, and Yoshihiko Hirose, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,382

Claims priority, application Japan, Jan. 30, 1986, 61-18954; Jul. 15, 1986, 61-164573; Nov. 25, 1986, 61-278808; Nov. 28, 1986, 61-283467; Nov. 28, 1986, 61-283468; Nov. 28, 1986, 61-283469

Int. Cl.[4] G03G *15/02;* **H01T** *19/00*

U.S. Cl. 361—225 **22 Claims**

1. A device for electrically discharging or charging a member to be discharged or charged, comprising:

a dielectric member;

first and second electrodes embedded in said dielectric member, said first and second electrodes being supplied with an alternating voltage therebetween to cause discharge adjacent a part of a surface of said dielectric member,

a third electrode disposed to or adjacent a part of the surface of said dielectric member at such a position as when said discharge starts to occur with increase of the alternating voltage applied between said first and second electrodes, no discharge occurs between said first electrode and said third electrode or between said second electrode and said third electrode;

means for applying an alternating voltage between said first electrode and said second electrode;

means for applying a bias voltage between said third electrode and said member to be discharged or charged to discharge or charge it.

4,783,717

APPARATUS FOR ROTATING A DISK

Leendert Zeeman, Dordrecht, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1985, Ser. No. 793,025

Claims priority, application Netherlands, Jul. 17, 1985, 8502057

Int. Cl.[4] G11B *25/04*

U.S. Cl. 369—266 **5 Claims**



1. Apparatus for rotating a disc comprising:

a deck plate;

a turntable journaled in the deck plate for rotation about an axis of rotation;

centering means for centering the disc on the turntable;

clamping means for clamping the disc against the turntable, said clamping means comprising pressure means and a support therefor, which support is movable between an operating position and a rest position, which pressure means is pressed against the disc on the turntable in the operaing position and is rotatable relative to said support about said axis of rotation, which support in moving from the operating position to the rest position moves said pressure means away from the disc, which support in the rest position carries the pressure means,

an electric drive unit comprising an annular stator section fixed to said support and an annular rotor section fixed to the pressure means, said sections being coaxial with said axis of rotation which the support is in the operating position, said rotor section lying between the stator section and the turntable.

4,783,718

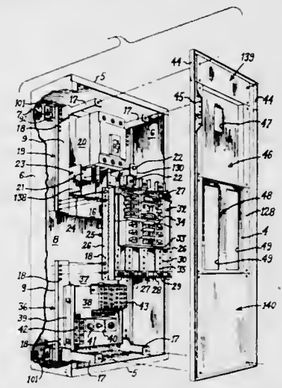
LIGHTING CIRCUIT BREAKER PANELBOARD MODULAR ASSEMBLY

Rodney D. Raabe; Joseph J. Mrowka; Jon P. McCuin, all of Bristol, and Joseph F. Noonan, Manchester, all of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 705,454, Feb. 25, 1985, Pat. No. 4,631,634. This application Aug. 4, 1986, Ser. No. 892,606

Int. Cl.[4] H02B *1/04*

U.S. Cl. 361—363 **6 Claims**



1. A circuit breaker panelboard assembly comprising:

closure means housing at least one main circuit breaker and a plurality of branch circuit breakers;

access means movably arranged on said closure means providing access to said main and said branch circuit breakers from outside of said closure;

shield means intermediate said access means and said main and branch circuit breakers preventing contact with electrical terminals on said main and branch circuit breakers;

a main circuit breaker module comprising a mounting pan, said mounting pan being flanked by a first pair of apertured side extensions, said main breaker having three main circuit breaker connection straps projecting from one end;

a branch circuit breaker module including a pair of opposing apertured side rails, said branch circuit breakers being mounted on said branch circuit breaker module over a plurality of bus bars and flanked by said pair of apertured side rails, said bus bars having connector straps arranged at their ends for electrical connection with said main circuit breakers connection straps; and

a neutral connection module comprising a neutral lug and a plurality of neutral connectors arranged on a base, the base being flanked by a second pair of apertured side extensions, said main circuit breaker module, branch circuit breaker module and neutral connection module being fastened together by attachment between said first and second apertured extensions and said apertured side rails.

4,783,719

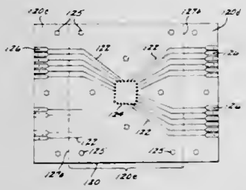
TEST CONNECTOR FOR ELECTRICAL DEVICES

John W. Jamison, Palm Springs, and Robert E. Allen, Mission Viejo, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 20, 1987, Ser. No. 5,054

Int. Cl.[4] H05K *01/18*

U.S. Cl. 361—398 **16 Claims**



1. An apparatus for providing bondless electrical contact to a rigid miniaturized electronic component holding device having a plurality of contact terminals located in a predetermined pattern on a surface of said device, comprising:

a flexible film having a conductive wiring pattern formed thereon, said wiring pattern including a first set of conductive pads formed thereon extending above the surface of said film in a pattern corresponding to said device contact terminal pattern and a plurality of conductor lines connecting to respective ones of said first set of conductive pads;

means for urging said flexible film against said surface of said electrical device with said respective ones of said first set of conductive pads aligned with corresponding ones of said device terminals so that electrical contact is achieved between said device terminals and said first set of conductive pads of said film, said means for urging said flexible film against said surface of said electrical device including;

(i) a first connector structural member of resilient material having a first surface of contour substantially conforming to said device surface, and supporting said flexible film;

(ii) a second connector structural member supporting said electrical device with said device terminals substantially exposed;

(iii) means for releaseably engaging said flexible film between said second member and said first connector structural member with said exposed surface of said electrical device against said flexible film; and

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(iv) means for aligning said device contact terminals with said raised film pads while said exposed surface of said electrical device is urged against said flexible film; and,

means for electrically connecting to said respective conductor lines formed on said film to provide electrical contact to said electrical device through said respective conductor lines and said first set of conductive pads.

4,783,720

PLUG ASSEMBLY

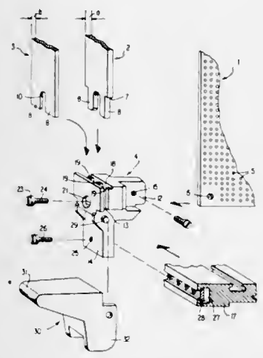
H. Michael Joist, Gagenau, and Hans-Ulrich Guenther, Straubenhardt, both of Fed. Rep. of Germany, assignors to Schroff Gesellschaft mit beschränkter Haftung, Straubenhardt, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,194

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 8607046[U]

Int. Cl.⁴ H05K *5/02*

U.S. Cl. 361—399 **5 Claims**



1. In a plug assembly having a printed circuit board, a face plate and two printed circuit board holders, for introduction into a frame-like structural assembly including bearing rails, at least one of said circuit board holders being provided with a clamping stand for the printed circuit board, a receiver slot for receiving a face plate, and a flange for attachment to at least one of the bearing rails, the improvement wherein:

said one printed circuit board holder having a face plate attachment means, at least one rib disposed in said receiver slot and a wall disposed adjacent said receiver slot which contains an opening, said face plate attachment means being disposed in said opening and passing through said receiver slot for attaching said face plate to said one printed board holder; and

said face plate has at least one projection insertable in said receiver slot of said one printed board holder.

4,783,721

COOLING SYSTEM FOR AN ELECTRONIC CIRCUIT DEVICE

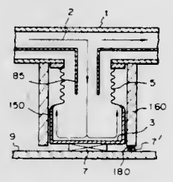
Haruhiko Yamamoto, Yokohama; Masahiro Suzuki, Inagi; Yoshiaki Udagawa, Tokyo; Mitsuhiko Nakata, Kawasaki; Koji Katsuyama, Yokohama; Izumi Ono, Hachioji, and Shunichi Kikuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 914,942, Oct. 3, 1986. This application Jul. 30, 1987, Ser. No. 79,877

Claims priority, application Japan, Oct. 4, 1985, 60-221209; Oct. 4, 1985, 60-152137; Nov. 19, 1985, 60-259284; Dec. 3, 1985, 60-273068; Dec. 3, 1985, 60-273069; Dec. 3, 1985, 60-273070; Dec. 3, 1985, 60-273071; Dec. 3, 1985, 60-273072; Dec. 3, 1985, 60-273073; Jan. 28, 1986, 61-17031

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—382 **9 Claims**



1. In an electronic circuit device including a printed circuit board having thereon at least one electronic circuit component, a cooling system including a cooling module comprising a conduit for coolant flow, a heat transfer plate exposed to the flow of the coolant for transferring the heat dissipated from the circuit component to the coolant, elastic means connected to the heat transfer plate for resiliently biasing the heat tranfer plate toward the circuit component, and rigid guide means connected to the conduit and closely surrounding said heat transfer plate for guiding and preventing improper alignment of the heat transfer plate.

4,783,722

INTERBOARD CONNECTION TERMINAL AND METHOD OF MANUFACTURING THE SAME

Takaaki Osaki; Norio Matsui, both of Tokyo; Shinichi Sasaki, Iruma, and Yutaka Egawa, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Chiyoda, Japan

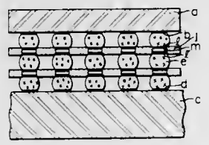
PCT No. PCT/JP86/00364, § 371 Date Feb. 19, 1987, § 102(e) Date Feb. 19, 1987, PCT Pub. No. WO87/00686, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 16, 1986, Ser. No. 23,552

Claims priority, application Japan, Jul. 16, 1985, 60-156621; Jun. 13, 1986, 61-137961

Int. Cl.⁴ H05K *1/11*

U.S. Cl. 361—411 **13 Claims**



1. An interboard connection terminal comprising:

at least one metal layer adapted to prevent diffusion of solder and having two opposed surfaces;

a pair of opposed, thin, solderable metal layers stacked one on each of said opposed surfaces of the metal layer; and

a pair of solder bumps fused and adhered one on each outer surface of said pair of solderable metal layers.

4,783,723

ELECTRIC DOUBLE-LAYER CAPACITOR

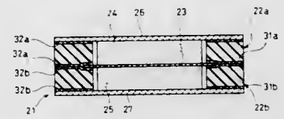
Koichi Watanabe; Michinobu Maesaka; Michihiro Murata, and Yoshio Arakawa, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 25, 1987, Ser. No. 18,603

Claims priority, application Japan, Mar. 31, 1986, 61-75338

Int. Cl.⁴ H01G *9/02*

U.S. Cl. 361—433 **6 Claims**



1. An electric double-layer capacitor comprising:

an electrically insulating ion-permeable separator;

a pair of polarizable electrodes oppositely provided on upper and lower sides of said separator;

a pair of collectors provided on the outer sides of respective said polarizable electrodes away from said separator; and

a gasket enclosing said polarizable electrodes for holding said polarizable electrodes between said pair of collectors,

said gasket comprising at least one base of vulcanized rubber and a pair of resin layers formed of polyolefin resin fusion-welded on top and bottom surfaces of said gasket, said collectors being heat-sealed to said resin layers on said top and bottom surfaces of said gasket.

4,783,724

ANGULARLY ADJUSTABLE TASK LIGHT

Harold R. Wilson, and Paul S. Gartland, both of Holland, Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Mar. 3, 1987, Ser. No. 22,306

Int. Cl.⁴ F21V *21/26;* **A47B** *23/06*

U.S. Cl. 362—133 **14 Claims**



1. In combination comprising: a shelf structure having a substantially planar and horizontally enlarged shelf, and front and rear channels which extend substantially horizontally and longitudinally along respective front and rear edges of said shelf and project downwardly therefrom, said front and rear edge channels being disposed so that they open toward one another in opposed relationship; and a light fixture positioned directly below said shelf between said front and rear edge channels, said light fixture including a boxlike housing having a pair of generally vertically extending end walls which are disposed substantially perpendicularly between said front and rear channels, said light fixture also having a light bulb stationarily mounted within said housing; the improvement comprising:

adjustable mounting means coacting between each said end wall and said shelf structure for permitting the position of the light fixture to be vertically angularly varied relative to the shelf structure;

said adjustable mounting means including a mounting bracket disposed adjacent each said end wall, said mounting bracket being longitudinally elongated in a front-to-back direction of the housing and pivotally joined to a respective said end wall for relative vertical pivoting therebetween about a substantially horizontal pivot axis;

said adjustable mounting means also including releasable and lockable adjusting means connecting said mounting bracket to a respective said end wall for selectively adjusting the vertical angularity of the bracket relative to the end wall to vary the vertical angularity of the light fixture with respect to the shelf, said adjusting means including (a) a pin-and-slot connection coacting between said bracket and said end wall in spaced relationship from said pivot axis for permitting relative vertical pivoting between said end wall and said bracket, and (b) a manually releasable locking element releasably cooperating between the mounting bracket and the end wall for permitting the bracket to be selectively locked to the end wall at a selected position as tilted about the pivot axis;

said adjustable mounting means further including an elongate support bar which is separable from said bracket and which is positioned beneath said shelf and extends transversely thereacross so that opposite ends of said elongate support bar project into and is supported on the opposed edge channels; and

said bracket having slot means defined thereon for accommodating therein said support bar for permitting the bracket to be releasably supported on the support bar, said slot means extending longitudinally of the bracket in the front-to-back direction of the light fixutre.

4,783,725

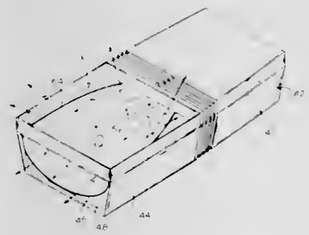
FLASHLIGHT WITH SPACE EFFICIENT REFLECTOR

David R. Schaller, Janesville; El-Sayed Megahed, Madison, both of Wis., and Charles F. Samson, Walpole, Mass., assignors to Rayovac, Madison, Wis.

Filed Aug. 24, 1987, Ser. No. 88,679

Int. Cl.⁴ F21I *15/06*

U.S. Cl. 362—157 **23 Claims**



1. A hand-held flashlight comprising:

(a) light-generating means having a light-generating axis for generating light in a polar pattern substantially in a first direction along said light-generating axis; and

(b) a light-shaping means for shaping said light into a light beam, said light-shaping means having a shape formed by rotating a generatrix around a longitudinal axis extending in a second direction to form a three-dimensional solid, and sectioning said solid with a plane substantially parallel to said second direction said light-generating axis being disposed in perpendicular to said longitudinal axis for projecting said polar pattern toward said light-shaping means.

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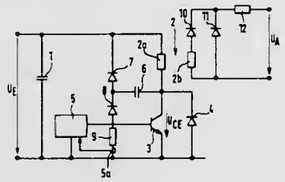
4,783,726
MODULAR LIGHT DEVICE
Chern J. Wang, No. 199, Sec.1, Hua Mei Si St., Taichung City, Taiwan
Filed Jun. 12, 1987, Ser. No. 62,438
Int. Cl.[4] F21P *1/00*
U.S. Cl. 362—252 **3 Claims**



1. A light device comprising:
a socket having a first conductive hollow member having a closed end, an open end, an internal thread, and a first electric contact element mounted on said closed end and insulated electrically from said closed end;
a bell-shaped member including a tapered end with a threaded hollow neck portion extending from said tapered end, said hollow neck being inserted threadedly in said first hollow member, and a flared end having a plurality of first channel members extending radially from said flared end, each of said channel members having a groove extending radially;
a lamp holding means having an annular plate member and a plurality of lamp holding plates extending radially from said annular plate member, each of said lamp holding plates having a lamp mounted thereon and conductors disposed thereon, said lamps being received in one of said grooves and said conductors are connected electrically to said socket;
a connector having a second conductive hollow member with a closed end, an open end, and a second electric contact element, said second hollow member being inserted through said lamp holding annular member into said bell-shaped member and connected electrically to said socket and said conductors, said connector capable of receiving and being in electrical connection with said first hollow member of another said light device so as to achieve successive connection of said light devices; and
an annular cover member secured to said bell-shaped member and having a plurality of second channel members extending radially from the periphery of said annular cover member, each of said channel plate members having a groove, said annular cover member and said bell-shaped member cooperating to hold firmly said lamp holding means.

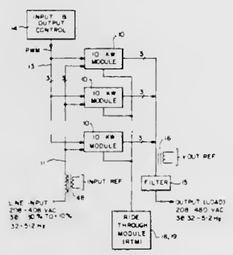
4,783,727
DC/DC CONVERTER
Erhard Neumann, Rudersberg, Fed. Rep. of Germany, assignor to Eckhardt AG, Stuttgart, Fed. Rep. of Germany
Filed May 14, 1987, Ser. No. 49,597
Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616160
Int. Cl.[4] H02H *7/122*
U.S. Cl. 363—20 **9 Claims**

1. A DC/DC converter, comprising:
a transformer having a primary winding and a secondary winding;
a transistor having a collector-emitter path for selectively connecting said primary winding to a D.C. input voltage to control a flow of current through said primary winding;
a first diode connected in parallel with said collector-emitter path and oriented to allow current to flow in a direction from the emitter to the collector of said transistor;
a discharge circuit including a choke connected in series with two diodes across said D.C. input voltage, said diodes being oriented to allow current to flow in a direction



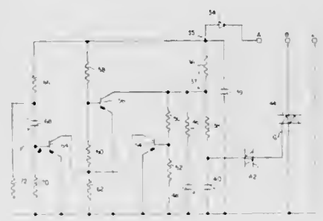
from a negative potential to a positive potential of said input voltage, and a capacitor connected between a junction of said two diodes and the collector of said transistor, whereby said discharge circuit periodically produces a negative magnetization current through said transformer primary winding; and
an input circuit including a rectifier diode, a free running diode and a storage choke connected to said secondary winding.

4,783,728
MODULAR POWER SUPPLY WITH PLL CONTROL
David C. Hoffman, Los Gatos, Calif., assignor to Modular Power Corp., San Jose, Calif.
Continuation-in-part of Ser. No. 857,145, Apr. 29, 1986, abandoned. This application Jul. 8, 1987, Ser. No. 71,586
Int. Cl.[4] H02M *5/458*
U.S. Cl. 363—37 **17 Claims**



1. A power supply for converting single or multi-phase line AC in a regulated manner to a desired single or multi-phase output comprising:
a plurality of substantially identical switched power modules connected in parallel to said AC line and to said output including input switching means switched by pulse width modulated signals for converting AC to DC and output switching means controlled by pulse width modulated signals for converting AC to DC and output switching means controlled by pulse width modulated signals for converting DC to AC; and
input and output control means separate from said power modules for driving said switching means with said pulse width modulated signals whereby any one of said substantially identical switched power modules may be removed from said system without adversely affecting the remaining plurality of switched power modules, said output control means including digital phase locked loop means (PLL) for generating said pulse width modulated switching signal, said PLL including microprocessor means for comparing an output sinusoidal voltage generated by said PLL with an input sinusoidal voltage, and counter and memory means driven by said microprocessor means in accordance with said comparing, for producing said output sinusoidal voltage of a frequency determined by said microprocessor means.

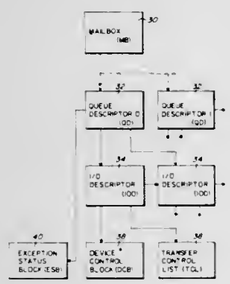
4,783,729
AUTOMATIC VOLTAGE DOUBLER SWITCH
John G. Konopka, Barrington, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Sep. 25, 1987, Ser. No. 101,117
Int. Cl.[4] H02M *7/04*
U.S. Cl. 363—143 **5 Claims**



1. An automatic voltage doubler circuit comprising:
rectifying means coupled to an AC line and selectively operable in either a diect mode or in a voltage doubler mode;
switch means for changing the operating mode of said rectifying means;
charging means responsive to a first voltage level on said AC line for operating said switch means;
cutoff means for disabling said charging means responsive to a second voltage level on said AC line; and
delay means coupled to said charging means for disabling said charging means during power up of said rectifying means.

4,783,730
INPUT/OUTPUT CONTROL TECHNIQUE UTILIZING MULTILEVEL MEMORY STRUCTURE FOR PROCESSOR AND I/O COMMUNICATION
Michael A. Fischer, San Antonio, Tex., assignor to Datapoint Corporation, San Antonio, Tex.
Filed Sep. 19, 1986, Ser. No. 910,006
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **31 Claims**

1. A method for communicating between at least one processor and a first and a second input/output (I/O) Device connected to one I/O adapter in a computer system, the computer system also including a main memory commonly connected to each processor andthe I/O adapter, each I/O Device accomplishing data input to and data output from the computer system, the computer system also including software recorded within the main memory for controlling operational functions of the computer system, said communication method comprising the steps of:
establishing a first-level memory structure in the main memory for the I/O adapter at a predetermined memory address which is uniquely associated with the I/O adapter, each first-level memory structure being designated a Mailbox;
establishing a first and a second second-level memory structure each at a predetermined memory address in the main memory for the first and second I/O Devices, respectively, each second-level structure being designated a Queue Descriptor, the memory address of each Queue Descriptor being different from the memory address of the Mailbox;
establishing a plurality of third-level memory structures each at a predetermined memory address in the main memory, each third-level structure being designated an I/O Descriptor, one I/O Descriptor being established for each I/O operation to be performed by the first and second I/O Devices, the memory address of each I/O Descriptor being different from the predetermined memory address of any of the Mailbox, Queue Descriptor and I/O Descriptors;
placing data in each I/O Descriptor which includes command information that defines a specific I/O data transfer operation to be performed by an I/O Device;
placing data in at least one of either the Queue Descriptor or each I/O Descriptor associated with each I/O Device which includes information that links each I/O Descriptor associated with each I/O Device in a Queue in the order in which I/O operations are to be performed by that I/O Device, a first and a second Queue being thereby formed and respectively associated with the first and second I/O Devices;
placing data in each said first and second Queue Descriptor which (i) includes information that defines a memory address for accessing each said first and second Queue,



and (ii) contains command information for polling the linked I/O Descriptors of each first and second Queue, respectively;
placing data in the Mailbox which includes information which (I) defines the memory address of a Queue Descriptor and (ii) contains command information to cause the I/O adapter to execute the command information in the Queue Descriptor;
and signaling the I/O adapter by action of the processor under control of the software to cause the I/O adapter to accomplish the following steps for each I/O Device:
locating the Mailbox at its predetermined memory address and reading and decoding the information in the Mailbox and executing commands defined by the command information in the Mailbox as a result of said signaling of the I/O adapter by action of the processor;
locating the Queue Descriptor at its predetermined memory address by using the memory address information obtained by decoding the information in the Mailbox, and reading and decoding the information in the Queue Descriptor and executing commands defined by the command information in the Queue Descriptor;
locating each I/O Descriptor at its predetermined memory address by using the queue linkage information obtained by decoding the information in the one of Queue Descriptor or I/O Descriptors, and reading and decoding the information in each I/O Descriptor and executing com-

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mands defined by the command information in each I/O Descriptor to perform I/O data transfers to and from the one I/0 Device;

communicating I/O data to the I/O adapter through the connection of each I/O Device to the I/O adapter; and

communicating I/O data between the processor and I/O adapter by performing operations indicated by the information contained in the data placed in at least the queue Descriptors and the I/O Descriptors in the main memory, after the command information in the Mailbox has been executed.

4,783,731

MULTICOMPUTER SYSTEM HAVING DUAL COMMON MEMORIES

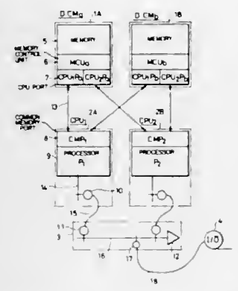
Yoshibiro Miyazaki, Hitachi; Jushi Ide, Mito; Takeshi Kato; Hiroaki Nakanishi, both of Hitachi, and Tadaaki Bandoh, Toukai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 513,077, Jul. 12, 1983, abandoned. This application Mar. 24, 1987, Ser. No. 30,266

Claims priority, application Japan, Jul. 15, 1982, 57-122151

Int. Cl.⁴ G06F *13/00, 15/16*

U.S. Cl. 364—200 **12 Claims**



1. In a multicomputer system having dual commom memories and plural computers which share said dual common memories, each dual common memory including a memory unit which has an operating system program area and a user program area, and memory access control means connected to the plural computers for permitting an access for read/write of data from any one of said computers to said memory unit; wherein each computer comprises access mode setting means for indicating either an online access or a debug access for each of a plurality of groups of divided addresses in each dual common memory; while said memory access control means in each dual common memory comprises function mode setting means for setting either an online mode or a debug mode for the associated memory unit, and checking means connected to the function mode setting means and responsive to an access mode signal from an access mode setting means for detecting a coincidence or noncoincidence between the access mode of the computer providing said access mode signal and said function mode in said memory access control means at the time of access by the computer to said dual common memory, and control means responsive to said checking means for rejecting said memory access at the time of detected non-coincidence between said access mode and said function mode and for allowing said memory access at the time of coincidence between said access mode and said function mode for an address area to be accessed in said dual common memory.

4,783,732

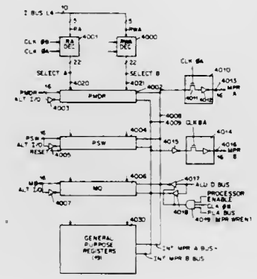
TWO-WIRE/THREE-PORT RAM FOR CELLULAR ARRAY PROCESSOR

Steven G. Morton, Oxford, Conn., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 12, 1985, Ser. No. 808,393

Int. Cl.⁴ G06F *12/00;* **G11C** *7/00*

U.S. Cl. 364—200 **12 Claims**



9. A cellular array processor according to claim 1, wherein each of said plurality of storage locations of said information storage means includes:

a pair of cross-connected inverter buffers having an intermediate impedance value and formed as one storage location unit, wherein one of said inverter buffers stores data as said first storage part of said storage location and the other of said inverter buffers stores the same data in inverse form as said second storage part of said storage location;

said first data line being connected to an output side of said first storage part of said storage location unit;

said second data line to an output side of said second storage part of said storage location unit;

a first gate transistor having a low impedance value relative to said intermediate impedance value of said storage location unit, wherein said first gate transistor has a first gate terminal for receiving said first address signal and operates to open and close said first data line to said first storage part; and

a second gate transistor having a low impedance value relative to said intermediate impedance value, wherein said second gate transistor has a second gate terminal for receiving said second address signal and operates to open and close said second connection to said second storage part.

4,783,733

FAULT TOLERANT COMMUNICATIONS CONTROLLER SYSTEM

David A. Greig, Menlo Park; David L. Hinders, Cupertino, and William R. Goodman, Palo Alto, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

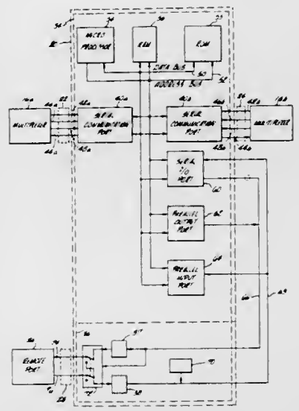
Division of Ser. No. 551,283, Nov. 14, 1983, Pat. No. 4,607,365. This application Apr. 21, 1986, Ser. No. 853,927

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—200 **1 Claim**

1. A line controller module for providing communication between a processor and any one of a wide variety of remote ports, the processor transmitting and receiving data in a first block level format and in a first data line level format and the remote port transmitting and receiving data in a second block level format and in a second data line level format and in an electronic line level format, with the processor being provided with information identifying the second format and being capable of downloading different software routines to the line controller and with the software routines being capable of converting the block level format and the data line level format, the line controller module comprising:

(a) a chosen one of a plurality of manually replaceable interface circuits, each such interface circuit providing a different electronic line level format and line level protocol to a remote port, said chosen interface circuit manually plugged into said line controller module and providing the line level format and line level protocol required by said remote port, thereby accommodating said remote port; and



(b) processing means for converting data transmitted from said processor to said remote port from the first block level format and the first data line level format to the second block level format and the second data line level format, and for converting data transmitted from said remote port to said processor from the second block level format and the second data line level format to the first block level format and the first data line level format, with the processing means controlled by software down-loaded from said processor.

4,783,734

COMPUTER SYSTEM WITH VARIABLE LENGTH PROCESS TO PROCESS COMMUNICATION

Michael D. May, and Roger M. Shepherd, both of Bristol, United Kingdom, assignors to INMOS Limited, Bristol, England

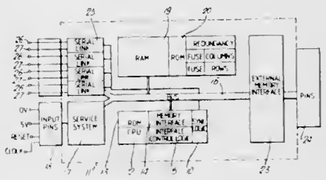
PCT No. PCT/GB84/00378, § 371 Date Jul. 3, 1985, § 102(e) Date Jul. 3, 1985, PCT Pub. No. WO85/02038, PCT Pub. Date May 9, 1985

PCT Filed Nov. 2, 1984, Ser. No. 756,431

Claims priority, application United Kingdom, Nov. 4, 1983, 8329509

Int. Cl.⁴ G06F *15/16*

U.S. Cl. 364—200 **20 Claims**



1. A method of operating concurrent processes in a computer system wherein each concurrent process executes a program having plurality of instructions comprising the steps of:

(a) forming a respective first pointer for each concurrent process to identify the process,

(b) forming a respective second pointer for each concurrent process to indicate a program stage for the process,

(c) scheduling a plurality of the concurrent processes for execution by a processor, including

(i) indicating a process which is being executed by the processor, said process being referred to as the current process,

(ii) identifying one or more processes forming a collection awaiting execution by the processor,

(iii) in response to a particular instruction stopping execution of the current process, storing a second pointer for said current process, changing the indication of the current process to indicate the next process in said collection and then executing said next process at a program stage indicated by the second pointer of the said next process; and

(d) transmitting messages between concurrent processes so that data is transferred from an outputting process to an inputting process in a communicating pair of processes, each process in said air executing a sequence of instructions in a program including communication instructions, said scheduling step being responsive to said communication instructions so that message transmission between the pair of processes is completed when both are at corresponding program stages, the transfer of data being effected by

(i) transferring from one addressable location to another at least one message unit of predetermined bit length,

(ii) execution of at least one of the processes of each pair providing a count of the number of message units to be transferred in a message,

(iii) execution of the outputting process providing an indication of a source address from which data is to be output,

(iv) execution of the inputting process providing a destination address to which the data is to be input and

(v) transferring from the source address to the destination address the number of message units indicated by said count.

4,783,735

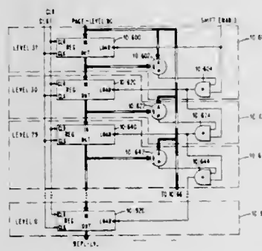
LEAST RECENTLY USED REPLACEMENT LEVEL GENERATING APPARATUS

Ming T. Miu, Chelmsford; Thomas F. Joyce, Westford; Jian-Kuo Shen, Belmont, and Forrest M. Phillips, North Chelmsford, all of Mass., assignors to Honeywell Bull Inc., Waltham, Mass.

Filed Dec. 19, 1985, Ser. No. 810,945

Int. Cl.⁴ G06F *12/02*

U.S. Cl. 364—200 **9 Claims**



1. An apparatus for generating signals designating the least recently used level for use in a cache memory having a plurality of levels, each level containing a plurality of addressable

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locations, and said cache memory including circuits for generating a page hit signal indicative of hit being detected indicating that the data requested has been located in said cache memory and a page level number coded for indicating the level in which said hit occurred, said apparatus comprising:

a number of register stages including an input stage and an output stage, each of said stages for storing a different replacement level value and being connected in tandem and each stage having only a clocked single multibit register for storing said different replacement level value;

input means coupled to said cache memory for receiving said page hit signal and said page level value for indicating said level in which said hit condition occurred, said input means being enabled during normal operation to transfer said page level value and said page hit signal as replacement level value and shift enable signal inputs respectively to said input stage multibit register;

means for simultaneously applying a single clock signal to each of said stage registers;

each of said register stages except said output stage further including:

a comparison circuit having an output and first and second sets of inputs respectively coupled to receive said different replacement value stored in said each stage multibit register and to receive from said input means, said page level number value; and,

logic gating means having first and second inputs and an output, said first and second inputs being connected to receive said shift enable signal and to said output of said comparison circuit respectively and said output being connected to both a first input of a logic gating means and an input to a stage multibit register of a next adjacent stage, said comparison circuit of each stage generating an output signal for indicating when there is the absence of an identical comparison between said page level value and said different replacement value stored in said each stage multibit register for enabling said logic gating means to transfer and apply said shift enable signal as said first input to said logic gating means and to said multibit register of said next adjacent stage;

said input means being inhibited by said absence of said page hit signal from applying said shift enable signal to said input stage thereby preventing any change in the stored different replacement level value contents of said number of stage multibit registers in response to said clock signal; and

said input and the remaining ones of said number of stages of multibit registers in response to said clock signal and said shift enable signal applied from said outputs of said logic gating means, loading said page level value into said multibit register of said input stage and simultaneously shifting the stored different replacement level contents through successive stages of said multibit registers up to and including the stage whose comparison circuit detected said identical comparison and inhibited said logic gating means from transferring and applying said shift enable signal to said multibit register and to said first input of said logic gating means of said next adjacent stage and any remaining stages, thereby providing at said output stage register within a minimum of time following the transfer of said hit signal, a replacement value which accurately represents said least recently used replacement level within said cache memory.

4,783,736

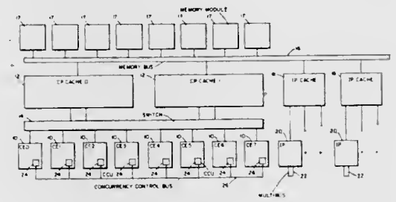
DIGITAL COMPUTER WITH MULTISECTION CACHE

Michael L. Ziegler, Whitinsville, and Robert L. Fredieu, Arlington, both of Mass., assignors to Alliant Computer Systems Corporation, Littleton, Mass.

Filed Jul. 22, 1985, Ser. No. 757,853

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **24 Claims**



1. A digital computer comprising

a plurality of memory elements, said memory elements being interleaved (i.e., each is assigned memory addresses on the basis of a low order portion of the memory address),

a plurality of processors connected in parallel, said processors each having means for intiating an access of data from any of said memory elements simultaneously with accesses of other said processors,

said memory elements each being capable of accepting an access from just one of said processors during a given cycle,

said memory elements being interleaved and said interleaving being characterized by access patterns generated by said processors when accessing data at particular strides,

said interleaving being selected so that the access patterns generated at a stride of one and a stride of two each meet the conditions that (1) the pattern will tolerate being offset with respect to an identical pattern by a particular OFFSET and any multiple of said OFFSET (wherein tolerating means that no memory access conflicts arise, i.e., more than one processor simultaneously attempting to access the same memory element) and (2) the pattern includes sufficient conflicts at offsets other than said particular OFFSET to force said processors to assume a relationship wherein said particular OFFSET is achieved, so that each said processor is able to access a different said memory element simultaneously without creating access conflicts.

4,783,737

PROM WRITER ADAPTED TO ACCEPT NEW WRITING ALGORITHM

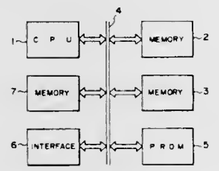
Mitsuyuki Ara, and Yoshihiro Honma, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1986, Ser. No. 928,507

Claims priority, application Japan, Dec. 25, 1985, 60-200528[U]

Int. Cl.[4] G06F *3/00, 7/06, 13/00;* **G11C** *17/00*

U.S. Cl. 364—200 **5 Claims**



1. A PROM writer, comprising:

(a) first memory means for storing a system program and a first writing algorithm;

(b) second memory means for storing data to be written into a PROM;

(c) CPU means operatively coupled to each of the first and second memory means and the PROM for executing the system program, the system program including a command which causes the CPU means to write the data stored in the second memory means into the PROM according to the first writing algorithm;

(d) third memory means coupled to the CPU means for storing a second writing algorithm; and

(e) interface means coupled to the CPU means for supplying the second writing algorithm to the CPU means, the system program causing the CPU means to store the second writing algorithm in the third memory means;

wherein the system program includes a command which causes the CPU means to write the data stored in the second memory means into the PROM according to the second writing algorithm.

4,783,738

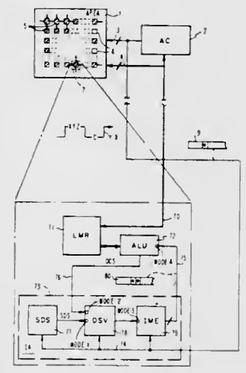
ADAPTIVE INSTRUCTION PROCESSING BY ARRAY PROCESSOR HAVING PROCESSOR IDENTIFICATION AND DATA DEPENDENT STATUS REGISTERS IN EACH PROCESSING ELEMENT

Hungwen Li, Pleasantville, and Ching-Chy Wang, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1986, Ser. No. 839,311

Int. Cl.[4] G06F *15/00*

U.S. Cl. 364—200 **7 Claims**



1. An array processor having a control unit with instruction issuing capability and having an array of individual processing elements for processing data according to instructions applied simultaneously to processing elements by the control unit, each processing element having input means, processing means, and output means connected to other processing elements characterized in that each of the processing elements is adaptive, in that each adaptive processing element receives an original instruction, generates a derived instruction and executes the derived instruction, each adaptive processing element comprising:

means for generating a derived instruction as a composite function of the original instruction and dynamic operational parameters by replacing bits in the original instruction; and

means to execute said derived instruction.

4,783,739

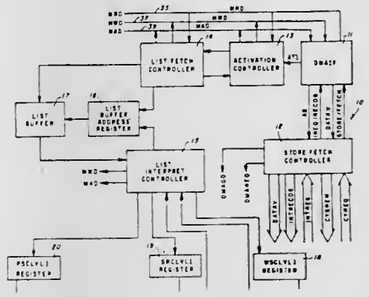
INPUT/OUTPUT COMMAND PROCESSOR

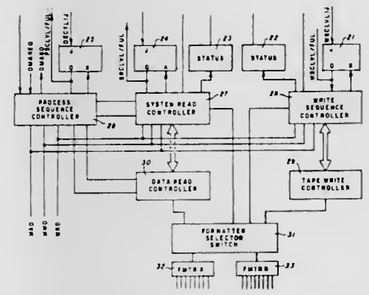
Powell L. Calder, Georgetown, Tex., assignor to Geophysical Service Inc., Dallas, Tex.

Continuation of Ser. No. 91,861, Nov. 5, 1979, abandoned. This application Jan. 19, 1983, Ser. No. 459,333

Int. Cl.[4] G06F *13/12*

U.S. Cl. 364—200 **10 Claims**





1. A command processor in an input/output controller for accepting commands from a central processor having a central memory, interpreting the commands and transmitting the interpreted commands to associated digital apparatus, comprising:

(a) store/fetch means connected to the central memory for directly accessing the central memory and for initiating all store and fetch cycles in the central memory;

(b) fetch and buffer means having:

(i) an activation controller operatively connected to receive the commands from the central memory for determining whether the commands may be sent directly to the associated digital apparatus or whether the central memory must be accessed for additional commands to be sent to the associated digital apparatus;

(ii) a list fetch controller, connected to the store/fetch means and to the activation controller for requesting from the central memory, through the store/fetch means, a plurality of commands when so indicated by the activation controller; and

(iii) a list buffer memory having an address register, for storing the plurality of commands received from the activation controller at desired addresses; and

(c) interpreting means, connected to interpret the commands in the list buffer memory to select the associated digital apparatus and to distribute the interpreted commands.

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4,783,740

INVENTORY MANAGEMENT SYSTEM

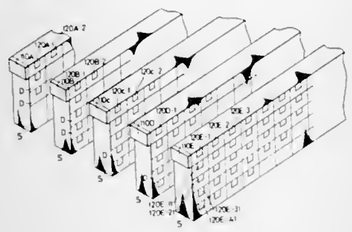
Toshimichi Ishizawa, Kawasaki; Ryuichi Nakagawa, Yokohama; Youji Yamaguchi, Tokyo; Takashi Kohayashi; Yoshihisa Toyoda, both of Yokohama; Nobuya Nishida, Sagamihara; Yoshitaka Naya, Tokyo; Hiroshi Araki; Isao Adachi, both of Yokohama; Akimichi Ishikawa, Tokyo; Eiji Ootaki, Choufu, and Masayuki Nagatsuka, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Yamato Electric Industry Co., Ltd., Yokohama, both of, Japan

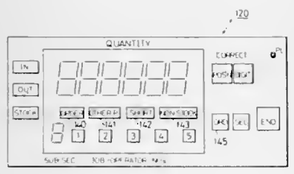
Filed Dec. 24, 1986, Ser. No. 946,045

Claims priority, application Japan, Dec. 26, 1985, 60-293996

Int. Cl.[4] G06F *15/24*

U.S. Cl. 364—403 **19 Claims**





1. An inventory management system comprising:

(a) a central control unit having:

(1) master file means for recording parts inventory information, and

(2) job file means for recording inventory job information; and

(b) a plurality of terminal unit means provided for each of a plurality of parts storing containers, including:

(1) job information display means for displaying said inventory job information related to parts stored in each container on the basis of said inventory job information recorded in said job file means; and

(2) parts inventory information updating means for updating parts inventory information recorded in said master file means.

4,783,741

COMPUTER SYSTEM FOR SIMULATING RETICULAR FORMATION OPERATION

Bernhard Mitteraurer, Viehhausen 59, A-5071 Wals bei Salzburg, Austria

Filed Aug. 8, 1984, Ser. No. 639,361

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1983, 3328610

Int. Cl.[4] G06F *15/42*

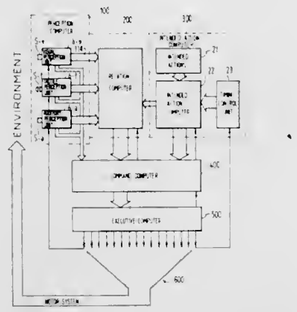
U.S. Cl. 364—413.01 **19 Claims**

1. A computer system for simulating reticular formation operation comprising, in combination:

(a) an input computer for producing signals representing, respectively, both the actual environment and the intended action to be taken; and

(b) a command computer, connected to said input computer, for executing a program on the principle of a permutograph thereby to give effect to said intended action in dependence upon said environment, said command computer comprising:

(1) a plurality (n) of addressable storage modules (M-1, M-2, . . . M-i, . . . M-n), each storage module including a program sequence memory for storing, as a storage module address, a unique program sequence corresponding to at least one intended action, the different program sequences stored, respectively, in different program memories being permutations of each other; and



(2) means for connecting said storage modules together into closed circuits, called "Hamilton loops", each Hamilton loop forming a series connection of a plurality of storage modules in a specific permutation of said program sequences that identify said storage modules by address;

whereby a specific run through the storage modules in the sequence defined by a Hamilton loop prescribes a specific course of action to be taken to effect said intended action.

4,783,742

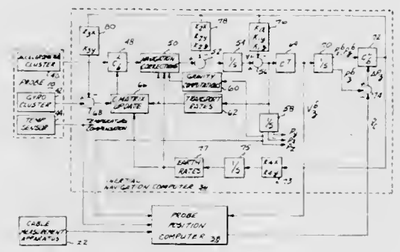
APPARATUS AND METHOD FOR GRAVITY CORRECTION IN BOREHOLE SURVEY SYSTEMS

Rex B. Peters, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 31, 1986, Ser. No. 948,100

Int. Cl.[4] G01V *19/02;* **G01C** *9/08;* **E21B** *47/00*

U.S. Cl. 364—422 **5 Claims**



1. A gravity-compensated borehole survey system comprising:

a probe configured and arranged for passage along said borehole, said probe including acceleration sensing means for supplying acceleration signals representative of the specific force asserted on said probe and angular rate sensing means for supplying angular rate signals representative of angular rotation of said probe about predetermined axes;

a cable affixed to said probe for raising and lowering said probe through said borehole;

cable control means for paying out and retrieving said cable to lower said cable into and retrieve said probe from said borehole; and

signal processing means connected for receiving said acceleration signals and said angular rate signals from said probe, said signal processing means providing:

(a) means for processing said acceleration signals and said angular rate signals during a series of repeated signal processing cycles to supply probe position signals representative of the position of said probe during each of said signal processing cycles, each of said probe position signals including a depth signal representative of the current vertical depth of said probe, said means for processing said acceleration signals and said angular rate signals being responsive to a gravity correction for correcting said acceleration signals relative to signal components that are attributable to gravitational force;

(b) means responsive to said depth signal for supplying a gravity gradient signal, said means for supplying said gravity gradient signal further being responsive to a signal representative of the density of the geological formations penetrated by said borehole at a depth corresponding to said current depth signal and being responsive to a signal representative of the gravitational force asserted on said probe when said probe is positioned at the surface of the earth near said borehole, said means for supplying said gravity gradient signal being configured and arranged so that the value of said gravity gradient signal is in substantial correspondence with the mathematical expression:

$$\frac{\Delta f}{\Delta H} = \frac{f_o}{R_o}\left(-2 + 3\frac{\rho(H)}{\rho_{ave}}\right)$$

where f_o represents the gravitational force asserted on said object when said object is located on the surface of the earth and Δf is a change in the gravitational force asserted on the probe as its vertical depth changes,

R_o represents the radius of the earth,

$\rho(H)$ represents the density of the geological formation surrounding said object during the current signal processing cycle,

ρ_{ave} represents the average density of the earth, and

ΔH represents a vertical displacement of the probe upwards;

(c) means responsive to said gravity gradient signal for supplying said gravity correction signal, said means for supplying said gravity correction signal being configured and arranged to supply said gravity correction signal in substantial accordance with the mathematical expression:

$$f(H) = \sum_{i=1}^{n}\left(\frac{\Delta f}{\Delta H_i}\right)(\Delta H)_i + f_o$$

where f(H) represents the gravity correction signal and the indicated summation represents accumulation of the product of the displacement, ΔH, and the gravity gradient signal for each signal processing cycle.

4,783,743

IMPROVED APPARATUS FOR DETERMINING WHETHER GEAR-SHIFTING IN AN AUTOMATIC TRANSMISSION CONTROL SYSTEM IS IN PROCESS OR HAS BEEN COMPLETED

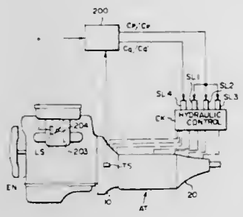
Seiji Yashiki; Haruki Higasbi; Kouichirou Waki, and Toshiyuki Kikuchi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Dec. 12, 1985, Ser. No. 808,172

Claims priority, application Japan, Dec. 18, 1984, 59-267209

Int. Cl.[4] B60K *41/08;* **G06F** *15/20*

U.S. Cl. 364—424.1 **16 Claims**



1. An automatic transmission control system comprising

a torque converter connected to the engine output shaft,

a transmission gear mechanism connected to the output shaft of the torque converter,

a gear-shifting control means which controls, according to predetermined gear-shifting characteristics, feed of pressure fluid to a fluid actuator for accomplishing gear-shifting in the transmission gear mechanism,

a torque converter output rpm detecting means which detects the rpm of the output shaft of the torque converter,

a converter rpm range setting means for determining a range of the rpm of the output shaft of the torque converter corresponding to the completion of said gear-shifting as a function of the rpm of the output shaft of the torque converter upon initiation of said gear-shifting and gear positions of the transmission gear mechanism before and after said gears-shifting,

an rpm change detecting means which detects the rate of change in the rpm of the output shaft of the torque converter,

an rpm determination means which determines whether the rpm of the output shaft of the torque converter is within said rpm range determined by the converter rpm range setting means,

an rpm change determination means which determines whether the rate of change in the rpm of the output shaft of the torque converter is smaller than a preset value, and

a gear-shifting completion determining means which receives outputs from the rpm determination means and the rpm change determination means and determines whether the gear-shifting is completed.

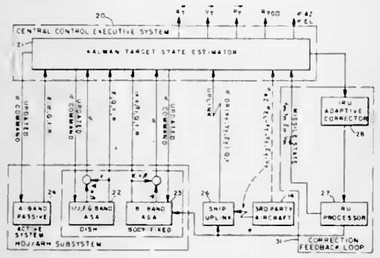
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4,783,744

SELF-ADAPTIVE IRU CORRECTION LOOP DESIGN INTERFACING WITH THE TARGET STATE ESTIMATOR FOR MULTI-MODE TERMINAL HANDOFF

William R. Yueh, Fullerton, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 8, 1986, Ser. No. 939,509
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—454 **11 Claims**



1. A target state estimation system in a missile for multi-mode guidance of said missile where measured range and range rate information and unavailable, wherein a missile launching platform having an established inertial frame of reference senses target radiation in the form of electromagnetic signals transmitted by a target, generates corresponding missile launching platform target line-of-sight (LOS) data referenced to said missile launching platform inertial frame of reference, and communicates said missile launching platform target LOS data to said missile, said missile target state estimator system comprising:

sensor means onboard said missile for sensing said target radiation and, in response thereto, for generating missile target LOS data;

inertial reference unit (IRU) means onboard said missile for establishing a missile coordinate frame of reference for said missile and for generating IRU missile state information with respect to said missile coordinate frame of reference;

a central control system onboard said missile connected to said sensor means and said IRU means, said central control system comprising Kalman filter means for receiving missile launching platform target LOS data, missile target LOS data and IRU missile state information for generating updated target state data based upon estimations of target state from previous missile launching platform target LOS data, missile target LOS data and IRU missile state information, updated subsequent missile launching platform target LOS data, missile target LOS data and IRU missile state information so as to provide estimates of current target state data corresponding to target acceleration, velocity, position, range-to-go, and reconstructed azimuth and elevation LOS angles, wherein said Kalman filter means comprises a multi-state horizontal filter and a multi-state vertical filter each kinematically modeled for expected target characteristics, said horizontal filter having a kinematic target model of a horizontal plane multi-state vector with one state of said horizontal plane multi-state vector defining a first range estimate discrepancy parameter and said vertical filter having a kinematic target model of a vertical plane multi-state vector with one state of said vertical multi-state vector defining a second range estimate discrepancy parameter, said horizontal and vertical filters coupled for crosstalk between said first and second range estimate discrepancy parameters; and

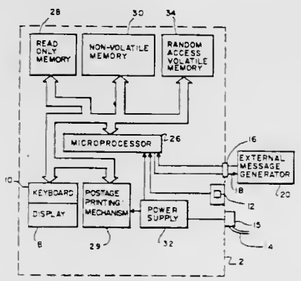
IRU adaptive correction means onboard said missile, connected between said central control system and said IRU means, and responsive to at least one input correction factor, with each input correction factor corresponding to a respective one of said first and second range estimate discrepancy parameters, and at least one corresponding geometry factor from said central control system, for generating a corresponding alignment correction factor which is provided to said IRU means, wherein said IRU means in response to said alignment correction factor provides corrected IRU missile state information to said Kalman filter means so as to correct unmodeled errors in said missile coordinate frame of reference and align said missile coordinate frame of reference with said missile launching platform inertial frame of reference.

4,783,745

NONVOLATILE MEMORY UNLOCK FOR AN ELECTRONIC POSTAGE METER

George M. Brookner, Norwalk, and John H. Soderberg, Stratford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 30, 1986, Ser. No. 823,901
Int. Cl.[4] G06F *3/00, 15/00*
U.S. Cl. 364—464.02 **29 Claims**



1. A postage meter comprising:

(a) printing means for printing postage;

(b) computing means coupled to said printing means for accounting for postage printed by said printing means;

(c) data entry means coupled to said computing means for entering messages into said computing means;

(d) nonvolatile memory means coupled to said computing means for storing a plurality of predetermined levels of secure data, said nonvolatile means having a set of bit locks each uniquely associated with each one of said predetermined levels of secure data; and

(e) program storage means coupled to said computing means adapted to store a set of programs which control the operation of said computing means and which includes a first program operable to identify which of said plurality of predetermined levels of secure data, if any, is referenced by an entered message, and a second program operable to determine if the bit lock associated with an identified level is set.

4,783,746

METHOD AND APPARATUS FOR OPTIMIZING THE VELOCITY OF MECHANISMS AND CYCLE TIME IN GLASSWARE FORMING MACHINES

Luis Cardenas-Franco, Monterrey, Mexico, assignor to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Jul. 23, 1986, Ser. No. 888,948
Int. Cl.[4] C03B *9/40*
U.S. Cl. 364—473 **6 Claims**

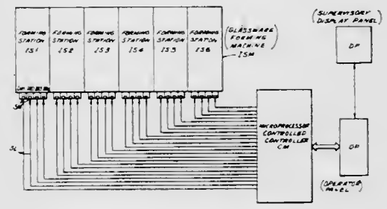
1. In a glassware article forming machine of the type including a plurality of individual feeding, forming and handling mechanisms for molten glass gobs, an apparatus for optimizing the velocity of operation of each individual mechanism and optimizing the forming cycle of the machine, comprising:

sensor means for each of the individual mechanisms of the machine, and operative to drive signals representative of the actual velocity of operation of said mechanisms; and

control means connected to said sensor means, and operative to receive and compare said signals with a predetermined maximum optimum velocity memory for said respective mechanisms, in order to provide a signal for compensating for deviations of the velocity of any one of said mechanisms from said predetermined maximum optimum velocity for said mechanism, and

to provide a command signal to trigger the operation of a succeeding mechanism when the preceeding mechanism has reached its point of cushioning,

whereby the velocity of operation of each individual mechanism of the machine, and the glassware forming cycle of the machine is optimized.

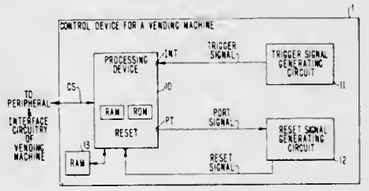


4,783,747

CONTROL DEVICE FOR AN AUTOMATIC VENDING MACHINE

Takahiro Komori, Gunma, and Kiyomitsu Higa, Maebashi, both of Japan, assignors to Sanden Corporation, Japan

Filed Mar. 4, 1987, Ser. No. 21,487
Claims priority, application Japan, Mar. 4, 1986, 61-30814[U]
Int. Cl.[4] G07F *11/00*
U.S. Cl. 364—478 **20 Claims**



1. A control device for automatically resetting an automatic vending machine comprising:

trigger signal generating means for periodically providing a trigger signal;

data processing means for executing a control program to control the vending machine, said data processing means comprising interrupt means responsive to the trigger signal for determining whether a parameter of the control program is within a predetermined range and thereby determining whether a vending machine malfunction has occurred, said processing means further comprising means for providing a port signal when a vending machine malfunction has occurred; and

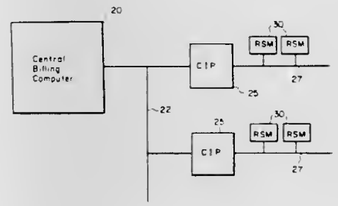
means responsive to the port signal for generating a reset signal to reset mechanical and electronic devices of the vending machine.

4,783,748

METHOD AND APPARATUS FOR REMOTE MEASUREMENT

Sayre Swarztrauber, New York, N.Y.; Michael R. Newsome, Wyckoff, N.J., and Mark C. Stern, New York, N.Y., assignors to Quadlogic Controls Corporation, New York, N.Y.

Continuation of Ser. No. 560,068, Dec. 9, 1983, abandoned. This application Mar. 4, 1987, Ser. No. 22,554
Int. Cl.[4] G01R *21/06, 19/14, 11/32*
U.S. Cl. 364—483 **16 Claims**



1. A remote sensing system comprising:

a plurality of remote sensing digital meters comprising:

means for sensing one or more parameters of a physical quantity as a measure thereof,

means for taking a plurality of samples of a function of the parameters sensed by said sensing means,

means for calculating from the samples taken by said sampling means one or more numerical values representative of said physical quantity,

means for accumulating the magnitude of the numerical value or values calculated by said calculating means,

means for providing the accumulated value to a remote location, and

at least one processing unit linked to said plurality of remote sensing meters via AC power lines, said processing unit comprising:

a central processing unit,

means for storing accumulated values received from said remote sensing meters, and

means for communicating with said remote sensing meters, said means comprising: means for transmitting identical signals to said remote sensing meters on a plurality of spaced apart frequency bands and means for receiving signals from said remote sensing meters on one of said frequency bands.

4,783,749

BASIC CELL REALIZED IN THE CMOS TECHNIQUE AND A METHOD FOR THE AUTOMATIC GENERATION OF SUCH A BASIC CELL

Peter Duzy; Ralf De Marino, both of Munich, and Berghardt Schallenberger, Feldolling, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Apr. 15, 1986, Ser. No. 852,159
Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518264
Int. Cl.[4] H01L *27/02*
U.S. Cl. 364—491 **6 Claims**

1. In a basic cell of the type constructed in accordance with complementary-metal-oxide-semiconductor technology, in which a plurality of transistors are arranged next to one another, a plurality of polysilicon first interconnects are arranged parallel to the extent of the transistors, and a plurality of metal second interconnects are arranged perpendicular to the first interconnects and extend adjacent the transistors, the improvement wherein:

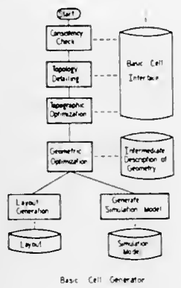
a maximum of four transistors are provided per basic cell and comprising first and second groups, said transistors of said first group being n-channel transistors and the transistors

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of said second group being p-channel transistors, said first group located in a first region of the cell and said second group located in a second region of the cell;

the transistors of said first group being interconnected to form a first circuit and the transistors of the second group being interconnected to form a second circuit;

metal tracks are arranged in the cell outside of the transistor areas at a lateral cell edge;



Basic Cell Generator

interconnects are provided adjacent said transistors and arranged such that an interconnect next following a previously formed interconnect extends adapted to the contour of the previously formed interconnect; and

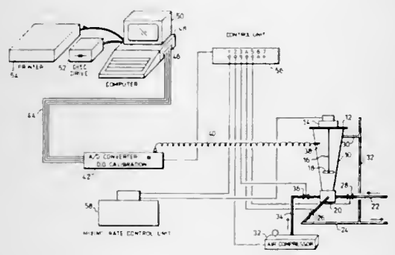
contacts are provided and arranged shifted with respect to interconnects connected thereto such that they are located in a bay formed in the appertaining neighboring interconnect.

4,783,750

DETERMINATION OF OXYGEN UPTAKE RATE IN WASTEWATER TREATMENT PLANTS

Daniel W. Smith, Edmonton, Canada, assignor to The Governors of the University of Alberta, Edmonton, Canada

Filed Sep. 15, 1986, Ser. No. 907,326
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—497 **10 Claims**



1. A method of controlling the aeration rate of an activated sludge wastewater treatment tank, comprising the steps:

(a) withdrawing a sample of mixed liquor and suspended solids from the tank into a chamber in which is located a dissolved oxygen probe that outputs a signal which is a function of the amount of dissolved oxygen in the liquid adjacent the probe,

(b) aerating the sample, then arresting the aeration,

(c) using a computer to sample the signal at regular intervals after aeration has ceased, and to produe a set of time-separated values corresponding to the sampled signals, which values represent the dissolved oxygen in the sample of liquid at timed intervals,

(d) emptying the chamber of its contents,

(e) repeating the steps (a) to (d) a plurality of times to generate a plurality of sets of said values,

(f) using computer means to calculate, for each set of said values, the rate at which the oxygen content of the sample decreases with time, and

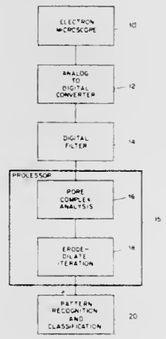
(g) whenever, for any set, the rate of decrease of the oxygen content is below a predetermined value, decreasing the said aeration rate.

4,783,751

ANALYSIS OF PORE COMPLEXES

Robert Ehrlich; Sterling J. Crabtree, Jr., and Robert Cannon, all of Columbia, S.C., assignors to University of South Carolina, Columbia, S.C.

Continuation of Ser. No. 524,022, Aug. 17, 1983, abandoned. This application Feb. 17, 1987, Ser. No. 16,495
Int. Cl.[4] G06F *15/62, 15/70;* **G01N** *33/24*
U.S. Cl. 364—506 **14 Claims**



1. A process for analyzing reservoir rock complexes comprising the steps of developing a digital representation of at least one scene of a field of view of a rock sample, arranging the digital representation into an array of pixels, separating the pixels representative of the pores and pore throats formed in the rock sample from the pixels representative of the non-porous areas of the rock sample for forming pixel representations of the pore and pore throat areas, progressively eroding and dilating the pore and pore throat representations such that each representation is subject to a reduction of an increasingly larger amount in size followed by a restoration in size until, a result of the last erosion, the representation is eliminated in its entirety, and displaying erosion-dilation spectra relating to the total amount of pore image, the number of pores and the pore roughness lost during each cycle of eroding and dilating.

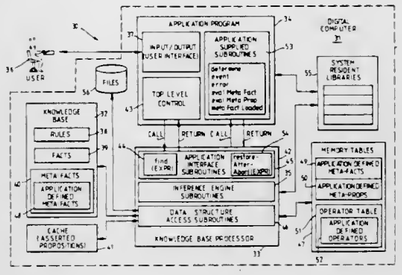
4,783,752

KNOWLEDGE BASED PROCESSOR FOR APPLICATION PROGRAMS USING CONVENTIONAL DATA PROCESSING CAPABILITIES

Samuel J. Kaplan, Portola Valley; Jonathan J. King, and Daniel Sagalowicz, both of Palo Alto, all of Calif., assignors to Teknowledge, Inc., Palo Alto, Calif.

Filed Mar. 6, 1986, Ser. No. 837,098
Int. Cl.[4] G06F *15/18*
U.S. Cl. 364—513 **41 Claims**

1. A knowledge base processor comprising a computer; said computer having a memory containing data; said computer also having means for processing said data; said data including a knowledge base and a control procedure; said knowledge base representing knowledge about a certain subject domain, said knowledge base including a set of rules which in combination is capable of being applied to conclude values for certain expressions; said data also including at least one domain-dependent application subroutine; said control procedure including subroutine entry points capable of being called for accessing the knowledge base and finding the value of a specified expression by invoking combinations of said rules; said



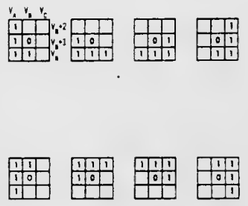
means for processing said data including means for executing said control procedure in response to calls to said subroutine entry points for accessing the knowledge base and finding the value of a specified expression by invoking combinations of said rules, and means for calling said application subroutine in response to the execution of certain designated steps in said control procedure during said invoking of said rules.

4,783,753

SYSTEM FOR REDUCING SPECKLE NOISE

Thomas R. Crimmins, Ann Arbor, Mich., assignor to Environmental Research Inst. of Michigan, Ann Arbor, Mich.

Filed May 7, 1986, Ser. No. 860,525
Int. Cl.[4] G06F *15/68;* **H03F** *1/266*
U.S. Cl. 364—574 **19 Claims**



1. A method for reducing speckle noise in a video image, said video image being formed of an m×n array of pixel elements, each pixel element having a respective gray-scale value (V) associated therewith, where zero is less than or equal to V which is less than or equal to K, here K is a maximum gray-scale value, the method comprising the steps of:

storing said video image in a memory by storing each of said m×n gray-scale values of corresponding pixel elements;

transforming said video image by recalling said gray-scale value, V_B, of each pixel element, comparing said gray-scale value V_B of each pixel element with the gray-scale value, V_A, of a first immediately adjacent pixel element and the gray-scale value, V_C, of a second immediately adjacent pixel element opposite to said first immediately adjacent pixel element and substituting a new gray-scale value, $V_{BN}=V_B+1$, for said gray-scale value, V_B, of the corresponding pixel element in response to at least one of the four following conditions being satisfied: $(V_B+2)\leqq V_A$; $V_C\geqq V_B<V_A$; $V_A\geqq V_B<V_C$; $(V_B+2)\leqq V_C$; and

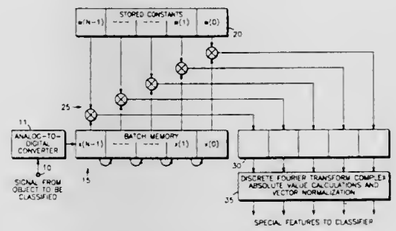
substituting said transformed video image for said video image in said memory.

4,783,754

PREPROCESSOR FOR SPECTRAL PATTERN CLASSIFICATION SYSTEMS

Jerald L. Bauck, Mesa, Ariz., and Robert Hecht-Nielsen, Del Mar, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,242
Int. Cl.[4] G01L *1/06;* **G06F** *15/34*
U.S. Cl. 364—513.5 **9 Claims**



1. A preprocessor for spectral pattern classification systems comprising a plurality of channel bandpass filter stages, the frequency response of the k-th frequency stage being substantially defined by

$$H_k^{\alpha}(e^{j\omega}) = \begin{cases} \cos^{\dagger}\left(\frac{\omega N - 2\pi k}{4\alpha}\right), (k-\alpha)\frac{2\pi}{N} \leqq \\ \omega \leqq (k+\alpha)\frac{2\pi}{N} \\ 0 \text{ otherwise} \end{cases}$$

where $K=0, \alpha, 2\alpha, 3\alpha, \ldots, [4]r\alpha$

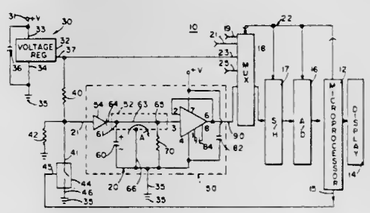
where N is the number of samples of data being filtered, r+1 is the number of stages, and α is an appropriately chosen positive integer constant typically selected to be =1, 2, 3, or 4.

4,783,755

INTERVAL TIMER CIRCUIT

Clark E. Blanchard, Kentwood, and Jon D. Lark, Grand Rapids, both of Mich., assignors to Jet Electronics & Technology, Inc., Grand Rapids, Mich.

Filed Feb. 11, 1986, Ser. No. 828,318
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—569 **20 Claims**



9. An interval timer for use in providing a time-related

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output voltage used for determining the downtime of an aircraft engine, said interval timer comprising:

a direct current reference voltage source;

a capacitor and resistor coupled in parallel relationship to each other, said capacitor and said resistor having values for providing a relatively high RC time constant;

means for selectively coupling said reference voltage source to said capacitor such that said capacitor will have charged to a predetermined voltage when the aircraft engine is shut down and said charged voltage will reduce from said predtermined voltage with shutdown time of the engine in a predictable manner allowing the voltage to be subsequently measured to determine the engine downtime; and

means coupled to said capacitor for monitoring the voltage across said capacitor to determine the downtime of the engine as represented by the reduced voltage across said capacitor upon restarting of the engine.

4,783,756

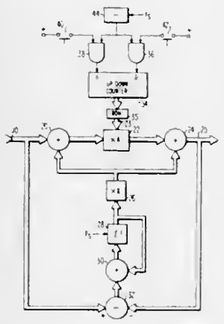
SAMPLED DATA TONE CONTROL SYSTEM

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Sep. 24, 1986, Ser. No. 911,156

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—715.01 **15 Claims**



1. A sampled data tone controlled system comprising:

a system input terminal for applying input samples, and an output terminal at whioh output samples are available;

means for applying a control variable A;

means coupled to said system input terminal and said output terminal for subtractively combining said input and output samples and integrating the combined samples to produce feedback samples; and

means, coupled to said system input terminal, said means for providing feedback samples and said means for applying a control variable A, for combining said input samples and said feedback samples in the ratio A:1+A to produce said output samples.

4,783,757

THREE INPUT BINARY ADDER

Joseph C. Krauskopf, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 24, 1985, Ser. No. 813,019

Int. Cl.[4] G05F *7/50*

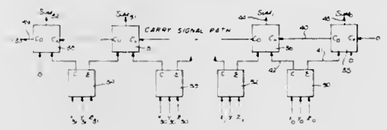
U.S. Cl. 364—784 **4 Claims**

1. A circuit for summing three binary words of N bits comprising:

a plurality of first circuits each for receiving one bit of the same significance of each of said three binary words and for providing a binary output having two bits wherein one of said two bits is of lower significance than the other of said two bits;

a plurality of adder cells, each having a carry-input terminal and carry-output terminal, said adder cells being coupled in series such that one of said carry-output terminals of one of said adder cells is coupled to one of said carry-input terminals of the next of said adder cells in said series;

said first circuits being coupled to said adder cells such that the lower significance bit of the ith one of said first circuits



is coupled to the ith one of said adder cells in said series wherein i=1, 2, N; and

said other of said two bits is coupled to $(i+1)^{th}$ one of said adder cells;

a final N^{th} carry from the last one of the first circuits is connected to the $(N+1)^{th}$ adder cell which also accepts the Nth adder cell's carry;

whereby three binary words are summed with only a single carry output terminal signal path.

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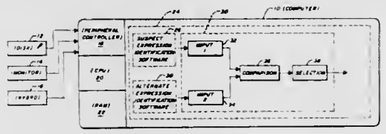
AUTOMATED WORD SUBSTITUTION USING NUMERICAL RANKINGS OF STRUCTURAL DISPARITY BETWEEN MISSPELLED WORDS & CANDIDATE SUBSTITUTION WORDS

Henry Kucera, Providence, R.I., assignor to Houghton Mifflin Company, Boston, Mass.

Filed Feh. 5, 1985, Ser. No. 699,202

Int. Cl.[4] G06F *15/21, 7/28*

U.S. Cl. 364—900 **31 Claims**



1. In apparatus for automated linguistic expression substitution, the improvement comprising

A. first input means for inputting, into said apparatus, a suspect expression signal representative of a linguistic expression consisting of characters,

B. second input means for inputting, into said apparatus, an alternate expression signal representative of a permissible linguistic expression consisting of characters,

C. comparison means, connected to said first and second input means, for comparing said suspect expression signal with said alternate expression signal and for producing a disparity signal numerically representative of differences between a spelling of the linguistic expression represented by said suspect expression signal and a spelling of the linguistic expression represented by said alternate expression signal, said comparison means including means for detecting disparity types representative of

(i) transposition of character order,

(ii) deletion of a character,

(iii) an unmatched character, and

(iv) differences in expression character length, occurring between said compared expression signals, said comparison means further including means responsive to the detection of said disparity type for producing a signal indicative of the numerically-weighted structural significance of that type, and

D. selection means, connected to said comparison means and responsive to a numerical value represented by said disparity signal, for selectively determining said alternate expression to be substitutable for said suspect expression and for producing an output signal indicative thereof.

4,783,759

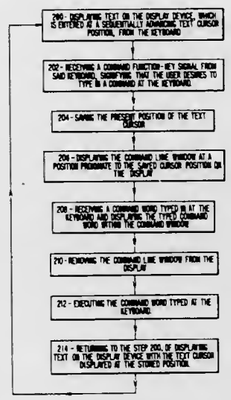
FLOATING COMMAND LINE

Kenneth W. Borgendale, Gaithersburg, Md.; Paul S. Cheng, Tokyo, Japan, and Kenneth A. Zaiken, Germantown, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 9, 1986, Ser. No. 905,356

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—900 **2 Claims**



1. In a text processing system including a memory for storing program instructions and a working area, a keyboard for entering alphanumeric characters representing commands and text and an alphanumeric display device having a display surface divided into a plurality of horizontal character rows for displaying said alphanumeric characters entered at said keyboard, a method for displaying commands entered at the keyboard to be executed by the system, comprising the steps of:

displaying said alphanumeric characters representing text on said display device by displaying each consecutive character as it is entered at the keyboard, at a next consecutive character position, which defines a text cursor position, in a first horizontal character row on said display until the end of a first row is reached at the right side of the display, and displaying the next consecutive character entered thereafter at the left side of the display in a second horizontal character row adjacent to and below said first row;

receiving a command function key signal from said keyboard, signifying that the user desires to type in a command at said keyboard;

identifying the position of a current horizontal character row containing said present text cursor position;

displaying a command line window having a boundary which occupies a horizontal character row adjacent to said current horizontal character row;

receiving the characters of a command word typed at said keyboard and displaying said characters of the command word within said command line window;

executing said command word typed at said keyboard;

whereby the user's attention remains focused in a region adjacent to said present text cursor position while displaying a command word within said command window which has been entered at said keyboard.

4,783,760

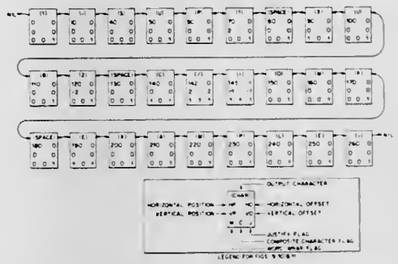
WORD PROCESSING TEXT JUSTIFICATION METHOD

Robert M. Carosso, Billerica, Mass., assignor to Honeywell Bull Inc., Waltham, Mass.

Filed Jun. 3, 1985, Ser. No. 740,700

Int. Cl.[4] B41J *5/30*

U.S. Cl. 364—900 **10 Claims**



1. An automated method of performing text justification to expand text within a line to produce flush left and right margins on an output medium comprising the steps of:

A. determining the number of expandable interword positions within the line (SPACES);

B. determining the number of expandable intercharacter positions within the line (CHARS);

C. determining the amount of expansion required within the line to a justified margin (EXPAND) by subtracting the width of the text from the total line width, the width of the text and the total line width being expressed in terms of horizontal granular units which correspond to the smallest horizontal distance the printhead of the output device can traverse along a line under control of the justification process, the value of a horizontal granular unit not being known to the justification process;

D. if both CHARS and SPACES are greater than 0:

(1) compute portion of EXPAND which is to go between characters and distribute it in expandable intercharacter positions; and

(2) compute portion of EXPAND which is to go between words and distribute it in expandable interword positions;

E. If CHARS is equal to 0, distribute EXPAND into expandable interword positions;

F. If SPACES is equal to 0, distribute EXPAND into expandable intercharacter positions;

4,783,761

SPELLING CHECK DICTIONARY WITH EARLY ERROR SIGNAL

R. William Gray, Ithaca; Donald T. Adams, Homer, N.Y., and Howard C. Duncan, IV, Marathon, all of N.Y., assignors to Smith Corona Corporation, Cortland, N.Y.

Filed Dec. 26, 1985, Ser. No. 813,351

Int. Cl.[4] G06F *7/04*

U.S. Cl. 364—900 **11 Claims**

1. A dictionary storage apparatus containing a word list used to verify the spelling order of character inputs comprising:

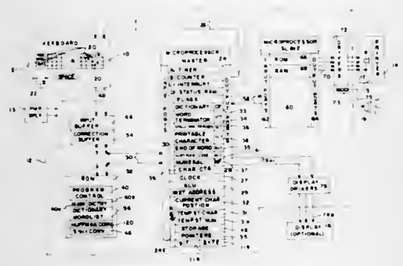
input means for receiving character inputs;

a first storage means for storing character information structured to sequentially check the spelling order of a first predetermined series of received character inputs;

a second storage means extending from said first storage means and containing further character information structured to check the spelling order of a variable string of

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character inputs strung from said predetermined series to validate spelling of words; and



signal output means connected to said first and second storage means for generating a signal immediately in response to a received character input being out of spelling order as structured in said first and second storage means.

4,783,762

PROGRAMMABLE CONTROLLER

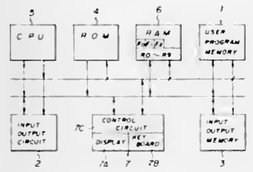
Tadashi Inoue, Hirakata; Noboru Asami, Nagaokakyo, and Mitsuru Nakamura, Uji, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 571,749, Jan. 18, 1984, abandoned. This application Apr. 30, 1987, Ser. No. 45,195

Claims priority, application Japan, Jan. 19, 1983, 58-8075

Int. Cl.[4] G06F *11/30, 15/46*

U.S. Cl. 364—900 **7 Claims**



1. A programmable controller having a trace mode, said controller comprising:

(a) origin instruction input means for generating an origin instruction to trigger a trace function,

(b) a memory means connected to said origin instruction input means, for receiving and storing said origin instruction,

(c) a display means connected to said memory means,

(d) a user program memory for storing user program instructions,

(e) instruction execution means connected to said user program memory, for receiving and executing said user program instructions,

(f) mode designation means, responsive to generation of said origin instruction, for designating a trace trigger mode,

(g) instruction and trace information extraction means, responsive to a designation of said trace trigger mode, for extracting an instruction which coincides with said origin instruction from a group of instructions being subjected to execution and processing by said instruction execution means and for extracting trace information, which has a reference corresponding to said instruction extracted which coincides with said origin instruction, from a group of instructions being subjected to execution and processing by said instruction execution means, by (i) setting a first flag in the memory means responsive to a designation of said trace trigger mode, to indicate that a trace trigger function has been designated; (ii) extracting an instruction currently being executed from the user program memory; (iii) responsive to said setting of the first flag, determining whether the instruction currently being executed coincides with the origin instruction; (iv) if no coincidence is determined in (iii), (a) storing the instruction currently being executed in a predetermined area of the memory means, (b) completing execution of this instruction, and (c) repeating (i), (ii) and (iii); (v) if a coincidence exists between the instruciton currenty being executed and the origin instruction, (a) setting a second flag in the memory means to prevent (iii) from being performed again until the trace trigger function has been terminated, (b) storing the instruction currently being executed in a predetermined area of the memory means, and (c) completing execution of this instruction, and (vi) sequentially extracting successive instructions for current execution from the user program memory and sforing said successive instructions in predetermined areas of the memory means.

4,783,763

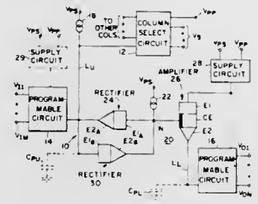
FIELD-PROGRAMMABLE DEVICE WITH BUFFER BETWEEN PROGRAMMABLE CIRCUIT

Michael J. Bergman, San Jose, Calif., assignor to North American Philips Corp., Signetics Division, Sunnyvale, Calif.

Filed Dec. 23, 1985, Ser. No. 812,688

Int. Cl.[4] G11C *7/00, 17/00*

U.S. Cl. 365—94 **17 Claims**



1. A field-programmble device in which there are: first and second circuits, each having at least one field-programmable element; first and second lines respectively connected to the first and second circuits; means for coupling the first and second lines; a first current supply for providing the first line with current adequate for normal operation of the device but insufficient to enable any of the field-programmable elements to be programmed; and select means for providing the first line with current that reaches a level sufficient tb enable each field-programmable element in the first circuit to be programmed during a programming period; characterized in that the coupling means comprises:

a second current supply for providing current at a node;

a first rectifier coupled between the first line and the node;

a second rectifier coupled between the node and the first line in the opposite forward conductive direction to the first rectifier;

an amplifier having a first flow electrode, a second flow electrode, and a control electrode for controlling current transmission between the flow electrodes, the control electrode coupled to the node, the second electrode coupled to the second line; and

supply means for providing the first electrode with current which is normally insufficient to enable any of the field-programmable elements to be programmed but which, in conjunction with the current from the select means, reaches a level sufficient to enable each field-programmable element in the second circuit to be programmed during a programming period.

4,783,764

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH BUILT-IN MEMORIES, AND PERIPHERAL CIRCUIT WHICH MAY BE STATICALLY OR DYNAMICALLY OPERATED

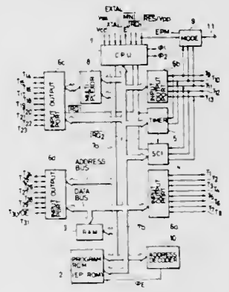
Fumio Tsuchiya, and Kiyoshi Matsubara, both of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1985, Ser. No. 802,198

Claims priority, application Japan, Nov. 26, 1984, 59-248106; Nov. 26, 1984, 59-248108

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—174 **3 Claims**



1. A semiconductor integrated circuit device comprising:

an information processing circuit which is operated by a periodic timing signal;

an electrically programmable read only memory which is coupled to said information processing circuit and which is accessed by either said information processing circuit to read data thereof or from outside of said semiconductor integrated circuit device to write data therein, wherein said electrically programmable read only memory has a memory array and a peripheral circuit and wherein said peripheral circuit is statically or dynamically operated to access said memory array when said electrically programmable read only memory is accessed by either said information processing circuit or from the outside of said semiconductor integrated circuit device; and

a control circuit for setting an operation of said peripheral circuit of said electrically programmable read only memory so that said peripheral circuit is statically operated when said electrically programmable read only memory is accessed from the outside of said semiconductor integrated circuit device and said peripheral circuit is dynamically operated in response to said periodic timing signal when said electrically programmable read only memory is accessed by said information processing circuit,

wherein said peripheral circuit includes a read circuit having: a sense amplifier made receptive to a data signal from said memory array and; a latch circuit made receptive to the output of said sense amplifier; and

wherein said control circuit is operative to output a control signal for interrupting the operation current of said sense amplifier after read data has been latched by said latch circuit, and further comprising:

a dummy memory array including a dummy data line; and

a read circuit for said dummy memory array, wherein said read circuit detects an end of the data reading operation based on detecting a predetermined level on said dummy data line and provides an output signal based on detecting said predetermined level, and

wherein said control circuit is responsive to the output of said read circuit to output a control signal for interrupting said sense amplifier operation based on the output signal of said read circuit.

4,783,765

BIPOLAR MEMORY CELL WITH CROSS-CONNECTED TRANSISTORS AND AN EXTERNAL CAPACITANCE

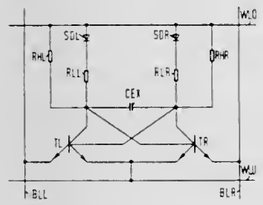
Wolfgang Werner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 21, 1986, Ser. No. 898,695

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529898

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—154 **20 Claims**



1. Integrated bipolar memory cell with random access, comprising an upper word line, a lower word line, two bit lines, two transistors each having two emitters, a base and a collector fed back crosswise to said base of the other transistor, two Schottky diodes, two low-resistance load resistors each forming a series circuit with a respective one of said Schottky diodes, two high-resistance load resistors each forming a parallel circuit with a respective one of said series circuits, each of said parallel circuits being connected between a respective one of said collectors and said upper word line defining active regions of the memory cell, one of said emitters of each of said transistors being connected to said lower word line, the other of said emitters of each of said transistors being connected to a respective one of said bit lines, and an external capacitance connected between said collectors outside said active regions.

4,783,766

BLOCK ELECTRICALLY ERASABLE EEPROM

Gheorghe Samachisa; George Smarandoiu; Chien-Sheng Su, all of San Jose, and Ting-Wah Wong, Cupertino, all of Calif., assignors to SEEQ Technology, Inc., San Jose, Calif.

Filed May 30, 1986, Ser. No. 869,207

Int. Cl.[4] G11C *11/34*

U.S. Cl. 365—185 **7 Claims**



1. A block erasable electrically programmable, electrically erasable floating gate memory cell, comprising:

a semiconductor substrate having spaced-apart source and drain regions disposed therein forming a channel therebetween,

a floating gate, electrically insulated from said semiconductor substrate said floating gate self-aligned only with respect to said drain region and extending over a portion of said channel,

a control gate, electrically insulated from said floating gate and from said semiconductor substrate, said control gate lying above said floating gate and being self-aligned with respect to said source and drain regions,

whereby said floating gate memory cell may be erased by attracting electrons to said drain.

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4. A block erasable electrically programable, electrically erasable floating gate memory cell, comprising:

a semiconductor substrate having spaced-apart source and drain regions disposed therein forming a channel therebetween,

a floating gate electrically insulated from said semiconductor substrate by a uniformly thick dielectric, said floating gate self-aligned only with respect to said drain region and extending over a portion of said semiconductor substrate between said drain region and said source region;

a control gate, electrically insulated from said floating gate and from said semiconductor substrate said control gate lying above said floating gate and above said semiconductor substrate said control gate self-aligned with respect to said drain region and said source region,
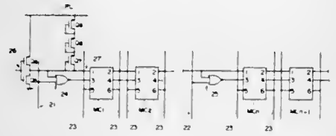
whereby said floating gate memory cell may be erased by attracting electrons to said drain.

4,783,767

STATIC RAM WITH DIVIDED WORD-LINE STRUCTURE

Minoru Hamada, Ogaki, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jun. 9, 1986, Ser. No. 872,126
Claims priority, application Japan, Jun. 14, 1985, 60-130296
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **7 Claims**



1. A static random access memory including flip-flops arranged as memory cells in an array including a plurality of rows and row selecting means, comprising:

power supply lines for said flip-flops, the power supply lines for flip-flops positioned in the same row being connected in common with each other,

a common power supply line connected to said power supply lines for said flip-flops,

means providing a signal having at least two distinct binary states to said common power supply line, and said common power supply line being coupled as a row selecting signal to said row selecting means.

4,783,768

SEMICONDUCTOR MEMORY

Nobuyoshi Tanimura, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 720,896, Apr. 8, 1985, abandoned. This application Apr. 24, 1987, Ser. No. 42,367
Claims priority, application Japan, Apr. 6, 1984, 59-67687
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **36 Claims**

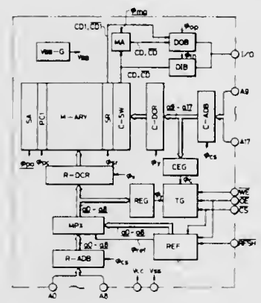
1. A semiconductor memory comprising:

a memory array having a plurality of memory cells;

first means for generating timing signals in a time series manner without the need of receiving external clock signals;

an address counter coupled to said first means, said address counter including means for generating address data designating memory cells from said memory array in response to the timing signals of said first means; and

second means coupled to said memory array and to an external terminal, said second means including means for serially transmitting data stored in memory cells designated by said address counter to said external terminal.

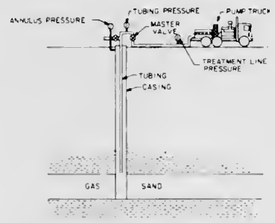


4,783,769

METHOD OF DETERMINING POSITION AND DIMENSIONS OF A SUBSURFACE STRUCTURE INTERSECTING A WELLBORE IN THE EARTH

Gary R. Holzhausen, Santa Cruz, Calif., assignor to Gas Research Institute, Chicago, Ill.

Filed Mar. 20, 1986, Ser. No. 841,644
Int. Cl.[4] G01V *1/133*
U.S. Cl. 367—35 **35 Claims**



1. A method of determining the position and dimensions of a subsurface fracture intersecting an existing wellbore in the earth comprising the steps of

creating an oscillation within the wellbore,

measuring oscillation in pressure and flow in the wellbore to define impedance at one or more measurement points, and

utilizing the impedance measured to define a model of the fracture.

4,783,770

METHOD OF THREE-COMPONENT REFLECTION SEISMOLOGY

Steve H. Danbom, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 18, 1985, Ser. No. 713,187
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—53 **5 Claims**

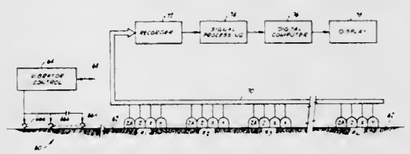
1. A method of three-component reflection seismology over selected earth surface for identification of dipping reflections, comprising:

generating seismic energy in at least one source point on the earth surface;

receiving reflected seismic energy at each of a plurality of spaced receiver points arrayed with said source point to delineate a plane seismic section, each receiver point including orthogonally aligned seismometers for detecting data signals for each of vertical particle velocity, radial particle velocity and transverse particle velocity;

recording separately each plurality of data signals for the vertical, radial and transverse particle velocities; and

processing said pluralities of data signals separately and interactively to define better those reflections emanating from steeply dipping geological formation boundaries and to differentiate those reflections originating from out of the plane of the seismic section, and including processing of the plurality of vertical data signals and plurality of radial data signals and cross-correlating to output a correlation signal for subsequent multiplying with said vertical data signals to output an enhanced vertical signal.

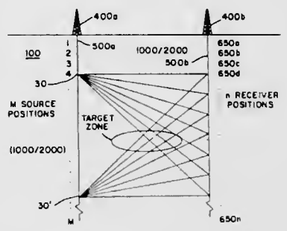


4,783,771

NONDESTRUCTIVE DOWNHOLE SEISMIC VIBRATOR SOURCE AND PROCESSES OF UTILIZING THE VIBRATOR TO OBTAIN INFORMATION ABOUT GEOLOGIC FORMATIONS

Bjorn N. P. Paulsson, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 841,074, Mar. 18, 1986, Pat. No. 4,702,343. This application Oct. 15, 1987, Ser. No. 109,334
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—57 **21 Claims**



1. A process for obtaining information from a formation penetrated by a wellbore comprising the steps of:

lowering a nondestructive downhole seismic source into a wellbore penetrating a formation;

periodically stopping said seismic source at predetermined locations within the wellbore;

clamping the seismic source to the wellbore while it is stopped;

hydraulically moving a reaction mass in the seismic source to generate seismic waves while the seismic source is clamped, said reaction mass conveying forces through the means for clamping and into the wellbore; and

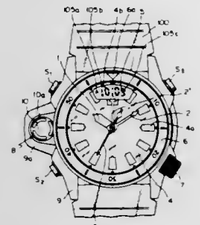
detecting the seismic waves at a desired position.

4,783,772

WRISTWATCH WITH PRESSURE SENSOR

Toshio Umemoto; Toshio Hiruta, both of Tokyo; Hideo Uehara, Sayama; Masato Yamada, Tokyo, and Kunikazu Mochida, Tokorozawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 840,790, Mar. 18, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 165,361
Claims priority, application Japan, Mar. 19, 1985, 60-039107[U]; Sep. 26, 1985, 60-213322; Sep. 26, 1985, 60-213323
Int. Cl.[4] G04B *47/06*; G01L *9/00*
U.S. Cl. 368—11 **18 Claims**



1. A wristwatch having a case, and an internal module provided in the case, said module comprising a face portion having means for displaying the time and detected depth or altitude, the improvement comprising a projection exending laterally from said face portion in a plane substantially normal to the axis of said face portion, a pressure sensor which is provided in said projection and which is functionally connected to the module, means for detecting a depth or an altitude in response to the measurement of pressure by the pressure sensor, means for displaying the detected depth or altitude, and a protective plate mounted in a major surface of said projection and defining gap within said projection between said protective plate and said pressure sensor, with said pressure sensor being located below said gap and opposite a center portion of said protective plate, said protective plate being provided with openings through which the pressure acts on the pressure sensing element, said openings being located in the vicinity of an outer periphery of the protective plate.

4,783,773

REGATTA TIMING WATCH

John T. Houlihan, Watertown, Conn.; T. Fred Olsen, Oslo, Norway, and Tom Thinesen, Sunnyvale, Calif., assignors to Timex Corporation, Waterbury, Conn.

Filed Jun. 17, 1988, Ser. No. 207,826
Int. Cl.[4] G04F *8/00*; G04C *17/02*
U.S. Cl. 368—108 **14 Claims**

1. An improved regatta timing watch, comprising:

a case having a plurality of manually actuated switches, and having a microcomputer in said case responsive to said switches, and having an annunciator in said cases responsive to said microcomputer,

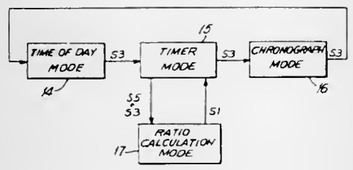
an electrooptical display disposed in said case and having a plurality of first actuatable segments arranged to display digits and a plurality of second actuatable circumferentially spaced radial segments surrounding said first segments,

said microcomputer being programmed to provide a time of day mode adapted to generate and display the time of day on said first segments, and a timer mode initiated in response to actuation of at least one of said switches, said timer mode being adapted so as to display time of day on

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said second segments and to display on said first segments the time remaining in a selected countdown period, said





countdown period being selected in response to actuation of at least one of said switches.

4,783,774

CONTROL SYSTEM FOR OPTICAL INFORMATION REPRODUCING APPARATUS

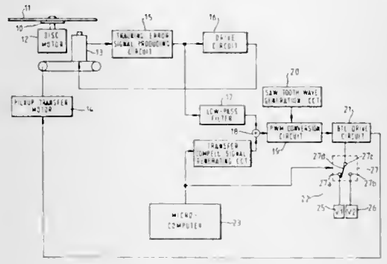
Akihiko Enomoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Dec. 23, 1986, Ser. No. 1,332

Claims priority, application Japan, Dec. 24, 1985, 60-291312; Dec. 24, 1985, 60-291313; Dec. 24, 1985, 60-291314; Dec. 24, 1985, 60-291315; Dec. 24, 1985, 60-291316; Dec. 24, 1985, 60-291317; Dec. 24, 1985, 60-291318; Dec. 24, 1985, 60-291319; Dec. 24, 1985, 60-291320; Dec. 24, 1985, 60-291321

Int. Cl.[4] G11B *19/24, 7/00*

U.S. Cl. 369—44 **38 Claims**



1. A control system for an optical disc information reproducing apparatus in which information data stored in an optical disc is read out during a rotation of the optical disc by a light spot of a light beam, the system comprising:

means for producing the light beam;

means for relatively moving the optical disc and the light spot of the light beam;

means responsive to the light beam reflected from the optical disc for reproducing the information data from the optical disc during the rotation of the optical disc, the reproducing means producing an electrical signal corresponding to the information data;

means for deriving a servo control signal from the reproduced signal;

means for modulating the servo control signal to a pulse width modulation (PWM) signal;

means for amplifying the PWM signal;

means for producing a response control signal,

means responsive to the amplifying means for driving the moving means; and

means for applying the amplifying means with a power supply voltage which is changeable in response to the response control signal.

4,783,775

DRIVER FOR AN OBJECTIVE OF AN OPTICAL SCANNING UNIT

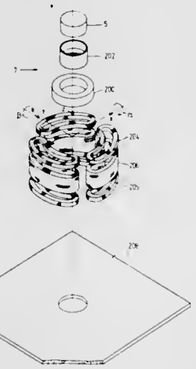
Wilhelmus A. H. Gijzen, Eindhoven, Netherlands; Leonhard Honds; Karl-Hanns Meyer, both of Aachen, Fed. Rep. of Germany; Robert N. J. Van Sluys, and Gerard E. Van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 24, 1986, Ser. No. 889,149

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529088; Aug. 14, 1985, 3529089; Netherlands, Nov. 25, 1985, 8503237

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **24 Claims**



1. An apparatus for scanning, with a beam of radiation, recording tracks on an information surface of an optical record carrier, said apparatus comprising means for converging said beam along an optical axis so as to form a scanning spot on said information surface, means for supporting said converging means for controllable movement with respect to said information surface, said supporting means comprising a movable annular member of magnetic material arranged about said optical axis, said converging means being supported by said annular member for movement therewith, first electromagnetic coil means disposed in each of two axially spaced outer planes which are generally perpendicular to said optical axis, each of said outer planes and said first coil means disposed therein being located adjacent a respective axial end of said annular magnetic member, said first coil means interacting with said annular magnetic member through an air gap therebetween so as to exert a first force on said annular member upon excitation of said first coil means, and second electromagnetic coil means arranged in a central plane which is generally perpendicular to said optical axis and is located between said outer planes, said second coil means interacting with said annular magnetic member via an air gap therebetween so as to

exert a second force on said annular member upon excitation of said second coil means.

4,783,776

METHOD OF RECORDING AND REPRODUCING DIGITAL INFORMATION AND APPARATUS THEREFOR

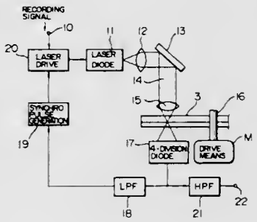
Masaji Ishigaki; Hideo Onuki, both of Yokohama; Yukio Fukui, Machida; Masayuki Inoue, and Kunikazu Ohnishi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 17, 1986, Ser. No. 886,413

Claims priority, application Japan, Jan. 22, 1986, 61-9955

Int. Cl.[4] G11B *7/125*

U.S. Cl. 369—109 **6 Claims**



1. A digital information recording and reproducing method comprising the steps of:

forming a plurality of light beam guide tracks on a recording medium capable of multiple light-wavelength recording, said tracks being spaced apart by a predetermined pitch and each of said tracks comprising a series of pre-pits disposed in a scan direction and spaced apart by an interval longer than the diameter of a spot of a light beam for use in recording and reproducing; and

recording and reproducing an information bit by changing said light beam to have a different wavelength predetermined n times in a predetermined order while said light beam is scanned by one interval of said pre-pits.

4,783,777

DISC PLAYER

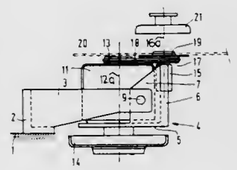
Eduard Camerik, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 19, 1986, Ser. No. 945,062

Claims priority, application Netherlands, Dec. 20, 1985, 8503522

Int. Cl.[4] G11B *25/04*

U.S. Cl. 369—265 **7 Claims**



1. A disc player comprising

a supporting member which can be swung about a swing axis between a first position and a second position,

a drive motor mounted on said supporting member,

a first turntable drivable by said motor and having a first axis of rotation, said first turntable being mounted on said supporting member so that when said supporting member is in the first position, a disc supported on said first turntable will be in the play position,

a second turntable drivable by said motor and having a second axis of rotation spaced from and parallel to said first axis of rotation, said second turntable being mounted on said supporting member so that when said suppoorting member is in the second position, a disc supported on said second turntable will be in the play position.

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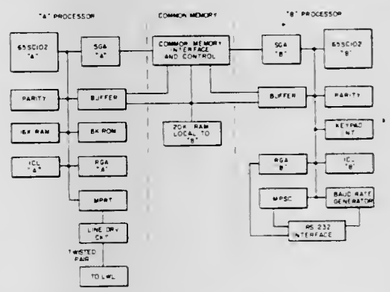
SYNCHRONOUS PACKET MANAGER

William W. Finch, Lisle, Ill., and Gulay Sencer, Red Bank, N.J., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Sep. 16, 1986, Ser. No. 908,112

Int. Cl.[4] H04L *5/00*

U.S. Cl. 370—60 **1 Claim**



1. In a telecommunications switching network for interconnecting data units arranged to transmit data in a first format to a switching unit arranged to switch data of a second format, an apparatus for synchronously converting said formats comprising:

a multi protocol serial controller (MPSC) module;

an interface operated to convert incoming data to TTL levels and connected to said MPSC:

said MPSC operated to convert received serial data onto a parallel data bus;

a memory means;

a first microprocessor connected to said parallel data bus and operated to place said data into said memory means;

a minipacket receiver transmitter;

a second microprocessor operated in response to the placement of the data into said memory means to forward said data to said minipacket receiver transmitter;

said minipacket receiver transmitter operated upon receipt of said data to format said data into minipackets and to convert said formatted data to an alternate mark inversion signal for connection to a switching network.

4,783,779

FREQUENCY ASSIGNMENT SYSTEM IN FDMA COMMUNICATION SYSTEM

Fumio Takahata; Mitsuo Nohara, and Yasuo Hirata, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,572

Int. Cl.[4] H04J *1/04;* **H01J** *9/38*

U.S. Cl. 370—69.1 **5 Claims**

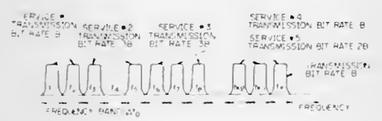
1. A transmitter/receiver system in a frequency division multiple access communication system which assigns a necessary number of frequencies, each having a predetermined transmission band, said transmitter/receiver system comprising:

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a transmitter including,

(a) a separation circuit which divides an input service into a plurality of low bit rate signal series to utilize small, unused frequency bands, each signal series being transmitted by one of said predetermined transmission bands, based upon carrier frequency assignment information when a transmission bit rate of said input service is higher than a transmission capability of said predetermined transmission band and when one frequency band large enough for transmitting an input service is not available at the instant of receiving said input service,

(b) a plurality of PSK modulators for modulating each output of said separation circuit, and



(c) a combiner for combining outputs of all the PSK modulators to provide a transmission output signal through a single transmission line; and

a receiver including,

(d) a plurality of PSK demodulators for effecting PSK demodulation for each signal transmitted from a transmitter,

(e) a multiplexer coupled with outputs of said demodulators for multiplexing said divided signal series into a high bit rate service according to said carrier frequency assignment information.

4,783,780

METHOD AND APPARATUS FOR SELECTING A FREE CHANNEL IN A MOBILE RADIO SYSTEM

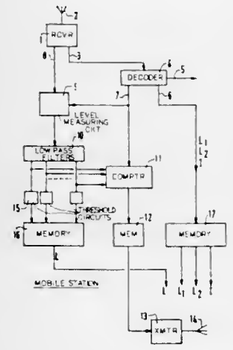
Roger P. J. Alexis, Neuilly sur Seine, France, assignor to U.S. Philips Corp., New York, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,557

Claims priority, application France, Jul. 9, 1985, 85 10490

Int. Cl.[4] H04J *3/16*

U.S. Cl. 370—95 **9 Claims**



1. A method of enabling a mobile station (M) to select a free duplex channel for communicating with a fixed station (F) in a cellular mobile radio system having a plurality of duplex channels each of which has a rising communication path and an associated descending communication path, respective duplex channels having respective addresses and providing communication between respective ones of a plurality of fixed stations and a plurality of mobile stations, the fixed stations being located in a pattern of cells constituting the cellular system; such method comprising:

each fixed station identifying the addresses of duplex channels having rising paths which are engaged by detecting whether the signal power level in each received rising path exceeds a first given threshold, and transmitting the addresses of such channels to the mobile stations over a signalling path comprising equidistant time interval channels which are successively and periodically allotted to the respective fixed stations in the cellular system;

determination by each mobile station of the addresses of duplex channels having descending paths which are engaged by detecting whether the signal power level in each received descending path exceeds a second given threshold; and

selection by the mobile station (M) of a free duplex channel from among duplex channels having addresses differing from those of channels which are engaged in the rising paths and those which are engaged in the descending paths;

such method being characterized by:

continuous transmission by each of the fixed stations, in the signalling path time interval channels respectively allotted to them, of the addresses of duplex channels which they are using and of which of such channels having engaged descending paths;

detection by the mobile station (M) of the signal power level in the signalling path time interval channels received from the respective fixed stations, and identification as interfering stations those for which such received signal power level exceeds a predetermined interference threshold but is below the maximum received signal power level; and

determination by the mobile station (M) of the addresses of duplex channels of fixed station (F) having engaged descending paths by eliminating from the address of all duplex channels having engaged descending paths the addresses of duplex channels of interfering fixed stations.

4,783,781

SEMICONDUCTOR MEMORY DEVICE HAVING REDUNDANCY CONFIGURATION WITH READ CIRCUIT FOR DEFECTIVE MEMORY ADDRESS

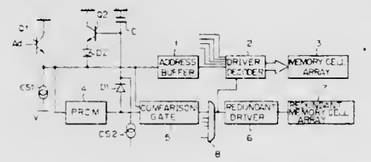
Tomoharu Awaya, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 9, 1986, Ser. No. 883,756

Claims priority, application Japan, Jul. 12, 1985, 60-153542

Int. Cl.[4] G06F *11/20*

U.S. Cl. 371—10 **8 Claims**



1. A semiconductor memory device having a redundancy configuration, comprising:

a first power supply line;

a second power supply line having a lower voltage than that of said first power supply line;

an input-buffer circuit including:

an input terminal operatively connected to receive an input address signal;

a first bipolar-transistor having a base operatively connected to said input terminal, a collector operatively connected to said first power supply line, and an emitter; and

a constant current source operatively connected between the emitter of said first bipolar-transistor and said second power supply line;

decoder means, operatively connected to said emitter of said first bipolar-transistor, for receiving the input address signal and decoding the input address signal;

a memory cell array operatively connected to said decoder means;

a programmable ROM for storing an address of a defective memory cell in said memory cell array, and having an output terminal for outputting the address of the defective memory cell;

a comparison circuit, operatively connected to the output terminal of said programmable ROM and to said input terminal of said input-buffer circuit, for comparing the address of the defective memory cell and the input address signal and for detecting an access to the defective memory cell;

a redundancy memory cell, operatively connected to said comparison circuit, accessed in place of the defective memory cell in response to the detection of the access to the defective memory cell by said comparison circuit; and

a second bipolar-transistor having a base operatively connected to said output terminal of said programmable ROM, having a collector operatively connected to said first power supply line, and having an emitter operatively connected to the emitter of said first bipolar-transistor,

said first bipolar-transistor, said second bipolar-transistor and said constant current source forming a current switch circuit, a voltage on the base of said second bipolar-transistor being adjusted with respect to a voltage of the input address signal applied to the base of said first bipolar-transistor during a normal operation such that said second bipolar-transistor is turned OFF regardless of the input address signal, and the voltage on the base of said second bipolar-transistor being adjusted with respect to another voltage applied to the base of said first bipolar-transistor and having a voltage different from the voltage of the input address of the defective memory cell during a read out of the address of the defective memory cell stored in said programmable ROM such that said second bipolar-transistor being turned ON or OFF according to the stored address of the defective memory cell.

4,783,782

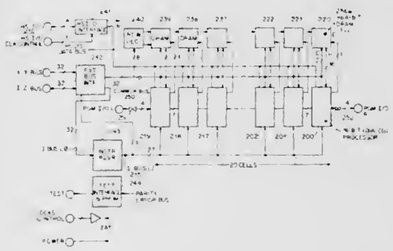
MANUFACTURING TEST DATA STORAGE APPARATUS FOR DYNAMICALLY RECONFIGURABLE CELLULAR ARRAY PROCESSOR CHIP

Steven G. Morton, Oxford, Conn., assignor to Alcatel U.S.A. Corporation, New York, N.Y.

Filed Dec. 12, 1985, Ser. No. 808,391

Int. Cl.[4] G06F *11/20*

U.S. Cl. 371—11 **10 Claims**



1. A dynamically reconfigurable cellular array processor chip having a plurality of processing cells that may include a number of randomly located defects, said cellular array processor chip comprises:

means, integrated on said chip, for storing data indicative of the location of said defects, whereby said data is used during dynamic reconfiguration to achieve an optimal array configuration for a problem to be solved by the processor.

4,783,783

DATA PROCESSING SYSTEM HAVING PIPELINE ARITHMETIC/LOGIC UNITS

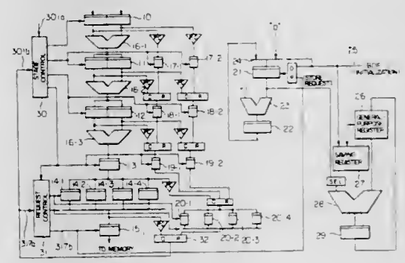
Seiji Nagai; Takaaki Nishiyama; Hiromichi Kainoh, and Fujio Wakui, all of Hadano, Japan, assignors to Hitachi, Ltd. and Hitachi Computer Eng. Co., both of Tokyo, Japan

Filed Jul. 24, 1986, Ser. No. 888,936

Claims priority, application Japan, Jul. 29, 1985, 60-165802

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—12 **5 Claims**



1. A data processing system in which a plurality of element data are subject to an arithmetic or logic operation sequentially by a single instruction and operational results for sets of said element data are stored sequentially in a memory by said instruction, comprising:

pipeline arithmetic and logic operation means including a plurality of stages connected in series are performing an arithmetic or logic operation specified by said instruction sequentially operating on said sets of element data while passing said sets of element data through said stages;

check information means for transmitting check information indicative of the presence or absence of a fault occurring in each of said stages in synchronism with the flow of said element data in said pipeline arithmetic and logic operation means;

request control means for issuing a store request to said memory each time an operational result of each set of element data is obtained while passing through said stages for sequentially storing said operational results of said respective sets of element data in said memory in response to a signal from said pipeline arithmetic and logic operation means; and

counter means for counting the number of store requests issued by said request control means,

said request control means including first suppressing means for suppressing the issuance of said store request in response to said check information being indicative of a fault in said operational result which is being stored in said memory.

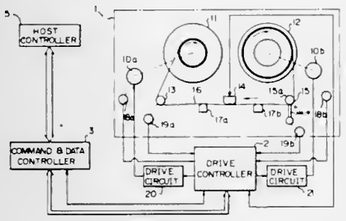
VOL 1096 ISS 2 NO 8 1988 UMI

4,783,784

MAGNETIC TAPE SYSTEM WITH WRITE RETRY MEANS

Masayuki Ishiguro, Kawasaki, and Noboru Owa, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 9, 1986, Ser. No. 883,755
Claims priority, applicatioo Japan, Jul. 12, 1985, 60-153832
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—13 **9 Claims**



1. A magnetic tape system for use in conjunction with a host controller, comprising:
a magnetic head;
first and second reels;
drive means for rotationally driving said reels;
magnetic tape wound on said reels and moving past said magnetic head by said drive means;
drive control, operatively connected to said drive means, for controlling said drive means;
detection means for detecting write operation errors; and
command and data control means, operatively connected to said drive control means and said host controller, for writing data blocks of various lengths on said magnetic tape and for feeding access instructions to said magnetic tape to operate said drive means via said drive control means according to instructions from said host controller and to report results of said operation to said host controller, said command and data control means writing blocks of data on said magnetic tape according to write commands and data from said host controller and when an error occurring during the writing of one of said blocks is detected, erasing the block of data containing the error, rewriting the write commands and data corresponding to said block of data containing the error at a position subsequent to and erased block, and adding and storing an amount equal to the lengths of all blocks erased to achieve a total erased-block length value, and when the total erased-block length value of said magnetic tape exceeds a predetermined value, said re-writing is stopped.

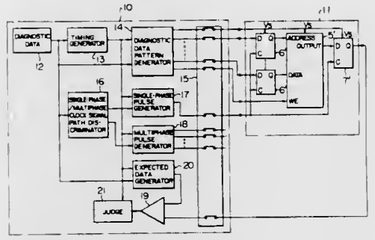
4,783,785

METHOD AND APPARATUS FOR DIAGNOSIS OF LOGICAL CIRCUITS

Nadateru Hanta, Kanagawa, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 5, 1987, Ser. No. 381
Claims priority, application Japan, Jan. 7, 1986, 61-1088
Int. Cl.⁴ G01R *31/28*
U.S. Cl. 371—25 **6 Claims**

1. A method for diagnosing a logical circuit having its input and output terminals respectively connected to input and output latches which are operated by the same clock pulse by applying test signals representative of a diagnostic data pattern to said logical circuit, comprising the steps of:
applying said test signals to the input terminals of said logical circuit for a predetermined time interval which is sufficient for said logical circuit to operate when it is normal;
applying one clock pulse of a desired pulse width which is shorter than said predetermined time interval to clock input terminals of said input latches and a clock input terminal of said output latch after an instant that said test signal are applied, so that said test signals are transferred to said logical circuit through said input latches by a first edge of said one clock pulse and an output signal from said logical circuit is latched in said output latch by a second edge of said one clock pulse; and



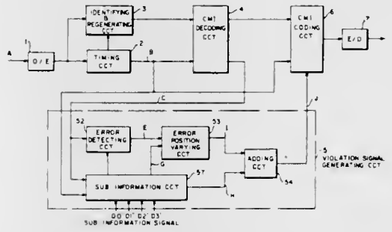
comparing, after said one clock pulse expires, an output signal of said output latch with expected data obtained when the operation of said logical circuit is normal to thereby diagnose said logical circuit.

4,783,786

CMI SIGNAL TRANSMISSION SYSTEM

Takashi Tsukakoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 11, 1986, Ser. No. 884,525
Claims priority, application Japan, Jul. 11, 1985, 60-153465; Aug. 27, 1985, 60-186539
Int. Cl.⁴ G06F *11/00*
U.S. Cl. 371—55 **3 Claims**



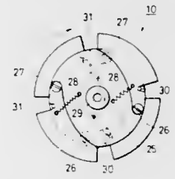
1. A repeater for use in a CMI signal transmission line system over which a transmission signal is transmitted, said transmission signal being produced by encoding a main signal pursuant to a CMI coding rule with a first sub-information signal superposed by a violation of the CMI coding rule, said first sub-information signal including a plurality of different kinds of sub-information arranged in a frame, said repeater comprising:
means responsive to said transmission signal for separating from said transmission signal the main signal which is pursuant to the CMI coding rule and a violation signal which violates the CMI coding rule;
means electrically coupled to said separating means for detecting out of the violation signal an error bit which appears in the transmission signal;
means electrically coupled to said separating means for detecting the first sub-information signal out of the violation signal to produce a detected sub-information signal;
means electrically coupled to said first sub-information signal detecting means for generating a second sub-information signal by inserting sub-information related to the repeater in a time slot of the first sub-information signal;
error pulse position varying means electrically coupled to said error bit detecting means and said second sub-information signal generating means for comparing a time slot of the error bit and a time slot of the second sub-information signal and, if the two time slots are not coincident, generating an error pulse and, if the two time slots are coincident, delaying the error pulse by a predetermined number of bits relative to the time slot of the second sub-information signal;
means for generating a violation indication signal by combining the error pulse signal outputted by said error pulse position varying means and the second sub-information signal; and
means electrically coupled to said separating means and said violation indication signal generating means for superposing the violation indication signal on the main signal by a violation of the CMI coding rule.

4,783,787

LASER BEAM GENERATING DEVICE WITH MULTIPLE POWER LEVELS

Yuzuru Doi, and Hironobu Nagashima, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1986, Ser. No. 871,038
Claims priority, application Japan, Jun. 12, 1985, 60-128966
Int. Cl.⁴ H01S *3/13*
U.S. Cl. 372—31 **13 Claims**



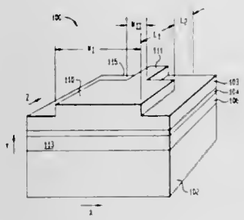
1. A laser beam generating device for the selectable delivery of a power laser beam at one of a first and second power level, said laser beam generating device comprising:
a laser for producing an output laser beam;
light interrupting means selectively disposed along a path of said output laser beam, said light interrupting means having light interrupting plate means for mechanically interrupting said output laser beam at a predetermined rate; and
means for selectively operating said light interrupting plate means in one of:
a first mode of operation wherein said light interrupting plate means does not interrupt said output laser beam so that said laser beam generating means delivers a laser beam at a maximum power level corresponding to an uninterrupted said output laser beam; and
a second mode of operation wherein said light interrupting plate means periodically interrupts said output laser beam so that said laser beam generating means delivers a laser beam having a power level reduced blow said maximum power level in correspondence with the periodic interruption of said output laser beam.

4,783,788

HIGH POWER SEMICONDUCTOR LASERS

Eugene I. Gordon, Convent Station, N.J., assignor to Lytel Incorporated, Somerville, N.J.

Filed Dec. 16, 1985, Ser. No. 809,578
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—45 **14 Claims**



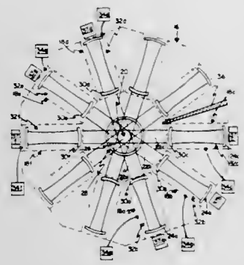
1. A semiconductor diode laser comprising
a semiconductor body including a substrate and an active layer capable of emitting radiation when a pumping current is applied thereto,
electrode means for applying said pumping current to said active layer,
first waveguide means for guiding radiation emitted in said active layer, said first waveguide means being wide enough to support a fundamental lateral mode and a higher order lateral mode, and
second waveguide means formed longitudinally adjacent to said first waveguide means for guiding radiation emitted in said active layer, said second waveguide means supporting only a fundamental lateral mode,
said first and second waveguides means being optically coupled, such that coupling losses are least for the fundamental lateral mode of said first waveguide means, thereby causing said first waveguide means to support only the fundamental lateral mode.

4,783,789

ANNULAR LASING APPARATUS

Warren W. Higgins, 5818 Jane Way, Alexandria, Va. 22310

Filed Jul. 2, 1985, Ser. No. 751,503
Int. Cl.⁴ H01S *3/082*; B23K *9/00*
U.S. Cl. 372—97 **14 Claims**



1. An annular lasing apparatus which comprises in combination:
a. a plurality of concave cylindrical outer reflectors each having a reflective surface and being disposed as opposing pairs substantially symmetrically and in a substantially planar manner along the perimeter of an outer circle, said outer circle having a center, each of said outer reflectors

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having said reflective surface thereof facing toward said center;

b. a plurality of cylindrical inner reflectors each having a partially reflective principal reflecting surface and a second surface and being disposed as opposing pairs substantially symmetrically and in a substantially planar manner along the perimeter of an inner circle substantially concentric with said outer circle, there being one of said inner reflector pairs for each of said outer reflector pairs, each of said outer reflector pairs and said corresponding inner reflector pairs forming two collinear optical resonators each of said collinear optical resonators having its optical axis along a diameter of said outer circle, one of said optical resonators located on each side of said center, each of said inner reflectors having said partially reflective principal reflective surface thereof facing away from said center, the second surface of each of said cylindrical inner reflectors being partially anti-reflection coated, thereby permitting each of said optical resonators in each of said collinear optical resonator pairs to interact with the other of said optical resonators in that pair of said collinear optical resonator pairs;

c. laser gain material located inside said outer circle and outside of said concentric inner circle suitable for supporting laser oscillation therein, whereby an electromagnetic oscillation originating substantially along one of said optical axes of any of said optical resonators and inside of said laser gain material experiences amplification as it travels between said inner reflector and said outer reflector substantially along said optical axis associated with said optical resonator therefor, said amplified oscillation exiting the region between said inner reflector and said outer reflector through said inner reflector as laser radiation, and whereby the laser intensity in a substantial portion of the region between said pairs of inner reflectors and surrounding said center represents a substantially uniform superposition of contributions from all of said resonators; and

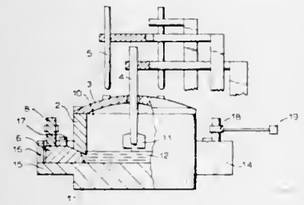
d. means for depositing energy into said gain medium in order to provide the energy required for the laser oscillation and amplification.

4,783,790

DIRECT-CURRENT ARC FURNACE FOR STEELMAKING

Alexander Y. Valchev; Rumen B. Radev, and German I. Germanov, all of Sofia, Bulgaria, assignors to NPP PO Elektrotermia, Sofia, Bulgaria

Filed Jan. 30, 1987, Ser. No. 8,794
Claims priority, application Bulgaria, Jan. 30, 1986, 73325
Int. Cl.⁴ H05B *7/12*
U.S. Cl. 373—108 **7 Claims**



4. In a DC arc furnace for steelmaking, having a furnace space defined by a bottom, a wall, and a roof, and accessible by a door and a spout; and electrode holders with one or more movable graphite anodes and one or more movable graphite cathodes, passing through holes in the roof; and one or more anodes of different composition and design for leading the positive pole of a DC source to scrap and to molten steel, the improvement comprising:

said anodes of different composition being two lateral steel anodes, each anode comprising a horizontal component representing a compact steel body without internal water cooling,

said horizontal component having a front portion which enters through a hole in the wall into the furnace space,

the bottom level of said front protion being disposed at a height lower than the door threshold and being in direct electric contact with the molten steel;

said horizontal component also having a rear portion which is outside the furnace and disposed in a lateral duct;

said lateral duct being lined with refractory material and water-cooled components;

said rear portion being provided with components for indirect water cooling, disposed outside the furnace in a level higher than the door threshold;

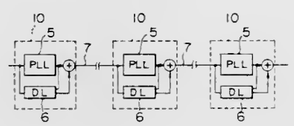
each of said anodes further comprising a vertical component representing a compact steel body without internal water cooling, the bottom portion of the vertical component being in direct electric contact with the rear portion of the horizontal component, and the top portion of the vertical component being attached in an electrode holder with components for water cooling and with a mechanism for motion in vertical direction.

4,783,791

MULTIPLE REPRODUCING REPEATER STATION SYSTEM

Ryozo Yoshino, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,753
Claims priority, application Japan, Apr. 16, 1986, 61-85907
Int. Cl.⁴ H04B *3/36*
U.S. Cl. 375—3 **6 Claims**



1. A multiple reproducing repeater station system comprising a plurality of repreater stations connected in tandem, each repeater station having a phase locked loop, wherein each of said phase locked loops includes mean for setting an operational response time thereof to be different from a data delay time due to a logical operation during the repeating operation within an associated one of said repeater stations.

4,783,792

APPARATUS FOR TRANSMITTING DIGITAL SIGNAL

Kenzo Akagiri, Yokohama, and Masayuki Nishiguchi, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP85/00290, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05747, PCT Pub. Date Dec. 19, 1985
PCT Filed May 28, 1985, Ser. No. 833,401
Claims priority, application Japan, May 28, 1984, 59-108183
Int. Cl.⁴ H04B *14/06*
U.S. Cl. 375—27 **7 Claims**

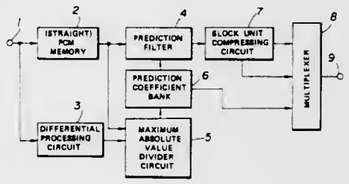
1. Apparatus for transmitting digital signals by transmitting an input digital data signal through a prediction filter having one of a plurality of predetermined sets of characteristics, characterized by the combination comprising:

a plurality of selection filters,

means for supplying said input digital signals to the inputs of said plurality of selection filters, the number of said plurality being less than the number of said plurality of sets,

means for storing parameters corresponding to said sets,

means for selecting said parameters corresponding to one of said sets corresponding to a set of characteristics for said prediction filter in response to a selecting signal,



comparison means connected to receive and compare the outputs of said plurality of selection filters for generating said selecting signal in response to the comparison of output data from said selection filters,

means for configuring said prediction filters in accordance with said selected parameters, and

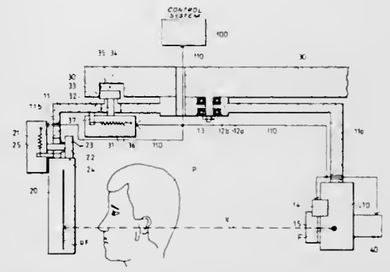
means for transmitting signals equal to said input digital data signals through said prediction filter.

4,783,793

X-RAY APPARATUS FOR PANORAMIC TOMOGRAPHY INCLUDING CONTROL SYSTEM

Arto Virta, Vantaa, and Pekka Strömmer, Espoo, both of Finland, assignors to Planmeca Oy, Finland

Continuation-in-part of Ser. No. 868,724, May 30, 1986. This application Sep. 9, 1986, Ser. No. 905,178
Claims priority, application Finland, Sep. 13, 1985, 853524
Int. Cl.⁴ A61B *6/14*
U.S. Cl. 378—39 **24 Claims**



1. Panoramic tomography X-ray apparatus, such as for obtaining images of a dental system, comprising:

an arm mounted for rotation;

means for rotating said arm including a rotary motion motor;

an X-ray generator having an X-ray tube with a tube head, said tube head being mounted on said arm for rotation therewith;

a cartridge containing X-ray film mounted on said arm for rotation therewith;

means for transporting said X-ray film including a film transport motor, said film transport means being mounted on said arm for rotation therewith;

control system means for controlling the speed of said rotary motion motor of said arm, the speed of said film transport motor and the distribution of said speeds during an exposure sequence independently of each other as a function of control data and a working program in said control system means, so that dental systems of varying sizes and shapes can be photographed by said panoramic tomography X-ray apparatus both sharply and within a suitable exposure time; and

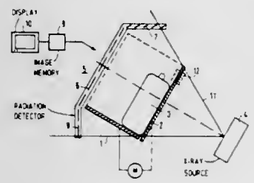
said control system means adjusting the speed of said rotary motion motor and maintaining the speed of said film transport motor substantially constant, so that location of a layer being photographed is changed relative to the speed variations of the rotary motion motor.

4,783,794

BAGGAGE INSPECTION SYSTEM

Rolf Dietrich, Hofheim, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 886,362
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530955
Int. Cl.⁴ G01N *23/04*
U.S. Cl. 378—57 **3 Claims**



1. A baggage inspection system comprising:

an X-ray source for generating an X-ray beam having a central ray;

a radiation detector disposed for detecting radiation from said X-ray source;

a conveyor path disposed between said X-ray source and said radiation detector for transporting articles through said X-ray beam in a transport direction, said conveyor path consisting of two conveyor surfaces disposed at a right angle with respect to each other, at least one of said conveyor surfaces being movable for transporting said articles, said right angle being unsymmetrically inclined relative to a horizontal direction which is transverse with respect to the transport direction such that said articles lie against both conveyor surfaces as a result of the weight of the articles, and one of said conveyor surfaces being disposed between said X-ray source and said articles at substantially a right angle relative to said central ray; and

means for generating a visible image of said articles from signals received from said radiation detector.

4,783,795

X-RAY GENERATOR SYSTEM

Mitsuru Yahata, Otawara, Japan, assignor to Kabushikigaisha Toshiba, Kanagawa, Japan

Filed Jan. 28, 1987, Ser. No. 7,482
Claims priority, application Japan, Feb. 18, 1986, 61-33551
Int. Cl.⁴ H05G *1/20*
U.S. Cl. 378—105 **3 Claims**

1. An X-ray generator system comprising:

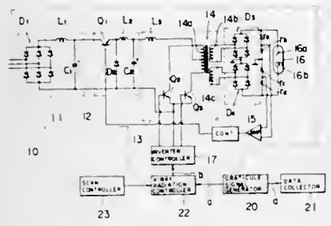
an X-ray source for generating X-rays;

inverter means, having a transformer with primary and secondary windings and a central tap on said primary windings, a coil coupled to said central tap, and first and second switch devices coupled to opposite ends of said primary winding, for generating a high voltage across said secondary winding for the generation of said X-rays in response to intermittent application of a DC voltage through said coil to said primary winding by complementary turning on and off said first and second switching devices; and

inverter controller means for repeatedly and complementa-

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rily turning on and off said first and second switching devices during periodic intervals, for simultaneously turning on said first and second switching devices immediately before said periodic intervals for a predeterminbed time



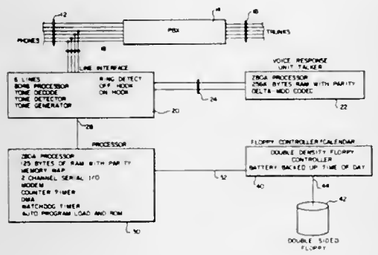
less than the time between said periodic intervals, and for maintaining both said first and second switching devices turning off from the end of said periodic intervals until the start of a subsequent one of said predetermined times.

4,783,796

PBX TELEPHONE CALL CONTROL SYSTEM

David J. Ladd, Los Gatos, Calif., assignor to OPCOM, San Jose, Calif.

Continuation of Ser. No. 425,227, Sep. 28, 1982, abandoned. This application Nov. 29, 1985, Ser. No. 803,126
Int. Cl.[4] H04M *3/50, 3/58*
U.S. Cl. 379—67 **17 Claims**



11. In a call control system for being coupled to a PBX in order to control the routing of telephone calls from one or more calling parties through said PBX between a plurality of incoming external trunks and a plurality of internal telephone subscriber lines, said system including

a line interface unit connected to some of said PBX subscriber lines for simulating a plurality of telephone extensions which can be called by said one or more calling parties through said incoming external trunks or through internal telephones connected to others of said internal telephone subscriber lines, the method comprising the steps of

detecting if a calling party on one of said incoming external trunks or said internal telephones is calling one of said simulated extensions,

answering the call and informing said calling party to signal an extension number corresponding to one of said internal telephones connected to one of said PBX internal telephone subscriber lines,

receiving and decoding said extension number from said calling party when signaled, and

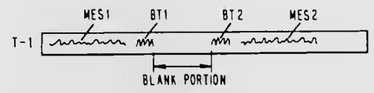
flashing and DTMF signaling said PBX to attempt a transfer of the call on one of said incoming external trunks or one of said other internal telephone subscriber lines to said telephone having said extension number.

4,783,797

TELEPHONE ANSWERING DEVICE AND METHOD HAVING INCOMING VOICE MESSAGE REPRODUCTION LOUDSPEAKER

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Jan. 6, 1986, Ser. No. 816,631
Claims priority, application Japan, Jan. 7, 1985, 60-000529
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—79 **2 Claims**



1. A telephone answering device which makes a loop circuit to establish communication between calling and called parties on a telephone line upon reception of a calling signal and sends on the line an outgoing message prerecorded on a recording medium, comprising:

switching means having a first state responsive to an incoming calling signal for controlling said device to reproduce from the recording medium a first pre-recorded outgoing message to a caller and immediately thereafter to establish on the recording medium a silent portion of a predetermined duration of time wherein any pre-recorded message is not reproduced, and a second state responsive to the end of said predetermined duration of time for controlling said device to reproduce from the recording medium a second prerecorded outgoing messaage;

means for amplifying the voice spoken by the calling party during said silent portion;

loudspeaker means for audibly reproducing the voice amplified by said amplifying means so that the called party will hear the voice without taking a telephone off-hook;

means for generating a low frequency signal;

means for blocking the low frequency signal from the telephone line;

means for recording on the recording medium the low-frequency signal before and after the silent portion;

means for detecting said low frequency signal to control said amplifying means to amplify outgoing messages during only the silent portion during play back; and

means for turning off said amplifying means just before said second outgoing message is reproduced so that said second outgoing message is not reproduced by said loudspeaker means.

4,783,798

ENCRYPTING TRANSPONDER

Stephen W. Leibholz, Rydal, Pa., and Samuel D. Epstein, Great Falls, Va., assignors to ACS Communications Systems, Inc., Reston, Va.

Filed Mar. 14, 1985, Ser. No. 712,015
Int. Cl.[4] H04L *9/04*
U.S. Cl. 380—23 **16 Claims**

1. A passive encrypting transponder for ensuring that only authorized users are given access for transmissions with a remote digital system, including a host computer, from a given computer terminal connected to said system across a telecommunications link, said transponder comprising:

(a) an input line, including first switching means, for coupling said given terminal to said transponder;

(b) an output line, including second switching means, for coupling said transponder to said link;

(c) third switching means for selectively coupling said input line to said output line;

(d) a user identification means including:

(i) a first memory portion for storing a first key which uniquely identifies said given terminal from other terminals connectable to said system, each of said authorized users being provided with a personal identification number which uniquely identifies that user from other authorized users;

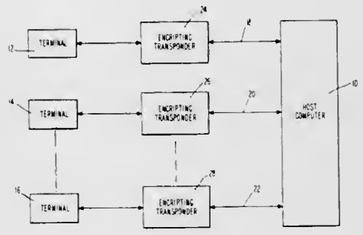
(ii) a second memory portion for prestoring an interrogator identification number which uniquely identifies said system from other possible systems;

(iii) a third memory portion; and

(iv) a fourth memory portion;

(e) an enciphering means, selectively responsive to said first key stored in said first memory portion, for encrypting, under said first key, said personal identification number received across said input line upon coupling thereto of said transponder by said first switching means, said encrypted personal identification number being transmitted across said link;

(f) a deciphering means, selectively responsive to said first key in said first memory portion, for decrypting an interrogator identification number and a first random number, both of which have been encrypted under said first key at



said remote system and transmitted to said transponder across said link, said decrypted first random number being stored in said third memory portion; and

(g) control means for generating said first key upon receipt of said personal identification number through said first switching means, for comparing said decrypted interrogator identification number with said prestored interrogator identification number, for generating a working key when said decrypted interrogator identification number and said prestored interrogator identification number match, otherwise aborting the transaction, said working key being a function of said personal identification number, of said interrogator identification number and of said first random number, said working key being stored in said fourth memory portion, said enciphering and said deciphering means being thereafter responsive to said working key and not to said first key, and for transmitting said interrogator identification number and said first random number to said host computer, both being encrypted under said working key, for verification of said working key by said host computer, said host computer transmitting an indication of said verification across said link to said transponder;

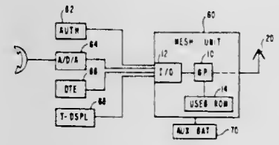
(h) wherein, upon reciept of said indication by said transponder, said control means activates said third switching means to couple said input line to said output line.

4,783,799

ELECTRONIC COMMUNICATIONS AND CONTROL SYSTEM

Joachim A. Maass, 121 Hillside St., River Plaza, N.J. 07701

Continuation of Ser. No. 651,483, Sep. 17, 1984, abandoned. This application Jul. 14, 1987, Ser. No. 73,253
Int. Cl.[4] H04B *7/15;* **H04K** *1/00*
U.S. Cl. 380—43 **14 Claims**



1. A radio communication system comprising:

a multiplicity of randomly scattered self-contained like relay transceiver stations which automatically select particular ones of said relay stations to complete a relay link for communicating radio messages between two user terminal stations so long as the distance between said stations is bridged by said relay stations in line-of-sight proximity with each other; each relay station including an antenna, a receiver, a transmitter, means for switching said antenna between said receiver and transmitter, a programmable frequency synthesizer connected to said receiver and transmitter, a signal demodulator connected to said receiver and synthesizer and supplying a demodulator signal, an input/output means connected to said demodulator and synthesizer, a central processing unit connected to said input/output means, said central processing unit for initiating and discontinuing communication with other stations independent of control from a user station upon receipt of a predetermined signal including programming means for automatically selectively responding to received message recruiting calls and transmitting an acknowledgment signal to the sender and transmitting recruiting calls to another relay station to complete a link for transfer of messages between said user stations independent of and without selection from a user station, memory means connected to said central processing unit for storing all predetermined programming modes of said programming means, clock means connected to said synthesizer for controlling the frequency thereof and to said central processing unit, a modulator connected to said transmitter and to said synthesizer and input/output means, a transmitter switch connected to said antenna switch and to said transmitter and modulator and input-/output means, and means supplying power to said input-/output means.

4,783,800

REMOTE CONTROLLED INTERACTIVE SCHEDULER SYSTEM

Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20815

Continuation-in-part of Ser. No. 566,312, Dec. 28, 1983, and a continuation-in-part of Ser. No. 580,158, Feb. 14, 1984. This application Feb. 24, 1986, Ser. No. 831,878
Int. Cl.[4] H04M *1/64;* **G04B** *47/00*
U.S. Cl. 379—67 **14 Claims**

1. A personalized appointment scheduling system for enabling a caller at a sending end of a telephone line to enter an appointment into the scheduling system which is located at a receiving end of the telephone line without the need for human intervention at the receiving end of the telephone line,

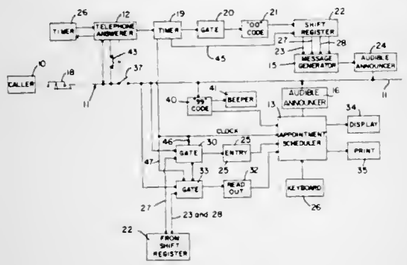
said scheduling system comprising a small, dedicated, digital, electronic scheduling unit having an electronic memory for storing plural time-of-day appointments for each

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different day or time period for a series of different days or time periods,

said scheduling system including entry circuit means coupleable to the telephone line and responsive to digital entry signals received over said line from a remotely located caller and representing a selected day and time-of-day for entering an appointment into the memory for that day,

said scheduling system including a retrieval circuit means connectable to the telephone line for interrogating said memory for any selected day or time period to determine the appointments previously scheduled for that day or



time period, and interpreting the memory to derive and read-out and send over the telephone line a subschedule of remaining available times-of-day that are free and have not been previously scheduled for appointment,

and a sequentially operated fixed message generator combined with the scheduling unit and responsive to the telephone call from the caller to produce instruction messages over the telephone line to the caller informing the caller of the manner of obtaining the subschedule of available times for a desired day and of the manner of entering an appointment into the memory of the scheduling unit on the desired day, using the caller's telephone.

4,783,801

APPARATUS FOR PROTECTING SECRET INFORMATION

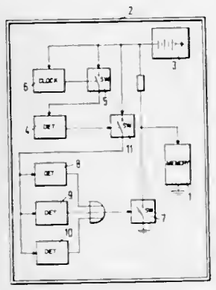
Wittich Kaule, Emmering, Fed. Rep. of Germany, assignor to GAO Gesellschaft fur Automation und Organisation mbH, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,284

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1983, 3347483

Int. Cl.⁴ H01L *23/02;* **H05K** *5/02;* **H04L** *9/00*

U.S. Cl. 380—3 **14 Claims**



1. An apparatus for protecting information from unauthorized access, comprising a housing in which a storage medium containing the information is provided, detector means for detecting unauthorized access to the interior of the housing, means for initiating erasure of the secret information when the detector means reacts, a battery inside said housing for supplying energy at least to the detector means, clock means connected to said detector means which is arranged to enable operation of the detector means only over interrupted predetermined time intervals and wherein randomizer means are provided for varying the predetermined time intervals in accordance with randomized statistical distribution principles.

4,783,802

LEARNING SYSTEM OF DICTIONARY FOR SPEECH RECOGNITION

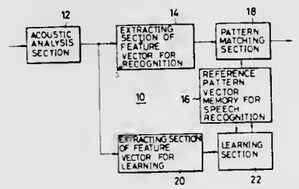
Yoichi Takebayashi, Chigasaki, and Hidenori Shinoda, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 12, 1985, Ser. No. 775,398

Claims priority, application Japan, Oct. 2, 1984, 59-206656

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—41 **34 Claims**



1. In a speech recognition and speech reference pattern vector learning device which obtains a first time series of a feature parameter of an input speech by analyzing the input speech, and extracts speech recognition feature vectors from a portion of the first time series of the feature parameter to recognize said input speech by collating patterns between a speech reference pattern vector registered in advance and the feature vectors for the input speech obtained in the above, a learning device of reference pattern vectors for speech recognition comprising:

a learning feature vector extracting section for extracting recognition feature vectors for the purpose of learning processing from the first time series of the feature parameter of the input speech, as well as for extracting also other feature vectors from a plurality of kinds of time series of feature parameters obtained by varying the first time series of the feature parameter; and

a learning section for causing the learning of a speech reference pattern vector which is stored in a reference pattern vectors memory for recognition of said speech by means of the learning feature vectors supplied by said learning feature vector extracting section,

said learning feature vector extracting section comprises a knowledge source concerning the variations in the input speech patterns, a conversion section for obtaining a plurality of kinds of time series of feature parameters by varying the first time series of the feature parameter of the input speech in accordance with the knowledge concerning the variations from the knowledge source, and a feature vector extracting section for extracting respective feature vectors from the plurality of kinds of time series and the first time series.

4,783,803

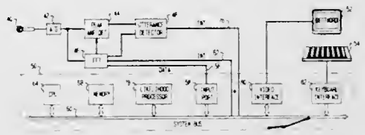
SPEECH RECOGNITION APPARATUS AND METHOD

James K. Baker, West Newton; Paul G. Bamberg, Framingham; Mark F. Sidell, Cambridge, and Robert S. Roth, Brighton, all of Mass., assignors to Dragon Systems, Inc., Newton, Mass.

Filed Nov. 12, 1985, Ser. No. 797,249

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—42 **127 Claims**



1. A speech recognition system for recognizing a word corresponding to a given utterance spoken after one or more preceding words, said system comprising:

means for storing an acoustic model of a given word;

means for making a word match score corresponding to the probability that said given word corresponds to acoustic data generated by said utterance, including means for making successive partial comparisons between said acoustic model and said acoustic data and for successively updating said word match score after each such partial comparison;

context storing means for storing a language context derived from one or more words spoken prior to said given utterance;

language score introducing means, including means for generating a language score for said given word corresponding to a language model probability estimate of the probability that said given word would occur given the language context stored in said context storing means and means for separately altering said word match score after each of a plurality of said partial comparisons by an amount corresponding to said language score; and

means for stopping said means for making a word match score from making further partial comparisons between said acoustic model of a given word and said acoustic data when the word match score for that given word is worse than a given threshold.

4,783,804

HIDDEN MARKOV MODEL SPEECH RECOGNITION ARRANGEMENT

Biing-Hwang Juang, Lincroft; Stephen E. Levinson, Westfield; Lawrence R. Rabiner, Berkeley Heights, and Man M. Sondhi, both of Berkeley Heights, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 21, 1985, Ser. No. 714,517

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—43 **8 Claims**

1. A method for analyzing speech comprising the steps of:

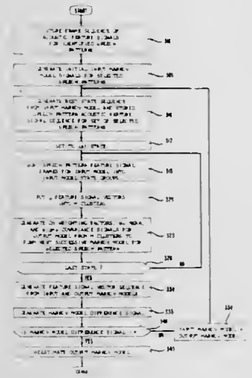
generating speech pattern reference templates, including, for each such template, the steps of:

a. analyzing at least one identified speech pattern to generate a frame sequence of acoustic feature signals representative thereof:

b. generating a first set of signals representative of a state-transitional (Markov) model of said identified speech pattern;

c. producing a speech pattern template responsive to the current state-transitional model and the said frame sequence of acoustic feature signals; and

d. iterating steps b and c, including with respect to step b matching the continuously valued characteristics of the model to the observation measurements to produce a continuous-probability-density function; and with respect to step c grouping the feature signals of the speech patterns into related clusters corresponding to states of the previous state-transitional model, whereby with further grouping of the feature signals the continuous probability



density function acquires components representing a mixture of different continuous probability density functions and the speech pattern template becomes the speech pattern reference template.

4,783,805

SYSTEM FOR CONVERTING A VOICE SIGNAL TO A PITCH SIGNAL

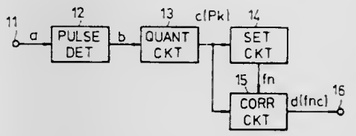
Toshihiro Nishio, Maebashi, and Kikuji Wagatsuma, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Dec. 3, 1985, Ser. No. 804,174

Claims priority, application Japan, Dec. 5, 1984, 59-256860; Dec. 5, 1984, 59-256861

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—49 **10 Claims**



1. A system for converting a voice signal to a pitch signal, said system comprising:

first means for obtaining a pulse signal having a period corresponding to peak values of an input voice signal;

second means for quantizing the pulse signal supplied from said first means and for generating a quantized signal;

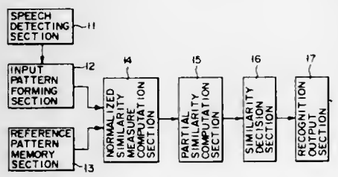
third means supplied with the quantized signal from said second means for setting the quantized signal as a preliminary pitch signal which indicates a preliminary pitch when the quantized signal assumes the same quantization level successively for a predetermined number of times; and

fourth means supplied with the quantized signal from said second means and the preliminary pitch signal from said third means for correcting the preliminary pitch signal by raising or lowering the preliminary pitch when a pitch described by said quantized signal and said preliminary pitch are not equal to each other, said fourth means gener-

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ating a pitch signal which indicates a pitch of said input voice signal.

4,783,806
SPEECH RECOGNITION APPARATUS
Kazuo Nakamura, Kariya, and Tadao Norjiri, Oobu, both of Japan, assignors to Nippoodenso Co., Ltd., Kariya, Japan
Filed Jan. 22, 1987, Ser. No. 6,061
Claims priority, application Japan, Jan. 22, 1986, 61-9983
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **5 Claims**



I. A speech recognition apparatus comprising:

partial pattern forming means for obtaining a partial pattern $A_{(p,q)}=a_p,a_{p+1}, \ldots, a_q$ (where $1 \leqq p \leqq q \leqq I$) whose starting point is time point $i=p$ in an input pattern $A=a_1, a_2, \ldots, a_i, \ldots, a_I$, which is expressed in the time series of feature vectors, and whose endpoint is time point $i=q$;

reference pattern memory means for storing the reference patterns B^n for each word number "n" of a reference pattern $B^n=b_1{}^n, b_2{}^n, \ldots, b_j{}^n, \ldots, b_{Jn}{}^n$, which is previously set for each word number "n";

normalized similarity measure computing means in which a function j(i) is set up which makes the time base "i" of the partial pattern obtained by said partial pattern forming means correspond to the time base "j" of the reference pattern stored by said reference pattern memory means, and a maximum similarity measure $S\{A_{(p,q)},B^n\}$as a maximum value of the sum of the vector similarity measure s $\{a_i, b^n, j(i)\}$ as defined by said time base "i" and said function j(i) is obtained as a normalized similarity measure as defined by a normalizing function $r[q-p+1, Jn, S\{A_{(p,q)}, B^n\}]$ which provides a normalized similarity measure not dependent on the time duration $t=q-p+1$ of said partial pattern and the time duration of said reference pattern;

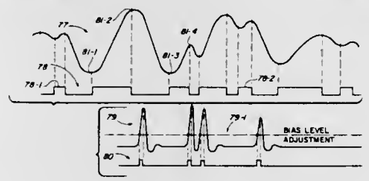
partial maximum similarity computing means for maximizing for each "p" the normalized similarity measure obtained by said normalized similarity measure computing means by using the dynamic programming algorithm, and for obtaining a maximum value of the result of said maximization for "n", as a partial maximum similarity measure;

$$D_q = R\{A_{(p,q)}, B^{n*}\} = \max_n [R\{A_{(p,q)}, B^n\}]$$

partial decision means for successively repeating the operation that the registered word "n" providing the partial maximum similarity measure D_q obtained in said partial maximum similarity computinq means is treated as a partial decision result W_q, in the range of $q=1$ to I, and for obtaining the partial similarity measure D_i and the partial decision result W_i ($i=1$ to I) at all the time points along the time series of the input pattern; and

output means in which the largest partial maximum similarity measure of those measures obtained in said partial decision means, is treated as a maximum similarity measure $D_{max}={}^{max}_{i}\{Di\}$ (where $i=1$ to I), and the partial decision result W_i providing that maximum similarity measure D_{max} is obtained, and said result is output as the recognition result.

4,783,807
SYSTEM AND METHOD FOR SOUND RECOGNITION WITH FEATURE SELECTION SYNCHRONIZED TO VOICE PITCH
John Marley, 8715 E. Mackenzie Dr., Scottsdale, Ariz. 85251
Filed Aug. 27, 1984, Ser. No. 844,769
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **40 Claims**



1. A method of transforming a sound signal having positive pressure wave portions and negative pressure wave portions into character signals, said method comprising the steps of:

(a) producing an analog signal representing said sound signal;

(b) producing a binary signal having a "1" level during positive pressure wave portions of said sound signal and a "0" level during negative pressure wave portions of said sound signal;

(c) detecting the peak amplitude of each pitch cycle of said analog signal and producing a pitch cycle marker signal synchronized to a maximum peak amplitude portion of said analog signal;

(d) producing a first number that represents the duration of a "1" level of said binary signal most closely following a pulse of said pitch cycle marker signal and producing a second number that represents the duration of the next most closely following "1" level of said binary signal;

(e) producing a character vector having a magnitude and a direction from said first and second numbers and comparing said character vector with a plurality of stored vectors to determine if said character vector matches any of said stored vectors; and

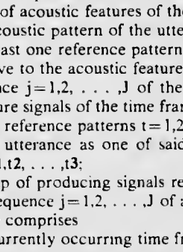
(f) producing a character signal representing a sound corresponding to a one of said stored vectors that matches said character vector.

4,783,808
CONNECTED WORD RECOGNITION ENROLLMENT METHOD
George R. Doddington, Richardson, and Michael L. McMahan, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 25, 1986, Ser. No. 856,722
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **7 Claims**

1. A method for generating a template for recognition of connected speech, comprising the steps of:

(a) generating an isolated word template of a selected word;

(b) identifying the selected word from a stream of continuous speech by matching the continuous speech with the isolated word template; and



(c) extracting a continuous word template from the continuous speech which corresponds to the selected word.

4,783,809
AUTOMATIC SPEECH RECOGNIZER FOR REAL TIME OPERATION
Stephen C. Glinski, Piscataway, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 7, 1984, Ser. No. 669,246
Int. Cl.[4] G10L *5/06*
U.S. Cl. 381—43 **6 Claims**



1. In a speech analyzer having a set of stored reference pattern templates $t=1,2, \ldots, V$ each comprising a time frame sequence $i=1,2, \ldots,$ It of acoustic feature signals including an end frame $i=$It representative of an identified reference pattern, a method for recognizing an unknown utterance as a string of reference patterns e.g. t1,t2, . . . ,t3 comprising the steps of:

producing signals representative of the time frame sequence $j=1,2 \ldots,J$ of acoustic features of the utterance responsive to the acoustic pattern of the utterance;

generating at least one reference pattern string e.g. t1,t2, . . . ,t3 responsive to the acoustic feature signals of the time frame sequence $j=1,2, \ldots,J$ of the utterance and the acoustic feature signals of the time frame sequence $i=1,2, \ldots,$It of the reference patterns $t=1,2, \ldots,V$; and

identifying the utterance as one of said reference pattern strings e.g. t1,t2, . . . ,t3;

wherein the step of producing signals representative of the time frame sequence $j=1,2, \ldots,J$ of acoustic features of the utterance comprises

receiving the currently occurring time frame portion of the utterance;

generating a signal j identifying the time frame in which the current portion of the utterance occurs in the succession of utterance time frames $j=1,2, \ldots,J$ responsive to the currently occurring portion of the utterance; and

producing a signal representative of the acoustic features of jth frame portion of the utterance responsive to the received currently occurring time frame portion of the utterance;

said step of generating at least one reference pattern string e.g. t1,t2, . . . ,t3 responsive to the acoustic feature signals of the time frame sequence of the utterance and acoustic feature signals of the time frame sequence $i=1,2, \ldots,$Iv of the reference patterns comprises;

responsive to the producing of the acoustic feature signals of the currently occurring portion of the utterance in the current time frame j, performing the following steps

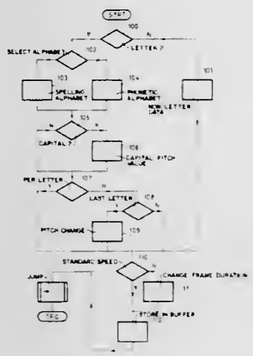
(a) producing a set of signals identifying levels $L=1,2, \ldots,$LMAX, each level corresponding to the position of a reference pattern in the at least one reference pattern string;

(b) time registering the acoustic feature signals of the current time frame j portion of the utterance with the acoustic feature signals of the time frames $i=1,2, \ldots,$It of each reference pattern for each level $L=1,2, \ldots,$LMAX responsive to the acoustic feature signals of the current time frame portion of the utterance and the acoustic feature signals of the time frame portions of the reference patterns; and

(c) producing a set of cumulative correspondence signals for the time registration path ending time frames It of the reference patterns at levels $L=1,2, \ldots$ LMAX for the currently occurring time frame j portion of the utterance; and

the step of identifying the utterance as one of said reference pattern strings e.g. t1,t2, . . . ,t3 comprises generating signals representative of reference pattern strings after the formation of the time registration path and time registration path correspondence signals of the levels for the last utterance time frame J responsive to the time registration path and time registration path cumulative correspondence signals for the reference pattern ending time frames It of levels $L=1,2, \ldots,$LMAX of the utterance portion time frames $j=1,2, \ldots J$.

4,783,810
DEVICE FOR GENERATING THE AUDIO INFORMATION OF A SET OF CHARACTERS
Johannes N. Kroon, Gemert, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Division of Ser. No. 821,112, Jan. 17, 1986, Pat. No. 4,689,817, which is a continuation of Ser. No. 465,984, Feb. 14, 1983, abandoned. This application Apr. 6, 1987, Ser. No. 35,103
Claims priority, application Netherlands, Feb. 24, 1982, 8200726
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—52 **17 Claims**



1. A device for generating the audio information of a set of characters which includes a first sub-set of lower case letters and a second sub-set of upper case capital letters, said device comprising, a data-processor unit connected to a first memory for the storage of speech data and to a second memory for the storage of external input characters presented thereto, said

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data-processor unit comprising control means for forming, on the basis of said speech data in the first memory, a speech pattern corresponding to said input characters presented, a speech generator connected to the first memory and controlled by the data processor control means, said data processor unit further comprising character recognition means for recognizing from the input characters presented those characters which belong to said second sub-set and for introducing a modification in the speech pattern for the characters belonging to the second sub-set, wherein the modification comprises a modification of a pitch component and/or a voice-characterizing component of the speech pattern while maintaining the identity of the second sub-set of letters.

4,783,811

METHOD AND APPARATUS FOR DETERMINING SYLLABLE BOUNDARIES

William M. Fisher, Plano, and Kathleen M. Marshall, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1984, Ser. No. 687,097
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—52 **26 Claims**



1. Apparatus for transforming a plurality of input segments to produce a plurality of syllabified output segments comprising:
an input buffer for receiving said input segments;
a memory for storing a set of transforming rules for selectively transforming an input segment an output segment;
a memory for storing a plurality of special symbols that each match a plurality of symbols used to represent said input segments, said special symbols used in formulating selected ones of said rules and each defined as a function of said symbols by the user;
a processor for applying said rule set to each input segment to produce an output segment; and
an outer buffer for storing said syllabilified output segments.

4,783,812

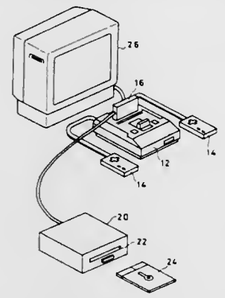
ELECTRONIC SOUND SYNTHESIZER

Yukio Kaneoka, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

Filed Aug. 5, 1986, Ser. No. 893,341
Claims priority, application Japan, Aug. 5, 1985, 60-172575; Oct. 28, 1985, 60-166379[U]
Int. Cl.[4] H03G *3/00*
U.S. Cl. 381—61 **14 Claims**

1. An electronic sound source apparatus comprising;
a first addressable memory means for storing fundamental wave wave-form data as a digital value,
an operating means for producing a modulation index $(J(t) < B(t)\,(C + \mathrm{Sin}\ w_m t)$ that changes with time according to modulation envelope data and modulation wave wave-form data $w_m t$, and wherein C is a constant,
a first multiplying means for multiplying fundamental wave frequency data (w_c) and said modulation index data J(t), and
means for applying the multiplied result of said first multiplying means to said first memory means as read out address data, thereby changing a rate at which said fundamental wave wave-form data is read out of said first memory means, and further comprising:
a D/A converting means for converting the digital value read out from said first memory means into an analog signal to produce a sound signal ($e = \mathrm{Sin}\ J(t) \cdot w_c t$).

10. An electronic sound source apparatus in accordance with claim 1, which further comprises a main unit containing



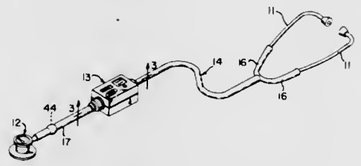
said first memory means, operating means, first multiplying means and D/A converting means, and means for setting said data including an external memory means removably connected to said main unit.

4,783,813

ELECTRONIC SOUND AMPLIFIER STETHOSCOPE WITH VISUAL HEART BEAT AND BLOOD FLOW INDICATOR

Chester W. Kempka, Issaquah, Wash., assignor to Lola R. Thompson, Seattle, Wash., a part interest

Filed Dec. 24, 1986, Ser. No. 946,383
Int. Cl.[4] A61B *7/04*
U.S. Cl. 381—67 **9 Claims**



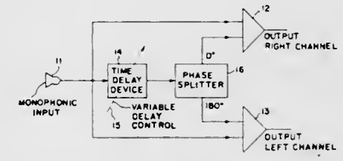
1. A stethoscope comprising;
sound pickup head,
ear piece,
a connector housing including first and second housing chambers defined by first and second housing chamber walls respectively, with said first housing chamber wall having an edge wall portion defining an opening,
first and second sound transmission conduits connected to said pickup head and said ear piece respectively,
a microphone for receiving sound waves and producing an electronic signal,
a mounting member having a microphone socket portion positioned within said first housing chamber, an elongated mid portion projecting from said socket portion through said first housing chamber opening and a connector end portion positioned exterior of said first housing chamber and sized for attachment of said first conduit thereto, said socket portion having an unperforated annular socket chamber wall defining an interior socket chamber with first and second end openings, said socket chamber wall being spaced apart from and out of contact with said first housing chamber wall to provide a dead air space therebetween, said first socket chamber end opening being sized to receive said microphone therein and said second socket chamber end opening being in communication with an interior sound conductive open channel extending fully through said mounting member from said connector end portion to said socket chamber to transmit sound waves from said first conduit to said socket chamber, said microphone being mounted within said socket chamber so as to detect sound waves communicated therewith only via said sound channel from said first conduit,
first sound and vibration insulating material positioned between said microphone and said socket chamber wall so that in combination with said microphone said first socket chamber end opening is sealed closed, said first material supporting said microphone out of direct contact with said socket chamber wall and providing an airtight seal therebetween such that sound passing through said sound channel is transmitted to said socket chamber and detected by said microphone therein,
a grommet of resilient material positioned within said first housing chamber opening, said grommet having a central opening sized to receive and hold therein said mounting member midportion with said mounting member midportion vibration insulated from said first housing chamber wall,
a speaker mounted in said second housing chamber, said second housing chamber having said second conduit attached thereto for transmission of sound waves generated by said speaker to said ear piece,
said speaker being oriented in said second housing chamber so as to transmit sound waves only via said second conduit,
second sound and vibration insulating material positioned between said speaker and said second housing chamber walls, and
electronic sound amplification means mounted in said connector housing,
said sound amplification means including electronic amplifier means and circuit means therefor interconnecting said microphone with said speaker for amplifying said electronic signal and transmitting said amplified electronic signal to said speaker for generating amplified sound waves to said ear piece.

4,783,814

STETHOSCOPE HAVING PSEUDOSTEREOPHONIC BINAURAL ENHANCEMENT

Kevin P. Foley, Alma, Mich., assignor to Comprehensive Health Care Corp. of America, Alma, Mich.

Filed Oct. 9, 1986, Ser. No. 917,160
Int. Cl.[4] A61B *7/04*
U.S. Cl. 381—67 **9 Claims**



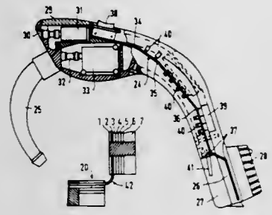
1. A stethoscope for use in listening to body sounds comprising:
a monophonic microphone for sensing said body sounds and converting said body sounds into a corresponding monophonic signal;
a right earphone and a left earphone enabling binaural hearing by a user of said stethoscope;
transversal filter means for converting said corresponding monophonic signal into a corresponding different output signal;
means for transmitting said corresponding different output signal to only one of said earphones; and
means for transmitting said corresponding monophonic signal to the other one of said earphones;
whereby sounds heard in said right and left earphones are different and create a pseudostereophonic effect during binaural hearing by said user.

4,783,815

MANUFACTURING MINIATURE HEARING AID HAVING A MULTI-LAYER CIRCUIT ARRANGEMENT

Gerhard Büttner, Grossenseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,719
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639402
Int. Cl.[4] H04R *25/00;* **H05K** *1/00;* **B44C** *1/22;* **C23F** *1/02*
U.S. Cl. 381—68 **16 Claims**



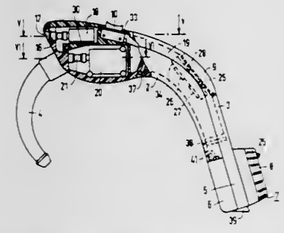
15. A miniature hearing aid comprising:
a housing;
a plurality of components disposed in said housing;
a circuit board in said housing to which at least some of said components are electrically connected, said circuit board having at least one section consisting of a section having a first selected number of layers with blind and through holes selectively drilled therein and at least one additional section consisting of a second selected number of layers less than said first selected number of layers; and
means for mounting said circuit board in said housing bent at said additional section.

4,783,816

HEARING AID TO BE WORN BEHIND THE EAR HAVING BATTERY AND VOLUME CONTROL FACING IN OPPOSITE DIRECTIONS

Gerhard Büttner, Grossenseebach, and Berndt Diefenbach, Percha, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,337
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 8428516[U]
Int. Cl.[4] H04R *25/00*
U.S. Cl. 381—68.7 **6 Claims**



1. A hearing aid for use behind the ear comprising:

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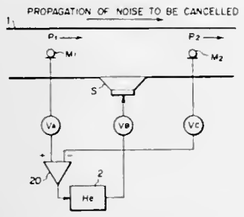
a housing with top and bottom ends and having an inner surface, an outer surface and two side surfaces;
a hook located at the top end of the housing;
a battery compartment located at the bottom end of the housing; and
a volume control located at said bottom end adjacent and parallel to said battery compartment wherein the battery compartment is mounted on the inner surface of the housing and the volume control is mounted on the outer surface of the housing.

4,783,817

ELECTRONIC NOISE ATTENUATION SYSTEM

Hareo Hamada, 4-8-1 Kajino-cho, Koganei, Tokyo; Takashi Enokida, Ichikawa; Tanetoshi Miura, 1-11-20 Minami-cho, Kokubunji, Tokyo; Minoru Takahashi; Takashi Kuribayashi; Kinichiro Asami, and Yoshitaka Oguri, all of Chiyoda, Japan, assignors to Hitachi Plant Engineering & Construction Co., Ltd.; Tanetoshi Miura and Hareo Hamada, all of Tokyo, Japan

Filed Jan. 12, 1987, Ser. No. 2,242
Claims priority, application Japan, Jan. 14, 1986, 61-7115
Int. Cl.[4] H03B *29/00*
U.S. Cl. 381—71 **14 Claims**



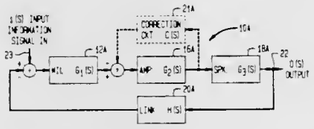
1. An electronic noise attentuation system for achieving attenuation of a sound wave propagated from a source of noise in a propagation passage of a sound wave by generating another sound wave 180° out of phase and having the same sound pressure as said propagated sound wave to produce interference between said two sound waves at a given position in said propagation passage, said system comprising:
first mechano-electric transducer means comprising a first microphone having a conversion characteristic and disposed at a position closer to said noise source than to said given position in said propagation passage to sense said propagated sound wave from said noise source and convert it into an output electric signal;
electro-mechanical transducer means comprising a speaker having a conversion characteristic and interposed between the position of said first mechano-electric transducer means and said given position in said propagation passage to generate a sound wave for cancelling said propagated sound wave from said noise source at said given position;
second mechano-electric transducer means comprising a second microphone having a conversion characteristic which matches said conversion characteristic of said first microphone and interposed between the position of said electro-mechanical transducer means and said given position to sense said generated sound wave from said electro-mechanical transducer means as well as said propagated sound wave from said noise source and convert them into an output electric signal;
operation means to obtain a difference between the output signals of said first and second mechano-electric transducer means and to generate an output signal representative of said difference;
drive signal generating means to receive the output signal of said operation means and generate on the basis of a given transfer function a drive signal to be given to said electro-mechanical transducer means so that the amount of sound cancellation of said electronic noise attenuation system can be maximized;
control means to determine a transfer function to be given to said drive signal generating means, set up in said drive signal generating means a control parameter for specifying said transfer function, and correct said control parameter according to changes of the propagation characteristics of said propagation passage as well as to changes of characteristics of the transducer means of said electronic noise attenuation system;
wherein said first and second mechano-electric transducer means are located in said sound wave propagation passage with said electro-mechanical transducer means therebetween at positions in which a transfer function Hr indicating a propagation characteristic of the sound wave propagated from said electro-mechanical transducer means toward said first mechano-electric transducer means with the conversion characteristics of said electro-mechanical transducer means and said first mechano-electric transducer means added thereto is equivalent to a transfer function Ht indicating a propagation characteristic of the sound wave propagated from said electro-mechanical transducer means with the conversion characteristics of said electro-mechanical transducer means and said second mechano-electric transducer means added thereto.

4,783,818

METHOD OF AND MEANS FOR ADAPTIVELY FILTERING SCREECHING NOISE CAUSED BY ACOUSTIC FEEDBACK

Dan Graupe, Highland Park; John Grosspietsch, Schaumburg, and Stavros P. Basseas, Chicago, all of Ill., assignors to Intellitech Inc., Northbrook, Ill.

Filed Oct. 17, 1985, Ser. No. 788,411
Int. Cl.[4] H03B *29/00*
U.S. Cl. 381—71 **60 Claims**



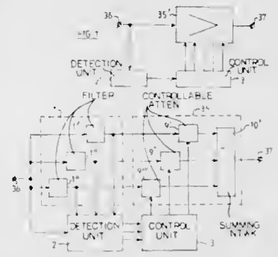
1. A method to control acoustic feedback in a communications system operating in an acoustic environment and having a microphone component for inputting audio information into the system, an amplifier component for amplifying audio frequency signals inputted to the microphone, and a speaker component for outputting audio frequency signals into said environment, said method comprising:
(a) identifying those parameters associated with acoustic feedback, including identifying time-variations in these parameters;
(b) adjusting the transfer function of said amplifier component in accordance with the identified parameter for cancelling the effects of said acoustic feedback in response to identification of the parameters associated therewith without attenuating any audio frequencies.

4,783,819

AUTOMATICALLY CONTROLLED AMPLIFIER ARRANGEMENT

Stephanus H. De Koning, and Alexander Verwijmeren, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1987, Ser. No. 15,453
Claims priority, application Netherlands, Feb. 18, 1986, 8600406
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—83 **12 Claims**



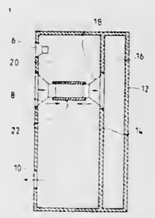
1. An automatically controlled amplifier arrangement comprising: at least one input and at least one output, a controllable amplifier unit connected between said input and output and which comprises separate control means for separately controlling the gain for different frequency bands to a value below the howling limit, a detection unit coupled to the input to detect oscillations of the arrangement in the case of acoustic feedback during operation, and a control unit which controls the gain of the amplifier unit under the influence of the detection unit, characterized in that the unit for detecting oscillations comprises at least two rectifying circuits to which is applied the signal to be amplified or a portion of said signal, at least two integrating circuits having different time constants and different gain factors, and a comparator circuit to which output signals of the integrating circuits are applied as input signals, the comparator circuit supplying an output signal when the amplitude of one of two input signals applied thereto exceeds that of the other one of said input signals.

4,783,820

LOUDSPEAKER UNIT

Johan P. Lyngdorf, Arnakvej 8, DK-8270 Höjbjerg, and Jorgen S. Stokholm, Rismosevej 29, DK-8260 Viby J., both of Denmark

Continuation-in-part of Ser. No. 816,111, Jan. 3, 1986, abandoned. This application Mar. 24, 1987, Ser. No. 29,677
Claims priority, application Denmark, Jan. 3, 1985, 26/85
Int. Cl.[4] H04R *1/02*
U.S. Cl. 381—89 **8 Claims**



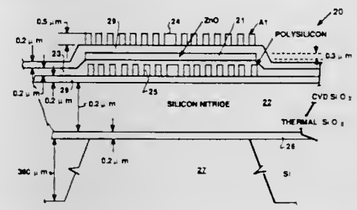
1. A loudspeaker unit for a reproduction of at least sound of low frequencies, the loud speaker unit comprising a cabinet provided with two low frequency loudspeakers, with a first low frequency loudspeaker mounted on a front plate of the cabinet, and with the front plate including an acoustic port spaced from the location of the front plate mounted low frequency loudspeaker, characterized in that the second low frequency loudspeaker is mounted on an internal partition plate behind the first front mounted low frequency loudspeaker and is electrically connected so as to operate, geometrically, in counter phase with the first low frequency loudspeaker, such that the two low frequency loudspeakers cooperate to produce sound in a front chamber between the front plate and the internal partition plate, said second low frequency loudspeaker cooperating rearwardly with a closed or substantially closed chamber located between the internal partition plate and a rear wall of the cabinet.

4,783,821

IC PROCESSED PIEZOELECTRIC MICROPHONE

Richard S. Muller, Kensington, and Eun S. Kim, Berkeley, both of Calif., assignors to The Regents of The University of California, Berkeley, Calif.

Filed Nov. 25, 1987, Ser. No. 125,375
Int. Cl.[4] H04R *17/00, 7/04, 19/00*
U.S. Cl. 381—173 **5 Claims**



4. A miniature diaphragm pressure transducer, comprising:
a diaphragm of silicon nitride based on a silicon wafer with a surface layer of thermal silicon dioxide, said diaphragm having an upper face,
a first chemically vapor deposited (CVD) layer of silicon dioxide covering said upper face,
a series of annular, basically concentric, polysilicon electrodes over said first layer of silicon dioxide,
a second CVD layer of silicon dioxide covering said polysilicon electrodes,
a zinc oxide piezoelectric film covering said second layer,
a third CVD layer of silicon dioxide covering said piezoelectric film,
a series of annular, basically concentric, aluminum electrodes on the opposite side of said piezoelectric film from said polysilicon electrodes, aligned with said polysilicon electrodes, over said third layer of silicon dioxide, and in contact with said piezoelectric film.

4,783,822

MULTI-ADJUSTABLE HEADBAND

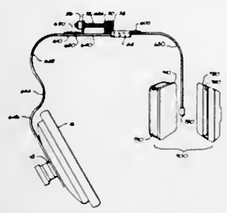
Pierce C. Toole, Cocoa; Howard E. Chalson, and Walter S. Bussey, both of Merritt Island, all of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 8, 1986, Ser. No. 894,541
Int. Cl.[4] H03M *1/05;* **A44B** *21/00*
U.S. Cl. 381—187 **5 Claims**

1. A headband for supporting at least one speaker element of the head of a user, comprising:
a C-clamp member having opposing ends defining an axial span therebetween with said at least one speaker element on one of said opposing ends thereof, and comprising two mutually-overlapping headband elements, the overlapping relationship of which is continuously adjustable along an axis of relative axial movement for selectively establishing a particular axial span between said opposing ends of said C-clamp member;

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axial span adjustment means, located substantially near the center of said C-clamp member, for making and holding minor variations of said particular axial span thereof, thereby selectively controlling axial pressure on the head of a user, said axial span adjustment means including a single rack member and a corresponding pinion member, said single rack member being fixedly received on one of said two headband elements with the teeth of such rack member being axially spaced therealong, and said pinion member having a rotation axis and being freely-rotatably



mounted on the other of said two headband elements with such rotation axis of such pinion being perpendicular to said axis of relative axial movement of said two headband elements, while also being in a plane parallel to the plane of such headband elements so as to provide access to said pinion for direct manipulation thereof by a user; and

securement means, separate from said axial span adjustment means and supported on at least one of said two headband elements, for selectively fixing the relative overlapping relationship of said two headband elements as established by said axial span adjustment means.

4,783,823

CARD IDENTIFYING METHOD AND APPARATUS

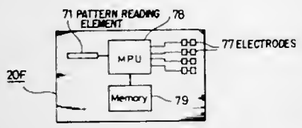
Hisashi Tasaki; Kimikazu Endo, both of Kyoto; Ichiro Miyagi; Shinichiro Tsunemi, both of Takatsuki; Yuichi Saida, Kameoka, and Katsuo Nakagaki, Takatsuki, all of Japan, assignors to Omron Tateisi Electronics, Co., Kyoto, Japan

Filed Sep. 18, 1986, Ser. No. 908,986

Claims priority, application Japan, Sep. 16, 1985, 60-228801; Sep. 18, 1985, 60-205768; Sep. 18, 1985, 60-205769; Sep. 18, 1985, 60-205770; Oct. 18, 1985, 60-233922; Oct. 18, 1985, 60-233923

Int. Cl.[4] **G06K** *9/00*

U.S. Cl. 382—4 **16 Claims**



1. A method of discriminatively identifying a card, said card having a predetermined characteristic feature, and further including means incorporated in said card for checking said characteristic feature and a memory incorporated in said card for storing preset information indicative of said characteristic feature, said method comprising the steps of:

(a) sensing the characteristic feature of said card;

(b) sending data relating to the characteristic feature sensed in step (a) to said checking means;

(c) retrieving said information indicative of said characteristic feature from said memory;

(d) comparing said characteristic feature sensed in step (a) with said information retrieved in step (c); and

(e) deciding said card is an authorized card when said comparison results in coincidence.

4,783,824

SPEAKER UNIT HAVING TWO VOICE COILS WOUND AROUND A COMMON COIL BOBBIN

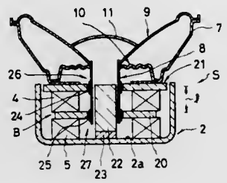
Yoshihiro Kobayashi, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Japan

Filed Oct. 18, 1985, Ser. No. 789,028

Claims priority, application Japan, Oct. 23, 1984, 59-159147[U]

Int. Cl.[4] **H04R** *9/06, 9/04, 1/24*

U.S. Cl. 381—195 **9 Claims**



1. A speaker system comprising:

(a) a magnetic circuit including

a pole piece,

a first magnetic member facing with the pole piece to define a first air gap,

a second magnetic member facing with the pole piece to define a second air gap which is spacially separated from the first air gap,

a first magnet disposed between the first and second magnetic members to provide magnetic flux at said first air gap and to contribute to the magnetic flux at said second air gap, and

a second magnet disposed under the second magnetic member, the second magnet being magnetized in an opposite polarity to the first magnet to provide magnetic shielding and to contribute to the magnetic flux at said second air gap;

(b) a speaker diaphragm connected to a voice coil bobbin on which first and second voice coils are wound, the first and second voice coils being arranged to be respectively placed in the first and second air gaps;

(c) a driver for producing first and second drive signals respectively applied to the first and second voice coils.

4,783,825

POSTAL MATERIAL READING APPARATUS

Nobuyuki Hirose, Yokohama, and Naoki Ota, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 22, 1986, Ser. No. 854,570

Claims priority, application Japan, Apr. 30, 1985, 60-93135; May 31, 1985, 60-116749; May 31, 1985, 60-118145

Int. Cl.[4] **G06K** *9/00*

U.S. Cl. 382—1 **5 Claims**

1. A postal material reading apparatus comprising:

(a) means for obtaining an image signal which represents a visual image of the surface of postal material having a repetitive mark formed by patterns arranged at predetermined intervals and having a characteristic location and height;

(b) memory means for storing said image signal;

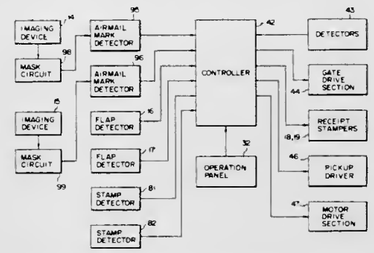
(c) means, responsive to said stored image signal, for identifying an area of said image which contains said repetitive mark formed by patterns arranged at predetermined intervals by detecting said intervals of said pattern and for

generating a masking signal indicative of said area, said means for identifying comprising:

(i) means for calculating a histogram for a portion of said postal material along an edge of said postal material wherein said mark is to be located, said histogram having peaks indicative of detection of said mark;

(ii) means for determining the heights and locations of said peaks; and

(iii) means for comparing said locations of said peaks with



said characteristic locations to determine if said histogram is representative of a mark located at said characteristic locations;

(d) gate means, responsive to said masking signal, for masking said area for said stored image signal upon reading said stored image signal from said memory means to produce a masked image signal of said postal material without said area containing said repetitive mark; and

(e) means for analyzing said masked image signal to determine the orientation of said postal material.

4,783,826

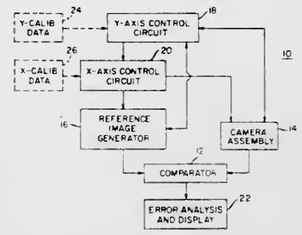
PATTERN INSPECTION SYSTEM

Dusan A. Koso, Cambridge, Mass., assignor to The Gerber Scientific Company, Inc., South Windsor, Conn.

Filed Aug. 18, 1986, Ser. No. 897,721

Int. Cl.[4] **G06K** *9/00*

U.S. Cl. 382—8 **31 Claims**



1. A system which inspects pattern-bearing material that is subject to topical distortions, comprising:

means for scanning in a first direction a plurality of predefined local regions of a pattern to be inspected to provide an image of each local region, said means for scanning having a scan width, in a second direction, greater than the width in the second direction of each said local region;

means for generating a reference image for each of said local regions;

means for shifting the position of the image of each said local region and the position of its corresponding reference image relative to each other to align as a pair the images in the second direction;

means for modifying in the first direction at least one of the dimension of the image of each said local region and the dimension of its corresponding reference image relative to each other to align as a pair the images in the first direction; and

means for comparing each pair of aligned images to detect errors in the pattern independent of misalignment of and topical distortions of each said local region.

4,783,827

SERIAL DATA PROCESSING APPARATUS

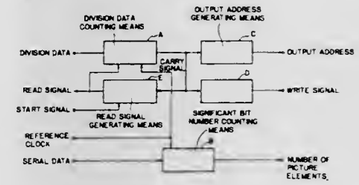
Akio Izumi, Yokosuka, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 27, 1986, Ser. No. 867,471

Claims priority, application Japan, May 27, 1985, 60-112236; Oct. 26, 1985, 60-238596

Int. Cl.[4] **G06K** *9/62*

U.S. Cl. 382—18 **5 Claims**



1. A serial data processing apparatus for use in an inspection in which a window area is set in advance in a visual field through which it is possible to view an article which is moved relative to an imaging device along a predetermined direction and a video output in relation to said article within said window area is obtained by said imaging device and compared with a given reference value, thereby making judgment as to whether said article is good or not, said apparatus comprising:

a one-dimensional imaging device serving as said imaging device and adapted to effect scanning for one line along an X-direction insersecting a Y-direction, sequentially to decompose the image of said article into picture elements and, to convert them into time-series binary signals and output them in the form of serial data;

first storage means for storing an X-coordinate section of said window area in advance;

second storage means for storing a Y-coordinate section of said window area in advance; and

video output preparing means which monitors the change of the relative position in the Y-direction between said article and said one-dimensional imaging device, and when it detects that the Y-coordinate of said imaging device is within the Y-coordinate section of a window area stored in said second storage means, this video output preparing means is supplied the X-coordinate section of the window area concerned from said first storage means, and said means take out and examines the data within the X-coordinate section of this window area in the serial data output from said one-dimensional imaging device, counts the number of bits of the data which take a predetermined logical value for each scanning and then sequentially adds the counted values to prepare a video output for said window area.

4,783,828

TWO-DIMENSIONAL OBJECT RECOGNITION USING CHAIN CODES, HISTOGRAM NORMALIZATION AND TRELLIS ALGORITHM

Firooz A. Sadjadi, St. Anthony, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 2, 1986, Ser. No. 870,603

Int. Cl.[4] **G06K** *9/48*

U.S. Cl. 382—21 **10 Claims**

1. A classification processor for classifying an unknown

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two-dimensional object having a chain code by correlating an unknown object's chain code histogram with stored chain code histograms of known two-dimensional objects comprising:

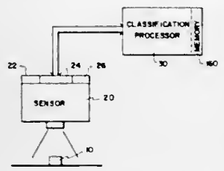
means for generating a histogram from the unknown object's chain code reflecting size and orientation of the unknown object;

means for correlating the generated histogram with a stored chain code histogram of a known object, comprising:

means for selecting a stored chain code histogram of a known object;

means for comparing the unkown object's chain code histogram with the selected known object's histogram in a vertical chain code histogram domain;

first means for generating a first correlation factor in the vertical domain to determine scaled size of the unknown object;



means for comparing the unknown object's chain code histogram with the selected known object's histogram in a horizontal chain code histogram domain;

second means for generating a second correlation factor in the horizontal domain to determine rotational orientation of the unknown object;

means for normalizing the known object's chain code hostogram by shifting the known object's chain code histogram horizontally and vertically as required to match a scaled size and a rotational orientation of the chain code histogram of a known object; and

means for applying a Viterbi algorithm for resolving a final ambiguity in deciding whether or not the generated histogram and the stored histogram are similar by processing the histograms with a distance function.

4,783,829

PATTERN RECOGNITION APPARATUS

Akira Miyakawa, Yokohama; Seiji Hata, Fujisawa, and Yoshie Nishida, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,555

Claims priority, application Japan, Feb. 23, 1983, 58-27518; Feb. 23, 1983, 58-27519

Int. Cl.[4] G06K *9/08*

U.S. Cl. 382—22 **26 Claims**

1. A pattern recognition apparatus, comprising:

(a) means for identifying an object region of an object from input image data;

(b) means for extracting outline pixels of the identified object region;

(c) means for polygonally-approximating an outline of said object region based on a positional relationship of the extracted outline pixels and for determining vertex coordinates of a polygonal approximation of the outline of the identified object region;

said vertex coordinate determination means including:

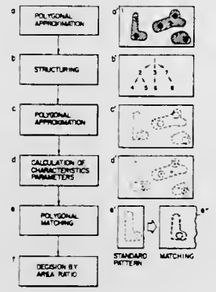
a polygonal approximation data memory for storing pixel pattern data which can be approximated as lines of a polygonal approximation of the outline from the input image data;

means for determining end points of segments of the outline by referring to the pixel pattern data stored in said polygonal approximation data memory based on connectivity among the extracted outline pixels, and for sequentially segmenting said outline into the segments; and

a vertex data memory for storing data about the end points of the segments to provide end point data as the polygonally-approximated vertex coordinates;

(d) means for determining characteristic data representing the center and the orientation of said polygonally-approximated region based on said vertex coordinates; and

(e) means for superimposing a polygonally-approximated region pattern on a dictionary pattern based on said characteristic data to generate a common region by matching the center of said polygonally-approximated region pattern with the center of said dictionary pattern and transforming the vertex coordinates of said polygonally-aproximated region pattern on the basis of any angular difference between the orientation of the polygonally approximated region pattern and orientation of said dictionary pattern to provide a transformed region pattern, and for determining a degree of matching between the transformed region pattern and the dictionary pattern.



4,783,830

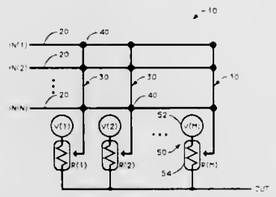
PATTERN RECOGNIZING CONTENT ADDRESSABLE MEMORY SYSTEM

Patrick Johnson, College Park, and David W. Rose, Bowie, both of Md., assignors to American Electronics, Inc., Lanham, Md.

Filed Mar. 24, 1987, Ser. No. 29,670

Int. Cl.[4] G06K *9/64*

U.S. Cl. 382—34 **15 Claims**



1. An analog content addressable memory system for determining the degree of similarity between an unknown pattern and a plurality of reference patterns, said system comprising:

input lines for presenting continuously variable values representing unknown patterns and reference patterns to said system, each of the patterns corresponding to a point in N-dimensional space;

memory means for storing said values representing the reference patterns; and

processing means for determining the distance between said point representing the unknown pattern and each of said points representing the reference patterns, said distance being inversely proportional to the degree of similarity between the unknown pattern and said reference patterns, said distance D being determined by the formula

$$\left[\sum_{J=1}^{N} [IN(J) - W(I,J)]^2\right]^{\frac{1}{2}},$$

where IN(J) are the values representing the unknown pattern, and W(I,J) are the values representing the stored patterns, J varying from 1 to N and I varying from 1 to M.

4,783,831

METHOD FOR PRODUCING A STANDARD PATTERN FOR PATTERN MATCHING

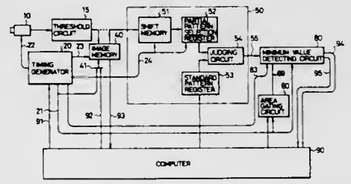
Seiji Kashioka, Hachioji; Yoshihiro Shima, Kodaira; Takafumi Miyatake, Hachioji, and Masakazu Ejiri, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,724

Claims priority, application Japan, Sep. 19, 1984, 69-194670

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—34 **9 Claims**



1. A method of producing a standard pattern comprising: successively selecting and storing in a memory of plurality of local patterns different in position and equal in size to a standard pattern to be obtained from an image of an object being examined; obtaining a distribution of pattern detail in picture elements constituting each local pattern; and chosing a standard pattern from said plurality of local patterns which has a distribution of pattern detail in picture elements most closely in conformity with a predetermined distribution of pattern detail.

4,783,832

IMAGE PROCESSING APPARATUS

Makoto Kaneko, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 22, 1986, Ser. No. 921,384

Claims priority, application Japan, Oct. 25, 1985, 60-239032

Int. Cl.[4] G06K *9/36*

U.S. Cl. 382—41 **6 Claims**

1. An image processing apparatus comprising:

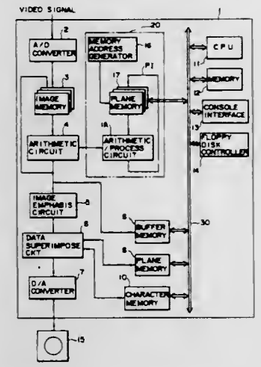
A/D converter means for converting a video signal representing an image including at least one edge line into digital image data;

first storage means for storing the image data;

edge image forming means for forming an edge image defined by the edge line from the image data read out from said first storage means; and

painting means including second storage means for storing painting data having the same data elements as that of the image data, including the edge image, from said edge image forming means, said painting means being adapted to read out the image data from said first storage means and the painting data from said second storage means, to process the image data and the painting data, and to paint the edge image with the painting data;

wherein said second storage means comprises a first plane memory for storing the image data, a second plane memory for storing the painting data, and a third plane memory, and said painting means comprises address output means for outputting address data for addressing the image data stored in said first plane memory, and means for performing arithmetic operations of data sequentially read out from said first and second plane memories and storing processed data in said third plane memory.



4,783,833

METHOD OF EXTRACTING AN IMAGE OF A MOVING OBJECT

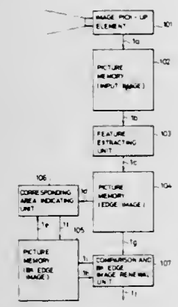
Atsushi Kawabata; Shinya Tanifuji, and Yasuo Morooka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1986, Ser. No. 935,260

Claims priority, application Japan, Nov. 27, 1985, 60-264855

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—22 **8 Claims**



1. A method of extracting an image of a moving object from an image inputted successively, said method comprising the steps of:

extracting a feature parameter of said inputted image;

storing said feature parameter of said input image as a feature paramter of a background image, said feature parameter of said background image being unchanged or slowly changing;

transferring said feature parameter of said background image so as to correspond positionally to a feature parameter of an image successively inputted;

forming a feature parameter of background image free of any moving object images, based on a weighted mean between said transferred feature parameter of said background image and said feature parameter of said image

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inputted successively, only said transferred feature parameter of said background image being weighted; and

extracting information relating to an image of said moving object from said feature parameter of said image through comparison of said feature parameter of said background image free of any moving object image and said feature parameter of said image inputted successively.

4,783,834

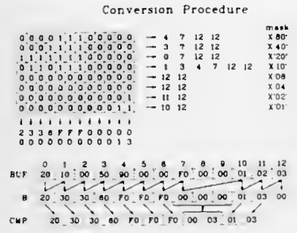
SYSTEM FOR CREATING TRANSPOSED IMAGE DATA FROM A RUN END OR RUN LENGTH REPRESENTATION OF AN IMAGE

Karen L. Anderson, Mohegan Lake, and Joan L. Mitchell, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1987, Ser. No. 17,372

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—46 **22 Claims**



1. A method for formatting electronic binary image data into transposed or rotated raster form, comprising:

assembling in the storage elements of a first buffer electronic image-indicative data in the form of vectors of run ends representing successive raster scan lines of an original image to be reproduced;

initializing to zero the storage elements of an intermediate buffer capable of containing one bit corresponding to each pel in the image to be transposed or rotated;

entering said electronic data into said intermediate buffer by using each run end in said first buffer to set the bit in said intermediate buffer corresponding to the pel position at which the run ends;

combining the elements of said intermediate buffer containing said entered electronic data with one another in sequence to create raster data; and

storing said raster data generated by the above-recited steps.

4,783,835

METHOD OF CHARACTER RECOGNITION

Koji Satoh, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 894,075, Aug. 5, 1986, abandoned, which is a continuation of Ser. No. 669,635, Nov. 7, 1984, abandoned. This application Dec. 28, 1987, Ser. No. 142,353

Claims priority, application Japan, Nov. 9, 1983, 58-211374

Int. Cl.[4] G06K *9/20*

U.S. Cl. 382—48 **18 Claims**

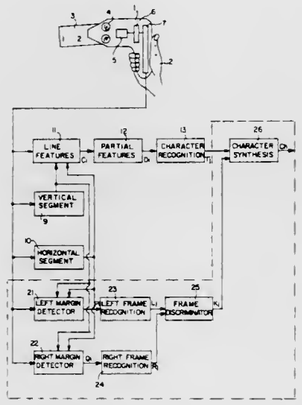
1. In an apparatus for recognizing a character with a hand held scanner having an image sensor composed of a two-dimensional array of photoelectric elements, projection lamps, a focusing lens, and a binary conversion circuit for converting output analog signals of the photoelectric elements into digital signals to form a binary pattern of the character scanned,

wherein the binary pattern of the character scanned is defined in a rectangular character area of rows and columns of cells in which digital bits representing the character scanned occur or do not occur, and

said apparatus including character area determining means for determining the character area by identifying the rows and columns of cells having digital bits representing the character scanned, and character recognition means for abstracting the presence of absence of digital bits on each line of the identified rows or columns of the character area into a set of line features, identifying the set of abstracted line features of the scanned character within the character area, and producing a character recognition result therefrom,

the improvement comprising:

character margin detection means, receiving the outputs from said binary conversion circuit and said character area determining means, for detecting the presence or absence of digital bits occurring in at least one line proximate each of a left side margin and a right aide margin of the character area, and providing left and right side margin output signals indicative of the detected digital bits in each respective line of the left and right side margins;



character frame recognizing means receiving the output signals from said character margin detection means for recognizing a left side frame structure, from the output signals for the detected line of the left side margin, and a right side frame structure, from the output signals for the detected line of the right side margin, based upon an order of occurrence of said left and right side margin output signals of said character margin detection means; and

character discrimination synthesis means receiving a character recognition output from said character recognition means and a left and right side frame structure output from said character frame recognizing means for synthesizing the results of said character recognition means and of said character frame recognizing means so as to discriminate between similarly shaped characters on the basis of differences detected in their left and right side margins and to provide a final character identification based thereon.

4,783,836

INFORMATION READING APPARATUS

Izumi Takashima, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1985, Ser. No. 768,570

Claims priority, application Japan, Aug. 31, 1984, 59-182935; Aug. 31, 1984, 59-182936

Int. Cl.[4] G06K *9/38*

U.S. Cl. 382—50 **9 Claims**

1. An information reading apparatus, comprising:

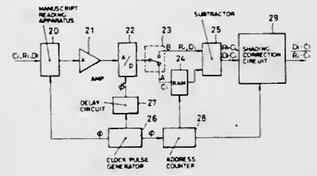
(a) a manuscript reader for producing a photoelectronically converted analog signal;

(b) an A/D converter for converting said analog signal into digital data including picture image data and shading correction reference image density data;

(c) memory means for storing said digital data corresponding to the output of said manuscript reader with no light input to said manuscript reader;

(d) subtracting means for subtracting said data stored in said memory means from both picture image data and shading correction reference density data so as to effect a base level correction of both said data; and

(e) shading correction means for effecting a predetermined shading correction based on said picture image data and



said shading correction reference density data, base levels of both data having been corrected by said subtracting means, said shading correction means comprising:

(i) logarithmic converting means for converting an output signal of said subtracting means into a logarithmic value;

(ii) other memory means for storing a shading correction reference density data of said logarithmic value, and

(iii) other subtracting means for subtracting said logarithmic value of said shading correction reference density data stored in said other memory means from said picture image data converted into a logarithmic value by said logarithmic converting means.

4,783,837

IMAGE PROCESSING APPARATUS

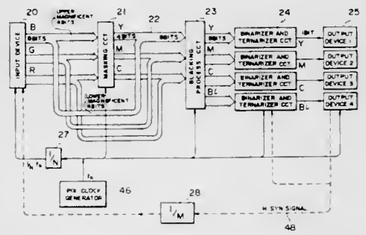
Naoto Kawamura, Anagi, and Hidejiro Kadowaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisba, Tokyo, Japan

Continuation of Ser. No. 480,823, Mar. 31, 1983, abandoned. This application Jul. 1, 1986, Ser. No. 881,492

Claims priority, application Japan, Apr. 6, 1982, 57-56964; Apr. 6, 1982, 57-56965

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—50 **26 Claims**



1. An image processing apparatus for producing a dotted image on a record medium from image data comprising:

means for sequentially inputting the image data;

means for processing the image data sequentially inputted by said inputting means without repeatedly using said image data to output a pulse-width modulated signal for changing a dot size of a dotted image to be produced; and

first and second threshold matrices;

wherein said processing means halftone process the image data by using said first and second threshold matrices relating to the same image data, and outputs the pulse width modulated signal.

4,783,838

IMAGE PROCESSING METHOD AND APPARATUS THEREFOR

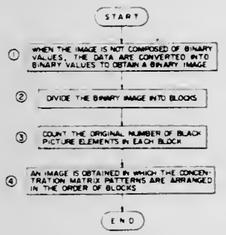
Masahiko Matsunawa, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1985, Ser. No. 813,050

Claims priority, application Japan, Dec. 26, 1984, 59-279492; Dec. 26, 1984, 59-279493; Dec. 26, 1984, 59-279494; Feb. 22, 1985, 60-34117; Mar. 12, 1985, 60-49629; Apr. 2, 1985, 60-70461

Int. Cl.[4] G06K *9/36*

U.S. Cl. 382—51 **12 Claims**



1. An image processing method comprising the steps of:

(a) converting an original image into a matrix pattern of binary picture elements;

(b) dividing the matrix pattern of binary picture elements into blocks of binary picture elements;

(c) counting a number of binary picture elements occurring in each block of said divided matrix pattern;

(d) providing the counted numbers of binary picture elements occurring in the respective blocks of said divided matrix pattern as a first concentration matrix pattern of concentration values; and

(e) reconstituting an output matrix pattern of binary picture elements from said first concentration matrix pattern by comparing the counted number for each divided block with a dither matrix and providing output binary picture elements for each reconstituted block in accordance with said comparing step.

4,783,839

IMAGE FILTERING APPARATUS AND METHOD

Jeffrey C. Bamber, London, England, assignor to National Research Development Corporation, London, England

PCT No. PCT/GB85/00580, § 371 Date Aug. 12, 1986, § 102(e) Date Aug. 12, 1986, PCT Pub. No. WO86/03594, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 12, 1985, Ser. No. 903,565

Claims priority, application United Kingdom, Dec. 12, 1984, 8431374

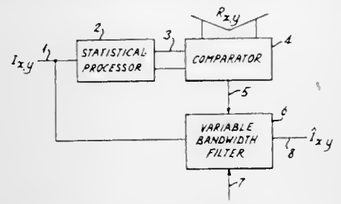
Int. Cl.[4] G06K *9/40*

U.S. Cl. 382—54 **8 Claims**

1. A method of filtering an image from an imaging system which is prone to speckle generation comprising the steps of identifying one or more properties of an image region which is a measure of speckle characteristic of the apparatus for that image region, determining the extent to which corresponding

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regions of a particular image requiring filtering resembles speckle normally generated by the imaging system in that part



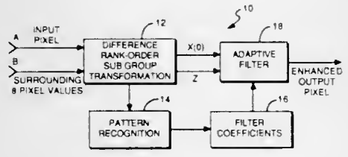
of the image and filtering the image in accordance with the extent to which said image resembles speckle.

4,783,840

METHOD FOR ENHANCING IMAGE DATA BY NOISE REDUCTION OR SHARPENING

Woo-Jin Song, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 4, 1987, Ser. No. 128,937
Int. Cl.[4] G06K *9/40, 9/44*
U.S. Cl. 382—54 **18 Claims**



2. A process for enhancing image data defined by a two-dimensional array of pixel values comprising the steps of:

selecting a pixel value to be enhanced from the array of pixel values;

sampling a select group of pixel values surrounding the pixel value to be enhanced from the array of pixel values;

taking the value difference between each pixel value of the select group of surrounding pixel values and the pixel value to be enhanced;

determining which one of the surrounding pixel values has the greatest value difference from the pixel value to be enhanced;

subgrouping the select group of surrounding pixel values into a plurality of subgroups each comprising select ones of the surrounding group of pixel values selected as a function of each pixel value's difference from the pixel value to be enhanced relative to the greatest value difference;

changing the pixel value to be enhanced to an enhanced value as a function of the number of pixel values in the subgroups and the positions of said pixel values in the subgroups relative to each other to provide a choice between image sharpening or noise reduction; and

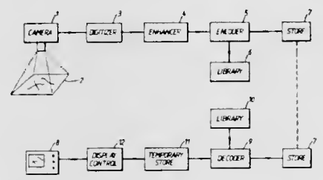
selecting a succeeding pixel value to be enhanced from said array of pixel values and applying the above steps to provide an enhanced pixel value for the succeeding pixel value so selected until substantially all the pixel values from the array of pixel values are changed to enhanced values.

4,783,841

DATA COMPRESSION

Paul G. Crayson, Cranham, United Kingdom, assignor to The General Electric Company p.l.c., London, United Kingdom

Filed May 4, 1987, Ser. No. 45,493
Claims priority, application United Kingdom, May 8, 1986, 8611179
Int. Cl.[4] G06K *9/00, 9/68*
U.S. Cl. 382—56 **23 Claims**



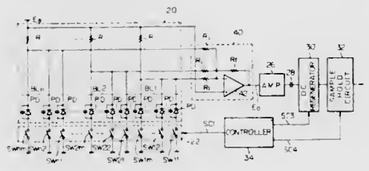
1. Apparatus for compressing pictorial data comprising: means arranged to accept an input signal of data representing digital words, each word describing a pixel of a picture; means arranged to separate the pictorial data into blocks, each data block representing an array of pixels; a library containing groups of patterns, each group relating to a respective block size and each pattern consisting of a block of data representing a pictorial feature and being associated with an identifying code containing fewer digits than the block size associated with its group; comparison means arranged to compare the content of each data block with patterns of the relevant group and means which, if a match between a data block and a pattern is found on comparison, causes the content of said data block to be represented in an output signal by said identifying code associated with the matched pattern whereby the pictorial data is compressed, and, if no match is found, causes said data block to be separated into blocks of smaller size and said smaller blocks to be applied to said comparison means.

4,783,842

IMAGE READER FOR IMAGE PROCESSING APPARATUS

Jyoichi Fuwa, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1985, Ser. No. 796,064
Claims priority, application Japan, Nov. 13, 1984, 59-237593
Int. Cl.[4] G06K *9/20*; H04N *3/14*
U.S. Cl. 382—67 **2 Claims**



1. An image reader for an image processing apparatus which photoelectrically transduces one line of images on a pixel basis, comprising:

a plurality of photoelectric transducer means arranged in an array in a line image sensor, said photoelectric transducer means being divided into a plurality of discreet blocks by a predetermined number in the order of arrangement, the photoelectric transducer means in each of said blocks having output terminals which are commonly connected;

analog adder means having input terminals to which outputs of said discreet blocks are connected in a one-to-one correspondence, outputs of said analog adder means being delivered as image signals associated with said transduce image;

means for selecting said photoelectric transducer means; and

wherein said analog adder means comprises an operational amplifier having an inverting input terminal and a non-inverting input terminal, a plurality of input resistors to one terminal of which the outputs of said discreet blocks applied, respectively, and the other terminals of which are commonly connected to the inverting input terminal of said operational amplifier, and a feedback resistor for feeding back an output of the operational amplifier to the inverting input terminal, the non-inverting input terminal of the operational amplifier being applied with a bias voltage; and

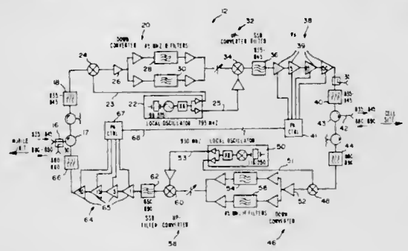
wherein said bias voltage cancels any signal produced by the non-selected phototransducer means.

4,783,843

SPLIT BAND FILTER FOR CELLULAR MOBILE RADIO

Barry J. Leff, Belmont; Edward R. Johnson, Sunnyvale, and Joseph F. Lutz, San Jose, all of Calif., assignors to Peninsula Engineering Group, Inc., San Carlos, Calif.

Filed May 23, 1986, Ser. No. 866,270
Int. Cl.[4] H04B *7/14*
U.S. Cl. 455—22 **8 Claims**



1. A filter, comprising:

at least two filter means, each having a filter input and a filter output, for attenuating transmission of signals therethrough above and below a filter means center frequency;

each of said filter means having a center frequency spaced from that of the other filter means to displace the filter passbands of each filter means such that the passbands overlap at a passband half voltage point; and

means for combining said outputs of each of said filter means;

whereby said filter means cooperate to provide a broad passband formed of the passbands of each of said filter means and having steep skirts that accordingly restrict said filter's passband.

4,783,844

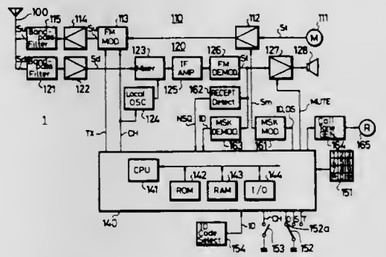
APPARATUS FOR TRANSMITTING AND RECORDING SIGNALS

Mitsuo Higashiyama, Kanagawa; Michimasa Komatsubara, Chiba, and Masato Yamagata, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 4, 1986, Ser. No. 870,345
Claims priority, application Japan, Jun. 20, 1985, 60-135182
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 455—34 **5 Claims**

1. Apparatus for transmitting and receiving audio signals between remote locations, comprising:

first and second transmitter-receiver units, each having a plurality of channels for transmitting and receiving audio signals, each said unit respectively including means for producing a code signal for transmission and reception between said first and second units, each of said units further comprising means for detecting correct reception of said code signal and setting said first and second transmitter-receiver units to the same one of said plurality of channels upon a detected correct reception and producing an interrupt signal when said code signal is not correctly received, means for searching for a vacant one of said plurality of channels in response to said interrupt signal, and means for selecting a vacant one of said plurality of channels as a communication channel for transmission and reception of said audio signals, said first and second transmitter-receiver units including means for repeatedly transmitting said code signal with said audio signals during communication over said communication channel, said means for detecting detecting incorrect reception of said code signal and producing said interrupt signal so that another vacant channel is searched for, whereby said audio signal and said code signal are then transmitted and correctly received by each of said first and second transmitter-receiver units over said another vacant channel.

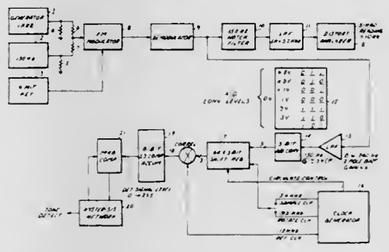


4,783,845

DIGITAL TONE SQUELCH DETECTOR

James R. McChesney, and Michael W. Cook, both of Fort Wayne, Ind., assignors to ITT Aerospace Optical, Fort Wayne, Ind.

Filed Dec. 20, 1985, Ser. No. 811,926
Int. Cl.[4] H04Q *7/00*; H04B *1/00*
U.S. Cl. 455—35 **2 Claims**



1. A digital tone squelch circuit comprising:

means for converting a first received analog signal to a first digital signal based on the amplitude of the first received analog signal;

means for correlating said first digital signal with a stored signal proportional to said first digital signal to generate a second digital signal based on the correlation between said first digital signal and said stored signal;

comparator means for comparing said second digital signal with a threshold signal whereby the presence of said first analog signal can be established;

a shift register connected to receive an output from said

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means for converting and provide an input to said means for correlating; and

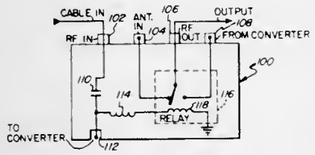
a clock generator connected to said shift register to rotate the contents of said shift register with a signal of a first frequency and also connected to said means for correlating with a signal of such a second frequency that the signal from said shift register to said means for correlating is effectively compared against a stored replica of said first received analog signal.

4,783,846

SWITCHABLE SIGNAL SOURCE MODULE FOR USE WITH CABLE TELEVISION CONVERTER

David E. Wachob, Elkins Park, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Jun. 4, 1987, Ser. No. 58,239
Int. Cl.[4] H04B *11/16*
U.S. Cl. 455—151 **22 Claims**



1. A television system comprising a switchable signal source module and a cable television converter, said cable television converter comprising:

an input/output terminal for receiving a television input signal and outputting a relay control signal;

means for generating sadi relay control signal and transmitting said relay control signal to said input/output terminal; and

television signal output terminal means for outputting a converted television channel signal; and said signal source module comprising:

first input terminal means for receiving a first input signal from a first cable television signal source;

second input terminal means for receving a second input signal from a second television signal source;

an input/output terminal;

relay means, having first and second television signal input ports coupled respectively to said first and second input terminal means, having a television signal output port coupled to said input/output terminal of said module, and having a relay control input port coupled to said input-/output terminal of said mouule, for selectively coupling said first input terminal means or said second input terminal means to said input/output terminal of said module based on said relay control signal; and wherein

said signal source module is mounted to said cable television converter with said input/output terminal of said module being electrically coupled to said input/output terminal of said cable television converter.

4,783,847

ELECTRONIC TUNING DEVICE

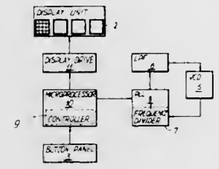
Moon-Sup Kim, Kyungki-do, Rep. of Korea, assignor to Sinhang Electronics Co., Ltd., Chungchun-Dong, Rep. of Korea

Filed Sep. 26, 1986, Ser. No. 913,010
Int. Cl.[4] N04B *1/06*
U.S. Cl. 455—158 **2 Claims**

1. In an electronic tuning device for a broadcast receiver, the electronic tuning device displaying broadcasting station name letters and frequency numbers, the improvement comprising:

memorizing means responsive to pressing at least one button on an electronic tuning device for seeking and memorizing sought name letters and frequency numbers of at least one broadcast station; and

seeking means responsive to pressing at least one other button on the electronic tuning device for displaying the



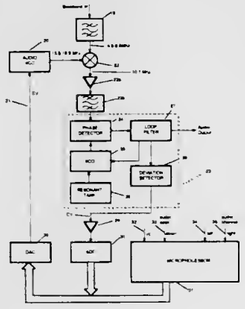
memorized name letters and frequency numbers and for producing a tuning signal corresponding the name letters and frequency numbers, whereby a broadcast receiver may be tuned to receive the signal of the broadcast station.

4,783,848

TVRO RECEIVER SYSTEM FOR LOCATING AUDIO SUBCARRIERS

John Y. Ma, Milpitas, and David H. McCracken, San Jose, both of Calif., assignors to Capetronic (BSR) Ltd., Kowloon, Hong Kong

Filed Oct. 21, 1985, Ser. No. 789,424
Int. Cl.[4] H04B *11/16, 1/26*
U.S. Cl. 455—182 **7 Claims**



1. An audio tuning system for receiving and tuning audio subcarrier signals in a TVRO system receiving RF signals from communication satellites, converting the RF signals to an IF frequency range, and demodulating the IF signals, said audio tuning system comprising,

a super heterodyne circuit producing an output signal, said circuit including a voltage-controlled oscillator VCO, and mixer for combining the demodulated IF signals with the output of said VCO to convert the frequency of the demodulated IF signals to desired frequencies in an audio IF frequency range,

a detector for detecting an audio signal at a prescribed audio IF frequency in the output of said super heterodyne circuit, said detector including automatic frequency control (AFC) means responsive to the audio IF output of said mixer for producing an error voltage representing any difference between the actual and desired frequencies of said audio IF output,

means for adjusting the controlling input voltage to said VCO in response to said error voltage to eliminate said difference between the actual and desired frequencies of said audio IF output by adjusting the frequency of the output of said VCO, means for generating an "audio seek" command signal, and means responsive to said "audio seek" command signal for

artificially adjusting the controlling input voltage to said VCO in a preselected direction independently of said error voltage,

monitoring the resulting error voltage produced by said AFC means in response to said artificial adjustment of said controlling input voltage,

continuing to artificially adjust the controlling input voltage to said VCO in said preselected direction in response to monotonic changes in the resulting error voltage, and

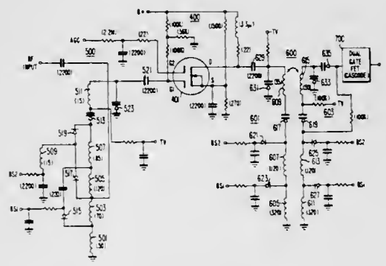
terminating the artificial adjustments of the controlling input voltage to said VCO in response to a non-monotonic change in the resulting error voltage, whereby the normal operation of said AFC means causes the heterodyne circuit to lock on to a new audio signal to produce the desired audio IF output.

4,783,849

FET TUNER

Max W. Muterspaugh, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Nov. 26, 1986, Ser. No. 935,439
Int. Cl.[4] H03J *1/16, 1/26*
U.S. Cl. 455—197 **6 Claims**



1. Tuning apparatus, comprising:

a source of a plurality of RF signals;

an RF stage including a first dual gate field effect transistor (FET) configured as a cascode amplifier and a first tuned circuit including a first inductance element and a first main varactor diode responsive to a tuning voltage coupled to a first gate electrode of said first FET amplifier for selecting one of said RF signals in response to a tuning voltage; said RF stage further including a first auxiliary varactor diode coupled to said first gate electrode of said first FET and responsive to said tuning voltage;

a local oscillator including a second dual gate FET configured as a cascode amplifier in the same manner as said first FET, oscillation conditioning means for conditioning said second FET amplifier to oscillate, and a second tuned circuit including a second inductance element and a second main varactor diode responsive to said tuning voltage configured in the same manner as said first tuned circuit coupled to a first gate electrode of said second FET for determining the particular frequency of oscillation of said local oscillator in response to said tuning voltage; said local oscillator further including a second auxiliary varactor diode coupled to said first gate electrode of said second FET in the same manner as said first auxiliary varactor diode is coupled to said first gate electrode of said first FET and responsive to said tuning voltage; and

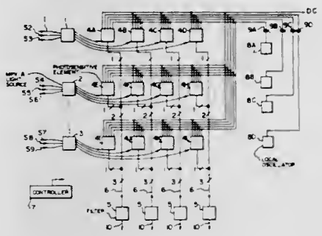
mixer means for combining the output signals of said RF stage and said local oscillator to produce an IF signal.

4,783,850

OPTOELECTRONIC COMPOUND SWITCHING MATRIX

Robert I. MacDonald, Ottawa, and Kenneth O. Hill, Kanata, both of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne des Brevets et D'Exploitation Limitee, Ottawa, Canada

Filed Mar. 7, 1984, Ser. No. 586,776
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—600 **27 Claims**



8. A optoelectronic switching matrix which includes a cross-point comprising:

(a) means for providing an optical signal formed of a plurality of frequency multiplexed input signals,

(b) a plurality of optoelectronic mixing detector photosensitive elements, for receiving the optical signal,

(c) means for providing an electrical local oscillator signal of selectable frequency,

(d) means for applying the local oscillator signal to the photosensitive elements whereby it is mixed with the received multiplexed input signals to form a plurality of heterodyned signals,

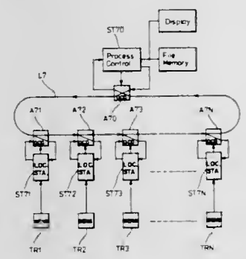
(e) means for coupling at least a predetermined one of the heterodyned signals to an output port.

4,783,851

OPTICAL COMMUNICATION SYSTEM

Kiyoharu Inou; Seiichi Naito, and Yoshihiro Sampei, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Jan. 18, 1985, Ser. No. 692,684
Claims priority, application Japan, Jan. 27, 1984, 59-13962; Jan. 27, 1984, 59-13963; Jan. 30, 1984, 59-14688
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—612 **6 Claims**



1. An optical communication system comprising

an optical transmission line;

a plurality of stations for transmitting and receiving optical signals among said stations through said transmission line;

a plurality of optical couplers connected between said transmission line and to respective ones of said stations, said optical couplers each comprising

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a first input terminal connected to said transmission line, and a second input terminal connected to a respective station;

a first output terminal connected to said transmission line, and a second output terminal connected to said respective station;

a polarized light separator comprising a first beam splitter and a first total reflection prism;

a polarized light synthesizer comprising a second beam splitter and a second total reflection prism;

an electro-optic element disposed between said separator and said synthesizer and comprising lead lathanum zirconate titanate material and two electrodes arranged opposite to each other, said element responsive to electrical signals applied to said electrodes selectively switching light from said separator to said synthesizer;

means for connecting said first and second input terminals to said first beam splitter so as to direct selectively light from said input terminals to said first beam splitter and said first total reflection prism;

means for connecting said first and second output terminals to said second beam splitter so as to direct selectively light from said second total reflection prism and said second beam splitter to said first and second output terminals; and

means under control of each station for applying control signals to said electrodes of said electro-optic element of the optical coupler of associated respective station to selectively direct part or all of the light from each of said first and second input terminals and said separator to said synthesizer and each of said first and second output terminals.

4,783,852

METHOD AND APPARATUS FOR ACQUIRING INFORMATION USING A RELATIVE PHASE DEVIATION OF THE OPTICAL SIGNAL OF A LOCAL OSCILLATOR OF A HOMODYNE RECEIVER

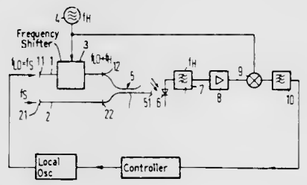
Franz Auracher, Baierbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 8, 1986, Ser. No. 894,662

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533327

Int. Cl.[4] H04B 9/00; G01B 9/02

U.S. Cl. 455—619 **16 Claims**



1. A method for the acquisition of information by way of a relative phase deviation between the phase of a received signal of an optical homodyne receiver and the phase of the optical signal of a local oscillator of said receiver, characterized in that the frequency (f_{Lo}) of the signal of said local oscillator is shifted by the frequency (f_H) of an auxiliary carrier and the frequency-shifted, optical signal is then superimposed upon the optical received signal and is detected, characterized in that the detected signal is band-passfiltered and is then shifted to the baseband frequency by mixing it with the same auxiliary carrier frequency, and characterized in that the signal which is shifted to the baseband frequency is low-pass-filtered wherein a controller receives the lowpassfiltered signal and provides an output to said local oscillator to control the phase of the optical signal of said local oscillator.

DESIGNS

NOVEMBER 8, 1988

298,380

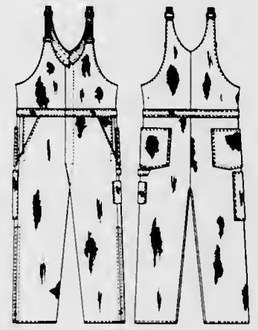
WELDER'S COVERALLS

Phillip E. Clutts, Sr., Granite City, Ill., assignor to Doyle C. Featherston, St. Louis, Mo., a part interest

Filed Mar. 18, 1985, Ser. No. 713,180

Term of patent 14 years

U.S. Cl. D2—29



298,381

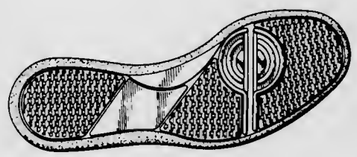
SHOE OUTSOLE

Paul D. Brown, Hingman, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok International Ltd., Canton, Mass.

Filed Feb. 6, 1987, Ser. No. 11,720

Term of patent 14 years

U.S. Cl. D2—320



298,382

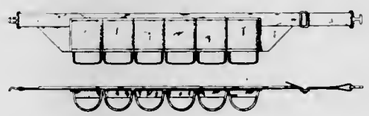
BEVERAGE CAN CARRIER BELT

Lester D. Webster, 0171 Highway 133 C6, Carbondale, Colo. 81623

Filed Mar. 21, 1986, Ser. No. 845,427

Term of patent 14 years

U.S. Cl. D2—630



298,383

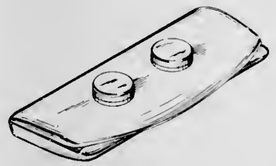
COMBINATION EYEGLASS AND CONTACT LENS CASE

Nathan Devore, and Donna Devore, both of 86 Tewkesbury Rd., Scarsdale, N.Y. 10583

Filed Nov. 25, 1985, Ser. No. 806,323

Term of patent 14 years

U.S. Cl. D3—34



298,384

SKI CARRIER

Gordon Steffens, 1710 Wisconsin NE., Albuquerque, N. Mex. 87110

Filed Aug. 1, 1985, Ser. No. 761,472

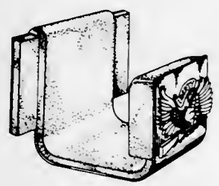
Term of patent 14 years

U.S. Cl. D3—36



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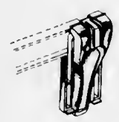
298,385
HOLDER FOR A GUN
Louis Rappa, 7368 Hollister Ave. Sp. 32, Goleta, Calif. 93117
Filed Jul. 1, 1983, Ser. No. 510,425
Term of patent 14 years
U.S. Cl. D3—38



298,386
STRAP PAD
Neil Y. Hirahara, 4431 Spring Meadow Rd., Cameron Park, Calif. 95682
Filed Mar. 15, 1985, Ser. No. 712,143
Term of patent 14 years
U.S. Cl. D3—54



298,387
CLAMP FOR A GARMENT HANGER
Everett L. Duester, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.
Filed Dec. 12, 1986, Ser. No. 941,283
Term of patent 14 years
U.S. Cl. D6—328

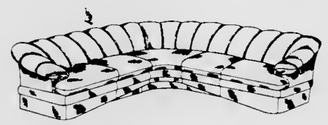




298,388
CHILD'S SAFETY SEAT FOR AN AUTOMOBILE
Robert D. Wise, Akron; Paul K. Meeker, Kent, and Mark A. Sedlack, Cuyahoga Falls, all of Ohio, assignors to Gerber Products Company, Fremont, Mich.
Filed Oct. 3, 1985, Ser. No. 783,986
Term of patent 14 years
U.S. Cl. D6—333



298,389
SECTIONAL SOFA
Randy R. Culler, High Point, N.C., assignor to Carson's of High Point, High Point, N.C.
Filed Oct. 15, 1986, Ser. No. 919,488
Term of patent 14 years
U.S. Cl. D6—335



298,390
CHAIR
Mario Bellini, Milan, Italy, assignor to Fehlbaum & Co., Switzerland
Filed Jun. 10, 1986, Ser. No. 873,217
Claims priority, application World Int. Prop. O., Jun. 5, 1986, DM/007028
Term of patent 14 years
U.S. Cl. D6—379



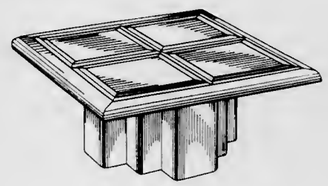
298,391
SECTIONAL SOFA
R. Tucker Quinn, High Point, N.C., assignor to Carson's of High Point, High Point, N.C.
Filed Oct. 13, 1987, Ser. No. 107,755
Term of patent 14 years
U.S. Cl. D6—381



298,392
DESK MODULE
H. Jack Hunkele, Longboat Key, Fla., assignor to H. Jack Henkele & Assoc., Inc., Longboat Key, Fla.
Filed Sep. 25, 1986, Ser. No. 911,660
Term of patent 14 years
U.S. Cl. D6—427



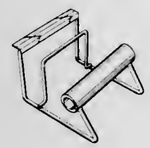
298,393
TABLE
Aaron J. Donner, Garrison, N.Y., assignor to Schnadig Corporation, Chicago, Ill.
Filed Feb. 28, 1986, Ser. No. 840,715
The portion of the term of this patent subsequent to May 2, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—486



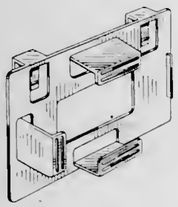
298,394
CUP DISPENSER
Clarence T. Brewer, Oak Park, Ill., assignor to Solo Cup Company, Urbana, Ill.
Filed Nov. 14, 1985, Ser. No. 804,981
Term of patent 14 years
U.S. Cl. D6—516



298,395
FOIL DISPENSER
Ann M. Colavito, 2325-3rd St. #322, San Francisco, Calif. 94107
Filed Mar. 11, 1986, Ser. No. 842,432
Term of patent 14 years
U.S. Cl. D6—518



298,396
TISSUE BOX HOLDER
Abel Gallego, 136-16 35th Ave., Flushing, N.Y. 11354
Filed Sep. 22, 1986, Ser. No. 910,190
Term of patent 14 years
U.S. Cl. D6—518



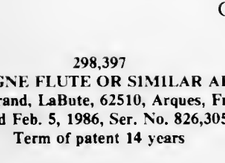
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298,397
CHAMPAGNE FLUTE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Feb. 5, 1986, Ser. No. 826,305
Term of patent 14 years
U.S. Cl. D7—13



298,398
TONGS
Bernard Trahar, Surrey Hills, Australia, assignor to Peter Fanning & Company Pty. Ltd., Melbourne, Australia
Filed Jun. 20, 1986, Ser. No. 877,098
Term of patent 14 years
U.S. Cl. D7—105

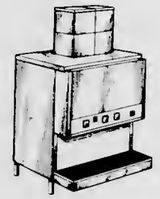




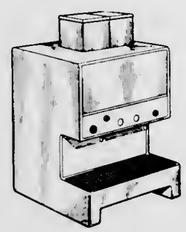
298,399
KNIFE HANDLE OR SIMILAR ARTICLE
Alfred Blochlinger; Christopher Collins; Wallace Tench, all of South Yarra, and Cvetan Petroff, Northcote, all of Australia, assignors to McPherson's Limited, Melbourne, Australia
Filed Nov. 6, 1985, Ser. No. 803,909
Claims priority, application Australia, May 7, 1985, 1162/85
Term of patent 14 years
U.S. Cl. D7—152



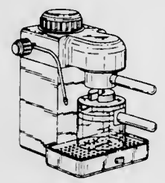
298,400
COFFEE MACHINE
Josef Frech, Gerstetten, Fed. Rep. of Germany, assignor to Wuerttembergische Metallwarenfabrik Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 13, 1985, Ser. No. 808,538
Term of patent 14 years
U.S. Cl. D7—308



298,401
COFFEE MACHINE
Josef Frech, Gerstetten, Fed. Rep. of Germany, assignor to Wuerttembergische Metallwarenfabrik Aktiengesellschaft, Fed. Rep. of Germany
Filed Dec. 13, 1985, Ser. No. 808,620
Term of patent 14 years
U.S. Cl. D7—308



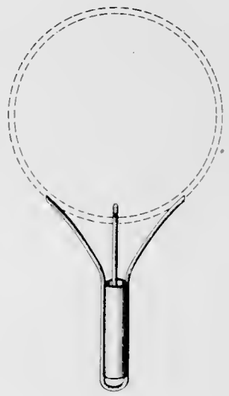
298,402
COFFEE MAKING MACHINE
Florian Seiffert, Wiesbaden, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Jul. 10, 1985, Ser. No. 753,303
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 5 MR 9545
Term of patent 14 years
U.S. Cl. D7—309



298,403
CASSEROLE HOLDER OR THE LIKE
Knut Hagberg, and Marianna Hagberg, both of Lund, Sweden, assignors to Ikea of Sweden AB, Almhult, Sweden
Filed Feb. 4, 1986, Ser. No. 825,917
Term of patent 14 years
U.S. Cl. D7—388



298,404
COOKWARE HANDLE
Charles D. Lemme, and Tracy R. Lemme, both of Tucson, Ariz., assignors to Copernicus Corporation, Tucson, Ariz.
Filed Jan. 13, 1986, Ser. No. 818,321
Term of patent 14 years
U.S. Cl. D7—393

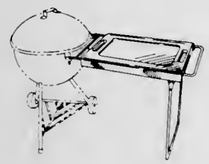


298,405
HANDLE FOR A KITCHEN TOOL OR THE LIKE
Jeffrey D. Schwartz, Taipei, Taiwan, assignor to Four Star International Trading Company, Taipei, Taiwan
Filed Jul. 22, 1987, Ser. No. 76,193
Term of patent 14 years
U.S. Cl. D7—395





298,406
WORKING SURFACE ATTACHMENT FOR A GRILL
James C. Stephen, Arlington Heights; James E. Tucker, Batavia, and John Beecher, III, Carpentersville, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed Jul. 24, 1986, Ser. No. 888,716
Term of patent 14 years
U.S. Cl. D7—402



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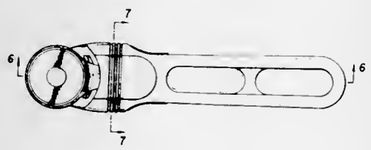
298,407
MULTI-PURPOSE HAND TOOL
Harry E. Vowell, Jr., P.O. Box 208, Wellborn, Tex. 77881
Filed Aug. 19, 1985, Ser. No. 766,564
Term of patent 14 years
U.S. Cl. D8—14



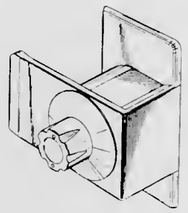
298,408
CLIP REMOVING TOOL
Harry R. Johnston, Coatesville, Pa., assignor to Mega Enterprises, Inc., Coatesville, Pa.
Filed Aug. 7, 1985, Ser. No. 763,196
Term of patent 14 years
U.S. Cl. D8—52



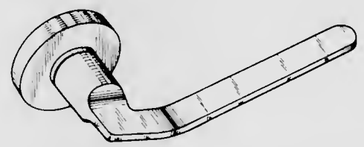
298,409
WHEEL CUTTER
Makoto Sugiyama, Gifu, Japan, assignor to Kai Cutlery Center Co., Ltd., Seki, Japan
Filed Nov. 25, 1985, Ser. No. 806,212
Term of patent 14 years
U.S. Cl. D8—98



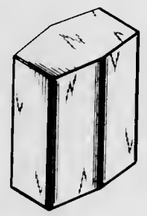
298,410
HANDLE FOR A DOOR, WINDOW OR THE LIKE
Paul L. M. Duke, Lexden, England, assignor to Titon Hardware Limited, Essex, England
Filed May 22, 1986, Ser. No. 968,660
Claims priority, application United Kingdom, Nov. 22, 1985, 1030651
Term of patent 14 years
U.S. Cl. D8—300



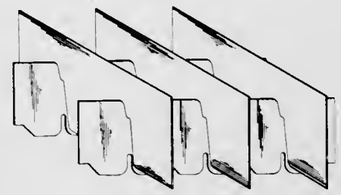
298,411
COMBINED LEVER AND ESCUTCHEON
Achille Castiglioni, Piazza Castello, 27, 20121 Milan, Italy
Filed Feb. 18, 1986, Ser. No. 833,741
Claims priority, application Italy, Sep. 3, 1985, 22874/85[U]
Term of patent 14 years
U.S. Cl. D8—301



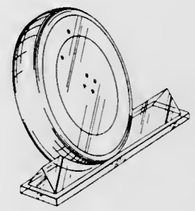
298,412
PACKAGING CONTAINER
Cathleen A. Ciuba, Tarrytown, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed Dec. 5, 1985, Ser. No. 805,358
Term of patent 14 years
U.S. Cl. D9—430



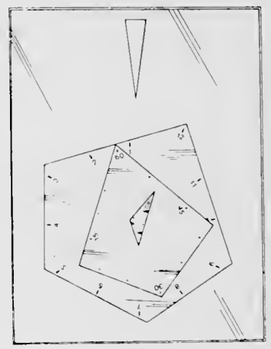
298,413
PAPERBOARD PARTITION UNIT
John L. Raudat, North Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.
Filed Oct. 8, 1985, Ser. No. 785,460
Term of patent 14 years
U.S. Cl. D9—456



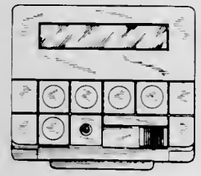
298,414
ELECTRONIC CLOCK
Melvyn H. Dawson, Jr., 1130 Rollingwood Trail, Maitland, Fla. 32751
Filed Jan. 21, 1986, Ser. No. 820,146
Term of patent 14 years
U.S. Cl. D10—15



298,415
WALL CLOCK
Patric Schrezenmaier, Pring-Albert-Str. 1, D-5300 Bonn, Fed. Rep. of Germany
Filed May 7, 1985, Ser. No. 731,645
Term of patent 14 years
U.S. Cl. D10—24



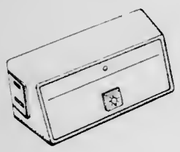
298,416
ELECTRONIC TIMER
William J. Rakocy, Madison, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Feb. 24, 1986, Ser. No. 836,191
Term of patent 14 years
U.S. Cl. D10—40



298,417
TIMER WITH SOUND AND LIGHT ACTIVATION
Michael D. Sund, Walnut Creek, Calif., and Peter Chan, Tsuen Wan, Hong Kong, assignors to Intelectroo Products Corporation, Hayward, Calif. and Brightmond Company Limited, Hong Kong
Filed Sep. 9, 1986, Ser. No. 905,612
Term of patent 14 years
U.S. Cl. D10—40



298,418
TIMER
Michael D. Sund, Walnut Creek, Calif., and Peter C. Chan, Tsuen Wan, Hong Kong, assignors to Intelectron Products Corporation, Hayward, Calif. and Brightmond Company Limited, Hong Kong
Filed Sep. 9, 1986, Ser. No. 905,614
Term of patent 14 years
U.S. Cl. D10—40



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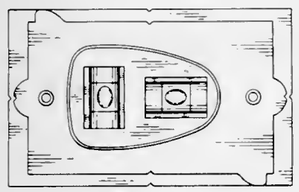
298,419
SAND TIMER
Anderson Lin, P.O. Box: 32-223 Taipei, Taiwan, Taiwan
Filed Mar. 10, 1986, Ser. No. 842,438
Term of patent 14 years
U.S. Cl. D10—44



298,420
SAND TIMER
Anderson Lin, P.O. Box: 32-223, Taipei
Filed Mar. 13, 1986, Ser. No. 844,780
Term of patent 14 years
U.S. Cl. D10—44



298,421
ELECTRICAL OUTLET BOX LEVELING TEMPLATE
Brent Tyroff, 333 Hot Wells Blvd., San Antonio, Tex. 78223
Filed Apr. 7, 1986, Ser. No. 850,386
Term of patent 14 years
U.S. Cl. D10—69

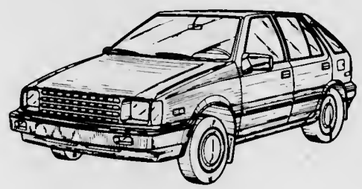


298,422
FINGER RING
Alessandro Messa, Via Giuseppe Verdi 15, Piacenza, Italy (29100)
Filed Dec. 13, 1985, Ser. No. 809,061
Claims priority, application Italy, Jun. 13, 1985, 22176/85[U]
Term of patent 14 years
U.S. Cl. D11—34

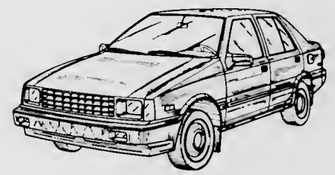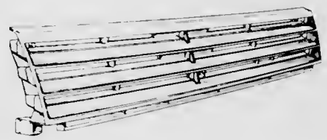




298,423
PASSENGER CAR
Jong S. Park, Kyungsangnam, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea
Filed Jan. 6, 1986, Ser. No. 816,285
Term of patent 14 years
U.S. Cl. D12—91



298,424
PASSENGER CAR
Jong S. Park, Ulsan, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea
Filed Jan. 6, 1986, Ser. No. 816,632
Term of patent 14 years
U.S. Cl. D12—92



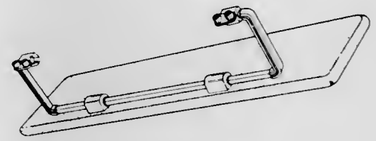
298,425
AUTOMOBILE RADIATOR GRILL
Ryuzo Kubo, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jun. 9, 1986, Ser. No. 872,457
Claims priority, application Japan, Dec. 23, 1985, 60-53411
Term of patent 14 years
U.S. Cl. D12—163



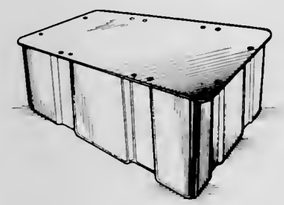
298,426
RADIATOR GRILLE FOR AN AUTOMOBILE
Hideto Kikuchi, Hachioji, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Aug. 21, 1986, Ser. No. 898,603
Term of patent 14 years
U.S. Cl. D12—163



298,427
VEHICLE SUN VISOR
Mats Jönsas, Mora, Sweden, assignor to Autopart Sweden Aktiebolag, Malung, Sweden
Filed Mar. 3, 1986, Ser. No. 835,304
Claims priority, application Sweden, Sep. 5, 1985, 85-2072
Term of patent 14 years
U.S. Cl. D12—191



298,428
FLOATATION UNIT
John M. Kendle, Jr., Charleston, S.C., assignor to Southern Dock & Marine, Inc., Charleston, S.C.
Filed Sep. 26, 1985, Ser. No. 780,186
Term of patent 14 years
U.S. Cl. D12—316



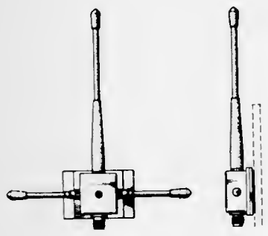
298,429
TELEPHONE STAND WITH SPEAKERPHONE
Antonio Lopez-Garcia, Madrid, Spain, assignor to Amper, Madrid, Spain
Filed Jun. 11, 1986, Ser. No. 873,771
Claims priority, application Spain, Dec. 19, 1985, 109658; Dec. 19, 1985, 109659
Term of patent 14 years
U.S. Cl. D14—60



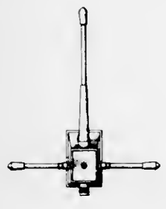


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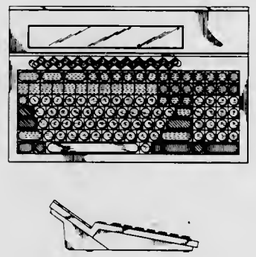
298,430
INTERIOR GLASS MOUNTED ANTENNA
Tetsuo Shimazaki, Tokyo, Japan, assignor to Alliance Research Corporation, Chatsworth, Calif.
Filed Jun. 6, 1986, Ser. No. 871,595
Term of patent 14 years
U.S. Cl. D14—86



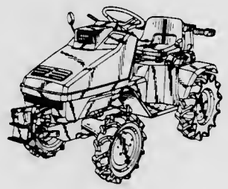
298,431
INDOOR ANTENNA
Tetsuo Shimazaki, Tokyo, Japan, assignor to Alliance Research Corporation, Chatsworth, Calif.
Filed Dec. 22, 1986, Ser. No. 945,320
Term of patent 14 years
U.S. Cl. D14—86



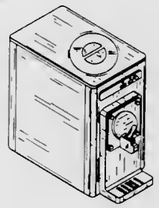
298,432
KEYBOARD
Kenneth H. Grange, and Johan C. Santer, both of London, England, assignors to Reuters Limited, London, England
Filed Jan. 9, 1985, Ser. No. 689,998
Claims priority, application United Kingdom, Jul. 27, 1984, 1021163
The portion of the term of this patent subsequent to May 17, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—100



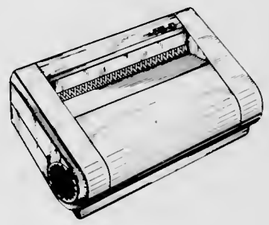
298,433
AGRICULTURAL TRACTOR
Yoshio Mikado; Masayuki Ohsumi, and Kazuo Shimizu, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 21, 1986, Ser. No. 831,916
Claims priority, application Japan, Sep. 6, 1985, 60-37746
Term of patent 14 years
U.S. Cl. D15—23



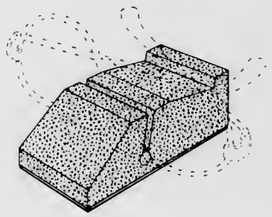
298,434
FLAKE ICE DISPENSER
Kendo Makihara, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 26, 1986, Ser. No. 912,350
Claims priority, application Japan, Mar. 28, 1986, 61-11504
Term of patent 14 years
U.S. Cl. D15—80



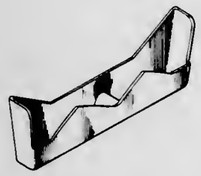
298,435
PAPER SHREDDER
Philippe Buteau, Paris, France, assignor to Societe d'Etude et de Construction d'Appareils de Precision (S.E.C.A.P.), Boulogne-Billancourt, France
Filed Aug. 27, 1985, Ser. No. 770,305
Claims priority, application France, Mar. 6, 1985, 85 1018
Term of patent 14 years
U.S. Cl. D15—127



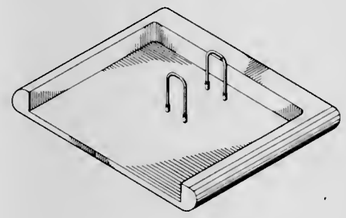
298,436
EYEGLASS HOLDER
Joseph J. Pralutsky, 231 Twin Lake Trail, Little Canada, Minn. 55127
Filed Feb. 3, 1986, Ser. No. 825,538
Term of patent 14 years
U.S. Cl. D16—129



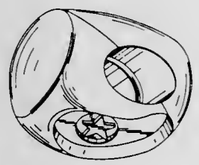
298,437
EYE GLASS HOLDER
Mike Vukasinovich, 315 Mobil Ave., Camarillo, Calif. 93010
Filed Jul. 10, 1986, Ser. No. 883,974
Term of patent 14 years
U.S. Cl. D16—129



298,438
DESK CALENDAR HOLDER
Arlan D. Lothe, Sun Prairie, Wis., assignor to Don Evans, Inc., DeForest, Wis.
Filed Aug. 19, 1985, Ser. No. 766,575
Term of patent 14 years
U.S. Cl. D19—20

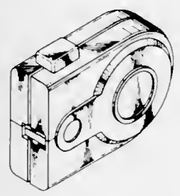


298,439
WRITING AID
Chris E. Rusk, 1900 State Rd. 32 West, Crawfordsville, Ind. 47933
Filed Apr. 7, 1986, Ser. No. 848,081
Term of patent 14 years
U.S. Cl. D19—55

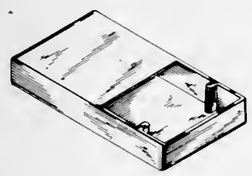


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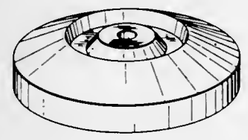
298,440
ADHESIVE TAPE DISPENSER
Masaki Kida, Tokyo, Japan, assignor to Shachihata Industrial Co., Ltd., Nagoya, Japan
Filed Jun. 19, 1986, Ser. No. 876,360
Claims priority, application Japan, Dec. 25, 1985, 60-54681
Term of patent 14 years
U.S. Cl. D19—69



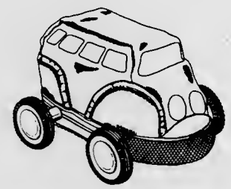
298,441
SCRATCH PAPER HOLDER
Simon Bucher, 8706 West Oklahoma Ave., West Allis, Wis. 53227
Filed Oct. 18, 1985, Ser. No. 788,922
Term of patent 14 years
U.S. Cl. D19—92



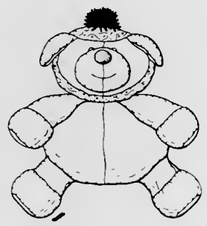
298,442
PAPER WEIGHT
William O. Murtagh, Toledo, Ohio, assignor to Gerity Products Company, Toledo, Ohio
Filed Aug. 11, 1986, Ser. No. 895,246
Term of patent 14 years
U.S. Cl. D19—96



298,443
TOY VEHICLE
Mary K. Chammah, 16 Redwing Place, Don Mills, Ontario, Canada M3C 2A8
Division of Ser. No. 786,077, Oct. 10, 1985. This application Nov. 23, 1987, Ser. No. 124,188
Claims priority, application Italy, Apr. 19, 1985, 21573/85
Term of patent 14 years
U.S. Cl. D21—128



298,444
STUFFED LAMB
Judith F. Albert, Oyster Bay, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 28, 1986, Ser. No. 838,060
Term of patent 14 years
U.S. Cl. D21—148



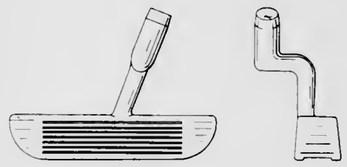
298,445
STUFFED BEAR
Judith F. Albert, Oyster Bay, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 28, 1986, Ser. No. 838,059
Term of patent 14 years
U.S. Cl. D21—159



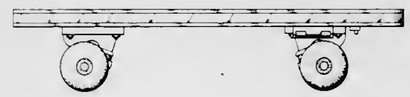
298,446
TOY ACTION FIGURE
Benjamin B. Bolger, 14820 Lincoln St., Grand Haven, Mich. 49417
Filed Dec. 5, 1985, Ser. No. 805,021
Term of patent 14 years
U.S. Cl. D21—171



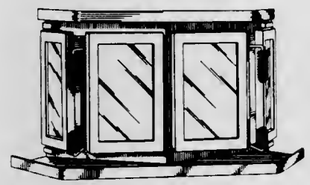
298,447
GOLF CLUB HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Affluent Golf Clubs, Inc., San Antonio, Tex.
Filed May 17, 1985, Ser. No. 735,143
Term of patent 14 years
U.S. Cl. D21—217



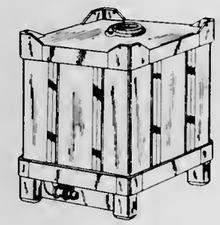
298,448
ILLUMINABLE SKATEBOARD
Jeffrey T. Seehaver, 934 W. Holt Ave. - Space 16, Pomona, Calif. 91768
Filed Feb. 5, 1986, Ser. No. 826,224
Term of patent 14 years
U.S. Cl. D21—227



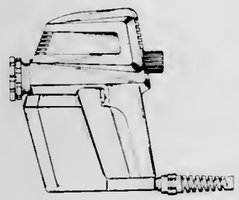
298,449
WOOD STOVE
Denis Matte, Quebec, Canada, assignor to F.X. Drolet, Inc., Quebec, Canada
Filed Feb. 27, 1984, Ser. No. 583,623
Term of patent 14 years
U.S. Cl. D23—350



298,450
TANK
Larry D. Thomas; David L. Waltke, and Gary Gibson, all of Beatrice, Nebr., assignors to Hoover Group, Inc., Roswell, Ga.
Filed Jun. 9, 1986, Ser. No. 872,742
Term of patent 14 years
U.S. Cl. D23—202

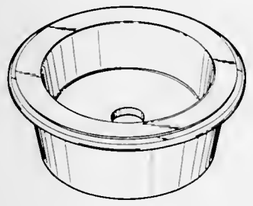


298,451
FLUID SPRAY GUN
Ewald Kille, Friedrichshafen, Fed. Rep. of Germany, assignor to J. Wagner GmbH, Fed. Rep. of Germany
Division of Ser. No. 840,724, Feb. 28, 1986. This application Dec. 29, 1987, Ser. No. 139,244
Term of patent 14 years
U.S. Cl. D23—225

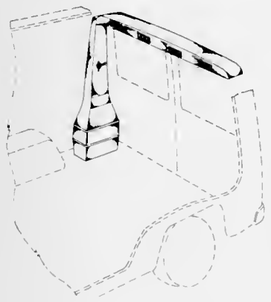


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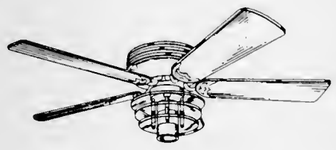
298,452
BASIN
Peter N. Carter, 100 Gawler Road, Ulverstone, Tasmania, Australia
Filed Apr. 26, 1985, Ser. No. 727,825
Claims priority, application Australia, Oct. 26, 1984, 9364/84; Oct. 26, 1984, 9365/84
Term of patent 14 years
U.S. Cl. D23—293



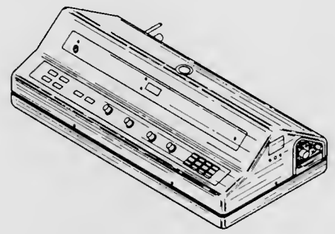
298,453
AIR VENTILATION UNIT FOR A VAN
David P. Gratton, Elkhart, Ind., assignor to Acme Radiator & Air Conditioning, Inc., Goshen, Ind.
Filed Apr. 17, 1986, Ser. No. 855,765
Term of patent 14 years
U.S. Cl. D23—325



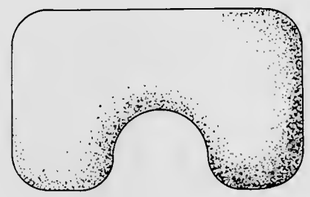
298,454
COMBINED MOTOR HOUSING, FAN BLADES AND LIGHT FIXTURE FOR A CEILING FAN
Jean Clyde-Mason, Hollywood, Calif., assignor to Casablanca Fan Company, Inc., City of Industry, Calif.
Filed Jun. 23, 1986, Ser. No. 877,672
Term of patent 14 years
U.S. Cl. D23—385



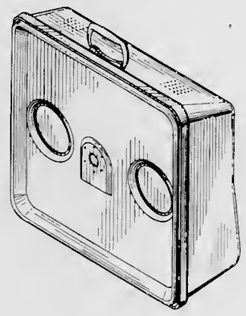
298,455
LASER BIOSTIMULATOR FOR VETERINARY AND HUMAN USE
Joseph R. Giove, 21097-B Longeway Rd., Sonora, Calif. 95370
Filed Aug. 26, 1985, Ser. No. 769,259
Term of patent 14 years
U.S. Cl. D24—8



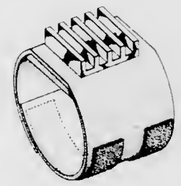
298,456
OBSTETRIC DELIVERY SEAT
Ruth Leonard, River Rd., Woolwich, Me. 04579
Filed Nov. 20, 1985, Ser. No. 805,911
Term of patent 14 years
U.S. Cl. D24—8



298,457
VISION TESTER
Neil Minkin, and Bonnie L. Minkin, both of Lawrence, Kans., assignors to Optical Technology Corporation, Lawrence, Kans.
Filed Jan. 24, 1986, Ser. No. 822,114
Term of patent 14 years
U.S. Cl. D24—17



298,458
THERMOELECTRIC DEVICE FOR HEATING AND COOLING THE SKIN
Ely Margolin, 1253C Newmarket Ave., South Plainfield, N.J. 07080, and Loren Shelffo, 185 S. Orange Ave., South Orange, N.J. 07079
Term of patent 14 years
U.S. Cl. D24—36



298,459
SANITARY NAPKIN
Sheila V. McCormick, 6951 Salem Dr., New Orleans, La. 70127
Filed Mar. 14, 1986, Ser. No. 844,749
Term of patent 14 years
U.S. Cl. D24—51



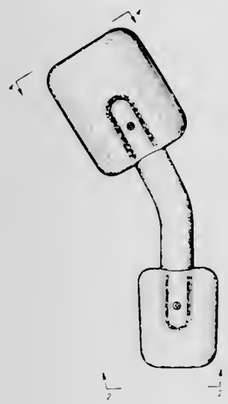
298,460
IV BOTTLE HANGER
John W. Pryor, 420 N. Cedros, Solana Beach, Calif. 92075
Filed Mar. 21, 1986, Ser. No. 845,431
Term of patent 14 years
U.S. Cl. D24—51



298,461
PROBE FOR SURGICAL INSTRUMENT
Joseph J Manno, La Jolla, Calif., assignor to Vitalmetrics, Inc, San Diego, Calif.
Filed May 6, 1986, Ser. No. 860,756
Term of patent 14 years
U.S. Cl. D24—51



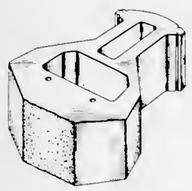
298,462
KNEE ORTHOSIS
Darryl L. Womack, Lakewood, Colo., assignor to Scott Orthotic Labs, Inc., Denver, Colo.
Filed Feb. 27, 1986, Ser. No. 836,604
Term of patent 14 years
U.S. Cl. D24—64



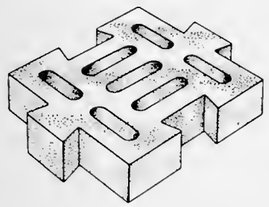


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298,463
RETAINING WALL BLOCK
Paul J. Forsberg, Richfield, Minn., assignor to Keystone Retaining Wall Systems, Inc., Edina, Minn.
Continuation-in-part of Ser. No. 870,860, Jun. 2, 1986, Ser. No. 869,933, Jun. 2, 1986, and Ser. No. 37,444, Apr. 3, 1987, abandoned. This application Jun. 8, 1987, Ser. No. 59,481
Term of patent 14 years
U.S. Cl. D25—114



298,464
CONCRETE BLOCK
Kevin P. Roote, Scarborough, Canada, assignor to Standard Industries Ltd., Toronto, Canada
Filed Jul. 8, 1985, Ser. No. 753,024
Claims priority, application Canada, Jan. 9, 1985, 09-01-85-8
Term of patent 14 years
U.S. Cl. D25—117

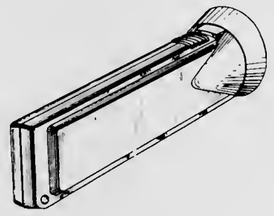


298,465
DECORATIVE EXTRUSION
Peter M. Stagl, Morris Plains, N.J., assignor to Avnet, Inc., New York, N.Y.
Filed Feb. 27, 1986, Ser. No. 838,037
Term of patent 14 years
U.S. Cl. D25—122





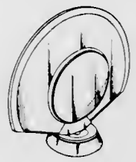
298,466
FLASHLIGHT
Spencer Murrell, Delaware, Ohio, and Bill Moggridge, Palo Alto, Calif., assignors to Black & Decker, Inc., Newark, Del.
Filed Jul. 8, 1986, Ser. No. 883,492
Term of patent 14 years
U.S. Cl. D26—46



298,467
UTILITY LAMP
Douglas Stover, 2324 Alvarado Dr., Kettering, Ohio 45420
Filed Oct. 31, 1985, Ser. No. 793,253
Term of patent 14 years
U.S. Cl. D26—63



298,468
TABLE LAMP
Pier G. Ramella, Milan, Italy, assignor to Flos S.p.A., Italy
Filed Mar. 17, 1986, Ser. No. 845,010
Claims priority, application Italy, Sep. 19, 1985, 7106B/85[U]
Term of patent 14 years
U.S. Cl. D26—104



298,469
LIGHT REFLECTOR FOR PHOTOGRAPHIC LIGHT
Walter Melrose, 62 Fraser Avenue, Toronto, Canada M6K 1Y6
Filed Feb. 25, 1986, Ser. No. 836,566
Term of patent 14 years
U.S. Cl. D26—131



298,470
COSMETIC COMPACT WITH TWO SIDE BUTTONS
Alain Filiz, New York, N.Y., and Salvatore J. Ascolese, Edison, N.J., assignors to L'Oreal S.A., Paris, France
Filed Apr. 10, 1986, Ser. No. 851,382
Term of patent 14 years
U.S. Cl. D28—82

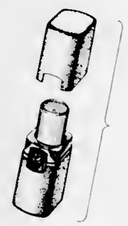


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LIPSTICK HOLDER
Ted I. Kingsford, Memphis, Tenn., assignor to Plough Inc., Memphis, Tenn.
Filed Mar. 17, 1986, Ser. No. 845,077
Term of patent 14 years
U.S. Cl. D28—85



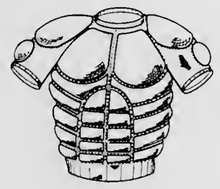
298,472
LIPSTICK CASE
Theodore Simonetti, New York, N.Y., assignor to L'Oreal S.A., Paris, France
Filed Apr. 9, 1986, Ser. No. 850,919
Term of patent 14 years
U.S. Cl. D28—85



298,473
FILTRATION UNIT FOR EXHAUST AIR FROM A CLEAN ROOM HELMET WORN FOR A STERILE ENVIRONMENT OR THE LIKE
Wyman H. Stackhouse, Manhattan Beach, and Ian M. Williamson, Redondo Beach, both of Calif., assignors to W. Stockhouse Associates Inc., El Segundo, Calif.
Filed Aug. 22, 1986, Ser. No. 899,052
Term of patent 14 years
U.S. Cl. D29—7



298,474
PROTECTIVE SHIRT
Evan L. Twede, 2114 E. Terra Linda Dr., Salt Lake City, Utah 84124
Filed May 12, 1986, Ser. No. 862,523
Term of patent 14 years
U.S. Cl. D29—10



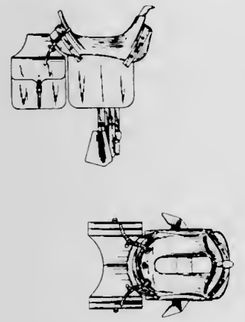
298,475
SAFETY VEST
Matti Viio, Box 563, S-191 05 Solentuna, Sweden
Filed Jul. 24, 1986, Ser. No. 889,816
Claims priority, application Sweden, Jan. 24, 1986, 86-0165
Term of patent 14 years
U.S. Cl. D29—10



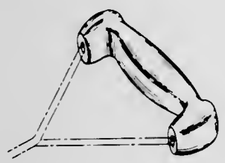
298,476
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Bo G. Lönnstedt, Kvarnbergsvägen 23, S-141 45 Huddinge, Sweden
Filed Feb. 21, 1986, Ser. No. 835,308
Claims priority, application Sweden, Dec. 19, 1984, 84-3400
Term of patent 14 years
U.S. Cl. D29—16



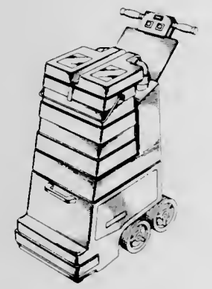
298,477
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Jefferson Spivey, P.O. Box 60584, Oklahoma City, Okla. 73146
Filed Jun. 7, 1985, Ser. No. 742,199
Term of patent 14 years
U.S. Cl. D30—135



298,478
LEASH HANDLE
Verne E. Ticknor, 333 N. Sbore Dr., South Haven, Mich. 49090
Filed May 22, 1985, Ser. No. 736,657
Term of patent 14 years
U.S. Cl. D30—153



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PORTABLE MACHINE FOR WET OR DRY VACUUM EXTRACTION
Paul G. Jacobs, Northridge; Bonifacio N. Avecilla, Alhambra, and Norman Lapworth, Los Angeles, all of Calif., assignors to EDIC, Los Angeles, Calif.
Filed Jan. 21, 1986, Ser. No. 821,544
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Abildskov, Dale, deceased (by Collins, Tracy, Bank & Trust, Personal Representative), to Edo Corporation. Three dimensional woven fabric connector. 4,782,864, Cl. 139-384.00R.

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Suzuki, Osamu; and Yokochi, Toshihiro, 4,783,408, Cl. 435-134.000.
Yokogawa Electric Corporation: *See—*
Inou, Kiyoharu; Naito, Seiichi; and Sampei, Yoshihiro, 4,783,851, Cl. 455-612.000.
Yokoshima, Minoru; Ohkubo, Tetsuo; and Kiyomoto, Masayuki, to Nippon Kayaku Kabushiki Kaisha. Di-(meth)acrylic acid ester, resin composition comprising the same and coating agent comprising the same. 4,783,544, Cl. 558-267.000.
Yokota, Akira, to Olympus Optical Co., Ltd. Optical system for altering the direction of the visual field in endoscopes. 4,783,156, Cl. 350-445.000.
Yokouchi, Takahito, to Mazda Motor Corporation. Seat belt device for use in a motor vehicle. 4,783,098, Cl. 280-801.000.
Yoneda, Tetsuya: *See—*
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Yoneyama, Masakazu: *See—*
Aono, Toshiaki; Shibata, Takeshi; Aotsuka, Yasuo; Takeno, Kazuma; and Yoneyama, Masakazu, 4,783,392, Cl. 430-203.000.
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Yoshida, Kiyomitsu: *See—*
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Yoshida Kogyo K. K.: *See—*
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Nishiyama, Hissai, 4,782,988, Cl. 226-52.000.
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Yoshikumi, Chikao: *See—*
Hayashi, Haruhisa; Oguchi, Yoshiharu; Matsunaga, Kenichi; and Yoshikumi, Chikao, 4,783,419, Cl. 436-516.000.
Yoshimi, Takashi: *See—*
Hoshi, Kenichi; Tosaka, Shoichi; and Yoshimi, Takashi, 4,783,431, Cl. 501-153.000.
Yoshimoto, Sadao: *See—*
Haneda, Yutaka; Yoshimoto, Sadao; Miki, Hisaya; Yasuda, Masaaki; Araki, Shintarou; and Nitabaru, Masatoshi, 4,783,557, Cl. 568-741.000.
Yoshino, Ryozo, to Hitachi, Ltd. Multiple reproducing repeater station system. 4,783,791, Cl. 375-3.000.
Yoshizawa, Keiichi, to TDK Electronics Co., Ltd. Magnetic tape cassette wrapper. 4,782,956, Cl. 206-606.000.
Yott, Edward W.; and Mellin, Robert C., to General Motors Corporation. Air distribution system for the occupant compartment of automotive vehicles. 4,782,742, Cl. 98-2.030.
Young, Elvan S.: *See—*
Goforth, Joseph M.; and Young, Elvan S., 4,783,603, Cl. 307-443.000.
Young, Terry G.; and Akkerman, Neil H., to AVA International Corporation. Pneumatic valve actuators. 4,783,046, Cl. 251-61.400.
Yuasa, Yukihisa: *See—*
Kato, Hisashi; Okai, Daiji; Yoshiba, Nobuyuki; and Yuasa, Yukihisa, 4,782,732, Cl. 84-313.000.
Yueh, William R., to General Dynamics, Pomona Division. Self-adaptive IRU correction loop design interfacing with the target state estimator for multi-mode terminal handoff. 4,783,744, Cl. 364-454.000
Yuhashi, Yukio: *See—*
Teraoka, Masao; Kurihara, Sakuo; and Yuhashi, Yukio, 4,782,720, Cl. 74-650.000.
Yunoki, Akio, to Yoshida Kogyo K. K. Slider holding apparatus. 4,782,587, Cl. 29-768.000.
Yuta, Kiyoteru, to Emhart Enterprises Corp. Two-part plastic clip. 4,782,562, Cl. 24-297.000.
Yuzawa, Yoshihiko: *See—*
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Zaidan Hojin Handotai Kenkyu Shinkokai: *See—*
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Zaiken, Kenneth A.: *See—*
Borgendale, Kenneth W.; Cheng, Paul S.; and Zaiken, Kenneth A., 4,783,759, Cl. 364-900.000.
Zanner, Johann: *See—*
Schmidt, Manfred; and Zanner, Johann, 4,783,019, Cl. 242-74.000.
Zaruba, John V.: *See—*
Rosenwinkel, Donald A.; Zaruba, John V.; and Breslow, Jeffrey D., 4,783,080, Cl. 273-255.000.
Zeeman, Leendert, to U.S. Philips Corporation. Apparatus for rotating a disk. 4,783,717, Cl. 369-266.000.
Zeller, Vincent P., to Halliburton Company. Multiple indexing J-slot for model E SRO valve. 4,782,897, Cl. 166-240.000.
Zengel, Hans-Georg: *See—*
Wohlfahrt, Klaus; Bergfeld, Manfred; and Zengel, Hans-Georg, 4,783,572, Cl. 585-500.000.
Zenith Electronics Corporation: *See—*
Konopka, John G., 4,783,729, Cl. 363-143.000.
Kraner, James L., 4,783,614, Cl. 313-404.000.
Ziegler, Michael L.; and Fredieu, Robert L., to Alliant Computer Systems Corporation. Digital computer with multisection cache. 4,783,736, Cl. 364-200.000.
Ziegler, Rene; and Stutz, Peter, to Sandoz Ltd. N-substituted ergoline- and 9,10-didehydro-ergoline-8-carboxamide-and-8-aminomethyl-derivatives, their production and their pharmaceutical composition. 4,783,464, Cl. 514-253.000.
Zimmerman, Harold M. Loading conveyor for concrete mixer. 4,783,171, Cl. 366-37.000.
Zoeller, Joseph R., to Eastman Kodak Company. Processes for preparing 3,4-dihydro 2-naphthanoic acid and 2-naphthanoic acid and esters thereof. 4,783,548, Cl. 560-10.000.
Zubik, Daniel M.: *See—*
Peterson, Francis C.; and Zubik, Daniel M., 4,783,101, Cl. 285-319.000.
Zubrod, Bruce R. Adjustable support for stirrup strap. 4,782,649, Cl. 54-46.000.
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NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Adachi, Akira: *See*—
Yoshimura, Shohei; and Adachi, Akira, Re. 32,780, Cl. 428-304.400.

Bergman, Roger W.: *See*—
Hansen, Robert D.; Klimpel, Richard R.; and Bergman, Roger W., Re. 32,778, Cl. 209-166.000.

Dow Chemical Company, The: *See*—
Hansen, Robert D.; Klimpel, Richard R.; and Bergman, Roger W., Re. 32,778, Cl. 209-166.000.

Hansen, Robert D.; Klimpel, Richard R.; and Bergman, Roger W., to Dow Chemical Company, The. Frothers demonstrating enhanced recovery of coarse particles in froth floatation. Re. 32,778, Cl. 209-166.000.

Japan Styrene Paper Corporation: *See*—
Yoshimura, Shohei; and Adachi, Akira, Re. 32,780, Cl. 428-304.400.

Klimpel, Richard R.: *See*—
Hansen, Robert D.; Klimpel, Richard R.; and Bergman, Roger W., Re. 32,778, Cl. 209-166.000.

Kruger, Robert A., to University of Utah. Radiographic systems employing multi-linear arrays of electronic radiation detectors. Re. 32,779, Cl. 378-19.000.

Sony Corporation: *See*—
Takahashi, Kiyoshi, Re. 32,781, Cl. 360-133.000.

Takahashi, Kiyoshi, to Sony Corporation. Flexible disk cassette with improved radial shift limitation structure for use in a magnetic recording and/or reproducing apparatus. Re. 32,781, Cl. 360-133.000.

University of Utah: *See*—
Kruger, Robert A., Re. 32,779, Cl. 378-19.000.

Yoshimura, Shohei; and Adachi, Akira, to Japan Styrene Paper Corporation. Core material for an automobile bumper. Re. 32,780, Cl. 428-304.400.

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American Hoechst Corporation: *See*—
McCroskey, Ralph P., B1 4,472,499, Cl. 435-18.000.

Bolick, Martha E., to Kimberly-Clark Corporation. Self-centering multiple use garment suspension system. B1 4,315,508, 11-8-88, Cl. 604-392.000.

Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., to USM Corporation. Lead sensing system. B1 4,549,087, 11-8-88, Cl. 250-561.000.

Holzrichter, Edward J., to Whittaker Corporation. Method of making selected polyesters. B1 4,474,939, 11-8-88, Cl. 528-272.000.

Katz, W. Simon: *See*—
Theodore, Paris, B1 3,758,978, Cl. 42-71.020.

Kimberly-Clark Corporation: *See*—
Bolick, Martha E., B1 4,315,508, Cl. 604-392.000.

Lagergren, Hans, to Lagergren, Hans. Endocardial electrode. B1 3,911,928, 11-8-88, Cl. 128-786.000.

Lagergren, Hans. Endocardial electrode. B1 3,935,864, 11-8-88, Cl. 128-786.000.

Maxner, Richard B.: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., B1 4,549,087, Cl. 250-561.000.

McCroskey, Ralph P., to American Hoechst Corporation. Reagents for the determination of enzymes. B1 4,472,499, 11-8-88, Cl. 435-18.000.

McLean, Jean A.: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., B1 4,549,087, Cl. 250-561.000.

Mirley, William H., Jr.: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., B1 4,549,087, Cl. 250-561.000.

Myers, William D. Posterior chamber lens implant. B1 1,031,998, 11-8-88, Cl. 623-6.000.

Theodore, Paris, to Katz, W. Simon. Grips for handguns. B1 3,758,978, 11-8-88, Cl. 42-71.020.

USM Corporation: *See*—
Duncen, Robert J.; Maxner, Richard B.; McLean, Jean A.; and Mirley, William H., Jr., B1 4,549,087, Cl. 250-561.000.

Whittaker Corporation: *See*—
Holzrichter, Edward J., B1 4,474,939, Cl. 528-272.000.

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Gratton, David P., 298,453, Cl. D23-325.000.

Affluent Golf Clubs, Inc.: *See*—
Cook, Raymon W., 298,447, Cl. D21-217.000.

Albert, Judith F., to Quaker Oats Company, The. Stuffed lamb. 298,444, 11-8-88, Cl. D21-148.000.

Albert, Judith F., to Quaker Oats Company, The. Stuffed bear. 298,445, 11-8-88, Cl. D21-159.000.

Alliance Research Corporation: *See*—
Shimazaki, Tetsuo, 298,430, Cl. D14-86.000.
Shimazaki, Tetsuo, 298,431, Cl. D14-86.000.

Amper: *See*—
Lopez-Garcia, Antonio, 298,429, Cl. D14-60.000.

Ascolese, Salvatore J.: *See*—
Filiz, Alain; and Ascolese, Salvatore J., 298,470, Cl. D28-82.000.

Autopart Sweden Aktiebolag: *See*—
Jonsas, Mats, 298,427, Cl. D12-191.000.

Avecilla, Bonifacio N.: *See*—
Jacobs, Paul G.; Avecilla, Bonifacio N.; and Lapworth, Norman, 298,479, Cl. D32-16.000.

Avnet, Inc.: *See*—
Stagl, Peter M., 298,465, Cl. D25-122.000.

Batts, Inc.: *See*—
Duester, Everett L., 298,387, Cl. D6-328.000.

Beecher, John, III: *See*—
Stephen, James C.; Tucker, James E.; and Beecher, John, III, 298,406, Cl. D7-402.000.

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Black & Decker, Inc.: *See*—
Murrell, Spencer; and Moggridge, Bill, 298,466, Cl. D26-46.000.

Blochlinger, Alfred; Collins, Christopher; Tench, Wallace; and Petroff, Cvetan, to McPherson's Limited. Knife handle or similar article. 298,399, 11-8-88, Cl. D7-152.000.

Bolger, Benjamin B. Toy action figure. 298,446, 11-8-88, Cl. D21-171.000.

Brewer, Clarence T., to Solo Cup Company. Cup dispenser. 298,394, 11-8-88, Cl. D6-516.000.

Brightmond Company Limited: *See*—
Sund, Michael D.; and Chan, Peter, 298,417, Cl. D10-40.000.
Sund, Michael D.; and Chan, Peter C., 298,418, Cl. D10-40.000.

Brown, Paul D.; and Diaz, Juan A., to Reebok International Ltd. Shoe outsole. 298,381, 11-8-88, Cl. D2-320.000.

Bucher, Simon. Scratch paper holder. 298,441, 11-8-88, Cl. D19-92.000.

Buteau, Philippe, to Societe d'Etude et de Construction d'Appareils de Precision (S.E.C.A.P.). Paper shredder. 298,435, 11-8-88, Cl. D15-127.000.

Carson's of High Point: *See*—
Culler, Randy R., 298,389, Cl. D6-335.000.
Quinn, R. Tucker, 298,391, Cl. D6-381.000.

Carter, Peter N. Basin. 298,452, 11-8-88, Cl. D23-293.000.

Casablanca Fan Company, Inc.: *See*—
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Castiglioni, Achille. Combined lever and escutcheon. 298,411, 11-8-88, Cl. D8-301.000.

Chammah, Mary K. Toy vehicle. 298,443, 11-8-88, Cl. D21-128.000.

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Ciuba, Cathleen A., to General Foods Corporation. Packaging container. 298,412, 11-8-88, Cl. D9-430.000.

Clutts, Phillip E., Sr., to Featherston, Doyle C., a part interest. Welder's coveralls. 298,380, 11-8-88, Cl. D2-29.000.

Clyde-Mason, Jean, to Casablanca Fan Company, Inc. Combined motor housing, fan blades and light fixture for a ceiling fan. 298,454, 11-8-88, Cl. D23-385.000.

Colavito, Ann M. Foil dispenser. 298,395, 11-8-88, Cl. D6-518.000.

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Culler, Randy R., to Carson's of High Point. Sectional sofa. 298,389, 11-8-88, Cl. D6-335.000.

Dawson, Melvyn H., Jr. Electronic clock. 298,414, 11-8-88, Cl. D10-15.000.

Devore, Donna: *See*—
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Devore, Nathan; and Devore, Donna. Combination eyeglass and contact lens case. 298,383, 11-8-88, Cl. D3-34.000.

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Don Evans, Inc.: *See*—
Lothe, Arlan D., 298,438, Cl. D19-20.000.

Donner, Aaron J., to Schnadig Corporation. Table. 298,393, 11-8-88, Cl. D6-486.000.

Duester, Everett L., to Batts, Inc. Clamp for a garment hanger. 298,387, 11-8-88, Cl. D6-328.000.

Duke, Paul L. M., to Titon Hardware Limited. Handle for a door, window or the like. 298,410, 11-8-88, Cl. D8-300.000.

Durand, Jean-Jacques. Champagne flute or similar article. 298,397, 11-8-88, Cl. D7-13.000.

EDIC: *See*—
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Fehlbaum & Co.: *See*—
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Filiz, Alain; and Ascolese, Salvatore J., to L'Oreal S.A. Cosmetic compact with two side buttons. 298,470, 11-8-88, Cl. D28-82.000.

Flos S.p.A.: *See*—
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Four Star International Trading Company: *See*—
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Frech, Josef, to Wuertembergische Metallwarenfabrik Aktiengesellschaft. Coffee machine. 298,401, 11-8-88, Cl. D7-308.000.

Gallego, Abel. Tissue box holder. 298,396, 11-8-88, Cl. D6-518.000.

General Foods Corporation: *See*—
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Gerber Products Company: *See*—
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Gibson, Gary: *See*—
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Giove, Joseph R. Laser biostimulator for veterinary and human use. 298,455, 11-8-88, Cl. D24-8.000.

Grange, Kenneth H.; and Santer, Johan C., to Reuters Limited. Keyboard. 298,432, 11-8-88, Cl. D14-100.000.

Gratton, David P., to Acme Radiator & Air Conditioning, Inc. Air ventilation unit for a van. 298,453, 11-8-88, Cl. D23-325.000.

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Hagberg, Knut; and Hagberg, Marianna, to Ikea of Sweden AB. Casserole holder or the like. 298,403, 11-8-88, Cl. D7-388.000.

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Hirahara, Neil Y. Strap pad. 298,386, 11-8-88, Cl. D3-54.000.

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J. Wagner GmbH: *See*—
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Jacobs, Paul G.; Avecilla, Bonifacio N.; and Lapworth, Norman, to EDIC. Portable machine for wet or dry vacuum extraction. 298,479, 11-8-88, Cl. D32-16.000.

Johnston, Harry R., to Mega Enterprises, Inc. Clip removing tool. 298,408, 11-8-88, Cl. D8-52.000.

Jonsas, Mats, to Autopart Sweden Aktiebolag. Vehicle sun visor. 298,427, 11-8-88, Cl. D12-191.000.

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Kida, Masaki, to Shachihata Industrial Co., Ltd. Adhesive tape dispenser. 298,440, 11-8-88, Cl. D19-69.000.

Kikuchi, Hideto, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 298,426, 11-8-88, Cl. D12-163.000.

Kille, Ewald, to J. Wagner GmbH. Fluid spray gun. 298,451, 11-8-88, Cl. D23-225.000.

Kingsford, Ted I., to Plough Inc. Lipstick holder. 298,471, 11-8-88, Cl. D28-85.000.

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Lin, Anderson. Sand timer. 298,419, 11-8-88, Cl. D10-44.000.

Lin, Anderson. Sand timer. 298,420, 11-8-88, Cl. D10-44.000.

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Makihara, Kendo, to Sharp Corporation. Flake ice dispenser. 298,434, 11-8-88, Cl. D15-80.000.

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25 R 4,783,576
48 4,783,577
117 F 4,783,578
117 FF 4,783,579

CLASS 175

65 4,782,902
410 4,782,903

CLASS 177

25 4,782,904
208 4,782,905

CLASS 180

23 4,782,906
140 4,782,907
227 4,782,908
271 4,782,909

CLASS 181

106 4,782,910
107 4,782,911
229 4,782,912
286 4,782,913

CLASS 182

113 4,782,914
129 4,782,915
150 4,782,916
182 4,782,917
187 4,782,918

CLASS 184

6.11 4,782,919

CLASS 187

9 R 4,782,920
127 4,782,921

CLASS 188

71.1 4,782,922
79.64 4,782,923
250 A 4,782,924
322.14 4,782,925

CLASS 192

0.073 4,782,934
13 R 4,782,926
21.5 4,782,927
45 4,782,928
53 F 4,782,929
58 C 4,782,930
70.12 4,782,931
70.17 4,782,932
70.18 4,782,933
98 4,782,935
106.2 4,782,936

CLASS 194

346 4,782,937

CLASS 198

301 4,782,938
395 4,782,939
735 4,782,940

CLASS 200

81.4 4,783,580
332 4,783,581

CLASS 203

87 4,783,242

CLASS 204

15 4,783,243
27 4,783,244
71 4,783,245
95 4,783,246
181.1 4,783,247
192.17 4,783,248
237 4,783,249
400 4,783,250
412 4,783,251
416 4,783,252

CLASS 206

5 4,782,941
5.1 4,782,942
161 4,782,955
175 4,782,943
185 4,782,944
203 4,782,945
223 4,782,946
279 4,782,947
315.7 4,782,948
387 4,782,949
457 4,782,950
484 4,782,951
534 4,782,952
557 4,782,953
574 4,782,954
606 4,782,956

CLASS 209

2 4,783,253
166 Re.32,778
211 4,783,254

CLASS 210

90 4,783,256
109 4,783,257
169 4,783,258
4,783,259
232 4,783,260
290 4,783,261
314 4,783,262
638 4,783,263
4,783,264
666 4,783,265
695 4,783,266
699 4,783,267
703 4,782,789
4,783,268
709 4,783,269
734 4,783,270
742 4,783,271
787 4,783,272
798 4,783,273
802 4,783,255

CLASS 211

13 4,782,957
41 4,782,958
59.2 4,782,959
184 4,782,960

CLASS 212

191 4,782,961
195 4,782,962

CLASS 215

206 4,782,963
216 4,782,964
220 4,782,965
230 4,782,966
231 4,782,967
276 4,782,968
295 4,782,969

CLASS 219

10.55 R 4,783,582
69 W 4,783,583
130.01 4,783,584
278 4,783,585
544 4,783,586
548 4,783,587

CLASS 220

1 R 4,782,970
3.2 4,782,971
4 F 4,782,972
68 4,782,973
86 R 4,782,974
90.4 4,782,975
306 4,782,976
324 4,782,977
335 4,782,978

CLASS 221

6 4,782,979
265 4,782,980
4,782,981

CLASS 222

1 4,782,982
45 4,782,983
456 4,782,984
481.5 4,782,985

CLASS 225

1 4,782,986

CLASS 226

2 4,782,987
52 4,782,988

CLASS 227

149 4,782,989

CLASS 228

1.1 4,782,990
19 4,782,991
190 4,782,992
235 4,782,994
265 4,782,993

CLASS 229

2.5 EC 4,782,995
125.09 4,782,996

CLASS 232

35 4,782,997

CLASS 234

1 4,782,998

CLASS 235

467 4,783,588

CLASS 236

49 4,782,999
93 R 4,783,000

CLASS 238

53 4,783,001

CLASS 239

29 4,783,002
102.2 4,783,003
205 4,783,004
222.17 4,783,005
380 4,783,006
381 4,783,007
421 4,783,008
580 4,783,009

CLASS 241

3 4,783,010
24 4,783,011
4,783,012
219 4,783,013
261.2 4,783,014

CLASS 242

1 4,783,015
55.2 4,783,016
55.3 4,783,017
56 R 4,783,018
74 4,783,019
76 4,783,020
131.1 4,783,021
199 4,783,022

CLASS 244

6 4,783,023
113 4,783,024
118.5 4,783,025
134 R 4,783,026
149 4,783,027

CLASS 246

170 4,783,028

CLASS 248

74.1 4,783,029
74.3 4,783,040
97 4,783,031
118.1 4,783,032
220.4 4,783,033
223.1 4,783,034
250 4,783,035
281.1 4,783,036
311.2 4,783,037
570 4,783,038
635 4,783,039
744 4,783,030

CLASS 249

103 4,783,041
127 4,783,042

CLASS 250

201 4,783,589
202 4,783,590
227 4,783,591
342 4,783,592
352 4,783,593
370.08 4,783,594
423 R 4,783,595
483.1 4,783,596
492.2 4,783,597
561 B1 4,549,087
566 4,783,598
574 4,783,599

CLASS 251

16 4,783,043
30.02 4,783,044
61.1 4,783,045
61.4 4,783,046
129.1 4,783,047
129.11 4,783,048
129.14 4,783,049
129.16 4,783,050
129.19 4,783,051
368 4,783,052

CLASS 252

32.7 E 4,783,274
49.7 4,783,275
67 4,783,276
69 4,783,277
95 4,783,278
135 4,783,281
299.61 4,783,280
511 4,783,279
546 4,783,282
547 4,783,283

CLASS 254

93 R 4,783,053
134.4 4,783,054

CLASS 260

369 4,783,284
543 R 4,783,285

CLASS 261

23.2 4,783,286

CLASS 264

26 4,783,287
27 4,783,288
28 4,783,289
39 4,783,290
40.4 4,783,291
40.5 4,783,056
40.6 4,783,292
4,783,293
45.3 4,783,294
50 4,783,295
51 4,783,296
63 4,783,297
155 4,783,298
173 4,783,299
175 4,783,300
209.2 4,783,301
251 4,783,302
535 4,783,303
556 4,783,304

CLASS 266

44 4,783,057
266 4,783,058
4,783,059
270 4,783,060
281 4,783,061

CLASS 267

140.1 4,783,062
4,783,063

CLASS 271

131 4,783,064
151 4,783,065
180 4,783,066

CLASS 272

68 4,783,067
97 4,783,069
144 4,783,068

CLASS 273

1 GG 4,783,076
26 A 4,783,070
32 H 4,783,071
73 E 4,783,072
85 CP 4,783,073
157 R 4,783,074
176 FA 4,783,075
211 4,783,077
216 4,783,078
253 4,783,079
255 4,783,080
281 4,783,081
319 4,783,092
357 4,783,082

CLASS 277

1 4,783,083
9 4,783,084
12 4,783,085
134 4,783,086
166 4,783,087
167.5 4,783,088

CLASS 280

6 R 4,783,089
47.26 4,783,090
218 4,783,091
405 A 4,783,093
515 4,783,094
672 4,783,095
711 4,783,096
756 4,783,097
801 4,783,098

CLASS 285

7 4,783,099
276 4,783,100
319 4,783,101

CLASS 292

216 4,783,102
4,783,103

CLASS 293

102 4,783,104

CLASS 294

54.5 4,783,105
88 4,783,106
4,783,107
98.1 4,783,108

CLASS 296

20 4,783,109
37.7 4,783,110
97.8 4,783,111
100 4,783,112
136 4,783,113
153 4,783,114
208 4,783,115
216 4,783,116
4,783,117

CLASS 297

3 4,783,118
195 4,783,119
230 4,783,120
300 4,783,121
468 4,783,122

CLASS 299

94 4,783,123

CLASS 303

37 4,783,124
92 4,783,125
96 4,783,126
100 4,783,127
114 4,783,128

CLASS 307

116 4,783,600
246 4,783,601
353 4,783,602
443 4,783,603
446 4,783,604
450 4,783,605
465 4,783,606
475 4,783,607

CLASS 310

90 4,783,608
168 4,783,609
328 4,783,610

CLASS 312

1 4,783,129
193 4,783,130
276 4,783,131
324 4,783,132

CLASS 313

25 4,783,611
331 4,783,612
346 R 4,783,613
404 4,783,614

CLASS 315

248 4,783,615

CLASS 318

329 4,783,616
567 4,783,617
587 4,783,618

CLASS 320

2 4,783,619

CLASS 323

313 4,783,620

CLASS 324

60 CD 4,783,621
78 D 4,783,622
156 4,783,623
158 P 4,783,624
4,783,625
208 4,783,626
4,783,627
320 4,783,628
322 4,783,629
329 4,783,630
538 4,783,631

CLASS 328

103 4,783,632
110 4,783,633
235 4,783,634

CLASS 330

107 4,783,635
252 4,783,636
295 4,783,637

CLASS 331

99 4,783,638

CLASS 333

126 4,783,639
156 4,783,640
219 4,783,641

CLASS 338

309 4,783,642

CLASS 340

365 R 4,783,645
572 4,783,646
675 4,783,647
724 4,783,648
747 4,783,649
748 4,783,650
771 4,783,651
801 4,783,652
805 4,783,653
825.190 4,783,656
825.44 4,783,654
825.49 4,783,655
825.520 4,783,657
825.540 4,783,658
870.37 4,783,659

CLASS 341

154 4,783,643
166 4,783,644

CLASS 342

101 4,783,660

CLASS 343

700 MS 4,783,661
757 4,783,662
778 4,783,663
781 P 4,783,664
786 4,783,665
872 4,783,666

CLASS 346

76 PH 4,783,667
4,783,668
134 4,783,669
140 R 4,783,670

CLASS 350

3.64 4,783,134
96.12 4,783,136
96.16 4,783,137
96.23 4,783,138
96.27 4,783,139
96.3 4,783,135
96.34 4,783,140
167 4,783,141
311 4,783,142
320 4,783,143
4,783,144
331 R 4,783,145
4,783,146
333 4,783,147
341 4,783,148
350 S 4,783,149
351 4,783,150
356 4,783,151
376 4,783,133
379 4,783,152
409 4,783,153
413 4,783,154
423 4,783,155
445 4,783,156
463 4,783,157
503 4,783,158
516 4,783,159
4,783,160
635 4,783,161

CLASS 351

49 4,783,162
136 4,783,163
156 4,783,164

CLASS 352

180 4,783,165

CLASS 354

21 4,783,671
4,783,672
189 4,783,673
289.1 4,783,674
303 4,783,675
400 4,783,676
402 4,783,677

CLASS 355

3 SH 4,783,678
7 4,783,679
8 4,783,680
14 R 4,783,681
14 SH 4,783,682
27 4,783,683
38 4,783,684
45 4,783,685
64 4,783,686
67 4,783,687

CLASS 356

36 4,783,166
71 4,783,167
301 4,783,168
348 4,783,055
350 4,783,169
4,783,170

CLASS 357

15 4,783,688
17 4,783,689
23.4 4,783,690
30 4,783,691
45 4,783,692
46 4,783,693
51 4,783,694

65 4,783,695
80 4,783,697

CLASS 358

75 4,783,696
133 4,783,698
142 4,783,699
213.11 4,783,700
213.19 4,783,701
4,783,702
313 4,783,703

CLASS 360

11.1 4,783,704
77 4,783,705
78 4,783,706
104 4,783,710
105 4,783,707
106 4,783,708
109 4,783,709
113 4,783,711
133 Re.32,781

CLASS 361

48 4,783,713
101 4,783,714
150 4,783,715
225 4,783,716
363 4,783,718
382 4,783,721
398 4,783,719
399 4,783,720
411 4,783,722
433 4,783,723

CLASS 362

133 4,783,724
157 4,783,725
252 4,783,726

CLASS 363

20 4,783,727
37 4,783,728
143 4,783,729

CLASS 364

200 4,783,730
4,783,731
4,783,732
4,783,733
4,783,734
4,783,735
4,783,736
4,783,737
4,783,738
4,783,739
403 4,783,740
413.01 4,783,741
422 4,783,742
424.1 4,783,743
454 4,783,744
464.02 4,783,745
473 4,783,746
478 4,783,747
483 4,783,748
491 4,783,749
497 4,783,750
506 4,783,751
513 4,783,752
513.5 4,783,754
569 4,783,755
574 4,783,753
715.01 4,783,756
764 4,783,757
900 4,783,758
4,783,759
4,783,760
4,783,761
4,783,762

CLASS 365

94 4,783,763
154 4,783,765
174 4,783,764
185 4,783,766
189 4,783,767
230 4,783,768

CLASS 366

37 4,783,171
142 4,783,172
314 4,783,173

CLASS 367

35 4,783,769
53 4,783,770
57 4,783,771

CLASS 368

11 4,783,772
108 4,783,773

CLASS 369

44 4,783,774
4,783,775
109 4,783,776
265 4,783,777
266 4,783,717

CLASS 370

60 4,783,778
69.1 4,783,779
95 4,783,780

CLASS 371

10 4,783,781
11 4,783,782
12 4,783,783
13 4,783,784
25 4,783,785
55 4,783,786

CLASS 372

31 4,783,787
45 4,783,788
97 4,783,789

CLASS 373

108 4,783,790

CLASS 374

33 4,783,174
170 4,783,175

CLASS 375

3 4,783,791
27 4,783,792

CLASS 376

186 4,783,305
213 4,783,306
217 4,783,307
272 4,783,309
288 4,783,310
370 4,783,308
417 4,783,311
458 4,783,312

CLASS 378

19 Re.32,779
39 4,783,793
57 4,783,794
105 4,783,795

CLASS 379

67 4,783,796
4,783,800
79 4,783,797

CLASS 380

3 4,783,801
23 4,783,798
43 4,783,799

CLASS 381

41 4,783,802
42 4,783,803
43 4,783,804
4,783,806
4,783,807
4,783,808
4,783,809
49 4,783,805
52 4,783,810
4,783,811
61 4,783,812
67 4,783,813
4,783,814
68 4,783,815
68.7 4,783,816
71 4,783,817
4,783,818
83 4,783,819
89 4,783,820
173 4,783,821
187 4,783,822
195 4,783,824

CLASS 382

1 4,783,825
4 4,783,823
8 4,783,826
18 4,783,827
21 4,783,828
22 4,783,829
4,783,833
34 4,783,830
4,783,831
41 4,783,832
46 4,783,834
48 4,783,835
50 4,783,836
4,783,837
51 4,783,838
54 4,783,839
4,783,840
56 4,783,841
67 4,783,842

CLASS 383

80 4,783,176
81 4,783,177
120 4,783,178

CLASS 384

130 4,783,179
448 4,783,180
450 4,783,181
504 4,783,182
620 4,783,183

CLASS 400

196.1 4,783,184

CLASS 401

37 4,783,185
190 4,783,186

CLASS 403

24 4,783,187
190 4,783,188
264 4,783,189

CLASS 414

347 4,783,190

CLASS 415

136 4,783,191

CLASS 422

3 4,783,314
56 4,783,315
58 4,783,316
68 4,783,317
101 4,783,318
135 4,783,319
245 4,783,320
300 4,783,321

CLASS 423

19 4,783,322
70 4,783,324
235 4,783,325
242 4,783,326
243 4,783,327
323 4,783,328
644 4,783,329

CLASS 424

1.1 4,783,313
4,783,330
44 4,783,331
59 4,783,332
63 4,783,333
78 4,783,334
407 4,783,335
462 4,783,336
468 4,783,337

CLASS 426

94 4,783,338
557 4,783,339

CLASS 427

2 4,783,340
4 4,783,342
8 4,783,341
4,783,343
31 4,783,344
96 4,783,345
244 4,783,346
379 4,783,347
402 4,783,348
407.3 4,783,349

CLASS 428

16 4,783,350
17 4,783,351
31 4,783,352
34.9 4,783,353
40 4,783,354
43 4,783,355
69 4,783,356
119 4,783,357
138 4,783,358
209 4,783,359
212 4,783,360
217 4,783,361
224 4,783,362
285 4,783,363
288 4,783,364
304.4 Re.32,780
315.5 4,783,366
364 4,783,367
408 4,783,368
4,783,369
425.9 4,783,370
432 4,783,371
435 4,783,372
446 4,783,373
447 4,783,374
480 4,783,375
511 4,783,376
594 4,783,377
600 4,783,378
607 4,783,379
702 4,783,380

CLASS 429

15 4,783,381
52 4,783,382
56 4,783,383
218 4,783,384

CLASS 430

7 4,783,385
19 4,783,386
76 4,783,387
115 4,783,388
137 4,783,389
156 4,783,390
196 4,783,391
203 4,783,392
270 4,783,393
331 4,783,395
353 4,783,396
380 4,783,394
389 4,783,397
567 4,783,398

CLASS 435

5 4,783,399
7 4,783,400
18 B1 4,472,499
34 4,783,401
52 4,783,402
68 4,783,405
108 4,783,403
134 4,783,408
135 4,783,404
180 4,783,409
196 4,783,410
200 4,783,406
235 4,783,407
237 4,783,411
240.1 4,783,412
284 4,783,413
302 4,783,414
320 4,783,415

CLASS 436

60 4,783,416
73 4,783,417
96 4,783,418
516 4,783,419
518 4,783,420

CLASS 437

4 4,783,421
15 4,783,237
31 4,783,422
33 4,783,423
40 4,783,424
46 4,783,425
81 4,783,426
90 4,783,427
209 4,783,428

CLASS 455

22 4,783,843
34 4,783,844
35 4,783,845
151 4,783,846
156 4,783,847
182 4,783,848
197 4,783,849
600 4,783,850
612 4,783,851
619 4,783,852

CLASS 501

5 4,783,429
96 4,783,430
153 4,783,431

CLASS 502

34 4,783,432
74 4,783,433
167 4,783,434
170 4,783,445
214 4,783,435
327 4,783,436
348 4,783,437

CLASS 503

206 4,783,438
213 4,783,439

CLASS 514

3 4,783,441
18 4,783,442
19 4,783,443
4,783,444
54 4,783,446
56 4,783,447
57 4,783,448
76 4,783,449
78 4,783,450
92 4,783,451
184 4,783,452
185 4,783,470
210 4,783,453
214 4,783,454
4,783,456
220 4,783,455
227.2 4,783,457
233.5 4,783,460
235.8 4,783,459
239.5 4,783,458
248 4,783,461
249 4,783,462
252 4,783,463
253 4,783,464
255 4,783,465
256 4,783,466
267 4,783,467
275 4,783,468
288 4,783,469
317 4,783,471
338 4,783,472
382 4,783,473
383 4,783,474
4,783,475
394 4,783,476
396 4,783,477
397 4,783,478
410 4,783,479
423 4,783,480
456 4,783,533
457 4,783,481

CLASS 521

63 4,783,489

CLASS 522

99 4,783,490

CLASS 523

117 4,783,491
130 4,783,492

CLASS 524

13 4,783,493
139 4,783,494
263 4,783,495
292 4,783,496
391 4,783,497
519 4,783,498
4,783,499
555 4,783,500
701 4,783,501
871 4,783,502

CLASS 525

66 4,783,503
72 4,783,504
73 4,783,505
109 4,783,506
240 4,783,507
310 4,783,508
329.7 4,783,510
431 4,783,511
527 4,783,509

CLASS 526

142 4,783,512
216 4,783,513
281 4,783,514
297 4,783,515

CLASS 528

14 4,783,516
52 4,783,517
90 4,783,518
98 4,783,519
174 4,783,520
206 4,783,521
272 B1 4,474,939
352 4,783,522

CLASS 530

323 4,783,523
350 4,783,524
418 4,783,525

CLASS 536

18.5 4,783,526
53 4,783,527

CLASS 540

113 4,783,528
145 4,783,529

CLASS 544

182 4,783,531
267 4,783,530
277 4,783,532

CLASS 546

91 4,783,534
234 4,783,537
316 4,783,535
345 4,783,536

CLASS 548

262 4,783,538
320 4,783,539
453 4,783,540

CLASS 549

83 4,783,541

CLASS 556

437 4,783,542
446 4,783,543

CLASS 558

267 4,783,544
319 4,783,545
355 4,783,546
388 4,783,547

CLASS 560

10 4,783,548
104 4,783,549
143 4,783,551
145 4,783,550
198 4,783,552

CLASS 564

232 4,783,553
463 4,783,554

CLASS 568

695 4,783,555
726 4,783,556
741 4,783,557
817 4,783,558
862 4,783,559

CLASS 570

110 4,783,560
183 4,783,561
196 4,783,562
246 4,783,563
254 4,783,564

CLASS 585

268 4,783,565
415 4,783,566
464 4,783,567
477 4,783,568
481 4,783,569
4,783,570
4,783,571
500 4,783,572
523 4,783,573
738 4,783,574
748 4,783,575

CLASS 600

17 4,782,817

CLASS 604

392 B1 4,315,508

CLASS 623

6 B1 Re.31,998
16 4,783,192

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	320	298,381		105	298,398		24	298,415		100	298,432	D23—	202	298,450		122	298,465
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	36	298,384			298,401			298,418		127	298,435		325	298,453		104	298,468
	38	298,385		309	298,402		44	298,419	D16—	129	298,436		350	298,449		131	298,469
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	4,782,726	4,782,889	4,783,632	4,783,773	4,782,655	4,782,865
	4,783,107	4,782,917	4,783,635	4,783,782	4,782,664	4,782,885
	4,783,523	4,782,937	4,783,639	10 : 4,783,285	4,782,687	4,783,094
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	4,782,569		4,783,201		4,782,833		4,782,721		4,782,975		4,783,327
	4,782,598		4,783,202		4,782,842		4,782,767		4,782,983		4,783,363
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	4,782,656		4,783,486		4,783,699		4,783,036		4,782,811		4,782,689
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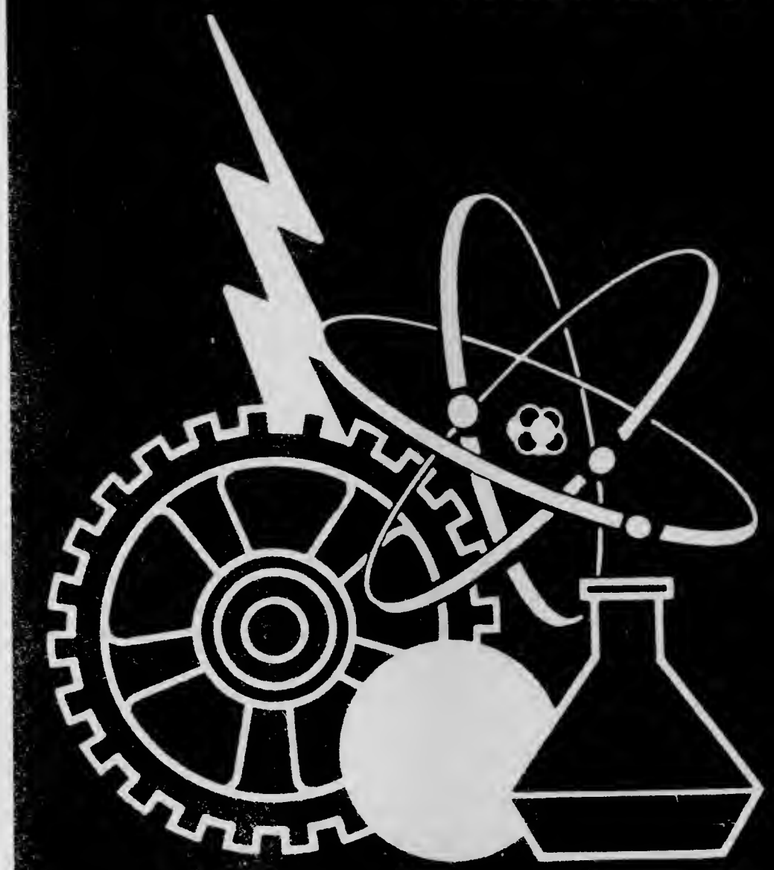
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Aug. 11, 1988.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 12, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,551,857 through 4,553,268
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985. which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 28, 1988. DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,467,477	06/372,912	8/28/84
4,467,480	06/560,323	8/28/84
4,467,486	06/411,656	8/28/84
4,467,487	06/311,483	8/28/84
4,467,489	06/360,602	8/28/84
4,467,490	06/452,384	8/28/84
4,467,496	06/319,395	8/28/84
4,467,503	06/477,167	8/28/84
4,467,509	06/422,412	8/28/84
4,467,510	06/337,919	8/28/84
4,467,514	06/444,432	8/28/84
4,467,515	06/345,750	8/28/84
4,467,527	06/347,861	8/28/84
4,467,533	06/238,841	8/28/84
4,467,540	06/355,103	8/28/84
4,467,541	06/293,934	8/28/84
4,467,543	06/462,539	8/28/84
4,467,544	06/430,807	8/28/84
4,467,547	06/382,562	8/28/84
4,467,548	06/338,547	8/28/84
4,467,549	06/302,893	8/28/84
4,467,552	06/534,607	8/28/84
4,467,554	06/541,481	8/28/84
4,467,555	06/348,863	8/28/84
4,467,557	06/447,434	8/28/84
4,467,558	06/492,168	8/28/84
4,467,559	06/433,553	8/28/84
4,467,567	06/385,895	8/28/84
4,467,571	06/272,139	8/28/84
4,467,572	06/365,171	8/28/84
4,467,574	06/262,510	8/28/84
4,467,585	06/381,895	8/28/84
4,467,587	06/387,003	8/28/84
4,467,591	06/416,144	8/28/84
4,467,592	06/427,189	8/28/84
4,467,593	06/432,988	8/28/84
4,467,595	06/532,338	8/28/84
4,467,596	06/446,874	8/28/84
4,467,598	06/258,389	8/28/84
4,467,603	06/281,483	8/28/84
4,467,609	06/412,155	8/28/84
4,467,612	06/470,277	8/28/84
4,467,620	06/449,597	8/28/84
4,467,621	06/421,320	8/28/84
4,467,668	06/445,478	8/28/84
4,467,678	06/412,126	8/28/84
4,467,689	06/391,019	8/28/84
4,467,692	06/453,351	8/28/84
4,467,693	06/428,734	8/28/84
4,467,699	06/318,128	8/28/84
4,467,701	06/282,742	8/28/84
4,467,704	06/441,351	8/28/84
4,467,709	06/429,019	8/28/84
4,467,712	06/383,997	8/28/84
4,467,721	06/443,747	8/28/84
4,467,724	06/413,017	8/28/84
4,467,726	06/315,545	8/28/84
4,467,728	06/293,668	8/28/84
4,467,729	06/350,234	8/28/84
4,467,735	06/400,712	8/28/84
4,467,737	06/557,900	8/28/84
4,467,746	06/414,801	8/28/84
4,467,753	06/288,851	8/28/84
4,467,756	06/262,038	8/28/84
4,467,757	06/361,014	8/28/84
4,467,768	06/346,875	8/28/84
4,467,784	06/472,569	8/28/84
4,467,787	06/416,860	8/28/84
4,467,788	06/435,906	8/28/84
4,467,796	06/326,562	8/28/84
4,467,798	06/330,339	8/28/84
4,467,799	06/369,922	8/28/84
4,467,802	06/343,202	8/28/84
4,467,803	06/364,215	8/28/84

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Patent Number	Serial Number	Issue Date
4,467,815	06/416,287	8/28/84
4,467,816	06/285,843	8/28/84
4,467,820	06/551,551	8/28/84
4,467,828	06/348,514	8/28/84
4,467,832	06/409,396	8/28/84
4,467,846	06/405,090	8/28/84
4,467,847	06/386,161	8/28/84
4,467,850	06/355,987	8/28/84
4,467,854	06/332,667	8/28/84
4,467,857	06/428,876	8/28/84
4,467,859	06/253,232	8/28/84
4,467,863	06/472,635	8/28/84
4,467,864	06/376,129	8/28/84
4,467,865	06/481,133	8/28/84
4,467,867	06/395,233	8/28/84
4,467,870	06/395,544	8/28/84
4,467,872	06/323,275	8/28/84
4,467,878	06/299,479	8/28/84
4,467,884	06/397,475	8/28/84
4,467,888	06/356,731	8/28/84
4,467,889	06/433,004	8/28/84
4,467,890	06/394,152	8/28/84
4,467,892	06/261,847	8/28/84
4,467,907	06/408,753	8/28/84
4,467,909	06/429,984	8/28/84
4,467,911	06/398,402	8/28/84
4,467,913	06/448,926	8/28/84
4,467,919	06/375,137	8/28/84
4,467,925	06/325,851	8/28/84
4,467,934	06/467,936	8/28/84
4,467,935	06/544,380	8/28/84
4,467,944	06/517,078	8/28/84
4,467,946	06/474,824	8/28/84
4,467,951	06/339,337	8/28/84
4,467,954	06/308,622	8/28/84
4,467,959	06/475,016	8/28/84
4,467,960	06/561,305	8/28/84
4,467,964	06/312,704	8/28/84
4,467,971	06/310,059	8/28/84
4,467,978	06/437,190	8/28/84
4,467,983	06/413,510	8/28/84
4,467,986	06/298,690	8/28/84
4,467,990	06/303,907	8/28/84
4,467,991	06/338,803	8/28/84
4,467,993	06/322,977	8/28/84
4,467,995	06/288,309	8/28/84
4,467,996	06/395,616	8/28/84
4,467,998	06/512,445	8/28/84
4,468,006	06/421,955	8/28/84
4,468,010	06/484,559	8/28/84
4,468,018	06/402,610	8/28/84
4,468,022	06/396,469	8/28/84
4,468,024	06/402,926	8/28/84
4,468,025	06/424,598	8/28/84
4,468,026	06/372,987	8/28/84
4,468,029	06/447,283	8/28/84
4,468,031	06/419,960	8/28/84
4,468,032	06/497,063	8/28/84
4,468,043	06/387,378	8/28/84
4,468,048	06/351,579	8/28/84
4,468,050	06/523,279	8/28/84
4,468,053	06/371,567	8/28/84
4,468,060	06/427,780	8/28/84
4,468,065	06/385,524	8/28/84
4,468,068	06/462,999	8/28/84
4,468,077	06/431,994	8/28/84
4,468,090	06/284,791	8/28/84
4,468,123	06/382,254	8/28/84
4,468,141	06/413,363	8/28/84
4,468,144	06/386,717	8/28/84
4,468,146	06/377,639	8/28/84
4,468,148	06/418,423	8/28/84
4,468,152	06/321,050	8/28/84
4,468,153	06/377,675	8/28/84
4,468,157	06/374,240	8/28/84
4,468,158	06/445,116	8/28/84
4,468,161	06/238,932	8/28/84
4,468,162	06/451,802	8/28/84
4,468,169	06/409,231	8/28/84
4,468,173	06/373,808	8/28/84
4,468,176	06/545,118	8/28/84
4,468,203	06/529,939	8/28/84
4,468,212	06/292,658	8/28/84
4,468,225	06/448,745	8/28/84
4,468,245	06/449,989	8/28/84
4,468,256	06/331,019	8/28/84
4,468,261	06/371,582	8/28/84
4,468,263	06/450,849	8/28/84
4,468,275	06/458,568	8/28/84
4,468,280	06/453,690	8/28/84
4,468,281	06/453,843	8/28/84
4,468,283	06/451,450	8/28/84
4,468,310	06/517,989	8/28/84
4,468,325	06/419,500	8/28/84
4,468,326	06/393,430	8/28/84
4,468,328	06/435,070	8/28/84
4,468,329	06/270,492	8/28/84
4,468,338	06/503,740	8/28/84
4,468,346	06/546,220	8/28/84
4,468,347	06/361,183	8/28/84
4,468,350	06/314,028	8/28/84
4,468,360	06/332,424	8/28/84
4,468,361	06/409,141	8/28/84
4,468,383	06/427,857	8/28/84
4,468,392	06/488,948	8/28/84
4,468,394	06/363,778	8/28/84
4,468,397	06/307,337	8/28/84
4,468,406	06/379,716	8/28/84
4,468,410	06/409,157	8/28/84
4,468,421	06/433,539	8/28/84
4,468,424	06/458,938	8/28/84
4,468,465	06/415,774	8/28/84
4,468,474	06/494,754	8/28/84
4,468,504	06/541,470	8/28/84
4,468,522	06/366,095	8/28/84
4,468,529	06/370,604	8/28/84
4,468,537	06/274,613	8/28/84
4,468,541	06/515,746	8/28/84
4,468,546	06/497,310	8/28/84
4,468,547	06/461,410	8/28/84
4,468,549	06/382,372	8/28/84
4,468,552	06/428,369	8/28/84
4,468,553	06/367,942	8/28/84
4,468,556	06/406,351	8/28/84
4,468,557	06/463,350	8/28/84
4,468,569	06/417,825	8/28/84
4,468,571	06/436,990	8/28/84
4,468,573	06/367,801	8/28/84
4,468,600	06/478,137	8/28/84
4,468,603	06/250,984	8/28/84
4,468,604	06/354,539	8/28/84
4,468,606	06/375,885	8/28/84
4,468,611	06/383,792	8/28/84
4,468,631	06/381,621	8/28/84
4,468,639	06/426,405	8/28/84
4,468,657	06/247,234	8/28/84
4,468,658	06/215,800	8/28/84
4,468,665	06/229,799	8/28/84
4,468,666	06/309,263	8/28/84
4,468,678	06/446,750	8/28/84
4,468,685	06/325,431	8/28/84
4,468,714	06/438,203	8/28/84
4,468,739	06/352,239	8/28/84
4,468,761	06/265,262	8/28/84
4,468,767	06/328,316	8/28/84
4,468,776	06/294,601	8/28/84
4,468,778	06/329,268	8/28/84
4,468,779	06/446,848	8/28/84
4,468,780	06/411,476	8/28/84
4,468,787	06/319,632	8/28/84
4,468,803	06/427,804	8/28/84
4,468,806	06/494,424	8/28/84
4,468,807	06/282,866	8/28/84
4,468,814	06/385,305	8/28/84

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,443,053	06/405,550	4/17/84	8/5/82	10/14/88
4,455,372	06/422,730	6/19/84	9/24/82	10/14/88
4,457,089	06/308,044	7/3/84	10/2/81	10/14/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,446,122, Re. S.N. 254,015, Filed Oct. 4, 1988, Cl. 424/11, PURIFIED HUMAN PROSTATE ANTIGEN, Tsann M. Chu, et al., Owner of Record: *Research Corporation Technologies Inc., Tucson, Ariz.*, Attorney or Agent: Stephen D. Murphy, Ex. Gp.: 223

4,658,259, Re. S.N. 254,260, Filed Oct. 6, 1988, Cl. 343/715, ON GLASS ANTENNA, Herbert R. Blaese, Owner of Record: *Inventor,* Attorney or Agent: George H. Gerstman, Ex. Gp.: 251

4,673,190, Re. S.N. 250,334, Filed Sept. 28, 1988, Cl. 280/289, PROTECTIVE BAR ASSEMBLY FOR MOTORCYCLE, Russell W. Ahlberg, Owner of Record: *Inventor,* Attorney or Agent: John A. Waters, Ex. Gp.: 316

4,731,506, Re. S.N. 253,227, Filed Oct. 4, 1988, Cl. 174/115, SIGNAL CABLE ASSEMBLY, Noel Lee, Owner of Record: *Inventor,* Attorney or Agent: Warren B. Kice, Ex. Gp.: 215

4,761,900, Re. S.N. 254,259, Filed Oct. 6, 1988, Cl. 37/142R, EXCAVATING TOOTH ASSEMBLY, Robert K. Emrich, Owner of Record: *Esco Corp., Portland, Oreg.*, Attorney or Agent: Jerome F. Fallon, Ex. Gp.: 337

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,077,588, Reexam. No. 90/001,617, Requested: Oct. 12, 1988, Cl. 244/31, PERMANENTLY BOUYANT BALLOON, Gerald J. Hurst, Owner of Record: *Gerald L. Hurst, Dallas and Leslie Barton, Carrollton, both of Tex.*, Attorney or Agent: Richards, Harris, et al., Ex. Gp.: 310, Requester: CTD Industries Corp., Inc., Chicago, Ill.

4,253,615, Reexam. No. 90/001,615, Requested: Oct. 6, 1988, Cl. 241/36, PALLET AUGER, Larry E. Koenig, Owner of Record: *Inventor, Bettendorf, La.*, Attorney or Agent: Henderson & Strum, Ex. Gp.: 320, Requester: Industronics Inc., South Windsor, Conn.

4,436,092, Reexam. No. 90/001,612, Requested: Oct. 3, 1988, Cl. 128/419, EXERCISE RESPONSIVE CARDIAC PACEMAKER, William A. Cook, et al., Owner of Record: *Perdue Research Foundation, Lafayette, Ind.*, Attorney or Agent: C. David Emhart, Ex. Gp.: 330, Requester: Cook GRP Inc., Bloomington, Ind.

4,492,762, Reexam. No. 90/001,614, Requested: Oct. 5, 1988, Cl. 436/537, FLUORESCENT POLARIZATION IMMUNOASSAY, C. J. Wang, et al., Owner of Record: *Abbott Laboratories, Abbott Park, Ill.*, Attorney or Agent: K. V. Rockey, Ex. Gp.: 130, Requester: H. L. Jackson, Tustin, Calif.

4,525,178, Reexam. No. 90/001,616, Requested: Oct. 12, 1988, Cl. 51/309, COMPOSITE POLYCRYSALLINE DIAMOND, David R. Hall, Owner of Record: *SII Megadiamond Inc., Provo, Utah,* Attorney or Agent: Christie, Parker, et al., Ex. Gp.: 150, Requester: Owner

4,618,354, Reexam. No. 90/001,613, Requested: Oct. 3, 1988, Cl. 65/2, METHOD APPARATUS AND BURNER FOR FABRICATING AN OPTICAL FIBER PREFORM, Hiroyuki Suda, et al., Owner of Record: *Sumitano Electric Ind. & Nippon Telegraph & Telephone Public Corp., Tokyo, Japan,* Attorney or Agent: Robert J. Frank, Ex. Gp.: 130, Requester: Owner

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of such proceedings sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, judgment will be entered against registrant and said registration will be cancelled.

Barum Packing Co., Inc., Medford, Oreg., Reg. No. 647,599, for the mark "STAGECOACH ORCHARDS and design", Canc. No. 16,588.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Advisory Committee for Patents and Trademarks Notice of Open Meeting

In accordance with Section 10(a)(2) of the Federal Advisory Committee Act (Public Law 92-463), announcement is made of the following Committee Meeting:

The Advisory Committee for Patents and Trademarks will meet from 9:00 a.m. to 4:30 p.m. on

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Dec. 2, 1988, at the U.S. Patent and Trademark Office in Crystal City, Arlington, Va. The meeting will be held in the Commissioner's Conference Room in Crystal Park 2, Room 912.

The agenda for the meeting follows:

(1) Independent Government Corporations
(2) Interrelationship of the PTO and ACPAT

The meeting will be open to public observation; approximately 12 seats will be available for the public on a first-come, first-served basis. If time permits, oral comments by the public of no more than three minutes on each topic within the above agenda will be allowed. Written comments and suggestions will be accepted before or after the meeting on any of the agenda matters.

For further information, contact E. R. Kazenske, Executive Assistant to the Assistant Secretary, Patent and Trademark Office, Crystal Park 2, Suite 906, Washington, D.C. 20231. Telephone: 703 557-3071.

DONALD J. QUIGG,
Oct. 24, 1988 *Assistant Secretary and Commissioner of Patents and Trademarks.*

Department of Treasury
United States Customs Service
[19 CFR Part 133]

Application for Recordation of Trade Name: "TUNE BELT," Tune Belt, Inc.

Action: Notice of Application for Recordation of Trade Name

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.13), for the recordation under Section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "TUNE BELT," used by Tune Belt, Inc., a corporation organized under the laws of the State of Ohio, located at 2601 Arbor Pl., Cincinnati, Ohio 45209.

The application states that the trade name is used in connection with clothing, manufactured by Kama Corp., Ltd. in Taipei, Taiwan.

Before final action is taken on the application, consideration will be given to any relevant data, views or arguments submitted in writing by any person in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Dec. 19, 1988.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Value, Special Programs and Admissibility Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (Room 2104).

For Further Information Contact: Bettie Coombs, Value, Special Programs and Admissibility Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202) 566-5765).

MARVIN M. AMERNICK,
Oct. 13, 1988 *Chief, Value, Special Programs and Admissibility Branch.*

Filing of Certain Papers and Authorizations to Charge Deposit Accounts by Facsimile Transmission

Effective Nov. 1, 1988, certain papers to be filed in national patent applications and reexamination proceedings for consideration by the Office of the Assistant Commissioner for Patents, the Office of the Deputy Assistant Commissioner for Patents, and the Patent Examining Groups (Patent Examining Corps) may be submitted to the Patent and Trademark Office (PTO) by facsimile transmission.

The provision of 37 CFR 1.33(a), requiring signatures on amendments and other papers filed in applications, is hereby waived to the extent that a facsimile signature is acceptable. The paper that is used as the original for the facsimile transmission must have an original signature, and should be retained by applicant or the representative as evidence of the content of the facsimile transmission. No special format, addressing information or written ratification is required for facsimile transmissions. However, the paper size must be 8½" by 14" or smaller to be accepted.

A facsimile center has been established in the Patent Examining Corps to receive and process submissions. The filing date accorded the submission will be the date the complete transmission is received by the PTO facsimile unit unless that date is a Saturday, Sunday or Federal holiday within the District of Columbia, in which case the official date of receipt will be the next business day.

Each transmission session must be limited to papers to be filed in a single national patent application or reexamination proceeding. It is recommended that the Serial Number of the application or Control Number of the reexamination be entered as a part of the sender's identification, if possible. It is also recommended that the sending facsimile machine generate a report confirming transmission for each transmission session. The transmitting activity report should be retained along with the paper used as the original.

The papers, including authorizations to charge deposit accounts, which may be submitted using this procedure, are limited to those which may be filed in national patent applications and reexamination proceedings and which are to be considered by the PTO organizations named above. Examples of such papers are amendments, responses to restriction requirements, request for reconsideration before the examiner, petitions, terminal disclaimers, powers of attorney, notices of appeal and appeal briefs.

New or continuing patent applications of any type, assignments, issue fee payments, maintenance fee payments, declarations or oaths under 37 CFR 1.63 or 1.67, and formal drawings are excluded, as are all papers relating to international patent applications. Papers to be filed in applications that are subject to a secrecy order under 37 CFR 5.1 - 5.8, and directly related to the secrecy order content of the application, are also excluded. Informal communications between applicant and the examiner, such as proposed claims for interview purposes, are permissible and are encouraged. Informal communications from applicants will not be made of record in the application or reexamination and must be clearly identified as informal such as by including the word "DRAFT" on each paper. To facilitate informal communications from examiners, applicants are encouraged to supply their facsimile phone numbers on communications to the Office.

The facsimile submissions may include a certificate for each paper stating the date of transmission. A copy of the facsimile submission with a certificate attached thereto will be evidence of transmission of the paper should the original be misplaced. The person signing the certificate should have a reasonable basis to expect that the paper would be facsimile transmitted on the date indicated. An example of a preferred certificate is:

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

_____
Type or print name of person signing certification

_____ _____
Signature Date

When possible, the certification should appear on a portion of the paper being transmitted. If the certification is presented on a separate paper, it must identify the application to which it relates, and the type of paper being transmitted; e.g. amendment, notice of appeal, etc.

In the event that the facsimile submission is misplaced or lost in the PTO, the submission will be considered filed as of the date of the transmission, if the party who transmitted the paper:

(1) Informs the PTO of the previous facsimile transmission promptly after becoming aware that the submission has been misplaced of lost;
(2) Supplies another copy of the previously transmitted submission with the Certification of Transmission; and
(3) Supplies a copy of the sending unit's report confirming transmission of the submission. In the event that a copy of the report is not available, the party who transmitted the paper may file a declaration under 37 CFR 1.68 which attests on a personal knowledge basis or to the satisfaction of the Commissioner to the previous timely transmission.

If all criteria above cannot be met, the PTO will require applicant to submit a verified showing of facts. Such a showing must show to the satisfaction of the Commissioner the date the PTO received the submission.

The facsimile center will have five facsimile units and will be staffed during the business hours of 8:30 a.m. and 5:00 p.m., Monday through Friday, excluding holidays. Although the units may normally be accessed at all times, including non-business hours, there may be times when reception is not possible due to equipment failure or maintenance requirements. Accordingly, applicants are cautioned not to rely on the availability of this service at the end of response periods.

The telephone number for accessing the facsimile machines is (703) 557-9564. In the event that the transmission cannot be accepted at the telephone number above, a backup number has been established at (703) 557-9567. The facsimile center staff can be reached at telephone number (703) 557-4277 during normal business hours.

DONALD J. QUIGG,
Oct. 19, 1988 *Assistant Secretary and Commissioner for Patents and Trademarks.*

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PATENT NOTICES

Certificates of Correction for the Week of Nov. 15, 1988

Re. 32,637	4,710,120	4,735,449	4,747,157
D. 287,489	4,710,228	4,735,540	4,747,263
D. 287,490	4,714,176	4,735,677	4,747,278
D. 296,330	4,714,254	4,735,855	4,747,587
4,360,502	4,715,226	4,736,281	4,747,709
4,360,503	4,715,231	4,736,558	4,747,870
4,455,663	4,715,427	4,736,614	4,747,928
4,578,109	4,716,565	4,737,289	4,748,045
4,583,430	4,716,797	4,737,425	4,748,110
4,620,311	4,717,807	4,737,652	4,748,221
4,636,841	4,718,129	4,737,829	4,748,273
4,638,020	4,719,385	4,737,933	4,748,464
4,638,471	4,719,930	4,738,156	4,748,477
4,641,288	4,720,126	4,738,275	4,748,545
4,644,071	4,722,639	4,738,370	4,748,630
4,645,623	4,723,250	4,738,415	4,749,646
4,646,239	4,723,553	4,738,686	4,749,858
4,647,325	4,724,033	4,738,741	4,749,971
4,649,419	4,724,050	4,738,931	4,750,626
4,661,250	4,724,230	4,739,147	4,750,692
4,668,056	4,724,478	4,739,198	4,751,137
4,668,245	4,726,062	4,739,580	4,751,220
4,668,664	4,726,304	4,739,831	4,751,261
4,670,118	4,726,891	4,740,163	4,751,424
4,670,407	4,727,398	4,740,195	4,751,648
4,672,853	4,727,940	4,740,515	4,751,998
4,674,140	4,729,021	4,741,158	4,752,095
4,679,511	4,730,212	4,741,487	4,752,859
4,680,698	4,730,259	4,743,057	4,753,209
4,682,509	4,730,496	4,743,114	4,753,258
4,683,241	4,731,568	4,743,216	4,753,607
4,683,572	4,731,844	4,743,509	4,754,122
4,684,796	4,732,145	4,744,288	4,754,336
4,691,007	4,732,453	4,744,374	4,754,372
4,691,162	4,733,050	4,744,764	4,754,531
4,692,412	4,733,091	4,744,865	4,754,852
4,697,278	4,733,544	4,745,338	4,755,934
4,699,483	4,733,994	4,745,408	4,756,377
4,700,261	4,734,247	4,745,647	4,756,737
4,704,208	4,734,280	4,745,739	4,757,296
4,704,249	4,734,306	4,746,113	4,757,735
4,704,767	4,734,337	4,746,490	4,758,780
4,704,780	4,734,443	4,746,561	4,759,639
4,707,558	4,734,614	4,746,664	4,759,660
4,707,728	4,735,017	4,746,809	4,763,480
4,707,944	4,735,422	4,747,055	4,769,599

Disclaimers

3,864,302.—*Patrick J. Foley, Jr.*, Roselle, Ill. FLAME RESISTANT POLYAMIDES. Patent dated Feb. 4, 1975. Disclaimer filed Sept. 21, 1988, by the assignee, *E. I. Du Pont de Nemours and Co.*

Hereby enters this disclaimer to the remaining term of said patent.

4,293,357.—*Noboru Higuchi*; *Teruo Yano*: Nagoya; and *Masahiro Ohnishi*, Kuwana, Japan. METHOD FOR PRODUCING CERAMIC HONEYCOMB FILTERS. Patent dated Oct. 6, 1981. Disclaimer filed Sept. 20, 1988, by the assignee, *NGK Insulators, Ltd.*

Hereby enters this disclaimer to claims 8-14 of said patent.

4,331,786.—*Paul R. Foy*, Paris; *Camille Jungblut*; and *Gerard E. Deleens*, Orsay, France. MOLDABLE AND/OR EXTRUDABLE POLYETHER-ESTER-AMIDE BLOCK COPLOYMERS. Patent dated May 25, 1982. Disclaimer filed Aug. 24, 1988, by the assignee, *ATOCHEM.*

Hereby enters this disclaimer to claims 8-14 of said patent.

4,460,186.—*Donald L. Hildebrand*, Union; and *Mario J. Martinez*, Elgin, Ill. GUIDE WHEEL SUSPENSION FOR A THREE WHEEL SWEEPER. Patent dated July 17, 1984. Disclaimer filed Sept. 26, 1988, by the assignee, *Elgin Sweeper Co.*

Hereby enters this disclaimer to claims 1, 2 and 15 of said patent.

4,570,161.—*David A Kummer*, Boca Raton; *Jesus A. Saenz*, Coral Springs; and *Stephen W. Trynosky*, Boca Raton, Fla. RASTER SCAN DIGITAL DISPLAY SYSTEM. Patent dated Feb. 11, 1986. Disclaimer filed Sept. 29, 1988, by the assignee, *International Business Machines Corp.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimer and Dedication

4,688,405.—*Norman Epstein*, Carmel, N.Y. CONCEALED POST LOCK. Patent dated Aug. 25, 1987. Disclaimer and Dedication filed Aug. 19, 1988, by the assignee, *Pragmatic Padlock Co., Inc.*

Hereby disclaims and dedicates to the Public claims 1 and 2 of said patent.

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box_____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and any subsequently filed papers for these applications.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications. (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications.
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain data received and/or serial number for patent applications prior to the Office's standard notification (return post card or the official "Filing Receipt", "Notice to File Missing Parts," or " Notice of Incomplete Information Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska—Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 8, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-3-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	10-24-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-12-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-28-87
DESIGN, GROUP 290—K. L. CAGE, Director	12-23-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-10-87
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	3-9-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-6-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-16-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-6-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,609,763 to 3,616,462, inclusive

Plant Patents . . . . . 3,063 to 3,081 inclusive

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REISSUES

NOVEMBER 15, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,782
METHOD FOR DETERMINING IN VIVO, BONE STRENGTH

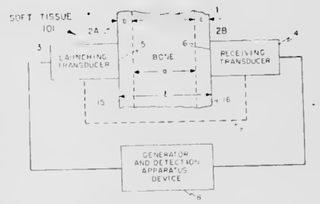
George W. Pratt, Jr., Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Original No. 4,421,119, dated Dec. 20, 1983, Ser. No. 329,932, Dec. 11, 1981. Division of Ser. No. 48,580, Jun. 15, 1979, Pat. No. 4,361,154, which is a continuation-in-part of Ser. No. 928,654, Jul. 28, 1978, Pat. No. 4,233,845. Application for reissue Dec. 20, 1985, Ser. No. 811,864

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660.06

4 Claims



3. A method for establishing, in vivo, the strength of a bone, that comprises the steps of:

a. providing:

(1) a linear scale;

(2) first transducer means having a sending surface to launch an acoustic pulse through a bone and surrounding soft tissue;

(3) second transducer means having a receiving surface to receive the pulse after transmission through a bone and surrounding soft tissue, said receiving surface being parallel to and facing said sending surface so that said soft tissue surrounding a bone may be positioned between and in contact with both of said surfaces;

(4) said first and second transducer means being mechanically interconnected by said linear scale so that the distance between said sending surface and said receiving surface may be measured; and

(5) means for measuring the transit time of the pulse from the first transducer means to the second transducer means to permit determination of the velocity of the propagated signal through a bone and soft tissue;

b. conducting the following steps (1)–(4) a first time:

(1) launching a pulse through a bone and surrounding soft tissue with said first transducer means;

(2) measuring the distance between said sending and receiving surfaces with said linear scale;

(3) measuring the transit time of the pulse from the first transducer means to the second transducer means with said means for measuring transit time and;

(4) determining the effective velocity of the pulse through said bone and surrounding soft tissue by dividing the measured distance by the measured transit time;

c. conducting the steps (b.1) through (b.4) at least one additional time; and

d. comparing the effective velocity determined by conducting steps (b.1) through (b.4) the first time with the effective velocity determined by conducting steps (b.1) through (b.4) at least one additional time with respect to a bone at a location corresponding to the location at which the first pulse was launched through the bone through which the first pulse was launched; and

e. assessing the strength of the bone through which each pulse has been launched on the basis of the comparison. 10

* * * * *

The questions raised in reexamination request No. 90/000,815, filed 07/22/85, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 32,783
SOLENOID CONSTRUCTION AND METHOD FOR MAKING THE SAME

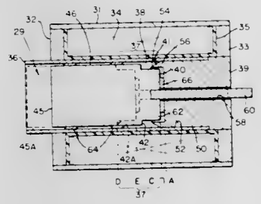
Bruce D. Clark, Clifton Springs, N.Y., assignor to G. W. Lisk Company, Inc., Clifton Springs, N.Y.

Original No. 4,539,542, dated Sep. 3, 1985, Ser. No. 563,891, Dec. 23, 1983. Application for reissue Jan. 4, 1988, Ser. No. 140,660

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—261

29 Claims



1. An assembly for use in a solenoid comprising:

(a) a hollow solenoid armature tube adapted to be received in a solenoid coil, said tube having an armature chamber therein;

(b) a stationary pole piece member fixed in and defining one end of said armature chamber;

(c) an armature member positioned in said armature chamber of said tube for axial sliding movement relative to and defining an armature stroke relative to said pole piece member;

(d) one of said members having an axially extending recess therein and the other member having a reduced in cross-section end portion adapted to be received in and complimentary to said recess;

(e) said one member having a [radially externally facing] frusto-conical surface surrounding said recess and *facing radially externally into an air gap in said chamber, said air gap* extending [into said chamber] *from said frusto-conical surface to said armature tube in a region of said chamber not entered by said other member;*

(f) said armature tube having a non-magnetic section defining a reduced magnetic gap extending coaxially with *said air gap and with* at least a portion of said armature stroke sufficient to permit selected magnetic forces to be produced on said armature; and

(g) said armature tube providing concentricity of said two members.

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Re. 32,784
CONDUCTIVITY MODULATED MOS TRANSISTOR DEVICE

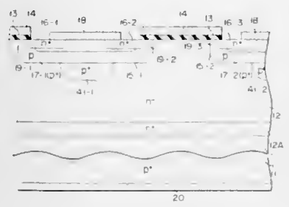
Akio Nakagawa, Hiratsuka, and Kiminori Watanabe, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Original No. 4,680,604, dated Jul. 14, 1987, Ser. No. 930,083, Nov. 13, 1986. Continuation of Ser. No. 707,556, Mar. 4, 1985, abandoned. Application for reissue Nov. 27, 1987, Ser. No. 126,309

Claims priority, application Japan, Mar. 19, 1984, 59-52810

Int. Cl.[4] H01L *29/78, 29/74*

U.S. Cl. 357—23.4 **5 Claims**



1. A conductivity modulated MOS transistor device comprising:

a first semiconductor layer of one conductivity type;

a second semiconductor layer of an opposite conductivity type, formed in contact with said first semiconductor layer;

a first semiconductor region of said one conductivity type formed by diffusion in a surface area of said second semiconductor layer;

a first semiconductor region of said one conductivity type formed by diffusion in a surface area of said second semiconductor layer;

a second semiconductor region of said opposite conductivity type formed by diffusion in a surface region of said first semiconductor region to face said second semiconductor layer, the surface region of said first semiconductor region sandwiched between said second semiconductor region and said second semiconductor layer forming a channel region, and a source electrode formed on the second semiconductor region;

a gate region including a gate insulation layer formed at least on said channel region, and a gate electrode formed on the gate insulation layer;

a third semiconductor region of said one conductivity type formed by diffusion in said first semiconductor region without entering the channel region, and shallower than said first semiconductor region and deeper than said second semiconductor region, and including a portion which lies outside a vertical projection of *a contact area between* said source electrode *and said second semiconductor region* directly under said second semiconductor region and has a higher impurity concentration than said first semiconductor region; and

a fourth semiconductor region of said one conductivity type formed by diffusion from central portions of the surface of said third semiconductor region within the vertical projection of said third semiconductor region and deeper than the first semiconductor region without extending to said portion of said third semiconductor region and said channel region.

Re. 32,785
AUDIO-FREQUENCY ELECTROMECHANICAL VIBRATOR

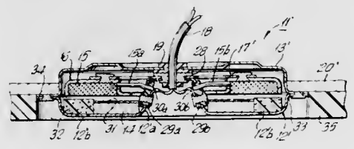
Mutsuo Hirano, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Original No. 4,635,287, dated Jan. 6, 1987, Ser. No. 661,916, Oct. 17, 1984. Application for reissue Aug. 10, 1987, Ser. No. 84,031

Claims priority, application Japan, Oct. 19, 1983, 58-161394[U]; Oct. 19, 1983, 58-161395[U]; Oct. 19, 1983, 58-161396[U]

Int. Cl.[4] H04R *1/04, 9/00*

U.S. Cl. 381—194 **11 Claims**



1. An audio frequency electromechanical vibrator comprising:

an open-topped flat case of a magnetic material with a cover plate closing the open end;

a annular drive coil unit for receiving an audiofrequency power signal and being disposed within said case, said coil unit comprising a annular coil housing of magnetic material with an open axial end and a coil contained in, and fixed to, said coil housing;

a flat ring-shaped permanent magnet having an axial end and being axially magnetized, said ring-shaped permanent magnet being disposed coaxial with, and adjacent, said annular coil unit in an axial direction so that said axial end of said permanent magnet faces said open axial end of said coil housing with an axial gap left therebetween; and

a spring damper plate being supported in said case for elastically supporting one of said coil unit and said magnet, the other one of said coil unit and said magnet being fixedly mounted to an inner bottom of said case.

PLANT PATENTS

GRANTED NOVEMBER 15, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,389
IMPATIENS PLANT NAMED SUNREGAL

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Oct. 8, 1986, Ser. No. 916,562

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Impatiens plant named Sunregal, as described and illustrated, and particularly characterized by its lavender purple bicolor flowers; deep red-purple main stem; compact self-branching growth habit; small dark green and shiny leaves with a purple midrib, and by its ability to produce two flowers per each leaf axil thereby making it highly floriferous.

6,390
KALANCHOE PLANT NAMED ROSARITA

Peter S. Hesse, Bradenton, Fla., assignor to Ball Pan Am Plant Co., Parrish, Fla.

Filed Jan. 23, 1987, Ser. No. 6,132

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named Rosarita, as described and illustrated, and particularly characterized by its rose pink flower color, compact growth habit, free branching and floriferous habit, early flower response, and by its adaptability to 10–15 cm pots.

6,391
KALANCHOE PLANT NAMED CAMPECHE

Peter S. Hesse, Bradenton, Fla., assignor to Ball Pan Am Plant Co., Parrish, Fla.

Filed Jan. 23, 1987, Ser. No. 6,133

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named Campeche, as described and illustrated, and particularly characterized by its lemon yellow, partially bicolored flowers, compact growth and floriferous habits, free branching habit, medium size and thick leaves, early flowering, and by its adaptability to production in 10–15 cm pots.

6,392
KALANCHOE PLANT NAMED LA PAZ

Peter S. Hesse, Bradenton, Fla., assignor to Ball Pan Am Plant Co., Parrish, Fla.

Filed Jan. 23, 1987, Ser. No. 6,134

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named La Paz, as described and illustrated, and particularly characterized by its pink and light orange bicolored flower, compact and free branching habit, early flowering, very floriferous habit, and by its adaptability to production in 10 to 15 cm pots.

6,393
KALANCHOE PLANT NAMED LA CRUZ

Peter S. Hesse, Bradenton, Fla., assignor to Ball Pan Am Plant Co., Parrish, Fla.

Filed Jan. 23, 1987, Ser. No. 6,135

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named La Cruz, as described and illustrated, and particularly characterized by its relatively large lavender to pink flowers, compact and free branching habit, early flowering, floriferous habit, and by its adaptability to production in 10 to 15 cm pots.

6,394
STREPTOCARPUS PLANT NAMED MINERVA

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 30, 1987, Ser. No. 9,374

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Streptocarpus named Minerva, as illustrated and described, and particularly characterized by its numerous short leaves in rosette form, blue violet flower color, floriferous habit, compact growth habit, early flowering and ability to flower under low light levels and high temperatures, and by its long lasting and non-shattering flowers.

6,395
STREPTOCARPUS PLANT NAMED MUSE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 30, 1987, Ser. No. 9,375

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Streptocarpus plant named Muse, as described and illustrated, and particularly characterized by its rosette plant form, red-purple flower color with darker streaking, compact growth habit, floriferous habit, ease of propagation, tolerance to light and temperature, small, pliable leaves, and by its long lasting and non-shattering flowers.

6,396
STREPTOCARPUS PLANT NAMED ARIADNE

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 30, 1987, Ser. No. 9,376

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Streptocarpus plant named Ariadne, as identified and described, and particularly characterized by its compact growth habit, white flowers with magenta streaking on lower petals; floriferous habit, early flowering, tolerance to low light and high temperature, relatively small leaves, and by its long lasting and non-shattering flowers.

6,397
STREPTOCARPUS PLANT NAMED ORION

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Jan. 30, 1987, Ser. No. 9,377

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Streptocarpus plant named Orion, as illustrated and described, and particularly characterized by its numerous pliable short leaves in rosette form, blue violet flower colors, compact growth habit, ease of propagation, floriferous habit, tolerance to low light and high temperature, ability to ship well, and by its long lasting, non-shattering flowers.

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6,398
CHRYSANTHEMUM PLANT NAMED VOLUNTEER
Leonard H. Shoesmith, deceased, late of Westfield, England (by May Victoria Shoesmith, executrix), assignor to Ball Pan Am Plant Co., Parrish, Fla.
Filed Jan. 21, 1987, Ser. No. 5,761
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Volunteer, as described and illustrated, and particularly characterized by its white ray florets and yellow-green anemone disc, compact and freely branching growth habit, 8½ week response, and by its adaptability to production in 4½" pots or as a garden mum.

6,399
CHRYSANTHEMUM PLANT NAMED VERO
William E. Daffett, and Cornelis P. VandenBerg, both of Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio
Filed Jan. 21, 1987, Ser. No. 5,762
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct plant of Chrysanthemum named Vero, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum of up to 8 cm at maturity; uniform nine week photoperiodic flowering response to short days; medium plant height when grown single stem; 15 to 20 cm peduncles on open, terminal sprays; and 13 degrees Celsius minimum temperature tolerance for initiation and development of flowering buds.

6,400
CHRYSANTHEMUM PLANT NAMED BUCCANEER
Leonard H. Shoesmith, deceased, late of Westfield, England (by May Victoria Shoesmith, executrix), assignor to Ball Pan Am Plant Co., Parrish, Fla.
Filed Jan. 21, 1987, Ser. No. 5,851
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Buccaneer, as described and illustrated, and particularly characterized by its bright yellow floret color, double flower form; compact, freely branching growth habit, and 8½ week flowering response period.

6,401
CHRYSANTHEMUM PLANT NAMED CORNHUSKER
Leonard H. Shoesmith, deceased, late of Westfield, England (by May Victoria Shoesmith, executrix), assignor to Ball Pan Am Plant Co., Parrish, Fla.
Filed Jan. 21, 1987, Ser. No. 5,852
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Cornhusker, as described and illustrated, and particularly characterized by its semi-double flower form and bright yellow ray florets, compact and free branching habit, and its eight week flowering response.

6,402
CHRYSANTHEMUM PLANT NAMED ENCORE
Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, and Cornelis P. VandenBerg, Salinas, Calif., assignors to Grace H. Mack, New Canaan, Conn.
Filed Dec. 8, 1986, Ser. No. 938,889
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct Chrysanthemum plant named Encore, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; white ray floret color; diameter across face of capitulum of up to 6 cm at maturity; short plant height with spreading and prolific branching pattern; average natural season flower date of August 30 in Salinas, Calif. and September 24 in Hightstown, N.J.; uniform seven week photoperiodic flowering response to short days in photoperiodic controlled flowering programs; and durable, uniform performance in outside fall flowerings and in spring small pot flowering programs.

6,403
CHRYSANTHEMUM PLANT NAMED GINGER
Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, and Cornelis P. VandenBerg, Salinas, Calif., assignors to Grace H. Mack, New Canaan, Conn.
Filed Dec. 8, 1986, Ser. No. 938,860
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Ginger, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; yellow to yellow-orange ray floret color with bronze-red center; diameter across face of capitulum of up to 5.5 cm at maturity; short plant height with spreading and prolific branching pattern; average natural season flower date of August 26 in Salinas, Calif. and September 24 in Hightstown, N.J.; uniform seven week photoperiodic flowering response to short days in photoperiodic controlled flowering programs; and durable, uniform performance in outside fall flowerings and in spring small pot flowering programs.

6,404
CHRYSANTHEMUM PLANT NAMED LEGEND
Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, and Cornelis P. VandenBerg, Salinas, Calif., assignors to Grace H. Mack, New Canaan, Conn.
Filed Dec. 8, 1986, Ser. No. 939,478
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Legend, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; yellow ray floret color; diameter across face of capitulum of up to 4 cm at maturity; medium plant height with spreading and prolific branching pattern; average natural season flower date of August 22 in Salinas, Calif. and September 17 in Hightstown, N.J.; uniform seven week photoperiodic flowering response to short days in photoperiodic controlled flowering programs; and durable, uniform performance in outside fall flowerings and in spring small pot flowering programs.

PATENTS

GRANTED NOV. 15, 1988

ERRATA

For CLASS	See PATENT NO.
156-094	4,783,891
092-161	4,783,897
110-264	4,784,043
600-024	4,784,115
141-198	4,784,193
280-012	4,784,233
192-058	4,784,247
269-021	4,784,377
526-314	4,785,058
420-540	4,785,092
378-004	4,785,354
323-238	4,785,390

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PATENTS

GRANTED NOVEMBER 15, 1988

GENERAL AND MECHANICAL

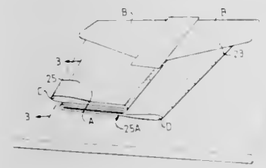
4,783,853
PROTECTIVE BODY SUIT
Christopher T. Zuber, 5741 Buena Vista, Oakland, Calif. 94618
Filed Apr. 17, 1987, Ser. No. 40,543
Int. Cl.[4] A41D *13/00;* A42B *3/02;* F41H *1/02*
U.S. Cl. 2—2 **24 Claims**



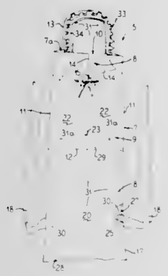
1. A body-protective article providing protection for a human user from impact-related shock comprising:
matched portions of a rigid, non-shattering, high-impact resistant polymer, interiorly lined with high-impact absorbing elastomer adhered to said polymer,
said polymer being chosen from the group consisting of polyvinyl chloride, polyethylene, polypropylene, nylon, and polyester, and each of a sufficient molecular weight to make it rigid and non-shattering,
said matched portions having fixed adjacent interlocking edges that enable the user to enclose a body portion therein, and
closure means holding said matched portions together.

4,783,854
FOLDED PROTECTIVE GARMENT
Mats Björklund, Sundbyberg, Sweden, assignor to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden
Filed Feb. 1, 1988, Ser. No. 149,077
Claims priority, application Sweden, Feb. 26, 1987, 8700818-1
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—51 **6 Claims**

1. A folded, protective garment, which is enclosed in a wrapping maintaining sterility, the garment being provided with sleeves, and in its folded-out state having a front and back which are substantially alike and joined together at their edges, the folded-out garment having a length such that it at least covers the user's trunk, characterized in that the lower end portions of the front and the back of the folded garment inside the wrapping are folded backwards to form a collar round the entry opening of the garment, the outside of the collar being the inside of the folded-out garment, and the collar having a length in the longitudinal direction of the garment such that the presumptive user's hand can grip around the outer and folded end edges of the collar without the fingers reaching over the collar and coming into contact with the rest of the garment, and in that the folded garment inside the wrapping is folded such that the outer end portion of the collar is preferably folded sideways about at least one folding line parallel to the longitudinal direction of the garment.



4,783,855
INFANT PRESENTATION WRAP
Borka Njegovan, 7605 ½ S. Odell, Bridgeview, Ill. 60455
Filed Oct. 16, 1987, Ser. No. 109,063
Int. Cl.[4] A41D *11/00*
U.S. Cl. 2—69.5 **12 Claims**

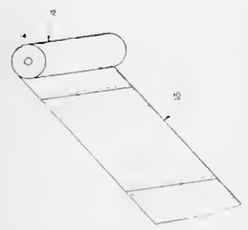


1. An infant presentation wrap, comprising:
an infant receiving pocket structure having a pocket defined by and between a back panel and a front panel and provided with an open top end, closed sides and a closed bottom end;
an infant headrest extension on said back panel projecting substantially beyond said open end;
an overlap extending from said closed bottom end and being of a length about equal to said pocket so as to be foldable into substantially covering relation to said front panel; and
generally aligned tie ribbon straps extending intermediately

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from opposite sides of said overlap and of a length to enwrap said pocket structure and the folded overlap and adapted to be tied into a retaining bow over the folded overlap.

4,783,856
DISPOSABLE RAIN GARMENT
Harold J. Bouwens, Newark; David V. Dobreski, Fairport, and Clifford H. Patridge, Jr., Newark, all of N.Y., assignors to Mobil Oil Corporatioo, New York, N.Y.
Filed Jan. 19, 1988, Ser. No. 145,013
Int. Cl.[4] A41D *3/04*
U.S. Cl. 2—87 **5 Claims**



1. A disposable rain garment which is separable from a continuous web of a lay-flat tubular waterproof film material forming at least two plys; first and second parallel transverse perforations spaced from each other across said web so as to define the length of said garment therebetween; a transverse seal joining the plys of said film material extending adjacent to and in parallel with said first transverse perforations on the side thereof towards the second transverse perforations; a curvilinear perforation extending through said web at the longitudinal central axis of said tubular body and intersecting said first transverse perforation and said transverse seal to define an aperture for the head of a wearer; and curvilinear perforations extending through said web in proximity to said transverse seal and diametrically opposite each other at the edges of said lay-flat tubular film material to define apertures for the arms of a wearer.

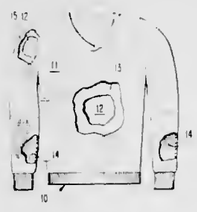
4,783,857
MOISTURE PERMEABLE PROTECTOR FOR PROTECTING HANDS AND FINGERS
Takashi Suzuki; Noburu Nishikawa; Tomio Shimizu, and Toshio Imai, all of Hyogo, Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan
Filed Oct. 31, 1986, Ser. No. 926,016
Claims priority, application Japan, Nov. 1, 1985, 60-169652[U]
Int. Cl.[4] A41D *19/00;* **C08E** *18/48*
U.S. Cl. 2—167 **2 Claims**

1. A moisture permeable protector for protecting hands and fingers consisting of a polyurethane thin film having excellent moisture permeability and a low water absorption swelling ratio which is made of polyurethane polymer having a polyoxyethylene content of 15-62%;
said polyurethane polymer being obtained by reacting a polyesterpolyol with an organic polyisocyanate in the presence of a chain elongation agent;
said polyesterpolyol having a polyoxyethylene content of 17-70% and a molecular weight of 500-3000 and being obtained by reacting polyethyleneglycol having a molecular weight of 200-600 with organic dicarboxylic acid



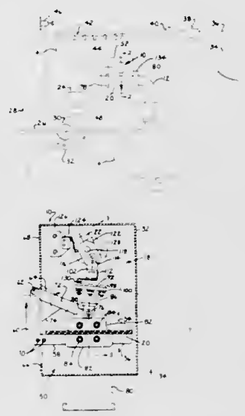
along or dicarboxylic acid and ϵ-caprolactone and/or short chain polyol.

4,783,858
SWEATER HAVING WINDBREAKING CHARACTERISTICS
Jack W. Chevalier, 4410 Grove Ave., Richmond, Va. 23221
Filed Dec. 14, 1987, Ser. No. 133,279
Iot. Cl.[4] A41D *1/04*
U.S. Cl. 2—90 **8 Claims**



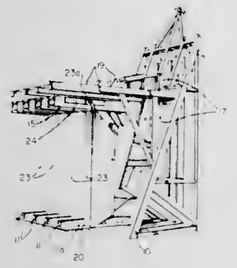
1. A windbreaking flexible quiet pullover sweater for physical activity such as golf that requires concentration, including:
an outer layer of warm knitted flexible and soft sweater material;
a body layer of warm, knitted, flexible, soft material inside of and substantially coextensive with said outer layer;
an inner windproof layer of thin windproof material sandwiched between said outer layer and said body layer having five parts;
a torso part of said inner windproof layer having a neck opening and covering the torso and shoulder region;
lower arm parts of said inner windproof layer covering the two lower arm from the elbow region to the wrist region;
both said torso part and said lower arm parts are loosely attached either to the inside surface of said outer layer or the outward facing surface of said body layer;
upper arm parts of said inner windproof layer covering both upper arm regions from the vicinity of the shoulder region to the elbow region which are loosely attached to the outward facing surface of said body layer or the insider surface of said outerlayer ever which said torso part and lower arm parts are not attached to;
said torso part, lower arm parts and upper arm parts of said inner windproof layer together covering substantially the entire torso, shoulder and arm of the wearer with little or no overlap between the said parts which are free to move with respect to each other and together with said body layer and outer layer form a composite sweater.

4,783,859
AIRCRAFT TOILET FLUSH VALVE
Mike M. Rozenblatt, Manhatten Beach; Jon E. Allen, Torrance, and Anna M. Jung, Redondo Beach, all of Calif., assignors to Monogram Industries, Inc., Culver City, Calif.
Continuation of Ser. No. 779,661, Sep. 24, 1985, abandoned. This application Nov. 4, 1987, Ser. No. 119,203
Int. Cl.[4] B64D *11/02*
U.S. Cl. 4—316 **9 Claims**



1. A flow control assembly for controlling flow through a drain from a toilet bowl to a waste tank maintained at a partial vacuum, the control assembly comprising:
(a) a flexible drain section connected in line in the drain;
(b) a nip mechanism movably connected to said drain section for nipping said flexible drain section shut to stop flow and for dilating said drain section open to enable flow;
(c) a drive motor having
an output shaft selectively driven in opposite directions by said drive motor, and
control means for starting and stopping said drive motor; and
(d) linkage means connecting said output shaft to said nip mechanism for nipping said flexible drain section shut on shaft motion in one direction and for dilating said flexible drain section open on shaft motion in the opposite direction, said linkage means including
lost motion means for permitting motion of said output shaft over a limited range of travel without opening or shutting of said nip mechanism,
resilient biasing means connected with said lost motion means for preventing operation of said lost motion means until said linkage means encounters a predetermined level of force resisting motion of said nip mechanism, said biasing means having sufficient stiffness relative to the force needed to shut said flexible drain section in the absence of an obstruction that said drain section is nipped fully to the shut condition without operation of said lost motion means, application of force beyond that necessary to fully shut said flexible drain section overcoming said biasing means to enable operation of said lost motion means, and
stop means actuated by said lost motion means and operably connected to said control means for stopping said motor when said linkage means applies a predetermined level of force to said nip mechanism and said lost motion means has travelled a predetermined distance.

4,783,860
COMBINED FLAPPER AND PISTON MOTION WAVE BOARD MODULE
Edgar R. Funke; Michael Miles, both of Gloucester, and Larry Corish, Nepean, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada
Filed May 26, 1987, Ser. No. 53,704
Int. Cl.[4] E02B *3/00;* **A47K** *3/10*
U.S. Cl. 4—491 **20 Claims**



1. A wet back device for generating wave motion in a water tank comprising a base frame operatively fixed relative to the tank, a main frame on said base frame, a glider frame mounted on the main frame for linear reciprocation in the tank parallel to a tank water level plane, a wave generating board mounted on said glider frame for linear movement therewith, and pivotally connected at its lower end thereto for pivotal motion thereon, said wave generating board having a front wave generating face and side faces, actuator lever means pivotally connected to the main frame for oscillation thereon; first connecting link means between said wave generating board and said actuator lever means; second connecting link means connected at a pivotally fixed end to said glider frame and having a second end connected to one of a plurality of positions on said actuator lever means or to said main frame, whereby to vary the geometry, of said actuator lever means, by connecting said second end of said second connecting link means to one of said positions produces, on actuation, movement of the wave generating board means which is one of:
(a) linear with the glider frame;
(b) part linear with said glider frame and part pivotal about its pivotal connections on and relative to the moving glider frame means; and
(c) pivotal about its pivotal connections on and relative to a stationary glider frame means, and sealing means on at least one side face of said wave generating board and extending normal to the tank water level plane substantially throughout the extent of the depth of said side face to provide a seal between said side face and an adjacent surface.

4,783,861
COVERING STRUCTURE
Chislain H. Leurent, Tourcoing, France, assignor to Brelan, S.A., Luxembourg, Luxembourg
Filed Nov. 6, 1986, Ser. No. 927,764
Claims priority, application France, Nov. 6, 1985, 8516464
Int. Cl.[4] E04H *3/16;* **L04B** *1/346;* **E05D** *15/06*
U.S. Cl. 4—498 **15 Claims**

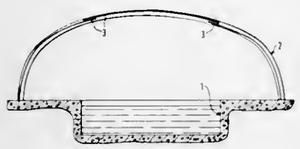
1. Covering structure for covering a zone comprising:
a plurality of covering elements together defining a vault configuration, said covering elements extending above the zone to be covered, each of said covering elements including;
(1) a pair of curved arches having a preselected length, each of said arches being curved over their entire length, said

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curved length extending over the entire zone to be covered, each of said curved arches including;

(a) a lower elementary arch defining a curved support arch, said support arch having an upper surface; and

(b) at least three superimposed curved guide grooves which extend over the entire length of said support arch, said at least three superimposed guide grooves being positioned along said upper surface of said support arch and being symmetrical with respect to a central vertical axis through said support arch, said grooves being comprised of at least three plane elementary curved outer arches which conclude longitudinal ribs forming spacers and which are stacked in top of one another above said support arch and which delimit



between them relative to said support arch said curved guide grooves.

(2) at least three covering plates of substantially the same length, one each of said covering plates being slidably received between said pair of curved arches in a respective pair of said at least three superimposed curved guide grooves wherein said at least three covering plates slide individually in the direction of the curve of said vault configuration along the length of each of said pair of curved arches; and

wherein said curved arches and said at least three covering plates cooperate to uncover greater than 50 percent of the zone to be covered when said covering plates are slidably superimposed over one another.

4,783,862

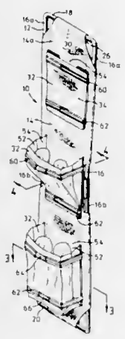
STRETCHER

Wendy J. Murphy, 48 Southvale Drive, Toronto, Ontario, Canada (M4G 1G3)

Filed Feb. 3, 1988, Ser. No. 151,950

Int. Cl.[4] A61G *1/00*

U.S. Cl. 5—82 R **20 Claims**



1. In a stretcher of the type having a patient support member which has a longitudinally elongated support face, the improvement of a plurality of pockets formed on the patient support face at spaced intervals along the length thereof, each pocket being proportioned to accommodate at least one baby whereby a plurality of babies can be accommodated in the pockets of the stretcher for mass evacuation purposes.

4,783,863

BEDDING FURNITURE WITH A PENDULUM FRAME

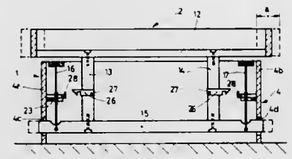
Hugo Degen, Seltisberg, Switzerland, assignor to Marpal AG, Chur, Switzerland

Filed Aug. 21, 1986, Ser. No. 898,718

Claims priority, application Switzerland, Sep. 3, 1985, 3789/85

Int. Cl.[4] A47D *9/00;* **A47C** *23/08*

U.S. Cl. 5—103 **18 Claims**



1. Bedding furniture, comprising a fixed stand, a pendulum frame, suspending means for suspending said pendulum frame from said fixed stand such that said pendulum frame can be swung horizontally in pendulum-like fashion from a rest position, and locking means for releasably locking said pendulum frame relative to said fixed stand at a stationary point located such that said pendulum frame can pivot about said point during its continued swinging movement, said locking means including at least one pair of locking members, said at least one pair of locking members including a first locking member mounted on said fixed stand and a second locking member mounted on said pendulum frame in such a manner that said second locking member will be releaseably and automatically engaged with said first locking member in response to a maximum swinging movement of said pendulum frame away from its said rest position, whereby said locking means permits the controlled adjustment of the swinging movement of said pendulum frame in the course of such movement.

4,783,864

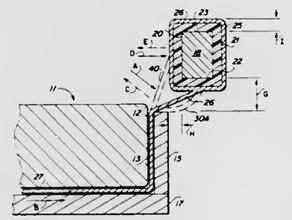
PRODUCING SUBCONSCIOUS INTEGUMENTAL REFLEX ACTION TO KEEP CHILDREN AWAY FROM GUARD RAIL WHILE SLEEPING ON BUNK BED

Ronald L. Turner, 4535 E. Marilyn, Phoenix, Ariz. 85032

Filed Aug. 3, 1987, Ser. No. 80,659

Int. Cl.[4] A47C *21/08*

U.S. Cl. 5—424 **4 Claims**



1. In a bunk bed including

a frame

a mattress carried in said frame, and

an elongate guard rail spaced a distance apart and upwardly from said mattress and having inner and lower surfaces

extending substantially the entire length of said rail, said distance being sufficient to permit the arms and legs of a child of a selected size to slid downwardly between said guard rail and mattress,

means for producing a compressive integumental sensation in a sleeping individual's limbs to produce a reflex action which reduces the likelihood that said limbs will slide downwardly between said guard rail and mattress, including

(a) elastic means secured over and covering said inner and lower surfaces of said guard rail and compressible when the limb of a sleeping individual bears thereagainst to conform to said limb and generate

(i) an integumental compression sensation on said limb to produce a reflex action to cause the individual to move his limb, and

(ii) an elastic expansive displacement force acting outwardly away from said guard rail on said limb, said displacement force requiring the individual to utilize his muscular system to generate a force opposing said displacement force to maintain his limb in position against said compressed elastic means,

said elastic means including a layer of material generally continuously extending along the length of said guard rail, said layer of material having a thickness of at least one half inch at each point along said covered inner and lower portions of said guard rail;

(b) a sheet of pliable material secured to said guard rail and extending from said guard rail along substantially the entire length of said rail and across said distance between said guard-rail and said mattress; and,

(c) elastic means beneath said mattress and attached to said sheet, said elastic means-pliable sheet combination, when a limb of the individual bears against and displaces said sheet outwardly from said mattress, conforming to said limb and generating

(i) an integumental compression sensation on said limb to produce a reflex action to cause the individual to move his limb inwardly toward said mattress, and

(ii) an elastic return force acting inwardly toward said mattress on said limb, said return force requiring the individual to utilize his muscular system to generate a force opposing said return force to maintain his limb in position against said displaced sheet.

4,783,865

INFANT NESTLING BARRIER

James G. Stotler, 16 SE. 50th Ave., Portland, Oreg. 97215

Filed Jun. 30, 1986, Ser. No. 880,181

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—424 **14 Claims**



1. A nestling barrier adapted to be placed on a surface on which an infant reposes, said nestling barrier comprising:

a block of soft material having a substantially flat bottom surface and a substantially vertical anterior surface, a substantially U-shaped recess in said block of soft material subtending the anterior surface, the recess being of a size suitable for receiving the head of the reposing infant therein and touching the top of the infant's head while extending part way around the infant's head, and

a weight embedded in said block of soft material, said weight being sufficient to impede movement of said nestling barrier by the infant along the surface, said weight being substantially dense with respect to said soft material and surrounded by a substantial thickness of said soft material, said weight being disposed closer to a bottom surface of the nestling barrier than to a top surface of the nestling barrier.

4,783,866

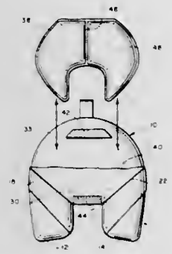
THERAPY PILLOW WITH REMOVABLE THERAPEUTIC GEL PACK

Ethel D. Simmons, 811 S. Bedford St., #301, Los Angeles, Calif. 90035; Lee Kudrow, 16542 Ventura Blvd., Encino, Calif. 91436

Filed Jan. 12, 1987, Ser. No. 2,052

Int. Cl.[4] A47G *9/00;* **A61F** *7/00*

U.S. Cl. 5—441 **5 Claims**



1. A therapy pillow for treating headaches comprising;

a cushioned pillow filled with a soft resilient material have a pair of extensions forming a substantially U-shape;

said pair of extensions constructed to fit around the back and a portion of the sides of a neck;

a pocket formed on at least one side of said pillow covering a substantial portion of said pillow and extending to near the end and in-seams to cover a substantial portion of said extensions;

said pocket constructed to provide intimate contact over nearly the entire occipital region of a human head resting on said cushioned pillow when said extensions are around the neck;

a flexible plastic container shaped to fit said pocket, said container being filled with a solution formulated to retain hot or cold temperatures for a substantial period of time;

said flexible container being comprised of two chambers, adapted to provide an even distribution of solution to the occipital region on both sides of a human head;

said pocket having an opening accessible from one side for insertion of said flexible plastic container with the heated or chilled solution, said opening being covered by a flap on said pocket;

closure means for closing and securing said pocket flap after insertion of said flexible plastic container;

whereby said pillow can be used to effectively treat headaches by providing intimate cushioned contact over nearly the entire occipital region of a human head resting on said pillow.

4,783,867

MULTI-FUNCTIONAL STATIONERY TOOL COMBINATION

Dan-Chern Tsao, 6F-1, No. 283, An-Ho Road, Taipei, Taiwan

Filed Oct. 30, 1987, Ser. No. 114,610

Int. Cl.[4] B26B *11/00*

U.S. Cl. 7—160 **5 Claims**

1. A multi-functional stationery tool combination, comprising:

a top casing (1), a bottom casing (3) connected to said top

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casing, a top guiding plate (2) connected between said top and bottom casings and a bottom guiding plate (4) connected between said top guiding plate and said bottom casing, said top casing having a narrow opening (101) therethrough, said top guiding plate having a protruding edge (20) thereon and a fixation hole (21) therethrough, said top guiding plate having a stepped platform (23) defining a measuring tape space with said top casing;

a slidable base (12) slidable mounted along said protruding edge;

a blade (N) mounted for sliding with said slidable base between said top casing and said top guiding plate;

fastening means (11) for connecting said slidable base to said blade, said fastening means having at least a portion extending through said narrow opening of said top casing for movement along said narrow opening for guiding the sliding movement of said blade;

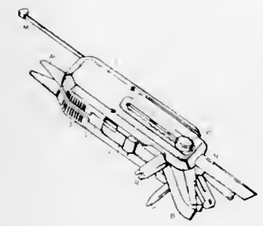
a staple removing device (R) pivotally mounted to said fixation hole of said top guiding plate for pivotal movement on said top guiding plate;

measuring tape means (M) mounted in said measuring tape space for discharging and retrieving a measuring tape;

said bottom guiding plate including a plurality of protruding elements (41);

a pencil sharpener (S) engaged with at least one of said protruding elements of said bottom guiding plate for positioning said pencil sharpener on said bottom guiding plate;

a container (5) for receiving pencil sharpening debris, said container having an opening facing said sharpener and being engaged with at least one of said protruding ele-



ments of said bottom guiding plate for positioning said container on said bottom guiding plate;

said top and bottom guiding plates each having a first elongated slot (25, 42) with the first elongated slot of said bottom guiding plate extending parallel to the first elongated slot of said top guiding plate, said top and bottom guiding plates each having a second elongated slot (26, 43) with the second elongated slot of said top guiding plate extending parallel to the second elongated slot of said bottom guiding plate;

a storage box (6) having a protruding knob (6) slidably engaged in the first elongated slot of each of said top and bottom guiding plates for sliding movement of said storage box along said first elongated slots and between said top and bottom guiding plates;

a stapler (B) having an engaging element (B2) slidably engaged with said second elongated slot of each of said top and bottom guiding plates for sliding of said stapler along said second elongated slots and between said top and bottom sliding plates;

a paper punch (C) mounted between said top and bottom guiding plates for punching a hole in paper;

a knife (D) pivotally mounted to said bottom guiding plate;

said bottom guiding plate having an L-shaped opening (40) therethrough and said bottom casing having an elongated opening (31) therethrough with at least a portion of said L-shaped opening extending parallel to said elongated opening;

a fixation element (A3) slidably mounted along and between said L-shaped and elongated openings;

two scissor blades (A1) pivotally mounted to said fixation element and being slidable between a storage position between said bottom guiding plate and said bottom casing, and a use position extending from said bottom guiding plate and bottom casing with sliding movement of said fixation element along said elongated and L-shaped openings;

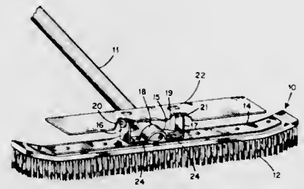
and spring means (A2) connected between said two scissor blades for biassing said scissor blades to spread when said scissor blades are in their use position extending out of said bottom guiding plate and said bottom casing.

4,783,868

VANE FOR UNDERLIQUID CLEANING DEVICE

James S. O'Callaghan, R.F.D. 2, Meredith, N.H. 03253

Filed Dec. 7, 1987, Ser. No. 129,450
Int. Cl.[4] E04H *3/20;* **A46B** *15/00*
U.S. Cl. 15—1.7 **12 Claims**



1. An underliquid-brush vane assembly comprising:

(a) a bracket assembly securable to an underliquid brush device for holding a vane plate in spaced relation to the back of said brush device;

b) a vane plate pivotally secured to said bracket assembly at pivot points on said bracket assembly; and,

(c) stops on said bracket assembly positioned assymetrically relative to said pivot points and limiting the rotational movement of said plate, whereby forward motion of a brush device, to which said bracket assembly is secured, in a liquid causes said plate to pivot to a position producing fluid pressure aiding contact of said brush with an adjacent surface while reverse motion of said brush causes said plate to pivot to a position of minimum impedance to movement.

4,783,869

ROTATIVE TOOTHBRUSH

Yu S. Lee, 283-13, Bukgajwa-dong, Seodaemun-ku, Seoul, Rep. of Korea

Filed Mar. 24, 1987, Ser. No. 29,712
Claims priority, application Rep. of Korea, Mar. 24, 1986, 86-3567; Jul. 21, 1986, 86-10550; Jul. 25, 1986, 86-10911
Int. Cl.[4] A46B *13/08*
U.S. Cl. 15—22 R **1 Claim**

1. A toothbrush comprising:

a brushhead member,

a shaft member connected to said brushhead member, said shaft member containing a plurality of net-shaped grooves disposed on the outside surface thereof,

a ring member slidably disposed on said shaft member and having a plurality of projecting members disposed thereon for engaging in said plurality of net-shaped grooves,

a cap member slidably disposed on said shaft member,

a tubular gripping member slidably disposed over said shaft member and said ring member for screw engagement with said cap member, and

spring means disposed inside of said tubular gripping member for biasing against the end of said shaft member



whereby the toothbrush is longitudinally and rotatably movable within the gripping member.

4,783,870

COMPACT DISK CLEANER

Ghoi K. Yeung, Hong Kong, Hong Kong, assignor to Recoton Corporation, Long Island City, N.Y.

Continuation-in-part of Ser. No. 745,672, Jun. 17, 1985, Pat. No. 4,654,917. This application Aug. 18, 1986, Ser. No. 897,289
Int. Cl.[4] B08B *11/02;* **G11B** *3/58*
U.S. Cl. 15—97 R **7 Claims**



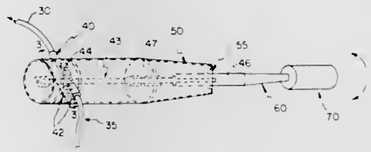
1. Cleaning apparatus for a compact disc comprising a housing having a hingedly coupled base and cover; a drive wheel disposed in the base of the housing and having a first axis of rotation rotatably supporting the compact disk, said drive wheel having external gear teeth; a rotatable carrier fixed to the cover and having a second axis of rotation, said rotatable carrier having external gear teeth and further having a cleaning pad fastened thereto which is adapted to contact the surface of the compact disk to clean the same; and drive means coupled to the wheel and the carrier for driving the drive wheel and the carrier to rotate about their first and second axes of rotation, respectively, so that the drive wheel supporting the compact disk and the cleaning pad cleaning the compact disk rotate at approximately the same speed; said drive means including a first gear system having first and second unitarily rotatable gear means and also including means to drive said first gear system, the first gear means being in direct meshing engagement with the external gear teeth of said drive wheel to rotate the drive wheel in a first direction, and a second gear system having third and fourth unitarily rotatable gear means, the third gear means being in direct meshing engagement with the second gear means and the fourth gear means being in direct meshing engagement with the external gear teeth of said carrier to rotate the carrier in a second direction opposite to said first direction.

4,783,871

WATER POWERED TOOTHBRUSH

Joseph Rich, Jr., R.D. 2, 177-B, Cobblewood Rd., Blairstown, N.J. 07825

Continuation-in-part of Ser. No. 730,115, May 30, 1985, abandoned. This application Feb. 3, 1987, Ser. No. 10,465
Int. Cl.[4] A46B *13/02*
U.S. Cl. 15—23 **7 Claims**



1. A water powered rotary toothbrush adapted to rotate in either of two directions comprising:

a housing having a center shaft and a pair of ports;

said center shaft having a first end in said housing and a second end extending out of said housing, said center shaft being rotatable in either direction;

said pair of ports being axially aligned with respect to each other, and each port being located on an opposite side of said housing;

a paddle wheel connected to said center shaft and positioned near the first end of said center shaft and approximately equally spaced from each one of said pair of ports, said paddle wheel being rotatable with said center shaft;

a rotatable brush element removably attached to the second end of said center shaft; and

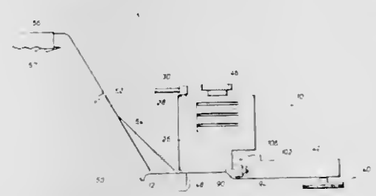
means for introducing water into said housing through one of said pair of ports so as to strike said paddle wheel causing said center shaft, said paddle wheel and said brush element to rotate and in the same direction.

4,783,872

FLOOR AND BASEBOARD TREATING MACHINE

Herbert G. Burboe, Amarillo, Tex., assignor to The 3J Company, Victoria, Tex.

Filed Nov. 25, 1986, Ser. No. 934,902
Int. Cl.[4] A47L *11/162, 11/18*
U.S. Cl. 15—98 **5 Claims**



1. A machine for treating a floor comprising:

a frame base plate defining a longitudinal axis,

a guiding and control handle attached to said frame base plate,

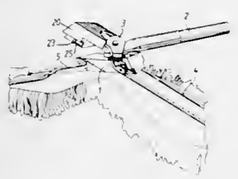
a pair of laterally spaced rollers secured to said frame base plate for at least partially pivotally supporting said machine with respect to the floor,

a mounting plate disposed on said frame base plate,

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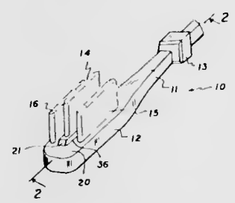
a drive motor carried by said mounting plate,
an elongated extension member secured at one end to said mounting plate and having at its other end a treating head means, said treating head means for rotatingly treating the floor and at least partially supporting said machine with respect to the floor,
means for transmission of rotation of said drive motor to said treating head means, and
securing means for angularly varying said mounting plate with respect to said frame base plate such that said mounting plate and said treating head means of said elongated extension member may be variably angularly oriented within an arc extending from both lateral sides of said longitudinal axis,
whereby the weight of said drive motor is at least partially transferred to said treating head means via said mounting plate and said elongated extension member.

4,783,873
SWEEP MOPS
Ronald A. Young, London, England, assignor to Scot Young Service Systems Limited, Lye, England
Filed May 26, 1987, Ser. No. 54,030
Claims priority, application United Kingdom, May 28, 1986, 8612959
Int. Cl.[4] A47L *13/258*
U.S. Cl. 15—147 A **11 Claims**



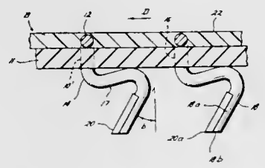
1. A sweep mop pad holder for a mop pad having two ends, said holder comprising a support section having a handle mounting on its upper side, two end sections which are adapted at outer ends thereof for the attachment thereto respectively of the two ends of the mop pad, said end sections being pivotally mounted to said support section so as to project at opposite ends thereof when in a generally aligned erected position for mopping, means for releasably latching said end sections in said erected position, with one of said end sections having an inward extension beyond said handle mounting and beyond its pivotal mounting to the support section, the arrangement being such that the latching means for said end sections can be unlatched to collapse the mop holder when both of said end sections can hang down freely from the pivotal mounting to said support section for wringing out of the attached mop pad, following which said handle can be so positioned relative to said support section that the handle engages said inward extension of said one end section and can then be used to support said one end section at an inclination to the vertical suitable for the mop to be re-erected with said end sections in said generally aligned mopping position by engagement of the collapsed mop with the floor and pressing down on to the floor by an operative holding the handle.

4,783,874
ADJUSTABLE HEAD BRUSH
Robert Perches, Encino; Otto Osswald, Santa Monica, and Erik M. Arnhem, Los Angeles, all of Calif., assignors to Robert Perches & Associates, Inc., Encino, Calif.
Filed Apr. 3, 1987, Ser. No. 34,058
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167.1 **8 Claims**



1. An adjustable head brush comprising:
a brush body having a head portion and a handle portion, said head portion defining a brush surface, an internal cavity and channel in communication therewith;
a first plurality of bristles adjacent said channel extending upwardly from said brush surface;
a moveable bristle support supporting a second plurality of bristles and being received within said channel;
support means coupled to said moveable bristle support operative to support said moveable bristle support in a raised position in which said second plurality of bristles extend upwardly beyond said first plurality of bristles, and a lower position in which said second plurality of bristles are generally even with said first plurality; and
slide means coupled to said support means and slideably supported upon said handle portion, said support means operative in response to movement of said slide means,
said moveable bristle support and said support means formed of a single molded member including an integral hinge coupling said moveable bristle support to said support means and said support means including an elongated pivot arm having a first end coupled to said moveable bristle support and a second end cooperating with said slide means and a pivot extension intermediate said first and second ends, said slide means operative to pivot said pivot arm.

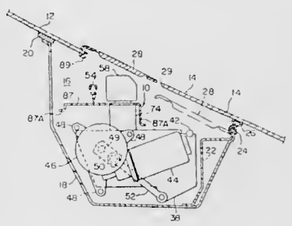
4,783,875
CLEANING DEVICE
Spencer D. Cottam, 11210 Cypress Way Dr., Houston, Tex. 77054
PCT No. PCT/US85/01076, § 371 Date Feb. 10, 1987, § 102(e) Date Feb. 10, 1987, PCT Pub. No. WO86/07292, PCT Pub. Date Dec. 18, 1986
Continuation-in-part of Ser. No. 513,695, Jul. 14, 1983, Pat. No. 4,531,253. This PCT application Jun. 10, 1985, Ser. No. 15,139
Int. Cl.[4] A47L *13/08*
U.S. Cl. 15—236.01 **20 Claims**



1. A cleaning device for use with a drive unit for contacting a surface to be cleaned comprising:

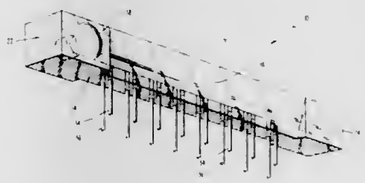
a plurality of bent wires, each wire having a crown portion and a pair of elongated pins extending substantially perpendicular in a downward direction from said crown portion;
a resilient mounting member receiving each of said bent wires with the crown portion on the upper surface of said member and with said elongated pins extending through said resilient mounting member;
said elongated pins having a first portion angularly disposed to the surface plane of said resilient mounting member and substantially within said resilient mounting member and a second portion connected to the first portion at an opposite angle relative to said first portion;
means cooperating with said mounting member for releasably attaching said device to a drive unit to impart movement to said wires relative to the surface to be cleaned; and said bent wires having an adhesion resistant coating.

4,783,876
CONCEALABLE WIPER APPARATUS FOR VEHICLE
Kazuo Souma; Osamu Kondo; Yasunori Hirosawa; Souichirou Okudaira, all of Aichi-ken; Ikuo Souda, and Yukio Honda, both of Shizuoka-ken, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Sep. 3, 1986, Ser. No. 903,323
Claims priority, application Japan, Sep. 3, 1985, 60-194676; Oct. 8, 1985, 60-233057; Oct. 18, 1985, 60-233055; Nov. 22, 1985, 60-263159
Int. Cl.[4] B60S *1/02, 1/26*
U.S. Cl. 15—250.17 **44 Claims**



43. A concealable wiper apparatus for a vehicle, comprising:
(a) an accommodating chamber provided inside a body of the vehicle and in the vicinity of a window glass provided on the vehicle body, said accommodating chamber having a surface substantially flush with said window glass;
(b) a wiper assembly accommodated in said accommodating chamber;
(c) lifting means for vertically moving said wiper assembly between an accommodated position at which said wiper assembly is accommodated in said accommodating chamber and a raised position at which said wiper assembly wipes said window glass;
(d) shutter means adapted to close an opening and to make said window glass and the vehicle body surface substantially flush with each other when said wiper assembly is accommodated; and
(e) closure means including a mole supported by said wiper assembly to move therewith for closing said opening and making said window glass and the vehicle body surface substantially flush with each other when said wiper assembly is at the raised position,
whereby, when said wiper assembly is accommodated, it is possible to reduce the air resistance to the vehicle and protect said wiper assembly from any external force.

4,783,877
HAND-HELD ASSAY WASHER
Paul W. Vince, Chantilly, Va., assignor to INTI Corp., San Rafael, Calif.
Filed Jan. 6, 1986, Ser. No. 816,256
Int. Cl.[4] B08B *9/04*
U.S. Cl. 15—302 **4 Claims**



1. A hand-held washer for beads or a plurality of containers comprising:
an elongated washer body of transparent material having upper and lower walls extending along the elongated length thereof;
an inlet channel extending within the washer body for carrying fluid from a source, the inlet channel being visible through the transparent material of the washer body;
an outlet channel extending within the washer body for supplying suction from a vacuum source, the outlet channel being visible through the transparent material of the washer body;
a plurality of wash tubes, each disposed in fluid communication with and extending from the inlet channel through the lower wall of the washer body at a selected location along the length thereof to a remote tip;
a plurality of aspirator tubes, each disposed in fluid communication with and extending from the outlet channel through the lower wall of the washer body at a selected location along the length thereof to a remote tip, said aspirator tubes descending further form the lower wall than the wash tubes and including covering thereon of non-scratch material extending beyond the remote tips thereof;
sealing means disposed within the washer body to terminate the inlet channel and the outlet channel substantially adjacent the last wash tube or aspirator tube in communication therewith along the lengths thereof to provide self-purging fluid paths in the inlet and outlet channels;
said washer body including side walls between the upper and lower walls that extend substantially along the portion of the elongated length thereof adjacent the selected locations and that taper inwardly over the dimensions of the side walls between the upper and lower walls at an angle substantially in alignment with the remote tips of said tubes to facilitate viewing of the remote tips of at least said aspirator tubes along the corresponding side wall of the washer body; and
valve means connected to the inlet channel controlling the flow of fluid therein.

4,783,878
VACUUM CLEANER
James McCambridge, Polo, Ill., assignor to Central Quality Industries, Inc., Polo, Ill.
Division of Ser. No. 919,660, Oct. 16, 1986, Pat. No. 4,688,293, which is a division of Ser. No. 721,061, Apr. 8, 1985, Pat. No. 4,654,926. This application Mar. 11, 1987, Ser. No. 24,557
Int. Cl.[4] A47L *9/22*
U.S. Cl. 15—327 D **5 Claims**

1. An improved vacuum cleaner of the type having a canister with a removable lid and defining an internal space and an

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inlet to admit matter into the internal space for accumulation therein, the improvement comprising:

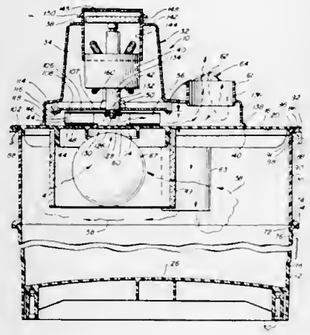
a motor without a casing having means for evacuating air from the space within the canister;

a housing defining a cavity to accept the motor;

means for attaching the housing to the canister;

means for mounting the motor without a casing in the housing cavity,

said motor mounting means including a cylindrical portion extending into the cavity to define a cylindrical chamber



for close surrounding reception of only a portion of the motor so that the remainder of the motor is directly exposed to the housing cavity;

means for exhausting air from the cylindrical chamber; and

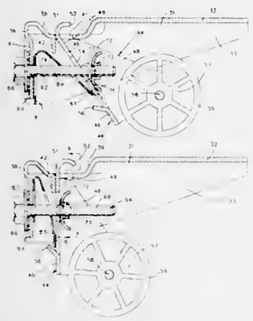
said motor mounting means including means for admitting ambient air into the housing cavity and for guiding passage of incoming ambient air in heat exchange relationship directly against and past the motor through the cylindrical chamber in a cooling flow path and through said exhausting means after passage of said air against the motor.

4,783,879

ROLLER ASSEMBLY FOR SUPPORTING HOUSEHOLD APPLIANCES

Douglas E. Weaver, Greenville, Mich., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 11, 1988, Ser. No. 142,509
Int. Cl.[4] B60B *33/06*
U.S. Cl. 16—34 **11 Claims**



1. An adjustable roller assembly for mounting on the underside of a household appliance, comprising:

a frame having a top wall securable to the appliance, said frame having a downwardly extending front wall;

a roller carrier including a center section having first and second ends, said first end being pivotally connected to said frame top wall at a point a spaced distance from said frame front wall;

a roller secured to said roller carrier adjacent said second end; and

threaded means interconnecting said frame front wall and said roller carrier at a point intermediate said first and second ends so that said threaded means operates to rotate said roller and roller carrier about said pivotal connection and thereby raise or lower said appliance.

4,783,880

DEMOUNTABLE URETHANE CASTER WHEEL TIRE

Howard H. Chapman, Bloomfield Hills, and Robert F. Chapman, Troy, both of Mich., assignors to Eagle Boring, Inc., Lapeer, Mich.

Filed Feb. 26, 1987, Ser. No. 19,346
Int. Cl.[4] B60B *33/00*
U.S. Cl. 16—45 **1 Claim**



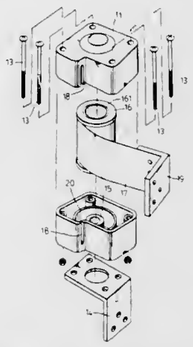
1. A caster wheel assembly (**10**) comprising: a wheel member (**40**) including a hub portion (**42**), a web portion (**48**) extending radially outwardly from said hub portion (**42**), and a first laterally extending rim portion (**52**); a circular member (**54**) including a web portion (**56**) removably fastened to said web portion (**48**) of said wheel member (**40**) and a second rim portion (**60**) extending laterally and projecting oppositely relative to said first rim portion (**52**), said rim portions (**52,60**) together having a V-shaped tire support surface (**62**) when viewed in cross section; a tire (**64**) consisting of a solid annular thin one piece metallic band member (**66**) having an outer and inner surface (**68,70**) and a solid one piece resilient member (**72**) having an inner surface adhered to said outer surface (**68**) of said band member (**66**), said resilient member having an outer tread, said inner surface (**70**) being V-shaped when viewed in cross section, and fastening means for fastening said circular member (**54**) to said wheel member (**40**) to clamp and deform said inner surface (**70**) of said band member (**66**) in a friction fit against said tire support surface (**62**) for preventing deflection of said resilient member (**72**) under heavy loads, said V-shape of said tire support surface (**62**) defines an interior angle α and said V-shaped inner surface (**70**) of said band member (**66**) defines an interior angle β, β being greater than α placing the resilient member at least adjacent the tire support surface in compression to prevent rubber defection under heavy loads.

4,783,881

DOOR CLOSING DEVICE WITH A BELT-SHAPED SPIRAL SPRING

Shi C. Ho, No. 31, Fan She Street, 1 Lin, Fan She Tseng, Fu Shin Hsiang, Chang Hua Hsien, Taiwan

Filed Apr. 9, 1985, Ser. No. 721,390
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—72 **7 Claims**



1. A door closing device, comprising:

(a) a housing adapted to be mounted to one of a door and a door frame, said housing comprising an upper portion and a lower portion connected to said upper portion by fastening means, each of said housing portions including a vertically extending slot along an exterior surface portion thereof;

(b) a hollow cylindrical reel rotatably disposed within said housing about a support member comprising a bushing;

(c) a belt-shaped spiral spring being wound on said reel and comprising a first end portion and a second end portion, said first end portion comprising means for mounting said spiral spring to one of said door and said door frame, and said second end portion being fixedly attached to said reel, wherein said slots, when said housing portions are assembled, mate with each other to form a larger slot, wherein said first end portion extends outwardly through said larger slot so that when a door opening force is applied to said first end portion, an elastic force is produced for effecting the closing of said door; and

(d) braking means fixedly mounted to said housing, said braking means continuously abutting an interior surface of said bushing to regulate the rotation of said reel; wherein said braking means comprises a plate, a plurality of balls, and a plurality of upwardly and outwardly extending strips integrally mounted along the periphery of said plate, whereby the upper ends of said strips force said balls to abut against said interior surface of said bushing positioned within the center of the rotatable reel, to thereby regulate the rotation thereof.

4,783,882

DOOR CLOSER ASSEMBLY

George Frolov, Farmington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 13, 1986, Ser. No. 818,155
Int. Cl.[4] E05F *1/08*
U.S. Cl. 16—72 **3 Claims**

1. A door closer assembly for connection between door and frame members relatively movable between open and closed positions, said assembly comprising:

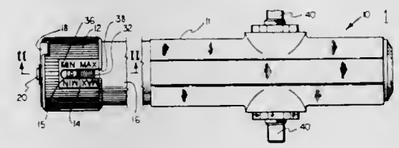
a housing member defining a longitudinally extending chamber and including screw threads formed on the external wall thereof adjacent a first end;

a screw-like member rotatably mounted within the chamber;

a follower mounted on the screw-like member and movable axially therealong upon rotation thereof;

spring means disposed in said chamber and engaged by said follower with axial movement of said follower relative to said screw-like member varying the degree of compression of said spring means;

handle means connected to said screw-like member and mounted for rotation about the first end of said housing member and including at least one axially elongated slot



extending parallel to the longitudinal axis of said housing member with rotation of said handle means resulting in rotation of said screw-like member; and

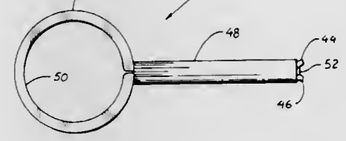
an indicator nut having screw threads engageable with the housing screw threads and including at least one upstanding lug member positioned within the slot of said handle means whereby rotation of said handle means results in simultaneously axial movement of said follower and said indicator nut.

4,783,883

LEVER ASSISTS FOR DOOR KNOBS

Alexander Szalay, 10 Rano St., Buffalo, N.Y. 14207

Filed Feb. 2, 1987, Ser. No. 9,912
Int. Cl.[4] B25G *3/28*
U.S. Cl. 16—114 R **1 Claim**



1. A new and improved leverage increasing device removably attachable to a conventional door knob, said leverage increasing device comprising:

clamp means positionable around said door knob;

handle means extending outwardly from and being attached to said clamp means wherein said handle means is integrally attached to said clamp means, and

clamp means tightening means for effecting a secure tightening of said clamp means around said door knob after said clamp means has been positioned thereover, and

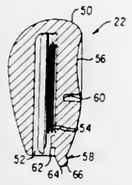
said clamp means comprises a strip of flexible rubber, and

said handle means comprises a length of rigid conduit, said strip of flexible rubber having its free ends positionable through an interior portion of said conduit, and

said clamp means tightening means comprises pulling said free ends of said rubber strip through said conduit until said clamp means is fixedly secure around said door knob, said clamp means tightening means further including a separate wedge member positionable between said free ends within said conduit to prevent further relative movement between said free ends and said conduit and enable subsequent removal of said separate wedge member for removal of said conduit from said strip of flexible material to enable removal of said clamp means from around said door knob.

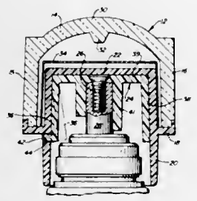
VOL 1096 ISS 3 NO 15 1988 UMI

4,783,884
KNOB
David K. Stricker, Juneau; John B. Kuhn, Rubicon; Virgil P. Huhmann, Beaver Dam, and William E. Chase, Colgate, all of Wis., assignors to Deere & Company, Moline, Ill.
Filed Jan. 13, 1987, Ser. No. 3,332
Int. Cl.[4] B25G *1/00*
U.S. Cl. 16—114 R 22 Claims



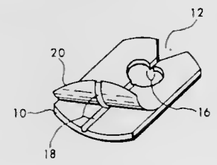
1. A knob for mounting on a lever having first mating means, said knob comprising:
a knob body;
means, operatively associated with said body, for receiving said lever; and
resilient means, integrally formed with said body, for operatively connecting said knob to said lever, said resilient means comprising an extension, said extension having second mating means operatively connected thereto, said second mating means being connected to the side of said extension most proximate said lever receiving means, said extension having means for selectively operatively engaging and disengaging said first and said second mating means, said selective engaging and disengaging means being a surface operatively positioned on the side of said extension most proximate said lever receiving means and at the end of said extension most remote from its connector to said knob body.

4,783,885
FAUCET HANDLE WITH DEFLECTABLE ATTACHMENT MEMBER
Steven Bory, River Forest, Ill., assignor to Injecto Mold, Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 29,624, Mar. 24, 1987. This application Jul. 22, 1987, Ser. No. 76,316
Int. Cl.[4] B65D *25/28*
U.S. Cl. 16—114 R 8 Claims



2. A faucet handle which comprises:
an upper portion having a top and a downwardly depending skirt; and
a lower portion having an outer peripheral wall, an inward member, and a central sleeve for connection to handle hardware;
said upper portion defining an aperture in said skirt, said lower portion defining an outwardly biased, inwardly deflectable retention member having a part which snugly fits within said aperture to retain said upper portion and lower portion in locked-together relation, said retention member being inwardly deflectable by pushing for a distance that permits unlocking and separation of said upper and lower portions, said retention member comprising a resilient strip portion of said outer peripheral wall connected to the rest of said lower portion at only one end, said downwardly depending skirt defining an annular flange positioned above said aperture, said flange serving to at least partly seal said aperture from view from directions facing said upper portion.

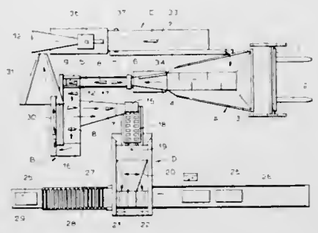
4,783,886
PAPER-LAMINATED PLIABLE CLOSURE FOR FLEXIBLE BAGS
Lou W. Koppe, P.O. Box 567, Athabasca, Alberta, Canada
Filed Aug. 24, 1987, Ser. No. 88,691
Int. Cl.[4] B65D *77/10*
U.S. Cl. 24—30.5 S 9 Claims



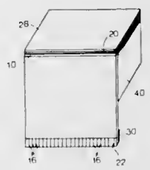
1. In a bag closure of the type comprising a flat body of material having two major sides which face in opposite directions, a lead-in notch beginning at one edge of said body of material and extending into said body, a gripping aperture in said body which is adjacent to and which communicates with said notch, and a layer of paper laminated to one side of said body, the improvement wherein said flat body of material
(a) is made of a flexible plastic of the type which can be repeatedly bent and straightened without fracture,
(b) is elongated, and
(c) has a longitudinal groove on said one side of said body which extends the full length of said one side, from said gripping aperture to the opposite edge,
whereby said closure can be bent so that it can easily be removed from a bag without damaging said bag, and thereafter can be straightened so that it can be re-used as a closure on said bag, and whereby any bending of said closure will cause said paper layer to tear or be distorted so as to leave an indication that said closure was bent and possibly removed and replaced.

4,783,887
MACHINE FOR CLASSIFYING, CLEANING AND ARRANGING TEXTILE TUBES
Jose R. Trias, Fontcuberta, 34-Urbanizacion "La Coromina", Manlleu (Barcelona), Spain
Filed Jul. 18, 1985, Ser. No. 756,964
Claims priority, application Spain, Jan. 22, 1985, 539,741
Int. Cl.[4] B65H *73/00*
U.S. Cl. 28—292 11 Claims

1. A machine for classifying, cleaning and arranging textile tubes, comprising:
means for taking in the textile tubes including clean tubes and tubes containing yarn residues;
means for classifying the tubes including means for circulating the tubes so that the clean tubes are separated from the tubes containing yarn residue and including a guide;
means for cleaning the yarn residue from the tubes containing yarn residue; and
means for arranging the tubes so that they can be uniformly stacked, said circulating means of said classifying means including a plurality of adhesive members and conveyor means for conveying the textile tubes on said plurality of adhesive members, said plurality of adhesive members being pivotally articulated to said conveyor means, said guide being formed so that when said plurality of adhesive members travel on said guide, the clean tubes being conveyed fall off by gravity and yet the tubes with yarn residue that are being conveyed are retained by said plurality of adhesive members.

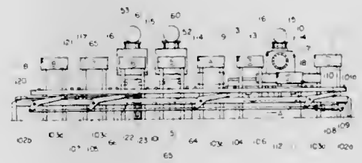


4,783,888
METHOD OF MANUFACTURING AN ULTRASONIC TRANSDUCER
Tadashi Fujii; Hiroyuki Yagami, both of Fujinomiya; Iwao Seo, and Masahiro Sasaki, both of Ibaraki, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 777,284, Sep. 18, 1985, Pat. No. 4,701,659. This application Mar. 26, 1987, Ser. No. 31,427
Claims priority, application Japan, Sep. 26, 1984, 59-199685; Oct. 27, 1984, 59-225126
Int. Cl.[4] H01L *41/22*
U.S. Cl. 29—25.35 4 Claims



1. A method of manufacturing an ultrasonic transducer, comprising:
a single conductive pattern formation step which comprises forming a first electrode and a first lead conductor integral with a first flexible substrate on a surface thereof, said first lead conductor extending along the surface of said first flexible substrate starting from a side edge of said first electrode, and forming a second electrode and a second lead conductor integral with a second flexible substrate on a surface thereof, said second lead conductor extending along the surface of said second flexible substrate starting from a side edge of said second electrode;
a bonding step of bonding said first and second electrodes to opposing first and second main surfaces of a piezoelectric member, which is formed from a piezoelectric polymer material or a piezoelectric polymer composite, by applying an adhesive to a surface of said first electrode and to a surface of said second electrode;
said second flexible substrate being formed as a part of said first flexible substrate, and said bonding step further comprising a folding step of folding said second flexible substrate onto said first flexible substrate with said piezoelectric member interposed therebetween; and
a polarizing step of polarizing said piezoelectric member at least by applying a voltage across said first and second electrodes.

4,783,889
TRANSFER MACHINING SYSTEM
Shigeru Hayashi, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Continuation of Ser. No. 11,875, Feb. 6, 1987, abandoned. This application Nov. 17, 1987, Ser. No. 121,540
Claims priority, application Japan, Feb. 13, 1986, 61-27984
Int. Cl.[4] B23Q *7/00*
U.S. Cl. 29—33 P 14 Claims



1. A transfer machining system, comprising:
conveying means for intermittently feeding a workpiece a fixed distance in a conveyance direction;
a plurality of supporting means for each supporting the workpiece until the moment of a subsequent intermittent feed, a plurality of said supporting means being arranged in the conveyance direction and spaced apart a distance equivalent to a single intermittent feed distance; and
a plurality of machining means arranged in the vicinity of respective ones of said supporting means for subjecting the workpiece supported by said supporting means to predetermined machining;
said conveying means including
a walking beam for receiving the workpiece, and
driving means for moving said walking beam upward, forward, downward and backward, wherein said walking beam is driven by said driving means to raise the workpiece supported by said supporting means from a supported position so as to be released from a supported state on said supporting means, to convey the workpiece in the conveyance direction to a point above the next supporting means and thereafter to lower the workpiece so that the workpiece is supported by this next supporting means;
one of said plurality of machining means having a first working area;
a supporting position of said supporting means near said machining means having the first working area being at a level different from that of supporting means adjacent said supporting means which is set near said machining means having the first working area, whereby the workpiece is set at a position which will not interfere with the first working area relative to said supporting means adjacent the supporting means which is corresponding to said machining means, 1
the machining means having the first working area having a side milling machining, and
further comprising
driving means connected to said side milling machine for moving said side milling machine toward and away from a workpiece supported on supporting means located near said side milling machine, and for reciprocating said side milling machine in the conveyance direction.

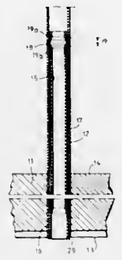
VOL 1096 ISS 3 NO 15 1988 UMI

4,783,890

METHOD OF REPAIRING A STEAM GENERATOR TUBE BY MEANS OF LINING

Jean-Paul Gaudin, Chassieu, France, assignor to Framatome, Courbevoie, France

Filed Mar. 27, 1986, Ser. No. 845,147
Claims priority, application France, Mar. 29, 1985, 85 04835
Int. Cl.[4] B23P *6/00*
U.S. Cl. 29—402.16 **2 Claims**



1. Method of repairing, by means of lining, a tube (**12**, **30**) of a steam generator with a tube bundle and a tube plate (**11**) inside which the tubes (**12**, **30**) of the bundle are expanded, from the inlet side (**13**) of the tube plate (**11**) with which the ends of the tube (**12**) lie flush as far as the outlet side (**14**) where the tubes penetrate the housing of the steam generator, said method comprising the steps of

(a) introducing into the tube (**12**, **20**) to be repaired, on the inlet side (**13**) of the tube plate (**11**), a tubular liner (**15**, **31**) with an external diameter slightly less than the internal diameter of the tube (**12**, **30**) and of suitable length for the repair to be performed;

(b) fixing the liner (**15**, **31**) by means of expansion inside the tube (**12**, **30**) in a first zone close to its end, in the vicinity of the inlet side (**13**) of the tube plate (**11**); and

(c) fixing the liner (**15**, **31**) inside the tube (**12**, **30**), in a second zone outside the tube plate (**11**), by effecting an initial mechanical deformation (**19**, **32**), by means of expansion, followed by a weld (**18**, **33**) between the liner and the tube;

(d) said mechanical deformation (**19**, **32**) of the liner (**15**, **31**), achieved by means of expansion of its end part opposite the end (**16**) expanded inside the tube plate (**11**), being located at a limited height;

(e) the parameters of said mechanical deformation (**19**, **32**) being calculated in accordance with the welding parameters subsequently applied; and

(f) said welding parameters being so determined that the temperature reached in critical zones (**19***a*, **19***b*), by means of conduction from a fusion zone, exceeds the temperature at which stresses in said critical zones are relieved, thereby relieving stresses in zones subjected to said deformation.

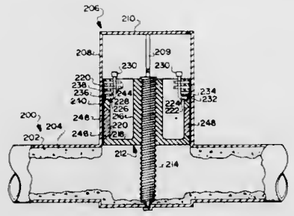
4,783,891

RELINING PROCESS FOR INTERIOR SURFACE OF A HOLLOW ARTICLE

Norman B. Rice, 2062 24th St., Cuyahoga Falls, Ohio 44223

Division of Ser. No. 865,757, May 22, 1986. This application Jul. 6, 1987, Ser. No. 69,834
Int. Cl.[4] B23P *17/00*
U.S. Cl. 156—94 **7 Claims**

1. A process for relining an interior surface of a hollow article which is capable of being pressurized, said process comprising: (a) inserting into said article an inflatable elastomeric lining which conforms to said interior surface when inflated, (b) bonding said lining to said interior surface by



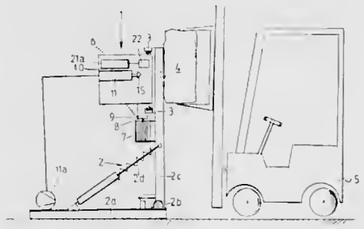
means of an adhesive, and (c) applying gas pressure to said lining to inflate the same.

4,783,892

METHOD AND APPARATUS FOR CUTTING A TYING MEMBER OF A BALE OF A RAW MATERIAL

Hubert Hergeth, Kockerellstr. 4, D-5100 Aachen, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 929,063
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, 3540190; Jun. 30, 1986, 3621912; Sep. 18, 1986, 3631707
Int. Cl.[4] B23P *19/02, 23/00*
U.S. Cl. 29—426.4 **6 Claims**



1. A method of cutting tying members surrounding a bale of material having a plurality of said tying members spaced apart over the length of said bale and exposed at a bound surface of said bale, said method comprising the steps of:

juxtaposing said bound surface of said bale with a support having a carriage displaceable on said support parallel to the length of said bale, and a cutting blade on said carriage having a cutting element engageable with said tying members of said bale and having a length which is equal to a small fraction of said length of said bale;

retracting said cutting blade in a direction perpendicular to said members and away from said bale and applying energy to said blade in a direction opposite to the direction of retraction and retaining said blade against said energy, said energy being sufficient to apply said blade against said members at at least 150 Nm on impact with each member;

displacing said carriage along the length of said bale;

sensing the alignment of said blade with each of said tying members upon the displacement of said carriage along said length of said bale; and

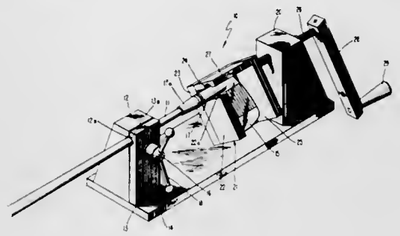
releasing said blade automatically upon each sensing of the alignment of said blade with one of said tying members so that said blade is driven with said energy against said tying member at a velocity of at least 3 m/sec to cut the respective tying member.

4,783,893

METHOD OF REMOVING A HEAD FROM A GOLF CLUB

Robert Farino, 12842 Jefferson Ave., Newport News, Va. 23602

Filed Sep. 4, 1987, Ser. No. 93,569
Int. Cl.[4] B23P *19/00, 19/04*
U.S. Cl. 29—426.5 **3 Claims**



1. A method for removing a head portion bonded to a shaft of a golf club by extracting the shaft from a hosel in a hosel section of said head portion, said method comprising:

(a) fixing the position of the shaft along its longitudinal axis with a shaft securing means,

(b) gripping the head portion with a head grasping means to turn the head portion about an axis of rotation that is substantially co-extensive with the longitudinal axis of the shaft,

(c) applying heat to the outer surface of the hosel section of the head portion for expanding the material therein with respect to the shaft, and

(d) applying pressure to the head for urging the heated portion away from the shaft securing means while rotating the head grasping means to turn the head portion about said axis of rotation,

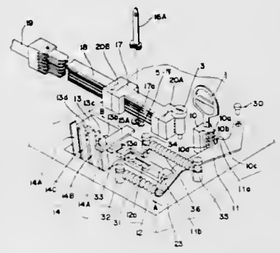
(e) rotating said head grasping means until the head portion is removed from the shaft.

4,783,894

LOCK PLATES INSERTING MACHINE AND METHOD OF INSERTING SAID LOCK PLATES FOR A KEY CYLINDER

Terumoto Yamaguchi, Anjo, and Akira Kominami, Nishikasugai, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Aug. 20, 1986, Ser. No. 898,107
Claims priority, application Japan, Aug. 20, 1985, 60-183624
Int. Cl.[4] B23P *15/00;* **E05B** *29/00*
U.S. Cl. 29—434 **5 Claims**



1. A lock plates inserting machine for inserting lock plates corresponding to respective serrations of a key into a plurality of lock plate receiving openings defined at regular intervals in a key cylinder in the axial direction thereof, said lock plates inserting machine comprising:

a base,

a key holder having a plurality of grooves defined therein corresponding to respective serrations of the key to be inserted;

at least one key serrations detecting member having one end freely pivotally mounted on a fulcrum disposed on said base and a key serrations detecting convex portion in the vicinity of said fulcrum, a spring resiliently urging said at least one key serrations detecting member in a direction to insert said key serrations detecting convex portion into one of said grooves of said key holder;

at least one slide member disposed on said base and having concave portions corresponding to the sizes of the key serrations defined at regular intervals thereon in its sliding direction, the slide amount of said slide member varying in accordance with the sizes of the key serrations;

said at least one key serrations detecting member being arranged and interconnected with said at least one slide member so that pivotal movement of said at least one key serrations detecting member causes sliding of said at least one slide member;

a plurality of push levers, corresponding to respective concave portions of said slide member, each said push lever being resiliently urged by spring means and positioned so that a particular one of said push levers is inserted into its corresponding concave portion of said slide member in accordance with the slide amount thereof;

a plurality of first push members corresponding to respective said push levers and being interconnected respectively to said push levers;

a plurality of lock plates support members securely mounted on said base at positions respectively corresponding to said first push members for supporting thereon lock plates of different sizes;

said first push members being positioned to push said lock plates from said lock plates support members;

an elevating member having a plurality of lock plate receiving grooves corresponding to the lock plates receiving openings of the key cylinder, the lock plates pushed out by said first push members being sequentially inserted into said lock plates receiving grooves; and

a plurality of second push members operated by a drive means and inserted into respective lock plate receiving grooves of said elevating member from one end thereof for inserting the lock plates placed in regular order in said lock plates receiving grooves into the lock plate receiving openings of a key cylinder held at the other end thereof.

5. A method of inserting lock plates for key cylinder, wherein the lock plates respectively corresponding to serrations of a key are inserted into a plurality of lock plate receiving openings defined at regular intervals on a key cylinder in the axial direction thereof, said method comprising the steps of:

inserting the key into a key holder;

inserting a key serrations detecting convex portion formed on a key serrations detecting member into one of a plurality of grooves defined in said key holder for detecting the key serrations so as to operate said key serrations detecting member in accordance with the size of one of the key serrations, said key serrations detecting member being resiliently urged by a spring;

sliding a slide member in response to the operation of said key serrations detecting member;

inserting one of a plurality of push levers corresponding to the size of one of said key serrations into a corresponding one of a plurality of concave portions formed on said slide member, a plurality of first push members being operated respectively by said plurality of push levers, each of said plurality of first push members being urged by respective springs and so disposed as to correspond to respective concave portions of said slide member;

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providing support members for holding different size lock plates;

pushing out, by one of said plurality of first push members, one of said lock plates corresponding to the size of said one of the key serrations and supported by one of said support members;

inserting said lock plate into one of a plurality of grooves defined in an elevating member and corresponding to the number of lock plate receiving openings defined in said key cylinder by continued pushing motion of said first push member;

inserting a plurality of required lock plates into respective grooves of said elevating member in accordance with the sizes and alignment of said key serrations by repeating the aforementioned operation; and

inserting required lock plates into corresponding lock plate receiving openings of said key cylinder disposed at one end of said elevating member by simultaneously inserting a plurality of second push members into respective grooves of said elevating member from the other end thereof so as to advance the lock plates together with said second push members within said elevating member.

4,783,895

METHOD OF MAKING APPARATUS FOR DAMPING TORSIONAL VIBRATIONS

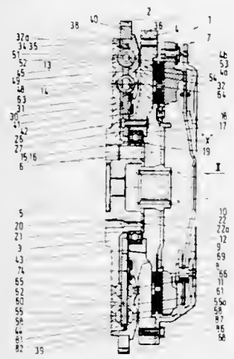
Wolfgang Reik, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jun. 23, 1987, Ser. No. 66,075

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622697; Sep. 6, 1986, 8623931; Sep. 19, 1986, 3631986; Dec. 13, 1986, 3642688

Int. Cl.⁴ F16C *15/00*

U.S. Cl. 29—434 **25 Claims**



1. A method of making torsional vibration damping apparatus wherein a composite flywheel has a first flywheel connectable with the engine of a motor vehicle and a second flywheel connectable with a transmission, wherein at least one of the first and second flywheels has an annular chamber for a supply of fluid medium being of pasty consistency having a high viscosity and wherein the first and second flywheels are movable angularly with reference to each other, comprising the steps of balancing at least the one flywheel; and rotating the one flywheel and the supply of fluid medium therein prior to the balancing step at a speed such that the fluid medium is uniformly distributed in the chamber to a level at a constant distance from the axis of rotation of the one flywheel.

4,783,896

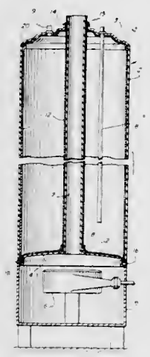
METHOD OF MAKING CATHODICALLY PROTECTED WATER HEATER

James S. Stubbe, Milwaukee; James L. Chevalier, Mequon, and Edwin C. Pow, Menomonee Falls, all of Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 940,430, Dec. 11, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,576

Int. Cl.⁴ B21D *53/00;* **B23P** *15/26;* **B21K** *29/00*

U.S. Cl. 29—455.1 **10 Claims**



1. A method of fabricating a water heater, comprising the steps of assembling and welding an upper steel head to the upper end of a cylindrical steel shell to provide a first preassembled unit, said upper head having an opening bordered by an upwardly extending annular flange, applying a non-metallic corrosion resistant coating to the inner surface of the shell and to the lower surface of the upper head and extending said corrosion resistant coating along the entire inner surface of said flange to the upper end thereof, securing a lower end of a flue within a central opening of a lower steel head to provide a second preassembled unit, applying a coating of a metal anodic to steel to the outer surface of the flue and extending the coating substantially continuously from the lower head to the upper end of the flue, applying a metal corrosion resistant coating to the upper surface of said lower head, assembling said second unit with said first unit by inserting the upper end of the flue through said opening in the upper head and bringing the outer periphery of said lower head into engagement with the inner surface of the lower end of said shell, welding the upper edge of said flange through said metal coating to said flue, and welding the lower end of said shell directly through said metal coating to said lower head.

4,783,897

PRESSURE CYLINDER FLANGE ATTACHMENT AND METHOD

Michael N. Basnett, Powys, Wales, assignor to Lucas Industries Public Limited Company, Birmingham, England

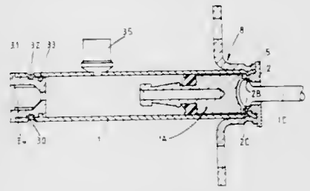
Filed Nov. 16, 1987, Ser. No. 121,051

Claims priority, application United Kingdom, Nov. 20, 1986, 8627751

Int. Cl.⁴ F01B *29/00;* **B23P** *15/00*

U.S. Cl. 92—161 **11 Claims**

1. A method of forming a pressure cylinder assembly which includes a cylinder and an outwardly projecting flange, comprises the steps of inserting into a tubular member a body having a depression in its outer surface such that said depression lies in opposition to the wall of the member, deforming said wall into the depression to lock the body at least axially within the member and to form a secondary depression in the outer surface of the member, placing a flanged collar around the member and deforming the collar into the secondary depression in such a manner as to lock the collar axially and rotationally relative to the body so that a flange of the collar may then serve to mount the assembly on a support.



8. A pressure cylinder assembly wherein an end member and a flanged collar are secured to a tubular member by a method according to claim 1.

4,783,898

METHOD OF PRODUCING A SHAFT HAVING PLATE-LIKE MEMBER JOINED THERETO

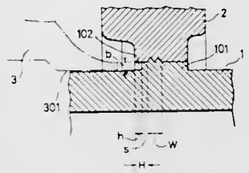
Hisanobu Kanamaru, Katsuta, and Yoshimi Sugaya, Funabashi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 75,938

Claims priority, application Japan, Jul. 25, 1986, 61-173656

Int. Cl.⁴ B21D *39/00*

U.S. Cl. 29—523 **11 Claims**



1. A method of producing a shaft having a member joined thereto, said member having two parallel flat first and second opposing surfaces, said method comprising the steps of:

forming a through hole in said member such that said through hole has a central axis perpendicular to said first and second parallel flat opposing surfaces of said member;

forming at least one annular groove in an inner peripheral surface of said through hole of said member, said annular groove having a rugged surface formed therein;

forming an annular projection with axial ends on the shaft at a position at which said member is to be mounted, said annular projection slightly projecting from a circumferential outer surface of said shaft and having an outer diameter which is substantially the same as or slightly smaller than the inner diameter of said through hole of said member, and forming first and second ring-shaped axial end surfaces on both axial ends of said annular projection;

inserting said shaft into said through hole of said member so that sides of said first and second axial end surface correspond to said first and second parallel flat surfaces of said member, and said first axial end surface of said annular projection is at the same level as said first parallel flat surface of said member;

supporting both one end of said shaft on the side of said second axial end surface of said annular projection and said second parallel flat surface of said member; and

pressing over an entire circumference of said first axial end surface of said annular projection of said shaft in an axial direction so that part of said annular projection of said shaft flows into said annular groove of said member to be fully filled therein.

4,783,899

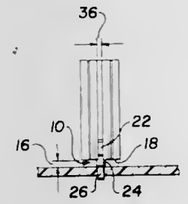
METHOD OF MOUNTING HEAT SINKS

Leonard S. Breese, Carrollton, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.

Division of Ser. No. 851,517, Apr. 14, 1986, which is a division of Ser. No. 644,215, Aug. 24, 1984, Pat. No. 4,602,315. This application Nov. 30, 1987, Ser. No. 126,822

Int. Cl.⁴ B23P *19/02*

U.S. Cl. 29—525 **4 Claims**



1. The method of mounting a heat sink having an aperture of first predetermined diameter therein on a circuit board having a hole of second predetermined diameter therein comprising steps of:

(a) inserting the first end of a roll pin into said aperture, said roll pin comprising an elongated hollow cylindrical body having an axially extending gap in the surface thereof and a first end portion, a second end portion and middle portion intermediate said first and second end portions with the external diameter of said middle portion larger than the external diameter of said end portions;

(b) urging the middle portion of said roll pin into the aperture sufficiently to cause said middle portion to deform and provide a tight fit between the roll pin and the heat sink with a substantial part of the middle portion extending from said aperture; and

(c) inserting the second end portion of said roll pin into said hole in the circuit board and forming an interference fit with said hole in the board when said middle portion of said roll pin contacts the circuit board, thereby spacing the heat sink a predetermined distance from the circuit board.

4,783,900

METHOD OF CONTINUOUSLY PRODUCING RAPIDLY SOLIDIFIED POWDER

Robert E. Hathaway, Dover, and Edward M. Norin, Pompton Plains, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 336,657, Jan. 4, 1982, Pat. No. 4,650,130. This application Dec. 22, 1986, Ser. No. 944,719

Int. Cl.⁴ B22D *11/126*

U.S. Cl. 29—527.6 **1 Claim**

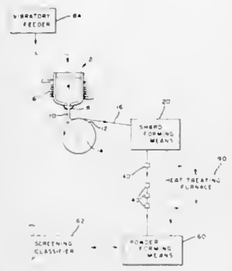
1. A method for continuously producing rapidly solidified powder, the method comprising the steps of:

(a) casting liquid metal onto a rapidly moving chill surface to produce a rapidly solidified continuous ribbon;

(b) continuously feeding said rapidly solidified continuous ribbon from said chill surface to means for forming shard;

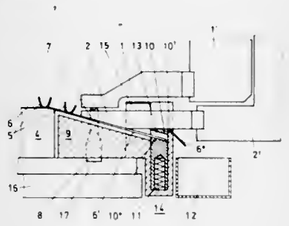
VOL 1096 ISS 3 NO 15 1988 UMI

(c) forming shard from said rapidly solidified continuous ribbon;



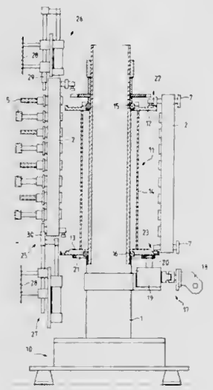
(d) continuously feeding said shard to means for producing powder; and,
(e) forming powder from said shard.

4,783,901
APPARATUS FOR SEPARATING ELECTRICAL CONNECTING ELEMENTS ON SUPPORT STRIPS
Hans-Jurgeo Klaussner, Via Lungo Lago 2-4, XXV aprile, I-21037 Lavena/Ponte Tresa, Italy
Filed May 26, 1987, Ser. No. 53,747
Claims priority, application Switzerland, May 31, 1986, 02203/86
Int. Cl.[4] B23P *23/00*; **H01R** *43/00*
U.S. Cl. 29—566.2 **5 Claims**



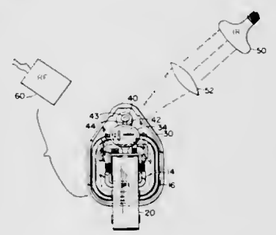
1. Apparatus for separating electrical connecting elements from a support strip and fixing the electrical connecting elements to the ends of conductors, comprising,
a stripping unit having upper and lower clamping jaws,
a crimping unit having an anvil located in a crimping zone and support strip supply means for supplying a support means supporting electrical connecting elements to said crimping zone, said lower clamping jaw having a cutting edge facing said anvil, said cutting edge being movable toward said anvil to separate one of said electrical connecting elements which is adjacent said anvil from said support means, and
a separating unit positioned outside said crimping zone and including a support strip guide for guiding said support strip into said separating device so that an end portion of said support strip which no longer supports electrical connecting elements may be separated from said support strip.

4,783,902
TOOL STORE FOR MACHINE TOOLS AND METHOD FOR THE OPERATION THEREOF
Peter Novak, Tägerwilen, Switzerland, assignor to Starrfrasmaschinen AG, Rorschacherberg, Switzerland
Filed Oct. 30, 1987, Ser. No. 115,770
Claims priority, application Switzerland, Nov. 3, 1986, 4344/86
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **11 Claims**



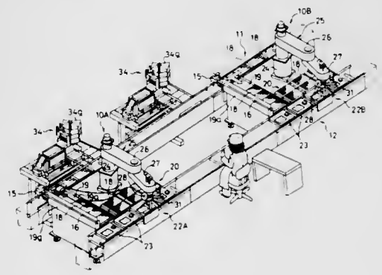
7. A method for removing a selected tool from a selected tool carrying mechanism in a tool store for machine tools, the store including a stationary vertical column, a vertical hollow cylindrical rotor having first and second opposite ends and an outer surface, the rotor being disposed rotably about the column, the column and rotor having a common vertical axis, first and second horizontal circular tracks centered on the axis and secured to the outer surface of the rotor adjacent corresponding first and second rotor ends, a plurality of vertically elongated tool carrying magazines, including the mechanism to be selected, disposed circumferentially about the outer surface of the rotor, each magazine having first and second running means which respectively engage the first and second tracks to enable each magazine to be movable circumferentially about the rotor, the magazine movement being controlled in such manner that when the magazines are stationary a horizontal circular arc section around the rotor is magazine free, a stationary frame disposed radially from and surrounding the cylinder, first gripper means secured to the frame at a removal station at one end of the magazine free section, and second gripper means secured to the rotor for seeking said selected one of the magazines, securing the selected magazine and moving the selected magazine to the first gripper means, the method including the steps of
initially blocking the tool magazines at the removal station by actuating the first gripper means;
moving the second gripper means by the rotor to the selected tool magazine carrying the selected tool;
causing the second gripper means to connect the selected magazine to the rotor;
unblocking the tool magazines at the coincident position by deactuating the first gripper means;
rotating the rotor until the selected magazine is positioned at the coincident position; and
actuating the first gripper means to cause the first gripper means to be secured to the selected magazine.

4,783,903
METHOD OF FORMING A BLIND SOLDER JOINT IN AN IGNITION COIL
James F. Fernquist, Farmington Hills, and Donald E. Ellison, St. Clair Shores, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.
Filed Jul. 16, 1987, Ser. No. 74,378
Int. Cl.[4] H01F *7/06*
U.S. Cl. 29—602.1 **12 Claims**



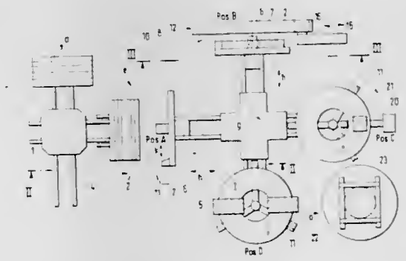
1. A method of forming a solder joint between a cup shaped high voltage terminal to be inserted within a high voltage opening in a plastic case of an ignition coil and a projecting secondary lead extending from a secondary coil inserted within a main opening in the case which comprises the steps of:
securing an adherent solder paste to the inwardly extending end of the high voltage terminal;
positioning the high voltage terminal within the high voltage opening in the case of the ignition coil with the inwardly extending end projecting to the main opening in the case;
placing the secondary coil in the main opening of the case with the secondary lead positioned to contact the solder paste secured to the high voltage terminal; and
heating the inwardly extending end of the high voltage terminal, the secondary lead and the solder paste to melt the solder paste to form a solder joint therebetween, said heating being accomplished without applying physical pressure to the high voltage terminal.

4,783,904
AUTOMATIC ASSEMBLY APPARATUS
Akira Kimura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 20, 1987, Ser. No. 123,270
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—786 **2 Claims**



1. An automatic assembly apparatus comprising:
first conveyor means for transporting trays carrying parts along a predetermined path;
second conveyor means for transporting pallets on which said parts are to be assembled along a path extending parallel with said path of the first conveyor means;
means defining a stocking section between said first and second conveyor means and at which a plurality of said trays can be accommodated in a row extending substantially at right angles from one side of said path of said first conveyor means towards said second conveyor means;
means for moving said trays from said first conveyor means to said stocking station including a pusher arm reciprocable from an idle position at the other side of said path of the first conveyor means across the latter and along the direction of said row;
means defining a working station adjacent to said second conveyor means;
means for defining parts supplying stations adjacent said second conveyor means near to said working station;
robot means mounted between said first and second conveyor means and being operative for carrying said trays from said stocking station to said parts supplying stations and for assembling, on said pallets transported to and from said working station by said second conveyor means, said parts from said trays situated at said parts supplying stations, said robot means including arm means supported, at one end, for rotary movements about a vertical axis between said first and second conveyor means and being horizontally extendible to have a reach, at its other end, encompassing said stocking station, working station and parts supplying stations, and tool means selectively positioned at said other end for operating on said trays and parts, respectively;
parts supplying means disposed adjacent said first conveyor means for supplying parts to said trays transported by said first conveyor means; and
means for detecting said trays on said first conveyor means and for causing actuation of said means for moving the trays from said first conveyor means to said stocking station.

4,783,905
METHOD AND APPARATUS FOR BINDING BAND RINGS
Friederich Hasenkamp, Nettetal, Fed. Rep. of Germany, assignor to Metallverarbeitung Breyell-Dinslaken GmbH, Nettetal, Fed. Rep. of Germany
Division of Ser. No. 936,210, Dec. 1, 1986. This application Oct. 9, 1987, Ser. No. 107,706
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543692
Int. Cl.[4] B65B *13/00*
U.S. Cl. 29—792 **8 Claims**



1. Apparatus for binding coils comprising a first turnstile means for receiving coils to be bound, said first turnstile means being rotatable about a vertical axis and having at least two generally horizontally disposed arms on which said coils are received, a second turnstile means rotatable about a vertical

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axis, said second turnstile means having a plurality of arm means which are moveable upon rotation of the second turnstile means to a plurality of stations which are disposed in spaced relationship about said second turnstile means, each of said arm means being horizontally extendable and retractable in a radial direction relative to said vertical axis of said second turnstile means, each of said arm means also comprising a driveable turntable means having a projecting holding arbor means which has an arbor axis, said turntable means and said arbor means being operable to receive and retain a coil thereon, each of said arm means further comprising swivel means mounting said turntable means on an outer end portion of said arm means and operable to swivel said turntable means between a first position wherein said arbor axis is generally horizontally disposed and a second position in which said arbor axis is generally vertically disposed, one of said stations being a transfer station at which coils are transferred from said first turnstile means to an arm means of said second turnstile means, at least one other of said stations being a binding station at which said coils are bound with binding material, and another of said stations being a removal station at which the bound coil is removed from one of said arm means, said stations being operated simultaneously, said second turnstile means being rotated such that each arm means passes sequentially through said stations to thereby provide binding of said coils as said coils are transferred to and removed from said second turnstile means.

4,783,906

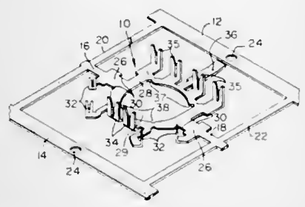
METHOD OF MAKING A CUSTOMIZABLE ELECTRICAL ARTICLE

David J. Gingerich, Swatara; Richard F. Granitz, Harrisburg; William H. Rose, Harrisburg, and David T. Shaffer, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 807,775, Nov. 12, 1985, Pat. No. 4,673,837, which is a continuation of Ser. No. 609,166, May 11, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 934,883

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—827 **3 Claims**



1. A method of forming a lead frame assembly comprising the steps of:

forming an integral lead frame from metal sufficiently thick withstand handling after forming, said lead frame having a general outer periphery having a plurality of openings located inwardly from said general outer periphery defining integrally joined metal sections, said integral lead frame including formed thereon a plurality of electrical engagement sections each of which is adapted to be electrically engaged by a respective electrical conductor means, and said integral lead frame further including a sufficient number of severable sections located at selected locations inwardly from said general outer periphery and remote from said electrical engagement sections so that severing thereof would separate said integral member into separate metal members at least two of which each include at least two said electrical engagement sections and define electrical circuit paths;

securing a dielectric covering over said integral lead frame and extending at least outwardly to said general outer periphery thereof and around substantial portions of said metal sections exposing at least said electrical engagement sections and including a general outer surface disposed outwardly from said severable sections, whereby a lead frame assembly is fully fabricated; and

locating and severing at least an appropriate one of said severable sections thereby forming at least two separate electrical circuits each having at least two said electrical engagement sections, whereby a fully fabricated lead frame assembly is capable of being customized after fabrication thereof by selective severing of said severable sections.

4,783,907

DEVICE FOR SIMULTANEOUSLY CUTTING AND TREATING A PLANT STEM

René Ravaux, 73 Grande Rue, 91510 Lardy, France

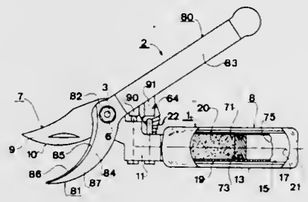
PCT No. PCT/FR86/00229, § 371 Date Apr. 30, 1987, § 102(e) Date Apr. 30, 1987, PCT Pub. No. WO87/00001, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 30, 1986, Ser. No. 43,284

Claims priority, application France, Jul. 4, 1985, 85 10206; Oct. 22, 1985, 85 15636

Int. Cl.⁴ A01G *3/00*

U.S. Cl. 30—123.3 **12 Claims**



1. In a device for simultaneous cutting and treating a plant stem, the device comprising:

at least one cutting blade (**9**);

at least one anvil blade (**84**) pivotally mounted relative to said cutting blade (**9**), and including a surface (**87**) suitable for sliding during rotation over at least a portion of a face (**44**) of said cutting blade;

at least one store (**19**) of treatment substance (**20**);

a channel (**39**) for said substance (**20**) made through at least a portion of the cutting blade (**9**) and opening out via at least one orifice (**41, 42**) situated in a face of said cutting blade;

means (**54, 64**) for controlling the transmission of a certain determined quantity of said substance (**20**) from said store (**19**) to said orifice (**41, 42**);

the improvement wherein said orifice opens within the face of the cutting blade slidable on said surface of said anvil at a given level, and wherein said means for controlling the transmission of said substance comprises means for causing a drop of said substance to be obtained at the outlet from said orifice when said surface (**87**) of the anvil blade is substantially opposite said face (**44**) of the cutting blade, and the device includes support means (**8, 80**) for said cutting blade (**9**) and for said anvil blade (**84**) in the form of two handles (**13, 83**), said two handles being respectively connected to said blades by respective mid-portions (**11, 82**), with rotation of said blades being driven about a rotary shaft (**3**) passing through said mid-portions, said store (**19**) being situated in a housing (**17**) provided in the handle (**13**) connected via one of said mid-portions (**11**) to said cutting blade (**9**), via a channel (**39**) having a portion (**47**) passing through said mid-portion (**11**) in order to connect said store (**19**) to said orifice (**41, 42**) provided in said cutting blade (**9**), whereby rotation of the cutting blade is effected with respect to the anvil blade such that the two surfaces (**44, 87**) of the blades, respectively overlap sufficiently that the orifice is partially or totally covered by anvil blade surface (**87**), thereby preventing treatment substance loss, minimizing consumption of treatment substance and insuring treatment application to the cut stem applied each time a cut is made.

4,783,908

INFRARED DRYING APPARATUS

Manfred Pabst, Cologne, Fed. Rep. of Germany, assignor to A. Monforts GmbH & Co., Fed. Rep. of Germany

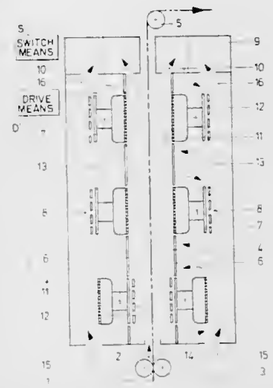
Filed May 11, 1987, Ser. No. 48,440

Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615720

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.⁴ F26B *3/28*

U.S. Cl. 34—4 **14 Claims**



1. An infrared drying apparatus comprising means defining a processing run along which a textile fabric web or the like to be treated may travel, wall means extending along at least a portion of said run, and at least one radiator means movably mounted in association with said wall means for movement with respect thereto, said radiator means having a first heated radiator surface and a second independently-heated radiator surface positioned for selective movement alternately into and out of disposition at said wall means in heating relation to said run.

4,783,909

REVERSIBLE HEEL COUNTER FOR SHOES

Paul J. Van Doren, Corona; Gordon C. Lee, Westminster, and Robert E. Diamond, Corona, all of Calif., assignors to Van Doren Rubber Co., Inc., Orange, Calif.

Filed May 4, 1987, Ser. No. 46,131

Int. Cl.⁴ A43B *23/08*

U.S. Cl. 36—68 **10 Claims**

1. A shoe construction, comprising:

a pair of quarters joined to form a heelpiece for the shoe, the quarters having an upper edge, and a lower edge;

a hinge in each of the quarters extending along a line, adjacent the juncture of the quarters, from the upper edge to the lower edge, located at an angle of between 45° to 57° with respect to the line formed by the juncture of the quarters, when viewed in a planar view, the hinge line comprising a cut in the quarters which has been rejoined by a merrow stitch to form a butt joint; and

a heel counter fastened to the quarters over the juncture of the two quarters, the heel counter depending from the upper edge of the quarters toward the lower edge, but terminating spaced from the lower edge.



4,783,910

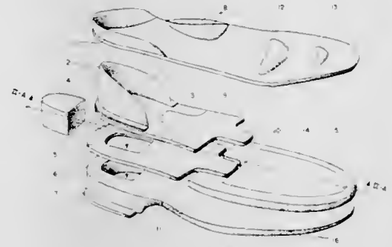
CASUAL SHOE

Jack A. Boys, II, 35 Woodcock Ave., Haverhill, Mass. 01830; Richard P. Bunch, 50 Prospect St., Reading, Mass. 01867; Alexander L. Gross, 85 E. India Row #33D, Boston, Mass. 02110; Robert W. Pagluiso, 17 Bates St., Methuen, Mass. 01844; Rui M. Parracho, 14 Anthony Rd., Peabody, Mass. 01960, and Lloyd S. Smith, 10 Langley Rd., Newton Centre, Mass. 02159

Filed Aug. 15, 1986, Ser. No. 879,897

Int. Cl.⁴ A43B *7/32, 13/12*

U.S. Cl. 36—107 **6 Claims**



1. A shoe, comprising:

an outsole, including a sole portion and a heel portion, the heel portion including an aperture therein having side walls;

a midsole attached to the top of the outsole, the midsole including a heel capsule having side walls and extending into the aperture in the heel portion of the outsole, wherein the capsule's side walls are generally conformable to those of the aperture; and

an anti-torsion member with a central axis lying in a complementarily shaped recess along the central axis of the midsole, the rear portion of the anti-torsion member lying proximate to the upper portion of the heel capsule, such member further including two integrally formed arms transversely disposed with respect to the central axis of the anti-torsion member, and extending towards the sides of the midsole;

such midsole including an energy efficient forefoot section, nested within a higher density perimeter, adjoining the anti-torsion member.

4,783,911

SKATE BOOT ASSEMBLY

Dennis N. Brown, 8528 Custer School Rd., Custer, Wash. 98240

Filed Aug. 25, 1986, Ser. No. 899,958

Int. Cl.⁴ A43B *13/38, 7/22, 5/04*

U.S. Cl. 36—115 **116 Claims**

1. A skate boot assembly having a longitudinal center axis, a

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transverse axis and a vertical axis, said assembly comprising:

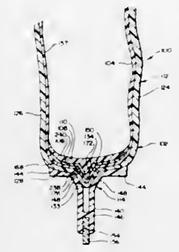
a. a main boot member defining a foot receiving cavity and comprising a lower sole portion, a toe portion, a heel portion, and two side portions;

b. a blade which has a lengthwise blade axis being aligned with, and centered on, said longitudinal center axis of the assembly;

c. a bladder adapted to be removably positioned in said boot cavity and made at least in part of a moderately yielding material, said bladder comprising a sole portion, and side and heel portions extending upwardly from the sole portion of the bladder;

d. an orthotic insert having a longitudinal alignment axis and adapted to be removably positioned in the foot receiving cavity of the boot adjacent the sole portion of the bladder, said insert having an upwardly facing surface contoured to position a plantar surface of a foot, in a manner to align the foot with the longitudinal alignment axis of the insert;

e. said assembly being arranged with first interfitting protrusion and recess means which is arranged in a manner that with a person's foot being positioned in said boot assembly, said first interfitting and protrusion and recess means is positioned to restrain at least said orthotic insert relative to the sole portion of the boot member with regard to movement in a horizontal plane, and to align the longitudinal alignment axis of the insert with the longitudinal center axis of the boot assembly, said protrusion and recess means being further arranged in a manner that without the person's foot being positioned in the boot assembly the protrusion and recess means are positioned to permit the bladder an the insert to be removed from the boot assembly;



whereby with the foot located in the boot assembly, the foot is positioned by the insert in a manner to support, center and align the foot with the longitudinal axis of the boot assembly, to insure proper centering with, alignment with, and support from the skate blade.

4,783,912

RESIN SKI BOOT

Koji Toda, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Jul. 22, 1987, Ser. No. 76,273

Claims priority, application Japan, Jul. 29, 1986, 61-117112[U]

Int. Cl.⁴ A43B *5/04*

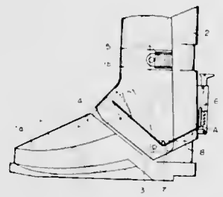
U.S. Cl. 36—120 **4 Claims**

1. An improved resin ski boot comprising a rigid shell adapted for accommodating an inner boot in contact with the foot and leg of a wearer, said rigid shell including a lower section for covering said wearer's foot and an upper section for covering the front portion of said wearer's leg,

cuff means for covering the rear portion of said wearer's leg, said cuff means including an upper end and a lower end;

pivot means for pivotably mounting said lower end of said cuff means to said lower section of said rigid shell whereby said cuff means can be pivoted between a closed position proximate to said upper section of said rigid shell for enclosing said wearer's leg and an open position, said pivot means being located in a predetermined position defining a horizontal plane parallel to said lower section of said rigid shell and a vertical plane perpendicular to said horizontal plane at said pivot means;

wire means for connecting said lower section of said rigid shell to said cuff means; and



seat means contacting an intermediate location on said wire means for applying tension to said wire means, said seat means being located above said horizontal plane and rearward of said vertical plane with respect to said pivot means.

4,783,913

SPIKE FOR GOLF SHOE

Yahyo Aoyama, Tokyo, Japan, assignor to Miyata Metal Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 46,263

Int. Cl.⁴ A43B *5/00, 15/00*

U.S. Cl. 36—134 **2 Claims**



1. A spike for sports shoes comprising:

a spike body;

a round dish-like metallic plate;

a fixing plate;

said spike body having a rear-end flange whose rear-end surface is formed with a small center hole;

said round dish-like metallic plate having a central opening for said spike body to be inserted, a dish-like concave portion of such configuration as adapted to receive said rear-end flange and a peripheral edge somewhat curved upward;

said fixing plate having a metallic disk body, a center pin protruding from a front surface of said dish body so as to be inserted in said small center hole, a threaded center shaft protruding from a rear surface of said dish body, and a plurality of small projections for the purpose of being subjected to spot-welding thereon and formed at equal intervals on the vicinity of and along a peripheral edge of said front surface of said disk body and a plurality of radially arranged notches formed on said rear surface; and

at least a pair of through-holes passing through both of said dish-like metallic plate and said fixing plate.

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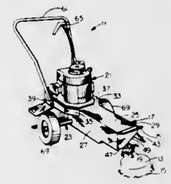
STUMP REMOVER

Mark G. Bowling, Dalton, Ohio, assignor to Limbco, Inc., Orville, Ohio

Filed Nov. 4, 1986, Ser. No. 927,274

Int. Cl.⁴ A01G *23/06*

U.S. Cl. 37—2 R **12 Claims**



1. A portable stump remover for cutting and grinding away a tree stump or limb situated within the ground comprising a rectangular-shape housing having a fore and an aft end and a horizontal top plate, a pair of side plates and a fore end plate, said fore end of said housing including a fixed bottom inclined angled plate extending upwardly from one side plate to the other, cutter means to facilitate the cutting and grinding of such stump or root mounted near the fore end of said housing, power means mounted upon said top plate of said housing near the aft end of said housing to provide the requisite rotational force to said cutter means, and wheel means to support said housing above ground level and facilitate the portable movement of the stump remover, said wheel means being mounted and supporting said housing near the aft end of said housing slightly behind the center of gravity of said power means such that said housing tends to rotate forward upon said wheel means causing said cutter means to contact such root or stump, said power means comprising an internal combustion engine having a horizontal stroke piston, said cutter means comprising a drive shaft supported for rotation within a bearing housing fixed to said inclined angled plate, said drive shaft including at one end a plurality of teeth for cutting and grinding such tree stump or root, and said axis of said drive shaft forming an angle of approximately 19 to 39 degrees with respect to a vertical plane extending fore and aft said housing.

4,783,915

SELF-PROPELLED SNOW REMOVING MACHINE

Ichiro Sasaki; Takeo Ogano; Tomoichiro Takasaki, and Toru Fukuda, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 62,503

Claims priority, application Japan, Jun. 18, 1986, 61-142591; Jun. 18, 1986, 61-142592; Jun. 18, 1986, 61-142593; Jun. 18, 1986, 61-142594; Jun. 18, 1986, 61-142595; Jun. 18, 1986, 61-92808; Jul. 23, 1986, 61-173454

Int. Cl.⁴ E01H *5/09*

U.S. Cl. 37—251 **18 Claims**

1. A self-propelled snow removing machine, comprising:

a body frame, said body frame extending rearwardly and upwardly with a steering handle attached to an upper end thereof;

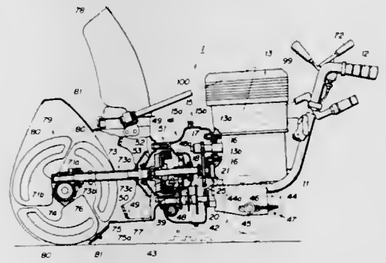
a snow removing mechanism operatively mounted on a front portion of said body frame;

a running mechanism operatively mounted on a lower portion of said body frame;

an engine mounted on said body frame, said engine having an output shaft extending forwardly of the body frame;

a power transmitting mechanism supported on said body frame and operatively coupled to said engine, said power transmitting mechanism including a transmission for connecting said engine output shaft to said running mechanism and for connecting said engine output shaft to said snow removing mechanism, and a clutch interconnected between said transmission and said snow removing mechanism;

said engine having a cylinder with its axis inclined laterally of the body frame and extending upwardly at a slight angle to a horizontal plane;



said power transmitting mechanism being mounted on said body frame forwardly of said engine; and

said power transmitting mechanism further including a gear mechanism for coupling said engine output shaft to said transmission and said clutch.

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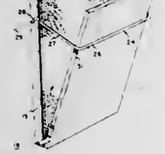
GARMENT PRESSING AND IRONING APPLIANCE

William H. Whitehead, 92 Cross Hwy., Redding, Conn. 06896

Filed Mar. 26, 1987, Ser. No. 30,508

Int. Cl.⁴ D06F *71/12, 81/06*

U.S. Cl. 38—71 **9 Claims**



1. A garment pressing and ironing appliance comprising in combination

A. a stationary housing incorporating a thin, flat pressing panel having substantially parallel lateral side edges, a front side and a rear side

a pair of sidewall columns integrally joined respectively to said side edges of the pressing panel, and defining a flat elongated cavity on the rear side of the pressing panel,

support means formed in the housing positioning it in a stationary orientation,

B. heating means embedded in the pressing panel adapted to deliver heat to substantially its entire surface,

C. a thin, flat rectangular clamping panel pivotally connected to the pressing panel on a first transverse pivoting axis for arcuate sector pivoting movement through an arc between about 10 degrees and about 30 degrees between a clamped position closely juxaposed to the front side of the pressing panel and an open unclamped position angularly displaced from the pressing panel,

D. clamping means releasably securing the clamping panel in its clamped position,

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E. and an ironing board retractable into said cavity and withdrawable therefrom for deployment in a substantially horizontal plane overlying and spanning the space between the upper ends of both said pressing panel and said clamping panel in its unclaimed position.

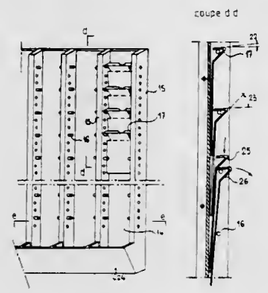
4,783,917
WRIST BAND
Robert E. Smith, 172 Sunset, Glen Ellyn, Ill. 60137, and Thomas A. Johnson, Jr., Carol Stream, Ill., assignors to Robert E. Smith, Glen Ellyn, Ill.
Filed Feb. 20, 1987, Ser. No. 16,853
Int. Cl.[4] G09F *3/14*
U.S. Cl. 40—633 **8 Claims**



1. A bracelet assembly for receiving thereon and for carrying identification information comprising:
- an elongated flexible band with fastening means for locking the band in a closed loop fashion around a wearer's limb;
- a transparent portion in the flexible band;
- a protective cover layer removably affixed to the flexible band over the transparent portion;
- a permanently deformable layer bonded directly to the transparent portion in the flexible band on the side thereof opposite the protective cover;
- a colored base layer bonded to the permanently deformable layer so as to seal the permanently deformable layer between the base layer and the flexible band;
- the permanently deformable layer being of contrasting color to the base layer and masking the base layer from view through the transparent portion;
- the permanently deformable layer being permanently deformed by the application thereto of lines of pressure to render the base layer visible through the permanently deformable layer;
- the desired identification information being received on and carried by the bracelet assembly by applying lines of pressure to one of the base layer and the protective cover and transmitting the same therefrom to the permanently deformable layer;
- the identification information being visibly displayed through the transparent portion when the protective cover layer is removed.

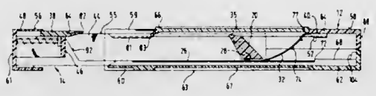
4,783,918
CASCADING CARD HOLDER
René Valery, 125 rue Houdan, Sceaux, France
PCT No. PCT/FR85/00304, § 371 Date Jul. 18, 1986, § 102(e) Date Jul. 18, 1986, PCT Pub. No. WO86/03166, PCT Pub. Date Jun. 5, 1986
PCT Filed Oct. 28, 1985, Ser. No. 893,308
Claims priority, application France, Nov. 20, 1984, 84 17643
Int. Cl.[4] G09F *1/10*
U.S. Cl. 40—124 **13 Claims**

1. A system for a vertical display of various information comprising:
- a plurality of display members, each said display member including a top edge, opposite side edges, a flat display surface for an information, and a member support means provided at the top edge of said display member for supporting said display member, said member support means including an elongated head extending at least along the entire length of the top edge of said display member and having a head end at each end of said elongated head;
- a pair of parallel slideways, each side slideway including (a) a retaining means for retaining a respective side edge of said display member adjacent thereto and (b) a series of supports vertically spaced along each said slideway, each said support of one said slideway forming one of a paired set of supports with a said support on the other side sideway such that on a respective paired set of supports respective said head ends of each said display member rest to support said display member and such that a plurality of said display members are individually supported one



below another along said pair of slideways by respective said paired sets of supports and retained therein by said retaining means; and
- a cascading means for sequentially moving each said display member in a cascade to a lower adjacent set of supports when a new display member is introduced into said pair of slideways.

4,783,919
DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF SHEETS
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
PCT No. PCT/EP85/00612, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03026, PCT Pub. Date May 22, 1986
PCT Filed Nov. 12, 1985, Ser. No. 885,565
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441449
Int. Cl.[4] G09F *11/30*
U.S. Cl. 40—511 **58 Claims**



1. Apparatus for cyclically rearranging a pile of sheets, comprising a first frame part having a viewing window for allowing the sheet at one end of said pile to be viewed, and a second frame part reciprocable relative to and parallel to said window, and means for removing, upon each reciprocation, an individual sheet at one end of the pile leaving a remainder of the pile and for adding the individual sheet to the other end of the pile, said means for removing including a separator bar on one of said frame parts for retaining the remainder of the pile, said separator bar extending transverse to the direction of reciprocation adjacent one end of said one frame part and having a first side facing toward said window and a second side facing away from said window, said individual sheet being removed across one of said sides of said separator bar and returned to the pile across the other of said sides of said separator bar, wherein during each reciprocation, a sheet facing said window is moved along said window parallel to said direction of reciprocation together with said second frame part, and means on said second frame part for acting on an edge of said

window-facing sheet transverse to said direction of reciprocation which moves along said window to keep said edge, during said movement, spaced from said window.

4,783,920
DISPLAY DEVICE FOR THE REPRODUCTION OF CHARACTERS AND SYMBOLS
Eckhart Muller-Tolk, Mühlenweg 10, 8011 Aying, Fed. Rep. of Germany, assignor to Eckhart Muller-Tolk, Fed. Rep. of Germany
Filed Mar. 24, 1986, Ser. No. 843,121
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510870; Aug. 22, 1985, 3529977
Int. Cl.[4] G09F *13/28*
U.S. Cl. 40—550 **18 Claims**



1. In a display device for the reproduction of characters, writing, symbols or the like, including light sources in the form of incandescent lamps; and a substrate on which said incandescent lamps are arranged closely adjacent each other, such as a display device for luminescent moving writing, luminescent areas, luminescent boards, marquees or the like; the improvement comprising: a plurality of openings being in said substrate in a preselected pattern; reflectors being inserted into said openings on the front side of said substrate, said reflectors having integral central rearwardly directed reflector neck portions; ring-shaped members being arranged in each of said openings and extending at right angles outwardly from said substrate, said reflectors having fixedly positioned light distributor caps coaxially mounted over the front side of said ring-shaped members, so that said ring-shaped members are positioned between and separate said reflectors and said light distributor caps; fastening means for securing said reflectors to said substrate; and lamp holders with electrical contact terminals at an end thereof being inserted into said reflector neck portions from an end opposite said reflector.

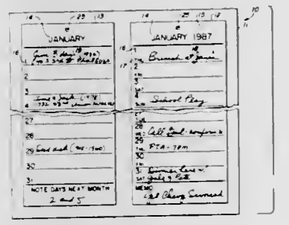
4,783,921
MOUNTING ARRANGEMENT FOR WIND-DEFLECTABLE BENDING SIGN
Gary P. George, St. Louis County, Mo., assignor to Stout Industries, Inc., St. Louis, Mo.
Filed Jun. 22, 1987, Ser. No. 64,544
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—602 **5 Claims**



1. In a wind resistant sign for display purposes including a base and a resilient planar panel having a base portion supported by the base for extending outwardly from the base in a direction perpendicular to the base, the base formed of first and second mounting members, means for securing the mounting members together with the panel base portion received between the mounting members, the panel being thin and of such resilience and strength as to undergo repeated bending deflection relative to the base in response to forces of wind upon the panel, a breakage resistance improvement comprising:
- a. each of said first and second mounting members having a respective throat-forming outer portion,
- b. each said throat-forming portion being curved outwardly from the plane of the panel to form a curved surface diverging smoothly from the plane of the panel,
- c. there being curved inner surfaces of each said outwardly curved throat-forming portion which inner surfaces do not contact the panel faces when the panel is not undergoing bending deflection but which inner surfaces provide strain-relieving curved support for the panel faces when the panel is undergoing repeated bending deflection in response to wind,
- d. the length of the first and second mounting members being at least as great as the width of the panel base portion,

whereby the panel base portion is prevented from breaking for a high number of bending cycles as said panel undergoes bending deflection in response to wind.

4,783,922
MEMORY ENHANCING CALENDAR SYSTEM
Theodore W. Moore, 10403 N. 38th Street, Phoenix, Ariz. 85028
Filed Jul. 24, 1987, Ser. No. 77,455
Int. Cl.[4] G09D *3/00*
U.S. Cl. 40—107 **11 Claims**



1. A memory training and enhancing system for bringing to mind the user's memory of events of perennial significance and preserving a record of these events in a permanent format, while also preserving for transient reference passing events in a non-permanent format, said system comprising:
- a permanent, annually reusable calendar for recording of events of permanent significance;
- a replaceable calendar for recording events of current and near-future transient significance; and
- means for maintaining said permanent, annually reusable calendar adjacent said replaceable calendar such that the recording of events of both transient and perennial significance occurring on the same calendar date are in close juxtaposition.

4,783,923
ACTUATOR FOR SLIDING PANEL SIGNS
Harold M. Grinwald, Big Bend, and Charles E. Trame, Mequon, both of Wis., assignors to Everbrite Electric Signs, Inc., Greenfield, Wis.
Filed Sep. 28, 1987, Ser. No. 101,490
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—488 **7 Claims**

1. A sign including sequentially laterally slidable display

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panels comprised of strips having laterally extending slots and slats extending from said strips interleaved with slats of adjacent panels,

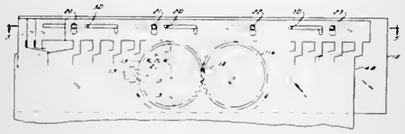
a base member presenting opposite sides and having laterally extending slots,

means supporting said panels for sliding on one side of said base member laterally relative to each other along the slots in the panel strips,

actuator means including a plurality of interfacing bar members arranged on the other side of said base member, said bar members having drive pins projecting from them which pass through slots in said base member and engage, respectively, in driving relation with successive panels,

means for supporting said bar members for sliding laterally in sequence relative to each other on the other side of the base member,

first and second intermeshed gears and means for driving one of said gears rotationally in one direction so the other gear rotates in the opposite direction about axes substantially perpendicular to the lateral direction,

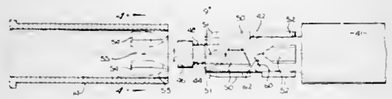


cam pins of shortest, intermediate and longest lengths arranged in succession about the rotational axis of said first gear and projecting axially therefrom,

rotation of said first gear causing the shortest cam pin to engage and shift the bar member most remote from said base laterally such that said drive pin of the bar member shifts the panel with which it is engaged to start a display cycle and continued rotation of said first gear causes the increasingly longer cam pins to shift the bar members successively nearer to said base member in sequence such that the drive pins on said bar members will shift sequentially the panels which the drive pins engage,

a cam pin extending axially from said second gear, said gears being synchronized such that when all of said bar members are shifted in one direction laterally said cam pin on the second gear will be at a rotational position for starting to return all of said bars and, hence, said panels simultaneously to their unshifted positions to enable repetition of an operating cycle.

4,783,924
HANDGUN SAFETY DEVICE
Warren R. Thurber, Westlake Village, Calif., assignor to Firelock, Inc., Golden, Colo.
Filed Feb. 13, 1987, Ser. No. 14,369
Int. Cl.[4] F41C *17/08*
U.S. Cl. 42—70.11 **13 Claims**



1. A device for preventing the discharge of a firearm, said firearm having a barrel, a muzzle and a cartridge chamber, said device comprising:

a rod including an inner and an outer end, said rod insertable in the barrel through the muzzle with the outer end extending from the muzzle;

spring means coupled to the rod and disposed against the muzzle when the rod is inserted into the barrel for urging the rod to withdraw from the barrel;

a cartridge disposed in said cartridge chamber;

locking means coupled to the inner end of the rod for engaging the cartridge and locking thereto as said rod is inserted into the barrel such that said spring means is partially compressed;

a spindle disposed at said inner end of said rod said spindle coupled to said rod by retaining means such that the spindle may rotate with respect to the rod about a common longitudinal axis;

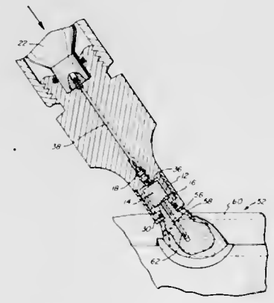
said spring means comprising:

a cap coupled to said outer end of said rod and freely rotatable thereabout, said cap including a bumper;

a muzzle stop disposed against said muzzle of said barrel when said rod is inserted into said barrel; and

a muzzle spring disposed between and biasing apart said cap and said muzzle stop.

4,783,925
PNEUMATIC PROJECTILE DISCHARGER FOR MUZZLELOADING FIREARMS
Harold R. Pollock, Jr., 17 Circle Dr., Stonington, Conn. 06378
Filed Dec. 2, 1987, Ser. No. 127,915
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **25 Claims**



1. A pneumatic discharging device for unloading or removing obstructions from a muzzle-loading firearm having a firing mechanism with a passage extending into its barrel, said discharging device comprising:

a compressed gas source;

means for selectively releasing gas from said compressed gas source, said means for selectively releasing gas includes a valve mounted in a valve body and a valve actuator for engaging said valve to release said selectively released gas; and

means for introducing said selectively released compressed gas into the passage of the firing mechanism to unload or remove an obstruction from the barrel of the muzzle-loading firearm, said means for introducing and said valve actuator are adapted to move relative to one another to release said gas when said valve actuator is pushed into contact with a portion of the firing mechanism of the firearm.

4,783,926
FISH GAFF
Chris H. McKinney, and Barry T. McKinney, both of Granite Quarry, N.C., assignors to P. H. McKinney, Granite Quarry, N.C.
Filed Mar. 21, 1988, Ser. No. 171,259
Int. Cl.[4] A01K *97/14*
U.S. Cl. 43—5 **7 Claims**

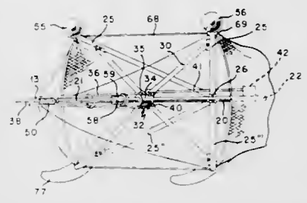
1. A fish gaff comprising a main body member, a pair of

complementary jaws having inner sides with fish engaging and impaling teeth extending inwardly therefrom, means pivotally supporting adjacent end portions of said jaws on one end portion of said main body member so that the free end portions of said jaws can move between a spread-apart open position and an adjacent closed position, resilient means operatively associated with said jaws for normally urging said jaws to said closed position to impale a fish positioned therebetween, and a coil spring trigger having opposite ends connected to medial



portions of said jaws and extending in a straight line path across the space between said jaws when in said open position with adjacent coils of said spring trigger in contact to maintain said jaws in said open position, the medial portion of said coil spring trigger being engageable by a fish in position between said open jaws so that said coil spring trigger is moved out of the straight line path and toward the pivoted support means of said jaws so that said resilient means is immediately free to urge said jaws to said closed position and impale said teeth into opposite sides of the fish positioned between said jaws.

4,783,927
DOORLESS, POSITIVE-SPREADING TRAWLING APPARATUS
Albert A. Leonard, P.O. Box 209, Quinebaug, Conn. 06262
Continuation of Ser. No. 807,252, Dec. 10, 1985, Pat. No. 4,697,372. This application Mar. 6, 1987, Ser. No. 22,946
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.[4] A01K *73/02*
U.S. Cl. 43—9 **6 Claims**



1. A doorless trawling apparatus for use with a fishing vessel and two gear, comprising:

(a) an elongated, bag-shaped net having a main axis and an opening through which the main axis passes,

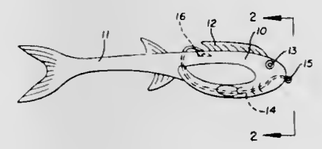
(b) a plurality of spreading bars emanating from a common connecting element, each bar being free to swing from a closed position along the main axis of the bag to a positively limited, open position at an angle away from the main axis, the common connecting element being an elongated, axial drag bar to which the spreading bars are each attached by a toggle mechanism,

(c) a slider assembly secured to the axial common connecting element, but capable of longitudinal movement,

(d) means for applying a towing force by said tow gear to the common connecting element, and

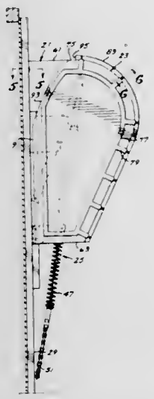
(e) a buoyancy control system incorporating a plurality of variable buoyancy floats and a remotely controllable air pressure supply to vary the buoyancy of the floats.

4,783,928
FISHING LURE
Brian Weaver, 575 Methodist Rd., Greenville, Pa. 16125
Filed Mar. 28, 1988, Ser. No. 174,153
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.24 **4 Claims**



1. An artificial fishing lure comprising a flexible resilient body portion and a tail portion, said body portion is elongated and is of varying transverse dimension along its length, a hook has an eyelet end and a barb end, said hook extending through an end portion of said body portion with said barb of said hook extending outwardly from the end of said end portion and intersecting said body portion at its junction with the tail portion defining an opening therebetween, said barb portion re-engaging said body portion adjacent said juncture of said body portion and said tail portions, means for securing a bait portion to said lure.

4,783,929
GUARD APPARATUS FOR SHROUDING SPRING LOADED GARAGE DOOR HARDWARE
Terry L. Blubaugh, Diamond Bar, Calif., assignor to Holmes-Hally Industries, Los Angeles, Calif.
Filed Sep. 4, 1987, Ser. No. 93,183
Int. Cl.[4] E05D *15/40*
U.S. Cl. 49—206 **12 Claims**



1. Guard apparatus for shrouding spring loaded garage door hardware of the type which mounts one side of a one-piece overhead garage door to a door jamb, such hardware being of the type which projects laterally from said door jamb and is formed with oppositely facing first and second sides, said apparatus comprising:

a first guard including a mounting flange for mounting on

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said jamb and formed with a first planar wall projecting from said flange along said first side of said hardware to cover said one side and formed at its periphery with a first peripheral flange projecting laterally of said first planar wall and terminating in a first mating lip;

a second guard formed with a second planar wall for projecting coextensive with such second side of such hardware and including a second peripheral flange projecting laterally of said second planar wall and terminating in a mating lip for mating with said first mating lip, said first and second peripheral flanges being so shaped and configured as to, when mated together, maintain said first and second planar walls spaced apart to form an envelope for accommodation of such hardware as said door is opened and closed;

mounting means for mounting said mounting flange to said jamb; and

fastening means for fastening said first and second mating lips together whereby said first guard may be mounted to said jamb and said second guard fastened thereto to cause said guards to form an envelope around said hardware to, in the event of rupture of said spring, contain segments of such spring within said envelope against being propelled therefrom under the influence of the release of pent up energy.

4,783,930

VEHICLE DOOR ASSEMBLY HAVING FLUSH SIDE GLASS

Roy F. Tiesler, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1987, Ser. No. 87,468
Int. Cl.⁴ E06B *7/16*
U.S. Cl. 49—374 **4 Claims**



1. A door assembly for an automotive vehicle comprising

a door means having a lower body and an upper frame, said lower body including inner and outer spaced panels and fore and aft ends which together define a door well having an elongated opening at its upper end,

said frame being generally U-shaped and having upwardly extending fore and aft sides and a top which together with the upper end of the lower body defines a window opening,

a window supported by said door means for generally vertical movement between open and closed positions and a window guide arrangement including a pair of guide tracks carried by the door means adjacent its fore and aft ends and guide means carried by the window and slidably received within said guide tracks and with the guide arrangement being operable to effect movement of the window through a path such that the window at its lower end is substantially flush with the outer panel of the lower door body and substantially flush with the top and sides of said frame when in its closed position,

the improvement being that said guide tracks are generally U-shaped in cross-section and comprise an upper portion whose width progressively increases proceeding from its upper end toward its lower end located adjacent said upper end of said lower body, a lower portion disposed within said lower body and laterally offset from said upper portion and an intermediate skewed portion disposed within said lower body adjacent its upper end and connecting said upper and lower portions to define a continuous track, and wherein said guide means comprises a rim module secured to said window and extending along and outwardly from the fore and aft side edges and bottom edge of said window,

said rim module along the fore and aft side edges of the window being slidably received within said upper portions of said tracks and along the lower edge of the window being slidably received within said intermediate and lower portions of said tracks, and a flexible seal means carried by said rim module at a location outwardly of the fore and aft side edges of the window and being coextensive with said rim module along said fore and aft side edges of the window,

said seal means facing outwardly of the window and engaging said guide tracks to provide a seal, said upper guide track portions due to their progressively increasing width proceeding from their upper ends toward their lower ends allowing said rim module and said window to be moved inwardly of said door means as the skewed intermediate portion of said track causes said rim module to move inwardly of the door and into said lower portion of said guide tracks when the window is being lowered from its fully closed position to release the seal means from tight pressure engagement with the guide tracks and

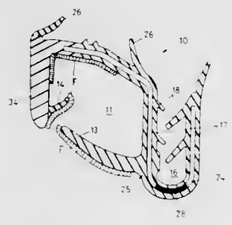
said upper and intermediate portions of said guide tracks respectively allowing the causing movement of said window outwardly of said door means as the window approaches its fully closed position to cause said seal means to tightly engage said guide tracks and to position said window so that it is substantially flush with said frame means and with the outer exterior panel of said lower body of said door means when in its fully closed position.

4,783,931

GLASS RUN CHANNEL

John A. Kirkwood, Edwardstown, Australia, assignor to Bridgestone Australia Ltd., Edwardstown, Australia

Filed Apr. 7, 1987, Ser. No. 35,601
Claims priority, application Australia, Apr. 7, 1986, PH5355; Sep. 9, 1986, PH7902
Int. Cl.⁴ E06B *7/23*
U.S. Cl. 49—441 **7 Claims**



1. A motor vehicle glass run channel having a generally S-shaped cross-section, comprising a metal core covered with an elastomer outer casing,

said cross-section defining a relatively small channel portion and a relatively large channel portion, said small channel portion having inwardly directed resilient barbs and said large channel portion having inwardly directed resilient lips, said barbs and lips being of elastomer,

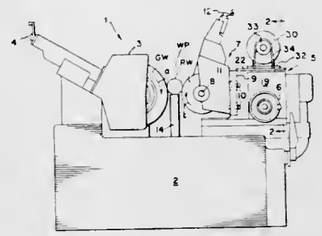
said core including a continuous unbroken strip extending longitudinally, and a plurality of bars extending transversely from the strip and spaced by slots, and said unbroken strip lying between limbs which flank said small channel portion.

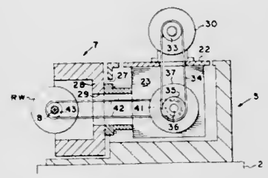
4,783,932

CENTERLESS GRINDER CONSTRUCTION

Russell J. Sager, 109 Bay Shore Dr., Bay City, Mich. 48706

Filed Feb. 11, 1987, Ser. No. 13,346
Int. Cl.⁴ B24B *5/30*
U.S. Cl. 51—103 R **4 Claims**





1. A centerless grinder construction comprising a base; a rotatable grinding wheel mounted on said base for rotation about an axis; a body member mounted on said base for linear movements toward and away from said grinding wheel; a rotatable regulating wheel; carrier means mounting said regulating wheel for rotation about an axis spaced from the axis of said grinding wheel; adjustable mounting means mounting said carrier means on said body member for linear movements with said body member and for rocking movements relative to said body member about an axis normal to the axis of rotation of said regulating wheel; support means secured directly to said carrier means for movements therewith; driving means rotatable about an axis spaced from and parallel to the axis of rotation of said regulating wheel; drive transmission means rotatable about an axis spaced from and parallel to the axis of rotation of said regulating wheel, said transmission means including a hydrostatic pump-motor assembly coupling said driving means and said regulating wheel for rotating the latter, said transmission means having an infinitely variable speed output and being operable to maintain substantially constant any selected output speed; and means securing said driving means and said transmission means directly to said support means whereby said driving means, said transmission means, and said regulating wheel are conjointly and bodily movable relative to said body member about said normal axis.

4,783,933

METHOD OF ABRADING WOVEN MATERIAL WITH THE PITS (ENDOCARP) OF THE GENUS PRUNUS FRUIT (DRUPE)

Jerry W. Cogle, Sr., Rte. 1, Box 404, Inwood, W. Va. 25428

Filed Sep. 14, 1987, Ser. No. 96,057
Int. Cl.⁴ B24B *1/00*
U.S. Cl. 51—313 **1 Claim**

1. A method of abrading woven material to produce worn effects, comprising the steps of:

placing a quantity of woven material into a compartment of a washing machine;

adding a quantity of unaltered mature fruit pits of the Genus Prunus fruit (Drope);

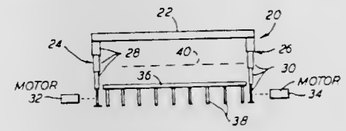
operating the washing machine until the woven material shows the predetermined wear effects.
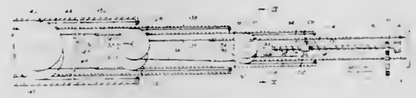
4,783,934

FREE-STANDING ASSEMBLY AND METHOD FOR MAKING SAME

Chris Langhart, New Hope, Pa., and Michael H. Brown, Monrovia, Calif., assignors to United Production Services, Inc., Duarte, Calif.

Filed Nov. 21, 1986, Ser. No. 934,234
Int. Cl.⁴ E04H *3/10*
U.S. Cl. 52—64 **23 Claims**





1. A free-standing assembly comprising:

a substantially horizontally oriented trusswork;

support means for adjustably supporting said trusswork in a substantially horizontal position above a ground surface and a platform, said support means including at least three legs, said legs each comprise a plurality of telescoping hollow leg members wherein said lowermost one of said leg members has a diameter smaller than each other leg member comprising the respective leg;

automatic actuator means operatively coupled to said legs and trusswork for alternatively raising and lowering said trusswork, said actuator means comprising a plurality of devices equal in number to said legs, said devices being disposed inside said hollow leg members; and

connecting means for rigidly attaching an upper end of said legs to said trusswork along an edge thereof to provide lateral stability.

4,783,935

MONOLITHIC FOUNDATION SYSTEM FOR BUILDINGS AND FORM THEREFOR

William B. Creager, 5410 W. Barbara Ave., Glendale, Ariz. 85302

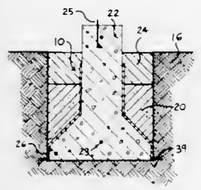
Filed Aug. 6, 1986, Ser. No. 894,219
Int. Cl.⁴ E04B *1/16*
U.S. Cl. 52—98 **39 Claims**

1. A monolithic building foundation system, comprising:

a plurality of horizontally elongated vertically planar mem-

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bers each having an upper planar portion and lower angled portion thereof, wherein each of said upper planar portions of each of said plurality of elongated vertically planar members further comprises an upper wall portion and a lower wall portion having weakened strip means disposed therebetween for separating said upper wall portion from said lower wall portion;



top tie means for removably coupling a pair of said plurality of horizontally elongated vertically planar members in a generally parallel relationship with respect to the upper planar portion, wherein the lower angled portions of each member of the pair diverge from each other; and

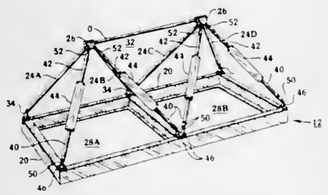
connection means for coupling each pair of said plurality of horizontally elongated vertically planar members in a generally end-to-end fashion thereby forming a unitary longitudinal chamber.

4,783,936

SPACE RAIL FOR LARGE SPACE SYSTEMS

Edward J. Hujsak, La Jolla, Calif., assignor to General Dynamics Corp./Space Systems Division, San Diego, Calif.

Filed Nov. 10, 1986, Ser. No. 929,576
Int. Cl.⁴ E04H *12/18*
U.S. Cl. 52—108 **9 Claims**



6. An assembly of space rails comprising,

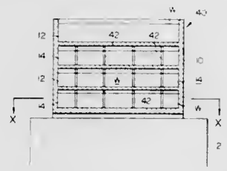
a plurality of relatively rigid planar parallelogram frame structures connected end-to-end, and a back structure comprising a plurality of tubular struts connected together and fixedly connected to said frame structure in such a manner so as to be foldable and substantially coplanar with said frame structure in an undeployed position and capable of forming pyramids as a space rail structure in a deployed position.

4,783,937

DEVICE FOR SUPPRESSING VIBRATION OF STRUCTURE

Takanori Sato, Tokyo, Japan, assignor to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1987, Ser. No. 42,365
Claims priority, application Japan, Aug. 6, 1986, 61-184922; Aug. 6, 1986, 61-184923; Nov. 26, 1986, 61-281184; Nov. 28, 1986, 61-283485; Jan. 23, 1987, 62-13368; Jan. 23, 1987, 62-13369
Int. Cl.⁴ E04B *1/92*
U.S. Cl. 52—168 **27 Claims**



1. A device for suppressing vibration of a structure, comprising:

a first tank, disposed in the structure, for receiving a first liquid for suppressing vibration of the structure, the first tank being adapted to contain such an amount of the first liquid that the first liquid is equal in natural period to the structure,

said first tank being adapted to contain such an amount of the first liquid that a ratio of effective mass of the first liquid over mass of the structure is about 1/50 to about 1/300,

the structure having a center of rigidity and the first tank having an inner face; and

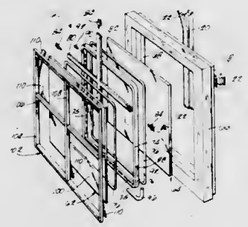
first baffling means, mounted to the inner face of the first tank, for baffling a flow of the first liquid so as to suppress the swinging of the structure, the flow being caused due to swinging of the structure about the center of rigidity.

4,783,938

WINDOW PANEL ASSEMBLY

Douglas J. Palmer, Mosinee, Wis., assignor to SNE Enterprises, Wausau, Wis.

Filed Feb. 5, 1988, Ser. No. 152,653
Int. Cl.⁴ E06B *3/70*
U.S. Cl. 52—171 **13 Claims**



1. An insulated window assembly comprising

first and second generally parallel spaced panes of a transparent sheet material;

a plurality of intersecting, internal muntin bars disposed in the space between said first and second panes;

a plurality of first intersecting outer muntin bars having a width slightly wider than said internal muntin bars and affixed by adhesive means on the outer surface of said first pane in coincidental alignment with said internal muntin bars; and

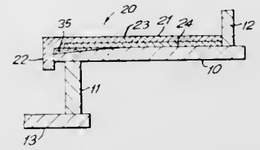
a plurality of second intersecting, outer muntin bars having substantially the same width as said first outer muntin bars and affixed by adhesive means on the outer surface of said second pane in coincidental alignment with said first outer muntin bars, said internal muntin bars and said first and second outer muntin bars being arranged in a pattern to provide said window assembly with the appearance of a historically correct, authentic divided lite window having individual panes separated by conventional muntin bars.

4,783,939

COVERING FOR IMPROVING WORN OUT STEPS

Gunther Bergmann, Neunkirchen, and Florestan F. V. Kunsberg, Mainleus, both of Fed. Rep. of Germany, assignors to Freiher von Kunssberg Vertriebsgesellschaft GmbH, Waldershot, Fed. Rep. of Germany

PCT No. PCT/EP86/00289, § 371 Date Mar. 16, 1987, § 102(e) Date Mar. 16, 1987, PCT Pub. No. WO86/06778, PCT Pub. Date Nov. 20, 1986
PCT Filed May 15, 1986, Ser. No. 6,654
Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517673
Int. Cl.⁴ E09F *11/00*
U.S. Cl. 52—188 **9 Claims**



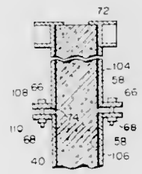
1. A covering for repairing worn-out steps, said covering having a unitary profile, and at least a capping (**24**) and a flange perpendicular thereto, said covering extending the entire width of the step, and at least in the area of the visible surfaces to be seen after assembly, being made of moldable hardened plastic said capping being provided on its underside with an insert of press board (**24**) which has a lower specific weight than the plastic material.

4,783,940

CONCRETE FILLED STEEL TUBE COLUMN AND METHOD OF CONSTRUCTING SAME

Takanori Sato; Yasukazu Nakamura; Hideo Nakajima; Yasushi Watanabe; Yoshihiro Orito; Toru Ito, and Yutaka Saito, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,713
Claims priority, application Japan, Dec. 28, 1985, 60-299530; Jan. 20, 1986, 61-9695; Jan. 21, 1986, 61-10882
Int. Cl.⁴ E04C *3/10*
U.S. Cl. 52—223 R **21 Claims**



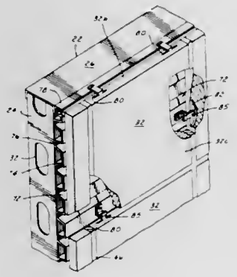
1. In a concrete filled steel tube column which constitutes a part of the framework of a structure, the steel tube column including: a steel tube connected to beams of the structure so that an axial compressive load is transferred from the beams and applied to the steel tube; and a concrete core, disposed within the steel tube, for bearing an axial compressive load transferred from the beams via the steel tube to the concrete core, the improvement wherein the steel tube comprises a plurality of prestressed tube pieces concentrically joined in series, each tube piece having an axial tensile prestress introduced thereinto to counteract a compressive stress resulting from said compressive load applied to the steel tube, whereby substantially no axial stress is induced in the steel tube, and wherein the concrete core is held under an axial compression, in addition to said axial compressive load, said axial compression of the core applying said prestress to each of the tube pieces.

4,783,941

PREFABRICATED PANEL FOR BUILDING WALL CONSTRUCTION

William Loper, 1683 E. Cedar, Denver, Colo. 80209, and Thomas Obermeier, 1700 Forest Pkwy., Denver, Colo. 80220

Filed Oct. 27, 1986, Ser. No. 923,410
Int. Cl.⁴ E04H *1/00*
U.S. Cl. 52—235 **18 Claims**



1. In a wall structure for a building having a building framework and a plurality of prefabricated panel sections secured to the building framework to form a wall surface, each panel section comprising:

a rigid support structure for attachment to the building framework and including a rigid deck substantially coextensive with the support structure;

a plurality of fascia panels overlying said support structure, said fascia panels having opposite front and back faces with the back face opposing the disposed closely adjacent the rigid deck, said panels formed of materials selected from the group consisting of ceramics and masonry;

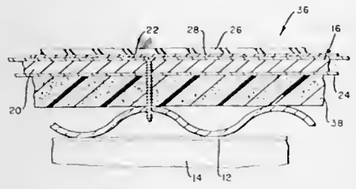
rigid means for supporting the dead load of said fascia panels on said support structure while permitting relative movement between the fascia panels and support structure;

means distributed across the back face of the panels between such face and the rigid deck for resiliently supporting and distributing the live load of said fascia panels on said support structure; and

means for sealing the joints between adjacent edges of the fascia panels.

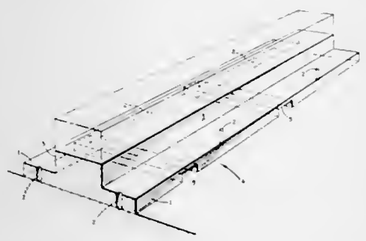
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4,783,942
COMPOSITE ROOF DECK ASSEMBLY WITH POLYMERIC MEMBRANE ADHERED TO FIBERGLASS MAT
C. Lynn Nunley, Dallas, and Joe W. Tomaselli, Plano, both of Tex., assignors to Loadmaster Systems, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 788,796, Oct. 18, 1985, Pat. No. 4,707,961. This application Apr. 15, 1987, Ser. No. 38,535
The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—309.1 22 Claims



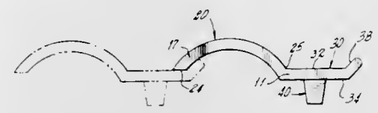
1. A composite roof deck assembly comprising: purlins; corrugated material; means securing said corrugated material to said purlins; a substantially rigid porous substrate layer having a facing of fibrous matte material; mechanical fasteners securing said layer to said corrugated material; a substantially continuous polymeric sheet disposed over said substrate layer; and a water based, polymeric adhesive disposed between said substrate layer and said polymeric sheet to join said substrate layer to said sheet.

4,783,943
DEVICE FOR FLOOR VENTILATION
Stig-Ake Ljungkvist, Skovde, Sweden, assignor to Nyboverken AB, Skovde, Sweden
Filed Apr. 10, 1986, Ser. No. 850,016
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—480 2 Claims



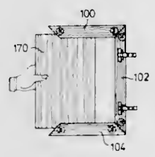
1. A spacer device for positioning on an existing floor and directly and solely supporting new flooring and material positioned between said existing floor and new flooring consisting of a bar defining a horizontal section and a vertical section of equal length, said horizontal section being wider than said vertical section said vertical section being joined to one side of said horizontal section at an intermediate portion thereof, said horizontal section having vertical holes therethrough on either side of said vertical section and having transverse grooves therein on a side opposite said vertical section.

4,783,944
BARREL ROOF TILE
Fernando Mendez, 10370 N.W. 135 St., Hialeah Gardens, Fla. 33016
Continuation-in-part of Ser. No. 754,608, Jul. 12, 1985, Pat. No. 4,606,164. This application Jun. 26, 1986, Ser. No. 879,046
Int. Cl.[4] E04D *1/04*
U.S. Cl. 52—536 2 Claims



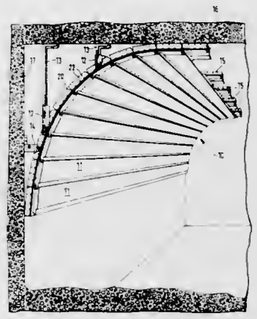
1. A roof tile having front, rear and two lateral walls, for cooperative interlocking arrangement in horizontal and vertical rows of said roof tile comprising:
A. a longitudinal flat section having an underside and an upperside wherein said flat section includes a longitudinal flange member along the end defining the other lateral wall of said tile and interlockingly engages with the edge of said side wall on said curved section;
B. a longitudinal curved section attached to said flat section longitudinally wherein said curved section defines one of said lateral walls and terminates with a horizontal surface that is leveled with the upperside of said flat section so that when said roof tile is placed next to another tile said horizontal surface rests on said upperside thereby providing a longitudinal resting area;
C. a longitudinal wedge member mounted to the underside of said flat section and extending from said rear wall to a point away from said front wall thereby defining a space for cooperatively housing the rear of the flat section of an abutting roof tile in front wherein said space allows said roof tile to snuggly house the rear portion of an abutting tile in front.

4,783,945
FURNITURE FRONT ELEMENT
Otto Heeg, Ruedigheimer Strasse 9, D-6450 Hanau/Main, Fed. Rep. of Germany, assignor to Portas Deutschland GmbH, Frankfurt and Otto Heeg, Hanau, both of, Fed. Rep. of Germany
Division of Ser. No. 631,759, Jul. 17, 1984, Pat. No. 4,707,204, which is a continuation-in-part of Ser. No. 324,022, Nov. 23, 1981, abandoned. This application Jan. 15, 1987, Ser. No. 3,553
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 8031386; Mar. 11, 1981, 8106975
Int. Cl.[4] E04C *2/38*
U.S. Cl. 52—656 5 Claims



1. A furniture front element having a main panel which may be readily disassembled for the purpose of changing the main panel decor comprising, four side frame members each having mitered end faces and a continuous inner peripheral groove, and adapted when joined to form a rectangular framework, at least two short first and second bores provided in each frame member extending longitudinally from each mitered end face and running parallel to each other, a right angle dowel member extending into the first bores of each adjacent pair of frame members, and said dowel members each having a reduced diameter neck spaced inwardly of the ends thereof, a rotatable eccentic fitting received within the rear face of each side frame member and adjacent each end thereof and adapted to coopeate with said reduced diameter necks of the dowel members to tighten the side frame members toward each other, a secondary right angle guide dowel received in each adjacent pair of said second bores, at least one main panel member with differing front and back design faces received within the peripheral groove of said frame members, said main panel member consisting of a plurality of overlying planar sheets, said frame member having a core of wooden material which is entirely encased by a synthetic laminated cover and said mitered end faces are sealed to prevent moisture from reaching the wooden core.

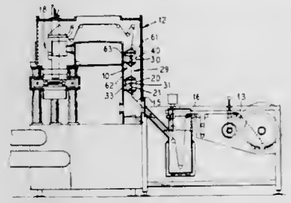
4,783,946
SUPPORTING RAIL FOR LOWER CEILINGS AND ATTACHMENTS
Normann Boegle, Melanchthonstrasse 22, D-7410 Reutlingen, Fed. Rep. of Germany
Filed Sep. 11, 1986, Ser. No. 906,912
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606112
Int. Cl.[4] E04C *3/30*
U.S. Cl. 52—720 26 Claims



1. A supporting rail for objects, particularly, lower ceilings, attachments and the like, comprising an elongated central rail part; and at least one elongated side rail edge extending along said central rail part and located at its one end for suspending shaped panels, boards and the like, said central rail part being provided with a plurality of formations spaced from one another in a longitudinal direction and allowing bending said central rail part, said central rail part being also provided with a plurality of through-going openings located between said formations for inserting additional elements, said formations in said central rail part being formed as a plurality of corrugations formed for allowing a compression of said central rail part in a longitudinal direction.

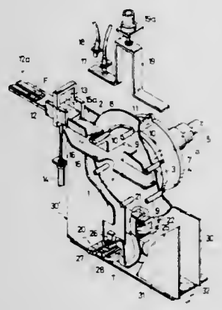
4,783,947
APPARATUS FOR REMOVING LIQUID AND RESIDUE FROM A WEB OF FILM
John L. Posey, McHenry; Ronald W. Swank, Crystal Lake; Martin E. Sliva, Cary, and John E. Picken, Crystal Lake, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Mar. 25, 1987, Ser. No. 30,655
Int. Cl.[4] B65B *61/00*
U.S. Cl. 53—167 20 Claims

18. In aseptic form, fill and seal packaging machine, an apparatus for removing liquid and residue from a web of film, the apparatus being located within a sterile cabin, comprising:
a first exhaust tube having a film inlet and a film outlet, the web of film passing through the exhaust tube, the exhaust tube including an interior under a negative pressure and exerting a vacuum force;
a first set of elongated air knives located downsteam of the exhaust tube along the film path, one of said air knives being located on a first side of the web of film and a



second of said air knives being located on a second side of the web of film and the air knives including an air inlet and a plurality of holes for blowing air onto the web of film;
the exhaust tube cooperating with the air knives so that at least a portion of the removed residue and liquid is captured by the exhaust tube; and
the exhaust tube and air knives being at least partially enclosed by a first internal chamber having a film inlet and a film outlet.

4,783,948
METHOD AND APPARATUS FOR BUNDLING AND ELONGATED ARTICLE
Akiyoshi Kando, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Apr. 23, 1987, Ser. No. 41,446
Claims priority, application Japan, Apr. 24, 1986, 61-95623
Int. Cl.[4] B65B *63/04*
U.S. Cl. 53—119 8 Claims



1. An appratus for bundling a relatively long article with a bundling band, said apparatus comprising:
(a) a guide on and along which the article is to be supplied;
(b) a take-up reel disposed dowstream of a downstream end of said guide for winding the article therefrom;
(c) a tray disposed below said take-up reel for receiving the wound article;
(d) a presser disposed above said tray and vertically movable toward said tray for compressing the wound article in a folded and flat posture; and
(e) a bundling unit disposed near said tray for bundling the folded article with the bundling band; wherein said take-

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up reel is adapted to be driven selectively at high and low rates of rotation, and said tape-up reel includes:

(1) a first disk mounted on a first horizontal shaft adapted to be connected to a drive which is switchable between high and low speed drivings, said first disk having a plurality of holes arranged at equal distance along an imaginary circle that is concentric with said first shaft and having at least one arcuate aperture extending along the imaginary circle between an adjacent pair of holes;

(2) a second disk disposed behind said first disk and mounted on a second shaft in the form of a tube disposed concentrically around said first shaft, said second disk being thereby movale toward and away from said first disk, said second disk having a plurality of support rods on and along its peripheral edge at equal distance which are projectable from and retractable into the respective holes in response to the movement of said second disk, said support rods as projected being supportable therearound the article, said support rods as retracted being releasable therefrom the article; and

(3) a third disk disposed being said second disk and mounted on a third shaft in the form of a tube disposed concentrically around said second shaft, said third disk being movable toward and away from said first disk and also rotatable around said first and second shafts, said third disk having on its priphery at least one clamp rod which is projectable from and retractable into said arcuate aperture and which is movable along said arcuate aperture toward and away from one of said support rods from clamping a leading end of the article at the beginning of the winding.

4,783,949

FLEXIBLE ADJUSTABLE WEDGE

Michael Chopko, Dallas, Pa., assignor to Culbro Machine Systems, Kingston, Pa.

Filed Mar. 7, 1988, Ser. No. 164,539
Int. Cl.[4] B65B *43/26, 65/00*
U.S. Cl. 53—393 **7 Claims**



1. A flexible adjustable wedge for expanding a tubular member in apparatus for applying said tubular member over an article, said wedge comprising:

four arms pivotally connected end-to-end by means of swivel joints;

at least one adjusting arm interconnecting two of said arms; and

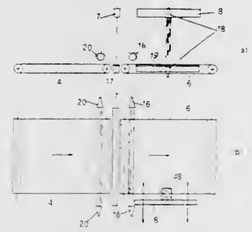
compressible spring adjusting means formed in said adjusting arm to permit said wedge to flex.

4,783,950

MACHINE FOR AUTOMATIC PROTECTIVE WRAPPING FOR USE WITH DIFFERENT-SIZED BAGGAGE

Umberto Santagati, Catania, Italy, assignor to Baggage Pack Italia S.p.A., Catania CA, Italy

PCT No. PCT/IT86/00042, § 371 Date Mar. 9, 1987, § 102(e) Date Mar. 9, 1987, PCT Pub. No. WO87/00144, PCT Pub. Date Jan. 15, 1987
PCT Filed Jun. 12, 1986, Ser. No. 35,582
Claims priority, application Italy, Jul. 9, 1985, 48327 A/85
Int. Cl.[4] B65B *11/08, 51/14, 53/06, 59/02*
U.S. Cl. 53—463 **10 Claims**



1. A method for the automatic wrapping of single pieces of baggage of different dimensions in a film of a heat-shrinkable plastic material to be sealed on the rear side by a transversal sealing and on both lateral sides by longitudinal side sealings, comprising:

charging a piece of baggage on a first conveyor and operating said conveyor;

detecting the position of a leading side of said piece for stopping said first conveyor with the piece in said position;

detecting the transverse dimension of said piece by a pair of contact feelers actuated by an actuating device and at the same time positioning side sealing bars at a second conveyor in an operative position controlled on the transverse dimension detected by said feelers;

re-operating said first and second conveyors and detecting when the rear side of said piece overpasses a position fixed on said second conveyor and stopping said second conveyor;

effecting a sealing of said film on the rear side of said piece;

re-operating said second conveyor and detecting when the leading side of said piece reaches a fixed position on said second conveyor and stopping said second conveyor;

effecting the side sealings on the lateral sides of said piece with the side sealing bars in said operative position;

re-operating said second conveyor for carrying said piece to a heat-shrinking oven; and

resetting said feelers and said longitudinal bars to their starting positions.

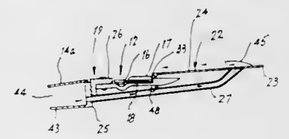
4,783,951

PNEUMATIC FINGER ATTACHMENT FOR HEADER UNIT

Lloyd Richards, P.O. Box 30, and Thomas A. Mills, P.O. Box 89, both of Quairading, Australia

Continuation of Ser. No. 784,232, Oct. 4, 1985, abandoned. This application Jan. 7, 1988, Ser. No. 143,217
Claims priority, application Australia, Oct. 4, 1984, PG7492
Int. Cl.[4] A01D *57/10*
U.S. Cl. 56—12.9 **10 Claims**

1. A harvesting system for agricultural machines comprising: a crop cutting means disposed transversely of the direction of travel of the harvesting marchine; a crop combing means disposed adjacent to and extending forwardly of said cutting means; said combing means having a plurality of receiving platforms collectively defining a generally planar surface beginning at a point forwardly of said cutting means and extending forward of said cutting means and defining a narrow gap thereby for receiving the crop to be cut, and pneumatic means for generating a bed of air moving along the upper surface of said combing means in a direction toward said cutting means and substantially parallel to the cutting plane of said cutting means, said pneumatic means including nozzle means for discharging air in a direction substantially along said upper surface of said combing means to create said bed and delivery



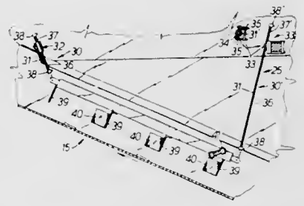
means for delivering air under pressure to said nozzle means, said nozzle means being located in the plane of said bed of air and said delivery means being disposed generally beneath said combing means, said nozzle means comprising an outlet nozzle disposed on the upper face of at least some of said receiving platforms to receive the forced air supply and arranged to direct a forced air flow towards the cutting means, substantially parallel to said planar surface to augment the gathering of said crop.

4,783,952

HARVESTERS

Peter Morellini, P.O. Box 188, Ingham Qld. 4850, Australia

Continuation-in-part of Ser. No. 781,871, Sep. 30, 1985, abandoned. This application Dec. 10, 1987, Ser. No. 131,195
Int. Cl.[4] A01D *45/10*
U.S. Cl. 56—13.9 **9 Claims**



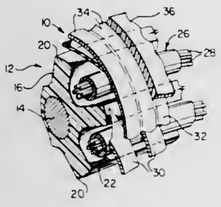
1. A cane harvester of the type including conveyor means for conveying cane billets wherein the improvement comprises a rake assembly, means for supporting said rake assembly in a substantially fixed operative attitude above said conveyor means, said rake assembly including frame means, a series of prongs fixed to said frame means and extending downwardly towards said conveyor means and terminating at a position spaced therefrom, at least some of said prongs in said series being spaced apart transversely of the direction of movement of said conveyor means and at least some of the prongs in said series being spaced apart longitudinally of the direction of movement of said conveyor means, said prongs being adapted to co-operate with cane billets on said conveyor means to level said billets and strip trash or leaves therefrom.

4,783,953

LAYING OF A TUBE CONTAINING TRANSMISSION ELEMENTS ONTO A SUPPORT FILAMENT

Collin A. Akre, Clavet, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 30, 1987, Ser. No. 102,990
Int. Cl.[4] G02B *6/10, 6/16;* **H01B** *13/02*
U.S. Cl. 57—9 **13 Claims**



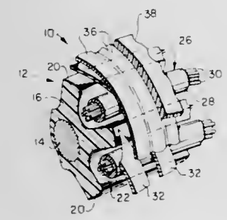
1. Apparatus for laying a tube containing a transmission element along the outer surface of an elongate support member with the tube passing around the support member, the apparatus comprising a laying head mounted around a passline for the support member, the laying head defining a chamber and having an upstream end part rotatable around the passline and defining an inlet for passage of the support member into the chamber and a guide passage positioned radially outwards from the inlet for guiding the tube into the chamber, the chamber subtending a larger angle around the passline than the guide passage and being unrestricted around the passline to permit lateral movement of the tube relative to the laying head and angularly around the passline, the head also having downstream end part defining an outlet for passage of the support member from the chamber, the head providing a circular entrance defining edge to the outlet from the chamber for urging the tube inwards towards the passline and onto the outer surface of the support member while enabling the tube during its lateral movement to slide along the edge and around the feedpath.

4,783,954

LAYING OF ELONGATE TELECOMMUNICATIONS TRANSMISSION MEMBERS ONTO SUPPORT MEMBERS

Collin A. Akre, Clavet, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 30, 1987, Ser. No. 102,989
Int. Cl.[4] G02B *6/10, 6/16;* **H01B** *13/02*
U.S. Cl. 57—9 **8 Claims**

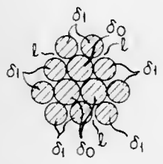


1. Apparatus for laying an elongate telecommunications transmission member into a groove which extends along the outer surface of a support member while passing circumferentially for more than one revolution around the support member, alternately in one direction and then in the other, the apparatus comprising:

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a laying station for the transmission member and a storage station for supply of the transmission member disposed upstream from the laying station along a passline for the support member;
a fixed storage position for the transmission member in the storage station;
positioning means for the transmission member disposed between the laying and storage stations, the positioning means having a guide surface spaced radially from and non-rotatable around the passline for guiding the transmission member as it moves from the storage to the laying stations;
a laying means disposed in the laying station, the laying means having a guide passage for guiding the transmission member, received from the positioning means into the groove of the support member, the laying means having unlimited rotational movement around the passline; and
a shielding tube means for the support member, the shielding tube means surrounding the passline and extending along the passline between the fixed positioning means and the laying means, the shielding tube means having a cylindrical outer surface which extends unimpeded for the whole length of the tube as a support surface for the transmission member.

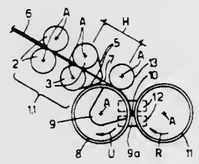
4,783,955
TIRE CORD
Takeshi Uchio, Abiko, Japan, assignor to Tokyo Rope Mfg. Co., Ltd., Tokyo, Japan
Filed Nov. 13, 1986, Ser. No. 930,298
Claims priority, application Japan, Nov. 20, 1985, 60-260466
Int. Cl.⁴ D02G *3/48*; D07B *1/06*
U.S. Cl. 57—213 **19 Claims**



1. A cord comprising:
a core comprising a plurality of wires; and
an outer layer comprising a plurality of wires, said outer layer surrounding said core;
said wires of said core and of said outer layer being twisted together in the same twisting direction and at the same pitch; and
all of said wires of said core having a diameter larger than the diameters of said wires of said outer layer, thereby providing a gap between adjacent said wires of said outer layer.

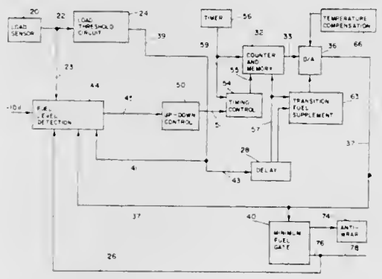
4,783,956
METHOD AND APPARATUS FOR PRODUCING A YARN
Herbert Stadler, Kollbrunn, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland
Continuation of Ser. No. 734,845, May 15, 1985, Pat. No. 4,660,371. This application Dec. 15, 1986, Ser. No. 941,981
Claims priority, application Switzerland, May 18, 1984, 2450/84
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.⁴ D01H *7/892*
U.S. Cl. 57—401 **23 Claims**

1. A method for the production of a yarn or the like, comprising the steps of:
separating fibers from a body of fibers;
feeding the separated fibers continuously along a predetermined path of travel in the direction of friction spinning means moving in a predetermined direction of movement;
mechanically guiding the fibers throughout said entire path of travel of the separated fibers from the body of fibers until reception by the friction spinning means;
directly receiving the fibers from the body of fibers at the friction spinning means in such a manner that a front end



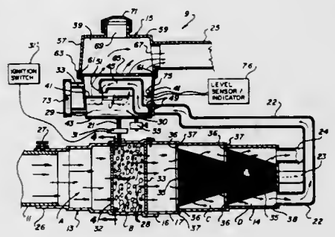
of the fibers, viewed in the direction of fiber travel, is already engaged by the friction spinning means during such time as a rear end of the fibers has not yet departed from the body of fibers;
transferring the mechanically guided and separated fibers to the friction spinning means;
forming a spun yarn at the friction spinning means; and
withdrawing the spun yarn in a direction governed by the friction spinning means.

4,783,957
FUEL CONTROL CIRCUIT FOR A TURBINE ENGINE
James J. Harris, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Dec. 23, 1986, Ser. No. 946,455
Int. Cl.⁴ F02C *9/28*
U.S. Cl. 60—39.281 **29 Claims**



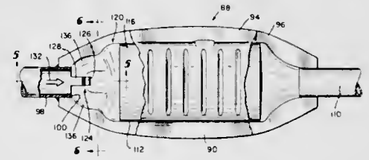
1. A fuel control circuit for a turbine engine, comprising:
means for determining a minimum fuel demand level necessary to prevent flameout for said turbine engine, said determining means being operative during low-load operation of said turbine engine; and
means for causing the storing of said minimum fuel demand level, said causing means being connected in signal communication with said determining means.

4,783,958
EXHAUST GAS PROCESSING DEVICE AND METHOD
Antonio B. Borja, 2210 S. Dexter, #2, Denver, Colo. 80210
Filed Sep. 29, 1986, Ser. No. 912,327
Int. Cl.⁴ F01N *3/04*
U.S. Cl. 60—274 **16 Claims**



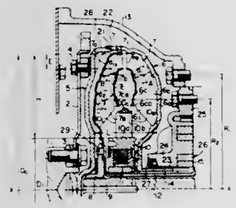
1. A method of treating hot exhaust gas before emission thereof into the environment, said method comprising:
collecting said hot exhaust gas;
heating solid discrete particle material with said hot exhaust gas;
directing said hot exhaust gas into contact with a supply of liquid so that turbulence in said supply of liquid is created to thereby enhance mixing of said hot exhaust gas and said liquid for cleansing purposes and to heat said liquid to a temperature nearer the vaporization point of said liquid;
causing said liquid to be directed toward said heated solid material to vaporize said liquid forming a steam and thereby coagulate particles of matter to be removed from said hot exhaust gas heating solid material;
removing said coagulated particles of matter from said vapor exposed exhaust gas by exposing said vapor exposed gas to a plurality of filters before directing said hot exhaust gas into contact with said supply of liquid; and
filtering said gas after contact thereof with said supply of liquid and before emission thereof into the environment.

4,783,959
EXHAUST PROCESSOR ASSEMBLY
Mark A. Sickels, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.
Filed Sep. 22, 1987, Ser. No. 99,557
Int. Cl.⁴ F01N *3/08*
U.S. Cl. 60—299 **16 Claims**



1. An exhaust processor assembly for processing a flow of combustion product supplied by a source means, the assembly comprising
a housing including inlet means coupled to the source means for admitting combustion product traveling in a certain flow direction into the housing and outlet means for exhausting combustion product from the housing,
substrate means positioned in the housing in downstream relation to the inlet means for treating combustion product admitted into the housing through the inlet means, the inlet means having a longitudinal axis and extending between the source means and the substrate means to define a predetermined axial dimension along the longitudinal axis, the inlet means including first diverging nozzle means communicating with the source means for providing an increase in the cross-sectional area of the inlet means in the flow direction over a first predetermined axial distance, second diverging nozzle means communicating with the substrate means for providing an increase in the cross-sectional area of the inlet means in the flow direction over a second predetermined, axial distance, and transition means interconnecting the first and second diverging nozzle means in fluid communication for providing a substantially uniform cross-sectional area of the inlet means in the flow direction over a third predetermined axial distance, the summation of the first, second, and third predetermined axial distances being substantially equivalent to the predetermined axial dimension of the inlet means, and
diverter means positioned in the inlet means for interrupting the flow of combustion product traveling through the inlet means toward the substrate means, the inlet means and the diverter means cooperating to provide distribution means for substantially uniformly distributing the flow of combustion product introduced into the housing across the inlet face of the substrate, thereby providing a distributed exhaust flow designed to load the substrate means substantially evenly to enhance combustion product treatment efficiency of the substrate means.

4,783,960
FLUID TORQUE CONVERTER WITH AXIALLY CUT AWAY STATOR INNER SHELL
Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tokuyuki Takahashi, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Aug. 12, 1981, Ser. No. 292,176
Claims priority, application Japan, Aug. 18, 1980, 55-113305
Int. Cl.⁴ F16D *33/00*
U.S. Cl. 60—338 **1 Claim**



1. A fluid torque converter, comprising:
(a) a pump impeller comprising a pump impeller outer shell member, a pump impeller inner shell member, and a plurality of pump impeller vanes extending between said pump impeller outer shell member and said pump impeller inner shell member and having edges which lead between said pump impeller outer shell member and said pump impeller inner shell member which define a pump inlet and a pump impeller outlet;
(b) a turbine member comprising a turbine member outer shell member, a turbine member inner shell member, and a plurality of turbine member vanes extending between said turbine member outer shell member and said turbine member inner shell member and having edges which lead between said turbine member outer shell member and said turbine member inner shell member which define a turbine member inlet and a turbine member outlet;
(c) a stator member comprising a stator member outer shell member, a stator member inner shell member, and a plurality of stator member vanes extending between said stator member outer shell member and said stator member inner shell member and having edges which lead between said stator member outer shell member and said stator

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member inner shell member which define a stator member inlet and a stator member outlet, said stator member vanes having substantially a constant width in the direction of the central axis of the fluid torque converter over the substantially whole length thereof extended between said stator member outer shell member and said stator member inner shell member;

(d) said pump impeller, said turbine member, and said stator member being coaxially mounted so as to be rotatable with respect to one another about a common central axis; said pump impeller outlet being generally proximate to said stator member inlet, and said stator member outlet being generally proximate to said pump impeller inlet;

(e) said pump impeller outer shell member, said turbine member outer shell member, and said stator member outer shell member generally cooperating to define an outer toroidal surface, and said pump impeller inner shell member, said turbine member inner shell member, and said stator member inner shell member generally cooperating to define an inner toroidal surface which is fitted within said outer toroidal surface; said outer and inner toroidal surfaces together generally defining a hollow toroidal hydraulic fluid circulation path for being filled with hydraulic fluid for transferring torque between said pump impeller and said turbine member;

(f) the ratio between the thickness of a cross section of said outer toroidal surface taken in a plane including said central axis along the direction of said central axis, and the thickness of said section of said outer toroidal surface along the direction perpendicular to said central axis, being less than approximately 0.9;

(g) an edge of said stator member inner shell member at said stator member inlet being substantially opposed to and aligned with an edge of said turbine member inner shell member at said turbine member outlet; and said edges of said stator member vanes which define said stator member inlet being substantially extended at portions thereof in the vicinity of said edge of said stator member inner shell member at said stator member inlet towards said turbine member outlet beyond said edge of said stator member inner shell member at said stator member inlet.

4,783,961

NATURAL GAS PRESSURE DIFFERENTIAL ENERGY RECOVERY SYSTEM

Randall W. Walters, 707 S. Main, Rice Lake, Wis. 54868

Continuation of Ser. No. 63,159, Jun. 16, 1987, abandoned. This application Jan. 13, 1988, Ser. No. 145,660
Int. Cl.[4] F15B *13/02, 21/04*
U.S. Cl. 60—370 **14 Claims**

12. An energy recovery system for recovering energy from a high pressurized natural gas comprising:

a processing vessel having wall means defining a bounded volume, said volume at least partially filled with a liquid;

a shaft extending through an aperture formed in said processing vessel, said shaft terminating at a free end disposed within said processing vessel, means for sealing said aperture and accomodating reciprocating movement of said shaft through said aperture;

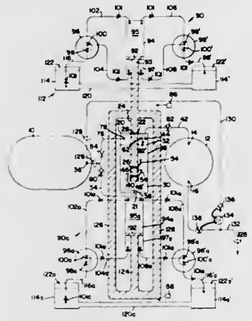
a source of a pressurized natural gas;

an expansion tank having a gas inlet to receive pressurized natural gas and reduce pressure of gas admitted to said expansion tank;

a high pressure conduit means for connecting said pressurized gas source in gas flow communication with a gas inlet of said processing vessel, said gas inlet disposed to admit gas to flow and collect in a volume of said processing vessel above a level of said liquid within said processing vessel with gas within said volume urging said shaft free end to move toward said level of said liquid;

gas discharge means for releasing gas from said volume and admitting said released gas said expansion tank when said free end of said shaft has moved towards said level of said liquid to a predetermined location;

means for blocking flow of gas from said volume to said expansion tank after said gas has been discharged to permit said shaft to move away from said level of said liquid to a first position; and



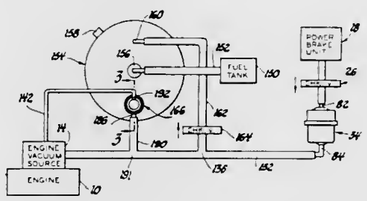
means for recovering energy from said moving shaft as said shaft moves between said first position and said predetermined location.

4,783,962

BRAKE BOOSTER VAPOR TRAP FILTER AND FUEL TANK VAPOR TRAP CANISTER VAPOR GUARD SYSTEM

John R. Grein, Waterport, N.Y., assignor to General Motors Coporation, Detroit, Mich.

Continuation-in-part of Ser. No. 692,551, Jan. 18, 1985, abandoned. This application Jun. 25, 1986, Ser. No. 878,349
Int. Cl.[4] F15B *21/04;* **F02M** *33/02*
U.S. Cl. 60—397 **5 Claims**



1. In a power servomotor system having a servomotor operated by differential air pressures with one pressure being atmospheric air pressure and the other pressure being air at other than atmospheric air pressure, said other pressure being selectively generated by a pressure source which also entrains vapors therein which are capable of adversely affecting said servomotor if the vapors enter said servomotor and particularly if the vapors are condensed therein, said servomotor being connected to said pressure source by a main fluid conduit through which said other pressure is provided to said servomotor, the improvement comprising:

a first branch fluid conduit having a first T connection into said main fluid conduit at one end and the other end operatively connected to the higher absolute air pressure of said differential air pressures;

a vapor trap in said first branch fluid conduit fluidly between said first branch fluid conduit other end and the higher absolute air pressure operatively connected thereto;

a second branch fluid conduit having a normally open check valve therein and a second T connection into said main fluid conduit at one end and the other end operatively connected to said vapor trap and said first branch fluid conduit other end via said vapor trap, said check valve being operable in response to a vacuum pressure in said main fluid conduit to close to prevent fluid flow from said vapor trap to said second T connection, said vapor trap trapping and holding at least some of said entrained vapors in said other pressure air, transmitted via said second branch fluid conduit when said check valve is open, which may otherwise be transmitted to said servomotor from said pressure source during air flow said pressure source to said servomotor through said main fluid conduit, said vapor trap being purged of vapors so trapped therein upon air flow through said vapor trap and said first branch fluid conduit and said first T connection and a portion of said main conduit from said T connection to said pressure source;

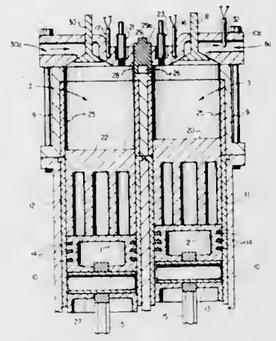
and means in said first branch fluid conduit preventing said last mentioned air flow from continuing after a time delay in which the vapor trap purge action occurs, said time delay being controlled by means responsive to the other pressure when that other pressure is being generated by actuation of the pressure source.

4,783,963

INTERNAL COMBUSTION STEAM ENGINE

Luther B. Thomas, 159 Herdon Ave., Shreveport, La. 71101

Continuation of Ser. No. 834,381, Feb. 28, 1986, abandoned. This application Jan. 21, 1987, Ser. No. 5,606
Int. Cl.[4] F01K *21/04*
U.S. Cl. 60—511 **1 Claim**



1. A method of operating an internal combustion steam engine including a pair of adjacent cylinders with a reciprocating piston in each cylinder, the first cylinder of said pair operating as a compression cylinder, the second cylinder of said pair operating as a power cylinder, a first valve means associated with only the first cylinder, a second valve means associated with only the second cylinder, and a third valve means associated with a flow of fluid between the cylinders, said method comprising the steps of:

(a) cylically opening and closing the first valve means to allow air to be drawn into the compression cylinder in a timed relationship with the movement of the compression piston;

(b) compressing said air as the compression cylinder moves toward top-dead-center;

(c) opening the third valve means to allow communication between the two cylinders when the power piston has reached top-dead-center and the compression piston is still approximately 50 degrees from top-dead-center so that the pressure in both cylinders is equalized;

(d) "injecting fuel into the compressed air in a timed relationship with the opening of said third valve means and igniting the fuel and air mixture".

(e) maintaining a constant volume of the burning gases as the power piston moves downward from top-dead-center and the compression piston continues to move upward towards top-dead-center;

(f) closing the third valve means when the compression piston reaches top-dead-center to thereby isolate substantially all of the combustion gases in the power cylinder;

(g) injecting a small amount of high pressure water into the hot gases now continued in the power cylinder to generate superheated steam whereby useful work is obtained as the steam expands within the power cylinder;

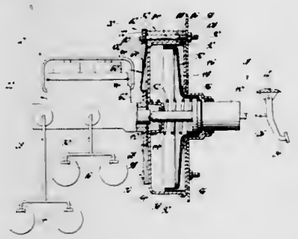
(h) opening the second valve means in a timed relation to exhaust fluid from the power cylinder after completion of the expansion stroke.

4,783,964

PNEUMATIC BRAKE BOOSTER WITH LOAD REACTION CARRYING MEMBERS

Michael W. Fanelli, Centerville, and Schuyler S. Shaw, New Carlisle, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1983, Ser. No. 465,629
Int. Cl.[4] B60T *13/46*
U.S. Cl. 60—547.1 **3 Claims**



3. In a differential pressure actuated power brake booster having a master cylinder mounted thereon for actuation and support and cooperating therewith to define a power brake assembly, an assembly mount supporting said power brake assembly in a vehicle for controlled operation by a vehicle operator, said booster including a booster housing defined by peripheral and side housing wall means, power wall means movably mounted in said booster housing within said housing wall means and cooperating with said housing wall means to define differential pressure chambers, and booster output means connecting said power wall means and said master cylinder in actuating and release force transmitting relation, the pressures in said differential pressure chambers selectively acting across said power wall means to generate boosted master cylinder actuating formce, the improvement comprising:

said housing wall means being light in weight and having strength sufficient to support the differential pressures thereacross but having insufficient strength to act as booster load carrying members which receive and transmit reaction force from said master cylinder to said assembly mount and which support said master cylinder on said assembly mount;

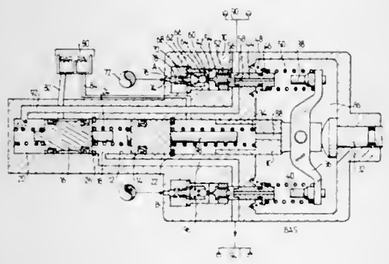
said booster having separate booster load carrying members comprising:

a first booster load carrying member in substantially full surface engagement with one of said side housing wall means and by such engagement providing substantially full surface axial reinforcement to said one side housing

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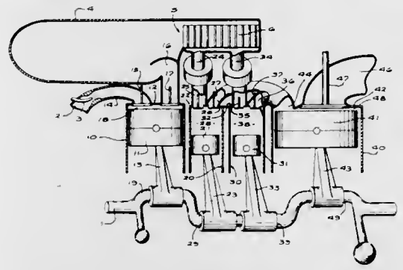
wall means, said first booster load carrying member being formed by said assembly mount,
a second booster load carrying member in juxtaposition with another of said side housing wall means and having said master cylinder securely mounted thereon,
and a third booster load carrying member defined by a plurality of bolt means connecting said first and second booster load carrying members and transmitting booster loads therebetween, said housing wall means including bosses thereon positioned outside the maximum radial extension of said chambers and having bolt passages therethrough receiving said bolt means therethrough, said bolt means providing the means securing said power brake assembly to said assembly mount,
whereby said housing wall means are not required to carry booster loads between said master cylinder and said assembly mount and all booster load carrying members are positioned outside said differential pressure chambers.

4,783,965
HYDRAULIC BOOSTER
Gilbert Kervagoret, Argenteuil, France, assignor to Bendix France, Drancy, France
Filed Jan. 20, 1987, Ser. No. 4,717
Claims priority, application France, Jan. 22, 1986, 86 00883
Int. Cl.[4] B60T *11/20*
U.S. Cl. 60—562 **5 Claims**



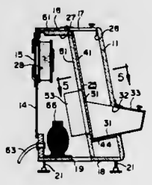
1. A full power hydraulic booster comprising a housing provided with a bore inside which is slidably mounted two pistons each associated with a respective pressure chamber connected to a respective brake circuit, an actuating piston mounted slidably inside the bore and displaceable by a brake pedal, displacement of the actuating piston causing displacement of the two pistons, and two valve means each associated with a respective brake circuit and controlling the flow of pressurized fluid from a respective pressurized fluid source to the associated brake circuit, characterized in that the two valve means are arranged parallel to the bore and are actuated simultaneously by the actuating piston, the pressurized fluid from the sources normally being communicated separately of the two pistonss and directly, via the two valve means, to the respective brake circuits, a failure of one fluid source resulting in the other fluid source providing pressurized fluid assisted displacement of one of the pistons which displaced fluid from the housing to the brake circuit associated with the one fluid source, failure of the other fluid source resulting in the other piston being displaced by means of the actuating piston so that the other piston displaces hydrostatic fluid pressure to the brake circuit associated with the other fluid source, the housing comprising a passage communicating the pressure chamber associated with the one piston with the associated brake circuit via a communication with one of the valve means, and a passage communicating the pressure chamber associated with the other piston with the associated brake circuit via a communication with the other of the valve means.

4,783,966
MULTI-STAGED INTERNAL COMBUSTION ENGINE
Clare A. Aldrich, 296 E. Gainsborough Rd., Thousand Oaks, Calif. 91360
Filed Sep. 1, 1987, Ser. No. 91,978
Int. Cl.[4] F02G *3/00*
U.S. Cl. 60—622 **42 Claims**



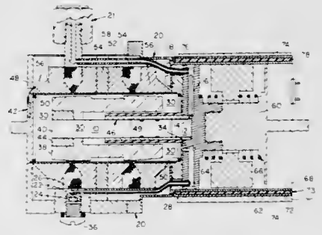
1. A multi-staged internal combustion engine, comprising:
means for compressing a working fluid;
accumulator means connected to the compressing means for receiving and storing the compressed working fluid;
means for cooling the compressed working fluid of the accumulator means;
means for receiving the cooled working fluid from the accumulator means, further compressing the working fluid, and combusting the working fluid to drive the engine; and
means for utilizing exhaust from the combusting means to drive the engine through expansion of the exhaust.

4,783,967
DISPENSER WITH TEMPERATURE CONTROL
Joseph F. Mullen, Norristown, Pa., assignor to Portion Control Systems, Inc., Philadelphia, Pa.
Continuation-in-part of Ser. No. 920,153, Oct. 16, 1986, Pat. No. 4,738,114. This application Jun. 12, 1987, Ser. No. 62,218
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **13 Claims**



1. A temperature-controlled dispenser for a variety of food service items, particularly items having given outside dimensions along three axes, comprising:
(a) a casing having a transverse partition including a thermally-conductive shoe of U-shaped cross section providing a channel cooperating with the casing to form a storage receptacle for said items at one side of said partition, said receptacle defining an upright channel having a horizontal depth sufficiently greater than the largest of the outside dimensions of the particular items, but less than three times the largest of said outside dimensions, whereby said items may tumble down through said channel close to said shoe,
(b) means to cause air to flow in a flow path through a chamber in said casing on the other side of said partition,
(c) electrically-powered heat exchange means mounted in said partition with one face thermally coupled to said shoe and an opposite face exposed to said flow path in said chamber;
(d) means to supply electrical power to said heat exchange means to heat one of said faces and cool the other of said faces to thereby control the temperature of said shoe channel and thereby the temperature within the channel and said receptacle, and
(e) said casing having discharge opening means providing access to the bottom of said receptacle for removing items stored in said receptacle and a charging opening providing access to the top of said receptacle for introducing items into said receptacle at the top for passage through said channel prior to being removed, said discharge opening means being dimensioned and arranged to prevent the items in said receptacle from falling freely through said discharge opening and to permit accumulation of a plurality of items in said receptacle adjacent the discharge opening, so as to permit manual removal of one or more of said items.

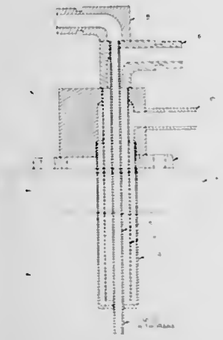
4,783,968
VIBRATION ISOLATION SYSTEM FOR A LINEAR RECIPROCATING MACHINE .
Graham J. Higham, Ashland; Ronald N. Morris, Acton, and Gerald R. Pruitt, Mendon, all of Mass., assignors to Helix Technology Corporation, Waltham, Mass.
Filed Aug. 8, 1986, Ser. No. 894,777
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **19 Claims**



1. A suspension system for a machine having a linear reciprocating piston comprising:
(a) a counterbalance mass attached to the machine such that an antiphase movement is produced relative to the reciprocating movement of the piston for attenuating a resulting force exerted by the piston; and
(b) an isolator having a damping ratio of 0.1 or greater positioned between the machine and the attached counterbalance mass and a mounting frame for attenuating the resonant frequencies, associated with the reciprocating machine and the counterbalance mass, that are transmitted into and out of the machine.

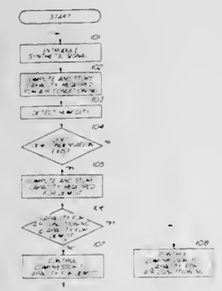
4,783,969
CRYOGENIC WITHDRAWAL APPARATUS AND METHOD
Larry Hohol, Pittston, Pa., assignor to Penox Technologies, Inc., Pittston, Pa.
Continuation-in-part of Ser. No. 890,562, Jul. 30, 1986, abandoned. This application Jun. 24, 1987, Ser. No. 65,732
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—52 **6 Claims**

1. A device adapted to sealingly engage with the neck of an insulated vessel containing a cryogenic liquid for withdrawing the liquid from the vessel, comprising:
(a) a withdrawal tube adapted to extend into the liquid for withdrawing the liquid from the vessel;
(b) a heat exchanger disposed about the withdrawal tube and adapted to be immersed in the liquid, comprising an outer tube and an inner tube nested within the outer tube and connected therewith; and
(c) gasifying means for gasifying the liquid withdrawn from the vessel,



wherein the withdrawal tube, the outer and inner tubes in the heat exchanger and the gasifying means are so connected that the gas produced in the gasifying means passes first through the outer tube, then through the inner tube and then to the exterior of the device or back to the gasifying means.

4,783,970
AIR CONDITIONING SYSTEM FOR VEHICLES
Tadahiro Takahashi, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Mar. 5, 1987, Ser. No. 22,285
Claims priority, application Japan, Mar. 12, 1986, 61-034637[U]; Mar. 28, 1986, 61-045767[U]; Apr. 30, 1986, 61-099933
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—176.3 **4 Claims**

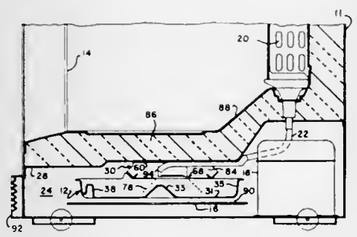


1. An air conditioning system for a vehicle, said vehicle having a compartment, and a windowpane, comprising:
duct means having at an upstream end thereof an air intake section and at a downstream end thereof an air blowoff section in communication with the compartment of the vehicle;
a refrigerating cycle including a compressor of a variable capacity type, for cooling and dehumidifying air flowing through said duct means;
synthetic signal arithmetic means for computing a synthetic signal based on at least an indoor-air temperature and an

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outdoor-air temperature which represent a thermal load, except for a mist on the windowpane of the vehicle;
detecting means for detecting the mist on the windowpane of the vehicle;
capacity arithmetic means connected to said synthetic signal arithmetic means for computing a capacity of said compressor required for air conditioning control, based on said synthetic signal;
auxiliary capacity arithmetic means connected to said detecting means for computing a capacity of said compressor required for demist control for removing said mist, only based on an output from said detecting means;
comparator means connected to said capacity arithmetic means and to said auxiliary capacity arithmetic means for comparing said capacity required for said air conditioning control and said capacity required for said demist control with each other; and
control means connected to said comparator means for controlling the capacity of said compressor so as to be brought to the greater one of said capacities compared by said comparator means.

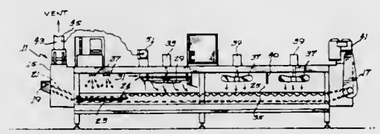
4,783,971
REFRIGERATOR DRAIN PAN APPARATUS
Donald Alba, Marengo, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa
Filed Feb. 8, 1988, Ser. No. 153,744
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—291 **12 Claims**



6. Drain pan apparatus for collecting water formed by melting ice during a refrigerator defrost cycle, comprising:
a drain pan comprising a bottom, side walls having outwardly extending lips with raised pads, a back wall and a front wall; and
a pair of spaced parallel longitudinal brackets for supporting said drain pan in an operating position for collecting said water, each of said brackets comprising a guide slot comprising a horizontal shelf for supporting a respective one of said lips in slidable engagement wherein said drain pan can be removed and replaced from said brackets by longitudinally sliding said lips of said pan along said horizontal shelf, each of said brackets further comprising clamps for engaging said pads in an interference fit in said operating position for preventing vibration noise between said pan and said brackets.

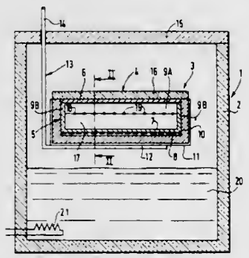
4,783,972
N_2 TUNNEL FREEZER
Lewis Tyree, Jr., Oak Brook; Martin M. Reynolds, Aurora, and Gary D. Lang, Naperville, all of Ill., assignors to Liquid Carbonic Corporation, Chicago, Ill.
Filed Oct. 29, 1987, Ser. No. 114,228
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—374 **20 Claims**

1. A cryogenic freezer comprising
a thermally insulated tunnel-like enclosure having an entrance and an exit,
means for conveying products being frozen from said entrance to said exit,
means for contacting products being frozen with liquid cryogen at a region generally near said entrance,
blower means located in an upper region of said enclosure at a location closer to said entrance than to said exit having a fan blade mounted for rotation about a generally vertical axis,
additional blower means mounted in said enclosure downstream of said blower means for circulating the cryogenic vapor within said enclosure in a direction transverse to the direction of said conveying means,



upstream and downstream baffle means associated with said blower means and linked together for complementary movement so as to selectively regulate the upstream flow of vapor and the downstream flow of vapor resulting from said blower means discharge to the respective extents desired, and
means for monitoring the temperature of vapor leaving the region of said entrance and adjusting the orientation of said baffle means in accordance with the temperature monitored.

4,783,973
APPARATUS FOR FREEZING BY MEANS OF A CRYOGENIC LIQUID BIOLOGICAL PRODUCTS PLACED IN STRAWS
Nicole Angelier, Echirolles; Joseph Bionda, Voiron, and Jean-Yves Thonnelier, Sassenage, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France
Filed Jul. 22, 1987, Ser. No. 77,671
Claims priority, application France, Jul. 28, 1986, 86 10908
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457 **11 Claims**



1. An apparatus for freezing biological products placed in straws, the apparatus comprising an enclosure having a first thermal insulation for containing a bath of cryogenic liquid, a case of flat shape including a lower wall and a cover and located in the enclosure and provided with a second thermal insulation, the thermal insulating power of said first insulation being substantially greater than that of said second insulation, the case comprising means for supporting straws in a horizontal plane and means for heating at least one of elements consisting of the lower wall and the cover of the case.

4,783,974
RE-ATTACHABLE BREAK-A-WAY EARRING ORNAMENTS AND NECKLACE
Charles Hernandez, 1209 W. Inglewood, Broken Arrow, Okla. 74011
Filed Jul. 2, 1987, Ser. No. 69,507
Int. Cl.[4] A44C *7/00, 15/00*
U.S. Cl. 63—2 **3 Claims**



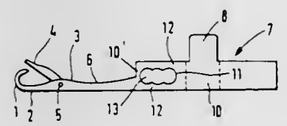
1. A detachable earring device for use with an ear having a hole therethrough which comprises:
a wear post having a first end and a second end and extendable through said ear hole, one end of said wear post having a support plate and a male connector;
a clutch means for attaching to the second end of said wear post to hold it in place on an ear;
an ornament having an aesthetic surface and another surface having a female connector attached thereto for detachably attaching to said male connector;
a second female connector in said ornament on the same side as said first connector;
a chain of beads having a first end and a second end, each end having a male connector for detachably attaching to said second female connector.

4,783,975
COLORED PEARL
Michio Komatsu, Onga, and Kiyohide Mimura, Chiba, both of Japan, assignors to Catalysts & Chemicals Industries Co., Ltd., Tokyo, Japan
Filed Dec. 17, 1986, Ser. No. 943,519
Int. Cl.[4] A44C *17/00*
U.S. Cl. 63—32 **9 Claims**

1. A process for producing a colored pearl comprising the steps of:
(1) forming a mixture of 20–100 wt. % of at least one member selected from the group consisting of pearl powder, shell powder, coral powder and shell powder of Crustacea and having a particle diameter in the range of 0.1–105 microns, 0–80 wt. % of calcium carbonate and 0–20 wt. % of an inorganic pigment, said weight percents being based on the weight of the mixture;
(2) subjecting the mixture to compression molding at a temperature of 400–1500° C. to form a molded article having a particle diameter of 20 mm. or smaller,
(3) utilizing said molded article as a nucleus by inserting it in a mollusk with shells; and
(4) culturing said mollusk to produce a colored pearl.

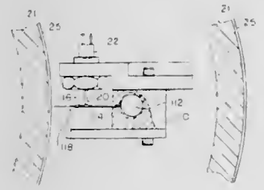
4,783,976
STAMPED KNITTING TOOL FOR TEXTILE MACHINES, PARTICULARLY KNITTING MACHINES
Sigmund Sos, Albstadt, Fed. Rep. of Germany, assignor to Theodor Groz & Söhne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Albstadt-Ebingen, Fed. Rep. of Germany
Filed Mar. 3, 1988, Ser. No. 163,731
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706856
Int. Cl.[4] D04B *35/04*
U.S. Cl. 66—121 **20 Claims**

15. In a stamped knitting tool for textile machines, particularly knitting machines, said tool including a shank having at least one butt and at least one opening, and a heterogeneous material filling said opening and being bonded to said shank, the improvement wherein:



the edges of said shank defining said opening have an irregular profile thereby defining means for anchoring said heterogeneous material in a form-locking manner.

4,783,977
APPARATUS FOR FORMING AND INTERRUPTING FLUID STREAMS
Michael W. Gilpatrick, Chesnee, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 22,586, Mar. 9, 1987, abandoned, which is a continuation of Ser. No. 893,455, Aug. 7, 1986, abandoned, which is a continuation of Ser. No. 839,460, Mar. 12, 1986, abandoned, which is a continuation of Ser. No. 779,292, Sep. 19, 1985, abandoned, which is a continuation of Ser. No. 665,968, Sep. 28, 1984, abandoned. This application Oct. 9, 1987, Ser. No. 110,073
Int. Cl.[4] D06B *1/02, 11/00*
U.S. Cl. 68—205 R **5 Claims**



1. An apparatus for forming a thin stream of fluid which intermittently strikes a target in accordance with externally supplied command data, comprising:
a. a manifold for containing and distributing said fluid at a desired pressure;
b. stream forming means in fluid communication with said manifold, said stream forming means comprising a relatively stiff section of tubing which is directed at said target and which is cantilevered from said manifold and is in fluid communication therewith, said tubing being capable of undergoing moderate deflection without permanent deformation;
c. a barrier means extending beyond the proximal end of said tube and extending transversely to the direction of said stream path, said barrier means serving to intersect the path of said stream when said tube is in a deflected position, and positioned to allow said stream to pass substantially unchanged and strike the target when said tube is in an undeflected position; and
d. tube deflection means comprising a plunger which, when extended, contacts said cantilevered tube and deflects distal end of said tube a sufficient amount to cause said stream issuing from said tube to strike a portion of said barrier means.

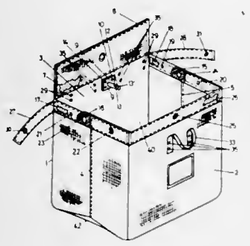
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4,783,978

SAFETY LOCK FOR SECURITY POUCHES

Jose A. Vallerga, Castanón No. 1347, 1406 Buenos Aires, Argentina

Filed Jun. 4, 1987, Ser. No. 58,133
Claims priority, application Uruguay, Jun. 20, 1986, 752833
Int. Cl.[4] E05B *65/52*
U.S. Cl. 70—65 9 Claims



1. A pouch for valuables having a safety lock comprising:

a pouch with an openable mouth having a back wall, an opposite front wall and two opposing articulated side walls extending therebetween with at least the top portions of said side walls adjacent the mouth defining ends thereof having rigid support members secured thereto;

said back wall having one end of an inwardly extending bolt member secured to an upper portion thereof, an opposite inwardly extending end of said bolt member having means to accommodate locking means, and said back wall having a rigid flap member extending from a top portion thereof and two longitudinal extensions extending laterally from opposite sides of the upper portion of said back wall, said flap member having an opening therethrough and being disposed to extend over the mouth and front wall of said pouch with the opening therethrough receiving said bolt member and each of said longitudinal extensions having an opening through an end thereof and being disposed to enfold over the side walls and front wall with the openings therethrough receiving said bolt member;

said opposite front wall having an opening therethrough in an upper portion thereof being disposed to receive said bolt member;

and said articulated side walls being arranged as inwardly extending lateral pleats with an opening in the rigid support members secured to each of said side walls being disposed to receive said inwardly extending bolt member;

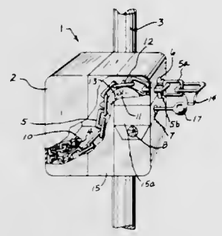
whereby upon closing the mouth of said pouch, the articulated side walls are arranged as inwardly extending pleats with the openings in the rigid support members being pierced by said bolt member, the opening in the front wall being pierced by said bolt member, the rigid flap member being enfolded over the mouth and front wall with the bolt member piercing the opening, the longitudinal extensions being enfolded about the side walls and front wall with the bolt member piercing the opening therethrough and thereby all the parts defining the openable mouth are squeezed and confined by virtue of the rigidity and juxtaposition thereof when they are pierced by said bolt member and locking means is mounted thereon.

4,783,979

DEVICE FOR MAKING VEHICLES BURGLAR-PROOF

Heinz Weiss, Dusseldorf Str. 103, 4000 Dusseldorfer 11, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,482
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632680
Int. Cl.[4] E05B *71/00*
U.S. Cl. 70—233 21 Claims



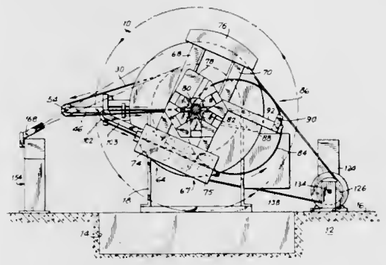
1. A device for making vehicles, especially two-wheelers, burglar-proof, said device comprising locking means for a flexible securing member and a container adapted to be fastened to the vehicle which has storage room for the securing member, said securing member being fixed at one end in the container, at the locking means and/or the vehicle, said container having an opening for the securing member from which the same protrudes in the non-used condition and through which the same is adapted to be removed upon use and to be drawn into the container after use, characterized in that said container (2) is provided with a driven guide/conveyor wheel (11) for said securing member (5) between said opening (6) and said storage room (4).

4,783,980

APPARATUS FOR MAKING HELICALLY WOUND INTERLOCKED FLEXIBLE PIPE

Joseph Varga, Toronto, Canada, assignor to Ceeco Machinery Manufacturing Limited, Coocord, Canada

Filed Oct. 19, 1987, Ser. No. 109,959
Int. Cl.[4] B21C *37/12*
U.S. Cl. 72—49 24 Claims



1. Apparatus for making helically wound interlock flexible pipe comprising:

a rotating head mounted for rotation about an axis which substantially coincides with the longitudinal axis of the interlocked flexible pipe to be formed, said rotating head defining a front side facing the direction where the product is formed and an opposing rear side;

strip supply means for supplying strip material to said front side of said rotating head;

driven forming means for forming said strip material into a formed strip having a predetermined intermediate cross-sectional configuration suitable for interlocking in a closing step;

a tubular mandrel coaxial with said axis projecting beyond said front side of said rotating head;

closing and interlocking means mounted on said front side of said head proximate said mandrel to close and interlock successively adjacent turns of the formed strip; and

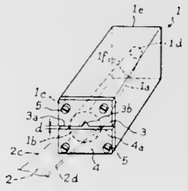
means for storing a variable length of said formed strip between said driven forming means and said closing and interlocking means.

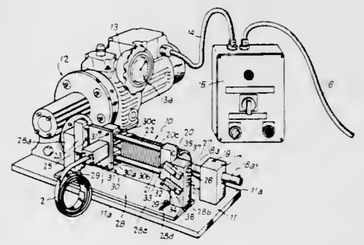
4,783,981

APPARATUS FOR FORMING A TUBE FROM A METAL BAND

Christian J. Shahum, Marseilles, France, assignor to Shahum S.A.R.L., Marseilles, France

Filed Apr. 16, 1986, Ser. No. 852,618
Claims priority, application France, Apr. 17, 1985, 85 05914
Int. Cl.[4] B21C *1/22, 3/02;* B21D *5/10, 9/05*
U.S. Cl. 72—52 29 Claims





1. A device for forming a tube from a substantially planar material, comprising:

an inlet having a first cross-sectional configuration for receiving said planar material;

an outlet having a second cross-sectional configuration, said second cross-sectional configuration being smaller in area than said first cross-sectional configuration, and said second cross-sectional configuration being substantially of the same cross-sectional configuration as said tube;

a conduit having a longitudinal axis, connecting said inlet and said outlet for passing said planar material, said planar material being formed into said tube as it passes through said conduit, said conduit comprising a substantially continuously smooth surface having a continuously decreasing cross section extending from said inlet to said outlet, said planar material being substantially solely formed by contact with said surface so as to be formed into said tube; and

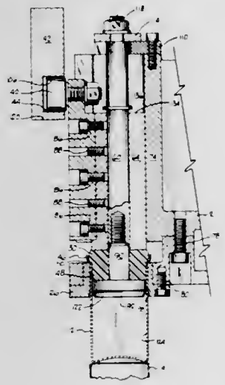
means removably mounted on said inlet, said means defining a slit for receiving and centering said planar material with respect to the cross section of said inlet and for guiding said planar material during the passage of said planar material in said conduit.

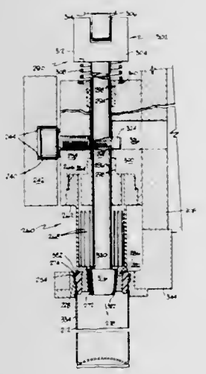
4,783,982

APPARATUS AND METHOD FOR TRIMMING A CAN BODY

Roger A. Hahn, Arvada, and Robert H. Schultz, Broomfield, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Continuation-in-part of Ser. No. 830,364, Feb. 18, 1986, abandoned. This application Sep. 29, 1987, Ser. No. 102,115
Int. Cl.[4] B21D *28/18*
U.S. Cl. 72—55 21 Claims





1. Apparatus for trimming away a portion of a can body adjacent its open end comprising:

a cutting member having an upper surface, a lower surface and an opening having a generally cylindrical inner surface extending therebetween;

a generally circular cutting edge formed at the intersection of said generally cylindrical inner surface and said upper surface;

support means for positioning a can body, said can body having an open end having an exposed top edge portion that remains exposed during said trimming operation, a closed end, generally cylindrical inner and outer surfaces and a longitudinal axis, within said cutting member so that the portion of said can body to be trimmed away projects upwardly from said upper surface of said cutting member

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toward said open end and the next adjacent portion of said can body below said portion that is to be trimmed away is radially opposite said generally cylindrical inner surface of said cutting member and said support means in contact with said closed end of said can body for supporting said can body in such position with no external force being applied to said portion of said can body to be trimmed away;

a resilient, deformable object;

an expandable mounting means having an outer surface on which said resilient, deformable object is mounted and a central opening extending at least partially therethrough;

movement means for moving said expandable mounting means to a location within said can body so that a first part of said resilient, deformable object is radially opposite to said next adjacent portion of said can body and a second part of said resilient, deformable object is radially opposite to said portion of said can body to be trimmed away;

force applying means mounted for movement into said central opening to apply radially outwardly directed forces on said expandable mounting means;

moving means for moving said force applying means;

control means for controlling said radially outwardly directed forces to act first on said first part of said resilient, deformable object to move said first part into contact with said next adjacent portion of said can body with sufficient force to prevent longitudinal movement of said can body; and

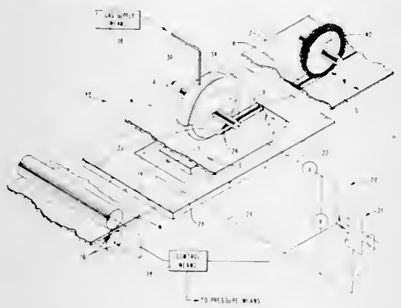
said control means controlling said radially outwardly directed forces to act secondly on said second part of said resilient, deformable object to move said second part into contact with said portion of said can body to be trimmed away to move said portion to be trimmed away against and over said cutting edge with sufficient force so as to sever said portion of said can body to be trimmed away from said can body.

4,783,983

METHOD AND APPARATUS FOR AMORPHOUS METAL SLITTING

Mandayam Narasimhan, 6 Summit Trail, Flemington, N.J. 08822

Filed Nov. 12, 1986, Ser. No. 929,521
Int. Cl.[4] B21B *3/00, 9/00;* **B26D** *7/10, 7/18*
U.S. Cl. 72—204 **20 Claims**



1. A method for continuously slitting solid amorphous metal alloy ribbon into strips of desired reduced width, comprising the steps of:

heating limited to a localized zone of said amorphous ribbon to a temperature, approximating the glass transformation temperature of said alloy;

substantially simultaneously indenting said amorphous ribbon by a positive engaging force with an indenter along said localized zone as material in said localized zone softens;

continuously moving said amorphous ribbon relative to said indenter to provide a line of continuous slitting; and

rapidly cooling said strips along the slitting line;

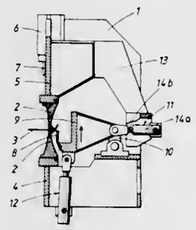
whereby electrical, mechanical and magnetic properties of the slit amorphous ribbon are maintained and clean, high-quality cut edges are obtained.

4,783,984

APPARATUS FOR FOLDING A SHEET METAL ELEMENT

Hans Aschauer, Eferding, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 23, 1982, Ser. No. 410,617
Claims priority, application Austria, Oct. 9, 1981, 4329/81
Int. Cl.[4] B21D *5/04*
U.S. Cl. 72—319 **3 Claims**



1. An apparatus for folding a sheet metal element, comprising a frame,

first and second gripping platens adapted to grip between said gripping platens a sheet metal element extending in a plane,

first and second carriers carried by said frame and spaced apart transversely to said plane and carrying said first and second gripping platens, respectively, at least one of said carriers and the gripping platen carried by it being movable relative to said frame transversely to said plane in one direction to grip said sheet metal element in said plane and in the opposite direction to release said sheet metal element,

at least one bending tool mounted in said frame, a respective one of said gripping platens constituting a backing tool having a bending edge adjoining said plane, and said bending tool facing said bending edge and being movable relative to said frame in a first direction which is substantially parallel to said plane and in a second direction which is transverse to said plane and adapted to cooperate with said bending edge so that a sheet metal element gripped by said gripping platens in said plane and protruding from said bending edge toward said bending tool is bent around said bending edge,

first drive means for moving said bending tool in said first direction and

second drive means for moving said bending tool in said second direction,

the improvement residing in that said second gripping plate constitutes a second backing tool having a second bending edge adjoining said plane and said bending tool is adapted to cooperate with said second bending edge so that a sheet metal element gripped by said gripping platens in said plane and protruding from said second bending edge toward said bending tool is bent around said second bending edge,

said first drive means is supported by the carrier which carries said gripping platen which constitutes said backing tool, and

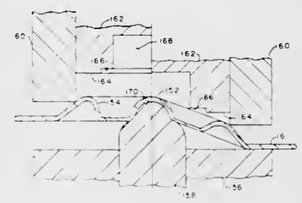
selectively operable means is provided for positively connecting said first drive means to said second carrier when said bending tool is operated to bend said sheet metal element around said second bending edge.

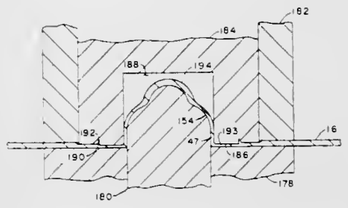
4,783,985

INTEGRAL RIVET AND METHOD OF MAKING

Robert L. LaBarge, Ben Avon Borough, and Frank E. Maier, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 847,772, Apr. 3, 1986, Pat. No. 4,678,096, which is a continuation-in-part of Ser. No. 738,975, May 29, 1985, abandoned. This application Mar. 9, 1987, Ser. No. 23,668
Int. Cl.[4] B21C *37/02*
U.S. Cl. 72—379 **11 Claims**





1. A method of forming an integral rivet in a sheet metal panel, comprising the sequential steps of:

coining a first annular portion of a metal panel to extrude a portion of metal inwardly and form an upstanding bubble;

coining a second portion circumscribing the first portion to extrude additional metal inwardly and form a partial rivet having a larger area in plan than the area in plan of the bubble;

coining a third portion circumscribing the partial rivet to extrude additional metal inwardly which increases the height of the partial rivet and forms the integral rivet.

4,783,986

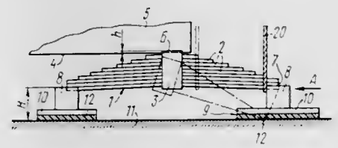
ANTI-VIBRATION MOUNTING FOR SHOCK-OR VIBRATION-PRODUCING MACHINERY

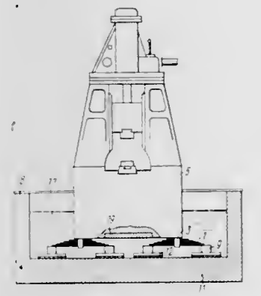
Valery P. Koshelev, Gorky, U.S.S.R., assignor to Gorkovsky Politekhnichesky Institut, Gorky, U.S.S.R.

PCT No. PCT/SU86/00047, § 371 Date Mar. 23, 1987, § 102(e) Date Mar. 23, 1987, PCT Pub. No. WO87/00458, PCT Pub. Date Jan. 29, 1987
PCT Filed May 29, 1986, Ser. No. 51,462
Int. Cl.[4] B21J *13/00*
U.S. Cl. 72—455 **5 Claims**

1. An anti-vibration mounting for shock or vibration-producing machinery, comprising leaf springs (1) formed of a plurality of individual spring members (2) secured to each other by straps (3), said strap members adapted to be received within recesses (6) of a base (4) of a machine, said springs having ends (7); supports (9,14) at each end of said leaf springs (1) placed on a foundation (11) for supporting said ends (7) of said leaf springs (1), characterized in that said ends (7) of each leaf spring (1) rest on a separate one of said supports (9, 14) at a height H above the foundation (11) which is determined by the condition

$$H > 2(h + \delta),$$





where

h = depth to which the strap (3) of the leaf spring (1) fits into the base of the machine; and

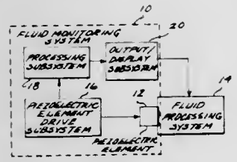
δ = static deflection of the leaf spring (1).

4,783,987

SYSTEM FOR SUSTAINING AND MONITORING THE OSCILLATION OF PIEZOELECTRIC ELEMENTS EXPOSED TO ENERGY-ABSORPTIVE MEDIA

Harold E. Hager, Seattle, and J. D. Sheldon Danielson, Edmonds, both of Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Feb. 10, 1987, Ser. No. 13,133
Int. Cl.[4] G01N *9/00, 11/16*
U.S. Cl. 73—32 A **28 Claims**



1. A system for monitoring the interaction between a piezoelectric element and an energy-absorptive medium of interest that said piezoelectric element is exposed to, said system comprising:

an amplifier, connected to said piezoelectric element, said amplifier causing said piezoelectric element to oscillate when said piezoelectric element is connected thereto, said

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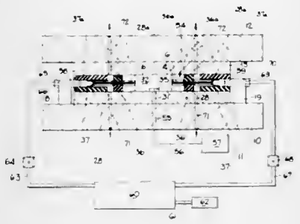
amplifier having an adjustable gain that allows the level of oscillation of said piezoelectric element to be adjusted;
feedback means for adjusting said gain of said amplifier, in response to variations in the electrical characteristics of said piezoelectric element produced by variations in the interaction between said piezoelectric element and said medium of interest, to sustain the oscillation of said piezoelectric element;
frequency output means for producing a frequency output signal indicative of the frequency of oscillation of said piezoelectric element;
gain-adjustment output means for producing a gain-adjustment output signal indicative of the adjustment in said gain of said amplifier produced by said feedback means;
processing means for analyzing said frequency output signal and said gain-adjustment output signal to determine a characteristic of interest exhibited by the medium of interest.

4,783,988

APPARATUS AND METHOD FOR DETECTING LEAKS IN WELDED HEAT EXCHANGER PLATES

Frank W. Bao, Cincinnati, Ohio; Richard K. Dressman, Florence, Ky., and James N. Harrison, Cincinnati, Ohio, assignors to Cincinnati Control Dynamics, Inc., Cincinnati, Ohio

Filed Aug. 25, 1987, Ser. No. 89,144
Int. Cl.[4] G01M *3/26*
U.S. Cl. 73—46 **1 Claim**



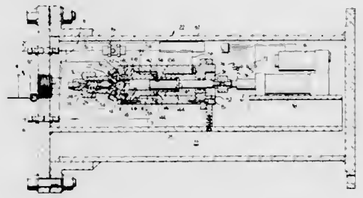
1. An apparatus for testing the integrity of the welds in the annular plate pairs of a heat exchanger of the type comprising a stack of said pairs of plates, said plates of each pair are substantially identical, having first and second sets of gas ports arranged alternately about each plate, said plates of each pair are joined together in back-to-back fashion with their first and second gas ports aligned, by continuous welds surrounding said aligned gas ports, those portions of said plates of said pairs located between adjacent ones of said first and second gas ports thereof being spaced from each other to permit passage of gas therebetween, said test apparatus comprising a fixed base member and a top member shiftable vertically toward and away from said base member between open and closed positions, a lower annular seal assembly mounted on said base member, an upper annular seal assembly mounted on said top member facing said lower annular seal assembly, when a plate pair is located on said lower annular seal assembly and said top member is shifte.] to said closed position, means are provided to form air-tight seals about the inner and outer peripheries of said upper and lower seal assemblies, means are provided on said upper and lower seal assemblies to form a sealed chamber about each of said continuous welds and the gas port it surrounds, a leak detector is connected to each of said sealed chambers, and means are provided to introduce air under pressure between said plates of said pair, whereby leakage of air through any of said continuous welds into its respective sealed chamber is identified and recorded by said leak detector connected to said sealed chamber.

4,783,989

VAPOR PRESSURE MEASUREMENT APPARATUS AND METHOD

Donald B. Reed, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 5, 1987, Ser. No. 22,155
Int. Cl.[4] G01N *7/14*
U.S. Cl. 73—64.2 **10 Claims**



1. Apparatus for making measurements of vapor pressure of liquids such as crude petroleum comprising:
housing means including a cylindrical bore formed therein and defining in part an expansible chamber, said housing means including a head portion closing one end of said bore and including an outlet conduit for conducting fluid out of said chamber;
valve means disposed in said outlet conduit to prevent the backflow of fluid from said outlet conduit into said chamber;
an inlet passage in said housing means operable to open to said chamber for conducting fluid to said chamber;
a reciprocal piston disposed in said bore and movable to a first position to uncover said inlet passage and permit the flow of liquid from said inlet conduit through said chamber and through said outlet conduit on a substantially continuous basis, said piston being movable to close off communication between said inlet passage and said chamber and to reduce the volume of said chamber to a predetermined minimum;
pressure sensor means in communication with said chamber at said minimum volume position of said piston;
said piston is disposed in said bore in close fitting relationship thereto to provide seal means between said chamber and said inlet passage, said seal means being formed entirely by a minimum space between said piston and the wall of said housing means defining said bore between said chamber and said inlet passage; and
actuator means for moving said piston from a first position to provide for admitting fluid to said chamber through said inlet passage to a second position and back toward said first position.

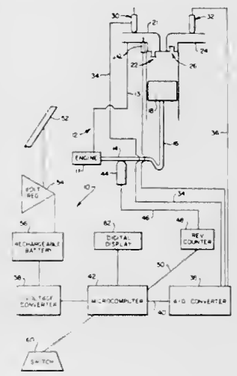
4,783,990

APPARATUS FOR MEASURING THE QUANTITY OF GAS PUMPED BY A COMPRESSOR

Arthur C. Eberle, Upper Arlington, and David M. Thomson, Columbus, both of Ohio, assignors to Columbia Gas System Service Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 800,784, Nov. 22, 1985, Pat. No. 4,676,095. This application Jun. 29, 1987, Ser. No. 68,027
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—112 **8 Claims**

1. Apparatus for measuring the throughput of a gas compressor, said apparatus comprising:
(a) an engine operatively connected to said compressor and powered by the same gas being compressed by the compressor;
(b) a first pressure sensor means for measuring the suction pressure of gas entering said compressor and generating a first signal representative of said suction pressure;
(c) a second pressure sensor means for measuring the discharge pressure of gas leaving said compressor and generating a second signal representative of said discharge pressure;
(d) a data storage means for storing signals representative of the piston displacement and piston clearance; and



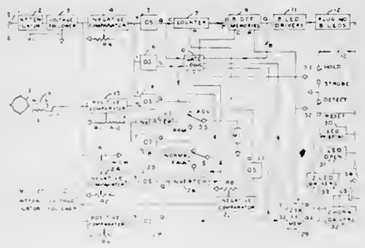
(e) a calculating means arranged to receive said first, second and stored signals and to calculate therefrom a fourth signal representative of the throughput by said compressor.

4,783,991

IGNITION AND COMBUSTION ENGINE PERFORMANCE MONITOR

Glenn H. Wixon, 10645 Art St., Sunland, Calif. 91040

Filed Jun. 20, 1984, Ser. No. 622,576
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—117.3 **3 Claims**



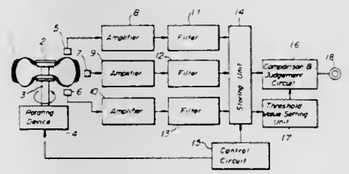
1. An engine analyzer comprising: means for producing accurately scaled ignition signals from the high voltage ignition source;
means for producing signals representing crankshaft top dead center piston positions;
means for providing reference sparkplug signals;
individual comparator means responsive to said high voltage ignition source signals, said position signals and said plug signals for producing comparator output signals;
means responsive to said comparator signals for indicating abnormal ignition operation.

4,783,992

METHOD OF DETECTING CONFIGURATION OF TIRE

Akira Ishibashi, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 26, 1987, Ser. No. 66,440
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 **7 Claims**



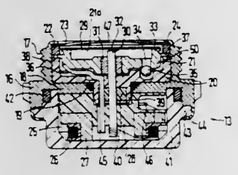
1. A method of detecting an outer configuration of a surface of an inflated tire comprising the steps of:
rotating the inflated tire through a sensor which can measure a distance between the sensor and the surface of tire in a non-contact manner to derive an analog displacement signal;
converting the analog displacement signal into a digital displacement signal;
storing the digital displacement signal in relation to a rotational position of the tire;
deriving peak points of the digital displacement signal;
detecting an outer configuration of a surface of tire in accordance with the detected peak points by deriving heights h_n between successive peak points;
deriving distance l_n between successive peak points;
deriving first and second areas AS_n and BS_n surrounded by the displacement signal and a rectangle whose opposite corners are coincided with successive peak points; and
comparing said heights h_n, distances l_n and areas AS_n and BS_n with threshold values h_R, l_R and AS_R and BS_R, respectively.

4,783,993

TIRE PRESSURE SENSOR FOR MOTOR VEHICLES

Haas Lothar, Stein; Hettich Gerhard, Dietenhofen, and Schmid Hans-Dieter, Nürberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00446, § 371 Date Jul. 23, 1987, § 102(e) Date Jul. 23, 1987, PCT Pub. No. WO87/03547, PCT Pub. Date Jun. 18, 1987
PCT Filed Nov. 5, 1986, Ser. No. 95,536
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543866
Int. Cl.[4] B60C *23/04;* **G01L** *7/08, 9/00*
U.S. Cl. 73—146.5 **6 Claims**

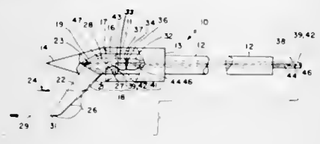


1. In a tire pressure sensor for motor vehicles, comprising a pressure switch for monitoring tire pressure, said pressure switch being fastened at a circumference of a wheel rim and being actuated by the tire pressure, said pressure switch including a reference pressure chamber; a diaphragm, said reference pressure chamber being closed in the direction of the tire by said diaphragm which is electrically conductive; an element

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enclosing said reference pressure chamber; a contact pin supported in said element and engageable with a middle area of the diaphragm for closing an electric circuit when there is sufficient air pressure in the tire; the improvement comprising an air gap (X) provided between the contact pin (**30**) and the middle area of the diaphragm (**29**) for testing leakage of the reference pressure chamber (**21***a*) when an equal pressure occurs on both sides of the diaphragm (**29**), the element enclosing the reference pressure chamber being fastened in a sensor housing (**16**), which is fixed in the wheel rim (**12**) and closed toward outside, in such a manner that it is surrounded by the compressed air in the tire (**11**).

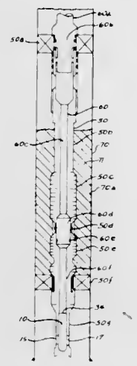
4,783,994
PRESSURE MEASURING PROBE
George C. Ashby, Jr., Newport News, Va., assignor to The Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Jan. 13, 1988, Ser. No. 143,436
Int. Cl.[4] G01F *1/465*; G01M *9/00*
U.S. Cl. 73—147 **9 Claims**



8. A probe for measuring pressure changes in a high velocity, high-temperature fluid stream comprising:
an exterior housing;
first and second inner housings within said exterior housing, said first inner housing forming a sealed cooling chamber around said second inner housing which forms said pressure chamber therein;
inlet and outlet tubes for maintaining cooling fluid in said cooling chamber thereby cooling said transducer means in said pressure chamber;
transducer means mounted in said closed pressure chamber for measuring pressure changes in said fluid stream; and
an open connector tube including a probe tip for passing a portion of said fluid stream into said closed pressure chamber, any change of pressure therein requiring a "settling-time" to appear in said closed chamber that is inversely proportional to the cross-sectional area of said connector tube.

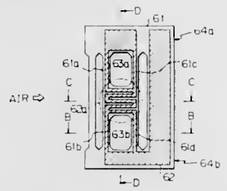
4,783,995
LOGGING TOOL
Donald H. Michel, Lafayette, La., and Paul A. Boatright, College Station, Tex., assignors to Oilfield Service Corporation of America, Lafayette, La.
Filed Mar. 6, 1987, Ser. No. 22,676
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 **26 Claims**

1. A method for evaluating the density of the material surrounding a drill hole in the earth's surface comprising the steps of:
a. attaching a logging device to a material installation tool for installing material into the area surrounding the dril hole;
b. initiating a material installation process;
c. obtaining a density log of the installed material as the



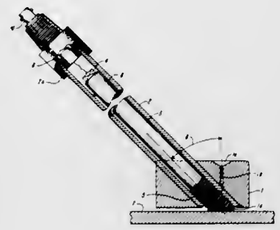
material installation tool is being moved through the drill hole; and
d. evaluating the density log of the installed material.

4,783,996
DIRECT-HEATED FLOW MEASURING APPARATUS
Minoru Ohta, Okazaki; Kazuhiko Miura, Aichi; Michitoshi Onoda, Toyohashi; Yukio Iwasaki, Gifu, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Jan. 30, 1986, Ser. No. 824,265
Claims priority, application Japan, Feb. 2, 1985, 60-17710
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204.17 **7 Claims**



1. A direct-heated flow measuring apparatus for measuring the flow rate within a passage comprising:
a substrate of monocrystalline silicon disposed within said passage;
film resistor means, formed at said substrate for generating heat and detecting the temperature thereof,
a plurality of apertures being formed in said substrate around said film resistor means, for throttling heat transfer of said film resistor means;
four triangular cross section bridges for reinforcing said substrate and said film resistor means, located on said substrate adjacent said apertures; and
means, connected to said film resistor means, for controlling an amount of heat generated by said film resistor means.

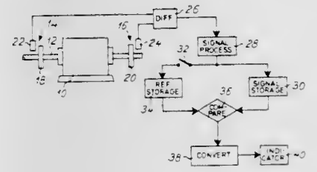
4,783,997
ULTRASONIC TRANSDUCERS FOR HIGH TEMPERATURE APPLICATIONS
Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., Waltham, Mass.
Filed Feb. 26, 1987, Ser. No. 19,020
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—644 **24 Claims**



1. An ultrasonic transducer assembly for transmitting ultrasonic waves to, or receiving ultrasonic waves from a solid surface which is at a temperature differing substantially from ambient, comprising,
an electroacoustic ultrasonic transducer;
an elongated buffer element formed of a creep resistant material having predetermined acoustic transmission characteristics and capable of sustaining a substantial temperature gradient along its long dimension, said buffer element having a surface at one end formed for pressurized acoustic coupling to said solid surface, said electroacoustic transducer being acoustically coupled to the opposite end of said buffer element;
a creep resistant housing of material different from that of said buffer element mechanically coupled to said buffer element over only a small portion of said longitudinal dimension close to the end of said buffer element formed for acoustic coupling to said solid surface, and
means for applying pressurizing force between said housing element and said solid surface, said mechanical coupling between said housing element and said buffer being such that said pressurizing force is transmitted to said buffer element for establishing a pressurized acoustic coupling between said one end of said buffer element and said solid surface.

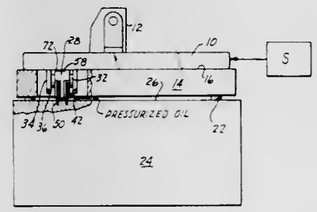
4,783,998
METHOD OF MONITORING THE OPERATION OF A CYCLICALLY MOVING, POWER GENERATING OR POWER TRANSMITTING ELEMENT AND AN APPARATUS FOR MONITORING THE OPERATION OF SUCH AN ELEMENT
Curt A. R. Sander, Hareskovby, Denmark, assignor to DME - Danish Micro Engineering A/S, Herlev, Denmark
PCT No. PCT/DK85/00065, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00714, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 5, 1985, Ser. No. 841,533
Claims priority, application Denmark, Jul. 6, 1984, 3355/84
Int. Cl.[4] G01M *13/02*
U.S. Cl. 73—660 **55 Claims**

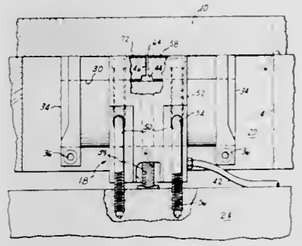
55. A method of providing a model representing a torsional motion of a cyclically rotating power transmitting or power generating element, comprising:
(a) providing a transfer function representative of said element;
(b) providing a signal representing a torque applied to or generated by said element, respectively, and;



(c) multiplying said transfer function and said signal so as to generate a signal including information regarding the transmission of said torque by said element.

4,783,999
VIBRATION TEST APPARATUS AND BEARING THEREFOR
David V. Kimball, Monrovia, Calif., assignor to Kimball Industries, Inc., Monrovia, Calif.
Filed Apr. 30, 1987, Ser. No. 44,590
Int. Cl.[4] G01M *7/00*
U.S. Cl. 73—665 **53 Claims**

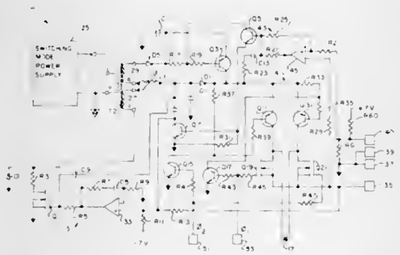




1. Vibration test apparatus having an extended stroke and improved stiffness for use with a plate mounting a test article for vibration testing, comprising a hydrostatic journal bearing plate guide having a housing mounted on a base, a shaft shiftable axially in said housing, carriage block means for connecting said shaft to said plate for movement relative to said housing in a plane including said shaft axis, and oil film means for operatively coupling said plate and a surface of said housing in vibration damping relation.

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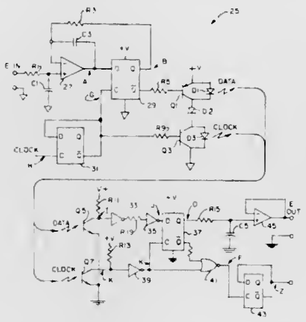
4,784,000
MAGNETIC FLOWMETER COIL DRIVER AND METHOD
Max H. Gaertner, Warminster, Pa., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 15, 1987, Ser. No. 3,591
Int. Cl.[4] G01F *1/60*
U.S. Cl. 73—861.12 **31 Claims**



16. A method of driving the coils in a magnetic flowmeter having a body adapted to be connected in a flow system for flow of liquid therethrough and coils for generating a magnetic field in the path of the fluid flowing through the body, the method comprising:
cyclically applying a relatively high voltage and a relatively low voltage across the coils;
sensing the current through the coils during a portion of the cycle when only the relatively low voltage is being applied across the coils;
increasing the length of time the relatively high voltage is applied during subsequent cycles when the current sensed during the time the relatively low voltage is applied across the coils rises slightly during the time said relatively low voltage is applied; and
decreasing the length of time the relatively high voltage is applied during subsequent cycles when the current sensed during the time the relatively low voltage is applied across the coils falls slightly during the time said relatively low voltage is applied.

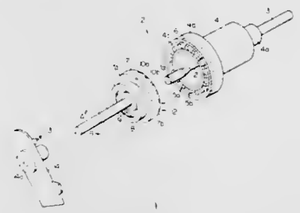
4,784,001
MAGNETIC FLOWMETER WITH ISOLATION AMPLIFIER AND RANGING CIRCUIT THEREFOR AND METHOD
Max H. Gaertner, Warminster, Pa., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jul. 13, 1987, Ser. No. 72,407
Int. Cl.[4] G01F *1/60;* **H04B** *9/00*
U.S. Cl. 73—861.12 **49 Claims**

1. An isolation amplifier for analog input signals comprising:
means for converting an analog input signal to a duty cycle imposed upon a digital waveform, said means including means for generating clock pulses for synchronizing the digital waveform;
means for optically transmitting the digital waveform and information representative of the clock pulses across a barrier which would degrade the analog input signal; and



means for receiving the optically transmitted digital waveform and clock pulse information and recreating the digital waveform with imposed duty cycle therefrom.

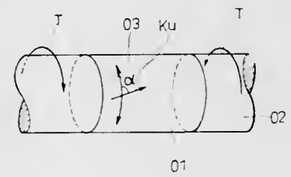
4,784,002
TORQUE SENSOR
Shinichi Io, Atsugi, Japan, assignor to Atsugi Motor Parts Company, Limited, Japan
Filed Jun. 15, 1987, Ser. No. 62,551
Claims priority, application Japan, Dec. 17, 1986, 61-302092; Dec. 23, 1986, 61-307214; Jan. 9, 1987, 62-2753; Jan. 9, 1987, 62-2754
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.33 **8 Claims**



1. A torque sensor comprising
a first shaft having a fore end portion which is constructed such that a displacement of torsion thereof occurs in the circumferential direction of said fore end portion;
a second shaft connected to said first shaft through said fore end portion;
a plurality of first magnetic segments each having a N-pole as a fixed magnetic pole and second magnetic segments each having a S-pole as a fixed magnetic pole, the first and second segments being secured to the second shaft so that the first and second magnetic segments surround said fore end portion of said first shaft and are alternately arranged equiangularly with respect to said fore end portion;
a plurality of first magnetism pickup path members and second magnetism pickup path members corresponding in number to said N-pole of said first magnetic segments and said S-pole of said second magnetic segment, respectively, the first and second pickup path members being alternately arranged so that each path member faces two adjacent first and second magnetic segments and is located midway between the two adjacent first and second magnetic segments;

an outer ring to which said first magnetism pickup path members are connected;
an inner ring to which said second magnetism pickup path members are connected; and
a magnetism detecting element provided between said outer and inner rings and adapted for detecting change in magnetic flux passing through said first and second magnetism pickup path members;
said displacement of torsion of said first shaft with respect to said second shaft being detected by change in magnetic flux passing through said first and second magnetism pickup path members when said N-pole of said first magnetic segment is displaced toward said first or second magnetism pickup path member by torsional displacement of said first shaft with respect to said second shaft.

4,784,003
MECHANICAL QUANTITY SENSOR ELEMENT
Naomasa Kimura; Masayuki Nishiguchi, and Minoru Noguchi, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 8, 1987, Ser. No. 1,406
Claims priority, application Japan, Jan. 10, 1986, 61-2130; Sep. 10, 1986, 61-211778; Sep. 10, 1986, 61-211779; Sep. 10, 1986, 61-211780
Int. Cl.[4] G01L *1/12*
U.S. Cl. 73—862.36 **4 Claims**



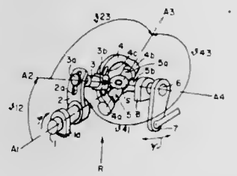
4. A sensor element comprised of a noncrystalline magnetic alloy piece and means joined thereto causing compression strain in at least a portion of said piece for producing improved stress-magneto characteristics of said piece.

4,784,004
WEB TENSION TRANSDUCER
Kenneth E. Ekola, 574 - 6th St., Dover, N.H. 03820
Filed Aug. 20, 1987, Ser. No. 87,399
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.48 **16 Claims**



14. Apparatus to be used in spaced combinations of two or more for supporting a roll on a shaft and providing a signal output reflecting tension on the roll at the points of support comprising:
(a) a collar non-movingly attached to the shaft;
(b) a pair of resiliently bendable opposed beams carried by said collar and extending therefrom parallel to opposite sides of the shaft;
(c) a cylindrical support member disposed over the shaft and carried by said pair of beams, said support member having an axial bore for the shaft to pass through which is a clearance fit to the shaft;
(d) a roller bearing fitted onto the outer periphery of said support member and having an outer diameter sized to have the roll slid thereover to be supported for rotation thereby; and,
(e) a plurality of strain gauges disposed on the upper and lower surfaces at least one of each of said pair of beams to provide signals at outputs thereof indicating the strain in each of said strain gauges.

4,784,005
CRANK DRIVE HAVING FOUR SPACIALLY EXTENDING AXES INTERSECTING IN ONE POINT
Jochen Balken, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany
Filed Oct. 5, 1987, Ser. No. 105,391
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635545
Int. Cl.[4] F16H *21/18, 21/42*
U.S. Cl. 74—42 **9 Claims**



1. A crank drive for converting a rotating input drive motion into an output drive motion, comprising a power input shaft (**1**) defining a first input axis (**A1**), a crank arm (**2**) connected to said power input shaft (**1**), first means for rotatably mounting said power input shaft (**1**) in a machine frame, power output means (**6**) for providing a power-take-off, second means operatively mounting said power output means (**6**) to said machine frame, a coupling member (**3**) defining a second axis (**A2**), third means (**3***a*) for adjustably connecting said coupling member (**3**) to said crank arm (**2**), whereby said coupling member (**3**) is arranged eccentrically to said power input shaft (**1**), a transmission member (**4**) defining a third axis (**A3**), fourth means operatively connecting said transmission member (**4**) to said power output means (**6**) defining a fourth axis (**A4**), said first, second, third, and fourth axes (**A1**, **A2**, **A3**, **A4**) intersecting in a common point (**S**), fifth means (**3***b*) for adjustably connecting said coupling member (**3**) to said transmission member (**4**), whereby said transmission member (**4**) is connected in a pivotable manner to said power input shaft, said power input shaft and said power output means taking up axial positions fixed in space during an operation of the apparatus, said first axis (**A1**) and said second axis (**A2**) enclosing a first adjustable angular spacing (θ_{12}), said second axis (**A2**) and said third axis (**A3**) enclosing a second adjustable angular spacing (θ_{23}), said third axis (**A3**) and said fourth axis (**A4**) enclosing a third adjustable angular spacing (θ_{43}), said fourth axis (**A4**) and said first axis (**A1**) enclosing a fourth adjustable angular spacing (θ_{41}), and wherein said first, second, third, and fourth adjustable angular spacings (θ_{12}, θ_{23}, θ_{43}, θ_{41}) are changeable by selectively and independently of one another changing one or more angular positions of said first, second, third, and fourth axes that follow each other from the power input shaft to said power output means.

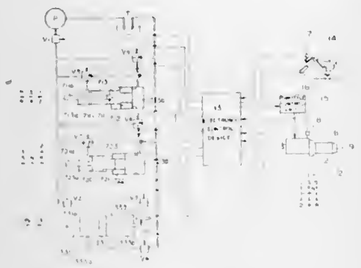
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4,784,006
GYROSCOPIC PROPULSION DEVICE
Lancelot I. Kethley, 900 NE. Minnehaha St., B4, Vancouver, Wash. 98665
Continuation-in-part of Ser. No. 814,409, Dec. 30, 1985, abandoned. This application Aug. 12, 1987, Ser. No. 84,973
Int. Cl.[4] F16H *27/04*
U.S. Cl. 74—84 R 12 Claims



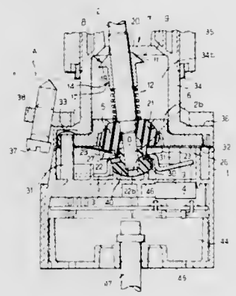
1. A gyroscopic propulsion device, comprising:
a vehicle having means for supporting the same on a surface;
a rotatable body mounted on the vehicle;
rotating means for establishing a first substantially horizontal axis of rotation for rotating the body; and
offsetting means comprising resilient elements which allow said body to initially offset by the effect of gravity and for offsetting said body by the force evoked by its rotation to a second axis of rotation, about which the body rotates, vertically and horizontally away from and substantially parallel to the first axis of rotation for propelling the vehicle.

4,784,007
METHOD AND APPARATUS FOR ACTUATING VEHICLE TRANSMISSION
Hisao Ishida, Tokyo; Masaki Ishihara, Kanagawa, and Makoto Uriuhara, Yokohama, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan
Continuation of Ser. No. 861,640, May 8, 1986, abandoned, which is a continuation of Ser. No. 539,967, Oct. 7, 1983, abandoned. This application Feb. 27, 1987, Ser. No. 20,200
Claims priority, application Japan, Oct. 7, 1982, 57-176696
Int. Cl.[4] F16H *5/40*
U.S. Cl. 74—335 4 Claims



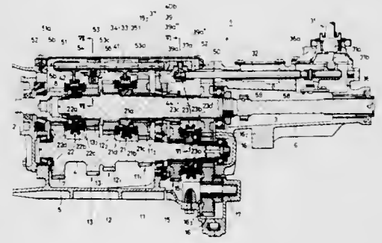
2. A method of actuating a vehicle parallel-gear transmission having a plurality of gears and an internal lever for moving shift blocks connected with shift rods and shift forks for changing gear ratios of the transmission, a hydraulically controlled select actuator operatively connected to said internal lever for moving said internal lever in a select direction, a hydraulically controlled shift actuator operatively connected to said internal lever for moving said internal lever in a shift direction substantialy normal to said select direction, a hydraulically controlled clutch actuator for connecting and disconnecting a clutch of the transmission, and a common fluid discharge passage connected to fluid discharge ports of said select and shift actuators and a fluid discharge port of said clutch actuator, the select and shift actuators being alternately actuatable to effect a gear changing operation, said method comprising the steps of, in order:
(a) applying a hydraulic pressure to said select and shift actuators, each in a position, to fix the actuators in the respective positions while the transmission is in a first gear ratio;
(b) actuating said clutch actuator, thereby disconnecting the clutch;
(c) removing the hydraulic pressure from said select and shift actuators;
(d) applying a hydraulic pressure to said select actuator in a position, to fix said select actuator in that position;
(e) applying a hydraulic pressure to said shift actuator to actuate same, so as to move the internal lever to a first neutral position;
(f) removing the hydraulic pressure from said select and shift actuators;
(g) applying a hydraulic pressure to said shift actuator in a position, to fix said shift actuator in that position;
(h) applying a hydraullic pressure to said select actuator to actuate same, so as to move the internal lever to a second neutral position;
(i) removing the hydraulic pressure from said select and shift actuators;
(j) applying a hydraulic pressure to said select actuator in a position, to fix said select actuator in that position;
(k) applying a hydraulic pressure to said shift actuator to actuate same, so as to move the internal lever and engage a desired gear ratio of the transmission;
(l) actuating the clutch actuator, thereby connecting the clutch, and, prior to or following step (1);
(m) removing the hydraulic pressure from said select and shift actuators to free both of the select and shift actuators and prevent wear of the transmission gears.

4,784,008
ANALOGUE MANIPULATOR WITH PREFERENTIAL ORIENTATIONS
Philippe Paquereau, Angouleme, and Xavier Ruaud, Marthon, both of France, assignors to La Telemecanique Electrique, Nanterre Cedex, France
Filed May 21, 1987, Ser. No. 52,474
Claims priority, application France, May 22, 1986, 86 07289
Int. Cl.[4] G05G *9/02;* H01H *25/04*
U.S. Cl. 74—471 XY 8 Claims



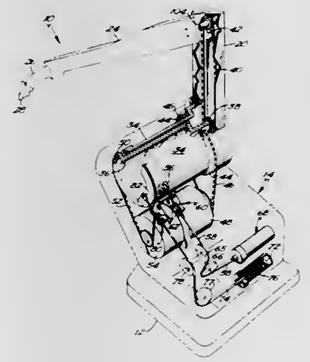
1. In a manipulator delivering signals characteristic of the orientation of a lever in space, such lever being movable, under transverse pressure, from a reference or neutral position, and elastically returned to said neutral position, said manipulator comprising a casing, a bearing surface stationary with said casing, a ball joint carried by said lever and resiliently urged against said bearing surface, said lever being connected to at least one movable member interacting with at least one pick-up for delivering an electrical signal responsive to the orientation of the lever, means resiliently opposing the angular displacement of said lever from its neutral position; the improvement in which said ball joint has radial ribs pointing away from the bearing surface and engaging corresponding radial slots formed in an elastic diaphragm between elastic tongues of said diaphragm which engage a base of said ball joint thereby to urge said ball joint against said bearing surface.

4,784,009
GEAR TYPE TRANSMISSION APPARATUS
Kenji Sakamoto; Etsuo Shirai; Kazuhiko Moriyama, and Hiroaki Nagamatsu, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Jul. 22, 1987, Ser. No. 76,398
Claims priority, application Japan, Jul. 23, 1986, 61-173280; Aug. 4, 1986, 61-183647
Int. Cl.[4] G05G *9/12*
U.S. Cl. 74—475 11 Claims



1. A gear type transmission apparatus comprising,
a transmission case containing a gear train arrangement including a plurality of gear trains and an output shaft to which an output of an engine is transmitted through the gear train arrangement and provided with an opening at an upper portion thereof,
a cover member mounted on the upper portion of said transmission case to cover said opening,
a holder member formed separately from said cover member and fixed on an under surface of said cover member to be positioned at the inside of a contacting face of said cover member provided for coming into contact with an upper end face of said transmission case, wherein said holder member is provided with a shift rod supporting portion disposed to be at least partially lower than the level of the contacting face of said cover member, and
a shift rod supported by said shift rod supporting portion of said holder member to be movable in a direction along its axis at a position above the output shaft for causing the gear trains to be in operation to transmit the output selectively, and at least a part of one of said holder member and said shift rod is positioned to be higher than the lever of said contacting face.

4,784,010
ELECTRIC ROBOTIC WORK UNIT
Dale A. Wood, Canton; Robert J. Todd, Milford Township, Wayne County, and Norman N. Fender, Hudson, all of Mich., assignors to Graco Robotics Inc., Livonia, Mich.
Filed Apr. 27, 1987, Ser. No. 43,278
Int. Cl.[4] G05G *11/00;* B25J *9/12*
U.S. Cl. 74—479 8 Claims



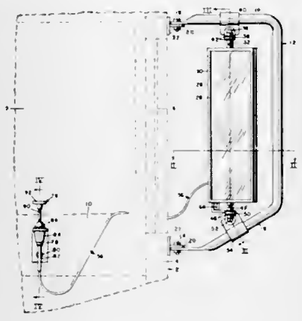
1. A robotic work unit comprising:
a base unit rotatable about a vertical first axis relative to a support surface;
a vertical arm pivotably mounted to said base along a horizontal second axis;
a shaft on which said vertical arm is mounted and which rotates in said base unit about said second axis;
a horizontal arm pivotably mounted to said vertical arm along a horizontal third axis, said third axis being generally parallel to said second axis;
a wrist mounted on said horizontal arm and movable along at least a fourth axis; and
at least one motor for moving said wrist, each said motor being mounted in said base unit and having a rotational output coaxial with said second axis, each said wrist motor being mounted with in said shaft.

4,784,011
REMOTELY CONTROLLED REAR VISION MIRROR
Carl C. Riley, 507 W. Grant, Pittsfield, Ill. 62363
Filed Jun. 11, 1987, Ser. No. 60,760
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—502.1 1 Claim

1. A remotely controlled rear vision mirror for automotive vehicles comprising:
a. a frame adapted to be mounted on the external side of a door of a vehicle,
b. a mirror mounted in said frame for pivotal movement on a vertical axis, and being disposed in a generally vertical plane,
c. an adjusting and locking device adapted for mounting within said vehicle, said adjusting and locking device including:
i. a tubular body member adapted to be fixedly related to said vehicle,
ii. a rigid spindle disposed within said body member and axially slidable therein, one end of said spindle projecting from said body member and the other end thereof being affixed coaxially to the associated end of the wire of said drive cable,
iii. a handle affixed to the projecting end of said spindle, whereby said spindle may be moved longitudinally in said body member or turned about its axis, and

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iv. locking means operable by turning said handle about its axis to lock said spindle against either type of movement relative to said body member, wherein said locking means includes a plug carried rotatably in one end of said body member, said spindle being non-circular in cross-sectional contour in passing through a matching non-circular aperture formed in said plug eccentrically to the axis of said plug, whereby rotation of said handle and spindle also forces rotation of said plug, the bore of said body member adjacent said plug also being eccentric to the axis of said plug, said spindle being axially slidable through said plug and bore only when the plug is turned to align the eccentricity of said spindle angularly with that of said body member bore, whereby rotation of said plug by said handle will wedge said spindle tightly against the wall of said body member bore to lock said spindle against motion relative to the body member, and



d. means interconnecting said adjusting and locking device to said mirror whereby the former is rendered capable of pivoting said mirror on its vertical axis, and of locking said mirror against pivotal movement, said interconnecting means including a drive cable adapted to be led from the exterior to the interior of said vehicle, and comprises a flexible wire enclosed in a flexible sheath, longitudinally sliding movement of said wire within said sheath being operable to pivot said mirror, and wherein said adjusting and locking means comprises means operable alternately either to slide said wire within said sheath, or to lock said wire against such movement, wherein the end of the sheath of said drive cable adapted to be led into the interior of said vehicle is affixed to said tubular body member, and wherein the end of said wire is extended from said sheath and connected to said other end of said spindle.

4,784,012

ROTOR BALANCE SYSTEM

John J. Marra, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 8, 1987, Ser. No. 94,214

Int. Cl.[4] F16F *15/22*; F01D *5/10*

U.S. Cl. 74—573 R **5 Claims**

1. A rotor balance system for an integrally bladed gas turbine engine rotor comprising:

a plurality of disks, each carrying a plurality of integral blades;

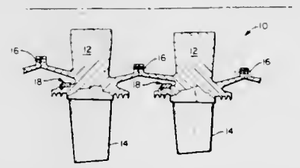
a single balance ring internally shrink fit to each disk;

an eccentric raised area throughout a substantial minority of the circumference of each balance ring, said balance ring being substantially uniform throughout the remainder of the circumference;

said balance ring selectively ground to establish a detail balanced condition of each disk;

a plurality of openings through the outer edge of each balance ring;

a plurality of balance weights within said openings for establishing a balanced condition of the assembled plurality of disks; and



a snap ring internal of each disk adjacent to said balance ring for retaining said balance weights within said openings.

4,784,013

HST SYSTEM DRIVING APPARATUS

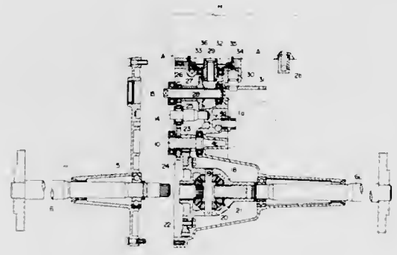
Kojiro Yamaoka, Nishinomiya, and Koichiro Fujisaki, Kobe, both of Japan, assignors to Kanzaki Kokyukoki Mfg. Co. Ltd., Amagasaki, Japan

Filed Nov. 7, 1986, Ser. No. 928,098

Claims priority, application Japan, Nov. 20, 1985, 60-179775[U]

Int. Cl.[4] F16H *57/02*

U.S. Cl. 74—606 R **3 Claims**



1. A driving apparatus for a tractor, comprising:

an axle;

a differential gear unit for driving said axle;

a speed change mechanism;

a transmission mechanism for transferring power from said speed change mechanism to said differential gear unit;

a casing, said casing comprising a case lid and a case body attached to said tractor for housing said differential gear unit and said transmission mechanism, wherein said transmission mechanism comprises at least one shaft, said shaft having a first end rotatably supported by said case body and a second end rotatably supported by said case lid, said case body and said case lid interface substantially at one end of said shaft of said transmission mechanism;

a loading surface provided on an outside surface of said case body for mounting said speed change mechanism;

means for detachably securing said case body and said case lid together, said detachably securing means including means for detaching said case lid from said case body for servicing said driving apparatus so that said differential gear unit and said transmission mechanism remain housed within said case body;

means provided by said casing for holding oil used by said speed change device wherein said oil serves to lubricate said transmission mechanism and said differential gear unit; and

means provided by said casing for receiving an oil filter for filtrating said oil.

4,784,014

ROBOT JOINT WITH AN ELECTRIC DRIVE MOTOR

Joachim Bruns, Lichtenwald; Gerhard Gosdowski, Bietigheim-Bissingen, and Andreas Kettner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

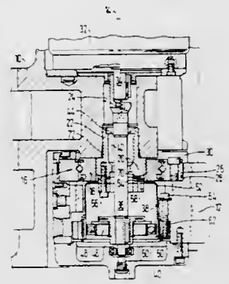
PCT No. PCT/DE86/00062, § 371 Date Dec. 9, 1986, § 102(e) Date Dec. 9, 1986, PCT Pub. No. WO86/07555, PCT Pub. Date Dec. 31, 1986

PCT Filed Feb. 19, 1986, Ser. No. 29,757

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3522336

Int. Cl.[4] F16H *37/00*

U.S. Cl. 74—640 **7 Claims**



1. A robot joint comprising a support part formed with a first bore; a robot part supported for rotation on said support part and being formed with a recess which communicates with said first bore; an electric motor mounted on said support part and being connected to a drive shaft which extends through said bore into said recess and is rotatable about a center axis; harmonic-drive-type reduction gears including an elliptical driving disk secured to said drive shaft, an elliptical ball bearing mounted on said driving disk and engaging without play the inner side of an elastically deformable, externally toothed ring; an elastically deformable, sleeve-shaped intermediate transmission member secured at one end thereof to said externally toothed ring and extending around said center axis into said recess and an internally toothed ring secured to said robot part and engaging at two diametrically opposed locations said externally toothed ring, said internally toothed ring having a different number of teeth than said externally toothed ring; a first annular mounting face provided on said support part around said first bore and being formed with radial teeth, a rigid flange secured to the opposite end of said intermediate transmission member, said rigid flange having a second annular mounting face provided with radial teeth engaging the radial teeth on the first mounting face; and means for fastening said rigid flange to said first mounting face.

4,784,015

MOMENTUM COMPENSATED ROTARY ACTUATOR WITH HARMONIC DRIVE

Larry L. Schumacher, 18876 Tenderfoot Trail, Newhall, Calif. 91321

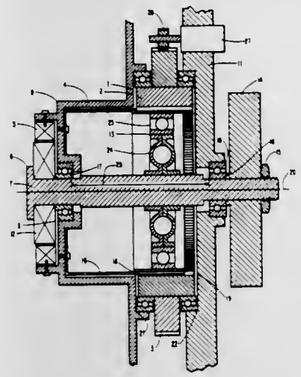
Filed Jan. 23, 1987, Ser. No. 6,231

Int. Cl.[4] F16H *33/00*

U.S. Cl. 74—640 **7 Claims**

1. An improved momentum compensated actuator of the type with a compensating inertia torqued relative to a pointed structure using a harmonic drive speed reducer to assure the rotational rate of the compensating inertia relative to a harmonic drive ring gear being the negative harmonic drive gear ratio times the pointed structure's rotational rate relative to the harmonic drive ring gear wherein the improvement comprises:

means to axially preload rotational element support ball bearings and rotationally support rotating momentum



compensated actuator elements relative to each other and to the base vehicle structure;

a harmonic wave generator coupling means with a torsionally stiff rotational axis and with translational compliance orthogonal to the rotational axis.

4,784,016

DIFFERENTIAL DEVICE USING A VISCOUS FLUID COUPLING MECHANISMS

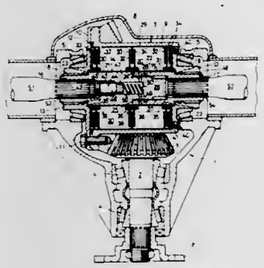
Katsuhiko Masuda; Seiichi Hirai, and Tetsuro Hamada, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,723

Claims priority, application Japan, Jan. 20, 1986, 61-8137; Jan. 27, 1986, 61-13780; Jan. 27, 1986, 61-8891[U]

Int. Cl.[4] F16H *35/04*

U.S. Cl. 74—650 **5 Claims**



1. A differential device using a fluid, comprising:

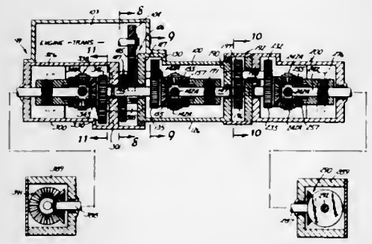
a differential case driven by a power unit in a rotational motion;

a pair of sleeves rotatably supported by said case on an axis of rotation of said case and each being connectable at an outer end thereof to one of a pair of rotary output shafts in such a manner as to be rotatable integrally with said output shaft, inner end portions of said sleeves extending into said case to face each other at end faces thereof with a small clearance left therebetween;

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a fluid-tight chamber defined between said sleeves and said case to be filled with a viscous fluid;
a plurality of drive plates and a plurality of driven plates disposed in said chamber alternately with each other and in an overlapping manner, said drive plates being mounted to be rotatable integrally with said case and slidable in an axial direction, said driven plates being mounted to be rotatable integrally with said sleeves and slidable in an axial direction; and
a plurality of guide rings interposed between said nearby driven plates to maintain said driven plates spaced from each other;
one of said guide rings being constantly located in a position where said end faces of said sleeves face each other.

4,784,017
CONTINUOUSLY VARIABLE TRANSMISSION AND TORQUE RETAINING DIFFERENTIAL
Edward W. Johnsboy, R.R. #1, Box 258A, Mentor, Minn. 56736
Continuation-in-part of Ser. No. 881,827, Jul. 3, 1986. This application Mar. 17, 1987, Ser. No. 27,215
Int. Cl.[4] F16H *37/06, 1/40*
U.S. Cl. 74—675 **13 Claims**



1. A variable ratio transmission comprising:
first and second gear clusters;
means to rotatably mount the gear cluster about separate, parallel mounting axes for independent rotation relative to each other;
each of said gear clusters comprising a plurality of rotatable gears including an input gear rotatable about an axis coincident with its respective mounting axis, an output shaft, output gear means for driving the output shaft, and control gear means to effect a driving connection between the input gear and the output shaft through the output gear means;
means for simultaneously driving the input gears of both gear clusters and
means for selectively and simultaneously controlling rotation of both of the gear clusters to simultaneously vary the effective ratio of rotation between the input gear and output shafts of both clusters through the output gear means of the clusters.

4,784,018
BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM
Mitsuhiko Okada, Toyota; Kunio Morisawa, Okazaki; Michitaka Kakamu, and Nobuyuki Kato, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Continuation of Ser. No. 738,189, May 28, 1985, abandoned. This application Mar. 7, 1988, Ser. No. 170,104
Claims priority, application Japan, May 28, 1984, 59-108216; Nov. 29, 1984, 59-252531; Nov. 30, 1984, 59-254907; Dec. 11, 1984, 59-261243; Dec. 11, 1984, 59-261244; Dec. 11, 1984, 59-261245; Dec. 14, 1984, 59-265023; Dec. 19, 1984, 59-267757
Int. Cl.[4] B60K *41/12;* **F16H** *37/00*
U.S. Cl. 74—689 **7 Claims**

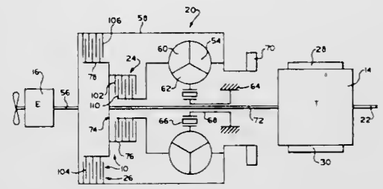


1. A belt type continuously variable transmission system comprising:
a belt type continuously variable transmission device wherein a transmission belt is racked across an input pulley and an output pulley and rotation is continuously variably transmitted from said input pulley to said output pulley; and
an auxiliary transmission device disposed on the output side of the belt type continuously variable transmission device and having at least a forward-reverse shift mechanism,
wherein said belt type continuously variable transmission device and said auxiliary transmission device are respectively housed in a belt type continuously variable transmission device housing and an auxiliary transmission device housing, both of which are formed by case members and separated by a radial partition member of said case members into independent sealed housings, respectively, and wherein said auxiliary transmission device is detachable from said continuously variable transmission device housing as an independent unit.

4,784,019
TORQUE CONVERTER DISCONNECT AND BYPASS CLUTCH STRUCTURE FOR AUTOMATIC MECHANICAL TRANSMISSION
Timothy J. Morscheck, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Continuation of Ser. No. 719,180, Apr. 7, 1985, abandoned. This application Jan. 15, 1987, Ser. No. 6,303
Int. Cl.[4] F16H *47/00*
U.S. Cl. 74—720 **14 Claims**

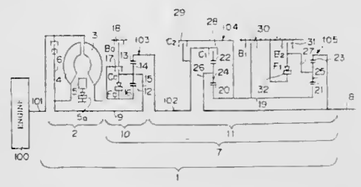
1. A torque converter and clutch structure for a drive system of the type comprising a torque converter drivingly interposed a prime mover and the input shaft of a mechanical change gear transmission, said torque converter having an impeller input member (**54**) adapted to be driven by said prime mover and a turbine output member (**60**) fluidly driven by said input member, said torque converter and clutch structure characterized by:

a connecting member (**74**) fixed for rotation with said input shaft of said mechanical change gear transmission;
a first friction clutch selectively engagable and disengagable to drivingly connect and disconnect, respectively, said output member to said connecting member;
a second friction clutch selectively engagable and disengagable to drivingly connect and disconnect, respectively, said input member to said connecting member;
said first friction clutch comprising at least one first friction member carried for rotation with said connecting member and



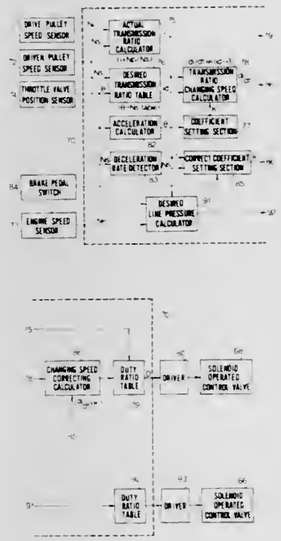
said second friction clutch comprising at least one second friction member carried for rotation with said connecting member;
said first friction clutch (**24**) providing the sole driving connection between said output member and said input shaft with said second friction clutch in the disengaged condition; and
means to independently engage and disengage said first and second friction clutches.

4,784,020
ANTI CREEP CONTROL METHOD AND SYSTEM PROVIDING DELAY BEFORE ANTI CREEP ACTION STARTING
Yukio Hamano, and Yutaka Taga, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Oct. 7, 1986, Ser. No. 916,112
Claims priority, application Japan, Oct. 7, 1985, 60-223355
Int. Cl.[4] B60K *41/22*
U.S. Cl. 74—866 **4 Claims**



3. For an automatic transmission comprised in a vehicle, comprising a fluid torque converter, a gear transmission mechanism, a manual gear range setting valve and a plurality of friction engaging mechanisms, selective engagement of said friction engaging mechanisms when said manual range setting valve is set to a forward range causing said gear transmission mechanism to provide various forward speed stages:
a system for anti creep control, comprising:
first means for repetitively performing at short time intervals a test as to whether anti creep provision conditions exist, said anti creep provision conditions including whether or not said manual range setting valve is set to a forward range, and whether or not the vehicle is substantially stationary;
second means for counting a determinate time interval after said anti creep provision conditions are first detected by said first means; and:
third means for performing anti creep control from a time point that said first means detects said anti creep provision conditions and said second means has counted said determinate time interval.

4,784,021
CONTROL SYSTEM FOR A INFINITELY VARIABLE TRANSMISSION
Yoshihiko Morimoto, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 2, 1986, Ser. No. 847,378
Claims priority, application Japan, Jun. 29, 1985, 60-143465
Int. Cl.[4] B60K *41/12*
U.S. Cl. 74—868 **8 Claims**



1. A control system for an infinitely variable transmission for transmitting power of an internal combustion engine to driving wheels of a motor vehicle, the transmission having a drive pulley including a hydraulically shiftable first disc and a first hydraulic cylinder for shifting the first disc, a driven pulley including a hydraulically shiftable second disc and a second hydraulic cylinder for operating the second disc, and a belt engaged with both pulleys, the system including a first hydraulic circuit having an oil pump of the vehicle and for supplying oil to the first and second hydraulic cylinders, and a transmission ratio control valve disposed in the first hydraulic circuit and having a shiftable spool so as to control the oil being supplied to the first hydraulic cylinder of the drive pulley to change the transmission ratio of the transmission, the improvement in the system comprising:
a second hydraulic circuit having a pressure regulator valve means communicating with said pump for maintaining pressure of oil supplied by the pump as control oil at a constant value, the second hydraulic circuit for supplying the control oil to the transmission ratio control valve so as to shift the spool;
control valve means provided in the second hydraulic circuit for controlling the amount of the control oil supplied to the transmission ratio control valve so as to shift the spool;
first means for detecting actual transmission ratio of the

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transmission and for producing a transmission ratio signal dependent on the detected transmission ratio,
second means for detecting magnitude of deceleration of the motor vehicle and for producing a deceleration signal dependent on said magnitude;
a control unit responsive to the transmission ratio signal and to the deceleration signal for producing a control signal; and
said control valve means being responsive to the control signal for increasing the amount of the control oil supplied to the transmission ratio control valve for increasing shifting speed of the spool in a downshifting direction with increasing magnitude of the deceleration.

4,784,022

INNER ROTARY CUTTERS FOR ELECTRIC SHAVERS AND MANUFACTURING PROCESSES FOR THE SAME
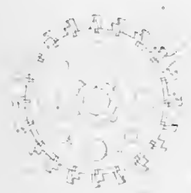
Katsuya Asawa, Matsumoto, Japan, assignor to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan

Division of Ser. No. 841,641, Mar. 20, 1986, Pat. No. 4,729,169. This application Mar. 5, 1987, Ser. No. 22,163

Claims priority, application Japan, Mar. 29, 1985, 60-68176; Mar. 29, 1985, 60-68177

Int. Cl.⁴ B21K *21/00*

U.S. Cl. 76—101 A **10 Claims**



1. A manufacturing process for an inner rotary cutter for an electric shaver, comprising the following steps:
(a) punching out from a plate material a cup-shaped inner cutter blank, having a cylinder section extending from the circumference of a circular section to a prescribed length in the axial direction;
(b) drawing said cylinder section to form a small cylinder section with reduced diameter and having an open-mouthed end and pressing the open-mouthed end of said cylinder section to form a ring plate section bent outward in the radial direction and having a flat face;
(c) grinding and polishing the flat face of said ring plate section; and
(d) cutting blades by applying a grinding tool on said ring plate section and said small cylinder section to form blade grooves, inclined relative to the direction of rotation, at prescribed intervals.

4,784,023

CUTTING ELEMENT HAVING COMPOSITE FORMED OF CEMENTED CARBIDE SUBSTRATE AND DIAMOND LAYER AND METHOD OF MAKING SAME

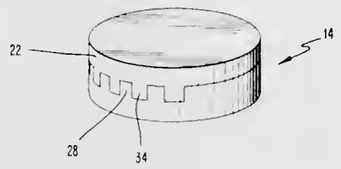
Mahlon D. Dennis, Kingwood, Tex., assignor to Diamant Boart-Stratabit (USA) Inc., Houston, Tex.

Filed Dec. 5, 1985, Ser. No. 804,864

Int. Cl.⁴ B23P *5/00*

U.S. Cl. 76—108 A **10 Claims**

7. A method of making a cutting element comprising the steps of:
forming a substrate of cemented carbide including first and second surfaces disposed opposite one another,
forming alternating ridges and groves in said second surface, each of said grooves formed by spaced apart planar side walls which are substantially parallel to each other, said side walls of each groove being spaced apart from, and substantially parallel to, the side walls of adjacent grooves whereby said ridges are of substantially uniform width throughout their depth,
covering said second surface with a layer of diamond grains



such that said grains fill said grooves and form a solid layer above said grooves,
applying heat and pressure to said substrate and diamond grains to cause said diamond grains to adhere to each other and to said second surface, and
bonding said first surface of said substrate to an outer surface of a generally cylindrical mounting stud.

4,784,024

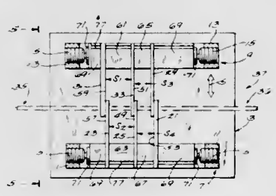
SPACERS FOR INSULATION CUTTERS

John D. Butler, New Berlin, Wis., assignor to Mechtrix Corporation, Menomonee Falls, Wis.

Filed Apr. 22, 1987, Ser. No. 41,114

Int. Cl.⁴ H02G *1/12*

U.S. Cl. 81—9.51 **17 Claims**



1. A machine for cutting a length of insulated conductor into discrete pieces and for stripping a predetermined strip length of insulation from at least one end of the cut pieces comprising:
a. a frame defining a cavity;
b. front and rear tool holders located within the frame cavity and adapted to reciprocate in opposite directions and in timed relationship with each other;
c. a pair of cutoff blades mounted in a respective tool holder for reciprocation therewith to cooperatively mesh and sever the insulated conductor at a predetermined location therealong;
d. a first pair of stripping blades, a first stripping blade being mounted to each tool holder for reciprocation therewith;
e. a first precision spacer having imperforate accurately spaced opposed end faces interposed between and in end facing contact with the cutoff and stripping blades on the front tool holder for solely cooperating therewith to accurately set the predetermined strip length on the front tool holder; and
f. a second precision spacer having imperforate accurately spaced opposed end faces interposed between and in end facing contact with the cutoff and first stripping blades on the rear tool holder for sole cooperation therewith to accurately set the predetermined strip length on the rear tool holder and to cause the first stripping blade on the rear tool holder to mesh with the first stripping blade on the front tool holder without interference or air gap,
so that the stripping blades cutting edge faces coincide to properly slice the insulated conductor insulation.

4,784,025

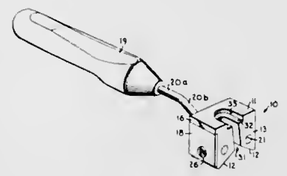
NAIL HOLDING DEVICE

Ralph R. Peck, Rte. 1, P.O. Box 151, Shubert, Nebr. 68437

Filed Jan. 15, 1987, Ser. No. 3,492

Int. Cl.⁴ B25C *3/00*

U.S. Cl. 81—44 **10 Claims**



1. A device for aiding nailing of nails through the top or peak portions of the corrugations of a corrugated sheet into a supporting surface under said sheet, said corrugated sheet having spaced apart, adjacent corrugations made up of substantially parallel hill portions separated each from the other by a valley therebetween, adjacent valleys also extending substantially parallel to one another, comprising, in combination:
(1) an integral metallic block having a top all and an opposing bottom wall with two side walls positioned substantially opposite one another and front and rear end walls positioned substantially opposite one another, said end walls and side walls being positioned at substantial right angles to one another, all of said walls being substantially rectangular in shape,
(2) the bottom wall being symmetrically inwardly and outwardly formed from the side walls to the substantial center thereof, thereby forming an accurate, elongate channel extending between and out of each of said end walls, whereby said bottom wall will closely overlie and fit over and onto the hill portion of any corrugation of a corrugated sheet with the side portions of said bottom wall and bottom portions of said side walls being received well down in the valley portions on each side of said overlaid corrugation hill portion,
(3) a slotted passageway extending substantially vertically through said block from substantially centrally of said top wall to substantially centrally of said bottom wall in the upwardly formed central portion of the latter wall, said slotted passageway extending in its entire length normally substantially vertically through said block and substantially vertically out of one end wall of the said block, whereby to enable a nail shaft to be inserted in said passageway in a normally substantially vertical position,
(4) said slotted passageway adapted to receive the shank of a nail therewithin and therethrough in normally substantially vertical position and means associated with said slotted passageway intermediate the ends thereof for resiliently engaging a portion of the side of the shank of a nail, whereby to resiliently and releasably retain said nail in said passageway for driving of said nail into and through a hill portion of said corrugations and thereafter into said supporting surface under said sheath.

4,784,026

PNEUMATIC SCREW ALIGNER-FEEDER

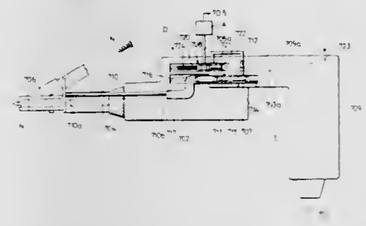
Kenji Kobayashi; Atsuyoshi Fujishima; Mitsuhiro Takatsuru; Jun Maemori, and Chikamitsu Sawada, all of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1985, Ser. No. 804,450

Claims priority, application Japan, Dec. 4, 1984, 59-184799[U]; Dec. 4, 1984, 59-184797[U]; Dec. 4, 1984, 59-184801[U]; Mar. 4, 1985, 60-30689[U]; Mar. 4, 1985, 60-30686[U]; Mar. 4, 1985, 60-30690[U]; Jul. 30, 1985, 60-116972[U]

Int. Cl.⁴ B25B *23/06*

U.S. Cl. 81—430 **10 Claims**



1. A screw aligner-feeder mechanism comprising:
means for containing screws;
means defined within said containing means for aligning screws in said containing means;
means defined within said containing means so as to be spaced from said aligning means for separating screws not aligned by said aligning means from screws aligned by said aligning means;
means operatively coupled to said aligning means for feeding aligned screws from said containing means; and
pneumatic means operatively coupled to said containing means for conveying air under pressure to said containing means so as to: (1) stir screws in said containing means, (2) direct screws toward said aligning means, (3) align screws in said aligning means and (4) direct screws along said feeding means.

4,784,027

INERTIAL HAMMER WITH SAFETY CONNECTION

A. Frost Hatch, III, 475 S. Second St., St. Helens, Oreg. 97051

Filed Jul. 20, 1987, Ser. No. 75,580

Int. Cl.⁴ B25B *19/00*; **B21C** *1/00*

U.S. Cl. 81—463 **6 Claims**

1. A inertial hammer for use on an object, comprising:
inertia producing means which includes a substantially spherical mass and an elongate bar extending along a diameter of the spherical mass both ends of said bar extending a predetermined distance form the spherical mass forming two diametrically spaced handle means,
first attachment means attached to the inertia producing means,
a first flexible cable attached at one end thereof to the first attachment means,
second attachment means secured to the free end of the first flexible cable for attaching same to the object,
third attachment means operably connected to the inertia producing means,
a second flexible cable attached at one end thereof to the third attachment means, and
fourth attachment means secured to the free end of the

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second flexible cable for anchoring same to the object, the second cable acting as a safety cable to restrain movement



of the inertia producing means in the event of disconnection of the second attachment means from the object.

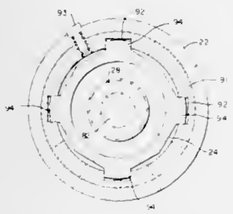
4,784,028

MANDREL ASSEMBLY FOR A PORTABLE LATHE

William E. Sandford, Camino, Calif., assignor to Tri Tool, Inc., Rancho Cordova, Calif.

Filed Sep. 24, 1986, Ser. No. 911,139
Int. Cl.[4] B23B *3/22*
U.S. Cl. 82—4 R **14 Claims**





1. In a mandrel assembly for a portable lathe having a non-rotatable mandrel shaft, a mandrel adaptor non-rotatably and slidably mounted on the mandrel shaft, and a rotatable cutting head supported on the mandrel adaptor the improvements comprising:

(a) a mandrel mounting head attached to a first end of the mandrel shaft, the mounting head defining at least one groove extending in a first plane forming an acute angle with a longitudinal axis of the mandrel shaft and at least one pair of laterally spaced apart, first bearing surfaces located adjacent each side of the at least one groove, each pair of first bearing surfaces being substantially coplanar and extending in a second plane forming an acute angle with the longitudinal axis of the mandrel shaft;

(b) at least one mandrel attaching block located on the mandrel mounting head, the at least one mandrel attaching block having a gripping surface and a pair of laterally spaced apart, second bearing surfaces in slidable contact with the pair of laterally spaced apart first bearing surfaces; and,

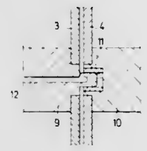
(c) a torque ring insert mounted between the mandrel adaptor and the mandrel shaft to allow relative movement therebetween in a longitudinal direction, but prevent relative rotation therebetween so as to react the torque generated by the rotatable cutting head.

4,784,029

SAWING METHOD, AND A DEVICE FOR UTILIZATION OF THE METHOD

Sven R. V. Gebelius, P.O. Box 15008, Bromma, Sweden (S-161 15)

PCT No. PCT/SE86/00148, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/05727, PCT Pub. Date Oct. 9, 1986
PCT Filed Apr. 1, 1986, Ser. No. 945,872
Claims priority, application Sweden, Apr. 2, 1985, 8501638
Int. Cl.[4] B23D *59/00*
U.S. Cl. 83—13 **13 Claims**



1. A method of sawing which comprises providing a pair of saw elements having saw teeth disposed respectively in adjacent planes and in opposite cutting directions, continuously moving the saw elements in opposite directions corresponding to the cutting directions of the respective teeth to form a saw cut in a work piece, and maintaining a space between operative edge portions of the elements containing the saw teeth by providing fluid pressure exceeding atmospheric between the elements.

4,784,030

SLITTER APPARATUS

Norman W. Waring, Kitchener, Canada, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

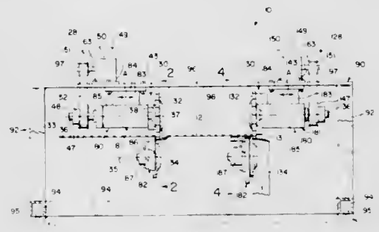
Continuation of Ser. No. 674,438, Nov. 23, 1984, abandoned. This application Jan. 27, 1987, Ser. No. 12,916
Int. Cl.[4] B26D *1/24*
U.S. Cl. 83—105 **1 Claim**

1. An apparatus for longitudinally cutting cord reinforced rubber sheet into at least two strips of tire ply stock of predetermined width, said apparatus comprising a slitting device, said slitting device comprising: an upper disc-like slitter rotatable about a horizontal axis, said upper slitter having a plurality of linear cutting edges along its periphery; and a lower disc-like slitter rotatable about a horizontal axis, said lower slitter having a circular cutting edge along its periphery; means to rotate said upper slitter; said upper and lower slitters disposed such that upon rotation of said upper slitter

(A) said plurality of linear cutting edges of said upper slitter cooperate in shear with said circular cutting edge of said lower slitter, and

(B) portions of said upper slitter are in frictional contact with said lower slitter thereby effecting rotation of said lower slitter;

said apparatus further comprising: a trimming device for trimming a boundary strip of said sheet, said trimming device located adjacent said slitting device and comprising: an upper disc-like trimmer rotatable about a horizontal axis, said upper trimmer having a plurality of linear cutting edges along its periphery; and a lower disc-like trimmer rotatable about a horizontal axis, said lower trimmer having a circular cutting edge along its periphery; means to rotate said upper trimmer; said upper and lower trimmers disposed such that upon rotation of said upper trimmer



(A) said plurality of linear cutting edges of said upper trimmer cooperates in shear with said circular cutting edge of said lower trimmer, and

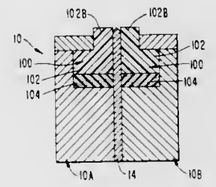
(B) portions of said upper trimmer are in frictional contact with said lower trimmer thereby effecting rotation of said lower trimmer; said trimming device further comprising a spring suitably mounted to bias said upper trimmer towards said lower trimmer and trim scrap deflector suitably mounted to deflect said boundary strip from said trimming device.

4,784,031

REPLACEMENT CHEEKSTRIP APPARATUS FOR USE WITH CUTTING CYLINDER KNIVES

Richard W. Dixon, 12424 Dewey Rd., Wheaton, Md. 20906

Continuation of Ser. No. 4,422, Jan. 20, 1987, abandoned. This application Apr. 6, 1988, Ser. No. 180,630
Int. Cl.[4] B23D *25/12*
U.S. Cl. 83—117 **2 Claims**



1. In a roll-fed printing press, a knife box assembly comprising a hollow, elongated knife box of generally rectangular cross-section and including a pair of channels, each channel having a web and a pair of flanges extending in the same direction from opposite edges of said web, one pair of corresponding flanges of the respective channels extending toward each other and supporting therebetween the base of a knife that bisects the knife box and projects therefrom through an opening between the other pair of corresponding flanges of the respective channels, and a pair of elongated cheekstrips extending longitudinally within the knife box at opposite sides of the knife, each cheekstrip comprising two elongated strip pieces that are contiguous along their length, one of said pieces being disposed adjacent to a flange of said one pair of flanges and the other of said pieces being disposed adjacent to a flange of said other pair of flanges, having a flat face juxtaposed with an opposed face of said knife, with the height of said face of said other piece in a direction extending away from said one piece being coextensive with a substantial portion of the corresponding height of said opposed face of said knife in the interior of said knife box, and having a portion that projects from the knife box through said opening between the last-mentioned flange and the knife, said other piece of said cheekstrip having a base portion adjacent to said one piece that is substantially rectangular in cross-section, said one piece being substantially rectangular in cross-section, said one piece being formed of a relatively soft, resilient sponge rubber material and said other piece being formed of a relatively hard polyurethane material, said two pieces of each cheekstrip being bonded to each other throughout their length, said cheekstrips filling substantially the entire hollow interior of said knife box at opposite sides of the knife.

4,784,032

SHEARS FOR ROD MATERIAL

Kurt Leeuwestein, Moers, Fed. Rep. of Germany, assignor to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,502
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3601077
Int. Cl.[4] B23D *25/12*
U.S. Cl. 83—345 **2 Claims**



1. Shears for dividing and cropping rod-shaped work material which is moving in a longitudinal direction, comprising two paraxial blade shafts driven in opposite directions and a blade holder rigidly secured to each blade shaft, and having therein at least one substantially plate-shaped blade, each blade having a cutting edge which is formed by a side face and a front face inclined at an acute angle thereto and which projects radially beyond the respective blade holders such that the cutting edges orbit along two circular paths which overlap slightly, the blades being secured to their respective holders so that in all positions of orbit the two clearance angles of the two blades located upstream of the cutting edges at the entry side are substantially equal to one another and the two clearance angles located downstream of said cutting edges at the delivery side are substantially equal to one another, such clearance angles being the angles formed between the longitudinal axis of the work material and the side or front faces of the blades, as the case may be.

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4,784,033
TRIPLE CHIP GROUND CARBIDE TIP BANDSAW BLADE WITH DUCTILE FILLER

Robert C. Hayden, Branford, and Michael P. Wanat, Wallingford, both of Conn., assignors to Milford Products Corporation, Branford, Conn.

Continuation-in-part of Ser. No. 821,275, Jan. 22, 1986, abandoned. This application Oct. 27, 1986, Ser. No. 923,424
Int. Cl.[4] B23D *61/12, 61/14*
U.S. Cl. 83—661 24 Claims

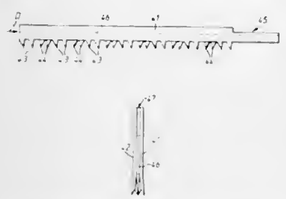


1. In a bandsaw blade for high speed, heavy duty cutting of a workpiece, the combination comprising:
a blade body of a continuous loop of hardened and tempered metal having a plurality of cutting tooth support means defined along the peripheral edge thereof and separated by gullet means;
a plurality of carbide cutting teeth mounted on said blade body in the tooth support means thereof and arranged in pairs;
each pair of said cutting teeth including a leading high tooth and a trailing low tooth constructed and arranged to effect a triple-chip cutting operation on the workpiece; and,
solder means for securing said cutting teeth to said cutting tooth support means, said solder means including ductile means therein for absorbing the stress forces induced in the tooth support means under dynamic load conditions.

4,784,034
SAW BLADES AND SAW ASSEMBLIES

Kevin Stones, Bishop Auckland, and Malcolm J. Wootton, Wolsingham, both of England, assignors to Black & Decker Inc., Newark, Del.

Filed Jul. 2, 1986, Ser. No. 881,228
Claims priority, application United Kingdom, Jul. 3, 1985, 8516808; Jul. 3, 1985, 8516809; Jul. 3, 1985, 8516810
Int. Cl.[4] B27B *11/02, 33/02*
U.S. Cl. 83—852 10 Claims

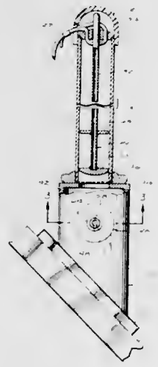


1. A saw blade assembly comprising a laminated structure including two outer parallel strips each having formed along one edge thereof a row of spaced saw teeth extending longitudinally of the assembly, such that the roots of the teeth in the row on one of said outer strips are laterally spaced from the roots of the teeth in the row on the other of said outer strips, and an inner spacer strip extending longitudinally between said two outer strips and permanently affixed on its opposite sides to said two outer strips such that the thickness of said inner spacer strip determines said lateral spacing, said inner spacer strip extending to but not beyond the base of the roots of said row of teeth on said two outer strips.

4,784,035
REMOTELY ACTUATED TOW LINE THROWING DEVICE

Stanley S. Fishfader, 5868 Compass Dr., Los Angeles, Calif. 90045; Sanford Friezner, 17836 Cathedral Pl., Encino, Calif. 91316; Keith L. Kirkeide, N. Regency 2, 9487 Regency Square Blvd., Jacksonville, Fla. 32203; Stanley G. Putzke, 3571 Oakes Dr., Hayward, Calif. 94542, and Stanley J. Singer, #54, 2100 W. Palmyra Ave., Orange, Calif. 92668

Filed Nov. 24, 1986, Ser. No. 933,808
Int. Cl.[4] F41F *5/04*
U.S. Cl. 89—1.34 56 Claims

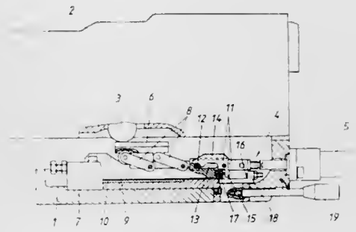


1. A throwing device including,
a throwing gun formed by a high pressure chamber located within a low pressure chamber and with a first frangible diaphragm having a predetermined breaking pressure interconnecting the two chambers and a second frangible diaphragm closing off the low pressure chamber and having a predetermined breaking pressure lower than the breaking pressure of the first diaphragm,
a barrel mounted adjacent to and extending from the second frangible diaphragm,
a projectile located within the barrel,
a main change substantially located within the high pressure chamber and an ignition charge coupled to the main charge for igniting the main charge upon activation of the ignition charge,
the ignition of the main charge providing for the production of rapid burning forming gas having an increasing pressure within the high pressure chamber until the pressure reaches the predetermined breaking pressure for the first frangible diaphragm wherein the first diaphragm bursts to allow the high pressure gas to escape by rapidly expanding into the low pressure chamber until the pressure reaches the predetermined breaking pressure for the second frangible diaphragm wherein the second diaphragm bursts to allow the low pressure gas to escape into the barrel to propel the projectile located within the barrel, and
the high and low pressure chambers are both formed as cylinders and wherein the high pressure cylinder extends within the low pressure cylinder through a side portion of the low pressure cylinder.

4,784,036
AUTOMATIC CANNON AND FIRE CONTROL MECHANISM

Karl Brichta, Ebergassing, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Jul. 15, 1987, Ser. No. 73,491
Claims priority, application Austria, Jul. 17, 1986, 1947/86
Int. Cl.[4] F41F *13/04*
U.S. Cl. 89—136 8 Claims



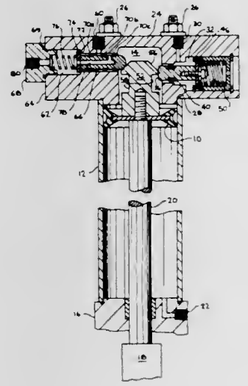
1. In an automatic cannon comprising
a cradle,
a cannon structure, which is reciprocably mounted on said cradle and comprises a trigger, which is opeable to fire said cannon,
a fire control mechanism, which is mounted on said cradle and comprises a trigger control member, which is movable between an inoperative position and an operative position and in said operative position is arranged to operate said trigger, an actuator, which is operable to move a predetermined distance in a predetermined direction for moving said trigger control member from said inoperative position to said operative position and is operable to move in excess of said predetermined distance, and
restoring means for restoring said trigger control member to said inoperative position,
the improvement residing in that
a clutch is provided for operatively connecting said actuator to said trigger control member,
clutch-disengaging means are connected to said actuator and operable to disengage said clutch, and
an end stop is mounted on said cradle and selectively movable between a first position and a second position and only in said second position is arranged to operate said clutch-disengaging means to disengage said clutch as said actuator moves in excess of said predetermined distance.

4,784,037
LOCKING APPARATUS FOR GATE VALVES

Joseph Fabyan, Livermore, and Carl W. Williams, Manteca, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1982, Ser. No. 453,981
Int. Cl.[4] F15B *15/26*
U.S. Cl. 91—43 10 Claims

1. A locking apparatus for fluid operated valves having a piston connected to the valve actuator which moves in response to applied pressure within a cylinder housing, comprising:
(a) a cylinder head secured to one end of said cylinder housing and having a first and a second cylindrical chamber with a first and a second fluid pressure input means connected to said first and second cylindrical chambers respectively, and one or more fluid pressure output means connected to said second cylindrical chamber;
(b) a catch pin slidably mounted within said first cylindrical chamber with a first end facing said cylinder and a second end facing away from said cylinder and enclosed by the walls of said first cylindrical chamber;
(c) a first sealing means secured about said catch pin diameter immediately adjacent to said second end, a second sealing means secured about said catch pin diameter at a location spaced from said first end and spaced from said first sealing means, said first fluid pressure inlet means being located in said first cylindrical chamber so as to be intermediate said first and second sealing means of said catch pin;
(d) a force producing means disposed within said first cylindrical chamber and in abutment with said second end of said catch pin for projecting said first end of said catch pin into said cylinder substantially perpendicular to the longitudinal axis of said cylinder;
(e) a selector pin slidably mounted within said second cylindrical chamber with a first end facing said cylinder and a second end facing away from said cylinder and enclosed by the walls of said second cylindrical chamber, having at least three sealing means about its diameter being spaced apart along its length, and further having an internal passage for conducting fluid between said second end of said selector pin and one of the spaces between said sealing means;
(f) force producing means disposed within said second cylindrical chamber and in abutment with said second end of said selector pin for projecting said first end of said selector pin into said cylinder substantially perpendicular to the longitudinal axis of said cylinder;
(g) a catch block secured to said piston with a sloped edge for retracting said catch pin and said selector pin into said first and second cylindrical chambers respectivley, and having a recess for engaging said catch pin for being held substantially stationary by said catch pin until released by applied fluid pressure; and
(h) means for applying fluid pressure to at least said first cylindrical chamber for moving said catch pin in a direction away from said cylinder and out of engagement with said recess of said catch block and allowing fluid pressure to pass around said first end of said catch pin into said cylinder housing.



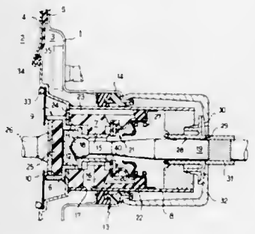
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4,784,038

PNEUMATIC BRAKE BOOSTER

Jean-Pierre Gautier, Aulnay Sous Bois, France, assignor to Bendix France, Drancy, France

Filed Sep. 3, 1987, Ser. No. 92,837
Claims priority, application France, Sep. 10, 1986, 86 12667
Int. Cl.[4] F15B 9/10
U.S. Cl. 91—369.2 4 Claims



1. A pneumatic brake booster, comprising a housing and a movable wall structure which divides the housing into two chambers, the wall structure comprising a metal plate and a diaphragm and which is fixed centrally to a hub structure accommodating distributor valve means, the hub structure having a tubular element extending to the outside of the housing and cooperating slidably with a guide and sealing assembly carried by the housing, and having at least one plastic body part forming communication ducts between the chambers and the distributor valve means, the distributor valve means including a shutter element capable of cooperating with two concentric shutter seats formed respectively by the body part and by a valve plunger coupled to an input member of the booster and having at least one part sliding in a tubular insert which extends into the body part and in which is arranged a reaction disk cooperating with an output member of the booster, the plate having a central annular part gripped between a radial shoulder of the insert and an annular end face of the body part, characterized in that the tubular insert is fixed to the central annular part of the plate, to which is also fixed the tubular element which forms a tubular part of the hub structure and in which the body part is mounted and fastened with an end face against the central annular part of the plate, the shutter element comprising a peripheral assembly part mounted in the tubular element against an annular end of the body part, the plate having, radially spaced apart from the central annular part, a groove for attachment of a central assembly bead of the diaphragm, the insert being metallic and welded to the central annular part of the plate, the tubular element being metalic and welded to the central annular part of the plate, and the body part fastened in the tubular element by crimping a zone of the tubular element into at least one substantially radial communication duct formed in the body part.

4,784,039

ELECTRIC AND PNEUMATIC VALVE POSITIONER

Chris M. Leinen, Houston, Tex., assignor to Topworks, Inc., Houston, Tex.

Filed Mar. 17, 1987, Ser. No. 26,951
Int. Cl.[4] F15B 13/16
U.S. Cl. 91—387 24 Claims

1. A control element positioning apparatus activated by an external control signal, comprising:

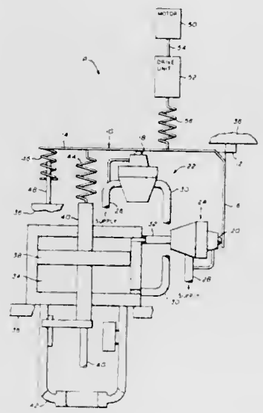
a balance beam, said balance beam being coupled to a pivot element;

a pair of pneumatic force balance elements each having an air nozzle, the nozzle of each force balance element being disposed adjacent to said balance beam and positioned whereby movement of said balance beam towards one nozzle moves said balance beam away from the other nozzle, each of said force balance elements having a pneumatic output port;

a cylinder, said cylinder having a piston disposed therein, said piston being coupled to a shaft;

each of said pneumatic output ports being coupled to an end of said cylinder;

a range spring coupled between said shaft and said balance beam;



a control spring having two ends, the first end coupled to said balance beam;

a drive unit having an input and an output, the output coupled to the second end of said control spring; and

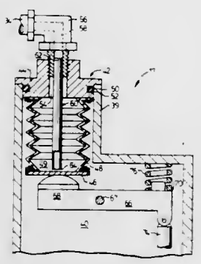
a motor having a shaft coupled to the input of said drive unit and whose motion is controlled by the external control signal.

4,784,040

CONTROL SYSTEM FOR EXPELLING LIQUID FROM A PNEUMATIC ACTUATOR

Charles W. Oswald, Decatur, and James M. Stanley, Oreana, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 18, 1987, Ser. No. 86,341
Int. Cl.[4] F15B 11/08, 21/04
U.S. Cl. 91—461 2 Claims



1. A control system for controlling the flow of a pressurized gas to and from a closed chamber of an expandable chamber assembly of a pneumatic actuator and for expelling from the closed chamber liquid formed by the condensation of moisture contained in the pressurized gas, comprising:

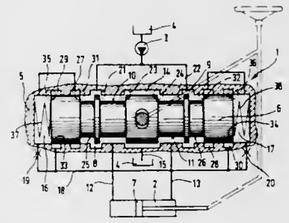
means for supplying the pressurized gas to extend the expandable chamber assembly in the pneumatic actuator and exhausting the pressurized gas to allow the expandable chamber assembly to retract and expel the pressurized gas and the liquid from the closed chamber, said means includes a valve having a first position for supplying the pressurized gas to the expandable chamber assembly and a second position for exhausting the pressurized gas from the expandable chamber assembly, said means further includes a tube having a first end portion suitably connected to the expandable chamber and a second end portion extending a predetermined distance into the closed chamber of the expandable chamber assembly, said pneumatic actuator being oriented with the second end portion of the tube being positioned in close proximity to the elevationally lowest portion of the closed chamber when the expandable chamber assembly is in the retracted position.

4,784,041

SERVOSTEERING PRESSURE CONTROL DEVICE

Armin Lang, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 894,273
Claims priority, application PCT Int'l Appl., Aug. 9, 1985, PCT/EP85/00406
Int. Cl.[4] F15B 9/10
U.S. Cl. 91—371 12 Claims



1. A servosteering control valve (1) comprising a housing (5) and valve piston (6) therein; flow control means (21, 22, 23, 24) coacting between said valve piston and said housing and upon being relatively shifted effects steering pressure flow from a servopump (3) and return flow to a tank (4), for a steering servomotor (2); said valve piston including opposed reaction chambers (16, 17) connected to be pressurized with respective servomotor pressure chambers responsive to respective steering directions; restrictor orifices (19, 20,; 45, 46) communicating with respective reaction chambers; inlet flow control means (31, 32) (39, 40) (42, 43) for pressurizing respective reaction chambers responsive to shifting of said valve piston by manual effort in steering a vehicle, wherein a steering mechanism is mechanically coupled to said valve piston and said servomotor;
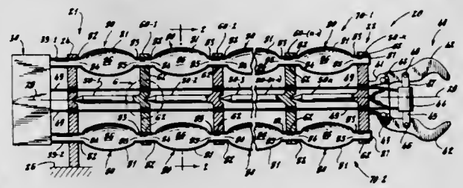
the improvement comprising storage means (18, 50) for receiving pressure agent from either reaction chamber and being interconnected therebetween through said restrictor orifices; outlet flow control means (35, 36) for respective reaction chambers connecting between said storage means and respective reaction chambers; wherein shifting of said valve piston in a direction opposite to a direction being steered responsive to pressure in a pressurized reaction chamber actuates the respective outlet flow control means permitting flow from a pressurized reaction chamber to said storage means thereby bypassing the respective restrictor orifice and effecting rapid response of said valve piston toward neutral position.

4,784,042

METHOD AND SYSTEM EMPLOYING STRINGS OF OPPOSED GASEOUS-FLUID INFLATABLE TENSION ACTUATORS IN JOINTED ARMS, LEGS, BEAMS AND COLUMNS FOR CONTROLLING THEIR MOVEMENTS

Henry M. Paynter, Adams Rd., R.R. #1, Box 306A, Pittsford, Vt. 05763, assignor to Nathaniel A. Hardin, Forsyth, Ga. and Henry M. Paynter, Pittsford, Vt., a part interest

Continuation-in-part of Ser. No. 828,786, Feb. 12, 1986, abandoned. This application Feb. 10, 1987, Ser. No. 13,247
Int. Cl.[4] F15B 11/00, 13/00; F01B 19/00
U.S. Cl. 91—534 40 Claims



1. A fluid-pressure actuated elongated jointed member having a longitudinal axis and capable of being moved about in various controlled directions, comprising:

a plurality of rigid elements located at respective positions spaced along said axis,

each of said elements extending across the axis and having first and second projections projecting outwardly on opposite sides of the axis, all of said first projections being on a first side of said axis and all of said second projections being on the second side of said axis,

said second side being opposite to said first side,

each of said elements being oriented generally perpendicular to the neighboring portion of the longitudinal axis at the respective position where the element crosses the axis,

a plurality of compression-carrying links positioned concentrically along the axis,

respective ones of said links extending between successive elements,

each link being rigidly connected to an element and having a pivotal relationship with the adjacent element,

first and second pluralities of fluid-inflatable tension actuators,

each of said tension actuators having an inlet end and an outlet end,

the tension actuators of the first plurality being joined end-to-end for forming a first inflatable string with the outlet end of each actuator in said first string communicating with the inlet end of the next actuator in said first string, and with the outlet end of the last actuator in said first string being blocked,

means for feeding pressurized fluid into the inlet end of said first string of tension actuators,

the tension actuators of the second plurality being joined end-to-end for forming a second inflatable string with the outlet end of each actuator in said second string communicating with the inlet end of the next actuator in said second string, and with the outlet end of the last actuator in said second string being blocked,

means for feeding pressurized fluid into the inlet end of said second string of tension actuators,

the first string of tension actuators extending generally parallel with said axis and being offset from said axis on the first side of said axis,

the second string of tension actuators extending generally parallel with said axis and being offset from said axis on the second side of said axis,

said first string of tension actuators being fastened to the first projections of said elements with respective fastening connections being located near ends of tension actuators in said first string, and

said second string of tension actuators being fastened to the

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second projections of said elements with respective fastening connections being located near ends of tension actuators in said second string.

4,784,043

ATOMIZER AND COAL-WATER SLURRY FIRED BOILER UTILIZING THE SAME

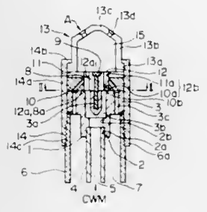
Hironobu Kobayashi, Katsuta; Shigeru Azuhata, Hitachi; Kiyoshi Narato, Ibaraki; Tooru Inada, Hitachi; Kenichi Sohma, Hitachi; Norio Arashi, Hitachi; Hiroshi Miyadera, Hitachi, and Yoshitaka Takahashi, Kure, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,574

Claims priority, application Japan, May 7, 1986, 61-103135; Feb. 16, 1987, 62-31472

Int. Cl.⁴ F23D *1/02*

U.S. Cl. 110—264 **40 Claims**



1. An atomizer including a fuel supply passage for supplying a fuel, an atomizing medium supply passage for supplying an atomizing medium which is to be mixed with said fuel, a mixing chamber in communication with said fuel supply passage and said atomizing medium supply passage, and spray ports for spraying the fluid mixture consisting of said fuel and said atomizing medium from said mixing chamber, said atomizer comprising:

a pre-mixing chamber having an annular cross-section defined by a large-diameter cylindrical surface and a small-diameter cylindrical surface, said fuel supply passage and said atomizing medium supply passage being in communication with said mixing chamber through said pre-mixing chamber, such that said fuel and said atomizing medium supplied from said fuel supply passage and said atomizing medium supply passage are pre-mixed in said pre-mixing chamber; and

said fuel supply passage having means for spraying said fuel into said pre-mixing chamber in a film-shaped flow of an annular cross-section corresponding to said pre-mixing chamber annular cross section and in a downstream direction, and said atomizing medium supply passage having means for spraying said atomizing medium into said pre-mixing chamber downstream of said fuel spraying means in a direction crossing said downstream direction of said film-shaped flow of said fuel.

4,784,044

PRESSURE ACTUATED AXIAL LOCKING

Klaus-Dieter Klement, St.-Mauri-Strasse 1, 5170 Juelich, Fed. Rep. of Germany

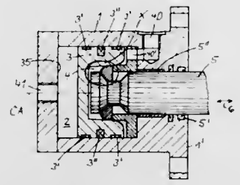
Filed Oct. 23, 1986, Ser. No. 922,192

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1985, 3537687

Int. Cl.⁴ F15B *15/26*

U.S. Cl. 92—24 **24 Claims**

1. A pressure actuated axial locking device having a central longitudinal axis, comprising a hollow cylinder, a hollow locking piston slidably movable in said hollow cylinder, means cooperating with said locking piston for performing an unlocking operation and a locking operation, said hollow locking piston comprising first surface means on a radially inward face of said hollow locking piston for a form-locking and unlocking operation, said first surface means extending at a first slanting angle relative to said central longitudinal axis, said first angle being smaller than a self-locking angle, rod means having a free rod end arranged for an axial displacement in said hollow locking piston, said rod means comprising form-locking means including second surface means next to said free rod end for a form-locking and unlocking of said free rod end, radially movably locking elements having third surface means arranged for cooperation with first and second surface means in a form-locking and unlocking operation, stop means arranged for



permitting a radial movement of said radially movable locking elements but preventing an axis movement of said locking elements in the same direction as a form-locking motion of said hollow looking piston, whereby said stop means are effective in a direction opposite form-locking motion of said hollow locking piston, said means cooperating with said hollow locking piston comprising first means for urging said hollow locking piston and thus said radially movable locking elements into engagement with said second surface means at said free rod end for said form-locking, and second means for urging said hollow locking piston into an unlocking position when said first locking means are not effective.

4,784,045

WOBBLE PLATE TYPE COMPRESSOR WITH DRIVE SHAFT EXTENDING INTO CYLINDER BLOCK

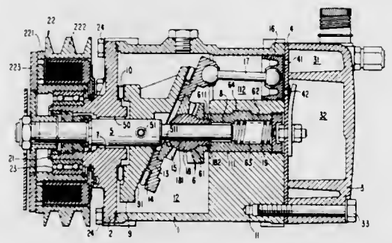
Kiyoshi Terauchi, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Sep. 23, 1987, Ser. No. 100,235

Claims priority, application Japan, Sep. 26, 1986, 61-146575[U]

Int. Cl.⁴ F01B *3/02*; **F04B** *27/08*

U.S. Cl. 92—71 **8 Claims**



1. In a wobble plate type compressor including a compressor housing having a crank chamber and a cylinder block having an axial center bore and a plurality of cylinders axially equiangularly formed around the center bore, a front end plate attached to one end opening of said compressor housing, a cylinder head attached to the other end of said compressor housing, a plurality of pistons slidably fitted within each of said cylinders, a cam rotor disposed within said crank chamber to rotate together with a drive shaft, a wobble plate coupled to said pistons through connecting rods and disposed on the inclined surface of said cam rotor to convert rotating motion of said cam rotor into reciprocating motion of said pistons; the improvement comprising a first bevel gear non-rotatably disposed within said crank chamber in alignment with said center bore of said cylinder block and having a first ball seat portion, a second bevel gear connected to said wobble plate and having a second ball seat portion, said drive shaft comprising a single integral member extending through said cam rotor and wobble plate to be rotatably supported in said center bore, a spherical member carried on said drive shaft in said crank chamber, said first and second seat portions of said first and second bevel gears being disposed on said spherical member and intermeshing with one another whereby the rotation of said second bevel gear and said wobble plate is prevented by said non-rotatably first bevel gear.

4,784,046

BRAKE BOOSTER UNIT MOUNTED ON A FIXED WALL OF A VEHICLE AND PROCESS FOR ASSEMBLING SUCH A UNIT

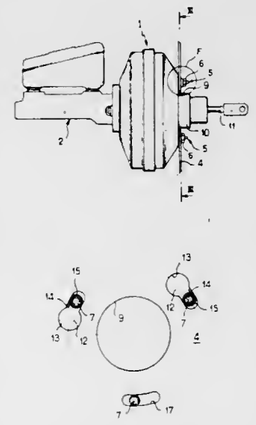
Jean-Pierre Gautier, 46ter Av. Louis Blanc, 93600 Aulnay Sous Bois, France

Filed Sep. 3, 1987, Ser. No. 92,838

Claims priority, application France, Sep. 10, 1986, 86 12669

Int. Cl.⁴ F01B *29/00, 11/02*

U.S. Cl. 92—128 **5 Claims**



1. A brake booster unit mounted on one face of a fixed wall of a vehicle and possessing at least one assembly bolt having one end fixed to the booster and a threaded part passing through a first orifice in the wall, and a nut screwed onto the threaded part of the bolt projecting relative to the other face of the fixed wall, characterized in that the first orifice in the wall has an elongate shape with a first end zone of enlarged cross-section which allows the passage of the nut which is screwed onto the threaded part of the bolt so as to be axially against a tubular spacer mounted on the bolt, the first end zone being connected to a second end zone of a cross-section corresponding to that of the spacer, and an element forming a wedge being interposed manually between the other face of the wall and the nut, the element forming the wedge comprising a plate possessing a cut-out having an edge interacting with the spacer so as to guide the latter and having a variable thickness, the cut-out in the plate made in the form of a first orifice having an elongate shape with a first end zone of enlarged cross-section which allows the passage of the nut screwed onto the threaded part of the bolt, the first end zone of the first orifice in the plate being connected to a second end zone of a cross-section corresponding to that of the spacer, the edge of the first orifice in the plate having a thickness increasing from the first end zone of the first orifice in the plate toward the second end zone thereof, the unit including means for immobilizing the plate in a final assembly configuration, the immobilizing means comprising a second elongate orifice in the plate and through which passes a second assembly bolt of the booster which extends also through a second elongate orifice in the wall, the second elongate orifice in the plate having an edge of a thickness varying in a direction opposite that of the edge of the first orifice in the plate.

4,784,047

OSCILLATING PISTON MOTOR

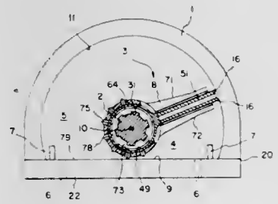
Kurt Stoll, Lenzhalde 72, 7300 Esslingen; Georg Heid, Kernerstr. 5, 7120 Bietigheim-Bissingen; Albrecht Wagner, Bussardstr. 28, 7065 Winterbach, and Gerhard Schrag, Im Braunkiel 14, 7305 Altbach, all of Fed. Rep. of Germany

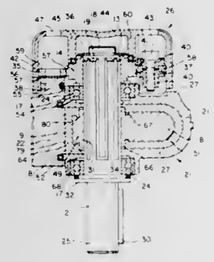
Filed Oct. 9, 1985, Ser. No. 785,887

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437608

Int. Cl.⁴ F01B *31/14*; **F15B** *15/24*; **F01C** *9/00*

U.S. Cl. 92—13.5 **14 Claims**





1. Hydraulic or pneumatic oscillating piston motor with a housing (**1**), providing a shaft (**2**) mounted in the housing with freedom to rotate and providing an oscillating piston (**3**), manipulated with pressure, attached to the shaft so that it has torsional strength, shaped as a lever with two lever arms (**49**,**8**), having a different area of pressure, sealed against the inner shell surface of the housing (**1**) and separating two working spaces (**4**,**5**), which can be acted upon with pressure, the first of the two lever arms being designed as a hollow cylindrical bushing (**49**) disposed around the rotated shaft (**2**), the surface of a mantle portion of the bushing is covered at least over a part of its circumference by a shell seal surface (mantle sealing) (**64**) in the manner of a hollow cylinder, the seal surface providing tapered, rib - spaced sealing lips (**75**), formed to it in one piece, disposed along the circumference, uniformly distributed in the circumferential direction of the bushing (**49**), radially standing away and pointing away from the seal surface, the housing (**1**) being composed of a jointless receptacle (**21**) dis-

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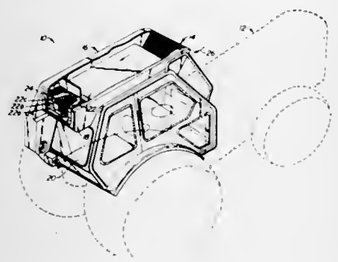
posed around the shaft (2) in the direction of the circumference in the working area of the oscillating piston (3) and of a cap (22) covering the receptacle, and the seal surface (64) working together exclusively with a flat opposite-surface (9) disposed next to the cover (22) of the housing (1) without additional sealing, the second lever arm (8), possessing a larger radial reach and being sealed by a wing seal (65) about its periphery, which is connected in one piece with the seal surface (64) and a packing, which seals the axial surfaces of the bushing (49) against the housing, the path of the lever arms (49,8) in the housing (1) cooperate with one another in such a way, that one of the lever arms can leave its path only after the moment, in which the other lever has reached its largest deflection, the largest swing angle of the oscillating piston (3) being determinable by an adjusting device (26), comprising an adjusting disk (35) which is attached to the shaft, has torsional strength, and provides a friction lining (56) as well as comprising stops (37), chucked with a clamping surface (28) against the friction lining (56), and an indicating device (46) is correlated to the adjusting device (26), the indicating device showing the respective position of the oscillating piston (3) and comprising a scale (50) which surrounds the shaft (2) in a circular way, the scale being placed with torsional strength and resting on the cap (44), which can be stuck on the adjusting disk (35) and can cover it and the scale cooperating with an indicating organ (63) which is disposed firmly to the housing (1).

4,784,048

FILTER SYSTEM INCORPORATED WITH CAB FOR ORCHARD SPRAYER

Robert M. Nelson, 579 Estates Dr., Yuba City, Calif. 95991

Filed Oct. 22, 1987, Ser. No. 112,206
Int. Cl.[4] B60H *3/06*
U.S. Cl. 98—2.11 **2 Claims**



1. In a removably attachable enclosed cab for an agricultural tractor having an overhead air intake plenum for drawing air from the forward upper portion of the cab, an air chest mounted on the upper rear portion of said cab below the vertical profile of said cab overlying the rear window of said cab, said air chest including air impervious side walls and at least one air impervious top wall and an air impervious bottom wall for confining air flow through said air chest; means communicating said plenum to the upper portion of said air chest, a filter pack placed within said air chest for filtering air passing from said overhead air intake plenum to the interior of said cab, said filter pack having vertically disposed air impervious side walls defining a central passage through said filter pack; and a blower system for drawing air below atmospheric pressure through said air chest and discharging air above atmospheric pressure to the interior of said cab to maintain an operator in said cab within an enclosed volume of filtered air, the improvement in said filter chest comprising:

a plate means in said air chest connected to the top wall of said air chest for mounting said filter pack adjacent one of said air impervious side walls of said air chest and in spatial separation from one of said side walls of said air chest to define from said air intake plenum along a side wall of said filter pack a downward passage to the bottom of the filter pack for the passage of unfiltered air;

support means for mounting said air filter pack in spatial separation above the bottom of said air chest for defining a lower entry passage of air into and for upward flow interiorly of said filter pack whereby air flow reversal occurs from the downflow to the bottom of the filter pack to the upflow through the filter pack; and

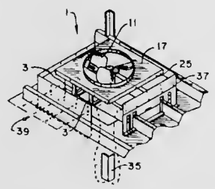
said air filter pack and plate means above said filter pack defining a discharge path under suction to said blower system for drawing said air below atmospheric pressure through said filter pack and discharging air above atmospheric pressure to said cab.

4,784,049

WHOLE HOUSE FAN

Robert E. Steiner, and Chandrakant V. Savla, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 830,899, Feb. 18, 1986, Pat. No. 4,620,802, which is a continuation of Ser. No. 618,892, Jun. 8, 1984, abandoned, which is a division of Ser. No. 428,090, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 248,021, Mar. 26, 1981, Pat. No. 4,385,550. This application Nov. 10, 1986, Ser. No. 929,088
Int. Cl.[4] F24F *7/013*
U.S. Cl. 98—42.1 **6 Claims**



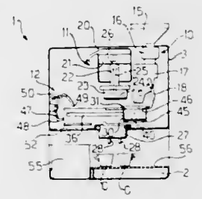
1. A whole-house fan adapted for installation in an opening in a ceiling above a pair of adjacent, parallel ceiling joists, without cutting either of said joists, said fan comprising a fan impeller having blades for drawing air through said opening in said ceiling, said fan impeller having a vertical axis of rotation, said fan impeller having a diameter of at least two feet, so that said blades extend over both said adjacent joists when said fan is in operation, a motor for driving said fan impeller, frame means for supporting said fan impeller and said motor on upper surfaces of said adjacent joists, said frame means comprising a pair of spaced apart, generally horizontal frame members, and a fan housing above said frame members for defining an air path through said assembly, each of said frame members being U-shaped, said fan housing being secured to up-turned arms of said members and said motor and said fan impeller being supported by horizontal reaches of said members, and mounting means on said frame members spaced apart sixteen inches and twenty-four inches on centers, for mounting said frame members to said upper surfaces of said adjacent uncut joists at right angles to said adjacent uncut joists, regardless of whether said adjacent uncut joists are spaced apart sixteen or twenty-four inches.

4,784,050

APPARATUS FOR PREPARING ESPRESSO COFFEE IN A HOUSEHOLD ENVIRONMENT

Alfredo Cavalli, deceased, late of Pessano con Bornago, Italy; by Cesarina Filippi, heir; by Massimo F. Cavalli, heir, and by Silvia Cavalli, heir, all of Via Galileo Galilei, 9, 20060 Pessano con Bornago, Milan, Italy

Filed Nov. 21, 1985, Ser. No. 800,234
Claims priority, application Italy, Nov. 21, 1984, 23846[U]
Int. Cl.[4] H47J *31/00*
U.S. Cl. 99—289 R **5 Claims**



1. Apparatus for preparing "espresso" coffee in a household environment comprising:

a load bearing frame defining a base;

a powder coffee metering dispenser assembly carried on said frame at a position overlying said base;

a hot water dispenser assembly carried on said frame at a position flanking the metering dispenser assembly and overlying said base;

guide forming means supported and extending at a position underlying said dispenser assemblies and overlying said base;

a cup-like percolator having guide forming means; and an emptying device for the cup-like percolator supported on said frame at a position adjacent to said guide forming means wherein said hot water dispenser assembly comprises an upright cylinder supplied with hot water under pressure, a piston slidable within the cylinder and having a rod extending axially in said cylinder and having a free end externally thereof, a pad attached to the free end of said rod, a plurality of holes through said pad for the sprinkle delivery of hot water, a conduit for supplying hot water to said holes, formed axially through said rod and said piston, and a calibrated check valve mounted in said conduit.

4,784,051

COFFEE OR TEA MAKER

Reinhard Häuslein, Minden, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 135,373
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643878
Int. Cl.[4] A47J *31/00*
U.S. Cl. 99—307 **6 Claims**

1. A coffee or tea maker for delivering hot water to a pot via a filter vessel comprising:

a fresh water container;

an overflow means disposed for introducing the hot water into the filter vessel when the filter vessel is disposed below a portion of said overflow means, said overflow means including an intermediate vessel having first, second and third passages;

a riser pipe disposed between said fresh water container and said intermediate vessel and extending through said first passage;

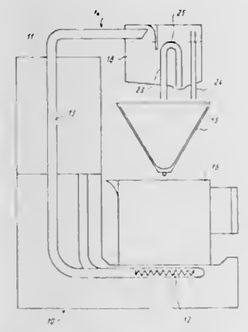
a flow heater for heating the water in said riser pipe;

means defining a support location for the pot;

a siphon extending through said second passage and disposed for periodically emptying said intermediate vessel; and

a ventilation pipe extending through said third passage and having first and second ends, wherein said first end of said ventilation pipe is disposed in said intermediate vessel and said second end of said ventilation pipe is disposed outside of said intermediate vessel; and

wherein said intermediate vessel is closed on all sides except for said passages.

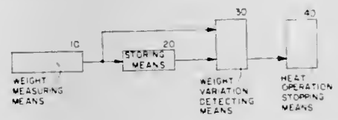


4,784,052

COOKING APPLIANCE

Mitsuo Harada, Tokyo, and Takuji Harada, Hiratsuka, both of Japan, assignors to Harada Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,747
Claims priority, application Japan, Dec. 16, 1986, 61-142088
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—331 **1 Claim**



1. A method of operating a cooking appliance, said method comprising:

a step of operating a weight measuring means, said step of operating a weight measuring means including a step of measuring the weight of an object to be heated at the start of cooking and successively at specified times;

a step of operating a storing means, said step of operating a storing means including a step of memorizing the measured weight of the object to be heated at the start of cooking;

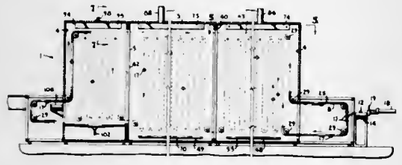
a step of operating a weight variation detecting means, said step of operating a weight variation detecting means including a step of detecting that the weight of said object has decreased to a specified ratio of the weight of the object at the start of cooking, or that the weight of said object is reduced by a specified weight from the weight of the object at the start of cooking, said step of operating a weight variation detecting means further including a step of responding to said weight measuring means and said storing means; and

a step of operating a heating operation stopping means, said step of operating a heating operation stopping means including a step of stopping heating of said object when the weight of said object has decreased to the specified weight ratio of the weight of said object at the start of

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cooking or when the weight of said object is reduced by the specified weight from the weight of the object at the start of cooking, said step of operating a heating operation stopping means including a step of responding to said weight variation detecting means.

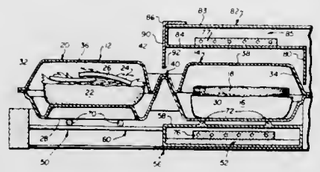
4,784,053
FOOD PRODUCT COOKER
Everett E. Barnhart, Raytown, Mo., assignor to Meyer Metalcraft Specialties, Inc., Windsor, Mo.
Filed Feb. 11, 1987, Ser. No. 13,681
Int. Cl.[4] A47J *37/08;* **A23L** *3/02*
U.S. Cl. 99—443 C **5 Claims**



1. In a food product cooker having an enclosure and a conveyor for transporting the food product through the enclosure; the improvement comprising wherein:
(a) said enclosure includes separate first and second vertically extending compartments; said conveyor having a vertical component of movement during at least a portion of the time a tray of said conveyor adapted to hold the food product passes through each of said first and second compartments; and including:
(b) heating means for supplying heat to each of said compartments; said heating means comprises a steam distribution system located in a lower portion of each of said first and second compartments; and said heating means generally uniformly introducing steam into the bottom of each of said first and second compartments;
(c) a ventilation system located near the top of said first and second compartments for selectively drawing gases from said first and second compartments to maintain generally uniform temperatures through said first and second compartments respectively; and
(d) heat sensor means associated with said first and second compartments, cooperating with said ventilation system and operably controlling steam to said distribution system so as to maintain generally constant temperatures in said first and second compartments respectively;
(e) control means for controlling the heat to each compartment such that each of said compartments is at a substantially different heating temperature and such that said first compartment is at a temperature above ambient and substantially below the temperature of said second compartment.

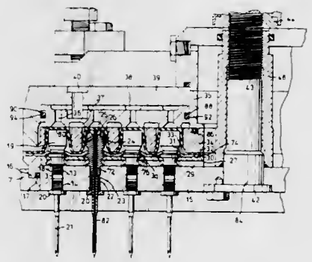
4,784,054
EQUIPMENT FOR HOLDING OR STAGING PACKAGED SANDWICHES
Gus Karos, Mayfield Heights; Nick Karos, Pepper Pike, both of Ohio; Ralph E. Weimer, Wheaton, Ill.; Norman R. Sloan, New Lenox, Ill., and Dye O. Miller, Barrington, Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.
Filed Aug. 28, 1986, Ser. No. 901,909
Int. Cl.[4] H05B *1/02;* **A47J** *36/24*
U.S. Cl. 99—483 **16 Claims**

1. Equipment for staging a compartmented sandwich package having at least two compartments, the equipment comprising, in combination: supporting means for supporting the package under the compartments; heating means for applying heat to only a preselected compartment of the package; and means



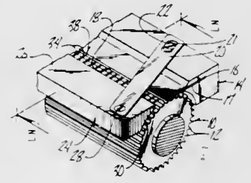
for retaining heat adjacent that compartment of the package to which heat is applied.

4,784,055
APPARATUS FOR INJECTING MEAT WITH A SUBSTANCE, IN PARTICULAR A SUBSTANCE OF A PASTE-LIKE CONSISTENCY
Johannes C. Langen, and Christianus P. Langen, both of Cuijk, Netherlands, assignors to Langen Research B.V., Cuijk, Netherlands
Filed May 20, 1987, Ser. No. 51,595
Claims priority, application Netherlands, May 23, 1986, 8601328
Int. Cl.[4] B02B *3/12, 23/00*
U.S. Cl. 99—533 **8 Claims**



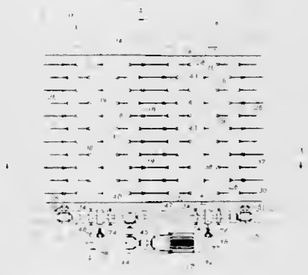
1. A machine for injecting a fluid substance into a portion of meat comprising;
(a) a needle support base,
(b) a plurality of injection needles each having a proximal end mounted in said needle support base and a distal end projecting from said needle support base, each of said needles having an injection passage opening longitudinally therethrough from its proximal end to its distal end,
(c) a fluid manifold chamber in said needle support base for receiving the fluid substance,
(d) a plurality of dosage chambers in said needle support base, one of said dosage chambers being associated with each needle for supplying an individual dose of fluid to its associated needle,
(e) one-way flow control means between the fluid manifold chamber and each dosage chamber and between each dosage chamber and the injection passage of its associated needle, said one-way flow control means being operable to permit fluid to pass from the manifold chamber into each dosage chamber while preventing the passage of fluid from each dosage chamber through the injection passage of its associated needle and to prevent the passage of fluid from the fluid manifold chamber into the dosage chambers while permitting fluid to pass from the dosage chambers through the injection passages of the needles whereby substantially uniform predetermined dosages of fluid are dispensed through each injection needle during injection.

4,784,056
SAFETY DEVICE FOR MEAT SKINNING MACHINES
Ray T. Townsend, Des Moines, Iowa, assignor to Towsend Engineering Company, Des Moines, Iowa
Filed Mar. 14, 1988, Ser. No. 167,872
Int. Cl.[4] A22C *7/12*
U.S. Cl. 99—589 **17 Claims**



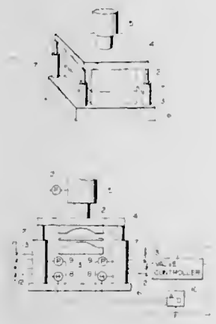
1. A skinning machine comprising a frame, a powered gripping roll having a plurality of gripping teeth rotatably mounted on said frame, a cutting blade having a cutting edge mounted on said frame with said cutting edge being closely spaced and parallel to said roll, the improvement comprising,
a safety means on said machine to prevent a machine operator's fingers from engaging said cutting edge and gripping teeth, comprising,
an elongated bar mounted on said machine in close spaced parallel relation to the cutting edge of said cutting blade,
a straight support edge on said elongated bar immediately opposite said cutting edge,
a plurality of substantially straight, stiff, spaced wire elements secured to said bar and extending from said support edge towards said cutting edge, said wire elements having outer ends that terminate in spaced relation to said cutting edge, the space between said outer ends and said cutting edge being sufficient to permit skin from a meat product to pass downwardly over said outer ends and underneath said blade, but preventing the fingers of a machine operator from being drawn into engagement with said blade.

4,784,057
TANDEM DRUM CLUSTER SEPARATOR
Dennis O. Mietzel, Columbus, and R. Kevin Wells, Madison, both of Wis., assignors to Hughes Company, Columbus, Wis.
Filed Apr. 6, 1988, Ser. No. 178,424
Int. Cl.[4] A23N *15/02;* **A47J** *21/00*
U.S. Cl. 99—638 **22 Claims**



1. A cluster separator for engaging and separating clusters of vegetable pods joined together by stem sections from a large quantity of individual vegetable pods, comprising:
(a) two substantially horizontally opposed surfaces which together define a restricted zone between the surfaces through which a quantity of vegetable pods may fall;
(b) a set of hooked rods mounted on each opposed surface and extending outwardly therefrom to form an array of rods thereon of selected density;
(c) means for moving the opposed surfaces to carry the two sets of hooked rods juxtaposedly through the restricted zone at the combined density of both arrays of rods to engage on the hooked rods vegetable pod clusters entrained with the falling vegetable pods while permitting individual pods to fall freely through the combined array of hooks, and then to carry each set of hooked rods separately away from the restricted zone to separate the engaged vegetable pod clusters from the individual vegetable pods prior to further processing.

4,784,058
PRESS CONTROL FOR MAINTAINING A LEVEL POSITION AND A UNIFORM PRESSURE ON A WORKPIECE
Noriharu Nakagawa, Neyagawa; Masanobu Kurumaji, Kobe; Kazuyuki Kijayama, Akashi; Koichi Fukushima, Kobe; Nobuo Kimura, Kobe; Satoshi Hirota, Kobe; Hiroaki Kondo, Kobe; Hiroyuki Kuwano, Akashi; Toshiaki Akita, Amagasaki, and Tsutomu Sano, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Filed Jul. 31, 1987, Ser. No. 80,477
Claims priority, application Japan, Aug. 13, 1986, 61-191128; Aug. 28, 1986, 61-202090; Jan. 8, 1987, 62-002071
Int. Cl.[4] B30B *15/24*
U.S. Cl. 100—35 **10 Claims**



1. A press working control method for controlling the press working operation of a press having a pressure cylinder for applying a working pressure to a workpiece, a press slide operatively connected to the pressure cylinder and carrying a movable die, a bed fixedly mounted with a fixed die, and a plurality of control cylinders supporting the press slide and each having one end fixed to the bed and the other end connected to the press slide, to control the dynamic parallel accuracy of the press slide and to control the working pressure acting on the workpiece being pressed on the press, which comprises:
detecting the operative pressures of the pressure cylinder by a first pressure detector;
detecting the respective positions of the control cylinders by position detectors;
detecting the respective operative pressures of the control cylinders by second pressure detectors;
comparing the respective heights of the control cylinders

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detected by the position detectors by first comparing means;

deciding manipulated variables respectively for the control cylinders by first manipulated variable deciding means on the basis of a result of a comparing operation of the first comparing means,

controlling the pressure in the control cylinders by first control means according to the manipulated variables decided by the first manipulated variable deciding means;

determining the working pressure acting on the workpiece by working pressure determining means from the difference between the operative pressure of the pressure cylinder detected by the first pressure detector and a total operative pressure obtained by adding the respective operative pressures of the control cylinders detected by the second pressure detectors;

comparing the working pressure determined by the working pressure determining means and a predetermined target working pressure by second comparing means;

deciding manipulated variables respectively for controlling the control cylinders by second manipulated variable deciding means on the basis of the result of the comparing operation of the second comparing means; and

controlling the pressure in the control cylinders by second control means according to the manipulated variables decided by the second manipulated variable deciding means.

4,784,059

CREDIT CARD EMBOSSING SYSTEM

Richard J. LaManna, Whippany; James L. Hinton, Short Hills, both of N.J., and Edward L. Cucksey, Upper Nyack, N.Y., assignors to National Business Systems, Inc., Ontario, Canada

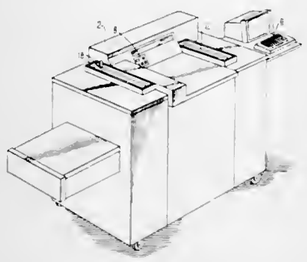
Continuation of Ser. No. 820,705, Jan. 21, 1986, Pat. No. 4,686,898. This application Apr. 24, 1987, Ser. No. 42,429

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.⁴ B41F *1/07*

U.S. Cl. 101—18 **27 Claims**

MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 153 Pages)



1. An embossing system for embossing blank cards with a plurality of vertically separated horizontally disposed lines on which characters are to be embossed comprising:

(a) card supply means for feeding blank cards to be embossed;

(b) card transporting means for receiving blanks cards to be embossed from the card supply means and for transporting the cards received from the card supply means along a single continuous transport path to a plurality of separate embossing positions and to a position where embossing is completed;

(c) a plurality of card embossing means each disposed at a separate one of the embossing positions disposed along the transport path, each card embossing means being vertically positioned with respect to the transport path to emboss a different one of the horizontally disposed lines of characters on each card; and

(d) control means coupled to the card supply means, the card transporting means and the plurality of card embossing means for controlling the card supply means to feed blank cards to the card transporting means, the transporting of the cards received by the card transporting means to the separate embossing positions along the transporting path and the position where embossing is completed and the plurality of card embossing means to emboss the plurality of lines on each blank card.

4,784,060

METHOD AND APPARATUS FOR VARYING INK FLOW IN A PRINTING MACHINE INKING MECHANISM BY DIFFERENTIAL ADJUSTMENT OF AN INK METERING DEVICE AT INDIVIDUAL LOCATIONS ALONG ITS LENGTH

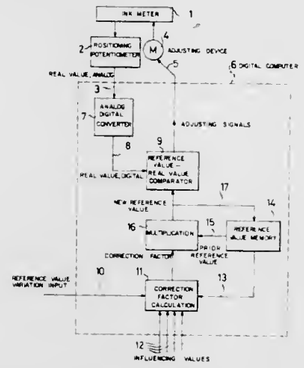
Willi Weisgerber, Johannisberg, and Manfred Aroldi, Mainz/-Rhein, both of Fed. Rep. of Germany, assignors to Miller-Johannisberg Druckmaschinen GmbH, Weisbaden, Fed. Rep. of Germany

Continuation of Ser. No. 284,375, Jul. 17, 1981, abandoned. This application Feb. 25, 1983, Ser. No. 469,767

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028025

Int. Cl.⁴ B41F *31/04*

U.S. Cl. 101—426 **6 Claims**



1. A method of varying the flow of ink in a printing machine inking mechanism by differential adjustment at individual adjustment locations spaced along the length of an ink fountain roller metering device, such as an ink blade or plural individual ink metering elements, by a plurality of adjusting devices, such as servo motors, stepping mechanisms or the like, each of which is adjustable selectively by a computer in accordance with variations in reference value presettings using reference value-real value comparison means to actuate the adjusting devices, including the following steps:

(a) providing for each adjusting device a reference value memory for storage of a selected reference value;

(b) storing a reference value presetting in the memories for the adjusting devices;

(c) inputting into the computer a correction to the reference value presetting and calculating a correction factor for the adjusting devices;

(d) multiplying the reference value presetting stored in the memories by the correction factor to obtain a new reference value; and

(e) transmitting the new reference value to the reference value-real value comparison means to actuate the adjusting devices.

4,784,061

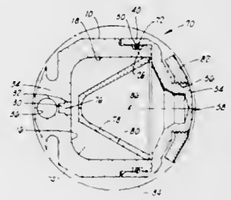
CAPSULE CHARGE LOCKING DEVICE

Glenn B. Christopher, Fort Worth, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 5, 1987, Ser. No. 106,472

Int. Cl.⁴ E21B *7/00*

U.S. Cl. 102—306 **11 Claims**



1. A shaped charge device, comprising:

a cylindrical metal case member having a closed end and an open end with a circumferential groove formed around the outer surface adjacent the open end;

a cylindrical metal cap member having a closed end and an open end that has a diameter of a size for mating engagement with the open end of said case member, and having a cap groove formed circumferentially about the inner surface adjacent the open end of the cap member and said open end having an angular bevel on the inner surface of said open end; and

a resilent O-ring is compressively received within the case groove and the cap groove when said cap member is slidably positioned in mating engagement with said case member.

4,784,062

FUZE FOR A PROJECTILE-FORMING CHARGE

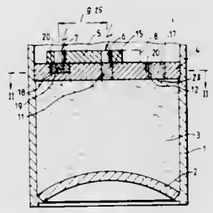
Karl Rudolf, Schrobenhausen, and Klaus Lindstadt, Schwaig, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 70,939

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625967

Int. Cl.⁴ F42B *13/10*

U.S. Cl. 102—476 **6 Claims**



1. A fuze for a projectile-forming charge or for a barb-forming hollow charge; comprising a casing housing said hollow charge; a cover plate on said charge on the end of the casing facing towards the fuze; through-extending bores in said cover plate; a centrally arranged booster charge and spatially separated therefrom at secure lateral distances, two additional diametrically oppositely located booster charges, said centrally arranged booster charge and said additional booster charges being located in said through-extending bores; a V-shaped triggering passageway in said cover plate, said additional booster charges being operatively interconnected by a rapidly reacting transmitting charge arranged in said passageway; a slider being displaceable along the surface of said cover plate facing towards the fuze; two detonators arranged in said slider at a spacing from each other, the detonators in an armed position of the slider being selectively alignable with the central booster charge and with a triggering location on the transmitting charge.

4,784,063

MOBILE APPARATUS FOR LOADING, TRANSPORTING AND LAYING AN ASSEMBLED TRACK SECTION
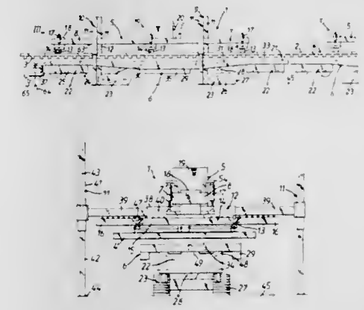
Josef Theurer, Vienna, and Manfred Brunninger, Altenberg, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Apr. 9, 1987, Ser. No. 36,069

Claims priority, application European Pat. Off., Jan. 29, 1987, 87890019.0

Int. Cl.⁴ E01B *29/02*

U.S. Cl. 104—3 **12 Claims**



1. A mobile apparatus for loading, transporting and laying an assembled track section consisting of rails fastened to ties on the track bed, which comprises

(a) a track section carrier comprising

(1) a carrier frame elongated in the direction of the rails,

(2) means mounted on the elongated carrier frame for gripping and holding the assembled track section,

(3) two pairs of transversely opposite lifting jacks arranged on the carrier frame for positioning on the track bed and including drives for vertically adjusting the jacks with respect to the track bed for lifting and lowering the carrier frame, and

(4) transverse positioning means fixedly connecting the jacks of each pair to each other, and the pairs of jacks being widely spaced from each other in the longitudinal direction of the rails to provide a high stability during lifting and lowering of the carrier frame, and

(b) a self propelled auxiliary vehicle movable independently of the track section carrier, the auxiliary vehicle comprising

(1) an elongated flatbed frame having two opposite ends spaced from each other in said direction and capable of receiving and supporting the carrier with the assembled track section gripped and held thereon, and

(2) a track-bound undercarriage and an off-track undercarriage at each end of the flatbed frame.

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4,784,064

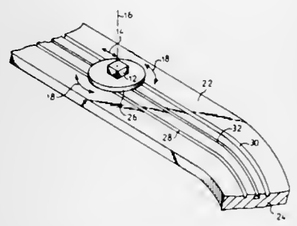
DEVICE FOR POSITIONING AN OBJECT

Robert Nemirovsky, 11-17 Hyman Ave., Bay Shore, N.Y. 11706, and Joseph Deutsch, 5 Jano Pl., Plainview, N.Y. 11803, assignors to Robert Nemirovsky, Bay Shore and Joseph Deutsch, Commack, both of, N.Y.

Filed Aug. 6, 1987, Ser. No. 82,307

Int. Cl.[4] B65G *39/18*

U.S. Cl. 104—135 **17 Claims**



1. A device for independent translation and rotation of an object comprising:

a. base means with a first set of groove means defining a translation path for the object;

b. platform means for holding said object, said platform means including a second set of groove means facing said base means for defining an axis of rotation for the object; and

c. single coupling means disposed between said base and said platform means, said coupling means including rolling ball means which are continuously and directly engaged between said first and said second set of groove means, which rolling ball means simultaneously roll and slide for a translating motion of said platform means along said path and independently rotating said platform around said axis.

4,784,065

CHAIR-LIFT WITH AUTOMATIC CONTROL OF THE CHAIR PROTECTIVE DEVICES

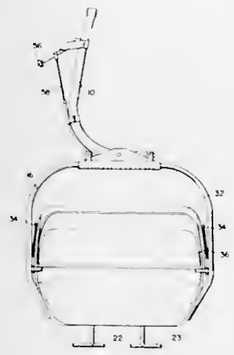
Max Brochand, Noyarey, France, assignor to Pomagalski S.A., Fontaine, France

Filed Mar. 10, 1987, Ser. No. 24,089

Claims priority, application France, Apr. 15, 1986, 86 05496

Int. Cl.[4] B61B *11/00*

U.S. Cl. 104—173.2 **11 Claims**



1. A chair-lift having chair coupled on a line to an aerial rope and equipped with a swing-back protective hood, capable of occupying selectively two positions, a lower closed position protecting the passengers seated on the chair and a raised open position for the passengers to mount and dismount from said chair, a hood opening operation being performed at the entry to a terminal and a closing operation being performed at the exit from the terminal, wherein the chair comprises a first energy storage means for moving the hood from one of said positions to the other, a first catch inhibiting the action of said first energy storage means to hold the hood in said one position, said first catch being able to be unlatched to trigger an automatic movement of the hood to said other position due to the action of said first energy storage means, independently of the speed of the chair, and a reloading means of said first energy storage means, located in the terminal, for loading said first energy storage means during the passage of the chair through the terminal after said automatic movement of the hood to said other position, said reloading means not acting on said first catch.

4,784,066

ADAPTER FOR A TRANSPORT SYSTEM

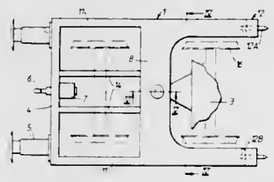
Bruce R. Ellis, Sheringham, England, assignor to Trailer Train Limited, United Kingdom

Filed Jul. 9, 1986, Ser. No. 883,569

Claims priority, application United Kingdom, Jul. 10, 1985, 8517409

Int. Cl.[4] B61D *3/18*

U.S. Cl. 105—4.1 **6 Claims**



1. In a road and rail transport system comprising a plurality of semi-trailers adapted for over the road travel, coupling means enabling semi-trailers to be releasably connected end to end for rail travel, a plurality of bogies for supporting the semi-trailers and quick release coupling means to permit a plurality of bogies and semi-trailers to be readily assembled to form a train, the improvement comprising

an adapter to permit traction of said train or connection of said train in a train comprising conventional rail cars, said adapter comprising a headstock, buffers to said headstock, attachment means for connecting said adapted to a locomotive, a transverse bolster member, side arms connecting the headstock to the bolster, extensions to said side arms extending on the side of the bolster remote from the headstock, means for connecting the ends of said extensions to the base of a semi-trailer, means for releasably connecting the adapter to a bogie, and means for connecting the adapter to a semi-trailer.

4,784,067

LIGHTWEIGHT CENTER BEAM RAILROAD CAR

William H. Harris, Michigan City, Ind.; James P. Klag, Crestwood, and Joseph W. Lam, Chicago, both of Ill., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Continuation of Ser. No. 802,428, Nov. 27, 1985, Pat. No. 4,681,041. This application Jul. 16, 1987, Ser. No. 74,347

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] B61D *3/08, 17/00*

U.S. Cl. 105—355 **7 Claims**

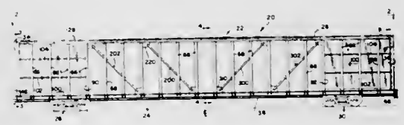
1. A freight carrying railroad car having a predetermined length comprising:

a body supported at each end by wheel-containing truck means;

the body having a vertical center beam extending longitudinally the length of the car between bulkheads at each end of the car;

the center beam comprising a center sill, a top sill parallel to and spaced above the center sill, and a plurality of vertical spaced apart columns rigidly connected at their lower ends to the center sill and at their upper ends to the top sill;

a each end of the car, a vertical plate (**100**) in the space from



the center sill to the top sill, and the space from the respective bulkhead inwardly to a column of the center sill;

the opposing vertical plates (**100**) being spaced from each other a distance of at least about 60% of the length of said car between the bulkheads; and

between each of the vertical plates (**100**) and the car length center, at least one bracing bar extending diagonally downwardly, toward the car lateral center line, from near the top sill to the center sill, so that when the car is subjected to impact loads the bars on one side of the car lateral center line are placed in tension and the bars on the other side of the car center are placed in compression.

4,784,068

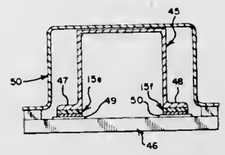
SEGMENTED SLIDING SILL WEAR PLATE

Michael K. Burke, Wheaton, Ill., assignor to Zeftek, Inc., Batavia, Ill.

Filed Jul. 24, 1987, Ser. No. 77,682

Int. Cl.[4] B61F *1/02*

U.S. Cl. 105—418 **10 Claims**



1. In a sliding sill support assembly for a railway car or a highway trailer boggie slider system, including a longitudinally arranged sill support means for slidably supporting a sliding sill, and wear plate means mounted on said sill support means, the improvement in said wear plate means which comprises an elongated flat metal base adapted to be bolted or welded to said sill support means, and a plurality of spaced pads of self-lubricating, high compressive strength plastic material bonded to said plate, said pads having coplanar wear surfaces, said plastic material having a coefficient of expansion higher than said base, and said pads sized to substantially eliminate high internal stresses which causes bowing of said wear plate when subjected to a wide range of ambient temperatures as experienced in normal operation.

4,784,069

CHEMICAL PROCESS FIRED HEATERS, FURNACES OR BOILERS

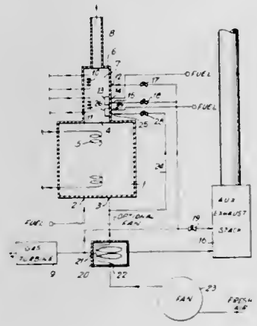
David C. Stark, Tokers Green, near Reading, England, assignor to Foster Wheeler USA Corporation, Clinton, N.J.

Filed Oct. 27, 1986, Ser. No. 923,513

Claims priority, application United Kingdom, Nov. 1, 1985, 8526978

Int. Cl.[4] F23J *15/00;* **F02C** *7/08*

U.S. Cl. 110—211 **6 Claims**



1. A chemical process plant incorporating a gas turbine, means for utilising the sensible heat of the gas turbine exhaust (GTE) and a fuel-fired heater including a radiant heating section, fuel being burnt in said radiant section for the purpose of heating therein process-fluid contained in a least one process coil, a heat recovery section being provided in the flue of the heater and containing one or more coils containing heat recovery fluids, wherein the improvement comprises a two-channel heat exchanger (**20**) having a first channel (**21**) connected between the gas turbine exhaust (**9**) and an auxiliary gas exhaust means and having a second channel (**22**) of the heat exchanger connected between a source of fresh air and the fuel-oxidizing medium input (**3**) of the radiant section of the heater, said heat exchanger (**20**) thereby supplying heated fresh air to said radiant section at substantially atmospheric pressure, and including a first burner (**26**) in said flue (**6**) and a bypass duct (**24**) connected between the output of the second channel of the heat exchanger and the first burner (**26**) for conveying surplus heated air from the heat exchange (**20**) to the first burner (**26**) for the purposes of supporting combustion therein, said first burner having a further duel supply, (**27**) and including controllable valve means (**28**) in said bypass duct for controlling the flow of fluid therein.

6. a chemical process plant coupled to a gas turbine exhaust (GTE) the plant comprising a radiant heating chamber (**1**) with feed means for feeding ambient air to the chamber air input (**3**) at substantially atmospheric pressure; fuel (**2**) and air inputs(**3**) to said radiant heating chamber; a heat exchanger (**20**) flow connected to said radiant heating chamber for preheating the air fed to the chamber air input (**3**), which heat exchanger (**20**) derives heat from exhaust gases of the gas turbine; and an exhaust gas outlet (**4**) from the radiant heating chamber (**1**) leading to a flue (**6**) having a heat recovery section (**7**) therein, said flue (**6**) further including an auxilliary burner (**26**) having a fuel input (**27**) and an air input (**25**), the air input receiving preheated air from said heat exchanger (**20**); and valve means (**26, 28**) for controlling the proportion of preheated air fed to the auxilliary burner; wherein said flue (**6**) includes an additional input (**12**) for the exhaust gases from the gas turbine, said additional input receiving the exhaust gases from a duct carrying such gases to the heat exchanger, and including valve means (**17**) for controlling the proportion of said exhaust gases fed to said additional input.

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PANTIHOSE MANUFACTURE

Dietrich Thurner, Leinfelden-Echterdingen, and Herman Schutzmeier, Immenstradt, both of Fed. Rep. of Germany, assignors to Detexomat Machinery Limited, Buckinghamshire, England

Filed Sep. 3, 1986, Ser. No. 903,257
Claims priority, application United Kingdom, Sep. 10, 1985, 8522438; Nov. 28, 1985, 8529364
Int. Cl.⁴ D05B *21/00*
U.S. Cl. 112—121.12 **26 Claims**



1. Pantihose manufacturing apparatus including a gusset inserting machine having a support body for mounting a pantihose garment for said machine to perform a gusset inserting operation on the garment, a second machine having support means over which legs of said garment are to be drawn prior to initiating a processing operation on said garment by the second machine and means to strip the garment from the support body and to transfer it onto said support means in a given orientation demanded by the second machine, said apparatus further having means adapted and operational to dispose the garment in a predetermined attitude related to said given orientation before said stripping means is activated to strip and transfer the garment, said stripping means being operative to preserve said attitude.

6. Pantihose manufacturing apparatus comprising a gusset inserting machine provided with a head for supporting the body of a pantihose garment for a gusset to be inserted into a crutch area of the body; a second machine for performing a hosiery manufacturing operation on the garment being operatively associated with the gusset inserting machine, the second machine being provided with support means for receiving the garment after insertion of a gusset; transfer means for stripping the garment from the gusset machine and for mounting it on said support means in a given orientation demanded by said second machine, the gusset machine including means to rotate the garment about its lengthwise direction to place a medial plane thereof in a predetermined attitude related to the given orientation, and said transfer means being operative to preserve said attitude during operation of said transfer means.

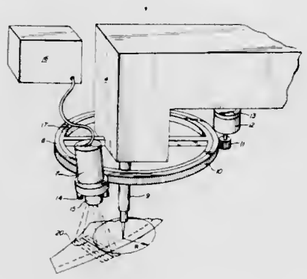
4,784,071

AUTOMATIC SEWING MACHINE WITH SCANNING CAMERA SYSTEM

Yaakov Sadeh, 11/6 Bialik St., Nes Ziona; Yaakov Makover, Moshav Beit Elazari, and Bar C. Mardix, HaRechasim St., Ramat-Gan, all of Israel

Filed Apr. 15, 1987, Ser. No. 38,773
Claims priority, application Israel, Dec. 25, 1986, 81091
Int. Cl.⁴ D05B *21/00*
U.S. Cl. 112—121.12 **11 Claims**

2. Computerized sewing apparatus comprising:
a sewing head mounted on a main frame;
a workholder coupled to the main frame;
a microprocessor coupled to said workholder for causing the workholder to move relative to the sewing head;
means for sensing the edge position of an object on said workholder and arranged to provide, to said microprocessor, an output signal corresponding to the sensed edge position;
a scanning camera coupled to the sewing head and disposed for rotation concentric to a needle bar mounted in said sewing head and arranged for scanning at least one line tangential to an imaginary circle around the needle's piercing point in the sewing plane;
said camera including means for generating a first output signal corresponding to said at least one scanned line;
encoder means coupled to said camera for providing a second output signal corresponding to the position of said camera;



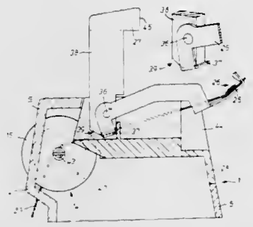
processor means for receiving said first and second output signals and converting them into a third output signal corresponding to the edge position of said object, and providing said third output signal to said microprocessor;
comparator means in said microprocessor to compare the actual edge position with the programmed expected edge position and to determine any deviation; and
means coupled to said microprocessor for modifying the sewing path during sewing to compensate for any such deviation.

4,784,072

SEWING MACHINE HANDLE OPERATED THREADING DEVICE

Rolf Kessler, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Apr. 16, 1987, Ser. No. 40,550
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613684
Int. Cl.⁴ B65H *57/00*; D05B *47/00*
U.S. Cl. 112—302 **12 Claims**



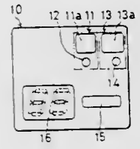
1. A sewing machine comprising a sewing machine housing, a carrying handle movably mounted on said housing, at least one thread guiding element movably positioned on said housing, and a drive mechanism associated with said handle and said thread guiding element and effective upon movement of said handle from an inactive inclined position to an upright carrying position to move said thread guiding element from a recessed position to a projecting threading position.

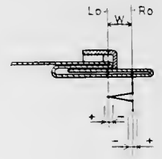
4,784,073

DEVICE OF A SEWING MACHINE FOR FORMING BLIND STITCHES

Susumu Hanyu, and Akio Kolde, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,980
Claims priority, application Japan, Aug. 9, 1985, 60-174033
Int. Cl.⁴ D05B *3/02, 1/24*
U.S. Cl. 112—453 **9 Claims**





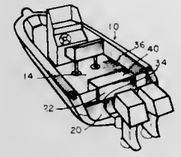
3. A device of a sewing machine for forming blindstitches having a microcomputer including control means and calculating means, a needle vertically reciprocating and swinging between two needle positions laterally of a fabric feeding direction, memory means storing switch control data for a plurality of different stitch patterns including a pattern of blindstitches, a fabric presser foot having a fabric guide provided thereon for guiding a fabric in the fabric feeding direction, the fabric being folded in a predetermined mode and set to the fabric guide so that the blindstitches may be formed on the fabric, detecting means operatively connected to the fabric presser foot to detect a vertical position of the fabric presser foot which is variable in dependence upon the thickness of the fabric to thereby produce an electric signal indicating the thickness of the fabric to be sewn, and pattern selecting means including a plurality of switches selectively operated to select the stitch patterns including the pattern of blindstitches, said device comprising blindstitch depth setting means (13) and blindstitch width setting means activated after one of said pattern selecting switches is operated to select the pattern of blindstitches; operating means including an operating switch (15), said operating switch (15) being activated after said blindstitch depth setting means (13) has been operated to cause said control means to set one of said two needle positions in a direction relative to said fabric guide (G) on one side thereof, said operating switch being activated after said blindstitch width setting means (11) has been operated; indicating means (16) operated in response to operation of said operating switch to digitally indicate a value representing the needle position, said calculating means making a calculation with said electric signal indicating the thickness of the fabric and said value representing the needle position to thereby provide an electric signal for causing said control means to set the other of said two needle positions on the other side of said fabric guide.

4,784,074

DUAL WALKWAY - CENTRAL BOAT TRANSOM

Jerome M. Michalak, Cocoa Beach, Fla., assignor to Ray Industries, Inc., Knoxville, Tenn.

Filed Jun. 29, 1987, Ser. No. 68,003
Int. Cl.⁴ B63B *1/00*
U.S. Cl. 114—57 **7 Claims**



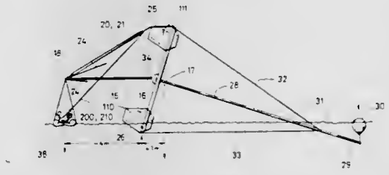
1. An outboard motor boat having a hull, deck and sides with said sides connected together and with said sides connected to said hull and with said deck connected to said sides and having an aft configuration comprising:
a transom configuration including:
an upwardly projecting central transom portion connected, arranged and positioned centrally between a port side through transom walkway and a starboard side through transom walkway and between said sides,
said upwardly projecting central transom portion projecting upward and solely supported at or below a base perimeter, said base perimeter connected to an aft deck portion of said deck, said upwardly projecting central transom portion projecting approximately the height of said sides,
said upwardly projecting central transom portion having an upper end, a port walkway side, a starboard walkway side, an aft side and a forward side,
said port side through transom walkway and said starboard side through transom walkway projecting aft from said aft deck portion, past said upwardly projecting central transom portion, to a position at least adjacent a portion of a side of an outboard motor position,
a transom mid portion connected to and between said sides and to said hull;
said transom mid portion, said port side through transom walkway and said starboard side through transom walkway defining said outboard motor position.

4,784,075

WATERCRAFT WITH RIGHTING AID

Jürgen Segger, Hamburg, Fed. Rep. of Germany, assignor to Marion Kleist-Schörling, Hamburg, Fed. Rep. of Germany, a part interest

Filed Jul. 16, 1987, Ser. No. 74,273
Int. Cl.⁴ B63B *3/14*
U.S. Cl. 114—61 **13 Claims**



1. A watercraft having a center of gravity at a predetermined level and also having a longitudinal axis, comprising:
a righting aid in the form of a pole-like single righting element that has two ends, a first end of which is detachably secured to said watercraft in such a way that, essentially

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on a line at right angles to a plane of buoyancy, and essentially at the level of the center of gravity of said watercraft, said single righting element is pivotable along at least one axis of freedom; the other free end of said single righting element is pivotable essentially orthogonally relative to the longitudinal axis of said watercraft for righting the latter when the watercraft has capsized.

4,784,076

BOOM ELEMENT, PARTICULARLY A CABIN OR A BERTH IN A SHIP

Rolf Carlsson, Billdal, Sweden, assignor to ACCI HB, Sweden

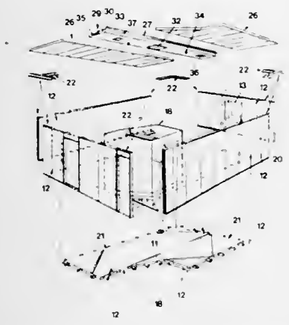
PCT No. PCT/SE86/00186, § 371 Date Dec. 24, 1986, § 102(e) Date Dec. 24, 1986, PCT Pub. No. WO86/06341, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 23, 1986, Ser. No. 9,335

Claims priority, application Sweden, Apr. 26, 1985, 8502028

Int. Cl.[4] B63B *29/02*

U.S. Cl. 114—71 **8 Claims**



1. A room structure for use in a supporting structure having a deck, the supporting structure also providing sources for one or more of electricity, heat, ventilation and like services for the room structure;

the room structure comprising:

a plurality of self-supporting wall members for standing up from the deck; the wall members meeting adjacent ones of the wall members to selectively define one of continuous straight walls and intersecting walls;

the wall members having lower ends, flanges at the lower ends, and means for attaching the flanges to the deck;

the wall members having upper ends; means for interconnecting the upper ends of the adjacent wall members where they meet for defining the continuous straight and the intersecting walls; the interconnecting means comprising longitudinally grooved members shaped for receiving the upper ends of the wall members for holding adjacent wall members together;

a roof comprising a plurality of roof members extending across the room between opposite parallel wall members wherein a first one of the plurality of the roof members for a room comprises a ceiling plate and another of the plurality of roof members comprises a beam; the beam providing a support for the ceiling plate, the beam further comprising a carrier for sources for electricity, heat, ventilation and the like;

the grooved members being of lengths along the upper ends of the wall members that the ceiling plate first roof members rest on the grooved members while the beam does not rest on the grooved members.

4,784,077

MOORING DEVICE

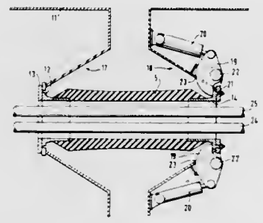
Kristoffer Idland, P.O. Box 639, Krossen, N-4391 Sandnes, Norway

Filed Feb. 19, 1987, Ser. No. 16,558

Claims priority, application Norway, Feb. 20, 1986, 860635

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—219 **11 Claims**



1. A mooring device, particularly for the mooring of a pair of adjacent barges to each other, comprising:

(a) at least one cavity in each barge, said cavities being complementary and forming a pair of complementary cavities,

(b) an elastic mooring body in each pair of complementary cavities, said mooring body having a pair of ends and a flange on each end,

(c) each of said cavities having an opening thereof, and

(d) each of said flanges cooperating with a respective opening for retaining said mooring body in said complementary pair of cavities.

4,784,078

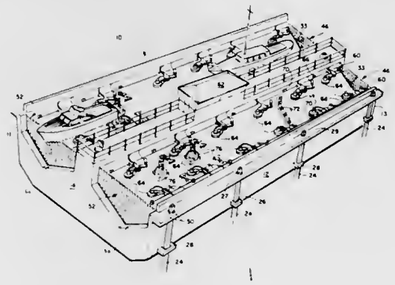
FLOATING SMALL BOAT CLEANING FACILITY

Leo D. Feurt, 12709 Kaitz, Poway, Calif. 92064

Filed Dec. 21, 1987, Ser. No. 135,734

Int. Cl.[4] B63B *59/00*

U.S. Cl. 114—222 **10 Claims**



1. A floating small boat cleaning facility comprising:

a floating dock assembly having a pair of laterally spaced longitudinally extending side walls each having a top edge, a front entrance end wall, a rear exit end wall, a bottom wall, and a top wall spaced downwardly a predetermined distance from the top edge of said side walls, these previously recited walls forming a buoyancy chamber between them:

means for anchoring said floating dock assembly to the sea floor comprising a plurality of guide brackets mounted on the outside surface of the side walls of said floating dock assembly, said guide brackets each having anchor piling slots, a plurality of vertically oriented anchor pilings having their bottom ends secured to the sea floor, each of said pilings having a portion thereof passing through the slots of said guide brackets;

said front entrance end wall having a cutout portion formed adjacent its top edge, a plurality of vertically oriented strips of flexible material have their bottom ends attached to the top edge of said front entrance end wall to form an entrance curtain through which boats may pass;

said rear exit end wall having a cutout portion formed adjacent its top edge, a plurality of vertically oriented strips of flexible material have their bottom ends attached to the top edge of said rear exit end wall to form an exit curtain through which boats may pass;

means for keeping said entrance curtain and said exit curtain floating in a substantially vertical orientation;

means for cleaning the hulls of boats brought into said floating dock assembly; and

means for vacuuming the debris cleaned off the hulls of the boats from the top wall of said floating dock assembly.

4,784,079

APPARATUS SUCH AS A WORKING PLATFORM WHICH BY MEANS OF TENSION LOADED TENSION MEMBER HAS BEEN ANCHORED AND WHICH HAS BEEN PROVIDED WITH MEANS FOR MOORING A VESSEL

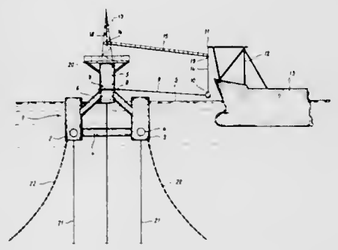
Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings Inc., Marly, Switzerland

Filed Oct. 5, 1987, Ser. No. 104,233

Claims priority, application Netherlands, Oct. 8, 1986, 8602526

Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—230 **2 Claims**



1. Apparatus comprising a buoyant body, a plurality of spaced apart vertical tension members which are exclusively designed for taking up tension load, bottom anchors located vertically below the buoyant body and to which lower ends of said vertical tension members are secured, said tension members pulling said buoyant body down against the buoyancy of the buoyant body, said buoyant body having buoyant parts substantially below water level and intersecting the water level with parts which above the water level support a portion for performing operations, the buoyant body carrying said portion for performing operations by means of a single vertical column which extends above the water level and which has horizontal dimensions which are smaller than those of the buoyant body, which column between the buoyant body and the portion for performing operations is surrounded by a rotatable ring having a stationary part connected to the column and a part movable with respect thereto around the column, said movable part having means for mooring a vessel and comprising a rigid arm rotatably connected about a horizontal axis to the movable part of the rotatable ring and at a distance from said horizontal axis being suspended from a vessel by means of a tension member which is loaded by means of a weight of a magnitude sufficient to maintain the vessel substantially in place with respect to the buoyant body, the area around the column and between the portion for performing operations and the top of the buoyant bodies and in which area the rotatable ring with rigid arm is located, being free of obstacles all around the column such that the vessel can freely swing around the column.

4,784,080

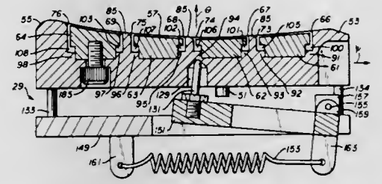
MULTI-SEGMENT TONING SHOE FOR LATENT IMAGE DEVELOPMENT

Andreas Bibl, Los Altos, and Gene F. Day, Hillsborough, both of Calif., assignors to Precision Image Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 796,872, Nov. 12, 1985, Pat. No. 4,665,165, which is a continuation-in-part of Ser. No. 763,040, Aug. 6, 1985. This application Jan. 29, 1987, Ser. No. 8,612

Int. Cl.[4] G03G *15/06*

U.S. Cl. 118—648 **21 Claims**



1. Apparatus for applying fluid developer to a latent image on a sheet supported by a backing member comprising,

a shoe having raised peripheral edges and a central recessed area surrounded by said peripheral edges, said peripheral edges including an upstream and a downstream support rim, said central recessed area including a multisegmented electrode with a plurality of substantially uniform electrode segments closely spaced from a supported sheet bearing a latent image stripe, each electrode segment having an upstream side and having a downstream side distant said upstream support rim relative to said upstream side of the electrode segment, said central recessed area having pluralities of developer supplies and drains extending parallel said electrode segments, each electrode segment spaced apart from an adjacent electrode segment by a developer supply and a drain, each supply located at said upstream side of an associated electrode segment and in communication with a supply of fluid developer for applying the developer to the sheet, each drain located at said downstream side of an electrode segment and immediately adjacent a supply with no intervening electrode between the immediately adjacent supply and drain,

pressure means for injecting fluid developer to each supply and creating a plurality of substantially distinct flows of developer from said upstream sides of said electrode segments toward the associated drain at the downstream side of each electrode segment,

means for biasing said shoe against said sheet, and

means for removing excess developer from each said drain and away from said sheet.

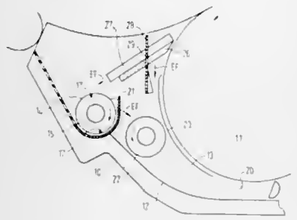
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4,784,081

MIXING DEVICE FOR CROSS-BLENDING OF DEVELOPER MIX IN DEVELOPING STATIONS OF ELECTROPHOTOGRAPHIC PRINTER DEVICES

Joseph Knott, Tutzing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 18, 1986, Ser. No. 943,193
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601328
Int. Cl.⁴ G03G *15/06*
U.S. Cl. 118—652 **9 Claims**



1. In a mixing device for blending a developer composed of carrier particles and toner for developing charge images applied to a charge image carrier in a developing station including a first mixing screw in a mixing chamber arranged parallel to a developing drum, said first mixing screw moving the developer from a delivery region parallel to said developing drum in a mixing through while blending it, a second mixing screw arranged below said first mixing screw for returning said developer along said developing drum, whereby said developing drum constantly conveys a part of said developer from said developing drum to said charge image carrier, and wherein a scraper strip arranged above said mixing screw picks up developer adhering to said developing drum and supplies it at least partially to said first mixing screw via a guide means, the improvement comprising wherein at least in the delivery region, said mixing trough of said first mixing screw includes axially extending mixing strips located at the circumference of the mixing screw extending over a plurality of spirals of said mixing screw for fast blending of the supplied developer and said mixing trough includes a plurality of openings via which said developer is supplied to said second mixing screw essentially over the full width of said mixing screw.

4,784,082

DISPOSABLE LITTER BOX SYSTEM

Steven Wolfe, 2024 N. Argyle, Apt. #E, Los Angeles, Calif. 90068

Filed Nov. 20, 1986, Ser. No. 933,232
Int. Cl.⁴ A01K *29/00*
U.S. Cl. 119—1 **4 Claims**



1. In combination, a protector for the interior cavity of a cat litter box containing letter material, said cavity being defined by a bottom wall and side walls extending upwardly from the bottom wall, said protector comprising a mat, said mat being an area coextensive with the bottom wall and of a height which is a small fraction of the height of the side walls, said mat being substantially flat on its underside and presenting on its upper side an array of protrusions and depressions, said protrusions extending upwardly into the litter material; and

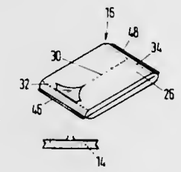
at least one sheet-like filter element of a greater extent than the mat and defining a matrix of orifices, the orifices being in register with the array of protrusions on the upper side of the mat, said filter element being interoperatively combined with said mat in such manner that the protrusions extend upwardly through the orifices in the filter element so that the filter element is disposed in the mat depressions, and the protrusions further extend into the litter material, to a height sufficient to prevent a cat digging in the litter material from clawing and ripping the filter element in the depressions.

4,784,083

FOIL PACKAGE AND METHOD FOR PRODUCING SAME

Hans R. Kiel, Verden, Fed. Rep. of Germany, assignor to Effem GmbH, Fed. Rep. of Germany

PCT No. PCT/DE86/00047, § 371 Date Oct. 31, 1986, § 102(e) Date Oct. 31, 1986, PCT Pub. No. WO86/04777, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 11, 1986, Ser. No. 931,748
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504798; Nov. 8, 1985, 3539637; European Pat. Off., Feb. 6, 1986, 86101553.5
Int. Cl.⁴ A01K *1/00*
U.S. Cl. 119—1 **3 Claims**



1. A composite foil package to retain a pourable material such as cat litter or the like comprising, an outer hull and an inner lining sealed initially to provide an interior space to retain said pourable material, the outer hull and inner lining provided with a longitudinal perforation extending essentially from one longitudinal end to the other and lateral parallel perforations at each end of said longitudinal perforation whereby said outer hull and inner lining may be folded outwardly after release of said longitudinal and lateral perforations, said inner lining provided with a perforation approximately midway between said lateral parallel perforations and being parallel thereto whereby when said inner lining is folded outwardly after release of said inner lining perforation said pourable material is exposed for use.

4,784,084

BREEDING CAGE FOR SMALL ANIMAL AND BREEDING OF SMALL ANIMAL USING THE SAME

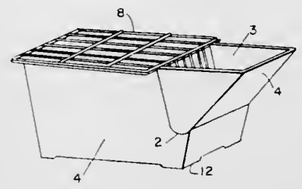
Michihiro Kohguchi; Tetsushi Ishikawa, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 17, 1986, Ser. No. 942,804
Claims priority, application Japan, Dec. 31, 1985, 60-297359
Int. Cl.⁴ A01K *31/00*
U.S. Cl. 119—18 **17 Claims**

1. A cage for breeding a small animal, comprising:

a feeder means including a chute having two sides, a forward wall and a rearward wall; and

a trapezoidal body having an open top, a bottom, two side walls, a front wall and a rear wall, said body widening from said bottom to said open top, the front wall of the body extending upward from said bottom for less than the



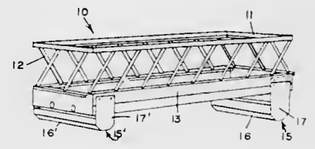
distance between said open top and said bottom, thereby defining at opening through an upper part of said front wall of said body, said feeder means being removably received within said opening so that a portion of said forward wall of said chute extends forward of said front wall of said body and a rearward wall of said chute closes said opening.

4,784,085

SUPPORT STANDARD FOR IMPLEMENT

John Schoessow, Rte. 2, Portage, Wis. 53901

Filed Jul. 11, 1986, Ser. No. 884,386
Int. Cl.⁴ A01K *1/10*
U.S. Cl. 119—58 **3 Claims**



1. A supporting standard for implements, a plurality of which provide flotation characteristics to an implement in water-soaked or otherwise poor load-bearing soils and facilitate removal thereof when embedded in frozen ground, each said standard comprising,

(a) a foot portion configured with a relatively broad basal face and with at least one pair of oppositely disposed, adjoined side walls upstanding an elevational distance at least as great as said basal face breadth wherein said at least one pair of said side walls comprises angled sections which upwardly diverge from said basal face for at least a portion of the height of said side walls,

(b) a pair of oppositely facing end portions transversely extending between end extremities of said side walls and adjoined thereto,

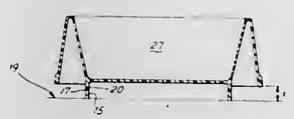
(c) means for attaching said foot portion and end portions to the lower extremity of an implement to be supported wherein said means comprise upwardly reaching extensions from at least one pair of said oppositely disposed side walls and said oppositely facing end portions thereby to position an implement to which said supporting standard is attached elevationally higher than said foot portion and provide for sinking of said foot portion in soft soil without embedding an implement so supported therein.

4,784,086

METHOD AND APPARATUS FOR PREVENTING INSECTS FROM ENTERING THE FOOD AREA OF AN ANIMAL FEEDING BOWL

Herbert H. Hand, 233 Tram Rd., Columbia, S.C. 29210, and Herbert G. Hand, Rte. 2, Box 56A, Gaston, S.C. 29053

Continuation-in-part of Ser. No. 914,335, Oct. 2, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 133,171
Int. Cl.⁴ A01K *5/01*
U.S. Cl. 119—61 **9 Claims**



2. An animal feeding bowl for placement on the ground and which prevent a crawling insect of a predetermined size from reaching the food area of the bowl, comprising:

bowl means defining a bowl area capable of holding animal food, said bowl means having an upper ridge defining the sole entry location for crawling insects into the bowl area;

supporting means for supporting said bowl means with respect to the ground for disposing said upper ridge at an elevation located above ground;

a first surface positioned with respect to said support means for defining a first pathway for a crawling insect to reach food in the bowl area from ground, said first surface extending upwardly from ground from a locus of a continuous shape for providing said first pathway disposed in a direction leading away from ground toward the bowl area for discouraging the climbing of the insect onto said first pathway when the insect is using -tactic response modes either individually, concurrently or serially;

obstacle means secured along the entire extent of said ridge and including a surface bearing member depending towards the ground and being spaced from ground by a predetermined distance, said distance being greater than said predetermined size of the insect so as to prevent the crawling insect from climbing onto said surface bearing member from ground, said surface bearing member physically blocking insects from passing from said first pathway across said ridge into said bowl area, said surface bearing member bearaing a second surface defining a second pathway being disposed in a direction leading from said first pathway toward ground to a point having an elevation different than the elevation of said ridge for discouraging continued movement by an insect along said second pathway toward ground when the insect is using -tactic response modes either individually, concurrently or serially, said obstacle means cooperating with said first surface for generating a phototactic barrier along said first pathway by shadowing thereof to discourage continued movement by the insect along said first pathway toward said bowl area when the insect is in a positive phototactic response mode, said obstcle means being disposed relative to said first surface for generating a geotactic barrier to disorient the insect's foraging for a food source at a particular elevation, said first and second pathways being disposed relative to the direction of food scent from food in the bowl area for discouraging the insect from movement along said first pathway toward said bowl area.

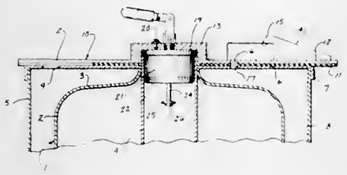
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4,784,087

CLAMPING APPARATUS FOR USE IN FOAMING WATER HEATERS

James L. Chevalier, Mequon; Douglas D. King, Menomonee Falls; John D. Pfeffer, Brookfield, all of Wis., and Allen L. Johnson, El Paso, Tex., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 13, 1987, Ser. No. 107,642
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—13 R 15 Claims



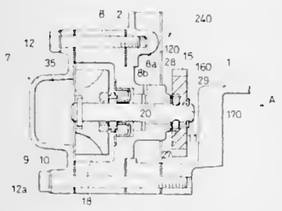
1. An apparatus for clamping a cover to a jacket that surrounds a tank as the space between the jacket and the tank is filled with an expandable resin material during a foaming operation, the upper end of said tank having aperture means, said apparatus comprising retaining means disposed against the outer surface of said cover, and clamping means engageable with said aperture means to hold said retaining means against said cover and prevent deformation of the cover during the foaming operation.

4,784,088

DRIVE DEVICE FOR COOLANT PUMPS

Shinichi Tamba, Kakogawa, and Akio Miguchi, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 20, 1986, Ser. No. 932,679
Claims priority, application Japan, Dec. 5, 1985, 60-187741[U]; Aug. 8, 1986, 61-187090
Int. Cl.[4] F01P *5/10*
U.S. Cl. 123—41.47 2 Claims



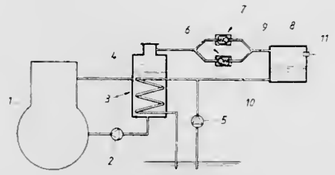
1. In a liquid-cooled internal combustion engine having a crankcase with a wall, an opening in said wall, and a crankshaft: a coolant pump having a pump body mounted in said opening and having a front end wall, a boss formed in said front end wall, a bore in said boss, a pump shaft rotatably journaled in said bore, said pump shaft having a forward end portion with a through hole extending diametrically through said pump shaft, a driven gear on said pump shaft and being drivingly connected to said crankshaft, a pin fixedly mounted in said through hole such that opposite ends of said pin project from said through hole, a pair of grooves formed in said drive gear and facing a front end wall of said boss and fittingly receiving therein said projecting ends of said pin to thereby fixedly mount said drive gear to said pump shaft, and a washer mounted around said pump shaft between said front end wall of said boss and said projecting ends of said pin.

4,784,089

COOLING SYSTEM FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

Tomas Visek, Steyr, Austria, assignor to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Dec. 3, 1987, Ser. No. 128,042
Claims priority, application Austria, Dec. 11, 1986, 3289/86
Int. Cl.[4] F01P *3/20*
U.S. Cl. 123—41.51 3 Claims



1. In a cooling system for a water-cooled internal combustion engine, comprising

a cooling circuit including an expansion vessel and a cooling water pump for circulating cooling water in said cooling circuit through said expansion vessel,

a reservoir,

a communicating line connecting said expansion vessel and said reservoir and incorporating a pressure relief valve and a check valve connected in parallel,

a heat exchanger for cooling said cooling water in said cooling circuit, and

a raw water pump for maintaining a flow of raw water through said heat exchanger,

the improvement residing in that

said reservoir is pressure-tight,

said communicating line opens into said expansion vessel adjacent to its top and into said reservoir adjacent to its top, and

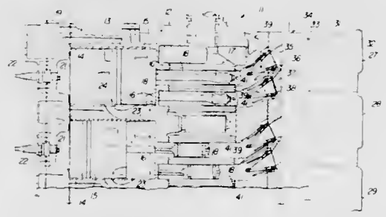
a discharge line from said raw water pump opens into said reservoir adjacent to the bottom thereof.

4,784,090

INTAKE DEVICE FOR OUTBOARD ENGINE

Masafumi Sougawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 30, 1987, Ser. No. 68,220
Claims priority, application Japan, Jun. 30, 1986, 61-153416
Int. Cl.[4] F02B *75/18*
U.S. Cl. 123—52 MV 7 Claims



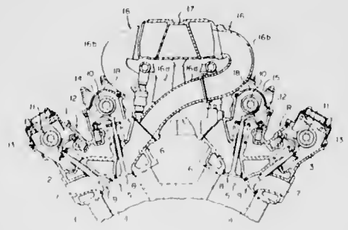
1. An induction system for a crankcase compression internal combustion engine having a crankcase defining a pair of crankcase chambers vertically disposed relative to each other and each having a respective inlet, an inlet for said induction system comprising a pair of side by side inlet openings disposed in a common horizontally extending plane spaced a substantial distance above said crankcase inlets, charge forming means for delivering a fuel air mixture to each of said inlet openings, and a manifold affixed to said crankcase and defining a first intake passage extending from one of said inlet openings downwardly to a first of said crankcase chamber inlets and a second intake passage extending from the other of said inlet openings downwardly to the other of said crankcase chamber inlets.

4,784,091

CYLINDER HEAD COVER STRUCTURE FOR A V-TYPE ENGINE

Masatoshi Okada, deceased, late of Kariya, Japan (by Masayuki Okada, a legal representative); Masami Nishida, and Kazuaki Hokazono, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 7, 1987, Ser. No. 35,330
Claims priority, application Japan, Apr. 8, 1986, 61-80586
Int. Cl.[4] F02M *35/10*
U.S. Cl. 123—52 MV 12 Claims



1. A cylinder head cover structure for a cylinder engine having first and second cylinder heads for forming first and second cylinder banks, each cylinder head being provided, in an inner side wall thereof, with intake ports each communicating with a cylinder formed in the cylinder bank, at least one camshaft provided in each cylinder bank above intake and exhaust valves to drive the valves in synchronization with rotation of the engine and supported for rotation by a plurality of bearings, discrete intake passages each of which is connected to one of the intake ports of one of the cylinder banks and extends above the other cylinder bank, and cylinder head covers mounted on the respective cylinder heads, characterized in that recessed portions are formed in each of the cylinder head covers at corresponding portions of the camshaft and respective said discrete intake passages extend through corresponding ones of said recessed portions.

4,784,092

LIQUID TO VAPOR FUEL CONVERTER SYSTEM

Edward Pitti, 30 Shelden Blvd., Centereach,, N.Y. 11720

Filed Oct. 2, 1987, Ser. No. 104,267
Int. Cl.[4] F02M *21/02*
U.S. Cl. 123—525 11 Claims

5. A liquid to vapor fuel converter system, for an internal combustion engine comprising:

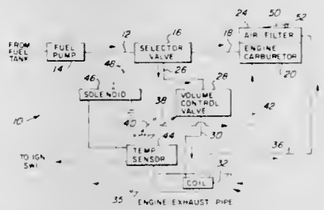
(a) a heating means for vaporizing fuel;

(b) a selector valve for directing fuel to either said heating means or to a conventional carburetor of said internal combustion engine;

(c) automatic means responsive to at least one parameter of said internal combustion engine for controlling said selector valve; and

(d) means responsive to the commands of an operator for controlling the quantity of fuel used to power said internal combustion engine, and wherein said automatic means responsive to at least one parameter of said internal combustion engine for controlling said selector valve includes;

(e) temperature sensor means mounted in intimate contact with said internal combustion engine whereby an electrical output of said temperature sensor means is responsive to temperature sensed; and



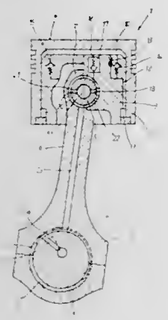
(f) said selector valve is an electrically controlled valve responsive to said temperature sensed, whereby the ratio of fuel directed to said heat means and said conventional carburetor is a function is said temperature sensed.

4,784,093

ARRANGEMENT FOR CONTROLLING THE OIL FEED TO A CONTROL CHAMBER OF A PISTON WITH VARIABLE COMPRESSION HEIGHT

Viktor Pfeffer, and Friedrich Wirbeleit, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,047
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638783
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—78 B 13 Claims



1. An arrangement for the control of the oil feed to a control chamber of a piston with variable compression height, particularly for internal-combustion engines, which control chamber is arranged between an interior piston part and an exterior piston part that is slidably guided at it, and which control chamber is connected to the lubricating oil circuit of the internal-combustion engine, via an oil bore arranged in said interior piston part, into the course of which a check valve is inserted that opens in the direction of said control chamber, and which oil bore leads out into an oil groove in a connecting rod small end bush of the connecting rod coupled to said interior piston part, as well as via a longitudinal oil bore leading from the oil groove through the connecting rod shaft to a control oil groove in the connecting rod bearing, and via a transverse bore extending in the crank pin between the control oil groove and a main oil bore, wherein the control oil groove extends only over a part of the bearing circumference in the connecting rod bearing and in the range between the last third of the outward motion of the piston to the last third of the inward motion of the piston, overlaps with the transverse bore.

VOL 1096 ISS 3 NO 15 1988 UMI

4,784,094

CYLINDER HEAD WITH DESMODROMIC VALVE OPERATION, FOR INTERNAL COMBUSTION ENGINES

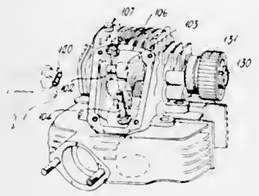
Ing. M. Bordi, and P. I. Gianluigi Mengoli, both of Bologna, Italy, assignors to Ducati Meccanica S.p.A., Bologna, Italy

Filed Apr. 2, 1987, Ser. No. 34,071

Claims priority, application Italy, Apr. 8, 1986, 21471 B/86[U]

Int. Cl.[4] F01L *1/30*

U.S. Cl. 123—90.25 6 Claims



1. A cylinder head for desmodromic valve operation for internal combustion engines which comprises:

a first rocker assembly comprising a pin having a major axis; a first rocker arm rockingly and slidably mounted on said pin such that said rocker may move at least along the axis of said pin; and a support bushing rotatably mounted on said pin, said support bushing being shorter in length than said pin so as to permit lateral displacement of said first rocker, said first rocker assembly operable to control the opening of said desmodromic valve; wherein said movement of said first rocker along the axis of said pin facilitates engagement and withdrawl of said first rocker from said valve so that access to a plurality of calibrated registers positioned on said valve is permitted without disengaging said rocker assembly.

4,784,095

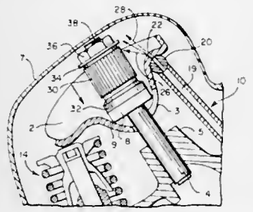
ROCKER ARM ADJUSTING NUT

Michael J. Golding, Port Orange, and William A. Pohle, Daytona Beach, both of Fla., assignors to Crane Cams, Incorporated, Daytona Beach, Fla.

Filed Dec. 15, 1987, Ser. No. 133,466

Int. Cl.[4] F01L *1/18;* F01M *9/10*

U.S. Cl. 123—90.41 6 Claims



1. An improved rocker arm adjusting nut intended to engage a threaded stud and position a stamped steel rocker arm and a pivot ball with respect to said stud and thereby define part of the valve train of an internal combustion engine, said adjusting nut comprising an axially elongated body with a substantially right circular cylinder central portion, a transversely overhanging upper collar spaced above said central portion, a bottom flange spaced below said central portion, a tightening nut portion spaced above said upper collar and an axial internal thread adapted to engage with an external thread on a stud, wherein said central portion has a circumferential surface that comprises axially extending passages, whereby oil droplets impinging upon said central portion circumferential surface will be urged by gravity to travel axially towards said bottom flange, when said improved rocker arm adjusting nut is used in its intended environment.

4,784,096

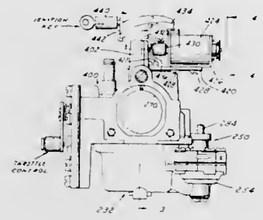
CARBURETOR IDLE VENT CONTROL

William C. Eberline, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Apr. 2, 1984, Ser. No. 595,716

Int. Cl.[4] F02M *1/16*

U.S. Cl. 123—179 G 1 Claim



1. In a carburetor for providing fuel to engines, such a outboard motors and land vehicles, the carburetor being of the type having a housing and a fuel and air mixing passage in said housing connected to the fuel induction chamber of an internal combustion engine, a main fuel nozzle and idle passages connected to said mixing passage, that improvement which comprises:

(a) an idle fuel chamber associated with said idle fuel passages,

(b) means forming an atmospheric passage in communication with said idle fuel chamber,

(c) means responsive to operator control to close said atmospheric passage to increase flow to said mixing passage to create a rich mixture to assist in engine starting,

(d) said atmospheric passage terminating externally of said carburetor housing in a projecting nipple having an external end with a bore opening to atmosphere to provide an atmospheric passage,

(e) said means to close said atmospheric passage comprising a plug movable against said nipple to close said bore,

(f) said means responsive to operator control comprising an electric solenoid having an armature portion provided with a flat surface to move toward said external end of said atmospheric passage in said nipple to close said passage in response to eneregization of said solenoid, and

(g) an operator controlled switch provided for remote control of said solenoid, said switch being associated with an ignition key cylinder and operated by longitudinal shifting of said cylinder.

4,784,097

COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINE

Shiro Ishida, Fujisawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 939,988

Claims priority, application Japan, Dec. 10, 1985, 60-276025

Iot. Cl.[4] F02B *19/08*

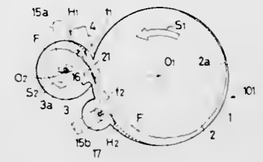
U.S. Cl. 123—260 13 Claims

1. A combustion chamber for an internal combustion engine, comprising:

a main combustion chamber hollowed out of the top of a piston;

a subsidiary combustion chamber hollowed out of said piston top, said subsidiary combustion chamber communicating with and disposed in side by side relatinship to said main combustion chamber;

a fuel injection nozzle located generally between said main and subsidiary combustion chambers, and having a main nozzle hole for supplying a spray of atomized fuel to said main combustion chamber and an auxiliary nozzle hole adapted to be opened before said main nozzle hole for supplying a spray of atomized fuel to said subsidiary combustion chamber; and



sparking means located in both main and subsidiary combustion chambers to accelerate ignition of the supplied fuel.

4,784,098

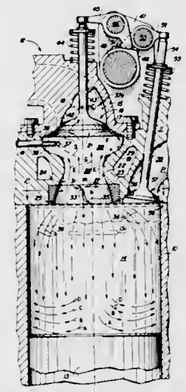
INTERNAL COMBUSTION ENGINE UTILIZING STRATIFIED CHARGE COMBUSTION PROCESS

Noel G. Artman, 15830 Nicklaus La., Sun City, Ariz. 85351

Filed Jul. 20, 1987, Ser. No. 75,510

Int. Cl.[4] F02B *19/08*

U.S. Cl. 123—262 20 Claims



1. In an internal combustion engine having a main air inlet passage communicating at an end thereof through the face of a cylinder head with an alternately expandable and contractable variable volume space in an end of a cylinder closed by such head, there being within the cylinder head a precombustion chamber forming a section of such passage and interposed between said space and an upstream portion of said passage, the chamber having a principal axis extending between opposite ends thereof and of which ends one is an air inlet and having a valve seat through which the chamber is communicative with the upstream passage portion and of which ends the other is an open end through which the passage has two-way communication with said space and is disposed to discharge air from the chamber into said space axially of the cylinder, the combination of

air deflecting means in said chamber and operable during expansion of said space to modulate the flow of intake air passing through the chamber into said space into the form of a stream composed of a core portion flowing axially of the cylinder into said space and of a tubular portion encircling the core portion and flowing helically thereabout,

fuel delivery means operable during a fuel injection period commencing during expansion of said space and subsequent to entry of a leading portion of the air stream into said space to inject evaporative fuel into the passage and into a trailing portion of said air stream therein at a rate to mix and form therewith an air-fuel mixture lean in fuel richness that flows within and at least partially through the chamber en route to said space during said expansion thereof, said fuel delivery means being operable to increase the volume of the trailing air stream portion mixed with fuel by advancing the starting time of the fuel injection period to increase the length of such period measured in units of space expansion, the fuel delivery means being further operable during engine operation, while the fuel delivery period is of said increased length, to increase said rate of fuel delivery and thereby increase the fuel richness of the air-fuel mixture, and, during the ensuing contraction of said space that causes part of the air-fuel mixture and part of the leading air portion within said space to flow therefron reversely through the chamber open end into the chamber, said air deflecting means is operable to cause such reverse flow to take the form of a stream composed of a central core portion flowing axially within the chamber and a tubular portion helically about that core portion.

4,784,099

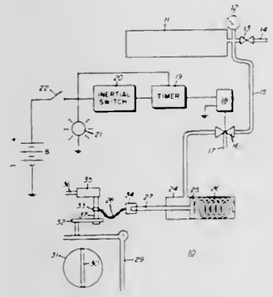
TIME OPERATED THROTTLE STOP

Harley R. Noe, 1845 Lincoln, and Warren Bauer, 1680 Sunset Strip, both of Mountain Home, Id. 83647

Filed Nov. 4, 1986, Ser. No. 926,580

Int. Cl.[4] F02D *11/08*

U.S. Cl. 123—398 6 Claims



1. A time operated throttle closing device for use on a drag racing vehicle which comprises:

means for selectively closing the throttle of an engine of a drag racing vehicle;

means for selectively deactivating said closing means;

means for sensing the initiation of the acceleration of the drag racing vehicle;

an adjustable timer for measuring a preselected period of time from the initiation of acceleration of the drag racing vehicle;

means for activating the closing means after the predetermined period of time has elapsed.

4,784,100

ELECTRICALLY CONTROLLED ENGINE IGNITION SYSTEM FOR POWER BOOST AND FUEL ECONOMY

Chin-Don Huan, No. 5-16, Lane 105, Kao Mei Road, Chiao Tou Li, Ching Shui Chen, Taichung Hsien, Taiwan

Filed Sep. 10, 1987, Ser. No. 96,825

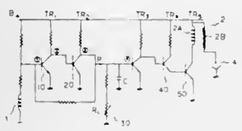
Int. Cl.[4] F02D *5/04*

U.S. Cl. 123—427 4 Claims

1. An electronically controlled ignition system for power boost and fuel economy connected between an induction output terminal of a distributer means and an ignition coil, includ-

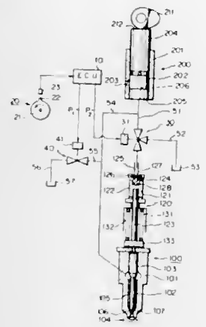
VOL 1096 ISS 3 NO 15 1988 UMI

ing a vacuum suction means connected to a venturi throat of a carburetor, the vacuum suction means comprising:
a housing;
a connecting tube means to connect said housing to the venturi throat of the carburetor;
a diaphragm movably mounted in said housing for upward and downward movement which movement is actuated by a change of vacuum state in the carburetor;
a spring disposed on one side of said diaphragm;



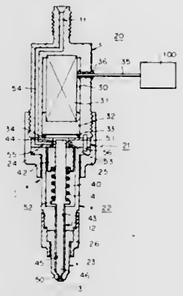
a pair of conducting legs disposed on the other side of said diaphragm and movable with said diaphragm;
a variable resistance means including a plurality of elongate serially connected variable resistors with one of said pair of conducting legs in slidable contact therewith to contact different parts along said variable resistors for effecting a change of resistance value of said variable resistance means;
a grounded metal plate with the other of said pair of conducting legs in slidable contact therewith.

4,784,101
FUEL INJECTION CONTROL DEVICE
Takashi Iwanaga; Hideya Fujisawa; Masaaki Kato, all of Kariya, and Masahiko Miyaki, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Apr. 1, 1987, Ser. No. 32,569
Claims priority, application Japan, Apr. 4, 1986, 61-78848
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—446 **21 Claims**



1. A fuel injection control device for an internal combustion engine, said device comprising:
A fuel injector having a body, said body having a bore, a fuel injection aperture and a fuel chamber formed therein, a needle valve slidably housed in said bore, and a pressure mechanism including a pressure control chamber, a pressure in said pressure control chamber causing said needle valve to prevent communication between said fuel chamber and said fuel injection aperture when a pressure in said pressure control chamber is relatively high, and causing said needle valve to allow communication between said fuel chamber and said fuel injection aperture when a pressure in said pressure control chamber is relatively low,
a pump having a high pressure chamber and means for pressurizing fuel in said high pressure chamber to send the fuel to said pressure control chamber and said fuel chamber,
means for reserving a low pressure fuel,
a first electrically-controlled on-off valve provided between said high pressure chamber and said pressure control chamber, said first valve connecting said pressure control chamber to said high pressure chamber when said first on-off valve is in a first state thereof and to said reserving means when said first on-off valve is in a second state thereof,
a second electrically-controlled on-off valve provided for allowing connection of said high pressure chamber and said fuel chamber to said reserving means when said second on-off valve is in a first state thereof and preventing the connection when said second on-off valve is in a second state thereof,
a position sensor sensing a rotational position of a crankshaft of said engine, and
means for switching first and second states of said first and second valves according to the sensed rotational position of said crankshaft of said engine, said switching means switching said first valve and said second valve to said respective first state upon the end of a fuel injection from said fuel injector.

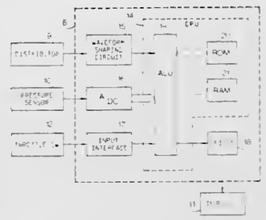
4,784,102
FUEL INJECTOR AND FUEL INJECTION SYSTEM
Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Kazuhide Watanabe, Toyohashi; Masahiro Takigawa, Nukata; Toru Yoshinaga, Okazaki; Yukihiro Natsuyama, Anjo, and Shigeki Daido, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Dec. 24, 1985, Ser. No. 813,463
Claims priority, application Japan, Dec. 25, 1984, 59-271782; Sep. 4, 1985, 60-193918; Nov. 1, 1985, 60-244126
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—447 **25 Claims**



1. A fuel injector comprising;
a housing having formed therein a fuel pressure control chamber and an accumulator, which temporarily retain fuel, a path leading into the fuel pressure control chamber and accumulator, so that they receive which is intermittently fed under pressure from a fuel source through said path, and formed with a nozzle hole through which fuel in said accumulator is injected;

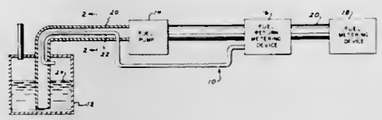
a piezo actuator accommodated in said housing, defining said fuel pressure control chamber and expanding and contracting in accordance with a voltage applied thereto to change the volume of said fuel pressure control chamber;
needle valve, of a type which opens and closes a responsive to an applied pressure, provided reciprocally movably within said housing between said accumulator and said nozzle hole and which, responsive to a pressure from said fuel pressure control chamber and accumulator, opens and closes communication between said accumulator and said nozzle hole;
check valve means for normally closing communication between said path and said fuel pressure control chamber and between said path and said accumulator and for opening said communication according to pressure in said path and/or in said fuel pressure control chamber; and
an electric circuit which controls a voltage applied to said piezo-actuator.
the arrangement being such that fuel supplied from said fuel source passes through said path and is fed under pressure into said fuel pressure control chamber and accumulator via said check valve;
said needle valve closing communication between said accumulator and said nozzle hole when said piezo actuator expands to increase fuel pressure within said fuel pressure control chamber, and opening communication between said accumulator and said nozzle hole when said piezo actuator contracts to decrease fuel pressure in said fuel pressure control chamber, thereby allowing fuel to be injected from said nozzle hole.

4,784,103
METHOD FOR CONTROLLING FUEL INJECTION FOR AUTOMOTIVE ENGINES
Hiroshi Ohishi, Hohya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 10, 1987, Ser. No. 72,160
Claims priority, application Japan, Jul. 14, 1986, 61-166407
Int. Cl.[4] F02M *51/00;* **F02D** *41/08, 41/12*
U.S. Cl. 123—493 **7 Claims**



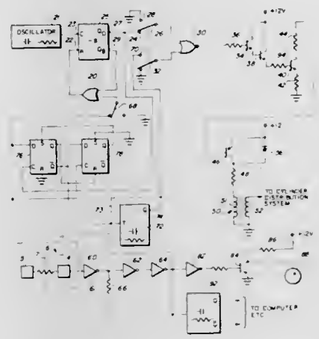
1. A method for controlling fuel injection for an automotive engine comprising:
determining constants of an injector for the fuel injection and of a capacity of a chamber formed in an intake passage of the engine;
detecting engine speed and intake-air pressure in the intake passage downstream of a throttle valve of the engine;
calculating a basic fuel injection time based on the detected engine speed and intake-air pressure;
said detecting intake-air pressure includes detecting the intake-air pressure at every one rotation of a crankshaft of said engine;
calculating the difference between the detected intake-air pressures at every one rotation of the crankshaft;
correcting the basic fuel injection time by adding thereto a correcting value which is the product of said constants and said difference.

4,784,104
FUEL LINE WITH INTEGRAL CO-AXIAL RETURN LINE
Danny L. Dimond, Neenah, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Jun. 18, 1987, Ser. No. 63,650
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—514 **5 Claims**



1. In a gasoline fuel system for an internal combustion engine having a fuel pump communicating with a fuel tank and delivering fuel to a device for introducing measured amounts of fuel into the engine and including a device for detecting and returning vaporized fuel and excess fuel to the tank, a fuel line connecting these components comprising:
a supply conduit for delivering fuel from the tank to the engine via the fuel pump, the detecting device and the measuring device and
a return conduit for returning detected vaporized or excess fuel to the tank with at least a portion of said return conduit co-axial with and contained within said supply conduit to prevent the escape of fuel vapor to the atomosphere.

4,784,105
HIGH PERFORMANCE DIGITAL IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES
Craig R. Brown, 1417 E. Cheryl Dr., Phoenix, Ariz. 85020
Continuation of Ser. No. 850,594, Apr. 11, 1986, Pat. No. 4,686,954. This application Mar. 23, 1987, Ser. No. 29,145
Int. Cl.[4] F02P *7/077, 15/10*
U.S. Cl. 123—607 **4 Claims**



1. A spark ignition system for an internal combustion engine comprising:
(A) a free running source of equally time-spaced pulses which periodically switch between logic "high" and logic "low" levels;
(B) engine angular position sensing means for generating an engine timing signal characterized by the presence of a first logic level when the engine angular position is within a first angular range and by the presence of a second logic level when the engine angular position is within a second angular range which does not include said first angular

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range, said first engine angular position corresponding to at least a portion of an engine cylinder power stroke;

(C) a triggerable source of intermittent high voltage pulses, said triggerable source having an output delivering a single high voltage single-polarity pulse each time it is triggered, said triggerable source comprising an ignition coil including a single-ended low voltage primary winding and a high voltage secondary winding;

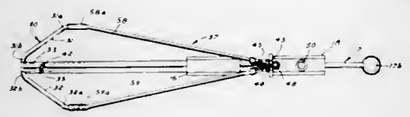
(D) trigger signal developing means having an input and an output, said trigger signal developing means output being connected to said triggerable source and adapted to trigger said triggerable source in response to the transition of a signal between logic "low" and logic "high" appearing at said input to said trigger signal developing means, said trigger signal developing means including an electronic switch disposed in series with said ignition coil primary winding and a d-c electrical power source such that, when said electronic switch is closed, current from said power source passes through said primary winding to generate a magnetic field and when said electronic switch is opened, the magnetic field collapses to induce a high voltage pulse in said secondary winding;

(E) gating means responsive to the presence of said first logic level in said timing signal to pass said equally time-spaced pulses to said input of said trigger signal developing means and to the presence of said second logic level in said engine timing signal to prevent said equally time-spaced pulses from being applied to said input of said trigger signal developing means;

(F) frequency determining means included in said free running source, said frequency determining means being set to establish the frequency of said equally time-spaced pulses to a frequency at which said ignition coil fully saturates during each period in which said electronic switch is closed such that said triggerable source delivers successive equal and full amplitude equally time-spaced high voltage pulses in response to successive equally time-spaced pulses applied to said gating means, all said pulses being of single and like polarity; and

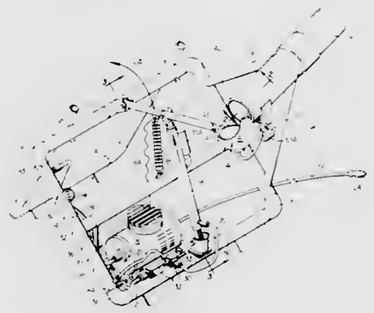
(G) high voltage distribution means for transferring a continuous train of equally time-spaced, full amplitude high voltage pulses generated by said triggerable source to a spark plug in the cylinder to be fired during the entire period when said engine angular position sensing means senses that the instantaneous engine angular position falls within said first angular range.

4,784,106
SLING SHOT GUN DEVICE
Galen D. Kees, Rte. 2, Box 17B, Durand, Wis. 54736
Filed Sep. 25, 1987, Ser. No. 100,886
Int. Cl.[4] F41B *3/00*
U.S. Cl. 124—20 R **5 Claims**



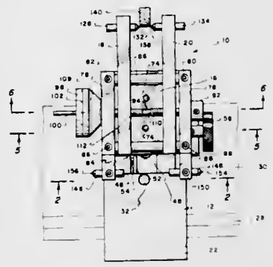
1. A sling shot device, having in combination
an extensible barrel,
means releasably holding said barrel in extended position,
a forward and rearward handle carried by said barrel,
a pair of upstanding pins disposed at the face of said rearward handle extending above said handle,
means pivotally securing said pins substantially centrally thereof to said handle,
a plunger recessed into said rearward handle between the lower portions of said pins separating the same to cause the upper portions of said pins to converge,
said plunger having a transversely narrowed portion outwardly of said pins,
an elastic catapult member,
means securing said catapult member at one end thereof to the forward end portion of said barrel,
a missile pouch carried at the other end of said catapult member,
a missile in said pouch,
said pouch and said missile therein being disposed to be retained by said converged upper portions of said pins,
said forward handle being moved forwardly of said rearward handle extending said barrel and placing said catapult member under tension,
said plunger being movable inwardly of said handle permitting said lower portions of said pins to converge upon the narrowed portion of said plunger and thus causing the upper portions of said pins to spread apart and release said pouch and missile,
means normally urging said plunger to extended position,
means carried by said plunger releasably securing said plunger in extended position,
a rearward portion of said barrel is slidable within the forward portion thereof,
said rearward portion of said barrel carries said rearward handle and said forward portion of said barrel carries said forward handle,
said rearward barrel portion has a longitudinal slot for the length of its movement within said forward barrel portion, said slot having a forward wall,
said forward barrel portion having a transverse pin therein as a stop member upon engagement with said forward wall,
an opening in the bottom wall of said forward barrel portion,
a vertical bore through said forward handle, a plunger in said bore, a spring under compression in said bore urging said plunger upwardly, the upper end portion of said plunger having an annular groove and an upward portion of reduced transverse dimension movable through said opening,
whereby said slot serves as a stop member for the adjacent end portion of said rearward barrel portion.

4,784,107
BALL PITCHING SYSTEM
Eddy D. Kelly, Rte. 3, Box 736, Rockwall, Tex. 75087
Filed Dec. 1, 1986, Ser. No. 936,398
Int. Cl.[4] F41B *11/00*
U.S. Cl. 124—61 **9 Claims**



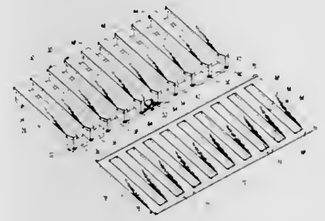
1. An improved system for hurling baseballs along a predefined arced trajectory of the type wherein a ball is hurled toward a batter, said improvement comprising:
a frame adapted for positioning upon a support surface;
an arm pivotally mounted to said frame and constructed for receiving a baseball on an end thereof for being hurled toward a batter;
means securable to said frame for supplying compressed air for pivotal actuation of said arm from a first rest position into an arced position;
a pneumatic cylinder coupled at a first end to said arm and at a second end to said frame and adapted for pivotally actuating said arm;
means coupling said compressed air means to said pneumatic cylinder for the actuation thereof;
a ball chute one end of which is disposed adjacent said arm and in close proximity to said end thereof constructed for receiving said baseball thereon in its rest position;
means for retaining and discharging balls from said ball chute upon said end of said arm prior to the pivotal actuation thereof to hurl said baseball toward said batter;
means for selectively actuating said pneumatic cylinder for hurling said balls positioned upon said pivotal arm by the pivotal actuation thereof from its rest position to its arced position in response to compressed air within said pneumatic cylinder; and
a compression return chamber coupled to said pneumatic cylinder in flow communication therewith for receiving compressed air therefrom during the pivotal actuation of said arm and providing a return force to said arm to return it to its rest position from its arced position.

4,784,108
GRINDING WHEEL DRESSING APPARATUS
Lloyd E. Johnson, 3583 Sunset Knolls Dr., Thousand Oaks, Calif. 91360
Filed Oct. 5, 1987, Ser. No. 104,293
Int. Cl.[4] B24B *53/00*
U.S. Cl. 125—11 DF **1 Claim**



1. A grinding wheel dressing apparatus comprising:
a base, said base being adapted to be mounted on the workpiece supporting table of a wheel grinding machine;
a platform mounted on said base, said platform being pivotally movable to and fixable in different positions relative to said base;
a plate mounted on said platform, said plate being lineally movable relative to said platform;
a pair of tool support arms mounted on said plate, said tool support arms being simultaneously movable on said plate, movement of said arms being either toward each other or away from each other, both said arms move at the same rate of movement;
a first cutting tool mounted on each said arm with therebeing a separate said first cutting tool for each said arm, said first cutting tools being located in a spaced apart relationship with a grinding wheel adapted to be located between said first cutting tools, whereby said first cutting tools are to cut into the opposite side walls of the grinding wheel thereby forming the grinding wheel to a desired thickness; and
a pair of second cutting tools mounted on said plate, each said second cutting tool protruding exteriorly of said plate so as to facilitate forming of an annular beveled surface on the circumferential edge of the grinding wheel, said second cutting tools being located in an oppositely facing direction relative to each other.

4,784,109
GRID SYSTEM
Brian A. Korpan, 540 Garfield St., New Westminster, B.C., Canada V3L 4A7
Filed Jul. 8, 1987, Ser. No. 71,023
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—25 R **4 Claims**



1. A barbecue or broiling grid system comprising a replaceable cover, a cover holder, and an engagement means for releaseably interconnecting said replaceable cover with said cover holder by a longitudinal sliding motion, said cover holder comprising a plurality of spaced apart supporting bars, said replaceable cover comprising a plurality of spaced apart open sleeves, said bars and said sleeves being shaped relative to one another to permit said sleeves to be longitudinally fitted to or removed from said bars, each of said bars provided with longitudinal outwardly projecting members, each of said sleeves provided with longitudinal opposed inwardly directed members which engage said outwardly projecting members of said bars when said replaceable cover is pushed longitudinally on to said cover holder forming an operative grid, whereby: in the event of said operative grid becoming soiled said replaceable cover can be removed from said cover holder by a longitudinal sliding motion and a new replaceable cover can be fitted to said cover holder by a longitudinal sliding motion to provide at least one clean outer surface on said operative grid.

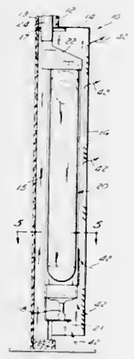
4,784,110
WALL FURNACE
Stanley F. Skafte, Cherry Valley, and Donald R. Dupras, Alta Loma, both of Calif., assignors to Williams Furnace Company, Colton, Calif.
Filed Nov. 14, 1986, Ser. No. 931,227
Int. Cl.[4] F24H *3/02*
U.S. Cl. 126—110 AA **2 Claims**

1. A wall furnace adapted to fit between a pair of studdings in a conventional stud wall of a room with a portion of the furnace extending outwardly into the room, said furnace comprising a burner; and a heat exchanger having duct means defining an elongated flow path including a vertically oriented combustion chamber having an inlet at its lower end to receive combustion gases emanating from the burner, said duct means further including a first radiator located on one side of said combustion chamber, said radiator having a vertically elongated downwardly extending section connected at its upper end to the upper end of said chamber and an upwardly extending elongated section connected at its lower end to the lower end of said downwardly extending section, said duct means also including a second radiator located on the opposite side of said combustion chamber from said first radiator, said second radiator having a vertically elongated downwardly extending

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section open at its upper end to the upper end of said chamber and a vertically elongated upwardly extending section having its lower end connected to the lower end of said second radiator downwardly extending section, the upper end of each of the upwardly extending radiator sections being adapted to be connected to a flue, said combustion chamber and said radiators each having a vertically elongated configuration with a generally flattened cross section wherein the longer dimension of the cross section extends generally perpendicular to the wall in which the furnace is to be installed, and the shorter dimension extends generally parallel to said wall, said radiators each





having a divider which extends generally perpendicular to said wall, the divider dividing the radiators into said downwardly extending and upwardly extending sections which are in communication with each other at the lower end of the divider said radiators being spaced from the combustion chamber except at the upper end where the radiators are in communication with the combustion chamber so that air may circulate between the radiators and the combustion chamber, the configuration of the combustion chamber and the radiators nevertheless being sufficiently flat that the spaced chamber and radiators will fit between the studdings of a conventional wall.

4,784,111

HOT AIR RECYCLING OVEN

Joseph Palomba, 32, rue Gabriel Lelong, Chartres 28000, France

PCT No. PCT/FR85/00056, § 371 Date Nov. 13, 1985, § 102(e) Date Nov. 13, 1985, PCT Pub. No. WO85/04308, PCT Pub. Date Oct. 10, 1985

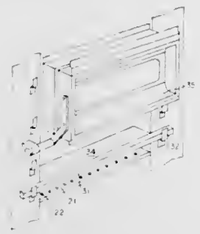
PCT Filed Mar. 21, 1985, Ser. No. 807,069

Claims priority, application France, Mar. 27, 1984, 84 04978

Int. Cl.[4] F23M *7/00*

U.S. Cl. 126—190 **8 Claims**

1. An oven for baking food products, said oven comprising a single loading opening which is closed by a principal door with hinge means having a vertical pivot axis located adjacent an edge of said door, said principal door having a filling opening closed by a vertically aligned series of small longitudinal folding doors extending across the width of the principal door, off set hinge means for pivotally supporting an edge of each of



the small longitudinal folding doors about 180° toward the front and along a horizontal axis located forwardly of said door, the opposite edge of each of said folding doors covering in a practically sealed manner an adjacent edge of the folding door which is immediately next to it.

4,784,112

CONTAINER FOR USE IN PRECOOKED FOODS

Yuichi Hayashi, 444-7, Hikawacho, Soka-shi, Saitama-ken, 340, Japan

Continuation of Ser. No. 926,614, Nov. 4, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 161,236

Claims priority, application Japan, Feb. 13, 1986, 61-18278[U]

Int. Cl.[4] A47G *23/04*

U.S. Cl. 126—262 **4 Claims**



1. A container for use in heating precooked foods comprising a disposable container main body composed of incombustible paper for containing precooked foods and a disposable heater device composed of incombustible material such as incombustible paper or aluminum, having a solid fuel, integrally packaged together with said container main body and capable of heating said main body, said heater device having a bottom wall supporting said solid fuel, an upwardly extending side wall and an open top for receiving said container main body and slidable thereon, said heater device having a plurality of recesses extending vertically of said upwardly extending side wall, said vertical recesses being open at the top and each having a laterally extending groove, said main body having an outwardly extending protrusion engaged in each of said vertical recesses for movement in said vertical recesses when said main body is lifted relative to said heater device and for engagement in said lateral grooves when said lifted main body is rotated in a first direction relative to said heater device and for disengagement with said lateral grooves and re-engagement with said vertical recesses for lifting said main body out of said heater device and separating said main body from said heater device when the main body is rotated relative to said heater device in the reverse direction.

4,784,113

HANDY HEATING CONTAINER

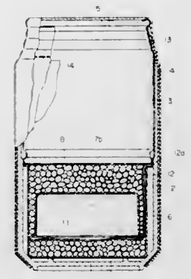
Kenji Nagai; Toshiaki Mizuhata, and Tuneo Kita, all of Osaka, Japan, assignors to Kita Sangyo Co., Ltd., Osaka, Japan

Filed Dec. 2, 1987, Ser. No. 127,910

Claims priority, application Japan, Dec. 22, 1986, 61-197786[U]; Feb. 25, 1987, 62-43597

Int. Cl.[4] F24J *1/00*

U.S. Cl. 126—263 **4 Claims**



1. A handy heating container having a retainer portion in a container, a storage space provided above the retainer portion for housing a can for food or drink, there being housed in said retainer portion a heat generating material and a solution package containing water or a solution consisting principally of water, characterized in that the solution package is integrally formed with the retainer portion and in that openings of the solution package are provided in the underside of the retainer portion, said openings being sealed with a film-like material, water discharge means being provided on the underside of the solution package, said water discharge means of said solution package being in the form of a pull band extension comprising a part of the underside of and extending from the outer peripheral edge of the flange.

4,784,114

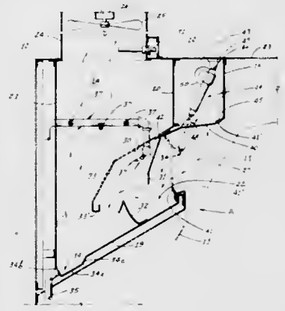
KITCHEN VENTILATING SYSTEM

Frank Muckler, Stone Mountain, Ga., and Edward B. Vandas, St. Louis, Mo., assignors to Richard F. Muckler, Commerce City, Colo.

Continuation of Ser. No. 374,991, May 5, 1982, abandoned. This application May 21, 1984, Ser. No. 613,010

Int. Cl.[4] F21C *15/20*

U.S. Cl. 126—299 E **13 Claims**



13. An extraction unit for a kitchen ventilating system including an exhaust duct and a fan for causing gases to be drawn into said extraction unit and to flow therethrough for centrifugal extraction of grease and the like from said gases normally without spray of water within said extraction unit, and for causing said gases subsequently to be exhausted through said exhaust duct, said extraction unit comprising a structure defining a plenum, an extraction chamber communicating with said plenum, and an exhaust gas inlet opening into said extraction chamber, a damper hingedly disposed for movement between positions closing and opening said exhaust gas inlet, and an actuator for driving said damper between said opened and closed positions, a structural extension above said damper for housing said actuator, said actuator being extendable-retractable in nature and connected to said damper through a further opening within said structural extension, said damper, when opened, overlying and thereby closing said further opening, said extraction chamber including an inclined, planar floor sloping rearwardly from said inlet and a rear wall directed upwardly from said floor, baffle means within said extraction chamber for causing gases entering said extraction chamber substantially to follow said floor, said floor including a depressed portion over only a rearward portion thereof for defining a grease-receiving gutter proximate said rear wall, and drain means communicating with said gutter, said baffle means being located relative to said rear wall for causing said exhaust gases following said floor to follow a sharply upwardly turning path crossing said depressed portion of the floor for centrifugal extraction of grease and the like entrained in said exhaust gases, thereby causing particles and droplets of grease and the like to be separated from said exhaust gases, captured in said gutter and drained therefrom by said drain means without resort to spray of water in said extraction chamber, said floor and depressed portion being mutually configured for causing said gases substantially to be prevented from flowing within said gutter, whereby grease and the like separated from said gases are captured and prevented from being re-entrained within the gases flowing through said extraction unit and exhausted into said exhaust duct, said actuator being extendable-retractable in nature and including an extension-retraction mechanism, and an electric motor for driving said mechanism to produce movement of said damper between its opened and closed positions by extension and retraction of said mechanism, said actuator being interconnected with said damper by a break-away device for safely providing breaking away of the connection of said actuator to said damper in the event of said damper being blocked during movement of said damper between its opened and closed positions.

4,784,115

ANTI-STUTTERING DEVICE AND METHOD

Ronald L. Webster, P.O. Box 9737, Hollins College, Roanoke, Va. 24020

Filed Jun. 16, 1986, Ser. No. 874,673

Int. Cl.[4] G09B *19/04*

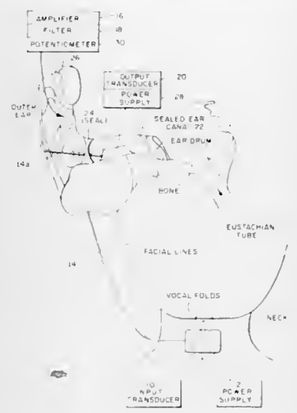
U.S. Cl. 600—24 **24 Claims**

1. A method of speech therapy comprising the steps of:

(a) providing electrical signals related to the speaker's vocal pulses; and

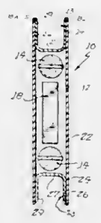
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(b) transforming the electrical signals into audio pulses within the speaker's ear canal to thereby increase the



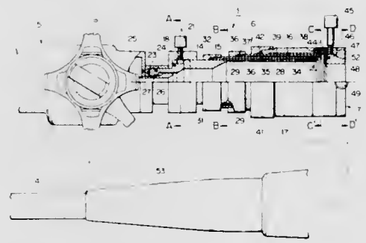
speed with which the speaker is informed of a characteristic of his voice.

4,784,116
CAPSULE FOR INTERSTITIAL IMPLANTS
John L. Russell, Jr., Marietta, Ga., and David N. Coggins, Spartanburg, S.C., assignors to Theragenics Corporation, Atlanta, Ga.
Continuation-in-part of Ser. No. 694,941, Jan. 24, 1985, Pat. No. 4,702,228. This application Jul. 29, 1987, Ser. No. 79,766
Int. Cl.[4] A61N *5/10*
U.S. Cl. 128—1.2 **18 Claims**



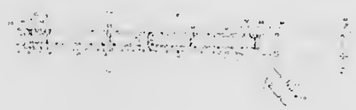
1. A seed for implanting radiation-emitting material within a living body, comprising:
radiation-emitting material; and
a container means for sealingly enclosing said radiation-emitting material, including a tubular body of substantially uniform wall thickness having at least one open end and an end cap of wall thickness not substantially greater than that of said tubular body closing said open end, said end cap having an end wall and a generally tubular skirt portion depending from the periphery of said end wall and terminating in a free end, said skirt portion being at least partially received in the open end of said tubular body so as to engage said tubular body, said skirt portion and said tubular body interfitting and joined to each other to form a fluid-tight seal, so as to prevent contact between bodily fluids and said radiation-emitting material in said container.

4,784,117
ENDOSCOPE INSERTION ASSISTING DEVICE
Atsushi Miyazaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 13, 1987, Ser. No. 14,907
Claims priority, application Japan, Feb. 14, 1986, 61-30265; Feb. 17, 1986, 61-32481; Apr. 23, 1986, 61-61285[U]
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **10 Claims**



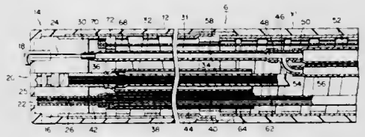
1. An endoscope insertion assisting device comprising a guide tube part provided with a hollow path through which an elongated endoscope insertion part can be inserted, a fitting part formed on the base side of said guide tube part and removably fitted with an endoscope operating part formed on the base side of said endoscope insertion part and a position adjusting mechanism capable of varying the position of said fitting part with respect of said guide tube part.

4,784,118
OPTICAL VIEWING DEVICE
Steven D. Fantone, Lynnfield; Peter F. Costa, Cambridge; William A. Holmes, Marblehead, all of Mass., and Frederick H. Moll, San Francisco, Calif., assignors to EndoTherapeutics, Menlo Park, Calif.
Filed Apr. 28, 1987, Ser. No. 43,335
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—6 **34 Claims**



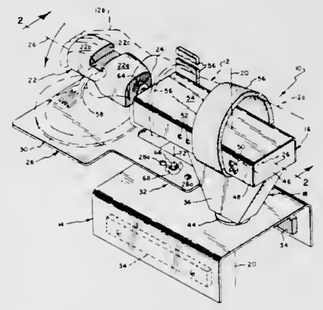
1. Apparatus for viewing a region within a body cavity or the like, comprising:
a light pipe having a distal end, a proximal end, and an elongate axis, designed to direct light from the proximal to the distal end to illuminate a region to be viewed near the pipe's distal end;
carried at the distal end of the light pipe, an objective lens system comprising a plurality of polymeric objective lens elements and constructed to form an image of the region illuminated by the light pipe;
a polymeric relay lens assembly mounted within the light pipe for relaying the image formed by the imaging system to a proximal region of the light pipe, wherein the relay lens assembly comprises symmetrical pairs of polymeric rod lenses arranged end-to-end within the light pipe, the light pipe structured to support and align the objective lens elements and the rod lenses; and
carried adjacent such proximal region of the light pipe, a viewing lens system including a plurality of polymeric viewing lens elements constructed and arranged to allow viewing of the image relayed by the relay assembly.

4,784,119
INSERTION ASSEMBLY OF AN ENDOSCOPE
Nobuyuki Matsuura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Jul. 21, 1987, Ser. No. 76,175
Claims priority, application Japan, Jul. 25, 1986, 61-174794
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **5 Claims**



1. An endoscope having an insertion section with a distal-end unit, comprising:
a distal-end member provided within said distal-end unit and having first, second, third and fourth through holes;
an image guide having a distal end inserted in the first through hole;
a first protective member having a distal end and a proximal end, and surrounding and protecting the distal end portion of said image guide;
a light guide having a distal end inserted in the second through hole;
a second protective member having a distal end and a proximal end, and surrounding and protecting the distal end portion of said light guide; and
a fluid supply tube having:
a main tube having a distal end inserted in the third through hole of said distal-end member, and a proximal end;
a branch pipe having first end coupled to the proximal end of said main tube, second and third ends, and located farther from said distal-end member than from the proximal end of at least one of said protective members, and spaced apart from the proximal end of said protective member for a predetermined distance;
at least two flexible sub-tubes coupled to the second and third ends of the branch pipe, respectively.

4,784,120
ARM CONSTRAINT
Rebecca A. Thomas, 361 Villa Ave., Buffalo, N.Y. 14216
Filed Sep. 23, 1986, Ser. No. 910,534
Int. Cl.[4] A61F *5/01*
U.S. Cl. 128—77 **10 Claims**



1. A constraint for the arm of a patient subject to uncontrolled tremors to aid in the self-feeding from a food container supported by said constraint, said constraint comprising in combination:
a base means adapted for mounting on support means;
a pedestal;
a first mounting means for mounting said pedestal to upstand from said base means and for rotation relative thereto about a first vertically disposed axis;
an elongated forearm rest means fixed to an upper end of said pedestal, said forearm rest means defining an upwardly facing horizontally disposed forearm rest surface;
hand rest means;
a second mounting means for connecting said hand rest means to one end of said forearm rest means for rotation relative thereto about a second horizontally disposed axis;
a food container supporting table;
third mounting means for mounting said table on said base means in an underlying relation to said hand rest means; and
constraint means for removably retaining a human forearm in engagement with said forearm rest surface with a human hand arranged for overlying engagment with said hand rest means, and said first and second mounting means are individually adjustable for varying the manual force required to rotate said pedestal and said hand rest means about said first and second axes, respectively.

4,784,121
KNEE EXERCISING DEVICE
Lester N. Brooks, 3027 Scott Rd., Oxford, Ohio 45056
Filed Jan. 26, 1988, Ser. No. 148,566
Int. Cl.[4] A61H *1/02;* **A63B** *21/00*
U.S. Cl. 128—25 R **5 Claims**

1. A knee exercising device for use by a user sitting on a chair, or the like, with the leg of the knee to be exercised being raised by a spacer placed between the thigh of that knee and the seat of the chair, said device comprising
a relatively thin, plate member adapted to be interposed between the buttocks of the user and the chair seat and position the device relative to the user's knees, said plate member being removably positioned on the chair seat,
a lever disposed between the legs of the user and pivotally mounted, intermediate its length, on said plate member for movement about a horizontal pivot axis, the pivotal axis of the lever being positioned generally parallel to and in general vertical alignment beneath the pivot axis of the knee joint, the upper portion of said lever being engagable by the user,
a leg engaging pad, and
means for mounting said pad on the lower portion of said

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lever for engagement with the lower leg, of the knee being exercised, in an area adjacent to and spaced above the user's foot,

whereby the user may manually displace the upper end of the lever to apply a controlled pressure on the lower leg in flexing the knee joint.

4,784,122

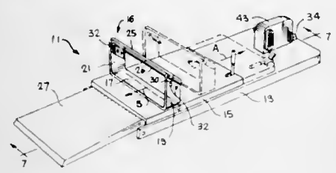
PORTABLE CERVICAL TRACTION DEVICE USING CONSTANT FORCE SPRINGS

Erwin W. Graham, 59 Quail Hollow Dr., San Jose, Calif. 95128

Continuation-in-part of Ser. No. 662,333, Oct. 17, 1984, Pat. No. 4,606,333, which is a continuation-in-part of Ser. No. 585,361, Mar. 1, 1984, Pat. No. 4,593,684. This application Aug. 15, 1986, Ser. No. 896,946

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—75 **8 Claims**



1. A portable cervical spine traction apparatus comprising,

a flat elongated support base adapted to be horizontally disposed and having front and rear portions,

a carriage slideably mounted on the front portion of said base, said carriage having a means for engaging the back of the skull, and

a spring means for biasing said carriage rearwardly relative to said support base, said spring means mounted to the rear portion of said base and having a first and a second constant force spring, connectable together for increasing bias by predetermined amounts of force, said first constant force spring being attached to said carriage and said second constant force spring being selectively engaged to said first constant force spring, and

release means for disengaging said second constant force spring from said first constant force spring, said release means having a cam and a disengaging plate, said disengaging plate having a cam surface portion and a portion passing between said constant force springs, said cam capable of exerting force on said disengaging plate, thereby separating said second constant force spring from said first constant force spring.

4,784,123

ORTHOPEDIC/ORTHOTIC SPLINT MATERIALS

Lloyd M. Robeson, Whitehouse Station, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 3, 1986, Ser. No. 815,925

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—90 **24 Claims**

1. A thermoplastic polymeric material useful in the preparation of orthopedic/orthotic splints comprised of a blend of:

(a) from about 90 to about 65 weight percent of an aliphatic polyester having a crystalline melting point of from 50°–70° C.,

(b) from about 10 to about 35 weight percent of a thermoplastic polyurethane,

and optionally, up to about 20 weight percent of at least one orthopedically acceptable additive, added to said blend of said aliphatic polyester and said polyurethane, said polyurethane comprised of up to 65 weight percent of a hard block segment formed by the reaction of a diisocyanate and an aliphatic polyol, and at least 35 weight percent of a soft block segment comprised of at least one of a polyether or a polyester.

4,784,124

BONE IMPLANT FOR PROSTHESES AND TOOL FOR INSERTING THE IMPLANT INTO A BONE

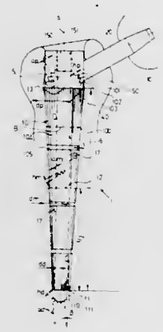
Werner Kaltenbrunner, St. Marein, and Rainer Kotz, Vienna, both of Austria, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Filed Jul. 8, 1986, Ser. No. 883,413

Claims priority, application Austria, Jul. 16, 1985, 2097/85

Int. Cl.⁴ A61F *2/36*

U.S. Cl. 128—92 YZ **50 Claims**



1. A bone implant for a prostheses, particularly for a joint or joint member of the human locomotor, especially walking system, comprising:

a shaft for insertion into a cavity formed in a bone of the locomotor system;

said shaft including a distal end associated with the diaphysis of said bone and a proximal end associated with the metaphysis of said bone;

said shaft possessing a shaft body;

said shaft body having an outer surface substantially in the shape of the outer surface of a truncated cone;

said shaft body containing an inner cavity open at least at said distal end of said shaft;

said shaft defining a main axis;

a plurality of projections outwardly protruding from said outer surface of said shaft body and extending along said outer surface in the direction of the main axis of said shaft from said proximal end at least close to said distal end of said shaft;

wherein each of said projections outwardly protruding from said outer surface of said shaft body protrudes to a maximum predetermined height at the proximal end to a minimum predetermined height at the distal end of said shaft;

each said projection having at least one edge directed substantially outwardly away from said main axis of said shaft; and

said outer surface of said shaft body and said projections outwardly protruding from said outer surface providing a substantially full area contact with the bone upon insertion into an implant cavity formed in the bone.

4,784,125

ARCUATE ELEMENT AND EXTERNAL FIXATION DEVICE CONTAINING SAME FOR OSTEOSYNTHESIS AND OSTEOPLASTY

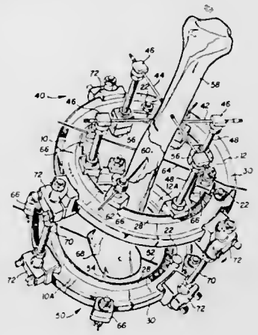
Georgio Monticelli; Renato Spinelli, both of Rome, Italy, and Marcel Wagenknecht, Le Lignon, Switzerland, assignors to Jaquet Orthopedie, S. A., Geneva, Switzerland

Filed Jan. 23, 1986, Ser. No. 821,671

Claims priority, application Switzerland, Jan. 24, 1985, 309/85

Int. Cl.⁴ A61F *5/04*

U.S. Cl. 128—92 Z **13 Claims**



1. An external fixation device for osteosynthesis comprising:

(a) first and second and sets of at least one pine or wire each, each set for retaining a bone portion;

(b) a plurality of assembly rods for interconnecting said first set and said second set; and

(c) means for connecting said first set of at least one pin or wire to said assembly rods comprising:

at least one arcuate element having generally a shape of a toroid or part of a toroid and having substantially no discontinuities over the length of said arcuate element for enabling at least one support member and at least one clamping member to move freely along said length and be secured in any desired position thereon, and

said arcuate element having a transverse cross section comprising a spacing web connecting opposed inner and outer polygonal-shaped clamping rims,

said support member having means for supporting said first set of at least one pin or wire on said arcuate member, and

said clamping member having means for gripping one of said assembly rods so as to connect said assembly rod with said arcuate member, and

each of said support member and clamping member having means to engage and be secured in any position along the length of said arcuate member either to said inner clamping rim only, or to said outer clamping rim only, or, one rim at a time, to both of said inner clamping rim and said outer clamping rim.

4,784,126

SURGICAL DEVICE

Donald H. Hourahane, Roodepoort, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

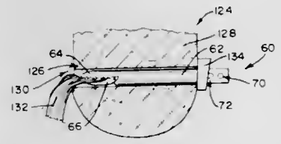
Division of Ser. No. 654,495, Sep. 26, 1984, Pat. No. 4,672,957. This application Apr. 17, 1987, Ser. No. 39,293

Claims priority, application South Africa, Oct. 4, 1983, 83/7419

Int. Cl.⁴ A61B *17/00*

U.S. Cl. 128—92 YF **10 Claims**

1. A method of surgery for attaching to bone the end of a ligament which has become detached therefrom, which method comprises drilling a passage in the bone so that the passage opens out at a mouth located at or adjacent the position where the ligament became detached from the bone, inserting an elongated clamp into the passage from the end of the passage remote from the mouth so that the clamp projects out of said mouth, clamping the part of the clamp which projects out of the mouth to the ligament, withdrawing the



clamp in a direction along the passage away from the mouth to tension the ligament while drawing the detached end of the ligament via said mouth into the passage, and anchoring the clamp in the passage so that the detached end of the ligament is located in the passage with the ligament under tension, to permit growth of fibrous and connective tissue in the passage to joint the ligament to the bone.

4,784,127

DEVICE FOR FIXING THE FRACTURED ENDS OF A BONE

Claus Mattheck, Leimersheim, and Martin Börner, Schwalbach, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 7, 1986, Ser. No. 837,275

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601344

Int. Cl.⁴ A61F *5/04*

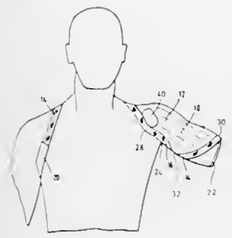
U.S. Cl. 128—92 YP **3 Claims**



1. A device for holding together fractured ends of a bone in a living body, said device comprising: a nail in the form of a hollow tube arranged to be secured to the bone, having a length dimension which will extend parallel to the axis of the bone when said nail is secured to the bone; said nail including inner and outer wall surfaces and a substantially uniform wall thickness throughout, a continuous slot extending axially along the entire length dimension of the nail, at least one pair of substantially diametrically opposed openings for holding connecting elements, with a certain elasticity being retained; and reinforcement members in the form of beads forming a unit with said nail, extending in the direction of said length dimension of said nail and disposed adjacent said openings.

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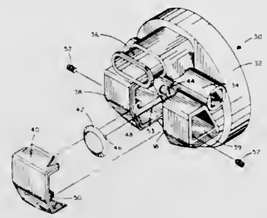
4,784,128
SHOULDER-JOINT BANDAGE
Rainer Scheuermann, Raisdorf, Fed. Rep. of Germany, assignor to Bauerfeind GmbH & Co., Kempen, Fed. Rep. of Germany
Filed Dec. 18, 1987, Ser. No. 135,148
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 8633843[U]; Feb. 12, 1987, 3704288
Int. Cl.[4] A61F *13/10*
U.S. Cl. 128—165 **10 Claims**



1. A shoulder-joint bandage for relieving pain as a result of shoulder-joint surgery and malfunction, comprising:
a sleeve of elastic material receiving one of the upper arms of a patient and having a distal edge remote from the respective shoulder joint of the patient and a cap at a proximal end of said sleeve overlying the shoulder joint whereby said sleeve has a proximal edge at said proximal end spaced from said cap and said cap has lateral edges extending from said proximal edge to an upper portion of said cap; and a first flexible belt and a second flexible belt;
said first flexible belt extending generally helically around said sleeve in a first direction from an upper part of said distal edge toward said shoulder joint, and along one of said lateral edges, said first belt extending from said sleeve across the back of the patient, running below the armpit of the other arm of the patient and being secured to said second belt;
said second flexible belt extending generally helically around said sleeve in an opposite direction from said first direction from said upper part of said distal edge toward said shoulder joint and crossing said first belt on said sleeve, and along the other of said lateral edges, said second belt extending free from said sleeve across the back of the patient to again cross said first belt, being connected to said first belt at a location remote from said sleeve, and being secured to said first belt.

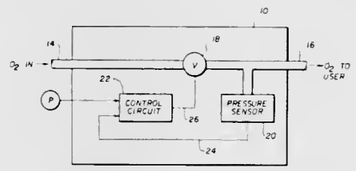
4,784,129
BREATHING REGULATOR
Dean R. Garraffa, Garden Grove, Calif., assignor to Under Sea Industries, Inc., Rancho Dominguez, Calif.
Continuation of Ser. No. 877,340, Jun. 23, 1986, abandoned.
This application Jun. 3, 1987, Ser. No. 58,682
Int. Cl.[4] B63C *11/02*
U.S. Cl. 128—200.29 **3 Claims**

1. A breathing regulator apparatus for scuba diving, the apparatus of the type having an air inlet within a chamber formed within a housing, a mouthpiece extending from said housing in fluid communication with said chamber for inhalation of inlet air and exhalation of exhaust air and an exhaust valve located in one wall of said housing and having an outlet external said housing for directing exhaust air out of said chamber, the apparatus comprising:
an exhaust-air-directing plenum extending laterally from said exhaust valve outlet to a pair of opposing outlet apertures and being integrally formed with a contiguous to an external surface of said housing for directing exhaust air laterally of said housing, said plenum having an inner wall surface and an outer wall surface, a portion of said outer wall surface of said plenum comprising a selectively removable cover overlying said exhaust valve located intermediate said pair of opposing outlet apertures for permitting access to said exhaust valve, said cover having means for being securely fastened to adjacent parts of said



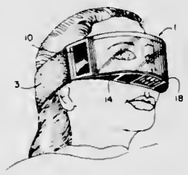
plenum, said plenum being made of the same material as said housing, said inner wall surface of said plenum separating said plenum from said chamber and forming a portion of said housing.

4,784,130
FLOW CONTROLLER
Franklin D. Kenyon, Williamsville, and John W. Puckbaber, Lakeview, both of N.Y., assignors to The John Bunn Company, Tonawanda, N.Y.
Filed Dec. 4, 1986, Ser. No. 937,730
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.21 **9 Claims**



1. A flow controller for use in supplying gas from a source to a user, said flow controller comprising means to supply said gas to said user during periods of the user's breathing inhalations and to not supply said gas to said user during periods of the user's breathing exhalations, said supply means comprising means to match the durations of said inhalation and exhalation periods to the user's actual breathing pattern based on a predetermined ratio of inhalation and exhalation duration times; said supply means comprising valve means, control means for said valve means and sensor means for sensing each inhalation breath of the user; said control means comprising circuit means comprising up/down counter means, first and second clock means, and steering circuit means for directing the pulses from one or the other of said first and second clock means to said up/down counter means; means to direct control signals from said control means to said valve means, means to direct pulses from one of said first and second clock means via said steering circuit means to said counter means to cause said counter means to count up from starting counting point, and means to direct pulses from the other of said first and second clock means via said steering circuit means to said counter means to cause said counter means to count down from the count generated by said pulses from said first-mentioned one of said clock means back towards said starting counting point, means to cause said control means to generate said control signal for said valve means when the count of said counter means comes to said starting counting point, and means to cause the ratio of the frequencies of pulse production from said first and second clock means to equal said predetermined ratio of the inhalation and exhalation duration times of the user's breathing pattern.

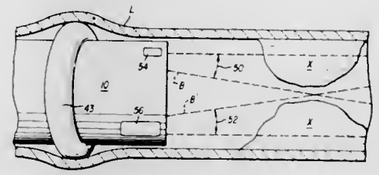
4,784,131
POLLEN PROTECTION DEVICE
Michael Schroeder, Konviktstrasse 10a, D-7800 Freiburg im Breisgau, Fed. Rep. of Germany
Filed Nov. 17, 1986, Ser. No. 931,131
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1986, 3608872
Int. Cl.[4] A62B *23/02*
U.S. Cl. 128—206.16 **7 Claims**



1. A pollen protection device, comprising:
(a) a frame-like holder which in use encloses the eyes and the nose of a user in a pollen-tight manner, said holder in a state of non-use being generally crescent shaped in horizontal cross section and formed of a flexible plastic material which can accommodate the shape of the face of the user, comprising:
(1) a front web in which is mounted an eye protecting lens constructed of a material permitting viewing therethrough by the user, the vertical dimension of said lens being such that the eyes and nose of the user are accommodated within said lens,
(2) upper and lower flange walls extending generally perpendicular to said front web and lens,
(3) web sections at the sides of the holder forming continuations of said front web and extending between said flange walls,
(4) air filter means mounted in each of said side web sections, said air filter means having a mesh less than 40 μm for filtering pollen and a filter area of at least sixteen square centimeters, and
(b) elastic band means secured to said holder by means of which said upper and lower flange walls can be drawn snugly against the face of the wearer.

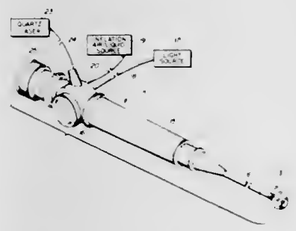
4,784,132
METHOD OF AND APPARATUS FOR LASER TREATMENT OF BODY LUMENS
Kenneth R. Fox, 2716 N. Upshur St., Arlington, Va. 22207, and A. Arthur Coster, 3541 Braddock Rd., Alexandria, Va. 22301
Continuation-in-part of Ser. No. 478,781, Mar. 25, 1983, which is a continuation-in-part of Ser. No. 329,978, Dec. 11, 1981, abandoned, which is a continuation of Ser. No. 87,894, Oct. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 32,844, Apr. 24, 1979, abandoned. This application Sep. 5, 1985, Ser. No. 772,697
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **15 Claims**

1. In a method of performing laser surgery in a body lumen comprising the steps of inserting a catheter into said body lumen, said catheter having a longitudinal axis and proximal and distal ends, at least one fiber means in said catheter for transmitting a beam of laser energy from said proximal to said distal end, positioning the distal end of said catheter adjacent an obstruction in said lumen and transmitting laser energy through said fiber means to impinge upon said obstruction, the improvement wherein said laser energy is a non-continuous wave, pulsed argon-ion laser beam having a pulse duration in the range of from 5 to 200 milliseconds, a pulse repetition rate of from about 1 to 50 pulses per second and a duty cycle of from about 5 to 50%, said pulse duration, pulse repetition rate



and duty cycle being selected to effect damage to said obstruction with substantially no thermal necrosis of the surrounding tissue.

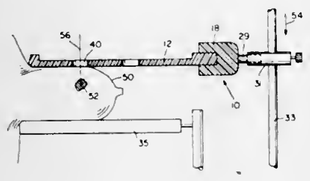
4,784,133
WORKING WELL BALLOON ANGIOSCOPE AND METHOD
Robert A. Mackin, 329 W. Granada Ave., Phoenix, Ariz. 85003
Filed Jan. 28, 1987, Ser. No. 8,276
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **15 Claims**



1. An angioscope comprising in combination:
(a) a flexible catheter having first, second and third channels therein and a proximal end and a distal end;
(b) an inflatable transparent balloon having a first opening and a second opening located opposite to the first opening;
(c) first means for producing a seal between the portion of the transparent balloon around its first opening and the distal end of the catheter;
(d) a tube having a first end connected in communication with a distal end portion of the first channel and having a second end extending through the second opening of the balloon, the second and third channels opening into the interior of the transparent balloon;
(e) a second means for producing a seal between the portion of the transparent balloon around its second opening and the second end of the tube;
(f) third means passing through the second channel for producing light that emanates from the distal end of the catheter;
(g) fourth means passing through the third channel for effectuating viewing of the illuminated region from the proximal end of the catheter; and
(h) fifth means passing through the first channel beyond the second end of the tube for interacting with tissue or substance illuminated through the wall of the transparent balloon by the third means and viewed through the fourth means and the wall of the transparent balloon.

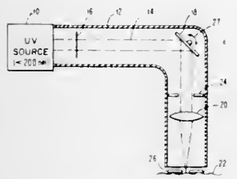
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4,784,134
BIOPSY LOCATOR PLATE
Thomas Arana, 89 Bloomfield St., Lexington, Mass. 02173
Division of Ser. No. 930,918, Nov. 17, 1986. This application Sep. 14, 1987, Ser. No. 96,153
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **4 Claims**



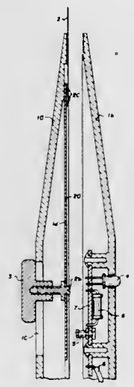
1. A locator plate for use with a bracket having a recess for slidably receiving the plate to form a biopsy paddle, said plate including a plurality of tissue access holes of generally uniform diameter and of generally uniform spacing along a first direction and arranged in a plurality of rows generally uniformly spaced in a second direction, said plate also including guide means including at least one elongated slot located in the rim of said locator plate and aligned longitudinally in said first direction to allow said plate to permit movement in said first direction up to a distance equal to at least one-half the distance of the interhole spacing plus one-half the diameter of a tissue access hole.

4,784,135
FAR ULTRAVIOLET SURGICAL AND DENTAL PROCEDURES
Samuel E. Blum, White Plains; Rangaswamy Srinivasan, Ossining, and James J. Wynne, Mt. Kisco, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 448,123, Dec. 9, 1982, abandoned. This application Aug. 11, 1986, Ser. No. 894,520
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **21 Claims**



1. A method for removing selected areas of a biological layer comprised of organic material, including the steps of:
selecting a desired area of said biological layer, and
irradiating said desired area with a plurality of pulses of pulsed ultraviolet radiation having wavelengths less than 200 nanometers and energy fluences sufficient to cause ablative photodecomposition of said biological layer to an optically visible depth, said pulses having energy fluences per pulse at least about 10 mJ/cm^2, the pulse fluence, pulse width and pulse repetition rate of said pulses being sufficiently small that no substantial accumulation of heat occurs in areas of said biological layer adjacent said desired area.

4,784,136
ELECTRICAL EPILATION
Peter Klein, 19763 - 44th Avenue, Langley, British Columbia, Canada
Filed Jan. 12, 1987, Ser. No. 2,421
Int. Cl.[4] A61B *17/41*
U.S. Cl. 128—303.13 **8 Claims**

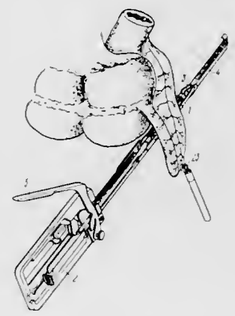


1. An electrical epilation apparatus for permanently removing unwanted body hair, comprising:
an electrically isolated pair of tweezers having opposed first and second arms;
a needle electrode bonded to an electrically conductive support plate slidably received in said first arm of said tweezers, said support plate having means to adjust the length of the needle electrode protruding from the tip of said first arm;
switching means between said first and second arms of said tweezers adapted to control electricity flow to said needle electrode when said tweezer arms are closed and opened;
an indicator light fitted into one of the tweezer arms and electrically connected to said switching means to indicate that said needle electrode is being energized; and
electrical generator means adapted to supply electrical energy to said needle electrode when said tweezer arms are closed.

4,784,137
SURGICAL SUTURING INSTRUMENT
Yaroslav P. Kulik, ulitsa Zeiskaya, 140, kv. 36, Blagoveschensk, and Ivan I. Shmyrin, prospekt Krasnogo Znameni, 30, kv. 132, Vladivostok, both of U.S.S.R.
Filed Nov. 16, 1987, Ser. No. 127,031
Int. Cl.[4] A61B *17/04;* **B31B** *1/68*
U.S. Cl. 128—334 R **2 Claims**

1. A surgical suturing instrument, comprising:
a staple jaw shaped as a rod having a first working end and a second end;
a handle of said staple jaw located at said second end opposite to said working end of the staple jaw;
a hinge joint located at said working end of said staple jaw;
a supporting jaw shaped as a rod having a first end and a second end, and associated with said staple jaw through said first end by means of said hinge joint;
said hinge joint enabling said supporting jaw to rotate through 180 degrees with respect to said staple jaw so that when said suturing instrument is in the drawn-apart position, said supporting jaw is in fact an extension to said staple jaw, and when said suturing instrument is in the drawn-together position, said supporting jaw is set parallel to said staple jaw;

a mechanism for turning said supporting jaw relative to said staple jaw;
a lever of said turning mechanism, having a pivot pin located on said handle;
a link of said turning mechanism, having a first end and a second end, said link being held, through said first end, to the arm of said lever and through said second end, to said supporting jaw;
slots adapted to accommodate staples and located at said working end of said staple jaw;



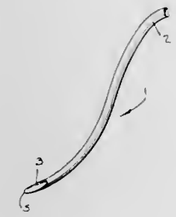
depressions for bending the legs of said staples, located on said supporting jaw, the number of said depressions being equal to the number of said slots, each of said depressions being arranged opposite to said respective slot when said instrument is in said drawn-together position;
a mechanism for ejecting said staples from said slots;
a mechanism for fixing said staple jaw and said supporting jaw in a position parallel to each other when the instrument is in said drawn-together position.

4,784,138
METHOD FOR IMPLANTING RETINAL TACK
Kevin B. Sinnett, Mukwonago, Wis., assignor to Trek Medical Products, Inc., Oak Creek, Wis.
Division of Ser. No. 4,798, Dec. 5, 1986, Pat. No. 4,712,550, which is a continuation of Ser. No. 720,988, Apr. 8, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 75,395
Int. Cl.[4] A61B *17/04, 17/00*
U.S. Cl. 128—334 R **9 Claims**



1. A method for securing a human patient's detached retinal to the choroid including the steps of
providing a retinal tack adapted to be inserted through the retina, choroid and sclera and having an enlarged head portion for engaging the patient's retina after insertion;
providing a tubular probe having a tip adapted to receive and sealingly engage the head of the retinal tack and an interior passage extending to the tip;
placing the head of the retinal tack into the tip of the probe and reducing the pressure in the interior passage of the probe to a subatmospheric level to releasably retain the tack in the probe tip;
inserting the probe into the patient's vitreous cavity through an opening in the eyeball and pushing the retinal tack through the retina, choroid, and sclera in the vicinity of the retinal tear until the head engages the retina and the retina is moved against the choroid;
introducing a positive pressure in the interior passage of the probe and moving the probe away from the retinal tack; and
withdrawing the probe from the vitreous cavity through the eyeball opening.

4,784,139
NEEDLE GUIDE INSTRUMENT
Nicholas J. Demos, 4 Cambridge Dr., Short Hills, N.J. 07078
Filed Jun. 23, 1986, Ser. No. 877,219
Int. Cl.[4] A61B *17/06*
U.S. Cl. 128—340 **2 Claims**





1. A needle guide instrument for guiding a suturing needle comprising the combination of:
an elongated member having a general longitudinal axis and having a gripping handle at one end;
a suturing needle guide at the other end having an exposed concave needle guiding surface terminating in a rounded tip said needle guide being sufficiently rigid that said guiding surface will function for directing and for positioning the advancement of a suture needle in the general direction of the elongated member; and
said gripping handle being elongated curved along its length away from said longitudinal axis for facilitating the gripping and positioning of the needle guide.

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4,784,140

DEVICE FOR CARRYING OUT CRYOTHERAPY

Andreas Donnerback, Krefeld; Klemens Thoma, Krefeld-Huls, and Wolfgang Volker, Tonisvorst, all of Fed. Rep. of Germany, assignors to Messer. Griesheim GmbH, Fed. Rep. of Germany

Filed Sep. 11, 1986, Ser. No. 906,072

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534629

Int. Cl.[4] A61H *33/06*

U.S. Cl. 128—374 **11 Claims**



1. In a device for carrying out cryotherapy on a body of a patient with a cold treatment gas, consisting of a cabin which is at least mostly enclosed, for containing the patient and which has connections for supplying and removing the treatment gas, the improvement being in that said cabin is formed by curved shells which curve toward one another and are spaced apart and out of contact with one another to enclose the patient permitting the patient's head to remain free of the treatment gas, and said shells having opposing openings for the entry and exit of the treatment gas.

4,784,141

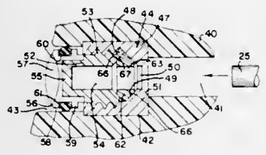
LEAD LOCKING MECHANISM FOR CARDIAC PACERS

Charles A. Peers-Trevarton, Pompano Beacb, Fla., assignor to Cordis Leads, Inc., Miami, Fla.

Filed Aug. 4, 1987, Ser. No. 81,354

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—419 P **6 Claims**



1. A lead locking mechanism for use within a longitudinal aperture through a neck portion of a cardiac pacer, said lead locking mechanism clamping a lead connector to close an electrical circuit, said lead locking mechanism comprising:

a substantially fixed annular collar mounted within the longitudinal aperture, said annular collar having an opening sized and shaped to closely slidably receive the lead connector, said annular collar having a threaded axially directed internal surface, said annular collar further including an internal frusto-conical chamfer surface that is defined between said axially-directed internal surface and said opening of the annular collar;

a hollow screw member threadedly mounted within said threaded axially directed internal surface of the annular collar, said hollow screw member having an annular core sized and shaped to closely receive the lead connector, said hollow screw member having a frusto-conical end surface; and

a lead connector locking ring confined between said internal frusto-conical chamfer surface of the annular collar and said frusto-conical end surface of the hollow screw member, said lead locking ring having a pair of generally oppositely facing frusto-conical ramp portions that extend between respective end faces of the locking ring and a circumferential portion of the locking ring that is between said respective end faces and that extends beyond said end faces of the locking ring, said locking ring further including a hollow central annular core and an axially directed slot which is a circumferential split of the locking ring that contracts into secure ring-like engagement of the lead connector when said hollow screw member is threadedly moved into said substantially fixed annular collar.

4,784,142

METHODOLOGY FOR ELECTRONIC DENTAL ANALGESIA

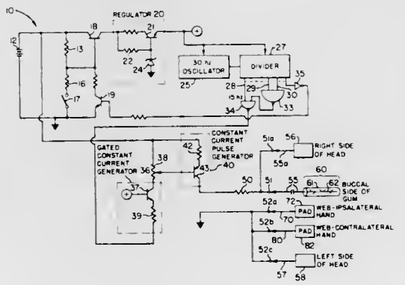
Saul Liss; Bernard Liss, both of Glen Rock, and Samuel Krakower, Teaneck, all of N.J., assignors to Pain Suppression Labs, Inc., Wayne, N.J.

Continuation-in-part of Ser. No. 868,652, May 30, 1986, Ser. No. 860,745, May 7, 1986, and Ser. No. 640,104, Aug. 13, 1984, Pat. No. 4,627,438, which is a continuatioo-in-part of Ser. No. 569,476, Jan. 9, 1984, Pat. No. 4,550,733, said Ser. No. 868,652, is a continuation-in-part of Ser. No. 618,144, Jun. 1, 1984, Pat. No. 4,614,193, Ser. No. 640,104, , and Ser. No. 860,745, , which is a continuation-in-part of Ser. No. 618,144, , and Ser. No. 640,104, , said Ser. No. 618,144, and Ser. No. 640,104, each is a continuation-in-part of Ser. No. 569,476,. This application Nov. 4, 1986, Ser. No. 926,971

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] A61N *1/34*

U.S. Cl. 128—421 **20 Claims**



9. A method for suppressing pain otherwise associated with a dental procedure in a subject's oral cavity including the steps of securing a first electrode at a first side of the head and a second electrode at the buccal side of the gum of a subject adjacent the work area, securing a third electrode to a second side of the head, and supplying an electrical wave comprising pulses of high frequency with a low frequency amplitude modulation to said first, second and third electrodes.

4,784,143

METHOD FOR CORRECTING HUMAN GAIT BY WEIGHTING OF FOOTWEAR

Steven L. Hebert, 05986 Canary Rd., and Theodore D. Ross, 88834 Highway 101, both of Florence, Oreg. 97439

Filed Nov. 16, 1987, Ser. No. 121,411

Int. Cl.[4] A61F *5/14*

U.S. Cl. 128—585 **8 Claims**



7. A method for correcting human gait by the weighting of footwear, comprising the following steps:

a. determination of the non-dominant side of the body;

b. determination of any dynamic fore-aft misalignment, with respect to the direction of movement, on the foot on said non-dominant side of the body, and whether said misalignment is toe-in or toe-out;

c. application of an initial weight to the footwear at the metatarsal portion of the foot and on the outside edge of said footwear if said dynamic fore-aft alignment is toe-out, or on the inside edge of said footwear if said dynamic fore-aft alignment is toe-in;

d. iterative redetermination of dynamic fore-aft alignment, and further addition to, or removal of, or repositioning of weight at said outside edge of said footwear if said dynamic fore-aft alignment is toe-out, or at the inside edge of said footwear if said dynamic fore-aft alignment is toe-in; so as to result in dynamic fore-aft foot alignment;

e. determination of any dynamic roll misalignment in the fore-aft aligned foot, and whether said dynamic roll misalignment is pronation or supination;

f. application of additional weight as follows:

for pronation, additional weight as follows: edge of the footwear;

for supination, addition of weight on the inside edge of the footwear;

g. iterative redetermination of roll alignment and addition to, or removal of, weight added for roll alignment correction so as to achieve roll alignment, while adjusting the weight and location of the fore-aft alignment weight so as to maintain the fore-aft alignment of the foot; and

h. repeat the process for the foot on the dominant side of the body.

4,784,144

OPTICAL FIBER IMAGE SENSOR

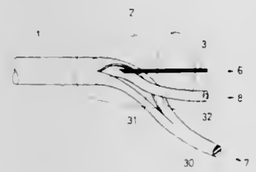
Kimizo Ono; Koichi Tsuno, and Mitsuru Nishikawa, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 836,217, Feb. 28, 1986, abandoned, which is a continuation of Ser. No. 519,333, Aug. 1, 1983, abandoned. This application Oct. 26, 1987, Ser. No. 115,644

Claims priority, application Japan, Jul. 31, 1982, 57-134055; Feb. 23, 1983, 58-29963; Feb. 24, 1983, 58-30579; Mar. 9, 1983, 58-39683; Mar. 18, 1983, 58-40540[U]; Apr. 1, 1983, 58-58423; Apr. 19, 1983, 58-68860

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—634 **37 Claims**



1. A surgical device used in procedures in which said device is inserted into body tissue, said device comprising: a source of illumination light, a single first light transmission path and a second light transmission path, said first light transmission path defining therein a longitudinal space which completely surrounds the outer periphery of said second light transmission path, said second light transmission path extending in said space of said first light transmission path such that light transmission is possible both from one end of said first light transmission path to the other end thereof and from one end of said second light transmission path to the other and thereof; one end of both said first and second light transmission paths existing at a site under optical scrutiny; said first light transmission path including a transparent plastic tube for transmitting illumination light to said site to be illuminated, and said second light transmission path including a light receiving optical fiber inserted into said illumination light transmitting transparent plastic tube.

4,784,145

MEMBRANE RETAINER ASSEMBLY FOR PHYSIOLOGICAL SENSING UNITS

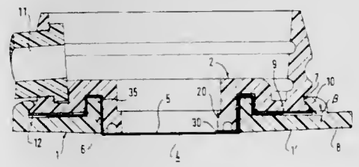
Walter Ahsbahs, Merzhausen; Karl-Heinz Pomorin, Stegen; Helmut Leist, Waldkirch, and Georg Ullrich, Freiburg, all of Fed. Rep. of Germany, assignors to Hellige GmbH, Freiburg, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,088

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609080

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—635 **5 Claims**



1. An improved retainer assembly for positioning a membrane in contact with the measuring surface of electrochemical physiological sensing unit especially suited for transcutaneous

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measurement of partial pressure of gas in blood or body tissue reducing changes in electrolyte film thickness said assembly comprising:

a membrane;

a clamping ring having a central opening and a peripheral annular recess receiving the rim of the membrane such that the membrane spans the opening, the clamping ring also having an inwardly projecting annular lip adapted to resiliently engage an annular groove of the sensing unit whereby the clamping ring is removably secured to the sensing unit; and

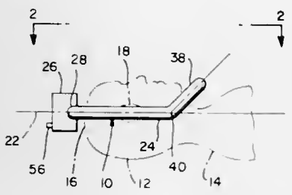
a retaining ring having a central opening, the rim of which is loosely fitted into the annular recess of the clamping ring thus maintaining the outer rim of the membrane within the annular recess, wherein the improvement resides in providing means in the form of at least one element selected from a foil strip or a tongue-like tab formed integrally with the retaining ring, said element extending radially inwardly from the rim of the retaining ring and so sized that when the retainer assembly is secured to the sensing unit the said element forms at least one capillary connection between the atmosphere and the electrolyte disposed between the membrane and the measuring surface of the sensing unit without the element itself covering or impinging on any significant portion of the measuring surface.

4,784,146

ANGLED SEGMENT RECEIVER COIL FOR NMR IMAGING OF A HUMAN HEAD

Anthony A. Mancuso; Jeffrey R. Fitzsimmons, and Ray G. Thomas, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Aug. 14, 1986, Ser. No. 896,237
Int. Cl.[4] A81B *5/05*
U.S. Cl. 128—653 **12 Claims**



1. A receiver coil structure for NMR imaging of a human head attached by a neck, having ear positions, and having a defined axis generally along a line extending from the top of the head through the neck, said coil structure comprising:

a coil lying primarily in a coil plane;

said coil being generally oval in configuration with sides and defined upper and lower ends spaced by an oval height;

said coil being sized for positioning around the head oriented such that the coil upper end is adjacent the top of the head, the coil sides are generally adjacent the positions, and the defined head axis lies in the defined coil plane;

said coil being formed of a conductor which is tubular and of a material which has good electrical conductivity; and

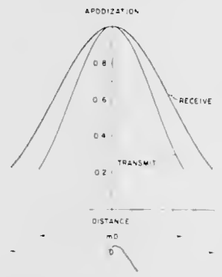
said coil including an angled segment defined as having a midpoint at the coil lower end and extending from the midpoint along the coil sides towards the coil upper end for a distance corresponding to approximately one-third of the oval height to segment endpoints, said angled segment diverging beginning at the segment endpoints out of the coil plane at an angle such that the coil lower end clears the neck when positioned around the head, and further comprising a component unit located at the upper end of said coil, said coil having terminal ends at the upper end, said component unit mounted to bridge said terminal ends, and said component unit including a capacitor electrically connected to the coil terminal ends to form a parallel resonant circuit.

4,784,147

METHOD AND APPARATUS FOR SIDELOBE SUPPRESSION IN SCANNING IMAGING SYSTEMS

Mehran Moshfeghi, White Plains, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 8, 1986, Ser. No. 939,193
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—653 **4 Claims**



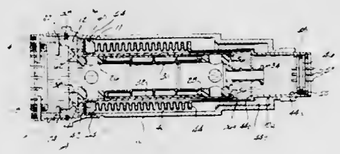
1. In a scanning imaging system which comprises transmitting means for directing energy to a focal zone using a first aperture, receiving means for receiving energy from said focal zone using a second aperture and means for scanning said focal zone with respect to an object to produce an image, the improvement wherein the ratio of the size of said first aperture to the size of said second aperture is a number $m \geq 1$ chosen such that the amplitudes of the first and second sidelobes of the system point spread function are approximately equal.

4,784,148

ULTRASONIC TRANSDUCER PROBE EXPANSION CHAMBER

Julian Dow, San Clemente, and Paul F. Meyers, San Juan Capistrano, both of Calif., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 21, 1986, Ser. No. 831,787
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.10 **11 Claims**



1. An ultrasonic transducer probe comprising:

a forward located assembly including a pivotally mounted ultrasonic transducer;

a motor, located to the rear of and connected to said assembly, for controllably moving the transducer to radiantly transmit ultrasonic energy; and

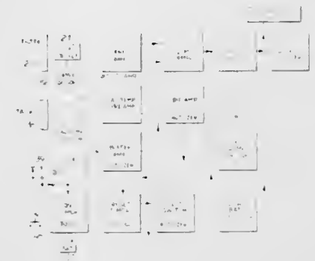
an acoustic couplant fluid chamber, enclosing said motor and assembly and including a cap assembly defining a forward hemispheric fluid compartment containing said transducer at the forward end, a rearward located cylinder defining a rearward fluid compartment and having a sealed rearward end and an open forward terminus, and a flexible, cylindrical bellows in fluid-tight connection between said cap assembly defining said hemispheric fluid compartment and said open forward terminus of said cylinder which defines an intermediate fluid compartment of sufficient cross-sectional area to enclose said motor, said cap assembly, bellows, and cylinder defining a contiguous longitudinal acoustic couplant fluid chamber, wherein said bellows comprises means for restricting volumetric variation of said acoustic couplant fluid chamber in response to thermal expansion and contraction of said fluid to longitudinal volumetric variation of said chamber.

4,784,149

INFRARED THERMOMETER WITH AUTOMATIC CALIBRATION

Herbert L. Berman, Los Altos Hills, and Richard W. Singer, Palo Alto, both of Calif., assignors to Optical Sensors, Inc., Los Altos, Calif.

Filed Jan. 13, 1986, Ser. No. 817,930
Int. Cl.[4] G01J *5/10*
U.S. Cl. 128—664 **13 Claims**



1. In combination, a probe for an infrared thermometer comprising a body, first means at one end of said body having a window at its distal end for admission of infrared radiation from tissue emitting radiation, an infrared sensor in said body emitting radiation, an infrared sensor in said body emitting a first signal responsive to the radiation entering through said window, said infrared sensor being in thermal equilibrium with said body to assume the temperature of said body, an ambient sensor in thermal contact with said infrared sensor emitting a second signal responsive to the temperature of said infrared sensor, second summing means summing the output signals of said sensors, third display means responsive to said summing means indicating the temperature of said tissue; and fourth means forming a chamber having an open first end and a closed second end, a target in said chamber adjacent said second end, said target being in thermal equilibrium with said fourth means to assume the temperature of said fourth means, whereby when said probe is inserted in said chamber it receives infrared energy of measured intensity from said target, and fifth error correcting means for adding an error signal to said second summing means to correct error in the signal from said infrared sensor.

4,784,150

SURGICAL RETRACTOR AND BLOOD FLOW MONITOR

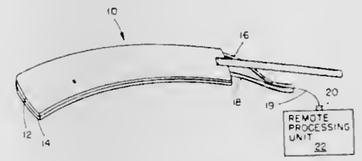
Rand M. Voorhies, New Orleans, La.; Craig M. Housworth, Oklahoma City, Okla., and Antonio J. Waring, New Orleans, La., assignors to Research Corporation, New York, N.Y.

Filed Nov. 4, 1986, Ser. No. 927,209
Int. Cl.[4] A61B *5/02, 17/02*
U.S. Cl. 128—664 **7 Claims**

1. A surgical retractor system for manipulation of living tissues and/or organs during diagnostic and/or surgical procedures, providing for the monitoring of the presence or absence of blood flow in the tissue adjacent to the surgical retractor, comprising:

a. a retractor blade;

b. said retractor blade including means for directing light having predetermined spectral characteristics related to blood onto the adjacent tissues and/or organs;



c. said retractor blade also including light receiving means mounted in cooperative relationship with said light directing means for receiving light which is reflected from the tissues and/or organs; and

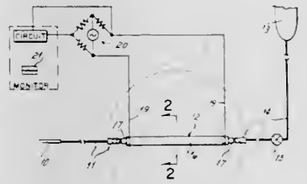
d. signal processing means coupled to said light receiving means for monitoring the signal received therefrom for indicating the presence or absence of blood flow through the adjacent tissues and/or organs.

4,784,151

TUBULAR PRESSURE TRANSDUCER

Thomas P. Frank, Dublin, and Wendell Thompson, Columbus, both of Ohio, assignors to Medex, Inc., Hilliard, Ohio

Filed Mar. 30, 1997, Ser. No. 31,758
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—675 **6 Claims**



1. Apparatus for measuring fluid pressure comprising:

a tube adapted to contain fluid whose pressure is to be measured,

one section of said tube being a conductive elastomer,

spaced conductive terminals in electrical contact with said section,

and means for measuring changes in the resistance of said section between said conductive terminals as the pressure of the fluid in said tube changes.

4,784,152

PULSE WAVE DETECTING APPARATUS

Masayuki Shinoda, Tajima, Japan, and William A. Ogletree, Newtown Square, Pa., assignors to Colin Electronics Co., Ltd., Aichi, Japan

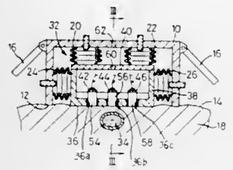
Filed Dec. 23, 1987, Ser. No. 137,347
Claims priority, application Japan, May 2, 1987, 62-109594
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—690 **12 Claims**

1. A pulse wave detecting apparatus for detecting a blood pressure pulse wave of an arterial vessel of a subject, based on an oscillatory motion of at least one contact element which is adapted to be depressed against a surface of a body member of

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the subject, such that said at least one contact element is oscillated in response to the pulsation of the arterial vessel, said detecting apparatus comprising:

a main frame for supporting said at least one contact element such that said at least one contact element is movable relative to said main frame, said main frame being attached to said surface of the body member;



positioning means operable at least for moving said at least one contact element relative to and along said surface, in a direction perpendicular to a direction of extension of said arterial vessel, to thereby locate one of said at least one contact element right above said arterial vessel; and

pressing means for moving said at least one contact element relative to said main frame, in a direction toward said surface, for forcing said at least one contact element against said surface.

4,784,153

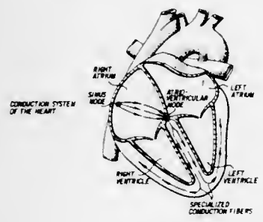
METHOD OF AND APPARATUS FOR DETECTING CARDIAC RHYTHM DISTURBANCE

Lloyd A. Marks, 727 Great Springs Rd., Bryn Mawr, Pa. 19010

Filed Nov. 12, 1986, Ser. No. 929,414

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—701 **17 Claims**



1. A cardiac diagnostic system for producing sounds from electrocardiogram signals comprising:

an electrocardiogram (EKG) module transmitting a first signal proportional to the shape of the electrocardiogram;

a means to receive said first signal and provide a second signal proportional to the first derivative of the first signal;

a computing means responsive to at least one of said first and second signals identifying when a QRS complex deflection of a heartbeat has occurred, determining at least one mathematical parameter derived from the shape of said QRS complex deflection and transmitting an output signal proportional to said mathematical parameter; and

a tone generating means responsive to the output signal of the computing means producing a tone whose characteristics are dependent upon said mathematical parameter of said QRS complex deflection and which tone is produced only for each QRS complex deflection.

4,784,154

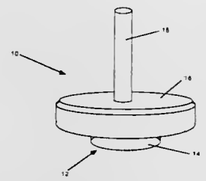
INTERFERENCE RESISTANT BIOMEDICAL TRANSDUCER

Donald J. Shirley, Boerne, and Merle E. Converse, Helotes, both of Tex., assignors to Colin Electronics Co., Ltd., Komaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,988

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—715 **14 Claims**



1. An interference-resistant transducer for monitoring acoustic signals, comprising:

a piezoelectric diaphragm having first and second sides, said diaphragm having one portion polarized in a first direction and another portion polarized in a second direction;

means for communicating an acoustic signal to said piezoelectric diaphragm to cause movement thereof, said piezoelectric diaphragm producing an electrical signal in response to said movement;

first and second electrodes on said first side of said piezoelectric diaphragm, said first and second electrodes having opposite polarities, said first electrode being aligned with said portion of said piezoelectric diaphragm polarized in said first direction, said second electrode being aligned with said portion of said piezoelectric diaphragm polarized in said second direction;

a third electrode on said second side of said piezoelectric diaphragm, said third electrode being aligned with said first and second electrodes in a configuration to cause said first and second electrodes to produce a differential output signal in response to the movement of said diaphragm; and

means for amplifying said differential output signal to provide an electrical representation of said acoustic signal.

4,784,155

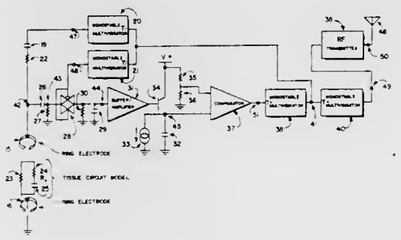
DEVICE FOR AUTOMATED DETECTION OF ESTRUS IN FARM ANIMALS

Perry A. Mills, Roseville, Minn., assignor to Data Sciences, Inc., Roseville, Minn.

Filed Jul. 17, 1987, Ser. No. 74,930

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—734 **13 Claims**



1. A transmitter for transmitting an output signal which is a function of resistive and reactive components of impedance of tissue in a reproductive system of a female animal, the transmitter comprising:

first and second electrode means for making electrical contact with the tissue;

means for supplying pulses of first and second different pulse widths to the first and second electrode means at first and second time intervals which are a function of the impedance between the first and second electrode means, so that differences in the first and second time intervals are a function of the reactive component of the impedance of the tissue, and duration of the first time intervals is a function of the resistive component; and

output means for producing the output signal with a characteristic which is a function of the first and second time intervals.

4,784,156

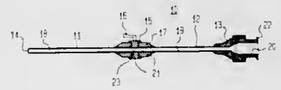
CANNULA INCLUDING A VALVE STRUCTURE AND ASSOCIATED INSTRUMENT ELEMENTS AND METHOD FOR USING SAME

Rakesh K. Garg, R.R. #1, Box 3032, Lafayette, N.J. 07848

Filed Sep. 16, 1987, Ser. No. 97,098

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—753 **1 Claim**



1. A medical instrument for penetrating external body tissue and for extracting samples of internal body tissue below such external body tissue, said instrument comprising: an outer hollow cannula including a valve structure, said cannula being adapted to receive instrument elements for performing the penetrating procedure; said cannula including a cylindrical body further including a longitudinally directed lumen and said valve structure being interposed along the path of said cannula lumen; said valve structure further including a cylindrical member being interposed along the path of said cannula lumen and being rotatable about an axis perpendicular to the longitudinal direction of said cannula lumen, said cylindrical member further including a short lumen having the same diameter as said cannula lumen and being rotatable to be concentric with said cannula lumen or to be perpendicular to said cannula lumen; said cannula including a proximal end and a distal end such that said valve structure is interposed in between said proximal end and said distal end, and said distal end being longer than said proximal end; said cannula including attachment means at said cannula proximal end and a circular annular surface at said cannula distal end; said medical instrument also comprising an instrument element being an inner hollow needle slidably received within said cannula, said needle including a proximal end, a distal end, attachment means at said needle proximal end, and a location surface marker on said needle, and a slanted annular elliptical surface at said needle distal end; wherein said location surface marker is located just proximal to said cannula attachment means when said needle slanted annular elliptical surface is located just proximal to said valve structure and within said cannula proximal end.

4,784,157

METHOD AND APPARATUS FOR TAKING SAMPLES FROM OR ADMINISTERING MEDICATION TO A PATIENT

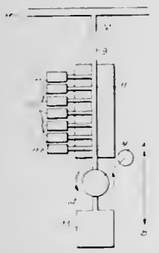
Justio A. T. Halls, 147 Briar Road, Kingswood, Garston, Watford, Herts; David W. Hawes, 40 Leighfield, Mortimer, Reading, Berks; Heinz S. Wolff, 53 Meadway, London NW11, and Richard D. Vahrman, 20 First Avenue, Garston, Watford, Herts, all of England

Filed Jan. 28, 1987, Ser. No. 7,678

Claims priority, application United Kingdom, Feb. 4, 1986, 8602732

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—762 **20 Claims**



1. A method of taking a plurality of blood samples from a blood vessel of a patient, using a like plurality of syringes therefor, said method comprising:

(a) connecting a manifold to said blood vessel;

(b) pumping at a slow rate anticoagulant through said manifold into said blood vessel;

(c) interrupting pumping step (b) and then drawing from said patient into said manifold at a rapid rate blood for said sampling;

(d) actuating a separate one of said plurality of syringes to remove from said manifold a sampling of blood;

(e) discontinuing the actuation of each such syringe prior to the complete filling thereof with blood;

(f) then flushing said manifold of blood by pumping therein at a rapid rate anticoagulant;

(g) then reactuating the partially filled syringe to draw from said manifold anticoagulant; and

(h) then returning to step (b) to operate another syringe to take another blood sample.

4,784,158

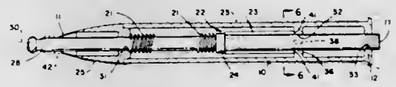
VAGINAL TESTING APPLICATOR AND METHOD

Paul M. Okimoto, 638 Cornell, Albany, Calif. 94706

Filed Aug. 21, 1987, Ser. No. 87,807

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—771 **13 Claims**



1. An applicator assembly for self-testing of a body cavity for the detection of a condition in said cavity including an elongated applicator body dimensioned to be received within said body cavity and having an open front and a length sufficient for positioning of said open front end of said applicator within said cavity beyond the external walls thereof; probe means having a tip end, said probe means being formed and positioned within said applicator body for movement of said

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tip end between a retracted position within said applicator body and an extended position outward of said open front end of said applicator body;

flexible sheath means having a closed end and removably mounted and extending over said open front end of said applicator body to prevent the entry of contaminates in said front end, wherein the improvement in said applicator assembly comprises

said sheath means extending across said tip end and being removably attached to said tip end for movement therewith between said extended position and said retracted position; and

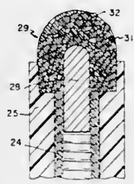
sensor means to detect a condition within said body cavity and carried by said sheath means for movement therewith on an exterior side of said sheath means proximate attachment of said sheath means to said tip end and said sensor means being dimensioned for retraction inside said applicator body through said open fron end.

4,784,159

PROCESS FOR MAKING AN IMPLANTABLE DEVICE HAVING PLASMA SPRAYED METALLIC POROUS SURFACE

Paul J. Szilagyi, El Portal, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 19, 1986, Ser. No. 898,007
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—784 **13 Claims**



1. A device or appliance that is implantable in organic tissue and that has a surface for enhancing organic tissue ingrowth thereinto, the device or appliance having been made by a process comprising:

providing a shaped substrate member having an electrically conductive surface;

blending a supply of electrically conductive elemental metal particles with a reductive gaseous environment in order to form a plasma deposition blend, said reductive gaseous environment including a reductive gas that substantially eliminates oxidation of the elemental metal particles during their subsequent plasma deposition within said reductive gaseous environment;

subjecting said plasma deposition blend to a source of energy in order to plasma excite said plasma deposition blend within said reductive gaseous environment;

spraying said excited plasma deposition blend onto said electrically conductive surface of the shaped substrate member within said reductive gaseous environment in order to thereby form a porous coating of substantially unoxidized elemental metal and pores onto said electrically conductive surface of the shaped substrate member; and

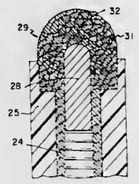
said steps of subjecting said plasma deposition blend to a source of energy in order to plasma excite it and spraying said excited plasma deposition blend onto said electrically conductive surface raise the temperature of the electrically conductive surface to a temperature significantly lower than a metal sintering temperature.

4,784,160

IMPLANTABLE DEVICE HAVING PLASMA SPRAYED CERAMIC POROUS SURFACE

Paul J. Szilagyi, El Portal, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 19, 1986, Ser. No. 898,006
Int. Cl.[4] A61N *1/04*
U.S. Cl. 128—784 **11 Claims**



1. A device or appliance that is implantable in organic tissue and that has a surface of enhancing organic tissue ingrowth thereinto, the device or appliance having been made by a process comprising:

providing a shaped substrate member having an electrically conductive surface;

blending a supply of electrically conductive ceramic material particles with a reductive gaseous environment in order to form a plasma deposition blend, said reductive gaseous environment including a reductive gas that substantially eliminiminates formation of oxides on the ceramic material particles during their subsequent plasma deposition within said reductive gaseous environment;

subjecting said plasma deposition blend to a source of energy in order to plasma excite said plasma deposition blend within said reductive gaseous environment;

spraying said excited plasma deposition blend onto said electrically conductive surface of the shaped substrate member within said reductive gaseous environment in order to thereby form a porous coating of substantially unoxidized conductive ceramic material and pores onto said electrically conductive surface of the shaped substrate member; and

said steps of subjecting said plasma deposition blend to a source of energy in order to plasma excite it and spraying said excited plasma deposition blend onto said electrically conductive surface raise the temperature of the electrically conductive surface to a temperature significantly lower than a ceramic sintering temperature.

4,784,161

POROUS PACEMAKER ELECTRODE TIP USING A POROUS SUBSTRATE

Michael Skalsky, Waverly; Zoran Millijasevic, Elanora Heights; Akira Nakazawa, Balmain, and Gerhard Gotthardt, Castle Hill, all of Australia, assignors to Telectronics, N.V., Netherlands Antilles

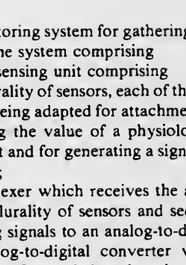
Filed Nov. 24, 1986, Ser. No. 933,998
Int. Cl.[4] A61N *1/05*
U.S. Cl. 128—785 **2 Claims**

1. An implantable stimulating lead for a cardiac pacemaker having a proximal end adapted to be connected to a pulse generator and a distal tip region having a surface area adapted to physically contact heart tissue for stimulating heart tissue in-growth, sensing heart contractions and promoting tissue ingrowth, said distal tip region comprising:

a first member defining a conductive electrode having a conductive first surface area forming a first portion of said distal tip surface area, to stimulate heart tissue and sense heart contractions; and

a second member defining a non-conductive substrate having a second surface area forming a second portion of said distal tip surface area for promoting tissue ingrowth, and attachment of said distal tip to heart tissue,

said second member including a soluble compound disposed



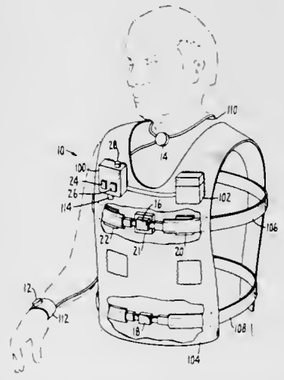
in said substrate for rendering said substrate non-porous until after implantation in the heart tissue whereupon said compound dissolves so as to render said substrate and said second surface area porous.

4,784,162

PORTABLE, MULTI-CHANNEL, PHYSIOLOGICAL DATA MONITORING SYSTEM

Robert D. Ricks, Newark; Robert Bornn, San Francisco, and David B. Hurt, Mountain View, all of Calif., assignors to Advanced Medical Technologies, San Mateo, Calif.

Filed Sep. 23, 1986, Ser. No. 910,457
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—903 **8 Claims**



1. A data monitoring system for gathering physiological data from a subject, the system comprising

(a) a portable sensing unit comprising

(i) a first plurality of sensors, each of the sensors of the first plurality being adapted for attachment to the subject for monitoring the value of a physiological parameter of the subject and for generating a signal corresponding to that value;

(ii) a multiplexer which receives the analog signals from the first plurality of sensors and sequentially forwards the analog signals to an analog-to-digital converter;

(iii) an analog-to-digital converter which receives the sequentially forwarded analog signals from the multiplexer as an input signal and converts the input signal to a corresponding first binary data word which is provided in parallel to a serial encoder;

(iv) a second plurality of sensors, each of the sensors of the second plurality being adapted for attachment to the subject for monitoring the value of a physiological parameter of the subject and for generating an electrical signal corresponding to that value;

(v) means for converting the electrical signals generated by the second plurality of sensors into a corresponding second binary data word which is provided in parallel to the serial encoder;

(vi) a serial encoder which receives the first and second binary data words and converts them to a serial digital data stream; and

(vii) a digital telemetry transmitter which receives the serial digital data stream and transmits the serial digital data stream by low-power radio signals; and

(b) a base station comprising

(i) a receiver which receives the radio signal and reconverts it to a digital data signal; and

(ii) a data processing unit which receives the reconverted digital data signal for storage and/or analysis and review.

4,784,163

PROCESS FOR PRODUCING SMOKING ROD WRAPPER AND SMOKING ROD CONTAINING SAME

Brian Adams, Newtown Abbey; Linda Cunningham, Armagh, and Shane C. Browning, Antrim, all of Northern Ireland, assignors to Gallaher Limited, England

Continuation of Ser. No. 834,235, Feb. 26, 1986. This application Mar. 10, 1987, Ser. No. 23,987
Claims priority, application United Kingdom, Feb. 28, 1985, 8505173; Jan. 7, 1986, 8600258
Int. Cl.[4] A24C *5/60*; B41M *3/00*
U.S. Cl. 131—284 **9 Claims**

1. A process for providing a smoking rod wrapper having an increased loading of a smoke enhancing additive while avoiding bleed-through in the wrapper, said method comprising the steps of:

providing a white, smoking rod wrapper material, said material being less than 100 microns thick;

providing a non-aqueous, liquid vehicle having a binder, the vehicle containing particles of a water soluble smoke enhancing additive for forming an ink, the particles being insoluble in the liquid vehicle and substantially all the particles having sizes in a range of 5–80 microns, the smokeenhancing additive being present in an amount in a range of 33–70% by weight of the ink, the smoke enhancing additive being selected from a class consisting of biuret, ammonium compounds, urea, menthol borate, tobacco components, tobacco extracts, synthetic flavorants, glycols, hydrophylic smoke dilutants, sugars, organic acids, sodium carboxymethyl cellulose, alkaloids, glycerol, and ethyl stearate;

printing one side of the smoking rod wrapper material with said ink to provide an effective smoke-enhancing amount of the additive on the wrapper material; and

drying said ink on the material to form a deposit having an impregnated ink part that is impregnated into the surface of the wrapper material and a raised part that is raised above the surface of the wrapper material, the smoke-enhancing additive being present substantially only in the raised part.

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4,784,164

SMOKING ROD WRAPPERS AND COMPOSITIONS FOR THEIR PRODUCTION

Brian Adams, Newtown Abbey; Shane C. Browning, Co. Antrim, and Linda Cunningham, Co. Armagh, all of Ireland, assignors to Gallaher Limited, England

Filed Jan. 2, 1987, Ser. No. 117

Claims priority, application United Kingdom, Jan. 7, 1986, 8600259; Aug. 27, 1986, 8620698

Int. Cl.[4] A24D *1/02*

U.S. Cl. 131—365 **31 Claims**

I. A smoking rod wrapper material having porosity apertures within a coated area in which the apertures are partially or fully blocked by a coating of a heat-removable porosity-reducing composition, and in which the composition comprises (a) 0 to 20% by weight polymeric binder and (b) 80 to 100% by weight of a non-polymeric blocking material that is solid at 30° C. and that, at a temperature between 30° and 150° C., melts and is absorbed into the substrate or volatilises, and thereby leaves the apertures substantially unblocked, the porosity apertures being below 100 μm in diameter and the amount of the composition in the coated area is 0.05 to 1 mg/cm^2.

4,784,165

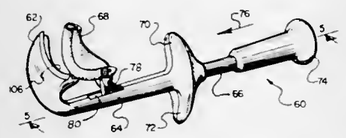
EYELASH CURLER

Robert F. Stein, 2476 Glencoe Ave., Venice, Calif. 90291

Filed Mar. 7, 1986, Ser. No. 837,530

Int. Cl.[4] A45D *2/42*

U.S. Cl. 132—217 **7 Claims**



1. An eyelash curler for curling eyelashes, comprising:
an upper jaw having a curling bar member with a lower edge;
a lower jaw having a rigid upper surface parallel to said curling bar member lower edge;
a cylindrical pad member fabricated of a uniformly resilient material and having:
a semi-circular cross section of a first diameter facing said lower edge; and
a pad thickness substantially corresponding to said first diameter; and
said rigid upper surface having a width substantially equal to said first diameter and supporting said resilient pad member; and
hand operated means for pressing said lower edge into said pad member compressing said uniformly resilient material throughout said first diameter onto said rigid upper surface.

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TRUCK WASHING MACHINE FOR WASHING TRAILER INTERIORS USING WATER UNDER PRESSURE AS REMOTE SOLE SOURCE OF POWER, CONTROL AND WASH LIQUID

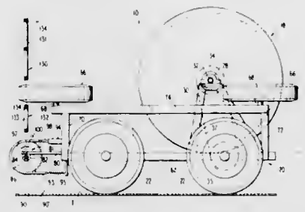
Douglas R. Brager, 2024 W. Greenough Dr., and Randall J. Kappes, 11250 Bench Rd., both of Missoula, Mont. 59802

Filed Nov. 23, 1987, Ser. No. 123,690

Int. Cl.[4] B08B *3/02, 9/08*

U.S. Cl. 134—50 **7 Claims**

1. In an apparatus for washing the interior of a vehicle body having an opening within an end thereof and a horizontal floor extending the length thereof, said apparatus comprising;
a wheeled self-propelled moveable frame, a drive motor mounted on said frame, a drive means powered by said drive motor and operable to propel said wheeled, moveable frame across said floor, a hose spool rotatably mounted on said frame, a hose coupled at one end to said spool and having an opposite free end, means for operatively rotating said hose spool for positively winding up said hose, a water spray bar system mounted on said frame and operatively coupled to said hose at said one end, means for coupling the free end of said hose to a source of water under pressure, and control means on said frame and responsive to movement of said self-propelled moveable frame for controlling operation of said frame drive motor, said hose spool rotating means and the water spray bar system, the improvement wherein:
said control means comprises a multi-way directional valve, means coupled to said multi-way directional valve responsive to a sensed position of said self-propelled moveable



frame along said floor of said vehicle body for changing the direction of water flow through said valve, said drive motor comprises a bidirectional water driven rotary motor, and wherein, said self-propelled moveable frame includes a hydraulic circuit coupled to said one end of said hose and including; means for supplying water to said multi-way directional valve for selectively supplying water flow in either of two direction to said bidirectional water driven rotary drive motor for reversing rotation thereof, and further means for dumping said water after passage to said bidirectional water driven rotary drive motor at the situs of said wheeled self-propelled moveable frame whereby, said pressure water source functions as a sole source of power for travel of said self-propelled moveable frame, all operational commands for said moveable frame, while providing adequate wash and rinse water to the apparatus spray bar system on said self-propelled moveable frame.

4,784,167

APPARATUS FOR THE CARE OF CONTACT LENSES

Peter Thomas, Wuppertal; Hans-Joachim Reitz, Roesrath; Udo Schaab, Korschenbroich, and Klaus-Dieter Wisotzki, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 6, 1987, Ser. No. 69,672

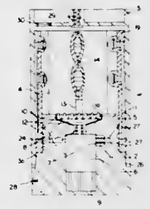
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639099

Int. Cl.[4] B08B *3/10*

U.S. Cl. 134—93 **14 Claims**

1. Apparatus for the care of contact lenses comprising a container for treatment liquid, a contact lens holder which fits into the container, nozzle means positioned in said container for spraying treatment liquid onto contact lenses supported by the contact lens holder, means for pumping treatment liquid from said container through said nozzle means, and a nozzle carrier for insertion into said container comprising a ring at one end and upright arms extending from said ring, said nozzle means being positioned on said upright arms to discharge into said container, said upright arms having channel-like grooves along their length which in conjunction with an inner side wall

of the container form flow conduits which communicate with the nozzles, said ring having bores which are directed radially



inwardly in communication with a flow passage means which connects said bores with an output of said pump.

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OPEN WASHING CYCLE DISHWASHING MACHINE

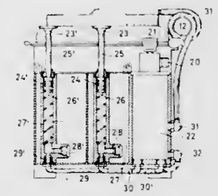
Dall'Oglio Erminio, Quartiere Ai Serrari, 6592 S. Antonino, Switzerland

Filed Mar. 25, 1987, Ser. No. 29,818

Claims priority, application Switzerland, Apr. 28, 1986, 1743/86

Int. Cl.[4] B08B *3/02, 13/00*

U.S. Cl. 134—100 **8 Claims**



1. In a dishwashing machine having a washing tank for holding a removable basket for receiving articles to be washed, a lid for the tank, at least one rotary spray arm rotatably mounted on an interior wall of the tank and having nozzles for spraying wash or rinse water onto the articles, and an outlet in the base of the tank for continuously discharging spent water to waste, the improvement comprising a mixing chamber having an outlet communicating with said spray arm nozzles and an inlet for connection to a supply of water under pressure, a valve for controlling the flow of water to the mixing chamber, a plurality of reservoirs for holding additives to be mixed with said water, a separate manually-operated, spring biased positive displacement pump for each reservoir, each pump having an inlet communicating with a reservoir and an outlet communicating with said mixing chamber, whereby the additives can be selectively introduced into the mixing chamber upon actuation of a pump to mix them with the water prior to being fed to the spray arm.

4,784,169

APPARATUS FOR TREATING ARTICLES WITH SOLUTION TO REMOVE SOLIDS AND THEN FILTERING THE SOLUTION

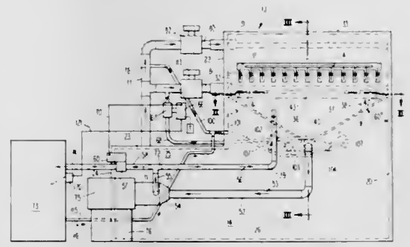
Walter J. Striedieck, Port Matilda, Pa., assignor to Chemcut Corporation, State College, Pa.

Continuation of Ser. No. 570,459, Jan. 13, 1984, abandoned. This application Mar. 10, 1987, Ser. No. 23,981

Int. Cl.[4] B08B *3/00;* **B01D** *23/24*

U.S. Cl. 134—111 **13 Claims**

1. An apparatus for chemically removing solid matter from articles being treated by a chemical treatment liquid and filtering from the treatment liquid the solid matter thus removed, said apparatus including a treatment chamber, article supporting means in an upper portion of said chamber for supporting articles being treated, means for delivering treatment liquid to spray means in said chamber for spraying onto articles supported therein for removal of solid matter from articles by the spray of the treatment liquid and collection means at a lower portion of said chamber for collecting treatment liquid for recycling to said delivery means, said apparatus including:
(a) separating filter means disposed at a sufficiently acute angle to the vertical to allow falling treatment liquid to pass therethrough and to allow solid matter not passing through the filter means to be washed along the filter means;



(b) filter washing means for delivering treatment liquid across said filter means for washing solid material therealong;
(c) a residence zone at a lower end of said separating filter means for receiving solids washed along the filter means, and distinct from said collection means; and
(d) evacuation means for evacuating an evacuate of treatment liquid and solid material from said residence zone;
wherein said residence zone for receiving solid material and treatment liquid is defined by having a discharge line connected thereto comprising means for receiving treatment liquid flowing into said residence zone and delivering said liquid to means for recycling it back to the upper portion of said chamber, and wherein said evacuation means includes propulsion means for delivering a stream of treatment liquid through said residence zone to evacuate accummulated solid material therefrom.

4,784,170

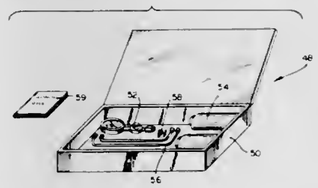
FUEL INJECTOR CLEANER KIT

Patrick Romanelli, and Robert J. Romanelli, both of 242 Brook St., Harrington, N.J. 07640

Filed May 28, 1987, Ser. No. 55,005

Int. Cl.[4] B08B *3/08, 9/00;* **F02B** *77/04*

U.S. Cl. 134—113 **11 Claims**

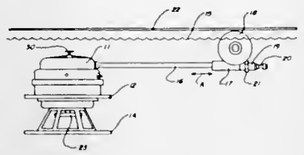


1. A kit for cleaning fuel injectors in a plurality of different motor vehicles comprising:
a pressurized container of a mixture of a cleaning fluid and a fuel for said motor vehicle;
a pressure regulator;

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at least a first coupling means for coupling said pressure regulator to said pressurized container;
second coupling means for coupling an outlet of said pressure regulator to said fuel injectors;
said second coupling means including at least first and second different adapters for coupling to said fuel injectors in respective ones of said different motor vehicles; and
said pressure regulator including controllable means for regulating a pressure of said mixture at said outlet to a value appropriate for a particular motor vehicle to which it is coupled.

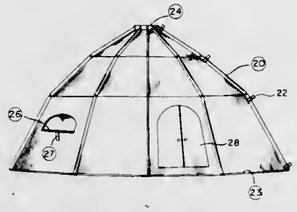
4,784,171
POOL SWEEP MODIFICATIONS
Sanford F. Campbell, 1850 Crestmont Rd., Redding, Calif. 96002
Filed Oct. 16, 1987, Ser. No. 109,484
Int. Cl.[4] B08B *9/08*
U.S. Cl. 134—167 R **5 Claims**



1. A pool sweep modification for use in adapting a pool sweep of the type having a pool sweep head with a top and a bottom and a substantially rigid water line attached thereto for use under a swimming pool cover, comprising:
a flotation device having:
a body;
axle means attached to said body;
buoyant wheel means rotatably attached to said axle means which rotate when oriented to contact said pool cover, and
attaching means for attaching said body to said substantially rigid water line in proper orientation so that said axle means is oriented at a substantially right angle to said rigid water line when said body is attached to said substantially rigid water line, and
a weight having attaching means whereby said weight is attached to said bottom of said pool sweep head,
said flotation device and said weight being matched to maintain said pool sweep substantially level substantially below the water line of said swimming pool, thereby substantially eliminating interference between said pool sweep and said pool cover.

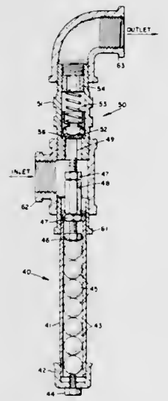
4,784,172
INSTANT EMERGENCY SHELTER
Joseph D. Yacoboni, P.O. Box 1606, Lake Placid, Fla. 33852
Filed Jun. 25, 1987, Ser. No. 66,326
Int. Cl.[4] E04H *15/00, 15/02, 15/18;* **E04B** *1/32*
U.S. Cl. 135—87 **3 Claims**

1. A shelter, comprising in combination:
(a) a plurality of trapezoidal panels divided in at least three trapezoidal sections and comprising a base section (**12**), almost rectangular in shape with the wider part of the section being at the bottom, a trapezoidal middle section (**13**), and an almost triangular top section (**14**), said sections being along defined transverse seams;
(b) a ring (**24**) acting as the locus of the top sections (**14**) of all the trapezoidal panels, said top sections having a top flange (**25**) adapted to be coupled to said ring, said ring being divided into resilient teeth-like tabs (**26**) corresponding in number to said panels, said tabs (**26**) being adapted and designed to engage said top flange (**25**) so as to hold the panels;
(c) first and second lateral vertical flanges (**20, 21**) on said panels, the first flange (**20**) having a U-shaped cross-section, while the second flange (**21**) has a straight vertical shape, designed to enter the U-shape and be held therein;
(d) clips (**22**) designed to fit over the U-shape of the first flanges (**20**) to firmly hold the first and second flanges together;



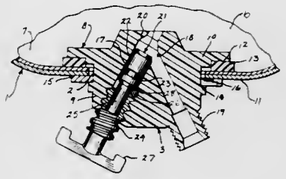
(e) a horizontal bottom flange (**23**) at the lower end of the base panel section (**12**) to be used in pinning the shelter to the ground;
(f) a door-like opening defined in at least one of said panels; and,
(g) a window-like opening defined in at least one of side panels.

4,784,173
WATER FREEZE PREVENTION VALVE
Frederick P. Carney, 229 Maplewood Estate, Scott Depot, W. Va. 25560
Filed Jun. 6, 1988, Ser. No. 202,818
Int. Cl.[4] F16K *31/64;* **E03B** *7/12*
U.S. Cl. 137—2 **33 Claims**



28. A method for incrementally and cumulatively sensing the expansion of a liquid while freezing, comprising:
A. providing an actuator having an elongated housing which is disposed substantially vertically and has a wall, an open end, and a closed end to define an elongated actuation chamber which is filled with said liquid;
B. providing a plurality of segments of a sensing means which is disposed within said chamber, each said segment having an uninterrupted peripheral portion extending substantially to said wall and an axial portion extending toward said closed end, said segments being biased toward said closed end;
C. providing a linkage means that is in contact with the topmost segment and is aligned substantially axially with said housing;
D. exposing said actuator to freezing temperatures;
E. forming a solid seal between each said peripheral portion and said wall when freezing of said liquid initially occurs near said closed end and along said wall; and
F. moving each said segment sequentially upwardly without destroying said solid seal when freezing of said liquid occurs above said closed end and beneath each said segment, whereby said linkage means is pushed upwardly for controlling flow of a fluid and preventing freezing thereof.

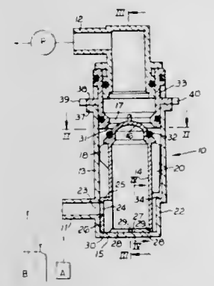
4,784,174
DRAIN AND SHUTOFF VALVE ASSEMBLY
William E. Ryan, Richfield, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed Jul. 29, 1987, Ser. No. 80,752
Int. Cl.[4] F16L *55/18*
U.S. Cl. 137—15 **17 Claims**



15. A method of installing a drain and shut-off valve fitting in a water pressure tank, comprising the steps of forming a water pressure tank with an opening in the lower end thereof, forming a fitting having an outer section shaped to be received within said opening and an inner section with a larger cross-sectional area than said outer section, inserting said outer section in said opening with said inner section located in said tank, positioning an annular sealing member between said inner section and the inner surface of the tank bordering the opening, assembling a flexible diaphragm transversely across the tank to divide the tank into an upper gas chamber and a lower liquid chamber, pressurizing the gas chamber to force the diaphragm into engagement with said inner section of said fitting to thereby compress said sealing member against said inner surface, and engaging a retaining member with said outer section adjacent the outer surface of said tank while said gas chamber is pressurized to thereby retain said fitting within said opening.

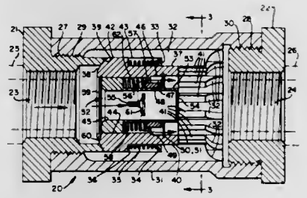
4,784,175
VALVE
Richard B. Hicks, Kingston-upon-Thames, United Kingdom, assignor to Aerosol Medical Limited, London, England
Continuation of Ser. No. 826,626, Feb. 6, 1986, abandoned. This application Mar. 24, 1987, Ser. No. 30,267
Claims priority, application United Kingdom, Mar. 4, 1985, 8505433; Nov. 19, 1985, 8528413
Int. Cl.[4] F16K *31/22*
U.S. Cl. 137—202 **11 Claims**

1. An aspirator having an air outlet connected to an air inlet of a valve, the valve having an air outlet connected to an inlet of a gas pump, the valve comprising an upright chamber having said outlet in the region of its upper end, a sump-like formation spanning the bottom of the chamber adapted for the collection of liquid entering the chamber and to prevent escape of the same, a hollow valve member contained within said chamber and having a closed upper end and an open bottom end above said chamber bottom, the valve member having limited up-and-down movement in the housing between a lowered, valve-open position to which it is biassed by gravity and in which the valve member is spaced from the outlet and a raised, valve-closed position in which said closed end seals the outlet, said valve inlet opening to the interior of the valve member, end means defining a restricted flowpath for said medium through said valve member and said sump-like formation between said valve inlet and outlet in said valve-open position, said restricted flowpath means being arranged and dimensioned to be occluded by a greater density medium collecting in said sump-like formation, the cross-sectional area of the space between the exterior of the valve member and the interior of the chamber being less than that of the valve member in



the same plane transverse to the direction of movement of the valve member, said restricted flowpath providing the sole communication between said valve inlet and said valve outlet in said valve-open position such that if, in use, said restricted flowpath is occluded the valve member will be raised to the valve-closed position by the pressure drop across it produced by the pump, the lower end of the valve member, when the valve is open, abutting an end wall of the chamber remote from the outlet, there being circumferentially-spaced projections on one of said lower end and said end wall that provide restricted openings of predetermined dimensions between the valve member and said end wall, said openings comprising said restricted flowpath.

4,784,176
ANTI-WATER HAMMER FLOW REGULATOR VALVE
Ancel M. Clough, 7717 Meadowhaven Dr., Dallas, Tex. 75240
Filed Jun. 25, 1987, Ser. No. 66,118
Int. Cl.[4] G05D *7/01*
U.S. Cl. 137—504 **5 Claims**



1. A combination liquid flow regulating and anti-water hammer shock wave relief valve insertable in a liquid flow piping system comprising: a valve housing having open fitting ends; an upstream end cap, and a downstream end cap inserted into opposite ends of said valve housing; first valve means and second valve means mounted within said valve housing; one of said first and second valve means being a liquid flow regulating valve, and the other of said first and second valve means being

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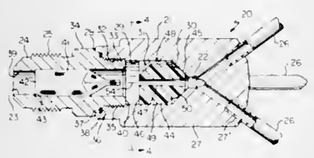
a predetermined upstream to downstream differential pressure opening valve; and one of said first and second valve means is mounted in the other of said first and second valve means; wherein said predetermined upstream to downstream differential pressure opening valve is a pressure relief valve; resiliently deflectable overload valve spring means mounted in said pressure relief valve with resilient bias force of said overload valve spring means biasing said pressure relief valve toward the closed state and with sufficient upstream to downstream differential pressure, relative to said pressure relief valve, resilient deflection of said overload valve spring means with opening of said pressure relief valve; said liquid flow regulating valve is mounted within said pressure relief valve; said pressure relief valve includes a relief valve body slidably mounted in said valve housing; housing liquid passage means in said valve housing spanning the longitudinal length of said relief valve body; relief valve seat means; and resiliently compressible spring means contained in chamber means between said valve housing and said relief valve body resiliently biasing said relief valve body toward and into seating engagement with said relief valve seat means closing said relief valve from through flow of liquid to said housing liquid passage means and out through said downstream end cap; said relief valve seat means includes a conical surface on the inner end of said upstream end cap; and a conical surface on the upstream end of said relief valve body matching and seatable in said conical surface of said upstream end cap.

4,784,177

EXPANSION DEVICE FOR A REFRIGERATION SYSTEM, PISTON THEREFOR AND METHODS OF MAKING THE SAME

Roger P. Sepso, Stratford, and John M. Halmose, Bridgeport, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Sep. 14, 1987, Ser. No. 96,979
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—513.3 **4 Claims**



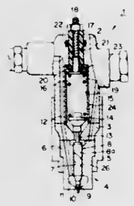
1. In an expansion device for a refrigeration system and comprising a housing means having opposed port means for coupling said device in said system and being separated from each other by an internal valve seat means of said housing means, and a movable piston disposed in said housing means and having a first end surface means adapted to engage against said valve seat means to tend to close the same when said piston is disposed in a first position thereof in said housing means, said housing means having an annular shoulder means, said piston having a second end surface means for engaging against said shoulder means when said piston is disposed in a second position thereof in said housing means, said piston having a passage means passing therethrough and through said end surface means thereof for interconnecting said opposed port means together in a restricted manner when said piston is in said first position thereof, said piston having an outer peripheral surface means interconnecting said end surface means together and being provided with a plurality of grooves therein for interconnecting said opposed port means together in a substantially nonrestricted manner when said piston is in said second position thereof, the improvement wherein said piston comprises a one-piece member of polymeric material and wherein said first end surface means of said piston comprises a substantially hemispherical section that is the part thereof that is adapted to engage said valve seat means when said piston is in said first position thereof, said grooves each interrupting said first end surface means and said second end surface means of said piston, said first end surface means of said piston comprising an outer annular section surrounding said hemispherical section, said outer section of said first end surface means of said piston being frusto-conical with the smaller base thereof joining said hemispherical section and the larger base thereof joining said outer peripheral surface means, said grooves interrupting only said outer annular section of said first end surface means of said piston, said grooves each having a bottom that is spaced outwardly from the larger base of said hemispherical section of said first end surface means of said piston at the point where the respective groove interrupts said outer annular section thereof, said second end surface means of said piston being substantially flat and being disposed substantially transverse to a longitudinal axis of said piston, said grooves each having a bottom surface that has two substantially straight sections one of which is disposed substantially parallel with the axis of said piston as said one section extends from said first end surface means to the other section which is angled toward said axis of said piston as said other section extends from said one section thereof to said second end surface means of said piston.

4,784,178

VALVE UNIT

Masashi Kasaya, and Tatsuhiko Abe, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Continuation of Ser. No. 706,476, Feb. 28, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 948,437
Claims priority, application Japan, Feb. 28, 1984, 59-35341
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—554 **9 Claims**



1. In a valve unit having a switch comprising an electrically conductive valve which slidably moves within a guide hole defined in an electrically conductive body and a layer for maintaining an electrically insulated state between said valve and said body for forming a switch wherein an electrically conductive state is established between said valve and said body when said valve is seated on a valve seat associated therewith and an electrically insulated state is established between said valve and said body when said valve is lifted from said valve seat,

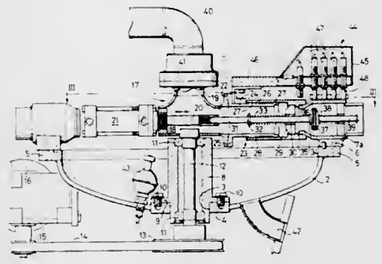
the improvement wherein said layer is made of three different portions which contain different compositions of a specific metal and a specific reaction gas, said specific metal being selected as having a property as metal of strong adherence to said valve and a property as a compound of the metal and the gas of being electrically insulating, wherein a first portion is disposed as an inner surface of said layer closer to said valve which is composed substantially of said metal, a second portion is disposed as an outer surface of said layer which is composed of an insulating compound of said metal and said gas, and a third portion is disposed as the region in between said inner and outer surfaces which is composed of a non-stoichiometric compound of said metal and said gas which varies progressively in the direction of thickness of said third portion from substantially the metal composition at said inner surface to the insulating compound composition at said outer surface so as to strongly bind said first portion of said layer to said second portion thereof, and said layer is coated on the peripheral surface of said valve such that said metal composition of said inner surface of said layer forms a strongly adhering bond to the surface of said valve and said outer surface of said layer forms an electrically insulating surface destined to make insulating contact with the wall of said guide hole.

4,784,179

AUTOMATIC PIPE COUPLING DEVICE

Pierre H. C. Carbenay, Montlouis sur Loire, France, assignor to Volumatic S.A., France

Filed Jun. 8, 1987, Ser. No. 59,375
Int. Cl.[4] F16K *11/18*
U.S. Cl. 137—607 **8 Claims**



1. An automatic pipe coupling device, comprising: a plurality of pipes, each pipe adapted to contain liquid under pressure, each of said plurality of pipes having ends which are radially fixed in a circle in a plane and each of said pipes having an automatic valve closing each of said ends; a telescopic coupling unit having an end communicating with another pipe, the coupling unit being rotatively mounted substantially in said plane within said circle, the end of said coupling unit including a slidable sleeve, means for driving said unit in rotation; and, means for bringing the end of said unit in succession in coincidence with the ends of said plurality of pipes, said means for bringing the end of said unit in coincidence with the ends of said pipes including a jack having a rod adapted to shift said sleeve and open said automatic valve.

4,784,180

SANITARY MIXING VALVE ASSEMBLY

Günter Sieberhagen, Hagen, Fed. Rep. of Germany, assignor to Knebel & Rottger GmbH & Co., Iserlohn, Fed. Rep. of Germany

Filed Sep. 18, 1987, Ser. No. 99,305
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705772
Int. Cl.[4] F16K *11/18*
U.S. Cl. 137—636.4 **18 Claims**

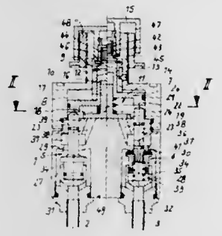
1. A mixing valve assembly comprising:

a housing formed with a cold water inlet, a hot water inlet, a mixing chamber connectable to said inlets, and a mixed water outlet connectable to said mixing chamber;

flow control valve means in said housing and mixed water temperature control means in said housing connected sequentially in the direction of water flow to said mixing chamber

an actuator operatively connected to the flow control valve means and the mixed water temperature control means, said flow control valve means being controlled by depression of the actuator and said mixed water temperature control valve means being controlled by rotation of the actuator; and

locking means for automatically holding said actuator in the position to which said actuator is depressed and automatically releasing said actuator upon a second depression of said actuator and a collar surrounding said actuator, said collar being rotatable but axially immovable with respect to said actuator, said collar defining in its periphery an approximately heart shaped guide slot having two notches one behind the other, said assembly having a fixed locking stud positionable with respect to the length of said guide slot and positionable in either of said nothces to hold the actuator in an axial position.

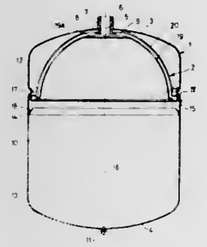


4,784,181

EXPANSION TANK WITH A BLADDER-TYPE DIAPHRAGM

Johan Hilverdink, Maarn, Netherlands, assignor to Flamco B.V., Gouda, Netherlands

Continuation of Ser. No. 914,792, Oct. 2, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 111,135
Claims priority, application Netherlands, Oct. 7, 1985, 8502736
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 **4 Claims**



1. An expansion tank which comprises

a generally cylindrical housing which has a side wall and opposite end walls, said generally cylindrical housing defining a center line therethrough and having a gas port and a liquid port,

a rigid clamping ring positioned inside of said generally cylindrical housing and movable along the side wall thereof, said rigid clamping ring including two generally radially inwardly-extending legs with free ends which provide the rigid clamping ring with a generally U-shaped cross section, and

first and second flexible bladder elements positioned inside of said generally cylindrical housing, each of said first and second flexible bladder elements having a peripheral edge, the peripheral edges of said first and second flexible blad-

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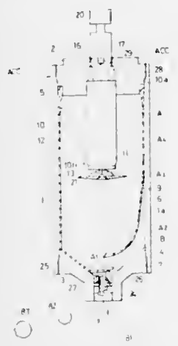
der elements extending between the two legs of said rigid clamping ring so as to be sealingly clamped together, said first flexible bladder element being positioned between said liquid port and said second flexible bladder element and defining a mouth which is attached to said generally cylindrical housing so as to be in commuı ication with said liquid port.

4,784,182

BLADDER TYPE ACCUMULATOR ASSOCIATED WITH A SENSOR

Nobuyuki Sugimura, 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Oct. 5, 1987, Ser. No. 104,507
Int. Cl.[4] F16L *55/02*
U.S. Cl. 138—30 **7 Claims**



1. A bladder type accumulator associated with a sensor, comprising a top wall plate provided at the top of a cylindrical container main body, a bladder disposed coaxially in an inner space of said container main body, an elongated holder having its top end portion fixedly secured to the top wall plate and projecting into an inner space of the bladder, and a sensor disposed within the bottom end portion of the holder including a shutter valve positioned within a moving locus region of a deformable bottom portion of the bladder, said shutter valve being slidable in an axial direction for opening or closing a shutter space in response to an axial movement of the deformable bottom portion of the bladder.
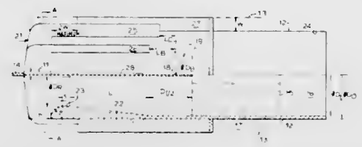
4,784,183

FLUID FLOW DEVICE

Alan E. Moore, Newport Pagnell, England, assignor to The British Hydromechanics Research Association, Cranfield, United Kingdom

PCT No. PCT/GB85/00486, § 371 Date Aug. 11, 1986, § 102(e) Date Aug. 11, 1986, PCT Pub. No. WO86/02578, PCT Pub. Date May 9, 1986
PCT Filed Oct. 22, 1985, Ser. No. 887,834
Claims priority, application United Kingdom, Oct. 22, 1984, 8426662
Int. Cl.[4] F15D *1/04*
U.S. Cl. 138—39 **6 Claims**

1. A fluid flow device comprising two co-axial conduits, a communicating chamber at one end of both conduits through which fluid may flow from one conduit to the other, reversing its axial direction of flow as it does so, vanes within the communicating chamber, each extending in a plane containing the common axis of the conduits and extending from the communicating chamber into the inner conduit and from the communicating chamber into the outer conduit, the planes of adjacent vanes being inclined at angles other than 90 degrees.



4,784,184

ELASTIC DRIP SILENCER AND FUNNEL

Christopher G. Gates, Chittenango, N.Y., assignor to Practique, Inc., Chittenango, N.Y.

Filed Sep. 1, 1987, Ser. No. 91,836
Int. Cl.[4] F16L *11/12*; B67C *11/00*
U.S. Cl. 138—109 **19 Claims**



17. An elastic hose for conducting liquids from a source of the liquid to a delivery site, comprising
an elongated tubular member made from a thin-walled elastic material, said tubular member having a central passage for conducting a liquid, said tubular member having a stretchability of about 400%-1,000%, said tubular member including
an upper funnel-shaped portion having a top opening, said top opening being stretchable over a source of liquid to form a gripping leak-proof seal,
a cylindrically-shaped middle portion contiguous with and below said upper portion, said middle portion having a diameter less than the diameter of said top opening, and
a cylindrically-shaped lower portion contiguous with and below said middle portion, said lower portion having a diameter smaller than said middle portion.

4,784,185

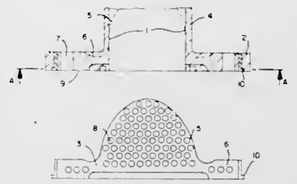
PIPE FOR GASES AND LIQUID WITH SCREW FLANGE

Karl G. Friedrichs, Leverkusen, Fed. Rep. of Germany, assignor to Flifa-Fahrzeugteile GmbH & Co., Mannheim, Fed. Rep. of Germany

Filed Mar. 31, 1987, Ser. No. 32,231
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611177
Int. Cl.[4] F16L *9/12, 11/02*
U.S. Cl. 138—109 **7 Claims**

1. A pipe for gases and liquids made of heat-resistant plastic

comprising a cylindrical body with a perimetric attachment flange having bores for attachment screws and being reinforced by a reinforcement ring that is integrally molded into the attachment flange and disposed concentrically around an



end of the pipe, wherein the reinforcement ring is made from a perforated profiled metal sheet having side extensions which concentrically surround the bores of the flange, said extensions having a height that is the same as the thickness of the flange in proximity to the bores.

4,784,186

NON-REINFORCED FILM OF CELLULOSE

Karl Stenger, Ruedesheim, and Horst Faust, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 15, 1987, Ser. No. 96,491
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1986, 3631669
Int. Cl.[4] A22C *13/00*
U.S. Cl. 138—118.1 **19 Claims**

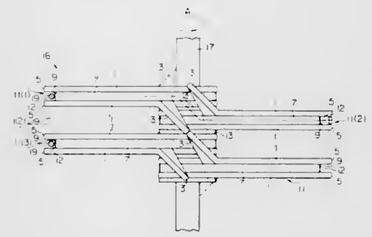
1. A stretched non-reinforced film of regenerated cellulose having a dry weight per unit area of 20 to 50 g/m^2, a dry moisture content of 6% to 15%, an elongation in the longitudinal direction of 0.5% to 1.5% upon exposure to water, and a shrinkage in the transverse direction of 3% to 8% upon exposure to water.

4,784,187

SHEDDING MOTION OF LOOM

Yoshiji Murayama, and Hide Kobayashi, both of Toukamachi, Japan, assignors to Sandy Cloth Co., Ltd., Niigata, Japan

Filed Apr. 15, 1987, Ser. No. 38,825
Claims priority, application Japan, Apr. 22, 1986, 61-92914
Int. Cl.[4] D03D *29/00*
U.S. Cl. 139—33 **1 Claim**



1. A device for producing shedding motion in a loom, said device comprising:
two assembled guides mounted in the loom parallel to one another,
each of said assembled guides comprising a shaft rotatably mounted in the loom and a plurality of blocks coupled to said shaft so as to rotate therewith, said blocks each having a couple-in opening extending therethrough and through which said shaft extends,
each of said blocks comprising a pair of thin rigid metal plates and a washer fixed to and extending between said pair of thin rigid metal plates,
each said rigid metal plate having a segmental shape including a base portion, a broad top portion, an opening extending therein at a substantially central location of said broad top portion, and a bent portion disposed adjacent a side of and inclined with respect to said broad top portion,
each said washer having a respective opening extending therein and a base portion, and each said washer being smaller than the pair of rigid metal plates between which the washer extends, and
wherein the openings extending in each of said thin rigid metal plates and in the washer extending therebetween of each of said blocks are aligned to define respective ones of said couple-in openings,
the broad top portions and the base portion of each of said rigid metal plates of each of said blocks are aligned, and the bent portions of said pair of metal plates of each of said blocks are inclined outwardly away from the washer extending between said plates and are disposed at opposite sides of the aligned broad top portions from one another,
adjacent ones of the entirety of said plurality of blocks of each of said assembled guides extend in opposite directions from one another with respect to the shaft of the assembled guide to which said blocks are mounted,
the outer peripheral edge of said base portions of each of said washers is spaced from the outer peripheral edges of each of the pair of rigid metal plates between which said washers extend to define respective yarn guides for guiding yarn in the loom between said rigid metal plates and the outer peripheral edges of said base portions of said washers, said base portions of the washers in each of said assembled guides define respective yarn pressors for pressing the yarn in a direction away from the respective shafts of each of said assembled guides as said shafts rotate, and said plurality of blocks of one of said assembled guides and said plurality of blocks of the other of said assembled guides are in a meshing engagement in which said respective yarn pressors cross the yarn guided in the respective yarn guides of said one of said assembled guides with the yarn guided in the respective yarn guides of the other of said assembled guides as the shafts of said assembled guides are rotated in opposite directions in the loom, and
one of the bent portions in each respective one of said plurality of blocks of each of said assembled guides blocks a respective said yarn guide of one of said plurality of blocks disposed adjacent thereto in the respective assembled guide so that the yarn guided in the yarn guides of said each respective one of said blocks is respectively transferred to the yarn guides of said blocks adjacent thereto as the shaft of said respective assembled guide is rotated.

4,784,188

AIR JET WEAVING MACHINE

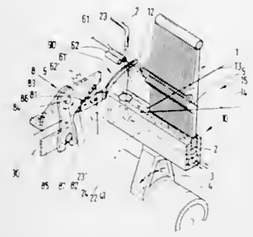
Hubert P. van Mullekom, Deurne, Netherlands, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Dec. 8, 1986, Ser. No. 939,134
Claims priority, application Switzerland, Dec. 20, 1985, 05455/85
Int. Cl.[4] D03D *49/50*
U.S. Cl. 139—116 **7 Claims**

1. An air jet loom in which a warp shed is formed through which a weft yarn may be inserted, said loom comprising a picking nozzle outside said shed for directing an air jet into the shed so as to introduce the weft yarn into the shed, a downwardly directed diverting nozzle for blowing a downwardly moving jet of air upon the occurrence of a machine stop signal, said diverting nozzle being disposed between said picking jet and the adjacent edge of the shed and directing its jet of air into intersecting relationship to the path of the jet of air from said picking nozzle, a receiver below the level of said picking nozzle in alignment with said diverting nozzle for receiving a weft yarn diverted by the jet from said diverting nozzle, and

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yarn guide means for assuring passage of said weft yarn to said receiver under the influence of the jet blown from said diverting nozzle, said yarn guide means being disposed in the zone between the discharge end of the picking jet and the adjacent edge of the shed at a location below the axis of the picking



nozzle and closer to the discharge end of the picking nozzle than the axis of the diverting nozzle, said yarn guide being independent from the blowing nozzle and the funnel and being stationarily mounted on the machine frame; said picking nozzle and funnel being movable together relative to said stationarily mounted yarn guide.

4,784,189

DEVICE FOR SURVEYING THE INSERTION OF A WEFT YARN

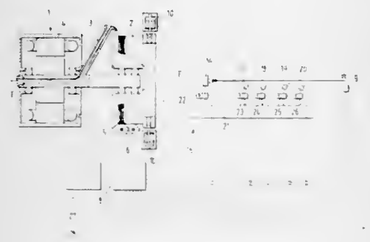
Jerker Hellström, Nol, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Continuation of Ser. No. 56,551, May 29, 1987. This application Feb. 29, 1988, Ser. No. 165,375

Claims priority, application European Pat. Off., May 30, 1986, 86 107377.3

Int. Cl.[4] D03D *47/34*

U.S. Cl. 139—370.2 **10 Claims**



1. Device for surveying the insertion of a weft yarn in a shed of a jet loom, comprising an arrival sensor arranged at one end of said shed for detecting the arrival of the weft yarn, the improvement wherein:

said arrival sensor and at least one yarn sensor, the yarn sensor being located in the vicinity of the withdrawal end of a drum of a yarn feeding device for generating a pulse signal indicating that the yarn passes its detection area during the withdrawal of the yarn from the drum, are connected to a surveillance circuit for generating a completion signal indicating the completion of the insertion of said weft yarn into said shed;

said surveillance circuit measures the period of time lapsed since releasing a stopping device;

said surveillance circuit periodically corrects said measured period of time on the basis of said yarn sensor pulse signal;

said surveillance circuit generates said completion signal, indicating the completion of the weft yarn insertion, if both of the two following conditions are fulfilled:

(1) said measured and corrected period of time exceeds a predetermined period of time, said predetermined period of time is set to be 80% to 99.5% of the period of time required for a complete weft yarn insertion, and

(2) said arrival sensor generates a signal representing the arrival of the weft yarn.

4,784,190

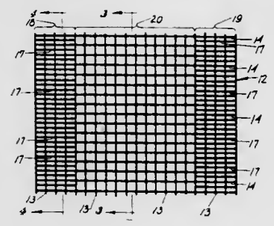
DRYER FABRIC HAVING LONGITUDINAL ZONES OF DIFFERENT PERMEABILITY

Peter Mullaney, Raleigh, N.C., assignor to Huyck Corporation, Wake Forest, N.C.

Division of Ser. No. 382,234, May 26, 1982, Pat. No. 4,460,023, which is a continuation-in-part of Ser. No. 197,551, Oct. 16, 1980, abandoned. This application Apr. 9, 1984, Ser. No. 598,471

Int. Cl.[4] D03D *23/00*; D21F *7/12*

U.S. Cl. 139—383 A **13 Claims**



1. A papermaker's dryer fabric in the form of an endless belt, said dryer fabric comprising machine direction and cross machine direction yarns woven in a multi-layer weave, and additional cross machine direction yarns, in the form of stuffer yarns and of a length shorter than the width of the fabric, being located in said dryer fabric at selected positions across the width of said dryer fabric to produce longitudinally extending zones of different fluid permeabilities.

4,784,191

DEVICE FOR STORING A WEFT YARN FOR INSERTING IN A JET LOOM

Yoshifumi Umemura, Toyoake; Yutaka Sato, Kariya; Kinpei Mitsuya, Aichi; Noboru Kobayashi, Anjo; Kazuhiko Okubo, Kariya, and Masabiko Kako, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 18, 1985, Ser. No. 810,400

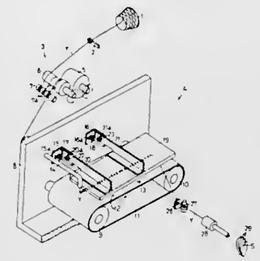
Claims priority, application Japan, Dec. 22, 1984, 59-271618; Dec. 28, 1984, 59-199588[U]; Jan. 11, 1985, 60-2606[U]; Jan. 11, 1985, 60-2605[U]; Jan. 21, 1985, 60-6464[U]; Jan. 25, 1985, 60-9379[U]

Int. Cl.[4] D03D *47/34*

U.S. Cl. 139—452 **15 Claims**

1. A device for storing a weft yarn for inserting in a jet loom comprising a surface which moves in one direction and retains a weft yarn thereon between a yarn-receiving position and a yarn withdrawal-start position spaced away from said yarn-receiving position in said one direction, and a feed nozzle which ejects said weft yarn together with fluid onto said weft yarn retaining surface at said yarn-receiving position, said fluid ejected from said feed nozzle impinging upon said weft yarn retaining surface at an impingement point, characterized in that a narrow blocking means extending transversely of said direction of surface movement for blocking said ejected fluid from the area of said surface downstream of said point engages said surface at a position slightly displaced from said impingement point and for a short distance therebeyond on the side thereof

towards said start position where a weft yarn withdrawal operation is started, said narrow blocking means permitting said yarn, ejected on to the latter, to pass thereunder, said yarn



when retained on said surface between said narrow blocking means and said withdrawal-start position being free of pressure against said moving surface.

4,784,192

PORTABLE RADIAL ARM MACHINE WITH AN ADJUSTABLE OVERALL DIMENSION

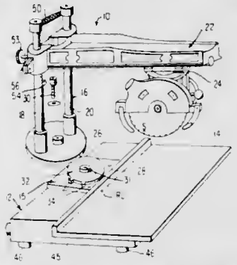
Guglielmo Raggiotti, Via Della Gabbia, 11, 06100 Perugia, Italy

Continuation of Ser. No. 418,671, Sep. 16, 1982, abandoned. This application Dec. 5, 1984, Ser. No. 678,378

Claims priority, application Italy, Sep. 16, 1981, 43515 A/81

Int. Cl.[4] B27B *5/00*

U.S. Cl. 144—35 A **15 Claims**



1. A portable radial arm machine having a working position and a collapsed non-operative transport position comprising:

a stationary base having upper and lower planar surfaces affixed thereto;

a work table secured against rotation with respect to said base and mounted to said upper surface;

first standard receiving means rigidly fixed to said base;

a standard having an upper end and a lower end;

standard mounting means positioned near the lower end of said standard and being pivotally connected to said standard receiving means for receiving said standard and permitting said standard to be pivoted with respect to said base and said first standard receiving means;

means for securing said standard mounting means to said first standard receiving means when said radial arm machine is in a working position and for permitting said standard mounting means to be repositioned with respect to said first standard receiving means when said radial arm machine is converted from the working position to the transport position;

a radial arm having an inner end and a distal end, said inner end slidably received on said standard for vertical movement with respect to said work table when said radial arm machine is in a working position;

a carriage slidably mounted on said radial arm for movement along said arm comprising

a yoke,

a cradle pivotally mounted to said yoke, and

a saw and motor assembly removably attached to said cradle and lying outside the confines of said yoke; and

second standard receiving means remote from said first standard receiving means and fixed to said base to secure said standard to said base when said radial arm machine is in the collapsed nonoperative transport position, wherein when said radial arm machine is in the working position said standard is positioned perpendicularly to said base and said work table, and when said radial arm machine is in the transport position said standard is positioned parallel to said base and said work table.

4,784,193

FLOWMETER

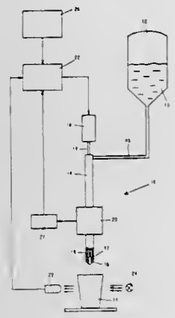
Rudolf Schmied, Konolfingen, and Peter V. Hafner, Liestal, both of Switzerland, assignors to Nestec S. A., Vevey, Switzerland

Filed Jan. 13, 1987, Ser. No. 2,809

Claims priority, application Switzerland, Jan. 22, 1986, 241/86

Int. Cl.[4] B65B *1/30*

U.S. Cl. 141—198 **11 Claims**



1. In a device for monitoring and controlling flow of a fluid product delivered through a pipe line wherein the device includes a control element for influencing the flow of the product in the pipe line, a drive unit for actuating the control element by means of a mechanically displaceable actuating rod extending to the control element and a magnetically inductive flow meter having a measuring tube for measuring fluid product flow for enabling control of the control element, the improvement comprising a pipe line having a magnetically inductive flow meter being positioned and aligned in the pipe line between a drive unit associated with the pipe line and a control element positioned in the pipe line and having an actuating rod being connected with the drive unit extending into the pipe line and axially through a measuring tube of the magnetically inductive flow meter and extending to and being connected with the control element for actuating the control element for influencing fluid product flow.

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4,784,194

INSERTED SUPPORTING MEANS FOR WORKTABLES

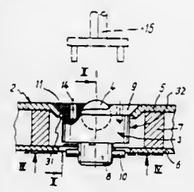
Stefan Danner, Reutlingen-Mittelstadt, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,449

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637559

Int. Cl.⁴ B25N *1/00*; **B65G** *13/00*

U.S. Cl. 144—286 R **19 Claims**



1. In a worktable providing rolling support for a workpiece placed thereon, the combination comprising:

(a) a generally horizontal table member having upper and lower surfaces and a plurality of passages spaced thereabout and extending vertically therethrough, said passages having a generally circular cross section with at least one laterally extending channel extending outwardly from the circumference thereof; and

(b) ball insert units removably seated in said passages, each of said ball insert units including a housing member of generally circular cross section with an upwardly opening recess and a peripheral portion adjacent the upper end thereof engaged with said table member to limit movement downwardly in said passage, a ball element seated in said recess and projecting above the plane of said upper surface of said table member to support a workpiece thereon, and an engagement element adjacent the lower end of said housing member having at least one lock portion projecting laterally outwardly from the circular periphery of said passage and engaged with a cooperating surface of said table member to prevent movement of said ball insert unit upwardly in said passage, said ball insert unit being rotatable in said passage to align said projecting lock portion with said channel to permit insertion and removal of said ball insert unit from said passage, at least one of said ball insert unit and table member having means thereon to resiliently bias said unit and member together to provide resistance to rotation of said ball insert unit within said table member, said ball insert unit having means adjacent its upper end for manipulation to effect rotation of said ball insert unit in said passage and overcome the forces biasing said members together to resist rotation and to effect locking and release of said ball insert member.

4,784,195

APPARATUS AND METHOD FOR HARVESTING WOODY PLANTATIONS

David L. Eggen, Rte. 1, Box 257, Moose Lake, Minn. 55767

Filed Jul. 29, 1987, Ser. No. 79,132

Int. Cl.⁴ A01G *23/08*

U.S. Cl. 144—337 **23 Claims**

1. An tree harvester for harvesting felled trees including:

(a) a wheel mounted, longitudinally extending, main frame;

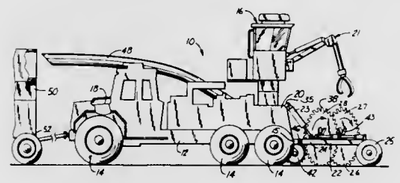
(b) a prime mover associated with the main frame and operable to move the main frame along its longitudinal axis in a forward direction;

(c) a felled tree processor supported on the main frame and having a forwardly facing infeed port for receiving trees to be processed and having an discharge port for discharging processed trees;

(d) tree stem infeed means mounted with respect to the main frame in position to lift stems of felled trees as the main frame moves forward and to carry said stems into the felled tree processor infeed port; and

(e) funneling means extending forwardly of the main frame operable to move trees to be harvested into longitudinal alignment with the tree stem infeed means and the infeed port as the main frame moves in its forward direction.

22. The method of harvesting trees to reduce them to chips of wood fibers, including the following steps:



(a) first felling trees whenever convenient, desirable, necessary or possible and arranging the felled trees in windrows with their tree stems all pointing generally in the same direction;

(b) next as a separate step, when the felled trees are found to have a moisture to wood content within an acceptable predetermined range, feeding the butt ends of the windrowed trees into a tree stem infeed port of a movable tree chipper as the chipper moves along the windrow in direction longitudinally of the tree stems from tree stem butt toward tree tip; and

(c) discharging the resulting wood chips from a chip discharge port of the chipper into a chip hopper moving with the chipper.

4,784,196

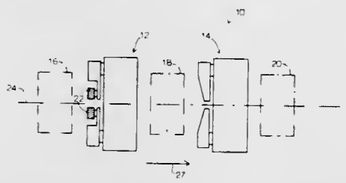
METHOD AND APPARATUS FOR DEBARKING LOGS

Ronald D. Pousette, Vancouver, Canada, assignor to Brunette Machine Works, Ltd., Vancouver, Canada

Filed May 15, 1987, Ser. No. 50,020

Int. Cl.⁴ B27L *7/00*

U.S. Cl. 144—341 **4 Claims**



1. Apparatus for debarking logs having long-fibre bark comprising

a first debarking station including first rotary means having operatively associated revolving cutterhead means operable to remove a portion of a log's bark as the log moves through the station, so as to leave a bark/no-bark, barberpole pattern on the log, and

a second debarking station downstream from said first station, adapted to receive a log exiting the latter and including second rotary means having operatively associated scraper means operable to remove the remaining bark.

4,784,197

BARKING DRUM AND METHOD OF HEATING SAME

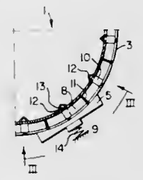
Keijo Alander, Järvelä ; Pekka Kokko, Kartano, and Tuomas Pontela, Soramäki, all of Finland, assignors to KONE Oy, Hyvinkaa, Finland

Filed Apr. 13, 1987, Ser. No. 37,597

Claims priority, application Finland, Apr. 23, 1986, 861596

Int. Cl.⁴ B27L *1/00*

U.S. Cl. 144—342 **9 Claims**



1. A method of supplying pressurized steam or the equivalent into a rotating barking drum for barking tree trunks in order to thaw and warm the bark, including the step of feeding the steam longitudinally of the periphery of said drum and discharging the steam from the periphery of said drum in a substantially radial direction into said drum at locations spaced apart along a substantial portion of the length of said drum.

4,784,198

PROCESS AND APPARATUS FOR LOADING CHIPPING MACHINES WITH LUMBER OF UNIFORM LENGTH

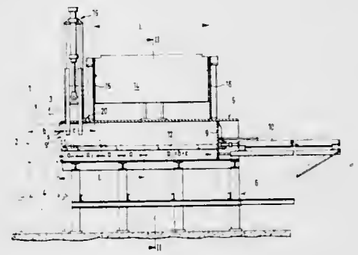
Wilhelm Pallmann, Zweibruecken, Fed. Rep. of Germany, assignor to Pallmann Machinenfabrik GmbH & Co. KG, Zweibruecken, Fed. Rep. of Germany

Filed Apr. 8, 1987, Ser. No. 35,766

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611866

Int. Cl.⁴ B27L *11/00*

U.S. Cl. 144—373 **17 Claims**



4. An apparatus for loading a pile of lumber to be chipped in a wood chipping machine, comprising:

(a) a chipping unit for chipping lumber, said unit having an open compartment into which portions of the pile of lumber to be chipped can be inserted;

(b) a conveying assembly including a trough for holding said pile of lumber oriented longitudinally relative to said trough, said trough having side walls and being open at its opposite ends, with one of said ends opening into said open compartment in said chipping unit;

(c) a loading magazine for holding a pile of lumber and delivering said pile into said trough, said magazine being mounted vertically above said trough and containing at least one movable closure member the opening of which permits said pile of lumber to be delivered to said trough;

(d) a thrust plate mounted for longitudinal movement in said trough from said other open end, in which position a pile of lumber can be delivered from said magazine to said trough, to said one open end adjacent said open compartment in said chipping unit, and

(e) means for periodically advancing said thrust plate an amount bearing a relation to the length of said pile of lumber and the width of said open compartment, said pile of lumber there being cyclically advanced into said open compartment for chipping by said chipping unit.

4,784,199

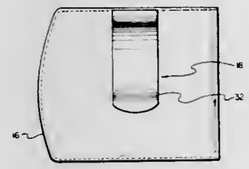
WALLET WITH REMOVABLE CLIP

Bradley W. Wise, 2661 Calle Abedul, Thousand Oaks, Calif. 91360

Filed Jun. 12, 1987, Ser. No. 62,152

Int. Cl.⁴ A45C *1/06, 13/18*

U.S. Cl. 150—134 **8 Claims**



1. A clip-on wallet, comprising:

a wallet opening from the top and having a pocket on the exterior thereof which is open on the bottom, and

a spring clip which is removably lodged in said pocket, the clip when in the pocket providing a means for attaching the wallet to a garment, and when removed from the pocket enabling the wallet to be carried without obstruction by the clip, said clip including a first arm that fits within said pocket, a second arm attached to and spring biased against the first arm from outside the pocket to hold the first arm within the pocket, and a third arm attached to and spring biased against the second arm to grasp a garment between the second and third arms, said first arm fitting snugly into said pocket, and said third arm being substantially greater in width than said first arm and bearing against the wallet lateral to said pocket to limit twisting of the clip with respect to the wallet.

4,784,200

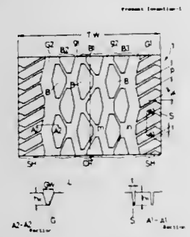
HIGH PERFORMANCE TIRE TREAD

Kenichi Fujiwara, Miki, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Filed Mar. 26, 1986, Ser. No. 844,379

Int. Cl.⁴ B60C *11/03*

U.S. Cl. 152—209 R **5 Claims**



1. A pneumatic radial tire comprising a tread provided with at least two longitudinal main grooves extending circumferentially in a substantially zigzag or wavy line to divide the tread width into two tread shoulder parts and a tread crown part

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therebetween, said crown part having a width of about 30 to 65% of the tread width;

each tread shoulder part having a plurality of generally axially extending narrow grooves to form circumferentially substantially separated blocks;

the width of the narrow grooves being in a range of 0.5 to 5 mm and said narrow grooves having a volume index in a range of 2.5 to 15;

each shoulder part having a circumferential stiffness index in a range of 30 to 70;

wherein the circumferential stiffness index in the shoulder part and the volume index of the narrow grooves are defined as follows:

the Volume Index = $V/(SXd)X100$

wherein:

V = total volume of the cut grooves in the shoulder part
S = surface area of the shoulder part
d = depth of the longitudinal main groove

the Circumferential Stiffness Index = $(Kpt/Kpo)X100$

wherein:

Kpt = circumferential stiffness in the shoulder part after the narrow grooves are provided
Kpo = circumferential stiffness in the shoulder part before the narrow grooves are provided

Circumferential Stiffness = F/y

wherein:

F = tangential force in the circumferential direction of the tire at the ground contacting surface of the shoulder part
y = variation of the ground contacting surface in the circumferential direction of the tire.

4,784,201
NON-PNEUMATIC TIRE WITH VIBRATION REDUCING FEATURES

Richard L. Palinkas, Northfield, Conn.; Scott R. Pajtas, Royal Oak, Mich., and George H. Nybakken, Middlebury, Conn., assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed May 13, 1986, Ser. No. 862,866
Int. Cl.[4] B60B *5/02*
U.S. Cl. 152—323 13 Claims



1. A non-pneumatic tire rotatable about an axis, comprising an annular body of resilient material and having the following:

(a) a generally cylindrical outer member at the outer periphery thereof:

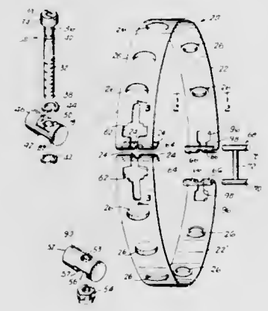
(b) a plurality of radially extending circumferential spaced-apart rib members connected at their outer ends to said cylindrical outer member for the purpose of structurally supporting said cylindrical outer member; and

(c) a tread provided on said cylindrical outer member on its outer surface, said tread comprising lateral grooves having axially inner and outer ends each of said axially inner ends being positioned at or near a central circumferential region of said tread, each of said axially outer ends intersecting an axially outer border of said tread, and each of said axially inner ends being positioned closer to a corresponding rib member than each of said axially outer ends.

4,784,202
WHEEL RIM FASTENER

Basil D. White, Lauder Hill, Fla., assignor to Tyron, Inc., Fort Lauderdale, Fla.

Division of Ser. No. 801,061, Nov. 22, 1985, Pat. No. 4,694,874.
This application Jul. 6, 1987, Ser. No. 69,830
Int. Cl.[4] B60B *21/00, 21/12*
U.S. Cl. 152—381.5 7 Claims



7. A fastener assembly for drawing together spaced apart adjacent ends of an annular well obstructor band, said ends having inwardly disposed flanges thereon, said flanged being adapted to receive a screw therethrough, said fastener assembly comprising:

a threaded screw having a head end, a threaded end, a throat between said head end and said threaded end, and a retaining groove on said throat;

a locking washer adapted to be received onto said throat adjacent said head end;

a locating ring adapted to fit into and to protrude partially from said groove;

a first member having a pair of opposed surfaces thereon, one of said surfaces being adapted to bear against one of said flanges, said first member further having a hole therethrough adapted to receive the throat of said screw but smaller than the head end of said screw, the other surface of said first member surrounding said hole being adapted to abut against said locking washer and said one surface of said first member surrounding said hole being adapted to abut against said locking ring;

a second member adapted to bear against the other of said flanges;

a self-locking nut adapted to screw onto the threaded end of said screw, said second member having an opening therethrough adapted to receive the threaded end of said screw, and a surface adapted to abut against said self-locking nut, said nut being fixedly attached to said second member and prevented from rotating relative to said second member,

said fastener assembly being assembled in a predetermined fashion with said locking washer received over said throat and adjacent said head end, said first member being received onto said throat, said locating ring being received onto said throat and resiliently fitted into said groove to retain said first member between said locking washer and said locating ring, said second member being received over the threaded end of said screw and said self-locking nut being threaded onto the threaded end of said screw, said locating ring preventing the removal of said first member and said threaded screw from said one flange while permitting rotational movement of said screw with respect thereto.

4,784,203
METHOD AND APPARATUS FOR MOUNTING AND REMOVING A PNEUMATIC TIRE

Michael Weiden, Messel, Fed. Rep. of Germany, assignor to Schenck-Auto-Service-Gerate, Fed. Rep. of Germany

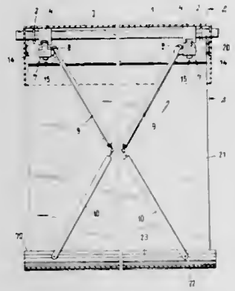
Filed Aug. 29, 1986, Ser. No. 902,207
Claims priority, application European Pat. Off., Sep. 4, 1985, 85111131.0
Int. Cl.[4] B60C *25/06*
U.S. Cl. 157—1.24 7 Claims

1. A device for mounting a pneumatic tire to a rim or removing a pneumatic tire from a rim, the tire and rim having a common axis of rotation and the tire having a pair of spaced apart beads arranged to engage an interior circumferential rim surface spaced radially outward of inwardly extending rim flanges, the device comprising a housing, support means on the housing arranged to hold the tire and rim in a plane, means for rotating the support means about an axis that coincides with the axis of rotation of the tire and rim, a column extending parallel to said axis of rotation secured in place on the housing adjacent the support means and having a longitudinal axis and arranged to rotate about that axis, an outwardly extending arm pivotally connected at one end thereof to the column for movement in an upward and downward direction, a guide roller rotatably connected to the arm at an outer end thereof for rotation about an axis normal to a longitudinal axis of the arm, means for allowing rotation of the guide roller about the longitudinal axis of the arm and means for allowing rotation of the guide roller about its axis, and the guide roller having a first surface for engaging the tire bead and pressing it against the rim flange and a second surface radially outward of the first surface relative to the axis of the guide roller arranged to elastically deform the tire bead until the effective diameter of the deformed bead portion is reduced to the point where it is free to pass into or out of the interior of the rim past one of the rim flanges.

4,784,204
AWNING

Viktor Lohausen, Goldmühlestr. 99/2, D-7032 Sindelfingen, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,198
Claims priority, application Switzerland, Mar. 29, 1984, 1587/84
Int. Cl.[4] E04F *10/06*
U.S. Cl. 160—22 28 Claims



1. An awning comprising:

an awning and a support therefor;

an awning shaft rotatably supported by said support in a substantially horizontal position; means for rotating said shaft;

an awning web having an inner end thereof secured to said awning shaft; said awning web having an outer end opposite said inner web; said awning web being capable of being unwound from said awning shaft with its outer end first;

bearing support means hinged on said support and adapted to be tilted about a tilt axis substantially parallel to said awning shaft;

a front bar for serving as a stretcher bar for said outer end of said awning web;

an articulated arm having an inner end and an outer end; outer joint means pivotally interconnecting said outer end of said articulated arm and said front bar;

inner joint means pivotally interconnecting said inner end of said articulated arm and said bearing support means;

tilt-down limiting means for limiting the tilting movement of said bearing support means occurring when said awning web begins to be unwound, said tilt-down limiting means including screw bolt means having a longitudinal axis and being pivotally mounted on said support about a pivoting axis parallel to said tilt axis, adjustable abutment means on said screw bolt means, and counter-abutment means on said bearing support means for being abutted by said abutment means;

tilt-up catching means including

socket means having a peripheral wall and being movable between a locking position and a releasing position,

slot means in said peripheral wall arranged to embrace said screw bolt means at least in said locking position,

guide means on said bearing support means for guiding the movement of said socket means, and

drive means connected with said articulated arm to provide a synchronized movement of said socket means;

said abutment means comprising lug means extending substantially normally to said screw bolt means, in the locking position of said socket means, said lug means being embraced by said socket means.

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4,784,205

DISPLAY SYSTEM

David B. Johnson, 3967 Hayes NE., Columbia Heights, Minn. 55421; Fredrik A. Johnson, 4135 Brunswick Ave. S., St. Louis Park, Minn. 55416, and Robert R. Zuehlsdorff, 19541 E. Front Blvd., NE., Wyoming, Minn. 55092

Filed Nov. 13, 1986, Ser. No. 930,713
Int. Cl.[4] A47G *5/00*
U.S. Cl. 160—351 8 Claims



1. A kit for constructing a portable display system, comprising:
(a) a plurality of generally H-shaped members, each of said members being sized and shaped substantially the same as the other of the members and including a pair of generally parallel legs defining a common plane, and a corresponding cross-bar, offset from said plane defined by associated legs, interconnecting said leg;
(b) means for mating either leg of one of said generally H-shaped members with either leg of another of said members, with mated legs aligned along an axis;
(c) means for disposing an assembly of mated generally H-shaped members wherein said assembly angles away from a surface on which the display system is to be posited; and
(d) at least one segment of flexible backdrop material attachable to said assembly to drape downwardly over at least a portion thereof;
(e) wherein said generally H-shaped members can be nested together.

4,784,206

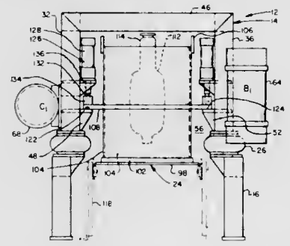
SAND VIBRATION AND COMPACTION APPARATUS AND METHOD

Robert G. Sauerman, Euclid; Russell Shimandle, Jr., Seville; Gregory Piontkowski, Parma; Matthew A. Baca, Northfield, and Donald L. Southam, Brecksville, all of Ohio, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 3, 1987, Ser. No. 128,063
Int. Cl.[4] B22C *15/10*
U.S. Cl. 164—18 39 Claims

5. A sand molding compaction unit comprising:
a frame having a vertical axis and shaped so that the center of gravity of the frame falls on the vertical axis;
means for resiliently connecting the frame to a rigid support, to permit limited horizontal and vertical oscillation of the frame relative to the support;
a sand molding flask rigidly supported within the frame and shaped such that the center of gravity of the flask when filled with sand lies within the frame substantially on the frame vertical axis;
first vibrator means for generating an oscillating force vector on the frame along a first horizontal axis passing through the center of gravity of the flask;
second vibrator means for generating an oscillating force vector on the frame along a second horizontal axis orthogonal to the first axis, passing through the center of gravity of the flask;
third vibrator means for generating an oscillating force vector on the frame along said vertical axis; and
means for independently controlling the magnitude and duration of the force vectors generated by the first, second and third vibrator means.

37. A method of operating a sand molding compaction system having a plurality of substantially identical rigid mold flasks, each adapted to contain a substantially identical mold pattern and sand, the frame including means for selectively rigidly connecting the frame to at least one of the flasks, means resiliently mounting the frame to a rigid support, at least one pair of motors coupled to the frame for movement with the frame, and means for synchronizing the motors to produce an oscillating net force vector acting on the flask, comprising the steps of:
(a) disconnecting and removing a first flask from the frame;



(b) operating all the motors in synchronized phase relationship at low speed to drive the frame slowly with an idle net vector;
(c) rigidly connecting a second flask to the frame while the frame is driven slowly by the idle vector;
(d) positioning a pattern in sand within the second flask;
(e) operating each motor pair in synchronized phase relationship in a predetermined sequence of high speeds to generate at least one net compaction vector on the frame, for compacting the sand around the pattern in the second flask;
(f) operating all the motors in synchronized phase relationship at low speed to drive the frame slowly;
(g) disconnecting and removing the second flask and contained pattern from the frame while the frame is driven in accordance with step (f); and
(h) repeating steps (b) - (g) successively with each of the remaining flasks and patterns.

4,784,207

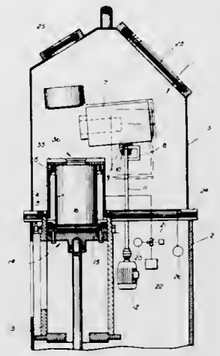
APPARATUS FOR VACUUM MELTING AND CASTING

Eliseo Di Maio, Milan, Italy, assignor to Mario Di Maio S.p.A., Milan, Italy

Continuation of Ser. No. 822,771, Jan. 24, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 110,555
Claims priority, application Italy, Jan. 31, 1985, 20657/85[U]; Jan. 8, 1986, 20416/86[U]
Int. Cl.[4] B22D *18/06, 27/15*
U.S. Cl. 164—255 5 Claims

1. Apparatus for casting comprising:
a bell;
a furnace contained in the bell for metal melting;
a mold having gas-permeable walls;
a vessel within the bell for receiving said mold for casting molten metal;
means for inserting said mold into said vessel without lifting said bell;
means for inclining said furnace for flowing molten metal into said mold received in said vessel;
means for producing a first level of vacuum inside said bell for removing gas pockets from molten metal;

means for producing a second level of vacuum, higher than said first level, inside said vessel substantially contempora-



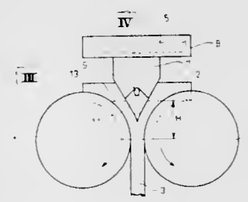
neous with inclining of said furnace for evacuating through said gas-permeable walls of the mold gases that form when molten metal touches said walls of said mold.

4,784,208

DUAL ROLL TYPE CONTINUOUS CASTING MACHINE

Hisahiko Fukase, Tokyo; Kunio Matsui; Akihiro Nomura, both of Yokohama; Kenji Matsuda, Matsudo, and Atsushi Hirata, Hiratsuka, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 16, 1988, Ser. No. 168,696
Claims priority, application Japan, Mar. 24, 1987, 62-69596
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—428 9 Claims



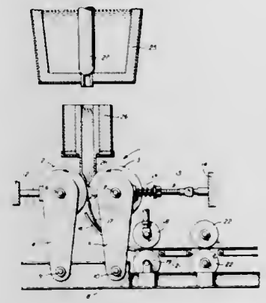
1. In a dual roll type continuous casting machine having cooling rolls disposed in parallel with each other, side seal plates disposed at opposite end faces of said cooling rolls to define together with said cooling rolls a molten bath and a core inserted and supported within said molten bath, an improvement comprising inside pouring passage means formed through said core for supplying a molten metal vertically into a gap between said cooling rolls and side pouring holes formed through longitudinally opposite ends of said core to open in opposed relationship with said side seal plates, each of said side pouring holes terminating in a cut-out portion to define together with the corresponding side seal plate a molten metal passage.

4,784,209

CONTINUOUS CASTING APPARATUS

Joseph W. Hlinka, Bethlehem, Pa., and George J. Drumheller, Worcester, Mass., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 6, 1987, Ser. No. 82,393
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—428 4 Claims



1. Apparatus for the continuous casting of molten metal comprising:
(a) a base member;
(b) a first pair of vertical support members connected to said base member and supporting a first rotatable cylindrical casting roll in a fixed horizontal position above said base member;
(c) a second pair of vertical support members pivotally connected to said base member and supporting a second rotatable cylindrical casting roll, in a horizontal position above said base member;
(d) spring means to adjust the position of said second casting roll relative to said first casting roll.

4,784,210

METHOD AND INSTALLATION FOR REPLACEMENT OF MOLD IN BLOCK TYPE MOVING MOLD CONTINUOUS CASTING MACHINE

Shuzo Takahashi, Yokohama; Yutaka Tsuchida, Yokosuka; Shiro Osada, and Nobuhisa Hasebe, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha and Nippon Kokan Kabushiki Kaisha, both of, Japan

Filed Jan. 7, 1988, Ser. No. 141,636
Claims priority, application Japan, Jan. 30, 1987, 62-20143
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—479 9 Claims



1. A method for replacement of a mold in a block type moving mold continuous casting machine comprising the steps of releasing clamping forces of clamps exerting on opposite sides of a block mold for secure mounting thereof on a corresponding carrier of an endless track, retracting at least the clamps on one of said opposite sides, shifting said block mold in a direction of said retracted clamps to thereby remove said block mold, and installing and securely clamping substitutive block mold in position.

6. An installation for replacement of a mold in a block type moving mold ontinuous casting machine wherein block molds

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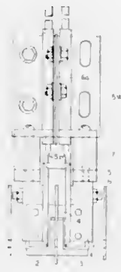
are joined to a plurality of carriers, comprising pivoted clamps at opposite sides of each of said carriers for securely clamping a corresponding block mold; springs loaded below said carrier for biasing said clamps in a direction of said clamps securely clamping the block molds; a passage groove on an undersurface of the block mold for allowing said block mold to pass without interference with said clamps in their released positions; clamp release means disposed in positions on opposite sides of said endless track; and pushing means adjacent to said clamp release means and on one side of said endless track for pushing the block mold.

4,784,211

APPARATUS FOR INTERCELL FUSION OF BATTERY CONNECTIONS

William E. Mullane, Warren, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio

Filed May 7, 1987, Ser. No. 46,679
Int. Cl.[4] B22D *19/04, 23/06*
U.S. Cl. 164—513 **8 Claims**



1. For use in a battery having flat tombstone type connections, each having a pair of vertical and horizontally outward extending portions of fusible material, each pair of vertical portions snugly surrounding a vertical partition of electrically insulating material having a horizontal hole; intercell fusing apparatus comprising a mold closely surrounding each pair of vertical portions and surrounding a partition portion above said hole, a pair of interconnected inverted U-shaped induction coils snugly surrounded by said mold, and a source of alternating current for energizing said coils at a frequency to fuse the vertical portions of said connections so as to fill said hole.

4,784,212

BUILDING PERIMETER THERMAL ENERGY CONTROL SYSTEM

Benny Brimer, Anaheim; William A. Hays, Jr., Dana Point, and Dieter L. Rall, Newport Beach, all of Calif., assignors to Transmet Engineering, Inc., Anaheim, Calif.

Filed Nov. 21, 1986, Ser. No. 933,473
Int. Cl.[4] F25B *29/00;* **G05D** *23/00*
U.S. Cl. 165—2 **14 Claims**

1. A method for regulating a building thermal energy control system comprising:

storing in a data memory a predetermined set point temperature for a building space;

measuring the temperature of the space by use of a temperature sensor which is reactive to the instantaneous temperature of the space to generate instantaneous temperature signals proportional thereto; entering said instantaneous temperature signals into the data memory;

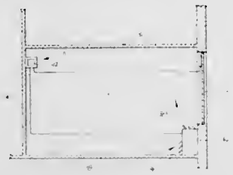
comparing said set point temperatures with said instantaneous temperature signals in the data processor to produce temperature deviation signals;

measuring over an extended period of time the magnitude and direction of heat flow through an envelope surrounding said building space, said envelope being exposed to outside weather conditions and said measurements being made by a heat flow sensor which is reactive to the instantaneous magnitude and direction of heat flow through said envelope to generate instantaneous heat flow signals proportional thereto;

storing said instantaneous heat flow signals in the data memory over said extended period of time;

summing said instantaneous heat flow signals in a data processor to produce control signals having magnitudes and signs representative of the net magnitudes and directions of said summations of said instantaneous heat flow signals;

producing output signals form the data processor in response to the magnitudes and signs of said control signals;



varying the gain of said output signals in accordance with said temperature deviation signals so that said gain increases and decreases in proportion to increases and decreases in the magnitudes of said temperature deviation signals;

applying the output signals to interface means which operates a thermal energy control system adapted to introduce thermal energy into the building space; and

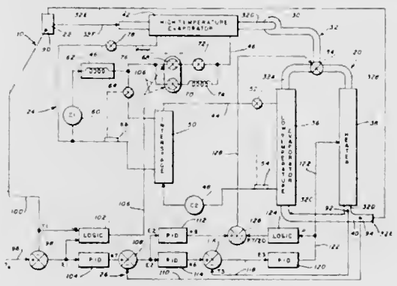
regulating the operation of said thermal energy control system in response to the gain of said output signals to introduce thermal energy at a higher rate when the temperature deviation signals are relatively large and at a lower rate when the temperature deviation signals are relatively small.

4,784,213

MIXING VALVE AIR SOURCE

George Eager, Cambridge, Mass.; Thomas J. Schey, Woonsocket, R.I., and Peter Selverstone, Cambridge, Mass., assignors to Temptronic Corporation, Newton, Mass.

Filed Apr. 8, 1986, Ser. No. 849,532
Int. Cl.[4] G05D *23/19, 23/13;* **F25B** *29/00*
U.S. Cl. 165—2 **18 Claims**



10. A method of precisely controlling the temperature at a predetermined location at a preselected temperature selected from a range of temperatures, said method comprising the steps of:

generating a pressurized stream of fluid;

separating said stream into first and second component streams;

heating said first component stream in response to a first control signal, wherein said first control signal is a power signal provided for heating said first component stream;

cooling said second component stream;

mixing said first and second component streams so as to provide a mixed stream;

controlling the amount of mixing of said first and second component streams in response to a second control signal;

carrying said mixed stream to said location; and

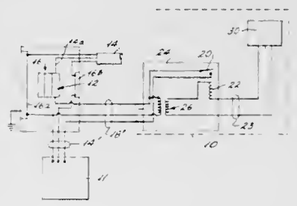
generating (1) said first control signal as a function of the preselected temperature, the temperature of said heated first component stream, the temperature of the mixed stream and said temperature at said predetermined location, and (2) said second control signal as a function of the preselected temperature, the temperature of said mixed stream and said temperature at said predetermined location, wherein said step of generating said first control signal includes the step of comparing said power signal to a predetermined maximum limit and said step of controlling the amount of mixing includes a step of adjusting the relative amounts of said first and second component streams mixed during said step of controlling the amount of mixing so as to substantially limit the power required for heating said first component to said maximum limit.

4,784,214

CONTROL SYSTEM FOR A RECREATIONAL VEHICLE'S AIR-CONDITIONING/HEATING UNIT

Joe R. Penson, Rt. 4, Box 754, Louisville, Tenn. 37777, and Randy H. Alfrey, 1406 Reaves Ave., Knoxville, Tenn. 37912

Filed Feb. 13, 1987, Ser. No. 14,363
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—25 **2 Claims**



1. A secondary control system for a RV's air-conditioning-/heat unit having a primary control at said unit for selectively energizing said heat/cooling unit and having a circuit breaker through which power is supplied to said air-conditioning/heating unit from a conventional power line, said secondary control system comprising:

switch means provided with an AC voltage reduction means, said voltage reduction means having an input connected to said circuit breaker, and a low voltage output, said switch means further provided with an electromagnetic relay having a normally open contract, said contract connected in series with said unit such that said unit is energized when said contact is closed and said unit de-energized when said contact is open; and

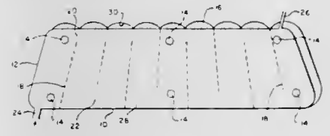
low voltage control means connected to said output of said voltage reduction means for placement in said RV at a selected location removed from said primary control to regulate air-conditioning/heating at said selected location, said low voltage control means connected to said relay for selectively opening and closing said normally open contact, said low voltage control means including an override means for manually closing said contact to shift control of said unit to said primary control, and an alternatively operable thermostatically controlled means for selectively opening and closing said contact in response to the temperature ambient said secondary control means.

4,784,215

THERMAL INSULATING SHADES

Peter Sing, 43 Donny Brook Rd., Scarsdale, N.Y. 10583

Filed Aug. 1, 1986, Ser. No. 893,009
Int. Cl.[4] A47H *5/00;* **E06B** *3/94;* **F24J** *2/36*
U.S. Cl. 165—41 **9 Claims**



1. Thermal insulating shade to be placed adjacent to and substantially overlaying the interior surface of an area to be insulated, the exterior surface of said area being exposed to variable weather conditions including sun's heat and winter's cold, the thermal insulating shade being both reversible and removable and comprising:

a plurality of panels, at least one of which has a highly reflective surface on one side thereof, said panels being shaped to conform in size and shape to the interior surface of the area to be insulated;

means for supporting said panels in spaced, substantially parallel relationship to each other to provide air space therebetween;

means for releasably mounting said plurality of panels in substantially parallel spaced relationship to the interior surface of the area to be insulated, so that one side of the thermal shade is insulated from the heat or cold prevailing on the other side thereof by reflection of said highly reflective surface, as well as by the insulating effect of said air space between said panels; and

means for circulating air through said air space to increase the insulative effect of the thermal shade, said air space being divided into a path for the flow of air provided between said panels, said path being longer than the distance from one end to the other of said panels, said path being provided by attaching each of said panels to its adjacent panel in parallel spaced lines to form air passages therebetween in such a way that each of said spaced attachment lines are terminated short of alternately opposite edges of the thermal shade, leaving openings for the passage of air from one said air passage to the next at alternating edges of the thermal shade.

4,784,216

HEATING AND/OR DRYING APPARATUS

Paul E. Bracegirdle, P.O. Box 113, Penndel, Pa. 19047; David L. Garbelman; Stuart W. Murray, both of Edmond, Okla., and George W. Swisher, Jr., Oklahoma City, Okla., assignors to Paul E. Bracegirdle, Penndel, Pa. and CMI Corporation, Oklahoma City, Okla.

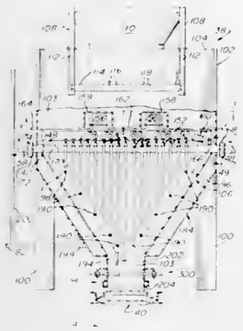
Filed Sep. 8, 1986, Ser. No. 905,367
Int. Cl.[4] F25B *29/00;* **F26B** *17/12;* **E01C** *19/10*
U.S. Cl. 165—64 **7 Claims**

1. Apparatus for indirectly heating aggregate material containing at least some liquid comprising a preheater-condenser for preheating the material, a heater for heating the preheated material and for generating a vaporous heater generated heat transfer fluid from the material, first conduit means connecting the preheater-condenser to the heater through which the heater generated heat transfer fluid is carried from the heater to the preheater-condenser, and conveyor means for conveying preheated material from the preheater-condenser to the heater,

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the preheater-condenser including a housing, inlet means through which the material enters the housing, outlet means for discharging the preheated material from the housing, first hollow heat exchange means supported vertically within the housing, first distributing means connecting the first conduit means and the first hollow heat exchange means for distributing the heater generated heat transfer fluid to the first hollow heat exchange means, and condensate removal means connected to the first hollow heat exchange means for removing from the housing condensed heater generated heat transfer fluid from the first hollow heat exchange means,

the heater including a receptacle and a chamber in which the material is heated, a sealable inlet means through which



the preheated material to be heated enters the receptacle, but through which gases formed in the heater will not escape to the atmosphere, the chamber having outlet means through which heated material is discharged from the chamber, heating means supported in a vertical orientation within the chamber, a plurality of collecting means supported within the chamber for collecting the heater generated heat transfer fluid from the material being heated, and accumulating means for accumulating the heater generated heat transfer fluid from the plurality of collecting means, the accumulating means being in communication with the collecting means and with the first conduit means through which the heater generated heat transfer fluid flows to the preheater-condenser.

4,784,217

THERMOCHEMICAL METHOD AND DEVICE FOR STORING AND UNSTORING HEAT

Didier Payre, Perpignan; Nathalie Mazet, Castelnau le Lez; Sylvain Mauran, and Bernard Spinner, both of Perpignan, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

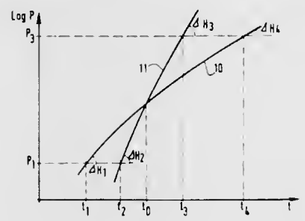
Filed Jun. 2, 1986, Ser. No. 869,528

Claims priority, application France, Jun. 4, 1985, 85 08408

Int. Cl.[4] F25B *17/00*

U.S. Cl. 165—104.12 **12 Claims**

1. A thermochemical device for storing and unstoring heat with increasing thermal potential, which device comprises, first and second reactors, each in contact with an external medium, the said first and second reactors, each comprising first and second reversible monovariant exothermic reactions, respectively, between a gas and first and second reagents, respectively, the said first and second reactions having Clapeyron curves that intersect in the working temperature range of the said device, and said first and second reactors being connected to each other by a communicating pipe so as to define



a confined space and permit the transfer of the gas between the reactors.

4,784,218

FLUID HANDLING APPARATUS

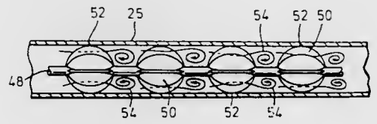
Richard A. Holl, #2 - 1507 Upper Middle Road, Burlington, Ontario, Canada L7P 4M5

Continuation of Ser. No. 739,777, Jun. 3, 1985, Pat. No. 4,670,103, which is a continuation of Ser. No. 438,300, Nov. 1, 1982, abandoned. This application Aug. 22, 1986, Ser. No. 899,454

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[4] F28F *1/40, 9/24*

U.S. Cl. 165—109.1 **13 Claims**



1. In a fluid handling apparatus an interrupter structure adapted for interruption of the boundary layer of a fluid flow at an apparatus surface or surfaces of the apparatus immediately adjacent to the interrupter structure, the said structure comprising:

a multiplicity of bladed interrupter elements disposed longitudinally relative to one another in the direction of flow of the fluid,

each interrupter element comprising a common core and at least three blade-like members extending mutually outwardly from the common core so as to separately touch or nearly touch the said apparatus surface or surfaces immediately adjacent to the respective element, each blade-like member being of at least approximately spherical segment profile in side elevation so that the portion thereof most closely adjacent to the respective apparatus surface protrudes into the said fluid flow boundary layer for pointwise interruption in a zone thereof;

each element thereby providing a number of adjacent pointwise boundary layer interruption zones corresponding to the number of blade-like members thereof.

4,784,219

HEAT EXCHANGER

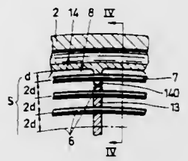
Georg Hirschle, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 15, 1985, Ser. No. 766,029

Claims priority, application Switzerland, Aug. 15, 1984, 3912/84-3

Int. Cl.[4] F28D *7/00;* F28F *9/22*

U.S. Cl. 165—160 **20 Claims**



1. A heat exchanger comprising

a pressure vessel;

a cylindrical gas flue in said pressure vessel for conveying a hot gas from an inlet zone to an outlet zone;

a tube bunch within said gas flue for conveying a cooling medium therethrough in heat exchange relation with the flow of hot gas, said tube bunch having an outermost coil of tubes transverse to the gas flow and spaced from said gas flue to define an annular crevice duct of a dimension that, at the working temperature, the average temperature of the gas issuing from said crevice duct is substantially equal to the average temperature of the gas issuing from the remainder of said tube bunch; and

means for maintaining the average heat flow through said outermost coil of tubes substantially equal to the average heat flow through the remaining tubes of said tube bunch during heating and radial expansion of said flue.

4,784,220

PIPE SPACING GRATE ROD SPACING HOLDER FOR HEAT EXCHANGERS

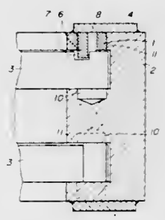
Ulrich Engel, Oberhausen, Fed. Rep. of Germany, assignor to Man Gutrhoffnungshütte GmbH, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 93,824

Claims priority, applicatioo Fed. Rep. of Germany, Sep. 19, 1986, 3631886

Int. Cl.[4] F28D *7/00;* F28F *9/00*

U.S. Cl. 165—162 **7 Claims**



1. A space holder for grate rods of a pipe spacing grate for guiding pipes of heat exchangers, comprising: a grate formed of plurality of intersecting grate rods arranged in more than one plane said grate rods each having grate rod ends each end having a recess; a substantially cylindrical frame having a groove around the inside of said frame for reception of the ends of the grate rods, the frame including a plurality of bores communicating with the groove, each having a central axis; a plurality of distance bolts, each of said bolts having a transverse slot for reception of one of said plurality of grate rods, each of said distance bolts having a projecting piece positioned in the transverse slot adapted to engage with said corresponding recess of the end of one of said plurality of grate rods so as to provide mutual spacing of said grate rods in said frame.

4,784,221

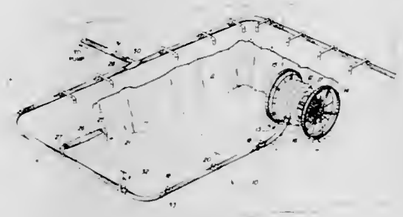
WELLPOINT SYSTEM AND REEL

Jack H. Share, P.O. Box 67, Port Orange, Fla. 32019, and Stanley Share, 211 Ellicott Dr., Ormond Beach, Fla. 32074

Filed May 27, 1987, Ser. No. 54,795

Int. Cl.[4] E21B *43/00;* E02B *11/00*

U.S. Cl. 166—52 **8 Claims**



1. A flexible wellpoint header pipe distribution apparatus comprising:

a wheel transport having at least two wheels;

an axle having each said wheel rotatable separately thereon;

a flexible wellpoint header pipe reel mounted to said axle and rotatable relative to said wheels;

reel handles attached to said reel for rotating said reel relative to said wheels;

flexible wellpoint header pipe wrapped around said reel and adapted to be reeled off responsive to rotation of said flexible wellpoint header pipe reel by rotation of said reel;

an annular ratchet being attached to said flexible wellpoint header reel and a pair of pawls being attached to one said wheel; and

means to engage one of said pawls with said annular ratchet to thereby allow said reel to rotate in only one direction relative to said wheels when one said pawl engages said annular ratchet.

4,784,222

WELLHEAD SEALING ASSEMBLY

David L. Ford, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Sep. 17, 1987, Ser. No. 98,195

Int. Cl.[4] E21B *33/03*

U.S. Cl. 166—85 **8 Claims**

1. A sealing assembly for sealing across a wellhead annulus between an outer member forming an outer concave annulus surface and an inner member forming an inner convex annulus surface and having an upwardly facing surface comprising

an annular body,

a sealing ring secured to said body and having inwardly extending sealing lips for sealing against the inner convex annulus surface and an upstanding rim having an outer diameter to be in close spaced relationship to the outer concave annulus surface,

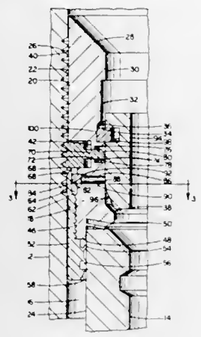
locking segments supported by said body and being movable radially outward into locking engagement with said outer concave annulus surface,

loading segments supported by said body and being movable radially outward into loading engagement with the interior of said upstanding rim of said sealing ring, and

means positioned within said body for moving said locking

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segments and said loading segments radially outward to lock said body at its position with said annulus and to



force said upstanding rim outward into sealing engagement with said outer concave annulus surface.

4,784,223

FORMING AN IMPERMEABLE COATING ON A BOREHOLE WALL

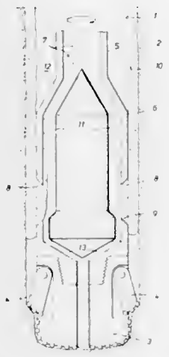
Robert N. Worrall, and Robert B. Stewart, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 21, 1986, Ser. No. 933,667

Claims priority, application United Kingdom, Dec. 30, 1985, 8531866

Int. Cl.[4] E21B *33/138*

U.S. Cl. 166—287 **34 Claims**



1. A method of forming an impermeable coating on the wall of a borehole in which a drill string is present, the method comprising:

injecting a slurry containing coating forming components in a pelletized form and a low viscosity carrier fluid through the drill string;

separating said components from the carrier fluid at a location close to the bottom of the borehole;

packing said separated components against the borehole wall as a continuous layer; and

allowing the layer of packed coating forming components to harden to an impermeable coating.

27. A method of forming an impermeable coating of the wall of a borehole in which a drill string is present, the method comprising:

injecting a slurry comprising coating-forming components and a carrier fluid through the drill string;

separating said components from the carrier fluid at a separator in the drill string;

packing said components against the borehole wall as a continuous layer;

allowing the layer of packed coating-forming components to harden to an impermeable coating; and

enhancing the coagulation of the coating-forming components by applying a heat source to the packed components.

4,784,224

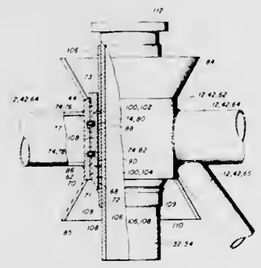
CASING GUIDE FOR WELL TEMPLATE

Colin P. Leach, and Charles N. White, both of Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 917,763, Oct. 10, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 127,351

Int. Cl.[4] E21B *43/01*

U.S. Cl. 166—339 **14 Claims**



1. A casing guide apparatus, comprising:

a well template having a template housing with a housing bore therethrough defining a well opening;

a cylindrical well casing received through said well opening; and

bushing means, operably associated with said template and said casing, for permitting relative vertical movement between said template and said casing and for preventing relative lateral movement between said template and said casing at said well opening wherein said bushing means includes:

a cylindrical bushing member having a cylindrical inner bushing bore within which said casing is closely received; and

latch means, operably associated with said bushing member and said well opening of said template, for latching said bushing member into a fixed position within said well opening upon insertion of said casing and said bushing means downwardly into said well opening of said template said latch means including:

an annular latching groove defined in said housing bore; and

radially outwardly biased locking means, connected to said bushing member and extending radially outwardly from said bushing member, for receipt in said latching groove of said housing bore of said template.

9. A method of constructing an underwater well, said method comprising the steps of:

(a) placing a well template having a well opening defined therein on a floor of a body of water;

(b) assembling a bushing means with a well casing;

(c) lowering said well casing downward through said well opening of said template until a lower portion of said casing is received in a well bore;

(d) connectably engaging said bushing means with said well template so that said bushing means is substantially fixed

relative to said template for preventing lateral movement of said casing relative to said template at said well opening;

(e) fixing said lower portion of said casing into said well bore; and

(f) allowing said bushing means to slide downward relative to said casing as said well template settles into said floor, thus eliminating a danger of buckling of an upper portion of said casing upon settling of said well template.

4,784,225

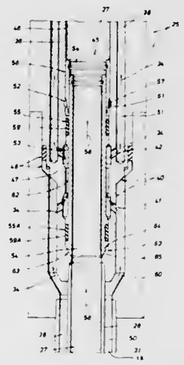
WELL VALVE ASSEMBLY METHOD AND APPARATUS

William H. Petersen, Kingwood, Tex., assignor to Shell Offshore Inc., Houston, Tex.

Filed Mar. 26, 1986, Ser. No. 844,430

Int. Cl.[4] E21B *34/06*

U.S. Cl. 166—373 **11 Claims**



1. A well valve assembly for use in controlling the flow of fluids through a passage defined through a well, said well having at least one throughbore defined therethrough, said passage being located outward from said throughbore, said well valve assembly comprising:

housing means having said throughbore defined therethrough, said housing means forming a portion of the well tree of said well, said housing means having:

flow stop means capable of blocking the flow of fluid through said passage, said flow stop means dividing in a fluid-tight manner said passage into a first annulus and a second annulus; and

flow opening means having first flow opening means defining at least one opening between said first annulus and said throughbore and having second flow opening means defining at least one opening between said throughbore and said second annulus, for placing said first annulus in fluid communication with said throughbore, and placing said throughbore in fluid communication with said second annulus; and

a first portion of latch means operatively formed by said housing means; and

valve-insert means capable of being lowered into the housing means after said housing means form a portion of said well tree, said valve insert means having a second portion of said latch means operatively formed thereto, said valve insert means being latched by cooperative engagement of said first portion and said second portion of said latch means operatively formed thereto, said valve insert means being latched by cooperative engagement of said first portion and said second portion of said latch means at a gauged position within said throughbore adjacent said housing means after having been lowered within said housing means, said valve insert means being movable through at least a portion of said throughbore defined through and above said housing means and being capable of selectively controlling the flow of fluids through said passage when latched in said gauged position.

4,784,226

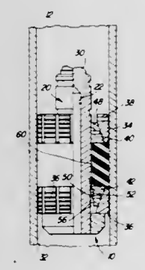
DRILLABLE BRIDGE PLUG

Mark L. Wyatt, Tulsa, Okla., assignor to Arrow Oil Tools, Inc., Tulsa, Okla.

Filed May 22, 1987, Ser. No. 53,828

Int. Cl.[4] E21B *33/129*

U.S. Cl. 166—376 **14 Claims**



1. A drillable bridge plug for sealing a well casing using a setting assembly and adapted to be readily drilled out to remove said bridge plug, said bridge plug comprising:

an inner mandrel having detachable means for connecting said bridge plug to the setting assembly formed at the upper end of said mandrel, said mandrel including a partial axial bore open to the bottom of said bridge plug, said partial bore operating as a fluid bypass passageway when said bridge plug is drilled out to provide pressure equalizing fluid communication above and below said bridge plug;

upper slip means and lower slip means mounted on said mandrel and adapted to selectively engage the well casing to anchor said bridge plug;

an elastomeric packing element mounted on said mandrel between said upper slip means and said lower slip means; and

upper and lower compression cones mounted on said mandrel, said cones operable to deform said packing element into sealing engagement with the well casing upon setting of said bridge plug;

a lock nut movably mounted on said mandrel adjacent said lower compression cone, said lock nut cooperating with ratchet threads formed on said mandrel and said lower compression cone to maintain compression of said packing element and prevent rotation of said bridge plug as said plug is drilled out;

said inner mandrel including said connecting means, said upper slip means, said lower slip means and said compression cones being made of cast iron wherein said bridge plug may be drilled out of the well casing.

4,784,227

AGRICULTURAL IMPLEMENTS

Keith J. Cosson, 416 N. Washington, Grand Island, Nebr. 68801

Continuation-in-part of Ser. No. 929,189, Nov. 10, 1986. This application Jun. 26, 1987, Ser. No. 66,489

Int. Cl.[4] A01B *39/26, 39/12*

U.S. Cl. 172—508 **20 Claims**

20. A ditching implement which is useful for ditching soil between row crops, said implement comprising:

(a) a depending shank member;

(b) a shield member attached to said shank in a generally

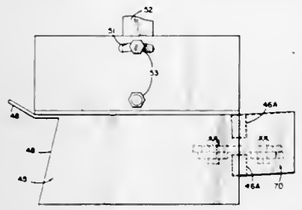
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horizontal plane; wherein the front edge of said shield member is sloped upwardly; wherein said shield member extends outwardly from opposite sides of said shank at least about 8 inches;

(c) a V-shaped plate member disposed beneath said shield member; wherein said plate member comprises first and second plates which are secured together at leading ends;

(d) a brace member connected between said plates;

(e) first and second wing members; wherein said wing members are each attached to separate mounting brackets; and wherein said mounting brackets are adjustably mounted to said brace member in a manner such that the angle between each said wing member and each said plate may be increased or decreased;



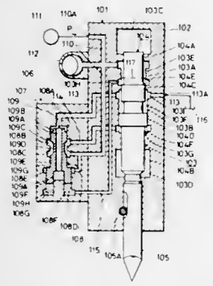
(f) support means adapted to support said shank member; wherein when said V-shaped plate member is pulled through the soil said shield member, said V-shaped plate member, and said wing members urge said soil outwardly from said shank to form a ditch between said row crops.

4,784,228

IMPACT DEVICE

Ikuo Ito, Nagoya, Japan, assignor to Teisaku Co., Ltd., Nagoya, Japan

Filed Sep. 9, 1987, Ser. No. 94,697
Claims priority, application Japan, Sep. 9, 1986, 61-138470
Int. Cl.⁴ B25D *9/18*
U.S. Cl. 173—134 **5 Claims**



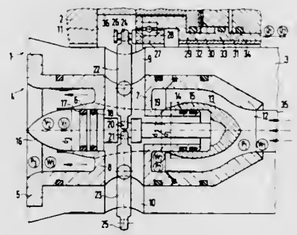
1. An impact device that consists of a housing having a bore, a piston, and a change-over valve for control of the reciprocal movement of the piston; the piston is reciprocable in the bore and consists of an upper shaft and a lower shaft, the diameter of said upper shaft is smaller than the diameter of said lower shaft and an upper flange part is formed in a middle part of said upper shaft of said piston and a lower flange part is formed at an upper end of said lower shaft, the diameter of said upper flange part is smaller than the diameter of said lower flange part and substantially the same as the diameter of said lower shaft and an upper surface of said upper flange part is a pressure effective surface for descending and a lower surface of said lower flange part is a pressure effective surface for ascending, the area of said lower surface of said lower flange part is larger than the area of said upper surface of said upper flange part, the bore consists of an upper bore in which said upper flange part is inserted and a lower bore in which said lower flange part is inserted, and said bore has an upper space formed in an upper side from said upper flange part of said piston, a middle space formed between said upper flange part and said lower flange part of said piston, and a lowre space formed in the lower side from said lower flange part of said piston, wherein said piston is pressed to descend and the lower space of said bore which supplies the hydraulic pressure to said lower surface of said lower flange part of said piston for ascending is reciprocally connected to a high pressure path and a low pressure path by the change-over movement of a change-over valve driven by hydraulic pressure corresponding with the position of said piston so that said piston is driven to descend and ascend reciprocally.

4,784,229

DEVICE, PREFERABLY FOR UNDERGROUND PURPOSES, TO TRANSFER INFORMATION OUT OF A DRILLING HOLE

Michael Ostkamper, Bochum, and Heinz Wallussek, Herdecke, both of Fed. Rep. of Germany, assignors to Schwing Hydraulik Elektronik GmbH, Herne and Bergwerksverband GmbH, Essen, both of, Fed. Rep. of Germany

Continuation of Ser. No. 902,294, Aug. 29, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 132,613
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531226
Int. Cl.⁴ E21B *44/00*
U.S. Cl. 175—45 **17 Claims**



1. A choker valve assembly for a target drill rod, said drill rod having an outer pipe, an inner pipe within said outer pipe and measuring means in said outer pipe for measuring functions of said drill rod, said measuring means having channels providing hydraulic signals in response to the data, said inner pipe having wall means for defining a flushing flow passage axially therethrough, said valve assembly comprising:

a body within said flow passage nonrotatably connected to said wall means and having means defining a tapered restriction portion in said flow passage;

a valve housing within said passage axially spaced from said restriction portion;

connecting means for non-rotatably connecting said housing within said passage;

a valve element supported by said housing and displaceable axially in said passage; and

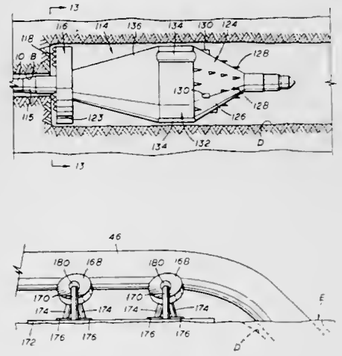
drive means extending between said measuring means and said valve element for causing axial movement of said valve element in response to said hydraulic signals, a portion of said drive means being located externally of said housing.

4,784,230

APPARATUS AND METHOD FOR INSTALLING A CONDUIT WITHIN AN ARCUATE BORE

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Continuation-in-part of Ser. No. 853,344, Apr. 17, 1986, Pat. No. 4,679,637, which is a continuation-in-part of Ser. No. 733,723, May 14, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 72,529
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.⁴ E21B *7/04, 7/08, 3/02, 10/26*
U.S. Cl. 175—61 **17 Claims**



1. A method for drilling an arcuate underground pilot bore hole along a predetermined arcuate path in one direction of travel between two surface locations, and then enlarging the pilot bore hole in an opposite direction of travel between the surface locations to receive a production conduit therein, the bore hole being drilled by a drill pipe string of connected pipe sections including a leading drill pipe section having a drill bit thereon with fluid discharge nozzle means in a leading face of the bit adjacent the formation to be drilled; said method comprising the steps of:

advancing the leading drill pipe section of the drill string having the drill bit thereon with said nozzle means in said face positioned adjacent the formation to be drilled from a surface entry location to a surface exit location;

discharging drilling fluid from said nozzle means with the center of the volume of drilling fluid being discharged being offset from the longitudinal axis of said leading drill pipe section to aid in guiding the drill pipe section along the predetermined path;

removing the drill bit from the drill pipe string after exit from the exit location;

attaching a reamer to the drill string at the exit location after the drill bit has been removed;

pulling the drill string and reamer along the pilot bore hole from the exit location to the earth entry location in an opposite direction of travel with the reamer forming an enlarged opening to receive the production conduit;

rotating said drill string and reamer during pulling thereof;

circulating drilling fluid through said drill string during the drilling and reaming operations;

pushing the drill string back through the reamed hole from said entry location to said exit location;

connecting the production conduit to the drill string at said exit location; and

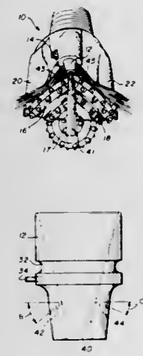
then pulling the drill string and production conduit back through the reamed opening from said exit location to said entry location for installing the production conduit with the enlarged reamed hole.

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EXTENDED DRILL BIT NOZZLE HAVING SIDE DISCHARGE PORTS

Dean T. Higgins, Mustang, Okla., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 7, 1987, Ser. No. 83,693
Int. Cl.⁴ E21B *9/08*
U.S. Cl. 175—340 **5 Claims**



1. A fluid nozzle for a well hole drill bit having a plurality of cutter cones mounted on a respective plurality of drill bit shirttails, comprising:

a body having a top, a bottom and a sidewall;

said body having a central aperture extending therethrough from said top to said bottom, and being mounted on the drill bit between adjacent cutter cones and extending toward the plurality of cutter cones, such that drilling fluid passes through said central aperture into an area between adjacent cutter cones;

a first channel formed in said body and extending through said sidewall, said first channel being in fluid communication with said central aperture and disposed at an angle to said central aperture, such that drilling fluid passes through said first channel into an area between a backface of a leading cutter cone and a respective leading shirttail; and

a second channel formed in said body and extending through said sidewall, said second channel being spaced apart from said first channel and in fluid communication with said central aperture and disposed at an angle to said central aperture, such that drilling fluid passes through said second channel into an area between a backface of a trailing cutter cone and a respective trailing shirttail.

4,784,232

TRANSMISSION FOR A WHEEL- OR TRACKTYPE VEHICLE COMPRISING A BRAKING DEVICE AND A STEERING UNIT

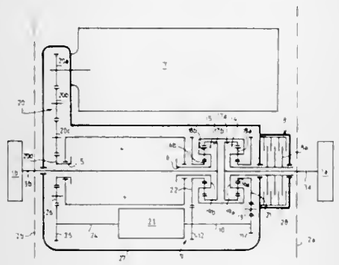
Pierre R. Leboime, Paris, France, assignor to SO.M.A. Europe Transmissions, Asnieres, France

Filed Nov. 19, 1986, Ser. No. 933,198
Claims priority, application France, Nov. 20, 1985, 85 17169
Int. Cl.⁴ B62D *11/08*
U.S. Cl. 180—6.2 **6 Claims**

1. In a vehicle with propelling means, such as wheels or tracks, on each of the longitudinal sides thereof, a transmission comprising a right output shaft and a left output shaft coupled to the propelling means, a gear box with input and output

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shafts respectively coupled to a motor unit and to the right and left output shafts, a braking device which can reduce the rotational speed of the right and left output shafts, and a steering unit comprising a shaft with, fitted thereon, a first and a second pinions, a third pinion engaged with the first pinion, and two planetary gear trains coaxial with the right and left output shafts, including each a planetary gear, a ring gear, planet wheels and a planet carrier and controlled by the second and third pinions for varying the rotational speeds of the right and left output shafts with respect to each other and thus changing the vehicle direction, characterized in that the input shaft of the gear box is coupled to the motor unit through a coupling mechanism extending along one of the longitudinal sides of the vehicle, in that the braking device is located in the vicinity of



the other longitudinal side of the vehicle and comprises a rotating part coaxial with the right and left output shafts, and in that the planetary gear trains are disposed back to back between the gear box and the braking device, with their planet carriers integral with each other and coupled onto to the output shaft of the gear box and the other to the rotating part of the braking device, while their ring gears are respectively coupled to the right and left output shafts, one through the rotating part of the braking device and the other through the gear box, and their planetary gears are rotatably integral with toothed wheels respectively engaged with the third and second pinions, the gear box, the right and left output shafts, the steering unit and the coupling mechanism are accommodated in a main casing, while the braking device is accommodated in an auxiliary casing carried by the main casing.

4,784,233

SKI BOARD

Alexander L. Favors, 70 Creek Rd., Chalfont, Pa. 18914

Filed Jul. 27, 1987, Ser. No. 78,169

Int. Cl.[4] A63C *17/18*

U.S. Cl. 280—12 H **7 Claims**



1. A new and improved skiing apparatus comprising:
elongated support means for supporting a user in the standing position thereon; and
a plurality of ski means attached to a bottom portion of said elongated support means and spaced longitudinally from each other;
each of said ski means including a downwardly extending support integrally attached to said elongate support means at an upper end of said supports and pivotally attached to each of said ski means at lower ends of said supports and each said ski means further comprising a unitary coil spring rearwardly positioned and independently mounted of said supports between said elongated support means and each of said ski means, said unitary spring serving to retain said ski means in a desired position relative to said elongate support means.

4,784,234

MOTOR DRIVEN POWER STEERING SYSTEM

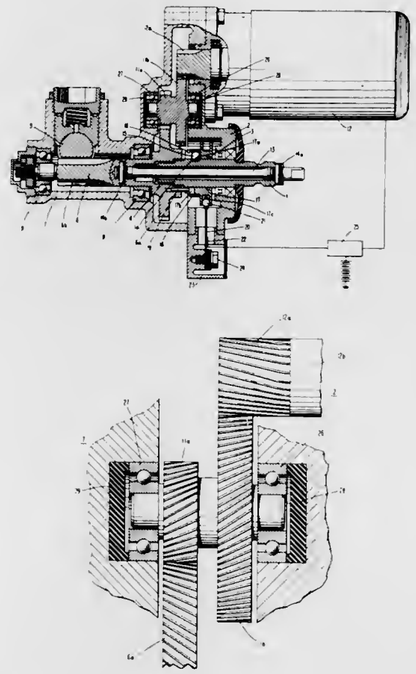
Hiroshi Naito, Toyota, and Akihide Kamiya, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 9, 1987, Ser. No. 23,258

Claims priority, application Japan, Mar. 13, 1986, 61-55687

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **3 Claims**



1. A motor driven power steering system comprising:
a steering shaft selectively rotatable in opposite directions;
an electric motor for providing a rotary force in opposite directions;
coupling means for operably coupling said electric motor to said steering shaft to transmit rotary force from the former to the latter, said coupling means including at least first and second interengageable gears for transmitting said rotary force, clearance existing between teeth of said first and second gears when said coupling means is at rest, said clearance being closed in response to relative rotation between said first and second gears in a manner creating a momentary impact;
torque sensor means for detecting the steering torque and direction thereof applied to said steering shaft and producing a steering torque signal for responding to the steering torque applied to the steering shaft; and
control means connected to said torque sensor for controlling energization of said motor and the direction of rotation thereof dependent upon said steering torque signal from said torque sensor;
said gears comprising helical gears such that substantially all of said momentary impact is converted into an axial force;
said coupling means including elastic means arranged to absorb said axial force;
said elastic means disposed out of the path of transmission of said rotary force so as to transmit no rotary force.

4,784,235

OIL PRESSURE REACTION CONTROL VALVE FOR POWER STEERING APPARATUS

Waichiro Ijiri, and Shuzo Hirakushi, both of Kashihara, Japan, assignors to Koyo Seiko Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP85/00563, § 371 Date Jun. 13, 1986, § 102(e) Date Jun. 13, 1986, PCT Pub. No. WO86/02325, PCT Pub. Date Apr. 24, 1986

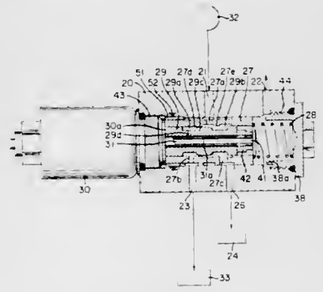
PCT Filed Oct. 11, 1985, Ser. No. 879,117

Claims priority, application Japan, Oct. 11, 1984, 59-213711

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—142 **11 Claims**



1. An oil pressure control device for use in a power steering apparatus, comprising: a valve casing disposed in an oil pressure path from an oil pump to a main valve and a reaction chamber, the valve casing being formed with a flow inlet and a return flow outlet connected to the oil pump, a first flow outlet connected to the reaction chamber and a second flow outlet connected to the main valve; a sleeve-like main spool slidably disposed within the valve casing and urged by a spring from one side of the valve casing, the main spool having an inner peripheral valve surface; a sub-spool axially slidable in accordance with the vehicle speed and having an outer peripheral valve surface, the sub-spool being fitted inside the main spool so that the inner periheral valve surface of the main spool and the outer peripheral valve surface of the sub-spool define a variable throttle having a varying area of opening for selectively connecting the flow inlet to the main valve and the reaction chamber according to the relative displacement between the main spool and sub-spool; a fixed throttle provided in the sub-spool and communicating between the reaction chamber and the return flow outlet for controlling a reaction pressure in the reaction chamber; first driving means operative when the vehicle speed is below a certain value for moving the sub-spool to cause the variable throttle to connect the flow inlet to the main valve and to disconnect the flow inlet from the reaction chamber and operative when the vehicle speed is above a certain value for moving the sub-spool in a direction to cause the variable throttle to disconnect the flow inlet from the main valve and to cause the variable throttle to connect the flow inlet to the reaction chamber; and second driving means disposed between the inner peripheral valve surface of the main spool and the outer peripheral valve surface of the sub-spool and operative when the reaction pressure reaches a given value in response to a steering pressure for effecting the displacement of the main spool in a direction to cause the variable throttle to disconnect the flow inlet from the reaction chamber thereby cutting the reaction pressure.

4,784,236

FOUR-WHEEL DRIVE VEHICLE

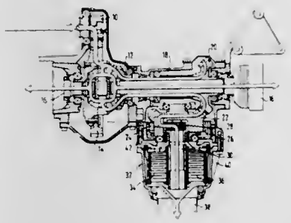
Paul Bausch, Hattenheim, and Hans-Peter Hemmer, Augustin, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 23, 1987, Ser. No. 29,334

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1986, 3611093

Int. Cl.[4] B60K *17/35*

U.S. Cl. 180—249 **17 Claims**



1. A four-wheel drive vehicle in which the wheels of a first axle are continuously driven while the wheels of a second axle are continuously driven while the wheels of a second axle are driven by a viscous clutch which is located in a power train between the first and second axles and which operates automatically depending on driving conditions, and in which the power train includes a controllable auxiliary clutch which permits torque engagement and disengagement of drive torque for the wheels of the second axle, characterized in that the controllable auxiliary clutch comprises a planetary gear train located in the power train between the first and second axles and controllable means which act on the planetary gear train for locking a transmission member.

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APPARATUS FOR AUTOMATIC RELEASE OF PASSENGER PROTECTION DEVICES IN THE EVENT OF AN ACCIDENT

Claus Condne, Wadgassen; Klaus Dobler, Gerlingen; Hansjörg Hachtel, Weissach; Bernhard Mattes, Sachsenheim, and Wadym Suchowerskyj, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00065, § 371 Date Nov. 6, 1987, § 102(e) Date Nov. 6, 1987, PCT Pub. No. WO87/05570, PCT Pub. Date Sep. 24, 1987

PCT Filed Feb. 25, 1987, Ser. No. 142,863

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609839

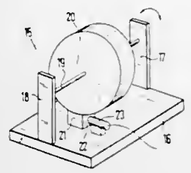
Int. Cl.[4] B60R *21/00*; G01C *9/12, 9/14*; G01P *15/03*

U.S. Cl. 180—268 **19 Claims**

1. An apparatus for the automatic release of passenger protection devices in motor vehicles in the event of an accident, comprising:
a sensor (**35**) formed to emit a control signal upon deviation form a prescribed driving situation of the motor vehicle, said sensor (**35**) including an anchorage (**12**) and a seismic mass (**10**) with a center of mass (**11**), said seismic mass (**10**) being elastically anchored outside said center of mass (**11**), said seismic mass (**10**) being formed to produce a torque in

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said anchorage (12) so that said sensor (35) simultaneously measures at least a positional angle with respect to an apparent vertical and an angular acceleration of the motor vehicle; and



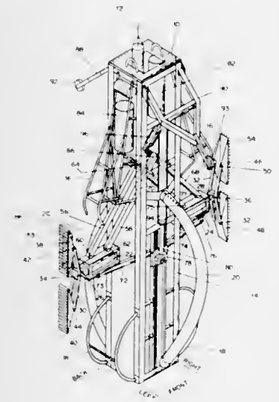
electrical circuit means for splitting said control signal into at least two ranges.

4,784,238

LARGE DIAMETER BOREHOLE APPARATUS

Jacques Maissa, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jul. 14, 1986, Ser. No. 885,048
Int. Cl.[4] G01V *1/40*
U.S. Cl. 181—105 **20 Claims**



1. Apparatus for placing a signal detector in a stationary position adjacent the wall of a borehole traversing a subsurface with earth formation, comprising:

an elongated body member adapted for suspension within a borehole;

first and second diametrically opposed displacement members cooperatively arranged on said body member;

first and second pairs of wall engaging pad members, coupled to said first and second displacement member, said pad members being anchored to said borehole wall;

a signal detector mounted to at least one of said pad members; and

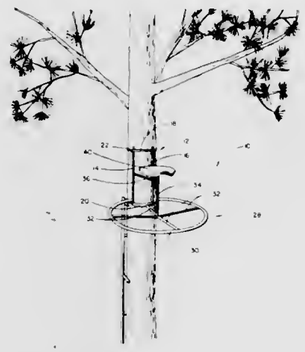
hydraulic power means for deploying said pad members into contact with the wall of said borehole and placing said signal detector in a stationary position adjacent said wall of said borehole.

4,784,239

LIGHTWEIGHT OPEN FRAME TREE STAND

Obie L. Kirkman, 457 Highway 55, Cove City, N.C. 28523

Filed Jan. 27, 1988, Ser. No. 149,165
Int. Cl.[4] A45F *3/26*; A01M *31/02*
U.S. Cl. 182—187 **13 Claims**



1. A tree stand comprising:

(a) a tree trunk mounting frame for engaging a tree trunk and including at least two flexible tie members connected to the mounting frame and extending therefrom for wrapping around a portion of the tree trunk so as to secure the mounting frame to the tree trunk;

(b) a circular foot bar secured to the mounting frame and extending outwardly therefrom in a plane that lies generally perpendicular to the axis of the tree trunk when the tree stand is appropriately mounted to such;

(c) the circular foot bar including an open section that defines two opposed ends, and wherein the mounting frame is connected to the two opposed ends of the foot bar;

(d) a series of generally equally spaced radial bars secured to the foot bar and extending inwardly therefrom to where they meet to form a central seat support point;

(e) a vertical seat support post extending upwardly from the central seat support point;

(f) lateral support means interconnected between the frame and the seat support post for stabilizing the seat support post; and

(g) a swivel seat mounted to the seat support post above the radial bar and spaced relatively close to the circular foot bar such that a hunter sitting in the seat may use his or her feet to engage the foot bar and by pushing the foot bar can rotate himself or herself about the axis of the seat support post in order that a direct view may be had of substantially the entire area surrounding the mounted tree stand.

4,784,240

METHOD FOR USING DOOR CYCLE TIME IN DISPATCHING ELEVATOR CARS

Robert C. MacDonald, W. Caldwell; Gerald M. Rees, Randolph; Elsa Abrego, Nutley; Matthew Martin, Randolph, all of N.J.; Jon Howard, East Hampton, N.Y.; Marjorie J. Polis, Sparta, and Jeffrey W. Blain, Scenic Lakes Township, Sussex County, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 16, 1988, Ser. No. 169,206
Int. Cl.[4] B66B *1/18*
U.S. Cl. 187—127 **4 Claims**

1. A method for assigning hall calls registered from floors of a building to a plurality of elevator cars having doors which open and close when a car stops at a floor during the process of providing elevator service for the floors of the building, comprising the steps of:

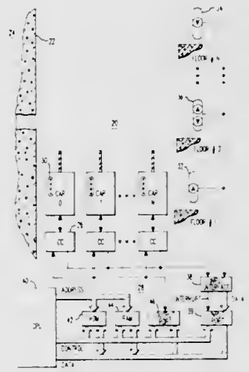
tabulating the number of door cycles and the cumulative door cycle time for each floor of the building,

calculating the average door cycle time for each floor of the building by dividing the cumulative door cycle time by the number of door cycles,

storing the average door cycle times for the floors of the building which result from the calculating step,

selecting a travel path for each car relative to a floor having a registered hall call to be assigned,

preparing a trip list for each car using the travel path selected,



determining the time (ETA) for each car to service the associated trip list and arrive at the floor of a hall call under consideration,

and assigning each hall call to an elevator car based upon the relative ETA times,

said step of determining the ETA time for each car including the step of adding the door cycle time for each stop of the elevator car on the associated trip list before reaching the floor of the hall call to be assigned,

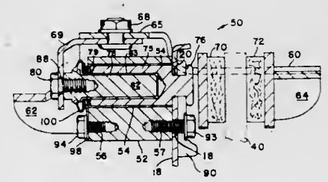
said step of adding the door cycle time using the stored door cycle time for the floor of the stop.

4,784,241

INTEGRATED DISC BRAKE AND DRUM RAKE CONSTRUCTION

Robert B. Temple, and James J. Colpaert, both of Granger, Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 911,836, Sep. 26, 1986, abandoned. This application Jul. 15, 1987, Ser. No. 73,923
Int. Cl.[4] F16D *63/00*
U.S. Cl. 188—70 R **23 Claims**



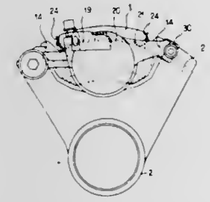
1. A disc brake, comprising a torque support member having receiving means, a piston housing having piston means disposed in a housing bore and the piston housing fixed to said support member, a yoke engaging on one side said piston means and on the other side a first brake pad, characterized in that the brake comprises rod means accepted in said receiving means and having an internal bore, the rod means extending within an opening in said piston housing, pin means attached at one end to said yoke and at the other end extending for slidable movement within said internal bore, the rod means permitting slidable movement of the yoke and pin means, the opening in said piston housing extending therethrough and the piston housing abutting a radial surface of said support member, the rod means including an enlarged head for securing said rod means to said support member, the pin means including thereabout a sleeve member received between the pin means and adjacent surface of the internal bore of the rod means, and the piston housing including aligned openings on opposite sides thereof, one aligned opening receiving a bolt which secures said piston housing to the support member and the other aligned opening receiving means for securing a plate member to the housing.

4,784,242

PAD FOR A DISC BRAKE AND DISC BRAKE EQUIPPED WITH SUCH PADS

Alain Thioux, Chennevieres, France, assignor to Bendix France, Drancy, France

Filed Oct. 21, 1987, Ser. No. 111,738
Claims priority, application France, Oct. 31, 1986, 86 15194
Int. Cl.[4] F16D *55/224, 65/06*
U.S. Cl. 188—73.34 **7 Claims**



1. A disc brake assembly having a caliper mounted slideably on columns attached to a supporting piece provided with bearing surfaces, and the brake assembly equipped with brake pads, each pad comprising a friction lining fastened to a pad support and an elastic member mounted on the pad support in order to compensate for play between the pad and the bearing surfaces, the elastic member comprising a leaf spring having two arms symmetrical relative to an assembly axis for the leaf spring on the pad support, each pad support having a radial lug with an opening therein, the elastic member having a tongue projecting therefrom and disposed adjacent the radial lug, fastening means disposed in the opening of the lug and a coaxial opening in the tongue in order to fasten inseparably the elastic member to the lug, each arm providing means for attaching the respective pad to the caliper of the disc brake assembly so that the pads, caliper, and supporting piece may be preassembled as a unit, the attaching means at free ends of the arms and having a shape substantially matching the shape of an adjacent caliper bearing surface, each free end folded toward the associated lug and in the shape of a V, the free ends ending in lips disposed apart from one another a distance less than a distance separating the caliper bearing surfaces so that the free ends may be snapped-fitted over the associated caliper bearing surfaces in order to attach the associated pad to the caliper, and at least one of the free ends exposed radially so that the one free end can be biased away from the associated caliper bearing surface and the caliper pivoted about one of the columns without the associated pad attached thereto whereby the associated pad remains between the bearing surfaces of the supporting piece for quick removal therefrom.

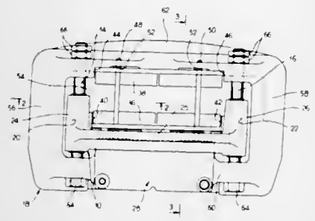
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SLIDING CALIPER DISC BRAKE

Jean-Claude Méry, Pavillons sous Bois, France, assignor to Societe Anonyme D.B.A., Drancy, France

Filed Jan. 17, 1984, Ser. No. 571,752
Claims priority, application France, Jan. 20, 1983, 83 00846
Int. Cl.⁴ F16D *55/224*
U.S. Cl. 188—73.45 **2 Claims**



1. A disc brake having a caliper mounted for sliding by means of two axial pins on a fixed support, operating means being associated with the caliper in order to urge directly a first friction element against a first face of the disc and, by reacting through the caliper, to urge a second friction element against the other face of the disc, the pins being fastened to the caliper and passing slidably through slide guide bores formed in arms of the fixed support, characterized in that said caliper includes a single central through opening bounded by inboard and outboard caliper portions and side portions extending over the disc to join together the inboard and outboard caliper portions, the central through opening being substantially rectangular shaped and exposing the pins and arms disposed therein, the arm generally cylindrically-shaped and axially extending, the diameter of the arms being substantially equal to the radial dimension of said side portions and the arm aligned circumferentially therewith, the arms and slidably received pins disposed closely adjacent the respective side portions in order to increase the flexural inertia of said side portions, the axial pins passing through the central opening and permitting radial extraction of said friction elements, and the fixed support including a tie-bar connection extending between the arms and through said single central through opening to a position above said operating means, the tie-bar connection joining the arms to provide for distribution of braking forces and spaced an axial distance from the disc, the tie-bar connection disposed axially between the operating means and first friction element and extending partially over the operating means in order to permit radial securement and radial extraction of said friction elements, the pins being prestressed in order to urge toward one another the inboard and outboard caliper portions and increase the rigidity and resistance to deflection of the caliper portions and increase the flexural inertia of the side portions, said pins each being formed by a threaded bolt comprising a head acting against one of the caliper portions and a nut engaging the other caliper portion and tightened on a threaded part of the bolt in order to effect said prestressing.

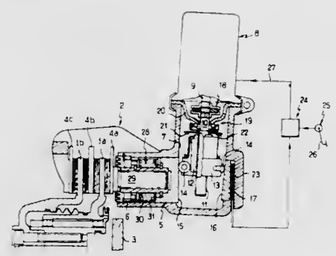
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ELECTRICAL BRAKING DEVICE FOR VEHICLES

Jean-Jacques Carre, Le Raincy, and Alain Thioux, Chennevieres, both of France, assignors to Bendix France, Drancy, France

Filed Nov. 18, 1986, Ser. No. 932,750
Claims priority, application France, Nov. 20, 1985, 85 17180
Int. Cl.⁴ B60T *13/74*
U.S. Cl. 188—156 **8 Claims**

1. An electrical braking device for a vehicle, comprising an actuating mechanism for displacing at least one friction member in one direction and for bringing the friction member into frictional engagement with at least one rotary member to be braked, the actuating mechanism comprising an electric motor which drives in reversible rotation a control shaft having a threaded part cooperating in driving engagement with an actuating member displaceable linearly to actuate the friction member, characterized in that the control shaft extends substantially at a right angle to said direction, the control shaft connected to an output shaft of the electric motor via a flexible coupling, the actuating member comprising a wedge structure associated with at least one pair of rollers cooperating respectively with a pair of opposing ramp surfaces each of which are located opposite a respective side of the wedge structure, at least a first ramp surface of the ramp surfaces formed on piston means displaceable in said direction to actuate the friction member, the mechanism including axial thrust-bearing means between the control shaft and an adjacent stationary wall, and the mechanism further comprising an assistance spring biasing continuously the wedge structure in an actuating direction toward the piston means so as to assist in displacing the wedge structure during each brake application.

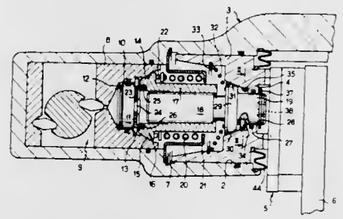


4,784,245

BRAKE MOTOR HAVING A RESETTABLE AUTOMATIC ADJUSTMENT DEVICE

Edgard Fabbro, Le Vésinet, and Pierre Pressaco, La Courneuve, both of France, assignors to Bendix France, Drancy, France

Filed Jun. 9, 1987, Ser. No. 60,181
Claims priority, application France, Jun. 18, 1986, 86 08812
Int. Cl.⁴ F16D *65/56*
U.S. Cl. 188—196 D **17 Claims**



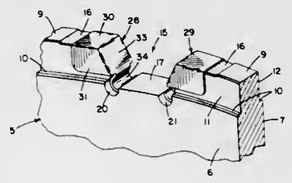
1. A brake motor, comprising a brake piston sliding in a bore in a body and actuatable hydraulically and mechanically by a mechanical control to move a friction member via an automatic adjustment device of reversing thread nut/screw type comprising an adjustment member locked in rotation carried by a front wall of the brake piston which is adjacent the friction member and interacting with a rotating adjustment member biased by a spring and in free frictional engagement against a nonrotating component of the mechanical control, and means manually actuatable for resetting the automatic adjustment device, characterized in that the adjustment member locked in rotation comprises an integral end which is integral with the adjustment member locked in rotation and passing sealingly and slidably through the front wall of the brake piston, means for frictional engagement working at least when the brake motor is in operation and being provided between the brake piston and the adjustment member locked in rotation to lock the adjustment member locked in rotation, the integral end of the adjustment member locked in rotation being rotatably actuatable exteriorly and manually to carry out resetting of the automatic adjustment device, the integral end extending through the front wall and accessible for direct manual adjustment thereof, and the adjustment member locked in rotation being directly and exteriorly actuatable, via the integral end, to effect said resetting without requiring axial displacement thereof.

4,784,246

BRAKE APPARATUS

Frank D. Edmisten, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 18, 1987, Ser. No. 16,151
Int. Cl.⁴ F16D *65/12*
U.S. Cl. 188—218 XL **25 Claims**



1. In a friction brake disc having a pair of annular flat wall surfaces, an inner peripheral wall surface, and an outer peripheral wall surface; said disc having a plurality of circumferentially spaced slots along the outer periphery extending into said outer peripheral wall surface and disposed for engagement by a spline of a torque device; each of said slots having a bottom surface and two spaced wall portions; the juncture of said bottom surface with each of said wall portions being recessed; each of said slots having a pair of spaced oppositely disposed integral cap clips located on said spaced wall portions; each of said cap clips having a pair of spaced side walls abutting portions of said annular flat wall surfaces adjacent the outer periphery and adjacent to said slots; each of said cap clips also having a flat frontal portion interconnecting adjacent ones of said pair of spaced side walls only and abuttingly engaging one of said wall portions of said slot; and each cap clip having a projection for seating engagement with one of said recesses only to retain said cap clips in their respective positions on said brake disc and remain as two separate spaced cap clips with no interconnection therebetween.

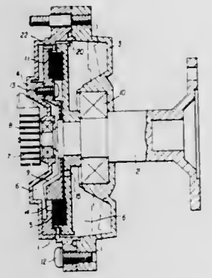
4,784,247

VISCOUS FLUID COUPLING

Ryuji Nakamura, Okazaki, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 24, 1987, Ser. No. 17,458
Claims priority, application Japan, Feb. 21, 1986, 61-036871
Int. Cl.⁴ F16D *35/00, 43/25*
U.S. Cl. 192—58 B **2 Claims**

1. A viscous coupling comprising:
one rotor fixed to an input member;
an output member;
an other rotor fixed to said output member, said rotors cooperating to define an operation chamber;
case means fixed to said output member, said case means and output member enclosing said rotors;
a first oil storage chamber formed between said output member and said other rotor;
an oil passage communicating said first oil storage chamber with said operation chamber;
a temperature sensitive member attached to said output member;
valve means responsive to said temperature sensitive member for selectively opening and closing said oil passage;



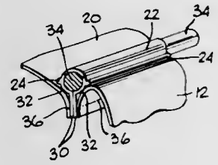
a second oil storage chamber formed between said one rotor and said case and being radially positioned such that at least a part thereof is adjacent a radially outside portion of said operation chamber;
a depressurizing hole formed in said one rotor and comprising means for equalizing a pressure between said first and second oil storage chambers; and
oil filled in said case means to a level such that a top surface of said oil does not reach said depressurizing hole when said one rotor is stationary.

4,784,248

PIPING FOR LUGGAGE AND THE LIKE

David E. Workman, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.

Filed Aug. 31, 1987, Ser. No. 91,558
Int. Cl.⁴ A45C *13/36*
U.S. Cl. 190—126 **8 Claims**



1. In a luggage container or the like, comprising adjacent panels the outer faces of which are separated by flexible piping the flexible piping comprising a tubular portion at least part of which is exposed to view, and leg means extending from the tubular portion internally of the luggage container, the adjacent edge portions of the adjacent panels being attached to the leg means of the piping, the improvement comprising:
a shoulder extending outwardly from each side of the tubular portion of the piping, the shoulders acting to stabilize the piping against twisting when exposed to torsional stress;
the outer faces of the adjacent panels abutting the piping below the shoulders so that the shoulders are visible, and wherein the exposed tubular portion is formed of a wall the thickness of which is less than the thickness of the shoulders.

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4,784,249

CLUTCH SERVOS

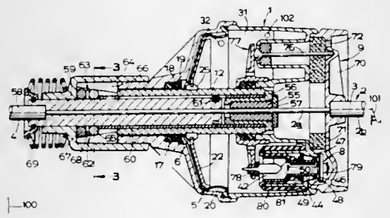
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries, Birmingham, England

Filed Oct. 2, 1985, Ser. No. 783,003

Claims priority, application United Kingdom, Oct. 5, 1984, 8425289; Apr. 27, 1985, 8510777

Int. Cl.[4] F16D *19/00*

U.S. Cl. 192—85 V 13 Claims



1. A vehicle clutch system comprising a pedal, a clutch, a cable assembly comprising a flexible inner cable component and a flexible outer sheath component, said cable assembly connecting said pedal with said clutch for operating said clutch, and a clutch servo acting upon said cable assembly for augmenting the force applied to said pedal, said cable assembly including a portion following an arcuate path, said clutch servo comprising a fixed housing having an inlet for connection to a source of pressure and an outlet for connection to exhaust, an input member in said housing to which an input force from said pedal is applied by said cable assembly, an output member for applying an output force to said clutch, and means for augmenting said output force comprising a movable wall, means defining a fluid pressure chamber in said housing, pressurisation of said chamber operating said movable wall, and valve means for controlling pressurisation of said chamber, said valve means beng operative, in response to said input force, to control communication of said chamber with said inlet and said outlet, wherein adjustment means for adjusting the effective length of said flexible cable component are incorporated in said servo housing to compensate for wear within said clutch without changing the effective stroke of said movable wall, said adjustment means comprising means connecting one of said cable assembly components with one of said housing and said wall for relative movement, and locking means for locking said cable assembly component and the one of said housing and said wall against said relative movement when said inner cable component moves from a retracted position.

4,784,250

SILO HAVING DOUBLE CHUTE ADAPTATION

James Vanderloop, Brillion, Wis., assignor to Forager Silo Systems, Inc., Kaukauna, Wis.

Filed Mar. 21, 1985, Ser. No. 714,471

Int. Cl.[4] B65G *11/20*

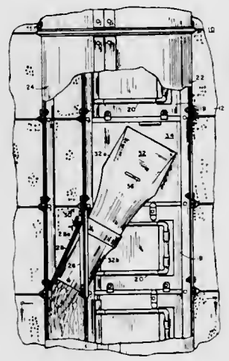
U.S. Cl. 193—34 4 Claims

1. In a silo having a tubular configuration defined by upright side walls for holding silage therein, and from which said silage is discharged, including a plurality of vertically spaced silo door openings in one side wall portion thereof, said door openings being in vertical alignment with each other, through which said silage may be discharged, an openable silo door covering each of said silo door openings, and an elongated U-shaped member covering said silo door openings and silo doors and cooperating with the silo side wall to form an access chute,

an apparatus for adapting said silo to provide a discharge chute in addition to said access chute, said apparatus comprising:

a housing, one edge of which is attached to the outside of said U-shaped member along the entire length thereof and the opposite edge of which is attached to the outside of the silo along the majority of the length thereof to thus enclose said discharge chute;

a plurality of vertically aligned side openings formed in the side of said U-shaped member facing said housing; and



a funnel, one end of which is removably engageable with any of said silo door openings, and the other end of which is removably engageable with a corresponding one of said side openings, for directing the silage as it is discharged from the silo through said corresponding one of said side openings.

4,784,251

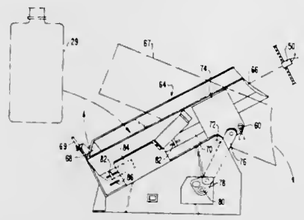
REVERSE VENDING MACHINE

Bruce H. DeWoolfson, and Don Dawson, both of Vienna, Va., assignors to Environmental Products Corporation, Fairfax, Va.

Filed Jan. 16, 1987, Ser. No. 4,348

Int. Cl.[4] G07F *7/06*

U.S. Cl. 194—209 23 Claims



20. A method of reverse vending and comminuting a container having a uniform product code affixed to its peripheral surface comprising the steps of:

receiving a container in a receptacle, the receptacle having an axis extending lengthwise through the mouth end and bottom end of the container supported therein;

weighing the container in said receptacle;

directing an acoustic signal in a direction substantially parallel to the axis of the receptacle to detect the presence of the container in said receptacle;

spinning the container about said axis to move the uniform product code past a scanner for identifying the container;

issuing consideration and dumping the container from said receptacle in response to a selected weight, selected uniform product code, and detected presence:

catching the dumped container adjacent one of its ends;

feeding the caught end of the container into a comminuter;

comminuting the container into pieces of a predetermined dimension; and

collecting said pieces.

4,784,252

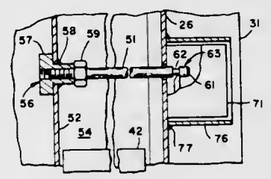
DOUBLE DOOR FRONT LOCKING NEWSPAPER VENDING MACHINE

Wallace E. Davis, 2318 Royal Oaks Dr., Alamo, Calif. 94507

Filed Mar. 2, 1987, Ser. No. 20,351

Int. Cl.[4] G07F *9/10, 11/02*

U.S. Cl. 194—350 5 Claims



1. A newspaper vending machine comprising

means defining an enclosure having an open front,

a security door having a rod opening and an opening therein and pivotally mounted in closing relation to the open front of said enclosure and mounting a coin release mechanism on an inner surface thereof,

an access door pivotally mounted in closing relation to the opening in said security door and having latch means adapted to cooperate with said coin release mechanism,

a rigid locking rod mounted within said enclosure and extending forewardly therein through said rod opening in said security door,

a rigid hollow cylindrical shield fixed to a front surface of said security door exteriorly of said enclosure about said rod opening, and

a key operated pin lock fitted entirely within said shield for latching engagement with said locking rod to lock said security door in closing relation to said enclosure for release only by key operation of said pin lock.

4,784,253

BLOW MOLDING APPARATUS

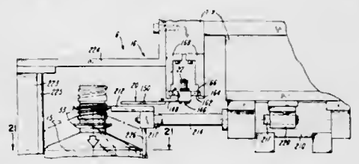
Joseph F. Gibbemeyer, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 869,499, Jun. 2, 1986, Pat. No. 4,723,906.

This application Jun. 12, 1987, Ser. No. 60,807

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—424 5 Claims



1. An ejector means for removing an elongated product from a position depending with its long axis vertical from a conveyor so as to fall in a substantially straight up and down position comprising:

a frame;

a conveyor means on said frame to linearly move to said eject station said product while suspended near its upper end in a U-shaped notch on one side of a holder, the open side of the U being sized to pass said upper end;

a movable eject bar vertically located closely underneath said holder and horizontally disposed with said product between itself and the open size of said notch;

a plurality of vertically extending guide members, at least one such guide being mounted on one of the eject bar and the frame and at least another such guide being mounted on the other side of the product on the other one of said bar and frame so that the product is positioned between said one and another guides;

power means to reciprocate said eject bar normally of said conveyor a distance such that the product is pushed horizontally out of the open side of the notch an amount to free it from said holder; and

said guide members assuming a vertical guiding engagement with the product by the time the latter is moved free of said holder so that the product falls away while being maintained in a vertical orientation.

4,784,254

METHOD AND APPARATUS FOR INCREASING THE NUMBER OF LONGITUDINAL ROWS OF ADVANCING BAKERY ARTICLES

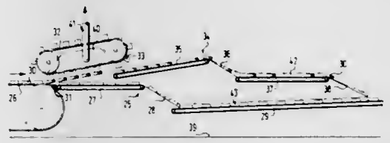
Horst Schraft, Stuttgart, and Horst Wilcewski, Kornwestheim, both of Fed. Rep. of Germany, assignors to Werner & Pfleiderer GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,552

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3644058

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—434 15 Claims



1. A method of rearranging a plurality of bakery articles which are being advanced in longitudinal and transverse rows such that the number of longitudinal rows is increased, said method comprising

advancing a plurality of bakery articles along a conveyor path in longitudinal and transverse rows, the longitudinal rows being arranged in equal groups in which the number n of longitudinal rows in each group is equal to the total number of longitudinal rows divided by the number of groups,

removing, at a removal station, one article from each longitudinal row after passage of n+1 transverse rows at said station,

advancing the removed articles along a path in which the removed articles form one additional longitudinal row for each said group,

guiding the advancing articles beyond the removal station to adjust the transverse spacing of longitudinal rows to provide a number of spaces equal to the number of additional rows; and

inserting into said spaces the removed articles in said additionally formed longitudinal rows.

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SPINNING BOBBIN TRANSPORTING DEVICE

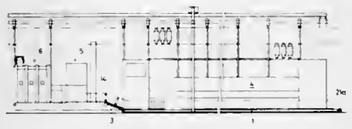
Hiroshi Uchida, Oumihachiman, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 12, 1984, Ser. No. 650,286

Claims priority, application Japan, Sep. 16, 1983, 58-143564[U]

Int. Cl.⁴ B65G *47/26*

U.S. Cl. 198—456 **6 Claims**



1. A bobbin transporting device for a spinning and winding system in which a winder and a fine spinning frame are provided in substantially adjacent relationship to each other, comprising:

a carrier transporting path extending along at least a portion of the periphery of said fine spinning frame,

a carrier accepting transporting path for said winder for accepting a carrier with a spinning bobbin thereon, said carrier accepting transporting path being connected to one end of said carrier transporting path,

a carrier returning transporting path for returning a carrier with an empty bobbin thereon which is discharged from said winder, said carrier returning transporting path being connected to the other end of said carrier transporting path,

said carrier transporting path and said carrier accepting transporting path being separated by a vertical distance H_1 and by a horizontal distance l_1,

said carrier transporting path and said carrier returning transporting path being separated by a vertical distance H_2 and by a horizontal distance l_2,

a first substantially linear connecting path inclined between said carrier transporting path and said carrier accepting transporting path at an angle θ_1, where:

$$\tan \theta_1 = H_1/l_1$$

a second substantially linear connecting path inclined between said carrier transporting path and said carrier returning transporting path at an angle θ_2 where:

$$\tan \theta_2 = H_2/l_2$$

whereby said carriers travel a vertical distance not greater than H_1 between said carrier transporting path and said carrier accepting transporting path, and

whereby said carriers travel a vertical distance not greater than H_2 between said carrier returning transporting path and said carrier transporting path.

4,784,256

APPARATUS FOR ASSEMBLING BLOWER WHEEL BLADES

John S. Ducate, Sr., Columbia, S.C., assignor to The Ducane Company, Columbia, S.C.

Continuation of Ser. No. 811,060, Dec. 19, 1985, Pat. No. 4,653,635, which is a continuation of Ser. No. 509,108, Jun. 29, 1983, Pat. No. 4,603,773. This application Feb. 26, 1987, Ser. No. 19,392

The portion of the term of this patent subsequent to Aug. 2, 2003, has been disclaimed.

Int. Cl.⁴ B65G *37/00*

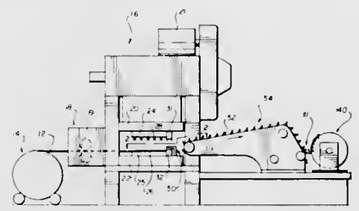
U.S. Cl. 198—468.4 **36 Claims**

1. A blade assembly apparatus for engaging individual elongated blades provided by a forming means and assembling a plurality of said blades in a predetermined spaced relationship for securing the blades together to form a blower wheel, said apparatus comprising:

blade fixture means for receiving and holding said blades in a predetermined spaced relationship corresponding to the blade spacing in a blower wheel, said fixture means including holding means for exerting a retaining force on each individual blade received in said fixture means;

conveyor means for conveying said blade from said forming means to said fixture means, said conveyor means including cradle means for receiving and holding said blades in a predetermined spaced relationship for insertion in said fixture means;

first transfer means for transferring each of said blades from said forming means to said conveyor means, said first transfer means including a first transfer head for carrying an individual blade, first retaining means for providing a first attraction force for positively retaining said individual blade in a fixed position on said first transfer head during said transfer from said forming means to said conveyor means, second retaining means providing a second attraction force for positively retaining each of said blades in a fixed position in said cradle means along a loading run of said conveyor means, and means for reciprocating said first transfer head between one position for picking up said individual blade as provided by said forming means and another position at which said individual blade is engaged by said cradle means and retained therein by said second attraction force;



first releasing means for providing such relative movement between said first transfer head and said cradle means after said individual blade is engaged by said cradle means as to overcome said first attraction force and release said individual blade from said first retaining means to said second retaining means, said individual blade being maintained in a fixed axial position by both said first and said second attraction forces during said release from said first retaining means to said second retaining means;

second transfer means for transferring each of said blades from said conveyor means to said fixture means, said second transfer means including third retaining means providing a third attraction force for positively retaining each of said blades in a fixed position in said cradle means along an unloading run of said conveyor means, a second transfer head for carrying an individual blade, fourth retaining means providing a fourth attraction force for positively retaining said individual blade in a fixed position on said second transfer head during said transfer from said conveyor means to said fixture means, and means for reciprocating said second transfer head between one position for engaging said individual blade while retained in said cradle means by said third attraction force and another position at which said individual blade is received in said fixture means;

second releasing means for providing such relative movement between said second transfer head and said cradle means after said individual blade is engaged by said second transfer head as to overcome said third attraction force and release said individual blade from said third retaining means to said fourth retaining means, said individual blade being maintained in a fixed axial position by both said third and said fourth attraction forces during said release from said third retaining means to said fourth retaining means;

drive means for positioning said cradle means so as to receive each of said blades from said first transfer means and for positioning said fixture means so as to receive each of said blades from said second transfer means; and,

third releasing means for providing such relative movement between said second transfer head and said fixture means after said individual blade is received in said fixture means as to overcome said fourth attraction force and release said individual blade from said fourth retaining means to said fixture means when said second transfer head reciprocates from said another position to said one position such that said individual blade is transferred to and retained in said fixture means, said individual blade being maintained in a fixed axial position by both said fourth attraction force and said retaining force during said release from said fourth retaining means to said fixture means, and said conveyor means including fifth retaining means providing a fifth attraction force for positively retaining each of said blades in a fixed position in said cradle means along a conveying run of said conveyor means extending between said loading run and said unloading run such that each of said blades is individually maintained in a fixed axial position by at least one of said forces from the time it is picked up from said forming means to the time it is retained in said fixture means.

4,784,257

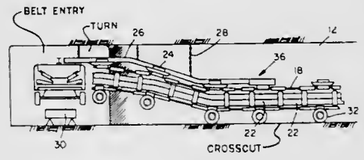
CONVEYOR SYSTEM INCLUDING A RE-RAILER

Richard E. Doerr, Middleburg, Fla., assignor to Consolidation Coal Company, Pittsburgh, Pa.

Filed Nov. 27, 1987, Ser. No. 125,847

Int. Cl.⁴ B65G *41/02*

U.S. Cl. 198—594 **15 Claims**



11. In a conveyor system for transporting mined coal from a mobile mining machine traversing a mine floor to a fixed conveyor, said conveyor system including an articulated mobile conveyor that moves with said mining machine and is supported upon a mine roof-mounted rail system, the improvement comprising:

means attached to said articulated mobile conveyor for supporting said conveyor upon the floor of said mine;

a curved transition section that can be temporarily mounted adjacent one end of said roof-mounted rail system, said curved transition section including a re-railer which ensures the smooth transfer of the articulated mobile conveyor to and from said rail system.

4,784,258

CONTACT LENS CARRYING CASE WITH MAGNIFYING AID APPARATUS

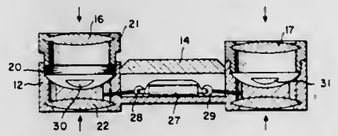
Alberto A. Figari, 99 Foxhedge Rd., Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 640,258, Aug. 13, 1984. This application Sep. 9, 1985, Ser. No. 773,795

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.⁴ A45C *13/10*

U.S. Cl. 206—5.1 **19 Claims**



1. A contact lens carrying case for accommodating contact lenses, said carrying case adapted to enable a user to inspect said lenses when accommodated by said case, comprising:

a right and a left lens housing member coupled together, with each of said members having an opened top and a closed bottom, and at least a portion of one of said housing members being responsive to the transmission of light;

a right and a left lens cover member each associated with one of said right and left lens housing members and adapted to cover said opened top when a contact lens is disposed within said housing with at least one of said cover members having a magnifying lens for inspecting said contact lens, whereby said magnifying lens enables a user to inspect said contact lens at an increased magnification in order to detect extraneous particles and to detect abnormalities in said lens when disposed within said associated housing.

4,784,259

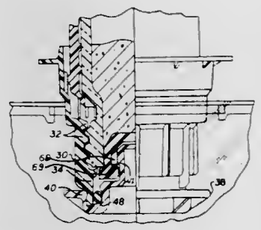
CONTAINER CONSTRUCTION WITH VANED EXTRACTOR

Richard W. Grabenkort, Barrington, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 30, 1987, Ser. No. 9,358

Int. Cl.⁴ A61M *5/14*

U.S. Cl. 206—221 **13 Claims**

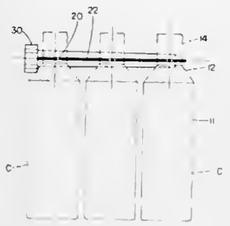


1. A flexible diluent container including an access port having first means for engaging the outlet portion of a second container which is closed by a removable stopper formed of resiliently compressible material and having an end wall of substantial thickness with a throat opening therethrough and an internal recess therewithin defining an inwardly facing shoulder inward of said end wall, said flexible container including extractor means comprising a protuberant engagement portion extending along a first axis for engaging such a stopper within said recess thereof for removal of the stopper from such a second container when engaged with said first means, wherein said engagement portion comprises a plurality of

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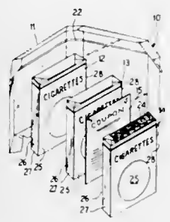
narrow vanes each joined with said protuberant engagement portion along said first axis and extending generally radially outward relative to said first axis such that their radially distal edges collectively define a transverse dimension of said engagement portion greater than the corresponding transverse dimension of said opening and said vanes are spaced from one another at said distal edges substantially greater distances than the thickness of said edges for ease of forcible passage through said throat and into said recess, said vanes having lateral axially proximal edges for thereafter engaging the internal shoulder of the stopper for effecting removal of said stopper from such a second container by said extractor means after entry into the recess of such a stopper.

4,784,260
COMBINATION NOZZLE/OIL CONTAINER CARRIER
Clair D. Holben, 2741 S. Jay St., Denver, Colo. 80227
Filed Mar. 28, 1988, Ser. No. 174,109
Int. Cl.[4] B65D *81/36, 83/00*
U.S. Cl. 206—223 **12 Claims**



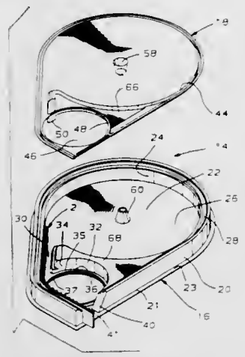
1. In an article carrier for articles including a plurality of containers, said containers having upper correspondingly sized ends through which the contents of the container may be poured, said containers arranged in juxtaposed upstanding relation, the improvement comprising releasable securing means releasably secured to said upper ends of said containers, webbing betwen and interconnecting said securing means, and dispensing means in the form of an elongated generally tubular portion, and connecting means connecting said tubular portion to said securing means with said tubular portion extending between said containers.

4,784,261
MULTIPLE UNIT CIGARETTE PACKAGE
Sidney W. Kutchin, 115 Astor St., Apt. 39W, Chicago, Ill. 60610
Filed Aug. 17, 1987, Ser. No. 85,559
Int. Cl.[4] B65D *75/38*
U.S. Cl. 206—256 **1 Claim**



1. A cigarette package comprising:
a transparent outer wrapper made of transparent tearable sheet cellophane sealed on a top portion, a bottom portion and a side portion and including:
a tear strip near the top portion of the package to enable the user to quickly and precisely tear away the top sealed portion of the cellophane thereby exposing the contents of the outer wrapper without destroying the integrity of the remaining portion of the outer wrapper;
three individual packets formed as independent stand-along independent packages in said outer wrapper,
each packet comprising a foil backed paper sealing seven cigarettes arranged side-by-side in a straight line so that each packet has a relatively flat rectangular shape,
a tear strip in the top portion of each individual packet, whereby the user may selectively remove the top of each individual packet by tearing away the corresponding foil backed paper;
a front face and a back face on parallel opposite sides of each packet and forming large surface areas corresponding to conventional display surfaces on a conventional 20 pack cigarette package and adapted to carry advertising trademarks and logos by means of which the manufacturer provides advertising messages;
side surfaces on opposite parallel sides of each packet of sufficient width to accommodate the thickness of a row of cigarettes and forming display surfaces to carry warnings, bar codes and other information; and
at least one advertising coupon card between the packets to provide a two-sided indicia-bearing front and rear faces of a size commensurate with said front and back faces to enable the manufacturer to provide selective advertising and promotional messages, whereby there is provided a cigarette package having three separate packets unitarily packed in a clear cellophane wrapper and wherein each packet is individually labeled as a stand-alone unit to afford optional utilitarian usage of the packets.

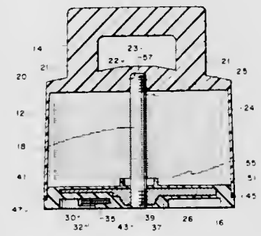
4,784,262
CASSETTE FOR LOOSE-PIECE PARTS SUCH AS ELECTRICAL TERMINALS AND METHOD OF LOADING
Gerald J. Duddy, Thousand Oaks, Calif.; William J. Rudy, Jr., Annville, and Howard R. Shaffer, Millersburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Jul. 31, 1987, Ser. No. 80,139
Int. Cl.[4] B68D *83/04*
U.S. Cl. 206—333 **19 Claims**



1. A cassette for containing loose-piece parts for automated dispensing into a machine, the loose-piece parts being contained in a belt within the cassette, the belt having parallel side edges and having spaced-apart cells extending between the side edges, each of the cells containing one of the parts and being open at least at a relative bottom end in a manner permitting and facilitating removal of a said part therefrom while the cell is within the cassette, the cassette comprising a housing having oppositely-facing major surfaces, side walls therebetween, a belt storage chamber, a belt feeding portion, a part

discharge station, and a belt passageway extending from the storage portion to the feeding portion, a relative bottom one of the housing major surfaces supports a relative bottom side edge of the belt within the storage chamber and the passageway and includes an edge supporting surface portion in the feeding portion enabling movement of the belt along a feed path during in-service use, and the feeding portion comprises a recess through the housing major surfaces shaped and dimensioned to receive a feeding means of the machine to engage the belt disposed adjacent a side wall of the recess and move the belt forwardly along the feed path, the cassette being characterized in that:
the storage chamber is cylindrical and has a centrally located chamber axis defined by axis projection means extending between said major housing surfaces, and the belt is spirally wound in the storage chamber about said axis projection means.

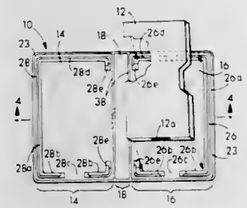
4,784,263
SAW BLADE CARRIER
Jeffrey A. Stanley, 4374 Ojai Rd., Santa Paula, Calif. 93060
Filed Jul. 9, 1987, Ser. No. 71,632
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—349 **11 Claims**



1. A carrier for circular saw blades comprising in combination:
a base member formed of a tough, synthetic, resin material having a cylindrical groove for receiving a cover and having means for centrally supporting a spindle;
a spindle having an upper threaded end and a lower end received in the central supporting means;
a cover formed of a tough, synthetic, resin material having a top wall and a generally cylindrical side wall terminating in a lower end received in said groove and having a threaded recess in the inner surface of the top wall terminating in an enlarged opening to form a guide for centering the spindle into the recess; and
a handle attached to said top wall, said cover and base when assembled forming a sealed, water-proof enclosure.

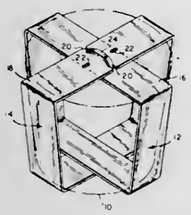
4,784,264
DISPLAY ALBUM
Philip K. Sykes, 5865 Fernwood, Shoreview, Minn.
Continuation of Ser. No. 935,503, Nov. 26, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 170,021
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—387 **9 Claims**

1. A book-style album for a cassette having a visible indicia along one side edge thereof, said album comprising front and rear covers,
a transparent spine connecting said covers together, said album including an inner tray sheet and an outer sheet bonded to one another,
at least one of the covers having a cassette receiving tray comprised of thin-walled sheet plastic prepared from a flat sheet by vacuum forming or the like, said tray including a major wall having a flat inner face that is free from cassette supporting projections and said face being bounded by three channel-shaped walls including a top tray wall, a bottom tray wall and a side tray wall extending respectively along a top edge, a bottom edge and along a free side edge of one of said covers,
said channel-shaped walls of the tray projecting inwardly from one cover in the direction of the other cover to define a tray receiving pocket therewithin,
the tray receiving pocket being sized to receive the cassette with the edge having the printed indicia located adjacent to the spine of the album,
cassette holding means on the album adjacent said one side edge of the cassette where the printed indicia is located and being adapted to contact one edge of the cassette



closest to the spine to serve as stop means for bracing the cassette, whereby the cassette is enclosed on four sides and retained in place solely by said top, bottom and side walls and by the cassette holding means,
the tray wall being substantially absent in the spine area to provide an open center in the wall of the tray aligned with the visible indicia on the cassette, said open center being substantially free from obstructions or other articles that would obscure the visible indicia on the side edge of the cassette whereby the printed indicia thereon can be seen through the album spine due to the clear field of vision provided by the open center when the cassette is placed in the album.

4,784,265
METHOD AND APPARATUS FOR PACKAGING AN OBJECT
Lawrence D. Gitlitz, W. Newton, and John A. Volo, Mansfield, both of Mass., assignors to New England Pottery Co., Inc., Foxborough, Mass.
Filed May 28, 1987, Ser. No. 57,331
Int. Cl.[4] B65D *85/44*
U.S. Cl. 206—423 **12 Claims**



1. A packaging device for an object having a predetermined shape comprising:
first and second closed bands of flexible material encircling the object in substantially perpendicular vertical planes, each of said bands being of a predetermined size and of sufficient width to keep the object from falling from the package;
said first band lying under said second band in the areas

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where the bands cross and having an opening formed in the portion thereof overlying the object on either side of the overlying second band; and

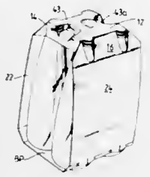
a handle spanning over the portion of said second band between said openings, said handle having enlarged ends each of which passes through and engages one of said openings in said first band.

4,784,266

MEANS FOR STABILIZING ARTICLES IN MULTIPLE ARTICLE PACKAGES

Jean Chaussadas, Deols, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 29, 1988, Ser. No. 161,702
Claims priority, application United Kingdom, Mar. 27, 1987, 8707392
Int. Cl.[4] B65D *65/12*
U.S. Cl. 206—434 **6 Claims**



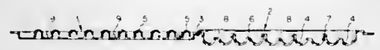
1. A package accommodating a plurality of articles, such as bottles of the type having a top panel and a bottom wall interconnected by spaced side walls thereby providing a tubular structure and end panel retention means at least partially to close the ends of the tubular structure so as to assist in preventing endwise dislodgement of the articles, stabilizing means for better maintaining said articles in a desired upright attitude, characterized in that said stabilizing means is put into its operative position automatically upon folding of said end panel retention means into their end retention position.

4,784,267

SURGICAL SPONGE COUNTER AND DISPOSAL CONTAINER

Annette L. Gessler, 204 Fredonia Rd., and Glenda D. Saylor, 3 Meadow La., both of Greenville, Pa. 16125

Filed Jul. 20, 1987, Ser. No. 75,624
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—438 **16 Claims**



10. A container for quickly and accurately counting used surgical sponges at the conclusion of surgery, said container comprising a lower half and an upper half, for placement onto said lower half, said lower half said container having plurality of spaced substantially pa[illegible] walls forming a plurality of troughs adapted to receive used surgical sponges, alternate walls of said plurality of walls having a shorter height than adjacent walls of said plurality of walls so that troughs on oposite sides of said alternate walls are adapted to receive either small sponges or a large sponge, said upper half of said container having a plurality of substantially parallel projections arranged to be complementary to said plurality of troughs, whereby a projection on said upper half extends within a portion of each of said plurality of troughs formed on said lower half when said upper half is closed onto said lower half and means on said upper half and means on said lower half for firmly holding said upper half in the closed position on said lower half when said container is closed.

4,784,268

STAND-UP OR HANGING DISPLAY BLISTER AND PACKAGE

William C. Perchak, Chicago, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jul. 20, 1987, Ser. No. 75,569
Int. Cl.[4] B65D *73/00*
U.S. Cl. 206—461 **11 Claims**



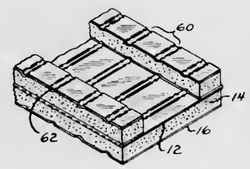
1. A thermoformed bubble for a bubble package usable either in a hanging or a free-standing display package comprising a bubble body, said body having peripheral flanges and a bottom portion, a base optionally usable to support said body in free-standing posture, said base being integral with said body and peripheral flanges and connected therewith by a living hinge crosswise of said bubble at said bottom portion of said body and peripheral flanges thereof, and means for fastening said base to said bottom portion of said body when pivoted about said hinge to a position normal to said peripheral flanges and engaging said bottom portion of said bubble.

4,784,269

PACKAGING WRAP

William R. Griffith, 685 Converse Dr., Cincinati, Ohio 45240

Continuation-in-part of Ser. No. 744,927, Jun. 14, 1985, Pat. No. 4,700,844. This application Nov. 14, 1986, Ser. No. 931,297
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] B65D *25/10, 85/48*
U.S. Cl. 206—453 **12 Claims**



1. A method of constructing a packaging wrap for supporting and protecting at least one article, which method comprises:

bonding a first layer of flexible material to a first major surface of a layer of shock absorbing material, the layer of shock absorbing material having first and second parallel edges along two sides of the first major surface;

severing the layer of shock absorbing material along a cutting line, the cutting line being parallel to the first and second parallel edges of the layer of shock absorbing material, and the distance between the cutting line and the first parallel edge of the layer of shock absorbing material being less than the distance between the cutting line and the second parallel edge of the layer of shock absorbing material;

folding the first layer of flexible material along a fold line located directly over the cutting line so as to fold a portion of the first layer of flexible material back on itself and to rotate the portion of the shock absorbing material between the cutting line and its first edge over onto the first layer of flexible material, whereby a curb is formed by the first edge of the shock absorbing material over the portion of the shock absorbing material between the cutting line and the second edge; and

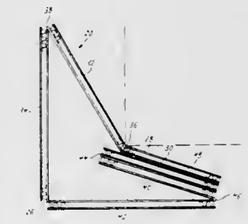
crimping the shock absorbing material along crimp lines transverse to the first and second cutting lines to facilitate the bending of the packaging wrap along the crimp lines.

4,784,270

CORNER POST FOR SHIPPING CONTAINER

Eddie Layer, and Bobby Whitworth, both of Louisville, Ky., assignors to Boise Cascade Corporation, Boise, Id.

Filed Apr. 28, 1987, Ser. No. 43,339
Int. Cl.[4] B65D *81/04*
U.S. Cl. 206—586 **15 Claims**



1. A corner post for insertion into each of the corners of a shipping container to hold an item contained therein in a spaced apart relationship from both adjacent sidewalls of said container as said container is shipped, said corner post being comprised of a single, continuous piece of substantially rectangular corrugated paperboard, said corner post having means defining a plurality of panels therein, at least two of said panels being joined over a substantial portion of their faces, said corner post having a first portion folded over a second portion in a first configuration so that said corner post is substantially flat in the first configuration, and wherein said corner post may be quickly and easily realigned by folding into a second, operable, configuration, said second configuration being characterized by space between said first and second portions wherein the first portion forms a substantially perpendicular angle and the second portion forms a substantially obtuse angle, said space being oriented to provide a cushioning effect between the item and both adjacent sidewalls.

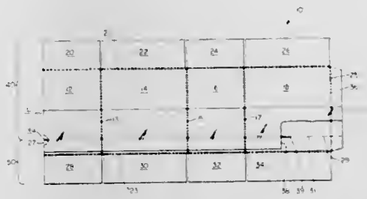
8. A convertible corrugated, one piece, corner post for insertion into a shipping container, said corner post being adapted to contact an item to be boxed into said container and retain it in a spaced relationship from both adjacent sidewalls of said container as said container is shipped, said corner post having a first configuration characterized as being substantially flat to facilitate its bulk handling and shipping, and a second configuration characterized as having first and second members substantially perpendicular to each other for close fitting into the corners of the container and joining members which extend between said first and second members such that a joining member foldably extends from each of said first and second members at an acute angle and such that said joining members are foldably connected to each other to substantially form an obtuse angle, said joining members being spaced apart from the first and second members at the foldable connection for contacting the item to be boxed into said container and provide cushioned support therefor from both adjacent sidewalls, wherein said corner post has means to quickly and easily be re-configured from said first configuration to said second configuration, all of said first, second, and joining members being joined together.

4,784,271

TEAR STRIP OPENABLE SHIPPING/DISPLAY CONTAINER WITH BUTT JOINT

Charles L. Wosaba, II; Peter W. Hamilton, and Robert J. Kissner, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 20, 1987, Ser. No. 123,098
Int. Cl.[4] B65D *75/68*
U.S. Cl. 206—617 **18 Claims**



1. An easy-open shipping display container comprising:

(a) top, bottom, and side panels, said top and bottom panels being hingedly attached to said side panels, said side panels having an inner surface and an outer surface;

(b) a line of severance cut in said side panels thereby defining a top cover section having a lower edge and a bottom tray section having an upper edge, said lower and said upper edges defining a butt joint;

(c) means for securing said top cover section to said bottom tray section, said securing means bridging said butt joint and having an inner surface and an outer surface; and

(d) means for splitting said securing means, said splitting means being positioned substantially superimposed over said butt joint, whereby pulling said splitting means splits said securing means, thereby separating said top cover section from said bottom tray section.

2. A blank for erecting an easy-open shipping/display container, said blank comprising:

(a) top, bottom, and side panels, said top and bottom panels being hingedly attached to said side panels, said side panels having an inner surface and an outer surface;

(b) a line of severance cut in said side panels thereby defining a top cover section having a lower edge and a bottom tray section having an upper edge, said lower and said upper edges defining a butt joint;

(c) means for securing said top cover section to said bottom tray section, said securing means bridging said butt joint and having an inner surface and an outer surface; and

(d) means for splitting said securing means, said splitting means being positioned substantially superimposed over said butt joint, whereby pulling said splitting means splits said securing means, thereby separating said top cover section from said bottom tray section.

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FLAT TOP CONTAINER AND BLANK FOR CONSTRUCTING SAME

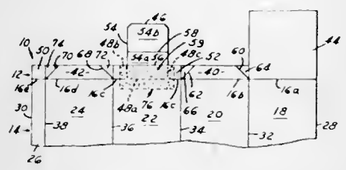
Robert E. Lisiecki, Bloomfield; Richard A. Miller, Detroit, and David M. Majewski, Northville, all of Mich., assignors to Pure-Pak Inc., Walled Lake, Mich.

Filed Dec. 18, 1987, Ser. No. 134,838
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—628 **10 Claims**

1. On a thermoplastic coated container including body pan-

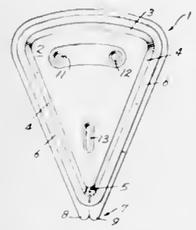
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els consisting of front and back panels and a pair of side panels, each having a top end; a pair of side fold-in edge panels integrally connected by first and second horizontal score lines to the top end of said pair of side panels and folded on said first and second horizontal score lines inwardly toward one another; a front fold-in panel integrally connected by a third horizontal score line to the top end of said front panel; a fold-out panel segment connected by a fourth horizontal score line to an intermediate portion of said front fold-in edge panel and folded on said fourth score line onto said intermediate portion of said front fold-in edge panel; a lift tab connected by a fifth horizontal score to said fold-out panel segment; and a cover panel integrally connected by a sixth horizontal score line to said back body panel and folded on said sixth horizontal score line onto said side fold-in edge panels and to said front fold-out panel segment and the outer portions of said front fold-in panel



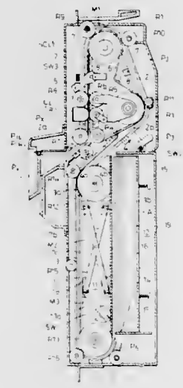
segment; the improvement comprising a first perforated line being formed on the top end of said front body panel along an intermediate portion of said third horizontal score line for operative cooperation with said fourth horizontal score line, said first perforated line being substantially equal in length to the width of said fold-out panel segment, and a pair of parallel perforated score lines extending from said first perforated line across said front fold-in edge panel, said fold-out panel segment and said lift tab being aligned with said front fold-in panel intermediate said parallel perforated lines; said parallel perforated lines and said first perforated line being adapted to rupture under tension upon the lifting of said lift tab to thereby lift said front fold-in panel intermediate said parallel perforated lines, said fold-out panel segment and said cover panel in unison and peel said cover panel away from said side fold-in edge panels to fully open said container between said side fold-in edge panels.

4,784,273
SINGLE SERVING CONTAINER FOR TORTES OR THE LIKE
Walter Niemetz, Gitzen 57, 5322 Hof, Austria
Filed Aug. 6, 1987, Ser. No. 82,285
Int. Cl.[4] B65D *85/72*
U.S. Cl. 206—634 **5 Claims**



1. A frangible, single-serving container for tortes and the like, comprising:
a base member for holding and serving a piece of torte or the like, having a sector-shaped base defining a first sector-shaped perimeter, a shallow base wall around the perimeter of the base, and a top rim on an upper edge of the base wall; and
a cover member for covering and protecting said piece of torte, having a sector-shaped top, an arc-shaped back wall, first and second radial walls, said radial walls defining a front edge, a bottom rim defined by said back and radial walls for engaging said top rim, said bottom rim defining a bisected tab having two halves adjacent said front edge, wherein said front edge is torn when the halves of the tab are forced in opposite directions.

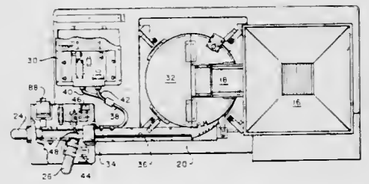
4,784,274
BILL DEVICE
Yoshikazu Mori; Susumu Kozima; Masayuki Watabe; Hideaki Onda, and Shigeru Yasuda, all of Saitama, Japan, assignors to Kabushiki Kaisha Nippon Coinco, Tokyo, Japan
Continuation of Ser. No. 6,656,769, Oct. 1, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 73,388
Claims priority, application Japan, Oct. 3, 1983, 58-184847; Nov. 25, 1983, 58-180889[U]
Int. Cl.[4] B07C *5/02*
U.S. Cl. 209—534 **11 Claims**



1. A bill device of the type which discriminates a true bill from a false bill among bills inserted into a bill insertion slit, which temporarily retains a true bill which has been accepted after discrimination, and which has selective capability for returning the retained bill toward the bill inserting slit and for accepting the same into a bill accumulating device as required, characterized in that:
a main body of said bill device is constituted of a relatively elongated casing, said bill insertion slit is formed substantially in the center of said casing in its longitudinal direction,
a first U-shaped bill conveying passage communicating with said bill insertion slit is provided in one half of said casing and a second U-shaped bill conveying passage communicating with said first U-shaped bill conveying passage is provided in another half of said casing,
bill discrimination means is disposed in the half of said first U-shaped bill conveying passage nearest said bill insertion slit, and
said bill accumulating device is disposed in the latter half of said second bill conveying passage, said latter half being the half furthest from said bill insertion slit,
said bill conveying passages being sufficiently long so that a plurality of bills after discrimination can be retained in said two U-shaped bill conveying passages, and wherein:
said casing is elongated in the vertical direction,
said insertion slit is disposed substantially in the center of a front panel of said casing,

said first U-shaped bill conveying passage is inverted U-shaped and said second U-shaped bill conveying passage is uninverted U-shaped, one end of said inverted U-shaped bill conveying passage communicates with said bill insertion slit and the other end thereof communicates with one end of said uninverted U-shaped bill conveying passage thereby forming a substantially S-shaped conveying passage as a whole, and wherein;
the members of said casing about both of said respective U-shaped bill conveying passages are relatively movable, thereby enabling said respective bill conveying passages to be opened.

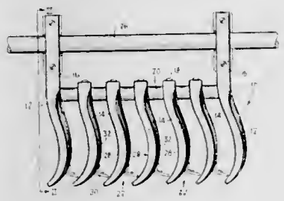
4,784,275
VERIFICATION SYSTEMS FOR SMALL OBJECTS
D. Alan Fridge, La Canada, Calif., assignor to Vanzetti Systems Inc., Stoughton, Mass.
Filed Sep. 15, 1986, Ser. No. 907,482
Int. Cl.[4] B07C *5/08, 5/342*
U.S. Cl. 209—558 **19 Claims**



1. A verification system for capsules, tablets or similar small objects, comprising:
a test block having a slot extending through the block;
conveyor means for directing the objects under test through said slot;
means for providing first and second longitudinally spaced color testing zones in said test block, said means including fiber optic arrays at the top and both sides of said slot at each of said two zones;
means for directing light to all six of the fiber optic arrays;
high speed spectrophotometer means coupled to receive light having spectral characteristics conforming to that of said object from all three fiber optic arrays at said first zone, and separately from all these arrays at said second zone;
means for comparing said sensed spectral characteristics with predetermined spectral characteristics;
means for initially directing all objects leaving said test block along an "acceptance" path; and
means for diverting objects having spectral characteristics which do not match said predetermined spectral characteristics from said "acceptance" path to a "rejection" path.

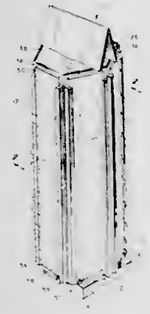
4,784,276
HANGER
Gary Gochanour, 3108 Baker Rd., Dexter, Mich. 48130
Continuation-in-part of Ser. No. 908,425, Sep. 16, 1986, Pat. No. 4,717,028. This application Dec. 30, 1987, Ser. No. 139,608
Int. Cl.[4] D06F *53/00*
U.S. Cl. 211—89 **9 Claims**

1. A garment hanger construction, comprising:
a pair of spaced-apart divider members having opposed substantially upright surfaces defining a downwardly opening garment-receiving space therebetween, at least one of said surfaces being concave in the vertical direction;
an elongated flap pivotally mounted at one end thereof on the other of said surfaces close to the lower end thereof, said flap extending across said garment-receiving space and toward said concave surface so that the opposite end of said flap is normally disposed close to said concave surface adjacent to the lower end thereof, said flap being pivotable upwardly in said garment-receiving space so



that the spacing between said opposite end of said flap and said concave surface progressively increases in an upward direction as said flap is pivoted upwardly in said space.

4,784,277
CAROUSEL DISPLAY
Patricia I. Wallish, Libertyville, Ill.; Steve Howard, Richardson, Tex., and Barry Silver, Northbrook, Ill., assignors to Patricia I. Wolfe, Libertyville, Ill.
Continuation-in-part of Ser. No. 875,788, Jun. 18, 1986. This application Apr. 24, 1987, Ser. No. 42,311
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—167 **1 Claim**



1. A rotary carousel counter display assembly comprising:
a counter support adapted to rest on a counter;
a column bearing on said base and extending generally upward from said base;
a bearing including an annular flange affixed to said column above said base;
a rotary shell including six integrally connected planar shell panels formed from a blank of generally planar paperboard stock and divided by fold lines; a bottom integrally formed with the blank which is formed into said rotary shell and partially closing a lower portion of said rotary shell, said bottom including a plurality of bottom flanges, each being integral with one of said shell panels, said bottom and said bottom flanges being defined by fold lines, each bottom flange being aligned with, and attached to, an interior portion of one of said shell panels, said bottom having a bottom orifice through which said column extends upwardly, and said bottom having a bottom surface resting on the annular flange of said bearing;
a top integrally formed with the blank which is formed into said rotary shell and closing an upper portion of said rotary shell, said top including a plurality of top flanges, each being integral with one of said shell panels, said top and said top flanges being defined by fold lines, each top

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flange being aligned with, and attached to, an interior portion of one of said shell panels, said top having a top orifice through which said column extends upwardly and two parallel spaced slots in said top, each lying on a tangent of a circle concentric with said orifice; and

a channel shaped restraint member fixed to each shell panel, each member having an elongate planar portion fixed to the outer surface of one of said shell panels, opposed U in cross-section edge portions integral with said planar portion and forming therewith a generally C-shaped card receiving slot, and a bottom flange extending outwardly from said planar portion and defining a bottom rest for a card received in said card receiving slot;

a plurality of product cards each bearing a plurality of products to be displayed, the products being releasably affixed in shingle fashion to each card, and each product card being slidably received in one of said card receiving slots

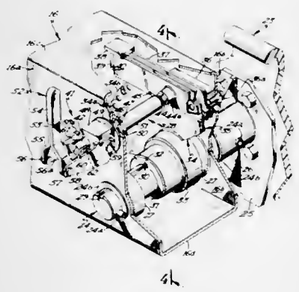
and an inverted V-shaped cap formed from a blank of paperboard stock and having two side panels connected at a fold line, each side panel having a tab which is received in one of said parallel spaced slots in said top.

4,784,278

LOCK MECHANISM FOR CRANE DEVICE

Terry L. Luscombe, Armstrong, Iowa, assignor to TG Industries, Inc., Armstrong, Iowa

Filed Feb. 17, 1987, Ser. No. 15,672
Int. Cl.[4] B66F *11/04*
U.S. Cl. 212—229 **2 Claims**



1. In combination with a truck mounted crane apparatus including an elongate telescopically extensible and retractable boom structure including elongate hollow lower and upper boom arms, means at one end of the lower boom arm connecting the latter to the bed of the truck to permit pivoting movement of the lower boom are relative to the truck bed, a receptacle for supporting an occupant therein, pivot means pivotally connecting the receptacle to the upper boom arm and including an elongate pivot axle having one end thereof secured to the receptacle, said pivot axle extending through and being journaled on the upper end of the upper boom arm to permit pivotal movement of the receptacle relative to the boom structure,

a locking mechanism including a pair of laterally spaced apart sector plates, each being affixed to said pivot axle for rotation therewith and positioned within the upper boom arm, one of said sector plates having a plurality of openings therein,

a plurality of clamping elements positioned within said upper boom arm and affixed thereto, said sector plates being disposed in interdigitating relation with respect to the clamping elements, one of said locking elements having an opening therein,

an elongate locking bolt shiftably mounted on and projecting into said upper boom arm adjacent said receptacle and being shiftable between an advanced locking position towards said sector plates and clamping elements, and a retracted release position in a direction away from said sector plates and clamping elements, said locking bolt, when shifted to the advance locking position, extending through the opening in said one of said clamping elements and through a selected opening in said one sector plate to lock the pivot axle and receptacle against pivotal movement relative to the boom structure, and, when in the retracted position, being released from the openings in said sector plate and clamping elements, and

an actuating handle connected with said locking bolt for shifting the same between locking and release positions.

4,784,279

PRESENT INVENTION RELATES TO IMPROVEMENTS IN TAMPER-PROOF CLOSURES

Richard C. Osting, Phoenixville, and William A. Conard, Harleysville, both of Pa., assignors to The West Company, Phoenixville, Pa.

Filed Jul. 31, 1987, Ser. No. 80,409
Int. Cl.[4] B65D *51/00*
U.S. Cl. 215—251 **5 Claims**



1. A combination of a container having a discharge opening and a pair of circumferentially extending axially spaced flanges defining a recess on the exterior of the container adjacent the discharge opening, a cap detachably secured over the discharge opening and a seal normally engaging over the cap comprising:

an annular top, a circumferentially extending skirt depending from the top adapted to be crimped at its lower terminal edge to engage under one of said flanges to hold it on the container,

a pull ring connected to the annular portion by a throat portion and partial score lines extending across the annular top portion and means defining a plurality of circumferentially spaced score lines extending from the lower edge of the skirt upwardly in an axial direction to a point closely adjacent the juncture of the skirt and annular top portion, said scores lines being spaced about said skirt at least at 60° intervals or less.

4,784,280

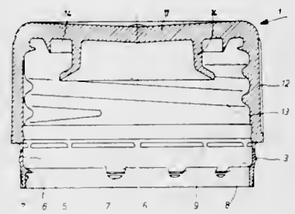
SEALING CAP WITH A SAFETY BAND

Hans-Werner Breuer, Himmelried, and Franz T. Bartl, Allschwil, both of Switzerland, assignors to Crown Cork AG, Reinach, Switzerland

Filed Feb. 5, 1988, Ser. No. 152,766
Claims priority, application Switzerland, Feb. 26, 1987, 737/87
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **7 Claims**

1. A sealing cap (**1**) for sealing a container opening (**2**), having a tear-off safety band (**3**) disposed on the lower edge of the cap the said safety band being intended to engage under an annular bulge (**4**) on the container opening when the cap is put on, the said safety band having, to this end, a plurality of

flexible tongues (**6**), which are oriented towards the central axis and which may be bent back when the cap is first put on and engage under the bulge (**4**) in the final position of the cap,



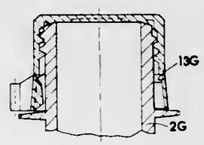
characterised in that clips (**7**) are disposed below the tongues, at least partly on the side facing away from the cap base (**11**), the tongues (**6**) bearing against the clips when axial force is acting on the safety band in the opening direction.

4,784,281

TAMPER-EVIDENT CLOSURES

Oleg Rozenberg, 1770 E. 14th St. #6B, Brooklyn, N.Y. 11229

Continuation-in-part of Ser. No. 680,157, Dec. 10, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 923,011
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **5 Claims**



1. A cup-shaped plastic unitary molded tamper-evident closure for operative association with a container which includes a neck portion having external threads formed thereabout and an annular collar below the threads of the neck portion, the annular collar including an outer peripheral wall and a lower annular wall extending inwardly from a lower end of said outer peripheral wall, said closure comprising:

a. an upper cap portion having internal threads for mated engagement with the external threads of the container;

b. a lower skirt portion connected to the upper cap portion and having an inside diameter that is closed to the outside diameter of the upper cap portion;

c. weakened intermediate portions circumferentially formed about the closure at the connection between the lower skirt portion and the upper cap portion;

d. said upper cap portion including about its circumference a plurality of vertically extending intermittently spaced grooves extending down to the level of the weakened intermediate portions;

e. a plurality of corresponding openings which separate the weakened intermediate portions and extend through the connection between the upper cap portion and the lower skirt portion;

f. a number of radially inwardly directed ribs located on the interior surface of the lower skirt portion for locking engagement with the annular collar of the container; and

g. said ribs being longitudinally aligned with the grooves on the upper cap portion.

h. said ribs being vertically spaced from the upper end of said lower skirt portion; and

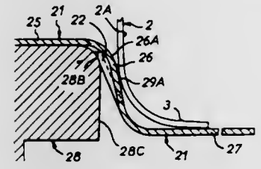
i. said ribs lockingly engaging said annular collar at an engagement portion on said lower annular wall which is inwardly spaced from said outer peripheral wall when the closure is assembled with the container.

4,784,282

END CLOSURES FOR A CONTAINER BODY

Lucien F. Le Bret, Saint Gratien, and Robert Saada, Maisons-Alfort, both of France, assignors to Gallay S.A., Paris, France

Division of Ser. No. 785,382, Oct. 7, 1985, Pat. No. 4,697,972. This application Mar. 25, 1987, Ser. No. 30,896
Claims priority, application France, Oct. 3, 1984, 84 15157
Int. Cl.[4] B65D *8/00*
U.S. Cl. 220—67 **3 Claims**



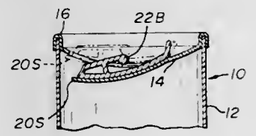
1. A stackable preformed end closure adapted to be seamed to a container body, comprising a recessed transverse central portion, a skirt extending axially and radially from said central portion, an annular concave connecting zone joining said central portion to said skirt, a flange extending radially outwardly from said skirt axially remote from said central portion, a plurality of inwardly protruding hollow boss means formed in said concave connecting zone and adapted to engage a corresponding connecting zone of a seaming chuck for driving the end closure in rotation with the chuck, said boss means also being engageable with the convex side of the connecting zone of an identical subjacent end closure in nesting relation therewith so that the flanges of said first mentioned end closure and the subjacent end closure are axially spaced from each other to facilitate separation and handling.

4,784,283

SELF-CLOSING BEVERAGE CAN

Paul Cantu, 4012 Tod Ave., East Chicago, Ind. 46312

Filed Jan. 21, 1988, Ser. No. 146,588
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—269 **14 Claims**



1. A metal beverage can having a top metal wall with means defining a weakened line thereon, which line is shaped in the outline of a flap, and which line substantially surrounds and defines a flap area of the top metal wall and extends to be adjacent one edge of the can top and which, when the weakened line is ruptured, forms a flap which can pivotally move downward into the interior of the can so as to provide a pour opening;

an opening structure mounted atop said top and serving to allow rupturing forces to be applied to said weakened line, said structure being mounted to said top so as to extend over said flap area;

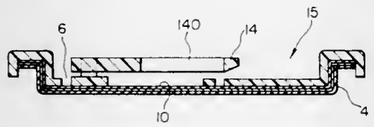
said flap when formed after said line is ruptured being resil-

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iently pivoted so as to, when pivotally depressed within said can below said top, return under spring bias to said area; and

said structure mounted atop said flap being so configured as to present a smooth surface above the flap which surface is sized and shaped to contact with the lip of a user of the can who brings the can top to his or her lips with the flap opening near the mouth and in response to such contact to resiliently pivot the flap after it is depressed, downward into the can so as to open the pour opening and allow the user to drink from the can.

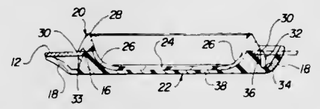
4,784,284
COVER FOR A CAN-SHAPED CONTAINER
Otohiko Miyanchi; Yoshihiko Kawakami; Mitsuo Imai, and Junji Yotsuyanagi, all of Kanagawa, Japan, assignors to Showa Denka Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 30, 1987, Ser. No. 32,125
Int. Cl.[4] B65D *17/34*
U.S. Cl. 220—270 **13 Claims**



1. A cover for a can-shaped container, comprising:
a multi-layer base comprising a metallic foil impermeable to oxygen and moisture and a heat-fusable resin layer formed on each side of said metallic foil;
a resin layer laminated to said multi-layer base and comprising an outer planar part and an inner planar part, said inner part being completely contained within said outer part and separated from said outer part by a gap between said resin layers, said inner part having a pedestal with an outer periphery contiguous with said gap, said outer periphery having a substantially circular shape; and
tearing means including a grip having a first portion attached to said pedestal and a second portion extending away from said first portion, said first portion having an outer periphery of substantially the same shape as said outer periphery of said pedestal, wherein said outer periphery of said first portion and said outer periphery of said pedestal are co-extensive relative to said gap to enable said first portion to press against said pedestal and puncture said multi-layer base over the arc-length of said circular outer periphery of said pedestal when said second portion is lifted.

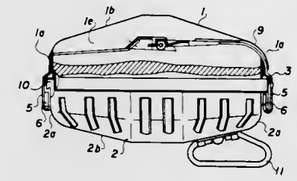
4,784,285
DUAL DUROMETER SELF LOCKING AND SEALING PLUGS AND METHOD FOR MAKING SAME
Praful J. Patel, Livonia, Mich., assignor to Chemcast Corporation, Madison Heights, Mich.
Filed Aug. 3, 1987, Ser. No. 80,850
Int. Cl.[4] B65D *55/00*
U.S. Cl. 220—307 **8 Claims**

1. A self-locking and sealing plug for filling and sealing an opening in a panel, said plug comprising
an opening filling - locking portion having an opening-filling central portion which terminates at its periphery in an annular locking portion, said locking portion having a continuous circumferential and axial-extending ridge portion having substantially the shape of and a circumferential dimension larger than said opening, said ridge portion tapering inwardly and upwardly from said circumferential dimension toward its top portion, said top portion having a circumferential dimension smaller than said ridge portion,
a sealing portion having a central surface portion overlying the said opening-filling central portion of said locking portion, said central surface portion terminating adjacent to its periphery in a sealing band surface constituting an axial extending continuation of said axial-extending ridge portion, and terminating at its periphery in an annular wing portion, said annular wing portion extending outwardly and upwardly from said sealing band surface and forming a secondary seal by resilient pressure contact with the surface surrounding said opening when said plug is installed in a panel opening,



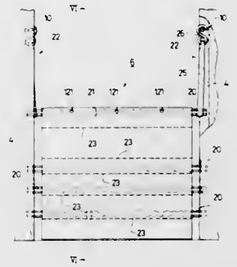
said locking portion and said sealing portion being united and bonded together in the areas of contact between said locking and said sealing portions,
said opening filling - locking portion comprising thermoplastic polyolefin resinous material having a durometer hardness reading in the range of about 60 to about 110 Rockwell R and
said sealing portion comprising a thermoplastic elastomeric material consisting essentially of a blend of thermoplastic crystalline polyolefin resin and cured monoolefin copolymer rubber and having a durometer hardness reading in the range of about 55 Shore A to about 55 Shore D.

4,784,286
CLOSING DEVICE
Klaus-Dieter Dahrendorf, and Volker Hunnebeck, both of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany
Filed Nov. 18, 1987, Ser. No. 122,009
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639421
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 **7 Claims**



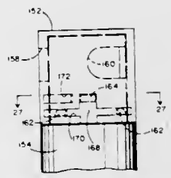
1. A closing device with tension bands for the gas-tight closing of an ever-ready container comprised of an upper shell and a lower shell of approximately equal size for respirators, where the tension bands are pulled together and held by a toggle catch, wherein the improvement comprises:
(a) the tension bands are arranged on the upper shell and are designed trapezoidally with the longer side of each trapezoid having hook-shaped parts which engage into correspondingly defined counter parts arranged at corner points of the lower shell;
(b) a locking element for the tension bands disposed between the shorter sides of each trapezoid; and
(c) a tension lever having a shorter and longer lever leg, said tension lever extending from the locking element with the end of the longer lever leg surrounding adjacent edge portions of the upper and lower shell.

4,784,287
BULKHEAD DEVICE FOR USE IN CONTAINER LINER BAGS
Hideo Yamada; Shigemi Ichiki; Hisamoto Naniwa; Susumu Uchida; Kenji Kadokura; Susumu Tsunoda, and Kunio Nakajima, all of Tpkyo, Japan, assignors to Nippoo Yusen Kaisha and Nihon Matai Co., Ltd., both of Tokyo, Japan
Filed Jun. 27, 1986, Ser. No. 879,433
Claims priority, application Japan, Jun. 29, 1985, 60-99275
Int. Cl.[4] B65D *25/16*
U.S. Cl. 220—403 **6 Claims**



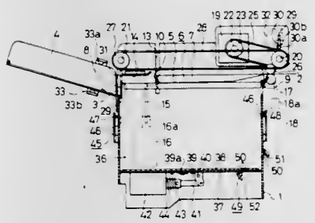
1. A bulkhead device for use with container liner bags which are used to line the inside of a container of the type having a recessed groove defined therein comprising:
a plurality of support members extending in a substantially parallel spaced apart relation and having both ends thereof adapted to be disposed in the recessed grooves which are defined in side walls of the container so as to be detachable therefrom for supporting an end face of a liner bag on the side of a door of the container;
positioning means for fixing the vertical position of the uppermost of said support members; and
spacer means for suspending the support members other than said uppermost support member from said uppermost support member thereby fixing the verticle position between said members.

4,784,288
ARTICLE DISPENSER WITH TAMPER-EVIDENT MEANS
Kenneth L. Jennings, Rte. 2, P.O. Box 83-4, Strafford, Mo. 65757
Continuation-in-part of Ser. No. 781,040, Sep. 27, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,381
Int. Cl.[4] B65D *83/04*
U.S. Cl. 221—4 **1 Claim**



1. A pill dispenser for containing and dispensing pills such as aspirin, vitamins, and the like, the dispenser comprising:
a container member having a compartment for containing said pills, said compartment communicating with a dispenser portion having a first aperture;
a dispenser control member having a second aperture and positioned relative to said dispenser portion of said container member for providing access to said pills only when said first and second apertures are substantially aligned;
means preventing removal of said dispenser control member from said container member after initial relative positioning thereof;
means indicating whether or not said first and second apertures may have been previously aligned;
said indicating means comprising at least one twist-limiting protrusion on said dispenser portion, a slot, a bridge and a second locking groove on said dispenser control member, said bridge separating said slot from said second locking groove, said slot receiving said twist-limiting protrusion upon placement of said dispenser control member on said dispenser portion and said bridge permitting only unidirectional travel of said twist-limiting protrusion from said slot into said second locking groove upon rotation of said dispenser control member whereby the initial position of said twist-limiting protrusion is indicative of whether or not said pill dispenser has been tampered with previously; and
wherein said removal preventing means comprises at least one non-removable locking protrusion on said dispenser portion and a first locking groove on said dispenser control member for receiving said protrusion in slideable engagement whereby said locking protrusion, once within said first locking groove, cannot be removed therefrom.

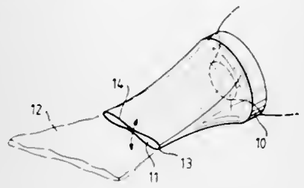
4,784,289
TICKET ISSUING DEVICE FOR A TICKET MACHINE
Izumi Ogawa; Keisuke Murakami; Mamoru Tago; Chihiro Aoki; Tsutomu Fujiwara, and Susumu Matsuda, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Nov. 7, 1986, Ser. No. 928,007
Claims priority, application Japan, Nov. 13, 1985, 60-254217; Nov. 13, 1985, 60-254218; Feb. 10, 1986, 61-27439
Int. Cl.[4] B65H *5/02, 43/08*
U.S. Cl. 221—9 **16 Claims**



15. A ticket issuing device for a ticket machine, comprising:
a feeding mechanism for feeding a ticket;
a holding plate for receiving a ticket fed thereto one at a time by said feeding mechanism and for temporarily holding a plurality of received tickets in a layerable condition thereon;
a receiving plate located adjacent an end of said holding plate opposite to said feeding mechanism;
an operating member operable in response to an issuing signal for pushing out said plurality of tickets on said holding plate to said receiving plate;
a storage for storing tickets therein; and
a transferring means operable in response to an issue stopping signal for directly transferring tickets on said holding plate into said storage.

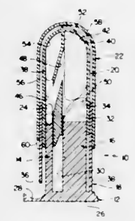
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4,784,290
APPARATUS FOR DISPENSING WET WIPES
John A. Howard, Bedford, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Nov. 28, 1983, Ser. No. 555,737
Claims priority, application United Kingdom, Nov. 29, 1982, 8233988
Int. Cl.[4] B65H 1/00
U.S. Cl. 221—63 6 Claims



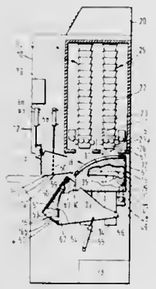
1. A container for dispensing wet wipes comprising a cassette filed with at least one wipe and provided with a seal comprising a tube of generally tapered form having a relatively wide mouth for receiving wipes and a relatively narrow orifice for dispensing them, the tube being divided circumferentially into relatively rigid axially extending zones and relatively flexible concave axially extending zones, so that when a wet wipe is dispensed the orifice is capable of expansion.

4,784,291
DISPENSER FOR SMALL UNIFORMLY SHAPED ARTICLES
Donald W. Melucci, Lincoln, R.I., assignor to Pharmtech Corporation, Warwick, R.I.
Filed Jun. 26, 1987, Ser. No. 67,139
Int. Cl.[4] B65D 83/04
U.S. Cl. 221—187 11 Claims



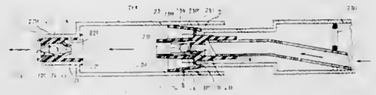
1. A dispenser for dispensing articles of substantially uniform dimension and configuration comprising a base receivable on a supporting surface, a slide member mounted on said base so that it is slidable with respect thereto between a lower first position and an upper second position when said base is received on said supporting surface, said slide member having a storage chamber therein for containing a plurality of said articles, an intermediate passage dimensioned and configured for receiving and containing a single one of said articles and communicating with said storage chamber for individually receiving articles therefrom, a transfer passage communicating with said intermediate passage, said transfer passage having upper and lower ends, and an outlet passage communicating with said transfer passage adjacent said transfer passage upper end, said outlet passage having a lower end and an outlet opening therein adjacent the lower end thereof, guide means mounted on said base and operable for guiding a single one of said articles from said storage chamber into said intermediate passage each time said slide member is moved from said first position thereof to said second position thereof and back to said first position thereof, and transfer means traveling in said transfer passage and operative for obstructing the passage of said articles from said intermediate passage to said transfer passage when said slide member is in the first position thereof and operative for allowing a single one of said articles to gravitate from said intermediate passage to said transfer passage and for then moving said article upwardly into said outlet passage when said slide member is moved from said first position thereof to said second position thereof and back to said first position thereof.

4,784,292
FOOD-STORAGE, HEATING AND DISPENSING APPARATUS FOR USE IN A VENDING MACHINE
John P. Johndrow, Stafford; Paul R. Taylor, Nottingham; Martin E. Wigg, Wolverhampton; Harold M. Wright, deceased, late of Birmingham; Julie K. by Whatson, administrator, and Sally-Anne by Wright, administrator, both of Coldfield, all of United Kingdom, assignors to Sankey Vending Limited, West Midlands, England
PCT No. PCT/GB86/00070, § 371 Date Dec. 8, 1986, § 102(e) Date Dec. 8, 1986, PCT Pub. No. WO86/04707, PCT Pub. Date Aug. 14, 1986
PCT Filed Feb. 10, 1986, Ser. No. 946,181
Claims priority, application United Kingdom, Feb. 9, 1985, 8503385; Jun. 15, 1985, 8515236
Int. Cl.[4] G07F 11/00
U.S. Cl. 221—101 8 Claims



1. Food-storage, heating and delivery apparatus comprising:
(a) storage chamber provided with an aperture;
(b) an oven disposed adjacent to the storage chamber and provided with an aperture, said apertures being in mutual alignment;
(c) first delivery xeans for selectively delivering articles to be vended from said storage chamber to said oven through said aligned apertures;
(d) second delivery means for delivering said articles from said oven through the oven aperture; and
(e) a single movable closure element having a first position in which it simultaneously closes both said storage chamber aperture and said oven aperture and having in addition a number of positions which allow said articles to be delivered from said storage chamber to the oven and which allow said articles to be delivered from the oven.

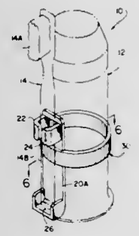
4,784,293
TOY WATER GUN
Yano Hiroshi, Moriguchi, Japan, assignor to Sekiden Co., Ltd., Moriguchi, Japan
Filed Jul. 31, 1984, Ser. No. 636,243
Claims priority, application Japan, Aug. 3, 1983, 58-142010
Int. Cl.[4] F41B 9/00
U.S. Cl. 222—79 2 Claims



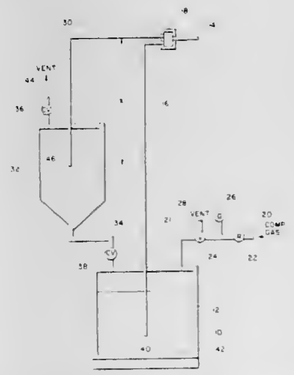
1. In a toy gun for projecting a fluent material and having a front gun body and a hollow rear gun body, one having a cylinder means including a cylinder wall as a part thereof and the other having a piston means including a piston wall as a part thereof, said piston means being slideable in said cylinder means for permitting movement of said gun bodies toward and away from each other, spaced apart grip means on the respective gun bodies projecting laterally thereof for gripping said bodies for relatively moving them for moving said piston means back and forth in said cylinder means, guide means on one of said gun bodies slideable along the other of said gun bodies for guiding said gun bodies in the direction of the longitudinal axes of said piston and cylinder means, and stop means on the other of said gun bodies along the path of movement of the one body and the guide means and being engageable with the stop means when the gun bodies are substantially at the end of the movement of the gun bodies away from each other for preventing the gun bodies from coming apart, nozzle means on the one of said piston means and said cylinder means which is forwardmost, one way valve means connected to said nozzle means on said piston means and one way valve means positioned on said cylinder means, the valve means on the rearmost one of said piston means and said cylinder means being closed and the valve means on the forwardmost one of said piston means and said cylinder means being open during movement of said piston means and said cylinder means toward each other and the valve means on the forwardmost one of said piston means and said cylinder means being closed and the valve means as the rearwardmost one of said piston means and said cylinder means being open during movement of said piston means and said cylinder means away from each other, the improvement comprising:
a fluent material suction tube attached to the one way valve means on the rearmost one of said piston means and said cylinder means and extending rearwardly into said rear gun body for supplying fluent material to said valve means, and a wire spring loop in said rearmost one of said piston means and said cylinder means and engaged between the wall thereof and the rearmost end of said suction tube for holding said rearmost end in a lowered position in said rear gun body.

4,784,294
TOOTHPASTE CONTAINER WITH ATTACHED TOOTHBRUSH SUPPORT
Robert Dickinson, 153 E. Palmetto Park East, Boca Raton, Fla. 33432
Continuation of Ser. No. 909,602, Sep. 22, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 114,495
Int. Cl.[4] B65D 35/24
U.S. Cl. 222—93 1 Claim

1. A paste-dispensing container with an attached implement support comprising a vertically oriented implement holder having upper and lower means extending transversely thereof to supportingly engage an elongated implement having a brush-like portion at an end thereof whereby the brush-like portion is free of contact with said holder, said implement holder having a horizontally oriented recess therein intermediate said upper and lower means, a vertically standing paste-dispensing container of a cylindrical shape in cross section and of a selected diameter, and a ring for attaching said implement holder to said paste-dispensing container having a vertically oriented recess on an inner surface thereof to receive therein said implement holder, said ring being of fixed, slightly larger diameter diameter than that of said paste-dispensing container so as to be readily placed in encircling relation about such container with a nominal clearance therebetween, said implement holder and said ring prior to being disposed on said container being placed in an assembled relation with each other by having said horizontally oriented recess of said implement holder interengaged with said vertically oriented recess of said ring, said implement holder being in an interposed position between said ring and said container effectively taking up said clearance therebetween, and forming a clamping action between said ring and implement holder, whereby said assembly of said ring and implement holder is held by friction against said container.



4,784,295
SLURRY DISPENSING SYSTEM HAVING SELF-PURGING CAPABILITIES
Allan L. Holmstrand, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.
Continuation of Ser. No. 15,774, Feb. 17, 1987, abandoned. This application Apr. 27, 1988, Ser. No. 188,150
Int. Cl.[4] B65D 88/54
U.S. Cl. 222—148 4 Claims



1. A slurry dispensing system for supplying a slurry to a workpiece comprising: sealed reservoir means for containing a supply of slurry; first conduit means leading from said reservoir means and in fluid communication with said supply of slurry; selectively operable pressure means operable to force

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slurry from said reservoir means into said first conduit means, said pressure means comprising a gaseous pressure source in fluid communication with said reservoir means, and first valve means selectively connecting said reservoir means to said gaseous pressure source or to the atmosphere surrounding said reservoir; nozzle means for supplying slurry to a workpiece; bypass means connecting said first conduit means to said nozzle means to supply slurry under pressure from said first conduit means to said nozzle means, said bypass means diverting excess slurry; second conduit means connected to said bypass means for receiving said excess slurry from said first conduit means; chamber means at an elevation below said bypass means connected to said second conduit means to receive said excess slurry; delivery means for delivering slurry in said chamber means to said reservoir means, said delivery means including pressure-responsive, normally-closed check valve means for permitting flow of slurry through said delivery means when the pressure in said reservoir means is not greater than in said chamber means, said system being operable so that when slurry is forced from said reservoir means to said nozzle means, excess slurry is collected in said chamber means, and when said pressure means is operated to not force slurry from said reservoir means said check valve means opens to permit slurry in said chamber means to return to the reservoir means and slurry in said second conduit means forms a column of slurry which supports a sub-atmospheric pressure within said bypass means so that air is admitted through said nozzle means to clean the system.

4,784,296

CAP FOR KEG DISPENSER

Joseph J. Bullock, Atherton, Calif., assignor to Cap Snap Co., San Jose, Calif.

Continuation of Ser. No. 816,063, Jan. 3, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 82,938

Int. Cl.[4] B67B *5/00*

U.S. Cl. 222—153 **9 Claims**



1. A cap formed of a resilient plastic capable of being torn for use on a container neck having a lip at its upper end and retaining means on its exterior, said retaining means being located substantially below said lip, said cap comprising a top disk, an elongated skirt depending vicinal the periphery of said disk having a bottom edge and horizontally disposed bead means on its interior spaced substantially upward relative to said bottom edge and substantially downward relative to said disk, said bead means being cooperable with said retaining means to secure said cap on said neck so long as said skirt is intact to resist tampering, said skirt having a tab extending downward and away from said bottom edge, said skirt being weakened by a score line substantially comprising an upward extension of the top edge of said tab, said score line having a terminus immediately below said disk and substantially above said bead means, said skirt having a thickness to either side of said terminus substantially greater than the thickness of said skirt at said score line, whereby upon pulling said tab said skirt tears along said score line, said disk guiding tearing of said skirt circumferentially immediately below said disk, to permit separation of said cap from said neck, said lip being sealed against the underside of said disk when said bead means and said retaining means are engaged.

4,784,297

BEVERAGE DISPENSER WITH AGITATOR

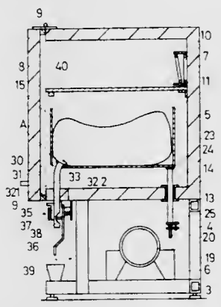
Solly Katz, P.O. Box 78036, Sandton, 2146, Transvaal, South Africa

Filed Mar. 10, 1987, Ser. No. 24,083

Claims priority, application South Africa, Mar. 10, 1986, 86/1737

Int. Cl.[4] B67D *5/06*

U.S. Cl. 222—161 **17 Claims**



1. A fluid dispenser comprising:
a holder having a width and a major dimension extending in a substantially horizontal direction;
a pivotal axis operatively positioned to extend along said substantially horizontal direction of said major dimension at one end of said holder for pivoting said holder;
at least one fluid container operatively positioned to be substantially flat within said holder;
said at least one fluid container having an outlet opening positioned at an aperture of said holder at one end of the fluid container contiguous with said pivotal axis in such a manner as to allow fluid to be dispensed from one side of said fluid container;
and means for disturbing the container in a reciprocal manner about said pivotal axis for discharging fluid therefrom.

4,784,298

APPARATUS FOR FEEDING BULK MATERIAL

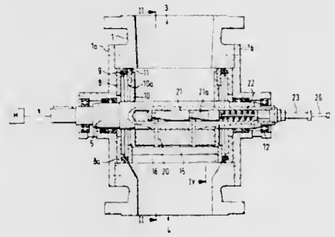
Dieter Heep, Bergatreute; Paul Vogel, Ravensburg, and Manfred Frey, Aulendorf-Zollenreute, all of Fed. Rep. of Germany, assignors to Waeschle Maschinenfabrik GmbH, Ravensburg, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 71,651

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623454

Int. Cl.[4] G01F *11/10*

U.S. Cl. 222—350 **15 Claims**



1. Apparatus for feeding bulk material; comprising:
a housing provided with inlet means and outlet means;

a rotor accommodated within said housing and having a shaft and a plurality of radially extending vanes supported on said shaft to define compartments for transporting the bulk material from said inlet means to said outlet means;
sealing means disposable in said vanes for sealing said vanes toward said housing, said sealing means including a sealing strip and a support which is interlocked with said sealing strip and provided with at least one radial bore;
adjusting means acting on said sealing means for maintaining the sealing action at said housing and including an adjusting bar which is guided within said shaft for axial displacement thereof and has at least two conical surfaces spaced from each other in axial direction, and push rods provided in said vanes and spaced from each other in such a manner that their one end abuts said conical surfaces and their other end bears against said sealing means; and
spring means urging said sealing means radially in direction toward said shaft to prevent disengagement of said sealing means from said vanes during rotation of said rotor, said spring means including a screw traversing said radial bore of said support and being threadably engaged in said vanes, and a compression spring extending in said radial bore with their one end bearing against said support and their other end supported by said screw.

4,784,299

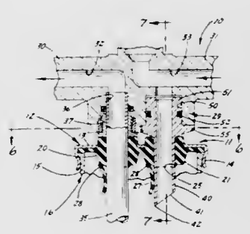
TAP WITH SPACED PRODUCT AND GAS TUBES

Donald R. Stenger, Roscoe, Ill., assignor to Johnsoo Enterprises, Inc., Rockford, Ill.

Filed Apr. 3, 1987, Ser. No. 34,274

Int. Cl.[4] B67D *1/12*

U.S. Cl. 222—397 **6 Claims**



1. A tap for dispensing a product from a container, said tap comprising a body having a product passage and a gas passage, said body having a socket which communicates with said gas passage, a relatively long product tube fastened securely to said body and communicating with said product passage to dispense product from said container, a substantially shorter gas tube communicating with said gas passage for delivering pressurized gas into said container for the purpose of forcing product to flow through said product tube, said gas tube having one end portion telescoped slidably with said socket and being releasable therefrom when said gas tube is held axially stationary and said body is pulled axially away from said gas tube, the opposite free end portion of said gas tube being beveled at an acute angle relative to the axis of the gas tube so as to cause a point to exist at one said of the free end of the gas tube, and coacting means on said gas tube and said body and engageable with one another to orient said gas tube in a predetermined angular position in said socket thereby to cause said point to be oriented in a predetermined angular position relative to said body.

4,784,300

LIQUID METERING DEVICE WITH TIME DELAYED CLOSURE

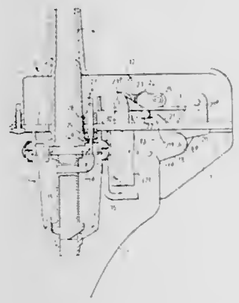
Colin Lees, Stafford, United Kingdom, assignor to Hanwin Supplies Limited, Cannock, England

Filed Oct. 16, 1987, Ser. No. 109,177

Claims priority, application United Kingdom, Oct. 17, 1986, 8624940

Int. Cl.[4] G01F *11/32*

U.S. Cl. 222—453 **6 Claims**



1. In apparatus for dispensing measured quantities of liquid comprising a measuring chamber with an inlet at one end which, in use, is connected to the mouth of an inverted bottle, and an outlet opening at the other end through which the measured quantity of liquid is dispensed, the measuring chamber incorporating a double-headed plunger which in a first position closes the outlet while leaving the inlet open so that the measuring chamber fills with liquid from the bottle, while in a second position the plunger closes the inlet and leaves the outlet open so that the measured quantity of liquid drains from the measuring chamber, and delay means for holding said plunger in said second position for a predetermined period of time sufficient to ensure delivery of the entire contents of the measuring chamber, the improvement comprising a linkage system, which has an operating member disposed adjacent to the outlet of the measuring chamber, said linkage system being coupled to said plunger and to said delay means, and a first spring means to return said plunger to its first position automatically at the expiration of the delay period afforded by the delay means, wherein the delay means comprises a piston and cylinder type assembly in which the piston is driven in the cylinder by a second spring means at a rate determined by the rate at which a fluid flows through a restricting orifice provided in said assembly.

4,784,301

DISPENSING SPIGOT

Peter R. Wells, Ashhurst, New Zealand, assignor to Wrichtcel Limited, Victoria, Australia

Continuation of Ser. No. 665,368, Oct. 26, 1984, Pat. No. 4,645,100. This application Jan. 29, 1987, Ser. No. 11,436

Claims priority, application Australia, Oct. 27, 1983, PG2086

The portion of the term of this patent subsequent to Feb. 24, 2004, has been disclaimed.

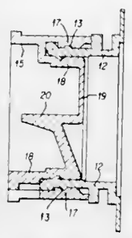
Int. Cl.[4] B65D *47/20*

U.S. Cl. 222—505 **12 Claims**

1. A container having a spout and a dispensing spigot attached to said spout for dispensing contents of the container, said spigot including a concave diaphragm wall fitting within said spout such that an external surface of the diaphragm wall engages an inner surface of the spout, the improvement comprising a groove formed in the external surface of the diaphragm wall and a complementary flange formed on the inner surface of the spout and projecting into said groove, one sur-

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face of said flange being in sealing contact with a wall of the groove, said flange being an elongate member in a direction projecting away from its associated inner surface of the spout and at an acute angle thereto, the length of said elongate member being greater than the thickness thereof, the length of said



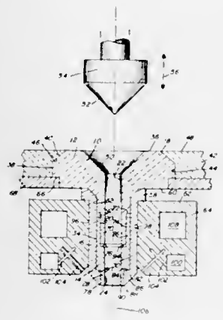
flange being formed between said one surface and a generally parallel second surface connected by an end wall of the flange, whereby sealing is achieved along substantially the entire surface of said one surface of the flange, wherein said second surface has at least an edge in contact with another wall of the groove.

4,784,302

GAS ATOMIZATION MELT TUBE ASSEMBLY

Ramaswamy V. Raman, Framingham, and Howard E. Surette, Lunenberg, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 29, 1986, Ser. No. 947,149
Int. Cl.⁴ B22F *9/08*
U.S. Cl. 222—603 **20 Claims**



1. In a confined gas atomization apparatus for producing fine metal powder from a high temperature melt, and having a melt reservoir having a downwardly opening outlet, an annular gas nozzle to deliver high pressure gas to an atomizing zone below the melt reservoir, the gas nozzle having a longitudinal bore therethrough, and a melt delivery tube projecting from the reservoir outlet, through the gas nozzle bore to near the atomizing zone, the improvement wherein the melt delivery tube comprises a melt delivery tube assembly comprising:

a refractory melt delivery tube having a longitudinal bore therethrough and comprising an upper portion seatable at the reservoir outlet for melt flow from the reservoir generally vertically downward through the reservoir outlet and melt tube bore, and a lower portion having a tip; and

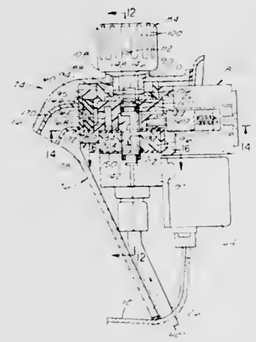
a supporting and thermally insulating shield having a longitudinal bore therethrough and coaxially and removeably mounted surrounding the longitudinal outer surface of at least the lower portion of the melt tube, including the entire tip, to provide a thermal barrier against impinging atomizing gas, wherein the support shield bore is shaped complementarily to the surrounded outer surfaces of the melt tube for close and slideable fit thereover, and the outer surface of the support shield is of a diameter permitting close and slideable fit of the support shield within the annular gas nozzle bore.

4,784,303

WATER DISPENSING SYSTEM

Munir J. Abad, Valencia, and Sven A. Pettersson, Santa Monica, both of Calif., assignors to Adams Rite Products, Inc., Glendale, Calif.

Filed Nov. 12, 1986, Ser. No. 929,749
Int. Cl.⁴ B67D *5/08;* **E03C** *1/04*
U.S. Cl. 222—639 **5 Claims**



1. A water dispensing system for an aircraft comprising:

a water supply including a source of hot water and a source of cold water and means for maintaining the water supply above atmospheric pressure while the aircraft is in flight and venting the water supply to atmospheric pressure while the aircraft is on the ground and the water supply is being drained.

a washbasin and faucet combination, said faucet being disposed above the washbasin,

a mixing chamber in the faucet coupled to the water supply wherein hot and cold water are mixed,

a manually operable control member in the mixing chamber and extending from the faucet which is movable to different positions to adjust the ratio of hot and cold water flowing through the mixing chamber,

switch means disposed within the faucet which is manually actuated by said control member to initiate delivery of water from said water supply to the faucet,

conduit means between the faucet and water supply and through the mixing chamber through which water flows,

solenoid control valve means in the conduit means which, upon energization by actuation of the switch means, opens said valve means for a predetermined time period to allow water to flow from the water supply through the conduit means and out the faucet.

4,784,304

TACKLE BOX

Charles Schweitzer, 3925 Newportville Rd., Newportville, Pa. 19056

Filed Oct. 8, 1987, Ser. No. 105,901
Int. Cl.⁴ A45F *3/02;* **A01K** *97/06*
U.S. Cl. 224—202 **9 Claims**

1. A new and improved tackle box, comprising:

a generally rectangular box formed from a heavy duty fabric material;

a closure flap integrally formed on said fabric box;

cooperating VELCRO closure fastening strips on a front wall of said fabric box and on said closure flap;

shoulder strap attachment loops formed on opposed exterior side walls of said fabric box;

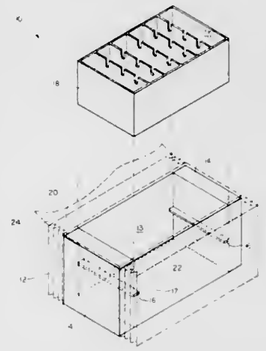
a pair of VELCRO fastened fishing rod holding straps on a front exterior wall of said fabric box;

a sunglasses case on said front wall between said fishing rod holding straps;

a rear accordion fold expandable storage pouch adjacent an interior back wall of said box;

a front accordion fold expandable pouch adjacent a front interior wall of said fabric box;

a central compartment formed between said front and rear storage pouches in said fabric box;



a pair of flotation compartments in said central compartment adjacent opposed interior side walls thereof;

each of said flotation compartments having a transversely extending support ledge formed thereon;

a compartmentalized storage tray removably received in said central compartment on said support ledges;

a pair of retaining flaps integrally formed with said fabric box adjacent opposed top side wall edges of said central compartment;

said retaining flaps having VELCRO fastening strips and adapted to overlie said flotation compartments; and

a pair of shoulder strap attaching loops formed on opposed exterior side walls of said fabric box.

4,784,305

GOLF ACCESSORY

Kenneth Schoenberg, 4206 Pleasant Valley Rd., Brighton, Mich. 48116

Filed Sep. 30, 1987, Ser. No. 102,730
Int. Cl.⁴ B60R *9/08*
U.S. Cl. 224—274 **5 Claims**

1. A golf accessory comprising

a housing, said housing having two elongated tubes,

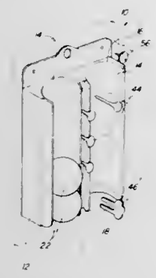
each tube being open on each end and having an interior dimensioned to receive a plurality of golf balls therein,

each tube having a longitudinally extending slot extending along one side between the ends of each tube, said slot having a width less than the diameter of a standard golf ball,

a stop member protruding into the interior of each tube adjacent a bottom end of each tube, each stop member having a portion substantially equidistantly spaced from the sides of the slot in its associated tube, each said stop member being dimensioned so that each said stop member abuts against and retains a golf ball in the interior of its associated tube,

wherein each stop member is rigid with respect to said housing,

wherein said tubes each have a radially outwardly flexible sidewall portion adjacent each bottom end which flexes



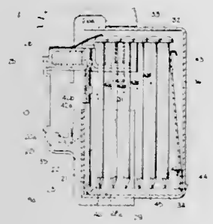
outwardly to enable a golf ball to pass across said stop member and out of said tube.

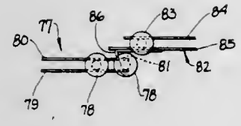
4,784,306

HIGH-LOAD FASTENER PACKS FOR USE WITH THE MAGAZINES OF FASTENER DRIVING TOOLS

Howard L. Baum, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Jul. 9, 1987, Ser. No. 71,647
Int. Cl.⁴ B25C *1/04*
U.S. Cl. 227—113 **29 Claims**





1. A fastener driving tool having a body with a forward portion, a reciprocating driver within said body forward portion, means to actuate said driver, a guide body mounted beneath said body forward portion having a drive track for said driver, an elongated fastener magazine having a forward end affixed to said guide body and having a fastener guiding channel leading to said drive track, and means associated with said tool to urge and advance fasteners within said magazine to said drive track, said magazine comprising first and second sides in parallel spaced relationship connected along their bottom edges to form a U-shaped cross section constituting said fastener guiding channel, said first magazine side having an opening formed therein leading to said channel, said opening extending partway into said tool body, a high-load fastener pack comprising a box-like structure, a plurality of fasteners in said pack, said fasteners being arranged in strips in side-by-side

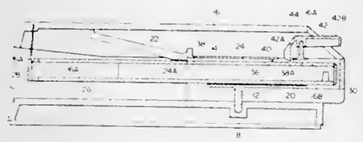
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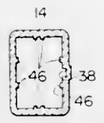
relationship, each strip comprising a tandem row of fasteners and means to temporarily join them together, means to releasably affix said pack to said tool in communication with said opening and said magazine channel, said pack having an opening leading to said magazine channel, and means within said pack to urge said fastener strips laterally toward said magazine.

4,784,307
CASSETTE TYPE STAPLER

Yoshiyuki Ebihara, 25-18 Kamiogi 4-chome, Suginami-ku, Tokyo, Japan

Filed Apr. 30, 1987, Ser. No. 44,144
Claims priority, application Japan, Sep. 26, 1986, 61-227476
Int. Cl.⁴ B25C *5/00, 7/00*
U.S. Cl. 227—120 **4 Claims**





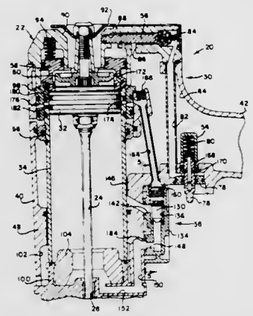
1. A cassette type stapler comprising, in combination:
(a) a base (**10**),
(b) a cassette holding member (**14**) pivotally mounted on said base and with said member having an elongate longitudinally extending hollow portion (**24**) defined by a plurality of generally planar side walls,
(c) a cassette member (**26**) disposed within said hollow portion of said cassette holding member, and with said cassette member having a plurality of generally planar side walls,
(d) longitudinally extending cooperative locating guide means (**38, 36**) on said members (**14, 26**) for guiding said cassette member in a desired orientation within said hollow portion of said cassette holding member,
(e) a locking device (**42**) mounted to said cassette holding member,
(f) means (**38A**) on said cassette member for cooperative locking engagement with said locking device to thereby releasably hold said cassette member when the latter is fully inserted into said hollow portion of said cassette holding member,
(g) and longitudinally extending rib means (**46**) disposed on all of said side walls of one of said members and with said rib means engaging all of said side walls of the other of said members to essentially prevent play between said members throughout their length with a minimum of friction therebetween when said cassette member is inserted into said hollow portion of said cassette holding member.

4,784,308
FASTENER DRIVING TOOL

Raymond F. Novak, Itasca, and Ernest F. Schaudek, Franklin Park, both of Ill., assignors to Duo-fast Corporation, Franklin Park, Ill.

Filed Apr. 3, 1986, Ser. No. 847,726
Int. Cl.⁴ B25C *5/13*
U.S. Cl. 227—130 **17 Claims**

1. A fastener driving tool comprising a pressure fluid reservoir, a drive piston, a fastener feed piston, valve means to connect the reservoir to the drive piston to effect a fastener drive stroke, and a pressure fluid return system for returning the drive piston and operating the feed piston at the end of a drive stroke, said return system comprising in combination:
a drive piston return valve having an inlet connected to the reservoir and an outlet connected to the drive piston; and
a feed piston return valve having an inlet connected to the reservoir and an outlet connected to the fastener feed piston.

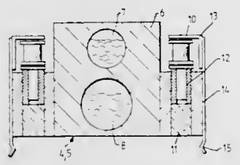


5. A fastener driving tool including a housing defining a reservoir for pressurized fluid, a cylinder, a drive piston movable in said cylinder, a driver carried by the drive piston and movable along a drive path, fastener feeding means for advancing a fastener into the drive path, valve means for connecting a first side of said drive piston to the reservoir for moving the drive piston and driver in a drive stroke, and the improvement comprising a first return valve for connecting said reservoir to the second side of said drive piston for moving the drive piston and driver in a return stroke to a static position and a second return valve for connecting the reservoir to said fastener feeding means.

4,784,309
SOLDERING MACHINE WITH COOLED GUIDE PROFILES

Wilfried Gottschild, Wertheim/Main, Fed. Rep. of Germany, assignor to FRSA Erust Sacks KG GmbH & Co., Fed. Rep. of Germany

Filed Feb. 26, 1987, Ser. No. 19,597
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3607089
Int. Cl.⁴ B23K *3/00;* **H05K** *3/34*
U.S. Cl. 228—37 **10 Claims**

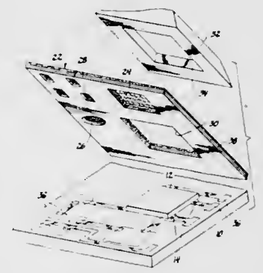


1. A soldering machine for soldering objects, comprising a fluxer for applying flux to an object, a preheater for preheating the object, a solder bath for applying solder to the object, the fluxer, preheater and solder bath lying in succession in a transport direction for the object, a fixed guide profile extending parallel to the transport direction adjacent the fluxer, preheater and solder bath, an adjustable guide profile extending parallel to the transport direction adjacent the fluxer, preheater and solder bath, said adjustable guide profile being spaced by a variable amount from the fixed guide profile in a direction across the transport direction for adjusting the distance between the fixed and adjustable guide profiles, each guide profile including at least one coolant conduit extending therethrough in the transport direction, and pump means operatively connected to the conduits of the fixed and adjustable guide profiles for pumping coolant through the conduits to cool the guide profiles, each guide profile comprises a profile rod which carries said conduit therein, a pair of chain guides fixed to opposite sides of said profile rod, a roller chain having guide bushings guided in said chain guides for revolving around said profile guide, and a plurality of solder fingers connected to said roller chain and sliding along opposite sides of said guide profile, an object to be soldered being engageable between the soldering fingers of said fixed guide profile and the soldering fingers of said adjustable guide profile.

4,784,310
METHOD FOR SCREEN PRINTING SOLDER PASTE ONTO A SUBSTRATE WITH DEVICE PREMOUNTED THEREON

David B. Metzger; Glenn S. Johnson, both of Kokomo, and Michael D. Bramel, Summitville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 843,030, Mar. 24, 1986, Pat. No. 4,678,531.
This application Nov. 28, 1986, Ser. No. 935,892
Int. Cl.⁴ B23K *31/02*
U.S. Cl. 228—123 **2 Claims**

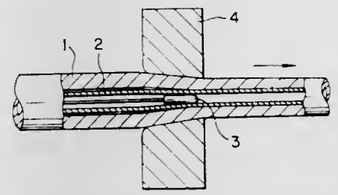


1. A method of manufacturing electrical circuit devices of the type including a substrate having at least two elements solder-bonded to a common surface thereof comprising the successive steps of:
(a) screening a solder-flux mixture onto a first area of the substrate surface;
(b) placing a first element on the screened-on solder-flux mixture;
(c) fusing the solder-flux mixture to bond the first element to the substrate;
(d) screening a solder-flux mixture onto a second area of the substrate surface by means of a screen having a covered aperture generally conforming with the first element;
(e) placing a second element on the screened-on solder-flux mixture on the second area; and
(f) heating the combination of substance, bonded first element, second element, and latter solder-flux mixture to fuse the latter solder-flux mixture and thereby bond the second element to the substrate.

4,784,311
PROCESS OF PRODUCING THICK-WALLED COMPOSITE METAL TUBING

Keizo Sugao, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 11, 1986, Ser. No. 884,697
Claims priority, application Japan, Jul. 25, 1985, 60-163032
Int. Cl.⁴ B21D *39/04;* **B23K** *1/00*
U.S. Cl. 228—131 **5 Claims**

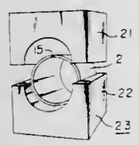


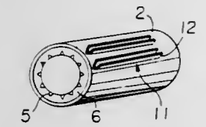
1. A process for producing a thick-walled composite metal fuel injection tubing which comprises inserting a small diameter steel pipe into a large diameter carbon steel pipe, subjecting the pipes to drawing to reduce the diameters and press-fit inner and outer tubular members resulting therefrom, and heat treating at 1000° to 1200° C. for at least 2.5 minutes and not more than 20 minutes the resulting press-fitted tubing in a furnace in non-oxidizing atmosphere to effect diffusion bonding of the mating faces of said inner and outer tubular members.

4,784,312
METHOD OF PRODUCING A FRAME BODY FOR AN ELECTRIC MOTOR

Tohru Gotoh, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,212
Claims priority, application Japan, Oct. 25, 1985, 60-239106
The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.
Int. Cl.⁴ B21D *39/00;* **B23K** *31/06*
U.S. Cl. 228—157 **5 Claims**





1. A method of producing a frame body for an electric motor which comprises in sequence:
(1) a step of bending a flat plate having a given size into a generally round body,
(2) a step of shaping said generally round body into a substantially true circle by pressing the generally round body

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in a radially inward direction by a metal mold having a given inner diameter,

(3) a step of welding edge surface portions opposing each other of the body to form a cylindrical frame body,

(4) a step of attaching heat radiation fins on the outer circumferential surface of the frame body by welding, whereby said frame body is deformed by thermal stresses, and

(5) a step of plastically shaping said frame body having attached heat radiation fins into a substantially true circle by pressing the inner circumferential surface of the frame body in a radially outward direction until the frame body has a predetermined inner diameter.

4,784,313

METHOD FOR BONDING SILICON CARBIDE MOLDED PARTS TOGETHER OR WITH CERAMIC OR METAL PARTS

Jerzy Godziemba-Maliszewski, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 14,992

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608559

Int. Cl.[4] B23K *1/04, 20/02*

U.S. Cl. 228—194 **26 Claims**

1. Method of joining molded SiC ceramic parts together or with ceramic parts formed of other ceramic materials, or with metal pieces, comprising the steps of:

preparing abrasively polished, clean surfaces to be joined respectively of a molded silicon carbide part and of a workpiece which is of a material selected from the group consisting of silicon carbide, ceramics other than silicon carbide and structural metals capable of keeping a clean, untarnished metallic surface until the heating step set forth hereinbelow begins;

interposing an alloy metal layer, of a thickness exceeding 3 μm and not exceeding 1000 μm, between said prepared surfaces to be joined and putting and holding said surfaces together while separated only by said alloy metal layer to produce a held-together assembly, said holding-together of said assembly being performed by mechanical pressure in the range from 0.5 to 60 MPa urging said prepared surfaces towards each other and said alloy metal being selected from the group consisting of (a) manganese-copper alloys in the by-weight composition range of 10 to 90% copper and (b) manganese-cobalt alloys in the by-weight composition range of 5 to 50% cobalt content, substantially all the remainder in each case being manganese; and

heating said held-together assembly in the absence of oxidizing gas for an interval not less than 5 or more than 50 minutes at a temperature lying from 20° to 300° C. below the melting point of said alloy metal, which temperature is high enough to produce diffusion-welding at said held-together surfaces, and thereby firmly joining said surfaces together, followed by cooling.

4,784,314

DECORATIVE PAPERBOARD BOXES

Ib Penick, Palatine, Ill., assignor to Stuctural Graphics Inc., Essex, Conn.

Filed Jul. 13, 1987, Ser. No. 72,547

Int. Cl.[4] B65D *5/42*

U.S. Cl. 229—8 **4 Claims**

1. A gift box designed to fold flat for storage comprising

four interconnected sidewall panel which form a rectangular enclosure having a first end opening and a second end opening,

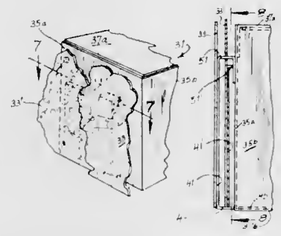
a first end wall panel attached to an upper edge of one of said sidewall panels and adapted to at least partially close said first end opening of said enclosure,

a second end wall panel attached to a lower edge of one of said sidewall panels and adapted to at least partially close said second end opening of said enclosure,

a design panel of decorative configuration lying generally adjacent to one of said sidewall panels,

first hinge means attaching said design panel to one of said sidewall panels, and

lever means interconnecting said design panel and one of



said end wall panels so that actuating movement of said lever means causes said design panel to become spaced apart from said one panel,

said lever means being hingedly connected to said design panel and being actuated as a result of the setting-up of said flat-folded giftbox to its operative configuration and the movement of said interconnected end wall panel to a closed position.

4,784,315

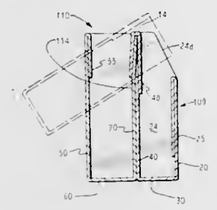
TWO PIECE SLIDING CARTON

Daniel P. Dutcher, Coon Rapids, Minn., assignor to Waldolf Corporation, St. Paul, Minn.

Continuation of Ser. No. 107,242, Oct. 9, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 170,067

Int. Cl.[4] B65D *5/38*

U.S. Cl. 229—9 **20 Claims**



1. A two-part sliding carton comprising:

a base part having generally the shape of a box with rectangular cross-sections open at the top and having a bottom panel on which said base part normally rests and a rear panel with a hinge slit therein, said slit being generally parallel to said bottom panel and covered by a cover panel affixed to the interior of the base part below said hinge slit, said cover panel extending from below the hinge slit substantially to the upper edge of said rear panel to define a slide pocket between said hinge slit and said upper edge that opens in the direction of said bottom panel; and

a cover part having generally the shape of a box with rectangular cross-sections slightly larger than the comparable cross-sections of the base part, said box being open at the bottom, said cover part having a rear panel with a hinge panel joined to the bottom edge of said rear panel at a hinge fold line, said hinge panel being folded toward the interior of said cover part such that said hinge slit to lie between said rear panel and said cover panel in the slide pocket when the cover part is nested over the base part and is raised relative to the base part for opening the carton and said hinge panel remaining in said slide pocket when the carton is opened by rotating the two parts relative to each other around the hinge fold line until the cover part no longer covers the base part.

4,784,316

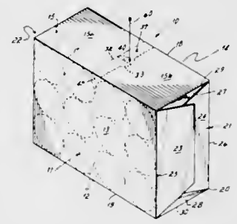
CARTON CARRYING HANDLE

Elmoe Crouch, Franklin, Ohio, assignor to The C. W. Zumbiel Co., Cincinnati, Ohio

Filed Jan. 21, 1987, Ser. No. 5,917

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 B **5 Claims**



1. A carton with carrying handle, said carton having a top wall panel having opposed side edges and a longitudinal axis, a side wall panel being connected on a fold line to each of said side edges, said handle comprising

a first breakaway cut line disposed substantially transverse to said top wall panel's longitudinal axis, and a hinge line also disposed substantially transverse to said top wall panel's longitudinal axis,

second and third breakaway cut lines that connect said transverse cut line and said hinge line at the ends thereof, all of said cut lines and said hinge lines cooperating to define a handle flap foldable beneath said top wall panel, and cooperating to define a handle hole that permits a user's fingers to be received therethrough when said carton is being carried by a user,

a fourth breakaway cut line that extends between said first cut line and said hinge line, said fourth cut line permitting said handle flap to be sub-divided into two sub-flaps as said handle flap is broken away from said top wall panel, each of said sub-flaps having an outer end adjacent a side edge of said top wall panel and an inner end located between said top wall panel's side edges, said sub-flaps' inner ends being adjacent to one another and said sub flaps' outer ends constituting the ends of said handle flap, and

an inner ear hinged at said inner end of at least one sub-flap, said inner ear being adapted to deflect downwardly when a user's finger begins pushing toward the interior of the carton in that general area defined by that inner hinged ear as said handle flap is broken away from said top wall panel.

4,784,317

ONE PIECE MAILER FOR LASER PRINTER

Tien-Tsung Chen, Claremont; Ghanshyam H. Popat, Alta Loma, and Stephanie A. Streeter, Pacific Palisades, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Filed Jun. 17, 1987, Ser. No. 64,074

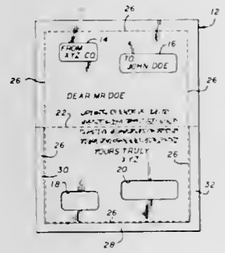
Int. Cl.[4] B65D *27/04, 27/14*

U.S. Cl. 229—92.3 **21 Claims**

1. A one-piece mailer for use with laser printers or copier machines, involving heating of the paper, comprising:

sheet paper means for receiving a printed message and for forming an envelope; said sheet paper means having an upper half and a lower half, and having dimensions of approximately 8½ inches by at least 11 inches, said sheet paper means constituting a single thickness continuous sheet of paper for its upper half;

printed message and address information printed on the front side only of said sheet paper means, with the message starting on the upper half of said sheet;



said sheet paper means including means for forming an envelope; and

means for sealing said envelope including a stable, water-activated, adhesive which will not flow or become activated from the heat of a laser printer or a xerographic copier machine or from high humidity storage conditions.

4,784,318

METHOD AND APPARATUS FOR CUTTING A PAPER OR FOIL WEB INTO VARIOUSLY-SIZED RECTANGLES

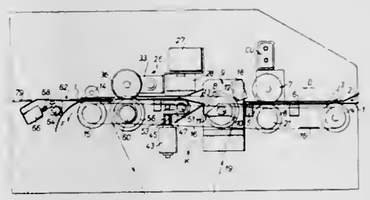
Otto Bay, Luzernstrasse 45, CH-4553 Subingen, Switzerland

Filed Mar. 2, 1987, Ser. No. 20,466

Claims priority, application Switzerland, Mar. 7, 1986, 945/86; May 7, 1986, 1880/86; Sep. 1, 1986, 3497/86

Int. Cl.[4] B26D *5/38*

U.S. Cl. 234—2 **7 Claims**



1. In a web-cutting machine having

a sensor (5),

a transverse cutter (9),

deflector means (13, 62), and a plurality of longitudinal cutters (26) spaced across the web (1), a method of cutting variously-sized rectangular forms from said web, comprising the steps of

sensing coding (20) disposed on an edge of said web,

making at least one cut (22) transversely across the web (1) to separate off a piece having a length specified by said coding;

actuating, in response to said coding (20), a first one of said deflector means, disposed downstream of said cut (22), thereby deflecting scrap (23) produced during said cut (22);

selectively actuating at least one of said plurality of longitudinal cutters 926) and thereby producing a corresponding number of longitudinal cuts (24a, 24b, 24c) in said piece, in

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accordance with said coding and with a format defined thereby; and

selectively actuating, in response to said coding (20), at least one of a plurality of second deflector means disposed downstream of said longitudinal cutters (26), thereby deflecting away scraps 25 produced during said longitudinal cuts.

4,784,319

DELAYED RESPONSE AIR CONDITIONING/HEATING CONTROL SYSTEM

Martin L. Kaiser, 15 Old Padonia Rd., Cockeysville, Md. 21030

Filed Jun. 16, 1986, Ser. No. 874,509

Int. Cl.[4] G05D *23/00*

U.S. Cl. 236—46 R **4 Claims**



1. A method for reducing waste incident to operation of a system for conditioning the environment within a space having a closure openable to an ambient environment that causes demand on said system through automatic control of operation of said system for conditioning as a result of said closure's being opened, comprising the steps:

(a) setting a predetermined time limit following opening of said closure;

(b) ascertaining whether the closure is still open at the end of said predetermined time limit,

(c)

(i) if the closure is still open at the end of said predetermined time limit, rendering the system for conditioning inoperative in a manner requiring manual restart;

(ii) if the closure is closed at the end of said predetermined time limit, abstaining from rendering the system for conditioning inoperative and resetting the predetermined time limit,

(d) following step (c) (i), ascertaining whether the system for conditioning was operating at the time it was rendered inoperative, and

(d) (i) if the system for conditioning was operating at the time it was rendered inoperative, emitting a sensory signal indicating that the system for conditioning was operating at the time it was rendered inoperative.

4,784,320

METAL HYDRIDE THERMOSTAT

Robert N. Ford, San Diego, Calif., assignor to General Dynamics Corp./Space Systems Division X, San Diego, Calif.

Filed Nov. 27, 1987, Ser. No. 125,845

Int. Cl.[4] G05D *23/00*

U.S. Cl. 236—93 R **4 Claims**

1. A metal hydride thermostat comprising,

a first expandable medium containing metal hydride,

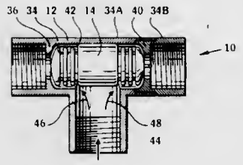
a second expandable medium containing a gas, said medium opening into said metal hydride so as to be adsorped and desorped thereby in response to temperature,

a first valve seat with an opening spaced from said first expandable medium,

a second valve seat with an opening spaced from said second expandable medium,

said first and second expandable mediums alternately engaging said first and second valve seats in response to variations in temperature thereby alternately opening and closing associated therewith,

means for directing fluid to said expandable media at varying



temperatures to expand or contract either of said media to cause said alternate opening and closing of said openings to thereby alternately direct said fluid through either of said openings depending on the temperature of said fluid.

4,784,321

FLAME SPRAY TORCH FOR USE WITH SPRAY MATERIALS IN POWDER OR WIRE FORM

Philippe Delaplace, Chemin de Fontannaz, Switzerland, assignor to Castolin S.A., Saint-Sulpice, Switzerland

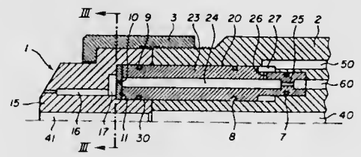
PCT No. PCT/CH86/00057, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06302, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 28, 1986, Ser. No. 9,362

Claims priority, application Switzerland, May 1, 1985, 1841/85

Int. Cl.[4] B05B *1/24*

U.S. Cl. 239—83 **21 Claims**



1. A flame spray torch for use with powdered or wire-shaped spraying materials with a torch body and a torch head, the torch body having feeding means for the spraying material as well as for a combustion gas and an oxidation gas and the torch head having a nozzle part provided with a plurality of gas nozzle channels and at least one channel for the spraying material, said torch having means for exchangeably connecting said nozzle part with said torch body along a contact surface, said nozzle part and said torch body being arranged so that said channel for the spraying material in the nozzle part communicates with said spraying material feeding means of the torch body, said torch body having at least two longitudinal recesses open towards said contact surface for receiving at least two exchangeable combustion gas—oxidation gas—injectors, said torch body further having for each injector an individual combustion gas supply channel and individual oxidation gas supply channel which supply channels are arranged for communicating with corresponding inlet channels of each injector, each injector having a mixing chamber communicating with said inlet channels and having an outlet channel arranged for communicating with at least one gas nozzle channel of said nozzle part.

4,784,322

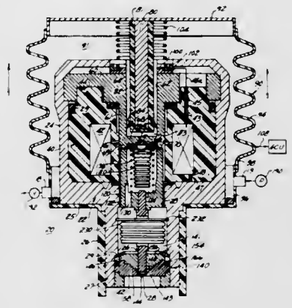
UNIT INJECTOR FOR GASOLINE ENGINES

Paul D. Daly, Troy, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 23, 1987, Ser. No. 112,653

Int. Cl.[4] F02M *47/02*

U.S. Cl. 239—89 **25 Claims**



1. A unit injector adapted to receive fuel from a relatively low pressure source, comprising:

a housing;

armature means responsive to an electromagnetic force for opening and closing a metering orifice to control the ejection of fuel therefrom;

a plurality of fuel receiving chambers disposed adjacent to the armature means and upstream of the metering orifice;

a check valve disposed upstream of the fuel receiving chambers, responsive to a pressure differential thereacross to control the flow of fuel to such chambers;

first accumulator means disposed in a first of the fuel receiving chambers, compressible in response to the pressure of the fuel therein for pressurizing the fuel in the plurality of fuel receiving chambers and for controlling the rate at which fuel is ejected;

an outer bellows, fluidly sealed at one end, and adapted to expand and contract as fuel is received and purged therefrom, including a flexible, springlike wall effective to restore the outer bellows to its non-expanded size;

means defining a pressure chamber;

means for communicating fuel to and from the bellows to the pressure chamber;

means movable with the outer bellows to pressurize the fuel in the pressure chamber and for urging same across the check valve, to pressurize the fuel in the plurality of fuel receiving chambers, compressing the first accumulator means; and

means for generating the electromagnetic force to move the armature means away from the metering orifice.

4,784,323

ELECTROMAGNETIC ATOMIZER

James K. Miller, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Jul. 17, 1987, Ser. No. 74,639

Int. Cl.[4] B05B *3/14, 1/26*

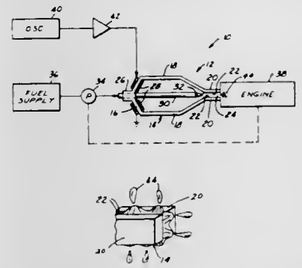
U.S. Cl. 239—102.2 **5 Claims**

1. A fuel atomizer for internal combustion engines comprising

ferromagnetic structure having a pair of surfaces spaced from each other to form a gap therebetween said ferromagnetic structure being characterized by a fundamental resonant frequency determined in part by mass and elasticity of said structure,

means for feeding liquid fuel to said gap at a rate so as to substantially fill said gap with liquid fuel, and

means for electromagnetically energizing said ferromagnetic structure at said fundamental resonant frequency for vibrating said structure including said surfaces at said fundamental resonant frequency and developing standing waves in said liquid fuel around the periphery of said gap.



4,784,324

SPRAYING APPARATUS

Carl DeWitt, Box 126, Rte. 2, Cobden, Ill. 62920, and Gerald A. Fink, R.R. 2, Box 228, Murphysboro, Ill. 62966

Filed Jan. 7, 1988, Ser. No. 141,639

Int. Cl.[4] B05B *1/20*

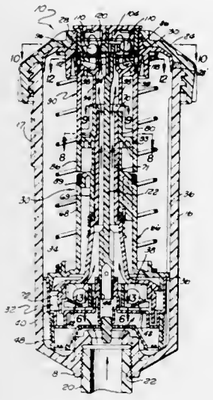
U.S. Cl. 239—165 **13 Claims**



1. Apparatus for spraying of liquid for herbicidal and insecticidal application and the like, comprising a supporting frame for being carried vehicularly, an upright support carried by the frame including an upright post and first telescoping means for providing selective vertical telescoping movement of the post and rotation thereof relative to the upright support, a boom carried by the post, means for providing selective pivoting of the boom relative to the post for vertical boom movement, the boom including a supporting boom section, a mid-boom section and a reconfigurable boom end element, the boom including second telescoping means for providing selective telescoping movement of the mid-boom section relative to the supporting boom sections, the supporting boom section, mid-boom section and boom end element all including spray nozzle means for selective spraying of liquids, the boom sections and end element providing selective positioning as well as approximation of terrain contour to be sprayed.

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4,784,325
ROTATING STREAM SPRINKLER
Samuel C. Walker, Upland, Calif.; George H. Lockwood, Wilton Manors, Fla.; Kenneth V. McCarthy, Glendora, and Raymond P. Feith, Covina, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Glendora, Calif.
Filed Apr. 1, 1987, Ser. No. 33,990
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—204 **77 Claims**



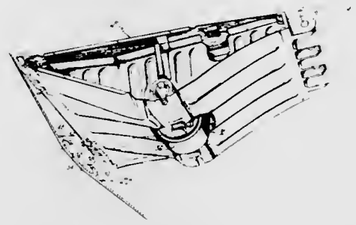
1. A rotary drive sprinkler, comprising:
a sprinkler housing adapted for connection to supply of irrigation water;
a spray head having at least one nozzle passage formed therein for outward projection of an irrigation water stream, said spray head being supported for rotation relative to said housing;
rotary drive means for rotatably driving said spray head through successive full-circle rotations;
a valve member comprising a valve ball movable with at least some rolling motion between an open position permitting water flow from said housing to said spray head nozzle passage for outward projection of the water stream from said spray head, and a closed position preventing water flow to prevent outward projection of the water stream from said spray head; and
control means for moving said valve member from said closed position to said open position for a predetermined part-circle portion of each full-circle rotation of said spray head.

64. A rotary drive sprinkler, comprising:
a sprinkler housing adapted for connection to a supply of water under pressure;
a spray head including means for projecting water outwardly from the housing; and
means for rotatably driving said spray head to distribute the outwardly projected water over surrounding terrain, said drive means including a rotatable turbine having a generally cylindrical inner cylinder with a plurality of outwardly radiating vanes, a drive case having said turbine rotatably supported therein with substantial flow clearances around and about all surfaces of the turbine, guide means projecting radially outwardly beyond said vanes for confining said turbine in relatively loosely centered relation within said drive case, and means for guiding water flow into said drive case in driving relation with said turbine vanes.

69. A rotary drive sprinkler, comprising:
a sprinkler housing adapted for connection to a supply water under pressure;
a spray head including means for projecting water outwardly from the housing; and
impact drive means for rotatably driving said spray head to distribute the outwardly projected water over surrounding terrain, said impact drive means including a drive member movably driven by water flowing into and through said sprinkler housing and a driven member coupled to said spray head, said drive member including impact means for impact engagement with said driven member to displace said driven member in a manner rotatably driving said spray head;
at least one of said drive member impact means and said driven member being formed from a resilient material having a hardness substantially less than about **100R** Rockwell hardness.

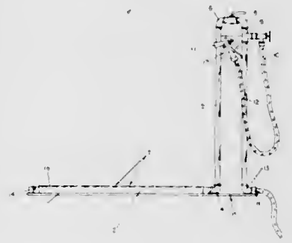
77. A rotary drive sprinkler, comprising:
a sprinkler housing adapted for connection to a supply of water under pressure;
a drive sleeve within said housing;
a spray head at the upper end of said drive sleeve;
drive means within said housing and including a drive case supported against rotation within said housing and a drive element for rotatably driving said drive sleeve, said drive case including a bearing sleeve having said drive sleeve rotatably supported therein; and
bearing seal means including a first seal washer having an inner diameter surface in sealing engagement with the exterior of said drive sleeve, and a second seal washer having an axial thrust surface for sealing engagement with a shoulder on said bearing sleeve, and a thrust spring bearing against said first seal washer to urge said first seal washer axially against said second seal washer to maintain said axial thrust surface thereof in sealing relation with said bearing sleeve shoulder.

4,784,326
CONVERGENT FLAP BEARING WITH INTEGRAL HOLD-DOWN DEVICE
Fred L. Honeycutt, Jr., Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Jul. 24, 1987, Ser. No. 77,262
Int. Cl.[4] B64C *15/00, 9/38*
U.S. Cl. 239—265.39 **1 Claim**



1. For a gas turbine engine of the type having a variable geometry convergent/divergent exhaust nozzle formed of a plurality of circumferentially adjacent segments, the improvement comprising:
a roller track affixed to the stationary structure of the engine outwardly of each circumferentially adjacent nozzle segment and along which each such segment is deployable to vary the geometry of the convergent/divergent nozzle, the track having a channel formed of a pair of opposing side walls extending inwardly from a roller surface at the base of the channel toward the corresponding nozzle segment, and a pair of tangs, one each extending perpendicularly into the channel from said opposing side walls; and
a bearing affixed to each nozzle segment and positioned so as to roll along the roller surface of the channel as the geometry of the exhaust nozzle is varied, wherein the bearing has
an inner race fixedly attached to the nozzle segment,
an outer race rotatable with respect to the inner race and disposed within said channel of the roller track,
a pair of disk-shaped side plates attached to the inner race, independent of the outer race, and
a bracket of essentially U-shaped geometry extending from each of the bearing side plates with the open side of the "U" facing a corresponding tang of the roller track so as to hold the outer race of the bearing in close proximity with the roller surface of the track as the bearing moves therealong.

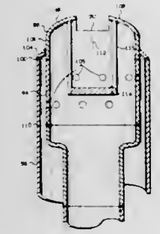
4,784,327
YARD STATION
Arlyn L. Lund, Box 100, Anita, Iowa 50020
Filed Dec. 23, 1987, Ser. No. 137,334
Int. Cl.[4] A01D *75/00*
U.S. Cl. 239—276 **2 Claims**



1. A stable, substantial apparatus for use in the cleaning of lawn implements and mowers, which apparatus comprises a horizontal base plate with holes therein to allow staking the apparatus to the ground; a pipe with holes along one side thereof, with a plug in one end, which pipe is attached to the top of the horizontal base plate so that the holes in the pipe face upward, and which pipe, at the other end thereof is attached to a pipe fitting which in turn attaches to a vertical pipe, which vertical pipe extends approximately three feet vertically to a connection, via fittings, with a valve assembly, which valve assembly provides means for controlling the access of water to the pipe with holes along one side thereof, and to a seperate hose and hand operated nozzel; which valve assembly attaches to a pipe, via fittings, which pipe extends downward vertically to a connection with the horizontal base plate and a connection which is suitable for attachment to a source of water such as a hose.

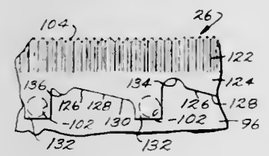
4,784,328
NOZZLE ASSEMBLY
Frank W. Skraba, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation of Ser. No. 920,472, Oct. 20, 1986, abandoned, which is a division of Ser. No. 786,277, Oct. 10, 1985, Pat. No. 4,675,099, which is a division of Ser. No. 541,933, Oct. 14, 1983, abandoned. This application Jan. 28, 1988, Ser. No. 149,999
Int. Cl.[4] B05B *7/00;* **B01J** *8/18*
U.S. Cl. 239—432 **2 Claims**

1. Apparatus comprising
an outer tube having a longitudinal axis and an end;
an inner tube having an end, a longitudinal axis, and a generally cylindrical sidewall, said inner tube being coaxially positioned in the outer tube, an annulus being defined between the inner tube and the outer tube;
a wall connecting the end of the outer tube to the sidewall of the inner tube, the end of the inner tube protruding past the end of the outer tube, the sidewall of the inner tube having a plurality of apertures through it which are located within the outer tube and near said wall so as to establish a plurality of flow paths between the inside of the inner tube and the annulus; a cap, affixed to the end of the inner tube, having an exterior surface and an interior surface with a slot extending completely through said cap and at least part way diametrically acorss said cap, said slot having a length and a width;



a plate baffle mounted inside of the inner tube and extending partially thereacross near the apertures so as to be longitudinally spaced from the cap and slot;
a means for introducing steam into the annulus between the inner tube and the outer tube;
a means for introducing oil into the inner tube; and
a means for providing a flow of cracking catalyst particles along the exterior surface of the cap so as to sweep the length of the slot.

4,784,329
GEAR DRIVEN PORTABLE LAWN SPRINKLER
Lawrence P. Heren, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Jun. 17, 1986, Ser. No. 875,097
Int. Cl.[4] B05B *1/26, 3/00*
U.S. Cl. 239—498 **5 Claims**



1. In a sprinkler including an annular head member having at least four water flow passages extending therethrough so that the outlet ends thereof extend in an upward and outward direction to the periphery of said head member in equal annularly spaced relation, a stream modifying cap member mounted on said head member for incremental indexed rotational movements about an upright axis of rotation, said cap member having formed on the periphery thereof sets of stream engaging depending elements of different vertical extent spaced apart a distance equal to the aforesaid incremental indexed movement of said cap member, said sets being equal in number and spacing to the number and spacing of said passage outlet ends and being arranged so that at each incremental position of indexed movement of said cap member the depending elements aligned with each passage outlet end is of the same vertical extent whereby the stream issuing from each passage outlet end at any indexed position is the same and each is changed in response to an indexed movement of said cap member, the improvement

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which comprises one of said depending elements of each set having an area sufficient to be engaged by the entire stream issuing from the outlet ends of said passages when said elements are aligned therewith, the stream engaging surfaces of said one elements being dished out so as to retain and deflect the streams so that they fall upon the pattern area with a minimum outward extent.

4,784,330

HIGH PRESSURE SPRAYING GUN

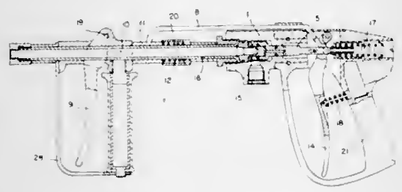
Paul Hammelmann, Zum Sundern 17, 4740 Oelde 1, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,865

Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617424

Int. Cl.⁴ B05B *11/00*

U.S. Cl. 239—526 **13 Claims**



5. A high pressure spraying gun, comprising:

(a) a jet pipe for discharging pressure water;

(b) pressure water supply means for supplying pressure water to said jet pipe;

(c) blocking means for selectively blocking and releasing a pressure water throughflow path between said jet pipe and said pressure water supply means, respectively;

(d) two trigger levers for right-handed and left-handed actuation, respectively, and arranged to act on said blocking means so as to selectively block and release said pressure water throughflow path between said jet pipe and said pressure water supply means, respectively;

(e) said blocking means including a single blocking valve having a valve body, spring means biasing said valve body in a first direction, and a rocking member rotatably mounted on said valve body so that it extends in an unloaded condition in a second direction which is transverse to said first direction, said rocking member having two end regions spaced form one another in said transverse direction and cooperating with said trigger levers so that said blocking valve can open said pressure water throughflow path only when both said trigger levers simultaneously act on both said end regions of said rocking member, thereby to prevent high pressure spraying when only one of said trigger levers is actuated; and

(f) control means arranged to hold said rocking member in a predetermined safety position.

4,784,331

ELECTROSTATIC SPRAY GUN DEVICE AND CABLE ASSEMBLY

John Sharpless, Oberlin; John C. A. Traylor, Elyria; Ronald J. Hartle, and Thomas E. Hollstein, both of Amherst, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed May 27, 1987, Ser. No. 54,746

Int. Cl.⁴ B05B *5/04*

U.S. Cl. 239—698 **5 Claims**

4. An electrostatic spray coating apparatus for spraying solid particulate powder coating particles onto an article, comprising:

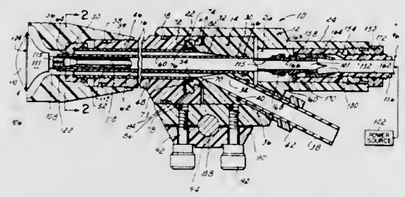
a spray device formed with a powder flow passageway and a discharge opening for emitting coating particles toward an article to be coated;

a cable assembly insertable within said passageway in said spray device, said cable assembly including a tube having a hollow interior filled with dielectric grease and a high voltage electrostatic cable fixedly secured within said hollow interior of said tube;

a particle deflector having an electrode connected to said cable, said particle deflector and electrode being mounted on said tube in the path of coating particles emitted from said discharge opening of said spray device;

adjustment means for axially moving said cable assembly within said passageway so that said particle deflector and electrode are moved relative to said discharge opening of said spray device in response to said axial movement of said cable assembly, said adjustment means comprising:

(i) a fixed member mounted to said spray device, said fixed member having a threaded internal passageway;



(ii) an adjustment member having an internal bore adapted to rotatably receive said high voltage electrostatic cable, said adjustment member being formed with external threads which mate with said internal threads in said internal passageway of said fixed member to permit axial movement of said adjustment member relative to said fixed member upon rotation of said adjustment member;

(iii) a cable mount fixed to said high voltage electrostatic cable;

(iv) a spacer interconnecting said adjustment member and said cable mount, said cable mount having means for retaining said spacer in a fixed axial position relative thereto while permitting rotation of said spacer relative to said cable mount; and

(v) a clamp interconnecting said cable mount and said tube.

4,784,332

SPRAY HEAD OF A ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Hitoshi Takeuchi, Toyota; Iwao Nomura, Kasugai; Yasuo Tokushima, Toyota; Koji Ota, Toyota, and Naoki Yamada, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

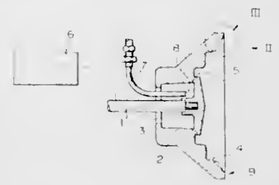
Filed Aug. 4, 1987, Ser. No. 81,452

Claims priority, application Japan, Mar. 19, 1987, 62-62444

Int. Cl.⁴ B05B *5/04*

U.S. Cl. 239—703 **9 Claims**

1. A spray head of a rotary type electrostatic spray painting device, comprising a cup shaped inner circumferential wall and a tip portion formed at an end of said cup shaped inner circumferential wall, said tip portion comprising: an annular flat face portion perpendicular to a rotating axis of the spray head and located at an outer periphery of said tip portion; a conical face portion extending from an inner peripheral end of said annular flat face portion to said cup shaped inner circumferential wall and diverging toward an outside of the spray head; and a plurality of paint guide grooves formed on an inner peripheral portion of said conical face portion and connected to said cup shaped inner circumferential wall, said conical face portion having a conically shaped paint guide face portion positioned



between said annular flat face portion and said paint guide grooves.

4,784,333

PROCESS FOR PRODUCING TONER POWDER

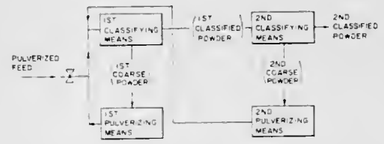
Norio Hikake, Yokohama; Nobuyuki Asaoka, Abiko, and Naoto Kitamori, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,281

Claims priority, application Japan, Oct. 29, 1986, 61-258948; Oct. 29, 1986, 61-258949

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—5 **12 Claims**



1. A process for producing colored resinous particles for use in toner powder, comprising:

preparing a pulverized feed material by melt-kneading a composition comprising at least a binder resin and a colorant or magnetic material, cooling and solidifying the kneaded product, and pulverizing the solidified product;

introducing the pulverized feed material into a first classification step to classify the feed material into a first coarse powder and a first classified fine powder;

introducing the classified first coarse powder into a first pulverization step to pulverize the coarse powder under the action of an impact force;

introducing the resultant pulverized product of the first coarse powder into the first classification step together with the pulverized feed material;

introducing the first classified fine powder into a second classification step to classify the fine powder into a second coarse powder and a second classified fine powder;

introducing the classified second coarse powder into a second pulverization step to pulverize the coarse powder under the action of an impact force which is smaller than that exerted in the first pulverization step;

introducing the resultant pulverized product of the second coarse powder into the first classification step or the second classification step; and

removing a minute powder fraction from the second classified fine powder for adjusting a particle size distribution, thereby to obtain the colored resinous particles.

4,784,334

METHOD AND APPARATUS FOR BREAKING INTO PARTS OF A CERTAIN SIZE AND SCREENING A BULK MATERIAL

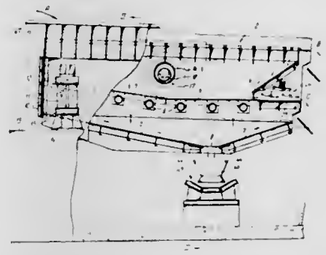
Paul Van Der Veer, Barendrecht, and Ernest C. M. J. Schmitz, Cadier en Keer, both of Netherlands, assignors to P. Van der Veer Holding B.V., Barendrecht, Netherlands

Continuation of Ser. No. 932,735, filed as PCT NL86/00008 on Mar. 6, 1986, published as WO86/05125 on Sep. 12, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 183,439

Claims priority, application Netherlands, Mar. 7, 1985, 8500657

Int. Cl.⁴ B02C *23/14*

U.S. Cl. 241—14 **11 Claims**



1. A method for breaking lumps of a loose bulk material into fractions of a certain size and screening the material, the method comprising feeding the lumps of loose bulk material onto one end of a flat grid, vibrating said flat grid such that at least a vibration movement in the direction perpendicular to the plane of the grid is obtained with an intensity such that large lumps of at least one type of bulk material which do not pass directly through the openings in the grid are, as a result of the said vibration movement, broken on said grid into fragments having a size which allows these fragments to pass through the openings in the grid, removing the lumps of bulk material which have not passed through said grid from a second end thereof as a first fraction, collecting the fragments of bulk material passing through said grid on a screen located below said grid and which vibrates with said grid, some of said fragments of bulk material passing through said screen and some of said fragments remaining on said screen, conveying said fragments of bulk material remaining on said screen through a mechanically driven reduction device at a discharge end of said screen to reduce their sizes, collecting the fragments of bulk material passing through said screen and the fragments of bulk material obtained from said mechanically driven reduction device on a common bottom structure, and discharging said collected fragments through a discharge opening in said bottom structure as a second fraction.

4,784,335

FINELY DIVIDED POWDER AND PROCESS AND APPARATUS FOR TREATING THE SAME

Werner Huether, Karlsfeld, Fed. Rep. of Germany, assignor to MTU- Motoern- und Turbinen-Union München GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1985, Ser. No. 805,713

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444847

Int. Cl.⁴ B02C *1/00*

U.S. Cl. 241—20 **25 Claims**

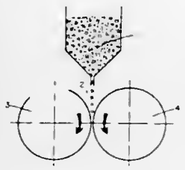
1. A process for eliminating undesirably large particles in powders of brittle materials capable of sintering or injection molding, comprising the steps of

placing the powder particles into a suspension having a concentration of solid particles in a liquid solvent with which it does not chemically react such that the average distance between the particles in the suspension lies within

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the range up to 100 times the average particle size of the powder,

conducting the suspension through at least one roller pair which includes therebetween a predetermined fixedly adjusted gap that corresponds to the desired maximum



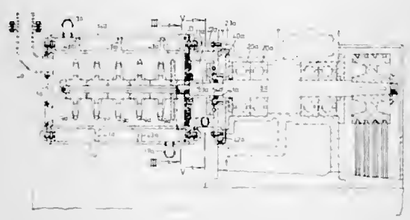
size of the powder particles, a minor portion of said powder particles being greater in size than the gap and a major portion of said powder particles being substantially smaller in size than said gap, matching the through-put thereof to the roller movement, and thereafter separating the powder particles from the liquid in the suspension.

4,784,336

GRINDING MACHINE FOR REFINING LIQUID MATERIAL

Tsai-Chuan Lu, No. 26, Ho-Chung Li, Chia-E City, Taiwan

Filed Mar. 10, 1987, Ser. No. 24,316
Int. Cl.[4] B02C *17/16*
U.S. Cl. 241—65 **7 Claims**



1. A grinding machine for refining liquid material, comprising:

(A) a grinding cylinder having a longitudinal axis;

(B) a multitude of grinding bodies contained in the grinding cylinder;

(C) means for admitting liquid material to be refined into the grinding cylinder for contact with the grinding bodies;

(D) a shaft extending into the grinding cylinder along the axis, and rotatable about the axis;

(E) a set of mixer blades on the shaft within the grinding cylinder;

(F) drive means for rotating the shaft and the mixer blades about the axis to urge the grinding bodies into grinding contact with the liquid material to be refined, with concomitant generation of heat from the grinding cylinder;

(G) means for dissipating the heat generated during grinding;

(H) a refined liquid material collection chamber coaxially adjacent the grinding cylinder, for collecting the refined liquid material from the grinding cylinder, said shaft extending axially through the collection chamber;

(I) outlet means for providing communication between the grinding cylinder and the collection chamber, including

(i) an end wall mounted on the chamber between the chamber and the cylinder,

(ii) an outer ring supportably mounted on the end wall concentric with the axis,

(iii) a hollow sleeve extending axially into the chamber and surrounding the shaft therein, said sleeve being supportably mounted on the shaft,

(iv) an inner ring supportably mounted on the sleeve concentric with the axis, said inner ring being surrounded by, and bounding an annular gap with, the outer ring, and

(v) radial adjustment means for radially adjusting the annular gap to have substantially the same clearance in all radial directions; and

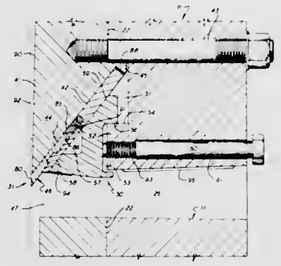
(J) means for discharging the refined liquid material collected in the collection chamber therefrom.

4,784,337

REVERSIBLE KNIFE ASSEMBLY FOR WOOD CHIPPER

Timothy P. Nettles, Carthage; Mark Robinson, Black River, both of N.Y., assignor to Carthage Machine Company, Div. of Industrial General Corporation, Carthage, N.Y.

Filed Sep. 21, 1987, Ser. No. 99,309
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—92 **18 Claims**



1. Apparatus for cutting chips from a log, having a plurality of radially disposed knife assemblies secured to the front face of a rotating disc adjacent to the entrance of spaced chip slots that pass axially through the disc, each knife assembly including an elongated cassette having a knife receiving recess formed in the top front surface thereof adjacent to a chip slot, at least one flat double edged knife blade seated in said chip slot, having a top surface that is coplanar with the top surface of the cassette, a keying means acting between the cassette and the knife blade for locating the blade in the recess with one of the cutting edges protruding beyond the front surface of the cassette into the entrance region of an adjacent chip slot, a knife retaining bar mounted in the recess behind the blade having an inclined surface that is seated in contact against the other cutting edge of the blade, and means to removably secure the retaining bar to the cassette to secure the blade within said recess.

4,784,338

DEVICE TO DRIVE A BODY THAT CARRIES OUT A TUMBLING AND ROTATING MOTION

Joseph Saladin, Wil, Switzerland, assignor to Oloid AG, Basel, Switzerland

PCT No. PCT/CH86/00162, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03351, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 25, 1986, Ser. No. 96,019
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542285
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—101.2 **7 Claims**

1. A material treatment apparatus which comprises

a stationarily positioned support member,

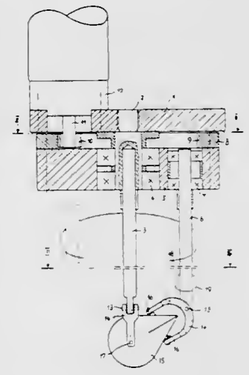
a first shaft which is fixedly connected to said support member and extends away from said support member, said first shaft including a first pivot bearing at an end thereof remote from said support member,

a body element which has first and second pairs of aligned pivot pins extending away from opposite sides thereof, said first and second pairs of pivot pins defining respective first and second rotation axes which are askew to one another,

a first forked control gimbal connected between said first pivot bearing and said first pair of aligned pivot pins,

a rotation member rotatably mounted on said support member, said rotation member having a center of rotation which is coaxial with said first shaft,

a second shaft which has a longitudinal axis and which



extends away from said support member in parallel with said first shaft, said second shaft being mounted so as to be rotated by said rotation member around said first shaft and also so as to be rotatable around said longitudinal axis thereof, said second shaft having a second pivot bearing at an end thereof remote from said support member,

a second forked control gimbal connected between said second pivot bearing and said second pair of aligned pivot pins, and

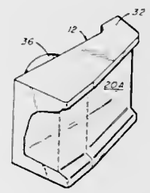
drive means for rotating said rotation member, thereby causing said second shaft to rotate about said first shaft, which in turn simultaneously causes said body element to move in a tumbling and rotating movement and said second shaft to rotate about its said longitudinal axis.

4,784,339

IMPELLER SHOE FOR IMPACT CRUSHER

Robert W. Deffenbaugh, Vancouver, Wash., assignor to Columbia Steel Casting Company, Portland, Oreg.

Filed Jun. 29, 1987, Ser. No. 67,371
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—275 **4 Claims**



1. An elongated impeller shoe for mounting to a bracket on a horizontal turntable of a vertical axis centrifugal rock crushing machine to accelerate aggregate radially outward from a central distribution cone to impact against stationary anvils to thereby crush the aggregate, said impeller shoe comprising:

an elongated body of wear resistant alloy material extending longitudinally from an inner end to an outer end;

said body having a generally trapeziform shape with a back bearing surface on one side extending longitudinally between the inner end and the outer end and adapted to bear against a said turntable bracket, a working front face extending longitudinally between upper and lower longitudinal channel lips from the inner end to the outer end, said front face having a plurality of adjacent exterior surfaces that each extend from the upper channel lip to the lower channel lip, each surface being adapted to lie substantially in a plane that is perpendicular to the plane of said turntable when said impeller shoe is mounted properly thereon and each surface forming a different acute angle with respect to said back bearing surface, the angles said exterior surfaces form with respect to said back bearing surface decreasing from the inner end to the outer end, and said exterior surfaces being adapted for receiving and directing aggregate therealong, an outer end surface extending transversely between the outer end of one working front face surface to the back bearing surface, and an inner end surface extending transversely between the inner end of another front face surface and the back bearing surface;

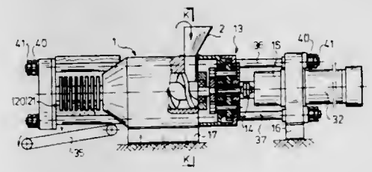
whereby said working front face in use produces a progressive wear pattern along its length that is substantially uniform in depth.

4,784,340

APPARATUS FOR COMMUNITION OF ORGANIC MATTERS

Ilona Tatai; Gusztáv Gündisch; Géza Szots, and Károly Molnár, all of Budapest, Hungary, assignors to Taurus Gumiipari Vallalat, Budapest, Hungary

Filed Jul. 2, 1987, Ser. No. 69,608
Claims priority, application Hungary, Jul. 2, 1986, 2761/86
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—301 **20 Claims**



1. Apparatus for comminution of organic matters, such as, comprising a comminuting unit having at least one tool having a pressure chamber and provided with yielding holes and co-acting axially driven stamp, wherein an intermediate-pressure compacting unit (**4**) before the comminuting unit (**5**), in respect of the direction of movement of the organic matter to be comminuted, and a low-pressure feeding-precompacting unit (**3**) preceding the compacting unit (**4**) are arranged, furthermore the feeding-precompacting unit (**3**) is provided with at least one driven worm (**6**; **7**; **8**), the discharge end of which is connected with a larger cross sectional end of a bell-mouthed narrowing chamber (**18**; **19**) of the compacting unit (**4**), while a reduced cross sectional end of the chamber (**18**; **19**) is joined to the pressure chamber (**28**) of the tool (**20**; **21**).

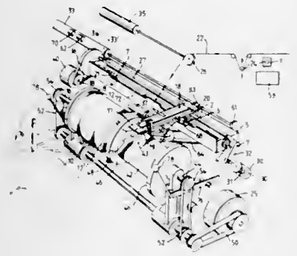
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4,784,341

TEXTILE YARN WINDING APPARATUS

Grenville M. Hill, Antrim, and William J. McDonald, Down, both of Ireland, assignors to James Mackie & Sons Ltd., United Kingdom

Continuation-in-part of Ser. No. 762,558, Aug. 5, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 68,257
Claims priority, application United Kingdom, Aug. 20, 1984, 8421129
Int. Cl.⁴ B65H *67/056*
U.S. Cl. 242—18 A **17 Claims**



1. In a yarn winding machine for alternately winding two bobbins at first and second winding positions in a continuous sequence, each bobbin having a barrel to receive yarn and a flange at each end of said barrel, a fully wound bobbin being replaced by an empty bobbin while an adjacent bobbin is being wound, said flanged bobbins being located adjacent one another in said first and second winding positions on substantially aligned axes, and said machine having drive means for rotating said bobbins, the improvement comprising

a yarn guide connected to said machine, said yarn guide extending over that bobbin barrel being wound so as to guide the yarn onto that barrel and lay it progressively thereover,

motion means connected with said yarn guide for moving said yarn guide along a linear path parallel to said bobbin's axis at each of said first and second positions,

return means connected with said yarn guide at each of said first and second positions for reciprocating said yarn guide along said linear path between two axially spaced planes defined by a bobbin's flanges,

transfer means engageable with said yarn guide for transferring said yarn guide from its reciprocal path along the length of a fully wound bobbin to its reciprocal path along the length of an adjacent empty bobbin while both bobbins are in rotation, the yarn being led from said full bobbin over the adjacent two flanges of said full and empty bobbins onto the barrel of said empty bobbin adjacent said flanges in a manner for forming a yarn tail on said empty bobbin,

yarn severing means connected to said machine for cutting said yarn tail at a predetermined position adjacent said two adjacent flanges of said full and empty bobbins but between the flanges of said empty bobbin, and

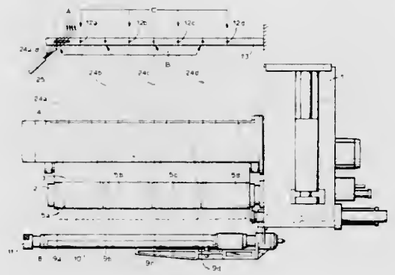
control means for controlling said yarn severing means so that said yarn tail is severed only after the first yarn turns on a said empty bobbin's barrel have been overlaid by later yarn turns resulting from reciprocal movement of said yarn guide.

4,784,342

DEVICE FOR SIMULTANEOUS SPOOLING A PLURALITY OF THREADS

Claus Matthies, Neumünster, and Ernst Vehling, Bordesholm, both of Fed. Rep. of Germany, assignors to Neumünstersche Maschinen- und Apparateban GmbH, Neumünster, Fed. Rep. of Germany

Filed May 20, 1987, Ser. No. 52,730
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 3619286
Int. Cl.⁴ B65H *54/02, 54/20*
U.S. Cl. 242—18 PW **7 Claims**



1. A device for simultaneous spooling a plurality of threads, comprising a machine housing; a spool mandrel having a plurality of pirns provided with tuck slots; inflow thread guides arranged on the machine housing and spaced from each other; a traverse motion device including changing thread guides for individual pirns; spreading thread guides and means for mounting the spreading thread guides for selective movement to a threading position wherein all the guides are at a position adjacent one end of the spool mandrel and a spreading position wherein a respective guide is substantially in the plane of a tuck slot of a respective pirn; a movable auxiliary organ having an edge and thread guiding slots arranged on said edge, the number of said inflow thread guides and guiding slots each corresponding to at least the number of threads and pirns, said auxiliary organ being a spreading flap wherein a respective guiding slot is exactly aligned and coincides with a respective tuck slot; and means for mounting said flap for selective movement to a postion spaced from a thread path extending from the inflow thread guides to the spreading thread guides and a position wherein the thread guiding slots engage the threads and move the threads into their respective tuck slots.

4,784,343

ACTUATING SYSTEM FOR A BOBBIN TUBE GRIPPER

Heinz Mutter, Winterthur; Ruedi Schneeberger, Seuzach, and Erwin Holbein, Uttwil, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Oct. 16, 1986, Ser. No. 919,652
Claims priority, application United Kingdom, Oct. 18, 1985, 8525791
Int. Cl.⁴ B65H *54/54*
U.S. Cl. 242—46.4 **13 Claims**

1. An actuating system operating on bobbin tube gripping elements of a bobbin tube gripping device and comprising:

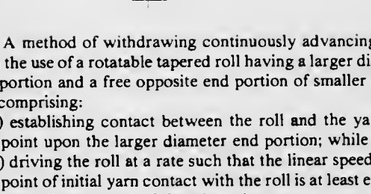
resilient means capable of assuming predeterminate states of compression,

means defining a confinement compartment bounded by an internal surface;

said resilient means contacting said internal surface of said confinement compartment;

said means defining said confinement compartment further including a movable member for holding said resilient means in at least one preselectable state of compression in which said resilient means generate a force operable to grippingly engage the bobbin tube gripping elements with the bobbin tube;

said resilient means constituting a body of porous elastomer enabling generation of said at least one preselectable state of compression with said resilient means in contact with



said internal surface of said confinement compartment; and

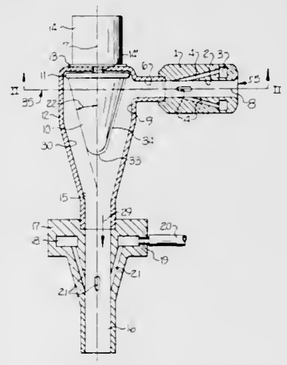
said body of porous elastomer of said resilient means substantially filling said confinement compartment when generating said force to gripping engage the bobbin tube gripping elements with the bobbin tube.

4,784,344

YARN WITHDRAWAL APPARATUS AND METHOD

Erich Lenk, Remscheid, and Albert Stitz, Kurten, both of Fed. Rep. of Germany, assignors to Barmag AG, Remscheid, Fed. Rep. of Germany

Filed Jan. 29, 1987, Ser. No. 8,490
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3602765; Apr. 8, 1986, 3611740; Apr. 17, 1986, 3613040; May 2, 1986, 3614864
Int. Cl.⁴ B65H *51/20*
U.S. Cl. 242—47.01 **36 Claims**



1. A method of withdrawing continuously advancing yarn, with the use of a rotatable tapered roll having a larger diameter end portion and a free opposite end portion of smaller diameter, comprising:

(a) establishing contact between the roll and the yarn at a point upon the larger diameter end portion; while

(b) driving the roll at a rate such that the linear speed of the point of initial yarn contact with the roll is at least equal to the delivery speed of the advancing yarn;

(c) forming windings of the yarn about the roll; and

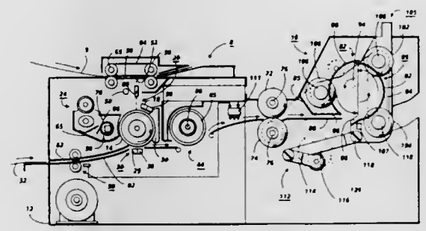
(d) selecting the cone angle of the roll to be greater than the angle of friction between the yarn and the roll surface so that the yarn windings are continuously displaced along the length of the roll to and along its smaller diameter end portion.

4,784,345

APPARATUS FOR AUTOMATICALLY ROLLING UP OUTPUT SHEETS FROM A DOCUMENT REPRODUCTION SYSTEM

Robert F. Romanowski, Rochester, and Raymond E. Poehlein, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 075,509, Jul. 20, 1987, abandoned. This application Sep. 21, 1987, Ser. No. 98,825
Int. Cl.⁴ B65H *18/16*
U.S. Cl. 242—66 **5 Claims**



1. Apparatus for rolling copy sheets into a tubular roll, the apparatus including:

means for accepting said copy sheets from an output station and for feeding said sheets into a roll-up station, the roll-up station including;

a cylindrical housing formed by a plurality of curved baffle members having apertures therethrough;

a plurality of rollers arranged around the circumference of said housing, a portion of the outer surface of said rollers seated in said apertures and extending a short distance into the interior of said housing;

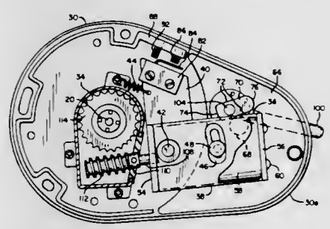
said rollers adapted to be driven in the same direction whereby, as a sheet is moved into said housing by said feeding means, the sheet is guided by said baffles and urging rollers and would into a tubular form.

4,784,346

MOTORIZED FISHING REEL

Walter J. Steffan, P.O. Box 116, Tygh Valley, Oreg. 97063

Filed Jul. 6, 1987, Ser. No. 70,203
Int. Cl.⁴ A01K *89/017*
U.S. Cl. 242—84.1 A **10 Claims**



1. A motorized fishing reel comprising a reel body with opposite ends,

a spool shaft journaled on said reel body,

a fish line spool mounted on said shaft,

drive receiving gears on said reel body operably connected to said shaft,

electric motor means having an electric circuit therefor operably connected to said drive receiving gears,

pivot means pivotally mounting said motor means on said reel body,

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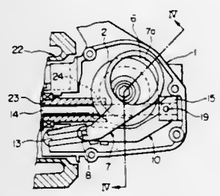
spring means urging said motor means pivotally in one direction,
switch means in said electric circuit operably engageable by said motor means and controlling on-off operation of the motor means depending upon the pivot position of the latter,
pivotal cam means on said reel body operably engageable with said motor means for pivoting the latter against the action of said spring means,
and lever means on said reel body located for hand engagement by a fisherman,
said lever means extending integrally from said cam means and arranged to pivotally move said cam to at least three operable positions,
a first of said cam positions pivoting said motor means to a motor deenergized switch condition and second and third of said cam positions pivoting said motor means to selected motor energized switch conditions whereby the fisherman can control operation of said reel by hand adjustment of said lever means.

4,784,347

SLIDING MECHANISM FOR SPINNING REEL

Takehiro Kobayashi; Kikuo Tsunoda, and Hideo Murakami, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Feb. 16, 1988, Ser. No. 155,850
Claims priority, application Japan, Feb. 16, 1987, 62-21618[U]
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—84.21 R **4 Claims**



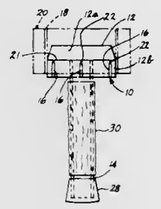
1. A sliding mechanism for a spinning reel comprising:
a hollow body formed of a main part and a cover, said main part and said cover including narrowly extending sliding grooves;
a master gear having an axis and an eccentric boss affixed thereto located within said body, said master gear being adapted to be rotated upon rotation of a handle of the reel;
a main shaft centrally located in said hollow body;
a spool attached to said main shaft;
a pivotal coupler lever having first and second ends;
a reciprocator having a first slider pin for swingably connecting said first end of said pivotal coupler lever and said main shaft;
a slider having a first end connected to said eccentric boss and a second end; and
a second slider pin located between said slider and said pivotal coupler lever for pivotally connecting said second end of said pivotal coupler lever to said second end of said slider, said second slider pin being slidably fitted in said sliding grooves.

4,784,348

DISPENSER AND METHOD FOR APPLYING WEB-LIKE MATERIAL TO PACKAGING UNITS

Alex F. McDonald, 111 E. 216th St., Euclid, Ohio 44123

Filed Oct. 20, 1986, Ser. No. 920,370
Int. Cl.[4] B65H *75/40*
U.S. Cl. 242—96 **12 Claims**



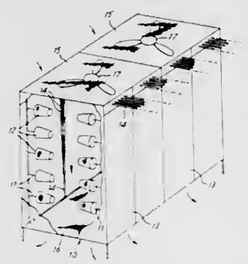
1. A method for manually applying flexible web material, such as plastic film or the like, to packaging units comprising, providing a roll of said flexible material having an open core, inserting into the core in frictional engagement therewith a spindle which then projects out one end of said core, relatively loosely wrapping a selected amount of said flexible material about said projecting portion of said spindle to form an encircling envelope of flexible material which is rotatable relative to said projecting portion of said spindle, and controlling the tension and speed of unrolling of said flexible web material from said roll while applying said flexible material to a packaging unit by manually squeezing said envelope of flexible material on said spindle to selectively cause a braking action between said spindle and said envelope, and including removing said envelope from said spindle by slipping it off the distal end thereof, and then replacing said envelope by wrapping a selected amount of new roll flexible material about said spindle to form a new encircling envelope of flexible material as a replacement for the original envelope of flexible material.

4,784,349

YARN CREEL APPARATUS

Kimberly J. Renwick, Huntersville, N.C., and William E. A. Shelton, Leicestershire, England, assignors to Alan Shelton Limited, Croft, England

Filed Sep. 25, 1987, Ser. No. 100,987
Claims priority, application United Kingdom, Sep. 27, 1986, 8623308
Int. Cl.[4] B65H *49/14*
U.S. Cl. 242—131 **8 Claims**



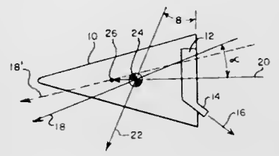
1. Yarn creel apparatus for the control of loose fly or lint comprising
a casing within which yarn packages are contained in use,
said casing having at least one inlet and at least one outlet defined therein,
air conduction means to draw air into the casing from the surrounding atmosphere through the at least one inlet and to expel air from the casing to the surrounding atmosphere through the at least one outlet,
first filter means provided in the at least one inlet to filter out debris from the air being drawn into the casing, and
second filter means provided in the at least one outlet to filter out debris from the air being expelled from the casing.

4,784,350

PASSIVE STEP TRIMMER FOR A MANEUVERING RE-ENTRY BODY (U)

Ralph M. Darden, Levittown, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1979, Ser. No. 22,125
Int. Cl.[4] F42B *15/02*
U.S. Cl. 244—3.1 **8 Claims**



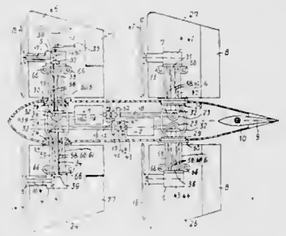
1. A method for changing the angle of attack of a maneuvering re-entry body in flight comprising the step of discharging mass from said maneuvering re-entry body by using the existing trajectory accelerations as the discharging force.

4,784,351

AIRCRAFT WITH A PLURALITY OF PROPELLERS, A PIPE STRUCTURE FOR THEREON HOLDABLE WINGS FOR VERTICAL TAKE OFF AND LANDING

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 973,780, Dec. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 487,272, Jul. 10, 1974, Pat. No. 4,009,849, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, which is a continuation-in-part of Ser. No. 782,349, Dec. 9, 1968, abandoned, which is a continuation-in-part of Ser. No. 551,023, May 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 328,395, Dec. 5, 1963, Pat. No. 3,320,898, which is a continuation-in-part of Ser. No. 828,115, Feb. 10, 1986. This application Jan. 20, 1987, Ser. No. 5,535
Claims priority, application Austria, Mar. 22, 1978, 2060/78
Int. Cl.[4] B64C *27/28*
U.S. Cl. 244—7 C **6 Claims**



1. An aircraft, which comprises, in combination,
a body, at least one power plant, at least four propellers, at least two pairs of wing portions, a transmission between said power plant and said propellers with said transmission leading equal portions of power from said power plant to said propellers, whereby said transmission transfers at least four portions of equal power and rate of speed individually each one of said portions of power individually to one of said propellers to synchronize the rotary velocities of said four propellers to equal speeds and forces arrangements to pivot the axes of said propellers and of said wing portions from vertical to horizontal and vice versa in unison and and improvement,
wherein said improvement comprises, in combination, arrangements in said power plant and in said transmission,
wherein said power plant revolves an output shaft in excess of three thousand revolutions per minute,
wherein said transmission includes a horizontal shaft in said body with a first tapered gear, one front first gear and a rear first gear on the respective end of said shaft,
wherein a vertical shaft with second and third tapered gears on its ends is provided in said body,
wherein a lateral shaft with fourth and fifth tapered gears on its end is provided laterally extending from said body and extending into a wing portion of said wing portions,
wherein a propeller driving shaft is provided with a sixth tapered gear in said wing portion and with holding means to hold a propeller,
wherein said first gear engages and meshes with said second gear, said third gear engages and meshes with said fourth gear, said furth gear engages and meshes with said fifth gear and said fifth gear engages and meshes with said sixth gear,
wherein said propeller driving shaft is borne in bearings and carries said propeller to revolve said propeller,
wherein said transmission includes a second horizontal shaft with gears complementary to said gears of said first shaft,
wherein four of said horizontal shaft, four of said lateral shafts and four of said propeller driving shafts are provided each with gears equal and complementary to said described gears,
whereby said four propeller driving shafts engage and drive said four propellers over said shafts and gears, and
wherein a pair of pipe structures is pivotably provided in said body, while each of said structures consists of at least three substantially parallel pipes which carry inner and outer bearings with said structures provided with holders to hold said wing portions, and
wherein said lateral shaft is provided between portions of said pipes of said structures while said lateral shaft is borne in said inner and outer bearings.

4,784,352

FORWARD POSTURE SUPPORT SEAT SYSTEM

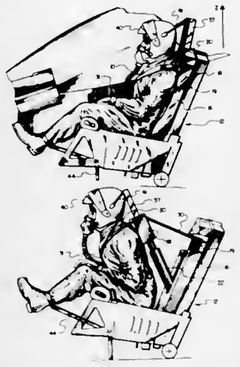
Eugene A. Smith, Vashon, Wash.; Barbara J. Courter, El Segundo, Calif.; Kenton M. Munson, Arcadia, Calif., and Stephen G. Wurst, Orange, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 20, 1986, Ser. No. 865,508
Int. Cl.[4] B64D *25/04*
U.S. Cl. 244—122 AG **28 Claims**

1. A forward posture support seat system for a crewmember of a vehicle comprising:
a seat, said seat having a seat back and a seat pan;
a torso support means secured to the crewmember's upper torso for supporting the crewmember's upper torso while the crewmember is seated in said seat in a crouched over position, said torso support means connected to said seat

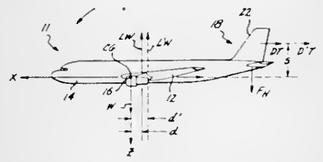
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behind the crewmember, said torso support means being lockable when the crewmember is in a crouched over



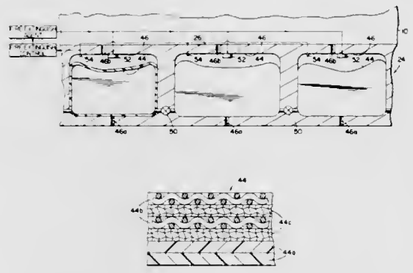
position such that fore and aft motion of the crewmember is substantially precluded.

4,784,353
AIRCRAFTS TAIL SECTION DRAG COMPENSATING FOR NOSE-DOWN PITCHING MOMENT
Armand Sigalla, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Mar. 2, 1983, Ser. No. 471,265
Int. Cl.[4] B64C *5/06*
U.S. Cl. 244—91 **9 Claims**



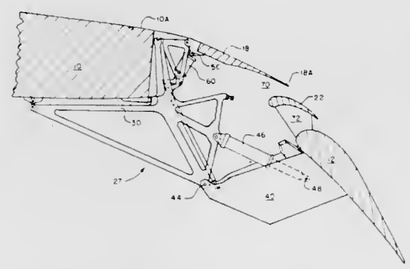
1. An aircraft comprising the combination of a fuselage, swept wings mounted near mid-body of the fuselage and a tail section, and having a characteristic speed-dependent, nose-down pitching moment due to rearward movement of the center of lift pressure on the wings as the aircraft while in level flight increases speed in a predetermined speed regime, said tail section having a vertical tail member rising from a root connected to said fuselage and terminating at a tip, said vertical tail member being so configured between said root and tip to provide a passive means for developing a compensating drag component that increases as the speed of said aircraft increases in said predetermined speed regime and acts on said tail member above its root so as to produce a speed-dependent, nose-up pitching component that substantially matches in magnitude versus speed, said characteristic speed-dependent, wing associated, nose-down pitching moment of the aircraft, so as to passively counteract said characteristic nose-down pitching moment.

4,784,354
EMERGENCY AIRCRAFT FUEL SYSTEM
John B. Tavano, 28 Edgewood Dr., Torrington, Conn. 06790
Filed Sep. 28, 1987, Ser. No. 101,596
Int. Cl.[4] B64D *37/06*
U.S. Cl. 244—135 B **5 Claims**



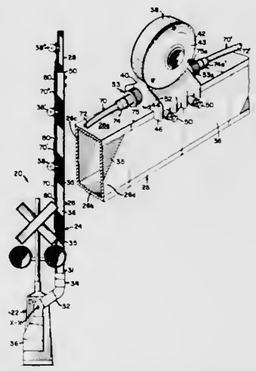
1. In an aircraft having a fuel system for delivering fuel to one or more power plants the improvement to said fuel system comprising:
a plurality of individual fuel tanks provided adjacent one another,
a collapsible bladder in each tank,
a bladder support cage for each fuel tank bladder,
said bladder being resiliently deformable so as to collapse as fuel is withdrawn by the fuel system, said bladder including at least an inner and an outer layer,
said inner layer being formed of elastomeric material, and
said outer layer comprising a relatively coarse stainless steel mesh fabricated from stainless steel wires with one quarter inch spacing between the wires.

4,784,355
FLAP SYSTEM FOR SHORT TAKEOFF AND LANDING AIRCRAFT
Gerald T. Brine, La Palma, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 10, 1986, Ser. No. 928,350
Int. Cl.[4] B64C *3/50*
U.S. Cl. 244—213 **17 Claims**



1. A flap system for an aircraft comprising:
(a) an aircraft wing having a trailing edge;
(b) a flap support fixedly mounted to the trailing edge of said wing;
(c) a wing flap having inboard and outboard ends and a fixedly attached flap mounting bracket which is pivotably mounted at a single pivot point to said flap support;
(d) a flap linear actuator pivotably attached directly to said flap support and directly attached to said wing flap mounting bracket for adjusting flap position relative to the aircraft wing;
(e) a single vane fixedly attached to said wing flap for coordinated movement therewith;
(f) a spoiler pivotably attached to said flap support;
(g) a spoiler linear actuator pivotably attached to said spoiler for independent spoiler actuation; and
(h) a link member pivotably connected directly to said flap mounting bracket and to a crank arm which is connected to said spoiler actuator for coordinating spoiler movement with flap movement in order to provide a double slotted flap system for increased lift.

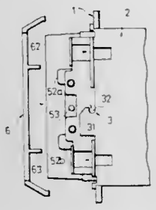
4,784,356
VARIABLE PLACEMENT INTERCHANGEABLE LAMP SYSTEM
David K. Fox, Wayzata, Minn., assignor to Railway Equipment Company, Minneapolis, Minn.
Continuation of Ser. No. 830,534, Feb. 18, 1986, Pat. No. 4,666,108. This application Feb. 24, 1987, Ser. No. 17,561
Int. Cl.[4] B61L *29/04*
U.S. Cl. 246—125 **20 Claims**



1. A lamp arrangement for a railway crossing arm having a signal relay switch circuitry comprising:
a plurality of electrically actuated lamps disposed in housings separate and distinct from the railway crossing arm;
fastening means for fastening a lamp housing to any of a plurality of selected locations along the length of said railway crossing arm, the fastening means including clamp means for nondestructively clamping the lamp housing onto the railway crossing arm whereby the lamps can be fastened to the railway crossing arm without requiring drilling or other deformation of the support member; and
cable means for electrically connecting a lamp fastened to any of said plurality of selected locations on the railway crossing arm to the relay switch circuitry.

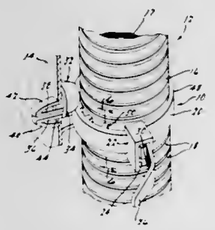
4,784,357
ATTACHMENT STRUCTURE OF CAR SOUND APPARATUS
Morio Kimura, Ono, Japan, assignor to Alpine Electronics Inc., Japan
Filed Nov. 19, 1986, Ser. No. 932,700
Claims priority, application Japan, Nov. 29, 1985, 60-184264[U]
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—27.1 **3 Claims**

1. An attachment structure for mounting a car sound apparatus by inserting the apparatus longitudinally in a rearward horizontal direction into an opening of an inner case which is fitted in an opening of a dashboard of a car, comprising:
said inner case having walls surrounding the opening of the inner case into which the sound apparatus is inserted, including at least one side wall having a pin retaining portion facing toward a forward horizontal direction, opposite from said rearward horizontal direction, having a front inclined edge inclined at an angle relative to a vertical direction and a pin retaining groove disposed in the rearward horizontal direction behind said front inclined edge;
a lock pin unit including a first plate mounted to one side of the sound apparatus corresponding to said one side wall of said inner case, a second plate and a sliding means for mounting said second plate to said first plate so as to be



slidable upwardly and downwardly in the vertical direction; said second plate having a pin extending in a transverse horizontal direction, which is perpendicular to said forward and rearward horizontal directions;
wherein upon insertion of the apparatus into the opening of said inner case, said pin of said lock pin unit is slidingly engaged with said front inclined edge of said pin retaining portion of said one side wall of said inner case to displace said pin and said second plate vertically upward along said front inclined edge and then vertically downward into said pin retaining groove for mounting the apparatus into said inner case, and conversely, for detaching the apparatus from said inner case, said pin is displaced vertically upward out of said groove and vertically downward along said inclined edge.

4,784,358
CABLE STRAP
James K. Kohut, Northville, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed Oct. 7, 1987, Ser. No. 105,419
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.3 **2 Claims**



1. In a cable strap for securing a cable to a panel, the cable including a tubular sheath having longitudinally spaced apart annular grooves on the outer surface thereof, the cable strap comprising a flexible strap, a buckle on one end of the strap, the buckle having a slot for insertion and retention of the other

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end of the strap with the strap wrapped around the cable, a fastener on the outer surface of the strap insertable through an opening in a panel for securing of the strap to the panel, the fastener being located adjacent to but spaced from the buckle, the improvement comprising a plurality of spaced apart teeth on the inner surface of the strap, at least some of the teeth being positioned between the buckle and the fastener, portions of the teeth being receivable in an annular groove when the strap is wrapped around a cable to thereby prevent the cable slipping through the cable strap, the portion of each tooth receivable in an annular groove extending transversely of the strap, each tooth having an additional portion which extends longitudinally of the strap, said first mentioned tooth portion extending further outwardly from the strap than the second mentioned portion whereby the first mentioned portion is receivable in an annular groove with the second mentioned portion pressing against the outer surface of the tubular sheath to inhibit turning of the tubular sheath within the cable strap.

4,784,359

ADJUSTABLE SUPPORT FOR OPTICAL DEVICE

Dwight G. Westover, Sierra Madre, Calif., assignor to TransTechnology Corporation, Sherman Oaks, Calif.

Continuation of Ser. No. 712,014, Mar. 14, 1985, abandoned.
This application Mar. 26, 1987, Ser. No. 31,167
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—274 **21 Claims**



1. Linearly positionable apparatus, comprising in combination:

a bar having a longitudinal dimension, first and second flat side surfaces extending along said longitudinal dimension, and first and second edge surfaces extending along said longitudinal dimension between said first and second side surfaces; and

a clamping device including

a first clamp member having a channel for receiving a portion of said bar including a portion of said first edge surface,

a second clamp member having a channel for receiving a portion of said bar including a portion of said second edge surface,

first adjustable means for securing said clamp members to one another with said bar being retained by said channels and for controlling the drag force between said clamp members and said edge surfaces when said bar is retained by said secured clamp members and said secured clamp members are slideably urged longitudinally along said bar, and

second adjustable means carried by said clamp members and said side surfaces for controlling the drag force between said clamp members and said side surfaces when said bar is retained by said secured clamp members and said secured clamp members are slideably urged longitudinally along said bar,

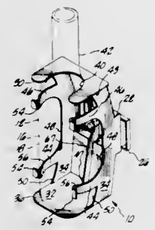
said first adjustable means being adjustable to secure said clamp members to one another with said bar retained by said channels independently of adjustment of said second adjustable means, and said first adjustable means and said second adjustable means being adjustable independently of one another for separately controlling the drag forces respectively controlled thereby.

4,784,360

BEVERAGE COOLER-CARRIER FOR VEHICLES

Peter Mok, 4343 Forest Oaks Dr., Thousand Oaks, Calif. 91360

Filed Nov. 14, 1986, Ser. No. 930,443
Int. Cl.[4] B60R *7/06*
U.S. Cl. 248—313 **1 Claim**



1. An apparatus for releasably carrying a beverage container having a cylindrical main portion in a fixed location in the interior of a vehicle, the vehicle having a stationary fixture therein, the fixture having a cavity for admitting air into the interior of the vehicle, the apparatus comprising:

(a) a housing comprising:

(i) a supporting surface for the container;

(ii) a tubular member forming a duct for transmitting air from the fixture, into communication with the outside of the container, and into the interior of the vehicle;

(b) means for fastening the housing to the fixture comprising:

(i) a hook member for engaging the fixture within the cavity, the hook member being movable with reference to the housing;

(ii) a clamp screw connecting the hook member to the housing for clamping a portion of the fixture between the hook member and the housing, the clamp screw having a head member and a shank portion, the head member engaging the housing, the shank portion extending through a portion of the housing into threaded engagement with the hook member;

(c) means for permitting the container to be moved laterally onto the supporting surface and releasably holding the container in a fixed position with the main portion thereof vertically disposed on the supporting surface, comprising first and second pairs of finger members extending from the housing for biasingly engaging opposite sides of the cylindrical portion of the container, the first pair of the finger members being proximate the supporting surface, the second pair of the finger members being spaced vertically apart from the first pair for permitting opposite sides of the container to be grasped at a vertical location between the first and second pairs of the fingers, at least one of the finger members comprising:

(i) first ramp means for overcoming the biasing as the container is moved laterally onto the supporting surface; and

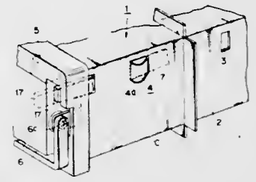
(ii) second ramp means for detenting the container in the fixed location on the supporting surface, the second ramp means also overcoming the biasing when the container is laterally moved away from the fixed location.

4,784,361

AUTOMOTIVE ELECTRONIC DEVICE MOUNTING ASSEMBLY

Shigetoshi Kobayashi; Seishichi Ohara; Terunobu Chiba, and Tomoji Yoshida, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 61,056
Claims priority, application Japan, Jun. 17, 1986, 61-91342[U]
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—551 **11 Claims**



1. An apparatus comprising a rectangular hollow bracket adapted to be mounted in a car passenger compartment, a car electronic device which can be slidably inserted into and removed from said bracket substantially parallel to an insertion direction, and means for releasably securing said electronic device in said bracket, the improvement comprising wherein said means for releasably securing said device includes:

an engage hole formed in a side wall of said bracket;

an engage member provided on a side of said electronic device and having an engage projection movable relative to said device transversely of said insertion direction between first and second positions in which said engage projection is respectively engaged with and spaced from said engage hole, and biasing means for yieldably biasing said engage projection toward its first position, wherein engagement of said engage projection in said engage hole when said engage projection is in its first position prevents removal of said electronic device from said bracket;

an unlocking member supported on said electronic device for movement between first and second positions and having means responsive to movement of said unlocking member from its first position to its second position for forcibly moving said engage member from its first position to a third position located between its first and second positions;

resilient means for yieldably biasing said unlocking member toward said first position thereof; and

holding projections provided on said unlocking member and means on said engage member engageable with said holding projections on said unlocking member when said unlocking member is in its second position and said engage projection is in its third position for releasably holding said unlocking member in its second position, movement of said engage member to its second position interrupting said engagement of said holding projections and said means on said engage member.

4,784,362

HYDRAULIC AUTOMATICALLY ASCENDING APPARATUS WITH A VOLUME-VARIABLE OIL TANK

Jobn Wang, No. 129, Tuan-Chu Lane, Tuan-Chu Li, Chiayi City, Taiwan

Filed Sep. 21, 1987, Ser. No. 99,230
Int. Cl.[4] F16F *9/08*; F16M *13/00*
U.S. Cl. 248—562 **7 Claims**

1. A hydraulic automatically ascending apparatus comprising:

a hydraulic cylinder including a piston, and a piston rod which extends upwardly from said piston to connect with an article,

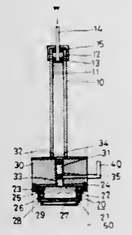
an oil tank, said tank being made of a material capable of being deformed so that it has a variable volume,

an elastomeric body mounted outwardly of said tank for biasing said oil tank to retract,

means for mounting said elastomeric body, and

oil passage means including an oil pipe for intercommunicating with said hydraulic cylinder and said tank and connecting block measns between said hydraulic cylinder and said oil tank, said oil pipe being inserted through said connecting block means,

said oil tank being shaped like a circular barrel having an open end and a closed end,



said mounting means including (a) a first circular flange projecting from said connecting block, (b) means defining therein a first circular bore for receiving said open end of said oil tank, and (c) a support formed with a second circular flange projecting toward said first circular flange for defining therein a second circular bore for receiving said closed end of said oil tank,

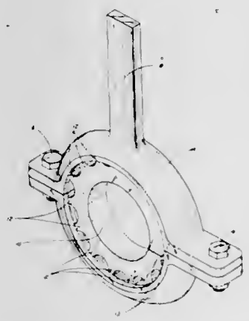
said elastomeric body comprising a tension spring interconnecting securely said first and second circular flanges for biasing said first circular flange to move toward said second circular flange while permitting said flanges always to be spaced from each other.

4,784,363

RADIAL PIPE MOUNT

Garland L. Brown; Roy E. Hoffman, Jr., both of Newport News, Va., and Thomas J. Quenville, Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1987, Ser. No. 55,951
Int. Cl.[4] F16L *3/00*
U.S. Cl. 248—610 **3 Claims**



1. A radial pipe mount comprising:

an elastomeric insert for bending around a pipe, said elastomeric insert having radial spokes;

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a retaining ring surrounding said elastomeric insert and retaining said elastomeric insert around said pipe with said radial spokes pointing outward;

said retaining ring being comprised of a semi-ellipse in cross-section to provide rigidity without low frequency resonance; and

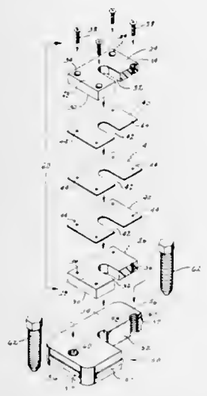
means attached to said retaining ring for supporting said radial pipe mount.

4,784,364

HEAT-BARRIER CHOCK AND SOLE PLATE SYSTEM

Larry W. Chamberlain, Eolia, and George W. Rives, Clarksville, both of Mo., assignors to Arrow Support Systems Corp., Eolia, Mo.

Filed Sep. 17, 1987, Ser. No. 97,734
Int. Cl.[4] F16M *5/00*
U.S. Cl. 248—673 **6 Claims**



1. For use in supporting and adjustably leveling a heat and vibration producing machine secured by a substantially vertical anchor bolt to a foundation having a sole plate thereon, without removing such anchor bolt,

a chock assembly including upper and lower chock halves of a plastic material characterized by substantially less heat conductivity and greater flexibility than steel and by freedom from creep in compression at the temperature and compressive loading from such machine, said chock halves having a common plan form including registering slots leading inward from an edge thereof, said slots being of such width and extent as to accommodate such anchor bolt when said chock assembly is atop such sole plate,

each said chock half having parallel top and bottom surfaces and having aligned registering bores perpendicular thereto, said chock assembly further comprising

one or more steel leveling shims disposed between said chock halves, each shim having a plan form substantially corresponding to the plan form of said chock halves and including a slot and bores adapted to register with said slot and bores of said chock halves the bores having means to secure said halves and shims in registration with each other,

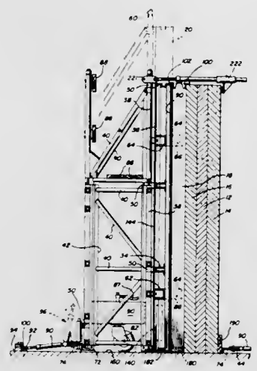
whereby said chock assembly minimizes deterioration of such foundation, and on relieving the load of such machine thereon, said chock assembly may be slid out from between such machine and sole plate for insertion or removal of one or more said shims between said chock halves without substantially affecting the said resiliency of their support.

4,784,365

APPARATUS FOR NEST-CASTING OF CONCRETE ELEMENTS

Geo A. Scott, Zaltbommel, Netherlands, assignor to Topland N.V., Aruba, Netherlands

Division of Ser. No. 325,185, Nov. 27, 1981, abandoned. This application Apr. 21, 1987, Ser. No. 41,645
Int. Cl.[4] E04G *11/20*
U.S. Cl. 249—21 **6 Claims**



1. An apparatus for nest-casting concrete panels comprising a substantially flat horizontal supporting surface, a first vertically disposed mold form on said supporting surface and including a substantially flat mold surface forming a first side wall of a mold cavity, a second vertically disposed mold form on said supporting surface and including a substantially flat mold surface forming a second side wall of a mold cavity, a pair of vertically disposed end mold forms on said supporting surface, each end mold form including a substantially flat mold surface forming end walls of a mold cavity, the lower ends of said mold forms engaging the supporting surface in a manner to retain concrete placed in the mold cavity while it cures to form a concrete panel, said second mold form including means in movably supporting engagement with the supporting surface for movement of the second mold form to spaced relation to a first formed concrete panel to form a second mold cavity, said end mold forms being mounted on said second mold form for movement therewith, said means supporting said second mold form including vertically adjustable wheeled means mounted on said second mold form and engaging said supporting surface to enable movement of the second mold form in any direction in relation to the first mold form and first formed concrete panel, said second mold form including means at the upper edge thereof adjustably connected to the upper edge of the first formed and subsequently formed concrete panels for maintaining the thickness of the upper end portion of the mold cavity.

4,784,366

POUR HOLE LOCK SYSTEM

John Muller, Englewood, Tenn., assignor to Davidson Textron Inc., Dover, N.H.

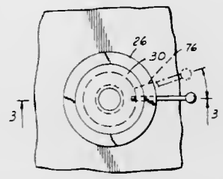
Filed Aug. 13, 1987, Ser. No. 84,917
Int. Cl.[4] B29C *33/12*
U.S. Cl. 249—91 **9 Claims**

1. In a mold tooling system having a female mold part and a mold cover for carrying an insert to be positioned within the cavity of the female mold part the improvement comprising:

means for defining a lock catch on said insert;

fill means for defining a pour nozzle for directing foam precursors through the mold cover into the cavity of the female mold part;

and coacting surface means on said fill means and said lock catch for engaging said fill means to said insert for releasably securing and locating the insert on the cover to reduce the variation of the actual insert location within the cavity with reference to a preselected true location therein.

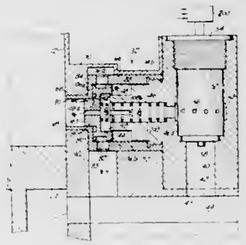


4,784,367

SCAVENGE VALVE FOR A TWO-CYCLE ENGINE

Paul D. Daly, Troy; Mark A. Brooks, Sterling Heights, and Robert E. Fallis, Milford, all of Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 27, 1987, Ser. No. 43,277
Int. Cl.[4] F16K *31/40*
U.S. Cl. 251—30.01 **13 Claims**



1. A valve for use in controlling the amount of working fluid purged from a cylinder of an engine prior to combustion, comprising:

a piston received in and forming part of a chamber in a housing; said housing including an aperture formed about said chamber and an inlet upstream of said aperture adapted to receive pressurized fluid;

said housing including a stepped bore which includes said inlet and a larger diameter portion downstream thereof forming a portion of said chamber, and wherein said piston is step-shaped and received within said stepped bore comprising a cup-shaped member including an axial wall slidably engaging said larger portion and a cross-member spanning said axial wall, and a narrow portion extending upstream of said cross-member and slidably received relative to said inlet, a passage through said extending portion and cross-member and wherein said cross-member is recessed from a downstream end of said axial wall proximate said chamber;

wherein said housing further includes means for slidably receiving the downstream portion of said axial wall and in cooperation with said piston for subdividing said chamber into a first portion, in communication with a downstream surface of said cross-member, and a second portion in communication with the downstream end of said axial wall, said piston movable between first and second positions to open and close communication between said aperture and an inlet;

first means for selectively establishing and terminating communication of said chamber with an outlet, whereby when communication is established a pressure force differential is created across said piston to urge same downstream, toward said first position, to uncover said aperture to permit flow from said inlet through said aperture;

means for balancing the pressure forces acting on upstream and downstream surfaces of said piston, such balancing means effective during intervals when said first means terminates communication of said chamber to said outlet; and

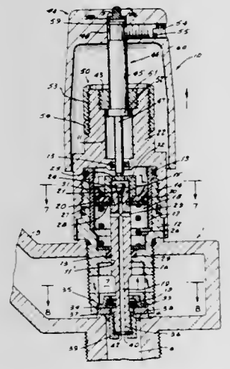
means for urging said piston in an upstream direction toward said second position to prohibit flow from said inlet through said aperture.

4,784,368

SELF-CLOSING VALVE FOR SANITARY INSTALLATIONS

Wilhelm Koch, Bongard, and Bernhard Burkard, Bremm Rbeinland Pfalz, both of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,132
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1986, 3634827
Int. Cl.[4] F16K *47/04*
U.S. Cl. 251—51 **4 Claims**



1. A self-closing valve assembly for sanitary installations comprising:

upper and lower valve housings coupled in a watertight seal to define between them, a metering chamber, normally filled with water as a metering fluid, the inner walls of which are lined with a plastic sleeve;

a metering means, shiftably mounted in said lower valve housing, including a first and second one-way valve means, said first one-way valve means is operably mounted in said metering chamber and displaces a predetermined volume of said metering fluid when said valve assembly is in its opened position;

said metering means includes a valve pin shiftably mounted in said lower housing, the upper end of which is disposed in said metering chamber, said upper end of said valve pin, having operably coupled thereto, said first and second one-way valve means, said valve pin having axial and transverse passageways formed therein, and which communicate with said metering chamber at said one end of said valve pin;

said first one-way valve means having a cup seal, positioned in said metering chamber, mounted to said upper end of said valve pin, said cup seal having a periphery made of resilient, deformable material to permit metering fluid to flow therearound when said first one-way valve means is

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shifted in said metering chamber from its closed to its opened position;

an actuating assembly comprising a handle and surrounding a portion of said upper valve housing, to shift said metering means from its normally closed, inoperative position to its open, operative position;

said actuating assembly including time adjusting means operably coupled to said upper housing portion within said handle to preset the distance said metering means is shifted so that a predetermined volume of said metering fluid is displaced in said metering chamber by said first one-way valve means;

closure means, including said second one-way valve means, operably coupled to said metering means to automatically shift said metering means from its opened to its normally closed position;

said second one-way valve means including a cone valve mounted to said lower housing and positioned in a corresponding conical valve seat formed in said axial passageway of said lower housing, said cone valve and said conical recess having a spiral passageway of constant cross sectional area which is in fluid communication with said metering chamber and said axial and transverse passageways whereby said displaced volume of said metering fluid is transferred at a constant rate said metering chamber after a predetermined period of time has elapsed when said first one-way valve means is shifted from its open to its close position in said metering chamber, to thereby automatically close said valve assembly.

4,784,369

CAMPER LIFT JACK AND HAND CRANK

James D. Bock, Elkhart, Ind., assignor to Bock Products, Inc., Elkhart, Ind.

Filed Apr. 21, 1988, Ser. No. 184,184
Int. Cl.[4] B60P *3/32*
U.S. Cl. 254—45 **2 Claims**



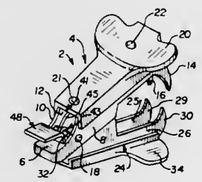
1. In combination, a lift jack and a hand crank, said lift jack including lift bracket means adapted to be positioned beneath a vehicle frame, extendable tube means connected to said lift bracket means for raising and lowering said lift bracket means, a rotatable actuator pin connected to said tube means, said actuator pin constituting means for effecting the raising and lowering of said tube means, and a leverage pin protruding outwardly of said actuator pin for facilitating connection to said hand crank to rotate the actuator pin, the improvement wherein said hand crank includes a shaft connected to a generally U-shaped bracket which is defined by side walls spacedly connected to a bottom wall, said side walls defining aligned bores fittable over said actuator pin, one of said side wall bores defining a slot adjacent said bore wherein said U-shaped bracket may be fitted over said actuator pin and leverage pin with the leverage pin contacting said bracket bottom wall as the hand crank is rotated to effect turning of said actuator pin.

4,784,370

STAPLE REMOVING DEVICE AND ASSOCIATED METHOD

Larry D. Strickland, 103 Holly La., Morgantown, W. Va. 26505

Filed Aug. 4, 1987, Ser. No. 81,468
Int. Cl.[4] B25C *11/00*
U.S. Cl. 254—28 **21 Claims**



1. A device for removing a staple from an object comprising:

a first member,

a second member which is movably secured to said first member,

pivot means connecting said first member and said second member,

said first member having attached a first clamping element,

said second member having a second clamping element for cooperation with said first clamping element in engaging a staple,

said first member and said second member each having teeth means adjacent a first end of the longitudinal axis of said staple remover for initiating removal of said staple from the object, and

said first clamping element projecting generally outwardly from said first member and said second clamping element projecting generally outwardly from said second member, whereby positioning a portion of a staple intermediate said first and second generally outwardly projecting clamping elements, relatively rotating said first and second generally outwardly projecting clamping elements toward each other to engage said staple between said first and second clamping elements, and moving said staple removing device away from said object will effect removal of said staple from said object.

4,784,371

HYDRAULIC JACK HAVING A SMALL DIAMETER BLEED PART IN THE CYLINDER WALL

William L. Kamper, Waukesha, Wis., assignor to Hein-Werner Corporation, Waukesha, Wis.

Filed Jul. 16, 1987, Ser. No. 74,089
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 H **3 Claims**

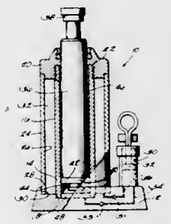
1. A hydraulic jack comprising

a cylinder having opposite ends and a cylinder wall, the cylinder wall having an interior surface and an outer surface, and the cylinder having a central longitudinal axis,

a ram having a head portion reciprocable in the cylinder between the cylinder ends, and a rod portion partially extending through one of the opposite ends of the cylinder,

sealing means carried on the ram head portion to provide a substantially fluid tight seal between the ram head portion and the cylinder interior surface, and

bleed port means for permitting the flow of fluid from the cylinder when the head portion moves to a position adjacent the one of the opposite ends of the cylinder so as to prevent forcing the ram head portion and the sealing means against the one of the opposite ends of the cylinder, the bleed port means including a bore extending through the cylinder wall between the interior surface and the



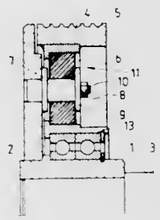
outer surface, and the bore having a length extending generally radially through said cylinder wall, said bore having a diameter of less than approximately 0.015 inches along substantially its entire length whereby the material forming the sealing means will not flow into said bore when said sealing means is positioned such that a portion of said sealing means is adjacent said bore.

4,784,372

TRACTION SHEAVE

Johannes de Jong, Järvenpää, Finland, assignor to Elevator GmbH, Switzerland

Continuation of Ser. No. 779,579, Sep. 24, 1985, abandoned. This application Aug. 13, 1987, Ser. No. 85,222
Claims priority, application Finland, Sep. 24, 1984, 843749
Int. Cl.[4] B66D *1/14*
U.S. Cl. 254—277 **4 Claims**



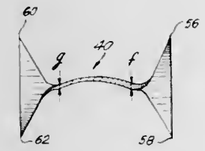
1. A traction sheave, in particular for a lift moving machinery, by which torque is transmitted from a machinery shaft to ropes supporting a lift cage, said sheave being constructed to reduce vibration caused by friction between the ropes and the sheave and which is tangentially directed with respect to the machinery shaft, said sheave comprising a hub connected with said machinery shaft and surrounding same and extending axially along and overlying said shaft, bearing means having an outer rotatable race and an inner race fixedly mounted upon said hub, a monolithic outer rim surrounding said shaft and extending axially along and overlying said shaft, said outer rim having grooves for said ropes and being fixedly connected to said bearing means outer race whereby the whole outer rim extends axially along and overlies said shaft and is rotatably carried on said hub, a flange fixed on said hub and surrounding said hub, and at least one elastic element connected between said outer rim and said flange, said at least one elastic element being located radially outward of said hub and spaced from said flange axially along said shaft and extending axially along and overlying said shaft, beam means mounted on said flange for rotatably carrying said elastic element on said hub, means located between said outer rim and said outer race holding said elastic element in position spaced axially from said flange, the outer rim, the elastic element, the bearing means, the hub and the shaft all being interconnected in the radial direction with respect to said shaft whereby forces directed radially of the outer rim by ropes in the grooves are transferred to said shaft in a radially inward direction and the whole outer rim is vibration damped.

4,784,373

BARBED TAPE

John W. Mainiero, Sandy Hook, Conn., assignor to MRM Security Systems, Inc., Sandy Hook, Conn.

Filed Jun. 20, 1986, Ser. No. 876,715
Int. Cl.[4] B21F *25/00*
U.S. Cl. 256—8 **4 Claims**



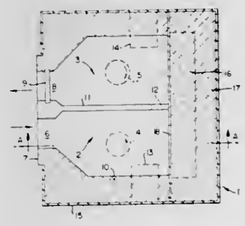
1. A barbed tape comprising an elongated tape portion having clusters of barbs extending from opposed sides of said tape portion and at spaced apart locations along the length of said tape portion, said barbed tape being preformed in generally helical coils of constant size, with the plane of said tape portion being generally perpendicular to the axis of said helical coil, said tape portion being of substantially uniform cross section along its length and having a radially inner circumference and a radially outer circumference, said uniform cross section being generally arcuate intermediate the radially inner and outer circumferences such that one surface of the tape portion is generally concave and such that the opposed surface thereof is generally convex the thickness of said tape portion aling the outer circumference thereof being uniformly less than the thickness along the inner circumference thereof.

4,784,374

TWO-STAGE ALUMINUM REFINING VESSEL

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 14, 1987, Ser. No. 49,417
Int. Cl.[4] C22B *21/06*
U.S. Cl. 266—215 **18 Claims**



1. An improved two-stage aluminum refining vessel having an insulated shell with bottom and side walls impervious to molten aluminum, comprising:

(a) a central baffle member positioned so as to separate the

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space within said refining vessel into two aluminum refining compartment sections;

(b) a first stage aluminum refining compartment within said refining vessel and having a front end, back end and an outer side wall, said central baffle member comprising the inner side wall of said first stage aluminum refining compartment, which is capable of receiving a first spinning nozzle assembly for the injection of sparging gas into molten aluminum during aluminum refining operations in said refining vessel;

(c) inlet means located at the front end of said first stage aluminum refining compartment for introducing molten aluminum thereto;

(d) a second stage aluminum refining compartment within said defining vessel and having a front end, back end and outer side wall, said central baffle member comprising the inner side wall of said second stage aluminum refining compartment, which is capable of receiving a second spinning nozzle assembly for the injection of sparging gas into molten aluminum during aluminum refining operations in said refining vessel, said first and second stage aluminum refining compartments thus being positioned in a side-to-side relationship within the refining vessel, the front end of said second stage aluminum refining compartment being located at the same side of the vessel as said front end of the first stage aluminum refining compartment;

(e) outlet means located at the front end of said second stage aluminum refining compartment for withdrawing molten aluminum therefrom;

(f) a cross-over opening in said central baffle member to enable passage of molten aluminum therethrough from said first stage aluminum refining compartment to said second stage aluminum refining compartment during continuous aluminum refining operations within said refining vessel, said first and second stage aluminum refining compartments being essentially free of obstructions apart from the spinning nozzle assemblies positioned therein during the refinery operations; and

(g) means for separating floating dross from the molten aluminum stream that is treated in said refining vessel,

whereby said two-stage refining vessel is desirably compact, convenient to install and operate, and free of obstructions apart from the gas distribution means employed therein upon use of said vessel in aluminum refining operations, said vessel being such that the flow direction through the system can readily be reversed.

4,784,375

STEPLESSLY BLOCKABLE SETTING DEVICE

Winfried Wirges, Koblenz, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

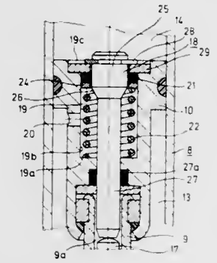
Filed Aug. 19, 1987, Ser. No. 86,856

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629250

Int. Cl.⁴ F16F *5/00;* **E05F** *3/04, 3/12*

U.S. Cl. 267—64.12 **22 Claims**

2. Steplessly blockable setting device comprising a cylinder (8) with a cylinder axis, a cavity (13, 14), a cylindrical inner surface (8*a*) and two end walls, a piston rod (9) conducted in sealing manner through at least one (11, 12) of the end walls, which rod is movable in the direction of the cylinder axis in relation to the cylinder (8), a piston unit (10) connected with the piston rod (9) to form a construction group (9, 10), which unit rests in sealing manner on the cylinder inner surface (8*a*) and divides the cavity (13, 14) within the cylinder (8) into two working chambers (13, 14), a fluid filling in the working chambers (13, 14), a by-pass connection (19*c*, 19, 20) which connects the two working chambers (13, 14) with one another, and a shut-off valve arrangement (18, 21), actuatable from the exterior of the cylinder (8), in the by-pass connection (19*c*, 19, 20), characterised in that a valve chamber (19) with a valve chamber axis and a valve chamber circumferential surface (19*b*) is provided, in that a valve body (18) is accommodated coaxially with and displaceably in the valve chamber (19), in that this valve body (18) comprises a valve head (25) with an external circumferential surface of larger diameter and a prolongation (26, 27) with an external circumferential surface of smaller diameter, in that radially between the valve body (18) and the valve chamber circumferential surface (19*b*) a sealing ring unit (21) is arranged which rests in sealing manner on the valve chamber circumferential surface (19*b*), in that the valve body (18) is axially biased into a basic position determined by a valve stop (29) in that the sealing ring unit (21) is axially biased into



a basic position determined by a sealing stop (29), in that when the valve body (18) and the sealing ring unit (21) are in the basic positions the valve head (25) rests in sealing manner with its external circumferential surface on the sealing ring unit (21), in that the valve body (18) is displaceable out of its basic position into an opening position in which the external circumferential surface of the prolongation (26, 27) has approached the sealing ring unit (21) and in that the sealing ring unit (21) is displaceable out of its basic position into an opening position in which it has approached the external circumferential surface of the prolongation (26, 27).

4,784,376

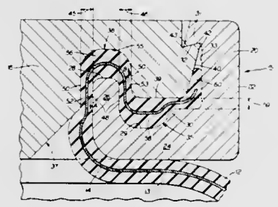
END CAP ASSEMBLY FOR AIR SPRING

Jack D. Ecktman, Indianapolis, Ind., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 17, 1987, Ser. No. 62,987

Int. Cl.⁴ F16F *9/54*

U.S. Cl. 267—64.27 **11 Claims**



1. An improved air spring including:

(a) a pair of end members adapted to be mounted at spaced locations;

(b) a flexible sleeve formed of an elastomeric material containing reinforcing cords and having open ends sealingly engaged with the end members forming a pressurized fluid chamber therebetween;

(c) one of said end members having an end cap extending within one of the open ends of the sleeve and a clamp ring extending about said one sleeve end in clamped engagement with said end cap compressing the sleeve material therebetween; and

(d) an annular curved axially extending projection formed on a mating surface of the clamp ring extending into a concave recess formed in a mating surface of the end cap placing the sleeve in compression shear throughout radially spaced annular areas on opposite sides of said projection, and an intervening area within said recess between said annular compressive shear areas having a greater separation than the thickness of the sleeve material to permit the sleeve material to expand therein.

4,784,377

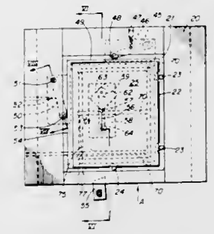
APPARATUS FOR LOCATING AND SUPPORTING CERAMIC SUBSTRATES

Daniel A. Woodward, West Palm Beach, Fla., assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 23, 1986, Ser. No. 945,567

Int. Cl.⁴ B25B *11/00*

U.S. Cl. 269—21 **7 Claims**



2. Apparatus for locating and supporting a substrate comprising:

(a) a support member;

(b) means for supporting said support member on a table;

(c) an intermediate plate movably supported on said support member;

(d) means for urging said intermediate plate towards a substrate locating means;

(e) said substrate locating means being mounted on said support member and contacting said substrate when said intermediate plate is urged toward said locating means;

(f) means mounted on said support member engaging said intermediate plate to a cam member mounted on said table, comprising a lever pivotally mounted intermediate its length on said support member, said lever including a cam engaging surface at one end for engagement with said cam member, said lever in engagement at its other end with said intermediate plate;

(g) means for applying a vacuum to a top surface of said intermediate plate; and

(h) means for alternately applying a pressure source and a vacuum to a support surface of said support member.

4,784,378

VIBRATING BODY MOUNTING ASSEMBLY

David M. Ford, Northville Township, Wayne County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 14, 1985, Ser. No. 798,086

Int. Cl.⁴ F16M *5/00, 13/00;* **B60G** *15/04*

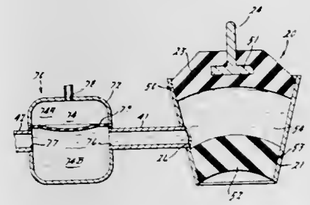
U.S. Cl. 267—219 **16 Claims**

1. An assembly for mounting a vibrating body to a support structure, said assembly comprising a mount and a vacuum accumulator, said mount comprising:

(a) a mount housing comprising a substantially rigid wall with a first opening therethrough and a first elasticly deformable body sealingly bonded to said wall to form a fluid-tight closure of said first opening, said mount housing defining an elasticly expandable fluid-tight mount chamber with a first port, said mount chamber being in fluid communication, through its said first port via a fluid conduit, with said vacuum accumulator;

(b) means for rigidly attaching said rigid wall to one of said vibrating body and said support structure; and

(c) means for attaching said mount to the one of said body and said support structure to which said rigid wall is not rigidly attached, said attaching means being fixedly coupled to said first elasticly deformable body;



wherein said vacuum accumulator comprises an accumulator housing defining a fluid-tight vacuum chamber with a fluid port and a pressure regulation port, said fluid port being in fluid communication with said first port of said chamber through said fluid conduit forming a fluid-tight connection with said first port and with said fluid port, the pressure regulation port of said vacuum accumulator being adapted to be in fluid communication with means for regulating pressure within said vacuum chamber.

4,784,379

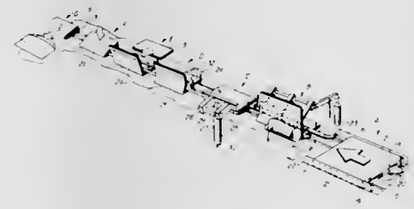
APPARATUS AND METHOD FOR AUTOMATED MAIL

Gary L. Vander Syde, Naperville; Paul Beatty, Chicago; Myron A. Bowles, Waukegan; Kenneth L. Guenther, Park Ridge; K. George Rabindran, Morton Grove, all of Ill.; Gerald D. Warden, Easton, Pa.; Michael A. Wisniewsi, Bolingbrook, and Kenneth Viani, Morton Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 24, 1987, Ser. No. 30,044

Int. Cl.⁴ B65H *39/02*

U.S. Cl. 270—55 **57 Claims**



1. Document handling apparatus comprising:

(a) transport means for conveying at least one letter sheet with information indicia thereon along a transport path adjacent document handling means,

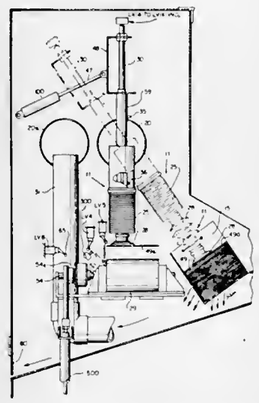
(b) means for depositing at least one unfolded letter sheet with information indicia thereon onto said transport path,

(c) an envelope stuffing station downstream of the said letter depositing means, and

(d) folding means upstream of said envelope stuffing station for folding said letter sheet comprising a clamp assembly and a roller folding assembly movable into engagement with said clamp assembly to fold said letter sheet.

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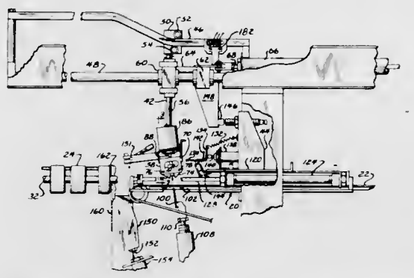
4,784,380
AUTOMATIC BATTERY STACKER
William J. Eberle, Irving, Tex., assignor to General Battery Corporation, Reading, Pa.
Division of Ser. No. 680,782, Dec. 12, 1984, Pat. No. 4,728,093, which is a division of Ser. No. 390,806, Jun. 22, 1982, Pat. No. 4,534,549. This application Feb. 18, 1987, Ser. No. 16,199
Int. Cl.[4] B65H 3/08
U.S. Cl. 271—103 3 Claims



1. An apparatus for removing a member from a plurality of members comprising:
(a) first and second manifold means,
(b) first and second pickup means wherein said first pickup means is coupled to said first manifold means, and said second pickup means is coupled to said second manifold means,
(c) said first pickup means adapted to capture said member from said plurality of members, and said second pickup means adapted to absorb dust in an environment surrounding said apparatus, and
(d) means for applying a negative pressure source alternately to said first and second manifold means, whereby said apparatus is operative in either an environmental or a pickup mode.

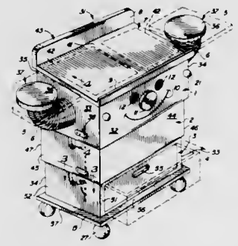
4,784,381
CLOTH PICKUP DEVICE
Richard Prochut, Streamwood, and Steve Ruderman, Oak Park, both of Ill., assignors to Union Special Corporation, Chicago, Ill.
Filed May 18, 1987, Ser. No. 50,990
Int. Cl.[4] B65H 5/12
U.S. Cl. 271—268 10 Claims

1. A cloth pickup device, comprising:
conveyor means for passing a cloth and having opening means;
first and second elongated jaws;
means for pivotally mounting said jaws about first and second axes substantially parallel to each about and spaced so that said jaws are pivotable from a first position wherein they are in operative clamping position with respect to each other to clamp a piece of cloth therebetween, to a second position wherein they are in an unobstructed open position to allow a piece of cloth to freely pass into a position between the jaws;
means for moving said jaws from said first position to said second position; and
means for actuating said jaws and moving them from said second position to said first position comprising an actuating member, and means for moving the actuating member between a first position on the other side of the conveyor



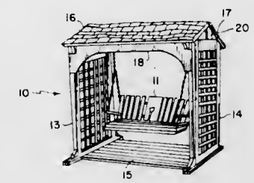
and a second position through the opening means toward the jaws.

4,784,382
CHILDREN'S USER-FRIENDLY PODIUM
Elizabeth A. Myers, 502 W. Royal Palm Rd., Phoenix, Ariz. 85021
Filed Jul. 18, 1986, Ser. No. 886,896
Int. Cl.[4] A63J 5/00
U.S. Cl. 272—25 30 Claims



1. A child's podium for teaching pre-school and elementary school age children to speak in front of a group by substantially eliminating the fear, apprehension, tension, and anxiety normally associated with standing and speaking in front of a group, said child's podium comprising:
a podium having a bottom portion, a front, a rear, a pair of sides, and a top surface means for holding a speaker's notes;
manually-selectable height-adjustment means for manually adjusting the height of the podium for a given individual's height;
facial feature means operatively disposed on at least one of the front and rear surfaces of the podium for providing a relaxed atmosphere for at least one of the speaker and the group to whom said speaker is speaking;
arm means operably disposed on the opposite pair of sides of said podium, said arm means being selectively positionable to a first retracted position substantially within the podium and to a fully extended position out of the sides of the podium;
hand means operatively disposed on the distal ends of said arm means, said hand means including a relatively flat surface which is disposed substantially horizontal when said arm means are manually positioned in said extended position, said flat surface of said hand means being adapted for holding objects and simultaneously providing said podium with the appearance of a robot-like being.

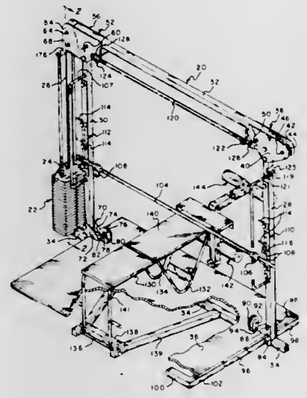
4,784,383
PORTABLE SWING ASSEMBLY
Heywood H. Roberts, 113 Roberta Dr., Hampton, Va. 23666
Filed Dec. 9, 1987, Ser. No. 130,437
Int. Cl.[4] A63G 9/16
U.S. Cl. 272—85 18 Claims



1. A portable swing assembly comprising:
a cross-bar for supporting a porch-type swing or the like;
a pair of vertically disposed substantially rectangular supports having a top and a bottom end and supporting said cross-bar substantially intermediate the top ends thereof;
a horizontal base or deck releasably connected to and adjacent the bottom end of said pair of rectangular supports;
a first arch support spanning and secured to one side of said rectangular supports adjacent the top ends thereof;
a second arch support spanning and secured to the other side of said rectangular supports adjacent the top ends thereof;
a pair of roof supports secured to and vertically extending upward, one each from one of said rectangular supports and adjacent the area thereof supporting said cross-bar;
bracket means attached to each said roof support;
a pair of roof panels adapted to engage each other and span said rectangular supports;
said pair of roof panels engaging said roof supports and said bracket means;
means for releasably securing said roof panels in engagement with said roof supports;
said roof panels being formed of a frame portion and a plurality of wood shingles attached to and covering one surface of said frame; and,
wherein the frame portions of said roof panels have sides adapted to engage each other when said roof panels are positioned on said rectangular supports.

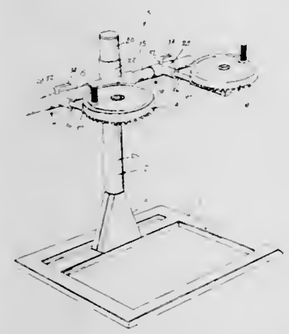
4,784,384
WEIGHTLIFTING EXERCISE DEVICE
James A. Deola, 5116 E. Chestnut Ave., Vineland, N.J. 08360
Continuation-in-part of Ser. No. 816,744, Jan. 6, 1986, abandoned. This application May 22, 1987, Ser. No. 53,392
Int. Cl.[4] A63B 21/06
U.S. Cl. 272—118 36 Claims

1. A device to allow a person to exercise comprising:
(a) a single resisting force means to provide an adjustable amount of continuous force resistance to be lifted from a single point attachment, the force being present during lift and during return,
(b) exercise grasping means comprising a horizontal bar to allow the person to grasp the bar and move the bar against the force,
(c) cable means comprising two separate cables connecting two separate connection points on the grasping means to the single resisting force means wherein the movement of either connection point lifts against the single resisting force means,
(d) a cable directioning means to train the cable means to training point locations positioned in a single plane on both sides of the person enabling the person to move the attachment points on the bar simultaneously against the resisting force means,
(e) frame means comprising two vertical frame members the frame members being to support the cable directioning means and the cable means and to resist without distortion the applied forces from the person moving the bar against the single resisting force means,
(f) two carriage means, one each freely riding up and down on opposite vertical frame members, and



(g) releasable locking means to detachably attach ends of the bar to the two carriage means,
wherein the carriage means are isolated from any forces from the single resisting force and any vertical force.

4,784,385
AQUATIC EXERCISING DEVICE
Joseph M. D'Angelo, 2835 Bottlebrush Dr., Los Angeles, Calif. 90077
Filed Feb. 20, 1987, Ser. No. 17,212
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—130 11 Claims

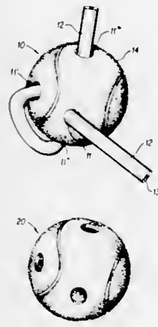


1. A variable resistance underwater exercising device comprising a support structure, a pair of support arms carried by said support structure, a pair of blade assemblies carried by said support arms and means for adjusting the orientation of said blade assemblies with respect to said support structure, each of said blade assemblies including a rotatably mounted support element, a handle member secured to said support element for manual rotation thereof, a plurality of blades carried by said support element for rotation therewith, a shroud disposed about at least a portion of said blades, means for allowing fluid flow through said shroud, and means for collectively varying

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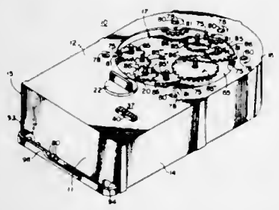
the angular orientation of said blades with respect to said support element to vary the resistance of the water on the blades upon the blades being rotated underwater by said handle member.

4,784,386
SAFETY GRIPS FOR EXERCISE APPARATUS AND METHOD FOR ATTACHING
William H. Muehl, Madison, Wis., assignor to National Institute of Biogerontology, Madison, Wis.
Filed Feb. 27, 1987, Ser. No. 19,745
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—137 **2 Claims**



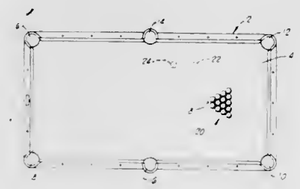
1. An elastic cable exercise device comprising
(a) elastic cable,
(b) elastomeric grip member for being manually grasped wherein each said grip member is configured as a resilient, hollow, closed surface, substantially spheroidal elastomeric body perforated with four perforations along three substantially mutually perpendicular axes through which said cable is laced to provide when said cable is stretched non-slip binding fastening said cable to said grip member.

4,784,387
GAME
Thomas K. Liversidge, Crescent Surf, Kennebunk, Me. 04043
Filed Feb. 1, 1988, Ser. No. 150,986
Int. Cl.[4] A63F *3/00, 9/00*
U.S. Cl. 273—1 GD **6 Claims**



1. An educational and recreational game comprising
a housing having a front wall, a rear wall, side wall and a top wall with a cut out opening,
drive gear means mounted to said top an having a drive gear which projects into said cut-out opening,
at least one ball control gear means around said cut out opening mounted to said top plate and having a gear which projects into said opening,
a pop up plate in said cut out opening,
said pop up plate having cut-outs spaced to accomodate said gears from said drive gear means and said ball control means,
said top plate having openings for insertion of balls,
said ball control gears having openings for positioning below said top plate openings to selectively permit said balls to pass therethrough,
ramp means below said top plate openings to receive said balls,
latch means for engagement with said pop up plate,
timer means to release to said latch means and cause said pop-up plate to move upwardly,
a plurality of gear devices for engagement with said drive gear and said ball control gear to form at least one gear train for rotation of said ball control gears,
magnetic means to releasably restrain said gear means on said top plate, and
ball means for use with said game.

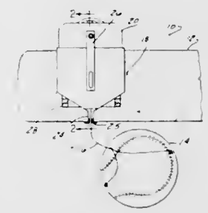
4,784,388
POCKET BILLIARDS GAME
Donald W. Owen, 803A Cardinal Creek Blvd., Norman, Okla. 73072
Filed Sep. 22, 1986, Ser. No. 910,208
Int. Cl.[4] A63G *31/00*
U.S. Cl. 273—2 **4 Claims**



1. A method of playing a method of playing a game on a pocket billiards table with fifteen object balls and a cue ball, which table has a foot spot, said method comprising the steps of:
(a) aligning fourteen of the object balls into the shape of a truncated triangle having the missing apex of the truncated triangle substantially centered on the foot spot;
(b) placing the remaining object ball anywhere on the table;
(c) placing the cue ball anywhere on the table;
(d) moving the cue ball for the purpose of striking any of the object balls;
(e) repeating said step (d) so long as both the immediately preceding movement of the cue ball caused at least one of the object balls to enter any of the pockets of the table and there is at least one object ball remaining on the table; and
(f) repeating steps (a) through (e) a predetermined number of times.

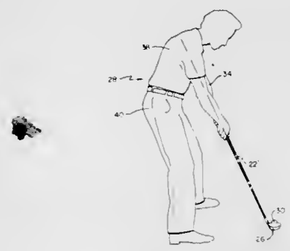
4,784,389
BASEBALL BATTING PRACTICE DEVICE
Roger Taylor, St. Clair Shores, Mich., assignor to Anthony C. Capolingua, Troy, Mich., a part interest
Filed Nov. 20, 1986, Ser. No. 932,577
Int. Cl.[4] A63B *69/40*
U.S. Cl. 273—26 E **1 Claim**

1. A baseball batting practice apparatus, comprising:
a solid regulation baseball bat having a striking end portion;
a ball;
a spinning reel, having a tether retrieving spool, nestingly mounted in a receiving aperture in said striking end portion;
a tether having one of its ends attached to said ball and its other end attached to said retrieving spool and extending directly therefrom, through a payout bore in said striking end portion of said bat, in a direction perpendicular to the longitudinal axis of said bat and in the direction of ball flight, said spinning reel having adjustable resistance to maximize the distance of ball travel;
a plurality of weights, selectively added to the striking end



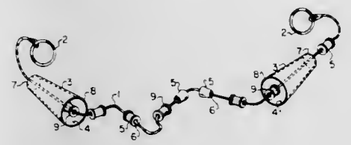
portion of said bat, to compensate for weight lost from said receiving aperture, to make the swing weight the same as that of the original bat;
a counter geared to said retrieving spool for measuring the distance of ball travel.

4,784,390
METHOD OF PLAYING A MATCHED SET OF GOLD CLUBS
Floyd D. Horgen, Rockledge, Fla., assignor to James Schacht, Clarksville, Tenn., a part interest
Filed Apr. 15, 1987, Ser. No. 38,774
Int. Cl.[4] A63B *53/00*
U.S. Cl. 273—77 A **2 Claims**



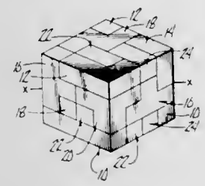
1. A method for conditioning a golf player to focus his attention on the position of his hands and arms relative to a golf ball while swinging a golf club at that ball rather than focusing his attention on the position of the golf club head relative to the ball and to thereby use substantially the same swing for striking the golf ball with every golf club in a set of plurality of matched golf clubs wherein each club of the set has essentially the same length, essentially the same weight, essentially the same swing weight and essentially the same lie but the golf clubs differ from one another in loft, the method comprising the step of:
a. the player assuming substantially the same stance in posture and distance relative to the golf ball for use of each golf club in the set;
b. the player pointing his arms directly at the ball at the time of address for use of each golf club in the set; and
c. the player swinging the golf club to strike the golf ball so that the player's arms are again pointing directly at the ball at the point of impact for each golf club in the set, with the angle defined between the player's arms and the golf club shaft being substantially the same at address and impact, thereby imparting to the golfer the same feel for swinging each of the golf clubs in the set but imparting a different trajectory to the golf balls struck thereby because of the difference in loft from one golf club in the set to another.

4,784,391
ROPE GAME DEVICE
Sylvia T. Herron, 6221 S. Cottage Grove, Chicago, Ill. 60637
Filed Nov. 6, 1986, Ser. No. 927,819
Int. Cl.[4] A63B *67/10, 63/00, 67/00*
U.S. Cl. 273—109 **6 Claims**



1. A game device comprising:
a. a single cord of rope with two ends, with;
b. two handles, one on each end of the rope;
c. two larger, substantially hollow truncated cones threaded on said rope disposed in opposite direction between said handles, each cone with its smaller end disposed toward the corresponding handle and its larger end disposed toward the middle of the rope, and
d. a plurality of smaller cylinders with a central passageway along their longitudinal axis, also threaded on said rope and disposed between said handles;
wherein the smaller cylinders are able to pass through the interior of the larger cylinders.

4,784,392
BLOCK PUZZLE
Clarence Johnson, and Irene Johnson, both of 106 Meadow View Dr., R.R. 2, Box 49, Decorah, Iowa 52101
Filed Sep. 8, 1987, Ser. No. 95,097
Int. Cl.[4] A63F *9/12*
U.S. Cl. 273—160 **2 Claims**



1. A block puzzle comprising:
a first set of eight pieces, including a straight piece, an L-shaped piece, a square piece, a T-shaped piece, a Z-shaped piece, a center piece, a left-hand piece, and a right-hand piece;
said straight piece comprising four straight-piece cubic units connected together in a straight line;
said L-shaped piece comprising a combination of three L-piece cubic units in a straight line and one L-piece cubic unit extending perpendicularly from one end of said straight line;
said square piece comprising four square-piece cubic units arranged in a square;
said T-shaped piece comprising three T-piece cubic units arranged in a straight line and one T-piece cubic unit extending perpendicularly from the center of said straight line;
said Z-shaped piece comprising first and second Z-piece cubic units arranged in a straight line, a third Z-piece

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cubic unit extending from said first Z-piece cubic unit in a first direction perpendicular to said line formed by said first and second Z-piece cubic units, and a fourth Z-piece cubic unit extending from said second cubic unit in a direction opposite to said first direction;

said left-hand piece comprising first, second, and third left-hand-piece cubic units defining a plane and being arranged with said first and third cubic units extending from said second left-hand-piece cubic unit and being perpendicular to one another, a fourth left-hand-piece cubic unit connected to said first left-hand-piece cubic unit and extending perpendicularly upward from said plane;

said center piece comprising first, second, and third center-piece cubic units defining a plane arranged with said first and third center piece cubic-piece cubic units extending from said second center-piece cubic units and being perpendicular to one another, a fourth center-piece cubic unit connected to said second center-piece cubic unit and extending perpendicularly upward from said plane;

said right-hand piece comprising first, second, and third right-hand-piece cubic units defining a plane and being arranged with said first and third right-hand-piece cubic units extending from said second right-hand-piece cubic unit and extending perpendicularly upward from said plane;

all of said straight-piece cubic units, said L-piece cubic units, said square-piece cubic units, said T-piece cubic units, said Z-piece cubic units, said left-hand-piece cubic units, said center-piece cubic units, and said right-hand-piece cubic units being of the same size and shape;

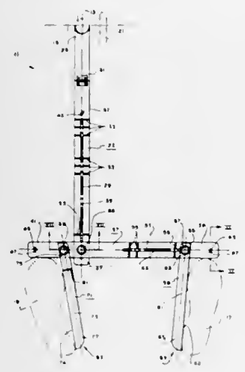
a second set of eight pieces identical to said first set; said first and second sets of said eight pieces being assembled into an overall cube having 64 of said cube units therein and having a length, width and height equal to four of said cube units.

4,784,393

GOLF SWING TRAINING DEVICE

Robert E. Williams, 619 Anderson, Memphis, Tenn. 38104, and Silas C. Byers, 3441 Village Grove Rd. P1.W.#7, Memphis, Tenn. 38115

Filed May 26, 1987, Ser. No. 54,222
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—187 R **6 Claims**



1. A golf swing training device for use as a training aid to properly position a golfer's stance relative to a golf ball and a target line between the golf ball and a target, said device comprising:

(a) an elongated first body member having a front end for being placed in an abutting relationship with the golf ball with the longitudinal axis of said first body member perpendicular to said target line and having a rear end:

(b) an elongated second body member having a right end and a left end, said second body member being attached to said first body member with the longitudinal axis of said second body member perpendicular to the longitudinal axis of said first body member;

(c) means for extending through said right and left ends of said second body member and said rear end of said first body member and into the ground to anchor said device to the ground;

(d) hinge means for pivotally connecting said front and rear ends of said first body member to one another and for allowing said front end of said first body member to be pivoted back onto the rear end of said first body member after said device has been anchored to the ground with said front end of said first body member abutting the golf ball and for allowing the golf ball to be unhindered by said device;

(e) an elongated right foot positioning means pivotally attached adjacent said right end of said second body member with the longitudinal axis of said right foot positioning means at an angle to the longitudinal axis of said second body member for providing a guide for the proper positioning of the golfer's right foot relative to the golf ball and the target line, said right foot positioning means having a longitudinal side edge along which the golfer's right foot is positioned; and

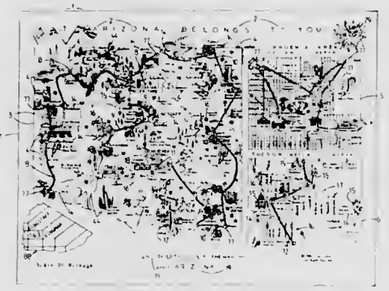
(f) an elongated left foot positioning means pivotally attached adjacent said left end of said second body member with the longitudinal axis of said left foot positioning means at an angle to the longitudinal axis of said second body member for providing a guide for the proper positioning of the golfer's left foot relative to the golf ball and the target line, said left foot positioning means having a longitudinal side edge along which the golfer's left foot is positioned, said right and left foot positioning means extending outward from said second body member on the side thereof opposite said front end of said first body member.

4,784,394

TOURIST GAME APPARATUS

Vitaly Sumin, 637, S. Hauser Blvd., #22, Los Angeles, Calif. 90036

Filed Apr. 6, 1987, Ser. No. 34,542
Int. Cl.[4] A63F *3/04*
U.S. Cl. 273—251 **10 Claims**



1. A board game apparatus designed to guide the players within an existing geographical place, said apparatus comprising:

a. a board having a playing surface including at least one outline map of said place showing the geographical features and indicia characterizing said place wherein on said map are displayed the itineraries in the form of playing paths, each said itinerary having stations located along its path at selected geographical locations representing attractions, some of said attractions being matched with at least one type of service selected from the group consisting of hotel accommodations, dining, shopping, car renting and entertainment, each said itinerary travel path having a beginning point and distinguishable color indicia associated therewith, said map having a finish point located thereon designating a common finish point for all players;

b. a plurality of playing cards designed to enrich the player's knowledge regarding said place, each said playing card corresponding to one of said stations on one of said itinerary playing paths and each of the cards having color indicia thereon that is substantially the same as the color indicia on the itinerary path that contains the space that corresponds to the card;

c. at least one winning card awarded to the winner of the game in accordance with the rules of the game;

d. at least one token means, each said token means being dedicated to a different player and being moveable for said travel, each token means having color indicia thereon that corresponds to one of the color indicia represented on the playing cards and the itinerary paths;

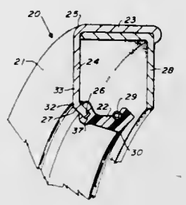
e. at least one enlarged unit of said map defined in accordance with its existing features, displayed on said board apart from said map, said unit representing an important tourist locality within said place, and comprising at least a portion of at least one of said itinerary travel paths.

4,784,395

FLUID SEAL WITH NOTCHED FLANGE AND METHOD FOR ITS MANUFACTURE

Steven L. Nickols, Frankfort, Ind., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jul. 11, 1985, Ser. No. 754,046
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—153 **7 Claims**



1. A die stamped oil seal comprising a case with a radial flange having an inner radial face and an outer radial face and having an annular bent portion bent along a bend line adjacent its free end to which an elastomer is bonded, the improvement comprising an annular notch provided in said outer radial face along said bend line for reducing distortion of said case during bending of said angular bent portion, said notch, prior to bending, having a flat surface portion extending radially from 0.005 to 0.015 inch to prevent tearing of said flange.

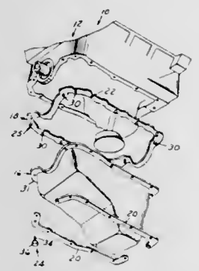
4,784,396

RETAINING CLIP AND GASKET FOR ENGINE SUBASSEMBLY

Joseph E. Scott, Milford, and Frank V. Crocco, Utica, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 1, 1987, Ser. No. 56,071
Int. Cl.[4] F16J *15/12;* **F16B** *13/06*
U.S. Cl. 277—235 B **4 Claims**

1. A gasket subassembly removably securing an engine gasket part to engine fastener and other parts prior to attachment of the subassembly to a portion of the engine, comprising, a gasket part overlying and contiguous to one side of an engine part to be attached to the engine, and a fastener screw or bolt part for attachment of the subassembly to the engine, the gasket and engine part having a screw or bolt hole thereon, the gasket having integrally formed in the hole a retaining clip having a washer-like base fixedly mounted to the gasket in the hole and a pliable tubular portion projecting therefrom through the engine part hole, and the fastening screw or bolt



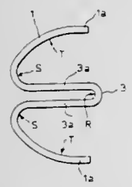
part having a shaft insertable through the tubular portion and base for attachment to the engine and a head part engageable with the opposite side of the engine part for resiliently securing the subassembly together, the clip having formed internally thereof a plurality of axially spaced teeth of an internal diameter less than the outside diameter of the shaft for releasably gripping the shaft with an interference fit upon insertion of the shaft through the clip to resiliently lock the parts together as a subassembly.

4,784,397

HOLLOW METALLIC SEALING RING

Michael J. C. Tozer, Craigmillar, Stocksfield, Northumberland, England, assignor to Michael J. C. Tozer, Northumberland, England and Specialist Sealing Limited, Channel Islands, Channel Islands

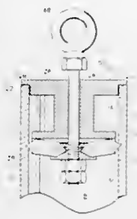
Continuation-in-part of Ser. No. 45,435, May 4, 1987, abandoned. This application Nov. 16, 1987, Ser. No. 121,196
Claims priority, application United Kingdom, May 2, 1986, 8610771
Int. Cl.[4] F16J *15/08, 15/28*
U.S. Cl. 277—236 **8 Claims**



1. A hollow metallic sealing ring comprised in radial cross-section of a pair of outwardly convex limbs which are contiguous with a loop formation having at least one straight sided loop, the limbs, from their junctions with the ends of the loop formation, being of increasing radius towards their free ends which are straight and substantially parallel.

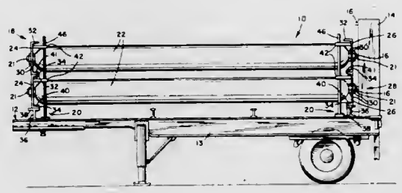
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4,784,398
CORE LIFTING CHUCK
Arnold M. Lund, 1210 Avocado Ave., Escondido, Calif. 92026
Filed May 18, 1987, Ser. No. 50,336
Int. Cl.[4] B66C *1/54*
U.S. Cl. 279—2 R **8 Claims**



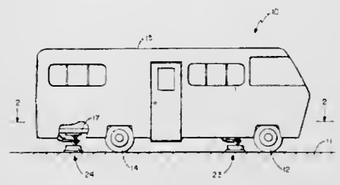
1. An expandable chuck for insertion into a vertically oriented, longitudinally extending, cylindrical hollow core about which a web of paper or other material is wound to form a roll, comprising:
an elongate body dimensioned for insertion into the core;
means connected to an upper portion of the body for engaging an upper end of the core to prevent the body from falling down through the core;
a central lifting post;
means for mounting the post to the body for vertical reciprocation relative thereto between a lowered position and a raised position;
a plurality of jaws;
linkage means for connecting the jaws between the central lifting post and a lower portion of the body for movement from retracted positions in which they are disengaged from an inner surface of the core to extended positions in which they are grippingly engaged with the inner surface of the core, the jaws moving from their retracted positions to their extended positions upon movement of the central lifting post from its lowered position to its raised position, and the jaws extending radially from the body at equally circumferentially spaced locations;
means connected to an upper end of the central lifting post for receiving a hook or other connecting mechanism of an overhead crane;
the lower portion of the body including a plurality of radially extending arms corresponding in number to the number of jaws;
the linkage means including a yoke connected to a lower end of the central lifting post;
means for pivotally connecting an inner end of each of the jaws to the yoke;
means for pivotally connecting an outer end of each of the jaws to an outer end of a corresponding one of the arms;
each arm including a downwardly extending trunion; and
the means for connecting the outer ends of each of the jaws including a pivot pin that extends through the outer end of each jaw and is journaled to a corresponding one of the trunions with the jaw pivotable between a pair of segments of the trunion;
whereby hoisting of the hook or other connecting mechanism with the crane will move the central lifting post to its raised position thereby grippingly engaging the jaws with the inner surface of the core and the roll will be lifted with the chuck, and the chuck can thereafter be readily removed from the core by manually lifting the upper end engagement means to allow the central lifting post to move to its lowered position under the force of gravity, thereby disengaging the jaws from the inner surface of the core.

4,784,399
MODULAR TUBE TRAILER
John F. Finn, 147 Beach Hill Rd., Berlin, Mass. 01503
Filed Mar. 23, 1987, Ser. No. 29,449
Int. Cl.[4] B60P *3/22;* **B61D** *5/02*
U.S. Cl. 280—5 C **9 Claims**



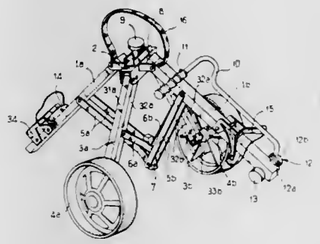
1. A tube trailer comprising:
(a) a horizontal supporting bed,
(b) a manifold housing which extends upwardly at one end of said bed, said housing having a plurality of valve fixtures,
(c) a rigid modular tube package comprising:
(1) a plurality of cylindrical compressed gas tubes, each end of each of said tubes having a cylindrical projection, at least one projection of each tube having external threads and constituting a fixture which is complimentary to said valve fixtures for being operatively connected to one of said valve fixtures,
(2) a first bracket,
(3) a second bracket, and
(4) connecting means for fixing said first bracket to one end of each of said tubes and said second bracket to the opposite ends of said tubes so that said tubes are parallel and spaced within a single plane, said connecting means comprising a plurality of spaced circular openings which extend in a single line in each of said first and second brackets, each of said opening having a diameter which is greater than the diameter of each of said projections so that said projections extend freely through said openings, the center of each of said openings being spaced from the centers of adjacent openings a distance which is greater than the diameter of each of said cylindrical tubes, and a nut for each projection which is threaded onto the projection for clamping the projections to said first and second brackets and thereby fixing said tubes to said first and second brackets,
(d) mounting means for fixing said modular tube package to said bed so that one end of each tube is adjacent said manifold housing to enable the projection of each of said tubes which is complimentary to said valve fixtures to be operatively connected to one of said valve fixtures, and
(e) coupling means for fixing a second tube package on top of said first tube package for vertical stacking of a plurality of said tube packages, said coupling means comprising:
(1) a lower horizontal flange at the bottom of each of said first and second brackets,
(2) an upper horizontal flange at the top of each of said first and second brackets which is vertically aligned with said lower flanges so that when a second tube package is placed on a first tube package the lower flanges of the second tube package rest on the upper flanges of the first tube package, and
(3) fastening means for clamping said second tube package to said first tube package.

4,784,400
VEHICLE LEVELING AND STABILIZING APPARATUS
Walter E. Hofius, 4030 W. 118th St., Bloomington, Minn. 53437
Filed Feb. 9, 1987, Ser. No. 12,327
Int. Cl.[4] B60S *9/00*
U.S. Cl. 280—6.1 **21 Claims**



1. A vehicle leveling apparatus to stabilize a vehicle of the type having a four corner chassis frame with a pair of side longitudinal frame members and level the vehicle from front to rear and from side to side with respect to a ground surface, comprising:
first, second, third and fourth jack stand assemblies for assembly to the longitudinal frame members of the vehicle maximate the first, second, third and fourth corners thereof;
each jack stand assembly including a jack having a base plate secured to the vehicle, a support plate downwardly extendible for ground engagement and upwardly retractable for storage with respect to the base plate, first and second articulated leg assemblies connecting the base plate and support plate, said leg assemblies assembled to be moveable between a first retraced configuraton with the support plate in a first position retracted relative to the base plate, and a second variably extended configuration with the support plate extended relative to the base plate to engage the ground surface;
first, second, third and fourth double-acing hydraulic power units of the cylinder-rod variety connected between the first and second leg assemblies of the first through fourth jack stand assemblies respectively for extension and retraction of the leg assemblies upon retraction and extension of the rod with respect to the cylinder;
each hydraulic power unit having the cylinder connected to one leg assembly of the respective jack stand assembly and the rod connected to the other leg assembly such that extension of the rod with respect to the cylinder is effective to move the leg assembly toward the first retracted configuration, and retraction of the rod with respect to the cylinder is effective to move the leg assembly toward the second varibly extended configuration;
each said cylinder having first and second hydraulic ports connected to first and second ends of the cylinder, a solenoid switch assembly connected to the cylinder having a first solenoid operated valve means connected to the first hydraulic port operable to let hydraulic fluid under pressure pass into the first end of the cylinder when the valve means is closed and permit hydraulic fluid flow from the first end of the cylinder when the valve means is open;
a second solenoid operated valve means connected to the second hydraulic port operable to let hydraulic fluid under pressure pass into the second end of the cylinder when the valve means is closed and permit hydraulic fluid flow from the second end of the cylinder when the valve means is opened;
hydraulic fluid supply means connected to the vehicle to supply hydraulic fluid under pressure to the hydraulic power units of the jack stand assemblies;
first, second, third and fourth control switches in the vehicle, each switch corresponding to a respective hydraulic power unit and connected to the first and second solenoid operated valve means of the solenoid switch assembly of the power unit, operative to selectively actuate one of the first and second solenoid valve means to effect extension and retraction of the jack stand assembly, each switch being moveable between a first position to open the first solenoid operated valve means and a second position to open the second solenoid operated valve means and a closed intermediate position;
said hydraulic fluid supply means including a hydraulic fluid reservoir, a hydraulic pump and a motor to drive the pump;
a first supply line means extending from the pump to the first hydraulic ports of the hydraulic power units;
a second supply line means extending from the pump to the second hydraulic ports of the hydraulic power units;
and supply line valve means operable in connection with the pluarality of switches to selectively permit hydraulic fluid flow under pressure through one of the first and second supply lines,
said hydraulic pump motor being connected to the control switches to be actuated by the control switches in either the first or second positon, and supply line valve means moveable to position to permit hydraulic fluid to flow through the second supply line means when one of the control switchs is moved to the first position to open a first solenoid operated valve means, and to permit hydraulic fluid to flow through the first supply line means when one of the control switches is moved to the second position to open one of the second solenoid operated valve means; and
a micro switch associated with each jack stand assembly and connectable with a leg assembly of the jack stand assembly, said micro switch being held open by the leg assembly when the leg assembly is in the retracted position and closed when the leg assembly is extended and the support plate moves away from the base plate;
an extension indicator lamp connected to the micro switch, means illuminating said lamp when the micro switch is closed, each said lamp being located proximate a control switch in the vehicle corresponding to the jack stand assembly.

4,784,401
COLLAPSIBLE CADDIE CART
Francois-Xavier Raguet, Hautes-Rivières, 08800 Montherme, France
Filed Jul. 2, 1987, Ser. No. 69,299
Claims priority, application France, Jul. 11, 1986, 86 10169
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—40 **13 Claims**

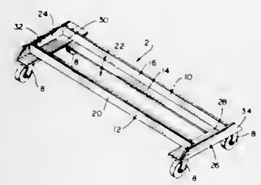


1. A collapsible cart intended in particular for carrying a load such as a golf bag and clubs, the cart being capable of taking up a first, collapsed position in which it is compact, and a second, deployed position, the cart comprising:
a plurality of half-risers hinged together at adjacent ends to a common hinge piece such that in the deployed position said two half-risers are substantially in alignment and constitute an elongated, upwardly sloping, central riser, each of said half-risers including a load-fixing means for

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receiving a bag or the like extending along said deployed central riser, a lower one of said half-risers forming a strut having a lower free end adapted to stand on the ground;
a plurality of side legs each hinged at one end to said hinge piece and each having its other, free end provided with wheel means such that in the deployed position said side legs slope obliquely as does said central riser, with said lower free end of said strut and said wheels on said side legs forming a triangle on the ground;
a set of links connecting each half-riser and each side leg to a central interconnecting post such that in said collapsed position said side legs and said half-risers are substantially parallel to one another and all of them are situated on the same side of said hinge piece.

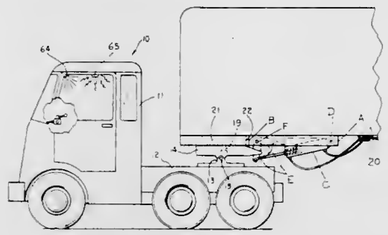
4,784,402
AUTOMOBILE DOLLY SYSTEM
Andrew B. Roman, P.O. Box 475, Story, Wyo. 82842
Filed May 23, 1986, Ser. No. 866,026
Int. Cl.[4] B60P *3/40*
U.S. Cl. 280—79.1 A **8 Claims**



1. Apparatus for transporting an automobile undergoing repairs comprising frame means having a length less than or approximately equal to the width of said automobile for receiving a base of a jackstand, said jackstand has a base means for engaging and being supported by a generally planar surface and is separate from said frame means, and wherein said frame means is at least of a strength adequate to support said jackstand and the force on the suspension system of said automobile created by the weight of said automobile, said frame means comprising means for supporting said jackstand comprising a pair of parallel substantially flat surfaces with a width approximately equal to the width of said base means for receiving said base means and two upstanding edges extending in substantially parallel directions and extending upwardly from said pair of parallel substantially flat surfaces for securely receiving a tire of said automobile and for providing an abutment for opposite sides of said base means of said jackstand when said base means is engaged on said substantially flat portion, whereby said base means may be supported on said bottom surface between said two edges, first and second end means for connecting said pair of parallel substantially flat surfaces, caster support means extending laterally outwardly from said frame means, and castering wheel means attached to said caster support means for allowing said frame, jackstand, and automobile to be easily moved about.

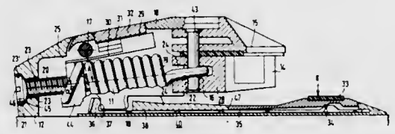
4,784,403
ANTI-JACKKNIFING APPARATUS
Wallace H. Hawkins, Greenville, and Calvin B. Gosnell, Travelers Rest, both of S.C., assignors to Red Arrow International, Inc., S.C.
Continuation of Ser. No. 758,677, Jul. 25, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 922,439
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] B62D *53/06*
U.S. Cl. 280—432 **10 Claims**

1. Anti-jackknifing apparatus for use in connection between articulated vehicles having a pulling unit and trailer wherein there is mounted on the pulling unit a plate having a v-slot and in the v-slot of the plate a coupling is made with a trailer coupling pin, wherein the apparatus comprises,
a support frame adapted to be mounted on said trailer,
an abutment member adapted to be positioned in an active engagement position between the sides of the v-slot of the pulling unit,
and drive means for said abutment member to move said abutment member into its active engagement position and retract it from said active engagement position,
said support frame including an abutment transverse support means including a mounting bar element mounted on the trailer above the v-slot of the pulling unit and behind the trailer coupling pin and positioning said abutment member which depends from the support frame in a depending



vertically aligned position from above said v-slot and into the zone between the v-slot plate mounted on the pulling unit, said transverse support means and said drive means restraining movement of the abutment such that when pivotal movement of the pulling unit and trailer moves the abutment member and v-slot plate relative to each other to cause engagement of the abutment member with the v-slot side of the v-slot plate such engagement arrests further relative swinging movement of the pulling unit and trailer,
bracing means connected to said abutment transverse support means for transferring forces applied to said abutment member by and during engagement with said v-slot plate to said mounting bar element to thereby transfer the forces from said support frame to the trailer at a point above the v-slot.

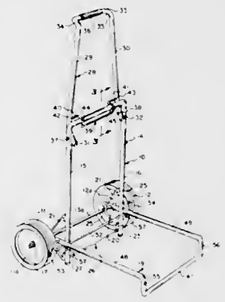
4,784,404
SAFETY SKI BINDING CAPABLE OF RELEASING SIDEWAYS
Ulrich Kowatsch, Leonberg, Fed. Rep. of Germany, assignor to Geze Sport International GmbH, Leonburg, Fed. Rep. of Germany
Filed Feb. 13, 1987, Ser. No. 14,509
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605313
Int. Cl.[4] A63C *9/085*
U.S. Cl. 280—629 **7 Claims**



1. A safety ski binding for releasably securing a ski boot having a sole to a ski having an upwardly facing surface to which the binding is mounted, the binding comprising:
a housing adapted to be mounted to the ski surface;
a carrier including a laterally releasable sole hold-down member adjacent a first end of the carrier;

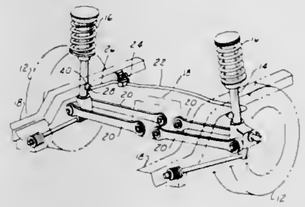
horizontal pivot means operatively coupling the carrier to the housing and permitting relative pivotal movements between the carrier and the housing about an axis generally parallel to and spaced from the ski surface;
a spring abutment piece;
a spring-to-hold-down member coupler; and
spring means comprising a coiled spring having a first operative end coupled by said spring-to-hold-down member coupler with the hold-down member, and a second operative end coupled by said spring abutment piece with the housing, so that spring means opposes the lateral release of the hold-down member by applying a corresponding spring force which acts between the hold-down member and the housing, the spring means being further arranged so that its force pivotally biases the carrier and the hold-down member about the horizontal pivot means in the direction of the ski surface, said spring-to-hold-down member coupler permitting the first end of said coiled spring to move with the carrier and the hold-down member when the carrier and the hold-down member pivot about the horizontal pivot means;
whereby the spring means biases the hold-down member in the direction of the ski surface and thereby enables it to grasp ski boot soles of varying thicknesses in addition to yieldingly opposing the lateral release of the hold-down member.

4,784,405
COLLAPSIBLE LUGGAGE CART
Edward B. Stein, Chicago, Ill., assignor to Stebco Products Corporation, Chicago, Ill.
Filed Jul. 24, 1987, Ser. No. 77,495
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—655 **25 Claims**



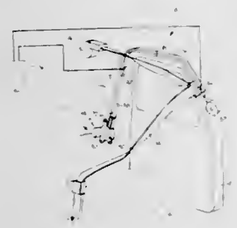
1. A collapsible luggage cart adapted to be hand carried by a user for deposit in overhead storage on an aircraft comprising an axle, a pair of wheels mounted on said axle in spaced relation, a frame structure connected to the axle, a U-shaped platform for carrying luggage mounted upon the cart and swingably movable relative to the frame from a storage position to a luggage carrying position, a handle on the frame in vertically spaced relationship to the axle, and clamp means carried by the handle and engageable with the frame for immobilizing and securing the handle in an upright extended fixed position relative to the frame when the luggage cart is to be used to carry luggage, said clamp means being retainingly engageable with said platform for immobilizing and securing said platform in its collapsed storage position when said clamp means is released from engagement with said frame.

4,784,406
FRICTION REDUCING AUTOMOTIVE SUSPENSION STABILIZER BAR
Jonathan D. Stinson, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 21, 1987, Ser. No. 110,828
Int. Cl.[4] B60G *15/00*
U.S. Cl. 280—665 **14 Claims**



1. A friction reducing suspension stabilizer bar and attachment means for a vehicle with telescoping struts, comprising:
a combination torsional and bending reaction segment running generally transversely across said vehicle and pivotally mounted to the chassis of said vehicle;
left and right crank arms, with each having a first end attached to said torsional and bending reaction segment and a second end adapted to be attached to a telescoping strut; and
bearing means for attaching each of said second ends to a telescoping strut such that said torsional and bending reaction segment will react to both torsional loading resulting from jounce and rebound movement of the suspension and to bending loads resulting from transversely directed forces imposed upon said second ends of said crank arms by said telescoping struts.

4,784,407
PASSIVE SAFETY BELT SYSTEM
Lawrence J. Verellen, Washington, and Theodore A. Baker, Almont, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed Aug. 25, 1987, Ser. No. 89,137
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—804 **18 Claims**



1. A passive safety belt system for a vehicle comprising:
a safety belt for securing an occupant in the vehicle;
a track for connection to a frame portion of the vehicle;
a carrier member connected with said safety belt and movable along said track between first and second positions for moving said safety belt between one position in which said safety belt secures the occupant in the vehicle and another position in which said safety belt does not obstruct movement of the occupant into the vehicle or from the vehicle;

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an elongated flexible drive tape connected with said carrier member for moving said carrier member between the first and second positions and having first and second end portions;

means located at one end of said track for moving said drive tape to cause movement of said carrier member to the first and second positions thereof;

said track consisting essentially of parallel first and second track sections for receiving said drive tape therein and for guiding said drive tape in parallel paths, one of said first and second tack sections overlying the other of said first and second track sections;

a pulley located at the other end of said track adjacent the ends of said first and second track sections and having a horizontal axis around which said drive tape extends to guide movement of said drive tape between said overlying first and second sections;

said moving means comprising:

a housing having a guide portion, said guide portion of said housing having first and second chambers receiving said first and second track sections, respectively,

first spool means located in said housing, connected with the first end portion of said drive tape and rotatable for winding said first end portion of said drive tape on said first spool means to guide said drive tape around said pulley from the first track section into the second track section to move said carrier member to the first position thereof,

second spool means located in said housing, connected with the second end portion of said drive tape, and rotatable for winding said second end portion of said drive tape on said second spool means to guide said drive tape around said pulley from the second track section into the first track section to move said carrier member to the second position thereof, and

drive means for driving said first and second spool means to wind said drive tape on said first spool means and to unwind said drive tape from said second spool means and for driving said first and second spool means to wind said drive tape on said second spool means and to unwind said drive tape from said first spool means.

4,784,408

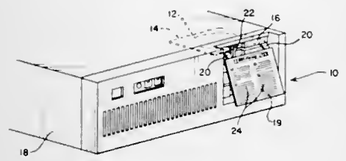
DISK LABEL

James Yasuda, 729 Matsonia Dr., Foster City, Calif. 94404

Continuation-in-part of Ser. No. 912,608, Sep. 29, 1986, abandoned. This application Jun. 10, 1987, Ser. No. 60,729

Int. Cl.[4] B42D *15/00*; **B41L** *1/20*; **G11B** *3/70*; **B31F** *5/00*

U.S. Cl. 283—81 **8 Claims**



1. In combination, a disk storage device for a data processing system, a protective carrier for said disk configured for insertion of said disk in and removal of said disk from a disk drive of the data processing system, said disk being rotatable inside said protective carrier while said protective carrier is stationary in the disk drive, a label in the form of at least one sheet bearing indicia pertinent to said disk, and at least one flexible strip fastener connected between and attaching said label to said protective carrier, said at least one flexible strip fastener having a sufficient length and being positioned with respect to said protective carrier and the label so that said label is positioned outside of the disk drive with the indicia visible to a user of said data processing system when said disk is in the disk drive, and so that said flexible strip fastener and said label are free of interference with operation of the disk drive.

4,784,409

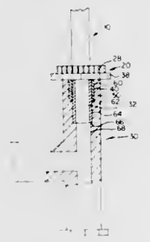
POLYBUTYLENE PLUMBING FITTINGS AND METHOD AND APPARATUS FOR ASSEMBLY THEREOF

James T. Piechowiak, 819 Oakdale Dr., Elkhart, Ind. 46517

Filed Jan. 2, 1985, Ser. No. 688,358

Int. Cl.[4] F16L *13/14*, *47/02*

U.S. Cl. 285—21 **16 Claims**



1. A tubular connection construction comprising:

a tube member,

a bushing means having inner and outer surfaces mounted about said tube member,

a connection member having an opening into which an end of said tube member and an end of said bushing means are inserted,

said bushing means including a rotatable portion extending out of said opening,

said bushing means forming separate, coaxial and substantially concentric friction welds substantially simultaneously with respect to both said connection member and said tube member when said bushing means is rotated with respect to said tube member and said connection member, each of said friction welds being formed substantially simultaneously over the length of that weld, and

said tube member, bushing means and connection member are each formed from polybutylene materials.

4,784,410

CONCENTRIC PIPING FLEX JOINT

George W. Peppel, Arlington, and Paul E. Sullivan, Bedford, both of Tex., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Jan. 30, 1987, Ser. No. 9,255

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—133.2 **3 Claims**

1. A flex joint for connecting a first pipe and a second pipe for relative pivotal motion about a pivot point and for transferring both tension and compressive forces between the first and second pipes, said flex joint comprising:

(a) a first rigid pipe connector including a first inner member and a first outer member, said first inner and outer members being concentrically located and spaced to form a first outer passage, said first inner member having a central opening to form a first inner passage, said first inner and outer passages extending through said first rigid pipe connector;

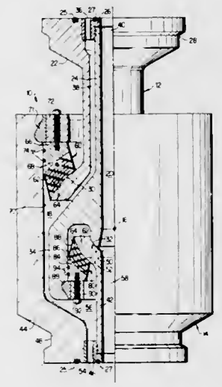
(b) a second rigid pipe connector including a second inner member and a second outer member, said second inner and outer members being concentrically located and spaced to form a second outer passage and said second inner member having a central opening to form a second inner passage, said second inner and outer passages extending through said second rigid pipe connector;

(c) said second outer member having a substantially cylindrical body with an open end and a constricted end;

(d) sections of both said first inner and outer members of said first rigid pipe connector extending within the interior of said cylindrical body of said second outer member from said open end of said cylindrical body, said second of said first inner member extending into said cylindrical body having an end with a C-shaped cross-section;

(e) a first inner spherical surface positioned near said open end of said cylindrical body of said second outer member;

(f) a first outer spherical surface positioned near that end of said first outer member extending within said cylindrical body of said second outer member of said second rigid pipe connector;



(g) a first elastomeric bearing assembly bonded between said first inner and said first outer spherical surfaces;

(h) one end of said second inner member extending into the open end of said C-shaped cross-section of said first inner member;

(j) a second outer spherical surface positioned near that end of said second inner member extending into the C-shaped cross-section of said first inner member;

(j) a second inner spherical surface position within the C-shaped cross-section of said first inner member;

(k) a second elastomeric bearing assembly bonded between said second inner and second outer spherical surfaces; and

(l) each of said spherical surfaces being centered on the pivot point of said flex joint.

4,784,411

SEAL ASSEMBLY, ESPECIALLY FOR A FLANGE SEAL

Hans-Joachim Tückmantel, Mülheim a.d. Ruhr-Heissen, Fed. Rep. of Germany, assignor to H.K.O. Handelsgesellschaft mbH, Oberhausen, Fed. Rep. of Germany

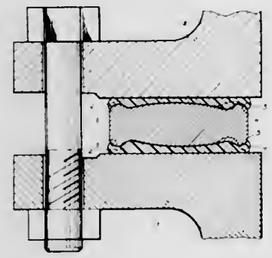
Filed Jul. 13, 1987, Ser. No. 72,448

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623310

Int. Cl.[4] F16L *17/06*

U.S. Cl. 285—363 **6 Claims**

1. A seal assembly comprising a sealing ring core in the form of a ring with an outer and an inner circumference, composed of a slightly deformable metal, and plastically deformable soft annular sealing ring core layers flanking said sealing ring core, said sealing ring core having at least one chamber-defining formation on an upper side of an edge thereof, said edge being near said outer circumference and on a lower side of said edge thereof running circumferentially, said soft sealing ring core layers being depressable by said chamber-defining formations on application against said layers of a compressing means to force together said sealing ring core and layers, the improvement wherein each of said chamber defining formations has a bulged rounded cross section and surfaces between said chamber-defining formations on said upper and lower sides of said core ring are smooth and arched.



4,784,412

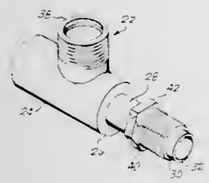
MOLDED FLUID CONDUIT FITTING WITH INTEGRAL SWIVEL NUT

John A. Van Dongen, Kent, Wash., assignor to Red Dot Corporation, Seattle, Wash.

Filed Sep. 16, 1987, Ser. No. 97,844

Int. Cl.[4] F16L *25/00*

U.S. Cl. 285—387 **12 Claims**



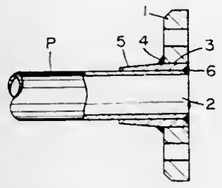
1. For use in a fluid conduit system, an improved fitting of the type having a stem, a shoulder extending radially outwardly from a first end portion of the stem, a flange extending radially outwardly from a second opposite end portion of the stem, and an externally threaded nut rotatably surrounding the stem between the shoulder and the flange, wherein the improvement comprises:

an integral molded plastic fitting body that includes the stem, the shoulder, and the flange; and

said nut comprising a major portion having a circumferential extent greater than 180° and an outer circumferential surface with coextensive external threads, a minor portion having a circumferential extent less than 180° and an outer circumferential surface with coextensive external threads, complementary mating surfaces carried by said major portion and said minor portion, and snap fit keying means carried by said mating surfaces for aligning said threads on the major portion and the minor portion when said major and minor portions are moved together and for holding said major and minor portions together in an assembled position in which said threads on said major and minor portions are aligned; said major and minor portions being made from a material that is sufficiently resilient to permit the major portion to be snapped onto the stem and the major and minor portions to be snapped together.

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4,784,413
END OF THIN-WALLED METAL TUBING OF SMALL DIAMETER COUPLED TO FLANGE
Yasuaki Hashimoto, Tagata, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Nagasawa, Japan
Filed Jan. 22, 1988, Ser. No. 147,176
Int. Cl.[4] F16L *23/00*
U.S. Cl. 285—416 **7 Claims**



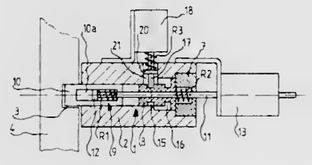
1. An assembly comprising:
an elongated thin-walled metal tubing having a small diameter and having a front longitudinal end;
a metal cylinder having opposed front and rear longitudinal ends defining a length substantially less than the length of the tubing and having a wall thickness larger than that of the tubing, the cylinder being fitted over the tubing with the respective front ends thereof being generally aligned, the cylinder and the tubing being welded together at their front ends but the rear end of the cylinder being free of welded connection to the tubing; and
a flange having a hole in which the cylinder is fitted in such a way that the rear longitudinal end of the cylinder protrudes from a surface of the flange, the outer surface of the cylinder being welded to the surface of the flange adjacent the hole therein.

4,784,414
LATCH MECHANISM
James J. Free, Elkhart, Ind., assignor to Coachmen Industries, Inc., Middlebury, Ind.
Filed Aug. 28, 1987, Ser. No. 90,596
Int. Cl.[4] E05C *9/08*
U.S. Cl. 292—52 **3 Claims**



1. In combination, a latch mechanism and a closure member, said latch mechanism including a torsion member having latching means operatively connected thereto for locking said closure member in a closed position, a handle operatively connected to said torsion member wherein pivoting movement of said handle effects corresponding rotation of said latching means into an open position, first biasing means associated with said torsion member and said handle for urging said latching means and closure member toward said closed position, said torsion member including first and second rods each having a bent end portion abutting said handle, said handle including a base plate having spaced opposed ears, each rod extending through a said handle ear, each rod further including an end portion opposite said bent end portion terminating in a hook member, said hook member constituting means for engaging a latch pin to lock said closure member in said closed position.

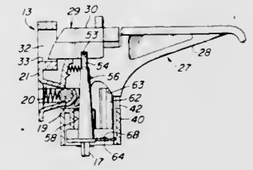
4,784,415
LOCKING AND UNLOCKING DEVICE
Jean Luc P. A. Malaval, Vigneux sur Seine, France, assignor to Fichet-Bauche, France
Filed Feb. 24, 1987, Ser. No. 17,698
Claims priority, application France, Feb. 24, 1986, 86 02517
Int. Cl.[4] E05C *17/56, 1/12*
U.S. Cl. 292—144 **4 Claims**



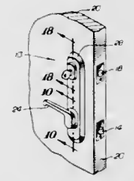
1. A device for locking or unlocking a member, comprising:
a bolt (**1**) slidably mounted within a body (**2**) and actuated by a first electromagnet (**13**) allowing said bolt to co-operate with a notch or keeper (**3**) provided within a member;
a second electromagnet (**18**) acting upon said bolt in order to block said bolt within said body when said bolt is in an inserted or non-inserted position within said keeper (**3**);
said bolt (**1**) comprising a rear part (**8**) having on its periphery two spaced annular grooves (**15, 16**) whereas said second electromagnet (**18**) includes one core (**17**) co-operating with said grooves to block said bolt in said inserted or non-inserted position, respectively;
said bolt (**1**) comprises a bored hollow forward end (**10**) adapted to co-operate with said keeper (**3**) and movably mounted within said body (**2**) with respect to said rear part (**8**) whereas said first electromagnet (**13**) includes one core or rod (**11**) secured to and extending through the rear part (**8**) of the bolt and having a free end adapted to slide within said hollow forward end (**10**); and
said free end comprises a stop member (**12**) slidably mounted in the bore (**10*a***) of said forward end (**10**), whereas a spring (R_1) is provided in said bore around said rod (**11**) between said stop member (**12**) and a rear portion (**10*b***) said forward end to constantly act upon the latter in a position bearing against said stop member;
whereby inconveniences resulting from jamming and misalignment of the bolt with respect to the member to be locked are eliminated.

4,784,416
DOOR LATCH
Marlin D. Crown, Sycamore, and James R. Johnston, Sterling, both of Ill., assignors to National Manufacturing Co., Sterling, Ill.
Filed Feb. 15, 1983, Ser. No. 466,486
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—341.15 **8 Claims**

1. A door latch mechanism adapted to be mounted to one face of a swingable door for operative latching engagement with a strike assembly mounted to the associated door jamb at a position to intercept said latch mechanism upon closing movement of the door, said strike assembly including a fixed strike surface and a laterally moveable, retractable strike, said latch mechanism comprising
a latch case having a notch adapted to receive said strike when said door is closed,
release means carried by said case for movement toward and away from said jamb when said door is closed for pushing said strike out of latching engagement with said notch,
a lock actuator mounted to said case for movement between a retracted, unlocked position out of engagement with said strike surface on said jamb and an extended, locked position wherein a portion thereof extends into operative, locking engagement with said strike surface, and
blocking means connected to said lock actuator for blocking the movement of said release means toward said jamb when said lock actuator is in said extended, locked position.

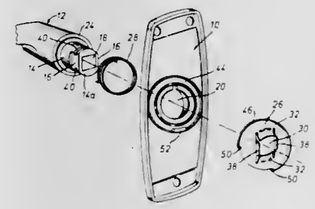


4,784,417
DOOR LATCH AND DEADBOLT ASSEMBLY
Paul D. Fleming, Glendale, and David L. O'Day, Canoga Park, both of Calif., assignors to W & F Manufacturing, Inc., Glendale, Calif.
Division of Ser. No. 825,053, Jan. 31, 1986, Pat. No. 4,671,089. This application Feb. 9, 1987, Ser. No. 12,434
Int. Cl.[4] E05B *1/00*
U.S. Cl. 292—347 **8 Claims**



1. A door handle apparatus, comprising:
an escutcheon for mounting upon a door, said escutcheon having an opening formed therein;
a socket rotatably mounted within said escutcheon opening;
a door handle secured to an outboard side of said socket for rotation therewith; and
spring means carried by said escutcheon for urging said door handle normally to a predetermined position with respect to said escutcheon;
said socket including an outboard recess of noncircular cross section and an inboard recess of noncircular cross section, said handle having a drive head for mating reception into said outboard recess, and fastener means extending from said inboard recess through said socket and further into said outboard recess for connection to said handle.

4,784,418
DOOR LATCH HANDLE FITTINGS AND RETAINERS THEREFOR
Arthur Pearson, Halesowen, and Jack Longville, West Bromwich, both of United Kingdom, assignors to George Salter & Co., Ltd., West Midlands, England
Continuation of Ser. No. 430,650, Sep. 30, 1982, abandoned. This application Aug. 7, 1985, Ser. No. 763,326
Claims priority, application United Kingdom, Oct. 1, 1981, 8129720
Int. Cl.[4] F05B *3/00*
U.S. Cl. 292—348 **25 Claims**



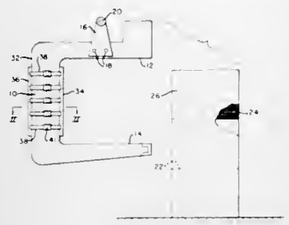
1. In a door latch lever handle fitting having a base plate and a lever handle including retaining means for rotatably securing a shank portion of the handle having a rear end to the base plate which is adapted to be secured to the face of a door, said retaining means comprising:
(a) a single, spring steel retainer member having a plate-like form including a shank portion contacting aperture periphery which fits over the shank portion of the handle,
(b) said retainer member including at least four tongues inclined rearwardly from said periphery including gripping tongues inclined inwardly from said periphery toward the central axis of said aperture,
(c) said gripping tongues being pre-bent out of the general plane of the retainer member prior to assembly of said retainer member on said shank portion to permit said retainer member to be pushed onto said rear end of the shank portion,
(d) said shank portion having a cross-sectional profile co-operable with said aperture periphery of said retainer member so that the shank portion is capable of being gripped by said tongues to restrain removal therefrom and prevent relative rotation between the shank portion and the retainer member,
(e) said retainer member including a rim portion having a bearing surface which biasingly engages the base plate with an axial thrust when said fitting is assembled with the inwardly and rearwardly inclined tongues of the retainer member gripping the shank portion of the handle to urge the shank portion toward the base plate,
(f) said fitting including abutment means and said retainer means including stop surfaces arranged to co-operate with the abutment means to locate the normal angular position of the handle and to limit the angular movement thereof with respect to the base plate.

4,784,419
COIL PROTECTOR FOR "C" HOOKS
Jorn E. Jensen, Leechburg, and Roy C. Bongartz, Indiana Township, Allegheny County, both of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.
Filed Mar. 3, 1988, Ser. No. 163,447
Int. Cl.[4] B66C *1/54*
U.S. Cl. 294—67.2 **7 Claims**

1. A pad of cushioning material adapted to be secured to an object by straps, said pad having spaced slots extending there-

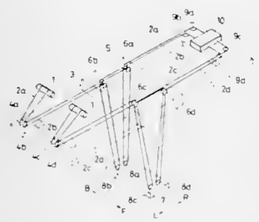
VOL 1096 ISS 3 NO 15 1988 UMI

through for receiving said straps, and reinforcing mesh material molded into the pad between the slots and the object to



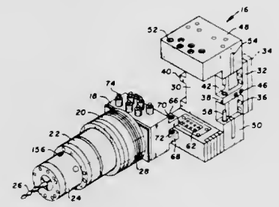
which the pad is to be secured to prevent tearing of the pad by the straps.

4,784,420
ORIENTATION CONTROL APPARATUS FOR SUSPENDER
Kazuhiro Makino, Kudamatsu, and Yasuhisa Ishii, Hikari, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 4, 1987, Ser. No. 21,641
Claims priority, application Japan, Mar. 12, 1986, 52446/86
Int. Cl.[4] B66C *13/06*
U.S. Cl. 294—81.4 **12 Claims**



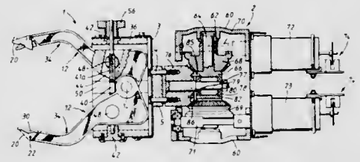
1. An orientation control apparatus for a suspender, comprising:
- a first lever which is mounted so as to rotate about its center between both its ends, and which has one end thereof connected to two ropes for hanging one end of the suspender, in a manner to substantially oppose to each other, and the other end thereof connected to two ropes for hanging the other end of the suspender, in a manner to substantially oppose to each other,
- a second lever which is mounted so as to be rotatable in a rotating direction of said first lever,
- a driver which rotates said second lever, and
- a damping device which connects at least one end of said first lever with at least one end of said second lever, and which operates in case of allowing said first lever to rotate relative to said second lever, to damp a force for rotating said first lever, and in the other case, to inhibit said first lever from rotating relative to said second lever.

4,784,421
INTERCHANGEABLE TOOL MOUNTING MECHANISM FOR ROBOTS
Joseph G. Alvite', Wyoming, Minn., assignor to Mecanotron Corporation, Minneapolis, Minn.
Filed Apr. 18, 1986, Ser. No. 853,674
Int. Cl.[4] B25J *15/04*
U.S. Cl. 294—86.4 **11 Claims**



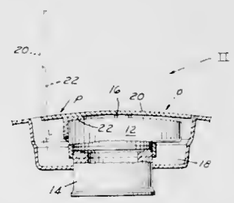
1. Apparatus for operatively and interchangeably supporting tools with respect to a robotic arm, including:
- a core, and means for mounting said core to said arm whereby the core extends outward from said arm in a longitudinal direction;
- first and second clamping members, and a mounting means for mounting said clamping members on opposite sides of said core for transverse movement between a closed position with the clamping members relatively near each other, and an open position with the clamping members relatively remote from each other;
- a first guide pin mounted to said first clamping member and extending in the transverse direction towards the second clamping member;
- a second guide pin axially aligned with said first guide pin, substantially equal in diameter to said first pin, mounted to said second clamping member and extending in said transverse direction toward the first clamping member;
- a tool support member including means forming a first opening in said tool support member slightly larger in diameter than said first pin and positionable in alignment with said first pin, and a second opening in said support member slightly larger in diameter than said second pin and axially aligned with said first opening, said support member selectively positionable between the first and second clamping members to substantially axially align said openings with said first and second guide pins, whereby said first and second pins lockingly engage said first and second openings, respectively, as said clamping members are moved to the closed position to integrally secure said tool support member between said clamping members; and
- means forming an aperture in said core slightly larger in diameter than said first and second pins and containing first and second free ends of said first and second guide pins, respectively, when the clamping members are in the closed position.

4,784,422
GRIPPER AND WRIST JOINT FOR A ROBOTIC ARM
Timothy J. Jones, London, and Brian R. Duke, Enfield, both of England, assignors to Universal Machine Intelligence Ltd., London, England
PCT No. PCT/GB86/00123, § 371 Date Jan. 6, 1987, § 102(e) Date Jan. 6, 1987, PCT Pub. No. WO86/05137, PCT Pub. Date Sep. 12, 1986
PCT Filed Mar. 6, 1986, Ser. No. 943,269
Claims priority, application United Kingdom, Mar. 6, 1985, 8505746
Int. Cl.[4] B66C *1/00*
U.S. Cl. 294—106 **16 Claims**



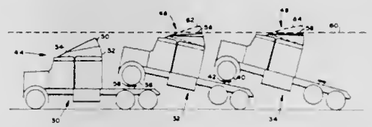
1. A gripper for a robotic arm comprising, in combination:
- a housing;
- a pair of gripper jaws;
- a pivot located in the housing and connecting the jaws for pivotal movement relative to each other about a pivot axis;
- said jaws being substantially symmetrical with respect to a predetermined plane containing the pivot axis;
- an adjusting rod journalled in the housing for rotation and coupled to each jaw for pivoting the jaws about the pivot axis to open and close the jaws in response to rotation of the rod in opposite directions; and
- guide means on the housing for guiding said pivot for rectilinear displacement during opening and closing movements of the gripper jaws thereby maintaining the jaws in symmetrical relation relative to said predetermined plane.

4,784,423
FILLER CAP
Ronald Pardy, Tiptree, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.
PCT No. PCT/GB86/00489, § 371 Date Nov. 6, 1986, § 102(e) Date Nov. 6, 1986, PCT Pub. No. WO87/01340, PCT Pub. Date Mar. 12, 1987
PCT Filed Aug. 18, 1986, Ser. No. 6,650
Claims priority, application United Kingdom, Aug. 28, 1985, 8521398
Int. Cl.[4] B65D *41/04*
U.S. Cl. 296—97.22 **2 Claims**



1. A filler cap for a fuel tank of a motor vehicle the mouth of the filler spout of which is arranged in a recess in the vehicle body, the filler cap comprising a body to fit over the mouth of the filler spout, a lock mechanism rotatable relative to the said filler cap body for locking the filler cap body to the spout, and a cover plate hinged on the filler cap body, the cover plate being pivotable between a first position in which the cover plate is flush with the vehicle body and covers the recess, and a second position in which access may be gained to the lock mechanism.

4,784,424
ROOFTOP DRAG REDUCING DEVICE FOR MULTI-TRUCK SHIPMENT WHEN MOUNTED
Nathaniel C. Wiley, Jr., Weston, Conn., assignor to Rudkin-Wiley Corporation, Bridgeport, Conn.
Filed Nov. 4, 1986, Ser. No. 926,892
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.2 **15 Claims**



1. A roof fairing for reducing drag on a vehicle, said fairing comprising:
- a bottom portion adapted to be rigidly mounted to the roof of a vehicle,
- a top portion movably mounted to said bottom portion such that said top portion is selectively receivable within said bottom portion in a folded storage position, and
- at least one of said top and bottom portions having at least a partial closure on the rear end thereof.

4,784,425
COACH SEAT LOCKING MECHANISM
Robert Bateman, Levittown, Pa., assignor to Trison Associates Incorporated, Feasterville, Pa.
Filed Jul. 16, 1987, Ser. No. 74,346
Int. Cl.[4] B60N *1/02*
U.S. Cl. 296—65.1 **19 Claims**



1. A seat locking mechanism for coach seats of the type comprising a fixed seat lower frame and a seat upper frame rotatable about the lower frame comprising
- a sturdy body secured to the seat lower frame, the body being provided with a vertical bore;
- a pedal arm pivotally secured to the body,
  - the pedal arm comprising a forwardly extending forward leg and a pedal cam, the pedal cam being moved when the forward leg is moved,
  - the pedal arm being movable between a first, upper position and a second, lower position;
- an extraction arm secured to the body and having reciprocal motion between a first, rearward postion and a second, forward position relative to the body,
  - the extraction arm comprising a cam follower portion in contact with the said pedal cam;
- a locking rod means vertically reciprocal within the said vertical bore between an upper, locked position and a lower, unlocked

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position to alternately lock and unlock the seat upper frame relative to the seat lower frame,

the locking rod means comprising a locking rod and a lever connected to and extending outwardly from the locking rod;

spring means biasing between a portion of the body and the lever to continuously bias the locking rod toward its said upper, locked position; and

operating finger means extending from the forward leg of the pedal arm to engage a portion of the locking rod means lever;

whereby the movement of the pedal arm from its first position to its second position will cause simultaneous movement of the extraction arm to its forward position and movement of the locking rod means to its lower, unlocked position.

4,784,426

INFANT PROTECTOR SHADE FOR AUTOMOBILE USE

Brenda A. Mannisto-Iches, 14177 Paddock St., Sylmar, Calif. 91342

Filed Feb. 8, 1988, Ser. No. 156,703
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—97.7 **2 Claims**



1. A device assembly comprising: a shade made of washable, light weight fabric material cut in a truncated triangular shaped configuration and having approximate dimensions of 33 in. on the front end and 19 in. on its back end, and approximately 28 to 32 in. in length; two identical drawstrings for the purpose of supporting said shade between an automobile front or back window and a seat headrest, said drawstrings being inserted in channels sewn in said shade along its longer dimension, said drawstrings being fabricated of grosgrain ribbon and not permitting said shade to unintentionally slide or slip along said drawstrings; two identical suction cups made of a rubber or plastic material and having hooks for the purpose of tying said drawstrings to them and for fastening the device to an automobile window; said shade when assembled with said drawstrings inserted in its channels and said suction cups attached, being configured for installation in an automobile so as to protect an infant from incident direct sunlight while avoiding obstruction of the driver's front and side vision.

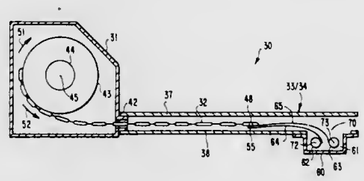
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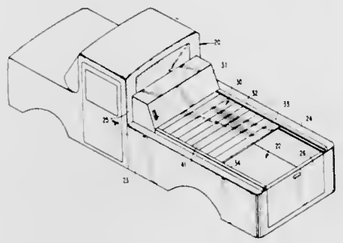
ENCLOSURE ASSEMBLY FOR OPEN BED VEHICLE

Guy A. Burgess, 501 Oak St., Melbourne Beach, Fla. 32951

Filed Feb. 26, 1987, Ser. No. 21,149
Int. Cl.[4] B60P *7/04*
U.S. Cl. 296—98 **35 Claims**

29. In a method of horizontally enclosing a structure using an enclosure assembly, said enclosure assembly including a rollable cover formed of a plurality of interconnected slat members, a rotatable stowage bar about which said cover is wound in its retracted condition and from and by which said cover is unwound to its deployed condition over said structure, and guide channels, arranged to be coupled with said structure and having an entrance for receiving said slat members from said rotatable stowage bar for guiding said slat members during travel thereof as said cover is wound or unwound by rotation of said rotatable stowage bar, the improvement comprising preventing the slats of said cover from becoming bunched together and jamming at the entrance to said guide channels as said rotatable stowage bar is rotated to unwind said cover therefrom and thereby push said slats toward said entrance of said guide channels, by coupling, to the slat members of said cover, at least one spring mechanism which applies a tensile force to the slat members of said cover in a direction away from said rotatable stowage bar toward said guide channels.



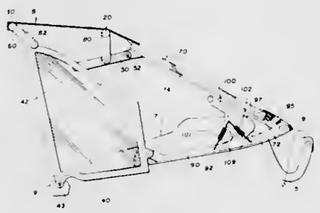


4,784,428

APPARATUS AND METHOD OF A CONVERTIBLE TOP WITH HARD GLASS WITH BOTTOM SEALING

Howard Moy, Rochester Hills, and John C. Peck, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 27, 1987, Ser. No. 78,462
Int. Cl.[4] B60J *7/12, 1/18*
U.S. Cl. 296—107 **9 Claims**



9. A method of assembling, folding, and storing a vehicle convertible top including a cover and a substantially rigid back window wherein the back window seals against a lower surface, said method in combination comprising:

pivotally connecting a first link to said vehicle generally transverse to a longitudinal dimension of said cover;

pivotally connecting to said first link a trim link extending rearwardly of said first link and trim link pivotal connection;

pivotally connecting to said first link above the pivotal connection of said first link with said trim link an upper window link;

pivotally connecting said substantially rigid back window to said upper link and to a trim link extension pivotally connected with said trim link whereby said back window is urged to mate with a lower sealing surface of said trim link;

pivoting said trim link from a first top upright position to a second intermediate top folded position whereby said back window is brought to a generally vertical position; and

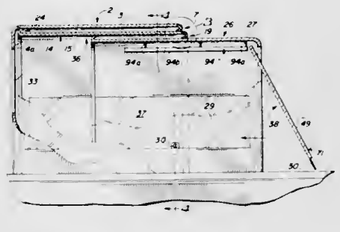
pivoting said first link with respect to said vehicle whereby said top is pivoted to a third stored position within said vehicle.

4,784,429

COLLAPSIBLE CAMPER TOP FOR PICK-UP TRUCKS

Jesse L. Hodges, P.O. Box 54, French Camp, Miss. 39745

Filed Aug. 12, 1986, Ser. No. 895,714
Int. Cl.[4] B60P *3/32, 7/02*
U.S. Cl. 296—165 **5 Claims**



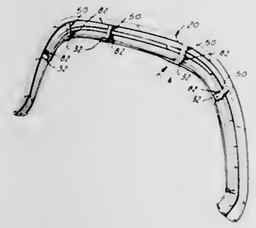
1. A collapsible camper top for a pick-up truck having a pair of side rails, comprising a front section having a front section top and front section sides downwardly extending from said front section top in spaced relationship, said front section sides each terminating in a front section foot, with each front section foot fixedly carried by the side rails of the pick-up truck, respectively; at least one middle section having a middle section top and middle section sides downwardly extending from said middle section top in spaced relationship, said middle section sides each terminating in a middle section foot, with each middle section foot slidably carried by the side rails of the pick-up truck, respectively, said middle section adapted to selectively nest and retract inside said front section in telescoping fashion and extend from said front section in operational configuration; an end section having an end section top and end section sides downwardly extending from said end section top in spaced relationship, said end section sides each terminating in an end section foot with each end section foot slidably carried by the side rails of the pick-up truck, respectively, said end section adapted to selectively nest and retract inside said middle section in telescoping fashion and extend from said middle section in operational configuration; a front section rear seal base attached to the trailing edge of said front section and a front section rear seal tip projecting from said front section rear seal base in downwardly and inwardly-curving relationship; a curved middle section front seal attached to the leading edge of said middle section and projecting from said leading edge of said middle section in upwardly and outwardly curving relationship; a middle section rear seal base attached to the trailing edge of said middle section and a middle section rear seal tip projecting from said middle section rear seal base in downwardly and inwardly-curving relationship; and an end section front seal attached to the leading edge of said end section and projecting from said leading edge of said end section in upwardly and outwardly curving relationship.

4,784,430

CLIP AND WHEEL FLAIR MOLDING ASSEMBLY

Richard F. Biermacher, W. Bloomfield, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Feb. 1, 1988, Ser. No. 151,043
Int. Cl.[4] B62D *25/00*
U.S. Cl. 296—198 **5 Claims**



1. A vehicle body structure having an outer panel located in a generally vertically oriented imaginary plane, said panel having an inwardly extending terminal flange adapted to intersect said imaginary vertical plane defining therewith a substantially ninety degree angle, a clip and molding arrangement for said body panel comprising:

a resilient plastic molding formed with a L-section including an outer leg adapted to overlie a portion of the outer surface of said body panel and an inner leg adapted to overlie said terminal flange, said outer and inner legs defining an integral juncture therebetween;

said outer leg having its interior hidden surface formed with an open channel adjacent said outer leg free end so as to face said molding juncture;

a plurality of metal spring clips having a generally L-shaped section forming a first outer arm and a second inner arm defining a predetermined acute included angle therebetween, each said clip first outer arm positioned adjacent the inner surface of said molding outer leg with the free end of said molding outer arm received within said open channel;

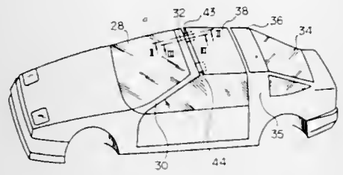
each said clip inner arm positioned adjacent the interior hidden surface of said molding inner leg and overlying said terminal flange with its free edge in fulcrumed contact therewith so as to initially define a predetermined acute angle with said terminal flange;

said molding inner leg having a plurality of through-bores spaced therealong, each said through-bore adapted for alignment with a hole in said clip inner arm;

whereby upon a threaded fastener being inserted through one of said molding inner leg through-bores and an aligned hole in said clip inner arm, said fastener threadingly engaging an aligned installation hole in said terminal flange, such that upon said fastener being threadingly tightened in said installation hole said clip inner leg being drawn into flush contact with the opposed face of said terminal flange with said clip outer arm pivoting about said clip inner arm fulcrumed free edge and in turn pulling the clip outer arm associated molding outer leg free end into tight contact with the body panel surface thereby obviating gaps therebetween.

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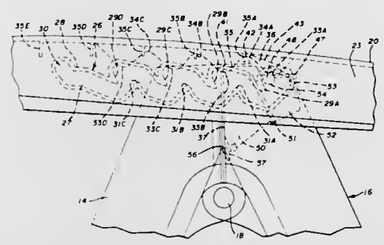
4,784,431
AUTOMOBILE ROOF STRUCTURE
Hiroshi Ohhashi, Okazaki, and Tokuichi Tatsumoto, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Mar. 13, 1987, Ser. No. 25,593
Claims priority, application Japan, Apr. 30, 1986, 61-100238
Int. Cl.[4] B60J *7/00*
U.S. Cl. 296—218 **20 Claims**



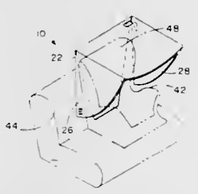
1. An automobile roof structure comprising:
a fixed roof section;
a bracket extending from said fixed roof section;
a detachable roof section selectively mounted on the bracket, said detachable roof section having an aperture;
fastening means comprising guiding means, a first engaging member and a second engaging member;
the guiding means mounted on the bracket of said fixed roof section, said guiding means having a tapered hole therewithin, the tapered hole having an upper edge having an inner diameter and a lower edge having an inner diameter, the inner diameter of the lower edge being greater than the inner diameter of the upper edge;
said first engaging member located adjacent the aperture of said detachable roof section; and
said second engaging member being selectively inserted into the tapered hole of the guide means and the aperture of the detachable roof section, the second engaging member having an engaging portion and a tapered surface, the engaging portion of the second engaging member selectively engaging with the first engaging member, the tapered surface having a first outer diameter and a second outer diameter, the first outer being less than the second outer diameter, the first outer diameter being located adjacent the engaging portion, the second outer diameter located apart from the engaging portion;
whereby when a center line of the tapered hole of the guiding means is not aligned with a center line of the aperture of the detachable roof section, the second engaging member forces the detachable roof section to move toward a proper position upon threading of the second engaging member into the first engaging member.

4,784,432
ADJUSTABLE CHAIR
Jerrold G. Brown, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 7, 1987, Ser. No. 83,699
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—28 **25 Claims**

1. In an article of furniture, a seat member, a back member pivotally attached to said seat member, leg members attached to said seat member, arm members attached to said back member, and means to position said back member at a plurality of angular positions with respect to said seat member, said means comprising a continuous loop extending longitudinally along at least one of said arm members and including an upper stop track defining a plurality of adjacent stop positions at which said seat member and said back member are at said plurality of angular positions relative to each other, said continuous loop also including a lower guide track having a plurality of upwardly extending guide peaks, each said stop position being defined by a portion of said upper track extending downwardly toward said lower guide track, the uppermost point of each said guide peak being higher than the lowermost point of each said portion of said upper track, and pin means carried by at least one of said leg members and being position within said continuous loop so as to be engageable with one of said plurality of adjacent stop positions such that upon relative movement of said continuous loop and said pin means by movement of said back member away from said seat member the next of said adjacent stop positions is engaged by said pin means, said back member and said seat member thereby being prevented from moving to other than the next adjacent relative angular position.



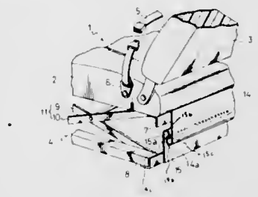
4,784,433
PORTABLE SUNSHADE FOR INFANTS IN VEHICLES
Lorraine Purnell-Ayres, Rte. 1, Box 56, Snow Hill, Md. 21863
Filed Feb. 10, 1988, Ser. No. 154,204
Int. Cl.[4] A47C *7/10*
U.S. Cl. 297—184 **6 Claims**



1. An infant sunshade for use in an automobile with a conventional infant-supporting seat such as an infant car seat having a back supported against an automobile seatback, comprising: a flat unitary member in the shape of a flat mushroom with stem and top with an overhang portion at each side, the stem proportioned for supporting the infant sunshade by insertion downwardly between the back of an infant car seat and automobile seatback, the top proportioned for folding forwardly over the car seat back to a position of support by the car seat back, the overhang portions on each side being each a flap hingeable selectively over the top or downward to shade an infant from sunlight at the sides.

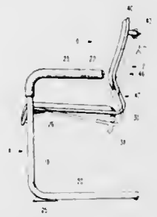
4,784,434
VEHICLE SEAT WITH SUSPENSION DEVICE
Kunihide Iwami, Akishima, Japan, assignor to Tachi-S Co., Tokyo, Japan
Filed Apr. 24, 1987, Ser. No. 42,317
Int. Cl.[4] B60R *21/00*
U.S. Cl. 297—216 **5 Claims**

1. A vehicle seat with a suspension device in which there is fixed a belt anchor to be joined with a seat and the seat is supported by the suspension device and in which the suspension devise includes an upper frame and a lower frame, characterized in that there are provided a pair of protection plates so arranged that one of them is fixed on a rearward portion of said upper frame and the other of them is fixed on a rearward portion of said lower frame in such a manner that they are disposed in a vertically mutually meeting relationship, in that each free end portion of said protection plates is formed with a curved or bent engagement terminal portion disposed between said upper and lower frames, such that both said engagement terminal portions of said protection plates are faced



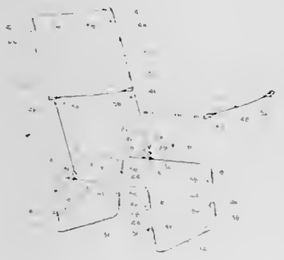
toward each other, and in that each of said engagement terminal portions comprise an innermost portion in an extremity, whereby said protection plates are in a halfway engagement with each other, in such a way that a predetermined distance exists between said respective extremities and said respective innermost curved portion, of said engagement terminal portions and wherein said plates are fixed in a position in which they extend from one side to the other side of said frames at the rear thereof, substantially covering the entire space defined at the rear of said seat between said upper and lower frames.

4,784,435
PATIENT CHAIR
Roger K. Leib, 1064 Crescent Heights, Los Angeles, Calif. 90035
Continuation of Ser. No. 833,977, Feb. 26, 1986. This application Dec. 3, 1986, Ser. No. 937,485
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—445 **36 Claims**



1. A chair comprising:
a. a rearwardly extending, substantially horizontal, downwardly deflecting seat means having a front and a rear for supporting a human body in a seated position;
b. a pair of substantially rigid, substantially vertical front legs spaced apart from each other;
c. a pair of substantially parallel, non-deflecting armrests disposed in spaced relation to one another, each armrest extending rearwardly from a respective one of the front legs; and
d. structure means for cantilevering the seat means below the armrests from the front legs at the front of the seat means so that the seat means can provide a rocking motion that increases rearwardly while the seat means is non-downwardly deflecting at its front edge;
wherein an individual seated upon the chair can support each of his arms upon one of the armrests so that an individual ingressing into and egressing from the chair can support his weight by pressing against the armrests with his hands, and
wherein the front of the seat means and the front of the armrests are in substantially the same vertical plane for ease of ingres and egress.

4,784,436
TRAVEL CHAIR
Garry Sutherland, Edmonds, Wash., assignor to Larry A. Peterson, Gig Harbor, Wash.
Filed Oct. 28, 1985, Ser. No. 791,752
Int. Cl.[4] A47C *7/00*
U.S. Cl. 297—440 **4 Claims**



1. A portable knock-down chair having a plurality of components for easy assembly and disassembly, comprising:
(a) a first longitudinal C-shaped seat support having a horizontal portion and a front and rear depending end portions;
(b) a second longitudinal C-shaped seat support having a horizontal portion and a front and rear depending end portions;
(c) a side support for each of said seat support having first and second ends, said first end including hinge means for pivotally connecting said first end to adjacent the rear end portion of one of said seat supports, and having a first position disposed generally transverse to the associated horizontal portion and a second position substantially contiguous with the associated horizontal portion of said seat support;
(d) a longitudinal C-shaped front leg support having depending end portions and adapted for removable attachment to said front depending end portions of said first and second seat supports so that said front leg support extends generally transverse to said seat supports;
(e) a longitudinal C-shaped rear leg support having depending end portions adapted for removable attachment to said rear depending end portions of said first and second seat supports so that said rear leg support extends generally transverse to said seat supports;
(f) C-shaped top support having depending end portions and adapted for removable attachment to the opposite second end of each of said side supports so that said top support extends generally transverse to said seat supports;
(g) said seat, side, leg and top supports being tubular;
(h) each of said seat and top supports having a receiving aperture proximate the end portions thereof;
(i) said depending end portions of said front and rear leg supports being sized for permitting insertion thereof into the ends of said first and second seat supports;
(j) said second ends of said side supports being sized for permitting insertion thereof into said ends of said top support;
(k) each of said ends of said front and rear leg supports and said second ends of said side supports including a spring

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loaded snap clip removably insertable through an associated receiving aperture in each of said ends of said seat and top supports for thereby locking the components together;

(l) a flexible seat panel having sleeves on two opposing sides adapted to receive the horizontal portion of said first and second seat supports; and

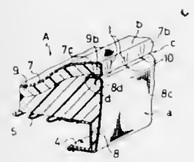
(m) a flexible back panel having sleeves on two opposing sides adapted to receive respective said side supports.

4,784,437

AUTOMOTIVE SEAT

Makoto Shimada, Akishima, Japan, assignor to Tachi-S., Ltd., Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,140
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **11 Claims**



1. An automotive seat comprising:

a main foam pad;

a sub-pad fixed on said main foam pad;

a cut-away recess at substantially U-shaped configuration formed along a boundary defined between said main foam pad and sub-pad;

a covering member which covers both of said main foam pad and sub-pad with such an arrangement that said covering member is partly inserted into said cut-away recess, thereby defining a first covering member section which covers said sub-pad and a second covering member section which covers said main foam pad, wherein, at said cut-away recess, there are defined first and second inwardly turned portions, respectively, in said first and second covering member sections, each of said first and second inwardly turned portions extending into said cut-away recess; and

said first inwardly portion being bonded by adhesive at multiple, spaced apart points to said second inwardly portion, whereby a plurality of decorative creases are created in lateral side portions of said first covering member section.

4,784,438

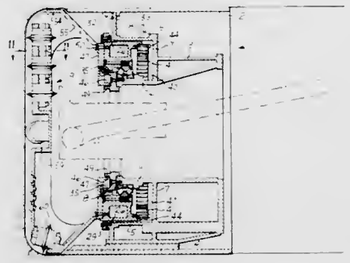
TUNNELING MACHINE ROTATABLE MEMBER

Tyman H. Fikse, 806 Shosbone Dr., La Conner, Wash. 98257

Filed Feb. 20, 1986, Ser. No. 831,757
Int. Cl.[4] E21B *10/12;* **E21C** *25/16;* **F16C** *35/07, 43/04*
U.S. Cl. 299—86 **16 Claims**

8. A tunneling machine cutter including an axle, a hub rotatively mounted on the axle and a cutting ring rim having a base mounted on the hub, the improvement comprising the hub periphery having abutment means projecting radially therefrom engageable by one side of the cutting ring rim, a circumferential external groove in the periphery of the hub spaced axially from said abutment means a distance less than the axial width of the cutting ring rim base for providing a portion of said groove underlying an edge portion of the cutting ring rim base, and a retainer ring engageable in said hub groove, abutting the ring rim and having a portion swaged into the portion of said hub groove underlying the cutting ring rim base for locking said retainer ring on the hub.

12. A method for tightening the rollers of antifriction radial-and-thrust bearings including two spaced annular rows of rollers and two axially spaced race members with a spacer ring therebetween, which comprises providing the spacer ring between the two axially spaced race members of malleable material having an annular portion more readily deformable for radial thickening and axial contraction than other annular portions of the spacer ring by approach movement of the axially spaced race members at opposite sides thereof, and



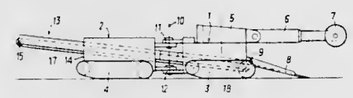
exerting sufficient axial pressure upon the axially spaced race members toward each other to effect relative approach movement thereof for contracting such more readily deformable portion of the spacer ring axially and thereby tightening and preloading the bearing rollers, and thereafter holding such axially spaced race members with the spacing ring contracted therebetween.

4,784,439

MOVABLE CUTTING MACHINE

Herwig Wrulich; Alfred Zitz, both of Zeltweg, and Erich Brandl, Knittelfeld, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Oct. 25, 1982, Ser. No. 436,438
Claims priority, application Austria, Nov. 16, 1981, 4948-81
Int. Cl.[4] E21C *33/00*
U.S. Cl. 299—57 **8 Claims**



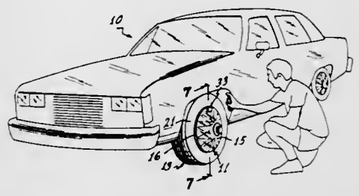
1. A movable articulated cutting machine comprising front and rear carriage assemblies pivotably connected to each other and capable of swivelling in an essentially horizontal plane about a vertical axis and being secured against relative pivotal movement in the vertical direction, drive means for swivelling the front and rear carriage assemblies about the vertical axis, each of the carriage assemblies being provided with a pair of independently operated power driven endless tract units, the front carriage portion carrying a universally swivelling cutting arm arranged on a swivelling means and carrying at least one horizontally rotating cutting head transverse to the arm and capable of cutting in the upward and downward directions thereby exerting an upward and downward force respectively on the rear carriage, the rear carriage assembly carrying auxiliary equipment, a conveyor trough having a receiving end located about the front carriage assembly and a discharge end located about the rear carriage assembly, the conveyor trough being articulated about a vertical axis located between the receiving and discharge ends whereby the rear carriage assembly and conveyor section are pivotable with respect to the front carriage assembly and conveyor section about the vertical axis, and the section of the conveyor trough carried by the front portion of the cutting machine being subdivided into two portions which are swingable one relative to the other around a horizontal axis.

4,784,440

AUTOMOBILE WHEEL SHIELD

David L. Fair, 3947 Pierce St., #665, Riverside, Calif. 92505

Filed Apr. 11, 1988, Ser. No. 179,668
Int. Cl.[4] B60B *7/00*
U.S. Cl. 301—37 R **11 Claims**



1. A shield for covering the wheel on an automobile during the process of spraying a protectant on the sidewall of the tire mounted on said wheel, said wheel having a rim portion with a flange and said tire being seated on said rim portion such that its sidewall forms a crevice therewith, said shield comprising:

a hollow body having a cylindrical rim on one end thereof for positioning over the outer flange of said wheel and a central knob on the other end thereof, said cylindrical rim having an circumferential outer edge;

an elongated retainer element on said cylindrical rim having an axially outwardly and radially inwardly directed beveled free end portion; and

a reinforcing means with a flat surface located on the hollow body generally opposite the free end portion of said retainer element;

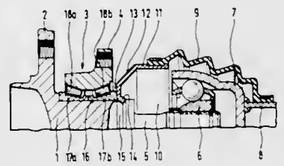
whereby said hollow body can be positioned by said knob with its cylindrical rim fitted over the flange of said wheel and by pushing on the flat surface of said reinforcing means, the free end portion of said retainer element can be wedged into the crevice formed between the sidewall of the tire and the rim portion of the wheel to thereby cause the shield to be detachably held on the wheel with the outer edge of said cylindrical rim abutting the sidewall of the tire.

4,784,441

PROTECTIVE BOOT SUPPORTING SLEEVE FOR UNIVERSAL JOINT IN WHEEL ASSEMBLY

Hans-Heinrich Welschof, Rodenbach, and Rudolf Beier, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 13, 1987, Ser. No. 2,867
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600785
Int. Cl.[4] B60B *27/02*
U.S. Cl. 301—124 R **8 Claims**



1. In a wheel bearing assembly for a vehicle wheel including a hub having an axis, a wheel carrier member encircling said hub, roller bearing means rotatably supporting said hub on said wheel carrier member, said roller bearing means including an inner bearing member axially affixed on said hub inwardly of said wheel carrier member, a universal joint for transmitting torque to said hub including an inner joint member rotatively affixed with said hub, said universal joint extending from said hub in the axial direction thereof, a protective sealing boot encircling said universal joint, said boot having a first end adjacent said hub and a second end spaced more remote from said hub and said second end secured to said universal joint, and a sleeve encircling the axis of said hub and located between said hub and said universal joint, said sleeve having a first end close to said hub and a second end more remote form said hub with said sealing boot attached thereto, the improvement comprising:

that said sleeve is a shaped metal part;

said sleeve at the first end thereof is permanently plastically deformed in press-fitted engagement with a groove formed in and encircling said hub; and

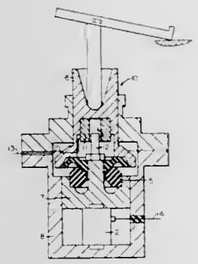
said sleeve adjacent the first end thereof has a radially extending annular region pressed in abutting engagement with said inner bearing ring.

4,784,442

BRAKE PEDAL VALVE WITH SETPOINT ADJUSTER INCLUDING DISPLACEMENT AND FORCE SENSORS FOR ELECTRICALLY CONTROLLED BRAKE SYSTEM

Erwin Petersen, Wunstorf, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 827,842, Feb. 7, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 150,104
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504096
Int. Cl.[4] B60T *13/66, 17/18;* **G05B** *9/03*
U.S. Cl. 303—15 **6 Claims**



1. An apparatus to determine a displacement of an operator-actuated brake force applicator on a motor vehicle equipped with an electrically controlled brake system, said apparatus comprising:

(a) a brake valve positioned on such motor vehicle;

(b) a first member positioned at least partially within said brake valve and engageable with such brake force applicator;

(c) a first sensing means positioned within said first member for measuring a displacement of such brake force applicator and for transmitting an output signal value representative of said displacement;

(d) a second member positioned within said brake valve;

(e) a force transmitting means positioned between said first member and said second member for transmitting a force from said first member to said second member during a brake application;

(f) a second sensing means positioned to engage said second

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member for measuring a force exerted by said second member and for transmitting an output signal value representative of said force being exerted by said second member;

(g) a first electrical signal evaluation circuit connected to receive said output signal value from said second sensing means;

(h) a second electrical signal evaluation circuit connected to receive said output signal value from said first sensing means;

(i) at least one of said first electrical signal evaluation circuit and said second electrical signal evaluation circuit including a means for monitoring a reasonableness of said output signal value of each of said first sensing means and said second sensing means according to predetermined conditions; and

(j) a means connected to at least one of said first electrical signal evaluation circuit and said second electrical signal evaluation circuit for transmitting a brake force signal value representative of said displacement of such brake force applicator to such electrically controlled brake system.

4,784,443

METHOD AND CIRCUIT CONFIGURATION FOR MONITORING AND CONTROLLING A SLIP-CONTROLLED BRAKE SYSTEM

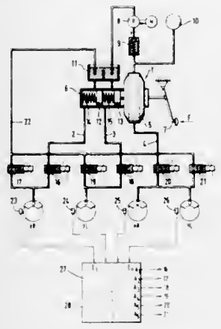
Lutz Weise, Mainz, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, am Main, Fed. Rep. of Germany

Division of Ser. No. 763,801, Aug. 7, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 63,729

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1984, 3429156

Int. Cl.[4] B60T *8/02*

U.S. Cl. 303—96 **3 Claims**



1. A method for monitoring and controlling a slip-controlled brake system for automotive vehicles having wheel means comprising front and rear wheels wherein the wheel rotational behavior is sensed, and wherein on detection of an imminent wheel locked condition, the braking pressure in the wheel brakes of the wheel means to which the wheel brakes of said wheels means in which a wheel tending to lock is a part will be temporarily controlled, said method comprising the steps of: detecting the occurrence of a malfunction of the slip control which has as a result an inadmissibly great tendency to lock of a first rear wheel and deactivating or maintaining the slip control of the front wheels as an independent function of the wheel rotational behavior of the second rear wheel wherein the slip control of the front wheels is deactivated as soon as the slip of the second rear wheel exceeds a predetermined threshold value.

4,784,444

FLUID-PRESSURE OPERATED ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

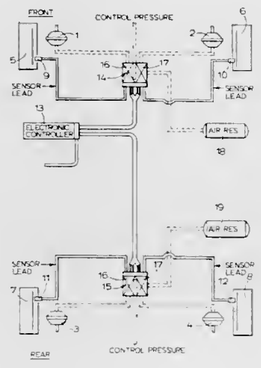
Denis J. McCann, Powys; Allan Williams; Edwin R. Carswell, both of Gwent, all of Wales, and William S. Broome, Worcestershire, England, assignors to Lucas Industries Public Limited Company, England

Filed Feb. 26, 1987, Ser. No. 19,433

Claims priority, application United Kingdom, Mar. 5, 1986, 8605383

Int. Cl.[4] B60T *8/38, 8/64, 8/42*

U.S. Cl. 303—118 **12 Claims**



1. A fluid-pressure operated braking system for vehicles comprising first and second wheels provided at each end of a common axle, first and second wheel brakes for said first and second wheels respectively, a supply for providing brake-applying operating fluid to each wheel brake, an operating fluid supply line between said supply and each said brake, respective first and second separate independently operable skid control units interposed respectively in said line between said supply and said first and second brakes, sensors provided to detect the skid point of wheel skids and to provide a skid signal when a skid point is detected, means responsive to a skid signal produced by any of said sensors, valve means provided to relieve independently the pressure of the fluid supplied to said first and second brakes at a skid point, each said skid control unit comprising a part of a control fluid circuit and each incorporating a memory chamber for storing a memory pressure dependent upon the brake pressure occurring at said skid point to provide a datum or knee point between first and second stages of brake re-application, said valve means being controlled by said means responsive to a skid signal, wherein said first and second brakes on said respective first and second wheels are each controlled by one of said separate respective independently operable skid control units, and a single latch valve is provided common to both units, said latch valve closing at the first skid point to be sensed by one of said sensors on either wheel, whereafter said rate of re-application of each of said first and said second brakes is controlled in response to signals from the individual sensors at a respective initial rate and thereafter at a subsequent rate, said initial rate of brake pressure increase of said first brake being determined by said memory chamber of said first skid control unit and said initial rate of brake pressure increase of said second brake being determined by said memory chamber of said second skid control unit, said subsequent rate of brake re-application of said first and said second brake being controlled by a common restricted flow of said brake-applying fluid.

4,784,445

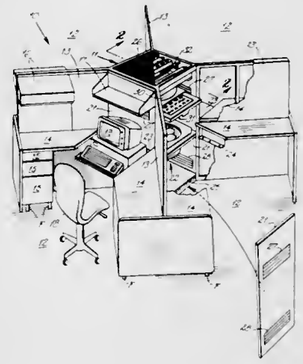
HEATED AND VENTILATED WORK STATION

Donald E. Ott, 17754 W. Spring Lake Rd., Spring Lake, Mich. 49456

Filed Sep. 14, 1987, Ser. No. 96,380

Int. Cl.[4] F24F *7/00*

U.S. Cl. 312—236 **4 Claims**



1. A modular work station, comprising, in combination, an upright, hollow container around a central space and formed of a plurality of vertical walls, a plurality of vertical partitions radiating sidewardly outward from said container and defining work areas therebetween for persons and heat-generating equipment therewithin, a top end of said container being open, a lower end thereof being closed by a bottom wall, each said container vertical wall having an upper and a lower adjustable louvered vent opening therethrough for communication between each said work area and said container central space, said upper vent opening being adjacent said heat-generating equipment, for heated air therefrom to enter said container, said lower vent opening being adjacent a feet of said person; a two-directional fan, for either upwardly or downwardly air flow, being installed in said container between said upper vent opening and said container open top end, and a singledirectional fan for only downwardly air flow, being installed in said container between said upper and lower vent openings.

4,784,446

TOOL CABINET

Thomas J. Newhouse, Grand Rapids, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Jun. 8, 1987, Ser. No. 59,543

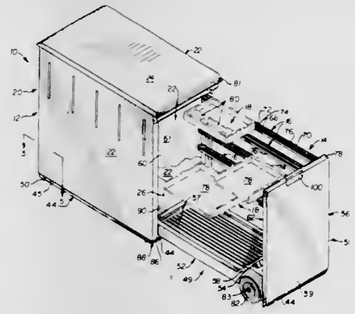
Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—317 R **10 Claims**

1. In a cabinet for use at a workstation, said cabinet comprising a housing and a drawer having first and second lateral sides and slidably mounted to said housing for movement between open and closed positions, the improvement wherein;

said drawer is open at said first and second lateral sides and further comprises rail means removably mountable in said drawer at selected one of said first and second lateral sides for removably supporting work tools for unobstructed access thereto from the other of said first and second lateral sides;

whereby said cabinet is adapted to be selectively positioned at either of the opposite sides of a workstation, with said rail means removably mounted to one of said first and second sides opposite the workstation and supporting work tools in said drawer for convenient access thereto from the other of said first and second sides adjacent the



side of the workstation at which said cabinet has been positioned.

4,784,447

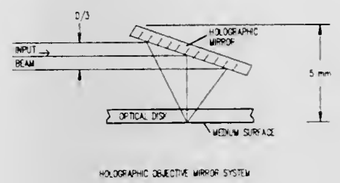
HOLOGRAPHIC OBJECTIVE MIRROR FOR OPTICAL STORAGE

Milton R. Latta, and Timothy C. Strand, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 13, 1987, Ser. No. 25,691

Int. Cl.[4] G02B *5/32*

U.S. Cl. 350—3.72 **1 Claim**



HOLOGRAPHIC OBJECTIVE MIRROR SYSTEM

1. A device for focusing a laser beam onto a track-containing optical storage medium, said device comprising means for directing the laser beam, in a direction tangential to the track direction on the optical medium, to a holographic mirror which diffracts the laser beam perpendicularly to the optical medium and also focuses the beam onto the optical medium, with the maximum perpendicular height of the holographic mirror above the optical medium being 5 mm.

4,784,448

RETROMODULATOR

Gunter Sepp, Ottobrunn, and Gunthard Born, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 4,059

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601764

Int. Cl.[4] G02B *26/08, 5/122*

U.S. Cl. 350—6.6 **5 Claims**

1. A retromodulator in the form of a triple mirror comprising three mirror surfaces, each disposed in a plane, at least one surface having electromechanical transducer elements for planar deformation, by which incident light radiation is re-

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troreflectable in modulated form, wherein at least one plane is formed as an oscillatory diaphragm, a plurality of transducer



elements affixed to the diaphragm exciting the diaphragm to natural oscillations.

4,784,449

HIGH RESOLUTION ACOUSTO-OPTICAL LIGHT DEFLECTOR

Franz Auracher, Baierbrunn; Rudolf Keil, Munich; Michael Stockmann, Munich, and Karl-Heinz Zeitler, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,064

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138745

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.13 **19 Claims**



1. An acousto-optical light deflector device with a high resolution for deflecting a beam of light from a source onto a plurality of resolved points, said deflector device comprising a common substrate having a portion forming a waveguide for conducting light of said beam, and a plurality of individual acousto-optical waveguide light deflectors with each deflector being able to deflect light at a plurality of resolved points, said deflectors being integrated on the common substrate in such a manner that the number of resolved points for the device is equal to the sum of the resolved points for each of the individual deflectors.

4,784,450

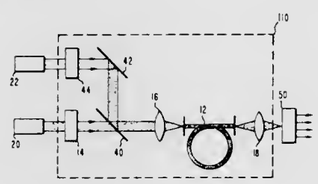
APPARATUS FOR GENERATING AND AMPLIFYING NEW WAVELENGTHS OF OPTICAL RADIATION

Ravinder K. Jain, Warrenville, Ill., and Knut Stenersen, Stommen, Norway, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 15, 1984, Ser. No. 660,767

Int. Cl.[4] G02B *6/26;* **H03F** *7/00*

U.S. Cl. 350—96.15 **38 Claims**



37. An apparatus for the tunable generation of new wavelengths of optical radiation from at least two input sources of narrowband coherent optical radiation having at least two predetermined wavelengths, comprising:

a birefringent optical waveguide having a fast axis and a slow axis and a birefringence value greater than 1.0×10^{-6};

input means positioned adjacent to said waveguide for focusing and transferring optical radiation from said at least two input sources into said waveguide; and

polarization control means disposed along an optical path between said at least two input sources and said input means for controlling the polarization of optical radiation transferred from said at least two input sources to said waveguide such that the polarization of said coherent optical radiation is at an angle of at least 5° with respect to said fast or said slow axis.

4,784,451

WAVEGUIDE OPTICAL SWITCHES

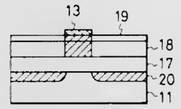
Hitoshi Nakamura, Hachioji; Tadashi Fukuzawa, Setagaya; Koji Ishida, Musashino; Hiroyoshi Matumura, Iruma; Kenji Hiruma, Koganei, and Hiroaki Inoue, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 762,328

Claims priority, application Japan, Aug. 10, 1984, 59-166356; Dec. 24, 1984, 59-270886

Int. Cl.[4] G02F *1/015*

U.S. Cl. 350—96.14 **8 Claims**



1. A reflection type optical switch comprising:

a semiconductor substrate;

a plurality of semiconductor layers formed on said semiconductor substrate; including an optical waveguide layer having a plurality of optical waveguide paths to propagate light; a switching region in at least one of said optical waveguide paths wherein switching is accomplished when a refractive index at said switching region is changed by carrier injection; and a path region for injecting carriers by said carrier injection;

a current confinement structure formed in at least one of said path region and said semiconductor substrate and formed to be separate from said optical waveguide layer, said current confinement structure allowing said carriers to be injected only into said switching region; and

a pair of electrodes for injecting the carriers into the switching region.

4,784,452

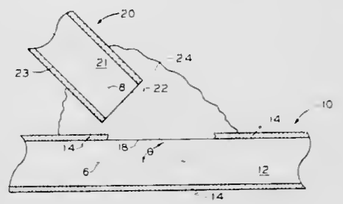
OPTICAL FIBER COUPLER

Malcolm H. Hodge, West Simsbury; James A. Moras, Simsbury, both of Conn., and Richard T. Dillon, Southwick, Mass., assignors to Ensign-Bickford Optics Co., Avon, Conn.

Filed Aug. 1, 1986, Ser. No. 892,799

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **25 Claims**



11. An optical fiber coupler comprising:

a length of a bus optical fiber having an unclad region exposing the fiber core in an intermediate portion thereof

at least one tap optical fiber having a free end and a core-exposing face thereon, said free end of said tap optical fiber being spaced from but adjacent to said bus optical fiber with the face of said free end generally facing said bus optical fiber unclad region, the axes of said tap optical fiber and said bus optical fiber being positioned such that the angle between the respective axes is no greater than the sum of the maximum bus optical fiber unclad region acceptance angle and the maximum tap fiber acceptance angle to permit lightwave communication between said tap optical fiber and said bus optical fiber; and

a rigid, cured resin encapsulating said tap optical fiber free end face and said bus optical fiber unclad region and fixing said tap optical fiber and said bus optical fiber at said angle, said cured resin filling the space between providing a path for lightwave communication between said tap optical fiber and said bus optical fiber.

4,784,453

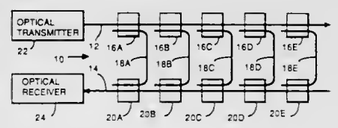
BACKWARD-FLOW LADDER ARCHITECTURE AND METHOD

H. John Shaw, and Behzad M. R. Moslehi, both of Stanford, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 2, 1987, Ser. No. 9,848

Int. Cl.[4] G02B *6/28*

U.S. Cl. 350—96.16 **16 Claims**



1. A fiber optic ladder array comprising:

a transmit optical fiber bus;

a plurality of branch single mode optical fibers;

optical coupling means connected between the transmit bus and the branch single mode optical fibers to couple optical signals from the transmit bus into each of the branch single mode optical fibers;

an output optical fiber bus that includes an output end; and

asymmetric optical coupling means for coupling light from the branch single mode optical fibers into the output optical fiber bus to reduce the amount of optical signla intensity lost when output signals propagate in the output optical fiber bus toward the output end.

4,784,454

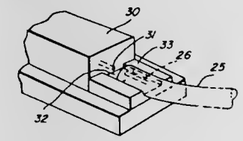
OPTICAL FIBER AND LASER INTERFACE DEVICE

Richard B. Dyott, Orland Park, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Continuation of Ser. No. 793,711, Oct. 29, 1985, Pat. No. 4,697,876, and a continuation of Ser. No. 469,977, Feb. 25, 1983, abandoned, and a continuation of Ser. No. 404,283, Aug. 2, 1982, abandoned. This application Oct. 5, 1987, Ser. No. 105,314

Int. Cl.[4] G02B *6/36;* **H01S** *3/18*

U.S. Cl. 350—96.20 **1 Claim**



1. A laser-optical fiber interface comprising the combination of

a solid state laser producing a point source of polarized light,

a polarization-holding, single-mode optical fiber having a single core and cladding with different refractive indices and forming a single-mode guiding region,

the core of said fiber having a non-circular cross-section defining two transverse orthogonal axes, said core having a longer transverse dimension along one of said orthogonal axes than along the other of said axes for guiding two fundamental modes, one of said modes having an electric field parallel to the axis of the longer transverse dimension and the other of said modes having an electric field parallel to the axis of the shorter transverse dimension,

the difference in the core dimensions along said orthogonal transverse axes and the difference between the refractive indices of said core and cladding being sufficiently large to de-couple the fundamental modes so that the polarization of said modes is preserved within the fiber,

said guiding region being offset from the geometric center of the fiber and located sufficiently close to one side of the surface of the fiber to allow coupling to a guided wave through said one side by exposure or expansion of the field of the guiding region, and

the outer surface of the fiber having a non-circular cross section forming an indexing surface with a predetermined geometric relationship to said guiding region and said orthogonal transverse axes so that the location of said guiding region and the orientation of said axes can be ascertained from the geometry of said indexing surface on the exterior of the fiber,

a substrate for receiving and supporting said indexing surface on the exterior of said fiber with the end of said fiber adjacent said laser, said substrate being positioned to precisely align the core of said fiber with said point source of polarized light produced by said laser and with the plane of polarization of said light from said laser aligned with one of said transverse orthogonal axis of said fiber.

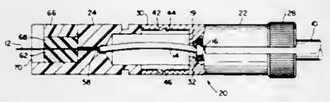
VOL 1096 ISS 3 NO 15 1988 UMI

4,784,455

STRAIN RELIEF CONNECTOR FOR OPTICAL FIBER

Francis Sladen, Neshanic Station; Peter Garner, Flemington, and Tadeusz Szostak, Jackson, all of N.J., assignors to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Mar. 17, 1982, Ser. No. 359,141
Int. Cl.[4] G02B 6/36, 7/26
U.S. Cl. 350—96.20 23 Claims



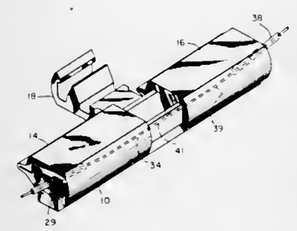
1. A connector for an elongate optical element comprising:
a first member for engaging said element at a first location;
a second member for engaging said element at a second location longitudinally spaced from said first location and defining thereby a predertimined extent of element, said predetermined extent being substantially equal to said longitudinal spacing between said first and second location, said first and second members being disposed for relative movement therebetween; and
means for changing the longitudinal spacing between said first location and said second location and for retaining said predetermined element extent upon relative movement of said first and second members whereby said predetermined elements extent exceeds the longitudinal spacing between said first and second locations.

4,784,456

FIBER OPTIC CONNECTOR

James G. Smith, Nokomis, Fla., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1987, Ser. No. 46,558
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 10 Claims



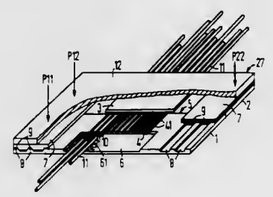
1. A fiber optical connector for splicing at least one pair of optical fibers end-to-end comprising:
a latchable housing having one bottom section and three top sections, each top section connected to the bottom section by a flexible hinge and adapted to close and latch with the bottom section independent of the other two top sections; and
a plurality of V-shaped grooves disposed axially along three continuously adjacent segments of said bottom section and forming a single, continuous V-groove extending axially from one end of the bottom section to the other end, one segment located at said one end of the bottom section and adapted to receive and latch with a first of the three top sections, a second segment located at the other end and adapted to receive and latch with a second top section, and a central segment adapted to receive and latch with a third, central top section.

4,784,457

CONNECTOR DEVICE FOR LIGHT WAVEGUIDES HELD WITH AN ADHESIVE

Lothar Finzel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 4, 1987, Ser. No. 21,689
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3608018
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 13 Claims



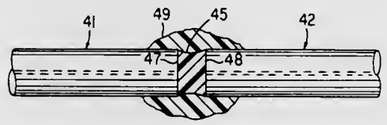
1. In a connector device for interconnecting two groups of light waveguides, said device having two carrier members having centering grooves extending from an abutting surface to a rear surface, a recess adjacent said rear surface so that the centering grooves can receive stripped waveguides while the cladded portion of the waveguide can be received in the recess, adhesive material being provided for securing of the cladded portions of the waveguides in the recess and the stripped portions of the waveguides in the centering groove, and means for positioning the two carrier members with the abutting surfaces in abutting relationship and the waveguides of one member being aligned with waveguides of the other member, the improvements comprising the adhesive material being used for securing the waveguides in the centering groove being a first adhesive material, which is a hard adhesive material and the adhesive material being used for securing the cladded waveguides in the recess being a second adhesive material which is softer than the first adhesive material.

4,784,458

OPTICALLY ALIGNED SPLICE FOR OPTICAL FIBERS

Leo Horowitz, Highland Park; Eric E. Hubner, Jersey City; Herbert T. Califano, Bloomingdale, and Walter V. Werner, Caldwell, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 16, 1985, Ser. No. 809,351
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 16 Claims



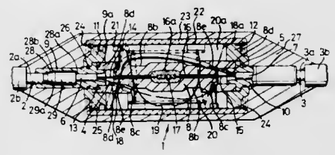
1. Method of providing a splice at mating ends of a first optical fiber having a first mating end to a second optical fiber having a second mating end, in which each of the two optical fibers are aligned by an alignment jig in a manner to cause the mating ends to be juxtaposed, in which optical transmission is optimized with the aid of the jig and an optical signal detector, characterized by:
applying a first bonding agent to at least one of the mating ends, the first bonding agent having an optical transmission characteristic which maintains a preferred optical sense of light transmitted through the optical fibers;
aligning the mating ends to achieve maximum transmission while maintaining the first bonding agent between the mating ends;
causing the first bonding agent to achieve a stabilized state; and
applying a second bonding agent externally of said first bonding agent so as to substantially surround the first bonding agent and the first and second optical fibers at the mating ends and thereby effect mechanical rigidity of the splice.

4,784,459

JOINING OF OPTICAL FIBRE CABLES

Peter D. Jenkins, Ipswich, England, assignor to British Telecommunications, London, England

Continuation of Ser. No. 387,816, Jun. 14, 1982, abandoned. This application Mar. 8, 1985, Ser. No. 709,974
Claims priority, application United Kingdom, Jun. 17, 1981, 8118564
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 1 Claim



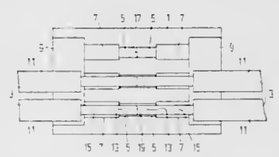
1. A method of joining two cables each including an annular tensile layer surrounding at least one optical fibre such method being characterised by first establishing a mechanical connection between the annular tensile layers with a longitudinally extending coupling member with tubular end parts and leading the ends of said fibres outwardly through bores in the side walls of said end parts, and thereafter joining said ends of said fibres outside of said coupling member and then enclosing the thus formed joint.

4,784,460

LIGHT-CONDUCTING FIBRES CONNECTING DEVICE WITH REDUCED TEMPERATURE EFFECTS

Giok D. Khoe, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,595
Claims priority, application Netherlands, Dec. 11, 1985, 8503409
Int. Cl.[4] G02B 6/38
U.S. Cl. 350—96.21 4 Claims



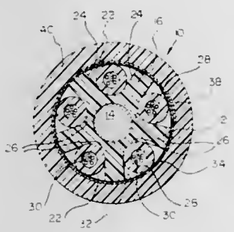
1. A device for interconnecting light conducting fibres comprising:
a carrier for supporting at least first and second light conducting fibres in an abutting light coupling relationship, said carrier having first and second aligned centering grooves supporting an end portion of each light conducting fibre in abutment without play, each centering groove having a length which is at most five times the diameter of said end portion, whereby temperature changes do not have an appreciable effect on the alignment of said optical fibres in said grooves;
first and second supporting grooves aligned with opposite ends of each centering groove, having a width 5 μm–10 μm greater than said centering grooves, supporting a portion of said light conducting fibre adjacent said end portion, said first and second supporting grooves being wide enough not to influence the position of said light conducting fibres in response to temperature changes; and
a cover for maintaining said light conducting fibres in said grooves.

4,784,461

OPTICAL CABLE WITH IMPROVED STRENGTH

Koichi Abe, Ottawa, and Brian Braham, Saskatoon, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 926,494, Nov. 4, 1986, abandoned. This application Mar. 17, 1987, Ser. No. 27,276
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 15 Claims



1. An optical cable comprising a longitudinally extending crush resistant central core formed with a plurality of circumferentially spaced outwardly facing ribs with adjacent ribs defining grooves between them, the ribs and the defined grooves extending longitudinally of the cable and lying at angles to the core axis; some of the grooves each housing a tube extending along the length of the groove; at least one optical fiber housed within and extending along each tube throughout the length of the cable; and a protective jacket surrounding the core.

4,784,462

SUBMARINE OPTICAL FIBER CABLE WITH GROOVED PLASTIC CORE AND MANUFACTURE THEREOF

Paolo G. Priaroggia, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 723,030, Apr. 15, 1985, and a continuation-in-part of Ser. No. 831,650, Feb. 20, 1986, Pat. No. 4,725,121. This application May 13, 1987, Ser. No. 49,677
Claims priority, application Italy, May 19, 1986, 20478 A/86
The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 10 Claims

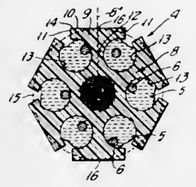
1. A submarine, optical fiber telecommunication cable comprising:
an axially disposed anti-torsional rope formed by a plurality of wires and having the interspaces therein filled with a substantially incompressible fluid;

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a core of plastic material around said rope, said core having a plurality of peripheral spaced, longitudinally extending grooves in the radially outer portion thereof with ribs intermediate said grooves, the wall of each of said grooves being discontinuous in cross-section at the radially outermost surface of said core but having radially extending, facing edge surfaces of said core adjacent to each other where said wall is discontinuous;

at least one optical fiber received in said grooves;

a substantially incompressible fluid filling any otherwise empty spaces in said grooves; and



a sheath around and engaging said core, said grooves, in the absence of said sheath, having a curvilinear cross-section and said facing edge surfaces being spaced from each other and the diametral dimension of said core at said ribs, in the absence of said sheath, being greater than the diametral dimension of the inner surface of said sheath, whereby the outer surface of said core conforms to the inner surface of said sheath when said sheath is applied thereto by reason of compression of said core.

4,784,463

ENDOSCOPE APPARATUS HOLDING APPARATUS

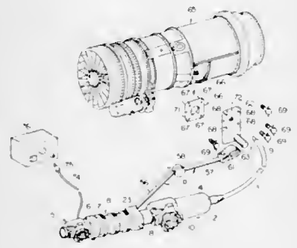
Atsushi Miyazaki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 22,295

Claims priority, application Japan, Mar. 7, 1986, 61-32681[U]; Sep. 17, 1986, 61-143388[U]

Int. Cl.⁴ G02B *23/26*; G01N *21/16*; A61B *1/00*

U.S. Cl. 350—96.26 **17 Claims**



1. An endoscope apparatus holding apparatus comprising:

an endoscope provided with an elongate insertion part, an observing means and illuminating light emitting means housed on the tip side of said insertion part and a curving operation means provided on the base side of said insertion part and operating to curve a curvable part formed near the tip of said insertion part;

an endoscope insertion assisting means provided with a guide tube part having a hollow path capable of inserting the insertion part of said endoscope and a holding means formed on the base side of said guide tube part and removably holding said endoscope;

an apparatus fitting means to at least one endoscope apparatus;

an attaching means capable of being detachably attached to an object to be inspected; and

a distance adjusting means capable of varying the distance between said attaching means and said fitting means, wherein said distance adjusting means and said attaching means are separate from each other and a removable fitting means is formed therebetween, and further wherein said fitting means includes gripping pieces attached to one of said distance adjusting means and said attaching means and a bar-shaped member attached to the other of said distance adjusting means and said attaching means and gripped by said gripping pieces.

4,784,464

ENDOSCOPE OPTICAL FIBER BUNDLE

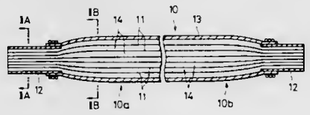
Teruo Ouchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1987, Ser. No. 10,616

Claims priority, application Japan, Feb. 4, 1986, 61-23634

Int. Cl.⁴ G02B *23/26*

U.S. Cl. 350—96.26 **11 Claims**



1. An optical fiber endoscope, comprising:

a flexible outer tube;

a flexible cover tube inserted in said outer tube and having a middle substantially circular portion of sectional area S;

a plurality of optical fibers inserted and sealed over substantially their entire length in said cover tube; and

a lubricant sealed in said cover tube;

wherein a sectional area s of said plurality of optical fibers when tightly bundled satisfies the relation

$$0.55S \leqq s \leqq 0.69S.$$

4,784,465

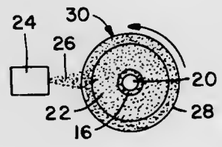
METHOD OF MAKING GLASS OPTICAL FIBER

George E. Berkey, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 402,056, Jul. 26, 1982, Pat. No. 4,453,961. This application Feb. 3, 1984, Ser. No. 576,891

Int. Cl.⁴ G02B *6/10*

U.S. Cl. 350—96.30 **5 Claims**



1. An optical fiber preform comprising a glass tube having at least an inner region surrounded by an outer region having a refractive index lower than that of said inner region, both ends of said tube being closed so that the aperture therein is completely enclosed, the pressure within said aperture being lower than ambient pressure, the aperture-forming wall surface being free from devitrification.

4,784,466

OPTICAL TRANSMISSION SYSTEM COMPRISING A RADIATION SOURCE AND A MULTIPLECLAD MONOMODE OPTICAL TRANSMISSION FIBRE WITH A NEGATIVE-STEP INDEX PROFILE

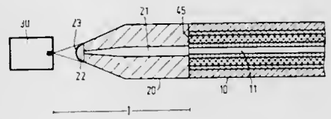
Giok D. Khoe, Eindhoven, Netherlands, and Peter K. Bachmann, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 17, 1986, Ser. No. 908,463

Claims priority, application Netherlands, Sep. 26, 1985, 8502625

Int. Cl.⁴ G02B *6/22, 6/26*

U.S. Cl. 350—96.33 **6 Claims**



1. An optical transmission system comprising a radiation source; a multiple-clad monomode optical transmission fibre with a negative-step index profile; and a single-clad monomode optical transmission fibre, having a tapered core characterized by a first refractive index, arranged between the multiple-clad monomode optical transmission fibre and the radiation source.

4,784,467

MULTI-LAYERED ANTI-REFLECTION COATING

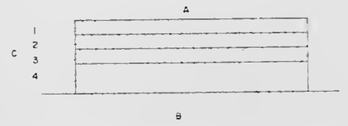
Sadao Akatsuka, Toyobashi, and Hakuzo Tani, Takatsuki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 13, 1987, Ser. No. 14,285

Claims priority, application Japan, Feb. 18, 1986, 61-34885

Int. Cl.⁴ G02B *5/28, 1/10*

U.S. Cl. 350—166 **7 Claims**



1. A multi-layered anti-reflection coating for use with a plastic substrate to reduce reflectance of light, comprising four layers;

a first layer made of SiO_2 furthest from the substrate;

a second layer made of a mixture of ZrO_2 and TiO_2;

a third layer made of ZrO_2; and,

a fourth layer made of a material selected from a group consisting of SiO and SiO_2.

4,784,468

DISPLAY MONITOR SHIELD ASSEMBLY

Leonard J. Tierney, 2413 Arctice Ave., Virginia Beach, Va. 23451, assignor to Leonard J. Tierney, Virginia Beach and Walter G. Ball, Norfolk, both of, Va.

Filed Nov. 24, 1987, Ser. No. 124,521

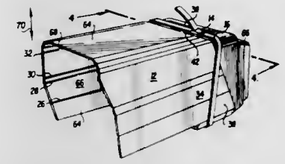
Int. Cl.⁴ G02B *27/00*

U.S. Cl. 350—276 R **12 Claims**

1. A portable monitor shield assembly comprising:

a relatively rigid monitor shield to be mounted on a display monitor to shield a display screen thereof from surrounding light, said monitor screen having a plurality of approximately parallel hinges extending along the length thereof to allow said shield to be folded about a display monitor to thereby partially enclose said monitor display screen, said monitor shield having a rear, mounting end to be mounted at the monitor and forward viewing end directed toward a viewer observing the monitor;

a belt having a first end attached to said monitor shield near said mounting end for wrapping about said monitor when said monitor shield is mounted on said monitor, and a second end portion; and



a buckle mounted on said monitor shield near said mounting end for receiving and engaging said second end portion of said belt so as to selectively allow said second end portion to move longitudinally relative to said buckle or to not move longitudinally relative to said buckle;

whereby said belt can be wrapped about a display monitor, engaged with said buckle, and closed to a tight loop for tightly gripping said monitor, thereby mounting said portable display monitor shield assembly on said display monitor.

4,784,469

BEAM SPLITTER FOR COLOR IMAGING EQUIPMENT

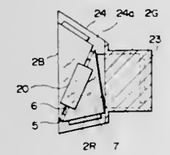
Tatsuki Tsukada, Yokohama; Hiroshi Nakamura, Kawasaki, and Kazuto Tanaka, Omiya, all of Japan, assignors to Matsusbita Electric Industrial Co., Ltd., Osaka and Fuji Photo Optical Co., Ltd., Saitama, both of, Japan

Filed Sep. 16, 1987, Ser. No. 97,185

Claims priority, application Japan, Sep. 17, 1986, 61-218469

Int. Cl.⁴ G02B *7/18, 27/14*

U.S. Cl. 350—287 **9 Claims**



1. A Beam splitter for a color imaging equipment, including red, green and blue channel prism blocks for separating incident beams into three primary colors of red green and blue, and comprising;

connecting member means for connecting said red channel prism block and said blue channel prism block, said connecting member means being provided on the surfaces of said red and blue channel prism blocks by striding across a joint portion containing an air-gap between said both blocks, and having an expansion coefficient which is identical to or smaller than that of said prism blocks; and

supporting plate means which are connected to said green channel prism block and are substantially not connected to said red and blue channel prism blocks and said connecting member means.

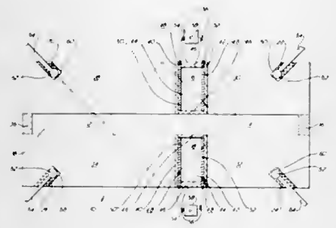
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4,784,470

OPTICAL SWITCHING DEVICE

Anthony P. Baker, New York, N.Y., assignor to ITT Defense Communications, a division of ITT Corporation, Nutley, N.J.

Filed Nov. 5, 1985, Ser. No. 795,157
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.[4] G02F *1/133*
U.S. Cl. 350—347 E 15 Claims



1. An optical switching device; said device comprising:
means for splitting an incident light beam into first and second polarized components, said means for splitting said incident light beam including a liquid crystal material;
means for selectively changing the polarization of said polarized components; and
means for recombining said components, said means for recombining said components of said incident light beam including a liquid crystal material whereby said two components are both directed to one of two different output ports.

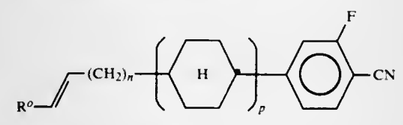
4,784,471

2-FLUOROBENZONITRILE DERIVATIVES AND THEIR USE IN OPTICAL DISPLAY DEVICES

Andreas Wächtler, Griesheim; Hans-Adolf Kurmeier, Seeheim/-Jugenheim; Reinhard Hittich, Modautal, and Bernhard Scheuble, Alsbach, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP86/00040, § 371 Date Oct. 14, 1986, § 102(e) Date Oct. 14, 1986, PCT Pub. No. WO86/04895, PCT Pub. Date Aug. 28, 1986
PCT Filed Jan. 30, 1986, Ser. No. 932,544
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1985, 3504866
Int. Cl.[4] G02F *1/13*; C07C *121/52*
U.S. Cl. 350—350 R 18 Claims

1. A compound of the formula:



wherein R° is H or linear alkyl of 1 to 7C atoms, p is 1 or 2 and n is 0 or 2.

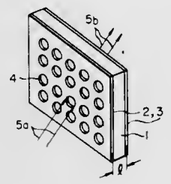
11. In a liquid-crystal phase comprising at least two liquid crystalline components, the improvement wherein at least one component is a compound of claim 1.

4,784,472

OPTICAL CONTROL SYSTEM AND METHOD

Eiichi Hanamura, and Tetsuji Tokihiro, both of Tokyo, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1985, Ser. No. 774,094
Claims priority, application Japan, Feb. 20, 1985, 60-33510
Int. Cl.[4] G02B *5/23*; G02F *1/01*
U.S. Cl. 350—354 6 Claims



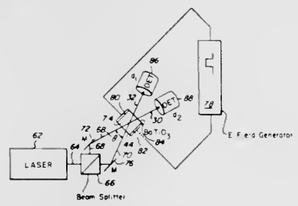
1. An optical control method for obtaining optical bistability comprising;
irradiating a crystal with both an exciton energy level and an excitonic molecule energy level, as the optical excitation energy level with a coherent incident light beam having energy (E) defined by $(Em/2-100\ \gamma m) \leqq E \leqq (Em/2-\Delta\nu-\gamma m)$ in which Em is the excitonic molecule energy level and γ is the half-amplitude level of absorption spectrum of two-photon resonance whereby a substantially coherent nonlinear optical response is obtained.

4,784,473

FERROELECTRIC OPTICAL SWITCHING

Debra M. Gookin, San Diego, Calif., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1987, Ser. No. 20,627
Int. Cl.[4] G02F *1/01, 1/03, 1/19*; G02B *5/30*
U.S. Cl. 350—355 17 Claims



1. An optical switch comprising:
a photorefractive ferroelectric crystal having a c axis;
first and second electrodes formed on opposing c axis faces of said crystal;
means connected to said first and second electrodes for applying a polarity reversible electric field across said crystal and for selectively reversing said polarity;
means for directing first and second beams of light through said crystal such that said first and second beams each have a component that is orthogonal to said c axis, whereby reversal of said electric field causes the power from said first beam of light to switch to said second beam of light

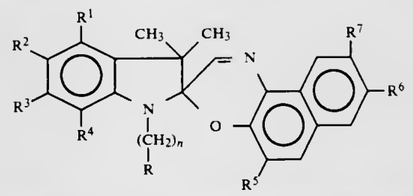
4,784,474

SPIRO-OXAZINE COMPOUNDS AND PREPARATION THEREOF AND PHOTOCHROMIC SHAPED ARTICLE

Shinichi Yamamoto, Kyoto, and Takashi Taniguchi, Shiga, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 750,007, Jun. 27, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,587
Claims priority, application Japan, Jul. 6, 1984, 59-139266; Aug. 24, 1984, 59-175048
Int. Cl.[4] G02B *5/23, 13/14*; C07D *273/00*
U.S. Cl. 350—354 13 Claims

1. A spiro-oxazine compound represented by the following general formula (A):



(A)

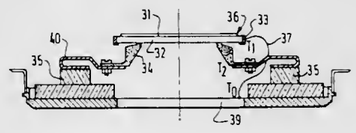
wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^7 independently represent a hydrogen atom or a substituent selected from the group consisting of an alkyl group having 1 or 2 carbon atoms, a halogenated alkyl group having 1 or 2 carbon atoms, an alkoxy group having 1 or 2 carbon atoms, a halogen atom and a nitro group, R represents an unsubstituted or substituted phenyl or naphthyl group, and n is an integer of from 1 to 5.

4,784,475

OPTICAL RELAY WHOSE TARGET IS COOLED BY A CONTROLLED TEMPERATURE GRADIENT HEAT EXCHANGER

Rémy H. F. Polaert, Villecresnes, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1987, Ser. No. 119,007
Claims priority, application France, Nov. 21, 1986, 86 16233
Int. Cl.[4] G02F *1/01, 1/03*
U.S. Cl. 350—355 5 Claims



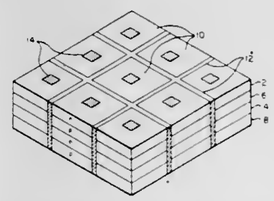
1. An optical relay comprising a target (12, 31) of electrically insulating material which allows the light to pass in a manner depending on the electric field parallel to the direction of propagation of this light, means (20, 22, 24) for having a first face of this target scanned by an electron beam, an anode (30) suitable for receiving the secondary electrons transmitted in response to the action of the beam, an optically transparent and electrically conducting plate provided against the second face of the target, this plate receiving the electric signal conveying the video information and thus forming the control electrode, the target being made of a material which becomes ferroelectric below a given temperature, the Curie temperature, and a heat exchanger (18) connected to a heat source which maintains the temperature necessary for its operation and acts on the target which is bonded to a plate (32) of an adequately heat conducting material, so that during the normal mode of operation the target is formed by:
a useful centre zone where it exhibits a single-domain ferroelectric phase
and a neutral peripheral zone having a temperature higher than the Curie temperature, where it exhibits a paraelectric phase,
characterized in that said plate (32) is provided at its periphery with a collar (33) which is a very good heat conductor and is maintained at a temperature T1 by means of at least one thermal bridge which is connected to the collar and to a reference source (39) which is maintained at a temperature T0, said plate being fixed to a plate support (34) which is kept at a temperature T2 by the heat source, said plate projecting beyond the support along its overal circumference so that in said plate there is an annular zone in which, in the plane of the plate and for all directions, there is a thermal flux which creates a temperature gradient T1–T2, the centre portion of said plate whilst substantially being isothermal, thus creates an isothermally active portion in the target which is cemented thereto, the periphery of the target being in contact with said plate via the annular zone, the collar (33) and the plate support (34) having a thermal expansion coefficient which is substantially identical to that of said plate.

4,784,476

NIPI REFRACTIVE INDEX MODULATION APPARATUS AND METHOD

Joel N. Schulman, Agoura, and Uzi Efron, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 27, 1987, Ser. No. 7,298
Int. Cl.[4] G02F *1/01, 1/03*; H01L *27/12, 45/00*
U.S. Cl. 350—355 24 Claims



3. An optical refractive index modulator, comprising:
a nipi structure comprising alternating n and p doped semiconductor layers,
first and second contact means establishing ohmic contacts with the n and p layers, respectively, said first and second contact means comprising respective contact elements extending through the nipi structure transverse to the n and p layers, each element being formed from a material that establishes ohmic contacts with its respective nipi layers and blocking contacts with the other layers, said first contact element comprising a ring enclosing aligned pixel portions of the nipi layers, and said second contact element comprising a wire extending through the nipi layers within the ring, and
means for applying first and second voltages to the first and second contact means, respectively, the differential between the two voltages modulating the refractive index of the nipi structure.

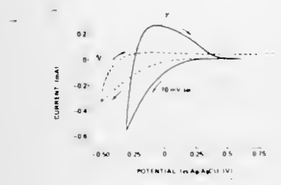
VOL 1096 ISS 3 NO 15 1988 UMI

4,784,477

ELECTROCHROMIC DEVICE USING TRANSITION METAL OXIDE AND METHOD OF PRODUCING SAME

Harutoshi Miyagi, Yokohama, and Teruko Yoshimoto, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 17, 1987, Ser. No. 74,967
Claims priority, application Japan, Jul. 22, 1986, 61-170743
Int. Cl.⁴ G02F *1/01*
U.S. Cl. 350—357 **18 Claims**



1. A method of producing an electrochromic device, comprising the steps of:
(a) providing first and second substrates at least one of which is transparent and each of which is coated with an electrode film;
(b) depositing a film of a transition metal oxide which serves as an electrochromic material that takes on color in its electrochemically reduced state on the electrode film of the first substrate;
(c) after step (b) immersing the first substrate in a solution of an electrolyte in an organic solvent containing water to cause the transition metal oxide film to adsorb water;
(d) forming a film of another electrochromic material on the electrode film on the second substrate;
(e) after steps (c) and (d) assembling the first and second substrates and a peripheral seal means into a blank cell in which the first and second substrates are held spaced from each other such that the film of the transition metal oxide faces the film of said another electrochromic material and in which a closed space is defined between the two substrates; and
(f) injecting an electrolyte liquid which is a solution of a supporting electrolyte in a nonaqueous solvent substantially free of water into said space in said blank cell,
the immersing step (c) being performed such that the treated film of the transition metal oxide contains such an amount of adsorption water that the concentration of water in said electrolyte liquid in the produced device becomes more than 0% and not more than 0.3% by weight.

4,784,478

MICROSCOPE OBJECTIVE

Katsuhiro Takada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,738
Claims priority, application Japan, Aug. 2, 1985, 60-169726; Aug. 2, 1985, 60-169727
Int. Cl.⁴ G02B *21/02, 9/12*
U.S. Cl. 350—413 **9 Claims**



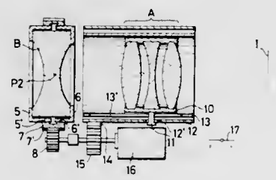
1. A microscope objective comprising a first lens component, a second lens component located in a range wherein the height of paraxial marginal ray becomes at least a half of the maximum height of paraxial marginal ray to be reached in said microscope objective, and a third lens component in the order from the object side, and said second lens component being arranged as a graded refractive index lens formed that the refractive index thereof is graded according to the radial distance from the optical axis and, moreover, the dispersion in the marginal portion thereof is different from the dispersion in the central portion thereof.

4,784,479

VARIFOCAL OPTICAL SYSTEM

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,342
Claims priority, application Japan, May 30, 1984, 59-110043; May 30, 1984, 59-110044
Int. Cl.⁴ G02B *15/00*
U.S. Cl. 350—423 **14 Claims**



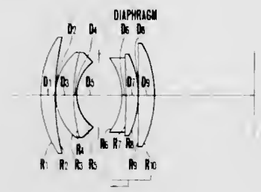
1. A varifocal optical system comprising:
a movable lens unit movable along an optical axis, said movable lens unit having a positive refractive power;
a compensation lens unit having principal points, said compensation lens unit having a variable negative refractive power which varies and compensates for the shift of an image surface resulting from the movement of said movable lens unit;
an image plane; and
means for varying the refractive power of said compensation lens unit in such a way that the principal point at said movable lens unit side of said principal points maintains a substantially same position relative to said image plane.

4,784,480

FOCUSING-IN-PART LENS SYSTEM

Hideo Yokota, and Yasuyuki Yamada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1981, Ser. No. 233,188
Claims priority, application Japan, Feb. 15, 1980, 55-17405
Int. Cl.³ G02B *9/42, 9/50, 9/52*
U.S. Cl. 350—471 **4 Claims**



1. A focusing-in-part lens system comprising:
frontmost lens means having a positive refractive power and maintained stationary during changing of the object distance, a fixed diaphragm arranged on the image side of said frontmost lens means, and rear lens means arranged on the image side of said diaphragm, said rear lens means

including an axially movable lens group for changing of the object distance consisting of a plurality of lenses and having a positive refractive power with the strongest diverging surface in this group with its concave curvature toward the front;
said lens system satisfying the condition of

$$1.2 < FA/F < 2.2$$

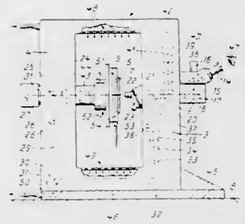
wherein F represents the focal length of the whole system, FA represents the focal length of the lens means closer to the object than said movable lens group of the rear lens means.

4,784,481

TRANSMITTED AND/OR INCIDENT LIGHT MICROSCOPE

Volker Wuerfel, Braunfels-Bonbaden, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

PCT No. PCT/DE85/00526, § 371 Date Aug. 13, 1986, § 102(e) Date Aug. 13, 1986, PCT Pub. No. WO86/03847, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 14, 1985, Ser. No. 897,759
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447128
Int. Cl.⁴ G02B *21/26, 21/20*
U.S. Cl. 350—529 **30 Claims**



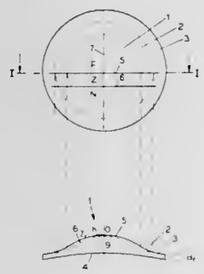
5. A transmitted-light or reflected-light microscope, wherein:
(a) the microscope has a casing which comprises a base and at least two stand parts, which—preferably—are connected together by at least one common stand plate;
(b) the stand parts are located—as seen from the observer—one behind the other;
(c) an object stage for receiving or holding objects to be viewed is located between the front and the rear stand parts;
(d) the portion of the microscope's optical axis oriented toward objects to be viewed lies perpendicular to the object stage plane and forms a discrete angle α, between 0° and 30° with the horizontal, and
(e) a plurality of air openings are arranged in the upper region of the microscope base or in mutually facing portions of the stand parts, and said openings are in communication with means for establishing a flow of room air therethrough.

4,784,482

MULTIFOCAL SPECTACLE LENS WITH HIGH POSITIVE FOCAL POWER

Günther Guilino, Munich, Fed. Rep. of Germany, assignor to Optische Werke G. Rodenstock, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 763,838, filed as PCT DE84/00263, May 12, 1984, published as WO85/02689, Jun. 20, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,605
Claims priority, application Fed. Rep. of Germany, May 12, 1983, 3343891
Int. Cl.⁴ G02C *7/06*
U.S. Cl. 351—169 **12 Claims**



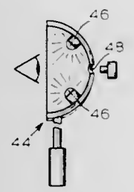
1. A multifocal spectacle lens with a high positive focal power, with a convex front surface, which comprises an aspheric focal section (1) with an additional near segment (N), a transition zone (2) surrounding the focal section and a rim zone (3), and including an inside surface which forms an afocal margin together with the rim zone, characterized by the near segment (N) being aspheric in form and separated from the focal section above it (F or Z) by a substantially horizontal dividing line (6) which has an approximately straight course, the lens having a main vertical meridian (7) passing through an optical axis (9) of the lens, the main meridian carrying over from the near segment into the focal section (1) by transecting the horizontal dividing line, the dividing line disapperaing mathematically at the main meridian, to provide thereby a transition along the main meridian between the near portion and the focal section, said transition being continuous to substantially avoid any jump in transition of vision along the meridian from the focal section to the near segment, or from the near segment to the focal section, along the main meridian.

4,784,483

BRIGHTNESS ACUITY TESTER

Jack T. Holladay, Houston, Tex., and Morey H. Waltuck, Sharon, Mass., assignors to Mentor O & O, Inc., Norwell, Mass.

Filed Apr. 1, 1986, Ser. No. 846,626
Int. Cl.⁴ A61B *3/02, 3/10*
U.S. Cl. 351—243 **22 Claims**

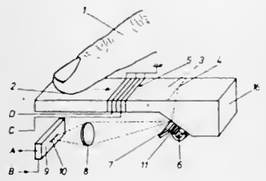


1. A brightness acuity tester comprising:
(a) a portable device closed in one direction and open in a

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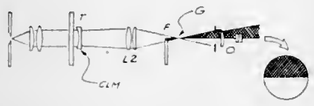
diametrically opposed direction; the periphery of said opening being sized such that the periphery of the opening is closely adjacent the eye;
(b) said device provided with a handle;
(c) an aperture provided in said device in said closed direction;
(d) a plug member designed removably to be mounted within said aperture;
(e) a source of illumination mounted within said device; and
(f) a power source coupled to said source of illumination.

4,784,484
METHOD AND APPARATUS FOR AUTOMATIC SCANNING OF FINGERPRINTS
Palle R. Jensen, Copenhagen V, Denmark, assignor to Jydsk Telefon A/S, Aarhus, Denmark
PCT No. PCT/DK86/00044, § 371 Date Dec. 4, 1986, § 102(e) Date Dec. 4, 1986, PCT Pub. No. WO86/06266, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 28, 1986, Ser. No. 23,557
Claims priority, application Denmark, May 2, 1985, 1984/85
Int. Cl.[4] G06K *9/74*
U.S. Cl. 356—71 **10 Claims**



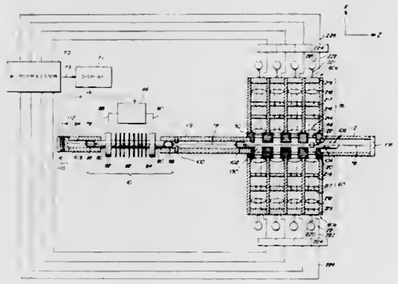
1. Method for automatic scanning of fingerprints by optical scanning of the fingerprint side of a finger, characterised in that the finger is moved along a scanning surface while measuring the rate of movement of the finger in relation to the scanning surface and in such a manner that by contact between the finger and surface there is formed an optical papillary pattern corresponding to a fingerprint whereupon the pattern is scanned when passing a scanning area and is converted into an electrical signal.

4,784,485
CONTACT LENS ZONOMETER
Arthur Ho, Randwick, Australia, assignor to Unisearch Limited, Kensington, Australia
Continuation of Ser. No. 803,109, Nov. 27, 1985. This application Jul. 13, 1987, Ser. No. 73,899
Claims priority, application Australia, Nov. 29, 1984, PG8351
Int. Cl.[4] G01B *9/00*
U.S. Cl. 356—124 **9 Claims**



1. Apparatus for the measurement of the size of an optic zone of a lens and/or the refractive power of that optic zone, comprising a light source, an illumination system including a first lens train adapted to produce a collimated beam of light from the light source, and a second lens train adapted to focus the collimated beam, mounting means holding the lens being measured and positioned between the first and second lens trains to hold the lens to be measured in the collimated light beam, substantially planar opaque means including an adjustable knife-edged device positioned between said second lens train and an observer and within a part of the focussed beam from said second lens train to occlude said part of the focussed beam, an observation system coaxial with the illumination system, the observation system being adapted to allow the observer to observe the lens to be measured and comprising said second lens train and a further lens which forms an eye piece, said eye piece having an anterior focal plane coincident with the image of the lens to be measured, which image is a single image of said focal plane and is formed by the second lens train, and measurement means including a cross wire fitted to the eye piece at the anterior focal plane and a linear measurement device to measure the translation of the lens to be measured across the mounting means relative to the cross wire to determine the size of the optic zone of the lens.

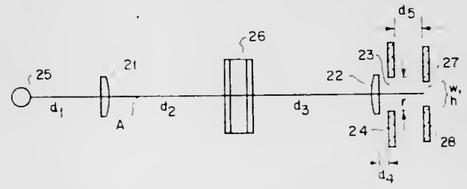
4,784,486
MULTI-CHANNEL MOLECULAR GAS ANALYSIS BY LASER-ACTIVATED RAMAN LIGHT SCATTERING
Richard A. Van Wagenen; Jeffrey D. Geisler; Donald E. Gregonis, and Dennis L. Coleman, all of Salt Lake City, Utah, assignors to Albion Instruments, Salt Lake City, Utah
Filed Oct. 6, 1987, Ser. No. 106,791
Int. Cl.[4] G01J *3/44*; G01N *21/65*
U.S. Cl. 356—301 **57 Claims**



1. A apparatus for the simultaneous analysis and quantification of selected multiple polyatomic gases in a gas sample by Raman light scattering, comprising:
a source of laser light capable of producing a laser beam along a longitudinal axis of a selected wavelength comprising a laser resonant cavity, said laser resonant cavity comprising a plasma tube and wherein one end of said laser resonant cavity contains an output coupler mirror and the other end contains a high reflectivity mirror which does not transmit light;
gas sampling cell means for containing said gas sample at multiple locations along said longitudinal axis so that said laser beam is incident upon said gas sample at said multiple locations, said cell means defining a longitudinal gas constraining chamber having end optical means interconnected by a sidewall, said cell means being oriented relative to said laser cavity such that when said laser beam is activated, the laser beam is coincident with and traverses the axis of said longitudinal gas chamber, said optical end means being positioned to reflect or transmit a laser beam along the axis of the longitudinal gas chamber, said cell means also having opposing, aligned side windows in said sidewall parallel to and on either side of the axis of said longitudinal gas chamber; and
a series of optical filter-detection channels for simultaneously acquiring a plurality of samples of the optical energy scattered out of said beam incident upon samples from said multiple locations along said longitudinal axis, the optical portions of said channels being longitudinally aligned on either side of said cell means positioned parallel

to and in alignment with said side windows, each of said optical filter-detection channels comprising:
an optical portion comprising a collection lens means positioned parallel to and in alignment with said laser beam and side windows outside same cell means to collect elastic laser scattered light and inelastic Stokes or antiStokes Raman scattered light passing through said side windows;
a filter portion comprising an interference filter means adapted to receive signals of both inelastic Stokes or anti-Stokes Raman scattered light and elastic laser scattered light passing through each such optical portion and transmit a single Stokes or anti-Stokes Raman line of a predetermined wavelength while rejecting scattered elastic laser light signals and all other signals of Stokes and anti-Stokes inelastic Raman scattered light; and
a detection portion comprising detection and amplification means for receiving Stokes or anti-Stokes Raman signals passing through said filter portion and converting said signals to digital electrical pulses, currents or voltages.

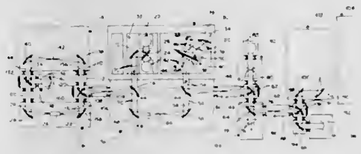
4,784,487
FLAT BAND OPTICAL RELAY USING APERTURES AND SIMPLE LENSES
George W. Hopkins, II, Sunnyvale, and Barry G. Willis, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 837,458, Mar. 7, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 207,037
Int. Cl.[4] G01J *3/28, 3/10*
U.S. Cl. 356—326 **11 Claims**



1. An optical apparatus for focussing light from a light source onto a slit, said optical relay comprising:
a first simple lens;
a second simple lens through which light from the light source passes, after passing through the first lens; and
a first opaque barrier defining a first aperture through which light from the light source passes after passing through the first lens, the distance of the first opaque barrier from the first lens being selected to produce through the slit a flux of light that is substantially flat as a function of wavelength over a range of wavelengths of interest.

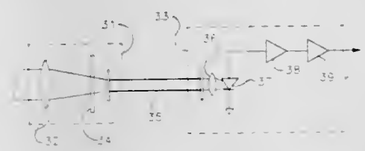
4,784,488
MODULAR RADIATION TRANSMISSION APPARATUS FOR SPECTROMETERS
Walter M. Doyle, Laguna Beach, and Norman S. Hughes, San Clemente, both of Calif., assignors to Laser Precision Corporation, Irvine, Calif.
Filed Aug. 27, 1986, Ser. No. 900,730
Int. Cl.[4] G01B *9/02*; G01N *21/01*
U.S. Cl. 356—346 **21 Claims**

1. An interferometer spectrometer system which includes a radiation source, one or more detector components, an interferometer outputting a radiation beam, and a modular optical switching component comprising:
a housing having a first aperture through which a radiation beam may pass, and second and third apertures through which that radiation beam may also pass;
the arrangement being such that the radiation beam axis of symmetry through the first aperture makes the same angle with the radiation beam axis of symmetry through the second aperture as it does with the radiation beam axis of symmetry through the third aperture;
means for mechanically connecting the housing to at least two other components in the system, in such a way that the system may be readily rearranged by detaching the housing from one system component and attaching it to another system component;
a mirror-supporting member rotatably mounted in the housing, the axis of rotation of such member being colinear with the axis of symmetry of the beam passing through the first aperture;



a reflecting surface which is carried by the mirror supporting member and which is designed to reflect a beam entering the first aperture through either the second or third aperture, or to reflect a beam entering either the second or third aperture through the first aperture;
means for turning the mirror-supporting member on its axis to select either a position in which the radiation travels through the second aperture, or a position in which the radiation travels through the third aperture; and
means for releasably retaining the mirror-supporting member in its selected position.

4,784,489
FIBER-OPTIC BASED REMOTE RECEIVER FOR LASER INTERFEROMETER SYSTEMS
Leonard S. Cutler, Los Altos Hills; Robin P. Giffard, Los Altos; William D. Holland, Palo Alto, and Lawrence J. Wuerz, Santa Clara, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 29, 1987, Ser. No. 43,906
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **4 Claims**



1. A remote receiver for a two-frequency laser interferometer, comprising:
a front-end section for receiving a light beam from the interferometer, comprising means for combining the two frequency components to form a combined light beam, means for focusing the light beam and directing the light beam to an optical output port;
a back-end section comprising an optical input port for receiving a light beam and means responsive to amplitude modulation of the light beam for producing an electrical signal representative of the difference in frequency between the two frequency components; and

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an optical fiber connecting the output port of the front-end section to the input port of the back-end section, for transmitting the light beam from the front-end section to the back-end section.

4,784,490

HIGH THERMAL STABILITY PLANE MIRROR INTERFEROMETER

Kenneth J. Wayne, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 2, 1987, Ser. No. 20,921
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—351 **3 Claims**



1. An interferometer having high thermal stability, comprising:
- light source means for producing a coherent light beam;
- a light detector;
- beam splitter means for separating the coherent light beam into a measurement beam and a reference beam;
- reflecting means, having substantially no optical path length, mounted on a movable measurement plane; and
- optical means having optical elements in thermal contact and in thermal equilibrium with the beam splitter, for cooperating with the beam splitter means to direct the reference beam along a reference path to said detector, and to direct the measurement beam along a measurement path to said detector, said measurement path including the round trip distance to the reflecting means on the movable measurement plane; and
- wherein the reference path passes through different optical elements than the measurement path, but the reference path and the measurement path have substantially the same optical path length through said optical means and pass through optical elements of substantially the same refractive index, so that the thermally induced changes in the optical path length of the reference path and the optical path length of the measurement path through the beam splitter and the optical means compensate one another.

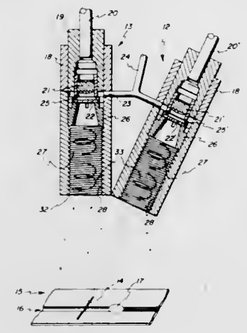
4,784,491

SYSTEM TO PROTECT OPTICS AGAINST DIRTY ENVIRONMENTS

Carl M. Penney, Schenectady, N.Y., and Richard M. Lund, Inverness, Fla., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 3, 1986, Ser. No. 870,269
Int. Cl.[4] G01B *11/24*
U.S. Cl. 356—376 **8 Claims**

1. An optical sensor head having improved protection against atmospheric debris comprising:
- a housing containing optical components and having an inlet to admit gas which flows past an exterior optical component to a gas channel;
- means in said housing to impart spiral swirling motion to said gas;
- said gas channel having internal relatively deep grooves pitched in the direction of gas motion as it rotates and swirls toward an exit opening;
- whereby incoming particles, smoke and other atmospheric debris generated by an industrial process are turned toward the grooved wall of said gas channel and prevented form depositing on said exterior optical component.

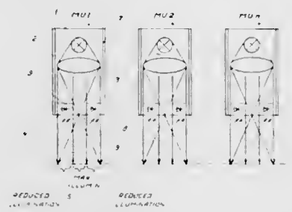


4,784,492

DEVICE FOR DETERMINING SURFACE PROPORTION OF A PRINTED PATTERN FOR PRINTING MACHINES

Bernd Morgenstern, Lützschena; Helmut Weigend, and Gudrun Dietrich, both of Leipzig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Nov. 21, 1986, Ser. No. 933,792
Claims priority, application German Democratic Rep., Nov. 22, 1985, 2831095
Int. Cl.[4] G01B *11/28*
U.S. Cl. 356—379 **5 Claims**



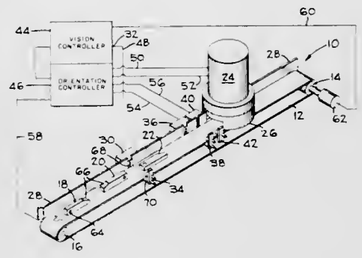
1. A device for determining printed surface proportion on a pattern to be used in a printing machine, comprising at least one measuring unit including a light source arranged for illuminating with a high light intensity a central area of the printed surface and, with a reduced light intensity, marginal areas at opposite sides of said central area, at least two light sensors each arranged at equal distance above an assigned marginal area whereby the intensity of light reflection from said printed surface against said sensors is in inverse proportion to the different illumination intensities of said central and marginal areas.

4,784,493

ELEMENT RECOGNITION AND ORIENTATION

Stanley P. Turcheck, Jr., Homer City; James P. Martin, Blairsville, and Arthur L. Dean, Indiana, all of Pa., assignors to FMC Corporation, Chicago, Ill.

Filed Jun. 11, 1986, Ser. No. 873,232
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—394 **3 Claims**



1. A method of assuring a work article being transported on a conveyor belt conforms to accepted tolerance of a sample article and is positioned on the belt in a desired orientation, comprising the steps of:
- providing an array of optical sensors aligned transverse to the belt;
- passing a plurality of sample articles, each of which is within accepted tolerances, past said array, in said desired orientation;
- reading the output of said array at intervals along the length of each sample article;
- creating inner and outer envelope patterns from the composite readings of said plurality of sample articles;
- storing said patterns;
- passing a work article past said array;
- reading the output of said array at intervals comparable to those intervals on said sample articles;
- comparing the read outputs for said work article with said stored envelope patterns;
- removing said work article from said belt when said read outputs falls outside said patterns;
- turning said work article to the desired orientation when said read outputs fall within said patterns and said comparison indicates said work article is positioned differently from said desired orientation; and
- allowing said work article to pass undisturbed when said read outputs fall within said patterns and said comparison indicates said article is positioned in said desired orientation.

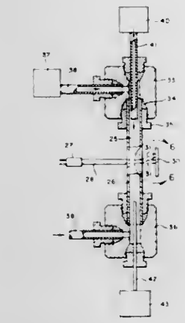
4,784,494

METHOD AND APPARATUS FOR DETECTING UNIVERSAL AND SELECTIVELY CONCENTRATION GRADIENTS, AND FOR DEFLECTING A LIGHT BEAM IN A CONTROLLED FASHION

Janusz B. Pawliszyn, Logan, Utah, assignor to Anthony R. Torres, London, Utah

Filed Dec. 31, 1986, Ser. No. 948,247
Int. Cl.[4] G01N *21/41, 21/00*
U.S. Cl. 356—432 **34 Claims**

1. A detector for detecting concentration gradients within a fluid sample having at least one concentration gradient extending in a concentration gradient direction in the sample and for selectively determining the presence or absence of a particular chemical compound within the sample, comprising a sample chamber; means for passing a probe beam of light through the sample chamber; means for detecting the position in the concentration gradient direction of the probe beam of light after passing through the sample chamber; and means for periodically supplying excitation energy uniformly in the concentration gradient direction through the area of the sample chamber through which both the probe beam and sample pass, said energy adapted to be absorbed by preselected chemical compounds if present forming a concentration gradient in a sample in the chamber to thereby create a temperature gradient in the sample proportional to the concentration gradient which will cause deflection of the probe beam in addition to deflection caused by the concentration gradients in the sample.

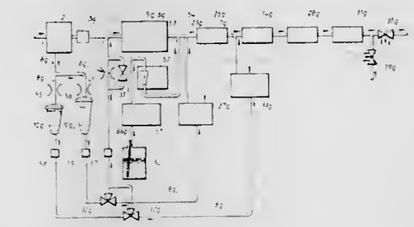


4,784,495

SYSTEM FOR PREPARING A FLUID INTENDED FOR A MEDICAL PROCEDURE BY MIXING AT LEAST ONE CONCENTRATE IN POWDER FORM WITH WATER

Lennart U. P. Jonsson, Furulund; Per-Olov A. V. Carlsson, Sosdala; Dan Jonsson, Lund; Sven Jonsson, Staffanstorp; Stefan L. Knutsson, Bjarred, and Ragnar Tryggvason, Lodekopinge, all of Sweden, assignors to Gambro AB, Sweden

Filed Dec. 10, 1987, Ser. No. 130,879
Claims priority, application Sweden, Feb. 6, 1987, 8700461; May 27, 1987, 8702234; Aug. 11, 1987, 8703120; Sep. 18, 1987, 8703626
Int. Cl.[4] B01F *15/04*
U.S. Cl. 366—151 **110 Claims**



1. A system for preparing a fluid for a medical procedure by mixing of at least one concentrate in powder form with water, said system comprising:
- a source of water;
- a vessel for containing a concentrate in powder form;
- first fluid conducting means having a first end communicating with said source of water for withdrawing water from said source of water, and a second end for delivering a prepared solution;
- second fluid conducting means communicating with said source or water and with an inlet of said vessel for introducing water from said source of water into said vessel to produce a concentrate fluid containing dissolved powder concentrate in water;

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third fluid conducting means communicating with an outlet of said vessel and with a mixing point in said first fluid conducting means intermediate said first and second ends for conducting said concentrate fluid from said vessel into said first fluid conducting means to be mixed with fluid being conducted through said first fluid conducting means to thereby produce a prepared solution in said first fluid conducting means for delivery to said second end of said first fluid conducting means;

measuring means in said first fluid conducting means downstream of said mixing point for measuring the composition of the prepared solution obtained by mixing of said concentrate fluid and water in said first fluid conducting means; and

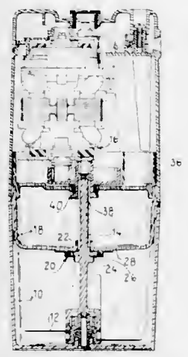
flow regulating means in said third fluid conducting means responsive to said measuring means for controlling the flow of said concentrate fluid from said vessel.

4,784,496

APPLIANCE FOR PREPARING MAYONNAISE AND SIMILAR SAUCES

Roger Weiss, Bagnolet, France, assignor to Moulinex, Societe Anonyme, Bagnolet, France

Filed Jan. 21, 1987, Ser. No. 8,933
Claims priority, application France, Jan. 30, 1986, 86 01288
Int. Cl.[4] B01F *15/02*
U.S. Cl. 366—162 **2 Claims**



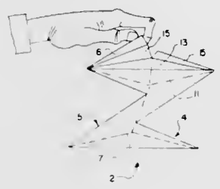
1. An appliance for preparing mayonnaise and similar sauces, comprising a work bowl, a mixing tool locatable within said work bowl, a rotatable shaft carrying said mixing tool and extending substantially vertically, and drive means for rotating said shaft about a vertical axis, the appliance further comprising a reservoir for oil or other liquid supported above said bowl, and a dispensing device providing communication for liquid between said reservoir and said work bowl, said dispensing device comprising a proportioning pump driven by said rotary shaft and having an intake orifice which communicates with the reservoir and a delivery orifice which communicates with the work bowl, the pump being arranged to ensure that oil or liquid flows into the bowl from the reservoir only when the shaft is rotated, wherein said reservoir has a bottom wall in which said intake orifice is located, and further comprising a housing fastened under said bottom wall, the delivery orifice being located in said housing, and wherein said proportioning pump is a pump of the gear type and is contained within said housing, said pump comprising a first gear wheel fixed to the rotary shaft and a second gear wheel meshing with said first gear wheel and mounted loosely within the said housing.

4,784,497

REFUSE RECEPTACLE

Warren A. Dutton, 1055 Los Robles Ave., Palo Alto, Calif. 94306

Filed Aug. 20, 1987, Ser. No. 87,616
Int. Cl.[4] B65D *33/24*
U.S. Cl. 383—43 **12 Claims**



1. A disposable refuse receptacle, or the like, comprising a foldable bag which is adapted to be stored in a flat folded condition and unfoldable to a useable expanded condition, in the expanded condition said bag including opposing end panels and opposing side panels defining a rectangular horizontal crosssection, and

a self-closing top closure integrally formed with said panels along upper edges thereof and including an elongated slot through which refuse may be passed, the receptacle being selfsupporting in the expanded condition of said foldable bag, said receptacle being in a fully assembled condition in the flat folded condition of said bag whereby no additional assembly is required to place the bag in the unfolded useable expanded condition.

4,784,498

RETAINER OF A LINEAR MOTION ROLLING-CONTACT BEARING AND ITS MANUFACTURING METHOD

Toshiaki Geka, Funabashi, and Koji Kanoh, Mino, both of Japan, assignors to Nippon Thompson Co., Ltd., Japan

Continuation of Ser. No. 772,799, Sep. 5, 1985, abandoned. This application Apr. 13, 1987, Ser. No. 38,478
Claims priority, application Japan, Sep. 5, 1984, 59-184468
Int. Cl.[4] F16C *29/06*
U.S. Cl. 384—45 **7 Claims**



1. In combination, a one-piece retainer and a linear motion rolling-contact bearing including a linear-extending rail and a slider, said bearing including a plurality of rolling members provided to roll along a predetermined endless passage defined by a pair of straight load sections and a pair of curved connecting sections each connecting corresponding ends of said pair of straight load sections in said slider, said retainer comprising:

a flat base portion extending between said rail and slider and being connectible to said slider, said flat base portion provided with an elongated straight slot which extends along a straight load section of said endless passage, said slot having a width which is larger than the maximum size of each of said rolling members, said slot including a pair of opposed end surfaces for limiting the lateral movement of said rolling members in said straight load section and in

a direction generally in parallel with a plane defined by said flat base portion, such that a center of each of said rolling members when located in each of said pair of straight load sections is located at a side of said slider with respect to a plane defined by an outer surface of said flat base portion which is opposite to an inner surface of said flat base portion in contact with said slider;

a central retaining portion which is integrally formed with said flat base portion and formed in the shape of a "U" with both ends connected to the ends of said slot, thereby providing a structural enclosure for retaining said rolling members in said straight load section when rolling therethrough; and

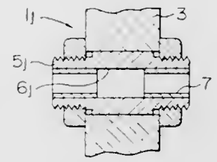
mounting means for mounting said retainer, in said slider of said bearing, between said slider and said rail.

4,784,499

BEARING UNIT

Osamu Fukute, Inuyama, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Nov. 3, 1986, Ser. No. 926,513
Claims priority, application Japan, Mar. 13, 1986, 61-55944
Int. Cl.[4] F16C *17/02*
U.S. Cl. 384—295 **19 Claims**



1. A structure including a bearing unit installed within a wall of an industrial machine comprising

a wall of an industrial machine having a generally planar portion of a first thickness and having a hole therethrough of predetermined circumference;

an elongated housing having a length, extending into said hole, at least as great as said first thickness of said generally planar portion of said wall of the industrial machine, and extending through said generally planar portion of said first thickness of said wall while in contact with a substantially major portion of said circumference of said hole in said wall;

said elongated housing having an inner bore, and an external thread extending along at least a portion of the length of said elongated housing;

holding means to hold said housing and said wall stationary relative to each other;

said holding means including

said external thread,

receiving means to receive said external thread,

opposing means to oppose the force of said external thread being received in said receiving means;

and at least one bushing press fitted within said inner bore of said elongated housing.

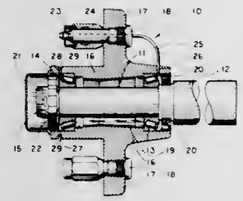
4,784,500

HUB LUBRICATION SYSTEM

B. Robert Prokop, Seminole, Okla., assignor to Hayes Axle, Inc., Seminole, Okla.

Filed Jun. 25, 1987, Ser. No. 68,280
Int. Cl.[4] F16C *33/66*
U.S. Cl. 384—462 **28 Claims**

1. A system for lubricating a hub assembly, said hub assembly including a spindle having an inner end attachable to an axle and an outer free end, inner and outer bearing assemblies spaced along said spindle, a hub body around said spindle and rotatable on said bearing assemblies, and a wheel mounting flange extending radially outwardly of said hub body and having lug bolts extending axially outwardly therefrom; the system comprising a grease fitting mounted in one of said lug



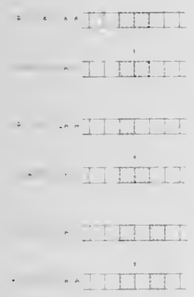
bolts; means to transfer grease applied at said grease fitting to a location internally of said hub body on the inner side of said inner bearing assembly; and means permitting the controlled discharge of grease from said hub body to indicate a complete greasing of the hub assembly.

4,784,501

METHOD OF ENHANCING FINE LINE OF PRINTER AND RELATED CIRCUIT

Masato Takami, and Akio Akao, both of Hirakata, Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed May 18, 1987, Ser. No. 51,729
Claims priority, application Japan, May 20, 1986, 61-117100
Int. Cl.[4] B41J *3/12, 3/20*
U.S. Cl. 400—120 **15 Claims**



1. A method for enhancing a fine line in a direction perpendicular to an arraying direction of the printing elements of a printer, in which said printer prints by making a plurality of linearly-arrayed printing elements selectively drive while relatively moving said printing elements and printing medium in the direction perpendicular to the arraying direction of said printing elements comprising the following steps of;

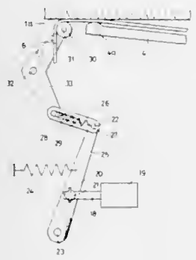
checking whether each of said plurality of printing elements is in the active state or not;

checking whether printing elements in the positions adjoining both sides of each active printing element are in the active state or not; and

causing either of two printing elements adjoining both sides of said active printing elements to be in the active state only when said two printing elements adjoining both sides of said active printing elements are inactive.

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4,784,502
THERMAL PRINTER
Hiroshi Kobayashi, Iwate, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Aug. 21, 1987, Ser. No. 88,695
Claims priority, application Japan, Nov. 5, 1986, 170065[U]
Int. Cl.[4] B41J *35/04*
U.S. Cl. 400—248 **2 Claims**



1. In a thermal printer including a thermal head movable in a scanning direction along a platen supporting a recording paper thereon, an ink ribbon having a thermally transferrable ink layer interposed between said thermal head and the recording paper for effecting printing by application of heat from said thermal head to said ink ribbon to transfer ink from the ink layer to the paper, a ribbon guide roller movable toward and away from said platen for guiding said ink ribbon to be pressed toward the paper and separated therefrom on a downstream side of said thermal head with respect to the scanning direction of said thermal head, and operating means for operating said ribbon guide roller for an erasing operation so as to move it in pressure contact for holding said ink ribbon in contact with the paper on the downstream side of said thermal head to allow ink on the paper to bond to the ink layer and, subsequently, to be lifted off from the paper,

the improvement wherein said operating means for said ribbon guide roller comprises:

a pivotable arm (**33**) supporting said ribbon guide roller on one end portion and having a second end portion thereof which is movable so as to pivot said first end portion;

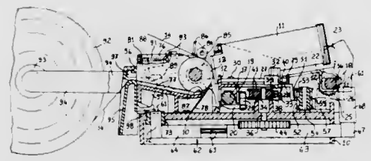
a pivotable lever (**25**) having a first portion, and a second portion which is actuatable so as to pivot said first end portion;

a solenoid (**19**) connected to said second portion of said lever which is actuatable ON and OFF for pivoting said first portion of said lever to a pivoted position and for releasing said lever back to a release position, respectively;

an arm driving spring (**26**) connected between said second end portion of said arm and said first portion of said lever for transmitting the force of said first portion of said lever, when pivoted to said pivoted position by actuation of said solenoid ON, through a tensile spring constant of said arm driving spring to said second end portion of said arm,

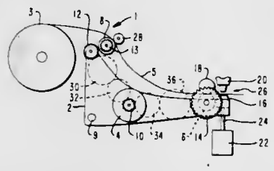
whereby said ribbon guide roller on said first end portion of said arm is pressed against the ink ribbon and the paper on said platen through the tensile force of said arm driving spring, which dampens the transmitted force and ensures that said ribbon guide roller is gradually brought into pressure contact with the paper in order to avoid cutting said ink ribbon and to accomodate different thicknesses of paper.

4,784,503
SERIAL DOT PRINTER WITH MOVABLE HEAD-CARRYING CARRIAGE
Francesco Bettini, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Mar. 11, 1987, Ser. No. 24,457
Claims priority, application Italy, Mar. 11, 1986, 67191 A/86
Int. Cl.[4] B41J *25/30*
U.S. Cl. 400—320 **8 Claims**



1. A serial dot printer including a transversely movable carriage, a printing head capable of printing dots during each stroke of the carriage in both directions, a closed loop toothed belt trained round a pair of toothed pulleys so as to have two parallel runs extending in the direction of movement of the carriage, a continuously rotating electric motor for driving one of said pulleys in one rotating direction, and drive means attached to said belt and coupled to said carriage so as to move the carriage alternately in said two directions when said drive means moves along a first one and a second one of said runs, said drive means including an element secured to said belt in a gap between two consecutive teeth thereof, said pulleys being each one provided with at least one groove to house said element when said drive means runs round said pulleys, said pulleys being each one provided with a pair of circular flanges, wherein said drive means includes a block member slidably guided on a pair of rectilinear bars provided on said carriage perpendicular to its displacement direction, a C-shaped member embracing said belt and having a pair of limbs each one substantially coplanar with one flange of each of said pair of flanges, each one of said limbs being adapted to engage a recess provided in each flange coplanar thereto, said element being formed of a pin carried by said block member and mounted on said limbs as to block said C-shaped member on said belt, said pin being rotatably coupled at least with one of said C-shaped member and said block member so as to cause said C-shaped member to rotate when moving round said pulleys.

4,784,504
MULTI-FUNCTION PRINTER
Tsutomu Hamano, Odawara, and Kunio Numata, Fujisawa, both of Japan, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 30, 1987, Ser. No. 79,852
Claims priority, application Japan, Aug. 29, 1986, 61-201900
Int. Cl.[4] B41S *15/04*
U.S. Cl. 400—605 **7 Claims**



1. Printing apparatus which is capable of printing in a first mode of operation on a first kind of record media which is provided from a supply contained within the printing apparatus, said supply being continuous in configuration, said printing apparatus also being capable of printing in a second mode of operation on a second kind of record media which is introduced into the printing apparatus from its exterior, comprising:

a printhead;

a platen;

a platen arm pivotally mounted in the printing apparatus and having the platen secured thereto in operative relation to said printhead;

operating means for shifting said platen arm between first and second positions;

feed roller means for feeding both first and second kinds of record media:

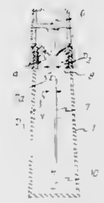
shift roller means mounted in the printer apparatus for withdrawing or feeding said first kind of record media;

reversible motor means mounted on said platen arm for driving said feed roller means and said shift roller means at selected times;

first transmitting means adapted to transmit the motion of said motor means to said feed roller means; and

second transmitting means adapted to transmit the motion of said motor means to said shift roller means when said platen arm is in said first position, whereby said first kind of record media can be withdrawn from a position said printhead and a space is opened between said printhead and said platen for introduction of said second kind of record media when said platen arm is in said first position, and whereby said first or said second kind type of record media can be fed out of said printing apparatus when said platen arm is in said second position.

4,784,505
CONTAINER WITH STRIPPER
Klaus-Peter Dahm, Lehnhast 48, 3052 Bad Nenndorf, Fed. Rep. of Germany
Filed May 29, 1981, Ser. No. 268,191
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032409
Int. Cl.[4] A45D *34/00, 40/26*
U.S. Cl. 401—122 **5 Claims**



1. A dispenser, adapted to apply a liquid to an object, comprising in combination,

a container for a liquid,

a closure for said container, and

an applicator connected to said closure and normally disposed in said container, said applicator including

a rod comprising a near end portion connected to said closure, a free end portion of predetermined maximum outside diameter, and between said end portions an intermediate portion of a certain length and of reduced diameter smaller than said maximum outside diameter, said free end portion including, near the tip, means for receiving and dispensing said liquid,

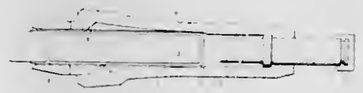
said applicator being movable in opposite longitudinal directions to and from a rest position wherein said rod is normally positioned uprightly in said container and at least said receiving and dispensing means is adapted to dip into the liquid,

a stripper secured in said container and having a central opening of an internal diameter, said maximum outside diameter of said rod being at least equal to said internal diameter of said opening in said stripper, and the reduced diameter of said rod being smaller than said internal diameter of said opening, and

engaging means between said container and said closure for selectively engaging said closure to said container and, respectively, disengaging said closure from said container by relative movement therebetween in said longitudinal directions throughout a predetermined distance,

said certain length of said intermediate portion of reduced diameter being at least equal to said predetermined distance, whereby there will be facilitated removal by said stripper of any liquid from the free end portion of maximum diameter of said rod, while the intermediate portion of reduced diameter of said rod will remain substantially free of any contact with the internal contour of said stripper during removal of said applicator from said rest position.

4,784,506
BREAKABLE AMPULE WITH SWAB
Robert Koreska, Paris, and André DeSaint-Leon, Meaux, both of, France, assignors to Kores Holding Zug AB, Zug, Switzerland
PCT No. PCT/FR86/00244, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/00487, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 8, 1986, Ser. No. 26,708
Claims priority, application France, Jul. 17, 1985, 85 10939
Int. Cl.[4] A47L *25/00, 17/00;* **A61M** *35/00*
U.S. Cl. 401—132 **5 Claims**



1. A device for applying a predetermined quantity of a liquid to a surface, said liquid being contained in a breakable ampule (**13**) which is substantially cylindrical and enclosed in a flexible and resistant casing closed at one end with an absorbent material, wherein said device comprises a tubular body (**1**) open at one end (**2**), accommodating the ampule (**13**) and comprising at least two flexible blades (**3**) and (**4**) formed in its wall, placed substantially opposite each other, each of these blades having at least one tappet (**7**) and (**8**) facing inward and offset longitudinally with respect to the corresponding tappet of the other blade.

4,784,507
FILING DEVICE FOR LAYERS OF SHEETS
Hans Vetter, Stuttgart, Fed. Rep. of Germany, assignor to Merz und Vetter GmbH, Fed. Rep. of Germany
Filed Aug. 13, 1986, Ser. No. 896,447
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530632
Int. Cl.[4] B42F *3/00, 13/10*
U.S. Cl. 402—13 **32 Claims**

1. A folder for retaining punched sheets, comprising:

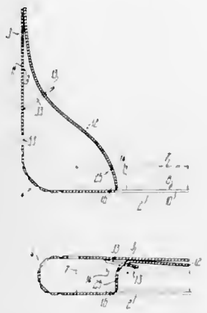
an integral one piece folder cut out from a flat sheet of bendable material which springs back from bending deformation, the folder having two side-pieces joined at a central folding joint zone defining a center line, the two side-pieces being foldable together and apart around the center line thereby to cover and to uncover the sheets when placed in the folder;

at least one filing tongue also cut out from the flat sheet of bendable material and integral with the side-pieces, the filing tongue being dimensioned and positioned to extend through a punched hole in the punched sheets and thereby to retain the sheets in the folder, the filing tongue being

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articulated to one of the side-pieces by a hinge defining a tongue joint axis parallel to the center line and spaced from the center line;

a receptacle bow defining an insert strip for receiving the filing tongue, the receptacle bow also being integrally cut out from said flat sheet, the receptacle bow being a generally U-shaped piece articulated at its ends to the other of said two side-pieces at a weakened hinge defining a strip joint axis parallel to the center line and spaced from the center line by a distance at least only slightly less than a distance between the tongue joint axis and the center line, the receptacle bow being folded upwardly from said other of the two side pieces and away from the center line, the



receptacle bow slidably receiving the filing tongue and an inner surface of the receptacle bow defining a transverse boundary for the filing tongue spaced farther from the center line than the tongue joint axis is spaced from the center line;

The filing tongue sliding freely through the receptacle bow due to forces along the filing tongue as the folder is opened and closed, the receptacle bow being folded over towards said other of the two side pieces when the folder is closed,

whereby the filing tongue remains substantially straight against said other of the two side pieces, being pushed as a non-folding compression member through the receptacle bow as the folder is closed.

4,784,508
TABULAR DIVIDER SHEETS
Brian M. Shannon, P.O. Box 9392, Fountain Valley, Calif. 92708
Filed Oct. 10, 1986, Ser. No. 917,986
Int. Cl.[4] B42F *13/00, 21/00, 21/08*; B42D *9/00*
U.S. Cl. 402—79 **10 Claims**

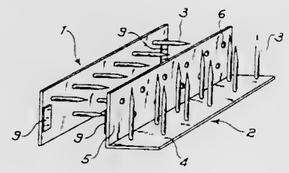


1. In a tabular indexing system having divider sheets placed between pages to be indexed, an indexing system having:

index insert sheets having index tabs along at least one edge; and

protective carriers having an enclosed pocket area for carrying said index insert sheets, said protective carriers being closed along at least two edges, thereby defining the enclosed pocket area, open along at least a first edge for allowing insertion of the index insert sheets such that the tabs of the index insert sheets extend beyond the pages to be indexed.

4,784,509
DEVICES FOR FIXING SUPPORT, JOINT OR HINGE ELEMENTS TO PANELS OF EXPANDED POLYSTYRENE, OR THE LIKE
Renato Gozzano, Milan, Italy, assignor to Lucifero S.r.l., Milan, Italy
Filed Aug. 5, 1986, Ser. No. 893,518
Claims priority, application Italy, Aug. 5, 1985, 21866 A/85
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—24 **12 Claims**



1. A system for mounting a pair of plate members on a panel having an edge surface and face surface wherein the panel is made of a readily penetrable material such as expanded polystyrene, the system comprising:

a first plate member having a first array of spikes projecting from a surface thereof;

a second plate member having a second array of spikes projecting from a surface thereof;

means for positively securing the first plate member to the second plate member in a position with said surfaces of the first and second plate members substantially normal with respect to one another and with said first and second array of spikes crossing one another;

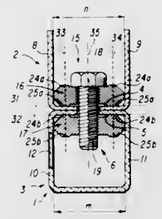
the system being mounted on the panel by mounting the first plate member on one of the surfaces of the panel by inserting the first array of spikes into the material thereof, and thereafter mounting the second plate member adjacent the other surface of the panel by inserting the second array of spikes into the material of the panel in a direction substantially perpendicular to that of the spikes of the first array of spikes and in such a manner that the first and second arrays of spikes cross one another and are proximate one another in the material when the first plate member is secured to the second plate member with the securing means.

4,784,510
STRUCTURE COMPOSED OF AT LEAST TWO STRUCTURAL ELEMENTS JOINED TOGETHER BY CONNECTION MEANS
Pier P. Messori, Pino Torinese, Italy, assignor to Iveco Fiat S.p.A., Turin, Italy
Filed Feb. 10, 1987, Ser. No. 12,946
Claims priority, application Italy, Feb. 11, 1986, 67099 A/86
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—25 **16 Claims**

1. A structure (1) comprising at least a first and a second structural element (2, 3) connected together in correspondence

with respective flat walls (4, 5) by connection means (6), characterised in that said connection means (6) comprise:

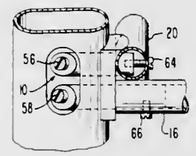
a first and a second plate (16, 17) each of which has at least two equidistant longitudinal projections (24*a*, 25*a*; 24*b*, 25*b*) provided with flat surfaces (28*a*, 29*a*; 28*b*, 29*b*) defining respective bearing faces (31, 32); said plates (16, 17) resting on respective opposing surfaces of said flat walls



(4, 5) in such a manner that the pairs of opposing projections (25*a*, 24*b*) define two parallel planes (33, 34); and

traction means (15) which lock said plates (16, 17) and said walls (4, 5) tightly together by exerting on these latter, by way of said projections (25*a*, 24*b*), a locking pressure along an axis (35) which is perpendicular to said bearing faces (31, 32) and lies between said projections (25*a*, 24*b*).

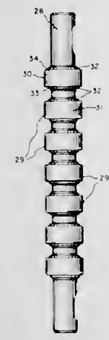
4,784,511
CONNECTOR FOR TUBULAR FRAME MEMBERS
Michael W. Greene, Incline Village, Nev., assignor to Little Lake Industries, Incline Village, Nev.
Filed Jun. 12, 1987, Ser. No. 61,835
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—169 **20 Claims**



1. A connector for a number of tubular frame members converging to a common location comprising: a connector body having a pair of spaced bars and means coupling the bars together, first ends of the bars being insertable into a first frame member a second end of one of the bars being insertable into a second frame member and the second end of the other bar being insertable into the third member; and means coupled with the bars for securing the body to the first, second and third frame members.

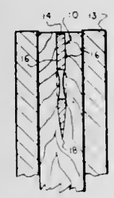
4,784,512
STEERING LINKAGE ARM ASSEMBLIES
Vernon C. Warner, St Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 12, 1985, Ser. No. 796,816
Int. Cl.[4] F16D *1/00*
U.S. Cl. 403—225 **4 Claims**

1. A pivotal drive pin or sleeve for the bearings of joint assembly mechanisms connecting the multiple units of track on track laying vehicles including a metallic pin or sleeve having at least one elastomeric bearing member bonded to said pin or sleeve, said elastomeric bearing member having a head and shoulder appearance with a larger diameter cylindrical portion



of elastomer having a smaller diameter cylindrical portion at each end of the larger portion.

4,784,513
TOOL WEDGE
Lewis E. Allen, P.O. Box 8026, Longview, Tex. 75607
Filed Jul. 17, 1987, Ser. No. 74,724
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—248 **3 Claims**



1. A wedge device of monolithic metal construction fabricated from an existing metal washer by grinding a portion to a tapered edge, the resulting wedge device having a circular outer perimeter and circular aperture, and

an upper extremity of sufficient thickness to resist deformation when hammered upon,

a lower extremity having a downwardly directed edge of sufficient sharpness to penetrate wood,

opposed substantially flat boundary surfaces in spaced apart relationship defining the general thickness of the device, and

said aperture communicating between said boundary surfaces in substantially centered relationship with respect to said perimeter.

4,784,514
SPACIAL JOINT FOR PARTS
Georgi B. Pantev, Sofia, Bulgaria, assignor to SP "Bulgarska Philatelia I Numizmatika", Sofia, Bulgaria
Filed May 7, 1987, Ser. No. 47,820
Int. Cl.[4] B25G *3/36*
U.S. Cl. 403—391 **6 Claims**

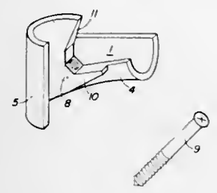
1. A spacial joint for joining two or more parts comprising two mating shells, each shell having at least two spacially angularly disposed members,

said members providing a clamping surface for engagement with a surface of the parts to be joined,

each shell being provided with a common mating edge

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between said members and on which there is formed a beveled edge portion and an engaging projection and an inclined opening through which a joining element may pass so as to join the two shells in mating relationship

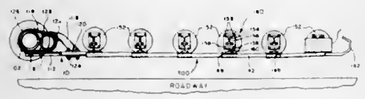


thereby engaging the projection of one shell with the beveled edge portion of the other shell and providing joining pressure on said clamping surface with respect to the surface of the parts to be joined.

4,784,515
COLLAPSIBLE HIGHWAY BARRIER

William G. Krage, Fair Oaks, and Owen S. Denman, Roseville, both of Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.

Continuation of Ser. No. 858,591, May 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 457,126, Jan. 11, 1983, Pat. No. 4,607,824. This application Feb. 23, 1988, Ser. No. 161,405
Int. Cl.[4] A01K *3/00*; E01F *15/00*
U.S. Cl. 404—6 **15 Claims**



1. A highway barrier for protecting an impacting vehicle from colliding with a roadside structure positioned alongside a roadway, said barrier comprising:

a beam having a forward end and a rearward end;

means, coupled to the rearward end of the beam, for rotatably mounting the beam to the roadside structure such that the beam is rotatable away from the roadway; and

a collapsible guardrail assembly mounted to the forward end of the beam, said guardrail assembly comprising;

a plurality of panels;

means mounting the panels together such that the panels extend alongside the roadway and mounting adjacent panels slidable with respect to one another to allow the panels to telescope together when struck by the impacting vehicle; and

means coupled to the panels and connectable to at least one roadside element for supporting the panels and allowing the panels to telescope together when struck by the impacting vehicle;

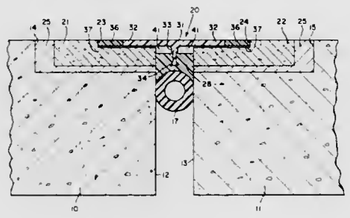
said panels and mounting means configured to deflect the impacting vehicle away from the roadway as the guardrail assembly telescopes together when struck by the impacting vehicle; and

said beam effective to deflect the impacting vehicle farther away from the roadway and the roadside structure as the beam rotates with respect to the roadside structure.

4,784,516
TRAFFIC BEARING EXPANSION JOINT COVER AND METHOD OF PREPARING SAME

Harold A. Cox, Rochester, N.Y., assignor to Harco Research, Inc., Rochester, N.Y.

Filed Feb. 10, 1988, Ser. No. 154,278
Int. Cl.[4] E01C *11/02, 11/04*
U.S. Cl. 404—69 **14 Claims**



1. An expansion joint for sealing the space between the spaced, confronting ends of a pair of adjacent, concrete roadway slabs having substantially coplanar upper surfaces, and spaced, confronting, transversely extending recesses formed in the confronting, upper edges thereof, comprising

a pair of elongate, prefabricated edger strips secured in said recesses in said slabs in spaced, confronting relation to each other, a portion of the upper surface of each of said strips having therein an elongate, transversely extending recess opening on the space between said slabs, and the remaining portion thereof being substantially coplanar with the upper surfaces of said slabs,

a resilient sealing element secured in and extending across the space between said slabs adjacent the upper end of said space, and

an elongate cover member having a generally plate-shaped, traffic-bearing section overlying the upper end of said space between said slabs and projecting at opposite sides thereof, respectively, into said recesses in said edger strips,

said cover member having an integral web section projecting downwardly from said traffic-bearing section and embedded adjacent its lower end in said sealing element, thereby to retain the upper surface of said traffic-bearing section substantially coplanar with the upper surfaces of said slabs.

4,784,517
METHOD AND DEVICE FOR WORKING OF ROAD SURFACES

Sven A. Bergqvist; Jan-Gunnar Hedlund, both of Sandviken, and Bert G. Levefelt, Mariestad, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Sep. 13, 1985, Ser. No. 775,687
Claims priority, application Sweden, Sep. 18, 1984, 8404673
Int. Cl.[4] E01C *23/12*
U.S. Cl. 404—75 **16 Claims**

1. A method for working of road surfaces, such as planing of roads having gravel or oil-gravel surfaces and ice-scraping, comprising rotatably mounting a plurality of wear elements in a support device having a base member and a holder body, moving the plurality of wear elements along the road surface with said wear elements being arranged in a row in said holder body and said base member connected to means for working the road surfaces which permits substantially only linear movement of said support device, including causing the wear elements to rotate about their longitudinal axis due to abutment against the road surface.

3. A device for working of road surfaces, such as planing of road having gravel or oil-gravel surfaces and ice-scraping, comprising a mounting plate for attachment to a machine for working of the road surface, and a plurality of wear elements having tips arranged in a row on said mounting plate, wherein the wear elements are rotatably mounted on the mounting

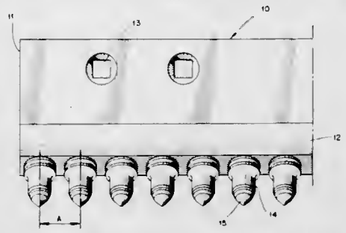
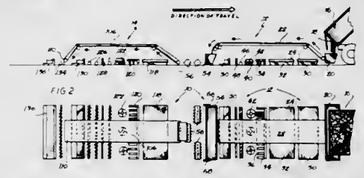


plate to remove material from the road surface to a substantial extent by crushing the material under rolling contact between the tips and the road surface.

4,784,518
DOUBLE-STAGE REPAVING METHOD AND APPARATUS

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving, Inc., Lawrence, Kans.

Filed Nov. 17, 1987, Ser. No. 121,897
Int. Cl.[4] E01C *23/14, 19/00*
U.S. Cl. 404—79 **13 Claims**



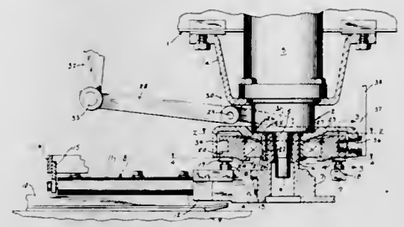
1. A method of restoring an asphalt roadway comprising the steps of heating an upper layer of existing roadway, scarifying the heated existing roadway surface to a predetermined depth to obtain a broken, loosened road material, adding a recycling agent to the loosened road material, mixing and screeding said loosened road material to form a recycled hot mix on the roadway, adding a new hot mix to said recycled mix in a heated condition, subjecting the recycled hot mix and the new hot mix to a milling action of predetermined depth to form a mixed material and leave a milling cut in the roadway, picking up and conveying the mixed material to a paving station, heating the part of the roadway that is at and below the aforesaid milling cut, scarifying said last-mentioned heated roadway part and combining the mixed material with the scarified roadway part at said paving station to form a new road surface.

4,784,519
DIRECTIONAL CONTROL MECHANISM FOR SURFACE WORKING MACHINE

Thomas G. Artzberger, Menomonee Falls, Wis., assignor to M-B-W Inc., Slinger, Wis.

Filed Mar. 26, 1987, Ser. No. 30,368
Int. Cl.[4] E01L *19/22, 19/42*
U.S. Cl. 404—112 **14 Claims**

1. A surface working machine, comprising a frame, at least one rotor mounted on the frame and including a rotatable vertical shaft, surface working means operably connected to said shaft and including a plurality of radially extending blade means disposed to contact a surface to be worked as said rotor rotates, each blade means being mounted for tilting movement about a horizontal axis, first operating means for simultaneously tilting each blade means about the respective horizontal axis to vary the pitch of the blade means in unison, and second operating means for individually tilting each blade means about the respective horizontal axis as said rotor rotates



to effect directional control of the machine, while the motor is maintained in a vertical orientation.

4,784,520
SHORELINE PROTECTING SYSTEM AND APPARATUS

C. Leigh Stevens, 3922 Norton Hills Rd., Muskegon, Mich. 49441

Filed Dec. 1, 1986, Ser. No. 936,513
Int. Cl.[4] E02B *3/00*
U.S. Cl. 405—21 **10 Claims**



1. An apparatus for protecting the shoreline of a body of water, closing a breach in a levee and the like comprising a plurality of rigid hollow structural units of generally triangular cross-sectional configuration for positioning a single unit or multiple units in an end-to-end relation along a shoreline or in a levee break, each of said units, being watertight and buoyant, means on each unit to enable non-buoyant material to be placed in the unit after it has been positioned in desired orientation for retaining the unit in place to form a barrier to water flow beyond the unit or units.

4,784,521
OCEAN DIVERSION WALL

David T. Martin, Rte. 3, Box 175 DM, Sherrills Ford, N.C. 28673, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007

Filed Feb. 3, 1987, Ser. No. 10,588
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—28 **4 Claims**

1. An ocean diversion wall adapted to be placed within coastal water for preventing erosion due to wave action, said wall comprising a plurality of off shore facing segments formed as one continuous unit, each of said segments including a base portion supported on the ocean floor, said base portion having a front and rear end, and a curved water receiving surface which extends rearward and upward and terminates in a reverse portion which extends forward to deflect the water towards the incoming waves, further comprising a forward perforated wall secured to said front end of said base portion to allow the incoming wave to pass through, said perforated wall being shorter in height than said rear end of said base portion;

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a deflector plate pivotably mounted on said perforated wall, extending rearwardly to a point spaced from and lower than



said reverse portion, thus defining a channel for water to curve therethrough back towards said waves.

4,784,522

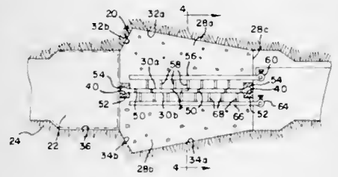
METHOD AND APPARATUS FOR EFFECTING HIGH PRESSURE ISOLATION OF LIQUIDS

Dennis Mraz, 410 Jessop Ave., Saskatoon, Saskatchewan, Canada S7N 2S5

Continuation-in-part of Ser. No. 930,424, Nov. 14, 1986. This application Aug. 26, 1987, Ser. No. 89,726

Int. Cl.[4] E21D *9/00*

U.S. Cl. 405—132 **12 Claims**



1. An isolation structure for use in an underground passage defined within a rock formation having a microfracture system through which liquid seepage may occur, said isolation structure comprising a plurality of dam members, expansion joint means operatively interconnecting said dam members in predetermined surface adapted for substantial surface contact with an inner peripheral surface of said underground passage when disposed therein, said expansion joint being operative to effect movement of said dam members when disposed within said underground passage to effect pressurized engagement between said external surfaces of said dam members and the inner peripheral surface of said passage whereby to enable predetermined stress to be achieved in the rock formation.

4,784,523

METHOD AND APPARATUS FOR REMOTELY ORIENTING A FLOWLINE FOR CONNECTION TO A SUBSEA STRUCTURE

Bill G. Louis, and Ronald C. Mack, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Mar. 26, 1987, Ser. No. 31,342

Int. Cl.[4] F16L *1/04;* **E21B** *43/01*

U.S. Cl. 405—169 **27 Claims**

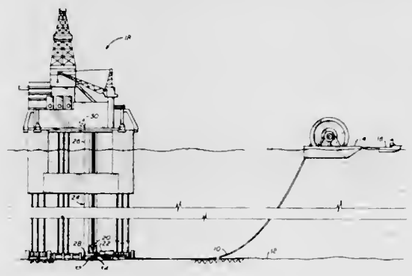
1. An apparatus for aligning a flowline having a lead end with an offshore structure extending upwardly from the bottom of a body of water for connection to a riser having a lower end and being associated with the offshore structure comprising:

a pipe guide for holding the lead end of the flowline and for directing the lead end of the flowline upwardly, the pipe guide having a lead end and being capable of being pulled along the bottom of the body of water, the pipe guide being attached to the lead end of the flowline;

a structural guide having a front side, the structural guide being attached to the offshore structure and being rotatable along a substantially vertical axis so that the front side faces toward the pipe guide;

a pull-in device connected to the offshore structure for pulling the pipe guide to the structural guide for connection thereto;

at least one riser guidepost for directing the lower end of the riser into alignment with the lead end of the flowline for



connection thereto once the pipe guide is connected to the structural guide;

at least one riser guidepost receptacle attached to the pipe guide in such a manner that the riser guidepost receptacle has substantially the same angular orientation as the lead end of the flowline, the riser guidepost receptacle being adapted to receive the riser guidepost; and

a riser connection device for connecting the lower end of the riser to the lead end of the flowline, the riser connection device being attached to the lower end of the riser and being adapted to mate with the riser guidepost and seat upon the lead end of the flowline.

4,784,524

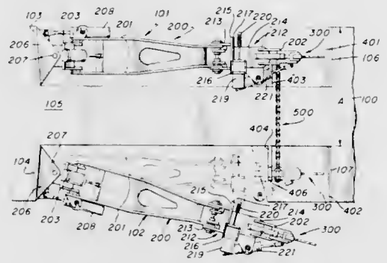
RAILROAD CABLE LAYING APPARATUS WITH PLOW BLADE SUPPORT AND DUAL PLOW TETHERING

Herman Stine, Dillsburg, Pa., assignor to Henkels & McCoy, Inc., Blue Bell, Pa.

Filed Apr. 14, 1987, Ser. No. 38,128

Int. Cl.[4] F16L *1/02*

U.S. Cl. 405—174 **7 Claims**



1. An apparatus for holding the plow blade of a railroad car-mounted cable laying device, said apparatus comprising:

support means on said railroad car for supporting said plow blade thereon; and

stop means on said support means for prohibiting said plow blade from sliding off said support means.

4,784,525

APPARATUS FOR USE IN INSTALLING A PIECE OF EQUIPMENT HORIZONTALLY ON A SUBMERGED UNIT AND FOR REMOVING IT THEREFROM

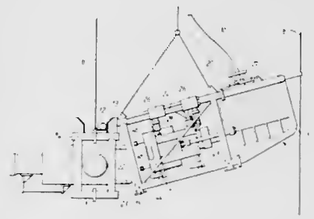
Daniel Francois, Marseille, France, assignor to Total Compagnie Francaise des Petroles, Paris, France and Den Norske Stats Oljeselskap Als, Stavanger, Norway

Filed Sep. 29, 1987, Ser. No. 102,457

Claims priority, application France, Sep. 29, 1986, 86 13508

Int. Cl.[4] B63C *11/00*

U.S. Cl. 405—191 **3 Claims**



1. Apparatus for installing a piece of equipment horizontally on a submerged unit and for removing it therefrom, comprising a receiving structure forming part of the submerged unit, a movable servicing module having a tubular frame defining a longitudinal direction and which is adapted to support said piece of equipment and to come up against the receiving structure with the frame in a substantially horizontal position, said longitudinal direction then being arranged substantially horizontally, complementary catching means on upper parts of said tubular frame and said receiving structure, for permitting said tubular frame, in an inclined position, to catch by means of its said upper part on said upper part of said receiving structure and to pivot relative to said structure to come up against said structure in said horizontal position, controllable interlocking means for locking said tubular frame to said receiving structure, longitudinal slideways provided on said tubular frame, slidable supports mounted on said slideways, a cradle provided with supporting means for supporting said piece of equipment and with bolt-screwing means for bolting said piece of equipment to said submerged unit, connection means between said cradle and each of said sliding supports for permitting transverse adjustment of their relative position, a longitudinal-travel jack for moving said cradle relative to said tubular frame, and complementary mutual engagement means on said submerged unit and on said piece of equipment for centering said piece of equipment on said submerged unit by transverse adjustment of the relative position of said cradle and said sliding supports which is permitted by said connection means.

4,784,526

ARCTIC OFFSHORE STRUCTURE AND INSTALLATION METHOD THEREFOR

J. Ward Turner, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Jun. 4, 1987, Ser. No. 58,110

Int. Cl.[4] E02B *17/02*

U.S. Cl. 405—204 **20 Claims**

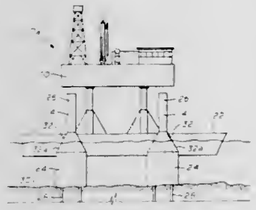
1. A support leg for an arctic offshore platform, comprising:

a support leg base resting on an ocean bottom location, said support leg base defining a vertical aperture extending through said support leg base;

a central column secured to said support leg base and extending upward from said support leg base to a position a spaced distance above the ocean surface, said central column defining a vertical aperture aligned with said support leg base vertical aperture;

a plurality of well conductors extending downward through said central column to a position below the bottom of said central column;

a plurality of piles extending into the ocean bottom, each of said piles being secured to said support leg base; and



a sloped-sided member defining a central aperture, said sloped-sided member being supported atop said base with said central column extending through said sloped-sided member central aperture, said sloped-sided member extending above the ocean surface.

4,784,527

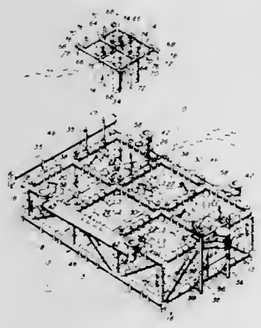
MODULAR DRILLING TEMPLATE FOR DRILLING SUBSEA WELLS

Andrew F. Hunter; Wen J. Wang, and Jeffrey L. Mueller, all of Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed May 29, 1987, Ser. No. 55,678

Int. Cl.[4] E02B *17/00;* **E21B** *43/01*

U.S. Cl. 405—207 **20 Claims**



1. A modular template for drilling subsea oil and gas wells, said modular drilling template comprising:

(a) a frame constructed of light-weight tubular steel members, said frame defining a plurality of generally rectangular, pod-receiving openings, said plurality of openings having no drill string guide means permanently affixed thereto;

(b) guide rods projecting upwardly from said tubular steel members;

(c) latch-engaging means attached to said frame;

(d) a plurality of well pods receivable in said openings in said frame, each well pod having

(i) at least one cylindrical sleeve for guiding a drill string, or the like;

(ii) pod guide sleeves for engaging said guide rods to

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properly position said well pod relative to said frame opening, and

(iii) a latch mechanism insertable into said latch-engaging means so as to prevent inadvertent removal of said well pod from said frame opening.

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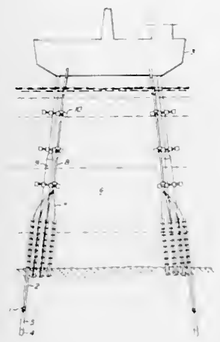
IMPROVEMENT WITH FREEZING USING DOWN-HOLE REFRIGERATION UNITS

August V. Spalding, Pinole; Richard C. Lundberg, Larkspur; Ronald O. Hamburger, Pacifica; Mahmoud H. Sabet, Hayward, and Gerald F. Borrmann, Lafayette, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 833,293, Feb. 25, 1986, Pat. No. 4,723,876. This application Jan. 30, 1987, Ser. No. 8,700

Int. Cl.[4] E02D *5/46*

U.S. Cl. 405—226 **5 Claims**



1. The method of installing a refrigeration unit in a tubular pile on an offshore structure which comprises:

connecting a refrigeration unit to a drill string;

lowering said refrigeration unit into the tubular pile with an oil well work-over rig;

grouting said refrigeration unit to the tubular pile; and

connecting utility lines to said refrigeration unit.

4,784,529

MOORING APPARATUS AND METHOD OF INSTALLATION FOR DEEP WATER TENSION LEG PLATFORM

Andrew F. Hunter, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 6, 1987, Ser. No. 105,941

Int. Cl.[4] B63B *35/44;* **E02D** *5/54*

U.S. Cl. 405—227 **13 Claims**

1. A method of mooring an offshore platform in a body of water having a surface and a floor comprising the steps of:

locating a plurality of anchoring means on the floor of the body of water, the anchoring means adapted for receipt of a plurality of mooring tendons through a side entry opening therein;

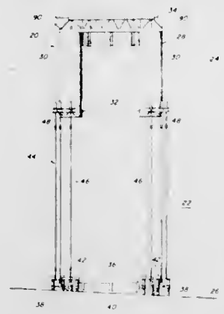
stationing a semi-submersible floating structure on the surface of the body of water above said anchoring means, said floating structure including a plurality of external tendon receptacles adapted for side entry receipt of said plurality of mooring tendons, said tendon receptacles being located at an initial distance above said anchoring means;

providing a plurality of one piece, substantially rigid tendons disposed substantially horizontally near said surface and adjacent said floating structure, said tendons having enlarged top and bottom end connectors and an actual length which is greater than said initial distance;

swinging the enlarged bottom end connector of said one of said tendons downwardly into a position adjacent one of said plurality of anchoring means;

pulling said enlarged bottom end connector of said one of said tendons through said side opening in said one of said anchoring means;

lifting said enlarged bottom end connector upwardly into seated engagement with said anchoring means;



positioning the enlarged top end connector of one of said tendons in one of said tendon receivers;

adjusting an effective length of said one of said tendons so that said effective length is less than said initial distance, and

repeating said steps of positioning, swinging, pulling and adjusting for each of said plurality of tendons whereby said offshore platform is moored in the body of water.

4,784,530

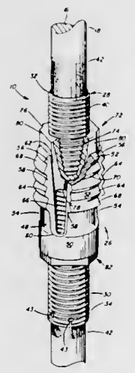
ROOF BOLT APPARATUS

Stanley J. Price, Jr., 4344 Brownsville Rd., Pittsburgh, Pa. 15227

Continuation of Ser. No. 907,900, Sep. 16, 1986, which is a continuation-in-part of Ser. No. 687,731, Dec. 31, 1984, abandoned. This application Oct. 9, 1987, Ser. No. 107,258

Int. Cl.[4] E21D *20/02, 21/00*

U.S. Cl. 405—259 **15 Claims**



1. An expansion shell assembly comprising,

a sleeve having a body portion with an upper end portion and a lower end portion and an axial bore extending through said body portion,

said body portion having an inner surface and an outer threaded surface,

a camming plug having a threaded axial bore and an outer surface, said camming plug threadedly engaged to said sleeve at a preselected location on said sleeve outer threaded surface,

an expandable shell having a plurality of longitudinally extending fingers spaced from one another by longitudinal slots,

said fingers each having an inner surface and an outer surface, each finger inner surface abutting said camming plug outer surface,

said camming plug being movable on said sleeve outer threaded surface relative to said expandable shell to exert an outward force upon said inner surfaces of said fingers to expand said fingers outwardly from said sleeve, and

said expansion shell assembly arranged to be secured to a roof bolt at a preselected location along the length of said roof bolt with the inner surface of the sleeve secured to the outer surface of said bolt.

4,784,531

BENDABLE ROOF BOLT WITHOUT NOTCH

Frank Calandra, Jr., Pittsburgh, Pa., assignor to Jennmar Corporation, Pittsburgh, Pa.

Filed May 29, 1987, Ser. No. 56,581

Int. Cl.[4] E21D *20/02*

U.S. Cl. 405—261 **9 Claims**



1. A bendable roof bolt for use in a mine to support a mine roof comprising,

a grade 60 rebar having a preselected length and a uniform cross sectional diameter of about five-eighths of an inch, said rebar having an end portion arranged to be inserted in a bore hole drilled in a mine roof and an opposite end portion,

said rebar preselected length being greater than the distance between said mine roof and the floor of said mine,

means for manually bending said rebar at a predetermined location along said rebar preselected length to form a bent rebar with a bent portion, said end portion of said bent rebar spaced angularly from said opposite end portion,

means for inserting said bent rebar end portion in said bore hole and advancing said bent rebar in said bore hole until a portion of said bent portion abuts said mine roof adjacent said bore hole, and

means for manually rebending said bent rebar at said predetermined location along said rebar preselected length after said rebar end portion is inserted in said bore hole to at least partially straighten said rebar bent portion and allow said rebar to be advanced in said bore hole.

4,784,532

MINE ROOF SUPPORTS

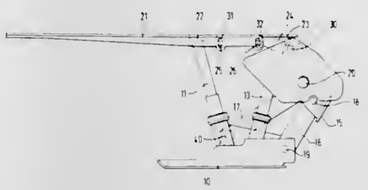
Kenneth D. Prescott, Leigh, England, assignor to Gullick Dobson Limited, Lancashire, England

Filed Jun. 19, 1987, Ser. No. 63,945

Claims priority, application United Kingdom, Jun. 26, 1986, 8615666

Int. Cl.[4] E21D *17/05*

U.S. Cl. 405—296 **5 Claims**



1. A mine roof support, comprising:

a mine floor engaging base;

an inclined rear shield;

linkage means for pivotally connecting said inclined rear shield and said base;

a mine roof engaging canopy pivotally connected to said inclined rear shield, said canopy having a front and a rear and a longitudinal axis extending between said front and rear, said canopy including first and second canopy parts each having a mine roof contacting upper surface;

at least two spaced-apart pivotal connecting means for connecting said first and second canopy parts together for relative movement, said at least two spaced-apart pivotal connecting means each having a pivotal axis, said pivotal axes extending parallel each other and transversely to said longitudinal axis, said at least two spaced-apart pivotal connecting means permitting relative rotational movement of said first and second canopy parts about said pivotal axes and relative linear movement in an upward direction transverse to said pivotal axes;

first hydraulic jack means extending from said base to said first canopy part;

second hydraulic jack means extending from said base to said second canopy part;

said first and second canopy parts being movable relative to each other about said at least two spaced-apart pivotal connecting means between a first configuration in which said roof contacting surfaces of said first and second canopy parts are substantially coplanar with each other for contacting a substantially planar mine roof, a second configuration in which said roof contacting surfaces of said first and second canopy parts from an obtuse angle between each other for contacting a convex mine roof, a third configuration in which said roof contacting surfaces are downwardly inclined with respect to each other for contacting a concave mine roof, a fourth configuration in which said roof contacting surface of said first canopy part is downwardly stepped with respect to said roof contacting surface of said second canopy part for contacting a correspondingly stepped mine roof, and a fifth configuration in which said roof contacting surface of said first canopy part is upwardly stepped with respect to said roof contacting surface of said second canopy part for contacting a correspondingly stepped mine roof.

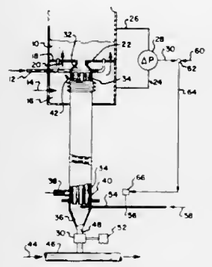
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4,784,533

SOLIDS FEEDER

Bard C. Teigen, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 14, 1986, Ser. No. 922,315
Int. Cl.[4] B65G *51/16*
U.S. Cl. 406—14 **4 Claims**



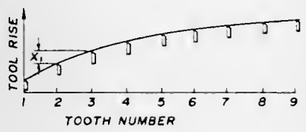
1. An apparatus for controlling the level of a fluidized bed of solid granular material comprising:
(a.) a bed drain pipe connected to the fluidized bed for receiving solid granular material therefrom, said drain pipe having a first flow area;
(b.) at least one supply pipe connected to receive the solid granular material from said bed drain pipe;
(c.) a substantially conical transition section connected to receive the granular solid material from said supply pipe, said conical transition section having an upper half;
(d.) a feed pipe connected to receive the solid granular material from said transition section, said feed pipe having a second minimum flow area less than said first flow area;
(e.) a transport pipe located below and connected to receive the solid granular material from said feed pipe;
(f.) air injection means for injecting air into said transition section;
(g.) means for generating a signal indicative of a pressure drop across the fluidized bed;
(h.) means for comparing the signal generated in paragraph (g.) to a desired fluidized bed level set point input;
(i.) means for establishing an error signal based on the comparison made in paragraph (h.); and
(j.) means for modulating air flow through said air injection means in response to said error signal.

4,784,534

TURN BROACH WITH REDUCED WEAR TOOTH CONFIGURATION

Brian D. Kaminski, Troy, and Pulak Bandyopadhyay, Rochester Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 13, 1987, Ser. No. 37,660
Int. Cl.[4] B23D *43/02*; B23B *5/18*
U.S. Cl. 407—19 **1 Claim**



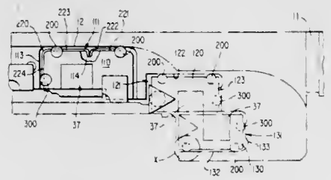
1. In a cutting tool of the type that has a series of N cutting teeth used to machine a layer of thickness T from the surface of a workpiece that rotates about an axis as the tool is advanced along a straight line perpendicular to said axis, the improvement comprising,
said teeth being configured such that the incremental advance of the first tooth is determined according to the formula T times (A/100)/[1-(1-A/100))expN] where N is the total number of teeth and A stands for a predetermined percentage of successive decrease in the incremental tooth advance, and with the remaining teeth in the series being is less than the incremental advance of each previous tooth according to the formula Xi=[(Xi-1) (1(A/100)))], where "i" stands for the second through the Nth tooth.

4,784,535

CUTTING TOOL

Josef Reinauer, Sigmaringen, Fed. Rep. of Germany, assignor to Firma Gottlieb Gühring, Ebingen, Fed. Rep. of Germany

Filed Mar. 30, 1987, Ser. No. 31,281
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611672
Int. Cl.[4] B23B *27/16*
U.S. Cl. 408—173 **22 Claims**



1. A cutting tool, comprising:
at least one exchangeable cutting blade mounted on a parallelpiped cutting blade holder which is adapted to be fixed at a tool body by a setscrew passing through the cutting blade holder such that the holder is pressed flat against a first recess surface and, at the same time, in the direction of a second recess surface extending at an angle with respect to the first one, the setscrew penetrating the cutting blade holder with clearance for freely adjustable fastening such that it includes an angle of substantially the same size with both recess surfaces and presses the cutting blade holder against the second recess surface by two adjustable support members (**200**) of which at least one is designed as a rotatable eccentric supporting pin the axis of which extends substantially parallel to the associated second recess surface and which is supported in a fitting recess of the cutting blade holder or of the tool body, and
a hairpin-type (**220**) spring having a bending portion (**221**) wherein the supporting eccentric pin (**220;400;220';202'**) is resiliently held in the fitting recess (**205;127**) by engaging said bending portion (**221**) of said hairpin-type spring (**220**).

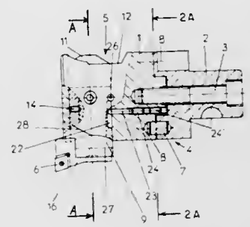
4,784,536

DRILLING HEAD

Emile Pfalzgraf, 7, rue de Neuwiller, 67330 Bouxwiller, France

Filed Apr. 17, 1985, Ser. No. 724,297
Claims priority, application France, Apr. 24, 1984, 84 06903; Sep. 13, 1984, 84 14315
Int. Cl.[4] B23B *29/034, 29/08*
U.S. Cl. 408—187 **11 Claims**

1. Drilling head comprising a body (**1**) mounted on a support (**2**) which is provided with a securement shank to which support said body is rigidly secured by an assembly screw (**3**), indexing means (**4**) for selectively interconnecting said body and said support in any selected one of a plurality of predetermined positions of rotation relative to each other, said perdetermined positions of rotation being spaced apart from each other by an acute angle, and an adjustable support and displacement assembly (**5**) for a cutting tool (**6**), said assembly being mounted on said body for movement relative to said body in a direction perpendicular to the axis of rotation of the body and support relative to each other, the indexing means (**4**) for the body (**1**) relative to the support (**2**) comprising a cylindrical lug (**7**) secured to one of the body (**1**) and the support (**2**) and adapted to cooperate with any selected one of a plurality of holes (**8**) of corresponding diameter disposed at regular intervals on the adjacent face of the other of the body (**1**) and the support (**2**), these holes being spaced apart from each other by an acute angle.

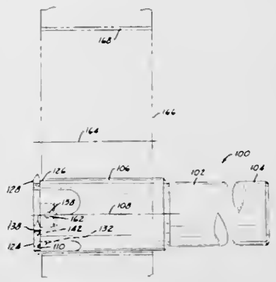


4,784,537

MULTIPLE TOOTH THREAD MILLING APPARATUS

Brian Baker, Lake Orion, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Continuation of Ser. No. 11,176, Jan. 5, 1987, abandoned. This application Jan. 19, 1988, Ser. No. 144,742
Int. Cl.[4] B23G *5/00*
U.S. Cl. 408—222 **17 Claims**



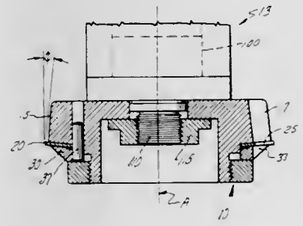
1. Apparatus for milling threads comprising:
A cutter spindle having a first end portion and a second end portion,
said cutter spindle having a longitudinal axis extending from said first end portion to said second end portion.
said second end portion having a face area and an aperture extending into said cutter spindle from said face area along said longitudinal axis,
an end plate attached to said face area and having a corresponding protuberance extending from said end plate along a central axis into said aperture,
said protuberance and said second end portion having first and second bores extending therethrough in a plane perpendicular to said axis, and further having a pin which is press fit into said first bore and said second bore,
said end plate having a plurality of insert pockets extending about said axis spaced around the periphery of said end plate,
a plurality of cutting inserts positioned in said pockets, and means coupled to said cutting inserts for holding said cutting inserts in said pockets.

4,784,538

DISPOSABLE DISK CUTTER

Erich Tlaker, Springfield, Vt.; Aaron Erisman, Charlestown, N.H., and Donald Whitney, N. Springfield, Vt., assignors to Fellows Corporation, Springfield, Vt.

Continuation of Ser. No. 760,697, Jul. 30, 1985, Pat. No. 4,629,377. This application Jun. 23, 1986, Ser. No. 877,578
The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.
Int. Cl.[4] B23F *21/28*
U.S. Cl. 409—35 **10 Claims**



1. A cutter element for a cutter tool, said cutter tool forming gear teeth and like profiles in workpieces and comprising a cutter back having a contoured mounting surface for said cutter element and a series of circumferential ridges, a retainer having a mounting surface for said cutter element which mounting surface is complimentary to the mounting surface of said cutter back, and means for clamping said cutter element between the mounting surfaces of said cutter back and said retainer; said cutter element comprising:
a thin annular cutter disk including a series of circumferential teeth which teeth are flat in their unstressed condition and align with said ridges of said cutter back for support when clamped between said cutter back and said retainer, said teeth of said cutter disk protruding beyond said ridges and said retainer at an effective, negative rake angle when clamped, said cutter disk being flexible enough to assume the shape of the cutter back mounting surface without damage to itself when clamped between said cutter back and said retainer and said cutter disk teeth being invertibly symmetrical whereby said cutter disk is invertible in its orientation between said cutter back and said retainer after one side of said cutter disk becomes dull.

4,784,539

TOOL COMMUNICATIONS METHOD

Robert A. Lehmkuhl, Cincinnati, Ohio, assignor to Manuflex Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 050,941, May 18, 1987. This application May 18, 1988, Ser. No. 195,666
Int. Cl.[4] B23C *9/00*; B23B *49/00*
U.S. Cl. 409—80 **6 Claims**

1. In a computer numerically controlled machining center having a spindle, a control rod passing through said spindle, a sliding element, said control rod coupled to said sliding element, a linear motor and transducer connected to said sliding element to control the position and force on said sliding element, a tooling device secured in said spindle, a tool actuating rod operable in said tooling device, the position of said tool actuating rod set relative to said tooling device prior to insertion in said spindle, the position is determined by the type of said tooling device in said spindle, the method of establishing tool presence and type of tooling device by advancing said

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control rod through said linear motor and sliding element with a controlled force until said spindle control rod stalls against

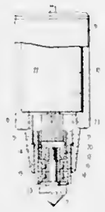


said tool actuating rod and said transducer signals position of said tool actuating rod to said computer numerical control.

4,784,540
ROTARY AND YIELDABLE DRIVE MEANS FOR A TOOL

Njal Underhaug, Rektor Saelands vei 21, N-4340 Bryne, Norway

PCT No. PCT/NO86/00068, § 371 Date May 12, 1987, § 102(e) Date May 12, 1987, PCT Pub. No. WO87/01641, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 23, 1986, Ser. No. 53,857
Claims priority, application Norway, Sep. 23, 1985, 853719; Sep. 22, 1986, 863763
Int. Cl.[4] B23C *3/12*
U.S. Cl. 409—140 **6 Claims**



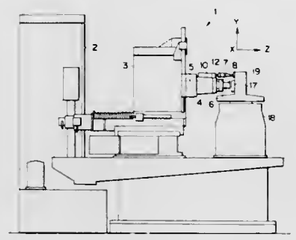
1. In combination, a rotary tool and drive means therefor, the tool having a conical taper between 60° and 120° to chamfer or to remove burrs from machined workpieces, the tool comprising a casing containing a motor for rotating the tool, the motor having a drive shaft connected for rotation to the tool, the tool having a shaft coaxial with said drive shaft, and means elastically connecting the drive shaft and the tool shaft for axial sliding movement of the tool shaft relative tot he drive shaft against a force urging the tool shaft in a direction away from the drive shaft.

4,784,541
HIGH-PRECISION EQUIPMENT

Toshiyasu Umehara; Ryukichi Tsuno, and Tsutomu Miyawaki, all of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Suwa, Japan

Filed Apr. 17, 1987, Ser. No. 40,523
Claims priority, application Japan, Apr. 21, 1986, 61-60429[U]; Aug. 11, 1986, 61-123569[U]; Jan. 23, 1987, 62-8441[U]; Feb. 24, 1987, 62-26252[U]
Int. Cl.[4] B23Q *15/24*
U.S. Cl. 409—186 **14 Claims**

1. A high precision processing equipment comprising:
a contactor provided in a numerical control processing unit and having a magnetic-electric converting element at an intermediate lateral portion thereof;
means for moving said contactor back and forth;
a workpiece or its support member to which one end of said contactor in its advancing position contacts; and

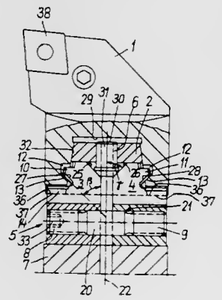


an annular magnet fixed to a spindle of said processing unit and having magnetic poles aligned in the axial direction,
said magnetic-electric converting element being located at a position opposed to the movable range of said annular magnet during movement of said processing unit while said contactor takes its advanced position.

4,784,542
TOOL-MOUNTING ASSEMBLY HAVING AN EXCHANGEABLE TOOL HEAD

Hans Tack, Velbert, and Kurt Mayer, Essen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 833,183
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507225; Oct. 10, 1985, 3536183
Int. Cl.[4] B23C *7/00;* **B23B** *31/40*
U.S. Cl. 409—234 **27 Claims**

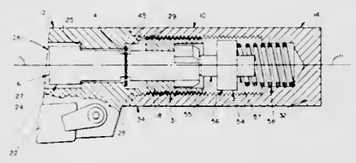


1. A tool-mounting assembly, comprising:
a tool head having a receiving bore with an opening and bore axis which extends through said opening, said bore having a groove with a slide face which extends at an acute angle to said bore axis, said tool head additionally having a frontal face surrounding said opening and extending perpendicularly to said bore axis; and
a basic tool holder having a base with a frontal face, having a receiving pin configured for insertion into said receiving bore, said receiving pin extending outward from said frontal face of said base and having a pin axis which coincides with said bore axis when said receiving pin is inserted into said receiving bore, and having externally actuated clamping device means for selectively clamping said frontal face of said tool head to said frontal face of said base when said receiving pin is inserted into said receiving bore, wherein said receiving pin includes a plurality of chucking elements having outside portions that are mounted on said base for radial movement with respect to said pin axis, each chucking element additionally having an inside portion with a slide face which is configured to enter said receiving bore and engage said slide face of said groove, said outside portions of said chucking elements being disposed on one side of said frontal face of said base and said inside portions of said chucking elements being disposed on the other side of said frontal face of said base, and wherein said clamping device means includes means for selectively forcing said chucking elements away form said pin axis to press said slide faces of said chucking elements against said slide face of said groove.

4,784,543
QUICK CHANGE TOOL HOLDER

James L. Mitchell, Owasso, Okla., and Robert W. Britzke, Rogers, Ark., assignors to Rogers Tool Works, Inc., Rogers, Ark.

Filed Aug. 25, 1987, Ser. No. 89,116
Int. Cl.[4] B23B *29/20*
U.S. Cl. 409—234 **26 Claims**



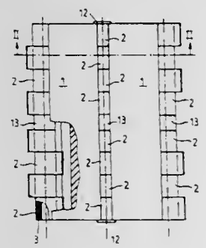
1. Apparatus for releasably connecting a cutting tool head to a shank, comprising:
a cutting tool head having a front end, a rear end and a bore therethrough, said rear end having an interface surface; face;
a shank having a front end, a rear end and a bore therein, said forward end having an interface surface adapted to engage said interface surface of said cutting tool head so as to hold said cutting tool head against rotation relative to said shank;
lockpin means disposed for rotation within the bore of said cutting tool head, said lockpin means extending longitudinally out of said cutting tool head and into the bore of said shank, said lockpin means having a front end and a rear end, said front end being secured to said cutting tool head; and
locknut means having a front end and a rear end and being adapted to fit moveably and securely within said bore of said shank, said locknut means having an aperture therein disposed to receive the rear end of said lockpin means, said locknut means having a locking and unlocking means for locking said lockpin means in said locknut means in response to rotation of said lockpin means in a first locking direction and for unlocking said lockpin means from locknut means in response to rotation of said lockpin means in a second and opposite unlocking direction.

4,784,544
LINK-BAND COVER

Werner Moritz, Siegen, Fed. Rep. of Germany, assignor to Kabelschlepp GmbH, Siegen, Fed. Rep. of Germany

Filed Aug. 31, 1986, Ser. No. 896,426
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1985, 8524436[U]; Dec. 3, 1985, 3542692
Int. Cl.[4] B23B *47/00*
U.S. Cl. 409—235 **15 Claims**

1. A link-band cover for guideways and moving parts of machine tools, and for other structural elements of the latter that could lead to accidents unless specifically protected against damage and destruction, said cover in combination comprising:
individual rigid strips that are sequentially arranged in alignment with each other side-by-side in a plane; each of said strips having long sides, with adjacent long sides of adjacent ones of said strips each being provided with a respective slot that is open toward said adjacent strip and that has an undercut base; and
hinge members in the form of hinge eyes introduced into each slot and disposed between each two adjacent strips to pivotably interconnect the latter, with each hinge eye being inserted and anchored in a spacing from each other, said hinge eyes being readily interchanged due to being

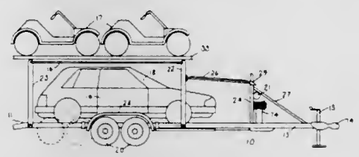


replaceable and interchangeable in one of said slots of said strips; hinge eyes between two adjacent strips also being aligned on a pivot shaft for an axially aligned movement relative to each other with adjacent hinge eyes between two strips being anchored in said slots of different ones of said two strips in a manner protected against damage and destruction via hot chips encountered during machine tool operation, wherein each of said long sides of a given one of said strips is provided with a concave groove that conforms to the radius of said hinge eyes, with each of said slots opening into a respective one of said concave grooves, and wherein each of said hinge eyes has a longitudinal slot formed by two parallel legs, each leg having an end that is bent outwardly away from the other leg.

4,784,545
DUAL LOAD TRAILER

Dennis G. Lawrence, P.O. Box 203, Sweet, Id. 83670

Filed Apr. 27, 1987, Ser. No. 42,950
Int. Cl.[4] B60P *3/08*
U.S. Cl. 410—26 **8 Claims**

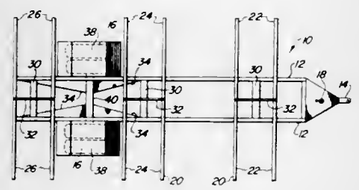


1. A double load highway trailer comprising:
a lower perimeter frame generally defining a horizontal rectangle having one axis parallel to the line of travel of the trailer;
a wheel carriage assembly slidably attached to the lower perimeter frame;
axle means attached to the wheel carriage assembly;
a plurality of road wheels mounted in pairs to the axle means;

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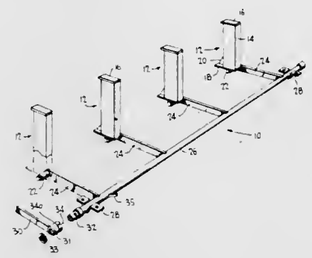
means for sliding the wheel carriage assembly forward and back relative to the lower perimeter frame;
a plurality of pivot arms in spaced relation to each other pivotally attached to the lower perimeter frame, and each movable in a substantially vertical plane parallel to the line of travel of the trailer;
an upper perimeter frame generally defining a horizontal rectangle, in spaced, parallel relationship with the lower perimeter frame and pivotally attached to the pivot arms;
means for translating the upper perimeter frame as the upper side of a parallelopiped defined by the pivot arms and the lower and upper perimeter frames;
means for progressively biasing the corners of said parallelopiped toward collapse thereof when the parallelopiped is fully extended and toward extension thereof when fully collapsed;
a trailer tongue attached to the lower perimeter frame;
hitch means attached to the trailer tongue.

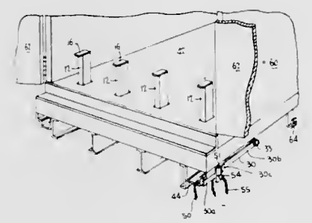
4,784,546
VEHICLE FOR TRANSPORTING ROUND BALES
Bruce Johnson, R.R. #1, Box #113, Muscatine, Iowa 52761
Filed Aug. 21, 1987, Ser. No. 87,735
Int. Cl.[4] B60P *3/00*
U.S. Cl. 410—49 **1 Claim**



1. A vehicle for carrying round agricultural bales comprising
(a) an elongated fore-and-aft main frame having front and rear ends, said main frame comprising left and right longitudinally elongated steel frames members and a plurality of transverse cross braces welded therebetween to connect and rigidify said frame members,
(b) a plurality of horizontally coplaner elongated cross members perpendicularly affixed to the right and left frame members, each cross member having laterally opposite support portions projecting equally at opposite sides of the main frame, each support portion having a free terminal end, said cross members being arranged in three pairs, the pairs being a foreward, rearward, and intermediate pair, and each said pair having such fore-and-aft spacing relative to a diameter of a typical round bale as to support such round bale between said support portions with its axis horizontal and transverse to the main frame, stop comprising a bar welded to upper surfaces of said cross members and being longitudinally aligned centrally between said free terminal ends,
(d) an axle housing having two ends, said housing being affixed beneath said main frame, and being centrally located between said intermediate and rearward pairs of cross members, and being attached to said right and left frame members by a plurality of triangular gussets.
(e) dual wheels having pneumatic tires journaled to each of said axle housing ends,
(f) a left and right fender affixed to said main frame and located above said dual wheels, and,
(g) nose portion attached to and extending forwardly of said main frame, said nose portion having a triangular shape, a side of said nose portion being coextensive with the width of said main frame, said nose portion being convergent to a foreward point having hitch thereon, said nose portion further comprising a jack located approximately centrally of said triangular shape.

4,784,547
CARGO RESTRAINING DEVICE FOR A VEHICLE
Clarence R. Prinz, Roanoke, Va., and Troy B. Malone, Ooltewah, Tenn., assignors to Southern Railway Company, Atlanta, Ga.
Filed Apr. 13, 1987, Ser. No. 37,324
Int. Cl.[4] B60P *1/00*
U.S. Cl. 410—52 **14 Claims**



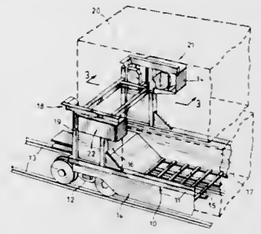


1. A cargo carrying vehicle comprising, a cargo supporting surface having at least one opening and a cargo restraining device comprising a standard at least partially within the opening and capable of freely shifting between a cargo restraining position projecting from the opening above the cargo carrying surface and an inoperative position projecting from the opening beneath the cargo supporting surface, a rotatable actuation shaft extending beneath the cargo supporting surface, and a control arm extending from the shaft and having a camming surface engaging the standard in the inoperative position for shifting the standard to the cargo restraining position upon rotation of the actuation rod in one direction.

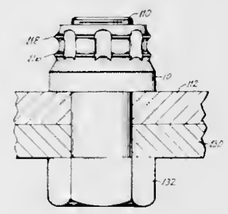
4,784,548
DOUBLE-STACKED FREIGHT CAR
Ronald S. Butcher, and Mohamed A. Khattab, both of Burlington, Canada, assignors to National Steel Car Limited, Hamilton, Canada
Filed Oct. 14, 1986, Ser. No. 918,041
Claims priority, application Canada, Jan. 22, 1986, 500129
Int. Cl.[4] B60P *3/40*
U.S. Cl. 410—54 **8 Claims**

1. In a freight car for transporting double-stacked freight containers, each container having a rectangular base with corner portions:
a main load bearing frame extending longitudinally with respect to the freight car;
a floor structure supported by the main load bearing frame for receiving and supporting a lower freight container of a first standard length;

end frame assemblies at opposite ends of the floor structure, each end frame assembly including an upright frame structure connected to the main load bearing frame and extending therefrom to a level above the height of the lower container;
each end frame assembly providing first and second pairs of corner supports at said level, each corner support providing a load bearing surface to support the weight of a freight container, the corner supports of each pair being longitudinally aligned with the corresponding corner supports of the other end frame assembly and being adapted to cooperate therewith for receiving and supporting an upper container above and independently of the lower container;
said first pairs of corner supports being positioned to receive and support an upper container of at least said first standard length, and said second pairs of corner supports being positioned to receive and support an upper container of an alternative second standard length greater than the first; and
means for selectively moving said first pairs of corner supports from a normal load supporting position to a retracted position at which they do not obstruct loading of an upper container of said second standard length.

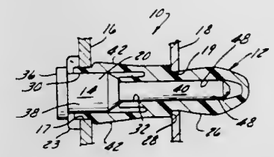


4,784,549
TORQUE-LIMITED COLLAR
George S. Wing, 531 Esplande, Apt. 515, Redondo Beach, Calif. 90277
Continuation of Ser. No. 702,811, Feb. 15, 1985, abandoned.
This application Nov. 16, 1987, Ser. No. 122,493
Int. Cl.[4] F16B *31/00*
U.S. Cl. 411—1 **15 Claims**



1. An improvement in an internally threaded collar comprising:
(a) external constant radius, axially-extending, annular bark means of the collar;
(b) at least one axially-extending trough in the bark means for accepting a setting element of a driver; and
(c) a portion of the bark means failing substantially completely in circumferential compression in response to circumferential bearing by the setting element to develop a circumferentially-extending furrow in the bark, the bark means being such that the failure occurs at a predetermined pre-load and the failed bark material remains integral with the balance of the bark means.

4,784,550
TWO-PIECE FASTENER FOR RELEASABLY SECURING TWO PANELS TOGETHER IN SPACED-APART FIXED RELATIONSHIP
Burnell Wollar, Barrington, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.
Filed Sep. 16, 1986, Ser. No. 907,802
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—32 **2 Claims**



1. A two-piece push-in stand-off fastener (**10**) for releasably securing a primary panel (**16**) and a secondary panel (**18**) together in spaced apart fixed relationship, each panel having a fastener, receiving hole (**17**, **19**) therein, said fastener (**10**) comprising:
a body (**12**) having a body head (**23**), a body shank (**22**) including a wide shank portion (**24**) and a narrow shank portion (**26**), a shoulder (**28**) on said body shank (**22**) between said shank portions (**24**, **26**) and defined by the insertion end of said wide shank portion (**24**), a bore (**20**) comprising a narrow bore portion (**32**) and a wide bore portion (**30**) near the insertion and head ends, respectively, of said body shank (**22**), and first and second locking means on said wide shank portion (**24**) and said narrow shank portion (**26**), respectively, of said body shank (**22**);
said first locking means comprising a resilient flexible wing (**42**) having an extended position wherein it projects outwardly of said body shank (**22**) and a depressed position wherein it projects inwardly into said wide bore portion (**30**), said wing (**42**) being resiliently movable between said extended and retracted positions through an opening in said body shank (**22**);
said second locking means comprising a ramp (**48**) on said narrow shank portion (**22**) within said narrow bore portion (**32**) and a resiliently movable leg (**44**) having an unexpanded position and an expanded position wherein it projects outwardly of said body shank (**22**), said leg (**44**) being resiliently movable between said unexpanded and expanded positions;
and a pin (**14**) having a pin head (**36**) and a pin shank (**34**) comprising a narrow pin portion (**40**) and an unthreaded wide pin portion (**38**) near the insertion and head ends, respectively, of said pin shank (**34**);
said pin shank (**34**) being initially insertable axially and non-rotatably into said bore (**20**) to a pre-assembled position wherein said wide pin portion (**38**) is disposed in non-interfering relationship with said first locking means (**42**) and wherein said narrow pin portion (**40**) extends only partway into said narrow bore portion (**32**) to thereby allow said wing (**42**) to move from its outwardly projecting position to depressed position as said wide shank portion (**24**) is inserted through the hole (**17**) in said primary panel (**16**) and to allow said second leg (**44**) to remain in unexpanded position and thereby enabling said narrow shank portion (**26**) to be inserted into the hole (**19**) in said secondary panel (**18**);
said pin shank (**34**) being further insertable axially and non-rotatably into said bore (**20**) to a fully inserted position wherein said narrow pin portion (**40**) extends fully into said narrow bore portion (**32**) and engages said ramp (**48**)

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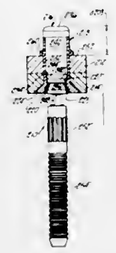
to thereby effect movement of said leg (**44**) to said expanded position wherein said secondary panel (**18**) is entrapped between said leg (**44**) and said shoulder (**28**), and wherein said wide pin portion (**38**) extends into said wide bore portion (**30**) in interfering relationship with said wing (**42**) and to prevent said wing (**42**) from moving to said depressed position to thereby maintain said wing (**42**) in said outwardly projecting position wherein said primary panel (**16**) is entrapped between said outwardly projecting wing (**42**) and said body head (**23**), said pin shank (**34**) being axially and non-rotatably removable from said bore (**20**) to enable said fastener (**10**) to be detached from said panels (**16**, **18**).

4,784,551

FASTENING SYSTEM AND METHOD FOR FLUSH AND PROTRUDING HEAD BLIND FASTENERS WITH COMMON PIN AND PARTICULARLY SUCH FASTENERS CONSTRUCTED OF EXOTIC MATERIAL

James W. Kendall, Huntington Beach, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Division of Ser. No. 738,080, May 24, 1985, Pat. No. 4,635,310. This application Nov. 13, 1986, Ser. No. 930,236
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—43 **7 Claims**



1. In combination a blind fastener and a pair of flat, plate-like workpieces varying in total thickness from a preselected minimum total thickness to a preselected maximum total thickness being clamped together by said blind fastener, said fastener adapted to be set by a tool applying a relative axial force to the fastener, said blind fastener comprising a tubular sleeve adapted to be located in aligned openings in the workpieces, a pin and a separate lock collar axially slidably mounted on said pin adapted to secure the pair of workpieces together by means of the relative axial force applied by the tool between said pin and said sleeve, said sleeve having a relatively straight sleeve shank terminating at one end in an enlarged sleeve head, said sleeve having a through bore including an enlarged diameter bore portion at its opposite end, an intermediate reduced diameter bore portion and an enlarged conical bore portion at said enlarged sleeve head, a sleeve stop shoulder defined by the juncture of said enlarged and intermediate bore portions,

said pin having a pin shank terminating in an enlarged pin head at one end and being adapted to be assembled to said sleeve with said pin head overengaging said sleeve shank at said opposite end, said pin having an enlarged diameter shank portion of a diameter to be received within said enlarged bore portion and having a intermediate shank portion of reduced diameter to be received within said intermediate bore portion, a pin stop shoulder defined by the juncture of said enlarged and intermediate pin shank portions, an annular lock groove located adjacent to said intermediate pin shank portion, said pin stop shoulder located a preselected distance from said lock groove such that upon engagement with said sleeve stop shoulder said lock groove will be located in radial alignment with said conical bore portion to define a lock pocket,

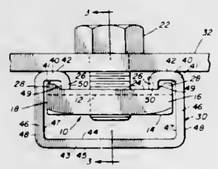
said lock collar being generally annular and adapted to be located within said conical bore portion, said pin in response to said relative axial force moving axially relative to said sleeve causing said enlarged diameter bore portion to bulb forming a blind head at the blind side of the workpieces, said pin continuing to move in response to said relative axial force until said pin shoulder engages said sleeve shoulder to initially stop further axial pin movement, said enlarged diameter pin portion and said intermediate diameter pin portion being of diameters adapted to be generally received in engagement with the corresponding one of said enlarged bore portion and said intermediate bore portion, respectively, said lock collar being urged into engagement with said pin by the relative axial force and being moved into said lock pocket to lock said pin and said sleeve together, said pin having a breakneck groove located a preselected distance from said pin stop shoulder whereby said breakneck groove will be located adajcent the outer surface of said sleeve head when said pin stop shoulder and said sleeve stop shoulder are engaged, said breakneck groove severing at a preselected magnitude of said relative axial force after said lock collar has been set, said pin stop shoulder being inclined at an angle of between 15 to around 20 degrees relative to the axis of said pin, said sleeve stop shoulder being defined by a rib extending axially inwardly from said conical bore portion a distance of around 0.50 of the outside diameter of the shank, said pin having a higher shear strength than said sleeve, the wall thickness (T) of said sleeve in said enlarged diameter bore portion being made to a minimum, said sleeve stop shoulder being located from said sleeve head a distance of around 0.25 of the outside diameter of said sleeve shank and within the thickness of the workpiece engaging said sleeve head whereby the sleeve is of minimal thickness at the shear line comprising the juncture of the said pair of workpieces so as to thus maximize the overall shear strength of said pin and said sleeve.

4,784,552

NUTS FOR CHANNELED STRUCTURAL MEMBERS

Hugo E. Rebentisch, Garden City, Mich., assignor to Unistrut International Corp., Wayne, Mich.

Continuation of Ser. No. 344,424, Feb. 1, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 597,811
Int. Cl.[4] F16B *37/00*
U.S. Cl. 411—85 **4 Claims**



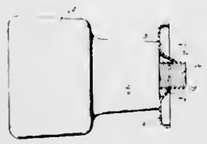
1. A nut in combination with a channeled structural member for affixing parts to said channeled structural member, said channeled structural member having a top portion, a bottom portion, two side portions, and a longitudinal slot in said top portion, said longitudinal slot bordered by inwardly projecting flanges, said top portion having an inside surface and an outside surface, said bottom portion having an inside surface and an outside surface, said two side portions each having an inside surface and an outside surface, and said inwardly projecting flanges each having an inside surface and an outside surface, said nut comprising a metal plate having a length relatively long compared to its width and having opposite parallel longitudinal side surfaces and end surfaces at an inclined angle to said side surfaces, said nut having one major face and an opposite major face substantially perpendicular to said side surfaces, said nut having a centrally located tapped opening, said nut having parallel sharp edges on the long sides of said one major face for engaging said inwardly projecting flanges of said channeled structural member, and having positioning means protruding from an end surface of said one major face for properly positioning said nut with respect to said structural member; said positioning means being spaced from said inside surfaces of said top portion, said bottom portion, and said two side portions of said channeled structural member.

4,784,553

VIBRATION RESISTANT FASTENER CONSTRUCTION

Melvin Spat, Stamford, Conn., assignor to Casco Products Corporation, Bridgeport, Conn.

Filed Oct. 16, 1986, Ser. No. 919,770
Int. Cl.[4] F16B *39/284, 37/16*
U.S. Cl. 411—247 **10 Claims**



1. A vibration-resistant attachment device, comprising in combination:

(a) a threaded stud having thread crests,

(b) a sheet metal member having an aperture the edges of which constitute an element of an interrupted female screw thread through which element the threaded stud extends,

(c) said sheet metal member having an integral thread-crest engaging means comprising an elongate, resilient tab which is struck from the sheet metal member, said tab having anti-backoff means comprising a face providing a sharp cutting edge extending longitudinally of the tab, said cutting edge engaging at least one crest of the threaded stud, and said anti-backoff means enabling bypassing movement of the said one crest when the stud is turned in a screwing-on direction with respect to the sheet metal member, said longitudinal cutting edge of the anti-backoff means biting into the said one crest so as to resist subsequent movement of the stud in an unscrewing direction.

4,784,554

T-BOLT ASSEMBLY

Douglas G. Break, Independence Green Apts., 24654 Madison Ct., Apt. 241, Farmington Hills, Mich. 48024

Filed Sep. 26, 1985, Ser. No. 780,594
Int. Cl.[4] F16B *35/02;* **F16D** *1/00*
U.S. Cl. 411—383 **4 Claims**

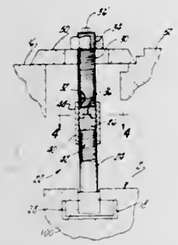
1. A T-bolt assembly comprising:

a first elongated stud having an outer periphery and external threads at a first end along said outer periphery and a cross bar at a second end adapted to be positioned in a T slot of a machine table and means for preventing rotation of said first stud with respect to said table, said external threads on said first stud having a predetermined orientation,

a second elongated stud having an outer periphery and external threads at a first and second end along said outer periphery, said external threads on said second stud having said predetermined orientation,

an internally threaded collar adapted to threadably engage the external threads on said first end of said first stud and the external threads at said first end of said second stud, said collar having a portion disposed radially outwardly from the respective outer peripheries of said first and second studs, wherein said collar locks said first and second studs against longitudinal movement with respect to each other whenever the collar threads threadably engage said threads on said studs,

means integrally formed at said first ends of said studs for preventing rotation of said studs relative to each other



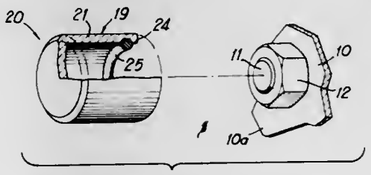
when said first ends of said studs are axially aligned and adjacent each other, said means comprising an axial projection on the first end of one stud which is axially freely slidably received in a like shaped recess of the first end of the other stud, said projection and said recess having a non-circular crossectional shape.

4,784,555

PROTECTIVE AND ORNAMENTAL COVER FOR NUTS AND BOLTS

Roger M. Cantrell, Rte. 4, Cedartown, Ga. 30125

Continuation of Ser. No. 773,648, Sep. 9, 1985, abandoned. This application Mar. 12, 1987, Ser. No. 25,005
Int. Cl.[4] F16B *37/14*
U.S. Cl. 411—431 **6 Claims**



1. A cover nut and bolt assembly comprising:

(a) a work piece having a generally flat surface;

(b) an externally threaded bolt having an end portion protruding outwardly along an axis from said flat surface;

(c) a symmetrical nut threadedly received on said end portion of said bolt, said nut having circumferentially a plurality of equally spaced flat side surfaces and equally spaced straight and continuous points forming common edges of the side surfaces of said nut at the maximum diameter of said nut, said points extending axially throughout substantially the entire length of said sides, said sides being flat throughout substantially their entire lengths;

(d) A cover or cap having a hollow tubular body, the interior of which has an inside dimension slightly larger than the maximum diameter of said nut, the cap or cover having an end portion which surrounds said nut when said cover or cap is placed over said nut and said end portion of said bolt, and a plate completely closing the other end portion of said body; the interior of said body being essentially unobstructed between the end of the bolt and the plate and being of a length greater than the length of either said end portion of said bolt or said nut, said body at said one end portion of said body having an end surface

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for abutting said flat surface when said cap or cover is inserted over said nut;

(e) said body being provided with a radially disposed continuous groove along said inside surface; and

(f) an elastomeric member received in said groove for frictionally firmly engaging said points of said nut when said cover or cap is inserted over said nut and said end portion of said bolt for providing essentially the sole means for securing said cap or cover in place on said nut.

4,784,556

DEVICE FOR THE REARRANGEMENT OF A PILE OF PICTURES

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

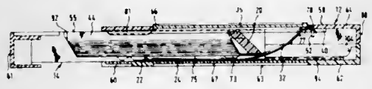
PCT No. PCT/EP85/00616, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03030, PCT Pub. Date May 22, 1986

PCT Filed Nov. 12, 1985, Ser. No. 888,327

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441463

Int. Cl.[4] G09F *11/30*

U.S. Cl. 414—37 **31 Claims**



14. Apparatus for the cyclic rearrangement of a pile of rectangular or square pictures by removing a picture from one end of said pile and returning it to an opposite end of said pile, said apparatus having a first and a second frame part which can be moved back and forth, parallel to the principal plane of the pile of pictures held by said frame parts between a first end position and a second end position, each of said first and second frame parts having stop means, said stop means of said first frame part cooperating with said stop means on said second frame part to define said end positions, wherein the two frame parts are coupled by a free-wheel-type device which, at least over some regions of the movement of the frame parts, prevents a change in direction of movement.

4,784,557

CUP OR COVER STACKER OF A CUP FILLING APPARATUS FOR DAIRY PRODUCTS

Burkhard Gies, Wuppertal, and Berthold Lingenhoff, Hilden, both of Fed. Rep. of Germany, assignors to Hamba-Maschinenfabrik Hans A. Muller GmbH & Co. KG, Wuppertal, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 58,139

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3619760

Int. Cl.[4] B65G *57/03, 59/06*

U.S. Cl. 414—45 **9 Claims**

1. A feeder for identical stackable articles having respective rims, particularly for cups or lids or dair product containers, comprising:

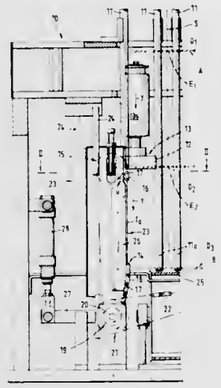
means for retaining a vertical column of said articles in which said articles rest upon one another;

separating means for dividing said column into a succession of individual ones of said articles, said separating means including a pair of horizontally spaced spindle heads at the base of said column rotatable about respective mutually parallel vertical axes and having helical formations engaging said rims to separate said articles individually from said stack upon rotation of said spindle heads;

a horizontal conveyor located directly below said column and vertically spaced from said spindle heads;

a pair of vertical conveyors flanking said horizontal conveyor and bridging the vertical spacing between said spindle heads and said horizontal conveyor and formed with succession of downwardly movable recesses each shaped to receive a rim of a respective one of said article for guiding said articles downwardly onto said horizontal conveyor;

drive means for operatively coupling said separating means



with said vertical conveyors for synchronous rotation of said spindle heads and downward movement of said recesses; and

means for swinging said vertical conveyors apart at least at said horizontal conveyor and in response to interruption of operation of said drive means to shift said vertical conveyors out of a path of articles on said horizontal conveyor and enable unhindered operation thereof.

4,784,558

APPARATUS FOR INVERTING AND STACKING FOLDED BOX BLANKS MADE OF SHEET MATERIAL
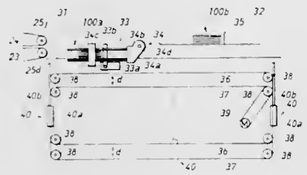
Daigoro Toriyama, Chiba, Japan, assignor to Tanabe Machinery Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,343

Claims priority, application Japan, Jul. 30, 1987, 62-188958

Int. Cl.[4] B65G *57/08*

U.S. Cl. 414—56 **35 Claims**



1. An apparatus for inverting and stacking a plurality of folded box blanks, each of which has a different thickness at its top and tail end portions, comprising:

supplying means for supplying said blanks along a direction of conveyance and for counting the number of said blanks;

first rail means extending along said direction of conveyance for receiving said blanks supplied by said supplying means;

stopper means for stopping and retaining said blanks supplied by said supplying means at a predetermined stacking position on said first rail means;

second rail means extending in said direction of conveyance and disposed vertically above said first rail means with an upstream end of said second rail means disposed downstream of said stacking position, a downstream end of said second rail means disposed at a position above an intermediate portion of said first rail means;

transferring means for inverting a first stack of said blanks at said stacking position on said first rail means onto said second rail means when a number of said blanks counted by said supplying means reaches a first predetermined value; and

conveyor means disposed along said direction of conveyance for moving a second stack of said blanks at said stacking position on said first rail means downstream along said direction of conveyance past said stopper means to a position below said second rail means when a number of said blanks counted by said supplying means reaches a second predetermined value, said conveyor means further moving the first stack on said second rail means onto the second stack on said first rail means to form a combined stack of blanks on said first rail means, said conveyor means moving said combined stack downstream along said first rail means in said direction of conveyance.

4,784,559

APPARATUS FOR SUBDIVIDING PILES OF SUPERIMPOSED STACKS OF PAPER SHEETS AND THE LIKE

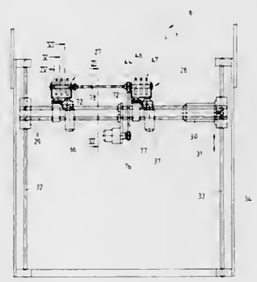
Hans-Dieter Kwasnitza, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,817

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608750

Int. Cl.[4] B65H *3/50, 33/02*

U.S. Cl. 414—114 **18 Claims**



1. Apparatus for subdividing a pile of superimposed stacks of sheets wherein each stack has a predetermined thickness and rests on a planar bottom panel of paperboard or the like, comprising separating means including at least one separating unit having a device for applying to the pile mechanical pressure from above, a separating element disposed in a plane which is parallel to the planes of bottom panels in the pile and is arranged to penetrate into the pile at a level below said device, distancing means for maintaining said device and said separating element in spaced-apart positions at at a mutual distance at least matching said predetermined thickness, and means for moving said device in a substantially vertical plane toward engagement with the topmost stack of the pile and for moving said separating element in a substantially horizontal plane penetrating into the panel beneath the topmost stack of the pile.

4,784,560

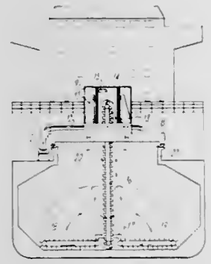
APPARATUS FOR TRIMMING AND EMPTYING BULK MATERIAL

Kaare Haahjem, N-6040 Vigra, Norway

Continuation of Ser. No. 877,705, Jun. 20, 1986, abandoned, which is a continuation of Ser. No. 562,691, Dec. 19, 1983, abandoned. This application Apr. 3, 1987, Ser. No. 35,279

Int. Cl.[4] B65G *67/60*

U.S. Cl. 414—142.5 **1 Claim**



1. Apparatus for trimming and emptying bulk material to and from substantially the complete volume in a storage room of a ship having length, width and height dimensions, said storage room having a hatch at the top thereof, comprising:

a chassis,

means for moving said chassis relative to the length and width dimensions of said storage room,

means having upper and lower ends, mounted on said chassis and movable therewith, for lifting the bulk material vertically out of said storage room when emptying said bulk material from said storage room,

a pair of elongated rake means mounted at the lower end of said lifting means, each of said rake means comprising a plurality of transverse elongate blades attached to a flexiable endless loop member substanitally exposed to said bulk material on at least a lower side length of the rake means, for moving material along the length thereof to said lifting means when emptying said bulk material from said room, or along the length thereof away from said lifting means when trimming said bulk material,

means for rotating said pair of rake means relative to said vertical dimensions of said room, and means for pivoting said pair of rake means for a substantially horizonal orientation in a vertical direction, and

means for raising and lowering said lifting means and the rake means attached thereto, whereby said pair of rake means has at least five degrees of motion relative to the volume of said storage room to remove substantially the entire contents thereof.

4,784,561

DEVICE FOR THE REMOTE FEEDING OF CYLINDRICAL PIECES TO AN AUTOMATIC MACHINE, SUCH AS A MACHINE PLUGGING THE TUBES OF A STEAM GENERATOR OF A PRESSURIZED-WATER NUCLEAR REACTOR

Jean P. Cartry, and Denis Schlaudecker, both of Lyons, France, assignors to Framatome, Courbevoie, France

Filed Apr. 30, 1987, Ser. No. 44,177

Claims priority, application France, Apr. 30, 1986, 86 06341

Int. Cl.[4] B65H *5/22*

U.S. Cl. 414—222 **7 Claims**

1. Device for the remote feeding of cylindrical pieces to an

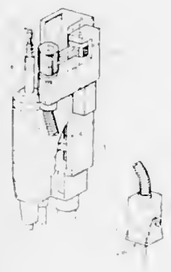
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automatic machine for plugging the tubes of a steam generator of a pressurized-water nuclear reactor, said machine comprising a support (7, 3) connected to an installation and a tool (1) movable on said support (7, 3) in a vertical direction, for taking up said cylindrical pieces (15) and positioning them in said installation, said device comprising

(a) a feed housing (10) of a size sufficient to contain a cylindrical piece (15) and having two opposite faces (17, 18) each provided with an orifice (19, 16), a first one (16) of said orifices, of a size sufficient to allow the passage of a cylindrical piece being equipped with a removable cover (20) through which passes a nozzle (24) connected to a compressed-air distribution means (25, 26), and a second orifice (19) being aligned with said first orifice;

(b) a flexible pipe (11), the inside diameter of which is greater than the diameter of said cylindrical pieces (15) and which is fastened at one of its ends to said housing (10) in the region of said second orifice (19); and

(c) a loading unit (12) fastened to the support (3, 7) and consisting of:



(i) a fixed part (28) connected rigidly to said support (3, 7) and having a bore (31) which extends in a direction parallel to the direction of movement of said tool (1) and in which is fastened the second end of said flexible pipe (11); and

(ii) a rotary arm (29) which has a receptacle (52) for receiving a cylindrical piece (15) and which is mounted on the fixed part (28) so as to be articulated about an axis parallel to the direction of movement of said tool (1) and is movable, by a means for movement (37), between a position for receiving the cylindrical pieces (15), in which the receptacle (52) of the rotary arm (29) is in the extension of the bore (31) of the fixed part (28), and at least one loading position, in which a cylindrical piece (15) located inside said receptacle (52) of said rotary arm (29) can be taken up by said tool (1) wherein

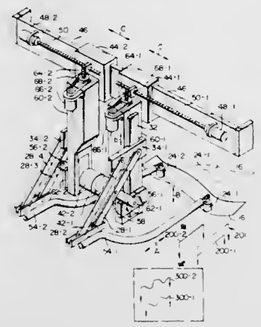
(d) the receptacle (52) of said rotary arm (29) contains a clamp for retaining said cylindrical pieces (15), said clamp consisting of cylindrical sectors (53) held by at least two elastic O-rings (54), so as to form a deformable cylinder the inside diameter of which is less than the diameter of said cylindrical pieces (15).

4,784,562

APPARATUS FOR CARRYING WORK TO AND OUT OF PRESS

Tomomi Kishi; Kosuke Shiramizu; Kanshi Nonami; Masahiko Takeuchi, and Takeshige Kurumizawa, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Taiho Seiki KK, both of Aichi, Japan

Filed Jul. 10, 1986, Ser. No. 883,918
Claims priority, application Japan, Jul. 19, 1985, 60-159786
Int. Cl.[4] B30B *15/30*
U.S. Cl. 414—225 **3 Claims**



1. An apparatus for carrying a single workpiece between a workpiece delivery location and a press comprising:

at least two workpiece carrying mechanism assemblies, each of which includes

an attachment for holding and carrying said workpiece between the workpiece delivery location and said press,

a first horizontal movement mechanism for horizontally moving said attachment in a first horizontal direction between the workpiece delivery location and said press, and

a vertical movement mechanism for vertically moving said attachment, said workpiece carrying mechanism assemblies performing biaxial movement of the respective attachments in the first horizontal and vertical directions independently of each other so as to simultaneously carry said single workpiece between the work delivery location and said press on a given route of travel.

4,784,563

DUMP TRUCK UNLOADER

Stephen S. Esh, Morgantown, and David B. Nolt, East Earl, both of Pa., assignors to C. U. Stoltzfus Manufacturing, Inc., Morgantown, Pa.

Filed Aug. 31, 1987, Ser. No. 91,119
Int. Cl.[4] B65G *67/24*
U.S. Cl. 414—523 **6 Claims**

1. A conveyor unloader for use in unmodified truck bodies comprising:

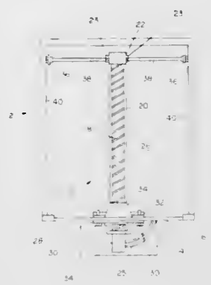
a conveyor means located on a floor of a truck body, extending from a first wall of the truck body into the interior of the truck body, with one part of the conveyor means penetrating the first wall of the truck body through an opening larger than the part of the conveyor means which fits through it;

a clamp means attached to the conveyor means near the point of the conveyor means which penetrates the first wall of the truck body, the clamp means comprising:

a plate means attached to the conveyor means, the plate means being oriented in a plane transverse to the conveyor means, having at least one dimension large enough so that it spans the opening through which the conveyor means penetrates and extends beyond the edges of the opening, and having at least two holes located so that with the plate means abutted against the first wall, the holes in the plate means are within the outline of the opening in the first wall;

at least one backing means with a dimension such that it also spans and extends beyond the edges of the opening through which the conveyor means penetrates with holes in the backing means that match the orientation of at least two holes in the plate means when the backing means is abutted against the opposite surface from the surface of the first wall against which the plate means is abutted; and

fasteners penetrating matching holes in the plate means and the backing means and creating a force to pull the two together to clamp the plate means and the backing



means around the edges of the opening through which the conveyor means penetrates the first wall;

at least two outrigger struts attached to the conveyor means at a location remote from the clamp means, the struts extending transverse to the conveyor means and having ends approaching a second wall and a third wall of the truck body, the second and third walls including surfaces, at least parts of which are essentially parallel to each other; and

press means attached at the ends of the struts which approach the second and third walls, the press means adjustably extending to contact the second and third walls, to press against the second and third walls at their surfaces which are essentially parallel and to create opposing forces which hold the conveyor means in its location.

4,784,564

REEL UNLOADING AND HANDLING STRUCTURE

Kenneth G. Selesky, San Juan Capistrano, Calif., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Mar. 23, 1987, Ser. No. 28,739
Int. Cl.[4] B66C *23/00*
U.S. Cl. 414—728 **14 Claims**

1. Apparatus for handling a wire reel comprising:

a support,

first and second mutually spaced pickup members fixedly connected to said support, said pickup members being spaced from one another by a distance not less than the thickness of a reel to be handled,

said pickup members comprising mutually opposed inwardly biased resilient holding devices for slidably receiving and grasping a reel positioned between the members, and

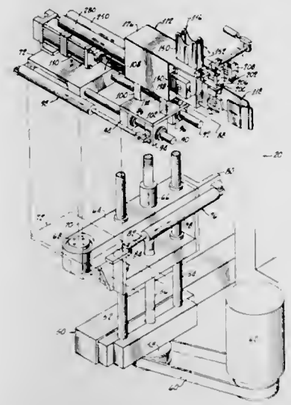
means for moving said support between a plurality of positions to thereby move a reel positioned between said pickup members.

5. An object manipulating apparatus comprising:

a carriage housing,

first and second mutually spaced and mutually opposed spring fingers mounted to the housing and having free ends adapted to resiliently clasp therebetween an object to be manipulated, and

a pusher block slidably mounted on the housing for motion between said spring fingers from a first position remote



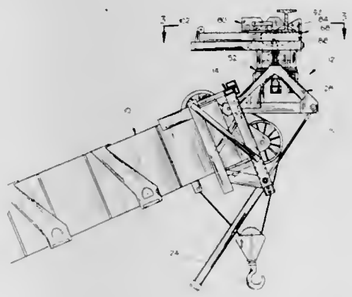
from said free ends of said spring fingers to a second position at the free ends of said spring fingers, thereby to eject an object resiliently clasped between the spring fingers therefrom.

4,784,565

BEAM PICKER

D. William Giroux, 3 Lakewood villa, Council Buffs, Iowa 51501

Filed Aug. 31, 1987, Ser. No. 90,710
Int. Cl.[4] B66C *1/64*
U.S. Cl. 414—735 **3 Claims**



1. In combination with a crane having an extendible and pivotal boom,

a first support means removably mounted on the end of the boom and having upper and lower ends,

a second support means having upper and lower ends,

means pivotally connecting, about a horizontal axis, the upper end of said second support means to the upper end of the said first support means,

a beam clamping support means pivotally and rotatably mounted on said second support means,

means for rotating said beam clamping support means relative to said second support means,

means for pivoting said beam clamping support means relative to said second support means,

and a beam clamping assembly movably mounted on said

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beam clamping support means adapted to clamp onto a beam to facilitate the movement thereof,

said beam clamping assembly including at least one pair of clamp halves movable between a clamped position, wherein said clamp halves cooperate to grip a beam, and an unclamped position, and power means for operably moving at least one of said clamp halves,

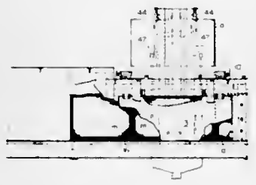
at least one of said clamp halves being slidably mounted for movement toward and away from the other clamp half, and operably connected to said power means.

4,784,566

METHOD FOR FEEDING BAR-LIKE MATERIALS

Katsuhiko Kumata; Isao Endo, both of Nagareyama; Syozi Numa, Tokyo; Ichiro Hirose; Takayoshi Sagawa, both of Hiratsuka, and Katsuyoshi Matono, Fukuoka, all of Japan, assignors to Tokyo Automatic Machinery Works Limited and Japan Tobacco, Inc., both of, Japan

Division of Ser. No. 659,217, Oct. 10, 1984, Pat. No. 4,696,617.
This application Jun. 25, 1987, Ser. No. 66,327
Claims priority, application Japan, Oct. 18, 1983, 58-195749
Int. Cl.[4] B65G *65/23*
U.S. Cl. 414—786 **10 Claims**



1. A method for feeding bar-like materials, comprising the steps of:

introducing receiving boxes having open upper faces for containing the bar-like materials onto one end of a flat bottom feeding passage which is connected, at an opposite end thereof, to a storing device, so that the boxes are in an inverted state with the open side facing the flat bottom passage,

conveying the receiving boxes, one by one, to a feeding station on the opposite end of said feeding passage in at least a closely adjacent relation to each other,

collectively discharging the bar-like materials in each receiving box onto the feeding passage in a layered manner by raising each frontmost receiving box which comes to the feeding station up to an upper limit;

containing the discharged bar-like materials in said layered manner by frame means and by an end wall of the next closely and rearwardly adjacent receiving box which forms a back wall for said discharged bar-like materials; and

transferring said discharged bar-like materials to said storing device by movement of said next closely and rearwardly adjacent receiving box wall thereagainst in said feeding station.

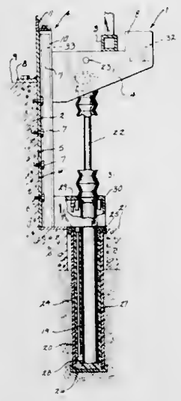
4,784,567

VEHICLE RESTRAINT UTILIZING A FLUID CYLINDER

Martin P. Hageman, Mequon, and Jonathan W. Kovach, Milwaukee, both of Wis., assignors to Kelley Company Inc., Milwaukee, Wis.

Continuation of Ser. No. 800,150, Nov. 20, 1985, abandoned.
This application Apr. 6, 1987, Ser. No. 35,229
Int. Cl.[4] B65G *69/00*
U.S. Cl. 414—401 **9 Claims**

8. In combination, loading dock means having a generally vertical dock face and having a horizontal driveway extending from said face, said driveway having a generally vertical recess, telescopic operating means including a first member secured within the recess and a second member disposed to move relative to said first member between a retracted position and an extended position, the upper end portion of said second member defining truck restraining means disposed to be positioned outwardly of an abutment on a truck parked in front of



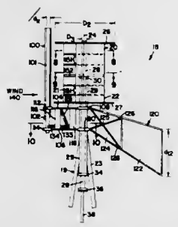
said loading dock means when said second member is in said extended position to prevent the truck from moving away from said loading dock means, and means for biasing said second member to the fully extended position whereby said second member can move downwardly from the extended position when a predetermined downward external force is applied to said truck restraining means.

4,784,568

WIND TURBINE SYSTEM USING A VERTICAL AXIS SAVONIUS-TYPE ROTOR

Alvin H. Benesh, 120 South Adams Ave., Pierre, S. Dak. 57501

Filed Jul. 1, 1987, Ser. No. 69,405
Int. Cl.[4] F03D *7/06*
U.S. Cl. 415—3 **22 Claims**



1. A Savonius rotor assembly for interacting with a moving fluid, comprising:

(a) a support framework;

(b) a rotor having top and bottom ends being mounted on the support framework for rotation about a central, vertically extending axis, the rotor having at least two blades;

(c) a deflector member extending substantially along the height of the rotor and positioned to one side of a horizontal line drawn through the central, vertically extending axis of the rotor parallel to the direction of the fluid flow, the deflector member having an outer edge and an inner edge, the inner edge being closest to the horizontal line

drawn through the central, vertically extending axis, the deflector member further having a straight portion and a curved portion, the straight portion extending from the outer edge to the curved portion and oriented at 90° relative to the horizontal line drawn through the central, vertically extending axis, the curved portion extending from the inner edge to the straight portion, the curved portion defining a surface generally concave with respect to the central vertically extending axis;

(d) fantail means interconnected to the deflector member and extending outward from the support framework for positioning the deflector member on the side of the rotor facing the direction from which the fluid is flowing, a longitudinal edge of the fantail means making an angle with the direction of the fluid flow, the fantail means, in normal operation, disposed on the opposite side of the horizontal line drawn through the central, vertically extending axis as the deflector member; and

(e) rotatable mounting means rotatably mounting the deflector member and the fantail means to the support framework for rotation of the deflector member and the fantail means about the central, vertically extending axis of the rotor in a fixed relationship to each other.

4,784,569

SHROUD MEANS FOR TURBINE ROTOR BLADE TIP CLEARANCE CONTROL

James E. Sidenstick, Rockport, Mass., and Richard M. Davis, Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 10, 1986, Ser. No. 818,444
Int. Cl.[4] F01D *11/00*
U.S. Cl. 415—174 **6 Claims**



1. A shroud ring for a hot gas turbine engine having a casing, a turbine wheel concentrically mounted in said casing and a combustion chamber to supply hot gases to said turbine wheel,

(a) said casing having a radially tapering wall therein along which said hot gases flow,

(b) said shroud ring being fixedly positioned in said casing concentrically about said turbine wheel,

(c) said shroud ring having a cross-section illustrating a generally U shape or channel member having a bottom wall and a pair of opposite upstanding walls with oppositely directed faces,

(d) said channel member being formed in an annular or ring configuration with said sidewalls being in a radially outward and upstanding relationship with respect to said bottom wall,

(e) said bottom wall having a radially outwardly directed curve or bow therein between said sidewalls.

4,784,570

WINDMILL

Michael G. A. Bond, Boundary Rd., Mountain Township, Ontario, Canada

Filed Dec. 7, 1987, Ser. No. 129,586
Int. Cl.[4] F03D *11/02*
U.S. Cl. 416—170 R **9 Claims**

1. A windmill, comprising:

(a) a windmill fan,

(b) a fan shaft having the fan mounted on a front end portion thereof for rotation therewith,

(c) an upwardly extending mast,

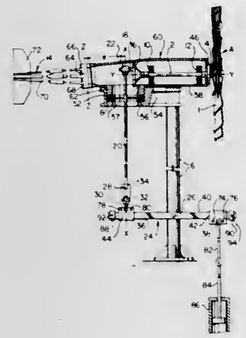
(d) a ring bearing mounted at an upper end of the mast for imparting relative rotation about an axis extending upwardly to one side of the mast,

(e) bearing means mounting the fan shaft on the ring bearing for rotation by the fan about a substantially horizontal axis intersecting the upwardly extending axis, while permitting the fan shaft to swivel on the ring bearing relative to the mast about the upwardly extending axis,

(f) a windmill tail assembly mounted on the ring bearing, and extending rearwardly from the fan for pointing the fan into a wind,

(g) a flywheel mounted on, and substantially coextensive with, a rear end portion of the fan shaft, for rotation therewith,

(h) a crank pin mounted off-center on the flywheel with respect to the axis of rotation of the fan shaft,



(i) a crank link rotatably mounted at an upper end on the crank pin and extending downwardly therefrom through the ring bearing for unobstructed crank oscillation, by the crank pin,

(j) a rocker beam assembly pivotally supported at an intermediate position along the length thereof to the mast for rocking in a seesaw manner,

(k) coupling means rotatably and pivotally attaching a lower end portion of the crank link to a driven part of the rocker beam assembly, whereby the rocker beam may be rocked by the crank link,

(l) connecting means on a driving side of the rocker beam assembly for utilizing rocking motion thereof, and

(m) amplitude adjusting means for adjusting the amplitude of the rocking motion transmitted by the rocker beam from the crank link to the connecting means.

4,784,571

APPARATUS AND METHOD FOR REDUCING BLADE FLOP IN STEAM TURBINE

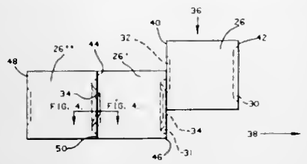
Jurek Ferleger, Longwood, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 9, 1987, Ser. No. 12,778
Int. Cl.[4] F01D *5/22*
U.S. Cl. 416—191 **20 Claims**

1. In a steam turbine having a disk with at least one groove disposed therearound and a plurality of blades, each blade having a root disposed at a proximal end thereof in registration with a groove and a shroud integral with the blade at a distal end thereof, the shroud of each blade having a pair of faces that oppose faces of the shrouds of adjacent blades, an apparatus for reducing relative motion between adjacent blades comprising resilient means disposed in each one of a slot machined in at least one face of each shroud for urging against the shroud

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adjacent each slot, the slot having a length less than the width of the shroud face, the slot encapsulating the resilient means



disposed therein, and an access slot for receiving a tool to manipulate the resilient means during and after assembly.

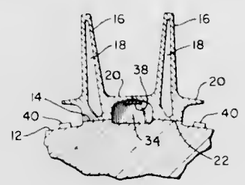
4,784,572
CIRCUMFERENTIALLY BONDED ROTOR
Rudolph J. Novotny, Stuart, and Larry D. Hamner, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Oct. 14, 1987, Ser. No. 108,171
Int. Cl.[4] F01D *5/34*
U.S. Cl. 416—213 R **6 Claims**



1. A circumferentially bonded rotor comprising:
a disk member having a radially extending web, and an outer portion wider than said web;
a blade member including a continuous circumferential inner edge and a plurality of integral outwardly extending blades;
at least one of said members having a plurality of axially spaced circumferential radially extending rings, the axial extent of said plurality of rings substantially exceeding the width of said web; and
said blade member surrounding said disk member and said rings extending toward and abuttingly diffusion bonded to the other member.

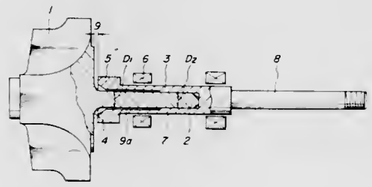
4,784,573
TURBINE BLADE ATTACHMENT
Robert Ress, Jr., Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Aug. 17, 1987, Ser. No. 86,114
Int. Cl.[4] F01D *5/30*
U.S. Cl. 416—213 R **4 Claims**

1. A bladed turbine disk comprising:
a disk having a substantially continuous impervious outer rim;
a plurality of hollow air cooled turbine blades, including air outlet openings, and an integral blade platform;
a cavity between adjacent blades below said blade platform and above said outer rim;
each blade having a continuous impervious base, an air inlet opening on one side of said blade in fluid communication with said cavity and below said platform; and
the base of each blade diffusion bonded to said outer rim of said disk, whereby the edge of the bond is everywhere



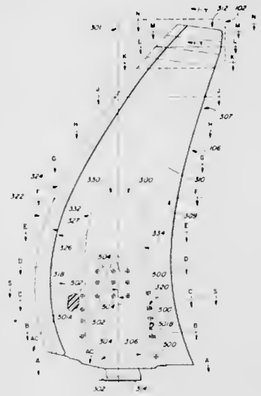
accessible for inspection, cleaning and surface modification;
and seal plate means for sealing far end of said cavity secured between said rim and said blade platform.

4,784,574
TURBINE ROTOR UNITS AND METHOD OF PRODUCING THE SAME
Nobuo Tsuno, Kasugai, and Minoru Matsui, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Continuation of Ser. No. 700,103, Feb. 11, 1985, abandoned. This application Mar. 20, 1987, Ser. No. 27,042
Claims priority, application Japan, Oct. 18, 1984, 59-218884
Int. Cl.[4] F01D *5/28*
U.S. Cl. 416—241 B **16 Claims**



1. A turbine rotor unit comprising:
a bearing housing;
a ceramic rotor comprising a front surface and back surface;
a ceramic shaft integral with said back surface of said ceramic rotor, said ceramic shaft having an outer peripheral surface;
a metal shaft having a first longitudinal end, a hollow cylindrical portion with a first inside peripheral surface and second inside peripheral surface, said first inside peripheral surface having a diameter which is larger than an inside diameter of said second inside peripheral surface, said first inside peripheral surface being located closer to said back surface of said ceramic rotor than said second inside peripheral surface, a second portion of said outer peripheral surface of said ceramic shaft being fixed to said metal shaft at said second inner peripheral surface, thereby forming a contact surface area between said metal shaft and said ceramic shaft, such that a longitudinally extending radial gap exists between a first portion of said outer peripheral surface of said ceramic shaft and said first inside peripheral surface, wherein a portion of said longitudinal extending radial gap is located between two bearing members within said bearing housing, and said contact surface area is located completely within said bearing housing.

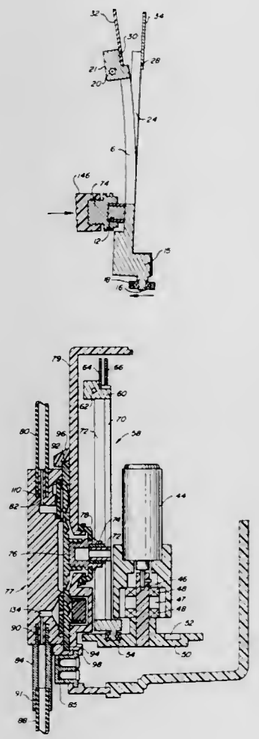
4,784,575
COUNTERROTATING AIRCRAFT PROPULSOR BLADES
Joey L. Nelson, Cincinnati, Ohio; Sidney B. Elston, III, Marblehead, Mass.; Wu-Yang Tseng, West Chester, and Martin C. Hemsworth, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Continuation of Ser. No. 932,427, Nov. 19, 1986, abandoned. This application Feb. 12, 1988, Ser. No. 157,179
Int. Cl.[4] F01D *5/14*
U.S. Cl. 416—226 **17 Claims**



1. A propulsor blade comprising:
an airfoil section having a tip end, a root end, a first and second surface therebetween defining a convex shaped leading edge and a concave shaped trailing edge, said first surface being essentially convex and said second surface being essentially concave, each surface being formed of a plurality of angle plied composite laminates bonded together;
a metallic blade spar interposed between said first and second surfaces and bonded to said surfaces for connecting said surfaces to said root end;
a plurality of airfoil cavities interposed between said first and second surfaces and positionally adjacent to said blade spar for effecting a desired weight of said blade, said plurality of airfoil cavities including at least a first and a second airfoil cavity, the first airfoil cavity being positioned adjacent to the leading edge of said blade spar and the second airfoil cavity being positioned adjacent to the trailing edge of said blade spar.

4,784,576
PUMP PRESSURE SENSOR
Richard M. Bloom, Seminole, Fla.; Carl Ritson, San Jose, Calif., and Hal C. Danby, Sudbury, England, assignors to Critikon, Inc., San Jose, Calif.
Continuation-in-part of Ser. No. 902,616, Sep. 2, 1986. This application Mar. 13, 1987, Ser. No. 25,681
Int. Cl.[4] F01B *25/26, 31/12;* F04B *21/00*
U.S. Cl. 417—63 **16 Claims**

1. A back pressure sensor comprising at least one flexible beam having a pivot end and a drive connector end, a pivot means positioned at the pivot end thereof, the flexible beam having a first mounting position and a pump actuator mounting position between the pivot end and the drive connector end, a drive connector means on said drive connector end thereof for engaging a pump drive, a pump actuator means connected to said pump actuator mounting position for connecting with a positive displacement member of a positive displacement pump, at least one sensor beam having a distal end and a vibration damping end, a second mounting position between said distal end and vibration damping end thereof secured to the first mounting position of the flexible beam by a non-rotational connection, a first capacitor plate mounted on the flexible beam at a position adjacent to the pivot end thereof, and a



second capacitor plate mounted adjacent the distal end of the sensor beam in a position facing the first capacitor plate at a distance which permits a capacitance coupling between the capacitor plates, a vibration damping means secured to the vibration damping end of the sensor beam for damping drive motion vibrations in the sensor beam.

4,784,577
PUMP PRESSURE SENSOR
Carl Ritson, San Jose, Calif., and Hal C. Danby, Sudbury, England, assignors to Critikon, Inc., San Jose, Calif.
Continuation-in-part of Ser. No. 902,616, Sep. 2, 1986. This application Mar. 13, 1987, Ser. No. 25,300
Int. Cl.[4] F04B *1/06;* A61M *31/00;* A61B *5/08*
U.S. Cl. 417—219 **19 Claims**

1. A back pressure sensor comprising a flexible beam having a pivot end and a drive connector end, the pivot end thereof having a pivot means, a pump actuator means joined to the flexible beam at a position intermediate the pivot end and drive connector end for connecting to a positive displacement member of a pump, a sensor beam attached to the flexible beam at a connecting position spaced from said pivot means, a first capacitor plate mounted on the flexible beam at a plate position which is spaced from the connecting position, a second capaci-

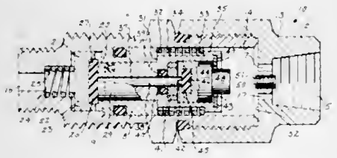
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tor plate mounted on the sensor beam in a position facing and spaced apart from the first capacitor plate at a distance which



permits formation of a capacitance coupling between the first and second capacitor plates.

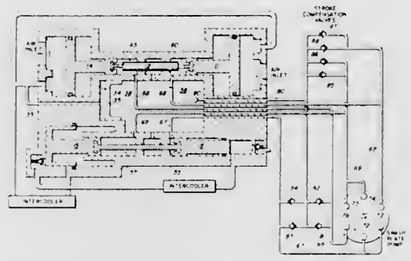
4,784,578
METERING DEVICE
Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.
Division of Ser. No. 75,040, Jul. 17, 1987. This application Feb. 29, 1988, Ser. No. 161,798
Int. Cl.[4] F04B *39/10*
U.S. Cl. 417—225 **8 Claims**



1. In a metering device for a liquid medium a housing having an inlet and an outlet for the liquid medium, a cylinder in said housing and having an open end communicating with the housing outlet, check valve means in said housing and biased to close the open end of the cylinder, a piston operatively disposed in the cylinder and forming therewith a metering chamber ahead of the piston, means to conduct the liquid medium from the inlet to the metering chamber, and means to drive the piston forwardly through a working stroke to force the liquid medium in the metering chamber out of the chamber and past the check valve means forward the housing outlet, said piston breaking the plane of the open end of the cylinder to completely evacuate the metering chamber on each working stroke to generally preclude entrapment of air in the chamber and thus provide for more accurate metering of the liquid medium.

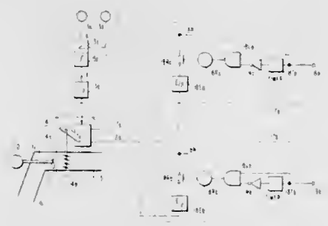
4,784,579
HYDRAULIC-PNEUMATIC POWER TRANSFER UNIT
Raymond W. Gazzera, Scottsdale, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Dec. 19, 1986, Ser. No. 944,496
Int. Cl.[4] F04B *1/18, 35/02*
U.S. Cl. 417—246 **7 Claims**

1. A power transfer unit for a gas turbine engine of the type which converts mechanical rotational energy into a flow of pressurized gas, comprising:
swash-plate pump means for producing a sequence of multiple individual pulses of pressurized liquid from the energy of a rotating shaft mechanically connected to said turbine,
a plurality of gas compressing piston units which are located remotely from said pump means and which reciprocate in a common plane within a block like housing,
said plurality of gas compressing piston units including at least four pistons arranged in at least two pairs of linked pistons, each pair of pistons adapted to move together in response to fluid pressure so that gas is drawn in by one of
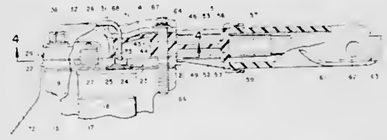


the pair while gas is forced out by the other of the pair and the linked pistons of one pair move oppositely to the pistons of another pair, and
conduit means for transferring each individual pulse of liquid in sequence to and from each one of said plurality of remote piston units to effect reciprocation thereof.

4,784,580
AIRFLOW CONTROL SYSTEM
Nobuharu Takata, and Kohji Kurita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 635,265, Jul. 27, 1984, abandoned. This application Feb. 13, 1987, Ser. No. 14,305
Claims priority, application Japan, Jul. 30, 1983, 58-139571
Int. Cl.[4] F04B *49/00*
U.S. Cl. 417—295 **4 Claims**



1. An airflow control system comprising
a pole change motor having a plurality of stator windings,
switch means for connecting the stator windings in a first arrangement producing a first number of poles and for connecting the stator windings in a second arrangement producing a second number of poles wherein the second number of poles is less than the first number of poles, with each of said first and second number of poles corresponding to different motor speeds;
an air passage;
a blower driven by the motor for producing airflow through the air passage;
air passage variable resistance means within the air passage;
control means including airflow sensing means and airflow set point means for operating the air passage variable resistance means so as to maintain the sensed airflow equal to the airflow set point;
said control means and said air passage variable resistance means having an air control response delay substantially greater than a delay in the change of motor speed in response to operation of said switch means; and
control compensating means connected between the switch means and the air passage variable resistance means for responding to the operation of the switch means to operate the air passage variable resistance means so that a change in the motor speed occurs simultaneously with an adjustment in the air passage variable resistance means to thereby minimize variation in airflow;
said control compensating means including first and second control compensating generators which respond to operation of the switch means in changing the stator windings from said first arrangement to said second arrangement and respond to operation of the switch means in changing the stator windings from said second arrangement to said first arrangement, respectively, to apply corresponding compensating outputs to operate the air passage variable resistance means to increase and decrease, respectively, the resistance to airflow.

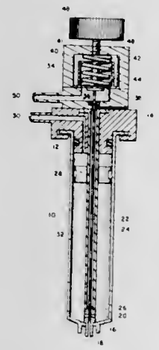
4,784,581
COMPRESSOR HEAD AND SUCTION MUFFLER FOR HERMETIC COMPRESSOR
Jack F. Fritchman, Cullman, Ala., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jan. 12, 1987, Ser. No. 2,575
Int. Cl.[4] F04B *11/00, 39/12*
U.S. Cl. 417—312 **11 Claims**



1. A hermetic refrigeration compressor comprising a case, a motor compressor unit mounted inside said case and including a cylinder block having a cylinder with an open end and a piston therein, an electric motor secured to said cylinder block to drivingly reciprocate said piston in said cylinder, a valve plate secured to said cylinder block and closing said open cylinder end, suction and discharge valve means operatively associated with said valve plate, a first cylinder head secured to said valve plate and having a discharge plenum connected to said discharge valve, a second cylinder head secured to said valve plate and having a suction plenum connected to said suction valve, said first and second cylinder heads being substantially coextensive with said valve plate and being spaced apart at all points to minimize thermal conduction between said plenums, said second cylinder head being of a material having a lower thermal conductivity than that of the material of said first cylinder head, said second cylinder head including a pair of passages extending away from said suction plenum and being secured to said valve plate by a single bolt extending between said passages.

4,784,582
FLUID DISPENSING PUMP
William E. Howseman, Jr., Sun Valley, Calif., assignor to Creative Automation Company, Sun Valley, Calif.
Filed Oct. 2, 1987, Ser. No. 103,721
Int. Cl.[4] F04B *9/08, 15/02*
U.S. Cl. 417—375 **11 Claims**

1. A pump for dispensing small individual quantities of a viscous fluid, said pump comprising:
a closed container for the storage of a viscous fluid to be dispensed, said container having first and second ends;
means in the first end of said container for receiving a pump element, said element having a dispensing hole therethrough for dispensing said fluid from said container;
a movable piston within said container, in a first position said piston having a tip end blocking said dispensing hole to prevent escape of fluid from said container;
drive means including a drive assembly housing positioned at the second end of said container and having an axially movable spring biased diaphragm coupled to said piston for moving said piston tip end in a direction axially of said dispensing hole and a predetermined distance therefrom to a second position to enable a column of viscous fluid to flow into the space vacated by said tip movement, said drive means further including means for applying pneumatic pressure to said diaphragm and against the loading of said spring for moving said piston tip from its first to second position, the release of said pneumatic pressure rapidly returning said piston tip from its second position to its first position to dispense said column of viscous fluid through said dispensing hole,



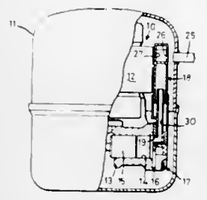
said drive means includes stroke adjustment means for adjusting the amount of axial movement of said plunger and the shot size of fluid to be ejected by said pump;
piston means within said tubular storage means and overlying said viscous fluid for applying pressure to said fluid to force said fluid into the void created by the removal of said plunger tip from said first to said second position,
wherein said piston means is urged against said fluid by pneumatic pressure applied through said housing into the second end of said tubular storage means; and
the pump element attached to the first end of said tubular shroud includes an axially spaced plunger bushing and ferrule, said ferrule having an axial opening and being mounted in an opening through the first end of said tubular container, the space between said ferrule and said bushing having at least one radial side opening to permit the entry of fluid from said container.

4,784,583
RECIPROCATING HERMETIC MOTOR COMPRESSOR WITH A THERMETICALLY INSULATABLE NON-ROTATABLE MUFFLER
Alfredo Bar, Pavia, Italy, assignor to Necchi Compressori S.r.l., Pavia, Italy
Filed Apr. 27, 1987, Ser. No. 42,856
Claims priority, application Italy, May 22, 1986, 42909 A/86
Int. Cl.[4] F04B *39/00*
U.S. Cl. 417—312 **2 Claims**

1. A reciprocating hermetically sealed motor compressor unit having a suction portion and a delivery portion comprising a driving electric motor, a frame, a cylinder positioned within said frame, a piston reciprocatable in said cylinder, a valve plate placed at one end of said cylinder and defining a

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circular suction hole, a head which fixes said valve plate to said frame and a muffler on the suction portion of said unit, said head defining a delivery chamber and said muffler having a portion seated within said circular suction hole, said refrigerant gas, from said muffler directly entering said cylinder without having a thermic exchange with said chamber, said head

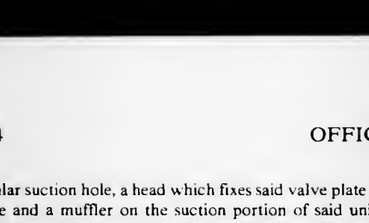


and muffler defining complementary walls to prevent said muffler from rotating about the axis of said hole and to fix said muffler to said hole, said complementary walls being defined by two inclined walls forming the lower end of said muffler and converging toward said suction hole and a perimetrical side wall formed in said head complementary to said walls of said muffler.

4,784,584
METERING DEVICE

Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.

Filed Jul. 17, 1987, Ser. No. 75,040
Int. Cl.[4] F04B *39/10*
U.S. Cl. 417—399 **4 Claims**

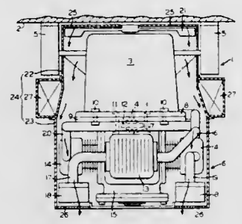


1. In a metering device for a liquid medium, a housing having an inlet and an outlet for the liquid medium, a cylinder in said housing and having an open end communciating with the housing outlet, check valve means in said housing and biased to close the open end of the cylinder, a piston operatively disposed in the cylinder and forming therewith a metering chamber ahead of the piston, means to conduct the liquid medium from the inlet to the metering chamber, a second piston operatively disposed within the cylinder behind the first-mentioned piston and connected to the first-mentioned piston with a lost motion connection, and means to drive the second piston forwardly through a working stroke, said second piston during each working stroke engaging upon and driving the first-mentioned piston through a working stroke to force the liquid medium in the metering chamber out of the chamber and past the check valve means toward the housing outlet, said first-mentioned piston breaking the plane of the open end of the cylinder to completely evacuate the metering chamber on each working stroke to thereby generally preclude entrapment of air in the metering chamber and thus provide for more accurate metering of the liquid medium.

4,784,585
ELECTRIC AIR COMPRESSOR

Yasuhisa Hata, Akashi, and Tikao Enokihata, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Jul. 6, 1987, Ser. No. 69,995
Claims priority, application Japan, Jul. 17, 1986, 61-109485[U]
Int. Cl.[4] F04B *39/06*
U.S. Cl. 417—372 **2 Claims**



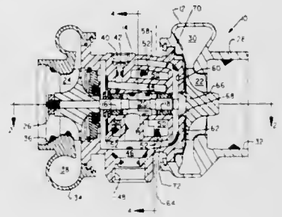
1. An electrically-operated, natural cooling-type air compressor unit connectable in a vertical position beneath the floor of a railway car, said air compressor unit comprising:
(a) an electrically-operated motor including a flange member, adjacent a lower surface of said motor;
(b) an outwardly-extending output shaft connected to said motor in a position such that a longitudinal axis thereof extends substantially perpendicular to a lower surface of such floor of such railway car;
(c) an air compressor including a flange member adjacent an upper surface of said air compressor;
(d) bolt means engageable with each of said flange member on said motor and said flange member on said air compressor for connecting said air compressor to said motor;
(e) an input shaft connected to said air compressor in a position such that a longitudinal axis thereof will be in substantial alignment with said longitudinal axis of said output shaft when said air compressor is connected to said motor;
(f) a coupling means for connecting said output shaft of said motor with said input shaft of said air compressor; and
(g) a mounting means connected to said motor for providing the sole mounting for said unit to such floor of such railway car.

4,784,586
TURBOCHARGER HAVING CONTROLLED HEAT TRANSFER FOR BEARING PROTECTION

I-Chung Ho, Rancho Palos Verdes, Calif., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 16, 1986, Ser. No. 919,748
Int. Cl.[4] F04B *17/00*
U.S. Cl. 417—114 **22 Claims**

1. Turbocharger apparatus comprising a housing including a center housing portion spacing apart a compressor housing portion and a turbine housing portion, said center housing portion journaling an elongate shaft extending between said compressor housing portion and said turbine housing portion, a bearing having an axial dimension and supported by said center housing portion adjacent said turbine housing portion, said bearing rotatably supporting said shaft, a turbine rotor drivingly connecting to said shaft and rotatable within said turbine housing portion, a comprssor rotor drivingly connecting to said shaft and rotatable within said compressor housing portion, each of said compressor housing portion and said turbine housing portion defining a respective inlet and a respective outlet communicating via a respective flow path for flow of combustion products and charge air respectively over said turbine rotor and said compressor rotor, said center housing portion defining a radially outer axially and circumferentially extending annular wall extending between said compressor housing portion and said turbine housing portion, said center housing portion further defining a bearing carrier portion interiorly of and spaced radially from said radially outer annular wall and extending between said compressor housing portion and said turbine housing portion to support said bearing, said center housing portion further defining at least one radially extending connecting portion supportingly extending

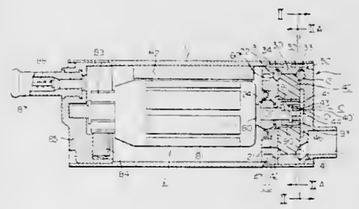


between said radially outer wall and said bearing carrier portion, each said at least one connecting portion being disposed substantially entirely axially toward said compressor housing portion with respect to a radially extending plane transverse to said shaft and intermediate the axial dimension of said bearing, said bearing carrier portion defining a cavity proximate to but spaced from said bearing, a mass of material disposed within said cavity and selected to undergo a molecular change of phase with attendant absorption of heat at a selected temperature.

4,784,587
PUMP APPARATUS

Toshibiro Takei, Okazaki; Yosbiyuki Hattori, Toyoake; Yutaka Kawashima, Okazaki; Tetuya Izumi, Kariya; Yoshifumi Ina, Okazaki, and Takeshi Matsuda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 5, 1986, Ser. No. 871,118
Claims priority, application Japan, Jun. 6, 1985, 60-123357; Jun. 6, 1985, 60-123358; Jun. 6, 1985, 60-123359; Aug. 10, 1985, 60-17642
Int. Cl.[4] F04B *17/00, 35/04*
U.S. Cl. 417—423.6 **17 Claims**



1. A pump apparatus comprising:
a pump housing defined by a hollow housing body and two end walls secured to said housing body;
a single impeller rotatably disposed in said pump housing, said impeller being enclosed at an outer periphery thereof of an inner periphery of said housing body in a substantially liquid-tight manner, whereby said impeller is journaled at said outer periphery thereof in said inner periphery of said housing body;
a first fluid passage for primarily pressurized fluid defined by said impeller and said pump housing at one side of said impeller, said fist fluid passage including an inlet and an outlet;
a second fluid passage for secondarily pressurized fluid defined by said impeller and said pump housing at the other side of said impeller, said second fluid passage including an inlet and an outlet;
a plurality of radial grooves formed on a peripheral portion of each end surface of said impeller, each of which radially extends to an outer peripheral surface of said impeller;
a motor including an output shaft for rotating and carrying at an end portion thereof said impeller;
a first radial clearance provided between said carrying end portion of said output shaft of said motor and said impeller; and
a second radial clearance provided between said outer peripheral surface of said impeller and an inner periphery of said housing body for rotation of said impeller, and said second radial clearance being smaller than said first clearance, whereby a radial movement of said impeller is restricted.

4,784,588
PLUNGER PUMP

Susumu Miyashita, Sayama, and Nobuyuki Hotta, Niiza, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Continuation of Ser. No. 30,259, Mar. 24, 1987, abandoned, and a continuation of Ser. No. 710,076, Mar. 11, 1985, abandoned.
This application Mar. 25, 1988, Ser. No. 175,676
Claims priority, application Japan, Mar. 14, 1984, 59-36292
Int. Cl.[4] F04B *21/04*
U.S. Cl. 417—439 **1 Claim**

1. A plunger pump for pumping a fluid comprising:
a main body of the pump;
a cylinder formed in said main body;
a plunger fitted in said cylinder for reciprocatory movement axially of said cylinder;
a pump chamber defined between a head of said cylinder and a top end portion of said plunger;
seal packings mounted at an inner peripheral wall of said cylinder and maintained in sliding frictional engagement with an outer peripherial surface of said plunger;
an inlet chamber for forwarding the fluid drawn by suction to said pump chamber;
a suction valve fitted to said main body and disposed between said pump chamber and said inlet chamber in communication with each other through said suction valve;
an outlet chamber for receiving the pressurized fluid from said pump chamber;
a discharge valve fitted to said main body and disposed between said pump chamber and said outlet chamber in communication with each other through said discharge valve;
said inlet chamber and said outlet chamber formed in said main body of the pump and located radially outwardly of said seal packings in close proximity thereto and extending along the axis of said cylinder, and each contoured to substantially surround a portion of said cylinder and said packings on both sides of said plunger;
said inlet chamber including an annular chamber extending around said cylinder and directly open to said inlet chamber and to said outer peripheral surface of said plunger between said seal packings, and said annular chamber having a suitable width along said plunger allowing the cooling of said plunger and said packings with the fluid in said annular chamber and said inlet chamber drawin by said suction valve into said pump chamber;
all said forementioned chambers located in said main body of the pump;
a semi-cylindrical wall between and separating said outlet chamber from said seal packings, said annular chamber, and said inlet chamber, allowing cooling from all said aforementioned chambers on both radial sides of said semi-cylindrical wall;

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a path for the fluid entering the plunger pump extending into said inlet chamber including said annular chamber, then through said suction valve and into said pump chamber and out of said pump chamber through said discharge valve and then said outlet chamber.

4,784,589

PURIFICATION OF PERTUSSIS ANTIGENS

Andrew Robinson, and Laurence 1. Irons, both of Salisbury, England, assignors to Public Health Laboratory Service Board, London, England

Filed Jan. 20, 1987, Ser. No. 8,880

Claims priority, application United Kingdom, Jan. 20, 1986, 8601279

Int. Cl.⁴ A61K *39/10;* **C07K** *3/12, 3/28*

U.S. Cl. 424—9 Q **9 Claims**

1. A process for the co-production of lymphocytosis promoting factor (LPF), filamentous haemagglutinin (FHA) and at least one fimbrial agglutinogen from a liquid culture of Bordetella pertussis, which comprises the steps of

(a) separating the culture into cellular and supernatant fractions,

(b) subsequent to step (a) concentrating the supernatant fraction to less than 50% of its original volume to form a concentrated aqueous supernatant fraction of reduced water content,

(c) subsequent to step (b), fractionating the concentrated supernatant fraction to isolate LPF and FHA containing fractions, and

(d) isolating at least one fimbrial agglutinogen from the cellular fraction.

4,784,590

FOIL-BLOWING APPARATUS WITH IMPROVED COOLING

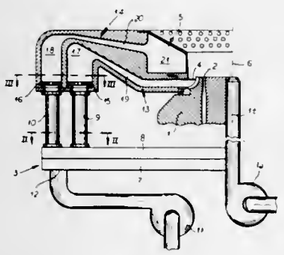
Hartmut Halter, Troisdorf-Eschmar, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 72,462

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623548

Int. Cl.⁴ B29C *47/24, 47/88*

U.S. Cl. 425—72.1 **8 Claims**



6. An apparatus for making a thermoplastic foil by blowing an extruded thermoplastic tube comprising:

a rotating extruder head with at least one circular outlet gap for said thermoplastic tube;

an air blowing device; and

a cooling device including at least;

two circular cooling air outlets surrounding said circular outlet gap of said extruder head,

a common cooling air blower,

a common cooling air duct structure connected to said common cooling air blower,

a cooling air distributor unit having a cooling air feed device provided for each of said cooling air outlets, each of said cooling air feed devices including a circumferentially circular distributor chamber and, connected thereto, a distributor duct leading to said cooling air outlet directly or indirectly by an additional one of said distributor chambers, said cooling air feed devices being aerodynamically independent of each other and connected to said common cooling air duct structure; and

a respective air flow control device located upstream of said upstream of said distributor chamber for each of said cooling air feed devices, said air flow control device being selected from the group consisting of an apertured diaphragm and a flap valve wherein said air flow control device is remotely adjustable.

4,784,591

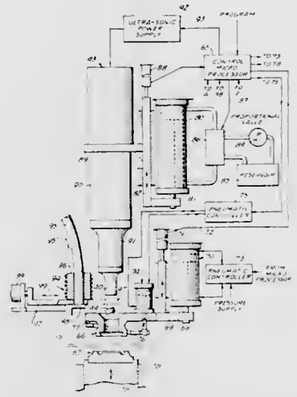
DIE SET AND APPARATUS FOR IN-SITU MOLDING OF A SEPARABLE FASTENER COMPONENT

Walter T. Ackermann, 159 Fern Hill Rd., Watertown, Conn. 06795

Division of Ser. No. 889,880, Jul. 28, 1986, Pat. No. 4,735,753. This application Jun. 17, 1987, Ser. No. 63,019

Int. Cl.⁴ B29C *43/04, 43/36*

U.S. Cl. 425—116 **22 Claims**



1. Apparatus for in situ formation of a plastic snap-fastener fitment in assembled relation with a porous substrate, comprising substrate-clamping means consisting of first and second dies having molding sides configurated for mutually registering and peripherally continuous contact with opposite sides of the porous substrate, said dies defining a mold cavity therebetween, and die-displacing means for moving said dies relative to each other between a first open position and a second position of clamped die-compression of substrate for at least a peripherally continuous outer limit of fitment definition, one of said dies having a cylindrical guide bore on an axis normal to the plane of said outer limit and centrally located within said outer limit, a ram reciprocably guided by said bore, said dies when clamped and said ram when advanced in said bore defining a fitment cavity which peripherally continuously surrounds at least the tip end of the ram and which also includes uncompressed pores of the substrate, means for delivering a predetermined charge of moldable plastic material to said cavity prior to ram advance in said cavity, ram-displacing means for compressing plastic material to fill said cavity, said ram-displacing means including an ultrasonic generator coupled for axially oscillating displacement of the tip end of said ram and stripper means engageable with said substrate to remove said fitment from at least one of said dies.

4,784,592

MACHINE FOR MOLDING OBJECTS

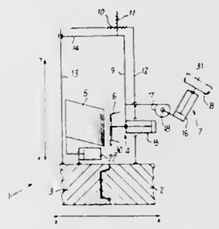
Pierre Dromigny, 54 avenue de Versailles, 75016 Paris, France

Filed Oct. 20, 1987, Ser. No. 110,277

Claims priority, application France, Nov. 19, 1986, 86 16100

Int. Cl.⁴ B29C *41/20, 41/36*

U.S. Cl. 425—121 **10 Claims**



1. In a machine for moulding objects, of the type comprising a male mould part and a female mould part of which at least one is mobile with respect to the other in a first direction, of the type comprising:

a device for conveying a film of determined format, intended to serve as at least partial coating of the moulded object, between a position of taking from a magazine containing a plurality of said films and a position of deposit of the film between said male and female mould parts, said film-conveying device comprising means for taking a film from said magazine capable of moving, in a movement associated with that of said mould parts, in a second direction (Y, Y') transverse to said first direction (X, X') between said position of film-taking and said position of deposit, and

a device for conveying a moulded object between a position of removal of the object between said male and female mould parts and a position of evacuation of the object, said object conveying device comprising means for taking the object from the mould capable of moving, in a movement associated with that of said mould parts, in said second direction (Y, Y') transverse to said first direction (X, X'), between said position of removal and said position of evacuation, said film-conveying device and moulded object conveying device, mounted on the same support, being capable of moving in synchronism so that, when the film conveying device is in position of deposit of the film between said mould parts, the object conveying device is in position of removal of the object between said mould parts, and, when the film-conveying device is in position of removal of a film from said magazine, the moulded object conveying device is in position of evacuation of the object,

the means for taking the film and the means for removing the object are driven by a system of two intersecting racks meshing with each other, of which one, parallel to said first direction (X, X'), is fast with a mould part and the other, parallel to said second direction (Y, Y') and mobile parallel to said second direction, is fast with said support.

4,784,593

DEVICE FOR POSITIONING A FILM, AND MOULDING MACHINE INCORPORATING SAID DEVICE

Pierre Dromigny, 54 avenue de Versailles, 75016 Paris, France

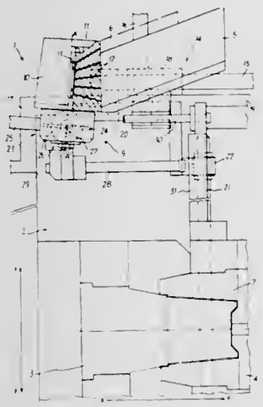
Filed Oct. 20, 1987, Ser. No. 110,278

Claims priority, application France, Nov. 19, 1986, 86 16101

Int. Cl.⁴ B29C *41/20, 41/36*

U.S. Cl. 425—121 **8 Claims**

1. In a device for positioning a film of determined format, intended to serve as at least a partial coating of the lateral surface of an object disposed in a cavity between two pieces of a machine at least one of said pieces of said machine being mobile with respect to the other in a first direction, said device comprising means for taking the film from a magazine containing a plurality of said films, comprising a film taking member whose outside form corresponds to the lateral surface of the object to be coated, means for applying the film on the lateral surface of said film taking member, and means for rotating said member about its axis so that, during rotation of said member, the film which is applied thereon is wound therearound at least partially, means being provided for conveying said film-taking



means between a position of taking the film from the magazine and a work position between said pieces, the means for conveying the film-taking means comprise a system of two intersecting racks meshing with each other, of which one, parallel to a first direction (X, X'), is fast with the first piece of the machine and the other, which is parallel to a second direction (Y, Y') at right angles to said first direction (X, X') and which is adapted to slide in a guide fast with the second piece of the machine, is fast with said film-taking means.

4,784,594

SINGLE LIP ROTARY TUBULAR EXTRUSION DIE

Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 821,935, Jan. 24, 1986, abandoned, which is a division of Ser. No. 474,630, Mar. 11, 1983, abandoned. This application Mar. 3, 1987, Ser. No. 21,630

Int. Cl.⁴ B29C *47/24*

U.S. Cl. 425—131.1 **1 Claim**

1. A tubular extrusion die for producing a tubular extruded film from a plurality of melt streams comprising:

an outer die wall and an annular rotary inner wall respectively defining at a first terminating end thereof outer and inner lips of an annular outlet orifice for the extrusion of a polymer melt film;

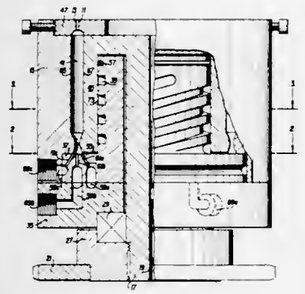
an annular flow passage defined by said outer and inner walls and extending axially of said die for supplying a polymer melt to said outlet orifice; a melt/seal distribution block having an upper stationary cylindrical inner support member positioned radially inwardly of said annular rotary wall and extending axially of said die, at least one extruder flight channel on the outer circumference of said cylindrical support member, said rotary wall defining one side of said annular flow passage, the opposite side of said rotary wall from said annular flow passage surrounding said cylindrical support member to form, with said extruder flight channel, an extruder seal for forcing melt entering into a space between said cylindrical support

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member and said rotary wall from said annular flow passage back into said annular flow passage;

a distribution plate having a plurality of annular melt inlet passages for supplying separate melt streams to said annular flow passage;

said melt/distribution block also having a plurality of concentric groups of annularly arranged holes, each group being arranged between said outer and inner walls and interconnecting a respective melt inlet passage with said



flow passage so that each of said groups of holes feeds a melt stream from a respective melt inlet passage directly into said annular flow passage which guides the melt stream from a respective melt inlet passage together with the melt stream from another hole group, to said outer and inner lips; and

means for rotating said inner wall for imparting transverse molecular orientation to a polymer melt extruded through said outlet orifice and produce a uniform layering of melt from said melt streams in said extruded film.

4,784,595

APPARATUS FOR EXTRUSION OF A THERMOPLASTIC MATERIAL

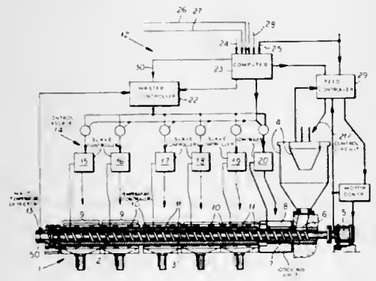
Hartmut Halter, Troisdorf-Eschmar, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Sep. 1, 1987, Ser. No. 91,818

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629995

Int. Cl.⁴ B29C *47/92*

U.S. Cl. 425—144 **2 Claims**



2. An apparatus for extrusion of a thermoplastic material comprising:

an extruder with an extruder screw and an extruder housing with a feed opening;

a drive with a variable-speed motor for said extruder screw;

a gravity feed device for feeding said feed opening of said extruder which is part of an additional regulating loop which controls the rotational speed of said variable-speed motor;

a regulating cascade for the mass temperature in said extruder, said regulating cascade having a plurality of temperature control zones, at least one mass temperature detector and at least one temperature control device downstream of said feed opening, one of said temperature control zones connected directly to said feed opening belonging to said regulating cascade and the temperature in said one of said temperature control zones being corrected with a set-point value during a mass temperature variation and further the drive speed of said variable-speed motor being reduced when through put is excessive and increased when the throughput is reduced;

a grooved sleeve in said one of said temperature control zones connected to said feed opening which is connected to said gravity feed device and in which said screw rotates;

a cooling device in said one of said temperature control zones at said feed opening; and

logic means connected to and controlling said regulating cascade and said additional regulating loop for servocontrol of said throughput and said mass temperature.

4,784,596

CALENDERING APPARATUS

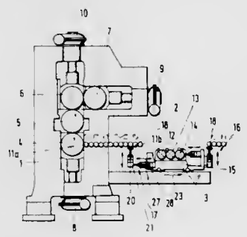
Wolfgang Heise, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,809

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643455

Int. Cl.⁴ B29C *43/24, 43/46*

U.S. Cl. 425—186 **7 Claims**



1. A calendering apparatus for producing thermoplastic plastic material films comprising a plurality of calender rollers, a take-up roller train and embossing means sequentially traversed by the material used for producing the film, and means for replacing at least one roller in said take-up roller train, wherein said embossing means comprises a plurality of embossing rollers disposed axially parallel to one another, said axes extending transverely to the direction of feed of said material to said embossing means, support means disposed laterally of said embossing rollers, means for displacing said support means to beneath said take-up roller train, carrier means for receiving said at least one roller to be replaced displaceably mounted on said support means.

4,784,597

APPARATUS FOR PRODUCING BLOWN FILM

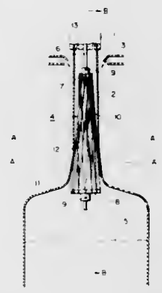
Saburo Akane, Toyama-shi, Japan, assignor to Super Bag Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1986, Ser. No. 892,077

Claims priority, application Japan, Aug. 10, 1985, 60-176765; Aug. 10, 1985, 60-176766

Int. Cl.⁴ B29C *47/90*

U.S. Cl. 425—326.1 **13 Claims**



1. A bubble stabilizer for a blown film extrusion apparatus, comprising:

a shaft adapted to be mounted on an extrusion die of the apparatus;

a pair of supporting members mounted on said shaft and spaced a predetermined distance from each other; and

a filament means constituted by a plurality of lengths of coil spring extending between the peripheral portions of said supporting members, the lengths being spaced peripherally at intervals of a predetermined size around said supporting members, said coil spring lengths extending in a skew position relative to the axis of said shaft.

4,784,598

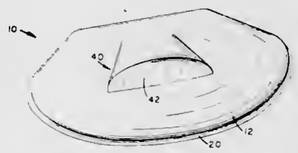
DRYWALL TOOL

Kraig A. Kranz, 5229 W. 111th St., Bloomington, Minn. 55437; Kenneth J. Kranz, 10549 Maryland Cir., Bloomington, Minn. 55438, and Kasey C. Kranz, 14002 Princeton Ave., Savage, Minn. 55378

Filed May 11, 1987, Ser. No. 48,382

Int. Cl.⁴ B29C *67/00;* **B05C** *1/16, 17/10*

U.S. Cl. 425—458 **9 Claims**



1. A tool for applying drywall compound to a drywall joint, said tool comprising:

an application member of resilient flexible material, said member having a generally flat application surface and an edge joining a periphery of said application surface with an operator engaging surface spaced from said application surface by a predetermined dimension;

said edge including an arcuate portion and a diametrically opposed generally straight portion;

said edge sized and said dimension selected for a central portion of said arcuate portion to be urged against a joint defined by contiguous flat drywall sheets with said application surface of opposite side of said central portion flexing to defined a smooth continuous surface from said central portion to points on said drywall sheets spaced from said joint;

handle means disposed on said operator engaging surface between said arcuate portion and said straight portion, a distance between said handle means and said straight portion selected for said straight portion to rest against an operator's palm with said operator's fingers engaging said handle means and with an operator's thumb opposing said application surface;

whereby drywall compound within said joint is urged to assume a smooth surface filling said joint and fanned away from said joint into smooth continuity with said drywall sheets.

4,784,599

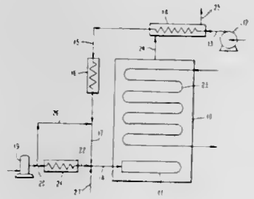
LIQUID FUEL COMBUSTION WITH POROUS FIBER BURNER

Paul W. Garbo, 48 Lester Ave., Freeport, N.Y. 11520

Continuation of Ser. No. 378,109, May 14, 1982, abandoned. This application Aug. 30, 1984, Ser. No. 645,538

Int. Cl.⁴ F23D *3/40*

U.S. Cl. 431—7 **10 Claims**



1. The improved combustion of liquid fuel having an end boiling point not more than about 650° F. to achieve high thermal efficiency and low NO_x emission which comprises preheating the combustion air in an amount not more than 15% in excess of the stoichiometric requirement, forming prior to combustion a hot, completely gaseous mixture of said liquid fuel and said amount of preheated combustion air, introducing said hot mixture into a porous fiber burner containing a uniformly distributed, small amount of fine aluminum powder, effecting flameless combustion of said hot mixture on the outer surface of said burner thereby yielding hot flue gas of low NO_x content below about 20 ppm, and passing said hot flue gas in countercurrent heat exchange with said combustion air for the aforesaid preheating thereof.

4,784,600

LOW NO_x STAGED COMBUSTOR WITH SWIRL SUPPRESSION

Frederick E. Moreno, Los Altos, Calif., assignor to PruTech II, San Jose, Calif.

Filed Oct. 8, 1986, Ser. No. 916,570

Int. Cl.⁴ F23M *3/00*

U.S. Cl. 431—9 **12 Claims**

1. In a low NO_x emission staged combustion burner of the type having a primary combustion chamber fired with a fuel-rich mixture of fuel and an oxygen-containing primary gas stream, followed by a secondary combustion chamber fired with a fuel mixture of hot fuel-containing gas exiting the primary chamber and an oxygen-containing secondary gas stream:

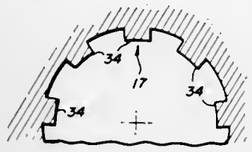
swirl means for imparting swirl to the primary burning gas stream of fuel and oxygen-containing gas in the primary combustion chamber to cause the primary gas stream to fill the primary combustion chamber and to increase the

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residence time of the primary burning gas in the fuel-rich primary combustion chamber of reducing final NO_x emissions;

transition means for substantially constricting the cross-sectional area of the primary stream of burning gas exiting the primary combustion chamber and for feeding the constricted primary gas stream into the secondary combustion chamber for preventing backmixing of gases from the secondary combustion chamber and for preventing flame impingement on the walls of the secondary combustion chamber;

secondary injector means for injecting a secondary oxygen-containing gas stream into the secondary combustion



chamber and about the primary gas stream of burning gas exiting and said transition means in a direction generally parallel and coaxially thereto;

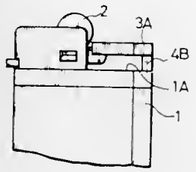
swirl suppressing means made of a refractory non-metallic material disposed within and extending along said transition means and protruding into essentially only the outer periphery of the gas stream exiting the primary combustion chamber for substantially reducing the swirl of the outermost regions of the primary gas stream exiting said transition means and for substantially reducing turbulent mixing of the parallel and coaxially travelling primary and secondary gas streams and for reducing the flame temperature in the secondary combustion chamber and thermal NO_x emissions therefrom.

4,784,601

GAS LIGHTER EQUIPPED WITH A SAFETY LOCK

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Kanagawa, Japan

Filed Jan. 20, 1988, Ser. No. 146,158
Claims priority, application Japan, Mar. 9, 1987, 62-33123[U]
Int. Cl.⁴ F23D *11/36*
U.S. Cl. 431—153 **3 Claims**



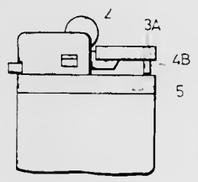
1. A gas lighter comprising a housing having a gas well contained therein, a gas valve fixed to the inside of the housing and communicating with the gas well, a gas ejection nozzle connected to the gas valve and fixed to the top of the housing, a fire-striking wheel rotatably fixed to the top of the housing in the vicinity of the gas ejection nozzle, a thumb-operated gas lever movably fixed to the top of the housing in the vicinity of the fire-striking wheel and operatively connected to the gas valve, the thumb-operated gas lever being responsive to thumb-push for descending and opening the valve, thereby permitting the ejection of gas from the gas ejection nozzle, and a windshield fixed to the top of the housing and surrounding the gas ejection nozzle, characterized in that the gas lighter further comprises a slidable L-shaped stopper whose one leg is slidably connected to the gas lever; the other leg of the stopper being on the top of the housing when the stopper is put in an inward position in which the stopper is relatively near the windshield, thus preventing the descent of the gas lever, and the other leg of the stopper being off from the top surface of the housing when the stopper is put in an outward position in which the stopper is relatively remote from the windshield, thus permitting the descent of the gas lever.

4,784,602

GAS LIGHTER EQUIPPED WITH A SAFETY LOCK

Tomio Nitta, Kanagawa, Japan, assignor to Tokai Corporation, Kanagawa, Japan

Filed Jan. 20, 1988, Ser. No. 146,157
Claims priority, application Japan, Mar. 9, 1987, 62-33124[U]
Int. Cl.⁴ F23D *11/36*
U.S. Cl. 431—153 **3 Claims**



1. A gas lighter comprising a housing having a gas well contained therein, a gas valve fixed to the inside of the housing and communicating with the gas well, a gas ejection nozzle connected to the gas valve and fixed to the top of the housing, a fire-striking wheel rotatably fixed to the top of the housing in the vicinity of the gas ejection nozzle, a thumb-operated gas lever movably fixed to the top of the housing in the vicinity of the fire-striking wheel and operatively connected to the gas valve, the thumb-operated gas lever being responsive to thumb-push for descending and opening the valve, thereby permitting the ejection of gas from the gas ejection nozzle, and a windshield fixed to the top of the housing and surrounding the gas ejection nozzle, characterized in that the gas lighter further comprises a stopper which is composed of a horizontal slide slidably connected to the gas lever and a vertical pin integrally connected to and extending downward from the horizontal slide, the top of the housing having a hole made in such a position that the vertical pin may be permitted to enter the hole when the slide is brought in the push-in working position, thus permitting the descent of the gas lever for lighting, the vertical pin being prevented from descending for lighting when the slide is brought in a position other than the push-in working position.

4,784,603

PROCESS FOR REMOVING VOLATILES FROM METAL

Casimir B. Robak, Jr.; Donald C. Evans, both of Newburgh, and Everett M. Ramsey, Richland, all of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 926,540, Nov. 4, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 109,551
Int. Cl.⁴ F27B *14/00*; F27D *5/00*
U.S. Cl. 432—5 **14 Claims**

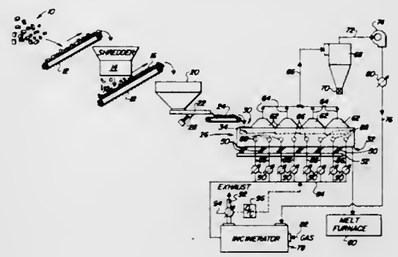
1. A process for removing volatiles contained on the surface of metal comprising the steps of:

(a) reducing said metal to a predetermined size less than approximately 12 inches in length;

(b) transporting said metal through a furnace at a predetermined rate of speed on a continuous conveyor having a perforated surface:

(c) heating said metal to a temperature of between 750° and 1100° F. to vaporize said volatiles without oxidizing said metal, said vaporizing producing fumes containing unburned hydrocarbons;

(d) burning said fumes containing said unburned hydrocarbons to produce hot gas;



(e) recirculating said hot gas to said furnace and through said perforated surface of said conveyor at a sufficient velocity to heat and fluff incoming metal; and

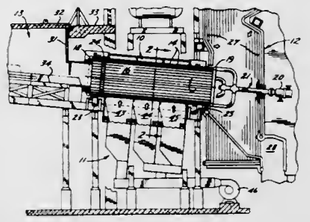
(f) vibrating said metal to maximize contact between the surfaces of said metal and said recirculating gas to vaporize substantially all volatiles contained thereon.

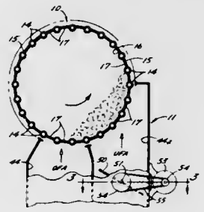
4,784,604

AIR PULSATION FOR COMBUSTORS

Chadwell O'Connor, Newport Beach, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 942,569, Dec. 15, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,266
Int. Cl.⁴ F27B *7/08*
U.S. Cl. 432—107 **1 Claim**





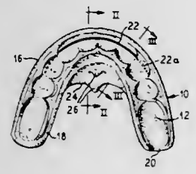
1. In a combustor having a cylindrical drum formed of water cooled pipes joined by perforated strips so as to be air porous, said drum being slowly rotated on its axis and having an upper open end of receiving burnable material and a lower end for discharging ashes or nonburnable material, the combination comprising, a windbox fitted to the lower portion of said drum for delivering air to penetrate and react with the material being burned, means for delivering air to said windbox, a valve disposed in said air delivery means and drive means connected to said valve for continually arresting and commencing air flow so that air is delivered to the drum in fluctuating pressure pulses, whereby the fluctuating pressure pulses of air enhance complete combustion of the burnable material, said valve includes a valve plate mounted in said windbox for rotation through an air blocking position and an air passing position, and said drive means includes a motor for rotating said valve plate and thereby generating said fluctuating pressure pluses.

4,784,605

ORTHODONTIC APPLIANCE TO CORRECT OPEN-BITE TENDENCIES IN CHILDREN AND ADULTS AND TONGUE-THRUST IN YOUNG CHILDREN

Earl O. Bergersen, 950 Green Bay Rd., Winnetka, Ill. 60093

Filed Oct. 13, 1987, Ser. No. 108,086
Int. Cl.⁴ A61C *7/00*
U.S. Cl. 433—6 **21 Claims**



1. An orthodontic tooth positioning appliance which is generally U-shaped in plan view and which includes at least one tooth receiving trough of a size and shape for positioning at least one row of a patient's upper and lower row of teeth of sufficient length to include incisors and canines, said trough being defined by lingual and labial-buccal flanges and including an isthmus interconnecting said flanges;

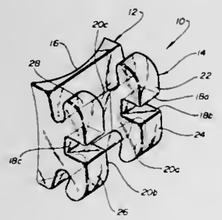
said isthmus having a vertical slit along less than an entirety of the length of said appliance in an anterior portion of said appliance which is engaged by at least some of the central incisor, lateral incisor and canine anterior teeth.

4,784,606

ORTHODONTIC BRACKETS MADE FROM ION EXCHANGE STRENGTHENED GLASS

Robin M. F. Jones, Pennington; Carl Panzera, Belle Mead, and Robert D. DeLuca, Pennington, all of N.J., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 932,745, Nov. 19, 1986, and a continuation-in-part of Ser. No. 921,984, Oct. 22, 1986, abandoned. This application Apr. 10, 1987, Ser. No. 36,640
Int. Cl.⁴ A61C *3/00*
U.S. Cl. 433—8 **4 Claims**

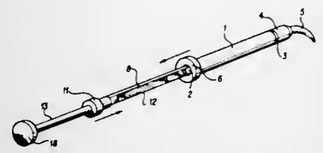


1. An orthodontic bracket including a base member having a tooth contacting surface, and a body member including walls

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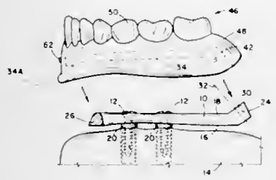
defining an archwire groove, said bracket comprising ion exchange strengthened glass.

4,784,607
DENTAL IMPRESSION SYRINGE
Michel Francois, Saint Ismier, France, assignor to Stabyl (s.a.r.l.) Chemin des Clos, France
Filed Nov. 25, 1986, Ser. No. 934,849
Claims priority, application France, Nov. 25, 1985, 85 17550
Int. Cl.[4] A61C *5/04*
U.S. Cl. 433—90 **8 Claims**



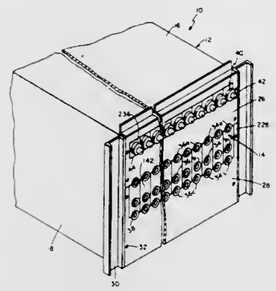
1. A syringe for injecting a pasty material comprising:
a main body formed with a longitudinal passage; and
a tube removably mounted within the passage to extend through the body, a piston mounted to extend slidably through the tube, said tube formed with a longitudinal slot in a side wall thereof and provided with a handling ring at a rear part of the tube, the cross section of the passage of the main body substantially corresponding to the cross section of the tube such that the tube inserted to extend within the body establishes an injection chamber defined by an internal wall of the tube and an internal wall passage of the body extending coextensive with said slot, said slot being defined between a pair of longitudinal generally sharp edges formed in the tube side wall, each edge extending between the internal wall and an external wall of the tube to directly connect said walls together along the edge so that each edge functions as a scraping edge enabling it to move along and in contact with a surface of a mixing plate on which pasty material is disposed to enable said material to be scraped by the edge directly onto the internal wall of the tube prior to inserting the tube into the body.

4,784,608
ATTACHMENT FOR REMOVABLY SUPPORTING A DENTURE IN THE MOUTH OF THE USER
Ralph C. Mays, 6740 S. 69th E. Ave., Tulsa, Okla. 74133
Filed Aug. 28, 1987, Ser. No. 90,456
Int. Cl.[4] A61C *13/22*
U.S. Cl. 43—172 **3 Claims**



1. An attachment for removably supporting a denture in the mouth of a user having at least two spaced apart dental posts installed in the users alveolar ridge, comprising:
an anchor member fittable semi-permanently into the mouth of the user for anchoring, such as by screws, to dental posts, the anchor member being curved to generally the shape of the alveolar ridge of the user and the anchor member having a bar portion extending between spaced apart dental posts, the anchor member having a proximal surface adjacent the user's alveolar ridge and an opposed distal surface;
a denture member which conforms generally to said anchor member and which is engageable in proximity with said anchor member distal surface, the denture member being castable into a denture having simulated gum portions and teeth portions, said anchor member having retention means and the denture member having retention means which removably interlocks with said anchor member retention means when a denture having said denture member formed thereon is in usable position within the mouth of a user, and the anchor member being of a curved form within a general plane and said denture member being a generally correspondingly curved form within a general plane, said planes being generally parallel to each other when said denture member is formed in a denture and the denture is in position within the mouth of a user, said anchor member retention means being in the form of spaced apart recesses each having an axis inclined at generally the same acute angle relative to said anchor member plane and said denture member retention means being in the form of integrally extending projections removably receivable within said anchor member recesses, each projection having an axis inclined at generally the same acute angle relative to said denture member plane; and
locking means attached to said denture member releasably engageable with said anchor member bar portion and moveable between a locked and an unlocked position, whereby when said locking means is in the unlocked position a denture having said denture member may be inserted into or removed from the mouth of a user.

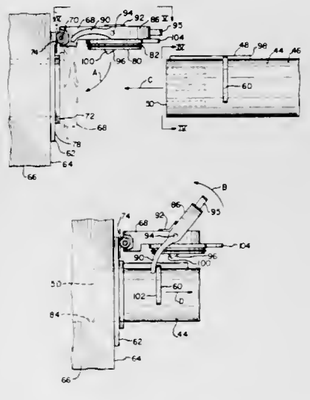
4,784,609
JACK MODULE WITH LAMP ASSEMBLY
Frederick L. Lau, Skokie, Ill., assignor to Switchcraft, Inc., Chicago, Ill.
Filed Oct. 9, 1987, Ser. No. 106,208
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—56 **22 Claims**

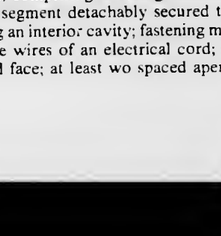


1. Lamp apparatus for a jack module, comprising:
a printed circuit board having a forwardly extending neck with top and bottom edges;
a pair of spaced conductor strips connected to said printed circuit board and extending forwardly along said neck;
a lamp housing having a hollow trunk covering portions of said conductor strips, said lamp housing having a top leg with a downwardly facing channel slidably engaging said top edge of said neck and a bottom leg with an upwardly facing channel slidably engaging said bottom edge of said neck, said hollow trunk having an aperture;
a retainer positioned between said conductor strips within said lamp housing, said retainer having a retaining boss extending into said aperture of said lamp housing for locking said lamp housing on said neck;

said lamp housing having a longitudinal bore; and
a lamp positioned within said bore, said lamp having a pair of terminals respectively contacting said pair of spaced conductor strips.

4,784,610
ELECTRICAL CONNECTOR
Clifton F. Stuart, Rte. 1, Box 137, Lynnville, Tenn. 38472
Continuation-in-part of Ser. No. 017,173, Feb. 20, 1987, abandoned. This application Nov. 23, 1987, Ser. No. 124,291
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—144 **20 Claims**

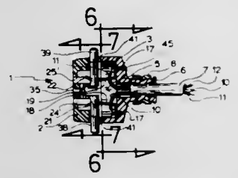




1. A connector apparatus for connecting a motive power source to a load comprising:
a plug means adjacent one end of a power conveying conduit;
a mating connector adapted for selective engagement and disengagement of said plug means in motive power conveying relationship therein;
said mating connector including a mounting flange means which is cooperable with fastener means for mounting said mating connector adjacent a surface;
disengagement means carried by said mating connector and selectively movable with respect thereto into operative engagement with said plug means when said plug means is engaged with said mating connector;
said disengagement means including pivotally movable means which is selectively movable with respect to said mating connector in contact with said plug means to effect disengagement of said plug means from said mating connector; and
spring bias means continuously biasing said pivotally movable means in a pivotal direction opposing the direction of pivotal motion thereof which effects such disengagement.

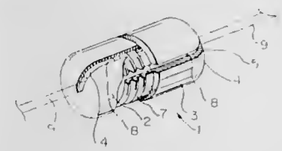
4,784,611
LOCKING PLUG
Fernand H. Poulin, 423 McDonald St., Granby, Canada J2G 6Z3, and Denis Oakes, 34 du Plateau, Ste-Julie, Canada J0L 2S0
Filed Aug. 18, 1987, Ser. No. 86,605
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—346 **8 Claims**

1. An electrical receptacle for use with a conventional electrical plug having blade-type contacts with an opening at their outer portions, comprising: a casing including a first segment and a second segment detachably secured together, said segments defining an interior cavity; fastening means in said cavity to connect the wires of an electrical cord; said first segment having an end face; at least wo spaced apertures provided in said end face and communicating with a pair of channels in said cavity; a pair of semi-rigid electrically-conductive strips disposed longitudinally in said cavity, each located adjacent one of said channels and longitudinally spaced from said end face; each strip being electrically connected to one of said fastening means and adapted to frictionally contact the associated blade



contact of said plug; a lock element disposed between the two said channels made of resilient, non-conductive material; said lock element having a lock means adapted to releasably lock into said opening of each said blade contact; further having an externally-operable release means to release the lock means, whereby said plug can be lockingly engaged and disengaged from the receptacle without any possibility of electric shock.

4,784,612
ELECTRIC PLUG HOLDER
Allen H. Ryan, R.R. #1, Lombardy, Ontario, Canada K0G 1LO
Filed Aug. 6, 1987, Ser. No. 82,166
Claims priority, application Canada, Sep. 2, 1986, 517316
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—367 **8 Claims**



1. A device for holding together a male plug and a female plug of an electrical connector in a connected state, each of the male and female plugs having an electrical cord extending therefrom, said device comprising:
male and female members of substantially cylindrical hollow configuration, each of said members adapted to accommodate one of the male or female plugs of the electrical connector, each of said members made of a flexible material and having a circular open end through which its accommodated plug can be accessed, and a shaped closed end of substantially uniform thickness and hemispherical configuration;
each of said members having a slot extending from said closed end to said open end, for receiving the electrical cord of its accommodated plug;
said male hollow member having an exterior surface, adjacent its open end, and presenting a first helix screw thread; and
said female hollow member having an interior surface, adjacent its open end, and presenting a second helix thread complimentary to said first helix thread for receiving said first helix thread, whereby said male and female members and their accommodated plugs are maintained in said connected state.
said first and second helix threads being of a sufficiently

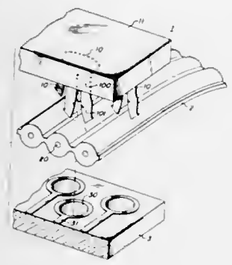
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large dimension to prevent the disengagement thereof and the resultant separation of said male and female members.

4,784,613
APPARATUS FOR JOINING CONDUCTORS TO CIRCUIT BOARDS

Cecil W. Deisch, Warrenville, Ill., assignor to American Telephone and Telegraph Company, AT&T Information Systems, Holmdel, N.J.

Filed Nov. 2, 1987, Ser. No. 115,296
Int. Cl.[4] H01R *9/07, 9/09*
U.S. Cl. 439—405 **6 Claims**



1. Apparatus for terminating a conductor on a plated-through hole of a circuit board said apparatus comprising
an insulator member having an electrical conducting contact embedded therein with a bifurcate portion consisting of a pair of prongs extending from a side of said insulator member for engaging the conductor therebetween and said prongs forming a compliant section with an end thereof formed both for piercing insulation of the conductor and for insertion into the circuit board plated-through hole to engage sides thereof and thereby establish an electrical connection between the conductor and circuit board plated-through hole.

4,784,614
COMPONENTS HAVING MEANS FOR KEYED INTERCONNECTABILITY

Amir-Akbar Sadigh-Behzadi, Van Nuys, Calif., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Sep. 30, 1987, Ser. No. 103,096
Int. Cl.[4] H01R *13/64*
U.S. Cl. 439—488 **13 Claims**

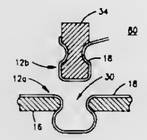


1. An assembly of matched interconnectable components comprising:
a first component; and
a second component constructed for interconnection with said first component;
said first component having first keying means including a raised pattern of letters, said letters identifying a particular color;
said second component having second keying means which interfittingly engages said raised pattern of letters of said first keying means;
said second component being color coded so as to correspond to the particular color identified by said raised pattern of said first component, to thereby provide a visual indication of the matched interconnectability of said first and second components.

4,784,615
DIRECT CONTACT FLEXIBLE CIRCUIT INTERCONNECT SYSTEM AND METHOD

Toh Teng-Hong, Penang, Malaysia, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1987, Ser. No. 1,291
Int. Cl.[4] H01R *13/04*
U.S. Cl. 439—496 **8 Claims**



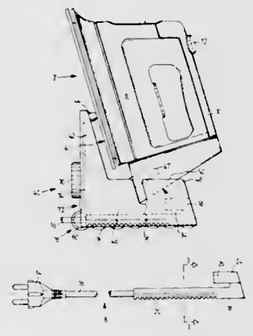
1. A system for establishing electrical contact between first and second flexible circuit members, said circuit members having opposite interconnection and carrier surfaces comprising:
at least one electrical conductor affixed to the interconnection surfaces of each said first and second flexible circuit members;
a rigid support for supporting said first flexible circuit member, said support having a slot into which said first flexible circuit member extends for defining an interconnection receptacle; and
a preformed resilient member overlaid by said second flexible circuit member, said resilient member having a substantially rectangular cross section body wider than the width of said slot, said body further having a necked portion corresponding substantially to the width and thickness of said slot;
whereby when said second circuit member overlaying said preformed resilient member is inserted into said interconnection receptacle to directly contact said first flexible circuit member, said necked portion engaging said slot compresses said preformed resilient member, retaining said resilient member in said interconnection receptacle and providing an electrical contact.

4,784,616
POWER SUPPLY DEVICE FOR AN ELECTRICAL APPLIANCE INTENDED FOR PERSONAL USE

Walter Zimmermann, Barcelona, Spain, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 887,329
Claims priority, application Spain, Jul. 23, 1985, 288306
Int. Cl.[4] H01R *33/00*
U.S. Cl. 439—568 **13 Claims**

1. An electrical iron system comprising
an electrical supply cord having plug type coupling structure for detachable connection to cooperating socket structure,
an electric iron intended for personal use, said electrical iron having socket structure for receiving said plug type coupling structure of said power supply cord for supplying electrical power to said electrical iron via said power supply cord when said plug type coupling structure of said power supply cord is inserted into said socket structure of said holder structure, and
holder structure adapted to support said iron when not in use, said holder structure including
projecting plug type coupling structure similar to said plug type coupling structure of said power supply cord for operatively engaging said socket structure of said iron when said iron is on said holder structure,
socket structure similar to said socket structure of said electric iron for detachably receiving said plug type coupling structure of said electric supply cord,
said plug type coupling structure of said supply cord, as inserted into either said socket structure of said electric iron or into said socket structure of said holder structure, being flush with the outer surface of either said electric iron or said holder structure in the area of said socket structure, and

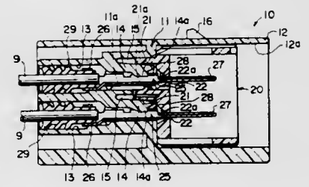


fixed electrical conductor structure within said holder structure electrically connecting said holder projecting plug type coupling structure and said holder socket structure so that electrical power may be supplied to said electrical iron via said power supply cord, said holder socket structure, said electrical conductor structure and said projecting plug type coupling structure when said iron is on said holder structure and when said plug type coupling structure of said power supply cord is inserted into said socket structure of said holder structure.

4,784,617
ELECTRICAL CONNECTOR HAVING POSITIONING MEMBER TO ALIGN CONTACT SECTIONS OF ELECTRICAL CONTACTS

Kenzo Oda, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 25, 1987, Ser. No. 30,771
Claims priority, application Japan, May 30, 1986, 61-082421[U]
Int. Cl.[4] H01R *13/426*
U.S. Cl. 439—595 **14 Claims**

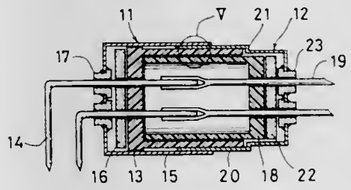


13. An electrical connector, comprising:
a dielectric housing member having contact-receiving passages;
electrical contact members having receptacle contact sections in said contact-receiving passages;
resilient latching arms extending from walls of said contact-receiving passages in engagement with said contact members to retain said contact members in position in said contact-receiving passages, said latching arms and the walls of the passages having a space therebetween; and
a retaining member in said housing member having projections disposed in the spaces between the passage walls and the latching arms thereby maintaining the latching arms in engagement with the contact members, said retaining member having holes in alignment with said receptacle contact sections.

4,784,618
FILTER CONNECTOR DEVICE

Yukio Sakamoto; Toshio Hori, and Yasuo Fujiki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 1, 1987, Ser. No. 45,607
Claims priority, application Japan, May 8, 1986, 61-69481[U]
Int. Cl.[4] H01R *13/66*
U.S. Cl. 439—620 **13 Claims**



1. A filter connector device comprising in combination:
a male connector and a female connector detachably engaged with each other, said male connector and said female connector having a plurality of male connector pins and a corresponding plurality of female connector pins, respectively which are disposed therein to be connected in series with each other upon engagement of said male connector and said female connector;
a plurality of filter elements including at least one capacitor and at least one inductor, at least one of said filter elements being provided in said male connector and at least one in said female connector, each filter element being associated with the connector pins in its respective connector, said filter elements forming a filter circuit in cooperation with said corresponding male and female connector pins connected in series with each other upon engagement of said male connector and said female connector;
wherein each said inductor is in the form of a plate having a plurality of holes for receiving said plurality of connector pins in its respective connector, said inductor being associated with all of said plurality of connector pins in its respective connector; and
wherein said inductor is provided with slits for preventing interference between adjacent ones of said plurality of connector pins in its respective said connector.

4,784,619
ELECTRICAL CONNECTION MODULE

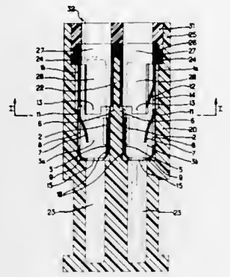
Lucien Blanchet, Vésinet, France, assignor to Air LB, Colombes, France

Filed Sep. 4, 1986, Ser. No. 903,527
Claims priority, application France, Sep. 9, 1985, 85 13351
Int. Cl.[4] H01R *11/09*
U.S. Cl. 439—724 **7 Claims**

1. An electrical connection module for receiving terminal pins which have locking collars and are mounted on the ends of wires, comprising,
at least one sheet metal connection piece bent into the shape of a pair of adjacent U-shaped sections, each said U-

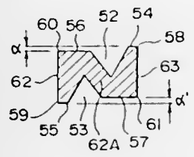
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shaped section having two branches which are spaced apart to receive a terminal pin inserted therebetween, each said U-shaped section having pin-engaging means, each said pin-engaging means including a contact tongue and two guide bosses, said contact tongue being cut and bent out from one branch of a U-shaped section, and the guide bosses being formed in the branch of the U-shaped section



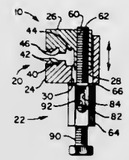
which is opposite from the branch where the contact tongue is located, at least one branch of each U-shaped section having an upper portion which extends above said pin-engaging means, said upper portion being provided with an integral locking catch which is cut and bent out from said upper portion and is positioned to engage a locking collar of a terminal pin.

4,784,620
ELECTRICAL CONTACT PIN
Yoshihito Tanaka, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 865,458, May 21, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 138,077
Claims priority, applicatioo Japan, Jul. 2, 1985, 60-144946
Int. Cl.[4] H01R *13/428*
U.S. Cl. 439—751 **3 Claims**



1. An electrical contact pin comprising:
a mounting portion to be fitted into a plated through hole of a circuit board and fixed therein without using any solder;
said mounting portion having a generally rectangular cross section with a top, a bottom, a pair of sides, and four sharp corners;
a pair of substantially triangular recesses provided on said top and bottom of said rectangular section in an alternating fashion to form a substantially N-shaped cross section; and
a pair of said sharp corners adjacent to said triangular recesses extending beyond said top and bottom to form a pair of resilient projected sharp corners.

4,784,621
WIRE CONNECTOR
William T. Auclair, Pinney St., Winsted, Conn. 06098
Filed Sep. 14, 1987, Ser. No. 95,841
Int. Cl.[4] H01R *4/36, 4/38*
U.S. Cl. 439—793 **14 Claims**



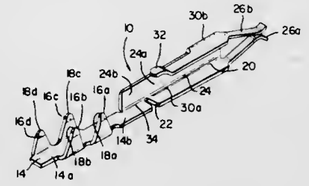
1. A wire connector comprising:
clamp means comprising a pair of cooperative jaw members for clamping an object in clamped relationship between said jaw members;
clamp securement means comprising a shaft threaded to one of said jaw members and a head assembly fixed to said shaft and engageable against said other jaw member for securing said jaw members in clamped relationship;
slot defining means in fixed relationship with said clamp securement means for defining a bifurcated slot having an enlarged first section having a first pre-established diameter and a contiguous reduced second section having a second pre-established diameter and at least partially defined by a closed end generally diametrically opposite the enlarged first section, said second diameter being less than said first diameter; and
wire securement means positionable in said slot for engaging against a wire received in said slot to securably connect said wire in fixed position therein wherein a wire having a diameter between said first and second pre-established diameters is securable in said enlarged section and a wire having a diameter less than said second pre-established diameter is securable in said reduced section whereby said connector defines an electrically conductive path which extends between said wire and said object.

4,784,622
STAMPED AND FORMED CONTACT
Ronald Senor, N. Attleboro, Mass., assignor to Augat Inc., Attleboro, Mass.
Filed Jul. 29, 1987, Ser. No. 79,765
Int. Cl.[4] H01R *13/11*
U.S. Cl. 439—853 **8 Claims**



1. An electrical contact providing a reduced, two-step insertion force for a component lead inserted therein, comprising:
a ring portion defining an entrance end;
a longitudinal axis extending symmetrically through said ring portion;
a first plurality of resilient beams formed integral with and outwardly disposed from the ring portion and tapered inward toward said longitudinal axis extending symmetrically through the ring portion, said first plurality of beams being of a first length and formed symmetrically about said ring portion; and
a second plurality of resilient beams of a length shorter than the length of said first plurality of beams formed integral with and outwardly extending from the ring portion and tapering toward said longitudinal axis, said second plurality of beams being formed symmetrically about said ring portion, said first and second plurality of resilient beams formed about said ring portion in an staggered symmetrical arrangement of first and second resilient beams wherein the component lead is insertable therein with reduced, two-step normal insertion force, initially engaging said first plurality of resilient beams and subsequently engaging said second plurality of resilient beams, and wherein said first plurality of beams and said second plurality of beams are independently formed with respect to one another.

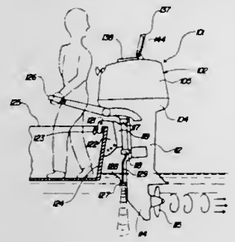
4,784,623
MASS TERMINABLE FLAT FLEXIBLE CABLE TO PIN CONNECTOR
Hoy S. Beck, Jr., Lexington, N.C., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Apr. 3, 1987, Ser. No. 34,802
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—872 **19 Claims**



1. A stamped and formed terminal for interconnecting first and second electrical conductors, the terminal having first and second conductor interconnection portions; the first conductor interconnection portion comprising a horizontal base and at least one upstanding conductor engaging member formed out of the plane of the horizontal base; the second conductor interconnection portion comprising a vertical base and first and second resilient arms on opposite sides of the vertical base formed out of the plane of the vertical base, the first resilient arm being substantially horizontal; the vertical base of the second interconnection portion being integral with the horizontal base of the first interconnection portion intermediate opposite ends of the terminal with a right angle bend formed between the vertical and horizontal base; each resilient arm being joined only to the vertical base.

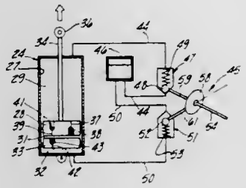
4,784,624
FISH FINDER OR DEPTH DETECTOR FOR MARINE PROPULSION
Shinji Yoshida, c/o 1400, Nippashi-cho, Hamamatsu-shi, Shizuoka-ken, Japan
Filed Jun. 5, 1987, Ser. No. 58,942
Claims priority, application Japan, Jun. 7, 1986, 61-132178; Jun. 7, 1986, 61-132179
Int. Cl.[4] B60L *1/14*
U.S. Cl. 440—2 **35 Claims**

1. A combined marine outboard drive and depth finder for attachment as a unit to a watercraft comprising an outboard drive adapted to be affixed to the transom of a watercraft, propulsion means carried by said outboard drive for propelling the watercraft, a transmitter/receiver for transmitting and receiving signals for detecting depth carried by said outboard



drive, and a display carried by said outboard drive for visually displaying the data obtained by said transmitter/receiver.

4,784,625
TILT LOCK MECHANISM FOR MARINE PROPULSION DEVICE
Ryoji Nakahama, Iwata, Japan, assignor to Sanshin Kobyo Kabushiki Kaisha, Hamamatsu, Japan
Continuation of Ser. No. 668,388, Nov. 5, 1984, abandoned. This application Apr. 8, 1987, Ser. No. 36,173
Claims priority, application Japan, Nov. 29, 1983, 58-223350
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **16 Claims**



1. In a tilt locking and shock absorbing arrangement for a marine outboard drive comprising a drive member supported for tilting movement relative to a hull of an associated watercraft about a substantially horizontally disposed tilt axis, a hydraulic assembly comprising a cylinder and a piston slidably supported in said cylinder and defining first and second chambers, a piston rod affixed to said piston and extending through one of said chambers, means for operatively interposing said hydraulic assembly between hull and said drive member for relative movement of said piston and said cylinder upon tilting movement of said drive member about said tilt axis, passage means extending between said first and second chambers, and defining a single fluid path therebetween valve means in said passage means for controlling the flow between said first chamber and said second chamber, said valve means comprising first check valve means in said passage means for permitting flow from said first chamber to said second chamber and for precluding flow from said second chamber to said first chamber, second check valve means in said passage means for permitting flow from said second chamber to said first chamber and for precluding flow from said first chamber to said second chamber, and control means for selectively opening one of said check valve means so that the other of said check valve means controls the flow through said passage means, the improvement comprising an accumulator having a first port comunicating solely with said first check valve means and a second port communicating solely with said second check valve means such that said fluid path includes said accumula-

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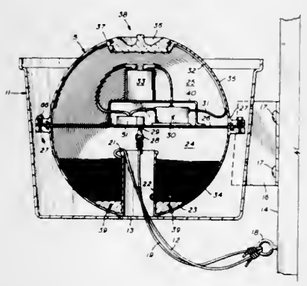
tor, said accumulator compensating for the changes in the volume of the fluid displaced from said one chamber by said piston rod.

4,784,626

SUNKEN VESSEL LOCATOR BUOY

Paul J. DeLaro, Rte. 2, Box 228-X, Freeport, Tex. 77541

Filed May 11, 1987, Ser. No. 48,644
Int. Cl.⁴ B63B *22/08*
U.S. Cl. 441—7 **4 Claims**



1. A sunken vessel locator buoy suitable for being carried in a receptacle attached to the superstructure of a vessel in such manner that said buoy will float free of said vessel in the event of said vessel's sinking,

wherein said buoy is connected to the superstructure of said vessel by a line stored inside said buoy and paid out from said buoy as said vessel sinks beneath the surface of the water, and

wherein said buoy is generally spherical in shape and is constructed of an upper hemispherically shaped shell, a lower hemispherically shaped shell, and a circular center plate to which the said upper and lower hemispherically shaped shells are attached in water-tight connection, and

wherein said upper hemispherically shaped shell is constructed of materials which are transparent to radio frequency transmissions, and

wherein said upper hemispherically shaped shell is in water-tight connection with said circular center plate forming an interior water-tight compartment for the enclosure of a power supply, a radio transmitter, a radio antenna, and a pull-key switch mechanism, and

wherein said pull-key switch mechanism is activated by means of the retraction of a pull-key shaft which extends through an orifice in the center plate into the lower hemispherically shaped shell of said buoy, and

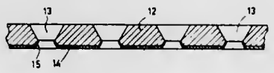
wherein said pull-key shaft is connected by a second line to the superstructure of said vessel, whereby when said second line is pulled taut as said vessel sinks, said pull-key shaft is retracted from said pull-key switch which makes electrical connection between said power supply and said radio transmitter, whereby said radio transmitter is activated and transmits, via said radio antenna, a radio frequency signal which may be homed - in on to locate said buoy and said sunken vessel located beneath the water.

4,784,627

METHOD OF FORMING A GLASS LAYER ONTO A SHADOW MASK

Maria C. Van Uden, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 879,830, Jun. 26, 1986, abandoned, which is a continuation of Ser. No. 636,535, Aug. 1, 1984, abandoned. This application Aug. 31, 1987, Ser. No. 91,467
Claims priority, application Netherlands, Mar. 14, 1984, 8400806
Int. Cl.⁴ H01J *29/07*
U.S. Cl. 445—47 **2 Claims**



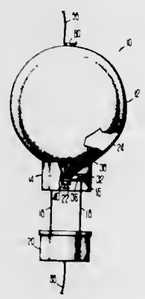
1. A method of manufacturing a colour selection electrode for a color display tube, the colour selection electrode including a plate having apertures disposed through mutually generally parallel sides thereof, characterized in that the method comprises spraying a suspension including lead oxide and boron oxide on one side of the colour selection electrode while maintaining a sub-ambient pressure on the other side of the color selection electrode, and then heating the suspension sprayed on the one side of plate to form a glass layer.

4,784,628

TOY BALLOON WITH IMPROVED SKIRT AND GONDOLA

Blaise L. McArdle, P.O. Box 994, Marblehead, Mass. 01945, and Frederick E. Tillotson, R.R. 1, Dixville Notch, N.H. 03576

Filed Feb. 10, 1987, Ser. No. 12,923
Int. Cl.⁴ A63H *27/10*
U.S. Cl. 446—225 **20 Claims**



1. An imitation lighter-than-air craft, comprising:

an inflatable balloon having a inlet valve, said inlet valve including an outwardly disposed neck;

a locking disc attached to said neck;

a tubular skirt separate from said disc having a longitudinal bore defined by an inner wall, said locking disc positioned within said bore; and

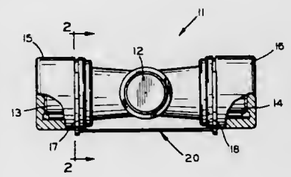
means for detachably securing said disc to said skirt within said bore at a position along said bore such that said skirt is biased against said balloon.

4,784,629

BEARING RETAINER STRAP

Terry D. Jones, Perrysburg, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 10, 1987, Ser. No. 83,078
Int. Cl.⁴ F16D *3/40*
U.S. Cl. 464—130 **6 Claims**



1. An apparatus for retaining a pair of bearing cups on opposed trunnions of a universal joint cross, each of the bearing cups having an annular groove formed in an outer surface thereof, comprising:

a pair of snap rings each having a semi-circular body portion with an outwardly extending portion formed therein; and

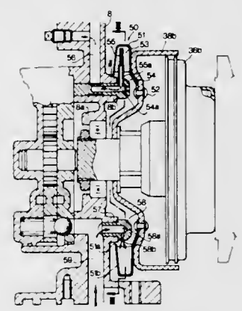
a bearing retainer strap having an elongated body of a predetermined length with a groove engaging portion formed at each end thereof, each said end being folded over upon said body to form said groove engaging portions adapted to extend into and engage the annular groove formed in an outer surface of a bearing cup and said outwardly extending portion of said snap rings adapted to abut opposite ends of said bearing retainer strap and maintain said groove engaging portions of said bearing retainer strap in the grooves formed in the bearing cups.

4,784,630

ROTATING SPEED DETECTING DEVICE FOR A CONTINUOUSLY VARIABLE TRANSMISSION FOR A VEHICLE

Masahiko Takahashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 130,882
Claims priority, application Japan, Dec. 17, 1986, 61-300634; Dec. 17, 1986, 61-300635
Int. Cl.⁴ F16H *11/06*
U.S. Cl. 474—28 **3 Claims**



1. A rotating speed detecting device for a continuously variable transmission having a drive pulley, an annular housing secured to a side of the drive pulley and forming an annular groove, a pitot tube provided in said annular groove, and an oil supply pipe for supply oil to said groove, wherein

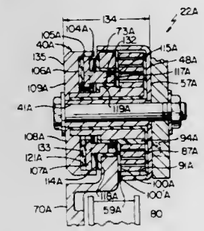
said pitot tube has an elliptic section, a major axis of the ellipse is arranged in a tangential direction of an annular flow of oil in said groove, and an open end of said pitot tube faces to said flow of oil.

4,784,631

BELT TENSIONER AND METHOD OF MAKING THE SAME

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 7,255, Jan. 27, 1987, Pat. No. 4,728,318, which is a division of Ser. No. 827,572, Feb. 7, 1986, Pat. No. 4,661,087, which is a division of Ser. No. 643,504, Aug. 23, 1984, Pat. No. 4,596,538. This application Nov. 9, 1987, Ser. No. 118,901
The portion at the term at this patent subsequent to Jun. 24, 2003, has been disclaimed.
Int. Cl.⁴ F16H *7/12*
U.S. Cl. 474—135 **1 Claim**



1. In a method of making a tensioner for a power transmission belt that is adapted to be operated in an endless path, said method comprising the steps of forming a support means for being fixed relative to said belt, forming a belt engaging means to be carried by said support means and be movable relative thereto, operatively associating mechanical spring means with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, forming said spring means to have a longitudinal axis and be spiraled about said axis thereof, forming said support means to comprise a shaft means having a longitudinal axis and fixed from movement relative to said belt engaging means, forming said belt engaging means to have a portion thereof rotatably carried by said shaft means so as to rotate relative to said shaft means, forming said support means to comprise a cup-shaped casing having an open end receiving said spring means therein, and disposing an antifriction disc-like member on said shaft means between said portion of said belt engaging means and said spring means, the improvement comprising the step of forming said disc-like member to substantially seal closed said open end of said casing whereby said disc-like member performs a dual function.

4,784,632

TOBACCO SMOKE FILTER AND METHOD AND APPARATUS FOR MAKING SAME

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 261,690, May 7, 1981, Pat. No. 4,637,409. This application Sep. 12, 1986, Ser. No. 906,974
Int. Cl.⁴ A24D *3/02*
U.S. Cl. 493—43 **6 Claims**

1. A method of making smoke filters comprising the steps of:

providing a filtering material including a multiplicity of fibrous members;

defining an elongated bonding zone;

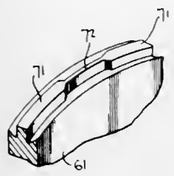
continuously feeding said filtering material through said bonding zone;

feeding a bond activating agent into contact with said filtering material in said bonding zone to bond said fibrous

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members to each other at spaced contact points to form an elongated, smoke-permeable filter rod member defining a tortuous path for passage of smoke therethrough;

overwrapping said rod member with an overwrapping material so as to juxtapose portions of the inner surface of the overwrapping material with the exterior surface of the rod member to form sealed areas precluding passage of smoke thereacross;



forming longitudinally continuous grooves in the form of circumferentially spaced recesses in said rod and said overwrapping material throughout the entire length of said rod, said recesses having a transverse cross-sectional area which varies as a function of longitudinal displacement along said rod member in a pattern which repeats itself at select, longitudinally spaced locations; and

transversely severing said rod at said selected locations to form individual filter elements.

4,784,633

CENTRIFUGE WITH A DRUM HAVING SOLIDS-EXTRACTION OPENINGS

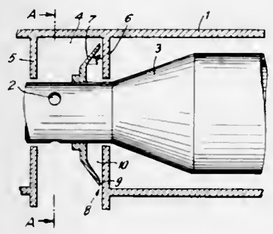
Paul Bruning, and Helmut Figgener, both of Oelde, Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Apr. 7, 1987, Ser. No. 35,572

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612919

Int. Cl.[4] B04B *1/20*

U.S. Cl. 494—41 **4 Claims**



1. In a centrifuge including a rotatable drum having an axis of rotation and solids extraction openings, a stationary housing surrounding the drum and having a solids catch chamber in the vicinity of the openings, at least one seal in the catch chamber comprising means forming an annular gap between the housing and drum including a radially extending surface on the housing and a radially extending demarcating disk on the drum, the improvement comprising means forming a pressure compensation space in the vicinity of the at least one seal and between the demarcating disk and the radially extending housing surface including the demarcating disk having a radially outer surface extending outwardly from the drum at an acute angle to the axis of rotation.

4,784,634

SOLID BOWL CENTRIFUGE

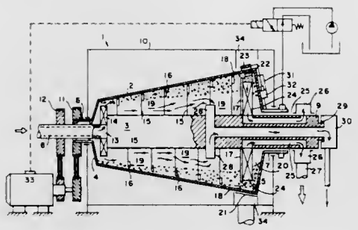
Herbert Schiele, Karlsfeld, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,182

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608664

Int. Cl.[4] B04B *1/20*

U.S. Cl. 494—52 **20 Claims**



1. A sludge dewatering centrifuge for separating liquid and solid components comprising:

a conical drum exhibiting a tapered end and an opposing wide end;

an inner rotor arranged within said conical drum;

drive means for rotating said drum and said inner rotor at different speeds, associated with said inner rotor and said drum;

radial inlet means for introducing sludge at said tapered end of said drum;

surface element means for axially transporting solid components disposed adjacent to an inner surface of said conical drum;

means for fixing said surface element means connected to said inner rotor wherein said means for fixing traverse a channel free of said surface element means defined between said inner rotor and said surface element means wherein a radial width of said channel is at least 50 % of a radial distance between said inner rotor and said inner surface of said drum;

a baffle plate connected to said inner rotor defining a compacting area on a side of said baffle plate facing said tapered end and a sediment discharge area on an opposing side of said baffle plate facing said wide end wherein said baffle plate and said drum define an annular passage between said compacting area and said sediment discharge area;

means for radially inward transport, and discharge, of solid components arranged in said sediment discharge area; and

means for transport, and discharge, of liquid components arranged in said compacting area.

4,784,635

CONTINUOUS-OPERATION CENTRIFUGE DRUM FOR CONCENTRATING SUSPENDED SOLIDS

Paul Bruning; Wilfried Mackel, both of Oelde, and Ulrich Wrede, Ennigerloh-Ostenfelde, all of Fed. Rep. of Germany, assignors to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

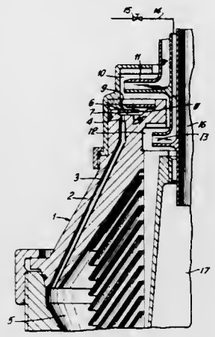
Filed Apr. 16, 1987, Ser. No. 39,210

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613335; Oct. 15, 1986, 3635059

Int. Cl.[4] B04B *11/02*

U.S. Cl. 494—70 **17 Claims**

1. In a continuous-operation centrifuge drum for concentrating suspended solids and having a radially outer portion, central portion and inner portion, including means forming a solid space in the radially outer portion of the drum, means forming an extraction chamber toward the radially central portion of the drum, from which the concentrated solids are continuously extracted, and means forming channels between the solids space and extraction chamber and through which concentrated solids are conveyed, the improvement comprising



means forming at least one unribbed annular space with a radially outer surface and a radially inner surface and positioned between the extraction chamber and the channels to effect the travel of solids through the unribbed annular space from one of the inner and outer surfaces to the other.

4,784,636

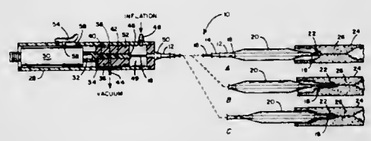
BALLOON ATHEROECTOMY CATHETER

Mark A. Rydell, Golden Valley, Minn., assignor to Schneider-Shiley (U.S.A.) Inc., Minneapolis, Minn.

Filed Apr. 30, 1987, Ser. No. 44,360

Int. Cl.[4] A61B *17/32*

U.S. Cl. 604—22 **5 Claims**



2. An atherectomy catheter assembly comprising:

(a) a first, flexible tubular member of a predetermined outside and inside diameter having a proximal end, and distal end and a lumen extending from said proximal end to said distal end;

(b) an inflatable expander member attached to said distal end of said first tubular member to be inflated by fluid passing through said lumen of said first tubular member;

(c) a second tubular member having an outer diameter less than said predetermined inside diameter of said first tubular member, a proximal end, a distal end, and a lumen extending from said proximal end to said distal end of said second tubular member, said second tubular member being coaxially disposed within said lumen of said first tubular member with a predetermined clearance between said outer diameter of said second tubular member and said inside diameter of said first tubular member, allowing rotation and axial displacement of the distal end of said second tubular member beyond the distal end of said first tubular member;

(d) a cutter member attached to said distal end of said second tubular member;

(e) motor means coupled to said proximal end of said second tubular member for imparting rotation thereto within said lumen of said first tubular member;

(f) means coupled to said proximal end of said first tubular member for directing fluid through said lumen of said first tubular member to inflate and deflate said expander member;

(g) means for applying a negative pressure to said lumen of said second tubular member at the proximal end portion thereof; and

(h) means located at said proximal end of said second tubular member for axially extending and retracting said distal end of said second tubular and said cutter member from said distal end of said first tubular member as said second tubular member is being rotated by said motor means.

4,784,637

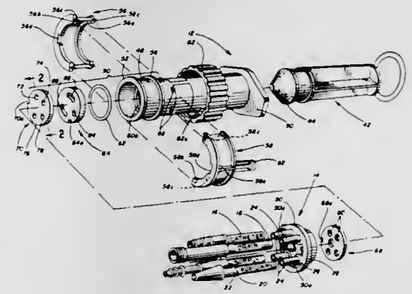
ASEPTIC IRRIGATION SYRINGE

Francis E. Ryder, Arab, and Rowland W. Kanner, Guntersville, both of Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Mar. 23, 1987, Ser. No. 29,329

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—32 **30 Claims**



1. A flow control apparatus for providing selective fluid communication with physiological organs, comprising: a nozzle structure including a plurality of discrete ports for connection to a corresponding plurality of separate fluid conduits; syringe means having a fluid chamber for containing and discharging fluid in communication with at least one of said conduits; two valve members having respective engaged surfaces relatively rotatable to provide valving action, said valve members including a first valve member having a plurality of through apertures respectively communicating with said nozzle ports and a second valve member having a through passageway communicating with said syringe chamber, said valve members being further selectively adjustable relative to at least one of said apertures to enable fluid flow between said respective nozzle ports and said syringe chamber; and clamp means for applying axially directed opposing forces on said valve members in order to establish a fluid-tight seal between said engaged surfaces; wherein said syringe means includes a cylindrical syringe body housing said chamber, said body further housing said valve members.

4,784,638

ANGLED HOLE VENTRICULAR CATHETER AND METHOD OF MAKING SAME

Jamshid B. G. Ghajar; Robert J. Hariri, and Fathali G. Ghadjar, all of New York, N.Y., assignors to Neurodynamics, Inc., New York, N.Y.

Filed Sep. 17, 1987, Ser. No. 98,097

Int. Cl.[4] A61M *31/00*

U.S. Cl. 604—49 **18 Claims**

1. A catheter for placement into the ventricular system of the brain of a subject comprising

a flexible elongated body having a wall thickness sufficient to contain and transport fluid therein and having a for-

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ward end and tip for insertion into the ventricular system of the brain of a subject; and

a plurality of spaced apertures located in said forward end of said body spaced from said tip, each of said apertures extending through the wall thickness at an angle such that a portion of said wall thickness is visible when viewing said aperture perpendicular to the axis of said body, and



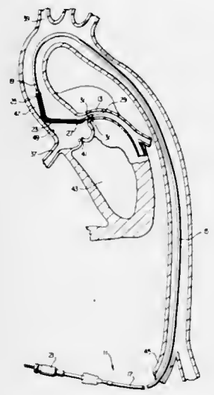
such that upon slight stretching of the catheter by means of a placement stylet the apertures will close upon themselves and reopen upon removal of the tension on the catheter, thereby to minimize abrasion of brain tissue upon insertion of said catheter and to prevent choroid plexus and ependymal tissue from growing into said catheter apertures, thereby providing improved flow of fluid into or from said ventricular system.

4,784,639

CATHETER AND METHOD OF INSERTING CATHETER

Piyush V. Patel, 3401 Salisbery, Midland, Tex. 79707

Filed Jul. 6, 1987, Ser. No. 70,039
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—53 **3 Claims**



1. A method of guiding a coronary angiographic catheter into a selected coronary artery wherein the coronary catheter has a tubular portion with a proximate end and a distal end, a tubular tip, and a flexible corrugated section capable of bending at a predetermined angle having a proximate end connected to the distal end of the tubular portion and a distal end connected to the tubular tip, the method comprising the following steps in order:

inserting the coronary catheter into a femoral artery of a patient;

guiding the coronary catheter through the femoral artery into the coronary artery system of the heart until the tubular tip of the coronary catheter is near the selected coronary artery; and

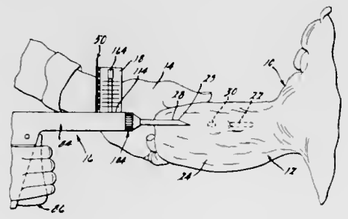
deflecting the tubular tip of the coronary catheter off of an artery wall to bend the flexible corrugated section at an angle sufficient to cause the tubular tip of the coronary catheter to enter the selected coronary artery so that desired angiography and angioplasty can be performed.

4,784,640

APPARATUS FOR IMPLANTING IMPLANTS IN CATTLE

Ronald F. Johnson, 3652 Brocker, and Norman E. Nicklas, 5120 Hurd, both of, Metamora, Mich. 48455

Continuation of Ser. No. 642,525, Aug. 20, 1984, Pat. No. 4,659,326. This application Aug. 12, 1986, Ser. No. 895,804
Int. Cl.[4] A61M *5/18*
U.S. Cl. 604—62 **1 Claim**



1. A system for implantation of growth hormone implants or the like having a package adapted to be injected into animals comprising:

a cartridge;

a plurality of implants disposed in said cartridge;

a plurality of retainers for retention of said implants in the animals disposed adjacent to said implants such that each retainer is aligned with a corresponding implant;

an injector including means for receiving said cartridge and said retainers, said means enabling proper disposition of each said implant with each corresponding retainer within said injector for implantation of said implants and retainers into the animals.

4,784,641

ARTICLE AND METHOD FOR THE ORAL DOSING OF FLUIDIC MATERIAL TO PATIENTS

Douglas J. White, Oceanport, N.J., assignor to Bio-Pak Associates, Farmingdale, N.J.

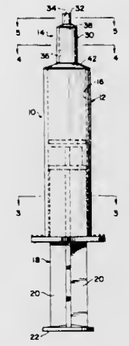
Filed Jun. 12, 1987, Ser. No. 62,128
Int. Cl.[4] A61M *3/00*
U.S. Cl. 604—77 **20 Claims**

1. A syringe for the oral administration of fluidic material to a patient, comprising:

(a) an elongate hollow barrel for holding a dosage of fluidic material, said barrel having a predetermined outside diameter and having an upstream end and a downstream end;

(b) a reciprocative plunger operatively connected to a piston slidably received within said barrel from the upstream end thereof; and

(c) a hollow, generally cylindrical cannula formed as a continuation of and integral with said barrel at the downstream end thereof and in axial alignment therewith, said cannula having an upstream sucking portion and having an outside diameter at its upstream end that is no greater than about one-half of said predetermined outside diameter of said barrel at the downstream end thereof to thereby form a shoulder between said downstream end of said barrel and said upstream end of said cannula which serves to assist in limiting penetration of said cannula into the patient's mouth during usage, said cannula being provided with a metering aperture means at its downstream end having an inner diameter less than the inner diameter of



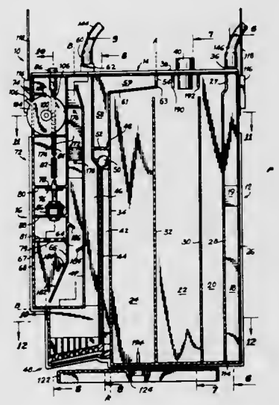
said upstream sucking portion to restrict the flow of fluidic material therefrom, under normal hand pressure on said plunger, to a level that is insufficient to cause gagging of said patient during oral administration of fluidic material to said patient, said cannula further having a predetermined length so as to provide a sucking surface for the patient during usage.

4,784,642

METERLESS DRAINAGE DEVICE WITH SUCTION CONTROL

Frederick A. Everett, Jr., Bloomfield, and Quinton J. Farrar, Wyckoff, both of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Oct. 7, 1986, Ser. No. 916,342
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—118 **34 Claims**



1. Apparatus for draining bodily fluids comprising:

a. collection chamber for collecting fluids from a body cavity, said collection chamber including an inlet for fluid communication with the body cavity;

b. seal chamber for preventing passage of atmospheric air into the body cavity; and

c. suction control chamber for meterlessly regulating the degree of vacuum imposed in the collection chamber and including:

1. first compartment communicating at one end with said seal chamber and having an inlet for coupling to a suction source;

2. second compartment communicating at one end with the other end of said first compartment and at its other end having an inlet for communicating with the ambient;

3. discrete dry meterless means for regulating the degree of suction imposed in said collection chamber at a plurality of predetermined preset levels of suction such that said regulation is substantially insensitive to pressure variations due to patient air leaks or suction source levels, said regulating means positioned within said second compartment, said dry regulating means dimensioned and configured so as to provide suction control at said predetermined preset level of suction independently of any liquid within said suction control chamber; and

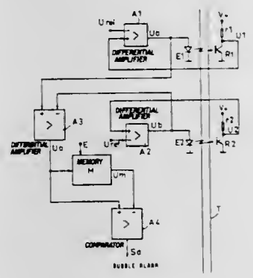
4. indicator means positioned within said first compartment for providing immediate confirmation of proper operation of suction of the body cavity.

4,784,643

DETECTOR OF AIR BUBBLES IN A CIRCUIT OF LIQUID

Roman Siretchi, Pau, and Pierre Vignacq, Soustons, both of France, assignors to Societe Anonyme: M.M.S., France

Filed May 28, 1987, Ser. No. 54,968
Claims priority, application France, May 28, 1986, 86 07657
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—122 **4 Claims**



1. A detector for detecting air bubbles or other liquid discontinuities in a circuit of liquid, comprising:

first and second spaced apart optical emitter-receiver pairs spaced apart from each other along a conduit carrying said liquid, each emitter-receiver pair comprising a light emitting means and a light receiving means placed in a facing relationship on opposite sides of said conduit;

a regulating circuit having a first input connected to said light receiving means, a second input of said regulating circuit connected to a source of a reference voltage and an output of said regulating circuit connected to said light emitting means in order to supply said light emitting means with a voltage which is a function of the difference between a voltage supplied by said light receiving means and said reference voltage such that said emitter-receiver pairs operate throughout a predetermined response range, independently of transparency of said liquid;

processing means comprising a differential circuit including first and second inputs connected to said first and second emitter-receiver pair, respectively, in order to produce a

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differential signal representative of the difference between a first voltage supplied by said light receiving means in said first emitter-receiver pair and a second voltage supplied by said light receiving means in said second emitter-receiver pair; and

said processing means operative to generate an alarm signal upon the appearance of an air bubble or liquid discontinuity in said conduit as a function of said differential signal.

4,784,644

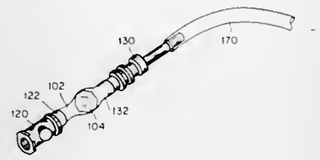
VALVE, CATHETER AND METHOD FOR PREVENTING THE INTRODUCTION OF AIR INTO THE BODY OF A PATIENT

Philip N. Sawyer, Brooklyn; Joseph F. Fitzgerald, Queens, both of N.Y., and Lester F. Miller, Danbury, Conn., assignors to Interface Biomedical Laboratories Corp., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 818,434, Jan. 13, 1986, Pat. No. 4,721,725, and a continuation-in-part of Ser. No. 484,205, Apr. 12, 1983, Pat. No. 4,684,364, and a continuation-in-part of Ser. No. 511,256, Jul. 6, 1983, Pat. No. 4,568,333. This application May 15, 1987, Ser. No. 50,589

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—122 **25 Claims**



1. Fluid flow control means comprising:

tubular means having open input and output bores connected by channel means and operable between an open position to allow fluid flow therethrough and a closed position to prevent ambient pressure air from passing therethrough;

obturating means located within said channel means for prestressing and maintaining a portion of said channel means in said closed position, said channel means being forceable to said open position in response to a positive fluid pressure in said input or output bore of said tubular means to allow fluid flow through said channel means from the bore containing the positive pressure to the other bore, said fluid flow control means capable of passing fluid in either direction depending upon which bore contains the positive pressure; said obturating means returning said channel means to said closed position when said positive pressure is removed;

inlet and outlet connectors for insertion into said input and output bores, respectively of the tubular means for releasable attachment of the control means to fluid directing means; and

housing means enclosing said tubular means and obturating means, and maintaining said inlet and outlet connectors at a predetermined spaced distance.

4,784,645

APPARATUS FOR DETECTING A CONDITION OF A MEDICATION INFUSION SYSTEM AND PROVIDING AN INFORMATIONAL SIGNAL IN RESPONSE THERETO

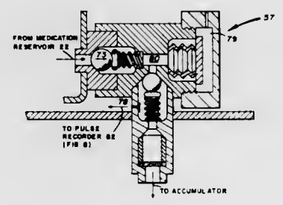
Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 439,139, Nov. 4, 1982, Pat. No. 4,619,653, which is a continuation-in-part of Ser. No. 34,155, Apr. 27, 1979, Pat. No. 4,373,527. This application Sep. 12, 1986, Ser. No. 906,714

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—153 **5 Claims**



1. An apparatus for infusing medication into a living body comprising:

a medication reservoir means for storing medication to be infused;

a pulsatile pump means operably coupled to said reservoir means for pumping a dose of medication in response to an electrical pulse input;

means for applying said electrical pulse input to said pumping means;

an infusion output from which pumped medication exits the system and is dispensed to the patient;

a sensing means, disposed at the infusion output, for sensing the actuation of said pumping means and the dispensing of a dose of medication and transducing an electrical signal corresponding to each dispensed dose; and,

a volume detecting means for detecting the volume of medication dispensed from said reservoir means, and including,

a counting means, operably coupled to said sensing means for counting the occurrences of said electrical signal corresponding to said dispensing dose, and

a means for providing an information signal when said counting means reaches a certain count number.

4,784,646

SUBCUTANEOUS DELIVERY DEVICE

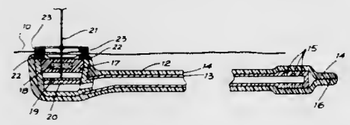
Vladimir Feingold, 6/15 Carrington Road, Castle Hill, New South Wales 2154, Australia

Filed Dec. 3, 1986, Ser. No. 937,232

Claims priority, application Australia, Dec. 3, 1985, PH3700

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—175 **11 Claims**



1. A subcutaneous delivery device comprising a catheter, a self-sealing input port at a first end of said catheter, a magnetic device adjacent the self-sealing input port, the magnetic device

comprising a first magnet located subcutaneously and a second magnet adapted to be magnetically held at an exterior location adjacent the first magnet, and valve means at a second opposite end of said catheter.

4,784,647

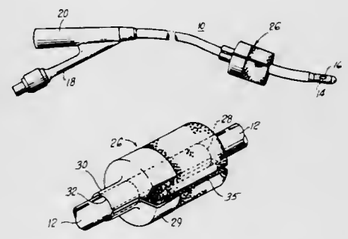
CATHETER MEATAL PAD DEVICE

James R. Gross, St. Charles, Ill., assignor to The Kendal Company, Boston, Mass.

Filed Jul. 30, 1986, Ser. No. 891,930

Int. Cl.[4] A61M *25/02*

U.S. Cl. 604—178 **3 Claims**



1. A metal pad for use in connection with a catheter, to minimize urinary tract infection associated with the meatus-catheter junction, and metal pad comprising:

a foam block of material having a first and second end;

a centrally located bore extending through said foam material;

a flexible coating of material disposed about said first end of said foam block;

a slit arranged radially outwardly from said bore through said foam block and said coating thereon, so as to enable said pad including said coating to be readily opened and disposed about a catheter shaft;

said coating material annularly covering about one-half of said foam material;

said coating material also unitarily comprising an anti-slip means comprising a boss which extends off of the coated end of said foam material;

said foam block thus presenting a non-coated surface at the pad-meatus junction.

4,784,648

INFILTRATION INDICATOR AND ALARM

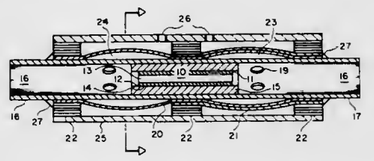
Param I. Singh, Lexington, and Saul Stricker, Marblehead, both of Mass., assignors to Applied Biomedical Corporation, Danvers, Mass.

Filed Sep. 15, 1986, Ser. No. 907,413

The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—141 **5 Claims**



1. A flow restrictor, for use in an infusion system comprising a source of liquid infusate pressurized to a substantially constant known driving pressure driving a flow rate of liquid infusate through said restrictor, comprising a small-bore flow passage, defined within a length of capillary tubing and having a length and a diameter, the ratio of said length to said diameter being at least 10, and said length being at least 3 millimeters, said flow restrictor being further capable of indicating pressure and flow of said liquid infusate and further comprising: a tubular duct sealably surrounding said capillary tubing and extending upstream and downstream thereof; an upstream hole and a downstream hole in the wall of said duct at locations respectively just upstream and downstream of said capillary tubing; thin-wall elastomeric tubing surrounding said duct and sealed thereto at distances upstream and downstream of said holes to provide sealed upstream and downstream annuli inflatable by pressurized infusate flowing outward through said holes; a transparent cylindrical jacket surrounding said elastomeric tubing and radially spaced therefrom at a small distance such that said elastomeric tubing touches said jacket when said annuli are inflated,

the thickness and elastic modulus of said elastomeric tubing providing said downstream annulus being sufficiently small that said downstream annulus may be inflated to touch said jacket when the pressure of said infusate, flowing through said downstream hole, is only 35 to 110 Torr and,

the thickness and elastic modulus of said elastomeric tubing providing said upstream annulus being sufficiently large that said upstream annulus may be inflated to touch said jacket only when the pressure of said infusate, flowing through said upstream hole, is at least 200 to 500 Torr.

4,784,649

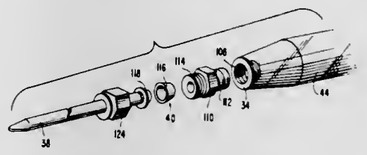
SURGICAL ASPIRATOR CANNULA

Maurice M. Imonti, Dana Point, and Charles E. Beuchat, Irvine, both of Calif., assignors to The Cooper Companies, Inc., Menlo Park, Calif.

Filed Mar. 20, 1987, Ser. No. 28,504

Int. Cl.[4] A61M *5/325*

U.S. Cl. 604—240 **10 Claims**



1. A surgical aspirator cannula comprising:

an elongated body member having a distal end and a proximal end,

said body member defining an aspiration conduit passing therethrough generally between said distal and proximal ends,

said proximal end being operatively connectable to a source of vacuum,

said body member defining at said distal end a distal end port having a threaded opening,

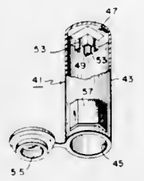
a removable securing means for removably securing a proximal end of an elongated cannula to said distal end port so that a longitudinal passageway of the cannula which engages the cannula proximal end is in fluid communication with said aspiration conduit,

said securing means comprising an adaptor having distal and proximal threaded male connectors and a nut secured between them, and an adaptor passageway extending therethrough, said proximal threaded male connector threadably engaging in said threaded opening by rotating said adaptor nut relative to said body member, a ferrule means fitting in said distal threaded male connector, and a cannula nut positionable around the cannula and when

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tightened causing said ferrule means to grip the cannula end and thereby secure the cannula to said distal end, and said ferrule means comprising a cone-shaped first ferrule fitting into said distal threaded male connector and a second ferrule fitting into said first ferrule and have a distal rim which said cannula nut engages.

4,784,650
NEEDLE HOLDER
Timothy J. Coburn, 4 Eliot Cir., Acton, Mass. 01720
Filed Mar. 23, 1987, Ser. No. 28,789
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—272 **6 Claims**



1. A holder for a surgical needle having a sharp proximal end and a hub portion at the distal end, comprising

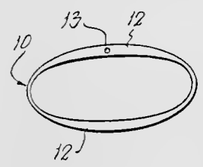
(a) a tubular member open at one end for receiving the stopper end of a blood collection pilot tube, the inner diameter of said tubular member being slightly greater than the outer diameter of said blood collection pilot tube and the length of said tubular member being greater than the length of the needle;

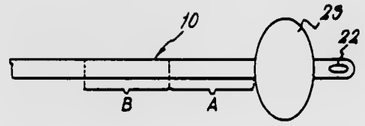
(b) the other end of said tubular member including an integral end wall;

(c) said end wall including an integral sleeve portion defining an enlarged opening in said end wall for receiving the sharp proximal end of the needle, the outer portion of said sleeve portion having an outwardly tapered sidewall, whereby said enlarged opening becomes progressively smaller in the direction of the interior of said tubular member to guide the needle proximal end therein, the configuration of said sleeve portion corresponding with the configuration of the needle hub portion, said sleeve portion containing slots for increasing the gripping action thereof, whereby when the needle is inserted into said tubular member through said opening, the needle hub is wedged within and held by said sleeve portion to arrest the further inserting of the needle, and when a stoppered blood collection pilot tube is inserted into the tubular member open end, the sharp proximal end of the needle penetrates the stopper of the blood collection pilot tube to deposit blood into the tube via the needle while preventing the sharp proximal end of the needle from contacting the user.

4,784,651
URETHRAL CATHETER
David S. Hickey, Manchester, England, assignor to The Victoria University of Manchester, Manchester, England
PCT No. PCT/EP86/00132, § 371 Date Oct. 21, 1986, § 102(e) Date Oct. 21, 1986, PCT Pub. No. WO86/05403, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 11, 1986, Ser. No. 924,841
Claims priority, application United Kingdom, Mar. 14, 1985, 8506638
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—282 **13 Claims**

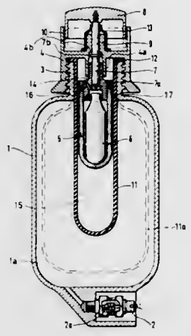
1. A urethral catheter comprising a tube having openings at both ends, and having in at least a portion of the length of the tube to be situated within the urethra, a thin flexible wall having a smooth inner surface of elliptical or oval form in cross-section such that, in said portion, the wall will undergo substantially complete collapse under normal urethral pressure, characterized by at least one zone of increased wall thickness extending around a selected part of the cross-sectional periphery of the tube and extending longitudinally in said portion to prevent the wall from collapsing completely other than by normal urethral pressure or from folding longitudinally, according to the part selected and wherein said thin flexible wall portion of said tube outside said zone of increased





wall thickness has flexural and resilient properties which permit elastic expansion of the tube wall when normal urethral opening occurs during expulsion of urine through the tube, with said thin flexible wall portion being formed of a material having a lateral compliance such that the maximum transmural pressure required to collapse a tube formed entirely of such material to half its normal cross-sectional area would be 100 cm water guage.

4,784,652
EYEWASH DISPENSER
Jan Wikström, Fagersta, Sweden, assignor to Fagersta EL & Diesel AB, Fagersta, Sweden
Continuation-in-part of Ser. No. 839,340, Mar. 13, 1986, abandoned. This application Aug. 12, 1987, Ser. No. 84,211
Claims priority, application Sweden, Mar. 27, 1985, 8501504
Int. Cl.[4] A61M *35/00*
U.S. Cl. 604—295 **3 Claims**



1. A portable, hand-held eyewash dispenser for discharging an eyewash liquid, the eyewash dispenser comprising:

a housing having a wall inner surface and being configured to permit the user to comfortably grasp and hold the same in one hand;

an expandable bladder having an outer surface and disposed in the interior of said housing;

said inner and outer surfaces conjointly defining a reservoir chamber therebetween for holding the eyewash liquid;

a propellant cartridge containing a propellant fluid under pressure;

a holder mounted within said bladder for holding said propellant cartridge therein;

nozzle means communicating with said reservoir chamber for guiding the eyewash liquid to the outside;

manually-actuated release means mounted on said housing for penetrating said cartridge to release said propellant fluid;

passage means interconnecting said cartridge and said bladder for conducting the released fluid into the interior of said bladder for filling and expanding the latter thereby placing the eyewash liquid under a predetermined pressure; and,

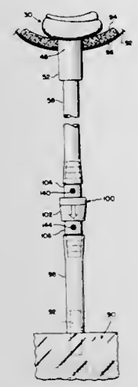
pressure valve means, mounted in said nozzle means, responsive to said predetermined pressure of said eyewash liquid for releasing the same to the outside.

4,784,653
ABSORBENT ADHESIVE DRESSING
Laura L. Bolton, Metuchen; Teresa H. Haddock, Cranbury, and Barry E. Constantine, Ocean Gate, all of N.J., assignors to Johnson & Johnson Patient Care, Inc., New Brunswick, N.J.
Filed Jun. 22, 1987, Ser. No. 64,377
Int. Cl.[4] A61F *13/02*
U.S. Cl. 604—307 **16 Claims**

1. An absorbent adhesive dressing especially for use in treating wounds of the ulcer and burn type where there is significant wound exudate comprising: a three layer sandwich-type construction having an occlusive film as the outer layer, an absorbent layer of fibers as the middle layer, and a wet-stick adhesive as the inner wound facing adhesive layer, wherein said adhesive layer is a continuous, substantially non-porous layer having a porosity of less than 0.5 cc/sec/in^2 which is made from an acrylic polymer having both hydrophillic and hydrophobic characteristics and said adhesive layer comprising a mixture of: (a) N-vinyl caprolactam and (b) n-butyl acrylate or 2-ethylhexyl acrylate or a combination thereof.

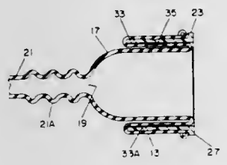
4,784,654
URINARY COLLECTION SYSTEM AND IMPROVED FEMALE URINARY APPLIANCE
William H. Beecher, Elmhurst, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Nov. 16, 1982, Ser. No. 442,207
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—329 **6 Claims**

1. An external urine collection system comprising soft and pliable upper member having means to sealingly engage surface tissue of an incontinent patient, a lower vessel for receiving and storing urine, a generally tubular urine flow passageway connecting said upper member with said lower vessel, valve means in said passageway for restricting flow of fluids towards said upper member, and hydrophobic venting means downstream of the valve means for allowing dissipations of excessive pressure downstream of the valve in said passageway while preventing egress of liquid from said system, said urine flow passageway having a vertical head above said valve of approximately eight inches to maintain a vacuum seal between



said upper member and body, a column of urine is maintained above said valve providing said head.

4,784,655
EXTERNAL CATHETER AND APPLICATOR
Terese A. Campion, Waterbury, Conn., and Hitoshi Sawantani, Osaka, Japan, assignors to Sherwood Medical Company, St. Louis, Mo.
Filed Mar. 4, 1987, Ser. No. 21,464
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—349 **12 Claims**



1. An external catheter and applicator combination, said catheter comprising an elastic sheath having upper and lower portions and inner and outer surfaces, wherein one end is adapted for transporting urine to a suitable reservoir and the other end is adapted to receive the glans of the penis; an applicator comprising a relatively rigid longitudinally extending ring means having inner and outer surfaces and an inside diameter which is slightly greater than the outside diameter of the lower portion of said sheath; said upper sheath portion extends longitudinally and is everted longitudinally over at least a portion of the outer surface of the lower portion of the outer sheath portion forming an everted outer surface, wherein at least a portion of the inner surface of the ring means contacts a portion of said everted outer everted surface of the upper sheath portion, the lower sheath portion being suitably sized to allow insertion of the penis and wherein when the ring means is slideably moved along the penile shaft said everted inner surface of the upper sheath portion is caused to revert along the penile shaft.

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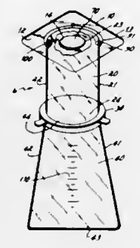
FECAL INCONTINENCE RECEPTACLE AND METHODS OF USE

Delores J. Christian, 3878 Riveria Dr., San Diego, Calif. 92109

Continuation of Ser. No. 729,639, May 2, 1985, abandoned. This application Apr. 23, 1987, Ser. No. 45,172

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—355 **29 Claims**



1. A portable fecal incontinence receptacle for collecting discharge for an anus of a bed-ridden or ambulatory person comprising

a gasket for sealingly engaging an area substantially adjacent to an anus of a bedridden or ambulatory person to form a liquid-tight seal therebetween, aid gasket comprising soft, pliable, stretchable and contractable plastic material having first and second opposite side surfaces and having outer inner marginal edge for permitting said gasket to conform to the curvatures between the buttocks when said gasket is inserted therebetween, the inner edge defining an aperture for communicating with an anus of a bedridden or ambulatory person to permit discharge from an anus of a bedridden or ambulatory person to pass therethrough, the first surface being coated with an adhesive and having a removable protective sheet covering the adhesive coating of said gasket,

conduit means for permitting discharge received from an anus of a person to pass therethrough, said conduit means having first and second ends and extending on the order of about 10 inches in length between the ends and having openings at each end thereof to define a passageway, the second surface of said gasket being secured to said conduit means about the first opening thereof to form a liquid-tight seal therebetween so as to form a passageway through the aperture formed by the inner edge of said gasket and the first opening of said conduit means, said conduit means being provided with venting means along a portion thereof for permitting a gas released into said portable fecal incontinence receptacle to escape therefrom, and

a disposable receptacle comprised of a flexible plastic material for collecting and disposing of on the order of about 1,000 milliliters of discharge received from said conduit means, said disposable receptacle having an opening at one end thereof sealingly and removeably connected along the second opening of said conduit means whereby, upon removal of the protective sheet, said gasket may be sealed to an area about an anus of a bedridden or ambulatory person, and upon passage of discharge from the anus, the discharge may pass through the aperture of said gasket and the passageway of said conduit means into said receptacle for disposal thereof whereby, upon use, said portable fecal incontinence receptacle may be worn by a person while bedridden or ambulatory without substantially obstructing flow of discharge into said disposable receptacle or requiring additional support when said disposable receptacle is in an emptied or filled state.

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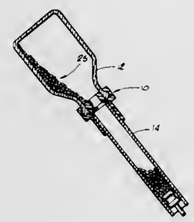
SYRINGE-VIAL MATERIAL TRANSFER INTERCONNECTOR

Lawrence A. Shimp; L. Brian Starling, both of Golden, and Frank L. Cordova, Littleton, all of Colo., assignors to Ceramed Corporation, Lakewood, Colo.

Continuation of Ser. No. 782,407, Oct. 1, 1985, abandoned. This application Dec. 9, 1986, Ser. No. 939,576

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—407 **8 Claims**



1. A method for the regulated gravity transfer of solid granule material between a vial and a syringe, comprising the steps of attaching the syringe to the vial with an interconnector having a generally tubular conduit with an annular surface on the upper opening to receive the syringe and a lower opening in communication with the vial interior, said tubular conduit having an annular flow-impeding port in said lower opening with a constant cross-section aperture and a granular flow-impeding annular shoulder on its lower side to impede the flow of granules from the vial to the syringe; partially inverting the assembled syringe, interconnector and vial so that said vial is at a higher level than said syringe, and striking said assembly to disturb the equilibrium of the granules, to allow the gravity transfer of granules from the vial past the flow-impeding port and through said tubular conduit and into the syringe; returning the assembled syringe, interconnector and vial to a partially upright position to prevent the gravity transfer of granules past the flow-impeding port; and detaching the syringe from the interconnector.

4,784,658

CONTAINER CONSTRUCTION WITH HELICAL THREADED EXTRACTOR

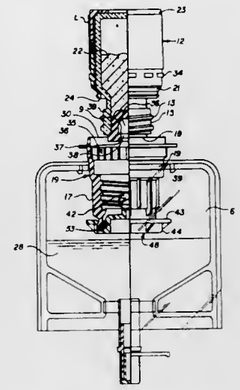
Richard W. Grabenkort, Barrington, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 30, 1987, Ser. No. 9,357

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—410 **15 Claims**

1. A flexible diluent container including an access port having first means for engaging the outlet portion of a second container which is closed by a removable resilient stopper having a recess in an exposed end of such stopper, said flexible container including extractor means comprising an engagement portion protruding along a first axis for engaging such a stopper within said recess thereof, for removal of the stopper from such a second container when engaged with said first means, wherein said engagement portion comprises helical thread means exposed on the periphery of said engagement portion and of a diametral dimension substantially greater than the diametral dimension of at least a portion of said recess for engagement of said helical thread means into the resilient material of such a stopper around the periphery of at least said portion of such recess therein, to facilitate entry of said engagement portion into the recess for thereafter engaging the stopper for effecting removal of said stopper by said extractor means.



4,784,659

VESSEL AND PROSTHESIS IMPREGNATED WITH DIISOCYANATE CROSSLINKED GELATIN

Peter Fleckenstein, Fuldabrück, and Heinz-Helmut Werner, Melsungen, both of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Filed Mar. 3, 1987, Ser. No. 21,129

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608158

Int. Cl.[4] A61F *2/06*

U.S. Cl. 623—1 **10 Claims**

1. An implantable vessel prosthesis comprising a porous tubular structure sealed by impregnation with a material containing gelatin which is crosslinked with a diisocyanate so that pores of the structure are filled with an insoluble crosslinked gelatin/diisocyanate decomposable at a rate of tissue growth into the pores on implantation of the prosthesis.

4,784,660

MANUALLY ACTUATED HYDRAULIC SPHINCTER HAVING A MECHANICAL ACTUATOR

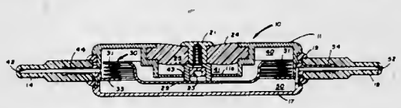
Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 421,441, Sep. 21, 1982, Pat. No. 4,571,749. This application Feb. 24, 1986, Ser. No. 831,950

The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.[4] A61F *2/04;* **A61B** *19/00*

U.S. Cl. 623—14 **13 Claims**



1. An implantable hydraulic urinary sphincter system comprising:

an artificial sphincter means for exerting pressure on a patient's urethra;

a control unit having a sphincter fluid chamber filled with incompressible sphincter fluid, said sphincter fluid chamber hydraulically coupled to said artificial sphincter means, and wherein pressure exerted by said artificial sphincter means varies according to said sphincter fluid pressure;

a pressure sensor means for sensing pressure at a preselected location in a patient's body;

a nominal pressure means for biasing sphincter fluid pressure to a selected nominal pressure, said nominal pressure means comprising a bellows;

a pressure transfer means located within said control unit and associated with said pressure sensor means, for automatically adjusting sphincter fluid pressure depending on pressure sensed by said pressure sensor means; and,

a mechanical actuation means associated with said control unit for mechanically actuating said bellows thereby decreasing the sphincter fluid pressure, wherein a decrease in sphincter fluid pressure decreases the pressure exerted by said artificial sphincter means.

4,784,661

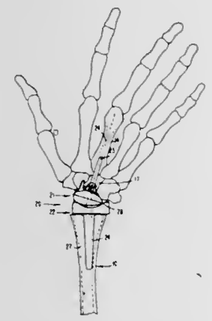
TOTAL WRIST PROSTHESIS

Robert Beckenbaugh, 3015 Valleywood Dr., S.W., Rochester, Minn. 55902; Ted Bolinger, R.R. 8, Box 78, and Dave Cox, R.R. 9, Box 72, both of Warsaw, Ind. 46580

Filed Nov. 22, 1985, Ser. No. 801,042

Int. Cl.[4] A61F *2/42*

U.S. Cl. 623—21 **25 Claims**



1. A total wrist prosthesis for implantation with the third metacarpal and the radius to provide an artificial wrist joint, comprising:

a first component having a head portion defining an ellipsoidal, convex articulating surface and further including a first fixation stem fixedly attached to the head portion;

a second component having a receptacle portion defining an ellipsoidal, concave articulating surface and further including a second fixation stem fixedly attached to the receptacle portion, said ellipsoidal, concave articulating surface being shaped complementary to the ellipsoidal, convex articulating surface of said first component;

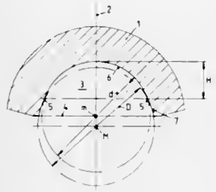
first fixation means for affixing the first fixation stem to one of the third metacarpal and the radius; and,

second fixation means for affixing the second fixation stem to the other of the third metacarpal and the radius;

the convex articulating surface of said first component being received adjacent the concave articulating surface of said second component when either said first fixation stem or said second fixation stem is received in the third metacarpal and the other of said first fixation stem or said second fixation stem is received in the radius.

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ARTIFICIAL HIP JOINT
Maurice E. Müller, Bern, Switzerland, assignor to Sulzer Brothers Limited, Winterthur and Protek AG, Berne, both of, Switzerland
Filed Oct. 29, 1986, Ser. No. 924,917
Claims priority, application Switzerland, Nov. 18, 1985, 4914/85
Int. Cl.[4] A61F *2/34, 2/30*
U.S. Cl. 623—22 **6 Claims**



1. An artificial hip joint socket for receiving a joint head, said socket having a socket bowl disposed in symmetric relation about a longitudinal axis with a spherical section at a polar region of a first diameter to define a spherical cap of a height equal to ⅓ said first diameter, and an annular part-spherical section extending from said spherical section on a second diameter greater than said first diameter.

4,784,663
ACETABULAR CUP ASSEMBLY
Robert V. Kenna, Saddle River, N.J., assignor to Pfizer Hospital Products Group, Inc., New York, N.Y.
Continuation of Ser. No. 831,246, Feb. 19, 1986, Pat. No. 4,718,911. This application Nov. 30, 1987, Ser. No. 126,521
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] A61F *2/34*
U.S. Cl. 623—22 **4 Claims**

1. A three-component acetabular cup assembly for receiving and releasably retaining the femoral head component of a prosthesis, comprising a two-component cup and a locking ring, in which:

said cup comprises (i) a metal shell defining an opening about a peripheral edge and adapted to removably fit within the natural anatomical acetabulum, and (ii) a cup-shaped inner bearing of substantially rigid plastic fixedly secured within said metal shell, the inner surface of said bearing being substantially hemispherical with a cylindrical apron and adapted to accept said femoral head, said apron having a plurality of resilient leaves formed by longitudinal slits extending to a distal end, whereby said leaves are adapted to move outwardly to allow passage of said femoral head into said inner bearing;

and said locking ring is made from the same plastic as said



inner bearing and has a substantially cylindrical configuration terminating in an outwardly projecting lip which overlaps the peripheral edge of said metal shell in the locked position, and also has projecting flanges, at least one of which is adapted to snap into a groove in said cup so that when said locking ring is pushed over the outer wall of said inner bearing it prevents the leaves of said bearing from moving outward and thereby releasably locks said bearing around said femoral head, there being an annular gap left between said lip of the locking ring and the adjacent periphery of the metal shell, whereby said locking ring may be readily disengaged and said femoral head removed while leaving said bearing fixedly secured within said shell by prying said lip away from said shell periphery.

4,784,664
NON-CHROME TANNING METHOD
Marcel Slegler, North Bergen; Ernest Diamont, Fanwood; Joseph L. Suarez, Wayne and Colin D. Quinn, Old Bridge, all of N.J., assignors to Seton Company, Newark, N.J.
Filed Jun. 24, 1986, Ser. No. 877,743
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] C14C *3/08, 3/10*
U.S. Cl. 8—94.33 **11 Claims**

1. A method for preparing leather from limed hides to yield leather having a "chrome" character without the use of chromium, comprising the steps, in sequence, of:

1. pretanning a hide with an essentially chromium-free tan until its shrinkage temperature is about 170° to 185° F.; and
2. tanning and retanning the pretanned hide by sequentially
   (a) submerging said pretanned hide in an aqueous solution containing water and about 4 to 6% by hide weight sodium compound wherein said sodium compound is selected from the group consisting of sodium chloride and sodium sulfate;
   (b) adjusting the pH of said aqueous solution to between about 4.0 and 4.5;
   (c) adding liquid synthetic tanning agents and vegetable tanning agents;
   (d) draining the hide and adding a mineral tanning agent in an amount calculated as 1 to 5% of the total hide weight, along with water calculated as 100% of the total hide weight;
   (e) further retanning the hide with a bicarbonate compound; and
   (f) draining and finishing said tanned hide.

4,784,665
AGENT FOR THE TREATMENT OF FIBERS
Isao Ona; Masaru Ozaki, and Osamu Tanaka, all of Chiba Prefecture, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan
Filed Jul. 2, 1987, Ser. No. 69,150
Claims priority, application Japan, Jul. 24, 1986, 61-174341
Int. Cl.[4] D06M *13/00*
U.S. Cl. 8—115.6 **4 Claims**

1. An improved method of obtaining oil spot free, siloxane treated fibers, the method comprising

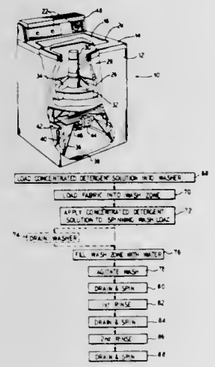
(I) applying a siloxane to the fibers and,

(II) drying the fibers, the improvement comprising using as a siloxane treatment a composition whose major siloxane component is an organopolysiloxane microemulsion whose average particle size after polymerization is equal to or less than 0.15 micrometers and whose viscosity after the emulsion is broken is at least 100 centistokes at 25° C., which siloxane is prepared by emulsion polymerizing cyclic organopolysiloxanes having the following formula



wherein each R is independently selected from monovalent hydrocarbon radicals and n is an integer having a value of 3 to 10.

4,784,666
HIGH PERFORMANCE WASHING PROCESS FOR VERTICAL AXIS AUTOMATIC WASHER
Robert A. Brenner, St. Joseph Township, Berrien County, and Anthony H. Hardaway, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Aug. 8, 1986, Ser. No. 894,813
Int. Cl.[4] D06M *1/16*
U.S. Cl. 8—137 **14 Claims**



1. A method of laundering a textile wash load in a washing apparatus having a rotatable wash zone including a peripheral wall, means for rotating said peripheral wall and said wash load in said wash zone about a generally vertical axis, and means for proving mechanical agitation to said wash load within said wash zone, comprising the steps of:

(1) introducing said textile wash load into said wash zone;
(2) rotating said wash load and said peripheral wall at of speed that is sufficient to maintain the load against the peripheral wall;
(3) continuously passing delivering a concentrated detergent solution in the range of not less than approximately 0.5% to 4% detergent concentration through said spinning wash load in the absence of mechanical agitation of said wash load during at least a portion of the time said load is being spun so that the total effective amount passed through is greater than the amount necessary to saturate the clothes load;
(4) terminating steps 2, and 3 after a first predetermined time period;
(5) introducing water to said wash zone to dilute the detergent solution;
(6) agitating the load in the dilute detergent solution for a second predetermined period; and
(7) rinsing said detergent solution from said clothes load.

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4,784,667

OXIDATION HAIR DYES COMPRISING DIAMINO-SUBSTITUTED PYRIDINES AND AMINO-SUBSTITUTED AROMATICS AS PRECURSORS

Norbert Maak, Neuss; Peter Flemming, Oberhausen, and Dieter Schrader, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 521,747, Aug. 19, 1983, abandoned. This application Oct. 7, 1985, Ser. No. 786,135

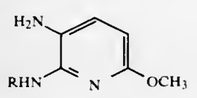
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233540

Int. Cl.⁴ A61K *7/13*

U.S. Cl. 8—409 **8 Claims**

1. An oxidation hair dyestuff composition for the dyeing of human hair, comprising

(a) from about 0.2 to 5 percent by weight of the combination of (1) at least one 2,3-diamino-6-methoxypyridine of the formula



(I)

wherein R is methyl or hydroxyethyl, with (2) at least one compound selected from the group consisting of 0-phenylene diamine, p-phenylene diamine, 2-aminophenol, and 4-aminophenol, which may be unsubstituted or substituted by one or two C_1–C_4-alkyl or C_2–C_4-hydroxyalkyl on the nitrogen atom as well as by one or more C_1–C_4-alkyl, alkoxy having from 1 to 4 carbon atoms, or halogens on the aromatic nucleus, the molar ratio of component (1) to component (2) being from about 2:1 to 1:2,

(b) from about 0.5 to 30 percent by weight of wetting and emulsifying agents,

(c) from about 0.1 to 25 percent by weight of thickeners, and

(d) the balance water.

4,784,668

NOVEL HETEROCYCLE-CONTAINING TRISAZO DYES

Walter Breitschaft, Ludwigshafen; Udo Mayer, Frankenthal, and Guenther Seybold, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland, Fed. Rep. of Germany

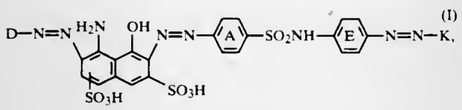
Filed May 13, 1987, Ser. No. 49,225

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618265

Int. Cl.⁴ D06P *3/32;* **C09D** *11/00*

U.S. Cl. 8—437 **3 Claims**

1. A compound of the formula I

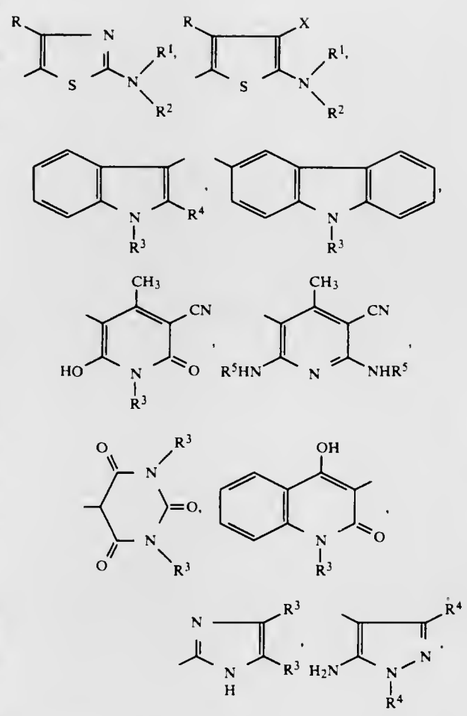


(I)

wherein

D is phenyl which is unsubstituted or substituted by fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkylsulfonyl, C_1–C_8-alkyl, C_1–C_4-alkoxy, carboxyl, C_1–C_4-alkoxycarbonyl, hydroxysulfonyl, carbamyl, C_1–C_4-mono- or dialkylcarbamyl, pyrrolidinocarbonyl, piperidinocarbonyl, morpholinocarbonyl, piperazinocarbonyl, N-(C_1–C_4-alkyl)-piperazinocarbonyl, sulfamyl, C_1–C_4-mono- or dialkylsulfamyl, pyrrolidinosulfonyl, piperidinosulfonyl, morpholinosulfonyl, piperazinosulfonyl or N-(C_1–C_4-alkyl)-piperazinosulfonyl and

K is a radical of a heterocyclic coupling component selected from a group consisting of



wherein

R is hydrogen or C_1–C_4-alkyl or is thienyl or phenyl which is unsubstituted or substituted by chlorine, bromine, methyl, methoxy, ethoxy, dimethylamino or diethylamino,

R^1 and R^2 independently of one another are each hydrogen, unsubstituted or substituted C_1–C_{10}-alkyl, C_5–C_7-cycloalkyl, unsubstituted or substituted phenyl, or allyl, or, together with the nitrogen atom to which they are bonded, form a five-membered or six-membered saturated heterocyclic radical,

R^3 is hydrogen or C_1–C_4-alkyl,

R^4 is hydrogen, C_1–C_4-alkyl or phenyl,

R^5 is hydrogen or unsubstituted or substituted C_1–C_{10}-alkyl, unsubstituted or substituted phenyl or allyl and

X is cyano, nitro, C_1–C_4-mono- or dialkylcarbamyl, pyrrolidinocarbonyl, piperidinocarbonyl, morpholinocarbonyl, piperazinocarbonyl, N-(C_1–C_4-alkyl)-piperazinocarbonyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylcarbonyl, unsubstituted or substituted phenylcarbonyl, C_1–C_4-alkylsulfonyl or unsubstituted or substituted phenylsulfonyl, and its salts and the rings A and E may furthermore be substituted by methyl, methoxy, chlorine or hydroxy sulfonyl, and its salts.

4,784,669

HAND TOOL FOR TERMINATING WIRES IN A CONNECTOR

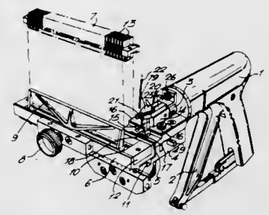
Werner Maack, Seeheim, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 25, 1983, Ser. No. 555,093

Claims priority, application United Kingdom, Nov. 27, 1982, 8233878

Int. Cl.⁴ B23P *23/00*

U.S. Cl. 29—566.4 **1 Claim**



1. A hand tool for terminating wires successively in respective electrical contacts arranged at intervals (**13**) in a row along an electrical connector (**7**), and comprising a wire inserting ram (**3**) mounted on and reciprocable relative to a frame (**4**) which defines a guideway (**5**) for a connector support (**6**) extending transversely of the path of the ram, (**3**) is characterized in that a wire gripping device (**19**) is mounted at an upper side of the forward end of the ram (**3**); the gripping device (**19**) comprising a pair of jaws (**21**) projecting forwardly of the ram (**3**) and being pivotally supported on the ram, the jaws (**21**) being resiliently biased towards a closed condition by a compression spring located between the jaws and being arranged to engage camming means (**25**) on the frame (**4**) on withdrawal of the ram (**3**) to a rearward position, the camming means (**25**) comprising a convergent recess formed in the frame and being arranged to open the jaws (**21**) against the bias, and to disengage on forward movement of the ram (**3**) to permit closure of the jaws (**21**) by the resilient bias, a wire aperture (**17**) being formed in the frame (**4**) below the leading end of the ram (**3**) when in its withdrawn position and in general alignment with the jaws (**21**) when in the open condition, a shear member (**18**) being disposed at a forward side of the aperture (**17**) arranged to coact with a lower portion (**29**) of the ram (**3**) forward end to shear the wire (**22**) as the ram (**3**) moves forward past the aperture (**17**) and shear member (**18**).

4,784,670

PARTIAL OXIDATION PROCESS

Mitri S. Najjar, Hopewell Junction, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 803,264, Nov. 29, 1985, Pat. No. 4,671,804. This application May 22, 1987, Ser. No. 53,455

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.⁴ C10J *3/46*

U.S. Cl. 48—197 R **26 Claims**

1. A process for the production of gaseous mixtures comprising H_2+CO by the partial oxidation of a feedstock comprising sulfur-containing liquid hydrocarbonaceous fuel and/or petroleum coke, said fuels having nickel and iron-containing ashes, or mixtures thereof; and said feedstock includes a minimum of 0.01 wt. % of sulfur; a minimum of 0.5 ppm nickel, a minimum of 0.5 ppm iron, and a minimum of 2.0 ppm of silicon; said process comprising:

(1) mixing together an additive comprising about 2 to 100 wt% of a supplemental sulfur-containing material and about 0 to 98 wt. % of a supplemental iron-containing material with said fuel feedstock; wherein the weight ratio of additive to ash in said fuel feedstock is in the range of about 0.2 to 20.0; and the weight ratio of iron plus sulfur to nickel in said mixture of additive and fuel feedstock is greater than 0.90;

(2) reacting said mxiture from step (1) at a temperature in the range of about 1800° F. to 2800° F. and a pressure in the range of about 5 to 250 atmospheres in a free-flow refractory lined partial oxidation reaction zone with a free-oxygen containing gas in the presence of a temperature moderator and in a reducing atmosphere to produce a hot raw effluent gas stream comprising H_2+CO and entrained molten slag; and where in said reaction zone said additive combines with substantially all of the nickel and most of the iron constituents and sulfur found in the feedstock to produce said molten slag substantially comprising (i) a fluid sulfide phase comprising the sulfides of iron and nickel having a minimum weight ratio of iron plus sulfur to nickel of 0.70 and a minimum sulfur content of 36 weight percent; (ii) a relatively minor amount of Fe, Ni alloy phase wherein Fe is in the range of about 30 to 95 wt. %, and nickel is in the range of about 5 to 70 wt%. and (iii) other slag components including silicates, vanadium-containing spinels, and other refractory components; and

(3) separating nongaseous materials containing substantially no Ni_3S_2 and a reduced amount of said Fe, Ni alloy phase from said hot raw effluent gas stream.

4,784,671

METHOD OF IMPROVING THE GRINDING PERFORMANCE OF GRINDING AND HONING BODIES

Karl Elbel, Gustav-Stresemannstrasse 100, D-7530 Pforzheim, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,468

Claims priority, application European Pat. Off., Mar. 6, 1987, 87103236

Int. Cl.⁴ B24D *3/00*

U.S. Cl. 51—293 **10 Claims**

1. A process for improving the grinding performance of a porous ceramic or plastic bound grinding or having body, comprising the steps of obtaining a conventionally produced porous ceramic or plastic bound grinding or having body, and filling the pore spaces of the bvody at least in part with at least one metal soap.

4,784,672

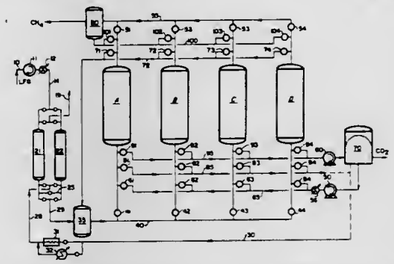
REGENERATION OF ADSORBENTS

Shivaji Sircar, Wescosville, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 8, 1987, Ser. No. 107,064

Int. Cl.⁴ B01D *53/04*

U.S. Cl. 55—26 **10 Claims**



1. In the process for pretreatment of landfill gas by selective adsorption for removal of trace impurities therein prior to bulk separation of CO_2 from CH_4 contained in the pretreated gas, the improvement which comprises:

(A) passing said landfill gas at superatmospheric pressure into the feed end and through a column containing successive layers of adsorbent wherein hydrocarbons and halohydrocarbons boiling above methane are removed by

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selective adsorption in the first of such layers and water and sulfur compound are retained by adsorption in the succeeding layer, thereby producing a purified dry gas effluent discharge at the exit end of said column comprised of substantially purified CH_4 and CO_2;

(B) thereafter regenerating the adsorbent layers in said column by the successive steps of:

(a) depressurizing the column to near ambient pressure level by withdrawal of gas therefrom at its initial feed end;

(b) passing hot regenerating gas into the column through the initial exit end thereof whereby said gas passes first through said water-retaining adsorbent layer at the highest regeneration temperature until a portion of said layer is heated to said highest regeneration temperature thereby driving off water and impurities earlier sorbed in said layer;

(c) reducing the inlet temperature of the hot regenerating while continuing passage of the hot gas successively through said water-retaining adsorbent layer and said hydrocarbonladen layer, thereby thermally desorbing the hydrocarbon impurities from the hydrocarbonladen layer without damage to the adsorbent in said layer;

(d) cooling the column to about ambient temperature range by flowing unheated gas through the consecutive adsorbent layers; and

(e) then restoring the column to the starting superatmospheric pressure level by introduction therein of a stream of purified dry gas comprised of CH_4 and CO_2.

4,784,673

DESICCANT COMPOSITION FOR SUPERCRITICAL CO_2

George C. Blytas, and Zaida Diaz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 17, 1987, Ser. No. 74,669
Int. Cl.⁴ C01B *31/20;* **B01D** *53/02, 53/14*
U.S. Cl. 55—29 **6 Claims**

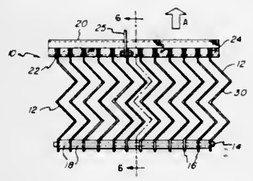
1. A process for reducing the moisture content of substantially supercritical moist carbon dioxide which comprises contacting moist carbon dioxide at substantially supercritical conditions of temperature and pressure of from 70° F. to 150° F. and 1071 psia to 2400 psia with a desiccant composition comprising glycerine containing 5%w to about 20% by weight of at least one bis-hydroxymethyl dioxane based on the total weight of the composition and recovering substantially supercritical carbon dioxide having reduced moisture content.

4,784,674

MIST ELIMINATOR MODULE AND A METHOD FOR SELF-CLEANING OF THE SAME

Otto Sarmiento, Darien, and Even Bakke, Stamford, both of Conn., assignors to Flakt, Inc., Atlanta, Ga.

Filed Aug. 5, 1987, Ser. No. 82,053
Int. Cl.⁴ B01D *46/04*
U.S. Cl. 55—96 **22 Claims**



1. A mist eliminator module for removing liquid components of a gas stream, comprising:

a plurality of mist eliminator blades formed from a smooth material, each blade having a captive edge portion and a free edge portion, and each blade being in substantial alignment with adjacent blades;

support means for resiliently holding said captive edge portion of said blades in spaced alignment; and

detachable spacer means for holding said free edge portion of said blades in spaced alignment;

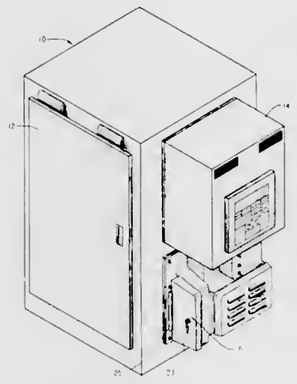
whereby each blades may be readily separated from adjacent blades after detaching said spacer means.

4,784,675

CABINET CONTROLLER

Leland C. Leber, Fort Collins; Charles L. Hunter, Loveland, both of Colo., and George N. Brown, Jr., Lexington, La., assignors to Teledyne Industries, Inc., Fort Collins, Colo. and Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 902,864, Sep. 2, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,171
Int. Cl.⁴ B01D *46/46, 50/00*
U.S. Cl. 55—213 **15 Claims**



1. An air-filtering system comprising:

a cabinet defining a confined interior equipment-containing space into which said air is admitted and maintained at a positive pressure relative to ambient atmospheric pressure external to said cabinet;

a housing having an inlet for admitting air into said housing from the ambient atmosphere external to said housing and having outlet means for delivering air from said housing into said equipment-containing space within said cabinet;

a canister having its own outlet opening and its own inlet opening and disposed within said housing, said canister containing an air filtration material located between said canister inlet opening and said canister outlet opening with said canister being in a position to enable air flow between said canister openings through said material;

propelling means disposed within said housing and so located in position relative to said canister as to move the air from said housing inlet in a downstream direction through said canister inlet opening, said filtration material and said canister outlet opening on through said housing outlet and into said equipment-containing space;

means located within said air filtering system for controlling said propelling means in response to the flow of said air through said housing in order to maintain essentially continuously a selected constant rate of air flow through said housing outlet and into said cabinet in compensation for changes in impedance of said material to air flow through said material;

said propelling means being located downstream of said air flow through said material;

and means for disposing said controlling means downstream from said propelling means directly in the path of said air flowing from said propelling means and ultimately toward said housing outlet.

4,784,676

DISPOSABLE VACUUM CLEANER BAG

Dorothy G. Hale, Rt. 2, Box 231-B, Bridgeport, Tex. 76026

Filed Nov. 12, 1987, Ser. No. 119,664
Int. Cl.⁴ B01D *47/02*
U.S. Cl. 55—255 **8 Claims**



1. A disposable dust collection bag for use internally of the dust collection compartment of a vacuum cleaner apparatus and comprising in combination:

an elongated collection bag of nonporous composition defining an internal compartment having a portion in which to contain a body of liquid comprising the dust collection media, said bag being of a size and shape adapted to be received internally of the vacuum cleaner dust collection compartment with which the collection bag is to be utilized;

inlet means defined in said collection bag at a location above the normal liquid level and adapted to receive dust laden air from the vacuum cleaner;

conduit means extending downwardly internally of said collection bag in communication with said inlet for discharging the received dust laden air flow to a location within the body of liquid in said compartment portion; and

outlet means defined in said collection bag at a location removed from the contained body of liquid through which air flow emerging from the body of liquid can be discharged relatively dust free to atmosphere.

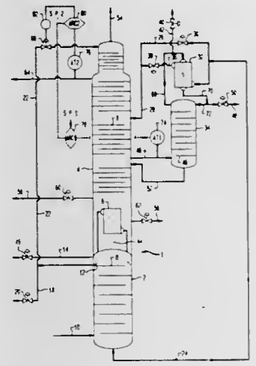
4,784,677

PROCESS AND APPARATUS FOR CONTROLLING ARGON COLUMN FEEDSTREAMS

Ismael Al-Chalabi, Westfield, N.J., assignor to The BOC Group, Inc., Montvale, N.J.

Filed Jul. 16, 1987, Ser. No. 74,402
Int. Cl.⁴ F25J *3/00*
U.S. Cl. 62—37 **32 Claims**

1. A process for separation of air by low temperature rectification capable of producing an oxygen, argon and nitrogen product which comprises: subjecting air to a two-stage rectification wherein a nitrogen rich reflux liquid from a first rectification stage is introduced into a second rectification stage to wash the rising vapor at the top portion of said second rectification stage and withdrawing from a zone of the second rectification stage where the argon content is high, a feedstream which is passed to a crude argon rectification stage, the improvement comprising analyzing in real time the nitrogen



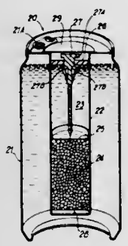
content of said feedstream and controlling the operation of said process in response to the results of said analysis.

4,784,678

SELF-COOLING CONTAINER

Arthur G. Rudick; Ashis S. Gupta, both of Marietta, and Richard H. Heenan, Atlanta, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Apr. 6, 1987, Ser. No. 35,122
Int. Cl.⁴ F25D *5/02*
U.S. Cl. 62—4 **3 Claims**



1. A self-cooling container comprising:

(a) an outer body for the storage of a beverage,

(b) an openable closure means located on the surface of said outer body,

(c) an inner body within said outer body and adjacent to said openable closure means having a first compartment containing a liquid and a second compartment containing a chemical that will react when contacted with said liquid to absorb heat, separated by a rupturable separator means, and

(d) a flexible diaphragm in movable association with said first compartment and accessible through said openable closure means, said flexible diaphragm capable of passing an externally applied force through said liquid and rupturing said rupturable separator means.

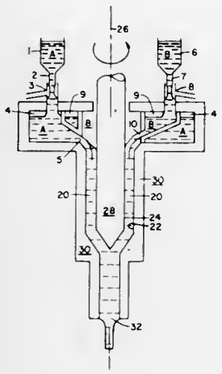
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4,784,679

METHOD FOR MAKING A LAYERED GLASS ARTICLE

William P. Lentz, deceased, Addison, N.Y. (by Cornelia V. Lentz, executor), assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 31, 1986, Ser. No. 925,787
Int. Cl.[4] C03C *25/02;* **C03B** *5/26, 7/14;* **B29D** *11/00*
U.S. Cl. 65—3.13 **3 Claims**



1. A method for the manufacture of a solid layered article having a radial variation in composition, said article comprising at least two solid materials of differing composition forming multiple alternating spiral layers within at least a portion of the article which comprises the steps of:

(a) providing a mixing zone for the shear mixing of a viscous liquid or plastic mass, which zone comprises a gap bounded by opposing surfaces, at least one of said surfaces having an axis of symmetry being rotatable with respect to the other about an axis of rotation coincident with said axis of symmetry;

(b) providing in the mixing zone a composite charge of material which incorporates at least two discrete component charges of hardenable viscous liquid or plastic material, which differ in composition from each other, the component charges being geometrically distributed within the mixing zone such that the relative proportions of at least two of the materials varies as a function of lateral position across the gap bounded by the opposing surfaces;

(c) rotating at least one of the opposing surfaces to generate shear stress across the gap and effect circumferential redistribution of material in the gap about the axis of rotation, sufficient to cause spiral layering of at least two of the component charges, and

(d) removing and hardening the layered composite charge to form the solid layered article.

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METHOD OF AND APPARATUS FOR MANUFACTURING FLOAT GLASS

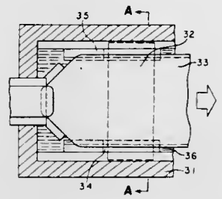
Yasuo Sato; Tsunehiro Saito; Hiroshi Mase; Katsuhiro Haruyama, and Masaaki Yoshikawa, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jul. 1, 1987, Ser. No. 68,415
Claims priority, application Japan, Jul. 3, 1986, 61-155026
Int. Cl.[4] C03B *18/04, 18/06*
U.S. Cl. 65—99.6 **11 Claims**

1. A method of manufacturing float glass having a predetermined thickness, comprising the steps of:

using a linear induction motor on a molten metal bath contained in a vessel, to form a height difference between an upstream first horizontal molten metal bath surface and a downstream second continuously horizontal molten metal bath surface;

continuously supplying molten glass to said first surface to



form thereon a glass ribbon having an equilibrium thickness; and

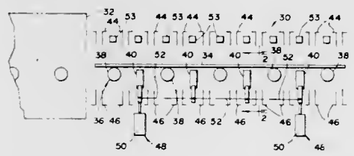
advancing said glass ribbon to said second surface to form thereon a glass ribbon having a predetermined thickness.

4,784,681

COMBINED GLASS SHEET BENDING AND QUENCH STATION

Harold A. McMaster, Woodville, Ohio, assignor to Glasstech International L.P., Scarsdale, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,246
Int. Cl.[4] C03B *23/023, 27/00*
U.S. Cl. 65—273 **25 Claims**



1. A combined bending and quench station for bending and quenching heated flat glass sheets received from a glass heating furnace, the station comprising: a roller conveyor proximate the glass heating furnace; said roller conveyor including elongated rolls spaced from each other in a parallel relationship and rotatably supported to receive a heated flat glass sheet to be bent; a plurality of molds being located generally between the rolls; each mold having a glass engagement surface for engaging the heated glass sheet to provide bending thereof above the conveyor; means for engaging the glass engagement surfaces of the molds with the hot glass sheet; and an upper blasthead mounted above the roller conveyor and a lower blasthead mounted below the roller conveyor, said upper and lower blastheads cooperatively supplying quenching gas that impinges with the bent glass sheet while engaged with the molds to fix the shape and provide tempering of the bent glass sheet.

25. A combined bending and quench station for bending and quenching heated flat glass sheets heated in a glass heating furnace, the station comprising: a roller conveyor proximate the glass heating furnace; said roller conveyor including elongated rolls spaced from each other in a parallel relationship and rotatably supported to receive and convey a heated flat glass sheet to be bent; a plurality of molds being located generally between the rolls fixedly mounted above the roller conveyor; each mold having a planar glass engagement surface; the glass engaging surfaces defining a curve longitudinally along the direction of conveyance along the roller conveyor; an upper blasthead mounted above the roller conveyor and a lower blasthead mounted below the roller conveyor, said upper and lower blastheads cooperatively supplying quenching gas; and a control for sequentially regulating air flow to the blastheads whereby the lower blastheads blow the heated glass sheet against the glass engagement surfaces of the molds to bend the glass sheet about a bending axis extending substantially perpendicular to the direction of conveyance, and both upper and lower blastheads supplying quenching gas that impinges with the bent glass sheet while engaged with the molds to provide hardening, fix the shape and initiate tempering of the bent glass sheet.

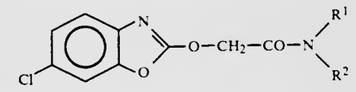
4,784,682

6-CHLOROBENZAZOLYLOXYACETAMIDES

Heinz Förster; Volker Mues, both of Wuppertal; Robert R. Schmidt, Bergisch-Gladbach; Hans-Joachim Santel, Cologne; Gerd Hänssler, and Ludwig Eue, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 731,233, May 6, 1985, abandoned. This application May 28, 1987, Ser. No. 55,102
Claims priority, application Fed. Rep. of Germany, May 16, 1984, 3418168
Int. Cl.[4] A01N *43/76, 43/78;* **C07D** *263/58, 277/68*
U.S. Cl. 71—88 **17 Claims**

1. A 6-chlorobenzazolyl-oxyacetanilide of the formula



in which

R^1 is alkyl with 1 to 6 carbon atoms, and

R^2 is phenyl which is optionally mono-, di- or tri-substituted by methyl or ethyl.

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Patent Not Issued For This Number

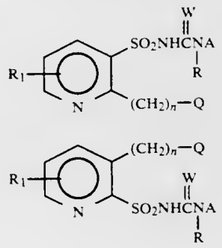
4,784,684

HERBICIDAL PYRIDINESULFONAMIDES

Morris P. Rorer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 724,451, Apr. 22, 1985, Pat. No. 4,668,279, which is a continuation-in-part of Ser. No. 638,964, Aug. 8, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 15,615
Int. Cl.[4] A01N *43/66;* **C07D** *251/18, 401/14*
U.S. Cl. 71—93 **24 Claims**

1. A compound of the formula I or II



I

II

wherein

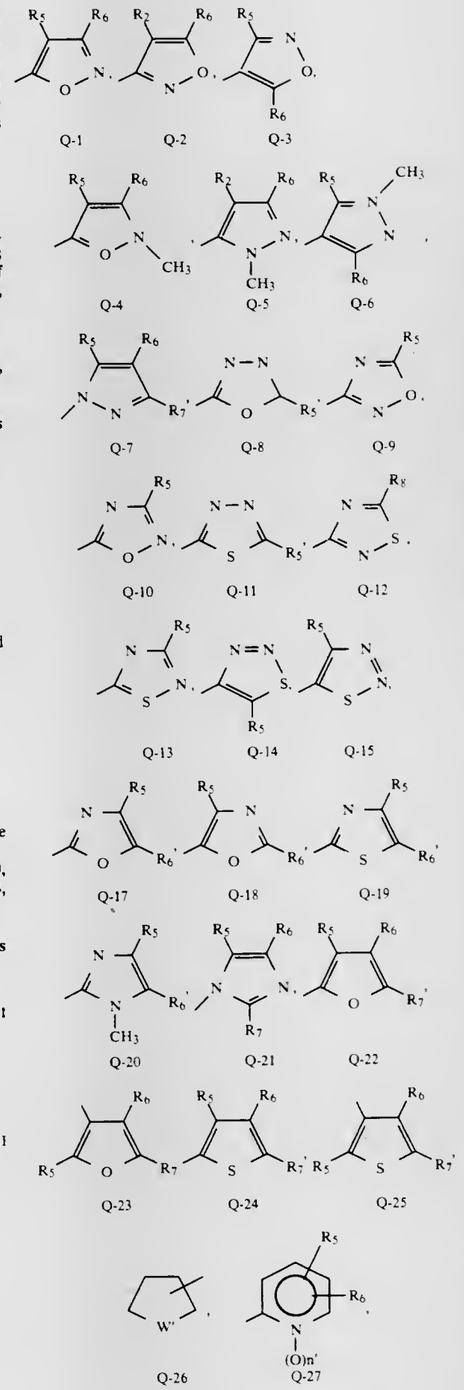
R is H or CH_3;

R_1 is H, Cl, Br, SCH_3 or CH_3;

n is 0, 1 or 2;

W is O or S;

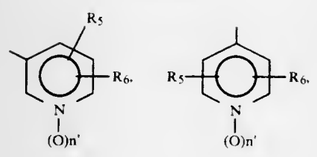
Q is selected from the group consisting of



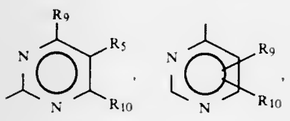
Q-1 Q-2 Q-3 Q-4 Q-5 Q-6 Q-7 Q-8 Q-9 Q-10 Q-11 Q-12 Q-13 Q-14 Q-15 Q-17 Q-18 Q-19 Q-20 Q-21 Q-22 Q-23 Q-24 Q-25 Q-26 Q-27

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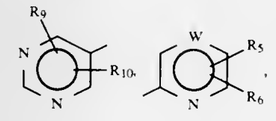
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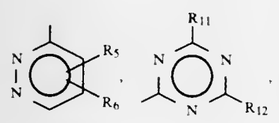
Q-28 Q-29



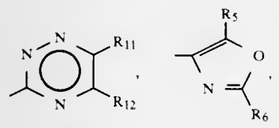
Q-30 Q-31



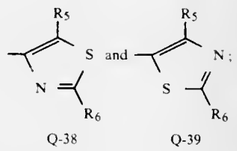
Q-32 Q-33



Q-34 Q-35



Q-36 Q-37



Q-38 Q-39

n' is 0 or 1;

R_5, R_6 and R_7 are independently H or CH_3;

R_5' is H, CH_3, C_2H_5, C_1-C_3 alkylthio, $SCH_2CH{=}CH_2$, SCF_2H, OCH_3 or OCH_2CH_3;

R_8 is H or Cl;

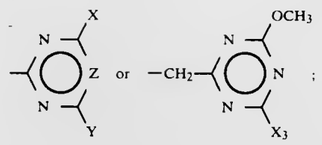
R_9 and R_{10} are independently H, CH_3 or OCH_3;

R_{11} and R_{12} are independently CH_3 or OCH_3;

W' is O, S or NR_{13}; and

R_{13} is H, C_1-C_3 alkyl or $CH_2CH{=}CH_2$;

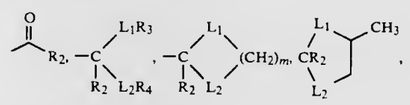
A is



A-1 A-6

X is CH_3, OCH_3, OCH_2CH_3, CH_2F, OCH_2CH_2F, OCH_2CHF_2, OCH_2CF_3 or CF_3;

Y is H, C_1-C_2 alkyl, OCH_3, OC_2H_5, CH_2OCH_3, $NHCH_3$, $N(OCH_3)CH_3$, $N(CH_3)_2$, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}H$, $CH_2OCH_2CH_3$, $OCH_2CH_2OCH_3$, CH_2SCH_3,



SCF_2H or cyclopropyl;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_2 is H or CH_3;

R_3 and R_4 are independently C_1-C_2 alkyl;

Z is N; and

X_3 is CH_3 or OCH_3;

provided that

when W is S, then R is H, A is A-1, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



and their agriculturally suitable salts.

9. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid diluent.

4,784,685

GLUTATHIONE DELIVERY SYSTEM

Alton Meister, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 817,696, Jan. 10, 1986, which is a continuation-in-part of Ser. No. 557,555, Dec. 2, 1983, abandoned. This application Jul. 1, 1987, Ser. No. 68,306

Claims priority, application Japan, Apr. 22, 1985, 60-86974; Apr. 22, 1985, 60-86975

Int. Cl.[4] **A01N** *37/00*

U.S. Cl. 71—106 **14 Claims**

1. A method for increasing cellular levels in plants of glutathione, comprising: administering a methyl and/or ethyl monoester of glutathione in substantially pure form in an amount to increase intracellular levels of glutathione, whereby said ester is transported into said cells and hydrolyzed intracellularly to glutathione, said ester being of the glycine carboxylic acid group of glutathione.

4,784,686

SYNTHESIS OF ULTRAFINE POWDERS BY MICROWAVE HEATING

Thomas T. Meek, Knoxville, Tenn.; Haskell Sheinberg, Los Alamos, and Rodger D. Blake, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 24, 1987, Ser. No. 41,950

Int. Cl.[4] **B22F** *9/18;* **C22C** *19/03, 29/12;* **F26B** *3/337*

U.S. Cl. 75—0.5 AC **5 Claims**

1. A method for making a composition of matter consisting essentially of nickel and aluminum oxide particles which are dispersed throughout the nickel comprising:

a. dissolving nickel nitrate and aluminum nitrate in water to form a solution, in amounts effective to yield said composition of matter;

b. exposing said solution to microwave radiation at a frequency and power effective to evaporate water for a period of time sufficient to form a powder, said powder being comprised of nickel oxide and aluminum oxide; and

c. reheating said powder in an hydrogen-rich atmosphere for a sufficient time and at a sufficient temperature to reduce said nickel oxide to nickel and cause said powder to form a coherent mass, thus forming said composition of matter.

4,784,687

TUNGSTEN RECOVERY

Diana M. Anderson, Sutton Weaver Runcorn, and Denis A. Hutton, Sale, both of England, assignors to Interox Chemicals Limited, London, England

Filed Mar. 18, 1986, Ser. No. 840,766

Claims priority, application United Kingdom, Mar. 29, 1985, 8508334

Int. Cl.[4] **C22B** *34/36*

U.S. Cl. 75—101 R **13 Claims**

1. In a process for the recovery of tungsten from pieces of tungsten alloy-containing material of at least 5 mm in size in which the pieces are contacted with an aqueous mineral acid solution of hydrogen peroxide at a temperature maintained at from 10° C. to 50° C. until at least some tungsten has passed into solution, the improvement which comprises contacting the aqueous acidic solution with a fused block weighing at least 30 grams of a promoter selected from the group consisting of:

(a) a compound having the formula:



wherein A is a hydroxyl or an amine substituent, B is a carboxylic acid or an aldoxime group, and C is an optional further substituent selected from the group consisting of alkyl, hydroxyl, and amino groups;

(b) amino phenol;

(c) 1,4-benzoquinone;

(d) dihydroquinone;

(e) 1,3-dinitrobenzene acid;

(f) oxalic acid;

(g) epoxysuccinic acid; and

(h) tartaric acid;

said promoters being solid at 50° C., whereby consumption of the promoter is less than the amount that would be consumed if the same amount of promoter had been introduced in powder or granular form, under otherwise identical process conditions.

4,784,688

TUNGSTEN RECOVERY

Diana M. Anderson, Sutton Weaver Runcorn, England, assignor to Interox Chemicals Limited, London, England

Filed Mar. 18, 1986, Ser. No. 840,765

Claims priority, application United Kingdom, Mar. 29, 1985, 8508335

Int. Cl.[4] **C22B** *34/36*

U.S. Cl. 75—101 R **16 Claims**

1. In a process for the recovery of tungsten from pieces of tungsten alloy-containing material of at least 5 mm in size in which the pieces are contacted with an aqueous mineral acid solution of hydrogen peroxide at a temperature maintained at from 10° C. to 50° C. until at least some tungsten has passed into solution, the improvement which comprises contacting the pieces with the aqueous mineral acid solution in a plurality of consecutive stages, each stage comprising the steps of contacting the pieces with a portion of the aqueous mineral acid solution containing a substoichiometric amount of hydrogen peroxide, maintaining contact until a substantial proportion of the free hydrogen peroxide content in the solution has been consumed, and thereafter separating the tungsten-enriched solution from the solid residue whereby the amount of tungsten that is extracted using a given amount of hydrogen peroxide and mineral acid under otherwise identical operating conditions is increased beyond that obtainable in a single stage.

4,784,689

PROCESS FOR PRODUCING SPONGE IRON PARTICLES AND MOLTEN PIG IRON

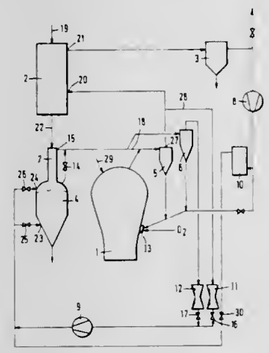
Bogdan Vuletic, Düsseldorf, Fed. Rep. of Germany, assignor to Korf Engineering GmbH, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 826,323

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3504346

Int. Cl.[4] **C21B** *13/06*

U.S. Cl. 75—38 **21 Claims**



1. A process for producing sponge iron particles and molten pig iron from lump iron ore comprising the steps of reducing the iron ore to sponge iron in a direct reduction unit by introducing the lump iron ore and a reducing gas into said direct reduction unit, discharging the sponge iron particles from said reduction unit and introducing same into an air separator, separating said sponge iron in said separator into a sponge iron fine particle fraction and a sponge iron coarse particle fraction, feeding the fine particle fraction to a melt-down gasifier, introducing coal and blown-in oxygen-containing gas into said melt-down gasifier to produce said reducing gas as well as the heat necessary for melting the fine particle fraction of the sponge iron, and introducing at least a part of said reducing gas into the direct reduction unit.

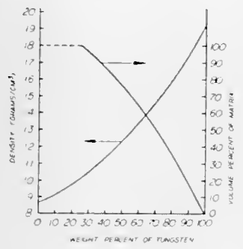
VOL 1096 ISS 3 NO 15 1988 UMI

4,784,690

LOW DENSITY TUNGSTEN ALLOY ARTICLE AND METHOD FOR PRODUCING SAME

James A. Mullendore, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 11, 1985, Ser. No. 786,457
Int. Cl.[4] C22C *1/04*
U.S. Cl. 75—248 6 Claims



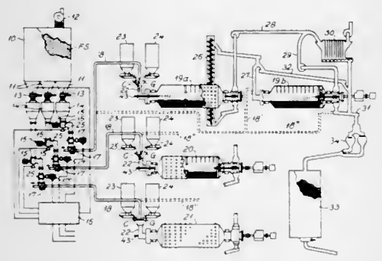
1. A method for producing a low density tungsten alloy article, said method comprising:
(a) compacting a relatively uniform tungsten alloy powder with the tungsten content comprising no greater than about 90% by weight of said alloy and the balance a matrix phase consisting essentially of iron and nickel in a weight of nickel to iron being from about 4 to 1 to about 1 to 1 to produce a preformed article:
(b) sintering said preformed article in a reducing atmosphere at a temperature below the melting point of said matrix phase for a sufficient time to form a densified article;
(c) mechanically working said densified article to produce the final article.

4,784,691

DRY CEMENT COMPOSITION

Poul L. Rasmussen, Rnne, Denmark, assignor to Aktieselskabet Aalborg Portland - Cement - Fabrik, Aalborg, Denmark

Continuation of Ser. No. 811,011, Dec. 19, 1985, abandoned, which is a division of Ser. No. 617,835, Jun. 6, 1984, Pat. No. 4,572,739, which is a continuation of Ser. No. 413,351, Aug. 16, 1982, abandoned. This application Jul. 21, 1987, Ser. No. 77,004
Claims priority, application Denmark, Dec. 17, 1980, 5380/80; Sep. 9, 1981, 4140/81
Int. Cl.[4] C04B *22/14*
U.S. Cl. 106—89 9 Claims



1. A dry cement composition packed for shipment to the final user and comprising water-soluble chromate in an amount injurious to health, and dry, particulate commercial ferrous sulfate in an amount of 0.01-10 percent by weight and sufficient to substantially chemically reduce the water-soluble chromate when water is added to and mixed with the composition.

4,784,692

COLOR-DEVELOPING AGENT FOR PRESSURE-SENSITIVE RECORDING SHEET AND COLOR-DEVELOPING SHEET THEREOF

Hiroaki Umeda; Mamoru Suzuki; Akira Hasegawa, and Kunio Hata, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1987, Ser. No. 122,078
Claims priority, application Japan, Dec. 10, 1986, 61-294509
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—21 6 Claims

1. A color-developing agent for pressure-sensitive recording sheet which comprises a reaction product of carboxylated terpenephenol resin, aromatic carboxylic acid and polyvalent metal compound.

4,784,693

CEMENTING COMPOSITION AND AQUEOUS HYDRAULIC CEMENTING SOLUTION COMPRISING WATER-SOLUBLE, NONIONIC HYDROPHOBICALLY MODIFIED HYDROXYETHYL CELLULOSE

William J. Kirkland, Newark, Del.; Carl A. Lukach, Katy, Tex., and William C. McLachlan, West Chester, Pa., assignors to Aqualon Company, Wilmington, Del.

Filed Oct. 30, 1987, Ser. No. 115,214
Int. Cl.[4] C04B *24/38*
U.S. Cl. 106—93 25 Claims

1. A cementing composition comprising a hydraulic cement and, as a fluid loss control additive, a water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose having a hydroxyethyl M.S., of at least about 1.5, wherein the hydrophobic modifier is a long chain alkyl group having 6 to 25 carbon atoms attached to the cellulose in an amount of from about 0.2 to about 4%, by weight of the total weight of the water-soluble, nonionic hydrophobically modified hydroxyethyl cellulose.

4,784,694

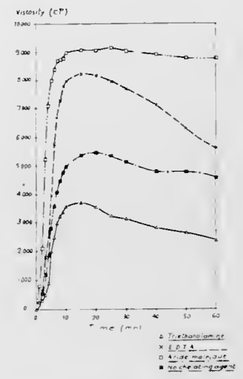
COMPOSITIONS OF POLYMER SYSTEMS, AND THEIR USE FOR EXAMPLE IN HYDRAULIC FRACTURING

Richard Lemanczyk, Saint-Heand, and Jacques Desbrieres, Saint-Etienne, both of France, assignors to Etudes et Fabrication, St. Etienne, France

Filed Dec. 19, 1983, Ser. No. 563,137
Claims priority, application France, Dec. 21, 1982, 82 21474
Int. Cl.[4] C08L *1/00, 5/00*
U.S. Cl. 106—203 17 Claims

1. Polymer based crosslinkable compositions for use in the state of crosslinked gels, in particular in the hydraulic fracturing of underground formations, of the type comprising:
a base polymer
a crosslinking agent
an acid buffer, and
a delayed base

wherein said compositions further comprise a chelating agent selected from the compounds containing at least one —COOH



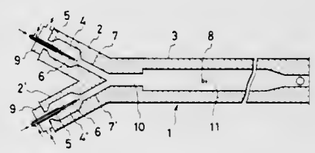
group and thiourea, in a proportion of 2–10% by weight of the polymer.

4,784,695

CARBON BLACK FOR BLENDING IN RUBBER

Masahiko Mito, and Kiyonari Nakai, both of Aichi, Japan, assignors to Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,288
Claims priority, application Japan, Mar. 16, 1987, 62-58792
Int. Cl.[4] C04B *14/36;* C08K *3/04*
U.S. Cl. 106—472 1 Claim



1. A carbon black for blending in rubber which has a BET specific surface area (N_2SA) within a range of 65 to 84 m^2/g, an a value to be obtained according to the following calculation formula, of at least 270 and a ratio of the BET specific surface area (N_2SA) to the iodine adsorption number (IA), $N_2SA/A1$, within a range of 1.10 to 1.35:

$$a=(24.M4DBP)^2\times(\text{Blackness}/IA)^2\times(\overline{D}st)^2\times10^{-6}$$

4,784,696

PROCESS FOR PRODUCTION OF CONCENTRATED SALT STABLE AND BEER STABLE AMMONIA CARAMEL COLOR UNDER SUPERATMOSPHERIC PRESSURE CONDITIONS

Setlur R. Ramaswamy, Louisville, Ky., assignor to D. D. Williamson & Co., Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 769,845, Aug. 26, 1985, abandoned. This application Nov. 12, 1985, Ser. No. 796,846
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] C13F *3/00*
U.S. Cl. 127—34 8 Claims

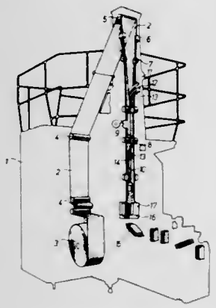
1. A method of forming a non-acid resistant salt and beer stable ammonia caramel color by reacting a carbohydrate syrup containing water and carbohydrates with an ammonia catalyst, selected from the group consisting of ammonia and aqueous ammonia said method comprising:
adding said ammonia catalyst to said carbohydrate syrup to form a mixture of said carbohydrate syrup and ammonia catalyst, said carbohydrate syrup having a dextrose equivalent of from about 75 to about 95;
subjecting said mixture to an effective temperature and pressure for an effective time to cause caramelization of said carbohydrates wherein said effective temperature is from about 230° F. to about 330° F. and said effective pressure is from about 15 to about 100 psi to establish a final color formation greater than 0.1 absorbance at 610 nm at 0.1% w/v through a 10 mm cell;
establishing the water content of said mixture at up to no more than about 40% before said mixture develops a color of about 60% of said final color formation.

4,784,697

METHOD AND AN ARRANGEMENT ON PACKING MACHINES

Giorgio Bordini, S. Prospero, Italy, assignor to Tetra Dev-Co., Modena, Italy

Filed Feb. 10, 1987, Ser. No. 13,052
Claims priority, application Italy, Feb. 14, 1986, 19421 A/86
Int. Cl.[4] B08B *9/06;* B65B *9/08*
U.S. Cl. 134—22.15 14 Claims



1. In a method for sterilizing parts of a packing machine of the type wherein packing material is shaped and filled with contents through a pipe having two feed ducts, the steps of:

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internally sterilizing the insides of the feed ducts by connecting the outlet ends of the feed ducts to each other to form a closed flow path and passing a sterilizing agent through the closed flow path, and thereafter

interrupting the flow path and externally sterilzing the outside of the filling pipe by introducing a sterilizing agent between the pipe and the material which surrounds the pipe and which extends substantially vertically and has a closed lower end,

wherein during the internal sterilization the feed ducts are connected to each other by means of a connecting element which is detached from the filling pipe when the connecting is interrupted and is placed into the packing material tube, the connecting element being detached with the help of a pressure difference created between the two sides of the element.

4,784,698
Patent Not Issued For This Number

4,784,699
PROCESS FOR DECONTAMINATING MILITARY NERVE AND BLISTER AGENTS

Donald R. Cowsar; Richard L. Dunn, both of Birmingham, Ala., and Robert A. Casper, Alpharetta, Ga., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 8, 1987, Ser. No. 36,035
Int. Cl.[4] B08B *5/00*
U.S. Cl. 134—42 **3 Claims**

1. In an improved process of decontaminating large quantities of protective clothing without substantially degrading said clothing, said clothing having been exposed to chemical warfare simulants, comprising: contacting said clothing for penetration and permeation with chlorine dioxide, a gaseous decontaminant, and degassing said decontaminant from said clothing.

4,784,700
POINT FOCUS SOLAR CONCENTRATOR USING REFLECTOR STRIPS OF VARIOUS GEOMETRIES TO FORM PRIMARY AND SECONDARY REFLECTORS

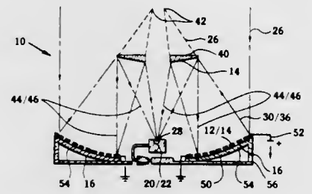
Theodore G. Stern; Mickey Cornwall; Bela Kaincz, and James W. Mildice, all of San Diego, Calif., assignors to General Dynamics Corp./Space Systems Div., San Diego, Calif.

Filed May 26, 1987, Ser. No. 53,972
Iot. Cl.[4] H02N *6/00;* **F24J** *3/02*
U.S. Cl. 136—248 **7 Claims**

1. A point focus solar concentrator comprising, at least one primary reflector having a central opening therethrough containing cylindrical parabolic reflector strips that direct solar flux towards line foci at selected focal lengths,

means for making said line foci coincide at a point focus, comprising

a fresnel reflector of a selected geometric configuration substantially overlaying said opening positioned between



the parabolic reflector strips and said line foci to intercept and reflect said flux from said first reflector towards the point focus, and

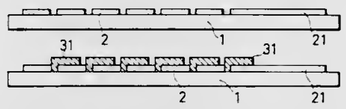
a solar energy receiver positioned to receive the solar flux directed to said point focus.

7. The point focus solar concentrator as claimed in claim 1 wherein said primary reflector includes a plurality of solar cells positioned on the reflector and connected to provide additional solar energy output.

4,784,701
MULTI-LAYERED THIN FILM SOLAR CELL

Hiroshi Sakai, Kanagawa; Seiji Wakamatsu, No. 13-8, Nangai 3-chome, Higashiyamato-shi, Tokyo, and Shigeru Ikeda, No. 34-41, Oaza Yatabe, Yatabe-machi, Tsukuba-gun, Ibaragi, all of Japan, assignors to Fuji Electric Corporate Research and Development Ltd.; Seiji Wakamatsu and Shigeru Ikeda, all of, Japan

Filed Mar. 24, 1987, Ser. No. 29,682
Claims priority, application Japan, Mar. 24, 1986, 61-65341
Int. Cl.[4] H01L *27/14*
U.S. Cl. 136—249 **3 Claims**



1. A multi-layered thin film solar cell, comprising:

a substrate,

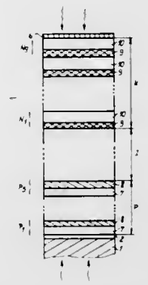
a plurality of transparent electrodes, and

a plurality of groups of photoelectric conversion elements formed of semiconductor material and forming successive photoelectric conversion layers, said layers having optical band gaps which decrease successively in a direction away from a side of said cell adapted to receive incident light, said groups of elements forming said layers being laminated on said substrate, each of said elements belonging to one of said groups being (i) connected in series with one of said elements belonging to another of said groups and (ii) connected in parallel with other elements in said one of said groups.

4,784,702
PIN PHOTODIODE FORMED FROM AN AMORPHOUS SEMICONDUCTOR

Yves Henri, Eybens, France, assignor to Thomson-CSF, Paris, France

Filed Apr. 16, 1987, Ser. No. 39,538
Claims priority, application France, Apr. 22, 1986, 86 05806
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—258 **15 Claims**

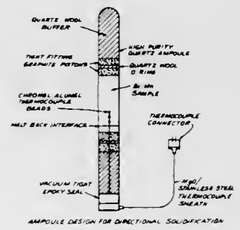


1. A PIN photodiode formed from an amorphous semiconductor, having an intrinsic semiconductor zone sandwiched between two outer zones, wherein at least one of said two outer zones is formed by a multilayer composition comprising undoped alternate layers of an amorphous semiconductor and an insulator, the other zones of the diode being formed with amorphous semiconductor.

4,784,703
DIRECTIONAL SOLIDIFICATION AND DENSIFICATION OF PERMANENT MAGNETS HAVING SINGLE DOMAIN SIZE MNBI PARTICLES

Ronald G. Pirich, Woodbury, and David J. Larson, Jr., Huntington Station, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 768,725, Aug. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 526,802, Aug. 26, 1983, abandoned. This application Mar. 9, 1987, Ser. No. 23,967
Int. Cl.[4] H01F *1/02*
U.S. Cl. 148—101 **5 Claims**



1. A method for producing a permanent magnet, comprising the steps of:

directionally solidifying a composition containing Mn and Bi in a liquid and MnBi and Bi in a resulting solid composition, said solid composition containing from 0.1 to 50% by atomic fraction Mn at a solidyfing rate of 0.5 cm/hr to 100 cm/hr and at a thermal gradient, in the liquid at the liquid-solid interface, of from 10° C./cm to 1000° C./cm so that there is in the solid an aligned array of magnetic signal domain size MnBi particles;

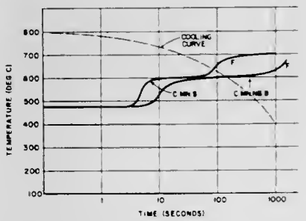
post heat treating the solid composition in a temperature range of from 200° C. to 260° C. for a period of from 1 to 100 hours so that the particles have substantially the theoretical maximum remanent induction of 8200 gauss and intrinsic coercivity of 35,000 Oe; and

increasing volume fraction of the McBi particles in the solid composition to substantially full density by hot rolling or extruding.

4,784,704
HIGH STRENGTH WELDABLE SEAMLESS TUBE OF LOW ALLOY STEEL WITH NIOBIUM

Robert B. Manton, 9726 E. 42nd St., Ste. 232, Tulsa, Okla. 74145

Filed Jan. 12, 1987, Ser. No. 2,270
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] C22C *38/22*
U.S. Cl. 148—334 **4 Claims**



1. A high strength weldable seamless tube which has been heated to an austentization temperature of about 1,670° F. and simultaneously internally and externally quenched and containing 0.24 to 0.28% carbon, 1.30 to 1.50% manganese, 0.15 to 0.35% silicon, not more than 0.01% sulfur, not more than 0.03% phosphorus; not more than 0.20% copper, 0.13 to 0.20% chromium, 0.15 to 0.60% molybdenum, 0.007 to 0.05% aluminum, not more than 0.02% nitrogen, 0.02 to 0.04% titanium, 0.0007 to 0.0025% boron, 0.02 to 0.10% niobium, and the balance iron, and wherein said tube has a minimum yield strength of about 135,000 psi.

4,784,705
WROUGHT HIGH SILICON HEAT RESISTANT ALLOYS

Gene Rundell, Adrian, Mich., assignor to Rolled Alloys, Inc., Temperance, Mich.

Filed Apr. 6, 1987, Ser. No. 35,356
Int. Cl.[4] C22C *38/34*
U.S. Cl. 148—327 **10 Claims**

1. A fully austenitic wrought high silicon heat resistant

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weldable alloy in an annealed condition comprising about 0.16 to 0.30% carbon, about 3,2 to 4.5% silicon, about 0.8 to 1.5% aluminum, about 17 to 20% chromium, about 12 to 16% nickel, up to about 2% manganese, 0 to about 0.07% rare earth metals and the balance iron with residual impurities in ordinary amounts whereby after annealing a second phase of carbide is formed to prevent embrittlement.

4,784,706

EMULSION EXPLOSIVE CONTAINING PHENOLIC EMULSIFIER DERIVATIVE

Lee F. McKenzie, Riverton, Utah, assignor to IRECO Incorporated, Salt Lake City, Utah

Filed Dec. 3, 1987, Ser. No. 128,098
Int. Cl.[4] C06B *45/00*
U.S. Cl. 149—2 **8 Claims**

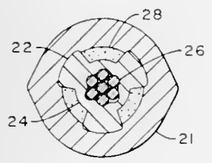
1. A water-in-oil emulsion explosive comprising a water-immiscible organic fuel as a continuous phase; an emulsified aqueous inorganic oxidizer salt solution as a discontinuous phase; and a phenolic derivative of polypropene or polybutene as an emulsifier.

4,784,707

METHOD OF MAKING ELECTRICAL CONNECTIONS USING JOINT COMPOUND

Karl Wefers, Upper Burrell Township, Pa.; Larry T. Taylor, and Richard H. Bott, both of Blacksburg, Va., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 7, 1986, Ser. No. 827,990
Int. Cl.[4] B32B *13/06*
U.S. Cl. 156—48 **22 Claims**



1. In a method of making an electrical connection wherein joint compound is applied, the improvement comprising applying as joint compound a solution of polymer and electrically conductive filler dissolved in solvent.

4,784,708

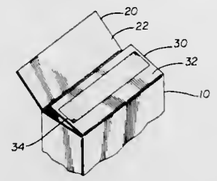
BONDING METHOD OF EMPLOYING GLUABILITY ENHANCEMENT COMPOSITION

Robert L. Allen, Park Ridge, Ill., assignor to Waldorf Corporation, St. Paul, Minn.

Filed Jun. 11, 1986, Ser. No. 872,973
Int. Cl.[4] C09J *5/04*
U.S. Cl. 156—67 **59 Claims**

20. A method of binding a resin-coated surface of a polyester film to a second surface using ethylene-vinyl acetate hot melt adhesives comprising:

applying to a gluing area of the resin-coated surface a gluability enhancing composition comprising ethylene vinyl



acetate, nitrocellulose, and rosin-modified maleic resins;

applying to the gluing area over the gluability enhancing composition the ethylene-vinyl acetate hot melt adhesive; and

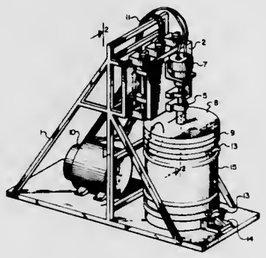
mating the second surface and the resin-coated surface.

4,784,709

SEAMLESS OVERPACK AND SPIN WELDING APPARATUS FOR MAKING SAME

Samuel L. Unger, Venice; Rodney W. Telles, Alhambra, and Hyman R. Lubowitz, Palos Verdes Est., all of Calif., assignors to Environmental Protection Polymers, Inc., Hawthorne, Calif.

Continuation-in-part of Ser. No. 589,517, Mar. 14, 1984, abandoned. This application Sep. 6, 1985, Ser. No. 776,081
Int. Cl.[4] B29C *65/06*; B65B *7/28*
U.S. Cl. 156—69 **6 Claims**



1. In an improved method for spin welding a first work piece to a second work piece, the first work piece having a perimeter, a first heat fusible plastic composition, and a first welding surface proximate to the perimeter, the second work piece having a second heat fusible plastic composition and a second welding surface, the method of the type which includes the following steps:

Step (1): rotating the first work piece by means of a platen concentrically connected to a rotating drive shaft having a substantially vertical orientation,

Step (2): holding the second workpiece stationary,

Step (3): pressing the rotating first work piece against the stationary second work piece for generating frictional

heat for melting the first and second welding surfaces, then

Step (4): arresting the rotation of said Step 1, and then,

Step (5): pressing the first work piece against the second work piece for curing and welding the first welding surface to the second welding surface,

the improvement for enabling the spin welding of the first work piece to the second work piece when the first work piece is susceptible to a centrifugal imbalance during said Step (1), the improvement comprising the following additional steps, each performed simultaneously with said Step (3):

(a) Step (3.1): reducing vibrational coupling between the first and second work pieces by employing first and second welding surfaces which are substantially planar and

(b) Step (3.2): damping the centrifugal imbalance of the first work piece by vibrationally coupling the first work piece with the platen and vibrationally coupling the drive shaft with a pillow block,

wherein in said Steps (3.2) and (5); the platen having a template fit which substantially spans and conforms to the contour of the upper surface of the first work piece for damping centrifugal imbalance in said Step (3.2) and for curing welding the first and second welding surfaces in said Step (5).

4. In an improved spin welding apparatus for spin welding a first work piece onto a second work piece, the first work piece having an upper surface, a first heat fusible plastic composition, and a first welding surface, the second work piece having a second heat fusible plastic composition and a second welding surface, the spin welding apparatus of the type which includes:

a platen for rotationally driving and exerting downward pressure upon the first work piece,

a drive shaft having an upper end and a lower end, the lower end of the drive shaft being concentrically attached to the platen for rotating the platen, and

a means for supplying torque to the drive shaft, the torque means being attached to the upper end of the drive shaft,

the improvement for enabling the spin welding of the first work piece when the first work piece is susceptible to a centrifugal imbalance, the improvement comprising:

(a) a pillow block coupled to the drive shaft between the platen and the torque means for vibrationally damping the drive shaft and controlling the centrifugal suspectibility of the first work piece during the spin welding process and

(b) the platen having a template fit with the upper surface of the first work piece, the template fit substantially spanning and conforming to the contour of the upper surface of the first work piece for exerting downward pressure upon the first work piece and for reducing and damping the centrifugal imbalance of the first work piece by vibrationally coupling the first work piece with the drive shaft and the pillow block when spin welding the first welding surface onto the second welding surface.

4,784,710

METHOD FOR MANUFACTURING A VEHICLE SEAT

Tadafumi Abe, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Sep. 29, 1987, Ser. No. 102,165
Int. Cl.[4] B29C *65/08*
U.S. Cl. 156—73.1 **5 Claims**

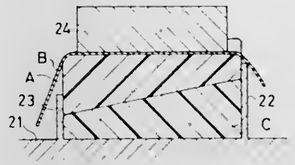
1. A method of manufacturing a vehicle seat, comprising the steps of:

placing a foam cushion member of varying thickness on an auxiliary support member of varying thickness inverse to the varying thickness of said cushion member;

said foam cushion member being flat in its welding region;

said auxillary support member being adapted to support said foam cushion member so that said welding region of said cushion member is positioned substantially horizontally;

then, placing a thermally weldable covering member on said welding region of said cushion member;



applying a pressure against said covering member and said foam cushion member in a downward direction, and

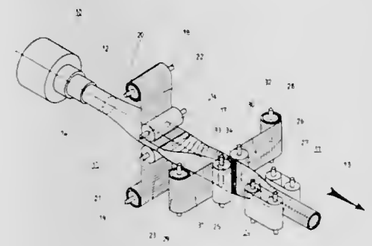
welding said covering member by means of ultrasound to said welding region of said cushion member, using an ultrasonic welding apparatus.

4,784,711

METHOD AND A DEVICE FOR APPLYING A SURFACE LAYER ONTO A HOLLOW PROFILE

Lennart Larsson, Malmö , Sweden, assignor to AB Akerlund & Rausing, Sweden

Filed Mar. 20, 1986, Ser. No. 841,945
Claims priority, application Sweden, Apr. 4, 1985, 8501701
Int. Cl.[4] B32B *31/02*
U.S. Cl. 156—165 **29 Claims**



1. A method for applying a surface layer onto a deformable, resilient elongated hollow profile having a predetermined original shape and having a wall portion which, in the cross section of the original shape, is curved, the method comprising the steps of:

advancing the profile longitudinally past a device for applying a surface layer;

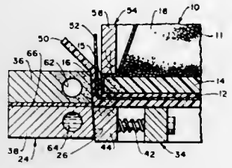
pressing the curved wall portion of said profile into a shape which is substantially straight in cross-section as the profile passes the device;

applying a surface layer to the outside of said wall portion of the profile while said wall portion is in said substantially straight shape; and

bringing the profile with the surface layer thereon to return to a shape substantially corresponding to the original shape of the profile.

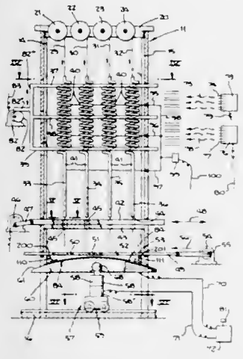
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4,784,712
PROCESS FOR SHEET LAMINATION
James E. Hoyle, P.O. Box 606, Fillmore, Calif. 93015
Division of Ser. No. 503,383, Jun. 10, 1983, Pat. No. 4,537,646. This application Apr. 26, 1985, Ser. No. 727,973
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.
Int. Cl.[4] B32B *3/04*; A47C *27/00*
U.S. Cl. 156—213 **12 Claims**



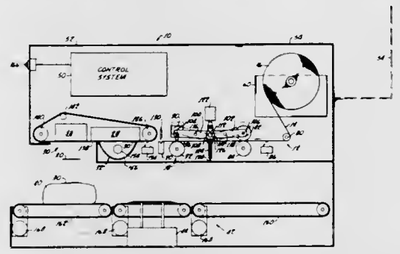
1. Process for forming and laminating a polymeric sheet, having a peripheral portion and an edge, onto a planar board having an edge, comprising:
creating an assembly by placing the sheet against the board with the edge of the sheet extending beyond the edge of the board;
heating the peripheral portion of the sheet to render the sheet formable and bendable over the edge of the board around the periphery of the board;
moving the assembly on a path normal to the plane of the assembly in a given direction through a substantially rigid forming die having a die passage slightly larger than the planar periphery of the board;
causing the die to bend and form the peripheral portion of the sheet over and adjacent the edge of the board around the periphery of the board;
completing the drawing of the assembly through the die and expelling the assembly from the die in said given direction.

4,784,713
APPARATUS AND METHOD FOR FORMING HAIRPIECES
Gilbert F. Van Nieulande, 23841 Kara Bay, Laguna Niguel, Calif. 92677
Filed Dec. 21, 1987, Ser. No. 135,836
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—245 **18 Claims**



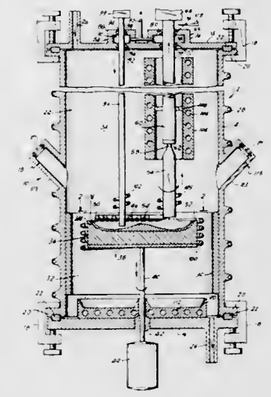
1. Apparatus for forming a hairpiece comprising:
a plurality of space elongated hollow tubes mounted on a support, each of said tubes having an upper coiled end and a lower straight end;
heating means associated with the upper half of said coiled ends for applying heat thereto;
cooling means associated with the lower half of said coiled ends for applying cooling air thereto;
strand feed means on said support disposed above the upper ends of said hollow tubes associated with each of said tubes for feeding an elongated strand of a synthetic hair material down through each of said tubes;
cutting means disposed at the lower ends of said tubes having apertures therein coaxially aligned with the longitudinal axis of said tubes thereby allowing strands passing through said tubes to pass through said apertures and past said cutting means, said cutting means including cutting blades thereon adapted to cut said strands when said strands have moved therepast; and
mold means disposed below said cutting means in the path of the lower ends of said tubes for retaining thereon a substrate conforming to the contour of the scalp of a hairpiece wearer whereby an adhesive surface may be applied to said substrate and strands of said material may be brought into contact with said substrate and molecularly bond thereto.

4,784,714
LINERLESS THERMAL LABEL PRINTER AND APPLICATOR
Tomoo Shibata, Irvine, Calif., assignor to Ricoh Electronics, Inc., Santa Ana, Calif.
Continuation-in-part of Ser. No. 827,621, Feb. 10, 1986, Pat. No. 4,707,211. This application Oct. 5, 1987, Ser. No. 104,776
Int. Cl.[4] B26D *5/20*; B32B *35/00*
U.S. Cl. 156—354 **16 Claims**



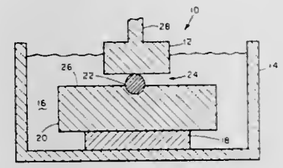
1. A thermal printer and label applicator for use with thermosensitive recording paper comprising a substrate, a thermosensitive color-forming layer disposed on one side of the substrate, and an adhesive disposed on an opposite side of the substrate, said printer and applicator comprising:
transport means for moving the thermosensitive recording paper from a stack or roll thereof to a printing station and a cutting station, said transport means including a pair of drive rollers disposed for engaging the thermosensitive recording paper therebetween;
thermal print head means disposed at said printing station for causing a preselected heating pattern in said thermosensitive recording paper in order to form desired visible images in the thermosensitive color-forming layer;
lever means for coordinated engagement and disengagement of the thermal print head means and the drive roller means with the thermosensitive recording paper, said lever means including a first and a second lever, said first lever having one end thereof attached to a thermal print head, said second lever having one end thereof attached to one of said drive rollers, said first and second levers having opposite end thereof attached to a common shaft and each lever being mounted on a first and second pivot, respectively, with said first and second pivots being disposed between the thermal print head and the drive roller means, said lever means further including means for moving the shaft in order to cause the first and second levers to rotate about the first and second pivots, respectively, to simultaneously engage and disengage the thermal print head means and the drive roller means with the thermosensitive recording paper;
cutting means disposed at said cutting station for cutting the thermosensitive recording paper into separated individual labels with visible images thereon;
means for handling the separated individual labels without contact with the adhesive;
means disposed at an adhesive activation station for activating the adhesive disposed on said separated individual labels in order to cause the adhesive to become tacky; and,
means for discharging the separated individual labels with tacky adhesive thereon.

4,784,715
METHODS AND APPARATUS FOR PRODUCING COHERENT OR MONOLITHIC ELEMENTS
Milton Stoll, 36 Mascolo Rd., South Windsor, Conn. 06074
Continuation of Ser. No. 898,136, Aug. 19, 1986, abandoned, which is a division of Ser. No. 564,773, Dec. 27, 1983, Pat. No. 4,650,540, which is a continuation of Ser. No. 594,257, Jul. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 614,728, Feb. 8, 1967, abandoned. This application Jan. 13, 1988, Ser. No. 145,649
Int. Cl.[4] C30B *15/14, 15/22*
U.S. Cl. 156—618.1 **18 Claims**



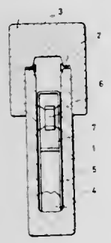
10. In a method of forming crystalline materials into substantially monocrystalline rods wherein said rod is withdrawn from a molten pool so that the material from the pool crystallizes at the interface therebetween to elongate the crystal structure of the rod, the improvement comprises:
providing a controlled temperature zone at the interface between the pool and the rod; and
controlling the temperature of the controlled temperature zone so that as the rod is passed through the controlled temperature zone at a fixed distance from the pool, the temperature profile horizontally across the cross-section of the rod at the rod-pool interface is uniformly controlled to maintain a uniform temperature across said horizontal cross section of the rod.

4,784,716
HYBRID SINGLE CRYSTAL OPTIC FIBERS BY EMBEDDING
Stephen C. Rand, Agoura, and Ricardo C. Pastor, Manhattan Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 6, 1985, Ser. No. 795,572
Int. Cl.[4] C30B *27/00*
U.S. Cl. 156—621 **6 Claims**



1. A process of fabricating hybrid single crystal fibers, said process comprising the steps of:
placing a bulk nonlinear crystal in a container for holding a solution, said bulk nonlinear crystal having a substantially flat upper surface;
selectively placing at least one fiber core on said surface of said bulk nonlinear crystal;
holding said fiber core upon said upper surface;
placing a controlled force biasing means for bearing upon said fiber on top of said fiber core;
filling said container with a saturated solution whose equilibrium solid phase matches the composition of said crystal, said solution covering said fiber core;
applying said biasing means to said fiber core in a controlled manner; and
releasing said biasing means after said fiber core is embedded a fixed distance into said bulk nonlinear crystal.

4,784,717
METHOD OF MANUFACTURING $BAPB_1$
Shinichi Hirano, 123 Meidai Yadacho Syukusya, 66, Yadacho 2-chome, Nagoya; Ryo Toyokuni, and Hiroshi Kuroda, both of 31-1, Kameido 6-chome, Koto-ku, Tokyo, all of Japan
Filed Apr. 1, 1987, Ser. No. 33,454
Claims priority, application Japan, Apr. 3, 1986, 61-77347
Int. Cl.[4] C30B *7/10*
U.S. Cl. 156—623 R **23 Claims**



1. A method of manufacturing $BaPb_{1-x}Bi_xO_3$ single crystal wherein the $BaPb_{1-x}Bi_xO_3$ single crystal is grown by hydrothermal synthesis which applies heat and pressure to a nutrient composed of $BaPb_{1-x}Bi_xO_3$ within an aqueous solution containing a nitrate as the main component at a temperature and pressure effective to grow the $BaPb_{1-x}Bi_xO_3$ single crystal.

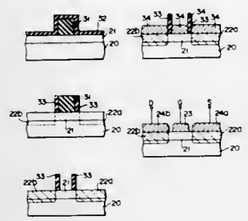
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4,784,718

METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

Tatsuro Mitani, Tokyo, and Toshikazu Fukuda, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1987, Ser. No. 16,770
Claims priority, application Japan, Feb. 27, 1986, 61-42256
Int. Cl.⁴ H01L *21/00, 21/306;* **B44C** *1/22;* **C03C** *15/00*
U.S. Cl. 156—643 **7 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:
forming a one-conduction type lightly doped semiconductor layer on a semiconductor substrate;
forming a dummy gate on a predetermined region on said lightly doped semiconductor layer;
forming a side wall film constituting member on the exposed surface of said lightly doped semiconductor layer, the side wall film constituting member covering said dummy gate;
performing an anisotropic etching for said side wall film constituting member to form a side wall film on the side of said dummy gate and to expose the surface of said lightly doped semiconductor layer;
introducing predetermined impurities into said lightly doped semiconductor layer, using as a mask said side wall film and said dummy gate, so as to form heavily doped regions;
selectively removing said dummy gate so as to expose said lightly doped semiconductor layer therebelow;
forming an electrode constituting member on said exposed lightly doped semiconductor layer and said heavily doped regions using the remaining side wall film as a mask; and
removing said side wall film and said electrode constituting member deposited thereon so as to form predetermined electrodes on said heavily doped regions and said lightly doped semiconductor layer.

4,784,719

DRY ETCHING PROCEDURE

Ronald J. Schutz, Warren, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 750,084, Jun. 28, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 144,761
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **12 Claims**



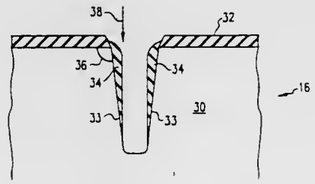
1. A process for fabricating a device comprising the steps of forming a resist mask on a substrate, etching said substrate to form a plurality of etch pits defining a plurality of features that are designed to have a desired linewidth by inducing reaction of said substrate with energetic species, and completing said device, wherein redeposition of material on the sidewalls of said etch pit occurs during said etching and wherein said process includes a step comprising locally compensating for the effect of said redeposition on the conformation of said sidewall by providing a processing environment for at least one of said features that differs from at least one of said features to aid in maintaining said linewidth.

4,784,720

TRENCH ETCH PROCESS FOR A SINGLE-WAFER RIE DRY ETCH REACTOR

Monte A. Douglas, Coppell, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 26,491, Mar. 16, 1987, and a continuation-in-part of Ser. No. 841,502, Mar. 19, 1986, abandoned, and a continuation-in-part of Ser. No. 841,391, Mar. 19, 1986, Pat. No. 4,690,729, and a continuation-in-part of Ser. No. 730,701, May 3, 1985, Pat. No. 4,702,795. This application Jul. 8, 1987, Ser. No. 71,111
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **B05D** *3/06*
U.S. Cl. 156—643 **29 Claims**



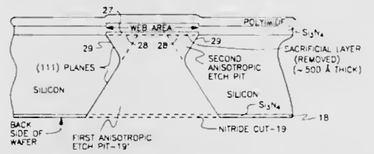
1. A process for etching a trench in a substrate, comprising the steps of:
etching a trench in a predetermined trench location of said substrate by means of a plasma source of etchants and ions;
selectively depositing materials on the sidewalls of said trench to control the profile of the trench being etched.

4,784,721

INTEGRATED THIN-FILM DIAPHRAGM; BACKSIDE ETCH

James O. Holmen, Minnetonka; Steven D. James, Edina, and Jeffrey A. Ridley, Burnsville, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1988, Ser. No. 158,824
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*
U.S. Cl. 156—647 **13 Claims**



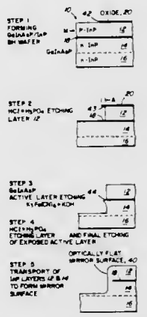
1. A process for fabricating a thin film microsensor for air flow comprising the steps of:
providing a single crystal (100) silicon wafer having a front planar surface, a backside surface and having a <110> direction;
depositing and delineating a rectangular area of a thin film layer of sacrificial selectively etchable material on the silicon front surface;
depositing a thin film of silicon nitride on the selectively etchable material and the rest of the silicon front surface, the film being thicker than the thickness of the sacrificial material;
depositing and delineating a thin film of electrically resistive material on the silicon nitride to form desired circuit elements such as detector resistors, circuit resistors and a heater resistor, said heater resistor and detector resistors being located over said sacrificial material area;
depositing an additional thin film of silicon nitride over the resistive material and the previous silicon nitride;
depositing a thin film of silicon nitride over the backside surface;
opening a cut through the silicon nitride on the backside to expose an area of the backside silicon surface, the cut being rectangular and orthogonal to the <110> direction;
introducing an anisotropic etch to the backside silicon surface at said nitride cut to anisotropically etch a first anisotropic pit through the silicon wafer until the layer of sacrificial selectively etchable material is reached;
introducing selective etch through the first anisotropic pit to etch out all of the sacrificial selectively etchable material leaving a thin cavity in its place; and,
introducing the anisotropic etch through the first pit and the thin cavity to anisotropically etch the silicon exposed by the removal of the sacrificial material and form a second anisotropic etch pit.

4,784,722

METHOD FORMING SURFACE EMITTING DIODE LASER

Zong-Long Liau, Arlington, and James N. Walpole, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 693,207, Jan. 22, 1985, Pat. No. 4,718,070. This application Oct. 19, 1987, Ser. No. 109,945
Int. Cl.⁴ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—649 **25 Claims**



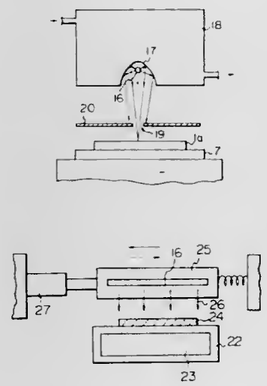
1. The method of forming a collimating element on a semiconductor surface comprising the steps of:
(a) forming layers of semiconductor material on a substrate;
(b) selectively etching the semiconductor layers to form a surface profile approximating the desired profile of the collimating element;
(c) smoothing the surface to the shape of the desired profile by a heat treatment without etching.

4,784,723

METHOD FOR PRODUCING A SINGLE-CRYSTALLINE LAYER

Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 483,132, Apr. 8, 1983, abandoned. This application Mar. 3, 1986, Ser. No. 837,318
Claims priority, application Japan, Apr. 9, 1982, 57-059249
Int. Cl.⁴ C30B *13/22*
U.S. Cl. 156—620.73 **8 Claims**



6. A method of producing a single crystalline layer for use in a semiconductor device having a semiconductor substrate placed on a stage and an insulating layer formed on the semiconductor substrate and using an energy source emitting a strip shaped beam, said method comprising the steps of:
(a) forming a polycrystalline silicon layer on the insulating layer; and
(b) irradiating the polycrystalline silicon with the strip shaped energy beam scanned in a first direction to form a single crystalline region, including the substep of:
(i) oscillating the stage having the semiconductor substrate thereon in a second direction which is perpendicular in a horizontal direction to the first direction of the strip shaped energy beam.

4,784,724

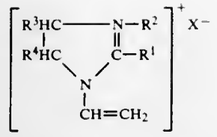
MAKING PAPER WHICH HAS A HIGH DRY STRENGTH

Sigberg Pfohl, Speyer; Volkmar Weberndoerfer, Mannheim; Heinrich Hartmann, Limburgerhof, and Friedrich Linhart, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 15, 1986, Ser. No. 852,363
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515086
Int. Cl.⁴ D21H *3/38*
U.S. Cl. 162—168.2 **2 Claims**

1. A process for making paper which has a high dry strength by adding a cationic copolymer to the paper stock and draining the latter with sheet formation, or by applying a cationic copolymer onto the surface of paper, the said copolymer being added in an amount of from 0.05 to 3.0% by weight, based on dry fiber or dry paper, wherein a water-soluble copolymer of 2 to 15% by weight of a compound of the formula

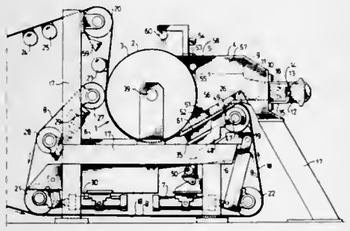
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where R^1 is CH_3, R^2, R^3 and R^4 are each H, and x^- is an acid radical, and from 98 to 85% by weig[illegible]acrylamide, methacrylamide or mixtures thereof, the K[illegible] of the copolymer being from 50 to 250.

4,784,725
VAT PAPER MACHINE
Erik G. Stenberg, Karlstad, Sweden, assignor to Valmet Paper Machinery, Inc., Helsingfors, Finland
Filed Oct. 14, 1987, Ser. No. 108,148
Claims priority, application Sweden, Oct. 20, 1986, 8604447; Sep. 22, 1987, 8703656
Int. Cl.[4] D21F *1/60, 1/00, 1/10*
U.S. Cl. 162—317 **20 Claims**



1. A vat paper machine comprising a vat having means forming a wall of said vat,

a headbox connected to the vat for providing a continuous supply of stock to a predetermined level in the vat,

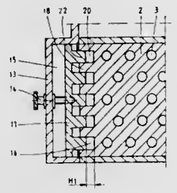
a rotatabe cylinder mold having a wire gauze covered outer surface, said cylinder mold being so positioned relative to the vat that upon rotation of the cylinder mold, the wire gauze covered surface will be brought into contact with the stock in the vat to form a web thereon by draining water from the stock through said wire gauge covered surface,

an outer wire forming an endless loop in said vat paper machine,

a breast roll located adjacent said means defining a wall of the vat and supporting said outer wire so as to extend along a path of travel from the breast roll through the vat along said wall defining means and then over and around a portion of the circumference of said cylinder mold,

and said wall defining means comprising an endless liquid-impervious belt forming an endless loop located on the inner side of the loop defined by said outer wire, said liquid-impervious belt and outer wire arranged so as to run together in close surface contact with each other at least within the area between the breast roll and the cylinder mold, whereby the liquid-impervious belt forms a liquid barrier for the stock in the vat.

4,784,726
PAPER MACHINE HEAD BOX WITH ADJUSTABLE PERFORATED PLATE FLOW DUCTS
Osmo Evälahti, Karhula, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland
Filed Dec. 16, 1986, Ser. No. 942,304
Claims priority, application Finland, Dec. 17, 1985, 854936
Int. Cl.[4] D21F *1/02*
U.S. Cl. 162—336 **20 Claims**



1. A head box, including side walls, for a paper-making machine, comprising:

a cross header in communication with a perforated plate having a plurality of flow ducts extending through the head box, the plate having a pair of side edge areas, each of said side edge areas having a plurality of outermost flow ducts of substantially uniform size relative to one another; the size of the outermost flow ducts in at least one of said side edge areas of the plate being different than the size of the non-edge area flow ducts in the perforated plate; means carried by the head box for substantially uniformly altering the size of the outermost flow ducts in said at least one of said side edge areas; and a slice.

4,784,727
SIZING AGENT AND USE THEREOF
Wolf-Dieter Schröer, Leverkusen; Joachim Probst, Cologne; Ingeborg Kolb, Leverkusen; Ulrich Beck, Bornheim; Peter Mummenhoff, Cologne, and Heinz Bäumgen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Jan. 20, 1983, Ser. No. 459,314
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203189
Int. Cl.[4] D21H *3/02*
U.S. Cl. 162—158 **5 Claims**

1. A sizing agent comprising:

(A) hydrophobic, cellulose-reactive sizing materials,

(B) from 1 to 60 parts, by weight, of fixing and sizing acceleration agents, per 10 parts, by weight, of the hydrophobic cellulose-reactive sizing materials, where the fixing and sizing acceleration agents are statistical terpolymers of:

(a) from 8 to 20% by weight, of N, N-dimethylamino ethyl acrylate, N, N-dimethyl-aminoethyl methacrylate or both;

(b) from 45 to 80%, by weight, of styrene; and

(c) from 8 to 35%, by weight, of acrylonitrile, wherein the total of (a) to (c) amounts to 100%, by weight, and the dimethylamino moieties of the terpolymer are protonated.

4,784,728
OXYGEN MEASURING APPARATUS AND METHOD WITH AUTOMATIC TEMPERATURE COMPENSATION
David M. Capone, Oakmont, Pa., assignor to Ametek, Inc., New York, N.Y.
Filed Jun. 23, 1987, Ser. No. 65,581
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—1 T **18 Claims**

1. An apparatus for measuring the oxygen content of a gas comprising;

a tube of solid electrolyte material capable of oxygen ion conductivity, said tube having a closed end in communication with said gas and an open end in communication with atmospheric air, a first electrode disposed on the inside surface of said tube, a second electrode disposed on the outside surface of said tube;

heater means disposed in close proximity to said tube for heating said tube for maintaining a control temperature at said tube;

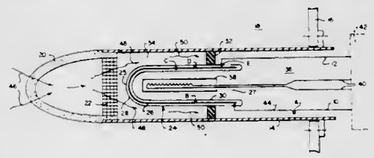
oxygen indicating means for indicating the oxygen content of said gas;

first wire means extending between said first electrode and said indicating means;

second wire means extending between said second electrode and said indicating means;

temperature measuring means connected to said indicating means for measuring the ambient temperature around said tube; and

ambient temperature compensating means in said apparatus for automatically compensating for any offset in said measurement of oxygen content based on a difference



between said ambient temperature and said control temperature.

16. A method for measuring the oxygen content of a gas comprising;

passing said gas to the outside of a tube of solid electrolyte material capable of oxygen ion conductivity, said tube having a closed end in communication with said gas and an open end in communication with atmospheric air, said tube having an outside electrode and an inside electrode;

heating said tube to maintain a control temperature at said tube;

the oxygen in said gas generating an electrical signal at said tube and passing said signal through said electrodes to an oxygen indicating means for indicating the oxygen content of said gas;

measuring the ambient temperature in the vicinity of said tube; and

automatically compensating for any offset in indication of oxygen content due to a difference between said ambient temperature and said control temperature.

4,784,729
ELECTROCHEMICAL ANALYSIS METHOD USING CORROSION PROBE
Raymond J. Jasinski, Tulsa, Okla., assignor to Cities Service Oil and Gas Corporation, Tulsa, Okla.
Division of Ser. No. 903,036, Aug. 29, 1986, which is a continuation-in-part of Ser. No. 740,497, Jun. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,236, Aug. 31, 1984, abandoned. This application Feb. 1, 1988, Ser. No. 151,002
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—1 T **12 Claims**

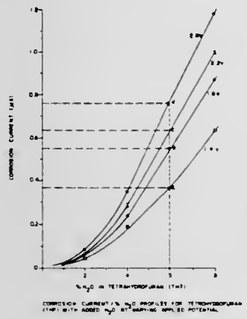
1. A process for detecting at last one electrochemically active component in a generally nonionic conductive fluid comprising the steps of:

(a) generating calibration data on a first sample of a generally nonionic conductive fluid not containing any detectable quantity of at least one electrochemically active component with a corrosion probe means having an ionically conductive surface, said generated calibration data comprising calibration current as a function of difference in calibration potential;

(b) inserting the corrosion probe means into another sample of said generally nonionic conductive fluid which may contain a detectable quantity of at least one electrochemically active component;

(c) applying a known difference in potential between two electrodes of the corrosion probe means;

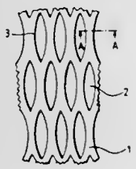
(d) measuring the current flowing through the nonionic conductive fluid of step (b) and through at least one of the



electrodes of the corrosion probe means in response to the applied known difference in potential; and

(e) comparing the measured current of step (d) with the calibration current from the generated calibration data of step (a) at the same potential as in step (c) to determine if said at least one electrochemically active component is present which is indicated by a difference between the measured current and the calibration current.

4,784,730
CATHODES SUITABLE FOR USE IN ELECTROCHEMICAL PROCESSES EVOLVING HYDROGEN
Peter M. Willis, Wallingford, and Ralph L. Phillips, Reading, both of England, assignors to Johnson Matthey Public Limited Company, London, England
Filed Jul. 16, 1987, Ser. No. 74,217
Claims priority, application United Kingdom, Jul. 16, 1986, 8617325
Int. Cl.[4] C25D *5/10*
U.S. Cl. 204—40 **9 Claims**



1. A cathode suitable for use in an electrochemical process evolving hydrogen comprising an electrically conductive substrate made of a non-ferrous metal or having a coherent, non-porous coating of non-ferrous metal and an electrocatalyst comprising a deposition of platinum and ruthenium or precursors thereof on the conductive substrate and a deposition of at least one of the metals gold and silver whereby the poison-resistance of the cathode to iron is increased as compared to a similar cathode without the gold or silver deposition.

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4,784,731

CHROMATE TREATMENT OF A METAL COATED STEEL SHEET

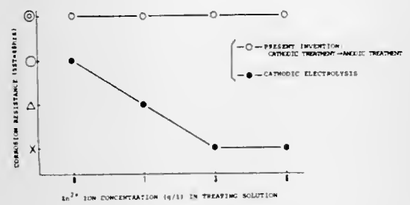
Seijun Higuchi; Akinori Maruta; Kenichi Asakawa, all of Fukuoka; Akimitsu Fukuda; Haruyoshi Terada, both of Tokyo, and Youji Ono, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 12, 1987, Ser. No. 49,502

Claims priority, application Japan, May 12, 1986, 61-107897; May 24, 1986, 61-118393

Int. Cl.[4] C25D *5/00*

U.S. Cl. 204—27 **9 Claims**



1. A method for treating a metal coated steel sheet, comprising:

subjecting a metal coated steel sheet to a cathodic electrolytic treatment, to form a cathodically electrolytic chromate film thereon, in a bath of a composition containing (1) Cr^{6+} ions, (2) ions of at least one element selected from the group consisting of Zn, Ni, Co, Al, Mg, Sn, Mn and Pb, and (3) at least one additive selected from the group consisting of PO_4^{3-} ions, a fluorine compound, silica and a silicate, and

immediately subjecting the resultant steel sheet to an anodic electrolytic treatment in a bath of said composition to convert said cathodically electrolytic chromate film and further to form an anodically electrolytic chromate film thereon.

4,784,732

ELECTROLYTIC FORMATION OF AN ALUMINUM OXIDE LAYER

Charles P. Covino, P.O. Box 265, Boss Rd., Ringoes, N.J. 08551

Continuation-in-part of Ser. No. 888,695, Jul. 24, 1986, abandoned. This application Apr. 23, 1987, Ser. No. 41,723

Int. Cl.[4] C25D *11/08*

U.S. Cl. 204—38.3 **4 Claims**

1. A process for making a composite aluminum article; which comprises immersing an aluminum substrate in an oxidizing acid bath containing sulfuric acid and a carboxylic acid; and electrolytically forming on the surface of the aluminum substrate an irregular, highly porous, and coarsely crystalline aluminum oxide layer integral with such surface by applying to the substrate a voltage which is steadily and continuously increased from start to finish of the electrolysis from about 5–15 volts to about 65–85 volts at a rate of about 1–3 volts/minute, wherein the current density is increased from start to finish of the electrolysis from about 10–30 amps/sq. ft. to about 60–80 amps/sq.ft. at a rate of about 1–3 amps/sq.ft./minute.

4,784,733

RECYCLING OF SPENT POTLINER

Euel R. Cutshall, Tuscumbia, and Luther O. Daley, Lauderdale County, both of Ala., assignors to Reynolds Metals Company, Richmood, Va.

Filed Nov. 23, 1987, Ser. No. 124,221

Int. Cl.[4] C25C *3/06*

U.S. Cl. 204—67 **5 Claims**

1. A method for replenishing an anode for use in a Soderburg alumina reduction cell comprising mixing spent potliner, petroleum coke and pitch to form a paste, positioning said paste on top of said anode and baking said anode during operation of said cell wherein the improvement comprises subjecting said spent potliner to naturally occurring atmospheric humidity for a period of at least about two months prior to said mixing to thereby permit an amount up to about 50% of the sum of spent potliner and petroleum coke present in said paste to be spent potliner while preventing or reducing substantially cracking of said anode.

4,784,734

AZETIDINONE DERIVATIVES AND PROCESS FOR THE PREPARATION OF THE SAME

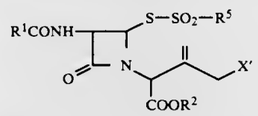
Sigeru Torii; Kenji Uneyama; Hideo Tanaka; Junzo Nokami; Michio Sasaoka; Norio Saito, and Takashi Shiroi, all of Okayama, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

Division of Ser. No. 865,651, May 16, 1986, Pat. No. 4,689,411, which is a continuation of Ser. No. 524,689, Aug. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 364,405, Apr. 1, 1982, abandoned. This application Jul. 9, 1987, Ser. No. 71,664

Int. Cl.[4] C25B *3/06*

U.S. Cl. 204—81 **4 Claims**

1. A process for preparing an azetidinone derivative represented by the formula:



(Ib)

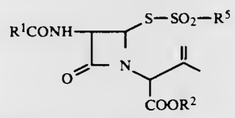
wherein

R^1 is lower alkyl mono-substituted with aryl or with aryloxy, the aryl being optionally substituted with hydroxy, methoxy, chloro or nitro and the aryloxy being optionally substituted with hydroxy, methoxy or nitro;

R^2 is lower alkyl mono- or di-substituted with aryl or with aryloxy, the aryl being optionally substituted with methoxy, chloro or nitro, and the aryloxy being optionally substituted with nitro, or R^2 is lower alkyl optionally mono- or tri-substituted with halogen;

R^5 is aryl optionally substituted with hydroxy, chloro, nitro, methyl or methoxy; and

X′ is a halogen, the process comprising subjecting to electrolysis an azetidinone derivative represented by the formula:



wherein R^1, R^2 and R^5 are as defined above in the presence of at least one member selected from the group consisting of hydrohalogenic acid and halide.

4,784,735

CONCENTRIC TUBE MEMBRANE ELECTROLYTIC CELL WITH AN INTERNAL RECYCLE DEVICE

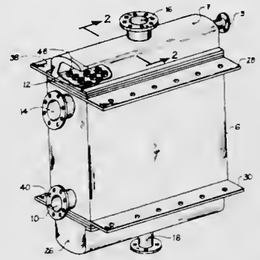
Marius W. Sorenson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 25, 1986, Ser. No. 934,770

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.[4] C25B *1/16, 1/26, 9/00, 15/08*

U.S. Cl. 204—98 **21 Claims**



11. A method for operating an electrochemical cell of the type having a hollow, cylindrically shaped reyccle tube; a hydraulically permeable, hollow, cylindrically shaped cathode concentric with and surrounding said recycle tube to define a first annular space therebetween; a hydraulically permeable, hollow, cylindrically shaped anode concentric with and surrounding said cathode to define a second annular space therebetween; and a hollow, cylindrically shaped, ion permeable membrane positioned in said second annular space concentric with said cathode and said anode, said membrane dividing the second annular space into an anode compartment containing the anode and a cathode compartment containing the cathode, said method comprising:

(a) flowing a catholyte from a lower portion of the first annular space, upward toward an upper portion of the first annular space, at least a portion of said flow passing adjacent to the cathode at a rate sufficient to sweep away at least a portion of any gas, formed during electrolytic operation of the cell;

(b) flowing the catholyte and gas upward and into a catholyte separation compartment;

(c) separating the gas from the catholyte; and

(d) recycling at least a portion of the catholyte through the hollow internal portion of the recycle tube to a lower portion of the first annular space, where the above-described flow pattern is repeated,

wherein a major portion of upward catholyte flow is through the interior portion of the cathode.

4,784,736

FUNCTIONAL, PHOTOCHEMICALLY ACTIVE, AND CHEMICALLY ASYMMETRIC MEMBRANES BY INTERFACIAL POLYMERIZATION OF DERIVATIZED MULTIFUNCTIONAL PREPOLYMERS

Harold K. Lonsdale, Bend, and Carl C. Wamser, West Linn, both of Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Filed Jul. 7, 1986, Ser. No. 883,043

Int. Cl.[4] B01J *19/12*

U.S. Cl. 204—157.15 **10 Claims**

1. A method of initiating redox reactions comprising transporting photochemically generated electrons through an ultrathin membrane on a support, said ultrathin membrane comprising the interfacial polymerization reaction product made from at least one prepolymer of the type M_FX_m, $M_F'Y_n$ and N_FY_n wherein

M_F and M_F' are monomeric or oligomeric moieties that are selectively photochemically or electrochemically reactive,

N_F is a linkable or crosslinkable monomeric or oligomeric moiety that is not photochemically or electrochemically reactive,

X and Y are groups which render said prepolymers reactive in an interfacial polymerization reaction,

m and n are integers ≥ 2, and wherein said interfacial polymerization reaction product possesses substantially the same selective photochemical or electrochemical reactivity as M_F and M_F'.

4,784,737

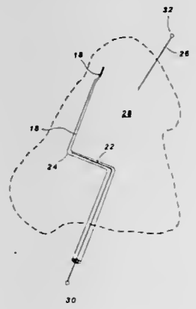
ELECTROMICROINJECTION OF PARTICLES INTO LIVING CELLS

F. Andrew Ray; L. Scott Cram, both of Los Alamos, and William R. Galey, Albuquerque, all of N. Mex., assignors to The United States Department of Energy, Washington, D.C.

Filed Apr. 18, 1986, Ser. No. 853,823

Int. Cl.[4] B01D *57/02;* **A61N** *1/30;* **A61B** *17/36;* **C12N** *15/00*

U.S. Cl. 204—180.1 **11 Claims**



1. An apparatus for introducing individual particles suspended in an electrically conducting aqueous solution into recipient biological cells. the apparatus comprising in combination:

an injection micropipette having an exit orifice size for piercing the membrane of a target recipient cell and an entrance orifice;

an electrically conducting medium located within the lumen of said injection micropipette in contact with the exit orifice thereof;

first electrode means located within the lumen of said injection micropipette, said first electrode means having a first end positioned within said electrically conducting medium contained in the lumen of said injection micropipette, and a second end which emerges from the entrance orifice thereof;

second electrode means located in the electrically conducting aqueous solution containing the recipient biological cells; and

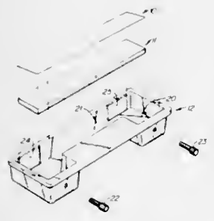
means for applying a first voltage and a subsequent second voltage between the second end of said first electrode means and said second electrode means both when the exit orifice of said injection micropipette is located in the conducting aqueous solution and when the exit orifice of said injection micropipette is located within the body of a recipient cell located in the conducting aqueous solution, the first voltage having a chosen magnitude and polarity for electrostatically attracting at least one particle to the region of the exit orifice of said injection micropipette, and for holding the particle in this location during the process of piercing the membrane of a cell with the exit orifice of said injection micropipette and insertion of the particle into the recipient cell body. and the second volt-

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age having a polarity opposite to that of the first voltage and a chosen magnitude for electrostatically repelling the particle away from the injection micropipette.

4,784,738
APPARATUS AND METHOD FOR GEL CASTING
Donald D. Sleeter, Berkeley; George G. Fernwood, San Anselmo, and Samuel Burd, Oakland, all of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.
Filed Dec. 12, 1985, Ser. No. 808,307
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—182.8 **10 Claims**



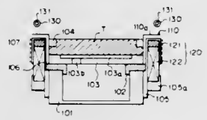


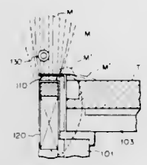
1. A method for casting a gel in a vertical gel enclosure having a bottom opening, said method comprising:
(a) wetting a wettable membrane sized to cover said bottom opening with a first solution of a gel-forming substance;
(b) holding said wetted membrane against said bottom opening until the gel-forming substance in said first solution sets to form a watertight seal across said bottom opening;
(c) filling said gel enclosure with a second solution of said gel-forming substance;
(d) setting the gel-forming substance in said second solution; and
(e) removing said membrane from said bottom opening.

4,784,739
METHOD OF PRODUCING A THIN FILM BY SPUTTERING AND AN OPPOSED TARGET TYPE SPUTTERING APPARATUS
Sadao Kadokura, Hachioji; Kazuhiko Honjyo, Hino, and Akio Kushara, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Dec. 22, 1987, Ser. No. 136,866
Claims priority, application Japan, Dec. 26, 1986, 61-308517
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192.2 **29 Claims**

20. A sputtering method of depositing a thin film on a substrate positioned beside a space extending between a pair of opposed cathode targets arranged in a closed vacuum chamber containing therein sputtering gas, comprising in combination the steps of:
applying electric sputtering power between the pair of opposed cathode targets and an anode electrode;
generating a first magnetic field extending in the direction perpendicular to the surfaces of said pair of opposed cathode targets for confining plasma, and;
refelcting electrons discharged from the surfaces of said pair of opposed cathode targets into said space extending between said pair of opposed targets.

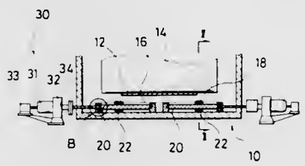
26. A sputtering method of depositing a thin film on a substrate, according to claim 20, wherein said pair of opposed





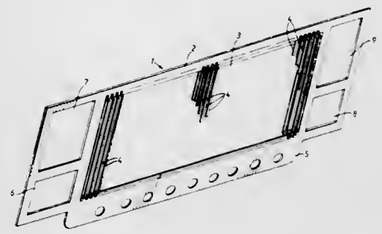
targets are made of a soft magnetic alloy, and wherein said substrate is made of a plastic film, whereby a two-layer perpendicular magnetic recording medium having a soft magnetic layer and a Co-Cr system layer thereon is produced.

4,784,740
PLATING CELL WITH EDGE MASKS
Shinjiro Murakami; Seiichi Takahashi, and Masahiko Urakami, all of Okayama, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan
Filed Sep. 24, 1987, Ser. No. 101,934
Claims priority, application Japan, Sep. 26, 1986, 61-227337
Int. Cl.[4] C25D *17/00*
U.S. Cl. 204—206 **8 Claims**



1. A radial plating cell comprising
a winding roll for winding thereon a metal strip having longitudinal and transverse dimensions,
an arch-shaped anode opposed to said winding roll and spaced at a predetermined distance from said winding roll,
a pair of edge masks interposed between said winding roll and said anode so as to come in register with the edges of the metal strip,
means for moving each of said edge masks in the transverse direction of the metal strip, and
drive means for driving said moving means,
said moving means comprising a drive screw and a travelling nut threadably engaged on said drive screw,
said edge mask being operatively connected to said travelling nut, and
said moving means being located in a channel which is formed in the surface of said anode that is opposed to said winding roll and extends in the transverse direction of the metal strip,
whereby the travelling nut and hence, the edge mask is moved axially of said drive screw with rotation of said drive screw.

4,784,741
ELECTROLYTIC CELL AND GASKET
Thomas W. Boulton, and Brian J. Darwent, both of Frodsham, England, assignors to Imperial Chemical Industries PLC, London, England
Filed Sep. 14, 1987, Ser. No. 95,920
Claims priority, application United Kingdom, Sep. 22, 1986, 8622749
Int. Cl.[4] C25B *13/02, 13/04*
U.S. Cl. 204—242 **15 Claims**



1. A gasket of an electrically insulating material suitable for use in an electrolytic cell, which gasket comprises a frame-like part which defines a central opening and a plurality of projections and/or recesses on and/or in a surface thereof which are adapted to cooperate with corresponding recesses and/or projections in and/or on a surface of an anode or of a cathode or of a gasket adjacent thereto, and in which the projections and/or recesses are present as a plurality of rows thereof on and/or in a surface of the gasket.

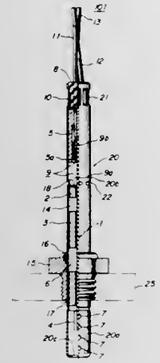
12. An electrolytic cell which contains a gasket as claimed in claim 1.

4,784,742
CATHODE FOR MAGNESIUM PRODUCTION
Oddmund Wallevik; Ole J. Kaasa, and Gunnar Endal, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway
Filed Nov. 24, 1986, Ser. No. 934,107
Int. Cl.[4] C25C *3/00*
U.S. Cl. 204—243 R **9 Claims**



1. An electrolytic cell for production of magnesium by electrolysis of a magnesium salt melt, said cell comprising a molten magnesium salt, an anode and a cathode, wherein the cathode consists of a substrate coated with molybdenum, tungsten or an alloy of these metals, and wherein the coating has a thickness of at least 10 μm.

4,784,743
OXYGEN SENSOR
Atsushi Iino, Nagoya, and Nobuhide Kato, Ama, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Nov. 22, 1985, Ser. No. 800,684
Claims priority, application Japan, Dec. 6, 1984, 59-258080; Dec. 6, 1984, 60-115576; May 29, 1985, 60-115574
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—425 **13 Claims**



1. An oxygen sensor comprising:
an oxygen sensor element comprising an oxygen ion-conducting solid electrolyte body having a standard electrode and a measurement electrode, each electrode being in contact with the solid electrolyte body, said solid electrolyte body further including a gap therein such that said standard electrode directly communicates with said gap;
a casing which incorporates said element therein, said casing comprising an airtight space in communication with said gap, whereby said casing isolates at least said element from an external atmosphere; and
at least one pair of oxygen pump electrodes for supplying oxygen to said airtight space by oxygen ion conduction through said solid electrolyte body.

4,784,744
PROCESS FOR STABILIZING INTERMEDIATES AND IMPROVING LIQUID YIELDS AND COKE QUALITY
Leslie R. Rudnick, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Sep. 10, 1987, Ser. No. 94,974
Int. Cl.[4] C10G *9/16, 9/12*
U.S. Cl. 208—48 AA **16 Claims**

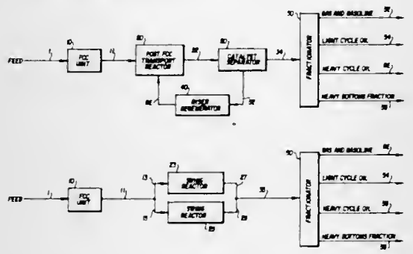
1. A process for reducing the amount of coke in a liquid hydrocarbon product from a thermal treating process comprising mixing with said liquid hydrocarbon a hydrocarbon stream from an extraneous source containing methyl free-radicals.

4,784,745
CATALYTIC UPGRADING OF FCC EFFLUENT
Donald M. Nace, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 54,062, May 18, 1987, abandoned, Continuation-in-part of Ser. No. 796,045, Nov. 7, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 122,477
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.
Int. Cl.[4] C10G *51/02*
U.S. Cl. 208—74 **30 Claims**

1. A process for catalytically cracking a petroleum fraction, comprising the following steps in sequence:

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(a) contacting said petroleum fraction with a cracking catalyst under catalytic cracking conditions to produce a catalytically cracked product;
(b) directly passing said catalytically cracked product to means for contacting said catalytically cracked product with a shape-selective crystalline silicate zeolite catalyst, and contacting said cracked product with said shape-



selective catalyst under conditions to produce a product comprising a gasoline fraction having a higher octane number and comprising a light distillate oil fraction having a lower pour point than said catalytically cracked product; and
(c) fractionating said product of step (b) to produce at least said gasoline fraction with improved octane number and said light distillate oil fraction with improved pour point.

4,784,746
CRUDE OIL UPGRADING PROCESS
Malvina Farcasiu, Flemington, and Rene B. LaPierre, Medford, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.
Filed Apr. 22, 1987, Ser. No. 41,188
Int. Cl.[4] C10G *9/00*
U.S. Cl. 208—106 **9 Claims**

1. A process for upgrading a crude oil which comprises heating a feedstream consisting essentially of a crude oil wherein said crude oil contains at least 2 weight percent of hydrocarbon components boiling below 330° F. of which at least 20 weight percent are aromatic compounds in the liquid phase, said feedstream being heated at a temperature of at least 400° C. and under pressure sufficient to maintain the feedstream in the liquid phase to effect an increase in the proportion of non-residual components in the crude oil wherein said proportion is increased by a transalkylation process.

4,784,747
CATALYSTS OVER STEAM ACTIVATED ZEOLITE CATALYST
David S. Shihabi, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 791,276, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 573,776, Jan. 23, 1984, Pat. No. 4,559,314, which is a continuation-in-part of Ser. No. 360,749, Mar. 22, 1982, abandoned. This application Jul. 8, 1987, Ser. No. 70,660
Int. Cl.[4] C10G *11/05, 45/64, 47/16*
U.S. Cl. 208—111 **16 Claims**

1. A process for catalytically cracking a hydrocarbon feedstock to a conversion product comprising hydrocarbon compounds of lower molecular weight than said feedstock hydrocarbon compounds, which process comprises contacting said feeedstock at cracking conditions with a catalyst composition prepared by the method which comprises forming a composite of a crystalline aluminosilicate zeolite having a silica:alumina ratio of at least about 250:1 and a Constraint Index from 1 to 12, a binder that contains alumina, and water, and contacting the composite with steam for at least one hour by heating the composite in the presence of water at a temperature from about 300° to 500° C. such that the pressure during steaming ranging between about 100 to 500 kPa, to enhance the activity of the catalyst.

4,784,748
FCC UNIT COMBINED WITH A CIRCULATING FLUID BED COMBUSTOR
Amos A. Avidan; Susan P. Donnelly, both of Yardley, Pa., and Frederick J. Krambeck, Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 28, 1987, Ser. No. 113,318
Int. Cl.[4] C10G *11/18*
U.S. Cl. 208—120 **13 Claims**

1. A process for the catalytic cracking of a hydrocarbon feedstock comprising:
(a) feeding a hydrocarbon feedstock to a catalytic cracking zone;
(b) introducing inert particles, from a circulating inventory of inert solids of a circulating fluid-bed combustor, into the reaction zone, at a temperature greater than about 950° F. in the presence of the feedstock and a once-through zeolite catalyst;
(c) catalytically cracking the feedstock to form cracked products;
(d) separating the inert particles from the catalyst and the cracked product; and
(e) returning the inert particles to the circulating fluid-bed combustor.

4,784,749
CRACKING/DEWAXING
Clarence D. Chang, Princeton; David S. Shihabi, Pennington, both of N.J., and Paul B. Weisz, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 864,746, May 13, 1986, Pat. No. 4,701,313, which is a continuatioo of Ser. No. 683,768, Dec. 19, 1984, abandoned. This application Aug. 6, 1987, Ser. No. 82,398
Int. Cl.[4] C10G *11/04*
U.S. Cl. 208—120 **16 Claims**

1. A process for cracking a feedstock comprising hydrocarbon compounds to lower molecular weight hydrocarbon compounds, which process comprises contacting said feedstock at conversion conditions with a catalyst composition comprising a siliceous zeolite prepared by the method comprising providing a boron-containing zeolie Beta with initial boron and aluminum contents each greater than the numeral 0, treating the zeolite with silicon tetrachloride at a temperature for a time sufficient to replace boron with silicon, and recovering the siliceous zeolite having reduced boron content but substantially preserved initial aluminum content.

4,784,750
CATALYTIC CRACKING PROCESS
Pierre Dufresne, Rueil-Malmaison, and Christian Marcilly, Houilles, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Jun. 4, 1986, Ser. No. 870,595
Claims priority, application France, Jun. 4, 1985, 85 08528
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **13 Claims**

1. In a catalytic process for cracking a hydrocarbon charge comprising subjecting a hydrocarbon charge to cracking conditions in the presence of a catalyst, the improvement wherein the catalyst contains by weight:
(a) about 50 to 95% of a matrix selected from the group consisting of at least one of alumina, clay, silica, silica-alumina, alumina-boron oxide, magnesia, silica-magnesia, zirconia and titanium oxide, and characterized by the following textural properties:
TPV (Total Pore Volume)$\geq$0.4 cm^3/g
S (Specific Surface)$\geq$100 m^2/g

PV_{75} (Volume of pores with diameter greater than 7.5 nm)$\geq$0.25 cm^3/g
$PV_{75}/TPV \geq 0.5$
(b) about 5 to 50% of a zeolite characterized by:
a SiO_2/Al_2O_3 molar ratio from about 8 to 70,
a sodium content lower than 0.15% by weight, determined on a zeolite roasted at 1100° C.,
a parameter a of unit cell size ranging from 24.55×10^{-10} m to 24.24×10^{-10} m,
a sodium ion uptake capacity, expressed in grams of sodium per 100 grams of neutralized and roasted zeolite, higher than about 0.85,
a specific surface higher than about 400 m^2/g,
a steam adsorption capacity at 25° C. (at a ratio between the water partial pressure and the saturation vapor pressure of water at 25° C. P/P_o of 0.10) higher than 6% by weight,
a pore distribution such that from 1 to 20% of the pore volume is pores of diameter ranging from 20 to 80×10^{-10} m, the remaining pore volume being essentially pores of diameter lower than 20×10^{-10} m.

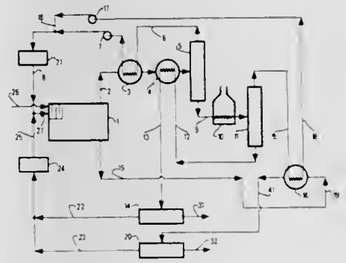
4,784,751
METHOD AND APPARATUS FOR RECLAIMING CONTAMINATED OIL
Ronald R. McGehee, Tucker, Ga., assignor to Keller Machine Works, Atlanta, Ga.
Filed Sep. 24, 1986, Ser. No. 911,159
Int. Cl.[4] C10M *175/00*
U.S. Cl. 208—181 **10 Claims**

1. In a method of reclaiming contaminated oil wherein some solid particles have been removed by means of an oil filter and contaminants, such as antifreeze and water, have been removed such as by vaporization in a heater, the improvement comprising:
circulating said contaminated oil and blending same in a container with an uncontaminated supply of oil which is delivered from the reclaimed uncontaminated supply.

4,784,752
METHOD FOR SUPPRESSING THE POISONING EFFECTS OF CONTAMINANT METALS ON CRACKING CATALYSTS IN FLUID CATALYTIC CRACKING
Periaswamy Ramamoorthy, El Sobrante, and Ashok S. Krishna, Concord, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed May 5, 1987, Ser. No. 47,084
Int. Cl.[4] B01J *21/16*
U.S. Cl. 208—251 R **28 Claims**

1. In a process for the conversion of hydrocarbon oil feed which comprises contacting a hydrocarbon feed containing metal contaminants including nickel, vanadium and iron with a cracking catalyst in a fluid catalytic cracking system, the improvement comprising:
(a) analyzing the hydrocarbon feed for nickel equivalents (defined as [nickel+0.2 vanadium+0.1 iron]) and determining the quantity of nickel equivalents in said hydrocarbon feed, and
(b) introducing a composition for mitigating or suppressing the contaminants-caused poisoning of the catalyst into said catalytic cracking system, said composition selected from the group consisting of bismuth, bismuth compounds and mixtures thereof, in a weight ratio of introduced bismuth composition to nickel equivalents of between about 0.01:1 and about 1:1.

4,784,753
DEASPHALTING PROCESS COMPRISING POWER RECOVERY FROM THE STAGE OF SEPARATING DEASPHALTED OIL FROM THE DEASPHALTING SOLVENT
Gérard Hotier, Rueil Malmaison, and Pierre Renard, Saint Nom la Breteche, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Oct. 17, 1986, Ser. No. 920,090
Claims priority, application France, Oct. 17, 1985, 85 15552
Int. Cl.[4] C10C *3/00*
U.S. Cl. 208—309 **9 Claims**



1. In a deasphalting process, wherein an asphalt-containing oil is subjected to extraction by means of a solvent selected from hydrocarbons having 3 to 6 carbon atoms and mixtures thereof, an oil phase of raw extract and an asphalt phase of raw raffinate are separately recovered and solvent is separated from each of said phases, the improvement in the solvent separation comprising:
(a) in a first step, heating said oily phase of raw extract to a temperature T_1 at a pressure P_1 which together are supercritical with respect to the solvent, so as to settle said oily phase into two phases, respectively a first phase of recovered solvent and a first extract phase of increased oil content and decreased solvent content, and separating said settled two phases from each other, and
(b) in a second step, heating said first extract phase of increased oil content and decreased solvent content separated in the first step to a temperature T_2 at a pressure P_2 which together are supercritical with respect to the solvent, so as to settle said first extract phase into two phases, respectively a second phase of recovered solvent and a second extract phase of increased oil content, and separating said settled two phases from each other, and recycling said first phase and said second phase of recovered solvent to said extraction, wherein at least a portion of the heat supplied to said first extract phase in the second step is heat of external origin, and at least a portion of the heat supplied to said oily phase of raw extract in the first step is supplied by a heat exchange with said first phase of recovered solvent before recycle thereof to said extraction and a heat exchange with said second extract phase of increased oil content, T_1, T_2, P_1 and P_2 being defined as follows:

$$Tc+1.5\ x_2-2x<T_1<Tc+1.5\ x^2-2x+45$$

$$T_1+2-<T_2<T_1+80$$

$$Pc+5<P_1<Pc+30$$

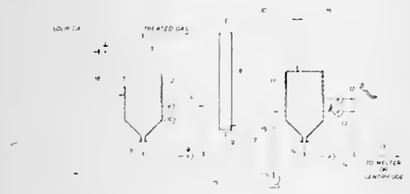
$$Pc<P_2<P_1+20$$

wherein Tc and Pc are respectively the critical temperatures and the critical pressure of the solvent, the temperatures being expressed in celsius degrees and the pressures in bars, and x is the average number of carbon atoms of the solvent molecule,

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the second extract phase of increased oil content forming the desired deasphalted oil wherefrom residual solvent, when present, can be separated.

4,784,754
SULFUR REMOVAL PROCESS
Howard L. Fong, Sugar Land, and David A. Van Kleeck, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Aug. 31, 1987, Ser. No. 91,485
Int. Cl.⁴ E01D *21/00, 21/02*
U.S. Cl. 209—2 **23 Claims**



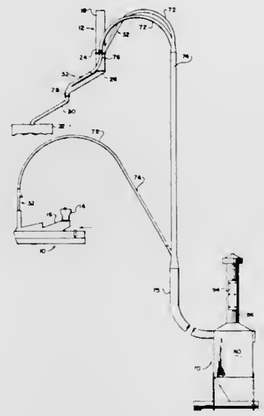
1. A process comprising removing sulfur particles from an aqueous polyvalent metal ion or polyvalent metal chelate solution by a method of sinking said particles in a zone, when at least some of the sulfur particles fail to sink to the bottom of the zone for recovery, agitating the sulfur particles suspended as a froth or foam and removing sulfur particles in a plurality of streams including at least one stream at a short distance from the top of the solution in the zone and at least one stream from the bottom of the solution in the zone, and optionally recombining the streams after removal.

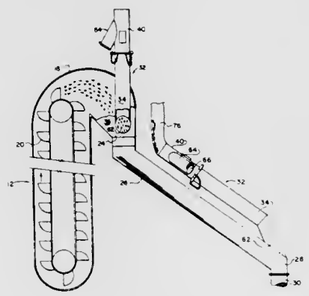
4,784,755
DUST CONTROL
Jimmy D. Taylor, Hereford, Tex., assignor to Allied Millwrights, Inc., Hereford, Tex.
Filed Jun. 10, 1986, Ser. No. 872,517
Int. Cl.⁴ B07B *4/02*
U.S. Cl. 209—136 **24 Claims**

1. The method of cleaning particulate from grain as the grain is being conveyed in closed conveyors having existing air therein and suspended flow at a location, comprising the steps of:

a. sucking existing air and particulate by a fan from the conveyor upward at an angle to horizontal of greater than 55° and at a velocity of about 2,000 feet per minute from the grain as the grain is being discharged in suspended flow;

b. immediately passing the air through said fan,



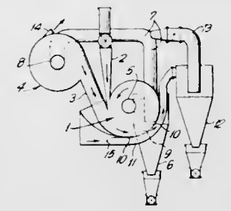


c. thereby discharging the air and particulate from the fan in a helical motion.

4,784,756
PNEUMATIC CLASSIFYING PROCEDURE AND MEANS
Pertti Ovaskainen, Rapattila, Finland, assignor to Larox Oy, Finland
PCT No. PCT/FI86/00044, § 371 Date Dec. 31, 1986, § 102(e) Date Dec. 31, 1986, PCT Pub. No. WO86/06660, PCT Pub. Date Nov. 20, 1986
PCT Filed May 5, 1986, Ser. No. 19,793
Claims priority, application Finland, May 3, 1985, 851762
Int. Cl.⁴ B04C *3/00*
U.S. Cl. 209—144 **8 Claims**

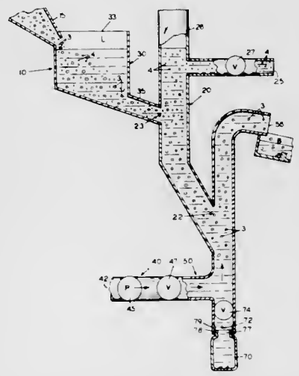
1. A pneumatic classifying procedure wherein particulate material is divided with the aid of centrifugal force into a fine product consisting of lighter particles and a coarse product consisting of heavier particles and wherein the fine product is

removed from the central part of a centrifugal field and the coarse product from its outer margin, characterized in that the



coarse product is removed with the aid of a separate gas flow which is tangential to the centrifugal field.

4,784,757
SOLID MATERIAL SEPARATOR
Edgar E. Nelson, Rt. 9, Box 24, Caldwell, Id. 83605, and Lonnie D. McClung, 48304 Garbo, Indio, Calif. 92201
Filed Jul. 13, 1987, Ser. No. 72,650
Int. Cl.⁴ B03B *5/00*
U.S. Cl. 209—159 **13 Claims**



1. Apparatus for the separation of mineral ores of differing specific gravity comprising:

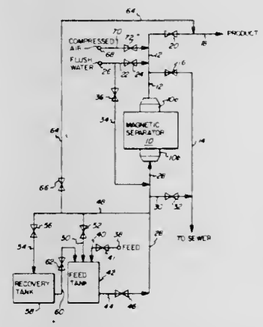
a vertically oriented separation tube, said separation tube provided with an unobstructed solid material inlet port; one or more light material discharge ports located above said inlet port; a stand pipe at its uppermost end, said stand pipe extending above the uppermost discharge port; and one or more unobstructed heavy material discharge ports located below said inlet port for rapidly removing heavy material by means of a high velocity stream of water;

pressurized water means;

a pressurized water conduit connected to said pressurized wate means and connected to and in fluid communication with said separation tube below said material inlet port; and

a holding tank having a top opening for introduction of solid materials and a bottom opening in unobstructed fluid communication with said solid material inlet port of said separator tube for transfer of solid material to said separator tube by gravity from said holding tank and transferring water from said separator tube to said holding tank, said top opening of said holding tank located above the top light material discharge port of said separator tube for maintaining a water level in said tank above said light material discharge port.

4,784,758
PROCESS FOR REMOVING MAGNETIC PARTICLES FROM A SUSPENSION OF SOLIDS IN A LIQUID
Mitchell J. Willis, Macon, Ga., assignor to Engelhard Corporation, Menlo Park, N.J.
Filed Aug. 27, 1986, Ser. No. 900,666
The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.
Int. Cl.⁴ B03C *1/02*
U.S. Cl. 209—214 **13 Claims**



1. A method for effecting wet magnetic separation of magnetically attractable particles from a suspension of solids in a liquid vehicle, including periodic flushing of a matrix on which such particles are collected, the method comprising the steps of:

(a) passing the suspension containing the magnetically attractagle particles upwardly through a stationary ferromagnetic matrix while applying a magnetic field to the matrix to collect the particles on the matrix, the matrix having the property of retaining said suspension therein after discontinuation of its passing through the matrix;

(b) after conducting step (a) for a selected treatment period, maintaining the magnetic field applied to the matrix while discontinuing the passing of the suspension through the matrix and passing a pressurized gas downwardly through the matrix to displace retaining suspension from the matrix;

(c) after step (b), discontinuing the magnetic field and flushing the matrix by passing a flush liquid therethrough in the absence of the magnetic field to flush collected particles from the matrix, the matrix also having the property of retaining said flush liquid therein after discontinuation of its passing through the matrix, and thereafter passing a pressurized gas downwardly through the matrix to displace retained flush liquid therefrom;

(d) recovering the displaced suspension of step (b); and

(e) repeating the above steps for a plurality of cycles.

4,784,759
MAGNETIC SEPARATION MACHINE
Eldon G. Elliott, 7397 Kingsbridge, Canton, Mich. 48187
Filed Mar. 17, 1987, Ser. No. 26,661
Int. Cl.⁴ B03C *1/14*
U.S. Cl. 209—223.1 **8 Claims**

1. An apparatus (10,10') for handling articles by magnetic attraction comprising; an elongated, hollow, cylindrical outer casing (12,12') of nonmagnetic material, said casing (12,12') having upper (22,22') and lower (24,24') ports and continuous, uninterrupted outer (28,28') and inner (30,30') surfaces extend-

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ing therebetween; a helical ramp (**32,32'**) of nonferrous, non-magnetic material rotatably disposed within said casing (**12,12'**) between said upper (**22,22'**) and lower (**24,24'**) ports and including a continuous helical outer edge (**40,40'**) constantly adjacent to said inner surface (**30,30'**), said ramp (**32,32'**)



and inner surface (**30,30'**) defining a spiral passageway; and magnet means (**42,42'**) disposed outside of said casing (**12,12'**) for directing a magnetic field through and into said passageway casing (**12,12'**) and into said passageway as said ramp (**32,32'**) rotates, said magnetic field extending continuously along the length of said passageway.

4,784,760

MAGNETIC SEPARATORS

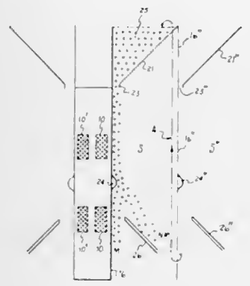
Jeremy A. Good, London, England, and Etienne H. Roux, Orwa, South Africa, assignors to Cryogenic Consultants Limited, London, England and Foskem (Proprietory) Limited, Phalaborwa, South Africa

Continuation of Ser. No. 712,470, Mar. 15, 1985, abandoned, which is a continuation of Ser. No. 395,225, Jul. 6, 1982, abandoned. This application Apr. 22, 1987, Ser. No. 45,177

Claims priority, application United Kingdom, Jul. 6, 1981, 8210865

Int. Cl.[4] B07C *5/344*

U.S. Cl. 209—223.1 **4 Claims**



1. A magnetic separator, comprising:

means defining a particle separation channel having at least one substantially vertical wall and an inlet and an outlet;

a superconducting magnet located entirely outside said particle separation channel and positioned closely adjacent said vertical wall of said particle separation channel, said magnet producing a strong magnetic field force along said vertical wall which is of maximum intensity at a first area extending over only a portion of the length of said vertical wall said portion being intermediate the inlet and outlet of the channel;

feeder means, located above said first area, for feeding a particle stream containing relatively magnetic and relatively non-magnetic particles, said feeder means being located with respect to said channel such that it will direct said particle stream to said channel in free fall trajectory closely adjacent said vertical wall and such that said particle stream will fall vertically to bring said particles within the influence of said magnetic field of said magnet;

diversion means positioned within said channel at said first area and located relative to said vertical wall for deflecting both said relatively magnetic and relatively non-magnetic particles of said particle stream in a diverted path away from said vertical wall, such deflection providing a horizontal component to the trajectory of said particle stream;

a splitter plate having an upper end and opposed sides, said splitter plate being mounted within said particle separation channel to form both a first passageway defined between one side of said splitter plate and said vertical wall and a second passageway defined between the opposite side of said splitter plate and the remainder of said particle separation channel wall surface at the level of the splitter plate, said upper end of said splitter plate being positioned in said diverted path of magnetic and non-magnetic particles at said first area relative to said vertical wall but below said diversion means;

said separator being structured and designed such that said magnetic field force of maximum intensity acts upon said particle stream deflected in said diverted path at said first area to attract said magnetic particles inwardly toward said vertical wall and into said first passageway formed by said splitter plate, while said non-magnetic particles continue along said diverted path and fall by gravity into said second passageway formed by said splitter plate for separation from said magnetic particles.

4,784,761

DRUM SCREEN

Alf Ökvist, Skärblacka, Sweden, assignor to Kone-KMW AB, Örnsköldsvik, Sweden

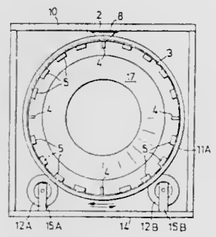
PCT No. PCT/SE86/00420, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/01624, PCT Pub. Date Mar. 26, 1987

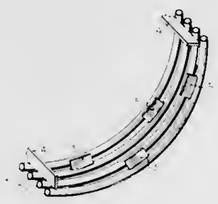
PCT Filed Sep. 18, 1986, Ser. No. 53,855

Claims priority, application Sweden, Sep. 19, 1985, 8504347

Int. Cl.[4] B07B *1/22*

U.S. Cl. 209—294 **14 Claims**





1. A drum screen for screening chips, including long splinters and chip pieces, said drum screen comprising a rotatable screen drum with screening slits extending in circumferential direction and formed between a plurality of parallel rings arranged one after the other and joined together at a predetermined distance fro each other by means of cross pieces which extend axially to the drum screen, characterized in that at least a plurality of the rings of the drum screen are provided with a plurality of guide plates arranged along their inner circumferential surfaces substantially parallel to the screening slits in order to turn long splinters and chip pieces enabling them to pass through the screening slits, the rings consists of tubes or rods bent to a substantially circular shape, and that the cross pieces comprise chip lifters extending in the direction towards the axis of the drum screen.

4,784,762

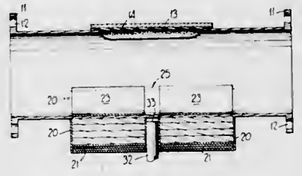
MAGNETIC TRAP

Sam W. Taliaferro, 3204 Chamblee-Tucker Rd., Tucker, Ga. 30341

Filed Jun. 26, 1986, Ser. No. 878,792

Int. Cl.[4] B03C *1/02*

U.S. Cl. 210—85 **2 Claims**



1. A magnetic trap comprising a substantially non-ferrous sheet, magnet means mounted to one side of said sheet forming a magnetic gap adjacent said sheet productive of a magnetic field to the other side of said sheet; and meter means mounted to said one sheet side with a Hall effect probe positioned to sense the strength of said magnetic field for metering the collection of metallic objects caught in the magnetic field by the trap, and wherein said magnet means is U-shaped having a pair of legs joined by a bight with the leg ends being mounted adjacent said sheet, and wherein said probe is positioned between said legs and extends through said bight between said legs to terminate closely adjacent said sheet.

4,784,763

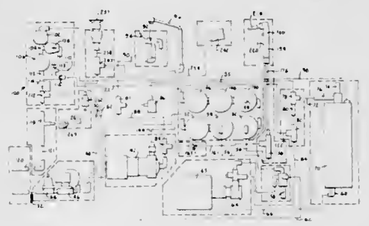
WATER PURIFICATION MACHINE

Larry G. Hambleton, Olathe, Kans.; Charles A. Moss, Lees Summit, Mo., and Jim Hunter, Shawnee, Kans., assignors to Labconco Corporation, Kansas City, Mo.

Filed Jul. 13, 1987, Ser. No. 73,063

Int. Cl.[4] B01D *13/00*; **C02F** *1/44*

U.S. Cl. 210—90 **22 Claims**



1. A water purification apparatus comprising:

an inlet line for receiving feed water to be purified;

reverse osmosis means for receiving the feed water and producing therefrom clean water and reject water of lesser purity than the clean water;

main pump means for pumping water from the inlet line to said reverse osmosis means;

a clean water line coupled with said reverse osmosis means for receiving the clean water therefrom, said clean water line being split into first and second alternative paths;

a drain line for receiving the reject water from said reverse osmosis means;

a clean water dispenser coupled with said first path of the clean water line and selectively operable to dispense the clean water therein;

water polishing means coupled with said second path of the clean water line for receiving the clean water therein and polishing same to produce higher quality polished water;

means for pumping the clean water from said second path of the clean water line through said polishing menas; and

a polished water dispenser for receiving and selectively dispensing the polished water.

4,784,764

ARRANGEMENT FOR THE FLOCCULATION OF FLOCCULATABLE SUBSTANCES IN SUSPENSIONS, PARTICULARLY FOR THE PURIFICATION OF THE BACKWATER OF DEINKING INSTALLATIONS FOR WASTE PAPER PROCESSING

Hans H. Kleinschnittger, Berg - Vorberg; Wolfgang Bassler, Allensbach; Albrecht Kahmann, Weingarten, and Wolfgang Siewert, Ravensburg, all of Fed. Rep. of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

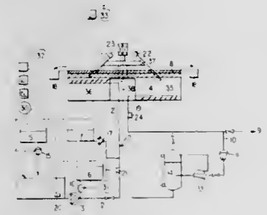
PCT No. PCT/EP86/00357, § 371 Date Feb. 19, 1987, § 102(e) Date Feb. 19, 1987, PCT Pub. No. WO87/00220, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 16, 1986, Ser. No. 19,241

Claims priority, application Switzerland, Jun. 24, 1985, 02 672/85-0

Int. Cl.[4] C02F *1/24*

U.S. Cl. 210—96.1 **8 Claims**



1. An arrangement for the flocculation of flocculatable substances in suspension, particularly for the purification of backwater of deinking installations for waste paper processing, comprising:

a reservoir for the delivery of a suspension;

a container having a bottom;

conduit means for supplying the suspension from the reservoir to the container in a predeterminate direction of movement;

means for supplying chemical agents to the suspension in a quantity adequate for flocculation of the suspension;

means for supplying air to the suspension;

said means for supplying chemical agents and said means for supplying air being arranged upstream of the container with respect to said predeterminate direction of movement of the suspension;

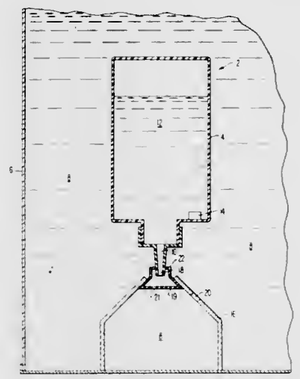
rotatable rotor means arranged within said container,

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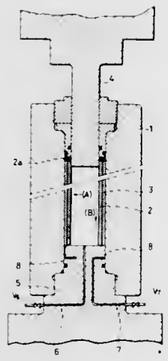
a shaft defining a substantially vertical axis of rotation provided for said rotatable rotor means;
said rottable rotor means arranged within said container rotating about said substantially vertical axis of rotation defined by said shaft;
said rotatable rotor means comprising at least two arm members;
each of said arm members extending substantially horizontally and radially outwardly from said shaft;
said shaft being structured to supply the suspension admixed with the chemical agents and air to one of said arm members for infeeding the suspension admixed with the chemical agents and air into the container;
said one arm member being situated below a liquid surface of the suspension within the container;
said other arm member removing from the container liquid substantially freed from floating flocculated substances of the suspension by means of said shaft;
said shaft defining means for supplying the suspension admixed with the chemical agents and air to said one arm member and for the outfeed of the liquid substantially freed from floating flocculated substances by said other arm member;
said other arm emmber being arranged above the bottom of the container;
said two arm members being arranged at different heights in said container such that said one arm member for supplying the suspension is positioned at a higher location than the other arm member for removing the liquid substantially freed from floating flocculated substances of the suspension and constituting clarified water;
each of said arm members having a free end and a predeterminate length between the shaft and the free end of each such arm member;
each of said arm members being provided with openings along the predetermined length of the arm members;
the two arm members being located at an acute angle with respect to one another;
said one arm member defining an upper arm member and said other arm member defining a lower arm member;
said upper arm memberfor infeeding the suspension, during rotation of the rotatable rotor means, trailing the lower arm member for removing the clarified water;
at least one measuring device for measuring a predeterminate characteristic of the flocculated substances in the container;
a removal conduit located substantially centrally of said shaft for removal of flotation scum formed by the floating flocculated substances;
conveying means for conveying the flotation scum to the substantially centrally located removal conduit;
an additional radially directed arm member provided for said rotatable rotor means;
said conveying means comprising a conveyor device arranged at said additional radially directed arm member;
a radially directed trough;
said conveyor device being arranged in said radially directed trough;
an impeller wheel disposed substantially parallel to the conveyor device; and
said impeller wheel including blade means for conveying the flotation scum into the trough for removal by the conveyor device and infeed thereof to the centrally located removal circuit.

4,784,765
AQUARIUM OXYGENATOR
Merrill Cohen, 180L Penrod Ct., Glen Burnie, Md. 21061
Filed May 2, 1986, Ser. No. 860,321
Int. Cl.⁴ C02F *1/72*
U.S. Cl. 210—169 **5 Claims**

1. Apparatus for dispensing oxygen by decomposing hydrogen peroxide in an aquarium containing water, comprising: a container holding hydrogen peroxide solution and a catalyst comprising 99.9% pure powdered metallic silver which passes through a size 325 mesh screen, an outlet from the container connecting into the top of an open-based ceramic structure, wherein a first portion of hydrogen peroxide is catalytically decomposed in the container to form oxygen and water, pressure generated by the presence of oxygen in the container forces a second portion of hydrogen peroxide to seep through the outlet into the water surrounded by the ceramic structure and to decompose to produce oxygen in the presence of organic material dissolved in said water and in the absence of said catalyst.



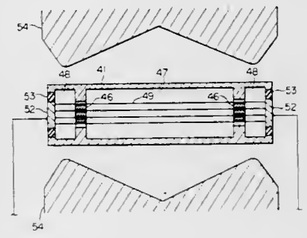
4,784,766
PRESSURE CRYSTALLIZATION EQUIPMENT
Masato Moritoki, Miki, and Kazuo Kitagawa, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
PCT No. PCT/JP85/00520, § 371 Date Nov. 12, 1986, § 102(e) Date Nov. 12, 1986, PCT Pub. No. WO87/01605, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 18, 1985, Ser. No. 939,160
Int. Cl.⁴ B01D *35/02*
U.S. Cl. 210—181 **9 Claims**



1. Pressure crystallization equipment comprising:
a cylindrical high pressure vessel having an inner surface;
means for establishing a pressure of at least 500 atmospheres within said vessel; and

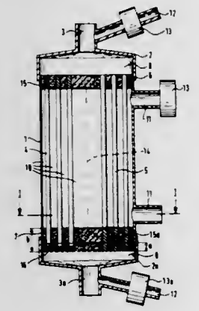
a filter structure disposed within said vessel and being fixed against substantial radial and axial displacement with respect to said vessel, said filter structure comprising a cylindrical metal mesh structure having at least two layers of mesh sintered together and a reinforcement disposed between said cylindrical metal mesh structure and said inner surface of said vessel for backing up said cylindrical metal mesh structure, said reinforcement and said cylindrical metal mesh structure being joined together at least at opposite ends thereof, there being at least one liquid flow path through said reinforcement, wherein a differential pressure between an inside and an outside of said filter structure is maintained by the inner surface of said vessel.

4,784,767
MAGNETIC SEPARATOR FOR FLUIDS
Tetsuhiko Hasuda, Yatabe; Yoshihisa Kitora, Amagasaki; Kiyoshi Taketou, Amagasaki, and Akira Ichikawa, Amagasaki, all of Japan, assignors to Director General, Agency of Industrial Science and Technology and Mitsubishi Denki Kabushiki Kaisha, both of, Japan
Filed Mar. 16, 1987, Ser. No. 26,470
Claims priority, application Japan, Mar. 20, 1986, 61-63417; Mar. 20, 1986, 61-63418
Int. Cl.⁴ B01D *35/06*
U.S. Cl. 210—222 **14 Claims**



1. A magnetic separator for fluid containing magnetic particles comprising:
a container having end walls and which is divided by a first partition into a particle trapping portion and a first particle accumulating portion which are in fluid communication with one another, the upper portion of said trapping portion being equipped with a fluid inlet and the lower portion being equipped with a fluid outlet for said fluid containing magnetic particles;
means for producing a magnetic field within said container, which increases from said trapping portion to reach a maximum between one of said end walls associated with said first particle accumulating portion of said container and said first partition;
particle trapping means for trapping said magnetic particles in said fluid as said fluid flows from said fluid inlet to said fluid outlet, said particle trapping means extending across said container through said trapping portion and said accumulating portion and being made of an electrically-conducting material which can be magnetized by said means for producing a magnetic field and being oriented with respect to said magnetic field so that said magnetic field will exert a force on said particle trapping means when an electric current is passed therethrough; and
means for passing an alternating electric current through said particle trapping means.

4,784,768
CAPILLARY FILTER ARRANGEMENT FOR STERILIZATION OF LIQUID MEDIA
Bernd Mathieu, Spiesen-Elversberg, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany
Filed Mar. 18, 1988, Ser. No. 169,815
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709432
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—321.8 **14 Claims**



1. Capillary filter arrangement for sterilizing liquid media comprising at least two semipermeable capillary fibre bundles which are in flow connection with each other and are arranged in a tubular housing, the ends of the housing each having a cast layer in which the capillary fibre bundles are received, the ends of the housing each being sealed with an end cap having at least one connection opening, a distributing chamber being formed between the end cap and cast layer in each case and a primary filtrate chamber being formed in the tubular housing between the cast layers, and the ends of the first capillary fibre bundle are sealed with respect to the first distributing chamber and the ends of the second fibre bundle are sealed with respect to the second distributing chamber so that the total internal lumen of the first capillary fibre bundle is in flow connection only with the second distributing chamber and that of the second capillary fibre bundle is in flow connection only with the first distributing chamber.

4,784,769
PLASMA POLYMERIZED ACETONITRILE PROTECTIVE COATINGS AND METHOD OF PREPARATION THEREFOR FOR ULTRAFILTRATION/MICROFILTRATION MEMBRANES
Paul J. Giordano, Jr., Hudson, and Richard C. Smierciak, Streetsboro, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed Nov. 21, 1986, Ser. No. 933,433
Int. Cl.⁴ B01D *39/08;* **B05D** *3/06, 5/00*
U.S. Cl. 210—500.21 **8 Claims**

1. A process for coating an ultrafiltration/microfiltration membrane with a protective thin film comprising:
(a) loading said ultrafiltration/microfiltration membrane in an enclosed reactor;
(b) evacuating said reactor;
(c) charging said reactor with an inert carrier gas and gaseous acetonitrile monomer;
(d) plasma-polymerizing said organic monomer such that a thin-film protective coating of said polymerized monomer is deposited on the entire effective surface of said membrane.

5. A nonfouling membrane comprising an ultrafiltration/microfiltration membrane surface on which is deposited an anti-

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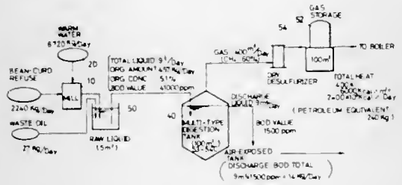
fouling polymerized acetonitrile monomer thin film protective coating.

4,784,770

METHOD FOR PRODUCING METHANE GAS

Masamichi Nagao, 87-302 Ikidanchi Nishi-Ku, Fukuoka, Japan

Filed May 16, 1986, Ser. No. 864,082
Claims priority, application Japan, May 17, 1985, 60-103882
Int. Cl.⁴ C02F *11/04*
U.S. Cl. 210—603 **5 Claims**



1. A method for producing methane gas, comprising the steps of:

grinding bean-curd refuse into fine particles of approximately 1–50 microns by grinding means which include a rotary disc and a fixed disc facing the rotary disc, a clearance between the discs being in a range of about 10–100 microns;

adding water or organic suspension during the grinding, to prepare a slurry;

feeding the thus-prepared slurry to a storage tank;

deaerating the slurry in the storage tank to obtain raw liquid for generating methane gas in high concentration;

after said deaerating step, feeding the raw liquid to a digestive tank; and

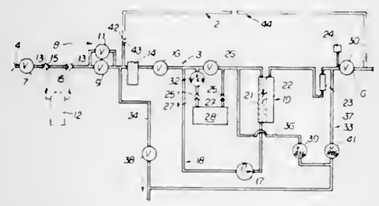
treating the raw liquid in the digestive tank with anaerobic bacteria to generate and the methane gas.

4,784,771

METHOD AND APPARATUS FOR PURIFYING FLUIDS

Ronald L. Wathen, and Steven L. Miller, both of Jefferson County, Ky., assignors to Environmental Water Technology, Inc., Ky.

Filed Aug. 3, 1987, Ser. No. 80,968
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—636 **39 Claims**



1. A method of purifying fluid utilizing reverse osmosis comprising:

passing fluid to be purified during a purifying cycle through an open ended feed zone, through a reverse osmosis zone to an open ended product zone and to an end user for a preselected time period;

interrupting said purifying cycle after said preselected time period by closing said feed and product zones and recycling residual fluid in by-pass relation to said reverse osmosis zone from said product zone in direct, continuously circulating flow to said feed zone for a preselected time period during a treating cycle; and,

introducing treating fluid from a treatment zone in direct, continuously circulating flow into the recycled fluid during said treating cycle to continuously disinfect/rejuvenate and flush said reverse osmosis zone throughout.

4. The method of claim 1, said treating fluid being an osmotically active formaldehyde solution having a rejection range of approximately 38% to approximately 50% with respect to the reverse osmosis zone to allow residual fluid to osmotically pass from said product zone through said reverse osmosis zone to said feed zone for a period of approximately one (1) to two (2) minutes to an equilibrium stage, said equilibrium stage lasting approximately one and one-half (1½) to two (2) hours.

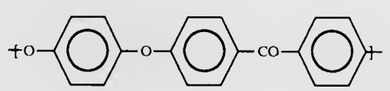
4,784,772

METHOD FOR THE PRODUCTION AND USE OF ULTRAPURE WATER AND APPARATUS THEREFOR

Yoshihisa Gotoh; Toshihiko Tutumi, both of Yokohama; Toshiaki Takahashi, Hatano, and Katsuhiko Ito, Kawasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jun. 16, 1987, Ser. No. 62,675
Claims priority, application Japan, Jun. 17, 1986, 61-139206; May 13, 1987, 62-114539
Int. Cl.⁴ C02F *9/00*
U.S. Cl. 210—638 **5 Claims**

1. In a method for the production and use of ultrapure water produced by subjecting deionized water, which has been obtained from a deionization step to a process comprising thepurification steps of a sterilization treatment, an activated carbon treatment, an ion-exchange resin treatment and a permeable membrane treatment, the improvement comprising feeding the water from each of the treatment steps after at least the sterilization treatment to the next step through first piping made of a crystalline polyether ether ketone resin having a recurring unit of the following formula:



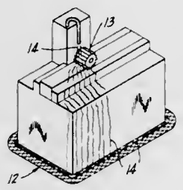
and the thus-produced ultrapure water is then fed through second piping, which is made of said crystalline polyether ether ketone resin, to and through a use system of the ultrapure water.

4,784,773

PETROLEUM PRODUCT ABSORBTION METHOD AND APPARATUS

Frank H. Sandberg, 524 W. Shady La., Mequon, Wis. 53092

Filed Jul. 27, 1987, Ser. No. 78,235
Int. Cl.⁴ C02F *1/40*
U.S. Cl. 210—691 **7 Claims**



1. The method of removing of oil from a carrier, comprising supplying a layer consisting essentially of an incense-cedar particulate material, said incense material including a small amount of paraffin wax and defining a hydrophobic material.

4. A tubular dam unit for confining and absorbing of petroleum product, comprising a porous tubular container formed of an apertured material, an incense-cedar particulate as the waste product of forming wooden pencils essentially filling said tubular container.

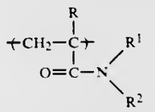
4,784,774

COMPOSITIONS CONTAINING PHOSPHONOALKANE CARBOXYLIC ACID FOR SCALE INHIBITION

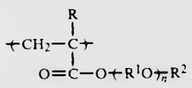
Zahid Amjad, Avon Lake, and William F. Masler, III, Hinckley, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 8, 1987, Ser. No. 105,933
Int. Cl.⁴ C02F *5/14*
U.S. Cl. 210—699 **16 Claims**

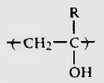
1. An admixture useful for inhibiting formation of scale-forming salts in an aqueous medium comprising at least one copolymer having weight average molecular weight of 1,000 to 50,000 and at least one phosphonoalkane carboxylic acid or a water-soluble salt thereof; wherein weight ratio of said copolymer to said phosphonoalkane carboxylic acid or its salt is 10:1 to 1:10; wherein said phosphonoalkane carboxylic acid and salts thereof contain 1 to 2 phosphono groups and 2 to 6 carbon atoms in the alkane group; wherein said copolymer consists essentially of at least one polymerized carboxyl monomer in amount of 50 to 90% by weight and at least one polymerized comonomer in amount of at least 5% by weight; wherein said carboxyl monomer is selected from acrylic acid, methacrylic acid, itaconic acid, maleic acid or its anhydride, salts of such acids, and mixtures thereof, and wherein said comonomer is selected from alkyl esters, substituted acrylamides, alkoxyalkyl acrylates, vinyl alcohol, and mixtures of such comonomers; wherein said alkyl esters are alkyl esters of itaconic acid and maleic acid containing 1 to 6 carbon atoms in each alkyl group; wherein repeating units of said substituted acrylamides are defined as follows:



where R is hydrogen or methyl and R^1 and R^2 are individually selected from hydrogen and alkyl groups of 1 to 12 carbon atoms provided that at least R^1 or R^2 is other than hydrogen; wherein repeating units of said alkoxyalkyl acrylates are defined as follows:



where R is hydrogen or methyl, R^1 is an alkylene group of 2 to 4 carbon atoms, R^2 is an alkyl group of 1 to 10 carbon atoms, and n is an integer of 1 to 5; and wherein repeating units of said vinyl alcohols are defined as follows:



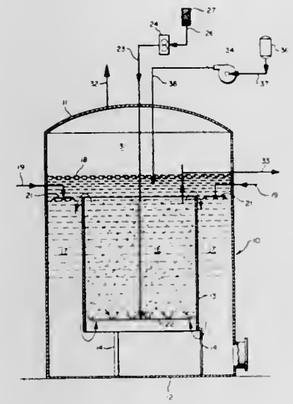
where R is hydrogen or an alkyl group of 1 to 6 carbon atoms.

4,784,775

REMOVAL OF HYDROGEN SULFIDE FROM SOUR WATER

Leslie C. Hardison, Barrington, Ill., assignor to ARI Technologies, Inc., Palatine, Ill.

Filed Mar. 2, 1987, Ser. No. 20,568
Int. Cl.⁴ C02F *1/74*
U.S. Cl. 210—712 **17 Claims**



1. A continuous process for treating sour water with an aqueous catalyst solution of a chelated polyvalent metal to effect catalytic liquid phase oxidation of dissolved hydrogen sulfide to sulfur by means of dissolved oxygen, wherein said polyvalent metal is reduced from a higher valence state to a lower valence state during said oxidation of hydrogen sulfide, said process comprising:

providing a recirculating system having a reaction zone for said oxidation of hydrogen sulfide and an interconnected oxygenation zone for introducing oxygen into said catalyst solution;

continuously recirculating between said reaction zone and said oxygenation zone a liquid mixture comprising a dilute aqueous catalyst solution containing a catalytic amount of a chelated polyvalent metal such that the liquid mixture has a predetermined polyvalent metal ion content selected from the range of from about 0.5 ppm by weight to about 5 ppm by weight;

introducing sour water feed containing dissolved hydrogen sulfide into an inlet portion of said reaction zone, and immediately mixing and diluting said sour water feed at said inlet portion with a massive excess of oxygenated liquid mixture recirculated from said oxygenation zone so as to maintain the molar ratio of dissolved oxygen plus one-half the higher valence polyvalent metal ion to sulfide ion in said liquid mixture in said reaction zone greater than about 1:1, said mixing and diluting being effected substantially entirely in liquid phase in said reaction zone so that said sour water feed is not contacted with air or gaseous oxygen or a stripping gas capable of stripping dissolved hydrogen sulfide from the liquid mixture until after the sour water has been diluted and has passed through said reaction zone;

introducing air or other oxygen-containing gas into said oxygenation zone, and therein contacting the air or other oxygen-containing gas with said liquid mixture recirculated from said reaction zone under conditions effective to increase the dissolved oxygen content of said liquid mixture and also to oxidize the reduced polyvalent metal to its higher valence state;

withdrawing a minor portion of the resultant oxygenated liquid mixture from said oxygenation zone as the sweet

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water product of the process, substantially the balance of the oxygenated liquid mixture being recirculated from said oxygenation zone to said reaction zone;

introducing replacement chelated polyvalent metal into the system at a rate sufficient to replace that removed in said sweet water product and to maintain said predetermined polyvalent metal ion content in said liquid mixture;

regulating the sour water feed rate and the sweet water product withdrawal rate to provide a predetermined residence time of the sour water in the system selected from the range of from about 5 to about 120 minutes; and

correlating said predetermined residence time and said predetermined polyvalent metal ion content so as to obtain substantially complete oxidation of the hydrogen sulfide in the sour water feed to sulfur.

4,784,776

PROCESS FOR TREATING AQUEOUS SUSPENSION

Francis J. Mangravite, Jr., Plano, Tex., assignor to Pony Industries, Inc., New York, N.Y.

Continuation of Ser. No. 609,609, May 14, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 897,568

Int. Cl.[4] C02F *1/56*

U.S. Cl. 210—728 **3 Claims**

1. An improved process for removing suspended matter from coal pile run-off water comprising contacting said coal pile run-off water with a flocculating agent comprising a mixture of a water dispersible melamine-formaldehyde resin and a diallyldialkylammonium halide polymer, the weight ratio of said water dispersible resin to said polymer being about 90:10.

4,784,777

PRINTING BLANKET RESTORATION

Matthew H. Dellinger, Cherryville, N.C., assignor to Smash, Inc., Lumberton, N.C.

Continuation of Ser. No. 753,035, Jul. 8, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 21,615

Int. Cl.[4] B29C *43/02;* **B29D** *24/00*

U.S. Cl. 252—8.7 **18 Claims**

1. A thick viscous liquid composition useful for restoring a printing blanket having an unmarred or unbroken elastomeric face but in need of restoration due to compression of the fabric backing thereof, said composition consisting essentially of as ingredients in a water solvent,

(a) about 1-10 of a sulfated fatty alcohol anionic surfactant, from about 3 to about 20% of a sulfonated alkylaryl anionic surfactant, and from about 0.5 to about 10% of an organic phosphate ester surfactant, and

(b) either (1) from about 1 to about 10% of a nonionic surfactant, or (2) from about 0.5 to about 2% of a water-soluble salt and from about 1 to about 8% of an amphoteric surfactant other than an amphoteric organic phosphate ester surfactant;

wherein said ingredients are individually present in an amount sufficient to provide said restoring upon a sufficient amount of said composition being applied to said fabric backing.

4,784,778

CORROSION INHIBITING COMPOSITION FOR ZINC HALIDE-BASED CLEAR, HIGH DENSITY FLUIDS

Charles C. Shin, Lafayette, Ind., assignor to Great Lakes Chemical Corp., West Lafayette, Ind.

Filed Sep. 30, 1986, Ser. No. 913,702

Int. Cl.[4] E21B *43/00, 41/02*

U.S. Cl. 252—8.551 **17 Claims**

1. A corrosion inhibiting composition adapted for use with clear, high density fluids having application as well completion and workover media comprising:

about 5-95 parts by weight of a thio group corrosion inhibitor selected from the group consisting of alkali metal and ammonium thioglycolates and thiocyanates, thiourea, mercapto acetic acid and salts thereof, dithiodiglycolic acid, and mixtures thereof; and

about 95-5 parts by weight of an aldose group antioxidant selected from the group consisting of ascorbic acid and salts thereof, gluconic acid, and mixtures of ascorbic acid with gluconic acid.

4,784,779

CORROSION INHIBITORS FOR CLEAR, CALCIUM-FREE HIGH DENSITY FLUIDS

Ahmad Dadgar, Lafayette, Ind., assignor to Great Lakes Chemical Corp., West Lafayette, Ind.

Filed Sep. 30, 1986, Ser. No. 913,409

Int. Cl.[4] E21B *43/00, 41/02;* **C09K** *7/02*

U.S. Cl. 252—8.551 **6 Claims**

1. A corrosion inhibited clear, high-density fluid for use as a well completion and workover medium comprising:

a clear aqueous solution of at least about 50 percent zinc bromide by weight of the solution and one or more alkali metal bromides, the solution having a density of about 11.5 to 20.5 pounds per gallon and a pH lying in the range of about 1.5 to 5.5;

a corrosion inhibiting amount of a corrosion inhibitor selected from the group consisting of sodium, ammonium and calcium thiocyanates and mixtures thereof; and

an effective amount of an aldose group antioxidant selected from the group consisting of ascorbic acid and salts thereof, gluconic acid and mixtures of ascorbic acid and gluconic acid said high density brine being free of calcium except for that of said calcium thiocyanate where calcium thiocyanate is employed.

4,784,780

LUBRICANT ADDITIVE COMPRISING MIXED HYDROXYESTER OR DIOL/PHOSPHORODITHIOATE-DERIVED BORATES

Liehpao O. Farng, Lawrenceville, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 98,339, Sep. 18, 1987, abandoned. This application May 3, 1988, Ser. No. 189,869

Int. Cl.[4] C10M *137/10*

U.S. Cl. 252—32.7 E **40 Claims**

1. The reaction product produced by: (a) reacting a phosphorodithioic acid and an epoxide, hydroxyester, or diol resulting in an intermediate product; and (b) reacting the intermediate product with a borating compound and a hydroxy-bearing compound to produce the desired reaction product, each reaction being conducted at a temperature between about 10° C. and about 150° C. for a period of between about 1 and about 48 hours in a proportion of reactants of about 1 mole of each.

4,784,781

LUBRICATING OIL COMPOSITIONS CONTAINING MULTI-FUNCTIONAL ADDITIVE COMPONENT

Richard A. Denis, Eastlake, and Frederick W. Koch, Willoughby Hills, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

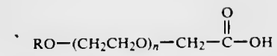
Filed Feb. 27, 1987, Ser. No. 20,287

Int. Cl.[4] C10M *105/22*

U.S. Cl. 252—39 **4 Claims**

1. A tractor fluid comprising:

a major amount of a mineral oil having therein 0.1% to 10% by weight of an overbased metal salt complex based on the weight of the fluid, the metal salt complex being that which is formed by metal cations in the presence of a compound represented by the formula (II)



(II)

wherein n varies over a range to provide an average of about 5 and R is an alkyl containing 16 to 24 carbons.

4,784,782

HETEROCYCLIC COMPOUNDS USEFUL AS ADDITIVES FOR LUBRICANT AND FUEL COMPOSITIONS

Joseph W. Pialet, Euclid, and Paul E. Adams, Willoughby, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

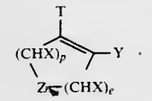
Filed Mar. 27, 1986, Ser. No. 845,204

Int. Cl.[4] C10M *133/00;* **C10C** *1/14*

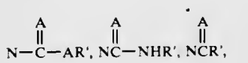
U.S. Cl. 252—47.5 **17 Claims**

1. An additive for functional fluids prepared by the process of reacting:

(I) at least one reactant of the formula:



wherein Z is S, NR',



PR' or PR'A where A is O or S and R' is H, alkyl or alkenyl; p is 0 to 2; e is 0 to 2 wherein e+p is 2 to about 4; X is independently H, COOH, NH_2, $CONH_2$, $NHNH_2$, OR', COR', NHR', OH, SH or CN, where R' is the same as defined above; wherein T is NH_2, NHR' where R' is the same as defined hereinabove, SH, OH or their tautomers; and Y is CN, CO_2H,



or CH_2NH_2 wherein A is the same as defined hereinabove; with

(II) at least one reactant selected from the group consisting of hydrocarbyl substituted carboxylic acid or derivatives thereof, hydrocarbyl phenolic reactant, or mixtures thereof; wherein the reactants are heated to a temperature of from about 80° C. to the decomposition temperature of the mixture to effect acylation or condensation reaction, and wherein from about 0.25 to about 2.0 equivalents of reactant (I) is reacted with each equivalent of the hydrocarbyl carboxylic acid or derivative thereof and/or hydrocarbyl phenolic reactant.

4,784,783

NON-VOLATILE HIGH-LIFT AMMONIA VAPOR ABSORBENT

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Dec. 15, 1987, Ser. No. 132,938

Int. Cl.[4] C09K *5/04*

U.S. Cl. 252—69 **16 Claims**

1. A liquid absorbent solution capable of reversibly absorbing and desorbing ammonia vapor comprising between 25 and 65 weight percent anhydrous ammonia and between 35 and 75 weight percent alkali metal thiocyanate component consisting essentially of at least 65 weight percent sodium thiocyanate (NaCNS) and at least 5 weight percent of at least one of potassium thiocyanate (KCNS), rubidium thiocyanate (RbCNS) and cesium thiocyanate (CsCNS).

4,784,784

SUCCINIC ACID ESTERS AND HYDRAULIC FLUIDS THEREFROM

Brent R. Dohner, Woodlands, Tex., assignor to Pennzoil Products Company, Houston, Tex.

Continuation of Ser. No. 886,776, Jul. 17, 1986, Pat. No. 4,689,166. This application Jun. 9, 1987, Ser. No. 60,012

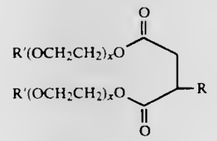
Int. Cl.[4] C10M *129/66, 173/02*

U.S. Cl. 252—79 **10 Claims**

1. An aqueous based hydraulic fluid comprising the following formulation:

Component	Amounts
Dispersant	10-40 wt. %
Surfactant	15-30 wt. %
Corrosion inhibitors	5-30 wt. %
Water	Balance

wherein the dispersant comprises a water dispersible polyethoxylated ester of the following formula:



wherein x is an integer ranging from about 6 to 10, R is a hydrocarbyl group which contains at least about 10 carbon atoms, and R' is an alkyl, alkenyl, aralkyl, or alkaryl group which contains from 1 to 20 carbon atoms.

4,784,785

COPPER ETCHANT COMPOSITIONS

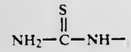
John L. Cordani, Waterbury, and Raymond A. Letize, West Haven, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Dec. 29, 1987, Ser. No. 139,589

Int. Cl.[4] C09R *13/02*

U.S. Cl. 252—79.4 **32 Claims**

1. An etchant for copper and copper alloys which comprises an alkaline ammoniacal copper salt solution and an etchant accelerating amount of a mixture comprising an ammonium halide, a water-soluble salt containing sulfur, selenium or tellurium in the anion, and an organic thio compound containing the group



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4,784,786

GLASS CLEANING COMPOSITION CONTAINING AN EMA RESIN AND A POLY(ACRYLAMIDOMETHYLPROPANE) SULFONIC ACID TO REDUCE FRICTION AND STREAKING

James A. Smith, Chatham, Mass., and George W. Kellett, Cranford, N.J., assignors to Creative Product Resource Associates, Ltd., Clifton, N.J.

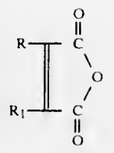
Continuation of Ser. No. 852,540, Apr. 16, 1986, Pat. No. 4,673,523. This application Apr. 8, 1987, Ser. No. 35,872

Int. Cl.⁴ C11D *3/30, 3/37, 3/44, 17/04*

U.S. Cl. 252—91 **17 Claims**

1. A glass cleaning solution comprising:

(a) an anhydride compound selected from the group consisting of about 0.03–0.25% of a co-polymer derived from (1) a maleic anhydride of the formula:



wherein R and R_1 are independently selected from the group consisting of H, (C_1-C_4)alkyl, phenyl, (C_1-C_4)alkylphenyl, phenyl(C_1-C_4)alkylene and (2) a (C_1-C_4)olefin;

(b) an amount of ammonia or an amine effective to solubilize said anhydride compound;

(c) about 0.025–0.5% of poly(2-acrylamido-2-methyl propane) sulfonic acid;

(d) an effective amount of an anionic surfactant;

(e) an effective grease-solubilizing amount of a (C_1-C_4)alkylene (C_1-C_4)alkyl ether or a (C_1-C_4)dialkylene (C_1-C_4)alkyl ether;

(f) about 5–25% of a (C_1-C_4)alkanol;

(g) the balance water.

4,784,787

METHOD AND COMPOSITION FOR BLEACHING LAUNDRY

Bernard Dubreux, Francheville Le Bas, and Francoise Chosson, Millery, both of France, assignors to Atochem, France

Filed May 12, 1987, Ser. No. 49,128

Claims priority, application France, May 15, 1986, 86 07151

Int. Cl.⁴ C11D *7/54*

U.S. Cl. 252—95 **12 Claims**

1. A method for bleaching laundry in a bath in the absence of any peroxide activator consisting essentially of introducing into said bath as the only bleaching agent a peroxidized compound and carrying out said bleaching at a pH of between 10.5 and 12.5 and at a temperature between about 30° and 60° C.; said peroxidized compound being a calcium peroxide in the hydrated or the anhydrous form and introduced so that the quantity of calcium per liter of bath is between 1×10^{-3} and 1×10^{-2} gram atom.

4,784,788

CLEANING PASTE WITH SOLUBLE ABRASIVE

Albert J. Lancz, East Brunswick, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Filed Dec. 14, 1985, Ser. No. 132,527

Int. Cl.⁴ C11D *3/04, 3/075, 3/43, 17/08*

U.S. Cl. 252—114 **14 Claims**

1. A hard surface high viscosity organic cleaning composition comprising by weight, about 65–80% of an organic liquid vehicle consisting essentially of about 15–35% of a water miscible organic solvent, about 3570% of a nonionic surfactant mixture containing an ethoxylated fatty acid as one of the surfactants, wherein the ethoxylated fatty acid constitutes about 6–38% by weight of the composition, and about 0.7–1.5% sodium hydroxide, gelled by the in situ reaction of the ethoxylated fatty acid with the sodium hydroxide to form a clear, nonflowable gelled vehicle, substantially free of water; and about 10–25% by weight of an inorganic water soluble particulate abrasive incorporated into the gelled vehicle.

4,784,789

LIQUID AQUEOUS CLEANING PREPARATIONS FOR HARD SURFACES

Peter Jeschke, Neuss; Eva Kiewert, Deusseldorf; Ludwig Schieferstein, Ratingen; Klaus Schumann, and Klaus-Dieter Wisotzki, both of Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,669

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1986, 3614336

Int. Cl.⁴ C11D *10/02, 3/37*

U.S. Cl. 252—174.23 **16 Claims**

1. In a liquid cleaning preparation for hard surfaces comprising an amphoteric polymer compound containing both anionic and cationic centers in the molecule thereof, said polymer compound having been obtained by copolymerization of a cationic vinyl monomer with an anionic vinyl polymer which in a 0.01% solution of water having a hardness of 16°d produce irreversible hydrophilization of polyvinyl chloride with increments in the wetting tension of at least 3mN/m, and an anionic, nonionic, cationic or amphoteric surfactant or mixtures thereof, said polymer compound being present in an amount of from about 0.01% to about 10% by weight, based on the weight of said preparation, the improvement comprising said polymer being present in a weight ratio of polymer to surfactant of from about 20:1 to about 1:1.

4,784,790

PREPARATIONS AND PROCESSES FOR CLEANING AND DISINFECTING ENDOSCOPES

Karlheinz Disch, Haan; Klaus Hachmann, Hilden, and Klaus Bansemir, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 17, 1987, Ser. No. 121,492

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1986, 3639322

Int. Cl.⁴ C11D *3/48*

U.S. Cl. 252—174.12 **19 Claims**

1. A process for cleaning and disinfecting a device or equipment having hard surfaces comprising the steps of

(a) contacting such hard surfaces with a cleaning solution at a temperature of from about 55° to about 65° C., maintaining such contact and such temperature for a period of time of from about 1 to about 15 minutes, wherein the cleaning solution contains

at least one low-foam nonionic surfactant,

at least one proteolytic enzyme,

at least one complexing agent,

and has a pH value of from 6 to 8;

(b) removing the hard surfaces and the cleaning solution from contact with each other;

(c) contacting the hard surfaces with a disinfectant solution at a temperature of from about 55° to about 65° C., maintaining such contact and such temperature for a period of time of from about 1 to about 15 minutes, wherein the disinfectant solution contains

at least one aldehyde selected from the group consisting of formaldehyde and aliphatic C_2-C_8 dialdehydes, and

at least one complexing agent, and has a pH value of from 6 to 8;

(d) removing the hard surfaces and the disinfectant solution from contact with each other;

(e) rinsing the hard surfaces at least twice with water having a pH between about 6 and about 8 and a water temperature of from about 55° to about 65° C. for at least the last rinse; and

(f) drying the rinsed hard surfaces with sterilized hot air at a temperature of from about 55° to about 65° C.; and wherein the water used in the cleaning solution of step (a), the disinfectant solution of step (c), and the water rinses of step (e) have a German hardness value of from about 3° to about 8° C.

4,784,791

HALOGEN-SUBSTITUTED PHENYL BENZYL ETHER DERIVATIVES

Shinichi Saito; Kazutoshi Miyazawa; Takashi Inukai; Hiromichi Inoue, and Kouji Ohno, all of Kanagawa, Japan, assignors to Chisso Corporation, Osaka, Japan

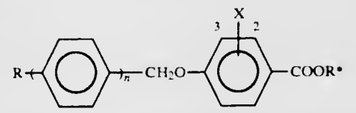
Filed Jul. 1, 1987, Ser. No. 68,332

Claims priority, application Japan, Jul. 4, 1986, 61-157317

Int. Cl.⁴ G02F *1/13;* **C09K** *19/06, 19/12;* **C07C** *69/76*

U.S. Cl. 252—299.6 **8 Claims**

1. A liquid crystal compound-represented by the general formula (I):



(I)

wherein R is a straight or branched alkyl or alkoxy group having 1 to 20 carbon atoms, R* is an optically active alkyl group having 4 to 20 carbon atoms, X is a fluorine atom or a chlorine atom, and n is 1 or 2.

4,784,792

FERROELECTRIC PYRIDINE COMPOUND AND LIQUID CRYSTAL COMPOSITION

Hiromichi Inoue; Takashi Inukai; Kouji Ohno; Kazutoshi Miyazawa, and Shinichi Saito, all of Kanagawa, Japan, assignors to Chisso Corporation, Ohsaka, Japan

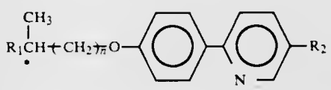
Filed Dec. 16, 1986, Ser. No. 942,626

Claims priority, application Japan, Dec. 27, 1985, 60-293934

Int. Cl.⁴ G02F *1/13;* **G09K** *19/34;* **C07D** *211/70*

U.S. Cl. 252—299.61 **8 Claims**

1. A ferroelectric pyridine compound expressed by the formula



(I)

wherein n represents an integer of 1 to 8, R_1 represents an alkyl group of 2 to 18 carbon atoms, R_2 represents an alkyl group of 1 to 18 carbon atoms and the symbol * indicates that C having the symbol attached thereon is an optically active carbon atom.

4,784,793

TERPENOID DERIVATIVES AND LIQUID CRYSTAL MATERIALS AND DEVICES CONTAINING THEM

David Coates, Bishop's Stortford; George W. Gray, Cottingham; David Lacey, Hull; Daniel J. S. Young, Doncaster; Kenneth J. Toyne, Hull, and Matthew F. Bone, Bishop's Stortford, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland and STC PLC, both of London, United Kingdom

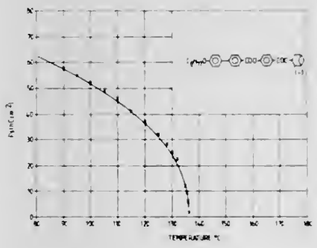
PCT No. PCT/GB86/00046, § 371 Date Nov. 26, 1986, § 102(e) Date Nov. 26, 1986, PCT Pub. No. WO86/04328, PCT Pub. Date Jul. 31, 1986

PCT Filed Jan. 24, 1986, Ser. No. 913,671

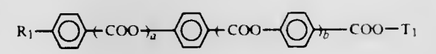
Claims priority, application United Kingdom, Jan. 26, 1985, 8501999

Int. Cl.⁴ G02F *1/13;* **C07C** *69/76, 119/10;* **C07D** *239/26;* **C09K** *19/34, 19/12, 19/20, 19/52*

U.S. Cl. 252—299.62 **16 Claims**



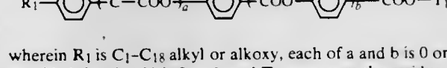
1. An ester of a terpenoid alcohol which has a formula:



(I)

wherein R_1 is C_1-C_{18} alkyl or alkoxy, each of a and b is 0 or 1 provided that (a+b) is 0 or 1, and T_1 represents the residue of a terpenoid alcohol selected from the group consisting of borneol, fenchol, isopinocampheol, nopol, perilla alcohol and dihydrocitronellol.

7. A ferroelectric smectic liquid crystal material which is a mixture of compounds, at least one of which is an ester of a terpenoid alcohol which has a formula:



wherein R_1 is C_1-C_{18} alkyl or alkoxy, each of a and b is 0 or 1 provided that (a+b) is 0 or 1, and T_1 represents the residue of a terpenoid alcohol selected from the group consisting of borneol, fenchol, isopinocampheol, nopol, perilla alcohol and dihydrocitronellol.

4,784,794

HIGH-DISPERSION SOL OR GEL OF MONOCLINIC ZIRCONIA SUPERMICROCRYSTALS AND PRODUCTION OF THE SAME

Etsuro Kato, Aichi, Japan, assignor to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Jan. 14, 1987, Ser. No. 3,279

Claims priority, application Japan, Jan. 14, 1986, 61-5899

Int. Cl.⁴ B01J *13/00*

U.S. Cl. 252—313.1 **18 Claims**

1. A high-dispersion product which comprises: a sol or gel of isolated monoclinic zirconia microcrystals dispersed in an

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aqueous solution without agglomeration at a concentration of 0.1 to 1 mol/liter, wherein said monoclinic zirconia microcrystals have uniform size, and a diameter or width smaller than 100 angstroms, and wherein said sol or gel is translucent.

4. A process for producing a high-dispersion product which is a sol or gel of monoclinic zirconia microcrystals which comprises:

adding water to hydrated salt crystal composed mainly of zirconyl chloride in an amount of 400 ml or less per 1 gram atom of zirconium so as to produce a mixture;

subjecting said mixture to hydrothermal treatment in a sealed container at more than 130° C. for more than 24 hours to produce a white pasty product;

diluting said white pasty product with water so that the zirconium concentration decreases below 1 mol/liter to produce a diluted product;

adjusting the pH of said diluted product to 3 to 7; and

concentrating said diluted product to obtain a high-dispersion product which comprises a sol or gel of isolated monoclinic zirconia microcrystals dispersed in an aqueous solution without agglomeration at a concentration of 0.1 to 1 mol/liter, wherein said monoclinic zirconia microcrystals have uniform size, and a diameter or width smaller than 100 angstroms, and wherein said sol or gel is translucent.

4,784,795

LUBRICANT COMPOSITION FOR WATER FITTINGS

Ulrich W. Fahl, Munich, Fed. Rep. of Germany, assignor to Dow Corning GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 27, 1985, Ser. No. 814,142

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447346

Int. Cl.[4] C10M *137/00, 129/34*

U.S. Cl. 252—32.5 **5 Claims**

1. A lubricant composition for water fittings consisting essentially of (a) a lubricant component having a viscosity of from 40,000 to 150,000 mm^2/sec and (b) an ion-removing amount of an additive component selected from the group consisting of complexing agents and (c) a hydrophobing agent.

4,784,796

CORROSION INHIBITORS

Duane S. Treybig, Lake Jackson, and Terry W. Glass, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 782,653, Oct. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 594,518, Mar. 29, 1984, abandoned. This application May 29, 1987, Ser. No. 56,614

Int. Cl.[4] C23F *11/14;* **C09K** *7/00;* **C25F** *11/04;* **C04B** *9/02*

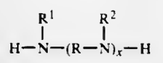
U.S. Cl. 252—392 **8 Claims**

1. A new composition of matter which is the reaction product resulting from reacting at a temperature of from about 25° C. to about 250° C. for a time sufficient to complete the reaction as determined by halide or residual acid number titrations,

(I) the product resulting from reacting, in the presence or absence of a suitable solvent,

(A) at least one aliphatic α,β-monoethylenically unsaturated aldehyde having from about 3 to about 6 carbon atoms; and

(B) at least one organic polyamine represented by the formula



wherein R is a divalent saturated C_2 to C_4 aliphatic hydrocarbon group; each R^1 and R^2 is independently hydrogen or a saturated alkyl amino or an alkyloxy group containing from 2 to about 4 carbon atoms or when two adjacent R^2 groups are taken together, they form a bridging alkylene radical containing 2 carbon atoms such that the R group containing 2 carbon atoms and two adjacent R^2 groups and two nitrogen atoms form a heterocyclic ring containing 4 carbon atoms and 2 nitrogen atoms; x has a value from 1 to about 8 and

wherein components (A) and (B) are employed in a mole ratio of (A) to (B) of from about 1:1 to about 1:6; and

(II)

(A) at least one saturated or unsaturated, cyclic or acyclic aliphatic mono- or polycarboxylic acid having from about 2 to about 50 carbon atoms; or

(B) at least one saturated or unsaturated, cyclic or acyclic aliphatic alkyl monohalide or alkyl polyhalide having from about 2 to about 50 carbon atoms; or

(C) a combination of (A) and (B);

wherein components (I) and (II) are employed in quantities which provide from about 0.4 to about 1 equivalent of carboxyl and/or halide groups from component (II) for each theoretically active amino hydrogen atom contained in component (I).

4,784,797

PROCESS FOR INHIBITING CORROSION OF FERROUS METALS

Duane S. Treybig, Lake Jackson, and Terry W. Glass, Clute, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 782,653, Oct. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 594,518, Mar. 29, 1984, abandoned. This application May 29, 1987, Ser. No. 56,615

Int. Cl.[4] C23F *11/04, 11/14;* **C09K** *7/00;* **C04B** *9/02*

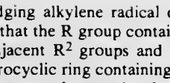
U.S. Cl. 252—392 **35 Claims**

1. A process for reducing or preventing the corrosion of ferrous alloys in contact with corrosive liquids or gases at temperatures of at least 350° F. which process comprises contacting the surface of said ferrous metal alloy with a corrosive inhibiting amount of a corrosion inhibitor composition comprising the reaction product of

(I) the reaction product of

(A) at least one aliphatic α,β-monoethylenically unsaturated aldehyde having from about 3 to about 6 carbon atoms: and

(B) at least one organic polyamine represented by the formula



wherein R is a divalent saturated C_2 to C_4 aliphatic hydrocarbon group: each R^1 and R^2 is independently hydrogen or a saturated alkyl amino or alkyloxy group containing from 2 to about 4 carbon atoms or when two adjacent R^2 groups are taken together, they form a bridging alkylene radical containing 2 carbon atoms such that the R group containing 2 carbon atoms and two adjacent R^2 groups and two nitrogen atoms form a heterocyclic ring containing 4 carbon atoms and 2 nitrogen atoms: x has a value from 1 to about 8: and components (A) and (B) are employed in a mole ratio of (A) to (B) of from about 1:1 to about 1:6: and

(II)

(A) at least one saturated or unsaturated, cyclic or acyclic aliphatic mono- or polycarboxylic acid having from about 2 to about 50 carbon atoms; or

(B) at least one saturated or unsaturated, cyclic or acyclic aliphatic alkyl monohalide or alkyl polyhalide having from about 2 to about 50 carbon atoms: or

(C) a combination of (II-A) and (II-B);

wherein components (I) and (II) are employed in quantities which provide from about 0.4 to about 1 equivalent of carboxyl or halide groups from component (II) for each theoretically active amino hydrogen atom contained in component (I).

4,784,798

DEMULSIFYING CLEANING PREPARATION HAVING A PROLONGED SURFACE-WETTING EFFECT

Juergen Geke, and Friedbert Zetzsche, both of Duesseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 885,980, Jul. 15, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 133,182

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530623

Int. Cl.[4] C11D *7/32*

U.S. Cl. 252—544 **13 Claims**

1. A demulsifying cleaning preparation free of organic solvent and having a prolonged surface-wetting effect consisting essentially of:

(a) a builder/complexing agent in an amount of from about 0.5 to about 10% by weight,

(b) at least one alkanolamine in an amount of from about 20 to about 60% by weight,

(c) at least one nonionic surfactant in a quantity of from 1 to 15% by weight, said nonionic surfactant being selected from the group consisting of the condensation products of n-octanol with 4 moles of ethylene oxide, i-octanol with 4 moles of ethylene oxide, n-octanol with 2 moles of propylene oxide and 5 to 6 moles of ethylene oxide and i-octanol with 2 moles of propylene oxide and 5 to 6 moles of ethylene oxide, and

(d) water in an amount which, with components (a), (b) and (c), adds up to 100% by weight, all weights being based on the weight of said cleaning preparation, and as optional constituents;

(e) a solution promoter in an amount of from about 1 to about 10% by weight,

(f) a corrosion inhibitor for lightweight metals in an amount from about 0.15 to about 0.25% by weight said corrosion inhibitor comprising phosphoric acid,

(g) a corrosion inhibitor for nonferrous metals in an amount of from about 0.2 to about 0.4% by weight said corrosion inhibitor coprising tolyl triazole, and

(h) a perfume or dye in an amount of from about 0 to about 1% by weight.

4,784,799

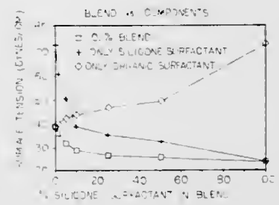
SYNERGISTIC SURFACTANT COMPOSITIONS

Lenin J. Petroff, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 25, 1988, Ser. No. 149,241

Int. Cl.[4] C11D *1/92, 1/94*

U.S. Cl. 252—545 **9 Claims**



5. The method of reducing the surface tension of an aqueous solution comprising adding to the aqueous solution an effective amount of a synergistic surfactant composition comprising an organic anionic surfactant and at least one organic zwitterionic functional silicone surfactant represented by the formula:

$$Me_3SiO[SiMe_2O]_x[SiMeR^1O]_ySiMe_3$$

and wherein:

Me = methyl;

$R^1 = CH_2CH_2CH_2N(R^2)_2(CH_2)_zSO_3^-$;

R^2 = methyl or ethyl;

x = 0–3;

y = 1–2; and

z = 3–4

whereby the surface tension of the aqueous solution is lower than if either of the anionic surfactant and the zwitterionic surfactant were present in the aqueous solution individually.

4,784,800

DETERGENT COMPOSITIONS

Francis J. Leng; Jacob Lucassen; David A. Reed, all of Merseyside; Philip J. Sams, Cheshire, and Peter Winterbotham, Merseyside, all of, assignors to Lever Brothers Company, New York, N.Y.

Filed Jun. 17, 1986, Ser. No. 875,428

Claims priority, application United Kingdom, Jun. 21, 1985, 8515721

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[4] C11D *1/29, 1/37, 3/43, 17/08*

U.S. Cl. 252—548 **22 Claims**

1. A homogeneous foaming detergent composition in liquid or gel form, consisting essentially of

(a) from 64.5% to 95% by weight of an active detergent system comprising

[i] a water-soluble salt of a C_3–C_{12} dialkyl ester of sulphosucciinic acid in which the alkyl groups may be the same or different,

[ii] a C_{10}–C_{18} alkyl ether sulphate and/or an ethoxylated nonionic detergent, the ratio of [i] to [ii] being from 20:1 to 1:4, and

[iii] optionally a C_{10}–C_{18} alkyl di(C_2–C_3) alkanolamide, in an amount not exceeding 15% by weight of the whole composition,

(b) from 0 to 12% by weight of urea,

(c) from 2 to 40% by weight of a solvent system consisting essentially of water optionally together with a C_2–C_3 mono- or polyhydric alcohol,

the molar proportion of ammonium ions to total cations being sufficient to neutralise at least 8 mole % of the dialkyl sulphosuccinate (i) as well as 100 mole % of any anionic detergent-active material other than dialkyl sulphosuccinate present, and constituting at least 40 mole % of the total cations in the presence of component (iii) and at least 50 mole % of the total cations in the absence of component (iii).

4,784,801

HAIR TREATMENT PREPARATIONS

Horst Hoeffkes, Duesseldorf-Hellerhof; Fritz Lange, Essen, and Karl Giede, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 2, 1987, Ser. No. 69,790

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622439

Int. Cl.[4] C11D *1/14, 1/12*

U.S. Cl. 252—554 **9 Claims**

1. In an aqueous hair treatment composition containing an anionic surfactant, the improvement wherein the anionic surfactant is an alkylether sulfonate of the formula

$$R^1—O—(C_nH_{2n}O)_x—(CH_2)_y—SO_3^{(-)}M^{(+)} \quad (I)$$

in which R^1 is a C_8–C_{18} alkyl group, n = 2 or 3, x = 0 to 20, y = 1 to 3 and $M^{(+)}$ is an alkali metal ion.

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4,784,802

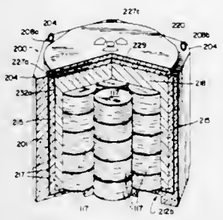
NUCLEAR WASTE DISPOSAL SITE

Charles W. Mallory, Severna Park, Md.; Ralph E. Watts, Library, Pa.; William S. Sanner, Jr., Murrysville, Pa.; Joseph B. Paladino, Pittsburgh, Pa.; Arthur W. Lilley, Finleyville, Pa.; Steven J. Winston, New Stanton, Pa.; Billy C. Stricklin, Oak Ridge, Tenn., and John E. Razor, Morehead, Ky., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 627,977, Jul. 5, 1984, abandoned. This application Aug. 20, 1986, Ser. No. 898,840

Int. Cl.[4] B65G *5/00;* **G21F** *9/24, 9/36*

U.S. Cl. 252—633 **12 Claims**



1. A disposal site for the disposal of toxic or radioactive waste, comprising:

(a) a trench in the earth having a substantially flat bottom lined with a layer of solid, fluent, coarse, granular material having a high hydraulic conductivity for obstructing any capillary-type flow of ground water to the interior of the trench;

(b) a non-rigid, radiation-blocking cap formed from a first layer of alluvium, a secod layer of solid, fluent, coarse, granular material having a high hydraulic conductivity for blocking any capillary-type flow of water between the layer of alluvium and the rest of the cap, a layer of water-shedding silt for directing surface water away from the trench, and a layer of rip-rap over the silt layer for protecting the silt layer from erosion and for providing a radiation barrier;

(c) a solidly-packed array of abutting modules of uniform size and shape disposed in the trench and under the cap for both encapsulating said wastes from water and for structurally supporting said cap, wherein each module in the array is slidably movable in the vertical direction in order to allow the array of modules to flexibly conform to variations in the shape of the flat trench bottom caused by seismic disturbances, and to facilitate the recoverability of the modules;

(d) a layer of solid, fluent, coarse, granular materials having a high hydraulic conductivity in the space between the sides of the modules and the walls of the trench for obstructing any capillary-type flow of ground water to the interior of the trench; and

(e) a drain, and wherein said layer of silt is sloped to direct surface water flowing over the cap into the drain.

11. A process for burying toxic or radioactive wastes contained within a plurality of uniformly shaped, solidly packed modules comprising the steps of:

(a) digging a substantially flat bottomed trench in the earth;

(b) lining the bottom of said trench with a layer of solid, fluent, coarse, granular material having a high hydraulic conductivity for obstructing any capillary-type flow of ground water to the interior of the trench;

(c) disposing a solidy-packed array of abutting modules of uniform size and shape encapsulating said wastes from water in the trench wherein each module in the array is slidably movable in the vertical direction in order to allow the array of modules to flexibly conform to variations in the shape of the flat trench bottom caused by seismic disturbances and to facilitate the recoverability of the modules;

(d) placing a layer of solid, fluent, coarse, granular material having a high hydraulic conductivity in the space between the sides of the modules and the walls of the trench for obstructing any capillary-type flow of ground water to the interior of the trench;

(e) locating a drain to receive surface water directed by said layer of silt which is sloped to cause said surface water to flow over the cap into the drain; and

(f) placing a non-rigid, radiation-blocking cap formed from a first layer of alluvium, a second layer of solid, fluent, coarse, granular material having a high hydraulic conductivity for blocking any capillary-type flow of water between the layer of alluvium and the rest of the cap, a layer of water-shedding silt for directing surface water away from the trench, and a layer of rip-rap over the silt layer for protecting the silt layer from erosion and for providing a radiation barrier, said cap structurally supported by said solidly-packed array of abutting modules.

4,784,803

CHEMILUMINESCENT COMPOSITION, AND A REACTIVE COMPONENT SUITABLE FOR SUCH A COMPOSITION

Giampiero Borsotti, Novara, Italy, assignor to Farmitalia Carlo Erba S.p.A., Milan, Italy

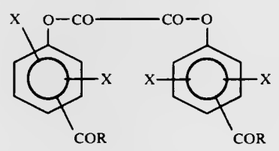
Filed Jun. 22, 1987, Ser. No. 64,708

Claims priority, application Italy, Jun. 30, 1986, 20971 A/86

Int. Cl.[4] C09K *11/00;* **C07C** *69/36*

U.S. Cl. 252—700 **9 Claims**

1. A chemiluminescent composition formed from at least two separate solutions in which those components which react with each other are kept separated, the components being chosen from the group consisting of at least one oxalate, at least one fluorescent substance, hydrogen peroxide and at least one catalyst chosen from the group consisting of alkaline salts of long-chain carboxylic acids and sodium and potassium salicylates, characterized in that said oxalate is a bis(dihalo-acylphenyl) oxalate of the formula:



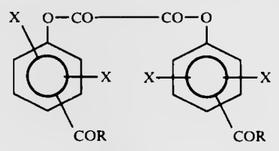
(I)

in which:

R is an alkyl containing from 3 to 11 carbon atoms,

X is a halogen chosen from the group consisting of F, Cl or Br in meta-meta positions with respect to the acyl group, and the —COR group is in the ortho or para position with respect to the phenolic hydroxyl, the hydrogen peroxide being present in the proportion of between 2 and 10 moles per mol of oxalate.

9. A chemiluminescent composition comprising, as an active ingredient, a bis(dihaloacylphenyl)oxalate of the formula:



(I)

in which:

R is an alkyl containing from 3 to 11 carbon atoms,

X is a halogen chosen from the group consisting of F, Cl or Br in meta-meta positions with respect to the acyl group,

and the —COR group is in the ortho or para position with respect to the phenolic hydroxyl.

4,784,804

N,N'-BIS(4-AZIDOBENZOYL)CYSTINE

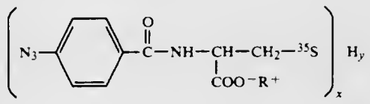
Ross S. Basch, New York, N.Y., and Michiel E. Ultee, Belle Mead, N.J., assignors to New York University, New York, N.Y.

Continuation-in-part of Ser. No. 760,281, Jul. 29, 1985, abandoned. This application Aug. 4, 1986, Ser. No. 894,469

Int. Cl.[4] C07C *117/08*

U.S. Cl. 260—349 **3 Claims**

1. A compound of the formula:



wherein x is 1 or 2; y is 1 when x is 1 and y is zero when x is 2; R is H^+ or monovalent cation which appended to the COO^- group forms a water-soluble salt; and ^{35}S signifies the radioactive sulfur isotope sulfur —35.

4,784,805

PROCESS FOR THE PREPARATION OF ANTHRAQUINOID INTERMEDIATES AND VAT DYES

Rudolf Blattner, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geiby Corporation, Ardsley, N.Y.

Filed May 7, 1987, Ser. No. 46,500

Claims priority, application Switzerland, May 15, 1986, 1972/86

Int. Cl.[4] C07C *50/22, 50/18, 103/75;* **C09B** *3/22*

U.S. Cl. 260—352 **15 Claims**

1. A process for the preparation of anthraquinoid intermediates and vat dyes obtained from unsubstituted or substituted benzanthrone, pyrazolanthrone or anthraquinone derivatives, in the presence of an alkali metal hydroxide and an aliphatic alcohol with a boiling point below 120° C., at elevated temperature, to effect dimerisiation or cyclisation, which process comprises carrying out the reaction with a weight ratio of alkali metal hydroxide to benzanthrone, pyrazolanthrone or anthraquinone derivative of less than 1:1 in a machine with kneading action but without grinding action.

4,784,806

METHOD FOR PRODUCING ANTHRAQUINONE COMPOUNDS

Makoto Hattori, and Satoshi Kajitani, both of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

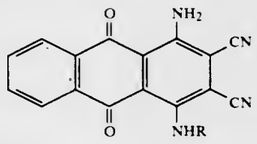
Filed Dec. 5, 1986, Ser. No. 938,250

Claims priority, application Japan, Dec. 10, 1985, 60-278588

Int. Cl.[4] C07C *97/24*

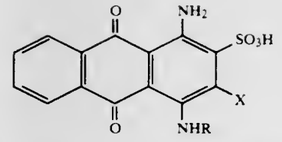
U.S. Cl. 260—378 **9 Claims**

1. A method for producing an anthraquinone compound having the formula (III)



(III)

where R is a hydrogen atom, or an unsubstituted or substituted alkyl or cycloalkyl group, which comprises reacting a compound having the formula (I), or a salt thereof



(1)

wherein R is defined as above and X is an hydrogen atom or a sulfonic acid group, in an aqueous medium with a cyanogenating agent in the presence of a compound of the formula (II),

$$HO—A\text{-}O)_nR' \qquad (II)$$

wherein A is a bivalent aliphatic saturated hydrocarbon residual group having 2 to 4 carbon atoms, R' is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and n is a number of from 1 to 100, the compound of formula (II) being present in an amount of from 2 to 90% by weight based on the total weight of the compound of the formula (II) and the aqueous medium, containing no quaternary ammonium or quaternary phosphonium compound.

4,784,807

PROCESS FOR SEPARATING TRIGLYLCERIDES BY DEGREE OF UNSATURATION

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 6, 1987, Ser. No. 70,266

Int. Cl.[4] C11B *3/00*

U.S. Cl. 260—405.5 **17 Claims**

1. A process for separating triglycerides having the higher degree of unsaturation from a mixture of triglycerides having varying lower degrees of unsaturations, said process comprising contacting said mixture at adsorption conditions with an adsorbent comprising an omega-type zeolite exchanged with Cu, H or K at exchangeable sites thereby selectively absorbing said triglycerides having the higher degree of unsaturation thereon and desorbing at desorption conditions said adsorbed triglycerides with a desorbent selected from the group consisting of toluene, ketones and mixtures of ketones with paraffin hydrocarbons.

4,784,808

DIETHYLAMMONIUM-2-(2,6-DICHLOROANILINO)-PHENYLACETATE

Theodor Eckert, Muoster, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 885,370, Jul. 14, 1986, abandoned, which is a division of Ser. No. 765,416, Aug. 14, 1985, Pat. No. 4,619,926, which is a division of Ser. No. 517,606, Jul. 27, 1983, Pat. No. 4,551,475, which is a division of Ser. No. 236,097, Feb. 20, 1981, Pat. No. 4,407,824. This application Feb. 18, 1988, Ser. No. 156,770

Int. Cl.[4] C07C *53/23*

U.S. Cl. 260—501.16 **1 Claim**

1. A compound being diethylammonium-2-(2,6-dichloroanilino)phenylacetate.

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4,784,809
PROCESS FOR PREPARING PERFLUOROALKYL-ALKYL SULFONIC ACID COMPOUNDS

Richard H. Goldbaum, and William R. Remington, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 27, 1986, Ser. No. 879,464
Int. Cl.[4] C07C *143/02*
U.S. Cl. 260—513 R **50 Claims**

1. A process for the manufacture of perfluoroalkyl-alkyl sulfonic acid compounds, having the formula:

$$C_nF_{2n+1}(CH_2)_bSO_3M$$

wherein
n=1 to 20,
b=2 to 20, and
M=H or NH_4,
comprising oxidizing the corresponding perfluoroalkyl-alkyl thiocyanate having the formula:

$$C_nF_{2n+1}(CH_2)_bSCN$$

wherein
n=1 to 20, and
b=2 to 20,
with a peroxycarboxylic acid having the following formula:

$$R(CO_3H)_n$$

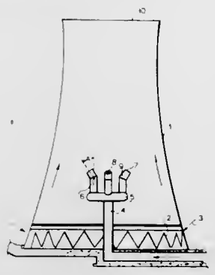
wherein
R=an alkyl, aralkyl, cycloalkyl, aryl, or heterocyclic group, and
n=1 or 2,
at effective process conditions to form a reaction mass containing the perfluoroalkyl-alkyl sulfonic acid compounds, wherein cooling is provided during the oxidizing step.

4,784,810
SMOKE GAS EXHAUST BY WAY OF A COOLING TOWER

Sigurd Jorzyk, Saarbrücken; Gerhard Scholl, Spiesen-Elversberg; Heinz Hölter; Heinrich Igelbüscher, both of Gladbeck; Heinrich Gresch, Dortmund-Wickede, and Heribert Dewert, Gladbeck, all of Fed. Rep. of Germany, assignors to Saarbergwerke Aktiengesellschaft, Saarbrücken, Fed. Rep. of Germany

PCT No. PCT/EP86/00111, § 371 Date Nov. 13, 1986, § 102(e) Date Nov. 13, 1986, PCT Pub. No. WO86/05577, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 4, 1986, Ser. No. 937,204
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509542; Mar. 16, 1985, 3509543
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—17 **5 Claims**

1. A cooling tower for condensor water from a steam power plant comprising:
a cooling tower centered on an upright axis;
a heat exchanger disposed in a lower portion of said tower and extending over substantially an entire cross-section thereof and traversed by condensor water in counterflow to cooling air rising through said heat exchanger;
a smoke-gas feed connected to said tower and formed with at least one gas outlet pipe disposed above said heat exchanger for introducing cleaned, preferably wet-cleaned smoke gas into the flow of rising air through a free end of said gas outlet pipe, said free end being angled upwardly and said gas outlet pipe being rotatable about a longitudinal axis thereof; and

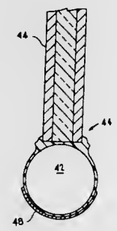


a rotor disposed in said free end, said rotor being provided with a variable-speed drive enabling freewheeling of said rotor when said rotor is not driven.

4,784,811
METHOD OF CONSTRUCTING IMPROVED PRESSURE-SENSITIVE OPTRODE

Tomas B. Hirschfeld, Livermore, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 675,633, Jul. 15, 1984, Pat. No. 4,599,901, and a continuation-in-part of Ser. No. 430,578, Sep. 30, 1982, Pat. No. 4,509,370. This application Mar. 3, 1986, Ser. No. 835,357
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.4 **10 Claims**

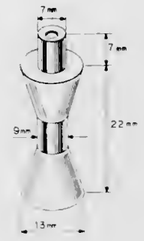


3. A method of constructing a pressure sensitive optrode comprising:
providing a fiber optic having a first end, a second end, and a diameter;
dissolving a plastic in a volatile solvent to form a plastic-solvent mixture, the volatile solvent having a boiling point;
placing a droplet of the plastic-solvent mixture on the second end of the fiber optic;
forming a bubble in the droplet by directing light into the first end of the fiber optic so that it emanates from the second end of the fiber optic and heats the volatile solvent in the droplet beyond its boiling point;
drying the bubble; and
coating the bubble with a fluorescent composition.

4,784,812
CERAMICS BINDER AND PRODUCTION OF CERAMICS ARTICLES

Katsuyoshi Saitoh, Kyoto, and Tsunenori Sakai, Yamaguchi, both of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,936
Claims priority, application Japan, Jun. 27, 1985, 60-141302
Int. Cl.[4] C04B *35/64*; C08J *3/02*
U.S. Cl. 264—63 **8 Claims**



1. A ceramics binder which comprises 0.5–50 parts by weight of at least one organic binding agent selected from the group consisting of a thermoplastic resin, a water-soluble binder and an organic solvent-soluble binder and 0.1–15 parts by weight of least one binding auxiliary selected from the group consisting of adamantane and trimethylenenorbornane.

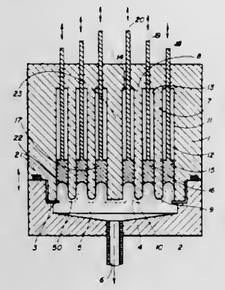
3. A method for making a ceramic article which comprises the following steps: mixing 0.6–65 parts by weight of a ceramics binder comprising 9.5–50 parts by weight of at least one organic binding agent selected from the group consisting of a thermoplastic resin, a water-soluble binder and an organic solvent-soluble binder and 9.1–15 parts by weight of at least one binding auxiliary selected from the group consisting of adamantane and trimethylenenorbornane with 100 parts by weight of a ceramics raw material powder at 80°–150° C., molding the resulting mixture by injection molding or extrusion molding, and sintering the molded article.

4,784,813
PROCESS FOR PRODUCING A FILTER WITH MULTIPLE FOLDS

Georg Schlor, Lübeck, and Gerd Pantaleon-Stemberg, Mölln, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 22, 1987, Ser. No. 53,378
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1986, 3622356
Int. Cl.[4] D21J *3/12*
U.S. Cl. 264—86 **5 Claims**

1. A process for producing a single continuous porous filter having multiple folds from an aqueous filter mixture, comprising the steps of:
arranging a porous form having fold section contours corresponding to folds of a filter, in a container having a plurality of separate loading chambers provided along the length of the form, the loading chambers being substantially coincident with the contours of the form and having a plurality of plunger elements, each of said plurality of plunger elements being disposed in a respective one of said plurality of loading chambers;
depositing the aqueous fiber mixture in the separate loading chambers; moving said plunger element and forcing said aqueous fiber solution toward said form with fibers being deposited on said form to provide a first fiber layer on adjacent fold sections as the aqueous portion of the mixture passes through said porous form; and, depositing additional aqueous fiber solution in selective ones of said plurality of loading chambers and selectively moving ones of said plurality of plunger elements to build up adjacent

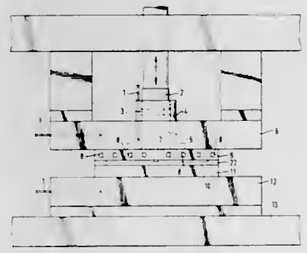


fold sections by depositing successive layers of fibers on said first fiber layer, said adjacent fold sections becoming connected together.

4,784,814
PRESSURE REACTION INJECTION MOLDING PROCESS FOR MAKING MOLDED BODIES OF THERMOSETS OPTIONALLY CONTAINING FILLER AND/OR REINFORCING MATERIAL

Hermann Diethelm, Giffers, and Wolfgang Dresen, Rüfenacht, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 3, 1986, Ser. No. 881,987
Claims priority, application Switzerland, Jul. 11, 1985, 3002/85
Int. Cl.[4] B29C *45/73*
U.S. Cl. 264—102 **14 Claims**



1. In a pressure reaction injection molding process for manufacturing a molded body of thermoset material by introducing into a mold a reactive mixture of thermosetting pre-polymer material, hardening agent and from 0% by weight to an effective property enhancing amount of filler, heating the material in the mold to hardening temperature, and adding fresh material to the mass during the hardening phase thereof,
the improvement comprising carrying out the aforesaid steps in a mold consisting essentially of an upper half and a lower half and an inlet opening downwardly through the upper half into the and, during the hardening phase, while introducing said fresh material under pressure into the mold through said inlet, maintaining the temperature of the upper half substantially below the hardening temperature of the reactive mixture and maintaining the temperature of the lower half at least at such hardening temperature, thereby compensating practically completely for any loss of volume in the molded body caused by shrinkage thereof during the hardening phase.

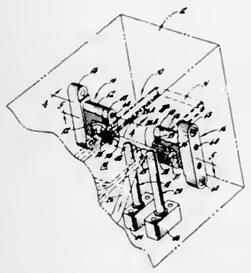
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4,784,815

EDGE-LAMINATING APPARATUS AND PROCESS

Peter F. Cloeren, and Charles H. Wernery, Jr., both of Orange, Tex., assignors to P.C.E. Corp., Orange, Tex.

Filed Jun. 5, 1987, Ser. No. 59,101
Int. Cl.[4] B29C *47/70*
U.S. Cl. 264—171 29 Claims



1. An edge-laminating apparatus comprising a first flow passage and an edge-laminating flow channel that converge; wherein said first flow passage comprises means disposed upstream of the convergence, for increasingly laterally displacing an edge of a stream flowing through said first flow passage, and for establishing laminar flow of the width-reduced stream prior to said convergence; wherein said edge-laminating flow channel is defined in part by an edge-lamination assembly, said means disposed upstream being a wall provided by said edge-lamination assembly; and wherein said edge-laminating flow channel is disposed at said convergence, relative to said first flow passage, such that an edge-laminating stream is driven by flow pressure into said edge of said width-reduced stream.

17. A process for forming an edge-laminated stream, said process comprising transversely spreading an edge-laminating stream to a width equal to a thickness of a second stream; and driving by flow pressure, the transversely-spread stream into a second stream edge of said thickness, thereby laterally displacing the entire second stream edge and reducing the second stream width.

4,784,816

METHOD FOR CONTINUOUS MANUFACTURE OF INORGANICALLY BONDED MATERIALS, ESPECIALLY MATERIAL SLABS

Heinz Sattler, Braunschweig, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft Zur Forderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

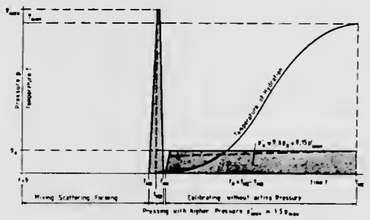
Continuation of Ser. No. 763,444, Aug. 7, 1985, abandoned. This application Sep. 16, 1987, Ser. No. 97,427
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429790; Nov. 15, 1984, 3441839
Int. Cl.[4] B28B *3/20*
U.S. Cl. 264—210.2 10 Claims

1. A method for continuous manufacture of slabs of material based on inorganic binders which cure by hydration, comprising the following steps:

forming an aqueous mixture including at least one inorganic binder which cures by hydrate formation and at least one reinforcing agent, said binder being selected from the group consisting of plaster and cement; said mixture having a pourable and spreadable consistency;

extruding said mixture continuously in the form of a slab;

compressing said extruded slab in a compression device, before hydration of said inorganic binder begins to occur, by application of pressure which is sufficiently high that the thickness of said slab after compression is less than the thickness specified for the finished extruded slab, and the density of said slab after compression exceeds the density specified for the finished extruded slab, the degree of compression being sufficiently large that after removal of the compressing pressure, restoring forces in the compressed extruded slab are sufficient to increase the thickness of the slab to such a value, greater than the final thickness specified for the slab, that the slab is calibratable to its specified final thickness and density in a calibration device which is capable of passively resisting residual restoring forces in the slab without active application of pressure;



removing the compressing pressure after hydration of said inorganic binder has begun and before hydration is complete; and

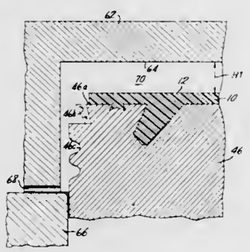
calibrating said extruded slab to a specified final thickness and density after removing the compressing pressure, by keeping said slab at the thickness specified for the finished slab until hydration is complete, in a calibration device which passively resists residual restoring forces in the slab without active application of pressure.

4,784,817

METHOD OF MAKING A CONTAINER CLOSURE

Edward J. Towns, Morristown; Edward M. Brown, Livingston, both of N.J., and William M. Lester, Delray Beach, Fla., assignors to TBL Development Corporation, Livingston, N.J.

Filed Sep. 7, 1984, Ser. No. 648,059
Int. Cl.[4] B29C *45/16;* B65D *41/04*
U.S. Cl. 264—219 15 Claims



1. A method for making a container closure having a closure member and a liner therein comprising the steps of:

(a) configuring a generally cylindrical forming tool core and a first forming tool jacket to define a first cavity for the making of a liner of first molding material and of preselected outline, wherein said core is shaped with a recess extending from a surface of said core radially interiorly thereof to effect shrinking of said first molding material radially interiorly against core surface bounding said recess, thereby to preclude second molding material used in closure member forming from egress into the interstice between such liner and core and to effect securement of a formed such liner with said core in the course of forming a closure member on a formed such liner;

(b) placing said core in said first forming tool jacket and introducing first molding material into said first cavity, thereby to form a liner on said core;

(c) configuring a second forming tool jacket to define, with said core with formed liner thereon, a second cavity for the making of a closure member of preselected outline;

(d) placing said core with formed liner thereon in said second forming tool jacket and introducing second molding material into said second cavity, thereby to form such closure member upon said formed liner to provide a closure; and

(e) removing said core from said second forming tool jacket and removing said closure from said second forming tool jacket.

4,784,818

METHOD FOR MOLDING SUPERPLASTIC CERAMIC

Fumihiro Wakai; Shuzo Kanzaki, and Shuji Sakaguchi, all of Nagoya, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,568
Claims priority, application Japan, Jun. 14, 1985, 60-130478
Int. Cl.[4] C04B *35/48*
U.S. Cl. 264—291 6 Claims

1. A method for the production of a shaped ceramic article, comprising:

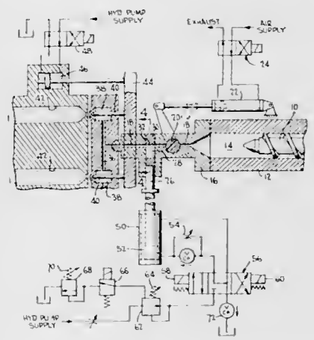
subjecting a preliminarily sintered shaped article of a zirconia-toughened ceramic, which exhibits an elongation of not less than 100%, as determined by the uniaxial tensile test, and which contains not less than 20% by volume of zirconia grains, to a stretching stress at a strain rate of not more than 10^{-2} sec.$^{-1}$ over the temperature range of 1200° to 1600° C., thereby superplastically deforming the zirconia-toughened ceramic and obtaining a shaped article of improved surface roughness and dimensional accuracy.

4,784,819

METHOD OF INJECTION MOLDING OF PLASTIC PARTS UTILIZING AN ACCUMLATOR CHAMBER AND VALVE CHAMBER BETWEEN THE PLASTICIZER AND MOLD

Robert Spurr, West Hartford, Conn., assignor to Fedders Machine & Tool Co., Inc., Londonderry, N.H.

Continuation of Ser. No. 360,048, Mar. 19, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 620,382
Int. Cl.[4] B29G *45/54*
U.S. Cl. 264—328.19 3 Claims



1. A continuous method of injection molding of plastic parts in a mold which includes a cavity for molding said plastic parts and means for closing said mold comprising the steps of

(1) plasticizing moldable plastic in plastic injection means including a barrel and an injection screw;

(2) charging the plasticized plastic from said injection means into passage means connecting said injection means with the mold cavity and then into said mold cavity, said passage means including an operable and closable shut-off valve adjacent said barrel of said injection means wherein said shut-off valve is in an open position, accumulator means spaced from said shut-off valve toward said mold cavity including an accumulator chamber and control means for controlling the amount and pressure of plastic in said accumulator chamber;

(3) purging said accumulator chamber completely of plastic simultaneously with the charging of plastic to said mold cavity and thereafter during said charging allowing said accumulator chamber to refill whereby said accumulator chamber is completely purged during each cycle;

(4) closing said shut-off valve in said passage means adjacent said barrel of said injection means, and while maintaining plastic pressure on said mold cavity through said accumulator chamber and control means, plasticizing a second charge of plastic for injection into said mold cavity;

(5) releasing the pressure on said mold cavity;

(6) removing plastic parts from said mold, and

(7) repeating said steps (2) through (6).

4,784,820

PREPARATION OF SOLUTION OF HIGH MOLECULAR WEIGHT POLYMERS

Sheldon Kavesh, Whippany, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 11, 1986, Ser. No. 895,396
Int. Cl.[4] B29C *47/10, 47/36*
U.S. Cl. 264—349 9 Claims

1. A method to prepare homogeneous solutions for extrusion of high molecular weight polymer comprising

forming a slurry of particles of the high molecular weight polymer in a solvent for the polymer, then

transferring said slurry to a positive displacement pump, then

pumping said slurry with said positive displacement pump under sufficient pressure to insure positive conveyance to a screw extruder, then

maintaining said slurry in said screw extruder for sufficient residence time and at a sufficient temperature so that a homogeneous solution of the polymer is formed, then

conveying said solution with a metering pump to an extruding device.

4,784,821

METHOD FOR MANUFACTURING A BUILDING BLOCK IMITATING A PILE OF DRY STONES

Dory Léopold, 7, rue Parc An Ty - Graces, 22200 Guincamp, France

Filed Jun. 24, 1987, Ser. No. 65,924
Claims priority, application France, Jun. 30, 1986, 86 09577
Int. Cl.[4] B28B *11/22;* B29C *43/20;* B32B *31/20*
U.S. Cl. 264—510 6 Claims

1. A method of manufacturing building block imitating a pile of dry stones, the block having a shape and including an outside face which is lined with visible juxtaposed stones held in place by cement, the method comprising the following stages:

(a) the stones are placed side-by-side on a bottom of a mold whose inside shape corresponds to the shape of the block, the bottom being constituted by a grating;

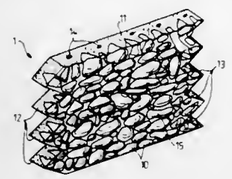
(b) the mold is filled with fluid cement;

(c) the cement is compressed in order to force it to be uniformly distributed within the mold and to creep between the stones;

(d) while the cement is kept under pressure, water is pro-

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jected through the bottom grating against the outside face of the block so as to remove any cement to be found thereon;



(e) pressure is removed from the cement and it is allowed to set; and

(f) the block is extracted from the mold.

4,784,822

CLARITY OF LOW DENSITY POLYETHYLENE COMPOSITIONS CONTAINING ANTI-BLOCK AGENTS BY ADDITION OF POLYETHYLENE GLYCOL (II)

Frank T. Kitchel, Hanover Park; R. Sven Solvik, Barrington, and Michael L. Opacich, Hoffman Estates, all of Ill., assignors to Enron Chemical Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 758,392, Jul. 24, 1985, Pat. No. 4,629,749. This application Dec. 10, 1986, Ser. No. 940,512

Int. Cl.[4] B29C *47/36*

U.S. Cl. 264—564 **5 Claims**

1. In a method for forming polyethylene films which comprises incorporating a silica or diatomaceous earth anti-blocking agent into polyethylene resin and then forming a film from this blend, the improvement which comprises treating the anti-blocking agent with polyethylene glycol prior to addition of the anti-blocking agent to the polyethylene resin such that at least 10 parts per million of polyethylene glycol is present in the final polyethylene blend whereby the see-through clarity of the resultant film is enhanced.

4,784,823

CORROSION PROTECTION

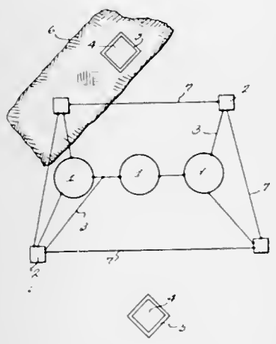
Werner Holtmann, Enger; Hartmut Kroll, Hanau; Gunther Luthardt, Rodenbach, and Volker Portscher, Haibach, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 2, 1982, Ser. No. 344,966

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103558

Int. Cl.[4] G21F *1/00*

U.S. Cl. 376—272 **28 Claims**



1. An apparatus for the protection against corrosion of a container means made of metal for the long time storage of radioactive material in a suitable geological formation comprising (1) said container means, (2) sacrificial anode means made of metal conductively connected thereto in said geological formation, and (3) arranged spatially near the container and the sacrifical anode means a material supply which is made of a material having a nobler potential than that of the container means.

4,784,824

EMERGENCY COOLING DEVICE FOR A PRESSURIZED WATER NUCLEAR REACTOR

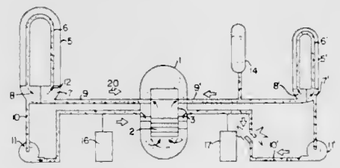
Jean-Luc Gandrille, Rueil Malmaison, and Nicolas Bonhomme, Pontoise, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed Apr. 13, 1982, Ser. No. 368,060

Claims priority, application France, Apr. 17, 1981, 81 07834

Int. Cl.[4] G21C *15/18*

U.S. Cl. 376—282 **4 Claims**



1. A pressurized water nuclear reactor comprising a core, a pressure vessel containing said core, a primary circuit in which the pressurized water circulates and arrives in said vessel through parts of said primary circuit called cold legs, a safety enclosure enclosing said pressure vessel and said primary circuit and an emergency cooling system for injecting a cooling liquid into said primary circuit in the event of leakage in said primary circuit, comprising at least one double injection circuit equipped with pump means arranged outside said safety enclosure and at least one set of accumulators containing a predetermined amount of cooling liquid under pressure arranged inside said safety enclosure and communicating with the cold branches of said primary circuit through which the pressurized water arrives in the reactor tank, through a valve whose opening causes the injection of cooling liquid into said primary circuit, said device comprising, by-passing each of said cold branches, with the interposition of a valve and independently of one another,

(a) a first accumulator of cooling liquid at a first pressure P1 less than the normal pressure of said primary circuit; and

(b) a second accumulator of cooling liquid at a second pressure P2 less than pressure P1;

(c) the injection of cooling liquid through said first and second accumulators in said primary circuit being caused by the automatic opening of valves corresponding to each of said accumulators when the pressure in said primary circuit falls below P1 and below P2, respectively;

(d) said pump means in each of said double injection circuits comprising two pumps arranged in series in a pipe communicating upstream with a refrigeration liquid reserve and downstream with said primary circuit, the pump arranged downstream having a rated operating pressure substantially higher than the rated operating pressure of the pump arranged upstream whose delivery is in communication with the suction of the pump arranged downstream, a portion of the circuit by-passed with respect to the pump situated downstream, provided with a closing valve, also enabling the placing of the upstream pump in direct communication with said primary circuit.

4,784,825

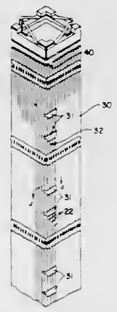
METHOD AND APPARATUS FOR PREVENTING AND REPAIRING VIBRATIONAL DAMAGE TO NUCLEAR FUEL RODS

Gary J. Busselman, Richland, and Adolfo Reparaz, Kennewick, both of Wash., assignors to Advanced Nuclear Fuels, Inc., Richland, Wash.

Continuation of Ser. No. 630,878, Jul. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 498,907, Apr. 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 461,276, Jan. 26, 1983, abandoned. This application May 6, 1987, Ser. No. 48,478

Int. Cl.[4] G21C *3/32*

U.S. Cl. 376—399 **12 Claims**



1. In a nuclear reactor comprising a core barrel, a plurality of baffle plates within said core barrel, said baffle plates having joints therebetween, a plurality of stationary fuel assemblies at least partially surrounded by said baffle plates, each of said assemblies comprising multiple parallel rows of elongated, small diameter, fuel rods, some but not all, of said assemblies having rods adjacent and exposed to said joints between baffle plates, and means for introducing cooling water between said core barrel and said baffle plates, which water flows down, around the baffle plates, and up through said assemblies whereby water jetting through said joints may induce vibrations in said rods adjacent said joints; the improvement comprising:

spring clip means disposed between the ends of said fuel rods adjacent said joints, gripping and securing together a plurality of said rods, thereby reducing said vibration, said clip means being removable from said fuel rods in a non-parallel direction to the axes of said fuel rods without requiring even partial disassembly of the latter.

4,784,826

OXIDATION RESISTANT IRON BASE ALLOY COMPOSITIONS

John M. Corwin, Royal Oak, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 3, 1986, Ser. No. 938,179

Int. Cl.[4] C22C *38/22, 37/10*

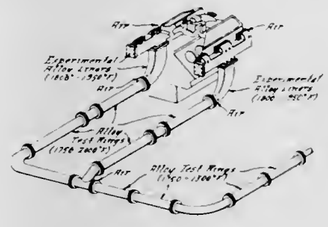
U.S. Cl. 420—8 **34 Claims**

1. An iron-base alloy composition exhibiting improved resistance to oxidation consisting essentially of:

(i) iron;

(ii) at least one alloy element selected from the group consisting of nickel, chromium, molybdenum, manganese, silicon, carbon, vanadium, cobalt, copper, nitrogen, aluminum, titanium, zirconium and mixtures thereof; and

(iii) an amount of a dopant element sufficient to show a significant and reproducible improvement in one or more oxidation resistant properties of the final composition selected from the group consisting of lithium, sodium, potassium, yttrium, lanthanum, cerium, calcium, magnesium, barium, aluminum, beryllium, strontium, and mixtures thereof.



4,784,827

NONMAGNETIC STEEL FOR CRYOGENIC USE

Keijiro Hiraga, Yatabe, and Keisuke Ishikawa, Shonan, both of Japan, assignors to National Research Institute of Metals, Tokyo, Japan

Continuation-in-part of Ser. No. 837,764, Mar. 10, 1986, abandoned. This application Sep. 29, 1986, Ser. No. 913,002

Claims priority, application Japan, Mar. 12, 1985, 60-47468

Int. Cl.[4] C22C *38/50*

U.S. Cl. 420—47 **6 Claims**



1. A nonmagnetic steel for cryogenic use consisting essentially of, by weight, 23.0 to 30.0% of Ni, 13.0 to 16.0% of Cr, 3.0 to 7.0% of Mn, 1.5 to 3.0% of Ti, 1.0 to 3.0% of Mo, and the remainder being Fe, said steel containing as trace elemental impurities not more than 0.02% of C, not more than 0.005% of P, nor more than 0.005% of S, not more than 0.2% of Si, not more than 0.5% by weight of Al and not more than 0.002% of B.

4,784,828

LOW CARBON PLUS NITROGEN, FREE-MACHINING AUSTENITIC STAINLESS STEEL

John J. Eckenrod, Coraopolis; Geoffrey O. Rhodes, Saxonburg; Kenneth E. Pinnow, Pittsburgh, all of Pa., and William E. Royer, Lafayette, N.Y., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Aug. 21, 1986, Ser. No. 898,488

Int. Cl.[4] C22C *38/40, 38/60*

U.S. Cl. 420—42 **11 Claims**

1. A free-machining, resulfurized, austenitic stainless steel consisting essentially of, in weight percent, carbon plus nitrogen both present having a total of up to 0.065,

chromium: 16 to 30,

nickel: 5 to 26,

sulfur: 0.10 to 0.45,

manganese: 0.75 to 2.00,

silicon: up to about 1,

phosphorus: up to about 0.20,

molybdenum: up to about 1,

copper: up to about 1,

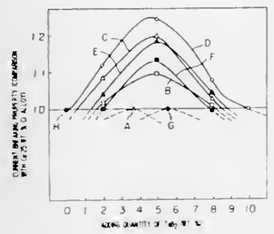
VOL 1096 ISS 3 NO 15 1988 UMI

balance iron with incidental impurities.

4,784,829
CONTACT MATERIAL FOR VACUUM CIRCUIT BREAKER

Mitsuhiro Okumura, and Eizo Naya, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1986, Ser. No. 857,190
Claims priority, application Japan, Apr. 30, 1985, 60-94809; Apr. 30, 1985, 60-94811
Int. Cl.[4] C22C *9/00, 27/06*
U.S. Cl. 420—428 **4 Claims**



1. A contact material for a vacuum circuit breaker which consists essentially of copper, chromium, and a boride of tantalum, wherein the content of said boride of tantalum is 10% by weight or less.

4,784,830
HIGH NICKEL CHROMIUM ALLOY

Pasupathy Ganesan; Gaylord D. Smith; Curtis S. Tassen, all of Huntington, and Jack M. Wheeler, Lesage, all of W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 881,623, Jul. 3, 1986, abandoned. This application Jun. 8, 1987, Ser. No. 59,750
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—443 **20 Claims**

1. A high nickel-chromium alloy characterized by (a) enhanced resistance to oxidation at elevated temperature, (b) good stress rupture life at such temperatures, and (c) a controlled grain size, said alloy consisting essentially of about 55 to 65% nickel, about 19 to 28% chromium, about 0.75 to 2% aluminum, about 0.2 to 1% titanium, about 0.04 to 0.1% nitrogen, up to about 0.1% carbon, up to 1% each of silicon, molybdenum, manganese and niobium, up to 0.1% boron, and the balance essentially iron.

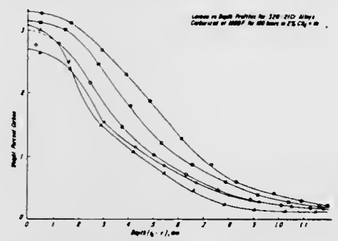
9. The alloy set forth in claim 1 and containing at least one of up to 0.1% of calcium and up to 0.1% magnesium.

4,784,831
HISCOR ALLOY

William L. Mankins, Huntington, W. Va., and David G. Tipton, Severna Park, Md., assignors to Incn Alloys International, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 670,767, Nov. 13, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 892,937
Int. Cl.[4] C22C *38/44, 30/00*
U.S. Cl. 420—584 **10 Claims**

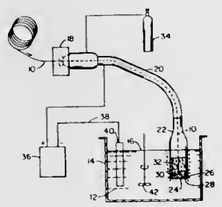
1. A (i) wrought, (ii) weldable iron-nickel-chromium alloy characterized by excellent (iii) hot and (iv) cold workability (v) a low work hardening rate, (vi) high strength at elevated temperature and being further characterized at temperatures at least as high as 1800° to 2000° F. by (vii) good carburization and (viii) oxidation resistance together with (ix) good structural stability when exposed at a temperature at least as high as 1200° F. for at least 1000 hours, the alloy consisting essentially of (weight percent) about 28 to 35% nickel, 20 to 24% chromium, at least 1.5% and up to 4.5% molybdenum, carbon present up to 0.12%, titanium from 0.2 to 1%, up to 1% aluminum, up to 2% manganese, up to 1% silicon and the balance iron, said alloy being in contact with a carbonaceous environment at high temperature which is conducive to causing carburization.



4,784,832
INTRODUCING MATERIALS INTO MOLTEN MEDIA

Charles E. Eckert, 260 Lynn Ann Dr., Kellywood Estates, New Kensington, Pa. 15068; Michael Scherbak, HC61 Box 252, Massena, N.Y. 13662; John M. Urbanic, 2013 Garrick Dr., Pittsburgh, Pa. 15235; Eric D. Arndt, 204 White Oak Dr., Lower Burrell, Pa. 15068, and Ronald E. Miller, 7 Acorn Pl., Murrysville, Pa. 15668

Continuation-in-part of Ser. No. 812,982, Dec. 24, 1985, Pat. No. 4,689,199, which is a continuation of Ser. No. 654,736, Sep. 27, 1984, abandoned. This application Aug. 25, 1987, Ser. No. 90,824
Int. Cl.[4] C22C *1/00*
U.S. Cl. 420—590 **15 Claims**



1. A process for adding a material to molten media, said process being capable of adding said material in substantial quantity, comprising the steps of:

(a) providing a chamber having a discharge positioned within said molten media;

(b) introducing into said chamber a gas comprising an ionizable gas under sufficient pressure to maintain an interior molten media surface substantially at said chamber's discharge region;

(c) providing a plasma within said chamber, the plasma substantially extending at least from said interior molten media surface to a site within said chamber and spaced from said interior media surface;

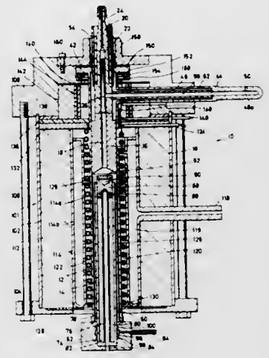
(d) supplying to said site within said chamber said material in molten form and converting said material into superheated spray substantially within said plasma and carried toward said interior molten media surface; and

(e) conducting a gas from said chamber into said media to aid entry of said material into said media.

4,784,833
APPARATUS FOR DETERMINING CHEMICAL STRUCTURE

Stephen J. Martin, Katy, and Raymond D. Worden, Houston, both of Tex., assignors to Ruska Laboratories, Inc., Houston, Tex.

Filed Jun. 19, 1986, Ser. No. 876,228
Int. Cl.[4] G01N *25/22, 31/12*
U.S. Cl. 422—80 **4 Claims**



1. A pyrolysis apparatus comprising:

a first, fused quartz tubular member defining a pyrolysis chamber having a gas outlet;

means for introducing sample material into said pyrolysis chamber;

means for effecting radiant heating of sample material in said pyrolysis chamber to effect pyrolysis thereof and produce gaseous components;

means for passing a first gas stream through said pyrolysis chamber and out said gas outlet to produce a second gas stream containing gaseous components;

a fused quartz nozzle member, said nozzle member defining a nozzle bore having an inlet and an outlet, the inlet of said nozzle bore being in open communication with said gas outlet of said pyrolysis chamber whereby the second gas stream passes through said nozzle bore;

a second, fused quartz tubular member defining a mixing chamber having an outlet orifice, the outlet of said nozzle bore being in open communication with said mixing chamber whereby the second gas stream passes into said mixing chamber; and

means to introduce a third gas stream into said mixing chamber;

said outlet of said nozzle member being smaller than said outlet orifice whereby a mixture of the second gas stream and the third gas stream passes out of said mixing chamber through said outlet orifice.

4,784,834
PIPETTE

Adolf M. Hirschmann, Heilbronn, Fed. Rep. of Germany, assignor to Glasgeratebau Hirschmann, Eberstadt, Fed. Rep. of Germany

Filed Dec. 12, 1986, Ser. No. 940,883
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543950; Apr. 25, 1986, 3614085
Int. Cl.[4] B01L *3/02*
U.S. Cl. 422—100 **12 Claims**

1. A pipette comprising:

a hollow outer jacket, said outer jacket including first and second axial ends;

holding means provided adjacent said first axial end, said holding means including an adapter connected to said hollow outer jacket, said adapter including a first opening therein, and a sealing rubber nozzle fixed between said adapter and said hollow outer jacket, said sealing rubber nozzle including a second opening therein aligned with said first opening, said holding means being capable of releasably retaining a liquid receiving member within said first and second openings;

a pressure pin slidably received and retained within said hollow outer jacket adjacent said second axial end;

first stop means provided at one end of said pressure pin;

a stepped cylinder mounted within said outer jacket, said stepped cylinder including a third opening, said third opening being coaxially aligned with said first and second openings;

second stop means on said stepped cylinder;

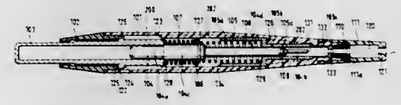
piston means slidably received in said stepped cylinder, said piston means movable with said pressure pin;

third stop means movable along said piston means and fourth stop means provided on said piston means, wherein said third and fourth stop means are located between said first and second stop means;

said piston means and said stepped cylinder defining an operating volume adjacent said first axial end such that said operating volume is in fluid communication with said first, second and third openings;

a protruding section of said piston means extending into said operating volume and dimensioned to pass through said second and third openings;

a pressure spring disposed between said first and said third stop means, said pressure spring exerting a first spring force between said first and third stop means to normally urge said third stop means against said fourth stop means;



a compression spring disposed between said second and said fourth stop means, said compression spring exerting a second spring force on said fourth stop means to urge said piston means out of said stepped cylinder, said second spring force being less than said first spring force;

means defining a pressure-equalization vent which normally communicates the operating volume with ambient atmosphere;

wherein during a first portion of a compression stroke, said piston means is movable by said pressure pin into said stepped cylinder against said second spring force only to prevent fluid communication between the operating volume and ambient atmosphere through the pressure-equalization vent and eject liquid from a liquid receiving member retained within said first and second openings, said compression spring being compressed between said second and fourth stop means, and said third stop means being brought into contact with said stepped cylinder during such a first portion of such a compression stroke;

and wherein during a second portion of a compression stroke, said piston means is movable by said pressure pin further into said stepped cylinder against said first and said second spring forces, said pressure spring being compressed between said first and third stop means and said protruding section of said piston means passing through said third opening to contact and displace a liquid receiving member retained within said first and second openings from said second opening during such a second portion of such a compression stroke so that such a liquid receiving member is removed from said holding means.

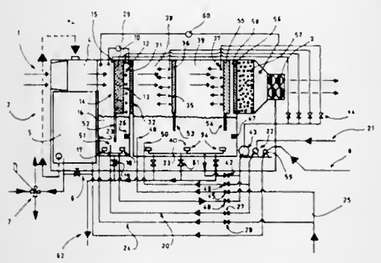
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4,784,835

UNIT FOR FILTRATION AND NEUTRALIZATION OF SULFUROUS ANHYDRIDE CONTAINED IN SMOKE FROM A BOILER

Patrice Fritz, 11c rue d'Altenheim, 67100 Strasbourg, France

Filed Jun. 13, 1986, Ser. No. 873,966
Claims priority, application France, Jun. 13, 1985, 85 09117
Int. Cl.[4] B01D *50/00*
U.S. Cl. 422—170 **4 Claims**



1. Apparatus for filtration of particles and neutralization of sulfurous anhydride for smoke and gases discharged by a boiler, comprising in combination

a scrubbing train including a heat recovery device that receives on an inlet thereof smoke and gases, and lowers the temperature thereof by heat exchanger means to cool the same to a temperature within the range of 10°C.-25° C.;

a prefiltration assembly which receives cooled smoke and gases from said heat recovery device and removes solids therefrom;

a desulfurization chamber which receives gases and any remaining smoke from said prefiltration assembly, and by neutralizing means removes sulfur therefrom, said desulfurization chamber delivering a resultant desulfurized flow to

a final stage condensation chamber, said final stage condensation chamber operating through condensation means to dehumidify the desulfurized flow;

an extraction turbine receiving the dehumidified flow for being operated therewith prior to discharge of said flow from an outlet of said apparatus by said extraction turbine,

communication flow means interconnecting said scrubbing train, said prefiltration assembly, said desulfurization chamber, said final stage condensation chamber, and said extraction turbine,

wherein said scrubbing train, said prefiltration assembly, said desulfurization chamber, said final stage condensation chamber, and said extraction turbine are formed and being contained in a modular box,

wherein said prefiltration assembly receiving cooled smoke and gases from said heat recovery device comprises two recovery hoppers, an electrostatic prefilter that is nonflammable and of a regenerable type, and includes a cleaning device having a plurality of spray distributors positioned with respect to said prefiltration assembly so that said distributors project jets of a neutralizing solution horizontally toward a downstream end of the prefiltration assembly to neutralize the sulfurous anhydride, said cleaning device also comprising, at a front thereof, an upper distributor having vertical jets allowing complete cleaning of said front, one of said recovery hoppers forming a downstream end of said prefiltration assembly being fed with pure water and a neutralizing solution, said neutralizing solution being selected from the group consisting of soda water, solution of potassium, alcohol, acetone, very fine zinc powder in suspension of water, cocoanut of charcoal, and iodine in oxidation, said upper distributor communicating with the cleaning device through a recycling circuit,

wherein said desulfurization chamber receiving gases and remaining smoke from said prefiltration assembly is composed of two spray compartments bounded by two end electrostatic filters, and one center electrostatic filter, said filters having a particle retention which is 100% effective for particles of 3 micron diameter, and 90% effective for particles of one micron diameter, each spray compartment being traversed by a counter-current of a spray cloud of micro-fog of said neutralizing solution which neutralizes the sulfurous anhydride, said spray cloud being generated in a counter-current by said spray distributors being positioned near respective opposite sides of said end filters, the desulfurization chamber extending downwardly through another of said recovery hoppers and being in communication with the spray distributors through said recycling circuit,

wherein each recovery hopper of said prefiltration assembly includes an acidity indicator associated with a separate regulation circuit acting on a pure water inlet, and on a neutralizing solution inlet communicating with each of said hoppers,

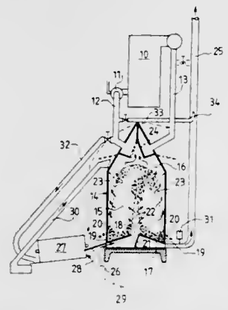
wherein said final stage condensation chamber receiving said desulfurized flow from said desulfurization chamber includes an electrostatic filter, and an active carbon filter, said electrostatic filter being a prefilter for said active carbon filter, said active carbon filter having a high retention for gas residues before the latter pass into the atmosphere.

4,784,836

DEVICE FOR THE PURIFICATION OF GAS, ESPECIALLY COMBUSTION GAS

Lennart Karlsson, Ödenäs 4581, Alingsås, Sweden (441 90), and Leif Karlsson, Strandlyckan, Bollebygd, Sweden (517 00)

Continuation of Ser. No. 828,308, filed as PCT SE 85/00124 on Mar. 18, 1985, published as WO 85/04237 on Sep. 26, 1985, abandoned.
This application Apr. 22, 1987, Ser. No. 41,624
Claims priority, application Sweden, Mar. 16, 1984, 84/01478
Int. Cl.[4] B01D *53/08*
U.S. Cl. 422—175 **8 Claims**



1. A heat exchanger connectable to a furnace producing contaminated effluent gas and adapted to purify said gas while simultaneously preheating air to said furnace comprising:

(a) at least two like units each having two ends and enclosing a storage space holding heat storing bodies comprising a predetermined quantity of basic granules,

(b) each unit being provided with air inlet means and combustion gas outlet means at one end thereof and air outlet means and combustion gas inlet means at the other end thereof,

(c) switch over valve means at said ends for guiding the flow of air and gas through the heat storing bodies in said storage space such that, alternating from one unit to another, contaminated gas will pass in one direction through one of said units while, simultaneously, air will pass in the opposite direction through another unit,

(d) each storage space and the heat storing bodies therein being adapted to ensure that the temperature of the gas passing through the associated unit is reduced to below the dew point for the moisture in the gas before it leaves the unit,

(e) first conduit means for transferring purified gas from said units to an exhaust duct,

(f) second conduit means for transferring heated air to said furnace from said units, and

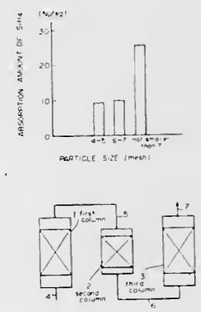
(g) a rotatable drum outside said storage spaces for cleaning the basic granules, means to heat said drum, as well as means for transporting granules from either storage space to said drum and back to the storage spaces.

4,784,837

ABSORBENT FOR TREATING GASES CONTAINING THE MATERIALS USED FOR SEMICONDUCTOR PRODUCTS AND PROCESS OF TREATING SUCH GASES WITH THE SAME

Masayasu Kitayama, Kawasaki; Yoshiaki Sugimori, Tokyo, and Schunich Ohta, Fujisawa, all of Japan, assignors to Nihon Sanso Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 531,345, Sep. 12, 1983, Pat. No. 4,535,072.
This application Aug. 9, 1985, Ser. No. 764,427
Claims priority, application Japan, Sep. 14, 1982, 57-160396
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—210 **6 Claims**



1. A process for treating a gas containing at least two impurities selected from the group consisting of volatile inorganic hydrides, volatile inorganic halogenides and organometallic compounds and for removing plural kinds of said impurities from the gas which is treated, comprising the steps of: passing the gas through an absorbent in which an aqueous solution of an alkali and aqueous solution of an oxidizing agent capable of oxidizing germane is impregnated into a porous solid carrier; and then passing the gas through another absorbent in which an aqueous solution of an oxidizing agent incapable of oxidizing germane is impregnated into a porous solid carrier.

4,784,838

METHOD OF STABILIZING SOLUTIONS OF CHELATED POLYVALENT METALS

James M. Paul, DeSoto, and Earl S. Shavely, Jr., Arlington, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 927,998, Nov. 7, 1986, abandoned. This application Apr. 26, 1988, Ser. No. 188,054
Int. Cl.[4] C01B *17/04*
U.S. Cl. 423—226 **7 Claims**

1. In a method of removing hydrogen sulfide (H_2S) from a gas by contacting the gas in a reaction zone with a reaction solution of a chelated polyvalent metal, thereby producing elemental sulfur (S), removing the elemental sulfur, regenerating the reaction solution, and recycling the regenerated reaction solution to the reaction zone,

the improvement comprising introducing into the reaction zone a free chelating agent at the rate defined by the following equation:

$$R = \frac{A \times S}{454 \text{ gm/lb}}$$

where

R is the rate of addition of the free chelating agent in lbs/hr;

A is specific adsorption of the chelating agent on free sulfur in gm/lb; and

S is the rate of free sulfur production in lb/hr; the rate R being sufficient to prevent the loss of the chelated polyvalent metal from the reaction solution due to the promotion of the disassociation of the chelated polyvalent metal into a free chelating agent and a free polyvalent metal and subsequent adsorption of the free chelating agent by the elemental sulfur and to maintain the content of the free chelating agent in the solution at about 0.1 to about 1.0% by weight of the chelated polyvalent metal.

4,784,839

METHOD OF MAKING METAL CARBIDE AND NITRIDE POWDERS

Roland Bachelard, and Philippe Joubert, both of Lyon, France, assignors to ATOCHEM, Courbevoie, France

Filed Mar. 25, 1987, Ser. No. 30,405
Claims priority, application France, Apr. 3, 1986, 86 04764; Apr. 3, 1986, 86 04765
Int. Cl.[4] C01B *31/36*
U.S. Cl. 423—290 **22 Claims**

1. A process for forming a metal nitride powder which comprises:

reacting at least one metal oxide composition with a binder and a material capable of supplying carbon to said reaction, or with a binder capable of supplying said carbon so as to produce granules having a controlled pore volume ranging from about 0.1 to 3 cm^3/g;

subjecting said granules to a carbothermal reduction reaction at a temperature ranging between about 1300°-1600° C. in an atmosphere containing nitrogen or which is capable of releasing nitrogen so as to form said metal nitride powder wherein said powder contains an excess of said carbon;

heating said powder so as to decarbonize said metal nitride until substantially all of said excess carbon is eliminated; and

collecting said metal nitride powder in the form of particles or agglomerates, said metal nitride powder having a specific surface area of at least about 30 m^2/g.

2. A process for forming a metal carbide power which comprises:

reacting at least one metal oxide composition with a binder and a material capable of supplying said carbon to said reaction, or with a binder which is capable of supplying said carbon so as to produce granules having a controlled pore volume ranging from about 0.1 to 3 cm^3/g;

subjecting said granules to a carbothermal reduction reaction at a temperature ranging between about 1300° and 1600° C. in a neutral atmosphere so as to form said metal carbide powder wherein said powder contains an excess of carbon;

heating said powder so as to decarbonize said metal carbide until substantially all of said excess carbon is eliminated; and

collecting said metal carbide powder in the form of articles or agglomerates, said metal carbide powder having a specific surface area of at least about 30 m^2/g.

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4,784,840

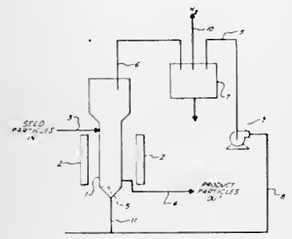
POLYSILICON FLUID BED PROCESS AND PRODUCT

Marcellan F. Gautreaux, and Robert H. Allen, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 899,906, Aug. 25, 1986, abandoned. This application Oct. 28, 1987, Ser. No. 114,453

Int. Cl.[4] C01B *33/02;* **B05D** *7/00*

U.S. Cl. 423—349 **20 Claims**



1. A process for preparing particulate polysilicon having a reduced amount of silicon dust on surfaces thereof, said process comprising:

(I) a productivity mode which comprises contacting in a fluidized bed, silicon seed particles having a size range of about 80 to 400 microns, with a gas comprising from about 10 to 100 mole percent of a thermally decomposable silicon compound, at a temperature above the thermal decomposition temperature of said compound; whereby (i) silicon metal produced from said compound is deposited on said seed particles thereby forming intermediate silicon particles having a size range of about 600 to 800 microns; and (ii) silicon dust, produced by homogeneous decomposition of said silicon compound, is deposited on surfaces of said intermediate particles;

(II) a quality mode which comprises contacting in a fluidized bed, said intermediate particles having surface dust thereon, with a gas comprising from about 1 to about 5 mole percent of a thermally decomposable silicon compound, at a temperature above the thermal decomposition temperature of said compound; whereby a silicon layer having a thickness sufficient to cement surface silicon dust to said particles is deposited on said particles thereby reducing the amount of removable silicon dust from the surface of said particles.

4,784,841

PROCESS FOR THE PRODUCTION OF COARSE, SCRUBBING AGGREGATES OF TITANIUM DIOXIDE PARTICLES BY OXIDATION OF TITANIUM TETRACHLORIDE IN THE VAPOR PHASE AND USE OF SAID AGGREGATES FOR THE PREVENTION OF DEPOSIT FORMATION IN THE SAME PRODUCTION PROCESS

Achim Hartmann, Pulheim, and Hans Thumm, Leverkuseo, both of Fed. Rep. of Germany, assignors to Kronos Titan, GmbH, Leverkusen, Fed. Rep. of Germany

Filed Sep. 21, 1987, Ser. No. 98,889

Claims priority, application European Pat. Off., Oct. 31, 1986, 86115134.8

Int. Cl.[4] C01G *23/08*

U.S. Cl. 423—613 **32 Claims**

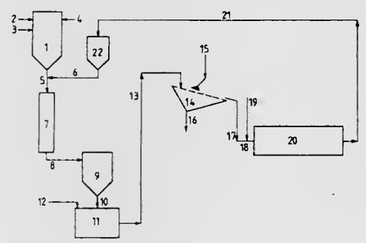
1. A process for the production of coarse scrubbing aggregates of titanium dioxide particles by vapor phase oxidation of titanium tetrachloride with an oxygen-containing gas thereby forming a hot gaseous reaction mixture contianing suspeneded TiO_2, previously recovered coarse TiO_2 scrubbing aggregates being commingled with the hot gaseous reaction mixture, the hot reaction mixture being cooled, the titanium dioxide being separated from the cooled reaction mixture, coarse titanium dioxide aggregates of sizes above 0.15 mm being separated from TiO_2 fines of sizes below 0.15 mm, recovered and recycled as scrubbing solids in the hot reaction mixture, the process comprising:

(a) adding coarse scrubbing aggregates of TiO_2 particles of sizes above 0.15 mm to the hot reaction mixture subsequent to the vapor phase oxidation;

(b) cooling the hot reaction mixture indirectly to 350°–500° C.;

(c) separating the titanium dioxide form the cooled reaction mixture;

(d) slurrying the separated titanium dioxide with water;



(e) using a moving screen to separate the coarse titanium dioxide aggregates having particle sizes above 0.15 mm present in the agqueous slurry of step (d) form the TiO_2 fines having particle sizes below 0.15 mm so as to form a residue on the moving screen;

(f) treating the residue on the moving screen with an aqueous solution;

(g) treating the moving screen residue that has been treated with an aqueous solution with an alkaline solution;

(h) calcining the treated moving screen residue; and

(i) returning the calcined material in the form of coarse TiO_2 scrubbing aggregates to the hot reaction mixture so as to form said coarse scrubbing aggregates of TiO_2 added in step (a).

4,784,842

THERAPEUTIC COMPOSITION FOR TREATMENT OF CUTS, BURNS AND ABRASIONS

Jean London, and James O. Gibson, both of 351 Main St., Apt. 316, P.O. Box 998, El Segundo, Calif. 90245

Filed Sep. 25, 1987, Ser. No. 100,837

Int. Cl.[4] A61L *9/04;* **A01N** *65/00*

U.S. Cl. 424—45 **15 Claims**

1. A therapeutic composition for the treatment of cuts, burns and abrasions which consists essentially of a mixture containing (a) about 10 to about 90% of a substance selected from the group consisting of a terpene and mixtures thereof, and (b) about 90 to about 10% of vitamin E, by volume.

4,784,843

DICYCLOHEXYLALKANES, THEIR PREPARATION, COSMETIC AND PHARMACEUTICAL FORMULATIONS CONTAINING THESE COMPOUNDS, AND THEIR USE AS OIL COMPONENTS

Adolph Segnitz, Ibbenbueren; Knut Oppenlaender, Ludwigshafen, and Paul Naegele, Neuhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

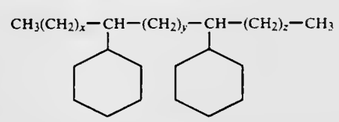
Filed Feb. 20, 1986, Ser. No. 831,451

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507175

Int. Cl.[4] A61K *7/021, 7/06, 7/42*

U.S. Cl. 424—63 **9 Claims**

1. In a cosmetic or pharmaceutical formulation containing an oil component in combination with cosmetically or pharmaceutically acceptable ingredients, the improvement wherein the oil component contains a spreadably effective amount of a dicyclohexylalkane of the formula I



(1)

where x, y, and z are each from 0 to 24 and the sum x+y+z is from 4 to 24.

4,784,844

VOLATILE SILICONE-WATER EMULSIONS AND METHODS OF PREPARATION AND USE

Raymond J. Thimineur, Scotia, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 449,081, Dec. 13, 1982, abandoned, which is a continuation of Ser. No. 099,956, Dec. 3, 1979, abandoned. This application Mar. 17, 1987, Ser. No. 24,873

Int. Cl.[4] A61K *7/06, 7/38, 7/42, 9/10*

U.S. Cl. 424—65 **21 Claims**

1. A silicone in water emulsion comprising:

(A) 100 parts by weight of a cyclic polysiloxane or a combination of cyclic polysiloxanes of the formula:

where n is an integer from 3 to 10, R is selected from the group consisting of $-CH_3$, $-(CH_2)_2CH_3$, $-CH_2CH_2CF_3$, $-CH{=}CH_2$, and $-C_6H_5$, and z is an integer from 1 to 10;

(B) from 0.7 to 666 parts by weight of an emulsifier selected from the group consisting of ethoxylated fatty acids, ethoxylated and non-ethoxylated sorbitan esters, ethoxylated alkyl phenols, and ethoxylated ethers; and

(C) from 5.0 to 960 parts by weight of water.

4,784,845

EMULSION COMPOSTIONS FOR THE PARENTERAL ADMINISTRATION OF SPARINGLY WATER SOLUBLE IONIZABLE HYDROPHOBIC DRUGS

Narendra R. Desai, Danbury, Conn.; Edward C. Shinal, Old Tappan, N.J.; Madurai Ganesan, Pomona, and Eugene A. Carpentier, Spring Valley, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 16, 1985, Ser. No. 776,306

Int. Cl.[4] A61K *31/02, 31/08, 31/16, 31/40*

U.S. Cl. 424—80 **27 Claims**

1. A composition of matter for delivery by hydrophobic drugs comprising:

(a) a hydrophobic drug;

(b) an oleaginous vehicle or oil phase said oleaginous vehicle or oil phase being substantially free of BHT or BHA;

(c) a co-surfactant or emulsifier;

(d) a co-surfactant or auxiliary emulsifier; and

(e) benzyl alcohol as a co-solvent;

wherein the hydrophobic drug may be a sparingly water liquid and may be a basic drug which has an ionization constant lower or nearer the physiological pH or an acid drug which has an ionization constant higher or nearer the physiological pH.

4,784,846

BROWN MICACEOUS OXIDE FOOT POWDER

Dean A. Whaley, 2706 Lafayette Ave., Richmond, Va. 23228

Filed May 13, 1987, Ser. No. 49,099

Int. Cl.[4] A61K *7/32, 7/38, 9/14*

U.S. Cl. 424—68 **8 Claims**

1. A topical composition for application to mammalian skin, comprising by weight of from 55% to 45% aluminum oxide about 30% silicon oxide, and 5% to 1% red iron oxide, and including substantially no water solubles.

4,784,847

WINE-CONTAINING SKIN-CARE PRODUCTS

Monika G. Zulliger-Bopp, and Alfred Zulliger, both of Ettingen, Switzerland

Filed Apr. 28, 1987, Ser. No. 43,609

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—69 **10 Claims**

1. A wine-containing skin-care cream including:

(a) a watery phase comprising by weight of the cream of about 40% to about 83% of alcohol extracted wine, about 0.4% to about 3% by weight of the cream of a powder extract of grape plant leaves and about 0.5% to about 5% of Sorbitol as a stabilizer for said wine, and

(b) about 60% to about 17% by weight of the cream of an oily phase comprising an ingredient selected from the group comprising vegetable oil, mineral oil, emulsifier as well as suitable mixtures thereof.

4,784,848

WAVING LOTION COMPOSITION

Takahiro Koyama, Hoya, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 866,186, May 22, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 118,200

Claims priority, application Japan, Jun. 14, 1985, 60-128370

Int. Cl.[4] A61K *7/09*

U.S. Cl. 424—71 **3 Claims**

1. In a lotion composition useful in a process for the permanent waving of hair, said composition comprising an alkaline aqueous solution of a reducing agent for treating hair and a thickening spreader, the improvement which comprises: said thickening spreader is a salt of a carboxymethylcellulose selected from the group consisting of the sodium, potassium, lithium and ammonium salts of carboxymethylcellulose, said salt of carboxymethylcellulose having an etherification degree of from 2.4 to 3.0, a one percent by weight aqueous solution of said salt of carboxymethylcellulose having a viscosity, at 20° C., of from 10 to 10,000 cps, said lotion composition containing from 0.1 to 3.0 percent by weight of said salt of carboxymethylcellulose.

4,784,849

SKIN CARE AND SHAVING COMPOSITIONS

Ronald J. Tutsky, P.O. Box 1646, Greenwich, Conn. 06836-1646

Division of Ser. No. 743,203, Jun. 10, 1985, abandoned, which is a continuation of Ser. No. 523,003, Aug. 15, 1983, Pat. No. 4,525,344. This application Feb. 3, 1987, Ser. No. 10,388

Int. Cl.[4] A61K *7/15, 7/48, 9/07*

U.S. Cl. 424—73 **4 Claims**

1. A substantially non-aqueous conditioning composition consisting essentially of:

(a) about 5 to 20% by weight of composition of a phospholipid;

(b) about 0.5 to 5% by weight of composition of vitamin E;

(c) up to 15% by weight of composition of jojoba oil; and,

(d) the remainder being a mixture of seed and vegetable oils.

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4,784,850

PROCESS FOR PREPARING ANTIBODIES AGAINST E. COLI K-99 ANTIGEN FROM BOVINE MILK

Gilead B. Abraham, Doar Maabarot, Israel, assignor to Mutzarei Maabarot, Israel

Filed Sep. 4, 1985, Ser. No. 772,399
Int. Cl.[4] A61K *39/40; C07K 15/06*
U.S. Cl. 424—87 **11 Claims**

1. A process for manufacturing a preparation containing antibodies which specifically bind to the K-99 antigen of strains of enterotoxigenic *Escherichia coli* which comprises:
clotting milk obtained from a postpartum cow, which had been previously vaccinated with *E. coli* strain 168,
separating fatty serum from cheese obtained therefrom,
separating out fat from said fatty serum,
subjecting resulting fat-free serum to ultrafiltration to remove from 30 to 50% of water present, and
sterilizing the resulting retentate.

4,784,851

COMPOSITION FOR TREATMENT OF ACIDOSIS IN RUMINANTS AND METHOD

Gary L. Rohwer, Sharp Ln., Parma, Id. 83660

Continuation of Ser. No. 712,505, Mar. 18, 1985, abandoned. This application Mar. 17, 1987, Ser. No. 27,070
Int. Cl.[4] A61K *31/10, 33/00*
U.S. Cl. 424—156 **9 Claims**

1. Method of treating ruminants for acidosis comprising applying to the tongue of the ruminant for gradual swallowing a composition in a dosage to provide from about 0.1 to about 0.5 grams of sodium bicarbonate or alkalinity equivalent thereof per lb. of animal per day so as to ameliorate symptoms of acidosis, said composition consisting essentially by weight of
(a) from about 40% to about 60% of a source of alkalinity selected from the group consisting of non-toxic carbonate, bicarbonate and sesquicarbonate,
(b) from about 15% to about 40% fatty vehicle, and
(c) from about 5% to about 40% thickener in an amount to obtain a paste consistency.

4,784,852

COMPOSITION FOR HUMAN SUPPLY OF SELENIUM AS TRACE ELEMENT

Erland Johansson, S-752 47, Uppsala, Sweden

Continuation of Ser. No. 715,038, Mar. 21, 1985, abandoned, which is a continuation of Ser. No. 509,436, filed as PCT SE 82/00304 on Sep. 30, 1982, published as WO 83/01196 on Apr. 14, 1983, abandoned. This application Nov. 12, 1986, Ser. No. 930,077 Claims priority, application Sweden, Oct. 6, 1981, 8158877
Int. Cl.[4] A61K *33/04*
U.S. Cl. 424—164 **7 Claims**

1. An improved composition for increasing the bioavailability of selenium as a trace element, said composition containing seleno methionine and sodium selenite in amounts corresponding to between 50 and 500 ug selenium,
Vitamin E in amounts of between 10 and 100 mg,
Vitamin B_2 in amounts of between 1 and 5 mg, and
Vitamin B_6 in amounts of between 2 and 10 mg.

4,784,853

ANTIVIRAL AGENT

Takeshi Inoi, Yokohamashi; Hiroaki Ishibashi, Minamatashi, and Etsuro Yoshikawa, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 649,660, Sep. 12, 1984, abandoned. This application May 4, 1987, Ser. No. 45,864
Claims priority, application Japan, Sep. 29, 1983, 58-181225
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **16 Claims**

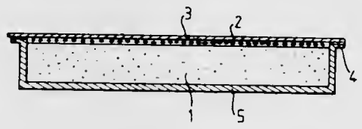
1. A dry ingredient obtained by
(1) milling the whole or the rhizome of *crocosmia x crocosmaeflora* N.E. Br. and subjecting it to extraction with a solvent selected form the group consisting of water, lower aliphatic alcohols and mixtures of the foregoing, at a temperature of from 0° C. to the boiling points of said solvent,
(2) filtering the resulting material and recovering the resulting filtrate,
(3) concentrating the filtrate, and
(4) filtering off any white precipitate that is formed, and
(5) drying the resulting solution to obtain the dry ingredient.

4,784,854

COSMETIC COMPOSITION OBTAINED FROM CELLULAR CULTURES OF CONJUNCTIVE TISSUE

Marie-Christine Seguin, and Jean Gueyne, both of Perigord 1, 6 Lacets Saint-Leon, Monte-Carlo, Monaco

Filed Jul. 29, 1986, Ser. No. 891,679
Claims priority, application France, Aug. 1, 1985, 85 11766
Int. Cl.[4] A01N *63/02;* **A61K** *35/12;* **A45D** *44/00*
U.S. Cl. 424—401 **18 Claims**



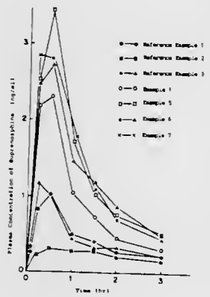
1.Cosmetic composition for treatment of the skin, comprising a medium for the culture of cells, characterised in that it comprises effective amounts of living cells of conjunctive tissue in a nutrient medium in which growth of the cells can take place.

4,784,855

PHARMACEUTICAL COMPOSITIONS AND SUPPOSITORY

Chikamasa Yamashita; Kouzo Ishida; Gohachiro Miyamoto, and Muneyoshi Ishikawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 61,973
Claims priority, application Japan, Jun. 16, 1986, 61-141086
Int. Cl.[4] A61F *9/02*
U.S. Cl. 424—436 **7 Claims**



1. A suppository composition which comprises N-cyclopropylmethyl-7α-[(S)-1-hydroxy-1,2,2-trimethylpropyl]-6,14endo-ethano-6,7,8,14-tetrahydronororipavine or its pharmaceutically acceptable acid addition salt as the active ingredient and a mixed base consisting essentially of from 70 to 95 wt. % of polyethylene glycol having an average molecular weight of 200 to 20,000 and from 30 to 5 wt. % of propylene glycol.

4,784,856

PERCUTANEOUS PHARMACEUTICAL PREPARATION

Mutsumi Fukuda, Osaka; Takashi Nakagawa, Shiga; Takaji Kishi, Hyogo; Michiharu Ando, and Masahachi Yoshioka, both of Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 663,129, Oct. 22, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 83,886
Int. Cl.[4] A61F *13/02, 13/00;* **A61L** *15/06;* **A61K** *31/79*
U.S. Cl. 424—448 **13 Claims**

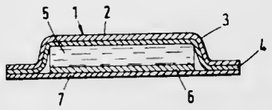
1. A percutaneous administration type pharmaceutical preparation in tape form comprising a flexible backing, which is not permeable by the active ingredient, and an adhesive base layer formed on said flexible backing; said adhesive base layer consisting essentially of an adhesive base material and an active ingredient compatible with said adhesive base material, wherein said adhesive base material is a copolymer containing 2-ethylhexyl acrylate (EHA) in a concentration of 45 to 80 mole %, a (meth)acrylate monomer in a concentration of 0 to 35 mole %, which is at least one selected from the group consisting of propyl acrylate, butyl acrylate, hexyl acrylate, 2-ethyy butyl acrylate, heptyl acrylate, octyl acrylate, nonyl acrylate, decyl methacrylate, and lauryl methacrylate, and N-vinyl-2-pyrrolidone (VP) in a concentration of 20 to 55 mole %, with the sum of the mole % of EHA, (meth)acrylate and VP being 100, and with the EHA/VP ratio by mole % being in the range from 80/20 to 45/55, and said active ingredient is isosorbide dinitrate (ISDN) which is contained in a concentration of 13 to 30% by weight in said adhesive base material and in a concentration of 80 to 100% of the saturated solubility concentration of ISDN in said adhesive base material.

4,784,857

DRUG DELIVERY DEVICE, ITS PREPARATION AND USE

Peter W. Berry, and Paul Holden, both of Herts, United Kingdom, assignors to Smith and Nephew Associated Companies PLC, United Kingdom

Filed Jun. 2, 1987, Ser. No. 57,904
Claims priority, application United Kingdom, Jun. 3, 1986, 8613382; Aug. 13, 1986, 8619702; Aug. 20, 1986, 8620226; Mar. 2, 1987, 8706780
Int. Cl.[4] A61F *13/00*
U.S. Cl. 424—449 **12 Claims**



1. A device suitable for the topical administration of a pharmacologically active agent comprising an active agent impermeable barrier layer, a reservoir comprising a thermoplastic polyurethane fibre mat containing the pharmacologically active agent having one surface in contact with the inner surface of the barrier layer and a protector layer removably in contact with the other surface of the reservoir.

4,784,858

CONTROLLED RELEASE TABLET

Kimon Ventouras, Le Lignon, Switzerland, assignor to Zyma SA, Nyon, Switzerland

Filed Aug. 22, 1986, Ser. No. 899,112
Claims priority, application United Kingdom, Aug. 29, 1985, 8521494
Int. Cl.[4] A61K *9/22, 9/26, 9/32*
U.S. Cl. 424—468 **15 Claims**

1. A controlled release tablet comprising
(I) a core, containing as essential components
(a1) at least one water-soluble pharmaceutically active substance;
(a2) a water-insoluble, non-digestible polymeric excipient being a member of the group consisting of (i) polyvinylchloride and (ii) a homo- or copolymer of lower alkyl acrylates, lower alkyl methacrylates, or lower alkyl acrylate and lower alkyl methacrylate; and
(b) a water-insoluble polymeric substance which is swellable under the influence of water being a member of the group consisting of hydroxypropylmethylcellulose, hydroxyethylcellulose, hydroxymethylcellulose, carboxymethylcellulose, sodium carboxymethylcellulose, alginic acid, sodium alginate, and cellulose, and
(II) a coating consisting essentially of an elastic, water-insoluble and semipermeable diffusion film of a polymer.

4,784,859

PROCESS FOR PRODUCING AN ALCOHOLIC SUGAR CANE JUICE BEVERAGE

David Lashley, Woodbrook, Trinidad and Tobago, assignor to William D. Ramjallacksingh, Trinidad and Tobago

Filed Jul. 14, 1987, Ser. No. 73,186
Int. Cl.[4] C12G *1/00, 3/00*
U.S. Cl. 426—11 **8 Claims**

1. A method of making an alcoholic sugar cane juice beverage, comprising the steps of:
(a) providing filtered and pasteurized sugar cane juice;
(b) inoculating the juice of step (a) with an alcohol fermentative yeast;
(c) fermenting the cane juice aerobically with agitation to provide an alcohol content of from about 11 to about 12% by weight;
(d) blending the fermented liquid to step (c) with pasteurized sugar cane juice to obtain a Brix of from about 9 to about 10 with an alcohol content in the range of from about 4 to about 6% by weight;
(e) clarifying and pasteurizing the liquid from step (d); and
(f) acidulating the clarified liquid of step (e) with a material selected from the group consisting of natural pasteurized acidic fruit juice and natural flavor extract.

4,784,860

PET FOOD

Flemming M. Christensen, Copenhagen; Hans A. S. Olsen, Holte, both of Denmark, and Columbus O. L. Boyce, Brewster, N.Y., assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Oct. 22, 1986, Ser. No. 921,414
Claims priority, application Denmark, Nov. 4, 1985, 5063/85
Int. Cl.[4] C23K *1/00*
U.S. Cl. 426—46 **3 Claims**

1. A method for forming a pet food which consisting essentially of enzymatically hydrolyzing a proteinaceous vegetable material by an SPS-ase preparation in an aqueous medium, then formulating a pet food composition containing the enzymatically hydrolyzed proteinaceous material therein as at least 10% w/w dry substance basis of the pet food composition, and thereafter cooking and shaping said pet food composition into a pet food.

4,784,861

WEIGHT-CONTROL FORMULATION

Gio B. Gori, Bethesda, Md., assignor to CCA Industries, Inc., East Rutherford, N.J.

Filed Nov. 24, 1986, Ser. No. 934,015
Int. Cl.[4] A23L *1/30, 1/308*
U.S. Cl. 426—74 **9 Claims**

1. An ingestible formulation consisting essentially of a mixture of fiber containing materials and means for absorbing water and creating a gelatinous bulk and viscous coating, the fiber containing materials being brans including at least oat and wheat brans and being selected from the group consisting of

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lignin, cellulose and hemi-cellulose, said means being selected from the group consisting of pectin, guar gum, psyllium and cutin, said formulation further comprising mineral supplements, which are salts selected from the group consisting of manganese, selenium, zinc, copper, iron and calcium, the brans, means and mineral supplements being intermingled in the form of a dry generally homogenous powdered substance adapted for being sprinkled on food, minerals corresponding to the added mineral supplements being removed from the foodstuff by being entrapped by the fiber containing materials in the human gut and the mineral supplements being in an amount which is greater than what is entrapped.

4,784,862

CONTINUOUS PRODUCTION OF GELLED CHUNKS OF FOODSTUFFS

Colin Wetherspoon, Ousden, England, assignor to Spillers Limited, London, England

Continuation of Ser. No. 821,653, Jan. 23, 1986, abandoned. This application Apr. 24, 1987, Ser. No. 42,559

Claims priority, application United Kingdom, Jan. 29, 1985, 8502124

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—103 43 Claims

1. A method of producing randomly formed and irregularly shaped edible chunks of comminuted material disposed in a matrix slurry, said chunks having an outer gel skin, comprising

forming at least one first slurry comprising a soluble gellable material;

forming at least one second slurry comprising a soluble gelling activator which will interact with said soluble gellable material;

wherein at least one of said slurries contains a comminuted food material,

bringing said slurries together while concurrently imparting a limited mixing action thereto and thereby breaking up said slurry containing food material into a plurality of randomly formed and irregularly shaped chunks surrounded by the matrix of the non-food slurry while simultaneously reacting the soluble gellable material with said soluble gelling activator at the interfaces of said shaped chunks to form a gel skin encapsulating each of said irregularly shaped chunks;

said gellable material and said gelling activator being present in an amount sufficient to produce said gel skin encapsulating said chunks;

said encapsulated chunks being sufficiently robust to remain in discrete form and sufficiently pliable to be pumped in the matrix of the non-food slurry directly to a high speed industrial container filler for packaging.

4,784,863

MEAT PRODUCT PACKAGE CONTAINING AN INNER LAYER OF STARCH/ETHYLENE VINYL ACETATE

Stanley Lustig, Park Forest, and Jeffrey M. Schuetz, Woodridge, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Nov. 30, 1987, Ser. No. 126,336

Int. Cl.[4] A22C *13/02*

U.S. Cl. 426—113 17 Claims

1. A meat product package comprising an enclosing multilayer film having an inner layer and an insitu aqueous medium-cooked meat product with its outer surface in adhering relation to said inner layer, and with said multilayer film comprising at least three layers including a barrier layer as the core, said inner layer being formed of ethylene vinyl acetate on one side of said barrier layer and an outer layer on the opposite side of said barrier layer, and wherein said ethylene vinyl acetate has between about 3% and about 18% by weight vinyl acetate, and at least about 4 grams/1000 ft.^{2} of starch particles having major dimensions less than about 100 microns and being substantially uniformly dispersed across the inner surface of said inner layer and integral therewith, at least the dispersed starch particle - containing ethylene vinyl acetate inner layer being irradiated at dosage of at least about 2 MR.

4,784,864

FOOD WRAPPER FOR A DRIED SEAWEED COVERED MASS OF RICE

Tetsuo Ikeda, Otsu, Japan, assignor to Ishida Systems Engineering Co., Ltd., Kyoto and Hayashiya Syokuhin Co., Ltd., Nagano, both of, Japan

Continuation of Ser. No. 35,247, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 663,915, Oct. 24, 1984, abandoned. This application Dec. 24, 1987, Ser. No. 139,067

Claims priority, application Japan, Oct. 25, 1983, 58-165653; Oct. 25, 1983, 58-165654; Oct. 25, 1983, 58-165655; Oct. 25, 1983, 58-165656; Jun. 26, 1984, 59-96377

Int. Cl.[4] B65D *65/09, 81/32*

U.S. Cl. 426—115 8 Claims



1. A food wrapper, comprising:

a first food of a mass of rice

an inner bag means of a synthetic resin material for storing said first food therein, said inner bag means having a triangular shape, the top side of said inner bag means being completely heat sealed and provided with a first tear-off means for producing an opening when said heat-sealed top side is torn off;

an outer bag means for storing said heat-sealed inner bag means therein, said outer bag means having a triangular shape and an opening at the top thereof, at least one flap at the top thereof and a second tear-off means at a lower end portion thereof for detaching said lower end portion of said outer bag means; and

a second food of a dried sea-weed positioned between said heat sealed inner bag means and outer bag means and surrounding at least a portion of said inner bag means, wherein said inner bag means sealingly separates said first and second foods so that moisture in said first food does not contact said second food, whereby when said top of said heat sealed inner bag means is opened by tearing off said first tear-off means and said lower end portion of said outer bag means is detached from said second tear-off means, said inner bag means can be removed through an opening created at the lower portion of said outer bag means by detachment of said lower end portion.

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4,784,865

LOW FAT COFFEE WHITENER AND METHOD FOR MAKING LOW FAT COFFEE WHITENER

Donald B. Baker, Tulsa, and Vanessa Hulett, Jenks, both of Okla., assignors to The Pro-Mark Companies, Tulsa, Okla.

Filed May 15, 1986, Ser. No. 863,334

Int. Cl.[4] A23C *11/00*

U.S. Cl. 426—250 22 Claims

1. A non-stabilized, fluid, dairy coffee whitener composition which exhibits the organoleptic properties of conventional dairy creamers comprising, as major ingredients, a butterfat-containing milk product in sufficient amount to provide a butterfat content in said coffee whitener composition not exceeding 1.0% by weight and nonfat dry milk, and including an emulsifier in an amount sufficient to disperse milk protein contributed to said composition by said milk product and said nonfat dry milk into finely divided protein micelles, said coffee whitener composition having a total solids content of 18–25% by weight, a protein content of 8–12% by weight, and total fat, saturated fat, cholesterol and calorie contents substantially below the corresponding contents of conventional half and half dairy creamers.

4,784,866

PROCESS OF ALKALIZATION OF COCOA IN AQUEOUS PHASE

Ulrich Wissgott, La Tour-de-Peilz, Switzerland, assignor to Nestec S. A., Vevey, Switzerland

Filed Oct. 1, 1986, Ser. No. 914,053

Claims priority, application Switzerland, Nov. 7, 1985, 4783/85

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—262 16 Claims

1. A process for alkalizing cocoa for improving taste and dispersibility and for obtaining alkalized cocoa having a range of colors in shades of red and brown comprising:

mixing nad heating cocoa and an alkalizing agent dissolved in water in an enclosed vessel at a temperature below 110° C. under a pressure in the vessel of from above 1 atmosphere to 3 atmospheres without evaporation of water while introducing an oxygen-containing gas during at least a part of the mixing and heating to maintain the pressure of from above 1 atmosphere to 3 atmospheres for alkalizing the cocoa; and then

evaporating the water from the alkalized cocoa.

4,784,867

PROCESS FOR PREPARING FOOD PRODUCT WITH FOOD BINDER COMPOSITION

Glenn D. LaBaw, Greenwich, and Stephen E. Meyer, Wilton, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 540,643, Oct. 11, 1983, abandoned. This application Mar. 21, 1986, Ser. No. 842,753

Int. Cl.[4] A23G *3/00*

U.S. Cl. 426—309 3 Claims

1. A process for the preparation of a food product comprising individual solid food ingredients bound together by an edible binder composition, said food product exhibiting a flexibility of about 5–20 kg and a tensile strength of about 0.1–0.6 kg/cm^2, said process comprising:

(a) forming a premix comprising about 15–40% water, about 15–35% sucrose, about 0.25–1.5% lecithin and one or more non-crystallizing sugars wherein the ratio of sucrose to non-crystallizing sugar is about 1:0:0.8–3;

(b) heating the premix to about 88°–102° F.;

(c) blending into the heated premix about 15–30% fat having a Wiley Melt Point within the range of about 88°–102° F.;

(d) heating the fat-containing premix to about 240°–270° F. for a period of time sufficient to lower the water to about 5–10% and to partially caramelize the non-crystallizing sugars, whereby a substantially homogeneous binder composition is formed comprising about 5–10% water, about 15–30% fat, about 0.25–1.5% lecithin, about 15–35% sucrose and one or more partially caramelized non-crystallizing sugars wherein the ratio of sucrose to partially carmelized sugar is about 1.0:0.8–8–3;

(e) mixing the binder composition with solid food ingredients; and

(f) cooling and dividing the bound solid food ingredients into food products of desired size and shape which exhibit a tensile strength of about 0.1–0.6 kg/cm^2 and a flexibility of about 5–20 kg at ambient temperatures.

4,784,868

POTABLE SPIRIT PRODUCTION

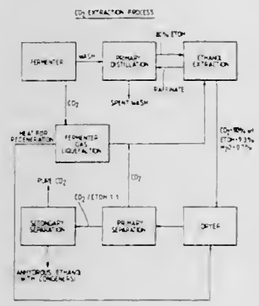
Albert T. Young, Tullibody, Scotland, assignor to United Distillers P.L.C., Scotland

Filed Jan. 20, 1987, Ser. No. 4,949

Claims priority, application United Kingdom, Jan. 17, 1986, 8601082

Int. Cl.[4] C12G *3/00;* B01D *3/14*

U.S. Cl. 426—493 12 Claims



1. A method of producing a potable spirit comprising providing a fermented wash containing ethanol, water and congeners, removing water from said fermented wash, to produce a substantially water-free mixture of ethanol and congeners, and then fractionally distilling said water-free mixture of ethanol and congeners in the absence of water to produce a potable spirit fraction containing water free potable ethanol.

4,784,869

METHOD OF BROILING FOOD PATTIES ON BOTH SIDES USING CONVEYORS

Gerald A. Bishop, 24601 Voorhess Dr., Los Altos Hills, Calif. 94022

Division of Ser. No. 784,267, Oct. 4, 1985, Pat. No. 4,667,589. This application Mar. 24, 1987, Ser. No. 30,047

Int. Cl.[4] A23L *1/01*

U.S. Cl. 426—523 3 Claims

1. A method of broiling food patties, comprising the steps of:

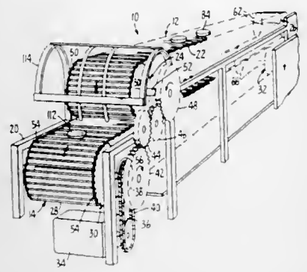
conveying the food patties on a first conveyor above and past a first burner to cook one side of the food patties, wherein said first conveyor includes an endless metal-link belt disposed between two rotating pulleys;

flipping the partially cooked food patties over and transferring the partially cooked food patties to a second conveyor disposed below said first conveyor, wherein said second conveyor includes an endless metal-link belt disposed between two rotating pulleys, and wherein said partially cooked food patties are flipped over and transferred to said second conveyor as said belt of said first conveyor rounds the pulley at the end of said first conveyor;

confining the food patties between a lower run of said first conveyor and an upper run of said second conveyor,

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wherein the belts of said first and second conveyors are driven at the same linear speed in opposite rotational directions; and



conveying the food patties past a second burner located immediately below the upper run of said second conveyor to cook the other side of the food patties.

4,784,870

PROCESS FOR PREPARING PASTE FOOD PRODUCT

Hitoshi Yokoyama; Morio Furui, both of Sennan; Katsuto Sahara, Sakai; Yukiya Iwanaga, and Toshiaki Saito, both of Sennan, all of Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 714,089, Mar. 20, 1985, abandoned. This application Jan. 2, 1987, Ser. No. 581

Claims priority, application Japan, Mar. 21, 1984, 59-54760; Aug. 10, 1984, 59-168564; Aug. 10, 1984, 59-168565

Int. Cl.[4] A23L *1/317, 1/314;* **A23C** *19/09*

U.S. Cl. 426—573 **9 Claims**



1. A process for preparing a paste product which comprises mixing a heat gellable protein-containing paste with an acidic paste in a low degree of homogeneity and heating to gelatinize the resulting mixture; the heat gellable protein-containing paste having a pH in the range of from 65 to 7.5 and being selected from the group consisting of animal meat paste, poultry meat paste, fish meat paste, shellfish meat paste, vegetable protein paste and a mixture thereof and the content thereof being not less than 50% by weight based on the total weight of the mixture; the pH of the acidic paste being at least 4 but less than 6.5 and the content thereof being not less than 5% by weight based on the total weight of the mixture; and the low degree of homogeneity being such that the cross section of 4 to 9 cm^2 at any portion of the mixture contains at least one string of said acidic paste.

4,784,871

METHOD FOR PRODUCING CALCIUM FORTIFIED YOGURT

Peter H. Park, Rochester, Minn., assignor to Marigold Foods, Inc., Minneapolis, Minn.

Filed Apr. 29, 1986, Ser. No. 857,148

Int. Cl.[4] A23C *9/13, 9/133*

U.S. Cl. 426—583 **6 Claims**

1. A method of producing a fruit-flavored yogurt fortified with a calcium salt which is undetectable in the final product visually or by mouth feel comprising the steps of:

a. providing a fruit flavoring having a pH of less than about 4.6 and comprising from about five percent to about forty percent by weight of the finished yogurt product;

b. adding an acid soluble calcium salt into the fruit flavoring, in an amount effective to provide the desired calcium enrichment, and allowing the fruit flavoring to at least partially solvate the calcium salt; and

c. combining the calcium enriched fruit flavoring with the yogurt.

4,784,872

PROCESS FOR ENCAPSULATING MICROELECTRONIC SEMI-CONDUCTOR AND LAYER TYPE CIRCUITS

Werner Moeller, Ulm, and Harald von Luettichau, Kirchheim-Oetlingen, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn, Fed. Rep. of Germany

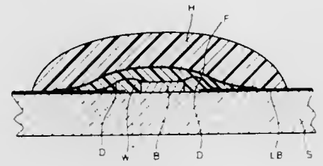
PCT No. PCT/DE85/00475, § 371 Date Jul. 16, 1986, § 102(e) Date Jul. 16, 1986, PCT Pub. No. WO86/03055, PCT Pub. Date May 22, 1986

PCT Filed Nov. 18, 1985, Ser. No. 909,118

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1984, 3442131

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—96 **12 Claims**



1. A process for encapsulating microelectronic hybrid semiconductor circuits or microelectronic semi-conductor components, comprising the following steps:

pour-coating the components (B) located on a substrate (S) with a soft, sealable plastic filling layer (W) to form an intermediate embedded product in which said component is hermetically enclosed on said substrate,

covering said intermediate product with a plastic-metal-plastic composite film or foil (F) comprising three layers,

of which a first plastic layer comprises a sealable polyolefin, preferably polypropylene, with a layer thickness of 10–100μ,

of which a second layer comprises a deformable metal with a layer thickness of 0.25–250μ,

and of which a third layer comprises an adhesive polyester with a layer thickness of 1–100μ,

and then encapsulating the pour-coated and covered component

with synthetic resin (H) so that

the first plastic layer of the film or foil is connected and intimately bonded to the sealable plastic filling layer (W) and so that

the third layer is connected and intimately bonded to the synthetic resin (H).

4,784,873

METHOD OF PRODUCING BIOLOGICAL SPECIMENS

Wilhelm Kiesecker, and Klaus Uhlmann, both of, Bad Homburg, Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,614

Claims priority, application Fed. Rep. of Germany, May 30, 1983, 3319564

Int. Cl.[4] A01N *1/02;* **A01G** *5/06*

U.S. Cl. 427—2 **1 Claim**

1. A method for producing durable flexible biological specimens from initial specimens containing tissue water comprising, removing the tissue water from the specimen in a vacuum and simultaneously treating the specimen with a water-soluble impregnating agent being polyethylene glycol having a vapor pressure lower than tissue water, regulating the vacuum pressure by continuous negative adjustment of the partial pressure gradient of the tissue water so that the tissue water is evaporated at a rate which allows direct and continuous substitution of the tissue water by the impregnating agent.

4,784,874

PROCESS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Shigeru Ohno, Yokohama; Masahiro Kanai; Shunri Oda, both of Tokyo, and Isamu Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

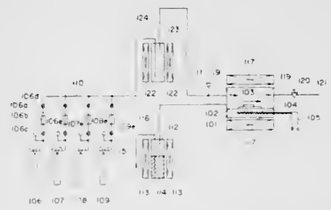
Filed Feb. 20, 1986, Ser. No. 831,448

Claims priority, application Japan, Feb. 20, 1985, 60-32208; Feb. 21, 1985, 60-33271; Feb. 22, 1985, 60-34774; Feb. 25, 1985, 60-35605; Feb. 26, 1985, 60-36764; Feb. 27, 1985, 60-36677

The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—49 **23 Claims**



1. A process for forming a deposited film comprising

separately introducing an active species (A) and an active species (B) into a film forming space housing a substrate therein, said active species (A) being formed by decomposing a compound containing carbon and a halogen; and said active species (B) being formed from a chemical substance for film formation which is chemically mutually reactive with said active species (A); and

applying heat energy to said active species (A) and active species (B) and allowing both active species (A) and active species (B) to react chemically with each other to form a deposited film on the substrate.

4,784,875

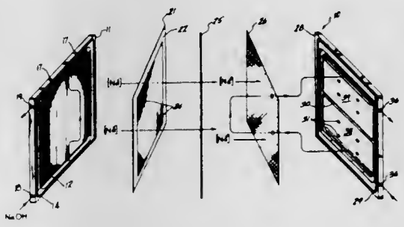
PROCESS FOR TREATMENT OF SEPARATOR FOR SODIUM HYDROSULFITE MEMBRANE CELL

David W. Cawlfield, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 088,267, Jul. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 032,803, Apr. 1, 1987, Pat. No. 4,740,287, which is a continuation-in-part of Ser. No. 944,273, Dec. 19, 1986, Pat. No. 4,743,350, which is a continuation-in-part of Ser. No. 892,518, Aug. 4, 1986. This application Jan. 19, 1988, Ser. No. 145,442

Int. Cl.[4] B05D *5/12, 3/04*

U.S. Cl. 427—126.3 **17 Claims**



1. A process for applying a solution to a polymeric mesh material and converting the solution to a hydrophilic coating while on the polymeric mesh material to increase the wettability of the surface of the polymeric mesh material, the mesh material having a predetermined open area in its surface and being used as a separator in an electrolytic membrane cell between an electrode and a membrane, the process comprising the steps of,

(a) removing surface contaminants from the polymeric mesh material;

(b) contacting the polymeric mesh material with an aqueous acidic titanium halide solution made by mixing together water, a surfactant, titanium halide and an acid selected from the group consisting of hydrochloric, hydrobromic and hydrofluoric to form an intermediate acidic titanium solution and then adding an alkali metal hydroxide to the intermediate titanium solution until the pH is in the range from about 3.0 to about 4.0;

(c) drying the titanium chloride solution onto the surface of the polymeric mesh material to form a coating thereon; and

(d) converting the coating to a titanium dioxide coating by contacting the coating with an oxidizing agent selected from the group consisting of sodium hypochlorite, calcium hypochlorite, hydrogen peroxide and chlorine dioxide.

4,784,876

SYMPATHETIC INK AND DEVELOPER SYSTEM

Haywood A. Walker, Jr., and Marvin P. Dixon, both of Liberty, Mo., assignors to Lynwood Graphics, Inc., Liberty, Mo.

Continuation of Ser. No. 948,149, Dec. 31, 1986, abandoned. This application Dec. 31, 1987, Ser. No. 142,276

Int. Cl.[4] B41M *3/12, 5/00;* **C09D** *11/10*

U.S. Cl. 427—150 **3 Claims**

1. A method of imaging a substrate with a concealed textual image, and subsequently developing the concealed textual image to render the same visable and readable, said method comprising the steps of:

imaging said substrate by imprinting thereon readable, textual characters, said imaging comprising imprinting said textual characters with a printing material including a carrier with a nickel salt dispersed therein, said carrier comprising a major portion of glycerin, said material

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being characterized by the property of being invisible to the naked eye when applied to said substrate;

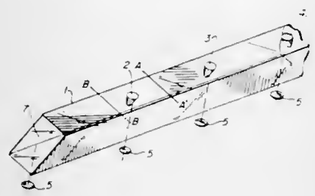
thereafter visually developing said invisible textual characters by applying thereto a liquid developer substance, said substance comprising from about 50 to 90% by weight water, from about 1 to 5% by weight dimethylglyoxime, and a quantity of a base, said dimethylglyoxime being dispersed within the developer substance for permitting a color reaction to take place between the nickel cation of said nickel salt and the dimethylglyoxime.

4,784,877

TWO LAYER COATING OF AN OPTICAL WAVEGUIDE

William P. Trumble, Kanata, Canada, assignor to Northern Telecom Limited, Canada

Filed Mar. 12, 1987, Ser. No. 25,198
Claims priority, application Canada, Nov. 5, 1986, 522264
Int. Cl.[4] B05D *5/06;* **C23C** *14/00;* **G02B** *6/22, 6/10*
U.S. Cl. 427—163 **22 Claims**



1. A method for making an optical waveguide element which comprises an optically transmissive rod compound of at least one selected from the group consisting of aryl esters, polycarbonates, polysulfones, carbonates-esters plastic alloys and aromatic ester carbonate copolymers having a predetermined cross sectional area and comprising (A) an external planar surface extending along its length in parallel with the longitudinal axis of said rod and (B) at least one cavity having (1) a longitudinal axis which is transverse to said longitudinal axis of said rod and (2) a border in said rod which defines an inclined planar surface, said method comprising the steps of

(a) coating said rod by plasma-assisted physical vapor deposition with a layer comprised of an unfused silicon oxide material having a refractive index that is lower than the refractive index of said rod; and

(b) rendering at least said inclined planar surface light-reflective by corrugating said inclined planar surface or coating said inclined planar surface with a light-reflective material.

4,784,878

SPRAY DRYING METHOD AND APPARATUS FOR CONCURRENT PARTICLE COATING

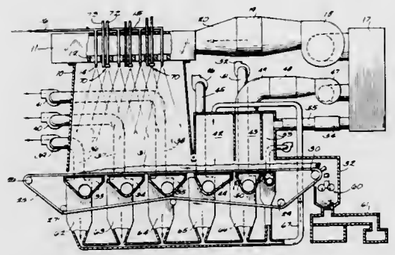
Mark P. Haak, Fond du Lac, Wis., assignor to Damrow Company, Inc., Fond du Lac, Wis.

Filed Apr. 6, 1987, Ser. No. 34,695
Int. Cl.[4] B05D *7/00;* **B01D** *1/16;* **B05B** *7/06;* **B05C** *5/00*
U.S. Cl. 427—212 **5 Claims**

1. A method of applying coating of a non-volatile substance to particles derived from a mixture of solid particles and liquid comprising the steps of:

spraying said mixture into a chamber along with a stream of heated gas to produce a mist of mixture droplets suspended in the gas to cause evaporation of the liquid from the solid particles in the droplets, and

spraying said substance into said chamber concurrently with said gas and said mixture to form a mist of substance droplets flowing in said gas stream so that the substance droplets contact said droplets of the mixture and resulting



solid particles and deposit a coating of the substance on the particles.

4,784,879

METHOD FOR PREPARING A MICROENCAPSULATED COMPOUND OF A PLATINUM GROUP METAL

Chi-Long Lee, and Robin L. Willis, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jul. 20, 1987, Ser. No. 75,790
Int. Cl.[4] C08G *77/06;* **B01J** *13/02*
U.S. Cl. 427—213.34 **8 Claims**

1. In a method for preparing a microencapsulated compound, said method comprising the following sequence of steps:

A. dispersing said compound in finely divided form in a fluid medium;

B. introducing into said medium a liquified thermoplastic organic polymer or a liquified precursor of said polymer, where said polymer is impervious to said compound,

C. depositing a solid coating of said polymer around each particle of said compound in an amount equal to at least 50 percent of the combined weight of said compound and said coating, and

D. recovering the resultant microencapsulated compound, the improvement comprising (1) selecting said compound from compounds of platinum group metals and (2) washing the recovered microencapsulated compound with a liquid that is a solvent for said compound but not for said polymer.

4,784,880

METHOD FOR MODIFYING ASYMMETRIC MEMBRANES BY ENDO-TREATING

Myron J. Coplan, Natick; R. Douglas Burchesky, and Salvatore Giglia, both of Norwood, all of Mass., assignors to Albany International Corp., Menands, N.Y.

Filed Jul. 25, 1986, Ser. No. 890,383
Int. Cl.[4] B05D *3/04, 5/00*
U.S. Cl. 427—245 **12 Claims**

1. The method of upgrading the selectivity of a dry asymmetric permselective membrane comprising a porous barrier layer adjacent to a porous main body, the barrier layer having an external surface and the main body having an external obverse surface, comprising:

(a) a wetting liquid which is not a solvent for the bulk of the membrane to said obverse surface to wet interstices of the bulk of the membrane; and

(b) drying the membrane by continuing the exposure of the external surface of the barrier layer to a drying atmosphere, the wetting liquid moving from said obverse surface through the membrane main body and the barrier layer.

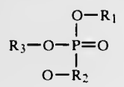
4,784,881

PROCESS FOR THE ADHESION OF POLY-P-XYLYLENE TO SUBSTRATES BY MEANS OF PHOSPHORIC ACID ESTER PRIMERS

Leonardo Fiore, Milan, and Aldo Cicuta, Novara, both of Italy, assignors to Montedison S.p.A, Milan, Italy

Filed Dec. 12, 1986, Ser. No. 940,792
Claims priority, application Italy, Dec. 19, 1985, 23300 A/85
Int. Cl.[4] C23C *16/02*
U.S. Cl. 427—255.6 **7 Claims**

1. A process for obtaining the adhesion of p-xylylene polymer to organic or inorganic solid substrates which comprises coating the substrate surface with a compound, as an adhesion promoter, having the formula:



wherein at least one of the radicals R_1, R_2 and R_3 is hydrogen and at least one of said radicals is

M being a methacrylyl or an acrylyl radical and D being a straight or branched alkylene radical containing from 2 to 6 carbon atoms, optionally halogen-substituted, then contacting said coated substrate with vapors of reactive divalent radicals of p-xylylene or derivatives thereof which polymerize after deposition onto the coated substrate surface.

4,784,882

METHOD FOR FORMING COMPOSITE POLYMER FILMS

Jeffrey D. Birdwell, Lake Jackson, and William P. Carl, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 31, 1985, Ser. No. 739,734
Int. Cl.[4] B05D *3/02;* **B32B** *27/00;* **C25B** *13/00*
U.S. Cl. 427—375 **15 Claims**

1. A method for forming composite polymer films comprising:

(a) forming a dispersion of a first perfluorinated polymer containing sites convertible to ion exchange groups and a dispersant having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands;

(b) forming a first film of the perfluorinated polymer by depositing the dispersion onto a second polymer containing ion exchange groups or sites convertible to ion exchange groups; and

(c) heating the two films for a time and at a temperature sufficient to fuse the two films to each other.

4,784,883

LIQUID CRYSTAL CELL AND METHOD OF ASSEMBLY OF SAME

Donald P. Chitwood; Raymond D. Wilson, both of Portland, and Duane A. Haven, Milwaukie, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

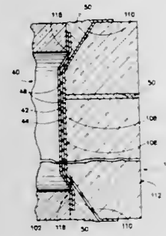
Filed May 5, 1987, Ser. No. 46,826
Int. Cl.[4] C09K *19/00*
U.S. Cl. 428—1 **4 Claims**

1. A liquid crystal cell mounted to an annular rim, comprising:

(a) a flexible substrate, the edge of the flexible substrate being attached to the rim;

(b) a rigid substrate, one surface of the rigid substrate having a substantially flat central portion and a beveled edge;

(c) spacer means positioned between the flexible and rigid substrates for maintaining space between the flexible substrate and the central portion of the surface of the rigid substrate; and



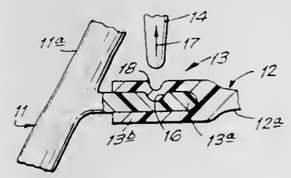
(d) bonding means for securing the beveled edge of the rigid substrate adjacent to the rim, the rigid substrate and rim being configured and arranged so that the flexible substrate is stretched when the rigid substrate is secured adjacent to the rim.

4,784,884

ARTIFICIAL PLANT AND METHOD OF MAKING SAME

Henry Weitz, Prosperity House, 8A Granville Road, Kowloon, Hong Kong

Filed Nov. 2, 1987, Ser. No. 115,414
Int. Cl.[4] A41G *1/00*
U.S. Cl. 428—26 **10 Claims**



1. In an artificial representation of a plant comprising organ simulating members respectively having rod-like and tubular connecting portions molded of thermoplastic resin and being axially interengaged to provide joints for assembling together the respective plant organ simulating member; the improvement of each of said joints having a hole fused through the respective tubular connecting portion and including a portion penetrating into the respective rod-like connecting portion interengaged therewith, the thermoplastic resin removed from said tubular connecting portion in fusing said hole therethrough collecting at least in part in said portion of the hole penetrating into said respective rod-like connecting portion and adhering to the latter for securely locking together the respective plant organ simulating members.

4,784,885

PEELABLE FILM LAMINATE

Dennis L. Carespodi, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 29, 1986, Ser. No. 902,340
Int. Cl.[4] B32B *27/32, 27/08*
U.S. Cl. 428—36.8 **14 Claims**

1. A heat sealable packaging laminate closure member for a container having a closure surface selected from the group consisting of polypropylene, high density polyethylene or linear low density polyethylene, said closure member being

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capable of forming a strong, cleanly peelable heat seal with said container, said closure member comprising:

(a) a thermoplastic heat sealable surface layer composed of a melt blend comprising between about 55 and about 95 wt. % of a substantially linear polyolefin and between about 5



and about 45 wt. % of a polyolefin thermoplastic elastomer; and

(b) a heat stable second layer which is structurally stable during heat sealing at temperatures of about 350° F. or greater and having sufficient thickness to provide structural stability during heat sealing.

4,784,886

WRAP-AROUND SLEEVE

Pierre Monget, Gondreville, and Daniel Caudron, Crepy-en-Valois, both of France, assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed May 11, 1987, Ser. No. 48,197

Claims priority, application United Kingdom, May 12, 1986, 8611494; Jul. 23, 1986, 8617972

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 428—36.1 **14 Claims**

1. A wrap-around sleeve comprising a plain weft-knitted sheet formed from at least one filament having an elastic modulus such that the sheet has a sufficiently high transverse curl force (as herein defined) that the sleeve remains wrapped around an object without separate closure means.

4,784,887

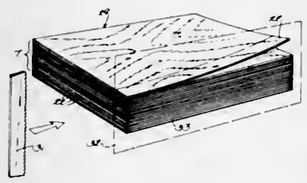
LAMINATE WOOD STRUCTURE

Carl W. Abendroth, Crystal Falls, Mich., assignor to Aga, Inc., Amasa, Mich.

Filed Sep. 8, 1986, Ser. No. 905,284

Int. Cl.⁴ B32B *3/10*

U.S. Cl. 428—54 **9 Claims**



1. A laminate wood structure in the form of a generally rectangular board having a length, a width, and a thickness, said length and said width defining a surface composed substantially entirely of edge-grain, said laminate wood structure comprising a plurality of elongate plain sawn wood strips each having exposed edge-grain along at least one edge, said wood strips being arranged in parallel stacked relationship to one another such that said surface is collectively formed by said edges of said plurality of strips.

4,784,888

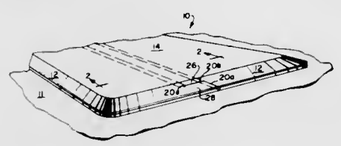
FOLDABLE PLASTIC PRODUCTS

Gary T. Schwertner, St. Joseph, Tenn., and Edward S. Robbins, III, 459 North Court, Florence, Ala. 35630, assignors to Edward S. Robbins, III, Florence, Ala.

Filed Aug. 6, 1987, Ser. No. 82,142

Int. Cl.⁴ B32B *3/08, 3/00*

U.S. Cl. 428—67 **30 Claims**



1. A foldable plastic product having a pair of surfaces bounded by sides which separate the pair of surfaces to establish therebetween an interior region consisting essentially of plastic, and integral hinge means associated with said interior region, said hinge means being formed by a continuous slit extending, when viewed in profile, at least (1) in one direction from one of said surfaces of said product towards the other of said surfaces thereof to a first location within said interior region, and then extending, (2) in a second direction different from said first direction, from said first location to a second location also within said interior region, said slit thereby establishing a flexible region which is elongated to a dimension as measured between said first and second locations generally in a direction of at least one of said pair of surfaces.

4,784,889

PRISONER LEG RESTRAINT

Jerry Daniels, 4308 Ooltewah-Ringgold Rd., Ooltewah, Tenn. 37363

Continuation-in-part of Ser. No. 2,212, Jan. 12, 1987, Pat. No. 4,728,553, which is a continuation-in-part of Ser. No. 803,650, Feb. 12, 1985, Pat. No. 4,643,932. This application Jun. 30, 1987, Ser. No. 68,020

Int. Cl.⁴ A62B *35/00;* **B60R** *22/00*

U.S. Cl. 428—100 **3 Claims**



1. Apparatus for restraining the lower limbs of a prisoner or the like within a vehicle having a door closable within a door frame of the vehicle, said apparatus comprising an elongated laminated strap having first and second plies of material bonded together, the first ply comprising a plastic sheet having hook and loop fastener elements extending from a surface thereof, the hooks extending from a location on said sheet toward one end and the loops extending from proximate said location toward the other end, said second ply comprising a vinyl sheet of the same size as said first ply, a grommet fastened to one of said ends of said strap, the second of said ends being a free end of said strap and permitting said free end to be drawn therethrough and folded over said grommet with portions of said hook and loop elements disposed in facing relationship so as to cooperatively adhere together when engaged, whereby said strap may adjustably disposed about the lower limbs of said prisoner to lock said limbs together, and a belt of finite length having a first end connected to said strap and having a

catch secured at another end, said length being sufficient such that the catch may be disposed outside the vehicle when the prisoner is within the vehicle, said catch being of a size not to slip between said door and said frame when the door is shut.

4,784,890

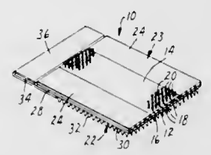
FASTENER ASSEMBLY WITH PERIPHERAL TEMPORARY ATTACHMENT LAYER

Philip D. Black, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 876,687, Jun. 20, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 111,078

Int. Cl.⁴ A44B *21/00*

U.S. Cl. 428—100 **3 Claims**



1. An elongate fastener assembly comprising:

an elongate polymeric backing strip having first and second major surfaces;

a multiplicity of stems each secured at one end to said backing strip, projecting generally normally to the first surface of said backing strip, and having enlarged heads at their ends opposite said backing strip exposed externally of said fastener assembly and adapted to engage loops on material pressed against said heads;

an open porous permanent attachment layer attached to the second major surface of said backing strip, said permanent attachment layer having sufficient open areas to afford movement of foam into said permanent attachment layer to permanently attach said fastener assembly to a foamed article;

a flexible temporary attachment layer comprising granular ferromagnetic material adapted to be attracted by magnets in a mold to temporarily hold said fastener assembly in position in the mold during the foaming process, said temporary attachment layer extending along opposite sides of the first major surface of the backing strip to afford a foam tight seal between the temporary attachment layer and the mold on opposite sides of the backing strip; and

means extending across the ends of said backing strip for restricting foam from passing between the opposite ends of the fastener assembly and the mold so that engagement of said temporary attachment layer on opposite sides of the backing strip with a mold under the influence of magnets in the mold and said means extending across the ends of said backing strip can prevent foam from moving into spaces around the heads and stems of the fastener assembly during the molding process.

4,784,891

INSULATION

Robert J. Shickel, P.O. Box 846, Essex, Conn. 06426

Filed Feb. 3, 1988, Ser. No. 151,924

Int. Cl.⁴ B32B *3/26*

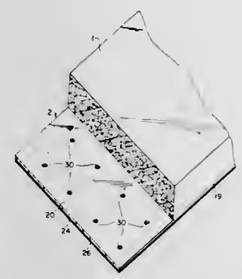
U.S. Cl. 428—137 **15 Claims**

1. In combination with a fibrous insulation medium having a face oriented toward a cold side environment and an opposite face oriented toward a warm side environment, an article providing increased efficiency to said medium as both a thermal barrier and a vapor disperser, said article comprising:

a first layer of material formed by a plastic sheet having closed cells of entrapped air with a first surface and a second opposite surface with said first surface being positioned adjoined said cold side face of said medium;

a second layer formed by a metal foil sheet having a first surface and an opposite second surface, said first surface of said foil sheet being fixed to said second surface of said first layer so that said foil sheet is spaced from said medium by said first layer; and

a third layer formed from a moisture absorbing sheet having a first surface and a second opposite surface, said first



surface of said third layer being fixed to said second surface of said foil sheet and said second surface of said third layer being directed toward said cold side environment;

said first, second and third layers further having passages extending therethrough from said first side of said first layer to said second side of said third layer to allow vapor collected within said fibrous medium to pass through said article and to regulate the passage of thermal energy through the fibrous medium and the said article.

4,784,892

LAMINATED MICROFIBER NON-WOVEN MATERIAL

Dennis G. Storey, and Peter Maddern, both of Maidstone, Great Britain, assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 12, 1986, Ser. No. 862,345

Claims priority, application United Kingdom, May 14, 1985, 8512206

Int. Cl.⁴ A61F *13/16;* **D04H** *1/54*

U.S. Cl. 428—172 **4 Claims**

1. A nonwoven three-layer laminate material having a basis weight in the range of from about 50 to about 150 gsm and consisting essentially of a coform central layer mixture of thermoplastic microfibers having a diameter generally in the range of up to about 10 microns including from about 50 to about 80 percent by weight of pulp fibers and said mixture also including superabsorbent particles held captive within said mixture of pulp and microfibers, and

on both sides of said central layer a meltblown surface layer consisting essentially of thermoplastic microfibers having a diameter generally within the range of from about 1½ to 10 microns,

said laminate being interbonded by a pattern of fused bonds serving to anchor the superabsorbent particles within said laminate, and occupying at least about 10 percent of the surface area of said laminate.

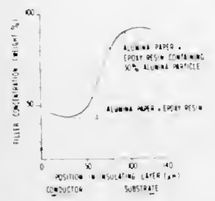
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4,784,893

HEAT CONDUCTIVE CIRCUIT BOARD AND METHOD FOR MANUFACTURING THE SAME

Yoshio Nishimoto, Kawanishi; Kiyoshi Hani, Amagasaki, and Shohei Etoh, Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,742
Claims priority, application Japan, Feb. 17, 1986, 61-21346[U]; Feb. 17, 1986, 61-32152; Feb. 25, 1986, 61-39605
Int. Cl.[4] B32B *3/00;* D21D *3/00*
U.S. Cl. 428—289 7 Claims



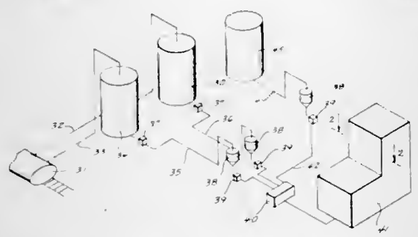
1. A heat conductive circuit board comprising:
(a) a metal substrate (3):
(b) an insulating layer (6) provided on at least one main surface of said metal substrate, said insulating layer being formed by impregnating an alumina paper with an organic polymer and a microfibrillar organic fiber as a bonding agent, said alumina paper being obtained by subjecting a material containing alumina fiber having a fiber diameter of a maximum of 50 microns and a fiber length which is at least ten times greater thant the fiber diameter as a principal component thereof in an amount in a range from 30 to 70% by weight to a paper-making process; and
(c) an electrically conductive metal foil layer (4) provided on said insulating layer.

4,784,894

MOLDED POLYMER COMPOSITE

Richard Johnstone; Edward E. Kirkham, both of Brookfield, and Edward J. Hummelt, Wauwatosa, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Mar. 23, 1984, Ser. No. 592,695
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—212 15 Claims



1. A composite for constructing an article comprising:
an aggregate formed of igneous rock material in a multiplicity of solid particles having discrete different particle sizes arranged so that the particles of one size are disposed in the interstices formed between the particles of the next larger size and compacted in a manner to result in a high degree of rock-to-rock contact with a minimum number and volume of voids between the solid particles; and
a solidified plastic resin filling said voids between said solid particles, said solidified resin providing a bonding material for said solid particles.

4,784,895

MAGNETIC RECORDING MEDIUM AND PROCESS FOR THE PREPARATION OF THE SAME

Chiaki Mizuno; Hiroshi Ogawa; Shinji Saito; Minoru Kanazawa, and Naoyoshi Chino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1988, Ser. No. 172,812
Claims priority, application Japan, Mar. 28, 1987, 62-74886
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—212 11 Claims



1. A magnetic recording medium comprising a nonmagnetic support, a first magnetic recording layer and a second magnetic recording layer, superposed in order, wherein:
the coercive force of the second magnetic recording layer is in the range of 400 to 2,000 Oe, the ratio of said coercive force to the coercive force of the first magnetic recording layer being in the range of 1.0 to 2.5;
the mean longitudinal length of the magnetic powder contained in the second magnetic recording layer is not longer than 0.35 μm, the ratio of said mean longitudinal length to the mean longitudinal length of the magnetic powder contained in the second magnetic recording layer being in the range of 0.4 to 1.0; and
a mixed area of compositions of the first magnetic recording layer and the second magnetic recording layer which has a thickness ranging from 0.1 to 1.1 μm provided between the first and second magnetic recording layers.

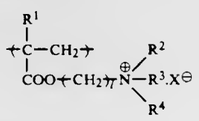
4,784,896

HEAT TRANSFER RECORDING SHEET

Teruo Matsunaga; Kazunobu Natori, both of Sagamihara, and Tamaki Kanai, Machida, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 21, 1986, Ser. No. 921,057
Claims priority, application Japan, Oct. 25, 1985, 60-237623; Oct. 30, 1985, 60-241717
Int. Cl.[4] B32B *27/06;* B41M *5/26*
U.S. Cl. 428—215 15 Claims

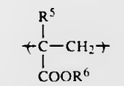
1. A heat transfer recording sheet comprising
(A) a substrate film, and
(B) formed on at least one surface of the substrate film, a film of an acrylic copolymer composed mainly of the recurring units of formula (1)



(1)

wherein
R^1 represents a hydrogen atom or a methyl group.

R^2 represents a hydrogen atom or an alkyl group having 1 to 5 carbon atoms,
R^3 and R^4 are identical or different and each represents an alkyl or hydroxyalkyl group having 1 to 5 carbon atoms,
X represents a halogen atom, and
l is 2, 3, or 4, and recurring units of the following formula (2)



(2)

wherein R^5 represents a hydrogen atom or a methyl group, and R^6 represents a hydrogen atom or a methyl, ethyl or hydroxyethyl group.

4,784,897

COVER LAYER MATERIAL ON A BASIS OF MATTING OR FABRIC

Heinrich Brands, Duisburg; Siegfried Fiebig, Marktheidenfeld, and Hans Schillings, Viersen, all of Fed. Rep. of Germany, assignors to Fiebig & Schillings GmbH, Marktheidenfeld, Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 796,935
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1984, 3408932
Int. Cl.[4] B32B *9/00, 5/16*
U.S. Cl. 428—219 15 Claims

1. A cover layer material on a matting or fabric basis for the manufacture of boards from liquid or liquid-containing starting components, covered bilaterally with cover layers, especially for the manufacture of gypsum boards and polyurethane (PU) hard foam boards, said matting or fabric having on one side a coating of 70 to 94 wt.-% of a powdered inorganic material and 6 to 30 wt.-%, absolutely dry weight, of a binding agent.

11. The cover material of claim 1, wherein the matting or fabric has a specific weight between 35 and 350 g/m^2, and the application weight of the coating is between 150 and 450 g/m^2.

4,784,898

HIGH SONAR TRANSMISSION COMPOSITION

Ram S. Raghava, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 13, 1987, Ser. No. 109,007
Int. Cl.[4] D03D *3/00*
U.S. Cl. 428—225 21 Claims

1. A high sonar transmission composition, comprising:
a plastic composite containing at least one layer of a low sound level loss material, at least one layer of a high tensile strength material, and a relatively rigid binder bonding said layers together, the amount of said low sound level loss material being an effective amount so that said composite has a sound level loss of about 4 decibels or less at 100 kilohertz.

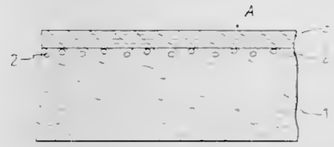
4,784,899

ELECTROCONDUCTIVE NONWOVEN FABRIC-RESIN COMPOSITE ARTICLES AND METHOD FOR PRODUCTION THEREOF

Nobuhiro Ono; Hiroyuki Kitamura, and Masanori Nishiura, all of Ueno, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed Mar. 16, 1987, Ser. No. 27,183
Claims priority, application Japan, Mar. 17, 1986, 61-60230
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—236 18 Claims

1. A method for producing a fiber-resin composite molded article having the properties of substantially uniformly reflecting and shielding electromagnetic waves, which composite placing, on a mold for compression molding having a desired molding surface, an effective amount of an electroconductive nonwoven fabric for a surface layer, a woven fabric for an intermediate layer adjacent to the nonwoven fabric, and a molding material for a substrate layer containing at least a liquid resin material and a reinforcing fiber, wherein at least said nonwoven fabric out of said nonwoven fabric and said



woven fabric is not substantially impregnated with liquid resin material; subjecting the resulting molding materials to depressurization treatment in the mold at a vacuum pressure of not higher than 360 mmHg; and then, prior to substantial gelation of said liquid resin material of said substrate layer, subjecting the molding materials to compression molding.

4,784,900

METHOD FOR SIZING POLYTRETRAFLUOROETHYLENE FABRICS

William P. Carl, Angleton, and Jeffrey D. Birdwell, Lake Jackson, both of Tex., assignors to University of Bath, Bath, United Kingdom

Continuation of Ser. No. 739,956, May 31, 1985, Pat. No. 4,650,711. This application May 9, 1986, Ser. No. 861,400
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] B32B *7/00;* D03D *3/00;* D06M *15/00*
U.S. Cl. 428—265 31 Claims

1. A method for sizing polytetrafluoroethylene fabrics comprising:
(a) contacting a polytetrafluoroethylene fabric with a sizing composition of a perfluorinated polymer containing sites convertible to ion exchange groups and a treating agent having: a boiling point less than about 110° C.; a density of from about 1.55 to about 2.97 grams per cubic centimeter; and a solubility parameter of from greater than about 7.1 to about 8.2 hildebrands; and
(b) removing the treating agent from the sizing composition thereby depositing the perfluorinated polymer onto the surface of the polytetrafluoroethylene fabric.

16. The sized fabric produced from the method of claim 1.

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FLEXIBLE PRINTED CIRCUIT BOARD BASE MATERIAL

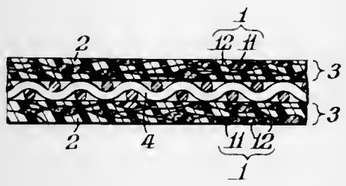
Minoru Hatakeyama, Sakuragaokanishi; Kosuke Moriya, and Ichiro Komada, both of Okayama, all of Japan, assignors to Japan Gore-Tex, Inc., Tokyo, Japan

Filed Apr. 13, 1987, Ser. No. 37,412
Int. Cl.[4] B32B *17/10*
U.S. Cl. 428—268 3 Claims

1. A flexible printed circuit board base material comprising

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a composite of an expanded, porous PTFE base sheet having cured bismaleimide-triazine resin impregnated within the pores



of the base sheet, wherein said base material is laminated to a glass cloth.

4,784,902

COMPONENTS THAT CAN EXHIBIT LOW SMOKE, TOXIC FUME AND BURNING CHARACTERISTICS, AND THEIR MANUFACTURE

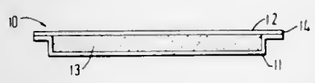
Geoffrey Crompton, 55 Arbour St., Southport, Merseyside, United Kingdom PR8 6SQ

Filed Sep. 16, 1986, Ser. No. 907,880

Claims priority, application United Kingdom, Sep. 19, 1985, 8523190; Dec. 17, 1985, 8531017; Jun. 20, 1986, 8615045

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—283 **13 Claims**



1. A component comprising a composite of at least first and second layers of fibrous material impregnated with phenolic resin and an intervening layer of a foamed insulating material, wherein the fibrous material is further impregnated with frits and a binding agent.

4,784,903

FIBROUS MAT FOR HOT MOLDING TO MOLDED ARTICLES

Gunter H. Kiss, Bahnhofstrasse 15, D-6443 Sontra 1, Fed. Rep. of Germany

Filed Aug. 28, 1987, Ser. No. 90,663

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629891

Int. Cl.[4] B32B *5/06*

U.S. Cl. 428—299 **8 Claims**

1. A fibrous mat for hot molding to molded articles comprising:

a central layer of a tangled fibrous material and an associated binder, said layer having opposed extended surfaces; and

at least one surface layer of a tangled fibrous material and an associated binder in superimposed contact with one of the extended surfaces of said central layer, the heat resistant fibrous material of said surface layer having a weight per unit area of 10 to 100 g/m^2 prior to the addition of the said associated binder, and subsequently being coated with a precondensed binder so as to achieve a 1.4 to 1.75 diameter ratio between the coated and previously uncoated fibers, the proportion by weight (g/m^2) of the binder to the uncoated fibrous material in said surface layer being 1.2:1. said surface layer at least in the unmolded phase having a higher tensile strength than the central layer, and possessing the characteristics of a moisture regulating membrane in the molded phase.

4,784,904

REINFORCED SHAPED ARTICLE

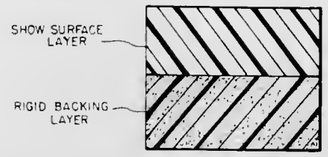
Richard Wood, Blackburn, and Gerald N. Nicholl, Bury, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 1, 1986, Ser. No. 880,729

Claims priority, application United Kingdom, Jul. 1, 1985, 8516617

Int. Cl.[4] B32B *5/20;* **C08J** *9/08;* **B29C** *67/22*

U.S. Cl. 428—317.9 **10 Claims**



1. Shaped article having a show surface of thermoplastic material with a reinforcement of a rigid polyurethane or polyisocyanurate foam, characterised in that the foam is substantially free from halocarbon blowing agent.

4,784,905

THERMOSENSITIVE IMAGE TRANSFER RECORDING MEDIUM

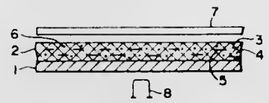
Akira Suzuki, Mishima; Nobuo Mochizuki, Shizuoka; Motoo Tasaka, Susono, and Mitsuru Hashimoto, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,763

Claims priority, application Japan, Mar. 1, 1985, 60-038868; Mar. 1, 1985, 60-038869; Jun. 27, 1985, 60-138987; Jun. 27, 1985, 60-138986; Jul. 29, 1985, 60-166024; Jul. 29, 1985, 60-166020; Jul. 31, 1985, 60-167477; Aug. 1, 1985, 60-168562; Sep. 2, 1985, 60-192098; Oct. 1, 1985, 60-216187; Nov. 11, 1985, 60-250894; Nov. 14, 1985, 60-253723

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—321.3 **26 Claims**



1. A thermosensitive image transfer recording medium comprising a support material and a thermofusible ink layer formed thereon, comprising a fine porous resin structure made of a resin containing therein (a) a coloring agent, and (b) a carrier material for holding said coloring agent at normal temperatures and for carrying said coloring agent out of said thermofusible ink layer for image formation upon application of heat thereto, and an image gradiation control agent comprising a pigment which is more wetting and more compatible with said resin of said fine porous resin than with said carrier material, and remains in said fine porous resin structure, without being transported from said porous resin structure when thermal energy is applied to said recording medium.

4,784,906

PACKAGING MATERIAL FOR PHOTOSENSITIVE MATERIALS FOR PHOTOGRAPHIC PURPOSE

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1986, Ser. No. 905,159

Claims priority, application Japan, Sep. 11, 1985, 60-138016[U]

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] B32B *5/16;* **B65D** *65/40*

U.S. Cl. 428—324 **11 Claims**

1. A packaging material for photographic photosensitive

materials which comprises a simultaneously coextruded multilayer film layer comprising a light-absorptive light-shielding thermoplastic resin layer containing more than 50 wt.% based on the resin content of layer of low-pressure linear low-density polyethylene resin, 0.1 to 15 wt.% of carbon black and 0.01 to 1 wt.% of a lubricant and being located as the inner layer and



a light-reflective light-shielding thermoplastic resin layer containing a thermoplastic resin and a light-reflective material being located as the outer layer.

4,784,907

MAGNETIC RECORDING MEDIUM

Akihiro Matsufuji; Akira Kasuga; Shigeo Komine; Yasuyuki Yamada, and Hajime Miyatsuka, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1986, Ser. No. 944,068

Claims priority, application Japan, Dec. 20, 1985, 60-288936

Int. Cl.[4] G11B *5/702*

U.S. Cl. 428—328 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer provided on the support, said magnetic recording layer comprising a binder and a ferromagnetic powder dispersed therein, which is characterized in that:

said magnetic recording layer comprises a fatty acid ester lubricant and a lubricant other than the fatty acid ester lubricant;

said binder is composed of a resin component comprising a vinyl chloride copolymer resin containing a repeating unit which has a polar group and having a glass transition point of not lower than 50° C. and a polyurethane resin containing a repeating unit which has a polar group and having a glass transition point of lower than 50° C., a ratio by weight of said vinyl chloride copolymer resin to said polyurethane resin being in the range of 70/30 to 30/70; and

at least one resin of said resins contains a repeating unit having at least one polar group selected from the group consisting of $-SO_3M$, $-OSO_3M$ and $-PO(OM')_2$, wherein M is hydrogen or an alkali metal atom, and M' is hydrogen, an alkali metal atom or a lower hydrocarbon group.

4,784,908

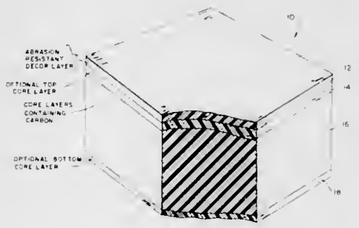
STATIC DISSIPATIVE LAMINATE FOR WORK SURFACES

Israel S. Ungar, Randallstown; Robin D. O'Dell, Pasadena; Alice Simon, Glen Burnie, and Joseph A. Lex, Pasadena, all of Md., assignors to Nevamar Corporation, Odenton, Md.

Continuation-in-part of Ser. No. 843,649, Mar. 25, 1986, abandoned. This application Aug. 13, 1987, Ser. No. 84,803

Int. Cl.[4] B32B *9/00, 9/06, 27/10*

U.S. Cl. 428—332 **20 Claims**



1. A decorative, static dissipative, high pressure laminate comprising a plurality of consolidated layers including a plurality of carbon containing core layers impregnated with thermoset core resin containing up to 6% by weight based on the weight of the resin solids of an ionic salt; and

a decor layer above said core layers, said decor layer having an abrasion resistant covering thereon and impregnated with thermoset resin containing 1–7% by weight of an ionic salt and an humectant in an amount sufficient to provide a surface resistance no greater than about 2×10^9 at a relative humidity of 17%.

4,784,909

ANTI-FUNGUS, DEODORANT FIBER MATERIAL

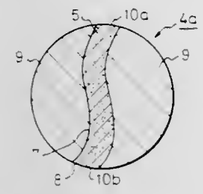
Shingo Emi, Daito, and Tamio Mitamura, Kobe, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 16, 1987, Ser. No. 97,155

Claims priority, application Japan, Sep. 16, 1986, 61-217774; Sep. 16, 1986, 61-217775; Sep. 16, 1986, 61-217776; Sep. 16, 1986, 61-217777

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—357 **22 Claims**



1. An anti-fungus, deodorant fiber material comprised of:

(a) a first fiber comprised of a first thermoplastic polymer containing at least 8% based on the weight of said fiber material, of a deodorant material and

(b) a second fiber comprised of a second thermoplastic polymer containing at least 1% based on the weight of said fiber material, of fine copper particles,

said first nd second syntheitc fibers being evenly blended with each other.

4,784,910

METHOD FOR GIVING ELECTRIC CONDUCTIVITY TO MOLDED POLYMER ARTICLE

Shoichi Nagai; Saburo Hiraoka; Mitsuo Senga, and Shinji Hama, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1986, Ser. No. 884,145

Claims priority, application Japan, Jul. 15, 1985, 60-155813

Int. Cl.[4] B32B *9/00*

U.S. Cl. 428—389 **10 Claims**

1. A method for giving electric conductivity to a molded polymer article which comprises heat-treating a molded polymer article in an aqueous solution consisting essentially of a copper salt, a reducing sulfur compound, and 0.1 to 10% by weight, based on the copper salt, of a water-soluble basic salt of a nitrogen-containing organic compound having at least 12 carbon atoms, to form a conductive layer comprising copper sulfide on the surface layer of the molded polymer article.

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4,784,911

THREE-DIMENSIONAL MULTI-COLOR PLASTIC PARTS AND METHOD OF MAKING SAME

John C. Gembinski, Dover; Robert A. Grimmer, Rollinsford, and Patricia A. Betzig, Dover, all of N.H., assignors to Ex-Cell-O Corporation, Walled Lake, Mich.

Continuation of Ser. No. 653,279, Sep. 24, 1984, abandoned. This application Jul. 15, 1986, Ser. No. 885,884

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—402 **2 Claims**

1. In a three-dimensional multi-colored plastic part for vehicular interior or exterior use having fused granular particles formed by casting plastic particles against a heated mold surface for fusing the particles together, the improvement comprising:

two or more types of pigmented granular particles, each of the individual granular particles having a diameter in the range of 300 to 400 microns and incuding a core of porous resin material of 250–350 micron size and an outer layer of submicron pigment particles in a dried liquid carrier which coats said core;

each type of particles having a light transmission which varies from that of the other types of pigmented granular particles;

individual ones of said stacked particles having discrete cores fused to form a solid part, said solid part haing non-patterned, color-blended fused fringe zones formed between each of said discrete cores, said fused fringe zones filling the voids therebetween and said discrete cores retaining the individual light transmission properties of the individual ones of the particles.

4,784,912

LATEX PARTICLES INCORPORATING STABILIZED FLUORESCENT RARE EARTH LABELS

James R. Schaeffer, Penfield; Tsang J. Chen, Rochester, and Michael A. Schen, Wellsville, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 713,202, Mar. 18, 1985, Pat. No. 4,735,907. This application Oct. 26, 1987, Ser. No. 112,302

Int. Cl.[4] B32B *27/32;* **G01N** *33/546*

U.S. Cl. 428—402 **4 Claims**

1. A fluorescent label comprising a fluorescent rare earth chelate incorporated into a polymeric particle which is derived from a loadable latex having a discontinuous phase and an aqueous phase,

said discontinuous phase consisting essentially of a polymer comprising:

(a) from about 50 to about 96 weight percent of recurring units derived from a water-insoluble ethylenically unsaturated polymerizable monomer,

(b) from about 2 to about 30 weight percent of recurring units derived from a nonionic water-soluble or water-dispersible ethylenically unsaturated polymerizable monomer, and

(c) from about 2 to about 20 weight percent of recurring units derived from an anionic ethylenically unsaturated polymerizable monomer containing at least one carboxy group.

4,784,913

MAGNETIC RECORDING MEDIUM

Katsuya Nakamura; Eitaro Nakamura, both of Tokyo, and Makoto Yamamoto, Hiratsuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,588

Claims priority, application Japan, Nov. 10, 1986, 61-266831

Int. Cl.[4] G11B *5/702*

U.S. Cl. 428—411.1 **13 Claims**

1. A magnetic recording medium comprising a base and a magnetic layer formed on at least one surface of said base, said magnetic layer comprising a magnetic powder and a binder, said binder being an adduct of a tertiary amine compound with a vinyl chloride copolymer containing an epoxy group, said adduct having an average degree of polymerization of 100 to 900, an epoxy group content of at least 0.5 wt. %, a quaternary ammonium group content of 0.05 to 0.5 wt. % in terms of the amount of nitrogen atoms in the ammonium group, and a vinyl chloride content of at least 60 wt. %.

8. A magnetic recording medium comprising a base and a magnetic layer formed on at least one surface of said base, said magnetic layer comprising a magnetic powder and a binder, said binder being a radical copolymer of vinyl chloride, a radical-polymerizable monomer having an epoxy group copolymerizable with the vinyl chloride and a radical-polymerizable monomer having a quaternary ammonium group polymerizable with the vinyl chloride, said radical copolymer having an average degree of polymerization of 100 to 900, an epoxy group content of at least 0.5 wt. %, an ammonium group content of 0.05 to 0.5 wt. % in terms of the amount of nitrogen atoms in the ammonium group, and a vinyl chloride content of at least 60 wt. %.

4,784,914

MAGNETIC RECORDING MEDIUM

Akihiro Matsufuji; Akira Kasuga; Shigeo Komine; Yasuyuki Yamada, and Hajime Miyatsuka, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1986, Ser. No. 944,114

Claims priority, application Japan, Dec. 20, 1985, 60-288935

Int. Cl.[4] G11B *5/702*

U.S. Cl. 428—418 **8 Claims**

1. A magnetic recording medium comprising a nonmagnetic support and a magnetic recording layer provided on the support, said magnetic recording layer comprising a binder and a ferromagnetic powder dispersed therein, which is characterized in that said binder is composed of a resin component comprising:

a vinyl chloride copolymer containing a repeating unit having at least one polar group selected from the group consisting of $-SO_3M$, $-OSO_3M$, and $-PO(OM')_2$, wherein M is hydrogen or an alkali metal atom, and M' is hydrogen, an alkali metal atom or a lower hydrocarbon group, and a repeating unit having a epoxy group in an amount of from 1 to 30 mol%; and

a polyurethane resin containing a repeating unit having at least one polar group selected from the group consisting of $-SO_3M$, $-OSO_3M$, and $-PO(OM')_2$, wherein M and M' have the same meanings as defined above;

the ratio between the vinyl chloride copolymer and the polyurethane resin being in the range of from 85:15 to 10:90 by weight.

4,784,915

POLYMER PIEZOELECTRIC FILM

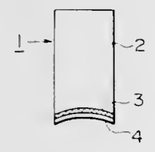
Teruo Sakagami; Kenichi Nakamura, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,835

Claims priority, application Japan, Aug. 16, 1983, 58-148785; Aug. 24, 1983, 58-153125

Int. Cl.[4] H01L *41/08, 41/18;* **C08F** *214/28*

U.S. Cl. 428—421 **7 Claims**



1. A polymer piezoelectric film, comprising a cast and poled film of a vinylidene fluoride copolymer said copolymer being in a form and having a molecular weight to provide a solution suitable for forming into a film by the casting method and comprising 40 to 90 mol. % of vinylidene fluoride and 10 to 60 mol. % of trifluoroethylene and having an inherent viscosity of 3.0 dl/g or more as measured in a dimethylformamide solution at a concentration of 0.4 g/dl at 30° C. and said film having an electromechanical coupling factor k_t of 0.22 or greater.

4,784,916

BILAYER WINDSHIELD AND PREFORMED TWO-PLY SHEET FOR USE THEREIN

Jean L. Bravet; Daniel Colmon, both of Thourotte; Gerard Daude, Villeneuve D Oron, and Michel J. Moncheaux, Compiegne, all of France, assignors to Saint Gobain Vitrage, Courbevoir, France

Continuation of Ser. No. 629,370, Jul. 10, 1984, abandoned. This application Apr. 2, 1987, Ser. No. 33,873

Claims priority, application France, Jul. 11, 1983, 83 11506; Jul. 11, 1983, 83 11507; Jul. 11, 1983, 83 11508

Int. Cl.[4] B32B *17/10. 27/40*

U.S. Cl. 428—423.1 **18 Claims**

1. A preformed flexible multi-ply transparent sheet effective for use in a bilayer glazing laminate, having optical, moisture-resistant, and energy-absorbing properties effective for use in a bilayer glazing laminate, one ply of which comprises a self-healing thermoset polymeric material, the other ply of which comprises an energy-abosrbing polyurethane ply which is substantially non-tacky at room temperature but which is capable of itself being adhesive under the influence of heat and pressure, wherein said sheet is capable of maintaining, in the absence of an adhesion promoter, effective adhesion as measured by the temperature and moisture conditions of ANSI-Z26 Test Nos. 3 and 4, said energy-absorbing polyurethane being prepared by reactive casting a solvent-free mixture of monomers; and wherein said multi-ply transparent sheet is produced by:

(1) depositing on a horizontal support a liquid film comprising a solvent-free mixture of monomers capable of forming a thermoset polymeric material;

(2) forming a solid underlying film of said thermoset polymeric material by polymerizing the monomers while on said support;

(3) depositing on said supported underlying film a liquid film comprising:

(a) an aliphatic or a cycloaliphatic diisocyanate containing about 2 to about 10 wt. % of urea groups,

(b) a polyol component including

(i) about 30 to about 45 OH equivalent percent of a polymeric diol having a molecular weight of about 500 to about 3,000,

(ii) about 20 to about 70 OH equivalent percent of a chain extender diol having a molecular weight of less than about 300, and

(iii) about 0 to about 35 OH equivalent percent of a polyol having a OH functionality greater than 2; and

(c) a polyurethane catalyst, wherein the NCO/OH ratio of said mixture is about 0.8:1 to about 1:1;

(4) forming a solid, optical, energy-absorbing overlying polyurethane ply within about an hour, thereby forming said multi-ply sheets; and

(5) removing said multi-ply sheet from said support.

4,784,917

THERMOSETTING RESIN COMPOSITION AND LAMINATE AND PROCESS FOR THE PRODUCTION THEREOF

Keiko Tawara, Ibaraki; Akira Nagai, Hitachi; Akio Takahashi, Hitachiota; Katuo Sugawara, Hitachi; Masahiro Ono, Hitachi; Ritsuro Tada, Mito; Motoyo Wajima, Hadano, and Toshikazu Narahara, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

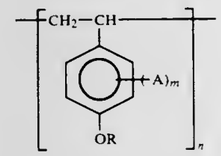
Filed Apr. 22, 1986, Ser. No. 854,507

Claims priority, application Japan, Apr. 23, 1985, 60-85497

Int. Cl.[4] B32B *17/10, 27/08, 27/34*

U.S. Cl. 428—441 **8 Claims**

1. A laminated board obtained from a prepreg impregnated with a synthetic resin which is a thermosetting resin composition consisting essentially of (a) a prepolymer consisting of a poly(p-hydroxystyrene) derivative represented by the general formula:



[I]

wherein A represents a hydrogen or halogen atom, R represents an alkenyl or alkenoyl group having 2 to 4 carbon atoms, m represents a number in the range of from 1 to 4, and n represents a number in the range of from 1 to 100, (b) a 1,2-polybutadiene or a derivative thereof and (c) a radical polymerization initiator.

4,784,918

COMPOSITIONS AND COATINGS OF PHOSPHORUS-CONTAINING FILM FORMERS WITH ORGANO SILANE AND COATED SUBSTRATES

Michael W. Klett, and Balbhadra Das, both of Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 30, 1987, Ser. No. 31,630

Int. Cl.[4] B32B *9/04;* **C09D** *5/16;* **C08F** *283/00;* **C08G** *79/02*

U.S. Cl. 428—447 **24 Claims**

1. A curable, chemical mixture for forming a flame retardant coating on hydroxyl-containing and/or inorganic oxide-containing surfaces, comprising:

(a) phosphorus-containing film former having functionalities selected from the group consisting of hydroxyl and methylol or mixture thereof, and

(b) at least one nucleophilic organo silane selected from the group consisting of organo silanes capable of undergoing nucleophilic reaction with hydroxyl radical displacement and organosilanes capable of Michael addition type of reaction via a nucleophilic phosphine compound.

4,784,919

TRANSFER PAPER FOR IMPARTING STEREOGRAPHIC PATTERN AND MANUFACTURING METHOD THEREOF

Isao Tokuno, Sakai, and Shuzo Ohara, Kawanishi, both of Japan, assignors to Goyo Paper Working, Ltd., Osaka, Japan

PCT No. PCT/JP86/00577, § 371 Date Jun. 17, 1987, § 102(e) Date Jun. 17, 1987, PCT Pub. No. WO87/02944, PCT Pub. Date May 21, 1987

PCT Filed Nov. 12, 1986, Ser. No. 74,400

Claims priority, application Japan, Nov. 15, 1985, 60-257461

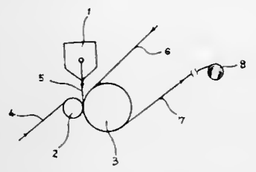
Int. Cl.[4] B32B *27/00, 31/00*

U.S. Cl. 428—500 **2 Claims**

1. A transfer paper for imparting a stereographic pattern formed by transferring a specific stereographic pattern printed

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on a synthetic resin sheet to a release layer of a release paper comprising a base material and said release layer provided thereupon, said synthetic resin sheet being formed of at least one member selected from the group consisting of polyesters, polyamides, polycarbonates, polyacetals and polypropylene,



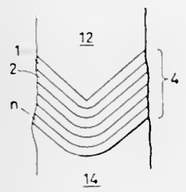
said base material being selected from the group consisting of paper, cloth, synthetic resin films, metal foils and laminates of metal foils and synthetic resins, and said release layer being formed of at least one member selected from the group consisting of poly-4-methylpentene-1, polypropylene, ethylene-propylene copolymer and silicone resins.

4,784,920

THIN FIBER-REINFORCED PLASTIC COMPOSITE PLATE AND METHOD OF MOLDING THE SAME

Terufumi Machida, No. 6-8-9-406, Tsurukawa, Machida-shi, Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,362
Claims priority, application Japan, May 6, 1986, 61-102168
Int. Cl.[4] B32B *17/12*
U.S. Cl. 428—542.8 **7 Claims**



1. A reinforced plastic structure including a plurality of laminated non-planar fiber-reinforced plastic plates having respective predetermined shapes and being fused together, said plastic structure being produced by a process comprising the steps of:

molding and laminating said plurality of fiber-reinforced plastic plates to obtain an incompletely hardened molded structure, each said plate being separately molded in a shape which approximates the corresponding predetermined shape of said plate when fused together with the other plates; and

hardening said molded structure including pressing and heat fusing said molded structure.

4,784,921

ALUMINUM ALLOY AUTOMOTIVE MATERIAL

M. E. Hyland, Forest Hills, and Warren H. Hunt, Jr., Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 794,467, Nov. 4, 1985. This application Jun. 29, 1987, Ser. No. 66,953
Int. Cl.[4] B32B *15/20*
U.S. Cl. 428—654 **40 Claims**

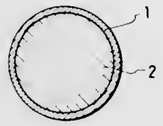
38. A plural panel vehicular structural member having spaced generally parallel inner and outer panels connected along peripheral portions thereof, said panels comprised of an alloy consisting essentially of 0.5 to 0.85% Si, 0.25 to 0.48% Mg, 0.05 to 0.40% Fe, 0.7 to 1.1% Cu, 0.1 to 0.5 wt. % Mn, the balance essentially aluminum and incidental elements and impurities and said inner panel being deep drawn product and formed in mild steel forming dies to produce said deep drawn product having a shape substantially identical to mild steel formed in said dies.

4,784,922

CORROSION-RESISTANT CLAD STEEL AND METHOD FOR PRODUCING THE SAME

Tsuneo Yoshimura, Tokyo, Japan, assignor to Mitsubishi Steel Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1986, Ser. No. 914,915
Claims priority, application Japan, Oct. 11, 1985, 60-224898; Oct. 11, 1985, 60-224899; Nov. 11, 1985, 60-250893; Nov. 20, 1985, 60-258673; Dec. 2, 1985, 60-269247
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—681 **16 Claims**



1. A corrosion resistant, high strength clad steel comprising a core made of a steel bar and a cladding made of a corrosion resistant metallic material and tightly covering the circumference of said core, the interface between said core and said cladding being metallurgically bonded, wherein said core is made of a composition consisting essentially of, by weight percentages, 0.10 to 0.50% carbon, 0.15 to 0.60% silicon, 0.20 to 3.00% manganese, 0.005 to 0.03% nitrogen and at least one ingredient selected from the group consisting of up to 0.30% vanadium, up to 0.20% niobium, up to 0.20% titanium and up to 0.005% boron and the balance consisting essentially of iron.

4,784,923

HARD METAL ALLOY WITH SURFACE REGION ENRICHED WITH TANTALUM, NIOBIUM, VANADIUM OR COMBINATIONS THEREOF AND METHODS OF MAKING THE SAME

Donald E. Graham, St. Clair Shores, Mich., assignor to Carboloy Inc., Warren, Mich.

Continuation-in-part of Ser. No. 767,127, Aug. 19, 1985, abandoned. This application Jun. 19, 1986, Ser. No. 876,189
Int. Cl.[4] B32B *9/00, 19/00*
U.S. Cl. 428—698 **22 Claims**

1. A method of producing a cemented carbide hard metal alloy having a surface region enriched with at least one of the carbides, nitrides and carbonitrides of tantalum, niobium or vanadium or combinations thereof comprising:

(a) depositing by chemical vapor deposition a layer of at least one of the carbides, nitrides and carbonitrides of titanium, hafnium and zirconium on the surface of a cemented hard metal alloy to a thickness of about 1 to about 5 microns, said cemented carbide hard metal alloy comprising (i) a first component being at least one of the carbides, nitrides and carbonitrides of tantalum, niobium and vanadium or combinations thereof, (ii) at least one binder metal, and (iii) optionally, a second component being at least one of the carbides, nitrides and carbonitrides of titanium, hafnium and zirconium such that the atomic percent ratio of the optional second component to the first component is in the range of from 0 to about 1.5;

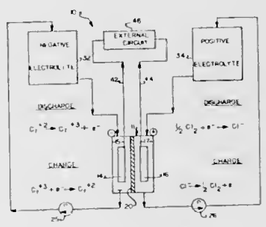
(b) heating the layered hard metal alloy to a temperature of at least about 1290° C. and for a time sufficient to form said surface enriched region.

4,784,924

METAL-HALOGEN ENERGY STORAGE DEVICE AND SYSTEM

Robert F. Savinell, Akron, and Chung-Chiun Liu, Cleveland, both of Ohio, assignors to University of Akron, Akron, Ohio

Continuation of Ser. No. 449,524, Dec. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 271,578, Jun. 8, 1981, Pat. No. 4,370,292. This application May 23, 1984, Ser. No. 613,370
Int. Cl.[4] H01M *8/04*
U.S. Cl. 429—15 **20 Claims**



1. A metal-halogen energy storage device, comprising:

an electro-chemical cell, said cell having a microporous separator, said cell having a temperature of from about 0° C. to about 100° C.;

a positive electrode and a negative electrode located in said cell, said microporous separator separating said positive electrode and said negative electrode and forming a chamber for each said electrode;

a negative fluid, said negative fluid located in said negative electrode chamber, said negative fluid having ions therein selected from the group consisting of tin, titanium, vanadium, and chrome; and

a positive fluid, said positive fluid located in said positive electrode chamber, said positive fluid having a halogen gas and halogen ions therein.

4,784,925

PRIMARY ELECTROCHEMICAL CELL CONTAINING MOLECULAR IODINE

Keith A. Klinedinst, Marlborough, and William D. K. Clark, Wayland, both of Mass., assignors to Whittaker Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 538,464, Oct. 3, 1983. This application Nov. 8, 1985, Ser. No. 809,747
Int. Cl.[4] H01M *4/00*
U.S. Cl. 429—29 **14 Claims**

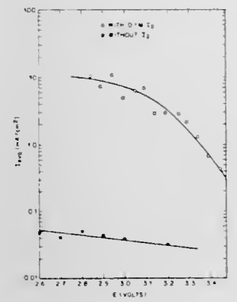
1. An electrochemical cell comprising

an oxidizable anode material;

a cathode current collector;

an electrolytic solution, in contact with the anode material and the cathode current collector;

said electrolytic solution consisting essentially of reducible liquid cathode material, an electrolyte solute dissolved in the reducible liquid cathode material for imparting conductivity to the electrolytic solution, and molecular iodine



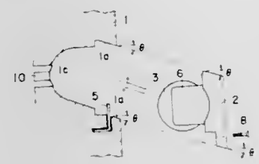
for catalyzing the electroreduction of the liquid cathode material.

4,784,926

CONSTRUCTION OF BATTERY COMPARTMENT

Takao Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1987, Ser. No. 94,759
Claims priority, application Japan, Feb. 26, 1987, 62-43297
Int. Cl.[4] H01M *2/10*
U.S. Cl. 429—96 **6 Claims**



1. In a device which requires battery replacement, the improvement comprising:

a main body having a side wall;

a battery compartment formed in the said side wall, said battery compartment having an associated locking member, a battery receiving portion and a pair of opposed inlet walls, said inlet walls being at an angle θ, said angle being inclined with respect to normal, relative to said side wall; and

a cover body having a battery receiving portion, a pair of opposed sides inclined at said angle for mating engagement with said inlet walls and means for attachment with said locking member.

4,784,927

ELECTROCHEMICAL CELL USING IODINE MONOCHLORIDE

Keith A. Klinedinst, Marlborough, and William D. K. Clark, Wayland, both of Mass., assignors to Whittaker Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 538,464, Oct. 3, 1983. This application Dec. 19, 1985, Ser. No. 826,531
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—196 **16 Claims**

1. An electrochemical cell comprising

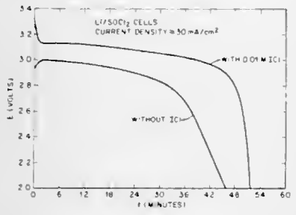
an oxidizable anode material;

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a cathode current collector of inert electrically conductive material; and

an electrolytic solution, in contact with the anode material and the cathode current collector;

said electrolytic solution consisting essentially of a reducible liquid cathode material which is electrochemically re-



duced on the cathode current collector, an electrolyte solute dissolved in the reducible liquid cathode material for imparting conductivity to the electrolytic soltuion, and a small quantity of iodine monochloride which catalyzes the electroreduction of the liquid cathode material on the cathode current collector.

4,784,928

REUSABLE ELECTROPHOTOGRAPHIC ELEMENT

Hsin-Chia Kan, Fairport; Bruce R. Benwood, Churchville, and William J. Staudenmayer, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,851

Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—58 **6 Claims**

5. An electrophotographic copying method which comprises:

forming a uniform electrostatic charge on the surface layer of an electrophotographic element which is adapted to receive charged toner particles for transfer to a receiver element, said surface layer comprising an uncrosslinked binder resin, a photoconductor and, heterogeneously dispersed in said layer as a separate phase, finely divided particles of an abhesive substance which is non-conductive and spreadable to form a thin film having low surface adhesion, exposing the surface layer to a pattern of actinic radiation, applying charged toner particles to the surface layer to develop the resulting latent image pattern, transferring and fixing the developed image to a receiver sheet, and obtaining a transferred fixed image on the receiver sheet, which is substantially free of hollow characters.

4,784,929

PHOTOSENSITIVE MEMBER WITH HYDRAZONE AND/OR AZINE CHARGE TRANSPORT MATERIAL

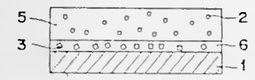
Hideaki Ueda, Kawanishi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1987, Ser. No. 51,619

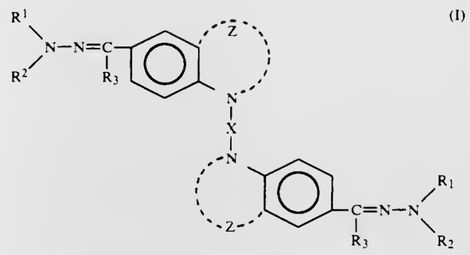
Claims priority, application Japan, May 21, 1986, 61-116677

Int. Cl.[4] G03G *5/09, 5/14*

U.S. Cl. 430—59 **8 Claims**

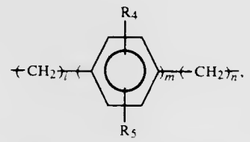


1. A photosensitive member containing a hydrazone and/or an azine compound represented by one of the following general formulaes (I) and (II):

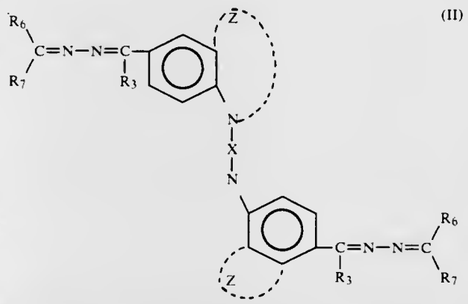


(I)

wherein R_1 and R_2 independently are any of alkyl group, aralkyl group, aryl group and heterocyclic group, where each group may have a substituent; R_1 and R_2 may combinedly form a ring; R_3 is any of a hydrogen atom, alkyl group, aralkyl group, aryl group and heterocyclic group, where the aralkyl group, aryl group and heterocyclic group may have a substituent; X is represented by the formula:



wherein R_4 and R_5 independently are any of a hydrogen atom, halogen atom, alkyl group, alkoxy group, aralkyl group, aryl group, aryloxy group, and aralkyloxy group, where each group may have a substituent; l and n independently are an integer 0 through 6; m is an integer 0 through 2; and Z is a heterocyclic group forming a ring containing a nitrogen atom, which may have a substituent;



(II)

Wherein R_3, X and Z are the same as in (I); R_6 and R_7 independently are any of a hydrogen atom, alkyl group, aryl group and heterocyclic group, where each group may have a substituent; and R_6 and R_7 may combinedly form a ring and further comprising a photoconductive material.

6. The photosensitive member of claim **1**, which consists essentially of a charge generating layer, a charge transporting layer and an electroconductive substrate wherein the charge transporting layer consists of the hydrazone compound and/or azine compound dispersed in a binder.

4,784,930

ELECTROSTATOGRAPHIC ENCAPSULATED TONER

Akira Hatakeyama, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 29, 1987, Ser. No. 8,304

Claims priority, application Japan, Jan. 29, 1986, 61-17264

Int. Cl.[4] G03G *9/16*

U.S. Cl. 430—138 **6 Claims**

1. In an electrostatographic encapsulated toner comprising a core material which comprises a binder, a colorant and a magnetizable particle, said binder comprising a polymer and an oily liquid capable of dissolving or swelling said polymer, and a shell enclosing said core material, the improvement wherein a surface of said magnetizable particle is coated with a polymer being essentially insoluble in the oily liquid.

4,784,931

METHOD FOR FORMING DYE TRANSFER IMAGE USING AMPHOTERIC SURFACE ACTIVE AGENT

Yasuo Aotsuka; Masakazu Yoneyama, and Hideki Naito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1987, Ser. No. 12,465

Claims priority, application Japan, Feb. 7, 1986, 61-24113; Jul. 23, 1986, 61-171680

Int. Cl.[4] G03C *5/54, 1/90*

U.S. Cl. 430—203 **8 Claims**

1. A method for forming an image comprising heating a light-sensitive element in the presence of water and at least one of base and a base precursor after or simultaneously with imagewise exposure to light thereof, said light-sensitive element comprising support having provided thereon a light-sensitive layer comprising a light-sensitive silver halide emulsion, a binder, and a dye providing substance which forms or releases a diffusible dye upon heating, and transferring said diffusible dye thus formed or released to a dye fixing layer of a dye fixing element, wherein at least one of said light-sensitive element and said dye fixing element contains an amphoteric surface active agent, wherein said water is supplied from exterior the light-sensitive element and the dye fixing element and is supplied in an amount of from 0.1× the weight of all layers comprising the light-sensitive element and the dye fixing element to the weight of water corresponding to the maximum swelling volume of all the layers in the light-sensitive element and dye fixing element.

4,784,932

IMAGE-FORMING METHOD EMPLOYING LIGHT-SENSITIVE MATERIAL AND IMAGE-RECEIVING MATERIAL

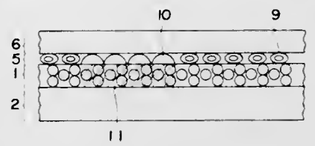
Taku Nakamura, and Keiji Takeda, both of Minami-ashigara, Japan; assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 11, 1987, Ser. No. 24,758

Claims priority, application Japan, Mar. 11, 1986, 61-55503; May 30, 1986, 61-124952; May 30, 1986, 61-124953

Int. Cl.[4] G03C *5/54, 1/68, 5/00*

U.S. Cl. 430—203 **10 Claims**



1. An image-forming method which comprises;

imagewise exposing a light-sensitive material comprising a light-sensitive layer provided on a support wherein the light-sensitive layer containing silver halide, a reducing agent, a polymerizable compound containing carbon to carbon unsaturation and a color image forming substance;

simultaneously or thereafter developing the light-sensitive material to polymerize the polymerizable compound within the area where the latent image of the silver halide has been formed, and thereby fixing the color image forming substance on the support within the area;

pressing the light-sensitive material on an image-receiving material comprising an image-receiving layer provided on a support wherein the image-receiving layer contains a granulated thermoplastic compound, to transfer the unfixed color image forming substance to the image-receiving material, wherein the color image forming substance is a color former and the image-receiving layer of said image-receiving material further contains a developer in a space formed by the grains of the thermoplastic compound, and

heating the image-receiving material.

4,784,933

METHOD FOR MAKING LITHOGRAPHIC PRINTING PLATE USING LIGHT WAVELENGTHS OVER 700 μM

Eiji Kanada; Yasuo Tsubai; Akira Tanaka; Toshiro Kondo; Yoshikazu Takaya; Masahiko Saikawa, and Hiroshi Nishinoiri, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 12, 1986, Ser. No. 929,477

Claims priority, application Japan, Nov. 12, 1985, 60-254202; Aug. 14, 1986, 61-191476

Int. Cl.[4] G03C *5/54;* **G03F** *7/06*

U.S. Cl. 430—204 **14 Claims**

1. A method for making a lithographic printing plate which comprises imagewise exposing to light of wavelength greater than 700 mμ, a light sensitive material which comprises a support and at least a silver halide emulsion layer and a surface physical development nuclei layer provided on the support, said emulsion layer comprising silver halide grains which contain at least silver bromide and containing at least one sensitizing dye having a maximum spectral sensitivity in the region of longer than 700 mμ and then developing the exposed light sensitive material with a silver complex diffusion transfer developer containing at least a thiocyanate.

4,784,934

SENSITIVITY OF PROCESSLESS RECORDING MEDIA

David F. Lewis, Monroe, Conn.; Mark L. Moskowitz, Wayne, N.J., and Steward E. Purdy, Binghamton, N.Y., assignors to GAF Corporation, Wayne, N.J.

Continuation of Ser. No. 941,885, Dec. 15, 1986, Pat. No. 4,734,355, which is a continuation-in-part of Ser. No. 773,487, Sep. 9, 1985, abandoned. This application Dec. 8, 1987, Ser. No. 130,267

The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.

Int. Cl.[4] G03C *1/72, 1/78*

U.S. Cl. 430—270 **7 Claims**

1. A process for improving radiant energy sensitivity of an image-receptive, normally crystalline polyacetylene compound which comprises: (a) dissolving said polyacetylene compound in n-butanol to reduce crystal size of said normally crystalline polyacetylene compound to form polyacetylene microcrystals, (b) dispersing the polyacettylene microcrystals in a non-solvating liquid to form a liquid dispersion containing from about 1 to about 50% polyacetylene solids and (c) ageing said dispersion at a temperature between about −78° C. and about 12° C. for a period of from about 0.25 hour to about 30 days and completing said ageing before drying said dispersion prior to imaging with said radiant energy.

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4,784,935

METHOD OF PRODUCING A PASSIVE OPTICAL DEVICE INCLUDING AT LEAST ONE REFLECTION GRATING

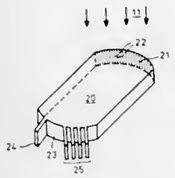
Wolfgang Ehrfeld, Karlsruhe, and Dietrich Münchmeyer, Stutensee, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Apr. 1, 1987, Ser. No. 32,638

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611246

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—321 **9 Claims**



1. Method of producing a passive optical device having optical components including at least one reflection grating, at least one port for polychromatic light and a plurality of ports for monochromatic light, comprising:

producing the optical components of said device utilizing X-ray depth lithography so that the grating lines of the reflection grating are parallel to the direction of X-ray radiation emitted as part of said X-ray depth lithography.

4,784,936

PROCESS OF FORMING A RESIST STRUCTURE ON SUBSTRATE HAVING TOPOGRAPHICAL FEATURES USING POSITIVE PHOTORESIST LAYER AND POLY(VINYL PYRROLIDONE) OVERLAYER

Lawrence K. White, W. Windsor Township, Mercer County, and Nancy A. Miszkowski, Lawrenceville, both of N.J., assignors to General Electric Company, Fairfield, Conn.

Continuation-in-part of Ser. No. 791,146, Oct. 24, 1985, abandoned. This application Sep. 9, 1986, Ser. No. 905,077

Int. Cl.[4] G03F *7/26*

U.S. Cl. 430—323 **9 Claims**

1. A process of forming a patterned resist structure on a substrate having topographical features comprising:

(a) depositing onto the substrate a layer of positive photoresist material;

(b) depositing over the photoresist layer a layer consisting essentially of poly(vinyl pyrrolidone) to a thickness from over 0.5 up to 1.5 times the height of the tallest topographical feature;

(c) pattern irradiating the structure with radiation that the positive photoresist material is radiation sensitive to;

(d) removing the poly(vinyl pyrrolidone) layer; and

(e) developing the photoresist layer by removing radiation exposed areas, whereby a portion of the substrate is exposed.

5. A process of forming a patterned resist structure on a substrate having topographical features comprising;

(a) coating the substrate with a layer of material which is absorptive at the light frequency utilized to irradiate said structure;

(b) coating the absorptive layer with a layer of positive photoresist material;

(c) coating the photoresist layer with a layer consisting essentially of poly(vinyl pyrrolidone) to a thickness from over 0.5 up to 1.5 times the height of the tallest topographical feature;

(d) coating the poly(vinyl pyrrolidone) layer with a layer of an opaque contrast enhancement material, that portion of which when irradiated by the light utilized to irradiate the structure becomes substantially transmissive of said light;

(e) pattern irradiating the structure with light;

(f) removing the contrast enhancement layer;

(g) removing the poly(vinyl pyrrolidone) layer;

(h) developing the photoresist layer by removing radiation exposed areas, whereby a portion of the absorptive layer is exposed; and

(i) removing the exposed portion of the absorptive layer thereby exposing the underlying portion of the substrate.

4,784,937

DEVELOPING SOLUTION FOR POSITIVE-WORKING PHOTORESIST COMPRISING A METAL ION FREE ORGANIC BASE AND AN ANIONIC SURFACTANT

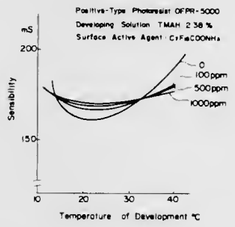
Hatsuyuki Tanaka, Samukawa; Hidekatsu Kohara, Chigasaki; Yoshiyuki Sato, Samukawa; Shingo Asaumi, Fujisawa; Toshimasa Nakayama, Hiratsuka; Akira Yokota, Yamato, and Hisashi Nakane, Yokohama, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Aug. 4, 1986, Ser. No. 892,646

Claims priority, application Japan, Aug. 6, 1985, 60-171833; Aug. 6, 1985, 60-171834

Int. Cl.[4] G03C *3/18*

U.S. Cl. 430—331 **2 Claims**



1. A developing solution for positive-working photoresist compositions which comprises:

(a) an aqueous medium;

(b) an organic basic compound free from metal ions in an an amount sufficient to obtain a pH between 11.0 and 13.5; and

(c) a fluorine-containing surface active agent in a concentration in the range from of 50 to 5000 ppm by weight, based on the amount of the developing solution, said fluorine-containing surface active agent being selected from the group consisting of an ionic fluorine-containing compounds represented by the general formula R_fCOOM and R'_fSO_3M, wherein R_f and R'_f are each a monovalent hydrocarbon group having from 2 to 20 carbon atoms, of which at least a part of the hydrogen atoms are replaced with fluorine atoms, and M is an atom or group selected from the group consisting of hydrogen, ammonium, quaternary ammonium of the formula NR_4, wherein each R is independently hydrogen or an alkyl group having 1 to 3 carbon atoms.

4,784,938

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keiji Obhayashi; Shinichi Nakamura; Shigeo Tanaka; Mitsuhiro Okumura, all of Hino; Masanobu Miyoshi, Odawara; Makoto Kajiwara, Odawara; Kaoru Onodera, Odawara, and Eiichi Sakamoto, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1986, Ser. No. 920,243

Claims priority, application Japan, Oct. 22, 1985, 60-236213; Jul. 31, 1986, 61-180975

Int. Cl.[4] G03C *1/40*

U.S. Cl. 430—505 **7 Claims**

1. A silver halide color photographic light-sensitive material comprising a reflective support having thereon a plurality of photographic structural layers including emulsion layers which comprise at least one blue-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer, at least one red-sensitive silver halide emulsion layer, and one non-light-sensitive layer adjacent to two of said emulsion layers, said emulsion layers containing dye-forming couplers, wherein;

said non-light-sensitive leyer and at least one other of said photographic structural layers include a nitrogen-containing heterocyclic mercapto antifogging compound.

4,784,939

PHOTOTHERMOGRAPHIC ELEMENTS

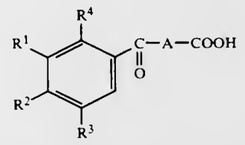
Oanh Van Pham, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 2, 1987, Ser. No. 92,226

Int. Cl.[4] G03C *1/34*

U.S. Cl. 430—607 **19 Claims**

1. A photothermographic emulsion comprising photosensitive silver halide, silver oxidizing compound, reducing agent for silver ion, and a binder which contains a fog-suppressing effective amount of a compound having the formula



wherein

R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen, halogen, cyano and nitro, with the proviso that at least one of R^1, R^2, R^3 and R^4 are other than hydrogen, and

A is selected from the group consisting of arylene, alkylene, aralkylene and alkarylene.

4,784,940

QUANTITATION OF CANCER PROCOAGULANT ACTIVITY IN SERUM

Stuart G. Gordon, Denver, Colo., assignor to Mesa Medical, Inc., Wheat Ridge, Colo.

Filed Jun. 26, 1987, Ser. No. 67,295

Int. Cl.[4] C12Q *1/56;* **G01N** *33/48*

U.S. Cl. 435—4 **12 Claims**

1. A method for detecting cancer procoagulant activity in blood serum comprising the steps of:

(a) obtaining a blood sample of animal or human blood;

(b) removing essentially all cellular material from said sample;

(c) dissociating said cancer procoagulant from other proteins present in said sample;

(d) denaturing said other proteins in said sample without denaturing said cancer procoagulant;

(e) separating said other proteins from said cancer procoagulant; and



(f) analyzing said sample for said cancer procoagulant by determining cancer procoagulant activity.

4,784,941

EXPRESSION AND DIAGNOSTIC USE OF PENV-3 ENCODED PEPTIDES WHICH ARE IMMUNOLOGICALLY REACTIVE WITH ANTIBODIES TO LAV

Susan M. Watanabe, Seattle; Wesley L. Cosand, Bothell; Susan McArdle, and Bruce M. Travis, both of Seattle, all of Wash., assignors to Genetic Systems Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 721,237, Apr. 8, 1985. This application Oct. 2, 1985, Ser. No. 783,299

Int. Cl.[4] G01N *33/545, 33/53;* **C12Q** *1/70*

U.S. Cl. 435—5 **17 Claims**



1. A protein which comprises a portion of the LAV envelope protein comprising the amino acid sequence of FIG. **5**, starting with isoleucine, number 1, and ending with threonine, number 173, which protein is immunologically reactive with antibodies of LAV.

4,784,942

MONOCLONAL ANTIBODIES AGAINST AUTOIMMUNE RNA PROTEINS

John B. Harley, Oklahoma City, Okla. 73103, assignor to The Board of Regents for the University of Oklahoma, Norman, Okla.

Filed Nov. 5, 1984, Ser. No. 670,000

Int. Cl.[4] G01N *33/564, 33/577*

U.S. Cl. 435—7 **42 Claims**

17. A method for detecting the presence of antibodies against an autoimmune RNA protein selected from the group consisting of Ro/SSA and La/SSB in a biological sample, comprising:

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contacting a composition selected from at least one of monoclonal antibodies against the selected autoimmune RNA protein and immunologically active fragments of such antibodies, in a reaction zone with a stoichiometric excess of the autoimmune RNA protein, under conditions permitting antibodyprotein binding, to produce a reactive substrate;

removing unbound components from the reaction zone;

contacting the biological sample with the reactive substrate in the reaction zone, under conditions permitting antibody-protein binding; and assaying for antibody-protein reaction occurring in the reaction zone after the sample is contacted therewith.

4,784,943

ICE NUCLEATION IMMUNOASSAY

Gareth J. Warren, San Francisco, and Paul K. Wolber, Hayward, both of Calif., assignors to Advanced Genetic Sciences, Inc., Oakland, Calif.

Filed May 22, 1987, Ser. No. 53,126

Int. Cl.[4] G01N *33/532, 33/533;* **C12N** *15/00*

U.S. Cl. 435—7 **35 Claims**

1. In a method for carrying out immunoassays involving immunological reactions of immunochemical counterparts wherein one of said immunochemical counterparts is linked to a label and wherein the immunoassay determination is related to measurement for the presence of label, the improvement which comprises using a biological ice nucleating agent as the label.

4,784,944

PROTHROMBIN TIME DETERMINING REAGENT AND METHODS OF USING AND PREPARING THE SAME

Hans-Jürgen Kolde, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Fed. Rep. nf Germany

Filed Apr. 5, 1985, Ser. No. 720,348

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1984, 3413311

Int. Cl.[4] C12Q *1/56;* **G01N** *33/86*

U.S. Cl. 435—13 **13 Claims**

1. A reagent for the photometric determination of prothrombin time, comprising a freeze-dried mixture of a thromboplastin having proteolytic activity, hexadimethrine bromide and an ANBA chromogenic substrate for thrombin, wherein the substrate is such that it is converted by the thromboplastin, in aqueous suspension in the presence of calcium ions, to the extent of less than 0.00125 times its initial concentration per hour at 37° C.

4,784,945

METHOD FOR DETERMINING LIPIDS

Joseph D. Artiss, Windsor, Canada; Dennis Bozimowski, Ballwin, Mo.; Robert J. McEnroe, Royal Oak, and Bennie Zak, Southfield, both of Mich., assignors to Board of Governors of Wayne State University, Detroit, Mich.

Filed Oct. 30, 1986, Ser. No. 925,720

Int. Cl.[4] C12Q *1/26, 1/34, 1/28;* **G01N** *33/92*

U.S. Cl. 435—25 **15 Claims**

1. A method for the determination of mixed lipids in a liquid which comprises:

(a) providing a thin layer chromatographic plate having a stationary phase as the thin layer which separates the mixed lipids;

(b) applying the liquid containing the mixed lipids to the stationary phase on the plate so that the mixed lipids separate into separated bands of individual lipids upon migration with a mobile phase;

(c) reacting the individual lipids with an aqueous solution comprising a hydrolase enzyme, an oxidase enzyme, a peroxidase enzyme and chromogen precursor(s), wherein the hydrolase enzyme catalyzes ester hydrolysis products from the lipids, the oxidase enzyme produces hydrogen peroxide by reaction with the hydrolysis products which in turn reacts in the presence of the peroxidase enzyme with the chromogen percursor(s) to form an oxidized chromogen complex(es) which is water insoluble so that the chromogen complex(es) remains in the band on the stationary phase; and

(d) determining the individual lipids in the thin stationary phase by means of the chromogen complex(es).

4,784,946

METHOD FOR ASSAYING THE GAMMA-INTERFERON PRODUCTIVITY OF BLOOD

Masakazu Mitsuhashi, Okayama, Japan, assignor to Kabushiki Kaisha Hayashihara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 17, 1985, Ser. No. 809,756

Claims priority, application Japan, Dec. 30, 1984, 59-280697; Dec. 30, 1984, 59-280698

Int. Cl.[4] C12Q *1/02*

U.S. Cl. 435—29 **18 Claims**

1. A clinical assay for detecting human cancer, said method comprising the steps of:

(a) collecting fresh human whole blood from a patient suspected of having cancer;

(b) incubating said human whole blood at a temperature in the range of 30–40° C. for 10–90 hours while exposing it to an anticoagulant and a gamma-interferon inducer (IFN-gamma inducer); and

(c) determining the level of HulFN-gamma in the resultant culture

(d) comparing said level of HulFN-gamma against a standard determined by measuring the HulFN-gamma productivity of whole blood collected from a healthy patient and incubated under the conditions of step (b)

(e) whereby an HulFN-gamma level obtained by said culturing of said blood of said suspected cancer patient which is significantly lower than said standard indicates the presence of cancer.

4,784,947

FLASH-PHOTOMETER FOR NEPHELOMETRIC DETERMINATIONS

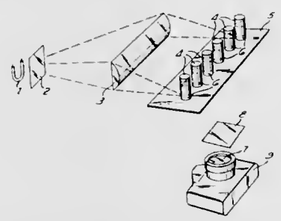
Hans G. Noeller, 1942 Deerpark Dr., #92, Fullerton, Calif. 92631

Continuation of Ser. No. 281,220, Jul. 7, 1981, abandoned. This application May 18, 1984, Ser. No. 611,913

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026089

Int. Cl.[4] C12Q *1/20, 1/06;* **C12M** *1/34*

U.S. Cl. 435—33 **5 Claims**



2. A method for determining the susceptibility of bacteria to antibiotics which comprises:

arranging a plurality of samples of liquid solutions comprising said bacteria and various antibiotic compositions in containers having substantially the same geometry;

simultaneously exposing each of said samples to a high intensity pulse of light in a first direction to cause light to radiate from said samples in a second direction;

exposing a photosensitive film to said radiated light to produce a plurality of zones of various degrees of exposure on said film corresponding to said samples;

comparing the optical density of said zones on the developed film as an indication of the susceptibility of said bacteria to said antibiotic compositions; and

assessing the most appropriate antibiotic and selecting it for use.

4,784,948

PRODUCTION OF STREPTOCOCCAL M PROTEIN IMMUNOGENS AND MOLECULAR PROBES

June R. Scott, Atlanta, Ga., and Vincent A. Fischetti, West Hempstead, N.Y., assignors to The Rockefeller University, New York, N.Y. and Emory University, Atlanta, Ga.

Continuation-in-part of Ser. No. 521,962, Aug. 10, 1983, abandoned. This application Jun. 18, 1984, Ser. No. 621,716

Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 5/00, 7/00*

U.S. Cl. 435—68 **41 Claims**

1. A process for producing a streptococcal M protein polypeptide having at least one immunoreactive and antigenic determinant comprising:

(a) culturing a prokaryotic unicellular organism containing a recombinant plasmid comprising a DNA sequence coding for a streptococcal M protein polypeptide having at least one immunoreactive and antigenic determinant capable of being replicated, transcribed and translated in the unicellular organism; and

(b) isolating said polypeptide from the culture.

4,784,949

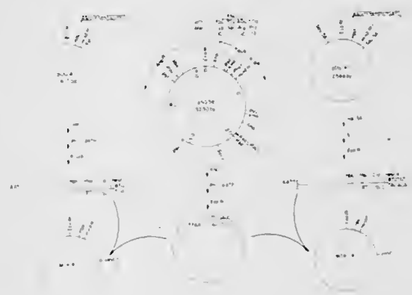
UNIVERSAL DOMINANT SELECTABLE MARKER CASSETTE

David H. Gelfand; Frances C. Lawyer, both of Oakland, and Susanne Stoffel, El Cerrito, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Apr. 19, 1984, Ser. No. 602,118

Int. Cl.[4] C12P *21/00;* **C12N** *15/00, 1/20;* **C07H** *15/12*

U.S. Cl. 435—68 **29 Claims**



1. A DNA sequence cassette encoding a dominant selectable marker effective in procaryotic and in eucaryotic transformants which comprises:

an ATG start codon in reading frame with the codons of a modified truncated aminoglycoside phosphotransferase-I (APH-I) gene, designated herein mtAPH-I, and at least one cassette-unique restriction site upstream of and proximal to the ATG start codon,

said mtAPH-I defined herein as the coding sequence for APH-I modified so as to retain the amino acid sequence encoded by the APH-I gene, but to eliminate any restriction site otherwise duplicative of said cassette-unique restriction site, and truncated by deletion of codons encoding at least one amino acid in positions 2-10 inclusive.

4,784,950

EXPRESSION OF FACTOR VII ACTIVITY IN MAMMALIAN CELLS

Frederick S. Hagen; Mark J. Murray; Sharon J. Busby; Kathleen L. Berkner, all of Seattle; Margaret Y. Insley, Woodinville; Richard G. Woodbury, and Charles L. Gray, both of Seattle, all of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 724,311, Apr. 17, 1985. This application Dec. 16, 1986, Ser. No. 810,002

Int. Cl.[4] C12N *15/00;* **C12P** *21/02;* **C07H** *15/12;* **C07K** *13/00*

U.S. Cl. 435—68 **32 Claims**

1. A DNA construct comprising a DNA sequence encoding Factor VII.

4,784,951

HYBRID CELL LINE FOR PRODUCING MONOCLONAL ANTIBODY TO ANTIGEN ON HUMAN THYMOCYTES

Patrick C. Kung, Bridgewater, and Gideon Goldstein, Short Hills, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Division of Ser. No. 100,072, Dec. 4, 1979, Pat. No. 4,364,395. This application Oct. 4, 1982, Ser. No. 432,461

Int. Cl.[4] A61K *39/00;* **G01N** *33/577*

U.S. Cl. 435—172.2 **6 Claims**

1. A hybridoma having the identifying characteristics of TCC CRL 8022.

4,784,952

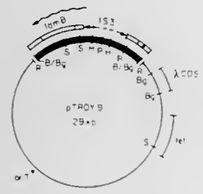
CONFERRED SUSCEPTIBILITY TO LAMBDA PHAGE IN NON-COLIFORM PROCARYOTIC HOSTS

Robert A. Ludwig, Santa Cruz, Calif., and Gert E. de Vries, Leiden, Netherlands, assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 656,693, Oct. 1, 1984, abandoned. This application Mar. 21, 1985, Ser. No. 715,124

Int. Cl.[4] C12P *19/34;* **C12N** *15/00, 1/20;* **C07H** *15/12*

U.S. Cl. 435—91 **18 Claims**



1. A recombinant DNA sequence which comprises the DNA sequence encoding lamB protein under control of a constitutive promoter.

10. A method to obtain a DNA sequence capable of constitutive expression of lamB in a non-coliform procaryotic host which comprises:

(a) selecting constitutive lamB producing *E. coli* cells;

(b) excising the lamB expression system by digesting the genomic DNA of the selected cells with one or a plurality of restriction endonuclease (s);

(c) cloning the DNA digest from (b) into a broad host range vector to obtain a precursor plasmid;

(d) cotransforming a target procaryotic host cell with the precursor plasmid of (c) and an additional narrow host range vector containing a sequence encoding a selectable

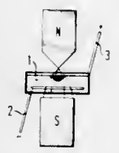
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marker in the target host which sequence is ligated to DNA homologous to lamB;
(e) selecting transformants for the selectable marker;
(f) removing the selective pressure, and screening for loss of the selectable marker; and
(g) recovering said lamB expression system DNA sequence.

4,784,953
PROCESS AND MICROORGANISM FOR DEGRADING STEROIDS
Joachim Schindler, Hilden, and Rolf Schmid, Dusseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Continuation of Ser. No. 361,685, Mar. 25, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 620,537
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113053
Int. Cl.[4] C12P *17/06;* **C12N** *15/00, 1/20;* **C12R** *1/01*
U.S. Cl. 435—125 **7 Claims**

1. A process for the preparation of 3aα-H-4α-(3'-propionic acid)-5α-hydroxy-7aβ-methyl-hexahydro-1-indanone and the δ-lactone thereof comprising culturing a steroid compound of animal or plant origin with a microorganism mutant Chol 149-K14 (DSM 2065) in an aqueous nutrient medium under aerobic conditions to degrade the steroid compound to said indanone, and recovering said indanone and the δ-lactone derivative thereof.

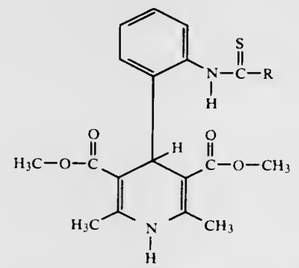
4,784,954
PROCEDURE AND DEVICE FOR THE FUSION OF CELLS
Ulrich Zimmermann, Hürtgenwald-Gey, Fed. Rep. of Germany, assignor to Kerforshungsanlage Julich, Fed. Rep. of Germany
Filed Jun. 11, 1984, Ser. No. 619,013
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321238
Int. Cl.[4] C12N *15/00, 13/00, 5/00*
U.S. Cl. 435—172.2 **14 Claims**



1. A process of fusing cells comprising the steps of:
doping the cells in a cell suspension with magnetic particles;
exposing the cells to a nonhomogeneous magnetic field which permeates a fusion space containing said cell suspension in such a way that the doped cells collect together at a distance from each other that will enable said cells to be fused to an adjacent cell;
exposing the cells to an external nonhomogeneous electrical field with a frequency in the range from 5 kHz to 2 MHz and an intensity of between 10V/cm and 2000V/cm, depending on the size of the cells, for a time period sufficient to enable the cells to line up, after the cells collect in the area of the highest field density of the magnetic field;
exposing the cells to a means for creating disruptions in the membrane structure of the adjacent cells which results in fusion of the cells when the cells contact each other.

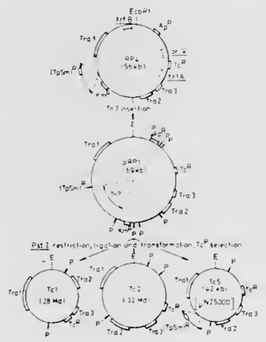
4,784,955
IMMUNOGEN CONJUGATES AND THE USE THEREOF IN A DIHYDROPYRIDINE ASSAY
Kevin P. Campbell, Iowa City, Iowa, assignor to Miles Inc., Elkhart, Ind.
Continuation-in-part of Ser. No. 653,699, Sep. 21, 1984, abandoned. This application Feb. 3, 1986, Ser. No. 825,572
Int. Cl.[4] G01N *33/531, 33/537, 33/577*
U.S. Cl. 435—172.2 **14 Claims**

1. 1,4-dihydropyridine immunogen conjugates of the formula:



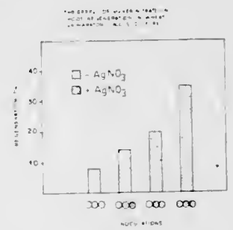
wherein R is bovine serum albumin, casein, ovalbumin or keyhole limpet hemocyanin.

4,784,956
VECTOR
Nigel J. Grinter, Caernarvon, Wales, assignor to Imperial Chemical Industries PLC, London, England
Continuation of Ser. No. 466,146, Feb. 14, 1983, Pat. No. 4,590,162. This application Oct. 11, 1985, Ser. No. 786,474
Claims priority, application United Kingdom, Feb. 17, 1982, 8204573
The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.
Int. Cl.[4] C12N *15/00, 1/20, 1/00*
U.S. Cl. 435—172.3 **8 Claims**



1. A vector for the transfer of DNA material between microorganisms which comprises a first plasmid and a second plasmid wherein the first plasmid carries a transposon (A), a part of whose DNA including the sequence which specifies its transposition function has been removed and the second plasmid carries a fragment of DNA from a transposon (A) including the sequence which specifies its transposition function, transposon (A) being any suitable transposon.

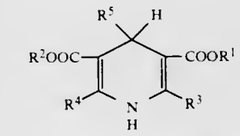
4,784,957
PROCESS FOR THE PROMOTION OF REGENERATION OF PLANTS FROM TISSUE CULTURES
Péter Medgyesy; László Márton, and László Purhauser, all of Szeged, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary
Filed Dec. 31, 1984, Ser. No. 687,607
Claims priority, application Hungary, Dec. 30, 1983, 4524/83
Int. Cl.[4] C12N *5/00, 5/02*
U.S. Cl. 435—240.4 **9 Claims**



1. A process for inducing or increasing shoot regeneration of a cereal or tobacco plant from plant cells cultured in a tissue culture medium which comprises the steps of:
(a) providing a tissue culture medium comprising a plant hormone and 5 to 100 mg/liter of silver nitrate; and
(b) forming a tissue culture by cultivating cereal or tobacco plant cells in the tissue culture medium whereby the silver nitrate inhibits ethylene action thereby inducing or increasing shoot regeneration.

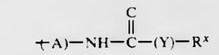
4,784,958
1,4-DIHYDROPYRIDINE DERIVATIVES AND 1,4-DIHYDROQUINOLINE DERIVATIVES RADIOACTIVELY LABELLED WITH ^{125}I, THEIR PREPARATION, AND THEIR USE IN TESTING MEDICAMENTS
Hartmut Glossman, Margenteuweg 4, D-6301 Neuchelheim, Fed. Rep. of Germany
Filed Nov. 19, 1984, Ser. No. 672,681
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341806
Int. Cl.[4] C07D *213/55, 215/16, 403/12;* **G01N** *33/534*
U.S. Cl. 436—504 **10 Claims**

1. A radioactively labelled 1,4-dihydropyridine derivative of the formula



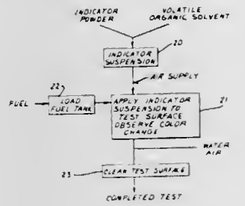
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in which R^1 and R^2 are the same or different and R^1 is a



group, in which A and Y are a straight chain or branched alkyl group with 1–6 carbon atoms and R^x is a phenyl radical substituted in the p-position, but not with halogen, or an imidazole radical attached to the 4-position, and if R^1 is not the same as R^2, then R^2 denotes NO_2, nitrile or alkoxy with 1–4 carbon atoms, R^3 and R^4 are the same or different and denote H, NH_2 or straight-chain or branched alkyl radicals with 1–4 carbon atoms, R^5 denotes an aryl radical which is unsubstituted or is substituted by 1 to 2 identical or different substituents from the group consisting of alkyl, alkoxy, phenyl, halogen, nitro, cyano, trifluoromethyl and alkylmercapto, and in which the radical R^x is also singly or doubly substituted by ^{125}I and has a specific activity of about 2200 to about 8800 Ci/mMole.

4,784,959
METHOD OF DETECTING HYDROCARBON FUEL LEAKS
Jeffrey G. Wegrzyn, Alpharetta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.
Division of Ser. No. 674,934, Nov. 26, 1984, which is a continuation-in-part of Ser. No. 607,450, May 7, 1984. This application Jul. 14, 1986, Ser. No. 885,554
Int. Cl.[4] G01M *3/20;* **G01N** *31/22*
U.S. Cl. 436—3 **10 Claims**



1. A method for detecting leaks in a fuel tank having a painted surface comprising:
a. applying a substance to the painted surface, said substance being suitable for detecting hydrocarbon fluid leaks by color change consisting essentially of from about 0.1 to about 5.0 percent by weight of a dye soluble in bath water and low chain alcohols whereby said dye is essentially non-staining on said painted surface and which does not migrate into or penetrate said painted surface said painted surface containing a polyurethane or epoxy resin base; from about 0.1 to about 1.0 percent of a surfactant; and a dry inert mineral carrier comprising a substantial balance of the substance;
b. observing any changes in the color of the substance; and
c. removing the substance from the painted surface being tested.

4,784,960
PROCESS FOR PREPARATION OF CONTROL FOR USE IN PROGESTERONE RECEPTOR
Richard J. Baranczuk, Overland Park, Kans., assignor to Peter S. Brune, Kansas City, Mo.
Continuation-in-part of Ser. No. 332,609, Dec. 21, 1981, Pat. No. 4,433,056, which is a continuation-in-part of Ser. No. 305,108, Sep. 24, 1981, Pat. No. 4,423,151. This application Feb. 21, 1984, Ser. No. 582,038
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.[4] G01N *33/567*
U.S. Cl. 436—8 **21 Claims**

13. A process for production of a control sample for use in progestin receptor assays; said process comprising the steps of:
(a) collecting a mammalian tissue comprising tissue from the group consisting essentially of normal breast, ovaries, fallopian tubes, uterus, placenta, corpus lutem tissues and combinations thereof; said mammalian tissue containing progestin receptors from a female animal selected on approximately a uniform given day of a female cycle associated with such animal, such that the progestin receptor level in said tissue is relatively constant for each animal species;

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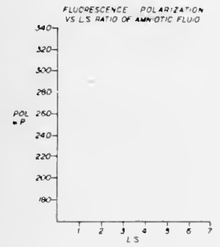
(b) adding a buffer solution to said tissue such that the pH of said tissue after adding said buffer is in the range of approximately 6 to 8;
(c) adding a progestin receptor stabilizing agent to said tissue;
(d) homogenizing said tissue, buffer and said agent together;
(e) centrifuging said homogenized tissue, buffer and agent;
(f) collecting the supernatant from said centrifuged tissue and buffer as said control sample; and
(g) freeze drying said control sample.

4,784,961

FLUORESCENCE POLARIZATION METHOD FOR MONITORING FETAL LUNG MATURITY

John C. Russell, Greenfield, Wis., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 23, 1987, Ser. No. 29,002
Int. Cl.[4] G01N *33/48*
U.S. Cl. 436—63 **3 Claims**



1. A method of determing fetal lung maturity comprising measuring the ratio of surfactant to albumin in a sample of amniotic fluid from a test subject and comparing the measured ratio to a standard and thereby determining the maturation of the fetal lung.

4,784,962

MIXTURE OF AMINO ACID DERIVATIVES, PROCESS OF PRODUCING THE MIXTURE AND USE OF THE MIXTURE FOR QUANTITATIVE DETERMINATION OF THE AMINO ACIDS

James A. Apffel, Jr., Los Gatos, Calif., and Rainer Scbuster, Marxzell-Burbach, Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 25, 1987, Ser. No. 18,890
Claims priority, application European Pat. Off., Feb. 26, 1986, 86102505
Int. Cl.[4] G01N *21/77, 33/68*
U.S. Cl. 436—89 **20 Claims**

1. A mixture of fluorescently-excitable derivatives of amino acids consisting essentially of OPA/MPA derivatives of primary amino acids and FMOC derivatives of secondary amino acids.

7. A process for preparing a mixture of amino acid derivatives amenable to excitation under fluorescent light comprising the steps of
(a) providing a sample containing at least one primary amino acid and at least one secondary amino acid;
(b) treating the sample with a buffer and with a solution of OPA and MPA in acetonitrile, in any sequence, to obtain a first mixture; and
(c) treating said first mixture with a buffer and with a solution of FMOC in acetonitrile in any sequence.

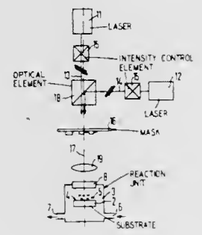
13. A process for quantitatively analyzing a sample of amino acids containing at least one primary amino acid and at least one secondary amino acid comprising the steps of
(a) providing a sample containing at least one primary amino acid and at least one secondary amino acid;
(b) treating the sample with a buffer and with a solution of OPA and MPA in acetonitrile, in any sequence, to obtain a first mixture;
(c) treating said first mixture with a buffer and with a solution of FMOC in acetonitrile in any sequence to form a second mixture;
(d) introducing at least a portion of the second mixture into a separatory device and eluting primary amino acid derivatives independently of secondary amino acid derivatives to form an eluent with no interspersed elution of primary and secondary amino acid derivatives; and
(e) analyzing the eluent to quantitatively determine the amounts of primary and secondary amino acid and derivatives thereof.

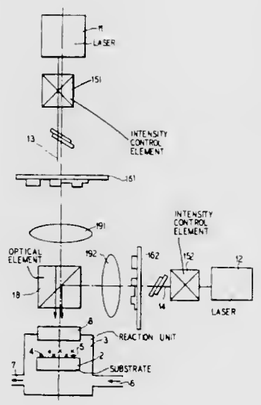
4,784,963

METHOD FOR LIGHT-INDUCED PHOTOLYTIC DEPOSITION SIMULTANEOUSLY INDEPENDENTLY CONTROLLING AT LEAST TWO DIFFERENT FREQUENCY RADIATIONS DURING THE PROCESS

Eberhard F. Krimmel, Pullach, Fed. Rep. of Germany, and Adolf G. K. Lutsch, Johannesburg, South Africa, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 706,155, Feb. 27, 1985, abandoned. This application May 11, 1987, Ser. No. 48,965
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407089
Int. Cl.[4] H01L *21/205, 21/225*
U.S. Cl. 437—19 **9 Claims**





1. In a process for light-induced, photolytic or light-induced

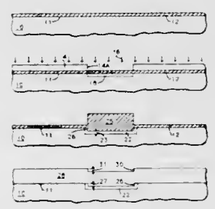
catalytic deposition or doping of layers or substrates with two different deposition or doping materials which are in contact in liquid or gaseous form with a surface of the substrate or layer, and wherein radiation to be employed for photolysis is directed to said surface, wherein the improvement comprises the steps of:
controllably depositing said at least two different materials simultaneously during at least a part of the process so that two different layers or dopings occur during the process;
employing at least two different-frequency radiations during the process, one of the radiations being associated with and independently controlling the depositing of or doping with one of the materials and the other radiation being associated with and independently controlling the depositing of or doping with the other materials;
independently controlling respective intensities of each of said two radiations in accordance with a desired deposition or doping with the respective two different materials; and
mixing the at least two different materials present with one another during the process.

4,784,964

EPI DEFECT REDUCTION USING RAPID THERMAL ANNEALING

Terry Hulseweh, and Mel Miller, both of Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 19, 1987, Ser. No. 109,684
Int. Cl.[4] H01L *21/265, 21/477, 21/324*
U.S. Cl. 437—26 **18 Claims**



1. A method for forming buried layers in semiconductor devices, comprising:
providing a semiconductor substrate having a principal surface;
providing a mask on the surface having a first opening;
implanting a first dopant through the first opening into the substrate;
heating to a temperature exceeding at least 600° C., at least partly in an oxidizing atmosphere and for a time of about 5 minutes or longer, to activate the implant and oxidize at least the implanted part of the substrate surface;
thereafter rapidly heating the substrate to a temperature exceeding at least 1000° C. in a time less than 30 seconds and thereafter cooling below about 750° C. in a time less than about 30 seconds; and
forming an epitaxial layer on the substrate surface.

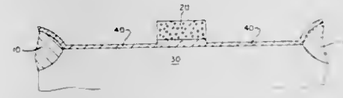
4,784,965

SOURCE DRAIN DOPING TECHNIQUE

Been-Jon Woo, Saratoga; Mark A. Holler, Palo Alto; Ender Hokeler, Santa Clara, and Sandra S. Lee, Los Altos, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 926,733, Nov. 4, 1986. This application Sep. 16, 1987, Ser. No. 97,532
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—30 **5 Claims**

1. A method of fabricating a metal-oxide-semiconductor (MOS) integrated circuit where an insulated gate electrode member is formed on a portion of a semiconductor substrate, comprising the steps of:
(a) forming an insulating layer over said substrate, including over opposite sides and upper surface of said gate member;
(b) forming low temperature oxide spacer members on said opposite sides of said gate member over said insulating layer;
(c) etching to remove upper surfaces of the structure resulting from step (b) wherein said spacers prevent etching of said insulating layer under said spacers until said spacers are completely removed causing said insulating layer to be thicker where said spacers prevented etching;



(d) causing ions of a conductivity type determining impurity to impinge on the structure resulting from step (c) wherein ion implanted regions of said ions are formed in said substrate, said thicker insulating layer regions preventing a portion of said ions from reaching said substrate;
(e) heating said substrate to diffuse at least a portion of said ions underneath said opposite sides of said gate member and to activate said ions such that said substrate adjacent to said gate member having lower concentration of ions than substrate disposed further from said gate member;
whereby graded source and drain regions are formed.

4,784,966

SELF-ALIGNED NPN BIPOLAR TRANSISTOR BUILT IN A DOUBLE POLYSILICON CMOS TECHNOLOGY

Kueing-Long Chen, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 2, 1987, Ser. No. 57,586
Int. Cl.[4] H01L *21/265, 21/20*
U.S. Cl. 437—031 **17 Claims**



1. A method of forming an NPN bipolar transistor on a first region of a first conductivity type material of a body, said method comprising:
forming a second region of material having a second conductivity type over a preselected area of said first region, said second conductivity type being of an opposite conductivity type to that of the first conductivity type;
forming a masking layer of polysilicon material over a predetermined portion of said second region to prevent doping of the portion of the second region underlying said masking layer of polysilicon material;
etching selected portions of said layer of polysilicon material to remove selected portions of said polysilicon and form dopant exposed regions on said body, including an emitter region, said emitter region being on a portion of said second region from which said polysilicon has been removed;
doping said emitter region such that said emitter region is of said first conductivity type and simultaneously masking from such doping those remaining portions of the second region underlying the polysilicon;
doping preselected portions of said first region with a dopant of said first conductivity type to form a collector region for the NPN transistor;
doping preselected portions of said second region with a

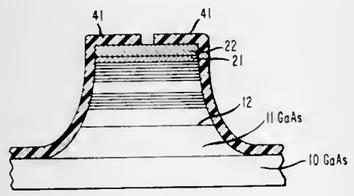
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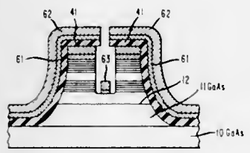
dopant of said second conductivity type to form a base region of said NPN transistor.

4,784,967
METHOD FOR FABRICATING A FIELD-EFFECT TRANSISTOR WITH A SELF-ALIGNED GATE

John E. Cunningham, Eatontown; Erdmann F. Schubert, Hazlet, and Won-Tien Tsang, Holmdel, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1986, Ser. No. 944,457
Int. Cl.[4] H01L *21/302*
U.S. Cl. 437—40 **3 Claims**



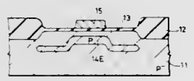


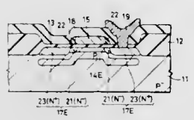
1. A method of fabricating field-effect transistors each having a source, drain and gate electrode comprising the steps of epitaxially growing layers on a semiconductor substrate including at least a current channel followed by a non-alloyed contact to form a semiconductor wafer, depositing a metallic layer over said non-alloyed contact, masking areas on the wafer corresponding to individual field-effect transistors using photoresist material and photolithography techniques, etching the metallic layer and the epitaxially grown layers to develop mesas corresponding to individual field-effect transistors, dissolving the deposited photoresist material used to define the mesa structures, masking the wafer using photolithograhy and photoresist material to define an area in each of the remaining metallic layers at the top of each mesa for the gate electrode structure of each field-effect transistors, etching in the defined areas to remove the exposed metallic layer and the non-alloyed contact, depositing a metallic layer over the entire wafer including the defined areas to form a gate structure in each defined area, and removing the photoresist material deposited during the second masking step.

4,784,968
PROCESS FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING MIS-TYPE FIELD EFFECT TRANSISTORS WITH IMPURITY REGION BELOW THE GATE ELECTRODE

Kazuhiro Komori, Kodaira; Kenichi Kuroda, Tachikawa, and Kousuke Okuyama, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 763,612, Aug. 8, 1985, Pat. No. 4,697,198. This application Jul. 20, 1987, Ser. No. 75,411
Claims priority, application Japan, Aug. 22, 1984, 59-173239; Jun. 21, 1985, 60-134040
Int. Cl.[4] H01L *21/265;* **B01J** *17/00*
U.S. Cl. 437—41 **23 Claims**





1. A process for producing a semiconductor device having a MIS-type field-effect transistor formed in a first semiconductor region of a first type of conductivity in a semiconductor substrate, comprising the steps of:

forming a second semiconductor region in said first semiconductor region, said second semiconductor region being separated from the surface of said semiconductor substrate, and said second semiconductor region further having the same type of conductivity as said first semiconductor region and an impurity concentration higher than that of said first semiconductor region;

forming a gate electrode on a gate insulating film on said semiconductor substrate, after said second semiconductor region has been formed;

introducing impurities of a second type of conductivity into said first semiconductor region using at least said gate electrode as a mask, so as to provide a first introduction step, said first introduction step being effected by the implantation of ions, so that the impurity concentration of the first type of conductivity is substantially lowered in said second semiconductor region except a portion at least under said gate electrode; and

introducing impurities of the second type of conductivity into said first semiconductor region using at least said gate electrode as a mask, so as to provide a second introduction step, said second introduction step forming at least a part of the source and drain regions.

4,784,969
METHOD OF MANUFACTURING A SEMICONDUCTOR MEMORY DEVICE

Akihiro Nitayama, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 28, 1987, Ser. No. 43,444
Claims priority, application Japan, May 2, 1986, 61-102456
Int. Cl.[4] H01L *21/385, 21/425, 29/94*
U.S. Cl. 437—41 **9 Claims**

1. A method of manufacturing a semiconductor memory device having a capacitor and transistor, which comprises the steps of:

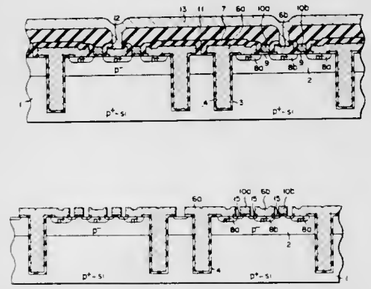
providing a groove in a capacitor-forming region of a semiconductor substrate;

forming a capacitor-insulating film on the semiconductor substrate, including the inner surface of the groove;

providing first and second holes in that portion of the capacitor-insulating film which is formed on the surface of the substrate;

forming a first conductive film over the entire surface of thus produced structure;

patterning said first conductive film, to form a capacitor electrode covering the inner surface of the groove and



first contact hole, and an interconnection electrode covering the second contact hole;

forming a first interlayer insulating film on the surfaces of the capacitor electrode and interconnection electrode;

forming a gate insulating film on that portion of the substrate which lies between the capacitor electrode and interconnection electrode;

forming a second conductive film over the entire surface of thus produced structure; and

back-etching the second conductive film, to form a gate electrode on the gate-insulating film which lies between the capacitor electrode and interconnection electrode.

4,784,970
PROCESS FOR MAKING A DOUBLE WAFER MOATED SIGNAL PROCESSOR

Allen L. Solomon, Fullerton, Calif., assignor to Grumman Aerospace Corporation, Irvine, Calif.

Filed Nov. 18, 1987, Ser. No. 122,177
Int. Cl.[4] H01L *7/50, 21/20*
U.S. Cl. 437—51 **17 Claims**

1. A method of forming an integrated circuit for abutting electrical connection with external electronics comprising:

forming a plurality of grooves in a first surface of each of first and second wafers, each of said wafers having a length and a thickness, said grooves extending a portion of the thickness of each of the wafers;

filling the grooves formed in said first and second wafers with a body of insulating material;

joining the first and second wafers along the grooved surfaces thereof;

thinning the first wafer so that the grooves formed therein extend the entire thickness of the first wafer;

forming doped regions on a second surface of the first wafer;

selectively applying conductive leads upon the second surface of said first wafer, said conductive leads being in electrical communication with the doped regions, at least one of said conductive leads extending across at least a portion of a groove formed in said first wafer;

thinning the second wafer so that the grooves formed therein extend the entire thickness of the second wafer;

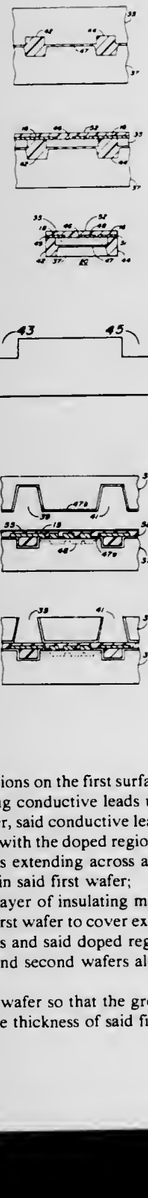
trimming the length of the first and second wafers so that lengthwise edges of the first and second wafers are defined by the grooves and at least one of said conductive leads is exposed at a lengthwise edge of said first wafer; and

depositing conductive material along at least one lengthwise edge of the wafers, said conductive material being in electrical communication with the exposed conductive lead and effective to facilitate electrical communication between the doped regions and external electronics.

9. The method of forming a multiwafer integrated circuit for abutting electrical connection to external electronics comprising:

forming a plurality of grooves in the surface of each of first and second wafers, each of said wafers having a length and a thickness, said grooves extending a portion of the thickness of each of the wafers;

filling the grooves formed in said first and second wafers with a body of insulating material;



forming doped regions on the first surface of said first wafer;

selectively applying conductive leads upon the first surface of said first wafer, said conductive leads being in electrical communication with the doped regions, at least one of said conductive leads extending across at least a portion of a groove formed in said first wafer;

depositing a first layer of insulating material along the first surface of said first wafer to cover exposed surfaces of said conductive leads and said doped region;

joining said first and second wafers along the first surfaces thereof;

thinning said first wafer so that the grooves formed therein extend the entire thickness of said first wafer;

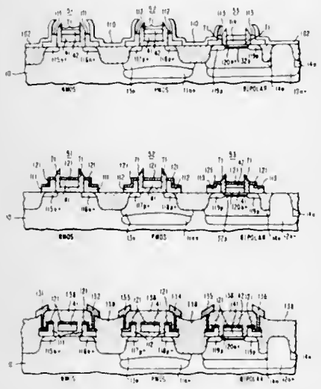
VOL 1096 ISS 3 NO 15 1988 UMI

thinning the second wafer so that the grooves formed therein extend the entire thickness of the second wafer;
trimming the length of said first and second wafers so that lengthwise edges of the first and second wafers are defined by the grooves formed therein, and at least one of said conductive leads is exposed at a lengthwise edge of said wafer; and
depositing conductive material along at least one lengthwise edge of the wafers, said conductive material being in electrical communication with the exposed conductive lead and effective to facilitate electrical communication between the doped regions and external electronics.

4,784,971
PROCESS FOR MANUFACTURING SEMICONDUCTOR BICMOS DEVICE

Tzu-Yin Chiu; Gen M. Chin, both of Marlboro; Ronald. C. Hanson, Middletown; Maureen Y. Lau, Keyport; Kwing F. Lee, Aberdeen; Mark D. Morris, and Alexander M. Voschenkov, both of Freehold, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 854,885, Apr. 23, 1986, abandoned. This application May 8, 1987, Ser. No. 47,946
Int. Cl.[4] H01L *21/70, 27/00*
U.S. Cl. 437—057 **2 Claims**



1. In a process for creating bipolar and CMOS transistors on a p-type silicon substrate where n+ buried wells have been implanted, a p-type epitaxial layer has been grown over the substrate, and field isolation regions have been created to isolate the CMOS and bipolar transistor regions on the wafer, said process comprising the following steps: growing a gate oxide over the entire layer; depositing a polycrystalline silicon material over the entire wafer; selectively etching the wafer to remove the polycrystalline silicon layer and the gate oxide that cover areas to be occupied by the bipolar transistors; implanting a p-type dopant in the exposed epitaxial layer; depositing a polycrystalline silicon layer over the entire wafer; implanting the polycrystalline layer with an n-type dopant to create a reservoir of n-type dopant; depositing a silicon nitride layer over the entire wafer; depositing a second polycrystalline layer over the silicon nitride layer; selectively etching the polycrystalline silicon and nitride layers to create stacks of polycrystalline silicon and silicon nitride over the regions of the wafer corresponding to gate elements of the CMOS devices and emitter elements of the bipolar devices; depositing a conformal oxide over the entire wafer; selectively etching the entire wafer so as to remove all of the conformal oxide except that which is adjacent to the stacks of polycrystalline silicon and silicon nitride to create walls of silicon dioxide around the stacks; depositing a polycrystalline silicon layer over the entire wafer; selectively etching the last deposited polycrystalline silicon layer to create islands of polycrystalline silicon over the CMOS and bipolar transistors; selectively implanting an n-type dopant in the islands of polycrystalline silicon corresponding to the NMOS transistors to create a reservoir of n-type dopant; selectively implanting a p+ type dopant in the islands of polycrystalline silicon corresponding to the PMOS and bipolar devices to create a reservoir of p-type dopant; selectively removing the polycrystalline silicon layer to a predetermined distance from the epitaxial layer such that the silicon nitride inside the walls of silicon dioxide is fully exposed; heating the wafer to cause the reservoirs of implanted dopants to diffuse into the epitaxial layer thereby simultaneously creating source and drain regions for the CMOS transistors and an emitter region for the bipolar transistors; removing the silicon nitride within the walls of silicon dioxide; and depositing a conductive material over the exposed polycrystalline silicon layers in order to permit conductive coupling to the elements of the CMOS and bipolar transistors.

4,784,972
METHOD OF JOINING BEAM LEADS WITH PROJECTIONS TO DEVICE ELECTRODES

Kenzo Hatada, Katano, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 763,787, Aug. 8, 1985, abandoned. This application Apr. 17, 1987, Ser. No. 40,769
Claims priority, application Japan, Aug. 18, 1984, 59-171937
Int. Cl.[4] H01L *21/60, 21/603*
U.S. Cl. 437—182 **10 Claims**

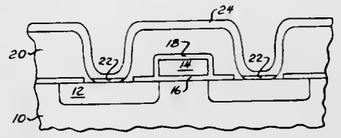


1. A method of manufacturing a semiconductor device which includes a semiconductor member having a semiconductor and an electrode, and a beam lead, comprising the steps of:
providing a substrate;
using a single process to concurrently form a lead portion and a projection of a beam lead on the substrate,
the projection extending from the lead portion, disposed on the substrate and projecting from the substrate;
aligning the projection of the beam lead with an electrode of a semiconductor member,
after said step of aligning, pressing the electrode against the projection so as to thereby join the electrode to the beam lead at the projection; and
after said step of pressing, moving the semiconductor member with the electrode thereof and the beam lead joined to the electrode away from the substrate so as to thereby separate the beam lead from the substrate.

4,784,973
SEMICONDUCTOR CONTACT SILICIDE/NITRIDE PROCESS WITH CONTROL FOR SILICIDE THICKNESS

E. Henry Stevens; Paul J. McClure, and Christopher W. Hill, all of Colorado Springs, Colo., assignors to INMOS Corporation, Colorado Springs, Colo.

Filed Aug. 24, 1987, Ser. No. 88,681
Int. Cl.[4] H01L *21/283*
U.S. Cl. 437—200 **11 Claims**

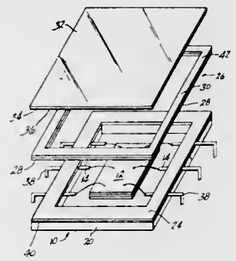


1. In the fabrication of an integrated circuit, a process for establishing an electrical contact at a contact opening in an insulative material to an underlying silicon region of said integrated circuit and for forming a metallurgic barrier over said contact comprising the steps of:
establishing a relatively thin control region in said contact opening over said underlying silicon region, said control region comprising a compound including silicon oxygen and nitrogen; then
establishing a first layer comprising a transition metal over said insulative material and said control region; and then
thermally cycling the integrated circuit to convert at least part of said transition metal layer into a metallurgic barrier and to establish a low resistance silicide contact region below said barrier in said underlying silicon region previously exposed by said contact opening, said control region retarding the development of said silicide contact region in said contact opening, said control region being replaced during said thermally cycling step by said silicide region, said control region thereby permitting the thickness of said silicide contact region relative to said metallurgic barrier to be controlled.

4,784,974
METHOD OF MAKING A HERMETICALLY SEALED SEMICONDUCTOR CASING

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 405,640, Aug. 5, 1982, abandoned, which is a division of Ser. No. 685,864, Dec. 24, 1984, Pat. No. 4,656,499. This application Oct. 31, 1986, Ser. No. 925,588
Int. Cl.[4] H01J *5/00*
U.S. Cl. 437—221 **7 Claims**

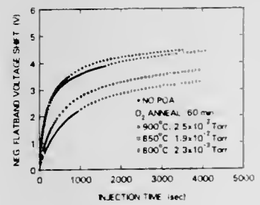


1. The process of hermetically sealing a semiconductor casing for an electrical component, comprising the steps of:
providing a metal alloy leadframe having first and second opposite surfaces and being adapted to have said electrical component connected thereto;
providing a metal or metal alloy base member;
providing a metal or metal alloy window frame and shaped component comprising a bi-clad of first and second metal or metal alloy components, said first metal or metal alloy component having at least a first surface for improved glass or ceramic bonding, said second metal or metal alloy component having at least a first surface being readily solderable;
selecting said leadframe, base member, and the first metal or metal alloy component of said window frame component from a metal or metal alloy having a coefficient of thermal expansion of from about 165×10^{-7} to about 170×10^{-7} in./in./°C.;
providing a metal or metal alloy lid having at least a first surface being readily solderable;
providing a glass or ceramic component having a coefficient of thermal expansion of at least about 160×10^{-7} in./in./°C., said coefficient of thermal expansion of said glass or ceramic component being closely matched to the coefficients of thermal expansion of said metal or metal alloy leadframe, said metal or metal alloy base member, and the first metal or metal alloy component of said window frame shaped component;
disposing said leadframe with said glass or ceramic component against the first and second opposite surfaces of said leadframe between the first surface of the first metal or metal alloy component of the window frame shaped component and the first surface of said metal or metal alloy base member;
glass bonding said leadframe to said base member and said window frame component without generating substantial thermal stress from exposure to thermal cycling;
mounting said electrical component to said leadframe; and
soldering the first readily solderable surface of the second component of said window frame component to the first readily solderable surface of the metal or metal alloy lid whereby said semiconductor casing is substantially hermetically sealed.

4,784,975
POST-OXIDATION ANNEAL OF SILICON DIOXIDE

Karl Hofmann, Ulm, Fed. Rep. of Germany; Gary W. Rubloff, Waccabuc, and Donald R. Young, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1986, Ser. No. 922,510
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—247 **14 Claims**



1. A process for enhancing the insulating and stability characteristics of SiO_2 insulator for a field-effect transistor semiconductor device which comprises providing a silicon dioxide layer on a substrate, and then annealing; wherein the annealing includes providing an ambient containing gaseous oxygen-containing species is at least one member selected from the group consisting of oxygen, ozone, nitrous oxide, and hydrogen peroxide to provide a partial pressure from said oxygen-containing species of about 10^{-6} torr to about 2×10^{-2} torr during

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annealing temperatures of about 600° C. to about 1100° C. for a time sufficient to enhance the insulating and stability characteristics of said SiO_2 insulator.

4,784,976

GLASS-CERAMICS CONTAINING NZP-TYPE CRYSTALS

Bruce G. Aitken, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 27, 1987, Ser. No. 126,182
Int. Cl.[4] C03C *10/02*
U.S. Cl. 501—10 **2 Claims**

1. A glass-ceramic article exhibiting a linear coefficient of thermal expansion of about -20 to $+65\times10^{-7}$/°C. wherein a crystal having the stoichiometry characterized by the formula $A_{0\text{-}4}B_2(XO_4)_3$ constitutes essentially the sole crystal phase, wherein a represents a monovalent or divalent cation selected from the group consisting of Zn, Mg, Mn, Fe, Co, Ni, Cu, Ca, Cd, Sr, Ba, Pb, Li, Na, and K, B represents at least one trivalent, tetravalent, or pentavalent cation selected from the group consisting of Fe, Ti, Cr, Zr, Nb, Mo, In, Sn, Y, and an RE, and X represents P cations which may be partially replaced by Si cations, and the cation ratio B:X is essentially 2:3.

4,784,977

HYDROGEN-CONTAINING GAS-CERAMICS

Bruce G. Aitken, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 11, 1988, Ser. No. 167,181
Int. Cl.[4] C03C *10/02, 3/097, 3/064, 11/00*
U.S. Cl. 501—10 **3 Claims**

1. A method for preparing a gas-ceramic body having a SiO_2-rich glassy surface layer and consisting essentially of very fine-grained crystals of cubic BPO_4 and very small, unconnected gas-containing cells uniformly dispersed within a SiO_2-rich glassy matrix, wherein said gas consists predominantly of hydrogen, comprising the steps of:

(a) melting a batch for a glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 30–60% SiO_2, 10–40% B_2O_3, 15–45% P_2O_5, and up to 20% total of at least one material in the indicated proportion selected from the group consisting of 5–15% BN, 5–10% Si, 5–10% SiC, and 10–20% Si_3N_4;

(b) cooling said melt to at least within the transformation range thereof and simultaneously shaping a glass body of a desired configuration therefrom; and thereafter

(c) exposing said glass body to a temperature between about 900°–1050° C. for a period of time sufficient to cause the development of cubic BPO_4 crystals and gas-containing cells therein.

4,784,978

HEXAGONAL BORON NITRIDE POWDER HAVING EXCELLENT SINTERABILITY AND A METHOD FOR THE PREPARATION THEREOF

Takeshi Ogasawara; Takahisa Koshida; Toshimitsu Koitabashi, all of Chiba, and Kimiaki Sasaki, Hyogo, all of Japan, assignors to Kawasaki Steel Corporation and Kawasaki Refractories Co. Inc., both of Kyogo, Japan

Continuation-in-part of Ser. No. 741,288, Jun. 4, 1985, abandoned. This application Jun. 30, 1986, Ser. No. 879,980
Claims priority, application Japan, Jun. 7, 1984, 59-117375; Aug. 30, 1984, 59-182379
Int. Cl.[4] C01B *21/064*
U.S. Cl. 501—96 **8 Claims**

1. A powder of hexagonal boron nitride with excellent sinterability having a purity of at least 95% by weight as boron nitride and containing an alkaline earth metal compound in an amount from 0.0001 to 0.1 mole calculated as alkaline earth metal per mole of boron, of which the crystallites (Lc) have a size in the range from 8 to 50 nm.

3. A method for the preparation of a powder of hexagonal boron nitride having excellent sinterability which comprises the steps of:

(a) mixing boric acid, dehydrated boric acid, ammonium borate and a nitrogen compound selected from the group consisting of urea, melamine, dicyandiamide, cyanuric acid and ammonium chloride to produce a powdery mixture;

(b) admixing the powdery mixture with 0.005 to 0.1 moles of a carbonaceous powder calculated as carbon per mole of boron in the powdery mixture and 2.5 to 30% by weight of borax or anhydrous borax calculated as anhydrous borax based on the boric acid, dehydrated boric acid and ammonium borate in the powdery mixture; and

(c) subjecting the powdery mixture to a heat treatment in a non-oxidizing atmosphere.

4,784,979

CATALYST AND CATALYST PRECURSOR CONTAINING VANADIUM AND ANTIMONY

Mark A. Toft, Lakewood; James F. Brazdil, Jr., Mayfield Village, and Linda C. Glaeser, Cleveland Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 7, 1987, Ser. No. 129,263
Int. Cl.[4] B01J *23/18, 23/22, 35/08*
U.S. Cl. 502—8 **18 Claims**

1. A method of making a catalyst precursor having vanadium and antimony in oxide form in the atomic ratio of Sb to V in the range from 0.8 to 4, by reacting the monoperoxovanadium ion, $VO(O_2)^+$, while in aqueous solution with an antimony compound which contains Sb having a valence of 3, thereby reducing the average valence of the vanadium to less than 5 and oxidizing antimony to a valence state of 5.

4. A method according to claim **1** with the additional steps of drying said precursor and thereafter calcining the resulting dried product at a maximum temperature in the range 650° to 950° C., thereby producing a catalyst.

4,784,980

PROCESS FOR PREPARING ZEOLITE A FROM SPENT CRACKING CATALYST

Ralph J. Bertolacini, Naperville, and Eugene H. Hirschberg, Park Forest, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 15, 1987, Ser. No. 73,527
Int. Cl.[4] B01J *29/38, 38/64;* **C01B** *33/28*
U.S. Cl. 502—25 **6 Claims**

1. A method for preparaing zeolite A from spent metals-contaminated cracking catalyst comprising zeolite Y and removing at least one metal from said catalyst which comprises the steps of:

contacting said catalyst with a solution comprising an alkali metal hydroxide and a sufficient amount of sodium aluminate to form said zeolite A under hydrothermal conditions at a pH of at least 10;

partitioning said catalyst from said solution;

washing said catlayst with water to remove unreacted alkali metal hydroxide, sodium aluminate, and residual contaminant metals.

4,784,981

VANADIUM/PHOSPHORUS MIXED OXIDE CATALYST, PROCESS FOR ITS PREPARATON AND ITS USE

Heinz-Jürgen Alpers; Karl-Heinz Heller, and Günther Lenz, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,633
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130343
Int. Cl.[4] B01J *27/198, 27/185*
U.S. Cl. 502—209 **30 Claims**

1. A process for the preparation of vanadium phosphorus mixed oxide-containing catalysts comprising

(a) introducing a pentavalent vanadium compound and a pentavalent phosphorus compound into an aqueous medium wherein the aqueous medium is free from agents which would substantially reduce the pentavalent vanadium compound;

(b) forming a substantially pentavalent catalyst precursor in the aqueous medium;

(c) recovering the pentavalent catalyst percursor from the aqueous medium;

(d) introducing the pentavalent catalyst precursor into a substantially organic liquid medium capable of reducing at least a portion of the vanadium to a valence state of about +4;

(e) effecting reduction of the vanadium;

(f) recovering the resulting partially reduced catalyst precursor from the organic liquid medium;

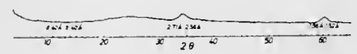
(g) calcining the partially reduced catalyst precursor, which further comprises introducing a promoter element-containing compound into the aqueous medium, or into the organic liquid medium prior or subsequent to the reduction of the vanadium.

4,784,982

COMPOSITE PHYLOSILICATE ADSORBENT AND PROCESS FOR PREPARATION THEREOF

Kouichi Usui, Houya; Masahide Ogawa, Shibata; Osamu Okumura, Funabashi; Teiji Sato, Shibata; Kouicbi Yamada, Sakura; Masanori Tanaka, Shibata, and Noriyuki Takahasbi, Nakajo, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,706
Claims priority, application Japan, Feb. 27, 1987, 62-43073
Int. Cl.[4] B01J *20/04, 20/08, 20/10*
U.S. Cl. 502—410 **17 Claims**



1. A composite phylosilicate comprising amorphous and porous silica or silica-alumina and a layer of an aluminum-containing phylosilicate formed on surfaces of primary particles of said silica or silica-alumina and having, as a whole, a chemical composition represented by three-component oxide molar ratios of SiO_2 of 5 to 80 mole%, MO (M stands for an atom selected from the group consisting of zinc and magnesium) of 5 to 65 mole% and Al_2O_3 of 1 to 60 mole%, an X-ray diffraction pattern in which there is no substantial peak at a spacing dx of 8.40 to 6.40 Å and there are peaks at a spacing dx of 2.71 to 2.56 Å and a spacing dx of 1.56 to 1.52 Å, a specific surface area of at least 200 m^2/g, and a pore volume of at least 0.25 cc/g in pores having a pore diameter of 10 to 300 Å.

4. A composite phylosilicate as set forth in claim **1**, wherein the aluminum-containing phylosilicate has a chemical structure represented by the following formula:

$$(Zn_{3-x}Al_x)(Si_{2-x}Al_x)O_5(OH)$$

wherein x is a number of from 0.1 to 1.75.

10. An adsorbent comprising a composite phylosilicate as set forth in claim **1**.

4,784,983

CATALYST SYSTEM FOR USE IN OLEFINIC POLYMERIZATION

Bingquan Mao; Aichun Yang; Ying Zheng; Juxiou Yang, and Zhulan Li, all of Beijing, China, assignors to Beijing Research Institute of Chemical Industry, Beijing, China

Filed Sep. 15, 1986, Ser. No. 907,664
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—111 **15 Claims**

1. A process for preparing a catalyst component comprising the steps of:

(A) dissolving magnesium halide compounds selected from the group consisting of magnesium halide, complexes of magnesium halide with water or alcohol, and derivatives of magnesium halide wherein a halogen atom is substituted by an alkyl group or a haloalkyl group in a solvent mixture of an organic epoxy compound and an organic phosphorus compound to form a homogeneous solution, the organic epoxy compound being selected from the group consisting of oxides of aliphatic olefins and diolefins, oxides halogenated aliphatic olefins and diolefins, and glycidyl ethers all having 2 to 8 carbon atoms selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, butadiene oxide, butadiene dioxide, epoxy chloropropane, methyl glycidyl ether and diglycidyl ether; and the organic phosphorus compound being selected from the group consisting of trimethyl phosphate, triethyl phosphate, tributyl phosphate, triphenyl phosphate, trimethyl phosphite, triethyl phosphite, tributyl phosphite and triphenyl phosphite;

(B) mixing the homogeneous solution with a liquid titanium tetrahalide having the formula $TiX_n(OR)_{4-n}$ wherein X is halogen, R is an alkyl group being identical or different, and n is an interger of 0 to 4;

(C) adding at least one auxiliary precipitant selected from the group consisting of organic carboxylic acid anhydrides, organic carboxylic acids, ethers and ketones to form a precipitate;

(D) adding at least one polycarboxylic acid ester when the precipitate appear; and

(E) separating the precipitate from the mixture and treating the separated precipitate with titanium tetrahalide or a mixture of titanium tetrahalide in an inert diluent.

4,784,984

STAINLESS STEEL RIBBON FOR USE AS A CATALYST CARRIER FOR AUTOMOBILE EXHAUST GAS AND CATALYST CARRIER CONTAINING THE RIBBON COILED INTO A HONEYCOMB

Mikio Yamanaka; Keiichi Omura; Masayuki Tendo, all of Sagamibara; Susumu Takemura, Tokyo; Takashi Sato, and Tsutomu Ozawa, both of Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 30, 1987, Ser. No. 8,954
Claims priority, application Japan, Jan. 30, 1986, 61-016915; Mar. 17, 1986, 61-056896
Int. Cl.[4] B01J *32/00, 35/04*
U.S. Cl. 502—439 **10 Claims**

1. A ribbon for use as a metal honeycomb of a catalyst carrier of a catalyst converter, consisting of an Al-containing stainless steel ribbon having an Al content of 20% or less and an Si coontent of 3% or less, which is produced directly by a process of solidifying the Al-containing stainless steel from a molten state thereof directly into a form of a ribbon at a cooling speed of at least 10^3 °C./sec, thereby forming an Al-concentrated layer on a surface of said ribbon as solidified, said ribbon having as a metallurgical structure a columnar structure with grain boundaries principally oriented in a direction along a thickness of the ribbon and a maximum grain diameter measured perpendicularly to the columnar axis of 30 μm.

4. A carrier for a catalyst for purification of exhaust gas of an automobile, which is produced by a process of solidifying a ribbon of an Al-containing stainless steel having an Al content

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of 20% or less and an Si content of 3% or less from a molten state thereof directly into a form of a ribbon at a cooling speed of at least 10 ^{3}°C./sec, thereby forming an Al-concentrated layer on a surface of said ribbon as solidified, said carrier having as a metallurgical structure a columnar structure with grain boundaries principally oriented in a direction along a thickness of the carrier and a maximum grain diameter measured perpendicularly to the columnar axis of 30 μm, coiling the ribbon at a temperature of at least 500° C. after solidification, and subsequently forming the coiled ribbon into a honeycomb.

4,784,985

SUBSTITUTED 4-METHYL-4,7-DIHYDRO-1,3-DIOXEPINS, THEIR PREPARATION AND THEIR USE AS SCENTS

Walter Gramlich, Edingen-Neckarhausen, and Hardo Siegel, Speyer, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

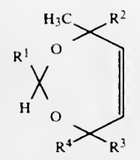
Filed Oct. 27, 1986, Ser. No. 923,214

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539467

Int. Cl.^{4} A61K *7/46*

U.S. Cl. 512—25 **2 Claims**

1. A scent composition which contains a substituted 4-methyl-4,7-dihydro-1,3-dioxepin of the formula I



(I)

where R^1 is a straight-chain or branched alkyl radical of 1 to 12 carbon atoms which may furthermore contain oxygen in the form of an ether group, or a 5-membered to 8-membered ring which is unsubstituted or substituted by alkyl groups and/or an alkylene group, has up to 10 carbon atoms and may furthermore contain oxygen in the form of an ether group, and R^2, R^3 and R^4 are each hydrogen or methyl, the total number of carbon atoms being not more than 25.

4,784,986

SKIN TREATMENT COMPOSITIONS AND METHOD OF USE THEREOF

Thomas C. Usher, Nassau, The Bahamas, assignor to Polydex Pharmaceuticals Ltd., Nassau, The Bahamas

Filed Oct. 30, 1986, Ser. No. 925,061

Int. Cl.^{4} C08L *89/06;* **A61K** *7/28*

U.S. Cl. 514—2 **5 Claims**

1. A cosmetic method for the treatment of skin by the deep absorption of a collagen derivative into the stratum corneum thereof which comprises applying to the skin an effective amount of a water soluble fatty acid amide of a water soluble hydrolysed collagen having a molecular weight in the range of about 1,000–10,000, and allowing said material to remain in contact with the skin for a sufficient period of time to effect substantial penetration thereof.

4,784,987

GRF ANALOGS VI

Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 2,723, Jan. 13, 1987, abandoned. This application Jun. 10, 1987, Ser. No. 60,149

Int. Cl.^{4} A61K *37/43;* **C07K** *7/10*

U.S. Cl. 514—12 **20 Claims**

1. A peptide, or a nontoxic salt thereof, having the sequence: R_1-R_2-R_3-R_4-R_5-Phe-R_7-R_8-R_9-Tyr-Arg-R_{12}-R_{13}-Leu-R_{15}-Gln-Leu-R_{18}-Ala-Arg-Lys-R_{22}-Leu-R_{24}-R_{25}-R_{26}-R_{27}-R_{28}-R_{29}-R_{30}-R_{31}-Gly-R_{33}-R_{34}-R_{35}-R_{36}-R_{37}-R_{38}-R_{39}-R_{40}-R_{41}-R_{42}-R_{43}-R_{44}-Ser wherein R_1 is N-Me Tyr, Tyr, desNH_2-Tyr, D-Tyr, N-Et Tyr, N-Ip Tyr, N-Me His, His, desNH_2-His, D-His, N-Et His, and N-Ip His; R_2 is Ala, D-Ala or D-NMA; R_3 is Asp or D-Asp; R_4 is Gly or Ala; R_5 and R_{27} are selected from the group consisting of Met, Leu, Val, Nva, Gln, Thr, Ile, Ala, Arg, Asn, Asp, Cys, Glu, Gly, His, Nle, Lys, Phe, Pro, Ser, Tyr and Trp; R_7 is Asn or Thr; R_8 is Lys, Asn or Ser; R_9 is Ala or Ser; R_{12} is Lys or Arg; R_{13} is Ala, Val or Ile; R_{15} is Gly or Ala; R_{18} is Ser or Tyr; R_{22} is Tyr or Leu; R_{24} is His or Gln; R_{25} is Thr, Asp, or Glu; R_{26} is Leu or Ile; R_{28} is Ala, Ser or Asn; R_{29} is Lys or Arg; R_{30} is Arg or Gln; R_{31} is Val or Gln; R_{33} is Gly or Glu; R_{34} is Gly, Arg or Ser; R_{35} is Ser or Asn; R_{36} is Met, Leu, Val, Nva, Gln, Thr, Ile or Nle; R_{37} is Ile or Glu; R_{38} is Glu, Gln or Arg; R_{39} is Asp, Arg or Gly; R_{40} is Asp, Ser or Ala; R_{41} is Asn, Arg or Lys; R_{42} is Glu, Phe, Ala or Val; R_{43} is Pro, Asn or Arg; R_{44} is Leu or Ala; provided however that at least one of the following is present: R_7 is Asn, R_8 is Lys, R_{13} is Ala, R_{22} is Tyr and R_{25} is Thr; and provided further that any or all of the residues after R_{27} may be deleted.

4,784,988

PEPTIDES CORRELATED TO LYSOZYME

Tiberio Bruzzese; Armando Cedro, and Holger H. Van Den Heuvel, all of Milan, Italy, assignors to Spa Societa' Prodotti Antibiotici S.p.A., Milan, Italy

Filed Dec. 11, 1986, Ser. No. 940,359

Claims priority, application Italy, Dec. 11, 1985, 23165 A/85

Int. Cl.^{4} A61K *37/02;* **C07K** *5/08, 7/08, 7/06*

U.S. Cl. 514—14 **14 Claims**

1. A peptide selected from the group consisting of:

H_2N—Asn^{46}—Thr—Asp—Gly—Ser—Thr—Asp—Tyr^{53}—COOH,

H_2N—Thr—Asp—Gly—Ser—Thr—Asp—Tyr—COOH,

H_2N—Asp—Gly—Ser—Thr—Asp—Tyr—COOH,

H_2N—Gly—Ser—Thr—Asp—Tyr—COOH,

H_2N—Ser—Thr—Asp—Tyr—COOH,

H_2N—Thr—Asp—Tyr—COOH,

H_2N—Asn^{39}—Thr—Gln—Ala—Thr—Asn—Arg^{45}—COOH,

H_2N—Thr—Gln—Ala—Thr—Asn—Arg—COOH,

H_2N—Gln—Ala—Thr—Asn—Arg—COOH,

H_2N—Ala—Thr—Asn—Arg—COOH,

H_2N—Thr—Asn—Arg—COOH, and

H_2N—Asn^{39}—Thr—Gln—Ala—Thr—Asn—Arg—Asn—Thr—Asp—Gly—Ser—Thr—Asp—Tyr^{53}—COOH.

4,784,989

MEANS FOR REMOVING MICROORGANISMS FROM TISSUE

Magnus Höök, 478 Malma Ringväg, S-752 40 Uppsala, and Torkel Wadströöm, P.O. Box 96, S-741 00 Knivsta, both of Sweden

PCT No. PCT/SE83/00323, § 371 Date May 14, 1984, § 102(e) Date May 14, 1984, PCT Pub. No. WO84/01108, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 13, 1983, Ser. No. 611,000

Claims priority, application Sweden, Sep. 14, 1982, 8205244

Int. Cl.^{4} A61K *37/02, 9/70*

U.S. Cl. 514—21 **10 Claims**

1. A method for treating a microorganism infection on a wound comprising applying to microorganisms on the wound an effective amount of a protein or fragment or residue thereof to bind to microorganisms, said protein selected from the group consisting of fibronectin, fibrinogen, collagen, laminin and chondronectin, and removing the protein or fragment or residue thereof which is bound to the microorganism from the wound.

4,784,990

HIGH MOLECULAR WEIGHT SODIUM HYALURONATE

Abraham Nimrod; Benjamin Greenman; Dov Kanner, all of Rehovot, and Moshe Landsberg, Petah Tikva, all of Israel, assignors to Bio-Technology General Corporation, New York, N.Y.

Filed Jan. 18, 1985, Ser. No. 692,692

Int. Cl.^{4} A61K *31/73;* **C08G** *83/00;* **C12P** *19/04;* **C12R** *1/46*

U.S. Cl. 514—54 **1 Claim**

1. A composition characterized by an absence of pyrogenicity and inflammatory activity and by the absence of proteins of animal origin which comprises between about 88% to 92% by weight sodium hyaluronate and from about 8% to 12% by weight water, the sodium hyaluronate being characterized by a minimum viscosity of about 3.5 m^3/Kg, an average molecular weight from about 3.5×10^6 daltons to about 4.0×10^6 daltons, a glucoronic acid to N-acetyl glucosamine ratio of 1:1, from about 4% to about 6% sodium ion, a specific optical rotation measured at 25° C. and at a wavelength of 436 nm from about 155° to 165°, less than 0.01% by weight protein, less than 0.001% by weight sulfate, less than 0.02% by weight neutral sugar, less than 0.05 ng/ml of endotoxin, less than 0.2 mg/g of iron and less than 0.2 mg/g of copper.

4,784,991

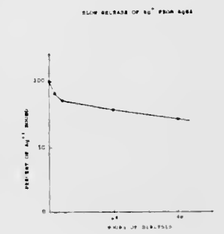
HEAVY METAL SALTS OF HYALURONIC ACID AND THEIR USE AS ANTIMICROBIAL AGENTS

Abraham Nimrod, and Benjamin Greenman, both of Rehovot, Israel, assignors to Bio-Technology General Corp., New York, N.Y.

Continuation-in-part of Ser. No. 840,419, Mar. 14, 1986. This application Mar. 9, 1987, Ser. No. 23,666

Int. Cl.^{4} A61K *7/32;* **A01N** *63/02*

U.S. Cl. 514—62 **2 Claims**



1. A method of treating a subject having keratitis which method comprises topically applying to an infection causing the keratitis an effective amount of a silver salt of hyaluronic acid.

4,784,992

PHOSPHORYLALKANOLAMIDE DERIVATIVES OF L-CARNITINE AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Alberto Reiner, Como, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Italy

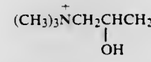
Filed Jan. 5, 1987, Ser. No. 397

Claims priority, application Italy, Jan. 13, 1986, 47524 A/86

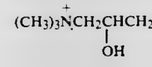
Int. Cl.^{4} A61K *31/685;* **C07F** *9/10*

U.S. Cl. 514—77 **8 Claims**

1. A method for treating myocardial steatosis which comprises administering to a patient an effective amount of a composition comprising an inner salt of L-carnitine of the formula



4. An inner salt of L-carnitine phosphorylethanolamide of the formula:



4,784,993

TRIAZOLE CONTAINING DIPHOSPHONATE COMPOUNDS AND THE USE THEREOF

Elmar Bosies, Weinheim, and Rudi Gall, Hirschberg, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

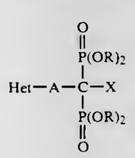
Division of Ser. No. 759,608, Jul. 26, 1985, Pat. No. 4,687,767. This application Jul. 23, 1987, Ser. No. 76,706

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428524

Int. Cl.^{4} A61K *31/41;* **C07F** *9/65*

U.S. Cl. 514—93 **17 Claims**

1. Compound of the formula:



(I)

wherein

Het is a substituted or unsubtituted heterocyclic ring selected from the group consisting of 1,2,3-triazole, and 1,2,4-triazole, and wherein the substituents are selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen selected from the group consisting of fluorine, chlorine, bromine, iodine; hydroxyl, carboxyl, an amino group optionally substituted by C_1–C_4 alkyl or alkanoyl of 1 to 6 carbon atoms; benzyl and benzyl substituted by C_1–C_4 alkyl, nitro, amino and aminoalkyl with 1 to 4 carbon atoms,

A is a straight-chained or branched, saturated or unsaturated hydrocarbon chain containing 2 to 8 atoms,

X is a hydrogen atom, hydroxy optionally substituted by alkanoyl of 1 to 6 carbon atoms or an amino group optionally substituted by an alkyl radical of 1 to 4 carbon atoms

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or by alkanoyl of from 1 to 6 carbon atoms and R is a hydrogen atom or an alkyl of 1 to 4 carbon atoms or a pharmaceutically acceptable salt thereof.

4,784,994

PROCESS FOR THE TREATMENT OF INFLAMMATORY AND ALLERGIC DISEASES

Axel Romer, Hurth-Gleuel, and Jorg Hager, Cologne, both of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 49,727

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1986, 3620674

Int. Cl.[4] A61K *31/33*

U.S. Cl. 514—183 **2 Claims**

1. A process for the treatment of skin allergic diseases in human beings comprising applying topically to the affected skin of the human being to be treated, an ointment formulation comprising 0.1 to 10% by weight of 2-phenyl-1.2-benzisoselenazol-3(2H)-one in the final ointment.

4,784,995

CEPHALOSPORIN COMPOUNDS

Toyonari Oine, Nara; Mitsuyoshi Wagatsuma, and Totaro Yamaguchi, both of Urawa, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

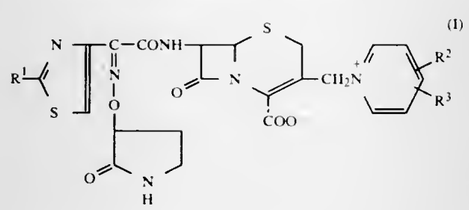
Filed Jun. 8, 1987, Ser. No. 59,584

Claims priority, application Japan, Jun. 16, 1986, 61-140988; Dec. 3, 1986, 61-288080

Int. Cl.[4] C07D *501/44;* **A61K** *31/545*

U.S. Cl. 514—206 **7 Claims**

1. A cephalosporin compound of the formula:



(I)

wherein R^1 is an amino group, either one of R^2 and R^3 is an alkyl group having one to 4 carbon atoms or an alkoxy group having one to 4 carbon atoms, and the other one of R^2 and R^3 is an amino group, or a pharmaceutically acceptable salt thereof.

4,784,996

PYRIMIDOINDOLES USEFUL AS HYPOGLYCAEMICS

Alan C. White, Englefield Green; Ian A. Cliffe, Cippenham, and Richard S. Todd, Burnham, Nr. Slough, all of England, assignors to John Wyeth & Brother Ltd., Maidenhead, England

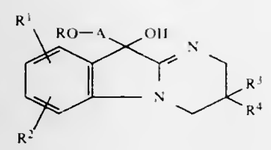
Filed Mar. 9, 1987, Ser. No. 23,337

Claims priority, application United Kingdom, Mar. 13, 1986, 8606253

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—267 **17 Claims**

1. A compound of the formula:



in which

A is alkylene of 1 to 6 carbon atoms;

RO is hydroxy, alkoxy of 1 to 6 carbon atoms, phenylalkoxy of 7 to 12 carbon atoms or substituted phenylalkoxy of 7 to 12 carbon atoms, where the substituent on the phenyl ring is hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

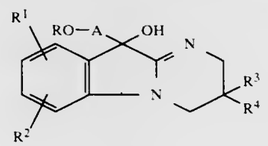
R^1 and R^2 are, independently, hydrogen, hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

and

R^3 and R^4 are, independently, hydrogen or alkyl of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

17. A method of treating diabetes which comprises administering to a mammal in need thereof a hypoglycemically effective amount of a compound of the formula:



in which

A is alkylene of 1 to 6 carbon atoms;

RO is alkoxy, alkoxy of 1 to 6 carbon atoms, phenylalkoxy of 7 to 12 carbon atoms or substituted phenylalkoxy of 7 to 12 carbon atoms, where the substituent on the phenyl ring is hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

R^1 and R^2 are, independently, hydrogen, hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, halo, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

and

R^3 and R^4 are, independently, hydrogen or alkyl of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,784,997

1-H-PYRIDO-[3,2-B][1,4]-THIAZINE

Alexander Klausener; Gerd Fengler; Hans-Josef Buysch, all of Krefeld, and Bernhard Pelster, St. Augustin, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

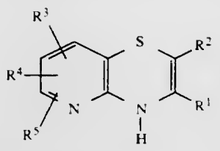
Filed Dec. 16, 1986, Ser. No. 942,468

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545097

Int. Cl.[4] A61K *31/54;* **C07D** *513/04, 513/12*

U.S. Cl. 224—2 **7 Claims**

1. A 1-H-pyrido[3,2-b][1,4]-thiazine of the formula



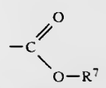
in which

R^1 represents hydrogen, optionally substituted C_1 to C_8 alkyl or C_2 to C_8-alkenyl, or the group

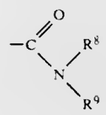


in which R^6 represents optionally substituted C_1 to C_8 alkyl, C_1 to C_8 alkoxy or C_6 to C_{12} aryl,

R^2 represents hydrogen, nitrile, the group



in which R^7 represents optionally substituted C_1 to C_8 alkyl, or the group



in which

R^8 and R^9 each independently represent hydrogen, optionally substituted C_1 to C_8 alkyl or C_6 to C_{12} aryl, and it being possible for the radicals R^8 and R^9 together with the nitrogen to which they are attached to form a 5- or 6-membered, optionally substituted heterocycle or additionally a pyrimidyl, imidazolyl, morpholinyl, thiomorpholinyl, piperazinyl or N-methyl piperazinyl, further R^2 represents the group



in which R^{10} represents optionally substituted C_1 to C_8 alkyl, it being possible for R^1 and R^{10} to form an optionally substituted 5- to 8-membered carbocycle, or optionally substituted C_6 to C_{12} aryl,

R^3 represents hydrogen, and

R^4 and R^5 each independently represent hydrogen, halogen, optionally substituted C_1 to C_8 alkyl, C_1 to C_8 alkoxy, C_6 to C_{12} aryloxy, C_1 to C_8 alkylthio, C_6 to C_{12} arylthio or the group



in which

R^{11} and R^{12} each independently represent hydrogen, optionally substituted C_1 to C_8 alkyl, or C_6 to C_{12} aryl, and it being possible for the radicals R^{11} and R^{12} together with the nitrogen to which they are attached to form a 5- or 6-membered, optionally substituted heterocycle and additionally a pyrimidyl, imidazolyl, morpholinyl, thiomorpholinyl piperazinyl or N-methyl piperizinyl, and salts thereof wherein the optional substituents mentioned for the radicals hereinabove are halogen, nitro, cyano, methoxycarbonyl, ethoxycarbonyl, and trifluoromethyl.

6. A pharmaceutical composition comprising an effective amount of one or more 1-H-pyrido-[3,2-b][1,4]thiazines according to claim **1** and pharmaceutically suitable vehicle or solvent therefor.

4,784,998

1,3,4-OXADIAZOLE PYSCHOTROPIC COMPOUNDS

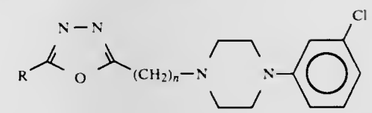
Joseph P. Yevich, Southington, Conn., assignor to Bristol-Myers Company, New York, N.Y.

Filed Apr. 6, 1987, Ser. No. 34,372

Int. Cl.[4] A61K *31/495;* **C07D** *271/10, 241/04*

U.S. Cl. 514—252 **10 Claims**

1. A compound of Formula I



I

and its pharmaceutically acceptable acid-addition salts wherein

R is C_{1-4} alkyl, trifluoromethyl or pentafluoroethyl; and

n is the integer 3 or 4.

7. The method of tranquilizing a mammal in need of such treatment which comprises administration to said mammal of a therapeutically effective tranquilizing amount of a compound of claim **1**.

8. The method of providing analgesia for a mammal in need of such treatment which comprises administration to said mammal of a therapeutically effective analgesic amount of a compound of claim **1**.

9. The method of alleviating depression in a mammal in need of such treatment which comprises administering to said mammal a therapeutically effective antidepressant amount of a compound of claim **1**.

4,784,999

NOVEL TREATMENT

Dieter Angersbach; Charles D. Nicholson; Joachim Göring, all of Gronau, Fed. Rep. of Germany; Brian Morgan, Betchworth, and Jonathan R. S. Arch, Epsom, both of England, assignors to Beecham Wuelfing GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 96,118

Claims priority, application United Kingdom, Sep. 11, 1986, 8621869

Int. Cl.[4] A61U *31/52*

U.S. Cl. 514—263 **2 Claims**

1. A method for the treatment of cerebral vascular and neuronal degenerative disorders related to learning, memory and cognitive dysfunctions in mammals including humans, which comprises administering to the mammal in need of such treatment an effective amount of 1,3-di-n-butyl-7-(2-oxypropyl) xanthine or a pharmaceutically acceptable salt thereof.

4,785,000

METHOD OF TREATING PATIENTS SUFFERING FROM CHRONIC PAIN OR CHRONIC COUGH

Mary J. Kreek, and Jack Fishman, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Division of Ser. No. 875,560, Jun. 18, 1986. This application Nov. 16, 1987, Ser. No. 121,784

Int. Cl.[4] A61K *31/22, 31/44*

U.S. Cl. 514—282 **9 Claims**

1. A method of treating a patient in chronic pain or suffering from chronic cough over a prolonged period to provide systemic analgesia or central antitussive effect while simultaneously avoiding the onset of intestinal hypomotility, comprising the oral administration to the patient 1–5 times daily of 1–2 dosage units comprising from about 1.5 to about 100 mg of an opioid analgesic or antitussive selected from the group consisting of methadone and propoxyphene and from about 1 to about 18 mg of an opioid antagonist or antagonist pro-drug substantially devoid of systemic antagonist activity when administered orally.

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4,785,001

ERGOLINE ESTERS

Aldemio Temperilli, Milan; Roberto Maj, Saronno; Sergio Mantegani, Milan, and Enzo Brambilla, Mariano Comense, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

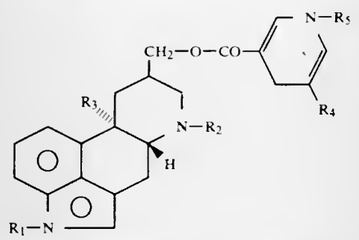
Filed May 21, 1987, Ser. No. 52,380

Claims priority, application United Kingdom, May 21, 1986, 8612366

Int. Cl.[4] A61K *31/48;* **C07D** *457/04*

U.S. Cl. 514—288 **9 Claims**

1. an ergoline of the formula



wherein R_1 is a hydrogen atom or a methyl group, R_2 is one member selected from the group consisting of methyl, ethyl, n-propyl, i-propyl, butyl, allyl, and propargyl groups, R_3 is a hydrogen atom or a methoxy group, R_4 is a hydrogen or halogen atom, and R_5 is a C_{1-4} alkyl group, or a pharmaceutically acceptable salt thereof.

4. A pharmaceutical composition comprising the ergoline of claim 1 in an amount which exhibits pharmacological activity at the central nervous system lever or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier or diluent.

4,785,002

IMIDAZO-PYRROLO-PYRIDINES USEFUL AS FUNGICIDAL AND GROWTH-REGULATING AGENTS

Wilfried Draber, Wuppertal; Gerd Hänssler, Leverkusen, and Klaus Lürssen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

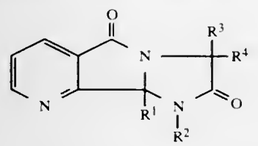
Filed Oct. 1, 1986, Ser. No. 914,090

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534948

Int. Cl.[4] A01N *43/40;* **C07D** *487/14, 487/20*

U.S. Cl. 514—293 **10 Claims**

1. A method of combating fungi or regulating the growth of plants which comprises applying to such fungi, such plants or to a fungus or plant growth situs an amount effective therefor of an imidazo-pyrrolo-pyridine of the formula



in which,

R^1 represents cyano, aminocarbonyl or straight-chain or branched alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part,

R^2 represents hydrogen or straight-chain or branched alkyl with 1 to 4 carbon atoms, or represents trimethylsilyl, or represents one equivalent of an alkali metal or alkaline earth metal cation, and

R^3 and R^4 independently of one another each represent straight-chain or branched alkyl with 1 to 6 carbon atoms, or represent cycloalkyl with 3 to 7 carbon atoms, or represent a cycloalkylalkyl which has 3 to 7 carbon atoms in the cycloalkyl part and 1 to 4 carbon atoms in the alkyl part and is straight-chain or branched on the alkyl part, or

R^3 and R^4 together represent a divalent alkanediyl radical with 4 to 6 carbon atoms.

6. A method according to claim 1, in which

R^1 represents cyano, aminocarbonyl or straight-chain or branched alkoxycarbonyl with 1 to 4 carbon atoms in the alkoxy part,

R^2 represent hydrogen or straight-chain or branched alkyl with 1 to 4 carbon atoms or represents trimethylsilyl, or represents one equivalent of an alkali metal or alkaline earth metal cation, and

R^3 and R^4 together represent butanediyl, pentanediyl or hexanediyl.

4,785,003

N-DISUBSTITUTED GLYCINE AND B-AMINO-PROPIONIC ACID DERIVATIVES HAVING ANTI-ULCER ACTIVITY

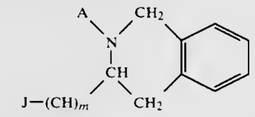
Sun H. Kim, Chestnut Hill, Mass., assignor to Biomeasure, Inc., Hopkinton, Mass.

Division of Ser. No. 661,354, Oct. 16, 1984, Pat. No. 4,598,067. This application Jan. 21, 1986, Ser. No. 821,071

Int. Cl.[4] A61K *31/47;* **C07D** *217/16*

U.S. Cl. 514—307 **6 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof,

wherein

A is N-Ac-Sar, pGlu, or homo-pGlu;

m is either an integer between 1 and 4, inclusive, when A is N-Ac-Sar, or an integer between 0 and 4, inclusive, when A is pGlu or homo-pGlu; and

J is



wherein R is a hydroxy group, an alkoxy group having between 1 and 3 carbon atoms, inclusive, or an aralkoxy group having between 7 and 17 carbon atoms, inclusive.

5. A method of treating an ulcer in a mammal comprising administering to said mammal a therapeutically effective amount of the compound of claim 1.

4,785,004

AROMATIC THIOETHERS

Andreas Von Sprecher, Oberwil; Werner Breitenstein, Basel, both of Switzerland; Andreas Beck, Freiburg, Fed. Rep. of Germany; Robert W. Lang, Pratteln, and Konrad Oertle, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

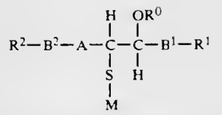
Filed Dec. 15, 1986, Ser. No. 941,676

Claims priority, application Switzerland, Dec. 23, 1985, 5513/85; Apr. 4, 1986, 1321/86

Int. Cl.[4] C07C *149/40;* **A61K** *31/235*

U.S. Cl. 514—311 **22 Claims**

1. A compound of the formula



(I)

in which the general symbols have the following meanings:

R^0 represents hydrogen or C_{1-7}-alkanoyl,

R^1 represents C_{1-3}-alkyl which may be substituted by one or more halogen atoms having an atomic number of at most 17,

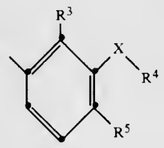
R^2 represents an aliphatic radical having from 5 to 15 carbon atoms,

A represents a single bond, ethylene or vinylene,

B^1 represents C_{1-7}-alkylene or phenylene,

B^2 represents a single bond, ethylene or phenylene,

M represents an aromatic radical of the partial formula



(M)

in which the symbols have the following meanings:

R^3 represents hydrogen or C_{1-4}-alkyl,

X represents NH, O, S or if R^4 represents hydrogen, a single bond,

one of the symbols R^4 and R^5 represents hydrogen and the other represents the group —CO—R^6, or

R^4 and R^5 together represent the radical —CO—$C(R^6)$=$C(R^7)$— or —CO—$C(R^7)$=$C(R^6)$— or

R^4 and R^5, together with X, represent the radical —N=$C(R^8)$—$C(R^6)$=CH—, in which

R^6 represents $—(CH_2)_b—COOR^3$ (in which b=0 to 2)

R^7 represents hydrogen or C_{1-4}-alkyl and

R^8 represents hydrogen, methyl, methoxy or halogen,

or a physiologically tolerable salt of such a compound having salt-forming properties.

4,785,005

6-(6-ALKYLPYRIDONE)-CARBOSTYRIL COMPOUNDS AND THEIR CARDIOTONIC USES

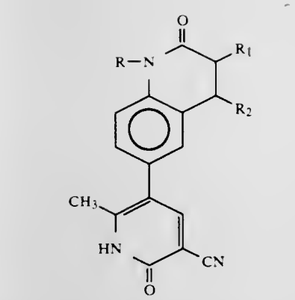
Henry F. Campbell, Lansdale; Donald E. Kuhla, Doylestown; Bruce F. Molino, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Filed Jun. 25, 1986, Ser. No. 878,123

Int. Cl.[4] C07D *401/04;* **A61K** *31/47*

U.S. Cl. 514—312 **6 Claims**

1. A compound of the formula



(I)

wherein:

R, R_1 and R_2 are each independently H or lower alkyl; or a pharmaceutically acceptable salt thereof.

4,785,006

FUNGICIDAL COMPOSITIONS CONTAINING PIPERIDINE COMPOUNDS AND USE

Paul A. Worthington, 4 Oakhurst Rd., Maidenhead Court Park, Maidenhead, Berkshire; Brian K. Snell, 38 Copse Mead, Woodley, Reading, Berkshire; Paul DeFraine, 5 Salisbury Close, Wokingham, Berkshire, and Vivienne M. Anthony, 4 The Croft, Maidenhead, Berkshire, all of England

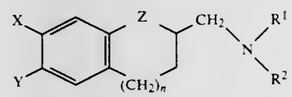
Filed Jun. 10, 1986, Ser. No. 872,686

Claims priority, application United Kingdom, Jun. 18, 1985, 8515390; Mar. 5, 1986, 8605418

Int. Cl.[4] A01N *43/40*

U.S. Cl. 514—319 **5 Claims**

1. A fungicidal composition comprising, as an active ingredient, a compound having the general formula:



(I)

and stereoisomers thereof wherein X and Y are hydrogen, alkyl or alkoxy, provided that at least one of X and Y is alkoxy Z is $—CR^3R^4—$ in which R^3 and R^4 are hydrogen or C_{1-4} alkyl, R^1 and R^2 together with the adjacent N-atom constitute an aryl substituted piperidine ring; and n is 1; together with a carrier therefor.

4,785,007

DRUGS COMPRISING 2,3- OR 3,4-DIPHENYL DERIVATIVES OF γ-NITRILE-ESTERS OR THE CYCLIZATION PRODUCTS THEREOF

Jacques Dreux, Lyons, and Serge Petit, Villeurbanne, both of France, assignors to Laboratoires Hoechst S.A., Puteaux, France

Filed Apr. 2, 1986, Ser. No. 847,255

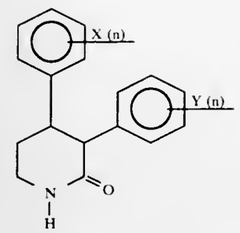
Claims priority, application France, Apr. 4, 1985, 85 05123

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—327 **5 Claims**

1. A pharmaceutical composition, which comprises as an active ingredient an amount effective for use as a pharmaceutical in the therapy of a host of a cyclized 2,3 diphenyl derivative of γ-nitrile-esters corresponding to the formula C

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(C)

in which, R is a hydrogen atom or a pharmaceutically compatible alkali metal or alkaline-earth metal or a C_1-C_4 alkyl group, and X or Y which may be identical or different, are a hydrogen or halogen atom or a trifluoromethyl group, C_1-C_4 alkyl, phenyl, phenyl-(C_1-C_4 alkyl), C_1-C_4 alkoxy, hydroxy, acyloxy, phenoxy, benzyloxy, C_1-C_4 alkylsulfonyl or di(C_1-C_4 alkyl)amino group, n being between 1 and 3 in the case where X and/or Y are other than hydrogen, and a pharmaceutically acceptacle carrier.

4,785,008

N-SUBSTITUTED 2-AMINO-THIAZOLES, PROCESS FOR THEIR PREPARATION AND THEIR THERAPEUTIC APPLICATION

Claude Coquelet, St Gely du Fesc; Daniel Sincholle, St Mathieu de Treviers; Claude Bonne, Castelnau le Lez, and Alain Alazet, Agde, all of France, assignors to Laboratoires Chauvin-Blache, Montpellier, France

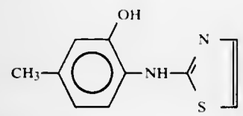
Filed Apr. 24, 1986, Ser. No. 855,411

Claims priority, application France, Apr. 30, 1985, 85 06568

Int. Cl.[4] C07D *277/42, 417/12;* **A61K** *31/425, 31/445*

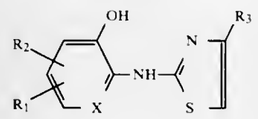
U.S. Cl. 514—342 **8 Claims**

1. A compound of the formula



and pharmaceutically acceptable salts thereof.

7. A process for the treatment of inflammatory phenonema, which comprises administering to a human in need thereof an effective amount of a compound of the formula



in which:

X is a C—H group or a nitrogen atom,

R_1 and R_2 are each selected from the group consisting of hydrogen, halogen, C_1-C_{12} alkyl, C_1-C_6 alkoxy, C_1-C_6 alkylthio, C_2-C_6 alkenyloxy, C_5-C_7 cycloalkyl, trifluoromethyl, nitro, amino, (C_1-C_6 alkyl)amino and di(C_1-C_6 alkyl) amino; and

R_3 is selected from hydrogen, —CH_2OH and —$COOR_4$, R_4 being selected from hydrogen and C_1-C_6 alkyl.

4,785,009

COCKROACH REPELLENTS

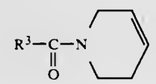
Terrence P. McGovern, Bowie, Md., and George S. Burden, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 27, 1984, Ser. No. 625,266

Int. Cl.[4] A01N *43/40;* **C07D** *211/68*

U.S. Cl. 514—354 **12 Claims**

1. A compound of the formula



wherein R^3 is an alicyclic ring structure having from 3 to 5 carbon atoms.

4,785,010

2-(AMINOALKYL)-PYRROLE DERIVATIVES, TO TREAT DISORDERS CAUSED BY RESTRICTION IN CEREBRAL FUNCTION

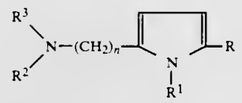
Gerhard Zoller, Maintal; Rudi Beyerle, Frankfurt am Main; Ursula Schindler, MöWaldorf; Rolf-Eberhard Nitz, Frankfurt, and Piero A. Martorana, Bad Homburg, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 604,533, Apr. 27, 1984, abandoned. This application Nov. 12, 1985, Ser. No. 797,210

Int. Cl.[4] A61U *31/44*

U.S. Cl. 514—356 **12 Claims**

1. Method for the treatment of humans for combating and preventing disorders which are caused by a restriction in cerebral function, and for the treatment of cerebral aging processes, which comprises administering to a human subject to or afflicted with such disorders and for aging processes an effective dose of 2-(aminoalkyl)-pyrrole derivative of the formula I



(I)

wherein

R denotes hydrogen, alkyl(C_1-C_5) or phenyl;

R^1 denotes hydrogen, alkyl(C_1-C_5), cyano-alkyl(C_1-C_4), alkoxy(C_1-C_4)-carbonyl, alkoxy(C_1-C_4)-carbonyl-alkyl(C_1-C_4); $R^7(R^8)$N-carbonylalkyl(C_1-C_4), acetyl-aminoethyl, phenyl or phenyl-alkyl(C_1-C_4), it being possible for the phenyl or the phenyl of the phenyl-alkyl also to be monosubstituted or polysubstituted by halogen, alkoxy(C_1-C_4), alkyl(C_1-C_4), $R^4(R^5)$N-, hydroxyl, mercapto, alkylmercapto(C_1-C_4), nitro, cyano, alkoxy(C_1-C_4)-carbonyl or alkoxy(C_1-C_4)-carbonyl-alkyl(C_1-C_4) or R^1 denotes $R^4(R^5)$N-R^6-, hydroxy-carbonyl-alkyl(C_1-C_4), 1-(alkoxy(C_1-C_4)-carbonyl)-2-mercapto-ethyl, 1-(alkoxy(C_1-C_4)-carbonyl)-2-hydroxy-ethyl, 1-(alkoxy(C_1-C_4)-carbonyl)-2-alkoxy(C_1-C_4)-ethyl, 1-(alkoxy(C_1-C_4)-carbonyl-2-alkylthio(C_1-C_4)-ethyl, 1-(alkoxy(C_1-C_4)-carbonyl)-2-(alkyl(C_1-C_4)-carbonyl-thio)-ethyl, 1-(alkoxy(C_1-C_4)-carbonyl)-2-(alkyl(C_1-C_4)-carbonyl-oxy)-ethyl, or 1-(alkoxy(C_1-C_4)-carbonyl)-2-phenyl-ethyl;

R^2 und R^3 independently of one another denote hydrogen, alkyl(C_1-C_5), alkanoyl(C_1-C_5), alkanoyl(C_2-C_5) which is mono-, di- or tri-substituted by amino, alkoxy(C_1-C_4), hydroxyl, alkanoyloxy(C_1-C_4), phenyl or halogen, phenylcarbonyl, phenylcarbonyl which is mono- or polysubstituted by halogen, alkoxy(C_1-C_4), alkyl(C_1-C_4), amino, $R^4(R^5)$N-, hydroxy, alkanoyloxy(C_1-C_4), mercapto, alkylmercapto(C_1-C_4), nitro, cyano, alkoxy(C_1-C_4)-carbonyl or aminosulphonyl, or R^2 and/or R^3 denote cycloalkylcarbonyl with 5 to 7 C atoms in the cycloalkyl radical or (4-chlorophenoxy)-acetyl;

R^4 and R^5 denote hydrogen or alkyl(C_1-C_4);

R^6 denotes alkylene(C_1-C_4);

R^7 and R^8 independently of one another denote hydrogen or alkyl(C_1-C_4);

and n denotes 1, 2 or 3, or a pharmacologically acceptable acid addition salt thereof.

4,785,011

DIHYDROPYRIDINE COMBINATION PRODUCT COMPRISING A DIHYDROPYRIDINE COMPOUND AND A CARDIOACTIVE NITRATE

Rainer Gross, Wuppertal, and Matthias Schramm, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 875,139, Mar. 17, 1986, abandoned. This application Sep. 18, 1987, Ser. No. 98,353

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1985, 3523540

Int. Cl.[4] A61K *31/34, 31/44*

U.S. Cl. 514—356 **5 Claims**

1. A solid medicament formulation for treatment of diseases of the coronaries and of the myocardium and which can be administered orally, comprising synergistically effective mixture of a dihydropyridine selected from the group consisting of nisoldipine and nitrendipine and a cardioactive nitrate selected from the group consisting of isosorbide-5-mononitrate and isosorbidedinitrate, wherein there is one part of the dihydropyridine per 1 to 1000 parts of the nitrate.

4,785,012

OXAZOLE ANTHELMINTIC AGENTS OF MARINE ORIGIN

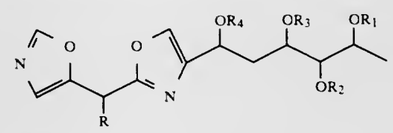
Philip Crews, Santa Cruz; Thomas R. Matthews, Los Gatos; Emilio Q. Cabana, and Madeline Adamczeski, both of Santa Cruz, all of Calif., assignors to Syntex Corporation and The Regents of the University of California, both of Palo Alto, Calif.

Filed Apr. 9, 1987, Ser. No. 36,267

Int. Cl.[4] A61K *31/42;* **C07D** *263/32*

U.S. Cl. 514—374 **20 Claims**

10. A method for treating helminthiasis which method comprises administering to a subject in need thereof an effective amount of a compound in substantially pure form of formula 1:



(1)

wherein

R is H, OH, or saturated acyloxy of 8 to 22 carbon atoms;

R_1, R_2, R_3, and R_4 are each independently H or acyl of 1 to 6 carbon atoms;

and the pharmaceuticlaly acceptable salts thereof or an effective amount of a phramaceutical composition wherein the active ingredient is a substantially pure form of the compound of formula 1 or its pharmaceutically acceptable salts.

4,785,013

FUNGICIDAL COMPOSITION BASED ON IPRODIONE

Albert Margossian, Chennevieress, France, assignor to Rhone-Poulenc Agrochimie, Lyons, France

Continuation of Ser. No. 357,669, Mar. 12, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,836

Claims priority, application France, Mar. 20, 1981, 81 05798; Feb. 5, 1982, 82 02020

Int. Cl.[4] A01N *43/50*

U.S. Cl. 514—391 **18 Claims**

1. An agricultural fungicidal composition comprising a concentrated suspension of iprodione in an oil-in-water emulsion which contains, by weight:

a. as an active ingredient from 20 to 40% of iprodione,

b. 50 to 160% by weight, relative to the iprodione, of an oil of which the hydrophilic/lipophilic balance (HLB) has a value of 8 to 12 on the scale of HLB values for the preparation of an "oil-in-water" emulsion,

c. from 0.1 to 2% of a non-ionic emulsifier of the ethylene oxide/fatty alcohol condensate type, and

d. optionally, from 0.5 to 2.5% of a substantially neutral, hydrophilic silica.

4,785,014

USE OF CLONIDINE IN MEMORY ENHANCEMENT

Patricia S. Goldman-Rakic, Hamden, and Amy F. T. Arnsten, Bethany, both of Conn., assignors to Yale University, New Haven, Conn.

Continuation of Ser. No. 742,344, Jun. 7, 1985, abandoned. This application Nov. 6, 1986, Ser. No. 927,900

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—401 **12 Claims**

1. A method of treating age-related cognitive decline in a normal aged primate which method comprises administering thereto a therapeutically effective amount of 2-[(2,6-dichlorophenyl)amino]-2-imidazoline or a nontoxic pharmaceutically acceptable salt thereof.

4,785,015

SUBSTITUTED 1,3,4,9-TETRAHYDROPYRANO [3,4-B]INDOLE-1-ACETIC ACIDS

Brian A. McKittrick, Bloomfield, and Alan H. Katz, Lawrenceville, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

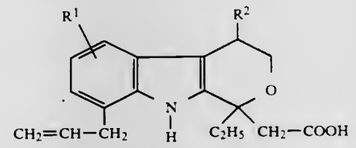
Filed Nov. 5, 1987, Ser. No. 117,775

Claims priority, application Canada, Feb. 20, 1987, 530253

Int. Cl.[4] C07D *491/052;* **A61K** *31/40*

U.S. Cl. 514—411 **7 Claims**

1. The compounds having the structure



(I)

wherein R^1 is hydrogen, lower alkyl having 1 to 4 carbon atoms or halogen, R^2 is hydrogen or lower alkyl having 1 to 4 carbon atoms or a pharmaceutically acceptable salt thereof.

7. A method for treating inflamation or pain in a mammal in need which comprises the administration to said mammal of an effective amount of a compound selected from those of formula (I) of claim 1, or a pharmaceutically acceptable salt thereof.

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4,785,016

INDOLE DERIVATIVES

Brian Evans, Buntingford; Alexander W. Oxford, Royston, and Darko Butain, Arlesey, all of England, assignors to Glaxo Group Limited, London, England

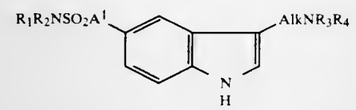
Filed Dec. 3, 1985, Ser. No. 804,102

Claims priority, application United Kingdom, Dec. 4, 1984, 84306424; Dec. 4, 1984, 8430625; Dec. 4, 1984, 8430626; Dec. 5, 1984, 8430773

Int. Cl.[4] A61K *31/40;* **C07D** *209/16*

U.S. Cl. 514—415 **8 Claims**

1. Indoles of the formula (I):



wherein

R_1 represents a hydrogen atoms or a C_{1-6} alkyl or C_{3-6} alkenyl group;

R_2 represents a hydrogen atom, a C_{1-3} alkyl, C_{3-6} alkenyl, or C_{5-7} cycloalkyl group, or a phenyl or phenyl (C_{1-4}) alkyl group in which the phenyl ring is unsubstituted or substituted by a halogen atom, a C_{1-3} alkyl, C_{1-3} alkoxy or hydroxyl group, or by a group $—NR_aR_b$, or $—CONR_aR_b$, wherein R_a and R_b, which may be the same or different, each represents a hydrogen atom or a C_{1-3} alkyl or C_{3-6} alkenyl group, or together with the nitrogen atom to which they are attached form a saturated monocyclic 5 to 7-membered ring or a saturated monocyclic 5 to 7-membered ring containing an additional oxygen atom or group NR_5, where R_5 is a hydrogen or a C_{1-3} alkyl; R_3 and R_4, which may be the same or different, each represents a hydrogen atom or a C_{1-3} alkyl or propenyl group or R_3 and R_4 together form an aralkylidene benzylidene group;

Alk represents an alkyl chain containing two or three carbon atoms which may be unsubstituted or substituted by not more than two C_{1-3} alkyl groups; and

A^1 represents an alkenyl chain containing two to five carbon atoms, and physiologically acceptable salts and solvates thereof.

8. A pharmaceutical composition for treating or preventing pain resulting from dilation of the cranial vasculaure which comprises as active ingredient an effective amount of at least one indole of general formula (I) according to claim **1** or a physiologically acceptable salt or solvate thereof together with one or more pharmaceutically acceptable carriers or excipients.

4,785,017

3,4-DIHYDRO-2H-1-BENZOPYRAN DERIVATIVES

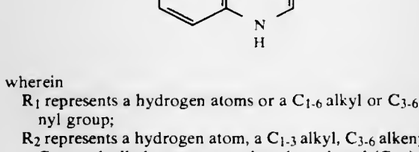
Noal Cohen, Montclair, and Giuseppe F. Weber, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 507,383, Jun. 24, 1983, abandoned. This application May 29, 1984, Ser. No. 614,368

Int. Cl.[4] C07D *311/60;* **A61K** *31/35*

U.S. Cl. 514—456 **13 Claims**

1. A compound of the formula



I

wherein R_1 is hydrogen or lower alkyl; R^2 is hydrogen or halogen, R^3, R^4 and R^5, independently, are hydrogen, alkanoyl, benzoyl or lower alkyl; R^6 and R^7, independently, are hydrogen or lower alkyl; X is alkylene of 3 to 7 carbon atoms; and n is as an integer of one to four provided one of R^3, R^4 or R^5 is alkanoyl or benzoyl and the other two, independently, are hydrogen or lower alkyl; or an enantiomer thereof, or, when R^7 is hydrogen, a salt thereof, with a pharmaceutically acceptable base.

4,785,018

GLYCINE DERIVATIVES

Masao Murase, Kusatsu, and Shigeaki Maruo, Ibaraki, both of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

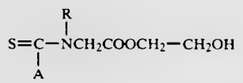
Filed Jun. 25, 1987, Ser. No. 66,820

Claims priority, application Japan, Jun. 27, 1986, 61-152149

Int. Cl.[4] C07C *153/063;* **A61K** *31/24*

U.S. Cl. 514—510 **5 Claims**

1. A compound of the formula (I):



[I]

wherein R is hydrogen or alkyl having from 1 to 4 carbon atoms and A is 1-naphthyl unsubstituted or substituted by one or more alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl.

4,785,019

N-CYANOALKYL-N-HALOALKYLTHIO CARBOXAMIDES AS FUNGICIDES

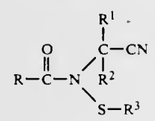
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 736,497, May 21, 1985, abandoned, which is a continuation of Ser. No. 655,483, Sep. 27, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 833,948

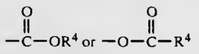
Int. Cl.[4] A01N *37/28;* **C07C** *121/417, 121/52*

U.S. Cl. 514—521 **26 Claims**

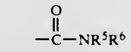
1. A compound of the formula:



wherein R is alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, lower alkenyl of 2 to 6 carbon atoms or lower alkynyl of 2 to 6 carbon atoms, all optionally substituted with 1 to 4 halogen atoms; lower alkoxyalkylene; aryl of 6 to 12 carbon atoms, aralkyl of 7 to 16 carbon atoms, or substituted aryl or substituted aralkyl both substituted with 1 to 3 substituents independently selected from phenyl, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, lower alkylthio of 1 to 6 carbon atoms, halogen, nitro, cyano,



wherein R^4 is hydrogen or lower alkyl of 1 to 6 carbon atoms,



wherein R^5 and R^6 are independently hydrogen or lower alkyl of 1 to 6 carbon atoms; R^1 and R^2 are independently hydrogen,

or lower alkyl of 1 to 6 carbon atoms; and R^3 is lower alkyl of 1 to 3 carbon atoms substituted with 3 to 6 halogen atoms or trihalovinyl.

15. A method of controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of claim **1**.

4,785,020

METHOD FOR PREPARATION OF ANION EXCHANGE RESINS HAVING VERY LOW CHLORINE CONTENT

W. Steven Boom, Dayton, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 12, 1987, Ser. No. 2,591

Int. Cl.[4] B01J *41/14*

U.S. Cl. 521—32 **17 Claims**

1. A process for preparing a strong-base anion exchange resin containing less than about 0.5 equivalent percent of active ionic chloride based on active sites of the resin, which comprises providing crosslinked polymer beads of a vinyl acrylic or vinyl aromatic monomer which have been haloalkylated; functionalizing the haloalkylated polymer beads with a tertiary amine containing no substantial amount of primary or secondary amine; further functionalizing the functionalized crosslinked polymer bead with a primary or secondary amine of a low molecular weight; and contacting the functionalized crosslinked polymer bead with at least one ionic agent exchangeable with chloride ions.

4,785,021

ADSORBENT AND METHOD OF PREPARATION

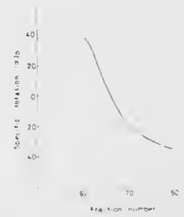
Hideaki Kiniwa, Yokohama, Japan, assignor to Research Development Corp. of Japan and Mitsubishi Kasei Corporation, both of Tokyo, Japan

Division of Ser. No. 26,970, Mar. 17, 1987. This application Feb. 5, 1988, Ser. No. 152,444

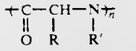
Claims priority, application Japan, Mar. 10, 1984, 59-44065; Jul. 13, 1984, 59-144372

Int. Cl.[4] C08J *9/40;* **G08J** *9/42*

U.S. Cl. 521—53 **3 Claims**

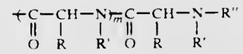


1. A cross-linked, polymeric material comprising an optically active, synthetic poly(amino acid) represented by the general formula (I):



(I)

wherein R stands for an organic group, R' stands for hydrogen or an alkyl group and n is an integer of at least 5, and a terminal amino group protected as shown by the general formula (II):

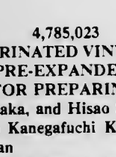


(II)

wherein R, R' each has the same meaning as above, R'' stands for an organic group and m is an integer of at least 4, said polymeric material obtained by a process including the steps of:

providing an amino group-containing, cross-linked polymer carrier in porous form,

polymerizing an N-carboxy anhydride represented by the general formula:



wherein R and R' each have the same meaning as above, in the presence of said carrier serving as an initiator to form a poly(amino acid) supported on said carrier and having terminal amino groups, and

protecting the terminal amino groups with an organic group.

4,785,022

USE OF RUBBERY COPOLYMERS TO DECREASE COFFEE LEAKAGE IN FOAM CUPS

Fred M. Sonnenberg, Merion, and Dennis M. Hajnik, West Chester, both of Pa., assignors to Arco Chemical Company, Newtown Square, Pa.

Filed Oct. 29, 1987, Ser. No. 113,853

Int. Cl.[4] C08J *9/22*

U.S. Cl. 521—57 **4 Claims**

1. A method for enhancing the coffee retention of molded foam cups made from vinyl aromatic polymer particles which have been impregnated with a blowing agent which method comprises coating the vinyl aromatic polymer particles with a effective amount of a rubber selected from the group consisting of polybutene, polyisobutylene, isobutylene-butene copolymer and butene-ethylene copolymer.

4,785,023

PELLETS OF CHLORINATED VINYL CHLORIDE RESIN COMPOSITION, PRE-EXPANDED PARTICLES AND PROCESS FOR PREPARING THEREOF

Yoshihiro Kimura, Osaka, and Hisao Shimazu, Settsu, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 82,630, Aug. 5, 1987. This application Jan. 27, 1988, Ser. No. 148,790

Claims priority, application Japan, Aug. 7, 1986, 61-186284; Aug. 12, 1986, 61-188812; Feb. 9, 1987, 62-28676

Int. Cl.[4] C08J *9/22*

U.S. Cl. 521—58 **8 Claims**

1. A pre-expanded particles of a chlorinated vinyl chloride resin having an average degree of polymerization of 300 to 5000 and a chlorine content of 50 to 75% by weight comprising inorganic material selected from the group consisting of particles and fibers and a solvent.

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4,785,024

VINYLIDENE CHLORIDE TYPE RESIN EXPANDABLE PARTICLES, FOAM PARTICLES, IN-MOLD FOAM MOLDING BY USE THEREOF AND PROCESS FOR PRODUCING THEM

Norihiko Sakata, and Nobuo Miura, both of Suzuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 747,036, Jun. 20, 1985, Pat. No. 4,613,626, which is a division of Ser. No. 678,416, Dec. 5, 1984, Pat. No. 4,550,003. This application May 7, 1986, Ser. No. 860,479

Claims priority, application Japan, Dec. 13, 1983, 58-233602; Dec. 14, 1983, 58-235594

Int. Cl.[4] C08J *9/22, 9/18;* **B29H** *7/20*

U.S. Cl. 521—60 **6 Claims**



1. Vinylidene chloride resin foam particles, which are multicellular particles with a closed cell percentage of 65% or more, comprising substantially non-crystalline vinylidene chloride resin particles with an average particle size within the range of from 0.05 to 5 mm expanded to an expansion ratio of 4 to 150-fold, said foam particles including a volatile organic blowing agent gas therein.

4,785,025

QUATERNARY TRIETHYLENEDIAMINE COMPOSITIONS AND THEIR COMBINATION WITH TERTIARY AMINES FOR DELAYED ACTION/ENHANCED CURING CATALYSTS IN POLYURETHANE SYSTEMS

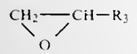
Edward A. Galla, Macungie; Robert L. Ricci, Allentown, and Gary D. Andrew, Walnutport, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 710,181, Mar. 11, 1985, abandoned, which is a continuation-in-part of Ser. No. 670,705, Nov. 13, 1984, Pat. No. 4,582,861. This application Nov. 6, 1986, Ser. No. 927,897

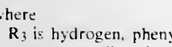
Int. Cl.[4] C08G *18/08, 18/20;* **C08J** *9/00;* **B01J** *31/00*

U.S. Cl. 521—118 **8 Claims**

1. In a method for the preparation of a polyurethane product by reacting a polyisocyanate with a polyester or a polyether polyol in the presence of a tertiary amine catalyst, the improvement which comprises employing as the catalyst composition a catalytically effective amount of a quaternary triethylenediamine composition prepared by reacting triethylenediamine with 2 molar equivalents of an alkylene oxide of the formula



in the presence of an organic carboxylic acid of the formula

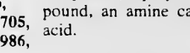


where

R_3 is hydrogen, phenyl, an alkyl group of 1 to 15 carbon atoms, an alkenyl group of 2 to 15 carbon atoms, an alkynyl group of 2 to 6 carbon atoms, a hydroxyalkyl group of 1 to 9 carbon atoms, a ketoalkyl group having a total of 3 to 15 carbon atoms, or an alkoxy alkyl group having a total of 2 to 20 carbon atoms;

a is 0 or 1;

Y is hydrogen, an alkyl group of 1 to 20 carbon atoms, an alkenyl group of 2 to 15 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, phenyl, an alkylphenyl having 1 to 9 carbon atoms in the alkyl group or groups attached to the phenyl ring, benzyl, an alkylbenzyl having 1 to 9 carbon atoms in the alkyl group or groups attached to the benzene ring, or a



wherein

b is 1 to 3 and Z is —OH, —CN, —Cl, an alkoxy group of 1 to 5 carbon atoms, a phenyl group or methoxyphenyl group, or

Z is $(CH_2)_dCOOR_4$ wherein d is equal to 0 to 4 and R_4 is hydrogen or an alkyl group of up to 20 carbon atoms.

4,785,026

POLYMER POLYOLS WITH HIGH SOLIDS CONTENT

Ernest L. Yeakey, and Michael Cuscurida, both of Austin, Tex., assignors to ARCO Chemical Company, Newtown Square, Pa.

Filed Nov. 24, 1987, Ser. No. 124,665

Int. Cl.[4] C08G *18/30*

U.S. Cl. 521—137 **19 Claims**

1. Polymer polyols with a high solids content made by the reaction of at least one alkanolamine with at least one organic polyisocyanate in a polymer polyol as a dispersing media.

4,785,027

PROCESS FOR PREPARING POLYURETHANE FOAMS IN THE PRESENCE OF A POLYETHER ACID

Robert D. Brasington, Gex, France, and Werner A. Lidy, Collonge-Bellerive, Switzerland, assignors to BP Chemicals Limited, Middlesex

Division of Ser. No. 146,695, Jan. 21, 1988, Pat. No. 4,764,541. This application Apr. 27, 1988, Ser. No. 187,006

Claims priority, application United Kingdom, Jan. 29, 1987, 8701993

Int. Cl.[4] C08G *18/00*

U.S. Cl. 521—157 **4 Claims**

1. A flexible polyurethane foam formulation, which is non-reactive at ambient temperatures, prepared by mixing a polyisocyanate, a polyfunctional active hydrogen containing compound, an amine catalyst, a blowing agent and a polyether acid.

4,785,028

GELS FOR PROFILE CONTROL IN ENHANCED OIL RECOVERY UNDER HARSH CONDITIONS

Dennis H. Hoskin, Lawrenceville; Thomas O. Mitchell, Pennington, and Paul Shu, Princeton Junction, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,727

Int. Cl.[4] E21B *43/22*

U.S. Cl. 523—130 **15 Claims**

1. An aqueous cross-linked gel formed by partially hydrolyzing an aqueous solution of a terpolymer comprising:

(a)

(i) 5 to 95% by weight of 2-acrylamido-2-methylpropane-3-sulfonate;

(ii) 5 to 95% by weight of N-vinyl-N-methyl acetamide;

(iii) 0 to 80% by weight of acrylamide where said terpolymer is refluxed with an alkali metal hydroxide in an amount of from about 0.5 to about 5.0% by weight for about 7 to about 16 hours at a temperature of about 100° C. thereby forming a polymer intermediate which can be gelled to form a gel of a size sufficient for profile control; and

(b) thereafter crosslinking said intermediate with sufficient transition metal ions, melamine/formaldehyde resin or resorcinol/formaldehyde resin, thereby causing said intermediate to form a gel of a size sufficient for profile control.

4,785,029

FRICTION MATERIAL COMPOSITION FOR BRAKE LINING

Toru Honma; Kenji Kakihara, both of Okazaki, and Makoto Ozawa, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

PCT No. PCT/JP86/00348, § 371 Date Mar. 9, 1987, § 102(e) Date Mar. 9, 1987, PCT Pub. No. WO87/00192, PCT Pub. Date Jan. 15, 1987

PCT Filed Jul. 9, 1986, Ser. No. 34,416

Claims priority, application Japan, Jul. 9, 1985, 60-151044; Jul. 10, 1985, 60-151937; Jul. 18, 1985, 60-158792; Jul. 18, 1985, 60-158793

Int. Cl.[4] C08K *7/14, 3/20*

U.S. Cl. 523—153 **12 Claims**

1. A resin molded composition of frictional material for use in brake linings, consisting essentially of:

matrix fibers composed of glass fibers and pulped polyamide fibers at the ratio of from 2:3 to 4:1 and constituting from 40 to 60% by volume based on 100% by volume of the total composition;

a phenolic resin binder of from 17 to 23% by volume based on 100% by volume of the total composition; and

organic and inorganic powder blending agents comprising at least zirconium oxide powder and cryolite powder and constituting from 17 to 47% by volume based on 100% by volume of the total composition.

2. A resin molded composition of frictional material for use in brake linings, consisting essentially of:

matrix fibers composed of glass fibers and pulped polyamide fibers at the ratio of from 1:9 to 7:3 by volume and constituting from 30 to 40% by volume based on 100% by volume of the total composition;

a phenolic resin binder of from 17 to 23% by volume based on 100% by volume of the total composition; and

organic and inorganic blending agents comprising at least zirconium oxide powder and cryolite powder and constituting from 37 to 53% by volume based on 100% by volume of the total composition.

4,785,030

CATIONIC LATEX COMPOSITIONS CAPABLE OF PRODUCING ELASTOMERS WITH HYDROPHILIC SURFACES

Isao Noda, Cincinnati, and Douglas F. Hager, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 18, 1986, Ser. No. 943,983

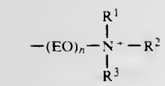
Int. Cl.[4] C08F *83/00*

U.S. Cl. 523—201 **2 Claims**

1. A latex composition which comprises:

(a) an aqueous phase;

(b) from about 5 to about 50% by weight of latex particles dispersed in said aqueous phase, said particles comprising an elastomeric hydrophobic core and an outer hydrophilic shell attached to said core, said core comprising a polymer selected from the group consisting of butadiene, isoprene styrene, and mixtures thereof, and said shell comprising moieties L–Q, wherein L comprises a hydrophobic hydrocarbyl group containing one or more unsaturated bonds and Q is of the formula



wherein R^1 and R^2 are each C_1 to C_4 alkyl or hydroxyalkyl, or together form a cyclic or heterocyclic ring, and R^3 or C_1–C_4 alkyl or hydroxyalkyl, and wherein n is an integer of from 5 to about 50.

4,785,031

STABILIZED AND CARRIED RED PHOSPHORUS AS FLAME-RETARDANT AGENT FOR POLYMERS

Luciano Scarso, Milan, Italy, assignor to Saffa S.p.A., Pontenuovo di Magenta, Italy

Filed Dec. 11, 1985, Ser. No. 807,830

Claims priority, application Italy, Jun. 27, 1985, 21311 A/85

Int. Cl.[4] C08K *9/04, 9/08, 9/10;* **C08L** *23/04*

U.S. Cl. 523—205 **8 Claims**

1. A granular flame-retardant agent for plastic materials, comprising:

50–90% by weight of particulate red phosphorus having individual particles encapsulated with a synthetic resin; and

10–50% by weight of a binder-carrier for said red phosphorus, wherein said binder-carrier is an ethylene polymer selected from the group consisting of polyethylene and ethylene copolymers containing at least 70% by weight of ethylene having a density (g/ml) of 0.910–0.925, and melt-index (expressed as g/10 minutes, according to ASTM-D 1238/ Condition E) within the range of approximately from 55 to 150 wherein said granular flame-retardant agent comprises pellets prepared by granulating the aggregate formed by the mixture of said ethylene polymer binder-carrier and said encapsulated red phosphorus particles.

4,785,032

WATER BASED COATING COMPOSITION AND POLYMER FILM COATED THEREWITH

Robert E. Touhsaent, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 905,091

Int. Cl.[4] C08K *5/00;* **C08J** *9/00, 9/22*

U.S. Cl. 524—42 **10 Claims**

1. A water based antistatic polymer film coating composition comprising:

(a) at least one water soluble antistatic agent which is acceptable for food packaging polymer films and which is selected from the group consisting of N-acyl sarcosinates and N,N-bis(2-hydroxyethyl) higher aliphatic amines;

(b) at least one water soluble or water dispersible film-forming polymer; and,

(c) a solution or dispersion-forming amount of water.

4,785,033

RUBBER-METAL ADHESION PROMOTERS

Syed K. Mowdood, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 871,945, Jun. 9, 1986, abandoned, which is a division of Ser. No. 694,380, Jan. 24, 1985, Pat. No. 4,605,693, which is a division of Ser. No. 584,180, Feb. 27, 1984, Pat. No. 4,521,558. This application Aug. 12, 1987, Ser. No. 84,654

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—86 **18 Claims**

1. A composite comprising a rubber composition with a metal reinforcing element embedded therein, wherein said rubber composition contains from about 0.05 to about 10 parts per hundred parts of rubber by weight of 5-nitro isatoic anhy-

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dride as an adhesion promoter and wherein said metal reinforcing element is a brass plated carbon steel.

4,785,034
POLYOLEFIN RESIN COMPOSITION

Morio Gaku, Saitama; Hidenori Kimbara, Tokyo; Akira Yahagi, Saitama, and Takaaki Osanai, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc. and Dainichiseika Color & Chemicals Mfg. Co. Ltd., both of Tokyo, Japan

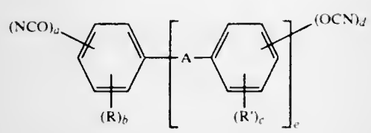
Filed Mar. 3, 1987, Ser. No. 22,054
Claims priority, application Japan, Mar. 3, 1986, 61-44072
Int. Cl.[4] C08K *5/16*

U.S. Cl. 524—99 **11 Claims**

1. A stabilized polyolefin resin composition comprising a polyolefin resin having incorporated therein

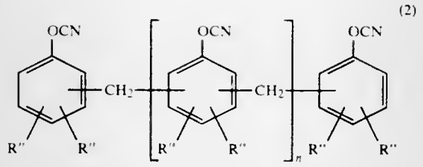
(a) 0.005-5% by weight of at least one monofunctional or polyfunctional cyanate ester represented by the formula (1) or (2):

(1)



wherein R and R', which may be the same or different, represents hydrogen, halogen, linear or branched C_1-C_9 alkyl; A is a C_1-C_9 alkylene group; a is a number from 0 to 5 wherein e=1 and a number from 2 to 5 where e=0; $b=5-a$ where e=1 and $6-(a+d)$ where e=0; $c=5-d$; d is a number from 0 to 5; e is a number 0, 1, 2 or 3; with the proviso that the sum of (a+d) always gives a number from 2 to 5,

(2)



wherein n is 0 or an integer of 1 or more; and R''s may be the same or different, and each R'' is hydrogen or methyl; and wherein of formula (2) there contains 50% by weight or more in total of cyanate esters in which n is an integer of 1 to 3,

(b) 0.01-5% by weight of at least one hindered amine ultraviolet absorber and

(c) 0.005-2% by weight of at least one hindered phenolic antioxidant.

4,785,035
CURING COMPOSITION

August L. L. Palluel, Windsor; Stephen P. Davis, High Wycombe Bucks, and Angela C. Fletcher, London, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

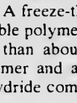
Filed Oct. 30, 1987, Ser. No. 114,735
Claims priority, application United Kingdom, Nov. 14, 1986, 8627314
Int. Cl.[4] C08L *75/00*

U.S. Cl. 524—101 **9 Claims**

1. A curing composition comprising a polymer component and a compatible oligomeric component, the polymer component being a co-polymer of functional silyl group-containing units derived from monomers of Formula (1):

$$CH_2=CR^1CO_2(CH_2)_aL \qquad \text{Formula (I)}$$

where a is 2 to 6
R^1 is hydrogen or methyl and
L is a group of Formula (II):



Formula (II)

where R^2 is C_{1-4} alkoxy, C_{2-4} alkoxy—C_{2-4} alkoxy, C_{1-4} alkanoyl, enolate or oximate, and R^3 and R^4 are C_{1-4} alkoxy, C_{2-4} alkoxy—C_{2-4} alkoxy, C_{1-4} alkanoyl, enolate, oximate or C_{1-6} alkyl; and structural units derived from polymerisable ethylenically unsaturated monomers such that each molecule of the polymer component contains at least two silyl groups of Formula (II); the oligomeric component being a compound of Formula (III):

$$E(GKL)_b \qquad \text{Formula (III)}$$

where b is 3 to 6; E is derived from a biuret or isocyanurate oligomer of a di-functional isocyanate, the isocyanate being a C_{4-15} aliphatic, cycloaliphatic or aromatic diisocyanate optionally substituted with one or more C_{1-6} alkyl groups or is derived from an adduct of C_{2-6} aliphatic diol, triol or tetraol and a poly functional isocyanate, the poly functional isocyanate being either a di-functional isocyanate as previously defined or being itself the adduct of an aliphatic triol and a di-functional isocyanate as previously defined,
G is

$$-[O(CH_2)_5CO]_c[O(CH_2)_dOCO(CH_2)_2]-$$

in which c is 0 to 2, d is 2 to 4;
K is

$$-[NR^5(CH_2)_m]-$$

in which m is 1 to 6, and R^5 is hydrogen, methyl, $-(CH_2)_nR^6$, or $-CH_2CHOH(CH_2)_n-R^6$ in which R^6 is the group L as defined with reference to Formula (1) and n is 1 to 4.

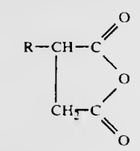
4,785,036
FREEZE-THAW STABLE POLYACRYLAMIDE EMULSIONS

Peter M. Robinson; Philip D. Raby, both of Columbus, and Nguyen Van-Det, Midland, all of Ga., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 27, 1987, Ser. No. 54,655
Int. Cl.[4] C08K *5/15*

U.S. Cl. 524—112 **15 Claims**

1. A freeze-thaw stabilized water-in-oil emulsion of a water-soluble polymer prepared by a polymerization reaction having less than about 50 percent by weight of the water-soluble polymer and a freeze-thaw stabilizing amount of a succinic anhydride compound of the formula:



wherein R is a substituted or unsubstituted alkyl or alkenyl group having about 5 to about 30 carbon atoms and wherein the substituents are selected from aryl and alkyl substituted aryl groups.

4,785,037
GASKET COMPOSITION FOR CAST POLYMERIZATION

Hiroyuki Ikeda, Toyama, and Suehiro Tayama, Otake, both of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,439
Claims priority, application Japan, Dec. 18, 1985, 60-285085
Int. Cl.[4] C08K *5/49*

U.S. Cl. 524—114 **16 Claims**

1. A gasket composition for cast polymerization, which comprises (A) 100 parts by weight of a vinyl chloride resin, (B) 30 to 70 parts by weight of a plasticizer composed of at least one member selected from the group consisting of carboxylic acid esters and phosphoric acid esters, (C) 0.5 to 10 parts by weight of an epoxy type plasticizer selected from the group consisting of an epoxidized soybean oil having an oxirane value of 5 to 10% and an epoxidized fatty acid ester having an oxirane value of 3 to 6%, and (D) 0.1 to 5 parts by weight of a stabilizer composed of at least one member selected from the group consisting of barium-containing compounds and zinc-containing compounds.

4,785,038
SOLVENT SYSTEM FOR DIFFICULTLY SOLUBLE POLYMERS

Wilfred Sweeny, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 27, 1987, Ser. No. 78,193
Int. Cl.[4] C08K *5/45, 5/41, 75/02, 77/10*

U.S. Cl. 524—173 **7 Claims**

1. A clear solution of a polymer containing the —NH— group selected from the group of aromatic polyamides, aromatic polybenzimidazoles and aromatic polyureas in a solvent comprising the admixture of (a) a base selected from the group of potassium or sodium alkoxides, hydroxides or hydrides, (b) a liquid sulfoxide, and (c) water or an aliphatic alcohol of up to eight carbon atoms, said base being present in the range of from 0.4 to 1.6 moles per mole of —NH— in the polymer, said alcohol being present in the range of from 1 to 5 moles per mole of potassium base, and in the range of from 1 to 1.5 moles per mole of sodium base or, if water is employed, it is present in the range of from 0.5 to 2.5 moles per mole of potassium base and in the range of from 0.5 to 0.75 moles per mole of sodium base and the liquid sulfoxide being present in an amount sufficient to effect solution.

5. The solution of claim **1** wherein the liquid sulfoxide is dimethylsulfoxide.

4,785,039
GLASS FIBER SIZE AND IMPREGNANT COMPOSITIONS

Donald J. Algrim, Columbus; Donn R. Vermilion; Donald J. Hammond, both of Newark, and Richard M. Haines, Warsaw, all of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Division of Ser. No. 901,862, Aug. 29, 1986, abandoned, which is a division of Ser. No. 668,112, Nov. 5, 1984, Pat. No. 4,636,437.
This application Jul. 29, 1987, Ser. No. 79,071
Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—188 **12 Claims**

1. A coating composition for glass fibers comprising an aqueous solution of a resin comprising a hydrolysis product of a copolymer of a vinyl aromatic monomer and maleic anhydride, an organo silane glass fiber anchoring agent in an amount of between about 0.3% to about 1.0 by weight of the coating composition, and an effective amount of a water-soluble pyrrolidone-containing polymer the pyrrolidone containing polymer being present in an amount not less than about 0.2% and not greater than about 0.4% by weight of the coating composition, the coating composition being present in an amount sufficient to form a protective film over the glass fiber.

4,785,040
PHENOLIC MOLDING MATERIALS AND PROCESSES

Manoj K. Gupta, Williamsville; Donald W. Hoch, Tonawanda, and Gideon Salee, Williamsville, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,404
Int. Cl.[4] C08K *7/16, 3/34*

U.S. Cl. 524—445 **39 Claims**

1. A phenolic molding composition comprising

(1) a resole pheolic resin,

(2) an alkaline earth metal hydroxide or oxide, or a mixture of more than one alkaline earth metal hydroxide or oxide or a silane compound, and

(3) a mixture of clay and tac fillers, wherein component (3) is present in said molding composition in a proportion of at least about 20 parts by weight per 100 parts by weight of said pheolic resin.

4,785,041
SCREEN PRINTABLE ORGANOSILOXANE RESIN COATING COMPOSITIONS

Robert C. Antonen, San Ramon; Diane M. Rasch, Alameda, both of Calif.; David A. Sierawski, and David J. Romenesko, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 31, 1987, Ser. No. 140,265
Int. Cl.[4] C08K *5/24*

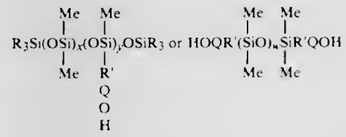
U.S. Cl. 524—265 **4 Claims**

1. A thixotropic, screen printable coating composition comprising

A. 100 parts by weight of a solubilized curable organosiloxane copolymer comprising methyl-substituted siloxane units, phenyl-substituted siloxane units and silanol groups, where said copolymer has a degree of substitution of at least 1.3;

B. from 3 to 20 parts by weight of a finely divided silica filler;

C. as the thixotropic agent, from 1 to 6 parts by weight of a liquid organosiloxane copolymer represented by the average general formula



where Me represents methyl; R represents at least one member selected from the group consisting of an alkyl radical containing from 1 to 10 carbon atoms, a halogenated alkyl radical containing from 1 to 10 carbon atoms and a phenyl radical; R' represents an alkylene radical containing from 3 to 10 carbon atoms, Q represents $-[OCH_2CH(CH_3)]_z-$, x is zero or a positive integer, w and y are at least 1; neither the value of w nor the sum of x and y exceed the value beyond which said copolymer is a solid at 25 degrees C., the units containing a Q substituent constitute from 2 to 80 percent of the total number of units in said copolymer and the value of z is from 2 to 30, inclusive;

D. an amount of a silanol condensation catalyst sufficient to cure said composition; and

E. from 10 to 30 parts by weight of a compatible solvent for said composition, said solvent having a boiling point of from 180 to 300 degrees C.

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4,785,042

POLYETHYLENE RESIN COMPOSITION CONTAINING AMORPHOUS ALUMINOSILICATES FOR IMPROVED FILMS

Yutaka Azuma, Sodegaura, and Yoshikatsu Tanaka, Ichihara, both of Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 900,735, Aug. 27, 1986, abandoned. This application Nov. 10, 1987, Ser. No. 120,217
Claims priority, application Japan, Sep. 13, 1985, 60-201734; Sep. 13, 1985, 60-201735; Jun. 26, 1986, 61-150028; Jun. 27, 1986, 61-149657
Int. Cl.[4] C08K *3/10, 3/34, 5/20*
U.S. Cl. 524—210 12 Claims

1. A polyethylene resin composition comprising:
(A) 100 parts by weight of a low density polyethylene,
(B) 0.01 to 2.0 parts by weight of an anhydrous amorphous aluminosilicate having the basic particle characteristics of zeolite as prepared by acid-treating zeolite,
(C) 0 to 1.5 parts by weight of fatty acid amide having a melting point of not more than 130° C., and
(D) 0 to 3.0 parts by weight of an antistatic agent.

4,785,043

PRESSURE-SENSITIVE ADHESIVE COMPOSITION PRODUCED FROM A BASE BLOCK COPOLYMER, A RESINOUS TACKIFIER, A NAPHTHENIC OR PARFFINIC MINERAL OIL, AND AN AROMATIC SYNTHETIC OIL

Kazuo Kawai, and Saburo Matsubara, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 873,189, Jun. 11, 1986, abandoned. This application Sep. 24, 1987, Ser. No. 100,463
Claims priority, application Japan, Jun. 14, 1985, 60-127926
Int. Cl.[4] C08J *23/00;* C08L *23/00, 9/00*
U.S. Cl. 524—272 4 Claims

1. An adhesive composition of a thermoplastic elastomer type which comprises:
(I) 100 weight parts of a base polymer of a block copolymer or its hydrogenated derivative represented by the formula

$$A-B-A)_n$$

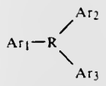
where A is a block polymer of a monovinyl substituted aromatic hydrocarbon, B is an elastomeric block polymer of a conjugated diene, and n is an integer of 1–5;
(II) 50–200 weight parts of a resinous tackifier;
(III) 5–50 weight parts of a softener which is a naphthenic or paraffinic mineral oil; and
(IV) 1–40 weight parts of at least one of the following synthetic oils:
(a) a synthetic oil having a molecular weight of 173–263 and represented by the formula

$$Ar_1-R-Ar_2$$

where Ar_1 and Ar_2 are each benzene or alkyl benzene rings and may be the same or different, and R is an alkylene group of 2–3 carbon atoms;
(b) a synthetic oil having a molecular weight of 300–398 and represented by the formula

$$Ar_1-R_1-Ar_2-R_2-Ar_3$$

where Ar_1, Ar_2 and Ar_3 are each benzene or alkyl benzene rings and may be the same or different, R_1 and R_2 are each alkylene groups of 2–3 carbon atoms and may be the same or different; and
(c) a synthetic oil having a molecular weight of 300–398 and represented by the formula



where Ar_1, Ar_2 and Ar_3 are each benzene or alkyl benzene rings and may be the same or different, and R is a straight-chain or branched-chain hydrocarbon group of 4–6 carbon atoms,
whereby, the composition has an adhesive force of longer than 180 minutes as determined on corrugated fiberboard at a temperature of 25° C. and at a load of 2,000 g.

4,785,044

FLAME RETARDANT POLYOLEFIN COMPOSITIONS

Charles P. Kannankeril, North Caldwell, N.J., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Filed Aug. 12, 1987, Ser. No. 84,684
Int. Cl.[4] C08K *5/10*
U.S. Cl. 524—310 26 Claims

1. A flame retardant polyolefin composition comprising a polyolefin resin, a halogen flame retardant compound high in halogen content which would ordinarily migrate to the surface of articles formed from said composition, and an esterified hydrocarbyl polyol having at least one fatty acid esterified thereon to stabilize said halogen flame retardant compound and prevent migration thereof to the surface of articles formed from said flame retardant composition.

20. A flame retardant polyolefin composition, comprising a polyethylene resin, decabromodiphenyl oxide, and a glyceride.

4,785,045

THERMOPLASTIC ELASTOMER COMPOSITION

Katsuyoshi Yonekura; Akira Uchiyama, and Akira Matsuda, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 729,351, May 1, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 6,282
Claims priority, application Japan, May 2, 1984, 59-87768; May 2, 1984, 59-87769
Int. Cl.[4] C08L *23/16, 23/26, 23/18, 23/10*
U.S. Cl. 524—528 12 Claims

1. A thermoplastic elastomer composed of a partially cross-linked product of a blend consisting essentially of
(a) 60 to 30 parts by weight of a peroxide-crosslinkable olefin copolymer rubber,
(b) 20 to 40 parts by weight of a peroxide-crosslinkable polyolefin resin, and
(c) 40 to 20 parts by weight of a peroxide-decomposable polyolefin resin,
the total amount of (a)+(b)+(c) being 100 parts weight, said crosslinked product being obtained by dynamically heat-treating said blend in the presence of (d) an organic peroxide, and said peroxide-crosslinkable polyolein resin (b) being a linear low density polyethylene composed of a random copolymer of ethylene and an alpha-olefin having 4 to 10 carbon atoms, said linear low density polyethylene having an ethylene content of from 90 to 99.5 mole %, a melt index of from 0.1 to 50 g/10 min., a density of from 0.910 to 0.940 g/cm^3 and a melting point of from 115° to 130° C.

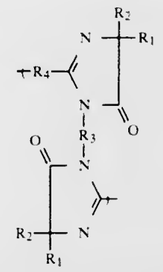
4,785,046

POLY(5-IMIDAZOLONE) AND PROCESS THEREFOR

Shiow C. Lin, Ellicott City, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 829,331, Feb. 14, 1986, Pat. No. 4,705,824. This application Aug. 7, 1987, Ser. No. 82,704
Int. Cl.[4] C08G *73/06*
U.S. Cl. 524—612 6 Claims

1. A poly(5-imidazolone) having recurring structural units selected from the formula group consisting of:



wherein R_1, R_2, R_3 and R_4 are each independent organic moieties.

4,785,047

METHOD FOR PREPARING CLEAR POLYORGANOSILOXANE ELASTOMERS

Jary D. Jensen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 30, 1987, Ser. No. 79,555
Int. Cl.[4] C08K *5/54, 3/36;* C08L *83/04*
U.S. Cl. 524—714 10 Claims

1. A method for preparing an optically clear, curable polyorganosiloxane composition, said method comprising the steps of
I. blending to homogeniety a first mixture comprising at least one polydiorganosiloxane which contains a least two groups, per molecule, that will react with a curing agent, from 10 to 100 percent by weight, based on the weight of said polydiorganosiloxane, of an untreated reinforcing silica filler, and as a filler treating agent, at least 15 percent by weight, based on the weight of said filler, of a hexaorganodisilazane that is miscible with said polydiorganosiloxane;
II. subsequently blending said first mixture with an additional quantity of said hexaorganodisilazane equal to at least 5 percent of the weight of said filler to form a second mixture, where the total weight of hexaorganodisilazane used to treat said filler is at least 30 percent of the weight of said filler; and
III. heating said second mixture under reduced pressure to remove volatile materials and form said polyorganosiloxane composition.

4,785,048

POLYUREA AND POLYUREA-EPOXY MICROCAPSULES

Hung-Ya Chao, Erie, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Feb. 8, 1988, Ser. No. 153,449
Int. Cl.[4] C08L *75/00*
U.S. Cl. 524—745 4 Claims

1. A process for the production of polyurea and polyurea/epoxy microcapsules, said process comprising the steps of:
a. mixing an oil-core material containing a colorless dye and a high boiling point carrier solvent with a polyisocyanate or a polyisocyanate-epoxy resin mixture;
b. dispersing the resultant solution into an aqueous solution of an emulsifying mixture, said mixture comprising a first emulsifier component of a protective colloid and a second emulsifier component of a sodium salt of a napthalene sulfonic acid formaldehyde condensate or diphenyloxide disulfonate, in order to form an oil-in-water emulsion;
c. adding a water-soluble polyamine into the emulsion;
d. stirring the emulsion to complete the reaction.

4,785,049

FORMING CLEAR GEL AND TRANSPARENT FILM BY REACTING ALUMINA HYDRATE WITH VINYL ALCOHOL-VINYL ACETATE COPOLYMER

Willy M. Balaba, Monroeville, and Gary J. DiFranco, Plum Borough, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 27, 1987, Ser. No. 78,457
Int. Cl.[4] C08K *3/22;* C08L *29/04*
U.S. Cl. 525—61 19 Claims

1. A method for preparing a stable gel comprising alumina hydrate combined with a water-soluble partially hydrolized polyvinyl acetate polymer, said method comprising
(a) preparing a sol comprising a colloidal dispersion of alumina hydrate in an aqueous medium,
(b) mixing said sol with a water-soluble partially hydrolyzed polyvinyl acetate polymer comprising about 85–99% vinyl alcohol groups,
(c) reacting said alumina hydrate with said copolymer in an aqueous solution having a pH of less than about 7, thereby to form a polymeric sol comprising alumina hydrate combined with the said polymer, and
(d) transforming the polymeric sol to a stable gel by eliminating the aqueous dispersion medium.

4,785,050

HIGH IMPACT STRENGTH, READILY FLOWING POLYAMIDE MOULDING MATERIALS

Dieter Wittmann, Krefeld; Christian Lindner, Cologne; Ludwig Trabert; Rudolf Binsack, both of Krefeld, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Sep. 15, 1986, Ser. No. 907,315
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 3534088
Int. Cl.[4] C08L *77/00*
U.S. Cl. 525—66 6 Claims

1. A thermoplastic moulding material comprising,
(A) 35–99% by weight polyamide,
(B) 1–65% by weight graft product, and
(C) 0–1% by weight, based on total weight of A and B, of fine particles of polytetrafluoroethylene, where B comprises,
(B1) 65–85% by weight of a graft base, where B1 is a particulate, cross-linked diene rubber having an average particle diameter (d50) of 0.25–0.8 μm, a gel content of at least 70% by weight and a glass transition temperature of less than −20° C. and
(B2) 35–15% by weight of a graft superstrate obtained by graft polymerizing, in the presence of a latex of B1, onto B1, more than 40% by weight of a monomer mixture based on the weight of B1 and where the monomer mixture consists essentially of,
(B2.1) 99–80 parts by weight methyl methacrylate,
(B2.2) 1–20 parts by weight n-butyl acrylate, and
(B2.3) 0–4 parts by weight of a urethane having acrylic acid ester or methacrylic acid ester groups in the molecule which are capable of copolymerization with B2.1 and B2.2.

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4,785,051

RUBBER-MODIFIED MONOVINYLIDENE AROMATIC POLYMER COMPOSITIONS

David E. Henton, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 840,484, Mar. 14, 1986, abandoned, which is a continuation of Ser. No. 726,577, Apr. 24, 1985, abandoned, which is a continuation of Ser. No. 353,910, Nov. 21, 1983, abandoned. This application Mar. 17, 1987, Ser. No. 24,872

Int. Cl.[4] C08L *51/04*

U.S. Cl. 525—71 **23 Claims**

1. An improved rubber-modified monovinylidene aromatic polymer composition comprising:

(a) a matrix consisting of a homopolymer of a monovinylidene aromatic monomer, and

(b) an elastomeric material (rubber), in an amount sufficient to toughen said composition, such elastomeric material being in the form of discrete particles dispersed throughout the matrix of the monovinylidene aromatic polymer and grafted with monovinyliden aromatic polymer;

wherein the improvement comprises the dispersed rubber particles comprising the following three components:

(1) a small particle component being from about 5 to about 85 weight percent of the rubber, the particles of this component having a volume average diameter of from about 0.04 to about 0.30 microns (μ);

(2) a large eumulsion particle component being from about 5 to about 85 weight percent of the rubber, the particles of this component having a volume average diameter of from about 0.4 to about 3.0μ; and

(3) a large mass particle component being from about 2 to about 90 weight percent of the rubber, comprising a rubber substrate having monovinylidene aromatic polymer grafted thereon and occuleded therein the rubber substrate comprising up to 9 percent by weight of a rubber-modified monovinylidene aromatic polymer prepared by a mass, mass-solution or mass-suspension polymerization process, which rubber-modified monovinylidene aromatic polymer is contained in the improved rubber-modified monovinylidene aromatic polymer composition the particles of this component having a volume average diameter of from aobut 0.6 to about 10.0μ.

4,785,052

METHYLMETHACRYLATE/PHENYLMALEIMIDE COPOLYMER AND STYRENE/MALEIC ANHYDRIDE COPOLYMER CONTAINING POLYMER ALLOYS

Barry D. Dean, Springfield, Pa., assignor to Arco Chemical Company, Newtown Square, Pa.

Division of Ser. No. 718,594, Apr. 1, 1985, Pat. No. 4,663,390, which is a division of Ser. No. 538,243, Oct. 3, 1983, Pat. No. 4,514,543. This application Nov. 14, 1986, Ser. No. 930,617

Int. Cl.[4] C08L *37/00, 39/04, 51/00*

U.S. Cl. 525—73 **1 Claim**

1. A polymer alloy comprising a first graft polymer, a second polymer, and a third polymer, wherein

(a) the first graft polymer is a random copolymer chemically grafted to a rubber wherein the copolymer is a random copolymer consists essentially of recurring units of methylmethacrylate and recurring units of N-phenylmaleimide,

(b) the second polymer is selected from the group consisting essentially of a random copolymer of recurring units of styrene and from about 9.5 to about 12.5 weight percent recurring units of maleic anhydride and a random terpolymer of recurring units of styrene, from about 6 to about 9 weight percent recurring units of maleic anhydride and from about 3 to about 8 weight percent recurring units of N-phenylmaleimide, and

(c) the third polymer is selected from the group consisting essentially of a random copolymer of recurring units of styrene and recurring units of acrylonitrile and a random terpolymer of recurring units of styrene, recurring units of acrylonitrile and recurring units of N-phenylmaleimide;

wherein the first polymer is present in an amount of at least 30 weight percent based on the polymer matrices.

4,785,053

OPTICAL RESIN MATERIAL HAVING IMPROVED BIREFRINGENCE

Iko Ito; Shozaburo Imai, and Michihisa Isobe, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP85/00607, § 371 Date Jul. 2, 1986, § 102(e) Date Jul. 2, 1986, PCT Pub. No. WO86/02653, PCT Pub. Date May 9, 1986

PCT Filed Nov. 1, 1985, Ser. No. 885,566

Claims priority, application Japan, Nov. 2, 1984, 59-232185

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—146 **8 Claims**

1. An optical resin material which comprises at least one constituent unit having positive main polarizability difference, and at least one constituent unit having negative main polarizability difference,

and wherein said constituent units have main polarizability differences of at least 50×10^{-25} cm^3 in terms of absolute values.

4,785,054

ACRYLIC AMMONIATION

Larry G. Snow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 928,365, Nov. 10, 1926, which is a continuation-in-part of Ser. No. 761,838, Aug. 2, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 137,977

Int. Cl.[4] C08F *8/32*

U.S. Cl. 525—208 **2 Claims**

1. An amine-substituted acrylic polymer prepared by reacting an acrylic polymer having glycidyl functionality with amine, the improvement wherein the acrylic polymer has a number average molecular weight about from 1,000 to 20,000 and about from 10 to 40 weight percent glycidyl methacrylate units; the acrylic polymer is reacted with an amine of the general formula RNH_2 wherein R is alkyl of 1 to 8 carbon atoms; the acrylic polymer and the amine are reacted at a temperature of about from 25 degrees to 140 degrees C. in an organic liquid which is a solvent for the acrylic polymer, the amine and the resulting amine-substituted polymer formed; the organic liquid is present in an amount which provides a polymer concentration of about from 20 to 70% by weight before amine addition; the amine is present to provide a mole ratio of amine to epoxy units of about from 5:1 to 50:1; and the reaction pressure is about from 1 to 30 atmospheres, to provide a polymer having about from 5 to 20 amine groups per polymer chain.

4,785,055

PROCESS FOR THE PREPARATION OF N-HALOAMIDE POLYMERS

Robin W. Dexter, Wilton; Peter A. Jarovitzky, Thomaston, and Yun-Lung Fu, Milford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 859,681, May 1, 1986. This application Jun. 23, 1987, Ser. No. 65,442

Int. Cl.[4] C08F *8/22*

U.S. Cl. 525—356 **11 Claims**

1. A process for the halogenation of a water soluble acrylamide polymer, said process comprising contacting solution of said polymer of a molecular weight of at least about 100,00, with a reagent selected from a halogen gas or a hypohalite at a temperature ranging from about −10° C. to about 80° C., at a pH of below about 6.0, and at a mole ratio of halogen gas or hypohalite to polymer ranging from about 0.1:99.9 to about 50:50, respectively, to thereby form the corresponding water-soluble, N-halogenated polymer.

4,785,056

Patent Not Issued For This Number

4,785,057

PARA-PHENYLENE SULFIDE BLOCK COPOLYMER, PROCESS FOR THE PRODUCTION OF THE SAME

Zenya Shiiki; Takayuki Katto; Yo Iizuka; Takao Iwasaki, and Toshitaka Kouyama, all of Iwaki, Japan, assignors to Kureha Kagawa Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 748,464, Jun. 25, 1985, abandoned. This application Apr. 30, 1986, Ser. No. 858,851

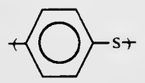
Claims priority, application Japan, Jun. 29, 1984, 59-134633; Aug. 27, 1984, 59-178016; Aug. 27, 1984, 59-178017

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

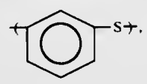
Int. Cl.[4] C08G *75/14, 75/16*

U.S. Cl. 525—537 **69 Claims**

1. A process for producing a p-phenylene sulfide/m-phenylene sulfide block copolymer which comprises a first step of heating an aprotic polar organic solvent containing a p-dihalobenzene and an alkali metal sulfide to form a reaction liquid mixture (C) containing a p-phenylene sulfide polymer of recurring units (A)



and a second step of adding a dihaloaromatic compound consisting essentially of a m-dihalozene to the reaction liquid mixture (C) and heating the mixture in the presence of an alkali metal sulfide and an aprotic polar organic solvent to form a block copolymer consisting essentially of a block consisting essentially of recurring units (A) and a block consisting essentially of recurring units (B)



the reaction in the first step being carried out until the degree of polymerization of the recurring units (A) has become 20 to 5,000 of (A) on the average; the reaction in the second step being carried out until the mol fraction (X) of the recurring units (A) in the resulting block copolymer has become 0.50 to 0.98; and the reactions in these steps being carried out so that the resulting p-phenylene sulfide block copolymer will have a melt viscosity (η^*) measured under conditions of 310° C./200 sec^{-1} of 10 to 100,000 poise and have:

(a) a glass transition temperature (Tg) of 20° to 80° C.,

(b) a crystalline melting point (Tm) of 200° to 350° C., and

(c) a crystallization index (Ci) of 15 to 45, this value being that of the heat-treated, but not stretch-oriented copolymer.

4,785,058

COMPOSITIONS FOR TIRES

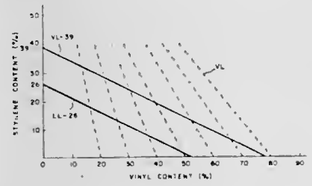
Tatsuo Sakashita, Suita; Takyya Okazaki, Toyonaka, and Masanori Kan, Amagasaki, all of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 611,694, May 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 358,871, Mar. 16, 1982, abandoned. This application Mar. 26, 1986, Ser. No. 846,270

Claims priority, application Japan, May 15, 1981, 56-73954

Int. Cl.[4] C08F *236/00*

U.S. Cl. 526—314 **3 Claims**



1. A tire tread composition for reducing energy consumption containing at least 30% star shaped random styrene-butadiene copoymer obtained by solution polymerization, and said star shaped random styrene-butadiene copolymer having a styrene content which is less than 20% and more than 10% and a vinyl content which is less than 50% and more than 40% and wherein the composition value X of said styrene-butadiene copolymers obtained by the following equation being in a range of 26 to 39:

$$X = \text{content of styrene (\%)} + \frac{100 - \text{styrene-content}}{100} \times \frac{\text{vinyl content (\%) in } BR}{2}$$

wherein BR is the butadiene component, and said copolymer having only one glass transition temperature below −50° C. and being lower than estimated glass transition temperature following Gordon-Taylor equation by 5° to 10° C.

4,785,059

PROCESS FOR THE PREPARATION OF A HYDROPHILIC WATER SWELLABLE GRAFT COPOLYMER

Peter J. Fydelor, Swindon; Ronald A. Miller, London; Barbara J. Ringrose, Swindon, and Jonathan W. A. Ramsay, London, all of England, assignors to The Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdon of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 819,885, filed as PCT GB 85/00/97 on May 10, 1985, published as WD 85/05364 on Dec. 5, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,678

Claims priority, application United Kingdom, May 10, 1984, 8412007

Int. Cl.[4] C08F *265/02, 267/02*

U.S. Cl. 525—301 **10 Claims**

1. A process for the preparation of a hydrophilic water swellable graft copolymer, said copolymer being in the form of or capable of being formed into a solid device, comprising the steps of:

(a) radiation graft copolymerising a polyethylene vinyl acetate polymer (PEVA) having between 8 and 30% by weight of vinyl acetate units, with an ethylenic carboxylic acid; and

(b) subsequently heat treating the graft copolymerised

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PEVA in an aqueous hydroxide solution at a temperature in excess of the softening point of the PEVA.

4,785,060

SOIL RELEASE PROMOTING PET-POET COPOLYMER, METHOD OF PRODUCING SAME AND USE THEREOF IN DETERGENT COMPOSITION HAVING SOIL RELEASE PROMOTING PROPERTY

Meshulam Nagler, Teaneck, N.J., assignor to Colgate-Palmolive Company, New York City, N.Y.

Filed Aug. 28, 1986, Ser. No. 901,218

Int. Cl.[4] C08G *63/04, 63/34, 65/32;* **C08L** *71/02*

U.S. Cl. 525—444 **5 Claims**

1. A method for preparing a soil-release promoting linear block copolymer of polyethylene terephthalate and polyethylene oxide terephthalate which comprises contacting polyethylene terephthalate with polyethylene glycol having a molecular weight in the range of from about 500 to about 10,000 under reduced pressure, and at a temperature in the range of from about 100° C. to about 350° C., in the presence of a catalytically effective amount of a mixed catalyst system wherein said catalyst system is titanium (IV) isopropoxide and sodium isopropoxide, wherein said titanium (IV) isopropoxide and sodium isopropoxide are used at a weight ratio of from about 3:1 to about 1:3, said linear block copolymer having a weight average molecular weight in the range of from about 15,000 to about 35,000.

4,785,061

METHOD FOR REDUCING THE ALIPHATIC HALIDE CONTENT OF EPOXY RESINS USING A SOLVENT MIXTURE INCLUDING A POLAR APROTIC SOLVENT

Chun S. Wang, and Zeng-Kun Liao, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 13, 1987, Ser. No. 85,046

Int. Cl.[4] C08G *59/14*

U.S. Cl. 525—507 **16 Claims**

1. In a method for reducing the undesirable halide content of an epoxy resin containing hydrolyzable halide and/or bound halide which method consists essentially of heating said epoxy resin which has been dissolved in a solvent system containing a ketone, an aromatic hydrocarbon, or any combination thereof in the presence of a basic-acting compound at a temperature and for a time sufficient to reduce the total aliphatic halide content of said epoxy resin and thereafter recovering the resultant epoxy resin; the improvement which comprises employing as an additional solvent an organic polar aprotic solvent different from the aforementioned ketone or aromatic hydrocarbon in an amount of from about 2 to about 80 percent by weight of the total amount of solvent employed.

9. A process for reducing the total undesirable halide content of an epoxy resin containing hydrolyzable and/or bound halide which process consists essentially of

(A) dissolving said epoxy resin in a solvent system which comprises

(1) from about 2 to about 80 percent by weight of at least one organic polar aprotic solvent which is neither a ketone nor an aromatic hydrocarbon;

(2) from about 20 to about 49 percent by weight of at least one ketone; and

(3) from about 20 to about 49 percent by weight of at least one aromatic hydrocarbon; and;

(B) heating the resultant solution to a temperature of from about 60° C. up to about 150° C.;

(C) adding from about 0.25 to about 10 moles of a 10% to about 70% aqueous solution of an alkali metal hydroxide per equivalent of total halide;

(D) continuing the heating for a time sufficient to reduce the total halide content of said epoxy resin;

(E) washing the product from step (D) with either water, a dilute aqueous solution of a weak inorganic acid, acid salt or a combination thereof; and

(F) recovering the resultant epoxy resin having a reduced total halide content from the product of step (E).

4,785,062

REACTION PRODUCT OF O-EPOXYALKYLATED TETRAKIS(HYDROXYPHENYL)ETHANE RESIN AND PHENOL WITH PRODUCT HAVING NO REMAINING EPOXY GROUPS

Alan R. Browne, Columbia, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

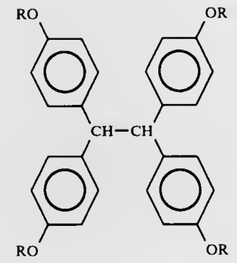
Filed Jul. 31, 1984, Ser. No. 636,419

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

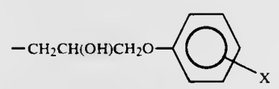
Int. Cl.[4] C08G *59/18, 59/20, 59/62*

U.S. Cl. 525—523 **1 Claim**

1. A composition comsisting of the reaction product of an O-epoxyalkylated tetrakis (hydroxyphenyl) ethane resin and sufficient substituted or unsubstituted phenol to react with all the epoxy groups, said reaction product being a group member of the formula:



wherein R is



and X is H, halogen, alkoxy containing 1 to 8 carbon atoms, alkyl containing 1 to 14 carbon atoms, aryl containing 6 to 14 carbon atoms and aralkyl containing 6 to 14 carbon atoms.

4,785,063

COPOLYMERIZABLE 2-(2'-HYDROXY-5'-ACRYLOYLOXYALKYL)-2H-BENZOTRIAZOLES

Mario Slongo, Tafers, and Jean Rody, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

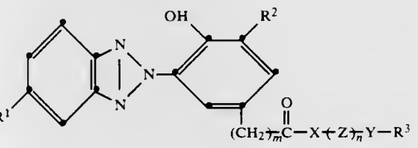
Continuation of Ser. No. 802,071, Nov. 26, 1985, abandoned, which is a continuation of Ser. No. 631,276, Jul. 16, 1984, abandoned. This application Jul. 18, 1986, Ser. No. 886,934

Claims priority, application Switzerland, Jul. 26, 1983, 4087/83

Int. Cl.[4] C07D *249/20*

U.S. Cl. 526—259 **5 Claims**

1. A compound of formula I



(I)

wherein

X is —O— or —N(R^4)—,

Y is —O— or —N(R^5)—,

Z is C_2-C_6-alkylene, 2-hydroxypropylene or cyclohexylene,

m is 2,

n is 1

R^1 is hydrogen or chlorine,

R^2 is tert-butyl,

R^3 is a group —C(O)—C(R^6)=C(H)R^7, wherein R^6 and R^7 independently of one another are hydrogen or methyl, or

R^3, when Y is —N(R^5)—, forms together with R^5 a group —C(O)—CH=CH—C(O)—, and

R^4 and R^5 independently of one another are hydrogen or C_1-C_4-alkyl.

5. A method of stabilizing a polymer against light-induced degradation by copolymerizing into said polymer an effective amount of a compound according to claim 1.

4,785,064

ULTRA-VIOLET LIGHT CURABLE COMPOSITIONS FOR ABRASION RESISTANT ARTICLES

Ramon F. Hegel, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 629,353, Jul. 10, 1984, Pat. No. 4,650,845. This application Nov. 3, 1986, Ser. No. 926,645

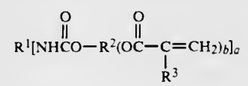
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] C08F *126/06, 126/02, 226/02*

U.S. Cl. 526—261 **25 Claims**

1. An article comprising a polymerized resin derived from (I) at least 45 parts by weight of a urethane polyacrylic ester first component having the formula

FORMULA I



wherein:

R^1 has the valence "a" and is the residue remaining after the removal of —NCO groups from an organic polyisocyanate;

R^2 has the valence b+1 and is a polyvalent aliphatic group having 4 to 10 carbon atoms;

R^3 is —H or —CH_3;

a is a number having a value of at least 2; and

b is an integer of 3 to 5,

(II) at most 55 parts by weight of a second component containing (A) from 30 to 60% by weight of a polyacrylic ester, (B) from 20 to 70% by weight of a polymerization shrinkage modifier, and (C) from 0 to 30% by weight of a diluent monomer, and (III) from 0 to 5% by weight of I plus II of a source of free radicals, said article having an inherent abrasion resistance to 000 steel wool of at least 140 kPa.

4,785,065

BINDERS FOR TRANSFER PRINTING

Guenter Uhl, Worms; Rudolf Toex; Gerhard Schroeder, both of Limburgerhof, and Klaus Schnell, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 68,177

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622602

Int. Cl.[4] C08F *26/08*

U.S. Cl. 526—264 **2 Claims**

1. A binder for transfer printing, consisting of a copolymer consisting of, based on the weight of the monomers,

(a) 5–95% by weight of N-vinylcaprolactam,

95–5% by weight of N-vinylpyrrolidone and

0–30% by weight of an alkyl ester or hydroxyalkyl ester of acrylic acid or methacrylic acid where alkyl is of 1 to 14 carbon atoms or hydroxyalkyl is of 2 or 3 carbon atoms, of a vinyl ester of a saturated carboxylic acid of 2 or 3 carbon atoms, acrylic acid, methacrylic acid, maleic acid or itaconic acid, the monomeric carboxylic acids being in the form of their alkali metal or ammonium salts, acrylamide or methacrylamide, or mixtures of these monomers, or

(b) 20–60% by weight of N-vinylcaprolactam and

80–40% by weight of an alkyl ester of acrylic acid or methacrylic acid where alkyl is of 1 to 14 carbon atoms, where alkyl is of 1 to 4 carbon atoms it is present in an amount of not more than 30% by weight.

4,785,066

NOVEL ORGANOSILOXANE INHIBITORS FOR HYDROSILATION REACTIONS

Myron T. Maxson, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 059,356, Jun. 8, 1987, abandoned, which is a division of Ser. No. 899,111, Aug. 22, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 144,209

Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—15 **3 Claims**

1. A platinum catalyst inhibitor for extending the working time at 25° C. of polyorganosiloxane compositions curable by a platinum catalyzed hydrosilation reaction without substantially decreasing the cure rate of said compositions at temperatures of at least about 100° C. where said inhibitor is represented by the average formula

$$RR'MeSi(OSiMeR'')_x[(OSiR'''Vi)_y]_zOSiRR'Me$$

where Me represents methyl, Vi represents vinyl, R represents methyl, ethyl, phenyl or —CH_2CH_2Rf, R' represents methyl or vinyl, each R'' and R''' are individually selected from the same group of radicals represented by R, Rf represents a perfluoroalkyl radical containing from 1 to 8 carbon atoms, the value of x is at least 4, the value of y is from 2 to 5, the value of z is at least 1, and said inhibitor is the product of an acid-catalyzed polymerization of a first cyclic diorganosiloxane containing repeating units of the formula MeR''SiO and a second cyclic diorganosiloxane containing repeating units of the formula R'''ViSiO, where said polymerization is conducted in the presence of an organosilicon compound comprising at least one unit of the formula RR'MeSiX where X represents a hydrolyzable atom or group.

4,785,067

PROTECTIVE COATING AND METHOD OF MAKING THE SAME

Douglas R. Brumbill, Fowlerville, Mich., assignor to Genesee Polymers Corporation, Flint, Mich.

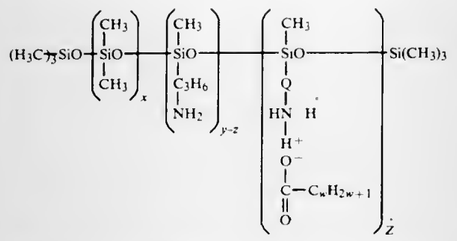
Continuation of Ser. No. 852,986, Apr. 16, 1986, abandoned. This application Mar. 25, 1987, Ser. No. 30,464

Int. Cl.[4] C08G *77/04*

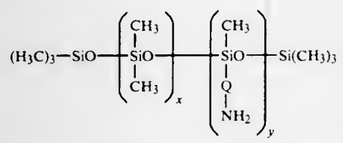
U.S. Cl. 528—26 **12 Claims**

1. A protective coating consisting essentially of a polysiloxane copolymer having the formula

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characterized by being prepared by reacting a trimethyl end blocked polyamine silicone fluid having the formula



with a saturated aliphatic carboxylic acid having the formula

$$C_wH_{2w+1}COOH$$

wherein Q is $—C_3H_6—$ to produce the polysiloxane copolymer and x is 10 to 1000, y is 2 to 200, Z is less the y and w is greater than or equal to 14.

4,785,068

RESIN COMPOSITION FOR USE IN ELECTRODEPOSITION PAINTS

Akira Tominaga, and Reiziro Nishida, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Jun. 16, 1987, Ser. No. 62,832

Claims priority, application Japan, Jun. 16, 1986, 61-138163

Int. Cl.[4] C08G *18/30*

U.S. Cl. 528—45 **16 Claims**

1. A resin composition for use in cationic electrodeposition paints, said composition comprising a cationic resin and a blocked polyisocyanate compound as a curing agent component, said blocked polyisocyanate compound containing per molecule one low-temperature dissociating blocked isocyanate group having a blocking agent dissociating temperature of 60° to 120° C. and at least one high-temperature dissociating blocked isocyanate group which dissociates the blocking agent at a temperature higher than said dissociating temperature by at least 40° C.

4,785,069

PREPARATION PROCESS OF HEAT-RESISTANT POLYMERS FROM POLYCARBOXYLIC ACIDS OR ANHYDRIDES IN THE PRESENCE OF AN ALKALI METAL FLUORIDE AND QUATERNARY ONIUM SALT

Masahiro Kouno, Manazurumachi; Akihiro Yamaguchi, Kamakura; Masanori Osawa, Yokohama; Kohei Shizuka, Fujisawa; Hiromi Nakano, Zushi, and Kazumi Mizutani, Yokobama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

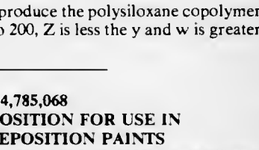
Division of Ser. No. 943,699, Dec. 19, 1986, Pat. No. 4,736,008. This application Dec. 29, 1987, Ser. No. 139,600

Claims priority, application Japan, Dec. 28, 1985, 60-293592; Dec. 28, 1985, 60-293593

Int. Cl.[4] C08G *18/08, 18/22*

U.S. Cl. 528—51 **9 Claims**

1. A process for preparing a heat-resistant polymer which comprises reacting an organic polyisocyanate with one or more compounds selected from the group consisting of organic polycarboxylic acids and organic polycarboxylic acid anhydrides in the presence of an alkali metal fluoride as a catalyst, wherein said alkali metal fluoride is used in combination with a quaternary onium salt represented by the following formula:



wherein Z represents a nitrogen atom or a phosphorus atom, R_1, R_2, R_3 and R_4 represent an alkyl, cycloalkyl, aralkyl or aryl group, or wherein any two adjacent R_1, R_2, R_3 or R_4 groups construct a structure of a heterocyclic compound with the central atom Z or further with other hetero atoms, and X represents a halogen atom, a nitrile or hydroxyl group.

4,785,070

IMIDAZOLINONE-CONTAINING COPOLYMER

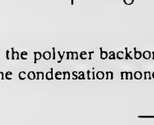
Jerald K. Rasmussen; Alan R. Katritzky; Larry R. Krepski; Howell K. Smith, II; Steven M. Heilmann, and Kumars Sakizadeh, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 681,553, Dec. 14, 1984, Pat. No. 4,667,012. This application Feb. 17, 1987, Ser. No. 14,875

Int. Cl.[4] C08G *83/00*

U.S. Cl. 528—73 **40 Claims**

1. A copolymer comprising one or more 2-imidazolin-5-one units of the formula



in the polymer backbone and other units derived from at least one condensation monomer.

4,785,071

RUBBER COMPOSITIONS

Hitoshi Kondo, Higashimurayama; Makoto Sasaki, Yokohama, and Yukio Kobayashi, Tokyo, all of Japan, assignors to Bridgestone Corporation and Nippon Oil Co., Ltd., both of Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,468

Claims priority, application Japan, Feb. 8, 1986, 61-24939; May 21, 1986, 61-114943; Jun. 20, 1986, 61-142967

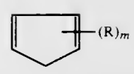
Int. Cl.[4] C08L *45/00, 7/00, 9/00*

U.S. Cl. 525—125 **4 Claims**

1. A rubber composition which exhibits improved cut resistance and chipping resistance comprising 1 to 30 parts by weight of at least one resin, based on 100 parts by weight of at least one rubber selected from the group consisting of natural and synthetic diene rubbers, wherein said resin is selected from the group consisting of:

(1) a hydroxyl group-containing cyclopentadiene resin (R_1) obtained by heat copolymerizing:

(i) 100 parts by weight of component A, wherein component A is at least one compound selected from a cyclopentadiene ring containing compound represented by the following general formula:



(I)

wherein R is an alkyl group having 1–3 carbon atoms and m is an integer of 0–6, and its Diels-Alder reaction adduct with,

(ii) 2 to 120 parts by weight of component B, wherein component B is a compound selected from the group consisting of unsaturated alcohols having 3-22 carbon atoms, unsaturated divalent alcohols, hydroxyalkyl acrylates and hydroxyalkyl methacrylates, and

(2) a resin (R_2) obtained by reacting:

(i) the hydroxyl group-containing cyclopentadiene resin (R_1) with,

(ii) component C., wherein component C is a polyisocyanate compound, at an equivalent ratio of isocyanate group in component C to hydroxyl group in resin (R_1) of 0.05–1.5.

4,785,072

POLYARYL ETHER SULPHONES

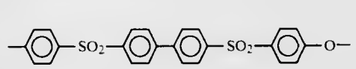
James E. Harris, Piscataway, N.J.; Louis M. Maresca, Pittsfield, Mass., and Markus Matzner, Edison, N.J., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 701,306, Feb. 13, 1985, abandoned, and a continuation-in-part of Ser. No. 701,234, Feb. 13, 1985, abandoned. This application Aug. 4, 1987, Ser. No. 81,344

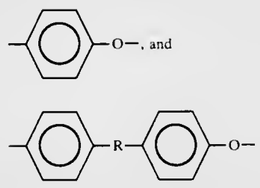
Int. Cl.[4] C08G *65/22, 65/40*

U.S. Cl. 528—125 **16 Claims**

1. An aryl ether sulphone polymer containing the following ether-liked structural units:



and at least two of the following:



wherein R is selected from SO_2, SO, CO, O, C_1-C_4 alkylidene and a direct bond.

4,785,073

MELAMINE-PHENOL-FORMALDEHYDE RESOLE MODIFIED BY GLYCOLS MOULDING COMPOSITION

Robert Farkas, Bishops Stortford, and Lothar M. Hohmann, London, both of England, assignors to Polymer Tectonics Limited, London, England

PCT No. PCT/GB84/00281, § 371 Date Apr. 11, 1985, § 102(e) Date Apr. 11, 1985, PCT Pub. No. WO85/00822, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 13, 1984, Ser. No. 723,957

Claims priority, application United Kingdom, Aug. 16, 1983, 8322059

Int. Cl.[4] C08G *14/10, 14/06;* C08L *61/34*

U.S. Cl. 528—163 **5 Claims**

1. A method of forming a shaped article comprising forming into shape a composition comprising:

(i) a melamine-phenol-formaldehyde resole wherein the molar ratio of melamine:phenol is in the range 1:4.7 to 1:0.29; wherein for each mole of melamine there are 1.5 to 3 moles of formaldehyde; and wherein for each mole of phenol there are 1.2 to 2 moles of formaldehyde, the formaldehyde requirements being additive;

(ii) a glycol or glycol derivative in an amount of at least 15% by weight of the phenol in the resole plus at least 50% by weight of the melamine in the resole; and

(iii) water, the water being not over 35% by weight based on the weight of resole, and causing the resole to cure at a pH in the range 4.0 to 8.6.

4,785,074

RADIATION-SENSITIVE POLYCONDENSATES, PROCESSES FOR THEIR PREPARATION, COATED MATERIAL AND ITS USE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 657,870, Oct. 4, 1984, Pat. No. 4,694,061. This application Jun. 22, 1987, Ser. No. 64,728

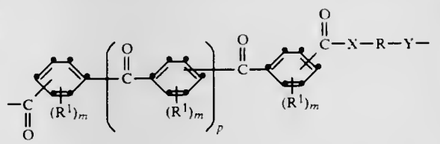
Claims priority, application Switzerland, Oct. 12, 1983, 5570/83

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

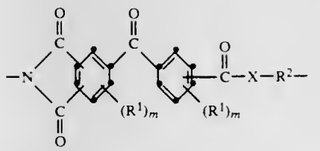
Int. Cl.[4] C08G *69/26*

U.S. Cl. 528—353 **24 Claims**

1. A radiation-sensitive linear saturated homopolycondensate or copolycondensate of the group comprising polyesters, polyester-amides and polyester-imides with benzophenone-di or -tri-carboxylic acid radicals, with at least one of the recurring structural elements of the formula I and/or II

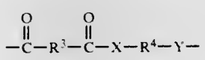


(I)



(II)

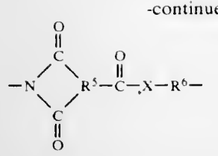
and, in the case of a copolycondensate, also recurring structural elements of the formula III and/or IV



(III)

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-continued



(IV)

in which the imide group in structural element II is bonded to two adjacent C atoms, m is 0 or a number from 1 to 4, p is 0 or a number from 1 to 5 and n is 0 or a number from 1 to 3, X is —S— or —O— and Y independently is —NR^7— or has the same meaning as X, R^1 is alkyl or alkoxy having less than 6 C atoms, aryl having 6 to 10 C atoms, aralkyl having 7 to 10 C atoms or halogen, R is an unsubstituted or substituted divalent aliphatic, cycloaliphatic, araliphatic or aromatic radical and, if X is —O— or —S— and Y is —NR^7—, R and R^7 together are alkylene having 5-7C atoms, R^2 is an unsubstituted or substituted divalent aliphatic or aromatic hydrocarbon radical, R^4 independently has the same meaning as R, and R^6 independently has the same meaning as R^2, R^3 is a divalent saturated aliphatic or aromatic radical, R^5 is a trivalent saturated aliphatic or aromatic radical in which the imide group is bonded to two adjacent C atoms and R^7 is a hydrogen atom, alkyl, cycloalkyl, aryl, aralkyl or alkaralkyl, the copolycondensates containing at least 10 mol %, based on the copolycondensate, of structural elements of the formula I and/or II.

4,785,075

METAL ACETYLACETONATE/ALKYLPHENOL CURING CATALYST FOR POLYCYANATE ESTERS OF POLYHYDRIC PHENOLS

David A. Shimp, Prospect, Ky., assignor to Interez, Inc., Jefferson, Ky.

Filed Jul. 27, 1987, Ser. No. 78,037
Int. Cl.[4] C08G *83/00*
U.S. Cl. 528—422 **36 Claims**

1. A curable composition comprising a polycyanate ester of a polyhydric phenol and a catalyst comprising a liquid solution of a metal acetylacetonate in an alkylphenol wherein the metal is a coordinating metal and wherein the alkylphenol has 1 or 2 alkyl substituents ortho or para to the phenol group and wherein the alkyl groups contain a total of one to about 22 carbon atoms.

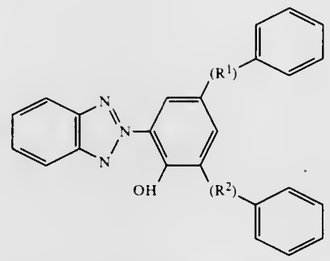
4,785,076

POLYPHENYLENE ETHER RESIN BLENDS HAVING IMPROVED ULTRAVIOLET LIGHT STABILITY

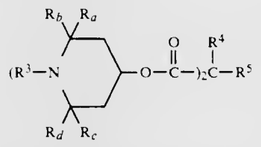
Peter H. Shu, Schenectady, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,977
Int. Cl.[4] C08K *5/34*
U.S. Cl. 524—91 **33 Claims**

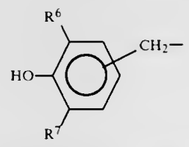
1. A thermoplastic composition, comprising
(a) a polyphenylene ether resin; and
(b) an ultraviolet light resistance enhancing amount of a stabilizer which consists of a combination of
(i) a compound having the formula:



in which R^1 and R^2 are independently divalent radicals derived from C_2 to C_{20} alkanes or alkenes, straight lined or branched, and
(ii) a compound having the formula



in which R_a, R_b, R_c and R_d each independently represents alkyl having from 1 to 6 carbon atoms; R^3 represents hydrogen, —OH or alkyl having from 1 to 12 carbon atoms; R^4 represents a hydroxybenzyl group of the formula



in which R^6 and R^7 each independently represents a branched alkyl group having from 1 to 9 carbon atoms, and R^5 represents an alkyl group having from 1 to 20 carbon atoms.

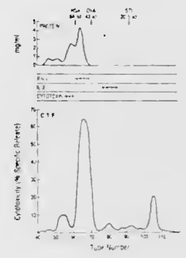
4,785,077

SUBSTANTIALLY PURE CYTOTOXICITY TRIGGERING FACTOR

Richard Kornbluth, San Diego; Thomas S. Edgington, La Jolla, and Susan A. Gregory, San Diego, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed May 5, 1986, Ser. No. 859,604
Int. Cl.[4] C07K *15/00;* **C12N** *5/00*
U.S. Cl. 530—351 **20 Claims**

1. A substantially pure human proteinaceous lymphokine, which lymphokine:
(a) has an apparent Mr of about 55 kilodaltons as determined by gel exclusion chromatography, using a gel matrix capable of fractionating proteins of an apparent relative molecular mass of about 6 to about 150 kilodaltons;
(b) is capable of inducing the secretion of a tumor cell-killing factor that includes tumor necrosis factor-alpha from interferon-gamma-primed monocytes with a cytotoxicity triggering specific activity of at least 50,000 units per milligram protein when said monocytes are primed by culturing in the presence of interferon-gamma for a time period of at least 36 hours;
(c) is secreted in impure form from differentiated, stimulated normal human helper T cells that express a $T3^+T4^+T8^-M1^-$ phenotype; and



(d) is substantially free of pyrogen, interferon-gamma, interleukin-2 and direct cytotoxin.

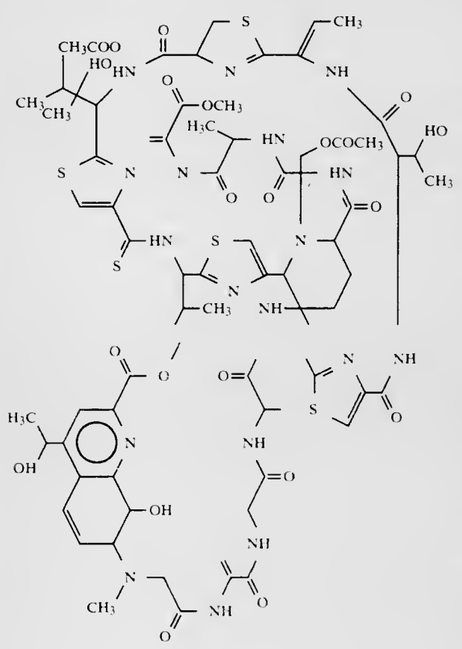
4,785,078

TRANSFORMATION PRODUCT OF THIOSPORAMICIN

Eugene F. Fiese, Ledyard; Charles E. Moppett, Mystic, and Wendell W. Windisch, Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/US85/00698, § 371 Date Nov. 20, 1986, § 102(e) Date Nov. 20, 1986, PCT Pub. No. WO86/06065, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 18, 1985, Ser. No. 938,083
Int. Cl.[4] C07K *7/52;* **A61K** *35/00*
U.S. Cl. 530—317 **5 Claims**

1. A Compound CP-53,648 of the formula

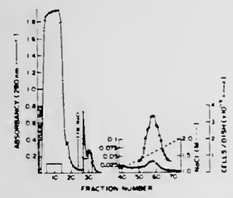


4,785,079

ISOLATION OF FIBROBLAST GROWTH FACTOR

Denis Gospodarowicz, San Francisco; Andrew Baird, San Diego, both of Calif., and Peter Bohlen, Ulster, Switzerland, assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 670,160, Nov. 9, 1984, abandoned. This application Dec. 10, 1986, Ser. No. 940,524
Int. Cl.[4] C07K *3/28*
U.S. Cl. 530—399 **13 Claims**



1. A method of obtaining substantially pure basic fibroblast growth factor comprising providing a biological sample containing significant levels of basic fibroblast growth factor, extracting the solubilized component of said biological sample, partially purifying basic FGF from said extract by a salt-precipitation step, then fractionating said partially-purified basic FGF-containing material so as to remove neutral and acidic proteins, and then treating said fractionated basic FGF-containing material using affinity chromatography employing heparin moieties linked to an insoluble support as the stationary phase and employing a salt gradient mobile phase of increasing salt concentration, and collecting liquid fractions containing substantially purified basic fibroblast growth factor therefrom.

4,785,080

LABELED ANALYTES

Peter R. Farina, North Salem, and James R. Golke, Yorktown Heights, both of N.Y., assignors to Baker Instruments Corporation, Allentown, Pa.

Continuation of Ser. No. 437,484, Oct. 28, 1982, abandoned, which is a division of Ser. No. 248,689, Mar. 30, 1987, Pat. No. 4,378,428. This application Aug. 29, 1985, Ser. No. 770,016
Int. Cl.[4] C12N *9/22, 9/38, 9/96;* **C12Q** *1/00;* **C07G** *7/00;* **C07K** *13/00;* **G01N** *53/00*
U.S. Cl. 530—402 **54 Claims**

1. A polypeptide-labeled analyte analog for use in carrying out an assay of a sample containing the analyte, having the following formula:

$$A_m—X_n—Z_o—Y_n—[PP_1]_p$$

and either Z or X; Z is a bridging group linked to X and Y; PP_1 is a polypeptide partner, m, n, and p, are intergers of from 1 to about 8, and o is zero or an integer of from 1 to about 8, said polypeptide-labeled analog being capable of competing with the analyte for binding to an antibody specific for the analyte, and said polypeptide-labeled analyte analog being capable of non-covalently binding with a second polypeptide partner, PP_2, to form a complex exhibiting anzymatic catalytic activity characteristic of the group consisting of ribonuclease and β-galactosidase activity capable of converting a substrate to a reporter molecule which can be detected, said enzymatic catalytic activity being inhibited by complexation of the polypeptide-labeled analyte analog with antibody and absent binding of said polypeptide-labeled analyte analog with the polypeptide partner, PP_2, catalytic activity is not expressed.

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4,785,081

PROCESS FOR THE PRODUCTION OF REACTIVE DYES BY ADIABATIC REACTION OF CYANURIC CHLORIDE WITH AN AMINO GROUP-CONTAINING DYE AT ELEVATED TEMPERATURE

Karlheinz Franke, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 821,212, Jan. 23, 1986, abandoned, which is a continuation of Ser. No. 671,075, Nov. 13, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 912,175

Claims priority, application Switzerland, Nov. 10, 1983, 6069/83

Int. Cl.[4] C09B *62/08, 43/16, 62/06, 62/10*

U.S. Cl. 534—598 15 Claims

1. A process for the production of reactive dyes by the reaction of cyanuric chloride with anionic dyes containing an amino group, which process comprises the adiabatic reaction of cyanuric chloride with the dye, at a temperature of 40° to 60° C. and a pH value of between 3.0 and 7.0, with the rapid addition of the educts within 1 to 30 minutes.

4,785,082

PROCESS FOR PREPARING A HIGHLY CONCENTRATED AQUEOUS PRESS CAKES OF AN AZO DISPERSE DYE FROM DILUTE AQUEOUS SUSPENSION THEREOF WHEREIN SURFACTANT IS ADDED BEFORE THE DYE IS ISOLATED

Joachim Weide; Erwin Dietz, both of Kelkheim, and Reinhold Deubel, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 5, 1985, Ser. No. 795,093

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3440487

Int. Cl.[4] C09B *41/00, 67/38, 67/40, 67/54*

U.S. Cl. 534—887 18 Claims

1. A process for preparing a highly concentrated aqueous press cake of an azo disperse dye, which comprises adding one or more surfactants which have a cloud point in aqueous solution in the course of the preparation of the respective dye in an aqueous medium, at the latest before the dye is isolated, and isolating the azo disperse dye at a temperature above the cloud point of the surfactant or surfactants used.

4,785,083

MIXTURES OF 1-N-C_{3-7}ALKYL-5-(4'-CHLORO-2'-NITROPHENYLOZO)-3-CYANO-6-HYDROXY-4-METHYLPYRID-2-ONE COMPOUNDS

Ulrich Zirngibl, Oberwil, Switzerland, assignor to Sandoz Ltd., Base, Switzerland

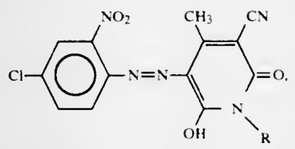
Filed Dec. 27, 1982, Ser. No. 453,750

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151648

Int. Cl.[4] C09B *29/22, 29/42, 67/22, 67/48*

U.S. Cl. 534—575 15 Claims

1. A mixture comprising at least two dyes of the formula



wherein R is unsubstituted *n*-C_{3-7}alkyl, with the proviso that at least two different dyes of said formula are present to the extent of at least 10 mole % each, based upon the total molar quantity of dyes present.

4,785,084

METHOD OF PREPARING PERACETYL OXAZOLINES

Christopher Warren, Carlisle, Mass.; Satoru Nakabayashi, Kawasakishi, Japan, and Roger W. Jeanloz, Newton, Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Jul. 31, 1986, Ser. No. 891,282

Int. Cl.[4] C08B *37/00;* C07H *15/00, 17/00, 17/02*

U.S. Cl. 536—17.9 7 Claims

1. A process for the production of a peracetyl oxazoline comprising reacting a peracetyl saccharide with a reactive compound selected from the group consisting of trifluoromethanesulfonic acid, trimethylsilyl trifluoromethanesulfonate, silver trifluoromethanesulfonate, sodium trifluoromethanesulfonate, trifluoromethanesulfonic anhydride, and trifluoromethanesulfonyl chloride,

wherein said reactive compound is capable of generating the formation of an intermediate saccharide acetoxonium, ion to produce a peracetyl oxazoline.

4,785,085

REBECCAMYCIN ANALOGS

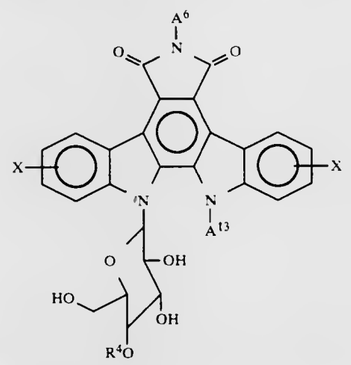
Takushi Kaneko, Guilford; Henry S. Wong, Durham, both of Conn., and Jacob J. Utzig, Buffalo, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 21, 1986, Ser. No. 933,428

Int. Cl.[4] C07H *19/23, 5/04, 19/044*

U.S. Cl. 536—23 11 Claims

1. A compound having the formula



wherein:

n is an integer from 1 to 6;

A^6 and A^{13} are selected from H and $—(CH_2)_nNR^1R^2$ and at least one of A^6 and A^{13} is $—(CH_2)_n—NR^1R^2$;

R^1 and R^2, independently, are selected from hydrogen, unsubstituted and substituted C_1–C_6 alkyl, aralkyl having 1 to 3 carbons in the alkyl moiety and unsubstituted phenyl or phenyl substituted with 1 to 3 alkyl, alkoxy, hydroxy, halo, carboxyl, alkoxycarbonyl, and amino and mono- and di-lower-alkylamino groups in the aryl moiety, and aryl selected from unsubstituted phenyl and phenyl substituted with 1 to 3 alkyl, alkoxy, hydroxy, halo, amino, mono- and dialkylamino, nitro, carboxyl, alkoxycarbonyl, and cyano groups provided that both R^1 and R^2 are not each aryl and, when taken together, R^1 and R^2 may be selected from $—(CH_2)_4—$ and $(CH_2)_2—R^3—(CH_2)_2—$ to form a 5- or 6-membered ring together with the N-atom wherein R^3 is selected from CH_2, NH, O and S;

X is selected from H, F, Cl, Br, C_1–C_3 alkyl, OH, carboxyl, alkoxycarbonyl and alkoxy wherein the alkyl moiety is C_1–C_3 alkyl, benzyloxy, amino, and mono- and dialkylamino; and

R^4 is selected from H and CH_3; and pharmaceutically acceptable acid addition and base salts thereof.

4,785,086

TEST FOR CAMPYLOBACTER

Ayoub Rashtchian, Northboro, and Renee Fitts, Framingham, both of Mass., assignors to Integrated Genetics, Inc., Framingham, Mass.

Filed Jan. 17, 1985, Ser. No. 692,778

Int. Cl.[4] C07H *21/00;* C12Q *1/68;* C12N *1/00, 1/20*

U.S. Cl. 536—27 4 Claims

1. A DNA probe consisting essentially of a DNA sequence from the plasmid present in:

(a) CJ12A (NRRL 15911);

(b) CJ29B (NRRL 15912);

(c) CJ59 (NRRL 15913); or

(d) CJ87A (NRRL 15914);

wherein said DNA sequence hybridizes under hybridizing conditions to DNA of at least 80% of bacteria in the species *Campylobacter jejuni*, and not to non-Campylobacter species.

4,785,087

PROCESS FOR DRY CATIONIZATION OF STARCH

Reinhard Stober, Hasselroth; Wolfgang Fischer, Kahl; Michael Huss, Eachborn, and Klaus Udluft, Mainz, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 947,458

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604796

Int. Cl.[4] C08G *59/40*

U.S. Cl. 536—111 24 Claims

1. A process for dry cationization of starch comprising reacting starch or a starch containing substance with an alkylidene epoxide in an alkaline medium in water, at a temperature of about 5 to 40 ° C. in the presence of a finely divided silica.

4,785,088

PIGMENTS AND THEIR PREPARATION

Helmut Flohr, Mainz; Joachim Jesse, Weisenheim am Sand; Bernhard Albert, Maxdorf, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

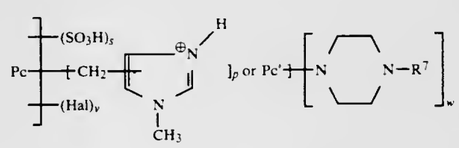
Filed Jun. 4, 1986, Ser. No. 870,749

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1985, 3520109

Int. Cl.[4] C09B *47/04, 47/30, 47/32*

U.S. Cl. 540—127 11 Claims

1. A pigment of the formula: F Het, wherein F is a cation of the structure (I) or (II):



(I) (II)

wherein Pc is a (p+s+v) valent radical of a metal-free phthalocyanine or of a metal phthalocyanine which contains VO, TiO, Pb, Sn, Cu, Ni or Mn as the central metal atom and in which the methylene group is bonded to a carbon atom of the imidazole ring, p is 1 to 4, s is 0 or 1, v is 0, 1, 2, 3 or 4, Pc' is a w valent radical of a metal-free phthalocyanine or of a metal phthalocyanine which contains VO, TiO, Pb, Sn, Cu, Ni or Mn as the central metal, Hal is bromine, chlorine or fluorine, R^7 is C_1–C_4-alkyl, C_2–C_4-hydroxyalkyl or C_2–C_4-aminoalkyl and w is 1, 2, 3 or 4, said cation having an absorption maximum at >700 nm and may or may not contain anionic groups and Het is an anion of a heteropolyacid based on tungsten, molybdenum, vanadium or a mixture thereof with phosphorus, silicon, cobalt, aluminum, manganese, chromium, nickel or a mixture thereof or a copper(I)-hexacyano ferrate(II) anion $[Cu_3Fe(CN)_6]^{\ominus}$, the pigment being obtained by laking the phthalocyanine based cation with the heteropolyacid.

4,785,089

NOVEL SULFONIC ACID ESTERS AND THEIR PREPARATION

Hans-Ulrich Blaser, Ettingen; Hans-Peter Jalett, Basle, both of Fed. Rep. of Germany, and Gottfried Sedelmeier, Schallstadt, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

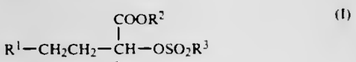
Filed Jun. 2, 1986, Ser. No. 869,799

Claims priority, application Switzerland, Jun. 13, 1985, 2501/85

Int. Cl.[4] C07C *143/68, 99/100;* C07D *223/16, 31/55, 31/36, 31/335, 31/255;* C07B *53/00*

U.S. Cl. 540—523 25 Claims

1. A compound of the formula



(I)

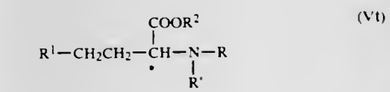
wherein

R^1 is (a) C_{5-6} cycloalkyl which is unsubstituted or substituted by C_{1-7} alkyl or (b) phenyl which is unsubstituted or substituted by at least one substituent selected from C_{1-7} alkyl, hydroxy, C_{1-7} alkoxy, C_{1-7} alkanoyloxy, fluorine, C_{1-7} alkylenedioxy, amino, C_{1-7} alkylamino, di(C_{1-7} alkyl-)amino, C_{1-7} alkanoylamino, carbamoyl, C_{1-7} alkyl carbamoyl, di(C_{1-7} alkyl) carbamoyl, C_{1-7} alkylsulfonylamino, sulfamoyl, C_{1-7} alkylsulfamoyl, di(C_{1-7} alkyl)-sulfamoyl, C_{1-7} haloalkyl, C_{1-7} hydroxyalkyl, and C_{1-7} aminoalkyl;

R^2 is C_{1-7} alkyl;

R^3 is phenyl which is substituted by halogen or nitro; and the asterisk denotes a carbon atom that is either present in the preponderant number of molecules in the S configuration or in the preponderant number of molecules in the R configuration.

10. A process for the preparation of a compound of the formula



(Vt)

wherein

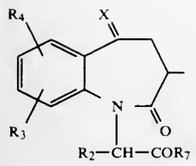
R^1 is (a) C_{5-6} cycloalkyl which is unsubstituted or substituted by C_{1-7} alkyl or (b) phenyl which is unsubstituted or substituted by at least one substituent selected from C_{1-7} alkyl, hydroxy, C_{1-7} alkoxy, C_{1-7} alkanoyloxy, fluorine, C_{1-7} alkylenedioxy, amino, C_{1-7} alkylamino, di(C_{1-7} alkyl-)amino, C_{1-7} alkanoylamino, carbamoyl, C_{1-7} alkyl carbamoyl, di(C_{1-7} alkyl) carbamoyl, C_{1-7} alkylsulfonylamino, sulfamoyl, C_{1-7} alkylsulfamoyl, di(C_{1-7} alkyl)-sulfamoyl, C_{1-7} haloalkyl, C_{1-7} hydroxyalkyl, and C_{1-7} aminoalkyl;

R^2 is C_{1-7} alkyl;

and the asterisk denotes a carbon atom that is either present in the preponderant number of molecules in the S configuration or in the preponderant number of molecules in the R configuration; and

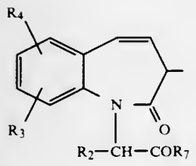
(i) R' is hydrogen or C_{1-7} alkyl; and R is a group of the formulae

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(VIII)

or



(IX)

or (ii) R′ is hydrogen and R is hydrogen; 1-phenyl C_{1-7} alkyl or 1-naphthyl-C_{1-7} alkyl; in which

R_2 is hydrogen or C_{1-7} alkyl;

R_3 and R_4 are each independently hydrogen, C_{1-7} alkyl, C_{1-7} alkoxy, C_{1-7} alkanoyloxy, hydroxy, halogen, or trifluoromethyl or both R_3 and R_4 together are C_{1-7} alkylenedioxy;

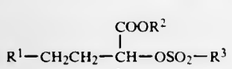
R_7 together with the carbonyl group to which it is attached is carboxy or a functionally modified carboxy; and

X is oxo, two hydrogen atoms, or one hydrogen atom and one hydroxyl group which comprises alkylating a compound of the formula



(II)

under inversion, with a compound of the formula



(I)

wherein R′, R, R^1, R^2 and the asterisk are as defined above and R^3 is phenyl which is substituted by halogen or nitro.

4,785,090

CEPHALOSPORIN DERIVATIVES

Takashi Tsuruoka, Kawasaki; Seiji Shibahara, Machida; Katsuyoshi Iwamatsu, Yokohama; Tsuneo Okonogi, Yokohama; Satoru Nakabayashi, Kawasaki; Yasushi Murai, Yokosuka; Hiroko Ogino, Kawasaki; Kiyoaki Katano, Yokohama; Takashi Yoshida, Tokyo; Shigeharu Inoue, Yokohama; Shunzo Fukatsu, Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

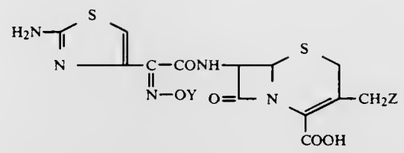
Filed Feb. 21, 1985, Ser. No. 704,077

Claims priority, application Japan, Feb. 23, 1984, 59-33747; Apr. 9, 1984, 59-71414; Jul. 3, 1984, 59-138206; Dec. 1, 1984, 59-254517

Int. Cl.⁴ C07D *501/38;* **A61K** *31/545*

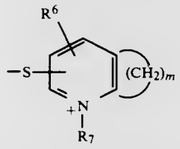
U.S. Cl. 540—225 **13 Claims**

1. A cephalosporin derivative of the formula:

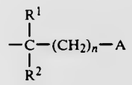


wherein

Z is a group of the formula:



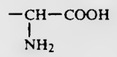
wherein m is an integer of 3–5, R^6 is hydrogen or alkyl of 1–3 carbon atoms, and R^7 is alkyl of 1–5 carbon atoms, alkenyl of 2–5 carbon atoms, cyclopropyl, a group $-(CH_2)_pB$ wherein p is 0 or an integer of 1–3 and B is amino, alkyl-substituted amino, hydroxy, carboxy, carbamoyl, trifluoromethyl, sulfonic acid, sulfonic acid amide, alkyl thio or cyano: Y is straight-chain or branched-chain alkyl of 1–5 carbon atoms, alkenyl of 2–5 carbon atoms, cyclo alkanomethyl of 3–6 carbon atoms, each group being optionally substituted by halogen, or a group



wherein n is 0 or an integer of 1–3, A is a group $-COR^3$ wherein R3 is hydroxy, a group



wherein R^4 and R^5, which may be the same or different, are hydrogen or alkyl of 1–5 carbon atoms, a group



or a 5 or 6-membered heterocyclic group which optionally substituted by methyl group, containing 1–3 nitrogen atoms or 2-aminothiazole group, and R^1 and R^2, which may be the same or different, are hydrogen, alkyl of 1–5 carbon atoms, or R^1 and R^2 may be combined together to form cycloalkylidene of 3–5 carbon atoms, or a pharmacologically acceptable salt thereof.

4,785,091

PROCESS FOR PRODUCING COPPER PHTHALOCYANINE PIGMENT

Taira Fujita; Toshiaki Kishimoto, and Hiroshi Okayasu, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 20, 1987, Ser. No. 110,528

Claims priority, application Japan, Oct. 31, 1986, 61-260991; Jan. 30, 1987, 62-21224; Feb. 24, 1987, 62-42221; Apr. 1, 1987, 62-81949; Jun. 8, 1987, 62-142964; Jun. 23, 1987, 62-157328; Jun. 25, 1987, 62-159175; Jun. 30, 1987, 62-164805; Jul. 1, 1987, 62-166030

Int. Cl.⁴ C09B *47/06*

U.S. Cl. 540—144 **8 Claims**

1. A process for producing copper phthalocyanine pigment, which comprises:

conducting the reaction of (a) phthalic anhydride or derivatives thereof, (b) urea and (c) copper or compounds thereof in a hydrophilic solvent in the presence of catalysts and at least one compound selected from the group consisting of:

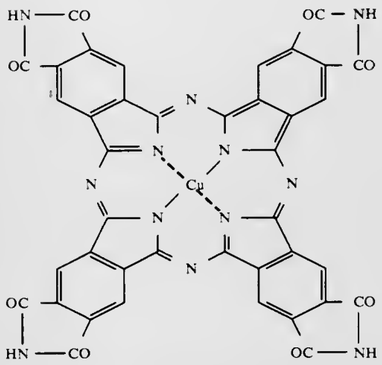
(1) aliphatic tetracarboxylic acids or an anhydride thereof,

(2) benzophenone-3,3′,4,4′-tetracarboxylic acid or an anydride thereof,

(3) pyromellitic acid or an anhydride thereof,

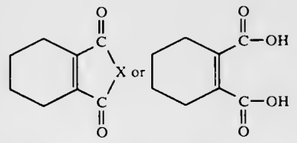
(4) copper phthalocyanine sulfonic acid,

(5) a compound represented by the formula (I):



(I)

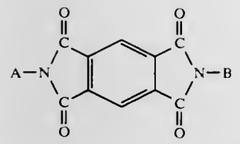
(6) a compound represented by the formula (II):



(II)

wherein X represents O, >NH, $>NCH_2OH$, >N—R in which R represents an alkyl group, allyl group or aralkyl group or a group NCH_2Y in which Y represents a phenyl group or derivatives thereof, a naphthalene ring or derivatives thereof or a phthalocyanine ring or derivatives thereof,

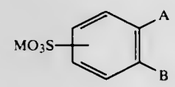
(7) a compound represented by the formula (III):



(III)

wherein A and B, which may be the same or different with each other, each represents a hydrogen atom, an alkyl group, hydroxyalkyl group, alkoxyalkyl group, cycloalkyl group, allyl group, aralkyl group or a group $-CH_2Y$ in which Y represents a phenyl group or derivatives thereof, a naphthalene ring or a derivatives thereof or a phthalocyanine ring or derivatives thereof,

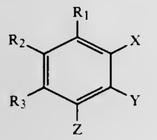
(8) a compound represented by the formula (IV):



(IV)

wherein M represents a hydrogen or an alkali metal, A and B, which may be same or different with each other, each represents a carboxyl group or a group derived from a carboxyl group and further, A and B may combine together to form an imide or an acid anhydride, and

(9) a compound represented by the formula (V):



(V)

wherein R_1–R_3 each represents a hydrogen atom, a carboxyl group or a group derived from a carboxyl group and, R_1–R_2 or R_2–R_3 may combine together to form an imide or an acid anhydride ring, X, Y and Z, which may be the same or different from each other wherein each represents a carboxyl group, a group derived from the carboxyl group or a nitrile group, and further X-Y or Y-Z may combine together to form an imide or an acid anhydride.

4,785,092

ALUMINUM BRAZING MATERIAL FOR USE IN ALUMINUM HEAT EXCHANGER

Keizo Nanba; Michiki Hagiwara, botb of Nagoya; Shosuke Iwasaki, Kobe, and Tetsuo Abiko, Osaka, all of Japan, assignors to Sumitomo Light Metal Industrial, Ltd., Tokyo and Sumitomo Precision Products Co., Ltd., Amagasaki, both of, Japan

Filed Mar. 15, 1985, Ser. No. 713,072

Claims priority, application Japan, May 25, 1984, 59-104456

Int. Cl.⁴ C22C *21/10*

U.S. Cl. 420—540 **4 Claims**

3. An aluminum brazing material used for assembling an

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aluminum heat exchanger by brazing, said aluminum brazing material consisting essentially of 4.5 to 10% of Si, from 0.03%



to 0.07% of Sr, from 9.3 to 10.7% of Zn and the balance essentially aluminum.

4,785,093

BICYCLIC COMPOUNDS

Cedric H. Hassall, Harpenden; Geoffrey Lawton, Hitchin, and Sally Redshaw, Stevenage, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 764,372, Aug. 12, 1985, Pat. No. 4,692,438. This application May 11, 1987, Ser. No. 48,172

Claims priority, application United Kingdom, Aug. 24, 1984, 8421493; May 29, 1985, 8513541

Int. Cl.[4] C07D *245/00, 487/06, 236/02;* **A61K** *31/50*

U.S. Cl. 540—460 **4 Claims**

1. A compound of the formula

II

wherein R^2 is hydrogen or alkyl having 1 to 8 carbon atoms; R^3 is hydrogen or phenyl which may be substituted with one or more substituents selected from halogen, alkyl having 1 to 8 carbon atoms, alkoxy having 1 to 8 carbon atoms or trifluromethyl; and Y is $—CH_2—$, $—CH_2CH_2—$ or $—N(R^6)—$ in which R^6 is hydrogen, alkyl having 1 to 8 carbon atoms or benzyl, 2-phenylethyl, 3-phenylpropyl, 4-chlorobenzyl or 4-methoxy-benzyl.

4,785,094

CRYSTALLIZATION OF BETA HMX

Michael L. Levinthal, Marshall, Tex., assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Sep. 26, 1986, Ser. No. 912,437

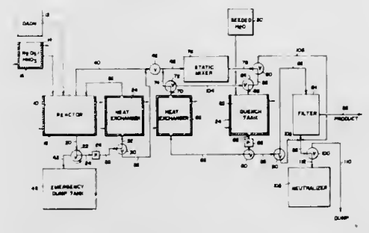
Int. Cl.[4] C07D *257/02*

U.S. Cl. 540—475 **7 Claims**

1. A method for selectively producing crystalline beta HMX, comprising the steps of:

A. providing an unsaturated solution of HMX in a solvent consisting essentially of nitric acid;

B. providing a dispersion of beta HMX seed crystals in a nonosolvent consisting essentially of water; and



C. adding said solution of HMX to said dispersion, thereby precipitating beta HMX selectively from said solution of HMX.

4,785,095

N-SUBSTITUTED THIO ALKYL PHENOTHIAZINES

Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Sep. 16, 1986, Ser. No. 908,077

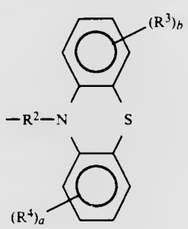
Int. Cl.[4] C07D *279/22*

U.S. Cl. 544—38 **11 Claims**

1. A composition of the formula:

I

wherein R^1 is selected from the group consisting of a higher alkyl of 4 or more carbon atoms, or an alkenyl, aryl, alkaryl, aralkyl, and



IV

R^2 is alkylene, alkenylene, or aralkylene; R^3 and R^4 are independently alkyl, alkenyl, aryl, alkaryl, aralkyl, halogen, hydroxyl, alkoxy, alkylthio, arylthio, or fused aromatic rings; and a and b are independently 0 or greater.

4,785,096

PROCESS FOR THE PREPARATION OF 1,4-DIAMINO-2,3-DICYANOANTHRAQUINONES

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

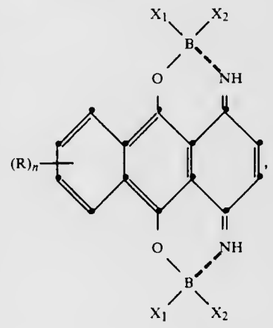
Division of Ser. No. 26,084, Mar. 16, 1987, Pat. No. 4,738,800. This application Jan. 19, 1988, Ser. No. 145,024

Claims priority, application Switzerland, Mar. 26, 1986, 1206/86

Int. Cl.[4] C07C *97/24;* **C07D** *223/26*

U.S. Cl. 544—69 **5 Claims**

1. A compound of formula



wherein X_1 and X_2 are halogen, R is alkyl, alkoxy, $—CO_2$alkyl, —CONHalkyl, $—SO_3M$ or $—CO_2M$, wherein M is hydrogen, ammonium or an alkali metal atom, nitro, cyano or halogen, and n is 0, 1 or 2.

4,785,097

METHOD FOR SYNTHESIZING SPIRO-OXAZINES

Won S. Kwak, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 26, 1986, Ser. No. 912,717

Int. Cl.[4] C07D *498/10, 498/20*

U.S. Cl. 544—71 **20 Claims**

1. A process of synthesizing a spiro-type compound comprising mixing an unsubstituted or substituted first compound selected from the group consisting of 2-methyleneindoline, 2-methylenebenzothiazoline, 2-methylenebenzoxazoline, or a halide salt thereof and a metal chelate of either an ortho-hydroxynitrosoaromatic compound or a substituted ortho-hydroxynitrosoaromatic compound, the aromatic compound selected from the group consisting of benzene, naphthalene, coumarin, quinoline, isoquinoline benzofuran, benzoxazine, isocoumarin, benzopyran, pyridine or chromone, in a solvent at temperatures sufficient to cause reaction of the first compound and the metal chelate.

4,785,098

WATER-SOLUBLE TRIPHENDIOXAZINE COMPOUNDS

Hermann Fuchs; Hartmut Springer, both of Königstein, and Günther Schwaiger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

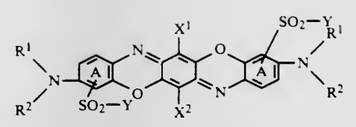
Filed Jul. 18, 1985, Ser. No. 756,770

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426727

Int. Cl.[4] C09B *19/00*

U.S. Cl. 544—76 **20 Claims**

1. A triphendioxazine compound corresponding to the formula



(1)

in which

R^1 is hydrogen; the R^2 terms may have an identical or a different meaning from one another and

each R^2 is alkyl of 1 to 6 C-atoms substituted by halogen, carbalkoxy of 2 to 5 C-atoms or alkanoylamino of 2 to 5 C-atoms;

the two benzne nuclei A have no additional substituents or are additionally substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 6 C-atoms, alkoxy of 1 to 5 C-atoms, halogen, carboxy and sulfo,

it being possible for the substituents in the two benzene nuclei A to be identical to one another or different from one another;

X^1 is hydrogen, halogen, cycloalkyl, aralkyloxy, alkoxy of 1 to 4 C-atoms, aryloxy, alkyl alkyl of 1 to 4 C-atoms, aryl, araylkyl, cyano, carboxy, carbalkoxy of 2 to 5 C-atoms, N-alkylcarbamoyl, N,N-dialkylcarbamoyl with alkyls of 1 to 4 C-atoms, N-arylcarbamoyl, alkanoylamino of 2 to 5 C-atoms or aroylamino, the aryl radicals in these substitutents being phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of halogen, nitro, alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, carboxy and sulfo;

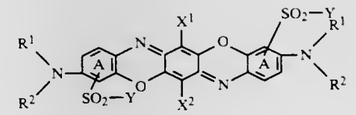
X^2 is identical to X^1 or different from X^1 and has one of the meanings given for X^1;

the groups $—SO_2—Y$ can have different meanings to one another or the same meaning;

Y is vinyl, or is ethyl substituted in the β-position by a substituent which can be eliminated by an alkali;

the molecule (1) necessarily contains at least one sulfo or sulfato of the sulfo and sulfato groups which the molecule (1) may contain.

2. A triphendioxanzine compound corresponding to the formula



(1)

in which

R^1 is hydrogen; the R^2 terms have an identical or different meaning from one another

and each R^2 is alkyl of 1 to 6 C-atoms substituted by phenyl which is unsubstituted or substituted by 1, 2 or 3 substituents selected from the group consisting of alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, halogen, nitro, sulfo, carboxy, alkanoylamino of 2 to 5 C-atoms, benzoylamino, sulfobenzoylamino and carbalkoxy of 2 to 5 C-atoms, and mandatorily by a group of the formula $—SO_2—Y'$ in which Y' is vinyl or is ethyl subbstituted in the β-position by a substituent which can be eliminated by an alkali, or

R^2 is phenyl unsubstituted or substituted by 1, 2 or 3 substituents selected from the group consisting of sulfo, carboxy, halogen, alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, nitro, alkylamino of 1 to 4 C-atoms, dialkylamino with each alkyl of 1 to 4 C-atoms, alkanoylamino of 2 to 5 C-atoms and benzoylamino, and substituted mandatorily by a group of the formula $—SO_2—Y'$ in which Y, is defined as above, or is naphthyl unsubstituted or substituted by 1, 2 or 3 sulfo and substituted by a group of the formula $—SO_2—Y$,;

the two benzene nuclei A have no additional substituents or

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are additionally substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 6 C-atoms, alkoxy of 1 to 5 C-atoms, halogen, carboxy and sulfo,

it being possible for the substituents in the two benzene nuclei A to be identical to one another or different from one another;

X^1 is hydrogen, halogen, cycloalkyl, aralkyloxy, alkoxy of 1 to 4 C-atoms, aryloxy, alkyl of 1 to 4 C-atoms, aryl, aralkyl, cyano, carboxy, carbalkoxy of 2 to 5 C-atoms, N-alkylcarbamoyl, N,N-dialkylcarbamoyl with alkyls of 1 to 4 C-atoms, N-arylcarbamoyl, alkanoylamino of 2 to 5 C-atoms or aroylamino, the aryl radicals in these substituents being phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of halogen, nitro, alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, carboxy and sulfo;

X^2 is identical to X^1 or different from X^1 and has one of the meanings given for X^1;

the groups $-SO_2-Y$ can have different meanings to one another or the same meaning;

Y is vinyl, or is ethyl substituted in the β-position by a substituent which can be eliminated by an alkali;

the molecule (1) necessarily contains at least one sulfo or sulfato of the sulfo and sulfato groups which the molecule (1) may contain.

4,785,099

WATER-SOLUBLE TRIPHENDIOXAZINE COMPOUNDS

Hartmut Springer, Königstein; Günther Schwaiger, Frankfurt am Main, and Walter Helmling, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

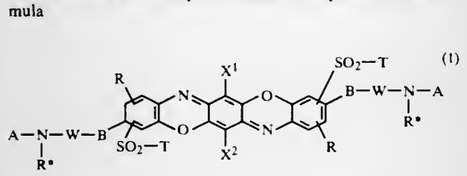
Filed Dec. 17, 1986, Ser. No. 943,643

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3544982

Int. Cl.[4] C07D *265/38;* **C09B** *19/02*

U.S. Cl. 544—76 **6 Claims**

1. A water-soluble triphendioxazine compound of the formula



(1)

in which:

T is alkyl of 1 to 6 C-atoms unsubstituted by 1 or 2 substitutuents selected from the group consisting of chlorine, alkoxy of 1 to 4 C-atoms, alkanoylamino of 2 to 5 C-atoms, cyano, sulfato, phosphato, acetyloxy, sulfo, carboxy, phenyl and naphthyl, the phenyl and naphthyl each being unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, halogen, sulfo, carboxy, sulfamoyl, carboamoyl, carboamoyl mono- or disubstituted by substituents selected from the group consisting of phenyl, alkyl of 1 to 4 C-atoms, phenylakyl with alkyl of 1 to 4 C-atoms and cycloalkyl of 5 to 8 C-atoms, sulfamoyl mono- or disubstituted by substituents selected from the group consisting of phenyl, alkyl of 1 to 4 C-atoms, phenylalkyl with alkyl of 1 to 4 C-atoms and cycloalkyl of 5 to 8 C-atoms, trifluoromethyl, alkanoylamino of 2 to 5 C-atoms, nitro, amino and amino mono- or disubstituted by substituents selected from the group consisting of alkyl of 1 to 6 C-atoms, phenyl, naphthyl and cycloalkyl of 5 to 8 C-atoms, and the alkyl group T is interrupted or is not interrupted by hetero groups selected from groups consisting of —O—, —S—, —NH—and —N(R')—in which R' is alkyl of 1 to 6 C-atoms unsubstituted or substituted by one or two substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 C-atoms, alkanoylamino of 2 to 5 C-atoms, cyano, sulfato, phosphato, acetyloxy, sulfo, carboxy, phenyl and naphthyl,

with the proviso that T, as a substituted alkyl, is not an ethyl group which is substituted in the β-position by a substituent which is eliminated by an alkali, or

T is phenyl or naphthyl, or phenyl or naphthyl each substituted by substituents selected from the group consisting of alkyl or 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carboamoyl mono- or disubstituted by substituents selected from the group consisting of phenyl, alkyl of 1 to 4 C-atoms, phenylalkyl with alkyl of 1 to 4 C-atoms and cycloalkyl of 5 to 8 C-atoms, sulfamoyl mono- or disubstituted by substituents selected from the group consisting of phenyl, alkyl of 1 to 4 C-atoms, phenylalkyl with alkyl of 1 to 4 C-atoms and cycloalkyl of 5 to 8 C-atoms, trifluoromethyl, alkanoylamino of 2 to 5 C-atoms, nitro, amino and amino mono- or disubstituted by substituents selected from the group consisting of alkyl of 1 to 6 C-atoms, phenyl, naphthyl nad cycloalkyl of 5 to 8 C-atoms;

B is oxygen or sulfur or a group of the formula —NH— or —N(R")— in which R" is alkyl of 1 to 6 C-atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 C-atoms, alkanoylamino of 2 to 5 C-atoms, cyano, sulfato, phosphato, acetyloxy, sulfo, carboxy, aryl unsubstituted or substituted by carboxy or sulfo, and cycloalkyl of 5 to 8 C-atoms, or

B forms together with W a direct covalent bond;

W forms together with B a direct covalent bond or

W is phenylene or naphthylene, or phenylene or naphthylene substituted by substituents selected from the group consisting of alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, halogen, sulfo, carboxy, sulfamoyl, carboamoyl, carbamoyl mono- or disubstituted by substitutents selected from phenyl, alkyl of 1 to 4 C-atoms, phenylakyl having an alkyl of 1 to 4 C-atoms and cycloalkyl of 5 to 8 C-atoms, sulfamoyl mono- or disubsitituted by phenyl, alkyl of 1 to 4 C-atoms, phenylakyl having an alkyl of 1 to 4 C-atoms and cycloakyl of 5 to 8 C-atoms, trifluoromethyl, alkanoylamino of 2 to 5 C-atoms and nitro;

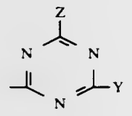
R is hydrogen or alkyl of 1 to 4 C-atoms or alkoxy of 1 to 4 C-atoms or halogen;

R^* is hydrogen or alkyl of 1 to 4 C-atoms unsubstituted or substituted by 1 or 2 substitutents selected from the group consisting of chlorine, alkoxy of 1 to 4 C-atoms, alkanoylamino of 2 to 5 C-atoms, cyano, sulfato, phosphato, acetyloxy, sulfo, carboxy, aryl unsubstituted or substituted by carboxy or sulfo, and cycloalkyl of 5 to 8 C-atoms, or is cycloalkyl of 5 to 8 C-atoms, or

R^* and R^o form together with both nitrogen atoms and with W or a part of W a 5- or 6-membered saturated heterocyclic ring;

A is a non-heterocyclic fiber-reactive group selected from β-chloropropionyl, 3-(β-chloroethylsulfonyl)-benzoyl and 2-fluoro-2-chloro-3,3-difluoro-cyclobutane-1-carbonyl, or

A is a group of the general formula



(2)

in which

Z is chlorine and

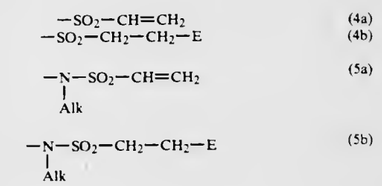
Y is an amino group of the formula



(3a)

in which

R^1 is hydrogen or alkyl or 1 to 4 C-atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of: alkoxy of 1 to 4 C-atoms; chlorine; cyano; carboxy; sulfo; sulfato; phosphato; hydroxy; phenyl unsubstituted or substituted by 1, 2 or 3 substitutents selected from the set of groups consisting of 3 alkyl groups of 1 to 4 C-atoms, 2 alkoxy groups of 1 to 4 C-atoms, 1 bromine atom, 2 chlorine atoms, 2 sulfo groups and 1 carboxy group; naphthyl unsubstituted or substituted by 1, 2 or 3 sulfo groups; and 1 group of the formula (4a), (4b), (5a) or (5b)



(4a)
(4b)
(5a)
(5b)

in which

E is a substituent which is eliminated by means of an alkali, and

Alk is hydrogen or alkyl of 1 to 4 C-atoms,

or R^1 is cycloalkyl of 5 to 8 C-atoms, and

R^2 is hydrogen or alkyl of 1 to 4 C-atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of: alkoxy of 1 to 4 C-atoms; chlorine; cyano; carboxy; sulfo; sulfato; phosphato; hydroxy; phenyl unsubstituted or substituted by 1, 2 or 3 substitutents selected from the set of groups consisting of 3 alkyl groups of 1 to 4 C-atoms, 2 alkoxy groups of 1 to 4 C-atoms, 1 bromine atom, 2 chlorine atoms, 2 sulfo groups and 1 carboxy group; naphthyl unsubstituted or substituted by 1, 2 or 3 sulfo groups; and 1 group of the formula (4a), (4b), (5a) or (5b) defined above, or

R^2 is cycloalkyl of 5 to 8 C-atoms, or is phenyl unsubstituted or substituted by 1 , 2 or 3 substituents selected from the set consisting of 3 alkyl groups of 1 to 4 C-atoms, 2 alkoxy groups of 1 to 4 C-atoms, 1 bromine atom, 2 chlorine atoms, 2 sulfo groups, 1 carboxy group and 1 group of the formula (4a), (4b), (5a) or (5b) mentioned and defined above, or is naphthyl unsubstituted or substituted by 1, 2 or 3 substituents selected from the set consisting of 2 sulfo groupos and 1 groups and 1 group fo the formula (4a), (4b), (5a) or (5b) mentioned and defined above,

at least one of those substituents in R^1 and R^2 is mandatorily a group of the above-mentioned formulae (4a), (4b), (5a) and (5b),

or R^1 and R^2 form together with the N-atom the group piperidino, morpholino or piperazino;

X^1 is hydrogen, halogen, cycloalkyl of 5 to 8 C-atoms, aralkoxy, alkoxy of 1 to 4 C-atoms, aryloxy, alkyl of 1 to 4 C-atoms, aryl, aralkyl, cyano, carboxy, carbalkoxy of 2 to 5 C-atoms, arylamino, carboamoyl, N-alkyl-carbamoyl with alkyl of 1 to 4 C-atoms, N,N-dialkyl-carboamoyl with alkyl each of 1 to 4 C-atoms, N-aryl-carbamoyl, alkanoylamino of 2 to 5 C-atoms or arylamino, the mentioned aryls in the mentioned groups being unsubstituted or substittued by 1 or 2 substituents selected from the group consisting of halogen, nitro, alkyl of 1 to 4 C-atoms, alkoxy of 1 to 4 C-atoms, carboxy and sulfo;

X^2 is identical to or different from X^1 and has one of the meanings indicated for X^1;

at least one of the groups selected from sulfo and sulfato, which may be present according to the above definitions, is mandatorily present in the triphenodioxazine compound.

4,785,100

PROCESS FOR THE PRODUCTION OF N-SUBSTITUTED MORPHOLINE AND PIPERIDINE DERIVATIVES

Manfred Kaufhold, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellshaft, Marl, Fed. Rep. of Germany

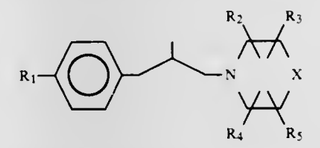
Filed Oct. 1, 1987, Ser. No. 103,329

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1986, 3633520

Int. Cl.[4] C07D *265/30, 295/02, 211/14*

U.S. Cl. 544—178 **15 Claims**

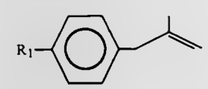
1. A process for the production of N-substituted morpholines and piperidines of the formula



I

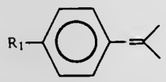
comprising the steps of

(a) reacting a methallylbenzene of the formula



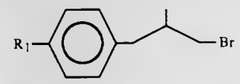
II

wherein R_1 is **H** or a straight or branched chained C_1–C_4 alkyl group, alone or in admixture with a corresponding isobutenylbenzene of the formula



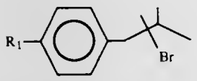
III

wherein R_1 is as defined above, with hydrogen bromide in the presence of a peroxide to yield, respectively, the corresponding bromine compound of the formula



IV

wherein R_1 is as defined above, alone or in admixture with a bromine compound of the formula



V

wherein R_1 is as defined above and wherein the bromine atom is on the secondary or tertiary carbon atom thereof, and

(b) reacting the resultant bromine compound of formula IV, alone or in admixture with the corresponding bromine

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compound of Formula V, with a morpholine or piperidine compound of the formula



VI

wherein R_2, R_3, R_4 and R_5 are each independently hydrogen, methyl or ethyl and X is as defined above.

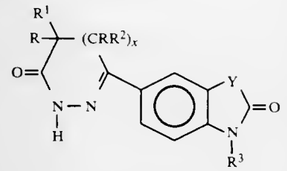
4,785,101

BENZODIAZINONE-HYDROXYPYRAZOLYL COMPOUNDS, CARDIOTONIC COMPOSITIONS INCLUDING THE SAME AND THEIR USES

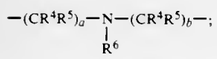
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale; William L. Studt, Harleysville; William C. Faith, Ambler, and Bruce F. Molino, Lansdale, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 800,986, Nov. 22, 1985, Pat. No. 4,725,686.
This application Jun. 17, 1987, Ser. No. 63,481
Int. Cl.[4] C07D *403/04*
U.S. Cl. 544—284 **18 Claims**

1. A compound of the formula



wherein:
x is 0;
Y is



a and b are 0, 1 or 2, provided that a+b is not greater than 2;
R^1, R^3, R^4 and R^6 are each independently H, alkyl having about one to about six carbon atoms phenyl lower alkyl or substituted phenyl lower alkyl;
R and R^5 are H or alkyl having about one to about six carbon atoms; and
geminal R^4 and R^5 groups may together form a spiro substituent, $-(CH_2)_d-$, where d is 2 to 5;
wherein substituted phenyl means a phenyl group substituted by one or more of lower alkyl, lower alkoxy, amino, lower alkyl amino, lower alkyl mercapto, hydroxy, hydroxy lower alkyl, acetoxy, benzyloxy, phenoxy, lower alkyl sulfinyl or lower alkyl sulfonyl;
or a pharmaceutically acceptable salt thereof.

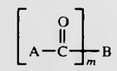
4,785,102

PHOTOLYTICALLY CLEAVABLE, N-ACYLATED STERICALLY HINDERED AMINES

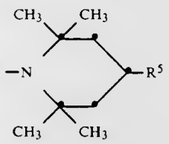
Godwin Berner, Binningen, and Mario Slongo, Tafers, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 21, 1986, Ser. No. 899,133
Claims priority, application Switzerland, Aug. 27, 1985, 3668/85
Int. Cl.[4] C07D *471/10*
U.S. Cl. 546—20 **5 Claims**

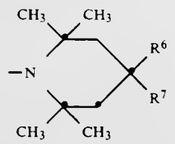
1. A compound of formula I



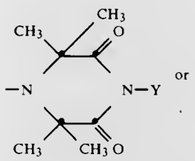
wherein
m is 1, 2 or 3,
A is a R^1—CO— or R^2—CH_2— group, wherein
R^1 is phenyl or phenyl which is substituted by halogen, C_1-C_{12}alkyl, C_1-C_4alkoxy or hydroxy, or is naphthyl, C_1-C_{12}alkoxy, cyclohexyloxy, phenoxy or benzyloxy and, if m=1, may also be a radical B,
R^2 is —CN, $-P(O)(OR^3)_2$, CH_3CO— or OR^4, wherein
R^3 is C_1-C_4alkyl or phenyl, and
R^4 is phenyl or phenyl which is substituted by halogen or C_1-C_4alkyl, and
when m is 1,
B is a radical corresponding to the formulae



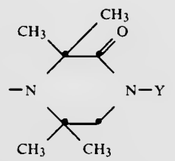
(II)



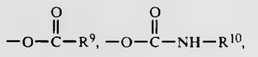
(III)



or

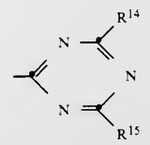


wherein
R^5 is hydrogen, $-OR^8$,

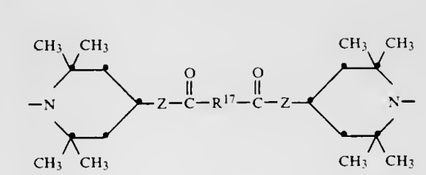


$-N(R^{10}R^{11})$,
R^6 is —OH or $-OR^{12}$ and R^7 is $-OR^{12}$, —CN, $-COOR^{13}$ or $-CONH_2$, or R^6 and R^7 together are the oxo radical (=O), or R^6 and R^7, together with the C-atom to which they are attached, form an unsubstituted 2-spiro-1,3-dioxolane, 2-spiro-1,3-dioxane, 5-spiro-1,3-oxazolidine, 2-spiro-1,3-oxazolidine or 5-spiro-1,3-imidazolidine ring or said ring substituted by one or more identical or different members selected from C_1-C_{12}alkyl or the oxo radical,
R^8 is C_1-C_{12}alkyl, benzyl, allyl or 2-cyanoethyl,
R^9 is C_1-C_{18}alkyl, C_2-C_{12}alkenyl, C_5-C_8cycloalkyl, phenyl or phenyl which is substituted by halogen, C_1-C_{12}alkyl, C_1-C_4alkoxy or hydroxyl, or is C_7-C_{12}phenylalkyl, C_1-C_4alkoxy or phenoxy,
R^{10} is C_1-C_{12}alkyl, cyclohexyl, phenyl, naphthyl, or phenyl which is substituted by C_1-C_4alkyl,

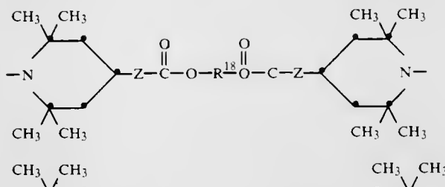
R^{11} is C_2-C_{12}alkanoyl, C_3-C_8alkenoyl, benzoyl or a group of the formula

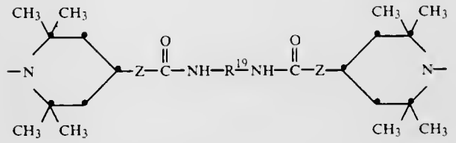


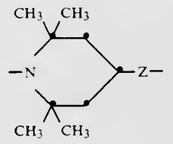
wherein
R^{14} and R^{15} are each independently of the other C_1-C_8alkoxy, phenoxy, or a group $-N(R^{10})(R^{16})$, in which R^{16} is hydrogen or C_1-C_{12}alkyl,
R^{12} is C_1-C_{12}alkyl and R^{13} is C_1-C_4alkyl, and
Y is hydrogen, C_1-C_{12}alkyl, allyl or benzyl;
when m is 2,
B is a divalent radical corresponding to the formulae

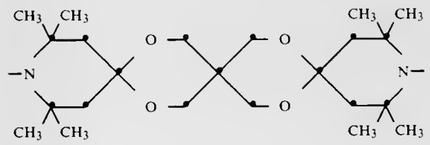


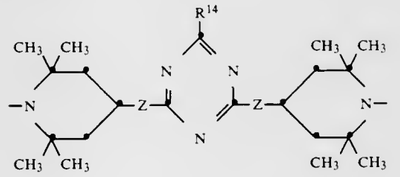
(IV)



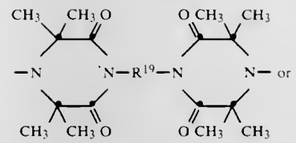


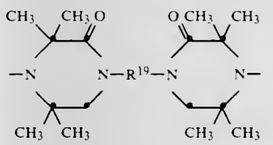




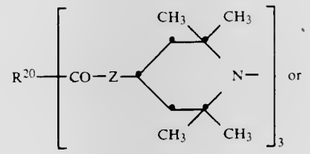


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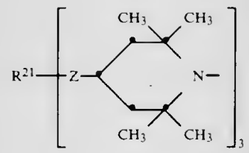




wherein
Z is —O—, —NH— or $-NR^{10}$—,
R^{17} is methylene, 1,2-ethylene, C_3-C_{20}polymethylene, or branched C_3-C_{20}alkylene, C_2-C_{10}alkenylene, 1,4-cyclohexylene, 1,3-cyclohexylene, cyclohexane-1,4-dimethylene, 1,3- or 1,4-phenylene, 1,4- or 1,5-naphthylene, 4,4'-diphenylene, diphenylmethane-4,4'-diyl, diphenyl oxide-4,4'-diyl or m- or p-xylene, or a radical —NH—R^{19}—NH—,
R^{18} is 1,2-ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,4-butylene, hexamethylene, 1,4-cyclohexylene or cyclohexane-1,4-dimethylene,
R^{19} is 1,2-ethylene, trimethylene, tetramethylene, hexamethylene, octamethylene, dodecamethylene, 2,2-dimethyltrimethylene, trimethyloctamethylene, 1,4-cyclohexylene, cyclohexane-1,4-dimethylene, 1,3-phenylene, 4,4'-diphenylene, diphenylmethane-4,4'-diyl, diphenyl oxide-4,4'-diyl, or m- or p-xylylene, and
R^{10} and R^{14} are as defined above;
and, when m is 3,
B is a trivalent radical corresponding to the formulae



or



wherein
R^{20} is propane-1,2-3-triyl, butane-1,2,4-triyl, benzene-1,3,5-triyl, benzene-1,2,4-triyl or naphthalene-1,4,5-triyl, R^{21} is a 1,3,5-triazin-2,4,6-triyl radical and Z is as defined above.

VOL 1096 ISS 3 NO 15 1988 UMI

4,785,103

2-OXA- OR -AZA-PREGNANE COMPOUNDS

Kenyu Shibata, Inagi; Nobuaki Yamakoshi, Kawasaki; Naoyuki Koizumi, Kawasaki; Shigehiro Takegawa, Kawasaki; Eiichiro Shimazawa, Sagamihara, and Mamoru Mieda, Ebina, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

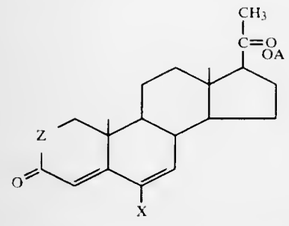
Filed Feb. 27, 1986, Ser. No. 833,715

Claims priority, application Japan, Mar. 7, 1985, 60-43731; Mar. 7, 1985, 60-43732

Int. Cl.[4] A61K *31/58, 31/585;* **C07J** *73/00*

U.S. Cl. 546—78 **5 Claims**

1. A compound of the following formula



(I)

wherein A is a hydrogen atom or a lower alkanoyl group of 2 to 6 carbon atoms, Z is an oxygen atom or the group



in which R is a hydrogen atom or an alkyl group of up to 6 carbon atoms, and X is a halogen atom.

4,785,104

3-(HYDROXYMETHYL)-ISOQUINOLINE DERIVATIVES

György Rabloczky; Jenö Körösi; Tibor Láng; István Ling; Tamás Hámori; Mária Kuhár née Kürthy; István Elekes; Péter Botka; András Varró ; Sándor Elek; Judit Sárossy née Kincsessy; Gábor Zólyomi; Zsuzsanna Láng née Rihmer, and Imre Moravcsik, all of Budapest, Hungary, assignors to EGIS Gyogyszergyar, Budapest, Hungary

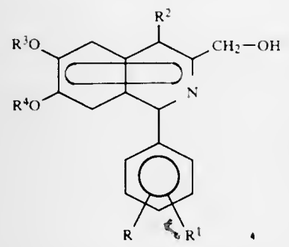
Filed May 20, 1987, Ser. No. 51,767

Claims priority, application Hungary, May 21, 1986, 2141/86

Int. Cl.[4] C07D *217/16*

U.S. Cl. 546—144 **2 Claims**

1. New 3-(hydroxymethyl)-isoquinoline derivatives of the general formula (I),



(I)

wherein

R and R^1 are identical or different and stand for a hydrogen or halogen atom, a nitro or a C_{1-4} alkoxy group,

R^2 stands for a hydrogen atom or a C_{1-4} alkyl group,

R^3 and R^4 are identical or different and stand for a hydrogen atom or a C_{1-4} alkyl group, or combined denote a methylene group,

with the proviso that if R stands for 3-methoxy, R^1 for 4-methoxy, R^3 and R^4 are identical and represent methyl or ethyl groups, R^2 is other than hydrogen atom, and pharmaceutically acceptable acid addition salts thereof.

4,785,105

8-HYDROXY ETHER QUINOLINE DERIVATIVES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

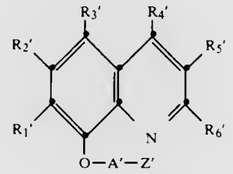
Division of Ser. No. 465,740, Feb. 11, 1983, Pat. No. 4,623,727. This application Sep. 29, 1986, Ser. No. 912,858

Claims priority, application Switzerland, Feb. 17, 1982, 980/82

Int. Cl.[4] C07D *215/28, 401/12, 405/12, 409/12*

U.S. Cl. 546—178 **7 Claims**

1. A compound of the formula



wherein

R_1', R_2' and R_3' independently of one another are each hydrogen, halogen, C_1-C_3alkyl, C_1-C_3alkoxy, nitro or cyano,

R_4', R_5' and R_6' independently of one another are each hydrogen, halogen or C_1-C_3alkyl,

A' is any one of the groups $—CH_2—$, $—CH_2CH_2—$ or $—CH(CH_3)—$, and

Z' is the group



wherein E is R_7 which is C_1-C_7alkyl which is unsubstituted or substituted by halogen or C_1-C_4alkoxy, or R_7 is C_3-C_6-cycloalkyl, C_2-C_4alkenyl, phenyl which is unsubstituted or substituted by halogen, nitro or C_1-C_3alkyl, or R_7 is benzyl which is unsubstituted or substituted by halogen, nitro or C_1-C_3alkyl, or R_7 is a 5-membered heterocyclic ring which contains one or two hetero atoms from the group N, O and S and which is unsubstituted or substituted by halogen,

including the agriculturally-acceptable acid addition salts and metal complexes thereof.

4,785,106

8-HYDROXY ETHER QUINOLINE DERIVATIVES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

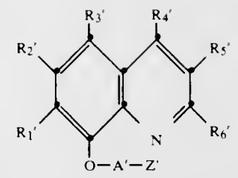
Division of Ser. No. 465,740, Feb. 11, 1983, Pat. No. 4,623,727. This application Sep. 29, 1986, Ser. No. 912,857

Claims priority, application Switzerland, Feb. 27, 1982, 980/82

Int. Cl.[4] C07D *215/28*

U.S. Cl. 546—178 **9 Claims**

1. A compound of the formula



wherein

R_1', R_2' and R_3' independently of one another are each hydrogen, halogen, C_1-C_3alkyl, C_1-C_3alkoxy, nitro or cyano,

R_4', R_5' and R_6' independently of one another are each hydrogen, halogen or C_1-C_3alkyl,

A' is any one of the groups $—CH_2—$, $—CH_2CH_2—$ or $—CH(CH_3)—$, and

Z' is cyano

including agriculturally acceptable the acid addition salts and metal complexes thereof,

with the proviso that R_1', R_2', R_4', R_5' and R_6' are not simultaneously hydrogen when R_3' is hydrogen or chlorine and A' is $—CH_2—$ or $—CH(CH_3)—$.

4,785,107

3-TERT-BUTYL-4-HYDROXYPHENYLPROPIONIC ACID AMINO-ALKYLAMIDE DERIVATIVES

Reinhard Helwig, Ludwigshafen; Peter Neumann, Wiesloch; Herbert Bender, Boehl-Iggelheim; Alexander Aumueller, Ludwigshafen, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

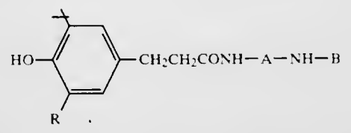
Filed Jun. 12, 1986, Ser. No. 873,706

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521558

Int. Cl.[4] C07C *121/78, 103/44;* **C07D** *213/73*

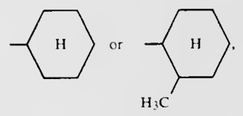
U.S. Cl. 546—244 **13 Claims**

1. A phenol derivative of the formula (I)

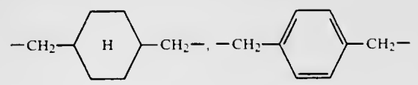


(I)

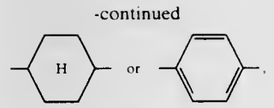
where R is CH_3, C_2H_5, n-C_3H_7, i-C_4H_9, t-C_4H_9, tert-amyl, i-C_6H_{13}, i-C_8H_{17},



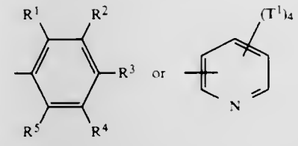
A is $—(CH_2)_2—$, $—(CH_2)_3—$, $—(CH_2)_6—$,



-continued



and B is a radical of the formula



where R^1, R^2, R^3, R^4, R^5 and T^1 independently of one another are each hydrogen, C_1-C_8-alkyl, halogen, CN, $COOT^2$ or $CONHT^2$, with the proviso that one or more of the radicals R^1, R^2, R^3, R^4, R^5 and T^1 are halogen, CN, $COOT^2$ or $CONHT^2$, and T^2 is C_1-C_8-alkyl.

4,785,108

SUBSTITUTED OXIME CARBAMATES

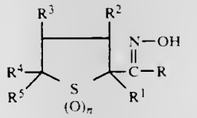
Richard J. Strunk, Cheshire, and Richard C. Moore, Wallingford, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Division of Ser. No. 616,994, Jun. 4, 1984, Pat. No. 4,640,927, which is a continuation-in-part of Ser. No. 595,156, Mar. 30, 1984, abandoned. This application Oct. 21, 1986, Ser. No. 921,938

Int. Cl.[4] C07D *239/72, 333/72*

U.S. Cl. 546—283 **3 Claims**

1. A compound having the structural formula:



where R is C_1-C_4 alkyl, cyclopropyl, C_2-C_4 alkoxyalkyl, C_2-C_4 alkylthioalkyl, C_2-C_4 alkylsulfinylalkyl, C_2-C_4 alkylsulfonylalkyl, C_4-C_8 dialkylaminoalkyl, phenyl, C_7-C_9 aralkyl, C_7-C_9 alkaryl, furyl, thienyl or pyridyl; R^1 is hydrogen or C_1-C_4 alkyl; R^2, R^3, R^4 and R^5 are the same or different and are hydrogen or C_1-C_4 alkyl; and n is 0, 1 or 2.

4,785,109

CERTAIN SULFONYL CARBAMATES OR THIOCARBAMATE INTERMEDIATES

Willy Meyer, Riehen; Werner Föry, Basle, and Werner Töpfl, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

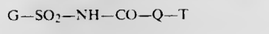
Division of Ser. No. 708,204, Mar. 4, 1985, Pat. No. 4,668,800, which is a division of Ser. No. 511,830, Jul. 8, 1983, Pat. No. 4,518,776. This application Jan. 30, 1987, Ser. No. 8,882

Claims priority, application Switzerland, Jul. 19, 1982, 4396/82

Int. Cl.[4] C07D *213/70, 213/69, 207/36, 307/64*

U.S. Cl. 546—293 **1 Claim**

1. A sulfonyl carbamate of the formula VIa



(VIa)

wherein

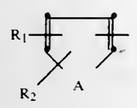
Q is oxygen or sulfur,

T is C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_3-cyanoalkyl,

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C_2-C_5-alkenyl, benzyl, or alkoxyalkyl or alkylthioalkyl having a total of at most 5 carbon atoms, and

G is a radical of the formula



wherein

A is oxygen, —NR_5— or —C=N—, where R_5 is hydrogen, C_1-C_4-alkyl or —CO—C_1-C_4-alkyl,

R_1 is hydrogen, C_1-C_4-alkyl, halogen, nitro, cyano, —NH_2, —$S(O)_n$—C_1-C_4-alkyl, —SO_2—C_1-C_4-alkoxy, —SO_2—di-C_1-C_4-alkylamino, —CHO, —$CONH_2$, —D—C_3-C_5-alkynyl, —CO—D—C_3-C_5-alkynyl, —D—C_1-C_4-alkyl, —D—C_3-C_4-alkenyl, —CO—C_1-C_4-alkyl, —CO—D—C_1-C_4-alkyl or —CO—D—C_3-C_5-alkenyl, n being one or two, and D being an oxygen, sulfur, —NH— or —N(C_1-C_4-alkyl)-bridge,

R_2 is hydrogen, halogen, CF_3, NO_2, C_1-C_4-alkyl or C_1-C_4-alkoxy,

R_3 is hydrogen, fluorine or chlorine, and

R_4 is halogen, C_1-C_4-alkyl, nitro, cyano, —NH_2, —$S(O)_n$—C_1-C_4-alkyl, —SO_2—C_1-C_4-alkoxy, —SO_2—di-C_1-C_4-alkylamino, —CHO, —$CONH_2$, —D—C_3-C_5-alkynyl, —CO—D—C_3-C_5-alkynyl, trifluoromethyl, or C_1-C_4-alkoxy substituted by cyano, halogen, C_1-C_4-alkoxy-or-C_1-C_4-alkylthio, or is —D—C_1-C_4-alkyl, —D—C_3-C_5-alkenyl, —CO—C_1-C_4-alkyl, 1,2-dichlorovinyloxy, —CO—D—C_1-C_4-alkyl or —CO—D—C_3-C_5-alkenyl, n being one or two, and D being an oxygen, sulfur, —NH— or —N(C_1-C_4-alkyl)-bridge.

4,785,110

PROCESS FOR THE PRODUCTION OF 2-AMINO-3-NITRO-6-(4-FLUOROBENZYLAMINO)-PYRIDINE

Winfried Orth, Hassloch; Jürgen Engel, Alzenau; Peter Emig, Niederdorfelden; Gerhard Scheffler, Hanau, and Hans Poble, Bielefeld, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 24, 1986, Ser. No. 843,253

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1985, 3510623

Int. Cl.[4] C07D *213/75*

U.S. Cl. 546—307 **7 Claims**

1. A process for the production of 2-amino-3-nitro-6-(4-fluoro-benzylamino)-pyridine wherein the materials employed consist essentially of: (a) 2-amino-3-nitro-6-methoxy-pyridine; (b) 4-fluoro-benzylamino; and (c) water at an elevated temperature.

4,785,111

N-CYCLOHEXYL-POLYCARBOXAMIDE COMPOUND AND DERIVATIVES THEREOF

Fumio Toda, Ehime, Japan, assignor to Mitsubishi Corporation, Tokyo, Japan

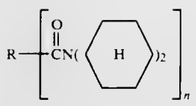
Filed Mar. 10, 1986, Ser. No. 837,199

Claims priority, application Japan, Mar. 9, 1985, 60-46999; May 27, 1985, 60-113553; May 27, 1985, 60-113554; Nov. 22, 1985, 60-262992

Int. Cl.[4] C07D *213/81, 213/82, 103/30, 103/37*

U.S. Cl. 546—316 **11 Claims**

1. A compound selected from the group consisting of N-cyclohexyl-polycarboxamide compounds of the formula



and derivatives thereof, where R is a benzene ring, an ethylidene group, a benzylidene group, a 1,2-cyclohexylene group, a 1,2-cyclohexenylene-4 group, or a 2,3-, 2,5- or 2,6-pyridinediyl group, and n is equal to 2, 3 or 4 when R is a benzene ring, and equal to 2 when R is one of the aforesaid groups excluding a benzene ring.

4,785,112

PROCESS FOR THE PRODUCTION OF 2,3,5,6-TETRACHLOROPYRIDINE AND 2,3,6-TRICHLOROPYRIDINE

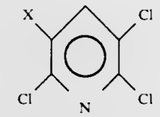
Michael A. DesJardin, San Ramon, and Todd E. Kindorf, Orinda, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 50,186, May 13, 1987, abandoned. This application Jan. 19, 1988, Ser. No. 145,799

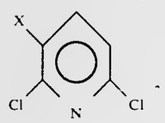
Int. Cl.[4] C07D *213/04*

U.S. Cl. 546—345 **9 Claims**

1. A process for selectively preparing a polychloropyridine of the formula



wherein X represents Cl or H which comprises contacting with chlorine in the vapor phase at about 300° C. to about 450° C. a less chlorinated polychloropyridine of the formula



wherein X represents Cl or H.

4,785,113

2,4-DICHLORO-3,5,6-TRIMETHYLPYRIDINE

Hans Junek; Martin Mittelbach; George Uray, and Hans-Werner Schmidt, all of Graz, Austria, assignors to Aktiebolaget Hassle, Sweden

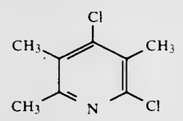
Filed Sep. 17, 1986, Ser. No. 908,355

Claims priority, application Sweden, Sep. 24, 1985, 8504409

Int. Cl.[4] C07D *211/72*

U.S. Cl. 546—345 **1 Claim**

1. A compound Compound selected from the group consisting of a compound compound having the formula



or the N-oxide thereof.

4,785,114

QUINOPHTHALONE DYES

Wolfgang Lotsch, Beindersheim; Peter Neumann, Wiesloch, and Heinrich Kowarsch, Oberderdingen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

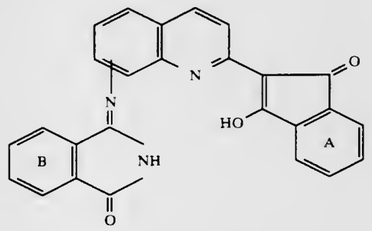
Filed Sep. 15, 1986, Ser. No. 907,221

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1985, 3533547; Sep. 20, 1985, 3533544

Int. Cl.[4] C07D *401/12*

U.S. Cl. 546—171 **3 Claims**

1. A quinophthalone dye of the formula



where the rings A and B are each substituted by 4 halogens selected from the group consisting of fluorine, chlorine and bromine.

4,785,115

BENZAZOLE SUBSTITUTED TEREPHTHALIC ACID MONOMERS

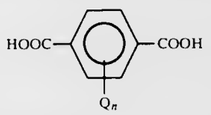
Tsu-Tzu Tsai, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the United States, Washington, D.C.

Filed Aug. 13, 1987, Ser. No. 84,784

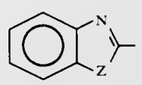
Int. Cl.[4] C07D *263/56, 277/66*

U.S. Cl. 548—180 **5 Claims**

1. A heterocyclic terephthalic acid of the formula



wherein n is 1 or 2 and Q is



wherein Z is —O—or —S—.

4,785,116

AMINOISOTHIAZOLE COMPOUNDS

Heinz Eilingsfeld, and Karl-Heinz Etzbach, both of Frankenthal, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

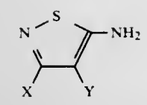
Filed Jan. 18, 1985, Ser. No. 692,524

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402024

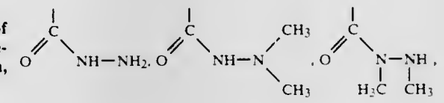
Int. Cl.[4] C07D *275/02, 275/06, 513/04*

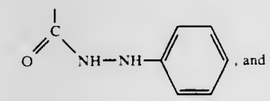
U.S. Cl. 548—212 **7 Claims**

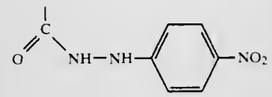
1. A compound of the formula:



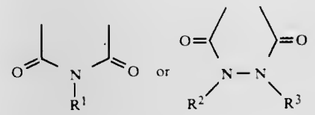
wherein X and Y independently are each a carboxyl group, a cyano group, a carboxylic ester group selected from the group consisting of C_1-C_{12}-alkoxycarbonyl, cyclohexyloxycarbonyl, allyloxycarbonyl, 2-(C_1-C_4-alkoxy)-ethoxycarbonyl, 3-(C_1-C_4-alkoxy)propoxycarbonyl, 2-phenoxyethoxycarbonyl, 3-phenoxypropoxycarbonyl, phenylmethoxycarbonyl, 2-phenylethoxycarbonyl, phenoxycarbonyl which is unsubstituted or substituted by chlorine, bromine, nitro or cyano; C_1-C_4-alkylphenoxycarbonyl, dimethylphenoxycarbonyl or a trimethylphenoxycarbonyl group; a carbamyl group which is unsubstituted or substituted and which is selected from the group consisting of C_1-C_{12}-alkylcarbamyl, cyclohexylcarbamyl, allylcarbamyl, 2-(C_1-C_4-alkoxy)-ethylcarbamyl, 3-(C_1-C_4-alkoxy)-propylcarbamyl, 2-phenoxyethylcarbamyl, 3-phenoxypropylcarbamyl, phenylmethylcarbamyl, 2-phenylethylcarbamyl, phenylcarbamyl which is unsubstituted or substituted by chlorine, bromine, nitro or cyano; C_1-C_4-alkyphenylcarbamyl, dimethylphenylcarbamyl, trimethylphenylcarbamyl, C_1-C_4-dialkylcarbamyl, methycyclohexylcarbamyl, and dicyclohexylcarbamyl; or a carboxylic hydrazide group selected from the group consisting of:







or X and Y together form a radical of the formula:



wherein R^1 is a group selected from the group consisting of hydrogen, C_1-C_{12}-alkyl, cyclohexyl, allyl, 2-(C_1-C_4-alkoxy)ethyl, 3-(C_1-C_4-alkoxy)-propyl, 2-phenoxyethyl, 3-phenoxypropyl, phenylmethyl, phenylethyl, phenyl which is unsubstituted or substituted by chlorine, bromine, cyano or nitro, C_1-C_4-alkylphenyl, dimethylphenyl or trimethylphenyl and R^2 and R^3 are independently hydrogen or C_1-C_{12}-alkyl, or one of R^2 and R^3 is phenyl which is unsubstituted or substituted by chlorine, bromine, cyano or nitro.

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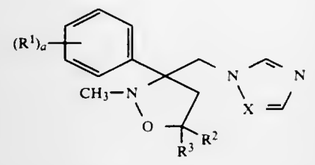
4,785,117

5,5-DISUBSTITUTED-3-PHENYL-3-PHENYL-3-[(1H-IMIDAZOL-1-YLMETHYL) OR (1H-1,2,4-TRIAZOL-1-YLMETHYL)]-2-METHYLISOXAZOLIDINE DERIVATIVES (IR 3012)

Vassil S. Georgiev, Penfield, and George B. Mullen, Avon, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 2, 1987, Ser. No. 104,701
Int. Cl.[4] A01N *43/52, 43/653;* **C07D** *233/60, 249/08*
U.S. Cl. 548—240 **6 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable acid addition salts thereof, in the form of their enantiomers or mixture of their enantiomers including diastereomeric pairs of such enantiomers,

wherein;

a=1 or 2,

R^1 is selected from hydrogen, halogen, lower alkyl and lower alkoxy groups and combinations thereof, provided that the ortho position is hydrogen,

R^2 is selected from lower alkyl, phenyl, substituted phenyl and alkoxycarbonyl groups and R^3 is selected from lower alkyl, phenyl and substituted phenyl groups, wherein the phenyl substituents are selected from one to three of halogen, lower alkyl, and lower alkoxy groups and combinations thereof, and

X is selected from CH or N.

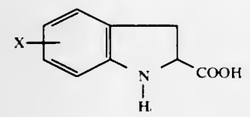
4,785,118

PROCESS FOR PREPARING INDOLINE-2-CARBOXYLIC ACIDS VIA ALPHA-HYDROXY-2-NITROBENZENEPROPANOIC ACID

Michael W. Winkley, and Ronald J. McCaully, both of Malvern, Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 829,674, Feb. 14, 1986, Pat. No. 4,645,857, which is a division of Ser. No. 700,371, Feb. 11, 1985, Pat. No. 4,585,879, which is a continuation of Ser. No. 565,083, Dec. 23, 1983, abandoned. This application Oct. 31, 1986, Ser. No. 925,573
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] C07D *209/42*
U.S. Cl. 548—491 **3 Claims**

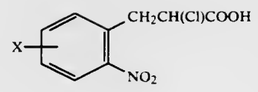
1. A process for producing an indoline-2-carboxylic acid of the formula:



I

wherein X is hydrogen, chlorine, bromine, C_{1-4} alkyl or C_{1-4} alkoxy, which comprises

(a) reducing the nitro group of an α-chloro-2-nitrobenzenepropanoic acid of the formula:



IV

and

(b) cyclizing the resulting α-chloro-2-aminobenzenepropanoic acid in aqueous base.

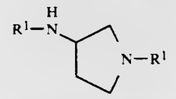
4,785,119

3-AMINOPYRROLIDINE COMPOUND AND PROCESS FOR PREPARATION THEREOF

Kou Hojo, Ageo; Anji Sakamoto, Fukaya; Masumi Tsutsumi, Maebashi; Tamotsu Yamada, Fujioka; Kazuhiko Nakazono, Fukaya, and Kazuya Ishimori, Yokohama, all of Japan, assignors to Tokyo Kasei Kogyo Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1986, Ser. No. 916,936
Claims priority, application Japan, Oct. 11, 1985, 60-226041; Oct. 11, 1985, 60-226042; Aug. 8, 1986, 61-186607
Int. Cl.[4] C07D *207/14*
U.S. Cl. 548—557 **5 Claims**

1. A process for preparing a compound of 3-aminopyrrolidine having the formula:



in which R^1 is hydrogen, which comprises reacting 1,2,4-trisubstituted butane having the formula:

$$XCH_2CHYCH_2CH_2Z$$

in which X, Y and Z each is a halogen or —OR, R being an alkylsulfonyl having 1 to 6 carbon atoms in the alkyl or an arylsulfonyl in which the aryl is phenyl or a phenyl substituted by methyl, methoxy, nitro or a halogen, with ammonia.

4,785,120

PROCESS FOR PREPARING SUBSTITUTED PHTHALIC ANHYDRIDES

Edmund J. Rumanowski, Dover, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 27, 1987, Ser. No. 78,124
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—240 **3 Claims**

1. An improved process for forming methyl phthalic anhydride by reacting the Diels-Adler addition product of a conjugated diene and maleic anhydride with bromine in the presence of a catalytic amount of nitrogeneous acid acceptor, wherein the improvement comprises:

(a) heating the admixture of addition product, acid acceptor and bromine for an increased length of time after bromine addition to increase the removal of by-product hydrogen bromide therefrom; and

(b) utilizing as the nitrogenous acid acceptor a formamide of higher molecular weight than dimethylformamide or a secondary amine containing a higher molecular weight alkyl group than methyl.

4,785,121

PREPARATION OF HALOPHTHALIC ANHYDRIDES

Andrea Leone-Bay; Elliott Bay, both of Ridgefield, Conn., and Peter E. Timony, Valley Cottage, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 851,625, Apr. 14, 1986, Pat. No. 4,730,046. This application Dec. 29, 1986, Ser. No. 947,798
The portion of the term of this patent subsequent to Mar. 3, 2005, has been disclaimed.
Int. Cl.[4] C07D *307/89*
U.S. Cl. 549—246 **14 Claims**

1. A process for selectively substituting an aromatic nitro group with a halogen which comprises: contacting a nitrophthalic anhydride with a phosphorus halide of the formula

$$R_nPX_{5-n}$$

wherein n is selected from 0, 1, 2 and 3; R is selected from the group consisting of C-6 to C-10 aryl and substituted aryl wherein the substituents are selected from the group consisting of: straight and branched chain alkyl, alkoxy, and haloalkyl; halogen, sulfonate and mixtures thereof; and X is a halogen to selectively denitrohalogenate the nitrophthalic anhydride.

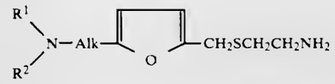
4,785,122

METHOD FOR PRODUCTION OF AMINE COMPOUND

Tsunemasa Ueno, Kawasaki, and Yutaka Morimoto, Yokohama, both of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

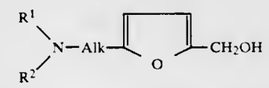
Filed Nov. 10, 1987, Ser. No. 119,055
Claims priority, application Japan, Nov. 11, 1986, 61-266588
Int. Cl.[4] C07D *307/52*
U.S. Cl. 549—495 **9 Claims**

1. A method for the production of 2-[[[5-(dimethylamino)-methyl-2-furanyl]methyl]thio]-ethane amine represented by the formula II:



(II)

wherein R^1 and R^2 independently stand for an alkyl group of 1 to 4 carbon atoms and Alk stands for an alkylene group of 1 to 4 carbon atoms, by the reaction of 5-(dialkylamino)alkylfurfuryl alcohol represented by the formula I:



wherein R^1, R^2 and Alk have the same mean ing as defined above, with cysteamine or cysteamine hydrochloride in the presence of free excess concentrated aqueous hydrogen chloride at a temperature of 30° to 80° C. for from about 15 to about 180 minutes.

4,785,123

ALKYLENE OXIDES PRODUCTION USING MOLTEN NITRATE SALT CATALYSTS

B. Timothy Pennington, Sulphur, La., assignor to Olin Corporation, Cheshire, Conn.

Filed Nov. 12, 1986, Ser. No. 929,552
Int. Cl.[4] C07D *301/06*
U.S. Cl. 549—532 **13 Claims**

1. A process for producing an alkylene oxide or mixture of alkylene oxides by a reaction which comprises reacting an olefin having from 3 to 6 carbon atoms per molecule, or mixture thereof, with an oxygen-containing gas, said olefin and said oxygen-containing gas being gaseous reactants, by contacting said gaseous reactants with a bath, stream, spray or mist of at least one molten nitrate salt catalyst, in the absence of a co-catalyst, said catalyst being present in an amount sufficient to absorb any heat generated during said reaction while maintaining an essentially constant reaction temperature, said reaction being conducted at a reaction temperature of between about 135° C. and about 600° C. and a reaction pressure of between about 1 and about 40 atmospheres.

4,785,124

PROCESS FOR PREPARING HIGHER ORDER CUPRATE COMPLEXES

Arthur L. Campbell, Glenview; James R. Behling, Lindenhurst; Sau-hoi N. John, Chicago, and Kevin A. Babiak, Evanston, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jun. 8, 1987, Ser. No. 59,294
The portion of the term of this patent subsequent to Oct. 12, 2005, has been disclaimed.
Int. Cl.[4] C07F *1/08, 7/22*
U.S. Cl. 556—28 **2 Claims**

1. A process for preparing a higher order cuprate complex comprising bringing into reactive contact a first cuprate complex of the formula:



or

$$[R—Cu—(CN)_2]LiN(R^1)_4$$

wherein:

(a) X is —CN, —SCN, —OSO_2—CF_3, or —S-phenyl;

(b) each R is independently lower alkyl, alkenyl, phenyl, naphthyl, phenanthryl, or thienyl, provided that (i) each of the aforementioned radicals may be substituted with non-interfering substituents and (ii) only one R in the first cuprate complex may be alkenyl, phenyl, naphthyl, phenanthryl, or thienyl; and

(c) each R^1 is independently lower alkyl;

with a stannane compound of the formula:

$$R_fSn(R^2)_3$$

wherein each R^2 represents independently lower alkyl and R_f represents a carbanion for carbon to carbon bond formation reactions of the formula:

$$(R^2)_3Sn—CH=CH—$$

whereby R_f replaces at least one R on Cu.

4,785,125

SYNTHESIS OF BIS(DICHLOROALUMINO)METHANE

Andrzej M. Piotrowski, Houston, and Dennis B. Malpass, La Porte, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Nov. 5, 1987, Ser. No. 116,847
Int. Cl.[4] C07F *5/06*
U.S. Cl. 556—180 **8 Claims**

1. A process for the production of bis(dichloroalumino)methane which comprises the gradual addition of methylene bromide to a mixture comprising methylene chloride and aluminum.

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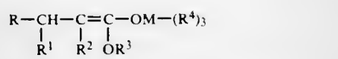
4,785,126

1,4-O-METALLATION PROCESS AND COMPOSITION

Salvatore A. Bruno, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 26, 1985, Ser. No. 727,813
Int. Cl.[4] C07F *7/08, 7/10, 7/18, 7/22*
U.S. Cl. 556—423 **6 Claims**

1. A composition of the formula



wherein M represents silicon, germanium or tin and R^3 represents a perfluoroalkyl group and R and R^1 are selected individually from the group consisting of hydrogen and alkyl, aryl, cycloalkyl and mixed alkyl-aryl radicals containing 1 to 20 carbon atoms, R^2 is selected from the group consisting of branched or straight chain alkyl radicals having 1 to 20 carbon atoms, fluoroalkyl, aryl, benzyl, cycloalkyl, substituted aminoalkyl, alkoxyalkyl, polyalkoxyalkyl, and phenoxyalkyl radicals; and R^4 is selected individually from the group consisting of hydrogen, halogens, and branched or straight chain alkyl, aryl, alkoxy, and benzyl radicals having from 1 to 20 carbon atoms.

4,785,127

VINYL POLYMER POLYOLS MADE USING PARTIALLY ALKOXYLATED POLYOXYALKYLENEAMINES

Michael Cuscurida, Austin, Tex., assignor to ARCO Chemical Company, Newtown Square, Pa.

Filed Aug. 5, 1985, Ser. No. 762,351
Int. Cl.[4] C07C *121/66*
U.S. Cl. 558—388 **11 Claims**

1. A vinyl polymer polyol which provides faster curing polyurethane foams with improved load bearing properties, prepared by the process comprising polymerizing via a free radical initiated reaction a monomer component consisting of a mixture of styrene and acylonitrile in the presence of a partially alkoxylated polyoxyalkyleneamine containing both $—NH_2$ and —OH groups as the dispersing media.

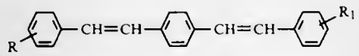
4,785,128

PROCESS FOR THE PREPARATION OF BIS-STYRYLBENZENES

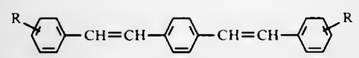
Leonardo Guglielmetti, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 213,150, Dec. 4, 1980, abandoned. This application Mar. 18, 1983, Ser. No. 474,731
Claims priority, application Switzerland, Dec. 13, 1979, 11040/79; Apr. 21, 1980, 3058/80
Int. Cl.[4] C07C *121/64*
U.S. Cl. 558—411 **15 Claims**

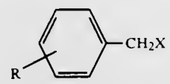
1. A process for the preparation of a fluorescent brightener consisting of (a) 51 to 99% of an unsymmetrically substituted compound of the formula



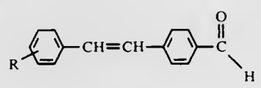
in which R and R_1 are identical or different and, if R and R_1 are identical, the substituent positions of R and R_1 must be different, and in which R and R_1 independently of one another are CN or a carboxylic acid ester group and (b) 49 to 1% of a symmetrically substituted compound of the formula



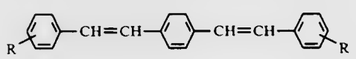
in which R is as defined above and the two Rs are bonded to identical positions of their phenyl rings, which comprises reacting terephthalaldehyde with a compound of the formula



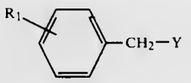
to give a mixture of the compounds of the formulae



and

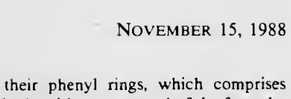


and then further reacting this mixture with a compound of the formula



to yield the fluorescent brightener wherein X and Y are identical or different and independently of one another are (a) hydrogen, (b) a radical of the formula —COOZ in which Z is alkyl or (c) a radical of the formula —ZnBr, —ZnCl, —MgBr, —MgCl,





4,785,129

METHYL 4,4,4-TRIFLUORO-3-OXO-BUTANETHIOATE

William F. Goure, Maryland Heights, and Len F. Lee, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 16, 1988, Ser. No. 156,115
Int. Cl.[4] C07C *153/09*
U.S. Cl. 558—253 **1 Claim**

1. Methyl 4,4,4-trifluoro-3-oxo-butanethioate.

4,785,130

PREPARATION OF DIMETHYL CARBONATE

Ajit K. Bhattacharya, Hopewell Junction, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 20, 1984, Ser. No. 652,246
Int. Cl.[4] C07C *68/00*
U.S. Cl. 558—277 **9 Claims**

1. The method of preparing a carbonic acid ester R_2CO_3 wherein R is a hydrocarbon group selected from the group consisting of alkyl, alkaryl, aralkyl, cycloalkyl, and aryl hydrocarbon groups which comprises

reacting an alcohol ROH with carbon monoxide and oxygen in the presence of a catalyst system containing

(a) as catalyst a copper hydrocarbonoxy halide Cu(OR')X wherein R' is a hydrocarbon group selected from the group consisting of alkyl, alkaryl, aralkyl, cycloalkyl, and aryl and X is halide; and

(b) as promoter (i) BF_3, (ii) $R'R_3PX$, (iii) $C_6H_5CH_2P(C_6H_5)_3X$, (iv) $(C_4H_9)_4PBr$, (v) $R'NR_3X$, (vi) Me_4NBr, or (vii) $C_6H_5CH_2N(C_2H_5)_3Cl$ thereby forming product carbonic acid ester; and

recovering said product carbonic acid ester.

4,785,131

SUBSTITUTED CYANONAPHTHALENE PROCESS

Venkataraman Ramachandran, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 26, 1987, Ser. No. 112,399
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] C07C *120/00*
U.S. Cl. 558—423 **18 Claims**

1. A process which comprises (1) cyanating a 6-alkoxy-tetralone which has 1–20 carbons in the alkoxy group by reacting it with hydrogen cyanide, a tri- or tetraalkylammonium cyanide, or a metal cyanide and a Lewis acid in a nitroalkane or nitroarene solvent at about 60°–120° C. so as to form a 6-alkoxy-1-cyano-3,4-dihydronaphthalene, (2) intimately mixing the resultant solution with an aqueous base selected from alkali metal and tetralkylammonium hydroxides and alkoxides at about 15°–100° C. so as to aromatize the 6-alkoxy-1-cyano-3,4-dihydronaphthalene, and (3) halogenating the resultant 6-alkoxy-1-cyanonaphthalene while still in the nitroalkane or nitroarene solvent so as to form a 6-alkoxy-5-halo-1-cyanonaphthalene.

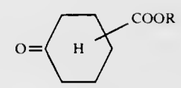
4,785,132

PROCESS FOR PREPARING CYCLOHEXANONECARBOXYLIC ACID COMPOUNDS

Tohru Miura; Teruyuki Nagata, and Hideki Mizuta, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

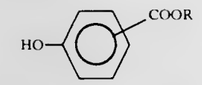
Filed Mar. 25, 1987, Ser. No. 29,881
Claims priority, application Japan, Aug. 21, 1986, 61-193986
Int. Cl.[4] C07C *67/303*
U.S. Cl. 560—126 **10 Claims**

1. A process for preparing cyclohexanonecarboxylic acid compounds of the formula:



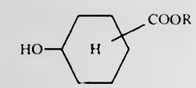
(I)

wherein R is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms, which comprises catalytically hydrogenating a hydroxybenzoic acid compound of the formula:



(II)

wherein R is as defined in formula (I), in a tertiary alcohol solvent or a secondary alcohol solvent other than a cyclohexanolcarboxylic acid compound of the formula:



wherein R is as defined in formula (I).

4,785,133

PROCESS FOR THE PREPARATION OF ALKYL 3-ALKOXYPROPIONATES

Peter W. Raynolds, and Glenn C. Jones, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,454
Int. Cl.[4] C07C *69/66*
U.S. Cl. 560—187 **6 Claims**

1. In a process for the preparation of an alkyl 3-alkoxypropionate containing at least seven carbon atoms which comprises reacting a dialkoxymethane containing at least five carbon atoms with a ketene at a temperature of about 10° to 50° C. in the presence of an acid catalyst, the improvement comprising carrying out the process in the presence of the reaction product of a carboxylic acid anhydride and concentrated or fuming sulfuric acid as the acid catalyst.

4,785,134

ALLYL ALCOHOL PRODUCTION USING MOLTEN NITRATE SALT CATALYSTS

B. Timothy Pennington, Sulphur, La., assignor to Olin Corporation, Cheshire, Conn.

Filed Jan. 28, 1988, Ser. No. 149,259
Int. Cl.[4] C07C *29/48, 29/50, 33/03*
U.S. Cl. 568—910.5 **16 Claims**

1. A process for producing allyl alcohol by reacting propylene with an oxygen-containing gas in the presence of at least one molten nitrate salt catalyst under reaction conditions which include a temperature of between about 135° C. and about 600° C. and a superatmospheric reaction pressure not exceeding 100 atmospheres.

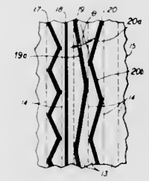
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4,785,135

DE-COUPLED PRINTED CIRCUITS

Mario E. Ecker, Poughkeepsie, and Leonard T. Olson, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1987, Ser. No. 72,833
Int. Cl.[4] H05K *1/00, 3/00*
U.S. Cl. 174—34 15 Claims



1. A circuit panel comprising:
at least one layer of electrically insulative material having a plurality of parallel channels designated thereon; and
a plurality of conductors on a surface of said layer lying within a region of voltage fluctuations in said conductors induced in one or more of the conductors in said conductor plurality by changes in current flow in one or more of the other conductors in said conductor plurality wherein the longitudinal axis of each of the conductors continually either converges or diverges with respect to the axes of others in said conductor plurality while each said conductor lies within one of said plurality of parallel channels on said surface and within said region of induced voltage fluctuations.

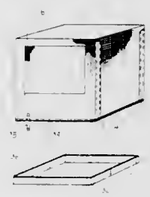
13. The method of constructing a circuit panel having diminished coupled noise between active and quiet conductors comprising the steps of:
providing an electrically insulative substrate having a plurality of parallel contiguous channels thereon for circuit conductors; and
forming within each said channel one electrical conductor whose longitudinal axis continually either converges or diverges with respect to any other conductor in any other channel within the coupled noise region of said one conductor when operating as an energized conductor.

4,785,136

ELECTROMAGNETIC INTERFERENCE SHIELDING COVER

John R. Mollet, 269 River Dr., River Vale, N.J. 07675, and Richard M. Gaiser, 5371 Tonawanda Creek Rd., Pendleton, N.Y. 14120

Filed Nov. 10, 1986, Ser. No. 929,407
Int. Cl.[4] H05K *1/00*
U.S. Cl. 174—35 R 15 Claims



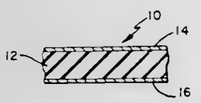
5. An electromagnetic interference shielding cover for computer terminals or the like comprising:
a rigid plastic sheet having air permeable openings said plastic sheet being thermoformed into a box-like shape having a first and a second open end;
woven wire or conductive fabric of metallized synthetic monofilament fibers bonded to one side of said plastic sheet;
rigid plastic front panel having an opening corresponding to the display unit screen size;
woven wire or conductive fabric of metallized synthetic monofilament fibers bonded to one side of said rigid plastic front panel;
a rigid frame attached to said front panel;
reduced glare blackened woven wire or conductive fabric mesh of metallized monofilament fibers fitted in an individual section and connected to said rigid frame:
means for attaching said front panel to said plastic sheet over said first open end and maintaining continuity of electric and magnetic path in said conductive fabric bonded to said plastic sheet and said front panel;
woven wire or conductive fabric cover of metallized synthetic monofilament fibers for covering said second open end;
means for attaching said conductive fabric cover to said plastic sheet over said second open end and maintaining continuity of electric and magnetic path in said conductive fabric bonded to said plastic sheet and said fabric cover;
closable slot means, associated with said fabric cover for closing around one or more cables passing through said cover so as to maintain continuity in the electric and magnetic path.

4,785,137

NOVEL NICKEL/INDIUM/OTHER METAL ALLOY FOR USE IN THE MANUFACTURE OF ELECTRICAL CONTACT AREAS OF ELECTRICAL DEVICES

George J. Samuels, Syracuse, N.Y., assignor to Allied Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 605,435, Apr. 30, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 814,469
Int. Cl.[4] H05K *5/06;* C22C *19/03, 28/00*
U.S. Cl. 174—52 FP 33 Claims



30. In an improved hermetically sealed container for electronic devices of the type comprising a body with a cavity having an opening, means for supporting one or more electronic devices, one or more electronic devices supported by said supporting means, and hermetic sealing means in hermetically sealing engagement with said opening, the improvement comprising hermetic sealing means which comprises a conductive cover element plated with a nickel based alloy disposed in registry with said opening and hermetically sealed thereto said alloy consisting essentially of from about 0.1 to about 99 weight percent nickel, from about 0.1 to about 75 weight percent indium and from about 0.1 to about 20 weight percent of one or more other metals selected from the group consisting of zinc, copper, gold, lead, silver, rhodium, germanium, ruthenium, rhenium, platinum, palladium, tin, iridium, antimony, gallium, bismuth, cadmium, osmium and arsenic.

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4,785,138

ELECTRIC CABLE FOR USE AS PHASE WINDING FOR LINEAR MOTORS

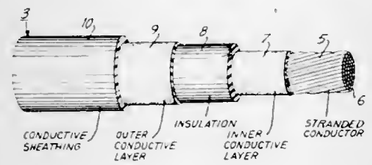
Otto Breitenbach, Nuremburg; Ferdinand Hanisch, Burgwedel, and Peter Madry, Barsinghausen, all of Fed. Rep. of Germany, assignors to Kabel Electro Gesellschaft mit beschränkter Haftung, Hanover, Fed. Rep. of Germany

Filed Oct. 31, 1986, Ser. No. 926,377

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1985, 3543106

Int. Cl.[4] H01B *7/18*

U.S. Cl. 174—106 SC **6 Claims**



1. In an electric cable for use as a phase winding in a three-phase alternating-current winding for linear motors in which the phase windings are fixed in a meander-like course in the grooves of an elongated inductor, the cable comprising a metallic conductor, an inner conductive layer surrounding the conductor, a layer of insulation disposed over said conductive layer, an outer conductive layer surrounding said insulation and a sheathing of electrically conductive material disposed over said outer conductive layer, the improvement wherein

said conductor is a stranded conductor having at least two layers of individual wires, and the direction of lay of the individual wires of the stranded conductor differs between successive ones of said layer of wires;

said conductor is compacted in its entirety to about 90% of its original size during and annealed after a stranding operation to provide for substantially inelastic bending of the conductor;

said inner conductive layer is formed on said stranded conductor by extrusion, fills up outer interstices between individual wires of an outer layer of the stranded conductor, and is firmly attached to said insulation surrounding the inner conductive layer;

said outer conductive layer comprises a highly conductive flexible material which is firmly attached to said insulation; and

the sheathing is of high electric conductivity and comprises a material of sufficient elasticity and sufficient mechanical strength to allow emplacement of the cable in grooves to be filled in said inductor, with substantially inelastic bending of the cable causing the cable to substantially retain the physical configuration of the grooves.

4,785,139

CABLE WITH FLEXIBLE HIGH PRESSURE EQUIPMENT ENCLOSURE MATERIAL AND METHOD OF CONSTRUCTING SAME

John F. Lynch, Boonton Township, Morris County, N.J., and Michel Y. Rondeau, San Jose, Calif., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 30, 1986, Ser. No. 868,860

Int. Cl.[4] H02G *15/14*

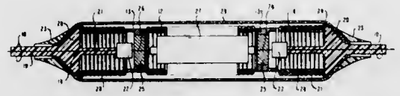
U.S. Cl. 174—70 S **5 Claims**

1. An equipment enclosure comprising a tubular housing having a transversely corrugated tubular wall extending along the entire length of said housing in which the corrugations have been compressed upon one another so that corrugations extend essentially radially with respect to the central longitudinal axis of said housing and sidewalls of adjacent corrugations are in contact at least adjacent to the peak portions on the outside of said housing and adjacent to the root portions on the inside of said housing, said housing being formed of a material which allows said housing to be resiliently bent with respect to said axis in response to application of transverse forces in the presence of approximately similar exterior and interior static pressures,

means sealing an interior region of said housing to maintain approximately a predetermined interior pressure value even though exterior pressure may change, and

means at respective opposite ends of said tubular housing for receiving oppositely directed longitudinal forces due to exterior pressure to render said housing essentially rigid in the presence of exterior pressure much greater than said interior region pressure.

4. A process for manufacturing a communication cable for use in an environment of pressure much higher than atmospheric pressure, comprising the steps of



forming a tubular member to have transverse corrugations along at least a portion of the length thereof, said corrugations being collapsed upon one another such that corrugation side walls are essentially radial with respect to said tubular member, and root portions between adjacent corrugation side walls are of essentially line-width length in the direction parallel to the longitudinal axis of said tubular member.

sealing the ends of said member to form a housing and to maintain a predetermined interior pressure therein,

applying to said ends of said member pressure receiving devices for transmitting to respective ends of said member longitudinal forces resulting from pressure which is expected to be encountered in the environment in which said housing is to be used and for thereby tending to maintain said housing in a minimum enclosed volume configurations and

assembling at least one housing so formed between adjacent cable sections to form a completed communicating cable.

4,785,140

SECURITY BOX FOR CABLE TV CONNECTORS

R. Eric Adams, Versailles; Joey L. Brown, Nicholasville, and David B. Frodge, Lexington, all of Ky., assignors to Moore Diversified Products, Inc., Lexington, Ky.

Filed Sep. 8, 1987, Ser. No. 93,598

Int. Cl.[4] H05K *5/00*

U.S. Cl. 174—50 **13 Claims**

1. A security box for cable TV connectors including:

a base having a support wall for mounting on a building wall;

support means extending from said support wall substantially perpendicular thereto;

mounting means for supporting cable TV connectors;

said support means having slidably supporting means for slidably supporting said mounting means;

a cover for disposition over said base to prevent access to said base;

said cover including:

a front wall;

a top wall extending substantially perpendicular to said front wall;

a bottom wall extending substantially perpendicular to said front wall and substantially parallel to said top wall;

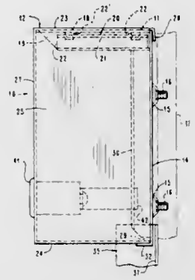
a pair of side walls extending from opposite sides of said front wall between said top wall and said bottom wall;

said top wall overlying said support means of said base when said cover is disposed over said base;

and said side walls extending to at least opposite sides of said support wall when said cover is disposed over said base;

said support wall of said base having cooperating means for cooperating with said bottom wall of said cover when said cover is disposed over said base to prevent upward movement of said cover relative to said base;

a lock supported by said cover;



said support wall of said base having lock cooperating means to cooperate with said lock to lock said cover to said base when said cover is disposed over said base;

and said cover having cable access means in at least one of said bottom wall and said pair of side walls to provide cable access to the interior of said base when said cover is disposed over said base.

4,785,141

WIRING STRUCTURE OF TERMINATION CIRCUIT

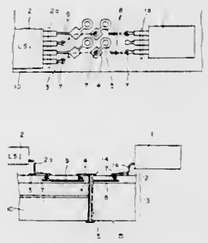
Mikio Nishihara, Setagaya, and Kiyoshi Kuwabara, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 893,318, Jul. 29, 1986, abandoned. This application Nov. 18, 1987, Ser. No. 124,418

Claims priority, application Japan, Nov. 29, 1984, 59-253562

Int. Cl.[4] H05K *1/11*

U.S. Cl. 174—68.5 **1 Claim**



1. A wiring structure for a termination circuit in a mutli-layered printed circuit board for mounting integrated circuits having signal terminals and termination circuits electrically connected by circuit wiring patterns formed on internal layers by way of throughholes, said wiring structure comprising:

a signal layer;

circuit wiring patterns formed in said signal layer;

a leadout layer formed on said signal layer;

leadout patterns formed in a portion of said leadout layer;

first throughholes extending through said leadout layer and said signal layer;

first lead patterns formed on said leadout layer and connected to the signal terminals of said integrated circuits;

first blind throughholes formed in said leadout layer and connecting said leadout patterns and said first lead patterns;

second lead patterns formed on said leadout layer and connected to said first throughholes;

second blind throughholes formed in said leadout layer and connecting said leadout patterns and said second lead patterns;

third lead patterns formed on said leadout layer and connected to terminals of said termination circuit;

third blind throughholes formed in said leadout layer and connected to said third lead patterns; and

fixed circuit patterns formed in said leadout layer and connecting said first throughholes and said third blind throughholes.

4,785,142

SUPERCONDUCTOR CABLE

Darrell F. Smith, Jr., Huntington; Bill L. Lake, Ona, both of W. Va., and Ronald G. Ballinger, Andover, Mass., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Apr. 10, 1987, Ser. No. 36,581

Int. Cl.[4] H01B *12/00*

U.S. Cl. 174—15 S **4 Claims**

1. A superconducting cable comprising an elongated type II superconductor in association with a parallel stabilizing conductor both in heat transfer relationship with at least one passage adapted to carry refrigerant, said superconductor, said stabilizing conductor and said at least one passage being enclosed by a sheath comprising an alloy consisting essentially of about 46–50% nickel, about 3–6% chromium, about 2.5–3.5% niobium, about 1.25–1.65% titanium, about 0.8–1.2% aluminum, and the balance essentially iron.

4,785,143

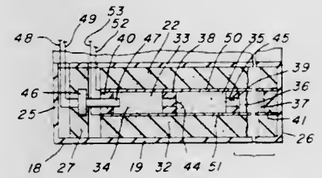
SAFETY EDGE FOR A DOOR

Norman K. Miller, 1 Concord Industrial Park, Concordville, Pa. 19331

Filed Aug. 17, 1987, Ser. No. 85,561

Int. Cl.[4] H01H *3/16*; **E05F** *15/00*

U.S. Cl. 200—61.43 **6 Claims**



1. A safety edge for a door or the like comprising an elongate outer sheath fabricated of flexible air impervious material and adapted for attachment to a door edge, airtight end closures on said sheath, an elongate inner formation of resiliently compressible foam configured to conformably occupy the interior of said outer sheath and being compressible under exter... pressure applied to said outer sheath, said inner foam including a longitudinally extending intermediate layer having transverse through openings defining therebetween partitions having longitudinal openings communicating between the transverse through openings, and a substantially rigid incompressible transverse structure in one region of said sheath, and having a configuration conforming to the interior cross-section of said sheath to effectively prevent deformation of the sheath, and fluid passage means communicating from said one region throughout the remaining interior region of said sheath, and a pressure sensitive switch element protectively located in said transverse structure within said sheath for sensing pressure

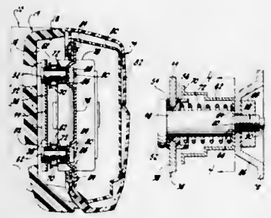
VOL 1096 ISS 3 NO 15 1988 UMI

change throughout said sheath without subjecting the switch element to external pressure.

4,785,144
HORN BLOWING SWITCH ARRANGEMENT

Harland R. Fosnaugh, Springboro, and Mark T. Winters, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1988, Ser. No. 155,973
Int. Cl.[4] H01H *9/00*; B60R *21/08*
U.S. Cl. 200—61.55 7 Claims

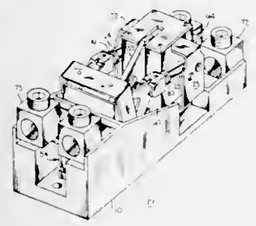


1. In combination with a vehicle steering wheel including a hub portion and a rim portion, and an inflatable restraint module, a horn blowing switch arrangement comprising, a support fixed within the hub portion of the steering wheel and including a plurality of spaced apertures therethrough aligned with corresponding apertures through the hub portion, a headed post member slidably received through each aperture of the support, means insulating the post members from the support, cooperating means on the module and the free end portions of the post members to fix the module to the post members for movement as a unit relative to the support, a sleeve member respective to and surrounding each post member, means fixing one end of each sleeve member to a respective post member, resilient means operative between the support and the module to engage the head portions of the post members with the support and space the other end of each sleeve member from the support, and a source of power connected across the sleeve members and the support, manual engagement of the module by the driver with sufficient force to overcome the resilient means engaging the other ends of the sleeve members with the support to complete a circuit across the source of power.

4,785,145
MODULAR ELECTRICAL DISCONNECT SWITCH

Robert L. Owens, Southington, and Paul D. Carpenter, Vernon, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,789
Int. Cl.[4] H01H *1/42*
U.S. Cl. 200—162 8 Claims



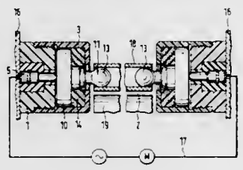
1. A modular electric disconnect switch comprising:

a molded plastic support base;
a line terminal assembly at one end of said base;
a load terminal assembly at an opposite end of said base;
a contact blade extending between said line and load terminal assemblies;
an operating mechanism connecting with said contact blade for electrically connecting and disconnecting said contact blade from said line and load terminal assemblies, said line and load terminal assemblies having interchangeable components;
said load terminal assembly comprising a T-shaped load terminal support adapter interposed between a first pair of side plates at one end of said side plates, with one end of said contact blade being pivotally attached to said side plates at an opposite end of said side plates;
said line terminal assembly comprising a T-shaped line terminal support adapter interposed between a second pair of side plates at one end of said side plates for providing a contact blade receiver slot at an opposite end thereof;
an arc chute arranged on top of said T-shaped line terminal support adapter; and
an arc runner attached to a top of said T-shaped line terminal support adapter intermediate said T-shaped line terminal support adapter and said arc chute.

4,785,146
ELECTRIC SAFETY SWITCH WITH TILTABLE CONTACT

Wilfried Dünki, Dorfstrasse 381, CH-5512 Büblikon, and Werner Saxer, Othmarsingerstrasse 263, CH-5604 Hendschiken, both of Switzerland

Filed Jun. 19, 1987, Ser. No. 64,818
Claims priority, application Switzerland, Jun. 20, 1986, 2499/86
Int. Cl.[4] H01H *21/24*
U.S. Cl. 200—250 17 Claims

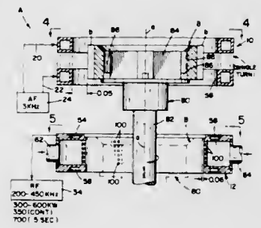


1. An electric switch comprising a housing; a first contact in said housing; a second contact tiltably mounted in said housing, said second contact comprising a substantially disc-shaped member and said housing having a substantially cylindrical internal surface surrounding said member, said member having a convex peripheral surface adjacent said internal surface and said peripheral surface having a radius of curvature which equals or approximates the radius of said internal surface; deformable biasing means provided in said housing for urging said second contact against said first contact; and means for disengaging said second contact from said first contact with attendant deformation of said biasing means, including an abutment provided in said housing adjacent said disc-shaped member and means for tilting said second contact with reference to said abutment in any one of a plurality of different directions with attendant deformation of said biasing means to thereby disengage said second contact from said first contact, said tilting means being accessible externally of said housing and including a projection which is substantially coaxial with said member and extends from said member, said housing comprising guide means defining for said second contact a predetermined path along which said second contact is reciprocable with reference to said abutment by said biasing means or with attendant deformation of said biasing means into and out of engagement with said first contact.

4,785,147
SYSTEM FOR HARDENING GEARS BY INDUCTION HEATING

George M. Mucha, Parma Hts., Ohio; George D. Pfaffmann, Farmington, and Donald E. Novorsky, Pleasant Ridge, both of Mich., assignors to Tocco, Inc., Boaz, Ala.

Continuation of Ser. No. 23,564, Mar. 9, 1987, Pat. No. 4,749,834, which is a division of Ser. No. 878,186, Jun. 25, 1986, Pat. No. 4,675,488. This application Oct. 7, 1987, Ser. No. 106,537
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] H05B *6/14*
U.S. Cl. 219—10.59 7 Claims



1. An apparatus for hardening the radially, outwardly facing surfaces of a generally circular toothed workpiece adapted to rotate about a central axis generally concentric with said outwardly facing surfaces, said surfaces defining an outer circle by the tips of said teeth of said workpiece, said apparatus comprising:

(a) first and second induction heating coils having inner circular surfaces generally matching and slightly larger than said outer circle of said workpiece;
(b) motor means adapted to be associated with said workpiece for locating said workpiece concentrically in said first induction heating coil;
(c) first power means associated with said first coil for energizing said first induction heating coil with a first alternating frequency current of less than about 5.0 KHz and a first power level greater than 100 KW;
(d) microprocessor means associated with said first power means for activating said first power means to energize said first coil for a time period less than about 10.0 seconds and deenergize said coil with said workpiece therein for a first time delay period of at least about 10 seconds;
(e) said microprocessor means effective to again actuate said first power means to energize said first induction heating coil with a second alternating frequency current of less than about 5.0 KHz and a second power level at least as great as said first power level and for a second time period substantially less than said first time period to produce an unstable temperature band located radially inwardly from said tips, said tips being at a higher temperature than the core of said workpiece but less than the critical temperature of said workpiece;
(f) said motor means controlled by said microprocessor means effective to said workpiece concentrically into said second induction heating coil after a second delay time no more than about 1.0 seconds;
(g) second power means associated with said second coil and actuated by said microprocessor means for energizing said second induction heating coil with a radio frequency current of more than 200 KHz at a third power level over 100 KW said microprocessor means further effective to actuate said second power means for a third time period of less than about 1.0 seconds; and,
(h) quench means within said second induction heating coil controlled by said microprocessor means for immediately spraying a quenching liquid against said surfaces after said third time period while said workpiece is in said second induction heating coil to quench said workpiece without adverse grain growth.

4,785,148
BROAD-BAND ABSORPTIVE TAPE FOR MICROWAVE OVENS

Ferdy Mayer, 10-21 rue de Lourmel, 75015 Paris, France

Filed Dec. 24, 1986, Ser. No. 945,974
Claims priority, application France, Dec. 24, 1985, 85 19142
Int. Cl.[4] H05B *9/06*
U.S. Cl. 219—10.55 D 5 Claims

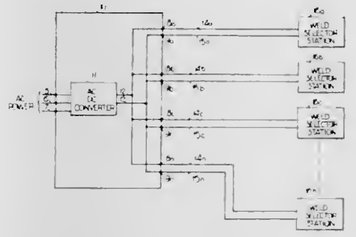
1. Absorptive tape or gasket for microwave ovens, positioned in a leakage path of microwave energy, and filling at least partially such passage, comprising an absorptive magnetic compound:

wherein the compound consists of a powder or mixture of powders of ferrites, in an organic matrix, where the powder or mixture is represented by the general formula $MO(-Fe_2O_3)$,
where M represents a bivalent metal, or mixture of bivalent metals, selected from the group consisting of Fe, Ni, Cu, Zn, Mn, and Mg, with a weight percentage of over 80%, and where the ferrite in this compound has a low frequency permeability higher than 200, said powder or mixture having a resistivity greater than 50 Ω-cm.

4,785,149
DISTRIBUTED STATION WELDING SYSTEM

Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067

Continuation of Ser. No. 791,224, Oct. 25, 1985, Pat. No. 4,716,274. This application Oct. 21, 1987, Ser. No. 111,033
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—130.21 6 Claims



4. An improved multi-station welding system for conducting a plurality of simultaneous welding operations, comprising:

power supply means for providing a source of DC power; and
a plurality of weld parameter selection means, each said weld parameter selection means being for providing welding power with a set of predetermined electrical parameter desirable for a predetermined one of a said plurality of welding operations; and each said weld parameter selection means comprising:
a power input terminal;
rectifying means connected between said power supply means and said power input terminal;
energy storage means connected to said power input terminal;
current limiting means;
first switching means responsive to a first drive signal for providing said welding power through said current limiting means to an output terminal, said welding power comprising an output voltage and an output current;
arc sustaining means connected in parallel with said first

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switching means for providing a predetermined minimum welding power, said predetermined minimum welding power being capable of sustaining an arc;

driving means means responsive to a second drive signal and a shutdown signal for selectably providing said first drive signal having a first set of electrical parameters to said first switching means;

feedback current sensing means for providing a current feedback signal responsive to said output current;

first oscillation means for providing said second drive signal, said second drive signal having a second set of electrical parameters, at least one of said second set of electrical parameters being responsive to a selected one of the following signals: said current feedback signal, a first manually signal, and both said current feedback signal and said first manually adjustable signal;

average current sensing means for providing said shutdown signal in response to the average value of said output current exceeding a predetermined maximum average output current value;

peak current sensing means for providing said shutdown signal in response to the peak value of said output current exceeding a predetermined maximum peak output current value; and

first output voltage sensing means for providing said shutdown signal in response to said output voltage being below a predetermined voltage, said predetermined minimum voltage being less than an arc sustaining voltage required to sustain an arc

a plurality of conducting means for connecting said power supply means to said plurality of said weld parameter selection means, each of said conducting means having a set of electrical characteristics and connecting a particular one of said weld parameter selection means to said power supply means;

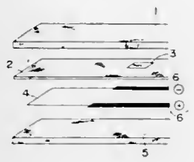
wherein each of said welding parameter selection means includes means for reducing particular effects of said electrical characteristics of said conducting means upon said predetermined electrical parameters of said welding power.

4,785,150

PLATE-LIKE ALUMINA HEATER

Takao Kojima, Nagoya; Nobuhiro Hayakawa, Cbita; Yutaka Nakayama, and Tetsusyo Yamada, both of Nagoya, all of Japan, assignors to NGK Spark Plug So., Ltd., Aichi, Japan

Filed Dec. 6, 1985, Ser. No. 805,807
Claims priority, application Japan, Dec. 11, 1984, 59-260070
Int. Cl.⁴ H05B *3/16*
U.S. Cl. 219—543 **8 Claims**



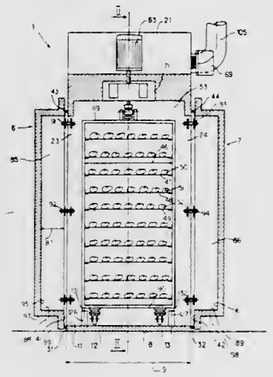
1. A heater comprising a sheet substrate formed of alumina having an electron-conductive pattern formed on a surface of the substrate and designed to generate heat, wherein at least a portion of said electron-conductive pattern is provided with an oxygen ion conductive layer on at least one side of said electron-conductive pattern, wherein at least 90% by weight of the oxygen ion-conductive layer consists of partially and/or entirely stabilized ZrO_2.

4,785,151

SWIVEL-TRUCK BAKERY OVEN

René Voegtlin, 2, rue de la Colline, Oberhausbergen, 67200 Strasbourg (Bas-Rhin), France

Filed Jan. 29, 1987, Ser. No. 8,174
Claims priority, application France, Feb. 5, 1986, 86 01666
Int. Cl.⁴ H05B *3/62*; A21B *1/24*
U.S. Cl. 219—400 **21 Claims**



1. A swivel-truck bakery oven for baking breads, pastries and the like, said oven being adapted to receive a swivel-truck, said swivel truck bakery oven comprising:

(a) a baking chamber closeable by a charging door of a predetermined door width;

(b) an electric control box;

(c) a re-circulation channel comprising a re-circulation fan and means for heating air received from said baking chamber;

(d) means for rotating a swivel-truck about a vertical axis, said swivel-truck having a rectangular base of a predetermined width, and a predetermined diagonal length, said swivel-truck being positioned inside said swivel-truck bakery oven, wherein rotation of said swivel-truck defines a cylindrical volume having a predetermined diameter;

(e) a blowing manifold comprising vertical louvres and a steam generator;

(f) a frame structure having a width corresponding to said diameter, said frame having a rectangular parallelipipedic central core having a width substantially corresponding to said door width; and

(g) two lateral covers detachably connected to said frame, opposed open sides of each of said lateral covers having a rectangular cavity of a depth slightly greater than half of the difference between said swivel-truck width and said diagonal, said lateral cover cavities comprising means for accommodating said swivel-truck when said swivel-truck rotates.

4,785,152

TIMING CONTROL DEVICE FOR A MICROWAVE OVEN

Kengo Hirata, Nara, and Kimie Morimoto, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1987, Ser. No. 117,041
Claims priority, application Japan, Dec. 23, 1986, 61-201990
Int. Cl.⁴ H05B *6/68*
U.S. Cl. 219—10.55 B **12 Claims**

1. A microwave oven comprising:

a heating chamber having a door;

high-frequency heating means for heating an article to be heated;

detecting means for detecting whether the door is open or closed and for producing a detection signal representing whether the door is open or closed;

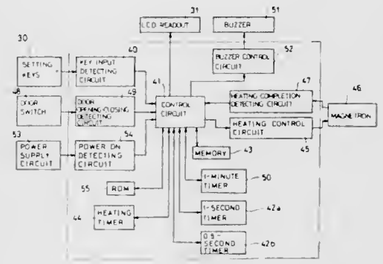
a plurality of setting keys for setting heating time;

timer means, operatively connected to said plurality of setting keys, for measuring said heating time set by said setting keys and for driving said high-frequency heating means during the heating of the article;

start means, operatively connected to said timer means, for enabling said timer means to perform a time measuring operation for a predetermined period of time after a depression of one of said setting keys;

stop means, operatively connected to said timer means, for temporarily preventing the operation of said timer means in response to said detection signal which indicates that the door has been opened; and

control means for causing said timer means to resume the heating of the article for the remainder of the heating time when one of said setting keys corresponding to the setting



keys initially used for setting said heating time is depressed within a specified period of time, said specified period of time beginning upon receiving said detection signal indicating that the door is closed again;

said control means setting a new heating time or adding more time to the heating time, corresponding to another setting key, when another setting key not corresponding to the setting keys initially used for setting said heating time is alternatively depressed;

said control means resetting said timer means when none of said plurality of said setting keys are depressed within said specified period of time, thereby rendering said setting keys usable also as a start key and making it possible to heat the article only for the remainder of the heating time after the door is opened and closed during cooking, or rendering the cooking time variable by depressing said another setting keys within said specified period of time and enabling setting a new heating time to replace the remainder of the old heating time.

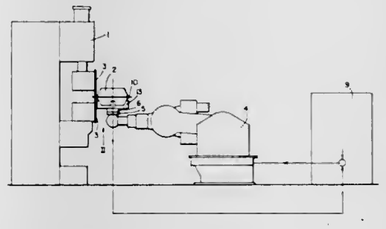
4,785,153

PROCESS AND DEVICE FOR RECIPROCAL GUIDANCE OF WORKPIECES AND TOOLS THAT MOVE RELATIVE TO ONE ANOTHER, PARTICULARLY ROLLING SEAM WELDING MACHINES

Burkhard Stimmel, Augsburg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen+Roboter, Fed. Rep. of Germany

Filed Feb. 6, 1987, Ser. No. 11,940
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1986, 3603919
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—86.41 **14 Claims**

1. A process for the reciprocal guiding of a workpiece using a device for moving a tool in association with the workpiece and a manipulator for moving the workpiece in a corresponding direction for effecting a rolling welding seam, comprising driving the workpiece by movement of the tool in contact with the workpiece while operating a manipulator to move the workpiece in a corresponding direction, monitoring the movement effected by the tool and the movement effected by the manipulator, and detecting any occurrence of a difference of



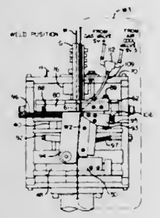
synchronous movement of the two imparted movements, readjusting at least one of the movement of the workpiece by the tool and the movement of the workpiece by the manipulator by a short term compensation of the difference between them.

4,785,154

METHOD AND APPARATUS FOR JOINING TOGETHER THE ENDS OF A METALLIC BAND BY RESISTANCE INERT GAS WELDING

Jack M. Moody, Milwaukie, Oreg., assignor to Cranston Machinery Co., Inc., Milwaukie, Oreg.

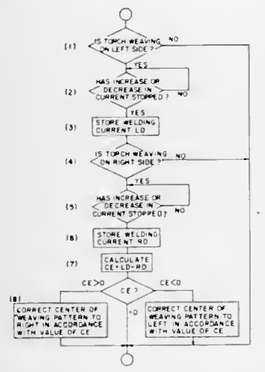
Filed May 20, 1987, Ser. No. 51,634
Int. Cl.⁴ B23K *11/00*
U.S. Cl. 219—78.01 **16 Claims**



1. The method of welding together ends of a metal band comprising bringing said ends into alignment with each other, pressing said ends into contact with each other in fusion position and turning on a flow of inert gas to apply an inert gas shield to the fusion area, applying a fusion voltage to said ends to start a fusion cycle, turning off said fusion voltage and flow of inert gas to terminate said fusion cycle, turning on a flow of cooling air directed to said fusion area to start a cooling cycle, turning off said flow of air to terminate said cooling cycle, applying an annealing voltage to said ends to start an annealing cycle, and turning off said annealing voltage to terminate said annealing cycle.

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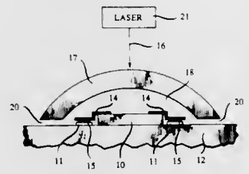
4,785,155
AUTOMATIC WELDING MACHINE PATH CORRECTION SYSTEM
Hajimu Kishi, Hino; Shinsuke Sakakibara, Komae, and Haruyuki Ishikawa, Shinjuku, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP85/00552, § 371 Date May 23, 1986, § 102(e) Date May 23, 1986, PCT Pub. No. WO86/02030, PCT Pub. Date Apr. 10, 1986
PCT Filed Oct. 4, 1985, Ser. No. 871,438
Claims priority, application Japan, Oct. 5, 1984, 59-209336
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—125.12 **6 Claims**



1. A method of path correction for an automatic welding machine which welds while weaving a welding torch to the left and right of a welding line, said method comprises the steps of:
(a) calculating a weaving path from a given starting point, end point, amplitude and frequency, the weaving path having sections parallel to the welding line at left and right extremes from the welding line;
(b) moving the torch along the weaving path calculated in step (a) and sensing a left side welding current and a right side welding current at the left and right extremes of the path parallel to the welding line when the torch is at the left and right extremes of the welding path;
(c) obtaining a difference between the left side welding current and the right side welding current;
(d) implementing a weaving path correction based on the difference if the difference is less than a predetermined value; and
(e) issuing an alarm and halting welding if the difference is greater than the predetermined value.

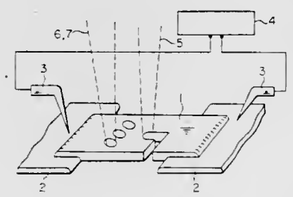
4,785,156
SOLDERING METHOD USING LOCALIZED HEAT SOURCE
John W. Benko, Trenton, and Alexander Coucoulas, Basking Ridge, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.
Filed Dec. 18, 1987, Ser. No. 135,183
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121.64 **11 Claims**

1. A process for bonding together first and second members comprising the steps of directing a laser beam to impinge on a third member so as to heat the third member and using heat from the third member to bond the first and second members characterized in that the third member is out of contact with



the first and second members and heat is transferred from the third member to the first and second members by radiation.

4,785,157
METHOD FOR CONTROLLING ELECTRIC RESISTANCE OF A COMPOUND-TYPE RESISTORS
Eishi Gofuku; Mitsuyuki Takada, and Hayato Takasago, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Jan. 7, 1987, Ser. No. 992
Claims priority, application Japan, Jan. 9, 1986, 61-2476; Jul. 15, 1986, 61-167128
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121.85 **31 Claims**

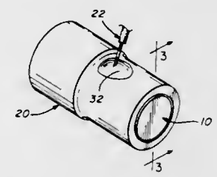


1. A method for controlling electric resistance of a compound-type resistor material comprising:
irradiating a laser beam on a compound-type resistor material so as to cause a change in its chemical state and provide a desired value of electrical resistance anywhere within a range above and below a value of specific resistance inherent to said compound-type resistor material.

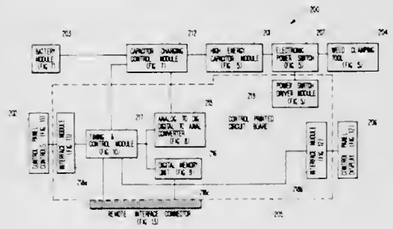
4,785,158
FLAME ARRESTOR AND METHOD OF MANUFACTURE
Alan R. Gaul, Mansfield, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation of Ser. No. 29,916, Mar. 25, 1987, abandoned. This application Jan. 26, 1988, Ser. No. 148,124
Int. Cl.⁴ B23K *15/00*
U.S. Cl. 219—121.14 **12 Claims**

1. A method of manufacturing a flame arrestor which comprises:
using a multiplicity of precision ground stock pieces,
spacing the pieces with a shim that is of such a thickness that the spacing between the pieces provided by the shim is within the necessary tolerances to provide a barrier to the propagation of a flame through the arrestor,
welding the pieces together, and

removing the shim from between the pieces to leave a gap between the pieces such that the gap is within the tolerances necessary to provide a flameproof path through the arrestor.



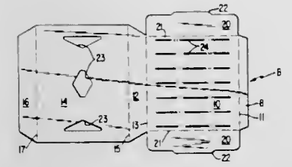
4,785,159
DENTAL WELDING DEVICE AND SYSTEM
Arturo Hruska, Rome, Italy, assignor to Titanweld B.V., Amsterdam, Netherlands
Continuation-in-part of Ser. No. 711,100, Mar. 13, 1985. This application May 14, 1987, Ser. No. 49,602
Int. Cl.⁴ B23K *11/26*
U.S. Cl. 219—111 **19 Claims**



1. A dental welding system for welding a dental element in accordance with a multi-pulse welding sequence while simultaneously storing the multi-pulse welding sequence for subsequent reapplication, said system comprising:
setting means operable by a user of the system for setting the multi-pulse welding sequence to be employed in welding the dental element;
generating means for generating the multi-pulse welding sequence set by said setting means so as to weld the dental element;
memory means for storing the multi-pulse welding sequence generated by said generating means; and
control means connected between said setting means, on the one hand, and said generating means and said memory means, on the other hand, and operable by the user for storing the multi-pulse welding sequence in said memory means and for simultaneously providing the multi-pulse welding sequence to said generating means.

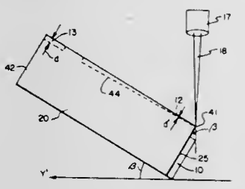
4,785,160
SLEEVE TYPE CARTON FOR MICROWAVE COOKING
Joseph J. Hart, Philadelphia, Pa., assignor to Container Corporation of America, Clayton, Mo.
Filed Aug. 4, 1987, Ser. No. 81,706
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 E **9 Claims**

1. A disposable, sleeve-type carton adapted to hold an item of food and assist in browning the exterior thereof when subjected to microwave radiation, said carton being formed from a unitary blank of foldable paperboard coated on at least one surface with a layer of an electrically conductive material, and comprising:
(a) top and bottom major walls foldably joined to each other by a pair of opposed minor walls to form a tubular structure open at the ends;
(b) one of said major walls being longer than the other of said major walls and having, inboardly adjacent opposite ends thereof, openings extending therethrough;
(c) a pair of opposed end walls for closing opposed ends of said tubular structure, each of said end walls including at least one end wall panel foldably joined to an end edge of the other of said major walls and including a lock tab projecting therefrom and adapted to be received within a related opening in said one major wall to provide interlocking engagement between said end walls and said one major wall;



(d) said bottom major wall being embossed to present a plurality of spaced parallel ribs projecting upwardly therefrom for direct contact with said food item to support said food item a slight distance above an upper surface of said bottom major wall.

4,785,161
LASER MACHINING FOR PRODUCING VERY SMALL PARTS
Richard A. Strom, Eagan, Minn., assignor to Control Data Corporation, Minneapolis, Minn.
Continuation-in-part of Ser. No. 888,605, Jul. 21, 1986, abandoned. This application Sep. 23, 1986, Ser. No. 910,593
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121.69 **14 Claims**



1. A method for machining at least one small part (having an axis) including machining at least one surface with a laser beam delivered to said surface for impingement in a series of spots adjacent to one another in a linear pattern to form a line by optical means which is moveable in a predetermined pattern such that the movement of the beam from one end to the other along said axis would without adjustment cause a non-uniform cavity depth of said part along the axis to be machined, wherein the method comprises:
positioning said part axis at an adjustment angle which is other than 90° relative to a line parallel to the impinging beam axis, such angle being sufficient to compensate for said non-uniformity in cavity depth.

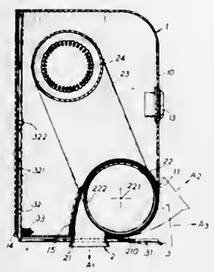
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4,785,162

MULTIPLE-FUNCTION ELECTRIC DRYER HAVING AN ADJUSTABLE POSITION DISCHARGE NOZZLE

Dai-Ming Kuo, P.O. Box 10160, Taipei, Taiwan

Filed Oct. 31, 1986, Ser. No. 925,612
Int. Cl.[4] F24H *3/02;* **H05B** *1/00;* **F26B** *21/00*
U.S. Cl. 219—368 **1 Claim**



1. A dryer comprising:

a casing having a front wall and a bottom wall, a nozzle opening formed on the lower portion of the front wall and the front portion of the bottom wall adapted for the angular movement of a nozzle about a horizontal axis within the confines of the nozzle opening;

a hot-air supplier in said casing including a nozzle extending outwardly through said opening for blowing hot air outwards, said nozzle protruding from a collar rotatably mounted on a horizontal-pipe portion of said hot air supplier and being perpendicular to an axis aligned with the center line of said pipe portion such that said nozzle with said collar can be selectively rotated around said axis of said horizontal-pipe portion within the confines of said nozzle opening, said horizontal-pipe portion being connected with a hot-air duct having an electric heating coil therein and provided with an air fan on an air inlet hood communicating with a casing air inlet; and

a grating frame telescopically mounted on said casing below the bottom wall thereof including a horizontal grating for laying towels or clothes thereon, said grating having a central recess portion located with respect to the nozzle opening in said casing bottom wall to allow the angular movement of said nozzle therethrough and a pair of vertical rods each connected with said horizontal grating and extending upwardly into said casing, a pair of positioners on said casing each having a latch resiliently held by a spring to engage with each of the plural recesses formed on each said vertical rod to adjustably position said grating under said casing for drying the towel or clothes laid thereon after rotation of said nozzle downwards for discharging hot air directly onto said towel or clothes, and whereby upon the rotation of said nozzle around said horizontal-pipe portion within the confines of said nozzle opening, the hot air as blown through said nozzle can be selectively adjusted for its blowing directions.

4,785,163

METHOD FOR MONITORING A HEATER

Chester L. Sandberg, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 716,780, Mar. 26, 1985. This application Apr. 27, 1987, Ser. No. 43,069
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—549 **15 Claims**

1. An elongate heater comprising

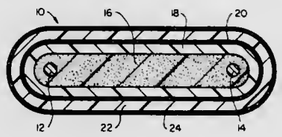
(a) an elongate heating member;

(b) an elongate insulating jacket which encloses and insulates the heating member throughout the length of the heater;

(c) a first elongate electrically conductive member which surrounds the insulating jacket throughout the length of the heater;

(d) an elongate separating and insulating member which surrounds and insulates the first conductive member throughout the length of the heater; and

(e) a second elongate electrically conductive member which surrounds the first conductive member and is separated and insulated therefrom throughout the length of the heater by the separating member;



said heater being one which is suitable for use in a method for monitoring the integrity of the heater while it is connected to a power supply and for reducing the power supplied to it if it incurs physical damage, said method comprising monitoring the impedance between the first and second electrically conductive members and providing means which reduces the power supplied to the elongate heating member if physical damage to the heater causes the impedance between the first and second electrically conductive member to be less than a predetermined magnitude.

4,785,164

SLIDE CALCULATOR FOR BACKGROUND LIGHTING

Muriel A. Reed, and Roger G. Reed, both of 6704 Hoover Rd., Indianapolis, Ind. 46260

Filed Jul. 13, 1987, Ser. No. 73,166
Int. Cl.[4] G06C *3/00*
U.S. Cl. 235—64.7 **5 Claims**



1. A slide calculator for accurately duplicating a preselected color and color saturation (Cd) for a photographic image of a neutral-gray-background illuminated with background-light modified by one or more color filters, by calculating a correct working distance for said background-light (Dbg-light), comprising:

a panel member having a window-like aperture and first and second sliding members, said sliding members being cooperatively associated with each other and said panel member, and movable with respect to said panel member;

a first set of cooperating scales positioned on adjacent portions of said panel member and said first sliding member, a first scale of said first set being on said panel member and having spaced apart portions in f-stop increments being representative of color-background saturation (Cd), with an indicator adjacent a portion of said first scale which is representative of a gray card, a second scale of said first set being on said first sliding member and having spaced apart indicia representative of preselected film ISO;

a second set of cooperating scales positioned on adjacent portions of said first sliding member and said second sliding member, a first scale of said second set being on said first sliding member and having spaced apart indicia representative of preselected camera lens f-stop (f_L), a second scale of said second set being on said second sliding member and having spaced apart indicia representative of total exposure factor ($Ef_L Ef_{bg}$);

a third set of cooperating scales positioned on adjacent portions of said second sliding member and said panel member, a first scale of said third set being on said second sliding member and having spaced apart indicia representative of said background-light working distance ($D_{bg\text{-}light}$), an index of said third set being on said panel member and being representative of a neutral-gray-background saturation coefficient (Dc) and a preselected background-light guide number (Gn) combined, whereby;

said background-light working distance ($D_{bg\text{-}light}$) is provided by sliding said first sliding member until said preselected color saturation (Cd) for said color-background aligns with said preselected film ISO, then sliding said second sliding member until said preselected camera lens f-stop (f_L) aligns with said total exposure factor ($Ef_L Ef_{bg}$), then ascertaining said background-light working distance ($D_{bg\text{-}light}$) opposite said index.

4,785,165

METHOD AND APPARATUS FOR IDENTIFYING, CUTTING AND PROCESSING DOCUMENTS

Robert R. Kruk, Crestwood, Ill., assignor to Inscerco Mfg. Inc., Crestwood, Ill.

Filed Jul. 9, 1987, Ser. No. 71,508
Int. Cl.[4] G06F *15/20*
U.S. Cl. 235—375 **11 Claims**

1. An apparatus including an inserting track for identifying, cutting and processing a plurality of coded documents comprising:

means for feeding paper sheets having a plurality of coded documents printed thereon;

register means for aligning the paper sheets;

first scanning means for determining the presence of a document and for reading the code from each document;

processor means to store code read from each document;

cutting means for separating the sheets into individual documents corresponding to the number of documents preprinted on the sheets;

collector means for receiving; storing and releasing the separated documents; and

means for transferring the separated documents onto the inserting track for further processing.

4,785,166

READER/WRITER FOR PORTABLE RECORDING MEDIUM WITH POWER SUPPLY ABNORMALITY DETECTION

Hidekiyo Kushima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

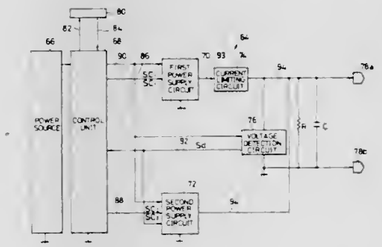
Filed May 5, 1986, Ser. No. 859,999
Claims priority, application Japan, Oct. 31, 1985, 60-245063
Int. Cl.[4] G06K *7/01, 7/06*
U.S. Cl. 235—441 **16 Claims**

1. A reader/writer for a portable recording medium which supplies operating power to a pair of contact terminals for the portable recording medium when connected to the portable recording medium, to carry out transfer of information between the portable recording medium and the reader/writer, comprising:

(a) power supplying means for supplying operating power to the portable recording medium;

(b) current limiting means connected in series to said power supplying means for limiting a power source current to be supplied to the pair of contact terminals for the portable recording medium;

(c) abnormality detection means coupled to the pair of contact terminals for detecting abnormality in the supply of operating power to the portable recording medium by



detecting the voltage between the pair of contact terminals; and

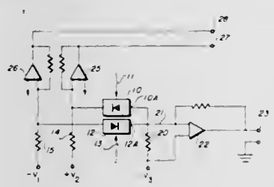
(d) switching and controlling means for switching the current limiting means, such that a first power source current is supplied from said power supplying means to the portable recording medium via said current limiting means following connection of the reader/writer to the portable recording medium, and such that a second power source current which is larger than the first power source current is supplied from said power supplying means to the portable recording medium by bypassing at least a portion of the current limiting means when no abnormality in the voltage between the pair of contact terminals is detected by said abnormality detection means.

4,785,167

PHOTODETECTOR HAVING CASCADED PHOTOELEMENTS

Benny A. Madrid, Albuquerque, N. Mex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1987, Ser. No. 90,198
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—214 A **6 Claims**



1. In a photodetection circuit having low common mode signal, the combination of:

first and second identical photodetectors each having an anode means and a cathode means with the anode means of the first photodetector being ohmically coupled to the cathode means of the second photodetector;

output circuit means electrically coupled to said anode means of the first photodetector and the cathode means of

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the second photodetector and an output means carrying a signal with no common mode noise; and

first and second individual output means respectively-electrically coupled to the cathode means of the first photodetector and the anode means of the second photodetector with the first and second individual output means not having said inherent common mode rejection.

4,785,168

DEVICE FOR DETECTING AND LOCALIZING NEUTRAL PARTICLES, AND APPLICATION THEREOF

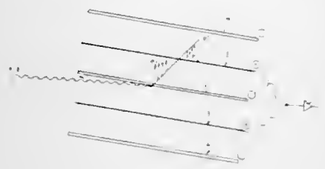
Mario Ruscev, Issy les Moulineaux; Irene Dorion, Paris, both of France, and Alain-Pierre Lilot, Liege, Belgium, assignors to Enertec, Montrouge, France

Filed Nov. 25, 1986, Ser. No. 934,975

Claims priority, application France, Dec. 4, 1985, 85 17915

Int. Cl.[4] G01T *1/185, 3/00*

U.S. Cl. 250—385.1 **33 Claims**



1. A device for detecting and localizing neutral particles comprising:

at least one sensor in the form of a gas-filled enclosure which is permeable to said neutral particles and which contains at least one converter capable of emitting ionizing particles under the impact of said neutral particles in order to give rise to charged particles by ionizing the gas, together with detecting means comprising charge multiplication means which are electrically polarized relative to said converter in such a manner as to attract said charged particles with sufficient force to give rise to an avalanche phenomenon, the device including the improvement wherein the particles propagating relative to said sensor following a predetermined average direction and the converter comprises a plate of solid material at an angle of less than 10° to said average direction and wherein said detecting means comprise a network of electrically conductive elongate charge collecting means which are substantially parallel to one another and to the plate of the converter, and which are connected to circuits for forming a one-dimensional image corresponding to the distribution of neutral particle intensity along a direction perpendicular to the projection on the plane of the converter plate of said average direction of particle propagation.

4,785,169

METHOD OF CORRECTING ERRORS IN HORIZON SENSORS CAUSED BY RADIANCE VARIATIONS

Richard A. Gontin, Rye, N.Y., assignor to Barnes Engineering Company, Shelton, Conn.

Filed Dec. 9, 1986, Ser. No. 939,905

Int. Cl.[4] G01J *1/34*

U.S. Cl. 250—340 **4 Claims**

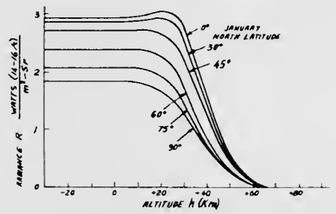
1. A method of correcting errors in the position of the earth's horizon as sensed by a horizon sensor caused by radiance variations which occur in accordance with the geographic location and season when the horizon sensor views the earth comprising the steps of:

viewing the earth with a first and second adjacent detector means in a horizon sensor mounted in a satellite orbiting the earth,

determining a first-order indication of the position of the earth's horizon from a first relationship between detector signals generated by said first and second detector means,

determining the radiance of the earth horizon using a different relationship between the detector signals generated by said first and second detector means,

computing a second-order correction to the earth's horizon position from a preestablished function of the earth's



horizon radiance which includes establishing a functional relationship between the secondary order correction to the earth's horizon position from a set of horizon profiles in the carbon dioxide band for different latitudes and seasons, and

deriving a corrected earth horizon position by applying said second-order correction to said first-order indication of the earth horizon position.

4,785,170

METHOD AND APPARATUS FOR THE ON-LINE MEASUREMENT OF TRANSMISSION OR REFLECTION ON MOVING OBJECTS IN THE RANGE OF DETECTABLE ELECTROMAGNETIC RADIATION

Wolfgang F. Witt, Clausthal-Zellerfeld, Fed. Rep. of Germany, assignor to Pantec Inc. -Büro Stephan Röthele, Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,611

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535515

Int. Cl.[4] G01J *3/50, 3/511*

U.S. Cl. 250—226 **13 Claims**



1. A method for photometrically determining optical properties of a test specimen, comprising the steps of:

transmitting through or reflecting from said test specimen a light beam having a range of detectable frequencies;

periodically interrupting said light beam prior to impingement thereof on said test specimen;

filtering said light beam, upon transmission thereof through or reflection thereof from said test specimen, to obtain essentially a single wavelength beam of light;

focusing said single wavelength beam, said single wavelength beam having an intensity determined in part by optical characteristics of said test specimen;

sensing said intensity of the focused single wavelength beam;

generating an electrical analog signal proportional to said intensity;

converting said analog signal to a digital signal;

sampling said digital signal during a period of continuous impingement of said light beam on said test specimen to obtain a plurality of sample intensity values, said step of

sampling occurring at a sampling frequency selected so that first and last sample intensity values of a predetermined number of consecutive ones of said sample intensity values are separated in time from one another by at most half of said period;

automatically calculating a first average intensity value from said consecutive ones of said sample intensity values;

further sampling said digital signal during a period of continuous interruption of said light beam substantially contiguous in time with said period of continuous impingement of said light beam to obtain a plurality of additional sample intensity values, said period of continuous interruption being at least as long as said period of continuous impingement, said step of further sampling occurring at said sampling frequency, whereby first and last sample intensity values of said predetermined number of consecutive ones of said additional sample intensity values are separated in time from one another by less than half of said period of continuous interruption;

automatically calculating a second average intensity value from said consecutive ones of said additional sample intensity values;

automatically calculating from said first average intensity value and said second average intensity value a background corrected light intensity value associated with said test specimen;

automatically calculating a quotient of said background corrected light intensity value and a predetermined background corrected reference light intensity value associated with said light beam at the wavelength of said single wavelength beam; and

wherein said focusing, sensing, generating, converting, sampling, calculating, further sampling and further calculating steps are preformed upon signals obtained from the same light path.

4,785,171

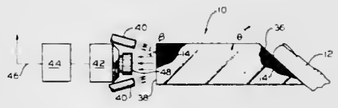
FINGERPRINT ACQUISITION SYSTEM WITH A FIBER OPTIC BLOCK

Robert F. Dowling, Jr., Woodstock, and Keith L. Knowlton, Brooklyn, both of Conn., assignors to Fingerprint Technology, Inc., Pomfret, Conn.

Filed Jan. 15, 1987, Ser. No. 3,615

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **26 Claims**



1. A characteristic pattern acquisition system comprising:

a fiberoptic block having a first end face for detecting a characteristic pattern placed thereon and a second imaging end face, the imaging end face being opposite the detecting end face for projecting an image of a characteristic pattern placed upon said detecting end face and for receiving light rays from a light source, said fiberoptic block comprising a bundle of optical fibers in adjacent parallel relationship having light ray-guiding cores, the optical fibers having opposite free end faces terminating in and forming said detecting and imaging end faces, respectively, the individual optical fiber detecting end faces each being angled such that when there is present outside the fiber detecting end face a medium, having an index of refraction less than that of the fiber core, parallel light rays in said fiber core are prevented from exiting through the fiber detecting end face while at least a portion of non-parallel light rays in said fiber core are permitted to internally reflect at the fiber detecting end face and reverse direction in said fiber;

a light source directed through the imaging end face of the fiberoptic block to illuminate a characteristic pattern placed upon the detecting end face of the fiberoptic block, and

means directed toward the imaging end face of the fiberoptic block for electronically transmitting said image of a characteristic pattern placed upon said fiberoptic block detecting end face.

4,785,172

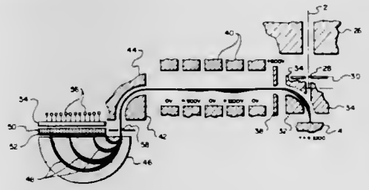
SECONDARY ION MASS SPECTROMETRY SYSTEM AND METHOD FOR FOCUSED ION BEAM WITH PARALLEL ION DETECTION

Randall L. Kubena, Agoura, and John W. Reeds, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 29, 1986, Ser. No. 947,153

Int. Cl.[4] H01J *37/252*

U.S. Cl. 250—309 **16 Claims**



1. A secondary ion mass spectrometry system for rapidly and comprehensively detecting and categorizing the secondary ions produced by a focused ion beam striking a target, comprising:

a mass separator for spatially separating the secondary ions in accordance with their respective masses,

a sensor array adapted to simultaneously sense the presence of mass separated secondary ions at intervals corresponding to mass separations no greater than about one atomic mass unit per interval within a predetermined range of ion masses, said sensor array comprising an array of spatially discrete charge collectors, said charge collectors corresponding to respective secondary ion masses at said intervals and positioned to sense the presence of secondary ions of said respective masses, and

a decoding means responsive to the sensor array for determining the masses of the secondary ions sensed by the array as a function of the location of the mass separated seconary ions, said decoding means comprising a plurality of output lines which are fewer in number than the number of charge collectors, and circuit means coupling each charge collector to a unique set of output lines, whereby a unique set of outputs is produced over said output lines for each different mass of secondary ion sensed by the sensor array,

the decoding means having a responsivity which is faster than the anticipated time interval between the arrival of successive secondary ions.

4,785,173

ELEMENT ANALYZING APPARATUS

Yoshiro Shiokawa, Fuchu, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,843

Int. Cl.[4] H01J *49/00*

U.S. Cl. 250—309 **6 Claims**

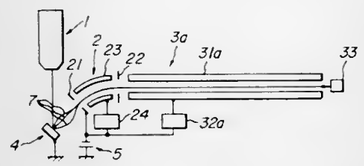
1. An element analyzing apparatus comprising:

a secondary ion excitation source;

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an ion optical system;

a mass spectrometer, said mass spectrometer being a quadrupole mass spectrometer having a construction fulfilling a relation $(L \times F)^2 > 0.2$, where L is a length of a quadrupole of the spectrometer and F is a frequency; and



means of accelerating secondary ions emitted from a sample and effecting the same to pass through said ion optical system and said quadrupole mass spectrometer under a condition with an energy more than a single secondary ion energy constant in addition to an energy of said secondary ions when emitted from said sample.

4,785,174

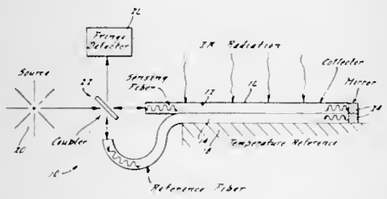
INTERFEROMETRIC THERMAL DETECTOR

Steven E. Hodges, Eugene, Oreg., and Gregory L. Tangonan, Oxnard, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jan. 28, 1987, Ser. No. 8,216

Int. Cl.[4] G01J *5/48*

U.S. Cl. 250—338.1 **15 Claims**



1. A method of detecting radiated thermal energy while being substantially unresponsive to convected or conducted thermal energy, said method comprising:

(a) introducing a coherent light source of a given frequency into proximal ends of a sensing optical fiber and a reference optical fiber;

(b) placing both fibers substantially in the same ambient environment so that both fibers are subjected to heating by convection or conduction in essentially the same amounts while permitting only the sensing fiber to be subjected to radiated thermal energy, the other fiber being shielded therefrom;

(c) recombining optical signals from the fibers; and

(d) interferometrically sensing changes in fringe patterns created by the recombined optical signals, the presence of radiated energy causing characteristics of the sensing fiber to become altered so as to change the fringe pattern.

4,785,175

INSPECTION OF BURIED PIPELINES

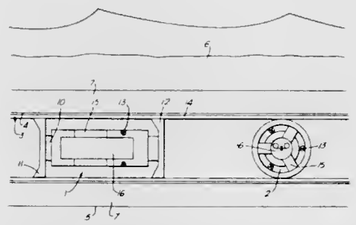
Malcolm R. Wormald, Abingdon; Lionel G. Sanders, Berick Salome, and Colin G. Clayton, Shippon, all of United Kingdom, assignors to British Gas plc, London, United Kingdom

Continuation of Ser. No. 676,256, Nov. 29, 1984. This application May 4, 1987, Ser. No. 45,205

Claims priority, application United Kingdom, Nov. 30, 1983, 8331914

Int. Cl.[4] G01V *5/10*

U.S. Cl. 250—360.1 **11 Claims**



1. A method of determining the integrity of material in covering or supporting relationship with a buried pipeline from recorded data obtained from a single run of a pig through said pipeline, said pig comprising source means which emits output radiation and said run of said pig causing interactions between said output radiation and said material all around said pipeline, which interactions produce ionizing radiation directed toward said pig, said pig further comprising shield material, a longitudinal axis, and detectors arranged around said axis and producing first data in response to said ionizing radiation, said detectors being shielded by said shield material so that each of said detectors responds primarily to said ionizing radiation from those of said interactions arising anywhere in a respective one of a number of view fields each extending part way around said pipeline, said first data from each said detector being representative of said ionizing radiation from said interactions in said respective field, said method further comprising, as said pig advances through said pipeline, recording in said pig for each said detector respective data to produce said recorded data, and recording in said pig second data representative of the position of said pig along said pipeline.

4,785,176

ELECTROSTATIC-MAGNETIC LENS FOR PARTICLE BEAM APPARATUS

Juergen Frosien, Ottobrunn, and Erich Plies, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 27, 1987, Ser. No. 30,964

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613915

Int. Cl.[4] H01J *49/06*

U.S. Cl. 250—396 ML **16 Claims**

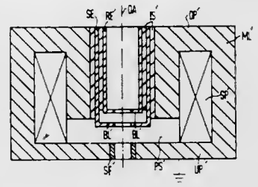
1. An electrostatic-magnetic lens for a particle beam apparatus, comprising:

a magnetic lens having an upper and a lower pole piece;

an electrostatic immersion lens superimposed on said magnetic lens and comprising:

a first electrode arranged in a region of said upper pole piece and means for applying a first potential to said first electrode, and

a second electrode and means for charging said second electrode with a second potential to generate an electrical field in said electrostatic immersion lens so that a



particle beam in said electrical field is decelerated from a first energy to a second lower energy.

4,785,177

KINEMATIC ARRANGEMENT FOR THE MICRO-MOVEMENTS OF OBJECTS

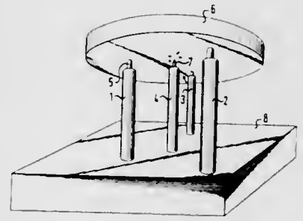
Karl-Heinz Besocke, Julich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,336

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610540

Int. Cl.[4] G21K *5/10*

U.S. Cl. 250—442.1 **13 Claims**



1. Micromanipulator for the micro-movement of objects, for imparting relative microscopic movements between the micromanipulator and objects which are to be examined or treated microscopically; comprising at least one kinematic element positioned for supporting or being supported by said object, said at least one kinematic element being constituted from a piezoelectric material and being deformable through the application of electrical voltages, at least a portion of said at least one kinematic element being hollow-cylindrical; support means for said object being located at one end surface of said at least one element; and a closed, continuous electrically-conductive coating being provided on one cylindrical surface of said at least one hollow-cylindrical kinematic element, and a plurality of electrically-conductive part coatings, which are electrically insulated relative to each other, being provided on the other cylindrical surface.

4,785,178

DRY STORAGE IRRADIATOR STRUCTURE

Patrick A. Lynch, 667 E. Sequim Bay Rd., Sequim, Wash. 98382; Douglas Jones, 11618 - 20th SE., Everett, Wash. 98205; Robert Franklin, 31517 37th Ave. SW., Federal Way, Wash. 98003, and James M. Cobb, 658 SW. 134th St., Seattle, Wash. 98146

Filed May 27, 1986, Ser. No. 866,701

Int. Cl.[4] G21F *5/02*

U.S. Cl. 250—497.1 **5 Claims**

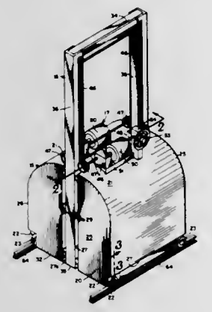
1. A transportable, self-contained irradiator comprising, in combination:

a body, formed of rigid radiation shielding material,

said body having a flat base and means to aid locomotion over an underlying supportative surrface, and

defining an internal radiator chamber extending upwardly into the body from an external orifice in the flat base, said orifice accepting a radiation source cavity type plug to aid in preventing passage of radiation therethrough,

said radiator source cavity plug having a labyrinth structure in its lower portion to sealably interfit with labyrinth structure of the external orifice of the internal radiator chamber, said cavity plug having



support means extending upwardly from the labyrinth structure to releasably carry at least one radiation source, said support means fitting within the radiator chamber defined in the irradiator body; and

mechanical means of moving the said cavity plug from a shielded position wherein it is completely contained within the radiation source cavity downwardly to a position wherein the radiation source is exposed at a spaced distance below the flat base of the irradiator body.

4,785,179

RADIATION PHOTOGRAPHING AND READING APPARATUS

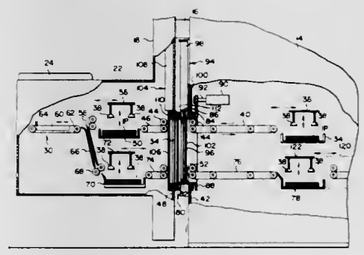
Kenji Iwasaki, Utsunomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 659,314, Oct. 10, 1984, abandoned. This application Jun. 10, 1987, Ser. No. 57,665

Claims priority, application Japan, Oct. 11, 1983, 58-190342

Int. Cl.[4] G01J *1/42;* **G03C** *5/16*

U.S. Cl. 250—372 **12 Claims**



1. A radiation photographing and reading apparatus for producing images of an object, said apparatus comprising:

an unexposed radiation image converting plate for absorbing X-ray energy in relation to the image of the object to become an exposed plate, said exposed plate emitting the

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absorbed energy as a stimulable light when exposed to a light beam;

a radiation photographing device for radiation photographing the object, said radiation photographing device including first photographing device transfer means for placing said unexposed plate in a photographing position for radiation photographing the object, a movable base, a radiation tube for providing said X-ray energy to said base, and a photographing housing mounted on said base and facing said radiation tube, said photographing housing being disposed to move together with said base, said photographing housing containing a holder for said unexposed plate to face said radiation tube for irradiation of said plate with said X-ray energy, and said photographing housing including a first wall having a first opening;

a reading device fixedly disposed adjacent to and spaced from said radiation photographing device for reading said exposed plate by scanning said exposed plate with said light beam, said reading device detecting and converting into an electric signal said stimulable light emitted from said exposed plate by scanning said exposed plate with said light beam, said electric signal corresponding to a fluoroscopic image of the object, said reading device including first reading device transfer means spaced from and aligned to cooperate with said first photographing device transfer means for transferring said plate from said reading device to said first photographing device transfer means, feed means for transporting said exposed plate to said first reading device transfer means, and a housing, said reading device housing including a second wall spaced from, adjacent to and substantially parallel with said first wall of said photographing housing, said second wall including a second opening aligned with said first opening; and

coupling means movable along a direction substantially perpendicular to said first and second walls and enclosing said first and second openings for coupling said photographing housing to said reading device housing, said coupling means including shielding means for preventing said unexposed plate and said exposed plate from being exposed to external light while said plate is being transferred between said first and second openings by said first photographing device transfer means and said first reading device transfer means, and said coupling means further including resilient means to absorb shock and vibration from said radiation photographing device to prevent said shock and vibration from being transmitted to said reading device.

4,785,180

OPTOELECTRONIC SYSTEM HOUSED IN A PLASTIC SPHERE

Johannes Dietrich, Gilching, and Georg Plank, Herrsching, both of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft-und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Apr. 1, 1987, Ser. No. 33,512

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611337

Int. Cl.[4] G01D *5/34*

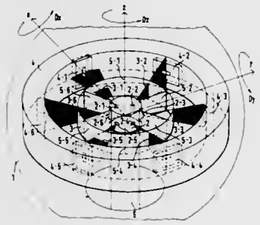
U.S. Cl. 250—231 R **3 Claims**

1. An optoelectronic system housed in a plastic sphere allowing for the simultaneous input of six displacement components, consisting of three displacements and three angular rotations in or around the three axes of a Cartesian system of coordinates, the optoelectronic system comprising:

at least six light-emitting devices arranged in a plane at equal angular displacements from each other;

a fixed slit diaphragm arranged in series with each of said at least six light-emitting devices;

a position-sensitive sensor having two output currents is arranged in series with each of said at least six light-emitting devices and corresponding slit diaphragms, the axis of each position-sensitive sensor being aligned orthogonally to the direction of the slit of the corresponding slit diaphragm, said light emitting devices with their corresponding slit diaphragms being adapted to move with respect to the position-sensitive sensors; and



an electronic controller for driving the individual light-emitting devices is allocated to each sensor so as to ensure the sum of the two outpt currents flowing out of the respective position-sensitive sensor to a constant and equal valve for all six systems and to also regulate the radiant intensity of the light-emitting devices.

4,785,181

MEASURING DEVICE FOR DETERMINING EXTENT AND DIRECTION OF RELATIVE MOVEMENT BETWEEN TWO OBJECTS HAVING MODULATION SECTION

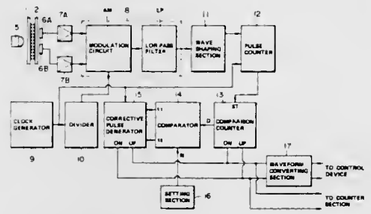
Norio Kimizuka, and Mituyosi Abo, both of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Dec. 1, 1986, Ser. No. 936,327

Claims priority, application Japan, Dec. 4, 1985, 60-273857

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—237 G **5 Claims**



1. A measuring device two output signals different in phase by 90° generated from a scale section which generates one signal every unit length movement of an object to be measured, to thereby detect the amount and direction of movement of said object, comprising:

a light source for radiating a light of constant level;

a photoelectric transfer section for receiving the light projected from said light source through a scale section which includes a pair of optical scales and for generating two output signals different in phae by 90° due to relative movement of said optical scales;

a carrier generating section for generating a carrier signal having a frequency higher than that of said two output signals of said scale section;

a modulation and addition section for carrying out modulation of said two output signals generated from said scale section by means of said carrier signal generated from said carrier generating section and for carrying out addition of at least said output signals to generate a modulated signal containing the amount of movement of said object as a phase component; and

a counting section for counting the number of clocks of a predetermined cycle contained in one cycle of said modulated signal generated from said modulation and addition section.

4,785,182

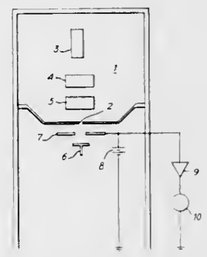
SECONDARY ELECTRON DETECTOR FOR USE IN A GASEOUS ATMOSPHERE

James F. Mancuso, Rowley; William B. Maxwell, Dracut, both of Mass., and Gerasimos D. Danilatos, North Bondi, Australia, assignors to ElectroScan Corporation, Danvers, Mass.

Filed May 21, 1987, Ser. No. 52,700

Int. Cl.[4] H01J *37/252*

U.S. Cl. 250—310 **13 Claims**



1. A device for generating, amplifying and detecting secondary electrons from a surface of a sample which comprises:

(a) a vacuum envelope having a pressure limiting aperture;

(b) a charged particle beam source located within the vacuum envelope and capable of emitting a charged particle beam;

(c) focusing means located within the vacuum envelope and capable of directing a charged particle beam emitted by the charged particle beam source through the pressure limiting aperture;

(d) sample platform means, disposed outside the vacuum envelope, capable of maintaining a sample enveloped in gas at a pressure of at least 0.05 torr in registration with the pressure limiting aperture such that a surface of the sample may be exposed to a charged particle beam emitted from the charged particle beam source and directed through the pressure limiting aperture;

(e) an electrode disposed outside of the vacuum envelope and positioned within between about 1 and about 200 mm from the sample platform means such that secondary electrons emitted from a surface of a sample located on the sample platform means and exposed to a charged particle beam emitted from the charged particle beam source may come into contact with it;

(f) a voltage source, connected between the electrode and an electrical ground, capable of maintaining an electrical potential difference between the electrode and the sample platform means of greater than about 50 volts and less than about 2000 volts, the electrode potential being positive relative to the sample platform means potential so as to accelerate secondary electrons emitted from a surface of a sample located on the sample platform means with an electric field of sufficient strength so as to cause emitted secondary electrons to collide with gas molecules and produce negative charge carriers which can subsequently produce additional negative charge carriers through multiple collisions with other gas molecules resulting in a number of negative charge carriers greater than and proportional to the number of original secondary electrons, the strength of the electric field being sufficiently low so as to avoid catastrophic electrical discharging or arcing;

(g) a current amplifier connected to the electrode; and

(h) current detection means connected between the current amplifier and an electrical ground.

4,785,183

METHOD FOR READING RADIATION IMAGE INFORMATION

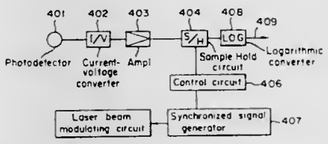
Hisanori Tsuchino; Akiko Kano; Kuniaki Nakano; Koji Amitani, and Fumio Shimada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1986, Ser. No. 907,658

Claims priority, application Japan, Sep. 18, 1985, 60-207599; Mar. 24, 1986, 61-65351

Int. Cl.[4] G01N *23/04*

U.S. Cl. 250—327.2 **7 Claims**



1. In a radiation image information reading method comprising scanning a stimulating ray over a radiation image converting panel surface to obtain radiation image information stored on said radiation image converting panel, said radiation image converting panel having a plurality of picture elements which contain image information, each of said picture elements including a stimulable phosphor which performs an emission when subjected to irradiation by a stimulating ray,

the improvement comprising:

performing scanning of said stimulating ray over said panel while repeating successively irradiation by said stimulating ray and stopping of said stimulating ray over said panel for every picture element of said panel; and

reading the stored radiation image information from said panel by detecting an image signal only during periods of irradiation by the stimulating ray.

4. In a radiation image information reading method comprising scanning a stimulating ray over a radiation image converting panel surface to obtain radiation image information stored on said radiation image converting panel, said radiation image converting panel having a plurality of picture elements which contain image information, each of said picture elements including a stimulable phosphor which performs an emission when subjected to irradiation by a stimulating ray,

the improvement comprising:

performing scanning of said stimulating ray over said panel while repeating successively irradiation by said stimulating ray and stopping of said stimulating ray over said panel; and

determining a difference between image signals read during periods of irradiation by said stimulating ray and periods of stopping of said stimulating ray, and generating said image information as a function of said determined difference.

4,785,184

INFRARED TRACE ELEMENT DETECTION SYSTEM

Fritz Bien, Concord; Lawrence S. Bernstein, Bedford, and Michael W. Matthew, Burlington, all of Mass., assignors to Spectral Sciences, Inc., Burlington, Mass.

Filed May 27, 1986, Ser. No. 866,891

Int. Cl.[4] G01N *21/61*

U.S. Cl. 250—343 **23 Claims**

1. An infrared trace element detection system comprising:

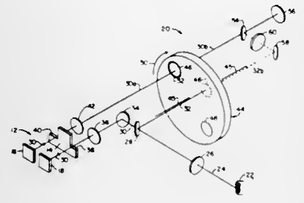
an optical cell;

means for introducing to and removing from said optical cell a sample fluid to be examined;

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means for introducing to said optical cell a sample beam of infrared radiation including a first wavelength band which is significantly absorbed by the trace element and a second wavelength band which is not significantly absorbed by the trace element for passage through said optical cell a number of times through the sample fluid;

a detector for selectively detecting in said first and second wavelength bands the output intensities of said sample beam of radiation from said optical cell and the intensities of a reference beam of said radiation;



means, responsive to said means for selectively detecting, for normalizing the sensed output intensity of the sample beam in one of said first and second wavelength bands with respect to the other; means, responsive to said means for selectively detecting, for normalizing the sensed intensity of the reference beam of radiation in one of said first and second wavelength bands with respect to the other;

means for comparing the normalized output intensity and the normalized reference intensity; and

means, responsive to said means for comparing, for determining the amount of trace element in the sample fluid.

4,785,185

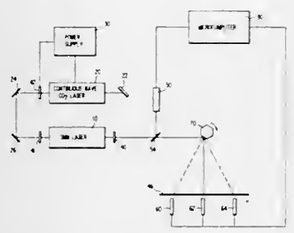
SUBMILLIMETER LASER MEASUREMENT OF WATER OR FILLER CONTENT OF SHEETS AND BANDS OF DIELECTRIC MATERIAL

Jerald R. Izatt, Northport, Ala., and Russell Boulay, Cap-Rouge, Canada, assignors to The University of Alabama, Tuscaloosa, Ala.

Continuation-in-part of Ser. No. 730,734, May 6, 1985. This application Oct. 29, 1986, Ser. No. 924,273

Int. Cl.[4] G01F *23/00*

U.S. Cl. 250—358.1 **8 Claims**



1. An apparatus for measuring the moisture content of a sheet or band of dielectric material, comprising:

at least one submillimeter laser pumped by a single CO_2 laser for outputting a beam of submillimeter wavelength radiation;

means for scanning said beam across the width of one face of said sheet or band;

detector means positioned opposite said sheet or band from said beam for receiving the portion of said scanning beam which is transmitted through said sheet or band and for outputting transmittance signals;

processing means for receiving said transmittance signals and for calculating the moisture content of said sheet or band wherein the spatial distribution of water content within said sheet or band of dielectric material can be measured with a maximum spatial resolution of approximately 1 millimeter.

4,785,186

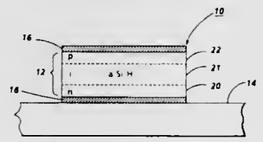
AMORPHOUS SILICON IONIZING PARTICLE DETECTORS

Robert A. Street, Palo Alto; Victor P. Mendez, Berkeley, and Selig N. Kaplan, El Cerrito, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 21, 1986, Ser. No. 921,302

Int. Cl.[4] G01T *1/24*

U.S. Cl. 250—370.14 **17 Claims**



1. A particle detector having a body portion for detecting high energy ionizing particles moving in a path toward said detector where, upon penetration into said detector body portion, form electron-hole pairs and comprising:

a substrate,

first electrode means formed on said substrate,

an a—Si:H film deposited on said first electrode,

said a—Si:H film comprises three monolithic, contiguous regions consecutively comprising an a—Si region doped to be a first conductivity type, an intrinsic region of a—Si and an a—Si region doped to be a second conductivity type,

second electrode means formed over said a—Si:H film,

means to increase the sensitivity to a level sufficient to detect single ionizing particles as they individually impact said detector body portion by increasing the collection efficiency of said a—Si:H film intrinsic region to have a low trap density below 1×10^{16} $cm^{-3}ev^{-1}$ with a large film thickness above 1 μm and operative at voltages above 50 volts per μm, and

means to collect said electron-hole pairs and indicate the number and energy level of said ionizing particles.

4,785,187

ALIGNMENT DEVICE

Takao Kariya, Akikawa; Susumu Goto, Hachiohji, and Masahiko Okunuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 073,308, Jul. 13, 1987, abandoned, which is a continuation of Ser. No. 935,127, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 713,560, Mar. 19, 1985, abandoned. This application Dec. 15, 1987, Ser. No. 134,532

Claims priority, application Japan, Mar. 27, 1984, 59-57211

Int. Cl.[4] H01J *37/20*

U.S. Cl. 250—491.1 **6 Claims**

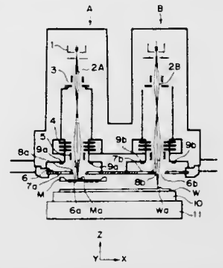
1. An alignment device comprising:

a reference having a reference mark for use in the alignment of an object:

means including an electron beam for scanning said reference mark and an alighment mark provided on the object;

means for detecting electrons from said reference mark and

from the alignment mark scanned with the electron beam; and



means for moving the object relative to the reference on the basis of the electron detection performed by said detecting means.

4,785,188

PRIMARY PARTICLE BEAM IRRADIATION APPARATUS AND METHOD OF IRRADIATION THEREOF

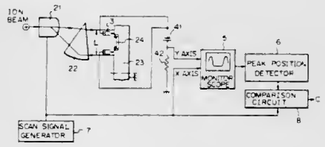
Haruhisa Mori, Yokohama; Tadayuki Kojima, Kawasaki; Satoshi Hasui, Machida, all of Japan; Hiroshi Ohmori, Peabody, Mass., and Shuji Kikuchi, Kumamoto, Japan, assignors to Fujitsu Limited, Kanagawa and Tokyo Electron Limited, Tokyo, both of, Japan

Filed Sep. 29, 1987, Ser. No. 102,448

Claims priority, application Japan, Sep. 30, 1986, 61-229969

Int. Cl.[4] H01J *37/304*

U.S. Cl. 250—492.2 **17 Claims**



1. A primary particle beam irradiation apparatus comprising:

a stage on which a target is placed;

means for irradiating a predetermined scan region on the stage with a primary particle beam;

a secondary ion sensor which selectively detects secondary ions generated at a predetermined irradiation position of said primary particle beam on said stage or the target; and

means, connected to said irradiating means and said secondary ion sensor, for controlling said irradiating means on the basis of an output signal from said secondary ion sensor.

4,785,189

METHOD AND APPARATUS FOR LOW-ENERGY SCANNING ELECTRON BEAM LITHOGRAPHY

Oliver C. Wells, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 728,122, Apr. 29, 1985, abandoned. This application Feb. 19, 1988, Ser. No. 159,459

Int. Cl.[4] H01J *37/317*

U.S. Cl. 250—492.2 **10 Claims**

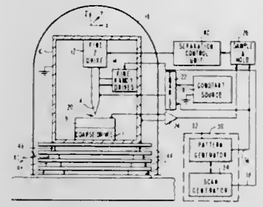
1. A lithographic apparatus for exposure of an electron-sensitive resist layer by low energy electrons, said apparatus comprising:

a workpiece spaced from a pointed electrode,

an electron-sensitive resist layer having a thickness of at least about 10 nm located on said workpiece, said resist layer facing said pointed electrode,

electron exposure means for providing low energy electrons to chemically modify selected areas of said resist layer to create a pattern of exposed regions therein, said electron means including:

a pointed electrode the apex of which points towards said electron-sensitive resist layer,



means for providing a flow of electrons having energies less than 1000 eV from said pointed electrode to said electron-sensitive resist layer,

means for scanning said pointed electrode with respect to said workpiece, and

means for positioning said pointed electrode a distance from said electron-sensitive resist layer not exceeding 1000 nm.

4,785,190

IRRADIATION DEVICE

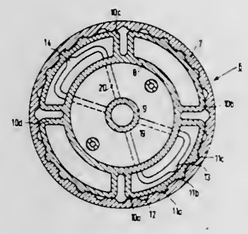
Johannes A. Frankena, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1987, Ser. No. 106,480

Claims priority, application Netherlands, Oct. 15, 1986, 8602584

Int. Cl.[4] G21K *5/00*

U.S. Cl. 250—503.1 **3 Claims**



1. An irradiation device having a housing accommodating at least one radiation source, which housing is pivotably secured to suspension members on two sides located substantially opposite each other, and which housing can be fixed in given positions with respect to the suspension members, characterized in that each pivot is composed of two co-operating concentric rings secured to the housing and to the suspension member, respectively, the facing walls of the rings being provided with series of regularly spaced co-operating projections and recesses, at least one of the rings being slightly deformable in the radial direction.

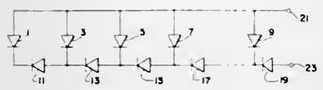
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4,785,191

INTERCONNECTED ARRAY OF PHOTOSENSORS FOR SIMULTANEOUSLY SENSING LIGHT INTENSITIES AT EACH OF A NUMBER OF LOCATIONS

Miroslav Ondris, Chagrin Falls, Ohio, assignor to Stemcor Corporation, Cleveland, Ohio

Filed Apr. 17, 1987, Ser. No. 40,532
Int. Cl.[4] H01L *27/14*
U.S. Cl. 250—578 **21 Claims**



1. An array for sensing the intensity of electromagnetic radiation at each of a plurality of locations comprising:

a plurality of photoresponsive means for electrically responding to incident radiation, each photoresponsive means having a first terminal of a first polarity and a second terminal of a second polarity opposite to said first polarity; and

a plurality of non-photoresponsive means for conducting current more readily in one direction than the other and for substantially not responding electrically to incident radiation, each non-photoresponsive means having a third terminal of said first polarity and a fourth terminal of said second polarity,

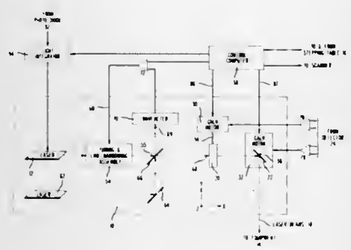
wherein said first terminals of said photoresponsive means are all electrically connected together to form one terminal of said array, and each of said second terminals of said photoresponsive means is electrically connected to a said fourth terminal of one of said non-photoresponsive means, said plurality of non-photoresponsive means being electrically connected in like-polarity series, a said third terminal of a non-photoresponsive means at one end of said series-connected string of non-photoresponsive means forming a second terminal of said array.

4,785,192

MAINTAINING OPTICAL SIGNALS IN PRESCRIBED ALIGNMENT WITH RESPECT TO WORKPIECE IN MOVABLE EQUIPMENT

John H. Bruning, Brookside, N.J., assignor to American Telephoce and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 862,475, May 12, 1986, Pat. No. 4,703,166, which is a division of Ser. No. 623,247, Jun. 21, 1984, abandoned. This application Jun. 12, 1987, Ser. No. 60,876
Int. Cl.[4] G01N *21/86*; G01V *9/04*
U.S. Cl. 250—548 **13 Claims**



1. An optical system, comprising:

a source of electromagnetic radiation;

equipment, including apparatus adapted to support a workpiece, said apparatus being physically separated from said source and said equipment being characterized by an axis which is nonparallel to a surface of said apparatus;

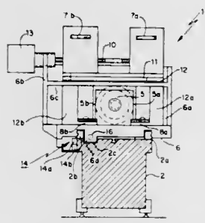
directing means for directing at least a portion of the radiation emitted by said source to said workpiece, said directing means including aligning means for maintaining a desired alignment between the directed radiation and said axis even during relative motion between said source and said equipment.

4,785,193

PROCESS AND APPARATUS FOR DETERMINATION OF DIMENSIONS OF AN ELONGATED TEST OBJECT

Hans-Ulrich Dassler, Oberschleissheim; Rudiger Haas, Faistenbaar, and Gerhard Löffler, Munich, all of Fed. Rep. of Germany, assignors to OEM Messtechnik GmbH, Fed. Rep. of Germany

Filed Jun. 13, 1986, Ser. No. 874,335
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1985, 3521260
Int. Cl.[4] G01B *11/08*
U.S. Cl. 250—560 **6 Claims**



1. A method for determining dimensions of a shaft-like test object comprising the steps of:

(1) individually illuminating diametrically opposed contour points of a test object by line-shaped light sources;

(2) reproducing said contour points by detecting an intensity variation in a projected linear image of said test object on lines of photodiodes associated with each of said line-shaped light sources;

(3) continuously determining a distance between said lines of photodiodes in the form of electrical signals; and

(4) utilizing the electrical signals and said detected intensity variations in order to calculate the distance between said contour points.

4,785,194

MULTIPLE SWITCH CONTROL SYSTEM

Morton S. Gottlieb, Rockville, Md., assignor to Izumi Corporation Industries, Inc., Patchogue, N.Y.

Continuation-in-part of Ser. No. 847,272, Apr. 2, 1986, Pat. No. 4,737,656. This application Mar. 12, 1987, Ser. No. 25,190
Int. Cl.[4] H02J *1/00*
U.S. Cl. 307—10 R **4 Claims**

1. A control system for controlling accessory equipment in a motor vehicle wherein control switches are located in the hub of a steering wheel of said motor vehicle remote from a control circuit network, said control system including:

(a) a source of power and a return;

(b) a first voltage divider including at least a first resistance and a common junction between said source of power and said return;

(c) a second voltage divider including at least a plurality of resistors in series connection between said source of power and said return;

(d) a plurality of substantially identical parallel circuits connected sequentially between said source of power and said return, each circuit of said plurality of circuits including a first input, a second input, a comparator, a logic gate, a switch and a load;

(e) said first input of each said circuit connected to said common junction for applying a first voltage to said comparator of each said circuit;

(f) said second input of each said circuit connected to said second voltage divider for applying a second voltage to said comparator of each circuit such that the value of said second voltage applied to the respective comparator is different from the value of that voltage applied to adjacent comparators as a function of the sequential position of the circuit along said second voltage divider;

(g) each said circuit of said plurality of circuits, except the first circuit of said plurality of circuits positioned along said second voltage divider further including one inverter, said inverter connected between the output of said comparator and one of the inputs of said logic gate of the parallel circuit in the higher adjacent position along said second voltage divider;

(h) a plurality of resistance elements equal in number to the number of circuits in said plurality of circuits and connected in parallel connection to each other and each resistance element of said plurality of resistance elements con-

nected in series connection between said common junction and said return for changing the value of said first voltage when one or the other of said resistance elements is electrically inserted between said common junction and said return;

(i) said switch of each said circuit having a normally open condition and a closed condition, driven to a closed condition in response to an output from a logic gate of the circuit of which each component is a part, said switch for electrically closing an electric circuit to at least one acessory of said accessory equipment of said motor vehicle when said switch is in said closed condition; and,

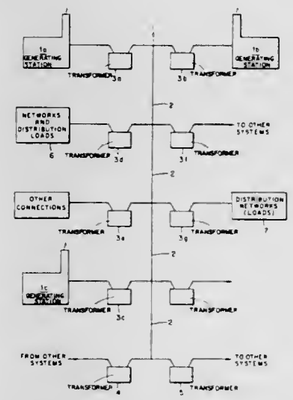
(j) a plurality of switch means equal in number to the number of resistance elements in said plurality of resistance elements and connected in parallel with each other and each switch of said plurality of switch means connected in series with at least one of said resistance elements of said plurality of resistance elements and each said switch of said plurality of switch means connected to said return for electrically inserting a different resistance element each into said first voltage divider for driving one circuit of said plurality of substantially identical, parallel circuits for controlling at least one accessory of said accessory equipment.

4,785,195

POWER LINE COMMUNICATION

Robert W. Rochelle; Fred W. Symonds, both of Knoxville, and Raymond K. Adams, Oak Ridge, all of Tenn., assignors to University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Jun. 1, 1987, Ser. No. 56,869
Int. Cl.[4] H04M *11/04*
U.S. Cl. 307—18 **18 Claims**



1. Apparatus for use in a power generating system comprising a generating station having at least one generator and load wherein power is generated at a nominal standard frequency and wherein said standard frequency varies with applied generation and load, comprising:

A. signal generating means for producing binary encoded electrical signals representing information;

B. means including at least one controller responsive to the application of said binary encoded electrical signals for pulse-code modulating the frequency of the power generating system to produce binary encoded information in the power system frequency corresponding to the binary encoded electrical signals;

C. interconnecting means interconnecting said at least one generator with said at least one load; and

D. receiving means connected to said interconnecting means for detecting said pulse-code modulation of the frequency of the power generating system and for decoding said binary encoded information to produce electrical signals representing said information.

4,785,196

METHOD AND APPARATUS FOR CONVERTING SEISMIC TRACES TO SYNTHETIC WELL LOGS

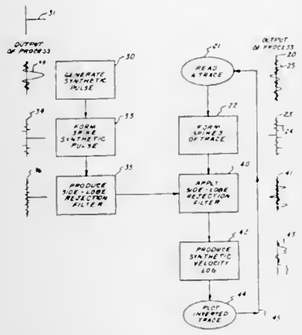
John T. Reed, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 7, 1983, Ser. No. 473,128
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—73 **9 Claims**

1. A method of producing an improved synthetic velocity log comprising the steps of producing a filter function which converts a synthetic pulse of predetermined bandwidth to an approximation of a spike function, producing a seismic trace, converting the seismic trace to a spike trace having spikes

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denoting the amplitudes of peaks and troughs, convolving the spike trace with the filter function to produce an output trace



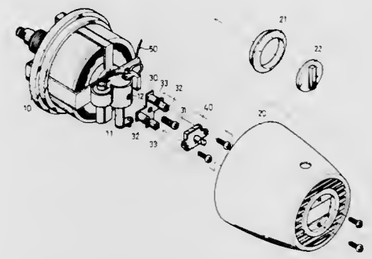
with enhanced high frequency content, and producing a synthetic velocity log from the output trace.

4,785,197
TILT SWITCH
Angel P. Bezos, Montgomery County, Md.; Emilio A. Fernandez, Fairfax County, Va., and James F. Shockley, Montgomery County, Md., assignors to Pulse Electronics, Inc., Rockville, Md.
Filed Aug. 20, 1987, Ser. No. 87,333
Int. Cl.[4] G08B *21/00*
U.S. Cl. 307—116 **8 Claims**



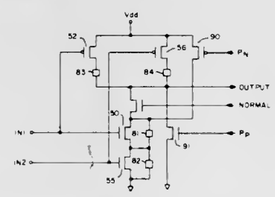
1. A gravity operated switching circuit for controlling the power supplied to a battery powered monitoring and signalling system having a microprocessor for controlling said monitoring and signalling functions comprising:
- a tilt switch which is open in a first orientation of said monitoring and signalling system and closed in a second orientation of said monitoring and signalling system, said tilt switch being gravity operated;
- timing means independent of said microprocessor connected to said tilt switch for providing a first control level with a first predetermined time constant when said tilt switch changes from a closed to an open condition and providing a second control level with a second predetermined time constant when said tilt switch changes from an open to a closed condition; and
- switched power supply means connected to said timing means for controlling the supply of electrical power to said battery powered monitoring and signalling system in response to said first and second control levels.

4,785,198
STRUCTURE OF FIXED DEVICE OF FAN SWITCH
Hsu Chin-Hsiang, 91, Lane 211, Chung Yiang Rd., Chung Ho Tsun, Long Chin Hsian, Taichung Hsien, Taiwan
Filed Feb. 19, 1988, Ser. No. 157,885
Int. Cl.[4] H01H *9/00*
U.S. Cl. 307—154 **1 Claim**



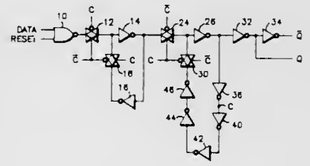
1. An improved structure of a fixed device of fan switch, composed of a motor, fan switch fixing plate having at least four supporting rods, fan switch, plastic back cover, index dial, and rotating switch, characterized in that:
- said fixing plate being fixed to a steering gear box at the rear end of the motor, said fan switch being fixed to the fixing plate by means of two of the supporting rods of the fixing plate, and said plastic back cover being fixed to the fixing plate through the other two supporting rods of the fixing plate in a position posterior to said fan switch so as to let the motor, the fixing plate, the fan switch and the plastic back cover be firmly fixed together as an integrated unit to complete the triple fixing of the fan switch fixed device to facilitate the assembly of the fan and the maintenance of the same.

4,785,199
PROGRAMMABLE COMPLEMENTARY TRANSISTORS
Avinoam Kolodny, Cupertino, and Yigal Brandman, Stanford, both of Calif., assignors to Stanford University, Stanford, Calif.
Division of Ser. No. 555,898, Nov. 28, 1983. This application Sep. 22, 1986, Ser. No. 910,322
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] H03K *19/02, 19/094, 19/173, 19/20*
U.S. Cl. 307—202.1 **3 Claims**



1. A logic gate comprising
- a first field effect transistor and a first variable resistance device connected in parallel,
- a second field effect transistor and a second variable resistance device connected in parallel,
- a third field effect transistor and a third variable resistance device serially connected,
- a fourth field effect transistor and a fourth variable resistance device serially connected,
- means connecting said third field effect transistor and said third variable resistance in parallel with said fourth field effect transistor and said fourth variable resistance thereby forming parallel circuitry,
- means serially connecting said first field effect transistor, said second field effect transistor, and said parallel circuitry between first and second voltage potentials,
- means for applying a first input to said first and third field effect transistors, said first and second field effect transistors being complementary,
- means for applying a second input to said second and fourth field effect transistors, said second and fourth transistors being complementary, and
- means for obtaining an output at the connection between said second field effect transistor and said parallel circuitry in response to said first and second inputs,
- said first, second, third, and fourth variable resistance devices having a high resistance state and a low resistance state for selectively enabling said first input and said second input.

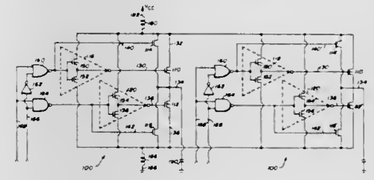
4,785,200
SELF CORRECTING SINGLE EVENT UPSET (SEU) HARDENED CMOS REGISTER
Robert C. Huntington, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 20, 1987, Ser. No. 56,171
Int. Cl.[4] H03K *3/037, 3/356*
U.S. Cl. 307—279 **7 Claims**



1. An improved register of the type wherein there is provided a master portion including a first feedback path, which master portion stores data during the first phase of a bi-phase clock signal, and a slave portion having an output and having an input coupled to said master portion including a second feedback path for storing said data during a second phase of said bi-phase clock signal, said slave portion including a series inverter and said second feedback path extending from the output of said series inverter to the input of series inverter, said master portion being isolated from said slave portion during said second phase, the improvement commprising:
- a plurality of attenuation and delay means coupled in series in said second feedback path, said plurality of attenuation and the delay means comprising an odd plurality of series coupled inverters.

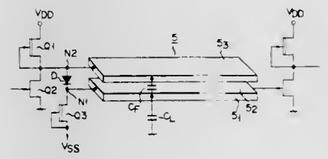
4,785,201
HIGH SPEED/HIGH DRIVE CMOS OUTPUT BUFFER WITH INDUCTIVE BOUNCE SUPPRESSION
Marcelo A. Martinez, Fremont, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.
Filed Dec. 29, 1986, Ser. No. 947,430
Int. Cl.[4] H03K *19/003*
U.S. Cl. 307—443 **8 Claims**

1. An output buffer comprising in combination:
- a line for connection to receive an externally developed power supply potential;
- a line upon which the output buffer develops a data output signal;
- coupling means for coupling said power supply potential line to said data output signal line;
- a line for connection to receive an externally developed circuit ground potential;
- a line for connection to receive an externally developed first data input signal;
- first delay means including a data input connected to said first data input signal line and a data output;



- an N-channel transistor including a gate connected to said first delay means data output, drain means connected to said data output signal line, and source means connected to said circuit ground potential line; and
- a P-channel transistor including a gate connected to said first delay means data input, source means connected to said data output signal line, and drain means connected to said circuit ground potential line.

4,785,202
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING AN INTEGRALLY FORMED BYPASS CAPACITOR
Nobuyuki Toyoda, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 6, 1987, Ser. No. 34,948
Claims priority, application Japan, Apr. 15, 1986, 61-86606
Int. Cl.[4] H03K *19/01*
U.S. Cl. 307—443 **10 Claims**



1. A semiconductor integrated circuit device, comprising:
- a logic circuit formed in a semiconductor substrate, said circuit including first and second nodes between which a potential difference is provided;
- a signal wiring of a large ground capacitance connected to the first node, the wiring supplying the output of a logic gate to the next stage logic gate; and
- a bypass capacitor connected to the second node;
- said wiring and bypass capacitor being of an integral structure prepared by laminating an upper conductor film pattern connected to the second node via an insulating film on a lower conductor film pattern connected to the first node.

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4,785,203
BUFFER CIRCUIT HAVING DECREASED CURRENT CONSUMPTION

Kenichi Nakamura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation-in-part of Ser. No. 23,577, Mar. 9, 1987, abandoned. This application Mar. 20, 1987, Ser. No. 28,669
Claims priority, application Japan, Mar. 20, 1986, 61-63214
Int. Cl.[4] H03K *19/017, 19/094;* H01L *11/16;* G06G *7/10*
U.S. Cl. 307—448 17 Claims



1. A buffer circuit for a semiconductor integrated circuit having first and second nodes (Vcc, Vss) which are supplied with first and second voltages respectively, an input node (D1) for receiving an input current from the integrated circuit, and an output node (D_{out}) for outputting an output current responsive to the input current, said buffer circuit comprising:

load transistor means (Q20, Q21, Q80) including a plurality of load transistors coupled in parallel between said output node and said first node, and having first and second states, for increasing the input current of the buffer circuit when said load transistor means is in one of said first and second states;

drive transistors means (Q27, Q28, Q82) including a plurality of drive transistors coupled in parallel between said output node and said second node, and having first and second corresponding states, for increasing the input current of the buffer circuit when said load transistor means is in the same state as said load transistor means; and

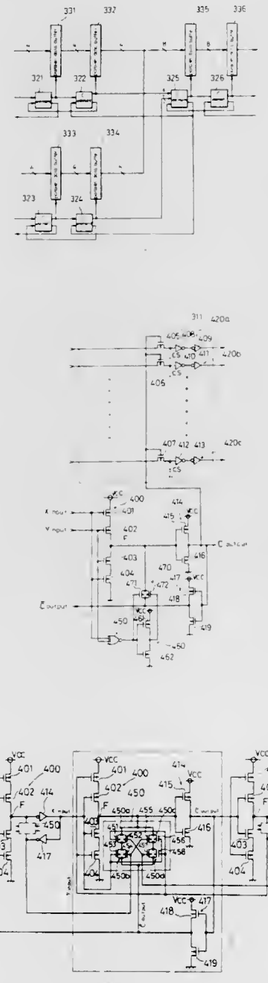
first switching means (17, 20) for sequentially switching said plurality of load transistors from the first state to the second state at predetermined delay times and from the second state to the first state simultaneously;

second switching means (21, 24) for sequentially switching said plurality of drive transistors from the first state to the second state at predetermined delay times and from the second state to the first state simultaneously.

4,785,204
COINCIDENCE ELEMENT AND A DATA TRANSMISSION PATH

Hiroaki Terada, Suita; Katsuhiko Asada, Amagasaki; Niroaki Nishikawa, Suita; Shinji Komori, Itami; Kenji Shima, Nishinomiya; Souichi Miyata; Satoshi Matsumoto, both of Nara; Hajime Asano, Toyonaka; Masahisa Shimizu, Kadoma, and Hiroki Miura, Hirakata, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo; Sharp Kabushiki Kaisha, Osaka; Matsushita Electric Industrial Co., Ltd., Osaka and Sanyo Electric Company, Osaka, all of, Japan

Filed Jun. 18, 1986, Ser. No. 875,551
Claims priority, application Japan, Jun. 21, 1985, 60-136603; Jun. 21, 1985, 60-136604; Jun. 21, 1985, 60-136605; Jun. 21, 1985, 60-136606; Jun. 21, 1985, 60-136607
Int. Cl.[4] H03K *3/353, 21/17, 23/44, 3/286*
U.S. Cl. 307—451 14 Claims



1. A coincidence element responsive to a plurality of input signals for outputting the level of N input signals, wherein N is an integer greater than one, when said plurality of input signals coincide with each other, which comprises:

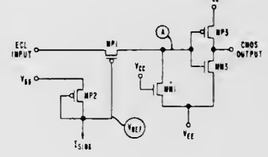
a serial connection of N first transistors of a first conductivity type and N second transistors of a second conductivity type wherein N is an integer greater than one, each of said N first transistors being associated with one of said N second transistors to form a transistor pair, each transistor of a transistor pair being responsive to an associated one of N input signals, said serial connection of N first transistors and N second transistors being connected between a first power supply and a second power supply; and

a CMOS inverter responsive to an output intermediate between said N first transistors and said N second transistors for outputting a coincidence signal.

4,785,205
HIGH SPEED ECL TO CMOS CONVERTER

Ikuo J. Sanwo, San Marcos, and Mukesh B. Suthar, Sunnyvale, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1987, Ser. No. 67,348
Int. Cl.[4] H03K *17/16, 19/017, 19/092*
U.S. Cl. 307—475 6 Claims



1. An ECL to CMOS converter for converting ECL logic level signals to CMOS logic level signals comprised of:

a first MOS gate, of first conductivity type, having source, drain, and gate electrodes, the source electrode connected to receive ECL logic level signals;

a second MOS gate, of first conductivity type, having source, drain, and gate electrodes, the drain electrode connected to the gate electrode, the source electrode connected to a biasing voltage, and the drain and gate electrodes further connected to the gate electrode of said first MOS gate;

a first and a second power terminal having voltage levels thereat corresponding to high and low CMOS logic levels, respectively;

a current sink connected between the drain and gate electrodes of said second MOS gate and said second power terminal;

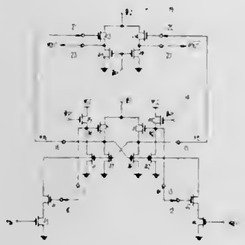
a third MOS gate, of second conductivity type, having source, drain, and gate electrodes, the drain electrode connected to the drain electrode of said first MOS gate, the source electrode connected to said second power terminal and the gate electrode connected to said first power terminal; and

a complementary inverter circuit connected between said first and said second power terminals, said inverter circuit having an input connected to the drain of said first MOS gate, and an output for providing CMOS logic level signals in response to the ECL logic level signals at the source of said MOS gate.

4,785,206
SIGNAL INPUT CIRCUIT UTILIZING FLIP-FLOP CIRCUIT

Katsuji Hoshi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 7, 1986, Ser. No. 882,563
Claims priority, application Japan, Jul. 5, 1985, 60-148639
Int. Cl.[4] H03K *3/356, 3/013, 17/04, 19/01*
U.S. Cl. 307—530 5 Claims



1. A signal input circuit comprising a flip-flop circuit having first, second, third and fourth terminals, a first transistor supplied with an input signal voltage, a second transistor supplied with a reference voltage, a first gate having a control terminal connected to said third terminal of said flip-flop circuit, a second gate having a control terminal connected to said fourth terminal of said flip-flop circuit, a reference terminal, means for connecting said first transistor and said first gate in series between said first terminal of said flip-flop circuit and said reference terminal, means for connecting said second transistor and said second gate in series between said second terminal of said flip-flop circuit and said reference terminal, said flip-flop circuit amplifying a difference in potential between said first and second terminals caused by a difference between said input signal voltage and said reference voltage and thereby producing an enlarged potential difference between said first and second terminals, said flip-flop circuit further producing a first level and a second level at said third and fourth terminals, respectively, when said input signal voltage is larger than said reference voltage and said second level and said first level at said third and fourth terminals, respectively, when said input signal voltage is smaller than said reference voltage, each of said first and second gates taking an open state by said first level and a closed state by said second level, and means coupled to said first and second terminals of said flip-flop circuit and responsive to said enlarged potential difference for producing an output signal.

4,785,207
LEAKAGE REGULATOR CIRCUIT FOR A FIELD EFFECT TRANSISTOR

John F. Eng, Buena Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

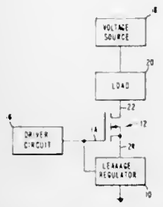
Filed Jan. 21, 1987, Ser. No. 5,716
Int. Cl.[4] H03K *17/16*
U.S. Cl. 307—577 8 Claims

1. An FET bias circuit for providing a bias voltage to an FET having a gate, a source and a drain to reduce drain-source leakage current in said FET, said circuit comprising:

a current transformer, coupled in series with said FET, for

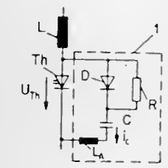
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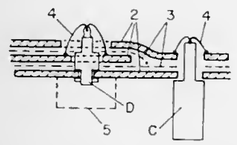
generating said bias voltage in response to the leakage current; and



means for coupling said bias voltage from said generating means to said FET gate.

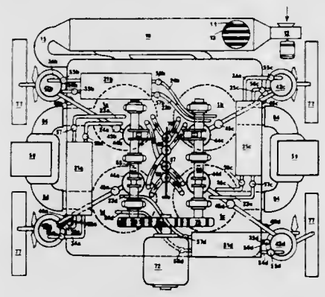
4,785,208
LOW-INDUCTANCE ANODE-CATHODE R-C CIRCUIT FOR A GATE-TURN-OFF POWER THYRISTOR
Claude Egger, Yverdon, and Stefan Umbricht, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland
Continuation of Ser. No. 800,159, Nov. 20, 1985, abandoned. This application May 19, 1987, Ser. No. 52,213
Claims priority, application Switzerland, Nov. 28, 1984, 5676/84
Int. Cl.[4] H03K *17/72*
U.S. Cl. 307—633 **7 Claims**





1. A gate turn-off thyristor circuit comprising:
a gate turn-off thyristor;
a snubber circuit connected in parallel to the gate turn-off thyristor, said snubber circuit comprising,
at least one snubber diode, and
at least one snubber capacitor;
said gate turn-off thyristor, said at least one snubber diode and said at least one snubber capacitor each having electrically opposed terminals or respective contact surfaces and a geometrical major axis;
said gate turn-off thyristor, said at least one snubber diode and said at least one snubber capacitor connected with each other via electrically conductive plates which essentially extend parallel to each other and which are electrically isolated with respect to each other; and
said gate turn-off thyristor, said at least one snubber diode and said at least one snubber capacitor arranged so that their respective geometrical major axes are parallel within the gate turn-off thyristor circuit.

4,785,209
RECIPROCATING LIQUID METAL MAGNETOHYDRODYNAMIC GENERATOR
Garrett M. Sainsbury, 10 Waratah Ave., Dalkeith, Western Australia, Australia
PCT No. PCT/AU86/00101, § 371 Date Nov. 26, 1986, § 102(e) Date Nov. 26, 1986, PCT Pub. No. WO86/06225, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 16, 1986, Ser. No. 5,157
Claims priority, application Australia, Apr. 17, 1985, PH00178
Int. Cl.[4] H02K *44/00*; G21D *7/02*
U.S. Cl. 310—11 **16 Claims**

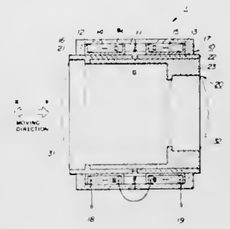


1. A magnetohydrodynamic generator comprising a pair of primary chambers for containing a quantity of conducting fluid comprising a liquid metal, a heat source for heating said conducting fluid, said primary chambers being interconnected at their lower ends by a channel incorporating a magnetohydrodynamic cell, a separate source of gaseous working fluid connected to said primary chamber through a heat regenerator for introducing said working fluid into the conducting fluid at an intermediate position spaced from said lower end and below the level of the conducting fluid, means for commencing the introduction of said working fluid into said conducting fluid when the level of conducting fluid in the primary chamber approaches its maximum and during the descent of that level, means for exhausting said working fluid from the primary chamber from above the level of the conducting fluid, means for cooling and compressing the working fluid exhausted from said primary chamber for subsequent injection into said primary chamber, said heat regenerator extracting heat from said exhausted working fluid and heating said working fluid prior to its injection into the primary chamber.

4,785,210
LINEAR MOTOR
Shigehisa Maruyama, and Hideo Niikura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed May 18, 1987, Ser. No. 50,398
Int. Cl.[4] H02K *41/00*; G02B *15/00*
U.S. Cl. 310—12 **11 Claims**

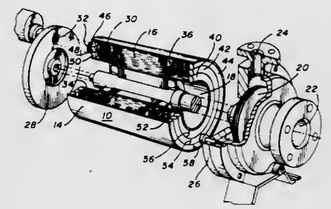
1. A linear motor, comprising:
first yoke means including a pair of magnetic yokes having a gap separating a first of said yokes from a second of said yokes;
second yoke means slidably coupled to said first yoke means;

permanent magnet means for generating magnetic fluxes passing through said first and second yoke means; and



coil means secured to said second yoke means for generating control magnetic fluxes for determining the relative position of said first yoke means and second yoke means.

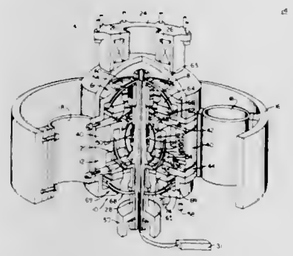
4,785,211
THERMAL EXPANSION ABSORBER
John W. Erickson, Huntington Beach, Calif., and Samuel D. Fegan, King of Prussia, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Feb. 24, 1987, Ser. No. 18,353
Int. Cl.[4] H02K *9/08*
U.S. Cl. 310—57 **12 Claims**



1. In an electric motor having an interior including a rotor and a stator and a stator chamber substantially completely filled with a first thermally conductive fluid, an improved means for accommodating thermal expansion of said fluid comprising:
a. at least one resilient sealed container having an inner spaced filled with a compressible second thermally conductive fluid, said inner space being completely sealed to prevent communication of said compressible second thermally conductive fluid with said interior, and
b. said resilient sealed container being mounted in said stator chamber to accommodate expansion of said first fluid as it absorbs heat within said motor.

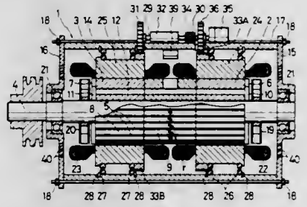
4,785,212
LARGE ANGLE MAGNETIC SUSPENSION SYSTEM
James R. Downer, Somerville; David B. Eisenbaure, Hull; Stephen R. O'Dea, Wilmington; Tim E. Bliamptis, Lexington; Rhonda R. Mariano, Winchester, and Laura J. Larkin, Somerville, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Apr. 21, 1986, Ser. No. 854,006
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 **27 Claims**

1. A magnetic suspension system for a rotary machine comprising:
two magnetic actuators spaced from each other along a primary axis, each including:
a stator including a curved support shell having a plurality of coil windings;
a rotor including a curved annular gap for rotatably receiving said shell and including means for providing a magnetic field in said gap;



each said gap extending away from the other said gap and converging arcuately toward said primary axis; and
means for selectively exciting said coils to interact with the magnetic field in each said gap and produce Lorentz forces for suspending each said rotor.

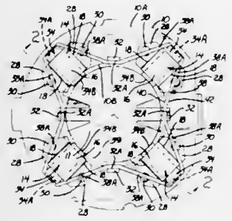
4,785,213
VARIABLE SPEED CONTROLLED INDUCTION MOTOR
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan
Filed May 28, 1987, Ser. No. 55,147
Claims priority, application Japan, May 30, 1986, 61-127094; Jun. 2, 1986, 61-128314
Int. Cl.[4] H02P *4/14, 13/10*
U.S. Cl. 310—116 **12 Claims**



1. A variable speed controlled induction motor comprising:
a rotor formed in one-piece having a plurality of rotor cores mounted, with a predetermined air space or a non-magnetic core portion being provided therebetween, on a common axis and having a plurality of conductive members interconnected and respectively mounted on said rotor cores;
a plurality of stators having a plurality of stator cores disposed side by side and surroundingly facing said respective rotor cores and having stator windings wound respectively on said stator cores, said stator windings being connected or coupled in series with respect to a power source;
connecting members short-circuiting said conductive members at said air space or non-magnetic core portion disposed between said rotor cores; and
phase shifting means for producing phase differences between the voltages induced on the portions of said conductive members which face one of said plurality of stators and the voltages induced on the corresponding portions of said conductive members which face another one of said stators

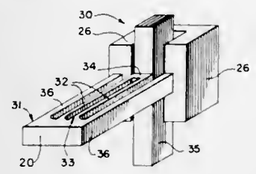
VOL 1096 ISS 3 NO 15 1988 UMI

4,785,214
BRUSH RIGGING FOR DYNAMOELECTRIC MACHINES
Jeffrey L. Mummert, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 30, 1987, Ser. No. 114,491
Int. Cl.[4] H02K *13/00*
U.S. Cl. 310—241 **5 Claims**



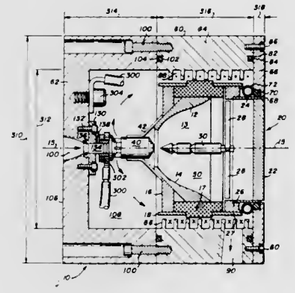
1. A brush rigging for a dynamoelectric machine comprising, a support, a plurality of circumferentially spaced and radially extending brush holders carried by said support a brush slidably supported by each brush holder, each brush holder being positioned to guide a respective brush for movement radially inwardly, a plurality of pins carried by said support, and an endless elastomeric band formed of electrical insulating material having inner surface portions directly engaging outer surface portions of said brushes and outer surface portions engaging said pins, said pins being located radially inwardly of the outer surface portions of said brushes that are engaged by said band, said band forcing said brushes radially inwardly.

4,785,215
RESONANT ELEMENT FORCE TRANSDUCER FOR ACCELERATION SENSING
Joab J. Blech, Haifa, Israel, assignor to Israel Aircraft Industries Ltd., Lod, Israel
Filed Nov. 5, 1987, Ser. No. 117,221
Claims priority, application Israel, Nov. 7, 1986, 80550
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—329 **21 Claims**



1. A resonant element force transducer comprising;
a doubled back beam comprising a single transducer element having a crossmember to one side of which there extends integrally formed therewith at least a pair of coplanar outer beams of substantially equal length and at least one inner beam coplanar with and disposed between said outer beams in substantially parallel fashion, the free ends of said outer beams being coupled to one of a first mounting pad and a second mounting pad, the free end of said at least one inner beam being coupled to the other of said first and second mounting pads.

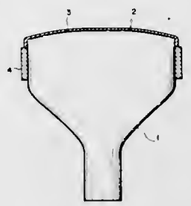
4,785,216
HIGH POWERED WATER COOLED XENON SHORT ARC LAMP
Roy D. Roberts, Newark, and John Kiss, San Jose, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.
Filed May 4, 1987, Ser. No. 45,314
Int. Cl.[4] H01J *61/06, 61/30, 61/52*
U.S. Cl. 313—32 **12 Claims**



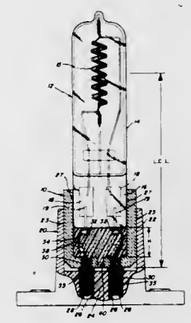
1. An arc lamp comprising:
a body formed of a dielectric material;
a concave reflector fitted within the body to define a curved reflecting wall symmetrical about a central axis;
a transparent window assembly sealingly mounted to the body transverse to said central axis to maintain pressurized gas within the space encompassed by the curved reflector and to pass collimated light from the lamp;
first and second opposed electrodes mounted to extend along said central axis with the distal tip ends of said electrodes being spaced apart from one another in opposed relationship to define an arc gap at the focal point of the concave reflector, and the first electrode having an inlet passageway to deliver fluid to a point below a first electrode tip and having an outlet passageway connected to said inlet passageway to withdraw fluid from the first electrode;
electrical connection means connected to the respective electrodes to convey a flow of electrical current to the electrodes; and
a housing having an internal cavity containing the body, reflector, and electrodes and having a window aperture to sealingly mount the window assembly, the housing also having an inlet aperture connected to said light passageway of the first electrode and having an outlet aperture, such that fluid enters the inlet aperture and inlet passageway and passes through the outlet passageway into the region between the housing and the body and then passes out the outlet aperture.

4,785,217
CATHODE RAY TUBE WITH ANTISTATIC FILM ON FRONT PANEL
Hidemi Matsuda, Oomiya, and Takeo Itou, Fukaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 23, 1987, Ser. No. 136,944
Claims priority, application Japan, Dec. 24, 1986, 61-306512
Int. Cl.[4] H01J *29/86*
U.S. Cl. 313—479 **3 Claims**

1. A cathode-ray tube comprising:
a front panel, and
an antistatic film formed on the outer surface of the front panel, made of mainly metal oxide and containing particles of at least one metal selected from the group consisting of Pd, Sn, Pt, Ag, and Au, said particles having an average particle size of 0.01 micron at most.

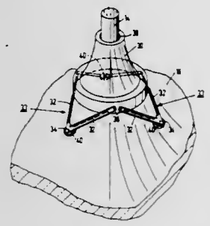


4,785,218
TUNGSTEN HALOGEN LAMP BASE
Clyde B. Kohl, Winchester, Ky.; John F. Ellis, El Paso, Tex., and Clair D. Stewart, Winchester, Ky., assignors to GTE Products Corporation, Danvers, Mass.
Filed Jul. 13, 1987, Ser. No. 72,952
Int. Cl.[4] H01K *1/28, 1/46*
U.S. Cl. 313—579 **13 Claims**



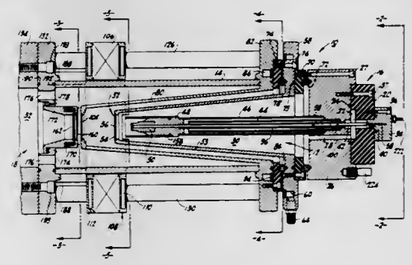
1. A lamp comprising:
a sealed envelope of vitreous material having a bulb portion and a press-seal at one end thereof;
a pair of electrically conductive lead-in wires hermetically sealed through said press-seal in spaced-apart relationship to one another and extending externally of said envelope beyond said press-seal;
a filament disposed in said bulb portion and electrically coupled to said lead-in wires;
a ceramic base for supporting said press-seal of said envelope and including integral sidewall means and base wall means, said sidewall means defining an envelope accommodating cavity dimensioned to snugly receive at least a portion of said envelope press-seal therein, said envelope press-seal being snugly positioned in said ceramic base with a void space between said press-seal and said base wall means;
a sealing cement disposed within said void space to secure said lamp in said base, wherein said press-seal portion enveloped by said base sidewall means is substantially free of sealing cement; and
a sealing cement passage in said ceramic base communicating with said void space and through which the sealing cement is injected into said void space.

4,785,219
CATHODE RAY TUBE WITH IMPROVED DEFLECTION UNIT MOUNTING
Hermanus M. J. R. Soemers; Johan F. J. M. Caers, and Joseph A. Meertens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 17, 1987, Ser. No. 86,436
Claims priority, application United Kingdom, Aug. 18, 1986, 8620057
Int. Cl.[4] H01J *23/16*
U.S. Cl. 315—3 **10 Claims**



3. A display device comprising a cathode ray tube having an envelope formed of an optically transparent faceplate, a neck and a conical portion interconnecting the faceplate and the neck, a deflection unit disposed about the neck-conical portion transition of the envelope, and at least six elongate connecting members connecting the deflection unit to at least three points of attachment on the conical portion, pairs of the connecting members having corresponding ends connected at spaced apart positions on the deflection unit, each connection point being contiguous with a connection point of an end of an adjacent member of another pair, the members of each pair being mutually convergent so that their terminal portions are attached substantially contiguously to the conical portion, the pairs being inclined with respect to a longitudinal axis of the cathode ray tube, the inclination of each of the pairs being such that each pair is substantially tangential to the conical portion at its point of attachment therewith so that substantially shear stress is applied to the point of attachment.

4,785,220
MULTI-CATHODE METAL VAPOR ARC ION SOURCE
Ian G. Brown, 1088 Woodside Rd., Berkeley, Calif. 94708, and Robert A. MacGill, 645 Kern St., Richmond, Calif. 94805
Continuation-in-part of Ser. No. 696,460, Jan. 30, 1985, Pat. No. 4,714,860. This application Mar. 13, 1987, Ser. No. 25,335
Int. Cl.[4] H01J *29/04*
U.S. Cl. 315—111.81 **10 Claims**



1. An apparatus for generating an ion beam comprising:
a. a vacuum enclosure;

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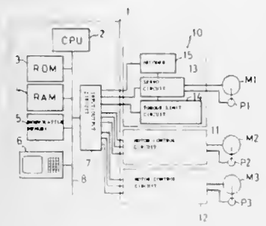
b. a support member having at least a movable portion located in said vacuum chamber;
c. a plurality of cathodes located on said movable portion of said support member, said plurality of cathodes being spaced from one another on said movable portion of said support member;
d. an anode located in one region of said vacuum chamber;
e. means for transporting said movable portion of said support member and any one of said plurality of cathodes located on said support member to a selected distance from said anode in said one region of said vacuum chamber;
f. a source of electrical power defining an electrical potential between said one of said cathodes and said anode;
g. means for producing an electrical arc between said one of said cathodes, located a selected distance from said anode, and said anode sufficient to vaporize and ionize a portion of said cathode to form a plasma;
h. means for guiding said plasma away form said one of said cathodes and anode in said one region of said vacuum chamber, in a predetermined direction to another region of said vacuum chamber spaced from said one of said cathodes and said anode; and
i. means for extracting ions from said plasma in said another region of said vacuum chamber spaced from said one of said cathodes and said anode.

4,785,221

DRIVE CONTROL DEVICE OF INJECTION MOLDING MACHINE DRIVEN BY SERVO MOTOR

Noriaki Neko, Hino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP86/00212, § 371 Date Dec. 23, 1986, § 102(e) Date Dec. 23, 1986, PCT Pub. No. WO86/06318, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 25, 1986, Ser. No. 12,671
Claims priority, application Japan, Apr. 26, 1985, 60-88914
Int. Cl.[4] H02P *5/00*
U.S. Cl. 318—311 **2 Claims**



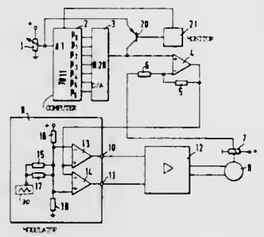
1. A drive control device of an injection molding machine which drives a servo motor as a drive source in accordance with a drive control output from a servo circuit, which includes an error register for storing a difference between a move command signal from a control unit and an actual shift amount from said servo motor, comprising:
readout means for periodically reading out a value stored in said error register;
discriminating means for discriminating whether or not the readout value exceeds a predetermined value; and
stop means for temporarily stopping supply of the move command signal from said control unit, when it is discriminated by said discriminating means that the readout value exceeds the predetermined value,
after supply of the move command signal has been temporarily stopped, said discriminating means discriminates whether or not the readout value from said error register is less than a second predetermined value, which is less than the predetermined value, and said stop means cancels stoppage of the move command signal when the readout value is discriminated to be less than the second predetermined value.

4,785,222

APPARATUS FOR ACTUATION OF A SETTING ELEMENT

Manfred Pfalzgraf, Frankfurt am Main; Kurt Probst, Schwalbach, and Andreas Wokan, Darmstadt, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,134
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628536
Int. Cl.[4] G05B *23/02*
U.S. Cl. 318—565 **3 Claims**



1. In a system for actuation of a setting element with a digital actuating device, particularly for a motor vehicle, the system further comprising:
a monitoring circuit and a bypass circuit bypassing the digital actuating device; and wherein
the digital actuating device is connected to said monitoring circuit, which circuit upon a failure of the digital actuating device activates the by-pass of the digital actuating device; and wherein
the digital actuating device comprises a microcomputer and a digital-analog converter, said bypass circuit comprising an electronic switch; and
the input of the computer is connected via said bypass circuit with an output of the digital-analog converter, and an output of the monitoring circuit is connected to a control input of the switch.

4,785,223

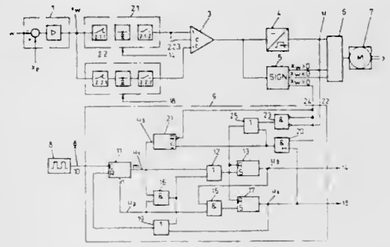
METHOD OF AND AN APPARATUS FOR GENERATING A PULSE TRAIN

Dietrich Hank, and Friedrich Richter, both of Leipzig, German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Jan. 3, 1986, Ser. No. 816,045
Claims priority, application German Democratic Rep., Mar. 28, 1985, 2745466
Int. Cl.[4] G05B *21/02*
U.S. Cl. 318—636 **5 Claims**

1. A method of generating a sampling signal succession for use in a system for controlling the tension or position of a continuous web advancing in synchronism with the rotation of a printing plate cylinder, comprising a first step of forming a first time interval having a duration approximately equal to an equalization time t_a of the controlling system, which is proportional to the rotational speed of the printing plate cylinder and, during the first time interval, interrupting the operation of the controlling system, sampling the tension- or position value of the web, and storing an ascertained error signal x_w; and a second step immediately following the termination of said first

time interval and including generating in the controlling system a pulse-length modulated binary signal for the performance of an adjustment step by an adjustment drive, the length of said binary signal being proportional to the error signal x_w.

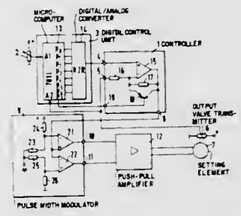


4,785,224

APPARATUS FOR THE ACTUATION OF A SETTING ELEMENT

Manfred Pfalzgraf, Frankfurt am Main; Andreas Wokan, Darmstadt; Kurt Probst, Schwalbach, and Bernward Stoll, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,133
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628535
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—663 **6 Claims**



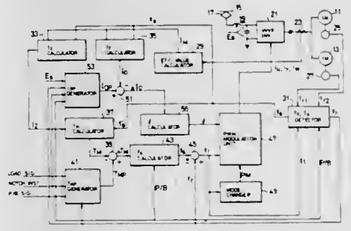
1. In an apparatus, particularly for a motor vehicle, for actuation of a setting element, the apparatus including a desired value transmitter, an actual value transmitter and an electronic controller responsive to signals of both transmitters for pivoting the setting element from a rest position; and wherein
said setting element deflects in proportion to a current fed thereto by the controller, the controller including means for converting a signal emitted from the desired value transmitter into a current which is proportional to the desired value in a bypass mode of operation;
said actual value transmitter is coupled to said setting element for signaling a deflection thereof; said converting means comprising
a switch for switching an operating mode of the controller between normal operation, when said actual value transmitter signals said deflection, and said bypass mode, when said actual value transmitter fails to signal said deflection.

4,785,225

CONTROL APPARATUS FOR AN INDUCTION MOTOR

Akira Horie, Katsuta; Yoshiji Jimbo, Katsuta; Kingo Abe, Katsuta; Jinkoo Choo, Kashiwa; Seiki Amikura, Katsuta, and Yozo Tsuzuki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,234
Claims priority, application Japan, Oct. 8, 1986, 61-237965; Feb. 4, 1987, 62-22351
Int. Cl.[4] H02P *1/30*
U.S. Cl. 318—811 **9 Claims**



1. A control apparatus for an induction motor, comprising;
a dc power source;
inverter means for converting dc power supplied from said dc power source into ac power of the variable voltage and variable frequency to feed the induction motor; and
modulation means for producing signals for operating said inverter means in accordance with the pulse width modulation method on the basis of a predetermined ratio of voltage to frequency in an ac output voltage of said inverter means and a reference for frequency of the ac output voltage,
characterized by
current detecting means for detecting an effective value of a motor current of the induction motor;
frequency detecting means for detecting an actual rotation frequency and an actual slip frequency of the induction motor;
pattern generating means for generating a reference for a torque to be produced by the induction motor;
comparing means for comparing the motor current detected by said current detecting means with the torque reference generated by said pattern generating means to obtain a deviation therebetween, in which at least one of the motor current and the torque reference is converted so that both are torque-related control variables of the same dimension; and
operating frequency reference generating means for calculating a reference for a slip frequency in accordance with the deviation obtained by said comparing means and obtaining the frequency reference to be given to said modulation means on the basis of the calculated slip frequency reference and the actual rotation frequency detected by said frequency detecting means.

4,785,226

POWDER SUPPLY DEVICE WITH SOLAR CELL

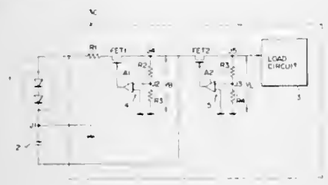
Hidetaka Fujisawa, and Katsuhiro Wakita, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1986, Ser. No. 921,326
Claims priority, application Japan, Oct. 21, 1985, 60-233496
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—21 **7 Claims**

1. A power supply device with a solar cell, comprising:
a solar cell having an associated output;
a secondary battery;
first means for controlling the output of said solar cell and

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for producing a first output voltage for charging said secondary battery;
second means for controlling said first output voltage produced by said first means and an output of said secondary battery, and for producing a second output voltage that is lower than said first output voltage for driving a load circuit;
means for connecting said first means to said secondary battery; and



means for connecting said secondary battery to said second means;
wherein said second means includes means for producing said second output voltage by controlling said first output voltage when the output of said solar cell is higher than said first output voltage, and for producing said second output voltage by controlling the output of said secondary battery when the output of said solar cell is lower than said first output voltage.

4,785,227

MOBILE EMERGENCY MEDICAL VEHICLE

John Griffin, Houston, Tex., assignor to Frazer, Inc., Houston, Tex.

Division of Ser. No. 816,390, Jan. 6, 1986, Pat. No. 4,672,296. This application Jan. 28, 1987, Ser. No. 7,599
Int. Cl.[4] B60P *3/00*
U.S. Cl. 322—1 **12 Claims**



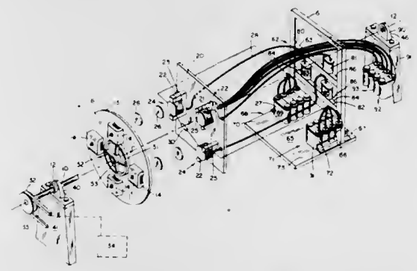
1. A mobile emergency medical vehicle having a medical equipment, supply and patient module comprising:
first motor means for transport of the said vehicle,
second motor means mounted adjacent the medical equipment, supply and patient module and operable independently from said first motor means,
electrical generating means associated with said second motor means capable of generating 115 volt AC and 12 volt DC through a converter for powering the electrical requirements of said module,
electrical charge storage means associated with said first motor means for initiating operation of said first and second motor means each independently of the other,
exterior and interior electrical lighting means powered by said electric generating means associated with said second motor means adapted to provide exterior emergency vehicle indicating means and interior electrical lighting means within said module,
electrical outlet means located within said module powered by said electrical generating means,
air-conditioning means and heating means for controlling the temperature within said module powered by said electrical generating means, and
switching means for switching at least a portion of said exterior and interior electrical lighting means from said electrical generating means associated with said second motor means upon failure thereof to said electrical charge storage means associated with said first motor means to maintain continuous operation of said lighting means.

4,785,228

ELECTRICAL ENERGY ENHANCEMENT APPARATUS

Sydney L. Goddard, 1034 N. Broadway, Haverhill, Mass. 01830

Filed Feb. 4, 1987, Ser. No. 10,687
Int. Cl.[4] H02P *11/00*
U.S. Cl. 322—29 **1 Claim**



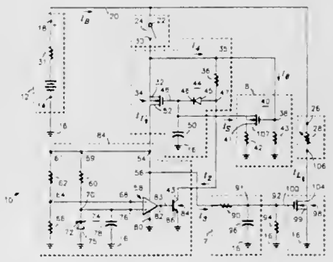
1. An apparatus for an electrical generator comprising:
a drive shaft being supported by at least two upstanding members, the shaft having an axis,
a non-magnetic disc carried by the shaft;
a plurality of permanent magnets having pole pieces carried by the disc all at the same radial distance and at regular angular intervals about the shaft axis;
a plurality of electromagnets mounted to a plate and having windings and having pole pieces fixed each at the same radial distance from the shaft axis as the distance of the permanent magnets from the shaft axis, and at regular angular intervals, the pole pieces of the electromagnets and the pole pieces of the permanent magnets being spaced relative to each other so that the permanent magnet pole pieces are carried by the disc past the electromagnet pole pieces as the disc rotates at equal angular distance intervals and closely to the successively passed electromagnets;
a plurality of sets of capacitors corresponding in number to the electromagnets, the capacitors of each set being connected in parallel to each other and connected across the windings of a corresponding electromagnet; and
an electric motor coupled to the shaft to drive the shaft, each electromagnet having the same inductance, and each set of parallel connected capacitors having the same capacitance,
whereby when the shaft is driven at a certain speed the permanent magnets induce in the electromagnets voltages of a frequency that causes the inductances and the capacitances to resonate;
said plate with the electromagnets mounted thereon being attached to a frame having cross bars wherein said frame is supported by a base plate and a plurality of back stops,
a first set of said sets of capacitors being attached to one side of the plate; a second set of said sets of capacitors attached to the opposite side of the plate; and
a third set of said capacitors comprising an upper capacitor attached to an upper cross bar of said frame, a capacitor attached to one side of the lower cross bar, a capacitor attached to the opposite side of the lower cross bar, and a capacitor positioned in a housing at the rear of the apparatus.

4,785,229

THRESHOLD DETECTING BATTERY PROTECTION CIRCUITRY

David W. Edwards, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1988, Ser. No. 178,409
Int. Cl.[4] G05F *1/569*
U.S. Cl. 323—284 **12 Claims**



1. A power control circuit for providing a shutdown signal in response to the magnitude of a monitored signal provided by a power supply crossing a predetermined threshold level, the power control circuit including in combination:
comparator means having a first input terminal, a second input terminal and an output terminal;
threshold level means coupled to said first input terminal of said comparator means for providing the predetermined threshold level thereto;
latch means having a first main terminal, a second main terminal and a control terminal, said first main terminal being coupled to receive the monitored signal, said latch means having a conductive state and a nonconductive state;
first circuit means coupling said second main terminal of said latch means to said second input terminal of said comparator means, said first circuit means providing a first control signal to said second input terminal of said comparator means, said control signal having a magnitude that varies with the magnitude of the monitored signal;
second circuit means coupled between said output terminal of said comparator means and said control terminal of said latch means; and
said comparator means switching the state of an output signal at said output terminal thereof to provide the shutdown signal in response to the magnitude of said control signal on said second input terminal of said comparator means crossing the predetermined threshold level applied to said first input terminal thereof, said second circuit means rendering said latch means nonconductive in response to said shutdown signal.

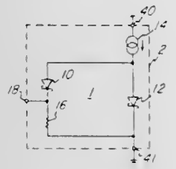
4,785,230

TEMPERATURE AND POWER SUPPLY INDEPENDENT VOLTAGE REFERENCE FOR INTEGRATED CIRCUITS

Kevin M. Ovens, Garland, and John D. Marsh, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 24, 1987, Ser. No. 42,492
Int. Cl.[4] G05F *3/18*
U.S. Cl. 323—313 **14 Claims**

1. A voltage reference circuit, comprising:
a first diode having a first predetermined forward voltage drop as a function of current;
a second diode having a second predetermined forward voltage drop as a function of current, lower by a preselected amount than said first diode voltage drop and connected to a compensated node and to one end of said first diode; and



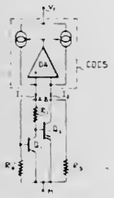
a resistive element connected to said compensated node and to another end of said first diode such that said second diode and said resistive element form a current path around said first diode;
wherein the temperature coefficient of voltage at said compensated node is less than that across said first diode.

4,785,231

REFERENCE CURRENT SOURCE

Rolf Böhme, Bad Friedrichshall, and Jürgen Sieber, Heilbronn, both of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 29,908
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610158
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—316 **15 Claims**



1. A reference current source, comprising: a controlled double current source, including a first terminal and a second terminal and means for producing a first current at said first terminal and a second current at said second terminal, the first and second currents being proportional to each other and proportional to a voltage across said first and second terminals;
a first transistor having its emitter connected to a reference point and its base connected to said first terminal;
a second transistor having its collector connected to said second terminal and its base connected to the collector of said first transistor;
first coupling means connecting the base of said first transistor to the collector of said first transistor, and second coupling means connecting the emitter of said second transistor to said reference point, one of said first coupling means and said second coupling means including a series connected resistor, and the other of said first coupling means and said second coupling means comprising a direct connection; and
a second resistor connected between said reference point and one of the collector of said second transistor and the base of said first transistor.

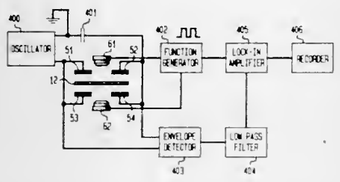
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4,785,232

CONTACTLESS HALL COEFFICIENT MEASUREMENT APPARATUS AND METHOD FOR PIEZOELECTRIC MATERIAL

Arthur Ballato, Long Branch, and Herbert A. Leupold, Eatontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 5, 1987, Ser. No. 65,820
Int. Cl.[4] G01R *29/22*
U.S. Cl. 324—56 9 Claims



1. Apparatus for the non-destructive, contactless measurement of the Hall coefficient of a piezoelectric material comprising:

first and second pairs of spaced apart electrodes, said electrode pairs defining an air gap between said electrode pairs;

means for positioning a disk of said piezoelectric material within said air gap, said disk having upper and lower surfaces which are generally parallel;

means for establishing a magnetic field within said air gap, said magnetic field being generally perpendicular to said upper and lower surfaces of said disk;

means, connected to said electrodes, for establishing a first alternating electric field in said air gap, said first alternating electric field causing said disk to vibrate piezoelectrically and to generate a second alternating electric field;

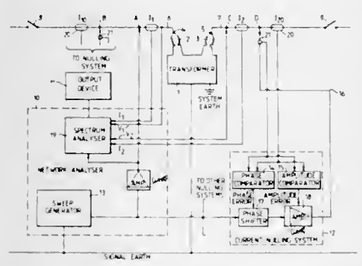
means for measuring said second electric field caused by said piezoelectric vibration, said measuring means being connected to at least one pair of said electrodes.

4,785,233

METHOD AND APPARATUS FOR TESTING ELECTRICAL EQUIPENT

Raymond L. Coleman, Cheshire, England, assignor to Era Patents Limited, England

Filed Aug. 25, 1987, Ser. No. 89,076
Claims priority, application United Kingdom, Aug. 26, 1986, 8620658
Int. Cl.[4] G01R *27/16*
U.S. Cl. 324—57 SS 10 Claims



1. An apparatus for testing an electrical system comprising electrical equipment having inherent stray impedances and conductor means connected to said equipment, said apparatus testing said electric system by detecting values of said inherent stray impedances in said equipment which are indicative of the state of said equipment, said apparatus comprising:

probe signal applying means arranged to be operatively connected to said conductor means adjacent said equipment and to apply a probe signal of substantially sinusoidal waveform;

frequency sweeping means operatively connected to said probe signal applying means to sweep said probe signal over a predetermined frequency range;

current monitoring means arranged to be operatively coupled with said conductor means remote from said equipment to monitor current flowing in said conductor means as a result of said application of said probe signal;

nulling signal feed means arranged to be operatively connected to said conductor means remote from said equipment to feed a nulling signal to said conductor means to nullify said current flowing in said conductor means; and,

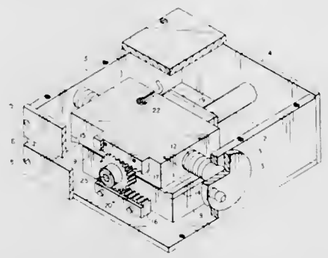
analyser means arranged to be operatively connected to said conductor means adjacent said equipment to analyse a response of said equipment to said probe signal to determine frequencies at which specific responses are produced as the result of said values of said stray impedances of said equipment whereby effects of impedance of said conductor means are eliminated.

4,785,234

DETERMINING ECCENTRICITY OF INSULATED WIRE

Dean C. Westervelt, Bullskin Twp., Fayette County, and Allan I. Bennett, Murrysville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1987, Ser. No. 61,769
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R 8 Claims



1. Apparatus for determining the eccentricity of insulation on an elongated conductor comprising

(1) two flat parallel opposing electrodes positionable on opposite sides of said insulated conductor, in physical contact with said insulation;

(2) means for moving one of said two electrodes relative to the other of said two electrodes in a direction parallel to said electrodes, whereby said insulated conductor is rotated therebetween;

(3) electrical contact means for making electrical contact to said conductor;

(4) means for translating said electrical contact means at the same rate that said insulated conductor is translated between said two flat opposing electrodes; and

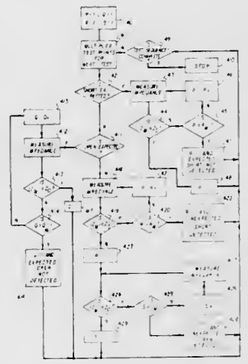
(5) electrical means for determining the maximum or minimum ratio of the capacitance of each of said two electrodes to said conductor as said insulated conductor is rotated between said two electrodes.

4,785,235

SHORTS TESTING TECHNIQUE REDUCING PHANTOM SHORTS PROBLEMS

T. Michael Hendricks, Loveland, Colo., and William A. Groves, San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 563,349, Dec. 20, 1983, abandoned. This application Mar. 8, 1988, Ser. No. 169,157
Int. Cl.[4] G01R *31/02, 27/02*
U.S. Cl. 324—73 PC 8 Claims



1. A method of measuring the impedance between a pair of test points of a circuit selected from a class of circuits that can have impedance settling times longer than a minimum repetition time T between a set of successive impedance measurements of one of these circuits, said method comprising the steps of:

(a) connecting said impedance between a pair of test leads that are connected to a resistance measuring device;

(b) within a time after step (a) that is smaller than the possible settling time of some devices under test, determining whether an impedance is in an expected resistance range;

(c) incrementing a parameter N; and

(d) if the impedance is not in an expected resistance range and if N is within a preselected parameter range between an initial value N_i and a final value N_f, then returning to step (b); otherwise

(e) ending this method;

wherein N_f is selected to be large enough that, if an unexpected value of the impedance is measured in a final execution of step (d), such final measurement occurs at a time after step (a) that is longer than the longest settling time of the class of devices under test.

4,785,236

DEVICE FOR MEASURING VOLTAGE BY SCANNING

András Balogh; Lajos Bella, and Gyula Somogyi, all of Budapest, Hungary, assignors to Miki Merestechnikai Fejleszto Vallalat, Budapest, Hungary

Filed Nov. 18, 1986, Ser. No. 931,820
Claims priority, application Hungary, Nov. 18, 1985, 4375/85
Int. Cl.[4] G01R *19/26, 17/06*
U.S. Cl. 324—120 16 Claims

1. A device for measuring an input signal, comprising:

auxiliary oscillator means for producing an auxiliary signal;

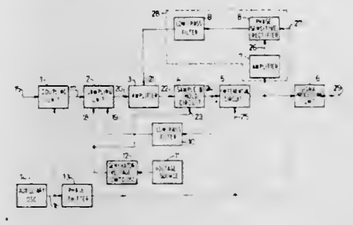
means for combining said auxiliary signal and said input signal to obtain a combined signal;

sampling means for sampling said combined signal;

first means for amplifying said sampled signal with an amplification adjustable in accordance with an amplification control signal to obtain an amplified signal;

phase shifting means receiving and phase shifting said auxiliary signal;

a differential circuit means for differentially combining said amplified signal and the phase-shifted auxiliary signal to obtain a difference signal;



feedback means for generating said amplification control signal in accordance with an auxiliary signal component of at least one of said amplified signal and said difference signal; and

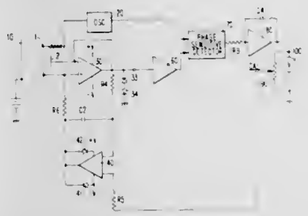
signal processing means for evaluating said difference signal in accordance with the measurement to be made.

4,785,237

AMPLIFIER WITH D.C. COMPENSATION

Mason F. Cox, Shelby, N.Y., assignor to Monroe Electronics, Inc., Lyndonville, N.Y.

Continuation of Ser. No. 681,297, Dec. 13, 1984. This application May 4, 1987, Ser. No. 45,207
Int. Cl.[4] G01R *19/00, 19/155*
U.S. Cl. 324—123 R 15 Claims



4. An electric meter comprising:

a non-contacting AC electric probe producing an input signal;

an AC amplifier having inverting and noninverting input terminals and an output terminal, said noninverting input terminal being coupled to said electric probe to receive said input signal; and

means coupled between said noninverting input terminal and said output terminal of said AC amplifier for integrating a signal at said output terminal to produce an integration signal which is coupled to said noninverting terminal and for driving a D.C. potential between said inverting and noninverting input terminals of said AC amplifier to a zero level using said integration signal during receipt of said input signal, thereby to counteract any DC offsets in said electric meter.

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SPEED SIGNAL GENERATING CIRCUIT SYSTEM

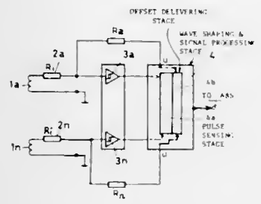
Volker Braschel, Heilbronn, and Reiner Emig, Tamm, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,611

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541853

Int. Cl.⁴ G01P *3/48*

U.S. Cl. 324—173 **4 Claims**



1. Speed signal generating circuit system to obtain a signal representative of speed of a rotating element having

a stationary inductive pick-up (**1***a* . . . **1***n*) responsive to induced flux change upon rotation of the rotating element, and generating an alternating voltage;

an amplifier (**3***a* . . . **3***n*) connected to receive the alternating voltge, said amplifier having hysteresis characteristics and providing an output pulse signal when the voltage level of the alternating voltage applied thereto exceeds a first predetermined level and terminates the output pulse signal when the voltage level of the alternating voltage applied thereto drops below a second predetermined level,

said system comprising, means superimposing a d-c signal (O*f*) over the alternating voltage, and terminating superimposition of the d-c signal when the amplifier (**3***a* . . . **3***n*) provides the pulse output signal.

4,785,239

METHOD AND APPARATUS FOR CHARACTERIZING MAGNETIC COATING COMPOSITIONS AS WELL AS IMPROVING MAGNETIC PARTICLE DISPERSIONS

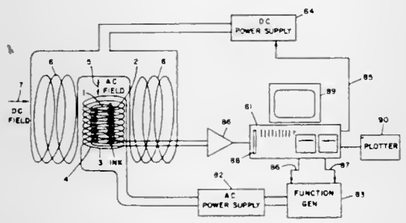
Arwed Brunsch, Stuttgart; Werner Steiner, Boblingen, and Gerhard Trippel, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1986, Ser. No. 871,969

Claims priority, application European Pat. Off., Jun. 13, 1985, 85107346.0

Int. Cl.⁴ G01N *27/74;* **G01R** *33/12;* **B05D** *5/12*

U.S. Cl. 324—204 **11 Claims**



7. Apparatus for characterizing the degree of magnetic particle dispersion in a magnetic coating composition, said apparatus comprising:

means for generating an alternating magnetic field through said magnetic coating composition;

means for generating for a predetermined time duration a a constant magnetic field perpendicular to said alternating magnetic field in said magnetic coating composition;

said time duration exceeds the relaxation time of the magnetic coating composition;

means for measuring the changes in the magnetic field surrounding said magnetic composition when said constant magnetic field is switched on and off whereby the degree of dispersion of magnetic particles in the coating composition may be characterized from the measured changes.

4,785,240

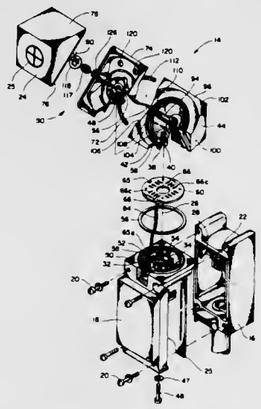
PROXIMITY SWITCH

Edwin R. Newell, Fletcher; Terry E. Franks, Leicester; Thomas R. Phelps, Asheville, all of N.C., and J. Michael Boozer, Hampton, N.J., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 655,817, Oct. 1, 1984. This application Mar. 4, 1988, Ser. No. 168,599

Int. Cl.⁴ G01B *7/14*

U.S. Cl. 324—207 **11 Claims**



1. An improved proximity switch for sensing an object in any one of a plurality of different planes, comprising:

a base assembly (**16, 18**) having a first connecting portion;

a first support part (**44**) rotatably mounted at said first connecting portion for rotation about a first axis (**26**);

a post (**94**) fixedly attached to said first support part (**44**), said post (**94**) defining a second axis (**72**) intersecting said first axis (**26**) at an angle of substantially 45°;

a sensing part (**50**) mounted for rotation about said post (**94**), said sensing part (**50**) having a substantially conical cavity formed therein, said substantially conical cavity having an axis substantially coincident with said second axis (**72**); and,

sensing apparatus (**68**) mounted within said sensing part (**50**) for providing sensitivity at a target face (**24**) for detecting nearby objects, said substantially conical cavity providing additional volume within said sensing part (**50**) for mounting said sensing apparatus (**68**) therein,

rotation of said sensing part (**50**) substantially 180° about said second axis (**72**) provides said target face a first position substantially parallel to said first axis (**26**) and a second position substantially perpendicular to said first axis (**26**), and rotation of said support part (**44**) about said first axis, when said target face (**24**) is in said first position substantially parallel to said first axis (**26**), provides said target face with a plurality of positions each of which has said target face substantially parallel to said first axis (**26**);

a fastening member (**46**) passing from said base assembly (**16, 18**) into said first support part (**44**) along said first axis (**26**);

at least one receiving member (**48, 48***a*) mounted in said sensing part (**50**) for receiving said fastening member (**46**) to hold said sensor lower portion (**44**) in said first position or in said second position, respectively;

a plurality of electrical conductors (**86**) fixedly mounted on a wall of said sensing part (**50**) so as to face a mating wall of said base assembly (**16, 18**);

a plurality of electrical contacts (**66, 66C**) mounted in said base assembly (**16, 18**) proximate to and providing electrical connection with at least some of said plurality of electrical conductors (**86**), in order to establish electrical connection between said sensing apparatus (**68**) and electrical components mounted in said base assembly (**16, 18**);

said post (**94**) is hollow along its axis, electrical wires connected to said sensing apparatus (**68**) pass through said post (**94**) along said second axis (**72**), and said electrical wires connect to selected ones of said plurality of electrical conductors (**86**);

said fastening member (**46**) being capable of being tightened into said at least one receiving member (**48, 48***a*) in order to provide mechanical force compressing said plurality of electrical conductors (**86**) into said plurality of electrical contacts (**66, 66C**), thereby providing said electrical connection; and,

said fastening member (**46**) locks said sensing part (**50**) in either said first position or said second position, and also said fastening member (**46**) locks said first support part (**44**) in a selected rotation position about said first axis (**26**).

4,785,241

ENCODER UNIT USING MAGNETORESISTANCE EFFECT ELEMENT

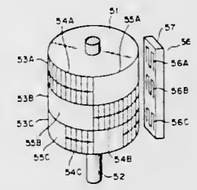
Shuzo Abiko, Chichibu; Hirokazu Goto, Hanno; Masakazu Kuhara; Hideto Sano; Hisanori Hayasbi, and Takeshi Osato, all of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed Aug. 5, 1986, Ser. No. 893,215

Claims priority, application Japan, Aug. 8, 1985, 60-173287; Sep. 13, 1985, 60-201617; Sep. 13, 1985, 60-201618

Int. Cl.⁴ G01B *7/14*

U.S. Cl. 324—208 **6 Claims**



1. An encoder unit comprising:

an object to be detected which has a plurality of tracks each alternately having a first region having a periodic magnetization pattern and a second region having no magnetization pattern, the length of said second region being greater than the period of said periodic magnetization pattern of said first region; and

a detector for detecting said object to be detected having a plurality of sensors disposed in opposed relationship with said object to be detected and oriented in the direction which intersects the direction of the magnetic flux of the magnetized pattern of said first region, each of said plurality of sensors having a plurality of unit magnetoresistance effect elements which are equidistantly spaced apart from each other and which are connected in series, the spacing between adjacent elements of said sensors being less than the length of the period of said magnetization pattern.

4,785,242

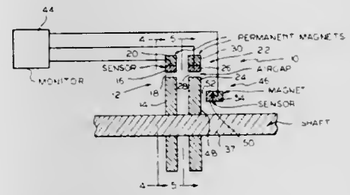
POSITION DETECTING APPARATUS USING MULTIPLE MAGNETIC SENSORS FOR DETERMINING RELATIVE AND ABSOLUTE ANGULAR POSITION

Jayant G. Vaidya, and Caio Ferreira, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 15, 1986, Ser. No. 941,850

Int. Cl.⁴ G01B *7/30*

U.S. Cl. 324—208 **31 Claims**



1. A position detecting apparatus, comprising:

first magnetic sensing means for accurately determining the angular position of a rotor fixedly mounted on a shaft for rotation therewith, said first magnetic sensing means including first target means having repetitive incremental variations in the periphery thereof fixedly mounted on said shaft so as to be operatively associated with said rotor so as to rotate with said shaft and said rotor, first sensor means fixedly mounted in spaced relation to said first target means and disposed at a fixed distance from the peripheral variations thereof independent of the absolute angular position of said rotor to define a first air gap therebetween, and first magnet means fixedly mounted in proximity to said first target means and said first sensor means to create a first magnetic field in said first air gap, said first sensor means cooperating with said first target means to accurately determine the relative angular position of said rotor by detecting repetitive incremental variations in said first magnetic field in said first air gap produced by said first target means as it rotates with said shaft;

second magnetic sensing means for absolutely determining the angular position of said rotor, said second magnetic sensing means including second target means having a smooth continuous variation in the periphery thereof fixedly mounted on said shaft so as to be operatively associated with said rotor so as to rotate with said shaft and said rotor, second sensor means fixedly mounted in spaced relation to said second target means and disposed at a variable distance from the periphery thereof dependent upon the absolute angular position of said rotor to define a second air gap therebetween, and second magnet means fixedly mounted in proximity to said second target means and said second sensor means to create a second magnetic field in said second air gap, said second sensor means cooperating with said second target means to absolutely determine the angular position of said rotor by detecting smooth, uninterrupted continuous variations in said second magnetic field in said second air gap produced by said second target means as it rotates with said shaft; and

means for monitoring output signals from each of said first and second sensor means, said output signals being proportional to variations in magnetic field strengths so as to be indicative of said first and second magnetic fields, said first sensor means producing an output signal for accurately determining each of a specific discrete plurality of accurate relative angular positions of said rotor and said second sensor means producing an output signal for approximately determining the approximate angular position of said rotor, said monitoring means determining the accu-

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rate and absolute angular position of said rotor by combining said output signals;

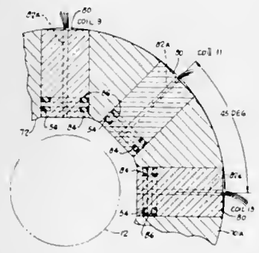
said approximate angular position being determined whenever said output signal from said first sensor means detects the next of said specific discrete plurality of accurate relative angular positions, said monitoring means simultaneously combining said output signals from said first and second sensor means to compare said approximate angular position with said accurate relative angular position, said approximate angular position being corrected to the accurate and absolute angular position corresponding to said accurate relative angular position of said specific discrete plurality of accurate relative angular positions as detected by said first sensor means.

4,785,243

ELECTRONICALLY SCANNED EDDY CURRENT FLAW INSPECTION

Richard F. Abramczyk, Brunswick; Steven J. Aron, Jr., Parma; Richard M. Harris, Medina, and James M. Toth, Lyndhurst, all of Ohio, assignors to LTV Steel Company, Cleveland, Ohio

Filed Jan. 29, 1987, Ser. No. 8,572
Int. Cl.[4] G01N *27/90*
U.S. Cl. 324—232 **7 Claims**



1. An eddy current flaw inspection system comprising:

drive means for propelling an elongated workpiece along a workpiece path;

a pluraltiy of individually energizable transmitter coils distributed at generally equally spaced locations in an encircling arc about the workpiece path with each of said plurality of coils oriented about a center coil axis that intersects an outer workpiece surface;

a signal generator for providing a coil energization signal;

excitation circuitry including

(i) switching means coupled to the signal generator for simultaneously coupling the energization signal to a pair of adjacent transmitter coils to induce eddy currents in the workpiece radially inward of said pair of transmitter coils; and

(ii) control means for causing the switching means to sequentially connect the signal generator to selected different coil pairs, causing said eddy currents to scan circumferentially around the workpiece;

a plurality of generally equally spaced series coupled sensing coils spaced around the workpiece for sensing induced eddy currents in the workpiece during the transmitter coil energization to detect flaws in the workpiece; and

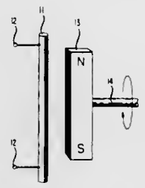
structure for mounting said plurality of sensing coils and transmitter coils in one to one relation to form a plurality of transmitter/sensing coil sets sharing a common coil axis.

4,785,244

MAGNETO-ELECTRIC SENSOR DEVICE AND SENSING METHOD USING A SENSOR ELEMENT COMPRISING A 2-PHASE DECOMPOSED MICROSTRUCTURE

Sungho Jin, Millington; Richard C. Sherwood, New Providence; Thomas H. Tiefel, Piscataway, and Robert B. van Dover, Gillette, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 676,537, Nov. 30, 1984, abandoned.
This application Apr. 8, 1987, Ser. No. 36,196
Int. Cl.[4] G01R *33/00*; H02M *5/10*; A61N *1/00*
U.S. Cl. 324—260 **10 Claims**



1. Device comprising means for producing an electrical signal in response to a change in a magnetic field,

said means comprising a body of a ferromagnetic alloy,

said body having a major dimension in a direction which here is designated as a major axis,

said body having electrical contact points which are spaced apart in a direction which has a substantial component in the direction of said major axis,

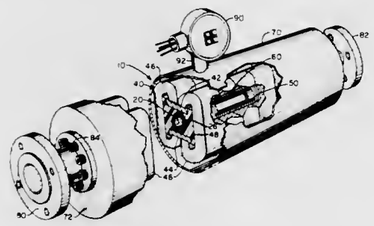
the microstructure of said body comprising a 2-phase decomposed microstructure comprising elongated, substantially aligned particles which are helically arranged in the absence of externally applied elastic stress, the helical axis having a substantial component in the direction of said major axis.

4,785,245

RAPID PULSE NMR CUT METER

Hyok S. Lew, Arvada, and Gerald L. Schlatter, Boulder, both of Colo., assignors to Engineering Measurement Company, Longmont, Colo.

Filed Sep. 12, 1986, Ser. No. 906,749
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—308 **17 Claims**



1. A method for determining the amount of organic material in a mixture that includes organic and aqueous material, comprising the steps of:

exposing the mixture continuously to a strong constant magnetic field to cause the nuclei magnetic moments of hydrogen atoms in the mixture to be oriented about parallel to the constant magnetic field;

while said mixture is exposed to said constant magnetic field,

simultaneously exposing said mixture to rapidly repeated pulses of an alternating magnetic field that alternates at about the Larmor frequency of the hydrogen atoms with pulse durations sufficient to reorient the nuclei magnetic moments of the hydrogen atoms in the mixture approximately 90° away from the positions parallel to the constant magnetic field and with the time intervals between successive pulses being sufficiently long to allow substantial recovery of the nuclei magnetic moments of hydrogen atoms in the organic molecules so that the material emits substantial measurable rf emission associated with said organic molecules, and with said time intervals being too short to allow any significant recovery of the nuclei magnetic moments of the hydrogen atoms in the aqueous materials and other nonorganic materials so that there is no significant rf emission from the mixture associated with the hydrogen atoms in the aqueous and nonorganic materials;

detecting and measuring the rf emissions from said mixture; and

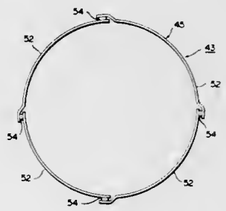
determining the fraction of the mixture comprising the organic material by comparing the maximum amplitude of the detected rf emissions from the mixture after said pulses subsequent to the first pulse with a known standard value of maximum amplitude emission from a sample constituting 100 percent of the organic materials in the mixture exposed to the same conditions as the mixture.

4,785,246

MAGNETIC RESONANCE IMAGING APPARATUS

Hiroshi Sugimoto, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 23, 1986, Ser. No. 877,381
Claims priority, application Japan, Jun. 26, 1985, 60-139361
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **4 Claims**



1. A magnetic resonance imaging apparatus which forms an image of the spin density distribution associated with relaxation time information within a subject by utilizing a magnetic resonance effect, comprising:

probe head means for applying a high-frequency magnetic field to the subject and receiving magnetic resonance signals from said subject;

inclined magnetic field coil means for generating and applying an inclined magnetic field to the subject, so that the magnetic resonance signals detected by the probe head means provide spatial information; and

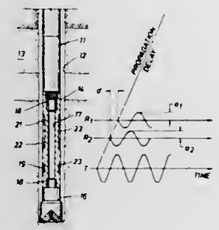
an electromagnetic coupling prevention member for preventing electromagnetic coupling between the probe head means and the inclined magnetic field coil means, said prevention member including a plurality of grounded sheet-like copper foils, coupled to one another in a cylindrical form such that their radial ends overlap one another; and an insulating member interposed between the overlapping ends of the copper foils.

4,785,247

DRILL STEM LOGGING WITH ELECTROMAGNETIC WAVES AND ELECTROSTATICALLY-SHIELDED AND INDUCTIVELY-COUPLED TRANSMITTER AND RECEIVER ELEMENTS

Richard A. Meador; Larry W. Thompson, both of Spring, and William R. Grayson, Houston, all of Tex., assignors to NL Industries, Inc., New York, N.Y.

Continuation of Ser. No. 508,360, Jun. 27, 1983, abandoned.
This application Apr. 6, 1987, Ser. No. 36,170
Int. Cl.[4] G01V *3/30*
U.S. Cl. 324—338 **30 Claims**



1. A method for use in a borehole for reducing interference and for enhancing an electromagnetic signal received by receiving means on a tubular housing member, comprising:

transmitting an electromagnetic signal into a surrounding formation from a transmitting means arranged in a recess on the exterior of but insulated from a tubular, electrically conductive housing means threaded at each end for threaded engagement in a drill string;

receiving said electromagnetic signal from said surrounding formation at a receiving means, said receiving means spaced longitudinally from said transmitting means and arranged in a recess on the exterior of but insulated from said housing means;

reducing the coupling to said receiving means of the electric field component of the received signal, including noise, by electrostatically, but not magnetically, shielding substantially all of said receiving means;

picking up the received signals from said receiving means by inductive current coupling means positioned within the shielded portion of said receiving means and cooperating with said receiving means; and

communicating a signal indicative of the signal received by said receiving means to a data handling means located within said housing means.

4,785,248

AIR IONIZATION CONTROL MEANS

C. Fred Mykkanen, and David R. Blinde, both of Minneapolis, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Oct. 15, 1985, Ser. No. 787,417
Int. Cl.[4] G01K *29/12*
U.S. Cl. 324—457 **1 Claim**

1. Apparatus for use in a system for controlling the ionization of air in the atmosphere of a work space having a ceiling, said apparatus comprising:

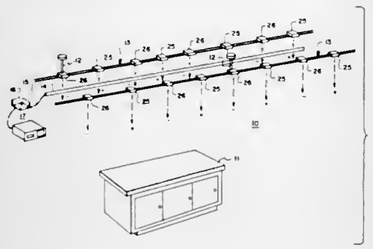
(a) a first emitter line insulatively supported from said ceiling in said atmosphere;

(b) a second emitter line insulatively supported from said ceiling in said atmosphere, said second line being in substantial parallel relationship to said first emitter line, and each of said lines comprising (i) first and second electrical conductors insulatively supported in spaced apart parallel relationship, and (ii) ion emitter means disposed along the length of said first and second emitter lines at spaced apart locations adapted, when said first and second conductors

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are electrically energized, to inject positive and negative ions into said atmosphere;

(c) an ungrounded ion averaging elongated electrically conductive bar means insulatively supported from said ceiling and positioned in said atmosphere midway between and effectively at the same elevation relative to the ceiling as said first and second emitter lines, the length of said bar means being sufficient to span a predetermined number of said ion emitter means whereby said ion averaging elongated electrical conductive bar means is at a



floating potential and receives an electrical charge representative of the average state of ionization of said atmosphere; and

(d) electrical charge sensing means electrically connected to said elongated electrical conductive bar means to thereby (i) receive a signal indicative of said electrical charge, and (ii) serve as a means for enabling control of the electrical energization of said first and second electrical conductors of said emitter lines to thereby maintain ionization at a pre-selected state at work stations located in said work space.

4,785,249

METHOD FOR MEASURING DISTANCE IN DIGITAL DISTANCE RELAYS

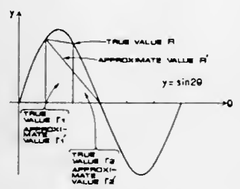
Takashi Yoshida, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 900,907

Claims priority, applicatioo Japan, Aug. 13, 1985, 60-179640

Int. Cl.⁴ G01R *31/08*

U.S. Cl. 324—509 **4 Claims**



1. A method for measuring distance in a digital distance relay apparatus comprising the steps of:

sampling voltage (v) and current (i) of an electric power system in a series of sampling time points at constant sampling intervals;

obtaining the following two equations from a formula "v=Ri+Ldi/dt", among said voltage (v) and current (i) and resistance (R) and inductance (L) of a power transmission line,

$$\int_{t_0}^{t_2} vdt = R \int_{t_0}^{t_2} idt + L[i]_{t_0}^{t_2}$$

-continued

$$\int_{t_1}^{t_3} vdt = R \int_{t_1}^{t_3} idt + L[i]_{t_1}^{t_3}$$

where t_0, t_1, t_2, t_3, . . . are a series of the sampling time points;

approximating an integral calculation,

$$\int_{tn}^{tn+2} f(t)dt,$$

in the two immediately preceding equations by the following approximation formula and thereby obtaining said resistance R and inductance L from said equations

$$\int_{t_n}^{t_{n+2}} f(t)dt \simeq T\left[k_1\left\{\frac{f(t_n)}{2} + f(t_{n+1}) + \frac{f(t_{n+2})}{2}\right\} + k_2\{f(t_n) + f(t_{n+2})\}\right]$$

where k_1, k_2 are constants;

subjecting the voltage and current of the power transmission line to sample hold at said constant sampling intervals to provide detected values;

digitizing the detected values to provide digitized signals; and

performing the integral calculation based on such digital signals to determine the resistance (R) and inductance (L) of said power transmission line.

4,785,250

ELECTRICAL COMPONENT SIMULATOR

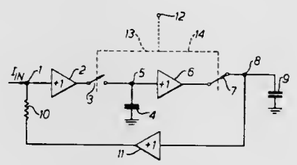
Rodney J. Lawton, Swindon, Great Britain, assignor to Plessey Overseas Ltd., Ilford, England

Filed Jan. 19, 1983, Ser. No. 459,331

Claims priority, application United Kingdom, Jan. 20, 1982, 8201607

Int. Cl.⁴ G06G *7/18;* **H03K** *5/00*

U.S. Cl. 328—127 **4 Claims**



1. An electrical component simulator comprising a first node; a first capacitor coupled between a second node and a reference potential; a second capacitor coupled between a third node and a reference potential; a resistor coupled between the first and third nodes; a first electrical switch arranged when in an open state to electrically isolate from one another the first and second nodes and when in a closed state to electrically couple together the first and second nodes; a second electrical switch arranged when in an open state to electrically isolate from one another the second and third nodes and when in a closed state to electrically couple together the second and third nodes; a first buffer amplifier coupled between the first node and the first switch, a second buffer amplifier coupled between the second node and the second switch and a third buffer amplifier connected in series with the resistor between the third and first nodes; wherein one of the first and second switches is open while the other is closed and means for reversing the states of the first and second switches in synchronism with one another at a predetermined rate whereby in response to a predetermined current applied to the first node there appears at that node a potential which increases with time.

4,785,251

DIGITAL FREQUENCY AND PHASE COMPARATOR

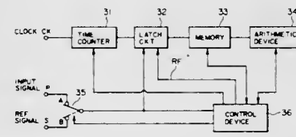
Tetsuo Akiyama, and Satoshi Kusano, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 8,087

Claims priority, application Japan, Jul. 26, 1984, 59-112452[U]

Int. Cl.⁴ H03K *5/26;* **G01R** *23/00*

U.S. Cl. 328—134 **11 Claims**



1. A digital frequency and phase comparator comprising:

a time counter;

input timing holding means for holding a first and a second count value of said time counter at two different input timings of an input signal; and

arithmetic means for determining one of a frequency and a period of said input signal in response to said first and second count values held in said input timing holding means and for determining a phase of said input signal relative to a reference signal in response to a selected one of said first and second count values held in said input timing holding means.

4,785,252

WAVEFORM PROCESSING CIRCUIT

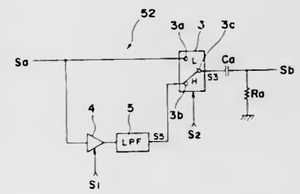
Hiroshi Fuji; Takashi Iwaki; Tsuneo Fujiwara, all of Tenri; Toshibisa Deguchi, and Shozou Kobayashi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 8, 1986, Ser. No. 916,644

Claims priority, application Japan, Oct. 8, 1985, 60-224599; Oct. 8, 1985, 60-224600

Int. Cl.⁴ H03K *5/00;* **H03B** *1/00*

U.S. Cl. 328—151 **14 Claims**



1. A waveform processing circuit comprising:

switching means for receiving an information signal having a first identifying portion and a second information portion as high frequency components on a low frequency carrier, said switching means including first and second input terminals and an output terminal, said signal being received at said first input terminal, and means for selectively connecting said output terminal to said first or said second input terminal;

sample-hold means, having an input receiving said information signal and an output connected to said second input terminal, for producing a signal consisting of said low frequency carrier; and

control means, responsive to said second information portion, for providing a first control pulse to said selectively connecting means to cause said output terminal to be connected to said second input terminal during said second information portion of said information signal, and for providing a second control pulse to said sample-hold means, said second control pulse being of greater duration than said second information portion to thereby cause said sample-hold means to sample and hold said low frequency carrier during the presence of said second information portion;

said switching means thereby outputting only said first identifying portion of said information signal.

4,785,253

INTEGRATED ELECTRIC FILTER WITH ADJUSTABLE RC PARAMETERS

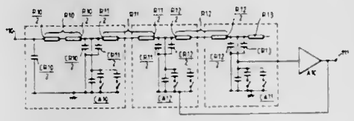
John B. Hughes, Hove, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1987, Ser. No. 40,952

Claims priority, application United Kingdom, Apr. 30, 1986, 8610561

Int. Cl.⁴ H03K *5/00;* **H04B** *1/10*

U.S. Cl. 328—167 **21 Claims**



1. An integrated electrical filter comprising at least one filter resistor, at least one filter capacitor and a control circuit for adjusting the value of the product of the resistance of the filter resistor and the capacitance of the filter capacitor, the control circuit comprising a phase detector, means for feeding a first signal to a first input of the phase detector, means for feeding a second signal to a second input of the phase detector, means for modifying the second signal in response to an output of the phase detector to cause the first and second signals to tend towards a given phase relationship, said modifying means including a control capacitor and a control resistor, characterised in that the control capacitor or control resistor comprise a plurality of capacitor or resistor elements, respectively that the output of the phase detector is effective to interconnect selected ones of the capacitor or resistor elements to give the control capacitor or control resistor a selected value, and that the control circuit further comprises means for adjusting the value of the filter resistor or filter capacitor, respectively in dependence on the selected value of the control resistor or control capacitor.

4,785,254

PULSED PARTICLE BEAM VACUUM-TO-AIR INTERFACE

Gilbert E. Cruz, Pleasanton, and William F. Edwards, Livermore, both of Calif., assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed Jun. 18, 1987, Ser. No. 63,602

Int. Cl.⁴ H05H *7/10*

U.S. Cl. 328—233 **3 Claims**

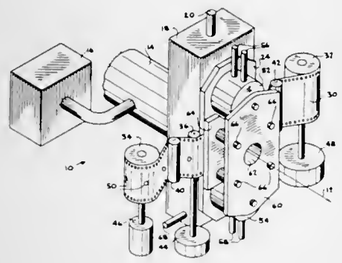
1. A vacuum-to-air interface for a pulsed particle beam accelerator of the type that, within a region of near vacuum existing within the accelerator, in operation continuously generates a sequence of individual high-powered particle pulses at a fixed repetition rate, the interface comprising:

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a pneumatic high speed gate valve having an open configuration and a closed configuration and adapted to be positioned contiguously to the region of near vacuum existing within the accelerator at a location where the sequence of particle pulses can pass through the gate valve in open configuration, and with the gate valve additionally adapted to be operated at the fixed repetition rate of the sequence of particle pulses;

a duct extending from the gate valve and terminating in an aperture, and providing a vacuum-tight passageway for the particle pulses after the particles pass through the gate valve in open configuration and then proceed onward toward and through the aperture;

advancing and positioning means, for periodically advancing a strip of metal or plastic foil across the aperture of the duct at the fixed repetition rate of the sequence of particle pulses, in a manner insuring that the foil strip remains stationary as each of the individual high-powered particle pulses passes through the aperture and then passes through and ruptures the foil strip, and further providing that following each rupture the foil strip is then advanced to a new position in which the portion of the foil strip that extends across the aperture is not ruptured;



a sealing band, adapted to be pneumatically operated at the fixed repetition rate of the sequence of particle pulses, for mechanically urging the foil strip, when stationary, against and into the aperture of the duct, to thereby improve the quality of the vacuum seal that the foil strip provides across the aperture for the interior passageway of the duct, with the sealing band being centrally hollow to permit the sequence of particle pulses to pass therethrough;

a means for keeping the foil strip from crinkling as it is being urged into the aperture, and, at the same time, for keeping the portion of the foil strip adjacent to that portion being so urged both stationary and flat; and

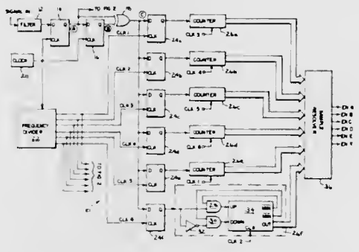
a means for introducing a sequence of individual gas quantities into the passageway of the duct, at the fixed repetition rate of the sequence of particle pulses, and with each individual gas quantity being introduced only when the gate valve is in the closed configuration and prior to the advancing and positioning means beginning to advance the foil strip to a new position, whereby the gas pressure of the gas quantity lifts off and separates the foil strip from the aperture of the duct so that the foil strip may be readily advanced.

4,785,255

DIGITAL FSK SIGNAL DEMODULATOR

Mark Lucak, Saline, and Michael Klein, Ann Arbor, both of Mich., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Nov. 23, 1987, Ser. No. 124,154
Int. Cl.[4] H03D *3/04*
U.S. Cl. 329—126 **14 Claims**



1. A demodulator for a frequency shift keyed (FSK) signal having bit intervals during each of which a bit of data is transmitted, the demodulator comprising:

means for generating a master clock signal having X number of pulses during each half of the bit interval of the FSK signal;

means for sampling the FSK signal during each pulse;

means for counting the number of transitions in the FSK signal that correspond in time to each of the same ordinally numbered pulses in a plurality of groups of X ordinally numbered pulses,

means for indicating for which ordinally numbered pulse the most transitions were counted; and

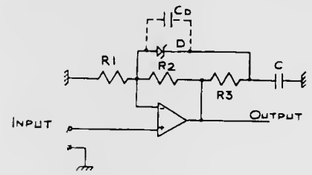
means responsive to the indicating means for comparing a pair of samples selected from different halves of a bit interval.

4,785,256

NON-LINEAR AMPLIFIER

Mark J. Khesin, Nepean, and Boris Livshits, Ottawa, both of Canada, assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 9, 1987, Ser. No. 106,530
Int. Cl.[4] H03F *1/36*
U.S. Cl. 330—110 **7 Claims**



1. Apparatus for the amplification of electrical input signals having both steady state and alternating components, the apparatus having at least two different levels of gain for each of steady state and alternating signals, the transition between the gain levels for both steady state and alternating signal components being at the same average input signal magnitude, said apparatus comprising:

amplifier means, said amplifier means including an amplifier and having inverting and non-inverting input signal terminals and an output terminal;

means for applying an input signal having steady state and alternating components between a first of said amplifier means input terminals and a reference potential; and

non-linear feedback circuit means connected between said amplifier means output terminal and the other of said input terminals, said feedback circuit means including:

voltage divider means, a first point of said voltage divider means being connected to said reference potential, a second point of said voltage divider means being connected to said amplifier means other input terminal, a third point of said voltage divider means being connected to said amplifier means output terminal;

a capacitance connected between a fourth point on said voltage divider means and the reference potential; and

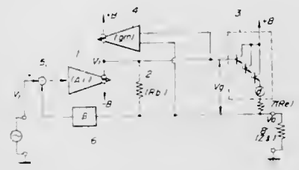
voltage sensitive switch means connected between said amplifier means other input terminal and said fourth point on said voltage divider means, said switch means having an internal capacitance, said switch means being in parallel with the portion of said voltage divider means between said second and fourth points and including said third point.

4,785,257

POWER AMPLIFIER CIRCUIT FOR AN AUDIO CIRCUIT

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed May 26, 1987, Ser. No. 54,828
Claims priority, application Japan, Jun. 2, 1986, 61-127729
Int. Cl.[4] H03F *1/32, 3/45*
U.S. Cl. 330—149 **10 Claims**



1. A power amplifier circuit for an audio circuit comprising:

(a) a drive amplifier having an impedance load, said drive amplifier driving said impedance load by use of a first power voltage from a first power source so that a first input voltage is amplified in said drive amplifier wherein the amplified first input voltage is outputted as a first output voltage;

(b) an output amplifier being driven by said first output voltage so that said output amplifier outputs the amplified first output voltage as a second output voltage;

(c) a distortion cancellation circuit for driving said impedance load with a voltage gain of "1" by use of a second power voltage from a second power source based on a first voltage difference between said first output voltage and said second output voltage, whereby a distortion included in said second output voltage is canceled by said distortion cancellation circuit; and

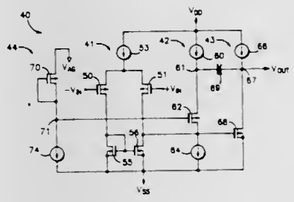
(d) a negative feedback loop for negatively feeding back said second output voltage to a primary amplifier as a negative feedback voltage, said primary amplifier generating said first input voltage based on a second voltage difference between said negative feedback voltage and an arbitrary input voltage.

4,785,258

CMOS AMPLIFIER CIRCUIT WHICH MINIMIZES POWER SUPPLY NOISE COUPLED VIA A SUBSTRATE

Alan L. Westwick, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 17, 1987, Ser. No. 97,765
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **8 Claims**



1. A CMOS amplifier which minimizes power supply noise, comprising:

a differential input stage comprising first and second transistors for respectively receiving first and second input voltages and providing a bias voltage proportional to a differential of the first and second input voltage;

an output stage coupled to the differential input stage for providing an output signal proportional to the bias voltage;

frequency stability means coupled to the output stage for providing frequency stabilization for the CMOS amplifier;

cascode means coupled to the frequency stability means, for maintaining a predetermined portion of the frequency stability means at a predetermined voltage potential referenced to a ground potential, said cascode means having an error voltage signal component; and

compensation means coupled to the cascode means for providing a compensation signal proportional to the error voltage signal component which cancels the error voltage signal, thereby allowing the predetermined portion of the frequency stability means to remain at the predetermined voltage potential.

4,785,259

BIMOS MEMORY SENSE AMPLIFIER SYSTEM

Walter C. Seelbach, Fountain Hills, Ariz.; Kevin L. McLaughlin, Eau Claire, Wis., and Danny J. Molezion, Norcross, Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1988, Ser. No. 150,607
Int. Cl.[4] H03F *3/16, 3/45*
U.S. Cl. 330—300 **16 Claims**



1. A circuit comprising:

a first supply voltage terminal;

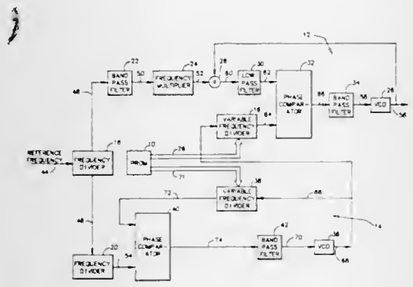
a second supply voltage terminal;

a first input terminal;

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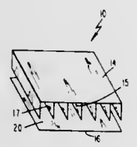
a second input terminal;
a first enable terminal;
a second enable terminal;
a first output terminal;
a second output terminal;
first means coupled between said first and second supply voltage terminals and coupled to said first and second input terminals for differentially providing first and second signals;
second means coupled between said first supply voltage terminal and said first output terminal and coupled to said first means and responsive to said first signal for providing a first output;
third means coupled between said first supply voltage terminal and said second output terminal and coupled to said first means and responsive to said second signal for providing a second output;
fourth means coupled between said first output terminal and said first input terminal and coupled to said first enable terminal for selectively clamping said input terminal; and
fifth means coupled between said second output terminal and said second input terminal and coupled to said second enable terminal for selectively clamping said input terminal.

4,785,260
FREQUENCY SYNTHESIZER FOR BROADCAST TELEPHONE SYSTEM HAVING MULTIPLE ASSIGNABLE FREQUENCY CHANNELS
Eric Paneth, Givataiim, Israel, assignor to International Mobile Machines Corporation, Philadelphia, Pa.
Filed Mar. 18, 1986, Ser. No. 840,908
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—2 **4 Claims**



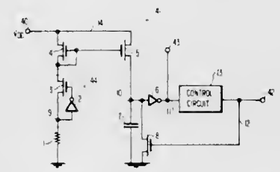
1. In a broadcast telephone system for communicating information signals over an assigned frequency channel, the combination of a synthesizer for generating a signal at the assigned frequency and a read-only memory (ROM) storing a plurality of sets of first and second signals associated with different predetermined assignable frequencies, the synthesizer comprising
a first phase-locked loop, including
a first voltage-controlled oscillator (VCO) for generating an output signal at a frequency within a first predetermined range including the plurality of assignable frequencies;
a mixer for mixing the output signal from the first VCO with a first frequency reference signal having a predetermined frequency that is derived from a common reference frequency signal;
a low-pass filter for passing the low-frequency product from the mixer;
a first phase comparator for comparing the passed low-frequency product with a second reference frequency signal having a frequency within a second predetermined range and derived from a second phase-locked loop, and for providing a first voltage signal indicating the result of said comparison; and
a first band-pass filter for passing the first voltage signal to the first VCO for controlling the first VCO, wherein the passband of the first band-pass filter is adapted for minimizing phase noise and electronic noise due to microphonics;
a second phase-locked loop, including
a second VCO for generating a third reference frequency signal within a third predetermined range;
a first frequency divider coupled to the ROM for dividing the frequency of the output signal from the second VCO by an amount indicated by a first signal from the ROM associated with a given assignable frequency;
a second phase comparator for comparing the divided output signal from the second VCO with a fourth frequency reference signal having a predetermined frequency that is derived from said common frequency reference signal and for providing a second voltage signal indicating the result of said comparison; and
a second band-pass filter for passing the second voltage signal to the second VCO for controlling the second VCO, wherein the passband of the second band-pass filter is adapted for minimizing phase noise and electronic noise due to microphonics; and
a second frequency divider coupled to the ROM for dividing the frequency of the output signal from the second VCO by an amount indicated by a second signal from the ROM associated with said given assignable frequency to provide the second reference frequency signal to the first phase comparator.

4,785,261
MAGNETICALLY INSULATED TRANSMISSION LINE OSCILLATOR
Larry D. Bacon; William P. Ballard; M. Collins Clark, and Barry M. Marder, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed May 19, 1987, Ser. No. 51,562
Int. Cl.[4] H03B *9/08, 9/10*
U.S. Cl. 331—82 **9 Claims**



1. A magnetically insulated transmission line microwave oscillator, comprising:
an elongated cathode;
anode structure comprising a first anode including slow-wave structures and a support for said slow-wave structures, said slow-wave structures comprising a plurality of thin conductive vanes arrayed as a family of parallel surfaces extending from said support towards said cathode, said vanes defining slow-wave cavities between said vanes;
said cathode and first anode forming a gap therebetween and defining a low impedance transmission line; and
pulsed power means, connected to said cathode and first anode, for producing field emitted electrons and an electric field in said gap, said electrons producing self-generated magnetic fields in a cross-field orientation with respect to the orientation of the electric field, only said cross-field magnetic fields insulating a flow of electrons in said gap and confining the flow of electrons within said gap;
microwave energy being generated by an interaction of electrons parallel to said cathode with oscillating modes of said slow-wave cavities perpendicular to said cathode, said interaction producing intense electron bunching and microwave radiation.

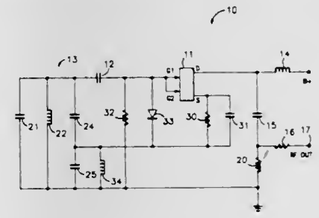
4,785,262
PULSE GENERATOR PRODUCING PULSES HAVING A WIDTH FREE FROM A POWER VOLTAGE AND A THRESHOLD VOLTAGE OF AN INVERTER USED THEREIN
Kazuo Ryu, and Kyuichi Hareyama, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Dec. 23, 1986, Ser. No. 945,920
Claims priority, application Japan, Dec. 23, 1985, 60-291136
Int. Cl.[4] H03K *3/02, 5/04*
U.S. Cl. 331—111 **14 Claims**



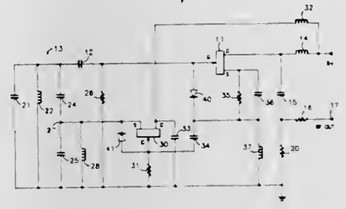
1. A pulse generator comprising:
a first capacitor having a first end held at a reference potential and a second end;
a first inverter having a threshold voltage and having an input portion connected to said second end of said first capacitor and an output portion producing an output when a voltage at said second end of said first capacitor exceeds said threshold voltage;
a first means for producing a signal for discharging said first capacitor for a limited time period in response to said output from said first inverter;
a first switch coupled to said first capacitor to discharge said first capacitor in response to said discharging signal from said first means;
a resistor having a resistance;
a second means coupled to said resistor for controlling a current flowing through said resistor to have a value obtained by dividing said threshold voltage by said resistance;
a third means for supplying said current to said first capacitor; and
a fourth means for deriving output pulses from said first means.

4,785,263
FET OSCILLATOR CIRCUIT
Robert S. Kaltenecker, Mesa, Ariz.; Robert E. Stengel, Ft. Lauderdale, Fla.; Ralph T. Enderby, Ft. Lauderdale, Fla., and James S. Irwin, Ft. Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 28, 1987, Ser. No. 55,207
Int. Cl.[4] H03B *5/00*
U.S. Cl. 331—117 FE **7 Claims**

1. A FET oscillator circuit utilizing a FET having gate, drain and source connections comprising:
resonance means connected to the FET gate;
bias voltage means connected to the FET;
impedance means connected to the FET source; and
a Schottky diode connected across the FET gate-source junction and impedance means, with an anode connected to the FET gate and a cathode connected to the impedance means, whereby positive voltages across the gate-source junction are limited to prevent gate-source current flow;
the impedance means comprising a resistor.



4,785,264
DUAL FET OSCILLATOR
Robert S. Kaltenecker, Mesa, Ariz.; Robert E. Stengel, Ft. Lauderdale, Fla.; Ralph T. Enderby, Ft. Lauderdale, Fla., and James S. Irwin, Ft. Lauderdale, Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 28, 1987, Ser. No. 55,206
Int. Cl.[4] H03B *5/12*
U.S. Cl. 331—117 FE **4 Claims**



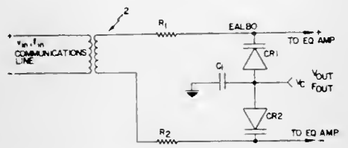
1. A dual FET oscillator suitable for use at UHF frequencies including first and second J-FET's each having gate, drain and sorce connections comprising:
resonance means connected to the gate of the first J-FET and to the second J-FET,
bias voltage means connected to the first and second FET's, and
the second J-FET being connected to the first J-FET as a source follower.

4,785,265
ENHANCED AUTOMATIC LINE BUILD OUT
Ramon Molnar, Willoughby Hills, and Denis M. Poirier, Cleveland Heights, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Oct. 1, 1987, Ser. No. 103,858
Int. Cl.[4] H03H *11/06*
U.S. Cl. 333—18 **10 Claims**

1. A line build out circuit for equalizing signals from plural cables of different lengths, comprising:
control voltage means for generating a control voltage indicative of the length of a cable to be traveled by a signal to be equalized;
a tuning component having a variable characteristic, an anode and a cathode, said control voltage means being

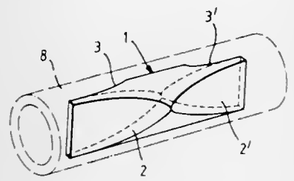
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connected to said anode for applying the controlled voltage thereto for varying the variable characteristic;
a capacitor connected to said anode;
a resistor connected to said cathode;
the signal to be equalized being applied over said resistor to said cathode and being measured at said cathode, the signal having a frequency roll-off representing a degree of attenuation which depends upon the frequency of the signal and upon the length of the cable over which the signal was supplied; and



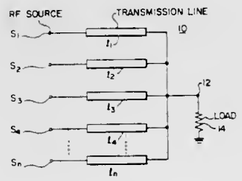
a second tuning component having a second anode connected to said first-mentioned anode, and a second cathode, a second resistor connected to said second cathode, said capacitor being connected on one side to said first-mentioned and second anodes, and an opposite side to a reference ground, said control voltage means connected to said first-mentioned and second anodes, the signal being measured between first-mentioned and second cathodes.

4,785,266
DIELECTRIC ROD POLARIZER HAVING WEDGE SHAPE POLARIZING PORTIONS
Paul Newham, Middlesex, and Bernard J. Andrews, Hertfordshire, both of England, assignors to The Marconi Company Limited, England
Continuation of Ser. No. 766,102, Aug. 15, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,063
Claims priority, application United Kingdom, Aug. 20, 1984, 8421102
Int. Cl.[4] H01P *1/17*
U.S. Cl. 333—21 A **7 Claims**



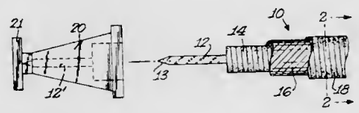
1. A radio frequency polarizer, comprising:
(a) a rod of dielectric material elongated along a length direction,
(b) said rod having a body portion and at least one end portion, said body portion having a cross-section transverse to said length direction and said cross-section having a width direction transverse to said length direction,
(c) said end portion having a length along said length direction and a wedge formation comprising a reduction of rod dimension in said width direction only,
(d) a tubular waveguide elongated along a length direction and containing said rod therein, said length direction of said rod coinciding with said length direction of said tubular waveguide,
(e) said tubular waveguide having a cross-section for carrying orthogonal plane-polarized waves, and said cross-section of said body portion conforming to and being a close fit in said cross-section of said tubular waveguide,
(f) said cross-section of said tubular waveguide being constant throughout said length of said wedge formation, said wedge formation being non-critically positioned longitudinally along and within said tubular waveguide, and
(g) said wedge formation of said rod of dielectric material effecting a differential phase-shift between orthogonal components of each of said orthogonal plane-polarized waves for conversion between plane and non-plane polarization.

4,785,267
RADIO FREQUENCY COMBINER
Dennis H. Covill, Tantallon, Canada, assignor to Nautical Electronic Laboratories Limited, Tantallon, Canada
Filed Nov. 18, 1987, Ser. No. 122,129
Int. Cl.[4] H01P *5/12*
U.S. Cl. 333—125 **13 Claims**



1. A combining network for use in combining a plurality of coherent radio frequency sources, said radio frequency having a wavelength, said combining network comprising a plurality of arms, each arm having a first end and a second end, said first end of each arm forming an input port for connection to one of said plurality of radio frequency sources, said second end each being connected to an output port which is common to all of said plurality of arms, each arm having a length in electrical degrees of said wavelength, that length being in the range from $55°+m(180°)$ to $70°+m(180°)$ where $m=0, 1, 2, 3, \ldots$.

4,785,268
DIELECTRIC WAVEGUIDE DELAY LINE
Jeffrey A. Walter, Wilmington; Kailash C. Garg, Newark; Joseph C. Rowan, Wilmington, all of Del., and Robert H. Gibson, Elkton, Md., assignors to W. L Gore & Associates, Inc., Newark, Del.
Filed Jul. 30, 1987, Ser. No. 79,686
Int. Cl.[4] H01P *9/00, 9/02*
U.S. Cl. 333—157 **14 Claims**



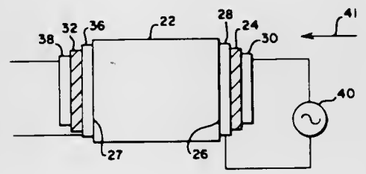
1. A delay line comprising a length L of a dielectric waveguide for the transmission of electromagnetic waves, said dielectric waveguide having:
(a) a core of polytetrafluoroethylene (PTFE);
(b) one or more layers of polytetrafluoroethylene (PTFE) overwrapped around said core, wherein

$$T=KL/c,$$

in which T is the total time delay, c is the velocity of light in free space and K is the delay constant for said dielectric waveguide;
(c) said one or more layers of polytetrafluoroethylene (PTFE) having an electromagnetic shielding layer thereover; and

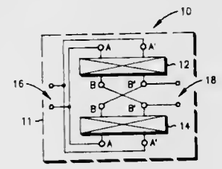
(d) said shielding layer being further overwrapped with a tape of carbon-filled PTFE.

4,785,269
MAGNETICALLY TUNED HIGH OVERTONE BULK ACOUSTIC RESONATOR
John D. Adam, Murrysville, and Bruce R. McAvoy, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 15, 1986, Ser. No. 863,481
Int. Cl.[4] H03H *9/00*
U.S. Cl. 333—188 **3 Claims**



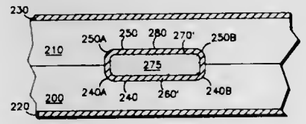
1. Tunable bulk electroacoustic apparatus for generating signals of variable frequency resonances, said tunable bulk electroacoustic apparatus generating and propagating said signals having a high Q at microwave frequencies, comprising:
a ferrimagnetic substrate material of a thickness sufficient to produce resonant operation at a predetermined operating frequency, said ferrimagnetic substrate material propagating bulk acoustic waves, said ferrimagnetic substrate material containing an upper and lower surface;
variable magnetizing means located proximate to said ferrimagnetic substrate material for generating a variable magnetic field in said ferrimagnetic material, said variable magnetic field produced by said variable magnetizing means acting in a direction parallel to the direction of propagation of bulk acoustic waves;
a first input transducer means coupled to said upper surface of said ferrimagnetic substrate material for generating said bulk acoustic waves towards said lower surface, wherein said variable magnetic field varies the frequency of said bulk acoustic waves;
a first connecting means for coupling an input signal to said first transducer;
a second output transducer means coupled to said lower surface for receiving said bulk acoustic waves; and
a second connecting means for coupling said second transducer to provide an output signal.

4,785,270
MONOLITHIC LATTICE SAW FILTER
Robert G. Kinsman, Naperville, Ill., assignor to Motorola Inc., Schaumburg, Ill.
Filed Dec. 30, 1987, Ser. No. 139,419
Int. Cl.[4] H03H *9/56, 9/60, 9/64*
U.S. Cl. 333—193 **17 Claims**



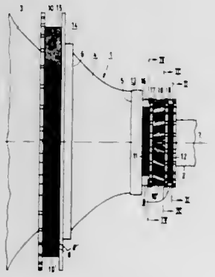
9. A bandpass filter comprising:
a monolithic piezoelectric substrate;
and a first and second set of elements disposed on said substrate and coupled in a cascaded circuit configuration, each of said set of elements comprised of a first and second dual port SAW device electrically coupled to one another, said first set of elements coupled to the input of said filter and coupled to said second set of elements, said second set of elements being coupled to the output o said filter.

4,785,271
STRIPLINE FILTER WITH IMPROVED RESONATOR STRUCTURE
Robert J. Higgins, Jr., Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 24, 1987, Ser. No. 124,639
Int. Cl.[4] H01P *1/203, 7/08*
U.S. Cl. 333—204 **5 Claims**



1. A stripline resonator structure comprising:
a substrate of dielectric material including first and second opposed surfaces and a center;
first and second ground planes disposed on said first and second surfaces, respectively;
a resonator structure having an elliptically shaped cross-section situated approximately at the center of said substrate, said resonator including a major axis oriented substantially parallel with said first and second surfaces.

4,785,272
ELECTOMAGNETIC DEFLECTION UNIT
Anwar Osseyran, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.
Filed Sep. 1, 1987, Ser. No. 92,254
Claims priority, application Netherlands, Sep. 24, 1986, 8602407
Int. Cl.[4] H01H *5/00*
U.S. Cl. 335—213 **2 Claims**



1. An improved electromagnetic deflection unit for a cathode-ray tube, comprising:
a hollow annular support having a longitudinal axis and a narrow and a wide end,
a set of field deflection coils of the saddle type for field deflection of an electron beam, these deflection coils being located on respective sides of a field coil separation plane

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through the longitudinal axis of the support and having a plurality of turns comprising portions which extend mainly longitudinally of the support, and

a set of line deflection coils of the saddle type for line deflection of said electron beam,

the set of line deflection coils being wound directly onto said support on the inner side thereof;

such improvement being characterized in that the field deflection coils each comprise a first part and a second part which are connected electrically in series, the first part of each of the field deflection coils being wound against the inner side of said support and the second part of each of the field deflection coils being wound against the set of line deflection coils, and in that at the narrow end of the support the portions of the turns of the second part of each of the field deflection coils which extend in the direction of the longitudinal axis of the support so extend beyond the line deflection coils.

4,785,273

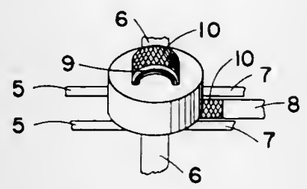
STRIP-LINE-CORE TRANSFORMER

David F. Doty, 701 Burmaster Dr., Columbia, S.C. 29223

Continuation-in-part of Ser. No. 716,697, Mar. 27, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 68,611

Int. Cl.[4] H01F *77/08, 19/00*

U.S. Cl. 336—61 **8 Claims**



1. A wideband r.f. transformer comprising:

a strip line core (SLC) made essentially from a carbonyl iron powder composite material, said core being defined by two substantially parallel plane surfaces and having two symmetrically spaced apart slots extending between said surfaces and substantially centered thereon;

said slots being spaced apart less than 2 cm and positioned so as to form opposite sides of a substantially void free coil-core-region of substantially square cross section in a plane parallel to said plane surfaces; and

a spiral winding of a strip line, consisting of conductor foil and spacer dielectric, threaded through said slots and round said coil-core-region;

said slots being positioned on said surfaces so that the cross sectional area presented to magnetic flux generated by said spiral winding by the coil-core-region is less than 80% of the mean total cross sectional area presented to the flux by the material outside of said coil-core-region.

4,785,274

THERMALLY-SENSIBLE OVERCURRENT PROTECTIVE RELAY INCLUDING AUTOMATIC RESETTING MECHANISM

Yuji Sako; Haruhiko Ito, both of Aichi, and Mineo Sano, Mie, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 110,084

Claims priority, application Japan, Oct. 17, 1986, 61-159003[U]

Int. Cl.[4] H01H *71/16, 37/70*

U.S. Cl. 337—49 **3 Claims**

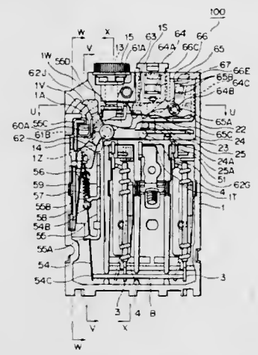
1. A thermally-sensible overcurrent protective relay comprising:

a bimetal responsive to a current flowing through a main circuit;

a toggle mechanism responsive to bending motion of said bimetal;

a normally-open contact having a normally-open fixed contact element and a normally-open movable contact element both formed by a resilient conductive thin plate having a first contact portion at one end thereof;

a normally-closed contact having a normally-closed fixed contact element and a normally-closed movable contact element both formed by a resilient conductive thin plate having a second contact portion at one end thereof; and



a changeover mechanism including a changeover lever selectable to an automatic resetting position and a manual resetting position in such a manner as to contact one surface of the contact portion of said normally-open fixed contact element at one end of said changeover lever pivotally rotatable to displace said normally-open fixed contact element toward said normally-open movable contact element and retain said normally-open contact in first and second positions at the other end of said selector lever, said normally-closed contact and said normally-open contact being interlockingly operated by the operation of said toggle mechanism.

4,785,275

STRAIN GAUGE

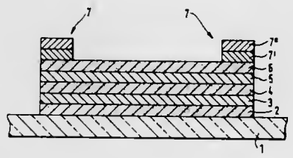
Wolfgang Adamitzki, Sulzbach, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 26, 1985, Ser. No. 769,550

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431114

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—5 **18 Claims**



1. A strain gauge comprising

a support;

contact layers for making electrical contact between the strain gauge and an external circuit;

a plurality of superimposed metallic resistance layers, said resistance layers being disposed on the support and being located between the support and said contact layers;

a partially conductive insulation layer disposed between and in contact with said resistance layers; and wherein

an uppermost one of said resistance layers is connected between one of said contact layers disposed at one end of the gauge and a second of said contact layers disposed at a second end of the gauge, a bottom one of said resistance layers located between said support and said uppermost resistance layer being electrically connected to said uppermost resistance layer by said partially conductive insulation layer to improve a gauge factor of the strain gauge.

4,785,276

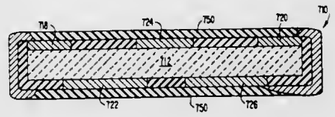
VOLTAGE MULTIPLIER VARISTOR

John E. May, Skaneteles, N.Y., assignor to General Electric Company, Fairfield, Conn.

Filed Sep. 26, 1986, Ser. No. 911,931

Int. Cl.[4] H01C *7/10*

U.S. Cl. 338—21 **8 Claims**



1. A varistor comprising:

a varistor body having a first major surface and an opposed second major surface;

a plurality of conductive regions disposed in spaced relationship on said first surface;

a plurality of conductive regions disposed in spaced relationship on said second surface;

said conductive regions being positioned such that the distance separating any conductive region and the nearest adjacent conductive region on the same surface of the varistor body is greater than the distance separating that conductive region and the nearest conductive region on the opposed surface of the varistor body,

wherein current will tend to flow from any of said conductive regions through the thickness of said varistor body to one of said conductive regions on the opposed surface of said varistor body.

4,785,277

NARROWLY-ADJUSTABLE RESISTOR

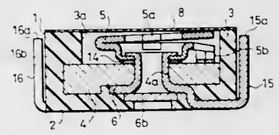
Toshiaki Yashiro, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jan. 28, 1987, Ser. No. 7,615

Claims priority, application Japan, Apr. 21, 1986, 61-58689[U]

Int. Cl.[4] H01C *10/32, 10/38*

U.S. Cl. 338—162 **3 Claims**



1. In an adjustable resistor having a slider rotatably mounted on a resistor base for adjusting a resistance value of said resistor, a case containing said slider and said resistor base formed by an upper wall, side walls, and a bottom wall, and terminals connected to said slider and said resistor base, respectively, which extend through the bottom wall to the outside of said case, wherein said resistor is to be mounted with its bottom wall on a surface of a printed circuit substrate and its terminals soldered to corresponding electrodes provided on the surface of the substrate,

the improvement wherein:

said slider is mounted on said resistor base by an eyelet having a lower folded part which forms part of the bottom wall closing said case and a lower end which constitutes one of the terminals extending through the bottom wall to the outside of said case;

said terminals extending through the bottom wall of said case to the outside thereof are each bent so as to have a stem part thereof extending upwards along a respective one of the side walls and terminating close to a peripheral edge defined by the upper wall and one side wall, and a branch part thereof extending sidewards to a peripheral edge defined by the one side wall and an adjacent side wall,

and solder from a solder jet is applied from the direction of the upper wall of the resistor case and induced to flow along said stem part or said branch part of the terminal to the bottom wall of said case on the substrate to reliably solder each terminal to a respective electrode on the substrate.

4,785,278

VARIABLE RESISTOR

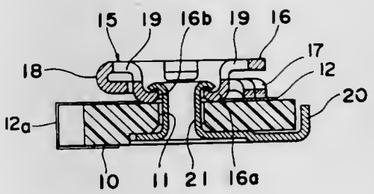
Hideo Nishizawa, and Yukinori Ueda, both of Fukui, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 29, 1987, Ser. No. 102,321

Claims priority, application Japan, Oct. 1, 1986, 61-235125

Int. Cl.[4] H01C *10/32*

U.S. Cl. 338—162 **4 Claims**



1. A variable resistor comprising a base plate having a hole at its center and a resistor around the hole, a slider provided with, at its one end, a driver plate having an approximately dish-shaped projection at its center, and an approximately ring-shaped arm portion having a contact point portion, which are coupled to each other at a coupling portion of the both ends, are punched out from one piece of conductive sheet metal and are turned up by 180° at the coupling portion with the projection portion being projected from an arm portion, and a terminal plate having a cylindrical portion inserted through the hole of the base plate and engaged into the hole of the projection portion of the driver plate, the driver plate being rotatably mounted onto the base plate through the terminal plate.

4,785,279

INTEGRATED CIRCUIT RESISTOR HAVING BALANCED FIELD PLATE

Alan T. Wetzel, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1986, Ser. No. 940,820

Int. Cl.[4] H01C *1/012*

U.S. Cl. 338—314 **18 Claims**

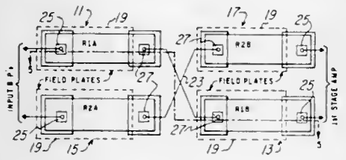
1. An integrated circuit resistor, comprising:

(a) a substrate having first and second resistor segments formed therein, each segment having a first and second end,

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(b) means electrically interconnecting the second end of said first resistor segment with the first end of the second resistor segment,

(c) a field plate disposed over a part of said first resistor



segment and electrically coupled to the first end of said second resistor segment, and

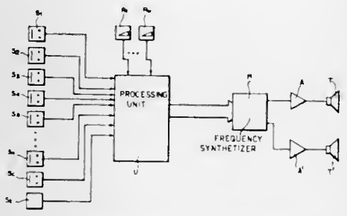
(d) a field plate disposed over a part of said second resistor segment and electrically coupled to the second end of said second resistor segment.

4,785,280

SYSTEM FOR MONITORING AND INDICATING ACOUSTICALLY THE OPERATING CONDITIONS OF A MOTOR VEHICLE

Enrica Fubini; Antonio De Bono, both of Turin, and Giacomo Ruspa, Vinovo, all of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Jan. 28, 1987, Ser. No. 7,693
Claims priority, application Italy, Jan. 28, 1986, 67069 A/86
Int. Cl.[4] B60G *5/00*
U.S. Cl. 340—52 F **8 Claims**



1. A system for monitoring and indicating acoustically the operating conditions of a motor vehicle, comprising:

a plurality of sensor devices, each arranged to monitor a respective physical or operating magnitude of apparatus, a device or a member of the vehicle, and to provide corresponding electrical signals,

acoustic signal generator means for generating a plurality of acoustic characterising signals, each indicative of a corresponding predetermined operating condition of a predetermined plurality of operating conditions, and a plurality of acoustic level signals indicative of corresponding predetermined levels of importance or seriousness attributable to the operating conditions, and

processing means connected to the sensor devices and the acoustic signal generator means and arranged:

to detect on the basis of signals provided by the sensor devices the occurrence of the operating conditions of the vehicle,

to attach in a predetermined manner a predetermined level of seriousness or importance to each operating condition, and

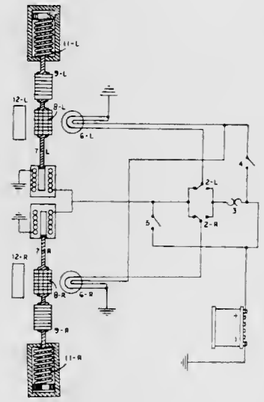
to supply to the acoustic signal generator means electrical control signals for causing the output of an acoustic signal comprising, in succession, the acoustic level signal and the acoustic characterising signal associated with the operating condition detected at any time.

4,785,281

MECHANICAL IMPLEMENTATION OF UNAMBIGUOUS AUTOMOTIVE BRAKE SIGNAL LIGHTS

David L. Cameron, 620 Hamlet Dr., Port Orange, Fla. 32019

Filed Jun. 25, 1987, Ser. No. 66,211
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—74 **3 Claims**



1. A method for effecting red colored light at the rear of an automotive vehicle as an unambiguous signal of braking, including the following electrical components:

a source of electrical energy;

manually actuated left and right turn signal selector switches;

a turn signal flasher device for automatically opening and closing electric circuits between said source of electrical energy and said turn signal selector switches;

a manually actuated tail light switch;

manually actuated brake actuation means;

a brake light switch actuated by actuation of said brake actuation means;

lamps illuminated by the flow of energizing electric current to effect the tail lights of said vehicle;

lamps illuminated by the flow of energizing electric current to effect the rear turn signal lights of said vehicle;

lamps illuminated by the flow of energizing electric current to effect the brake signal lights of said vehicle; and

electrical conductor means whereby said components are interconnected; said method comprising:

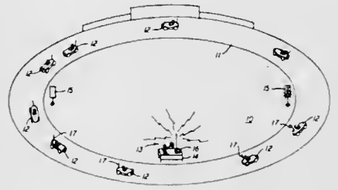
mechanical means to reversibly alter the path traversed by light emanating from all said illuminated lamps, said light being subsequently transmitted from the rear of said vehicle, said path alteration causing, in the case that said brake actuation means is not actuated, said light to be transmitted through material containing a non-red colored pigment, said pigment causing said light to be further transmitted as non-red colored light, and said alteration further causing, in the case that said brake actuation means is actuated, said light to be transmitted through material containing a red colored pigment, said pigment causing said light to be further transmitted as red colored light.

4,785,282

PULSE CODED WARNING SYSTEM FOR RACETRACK

Richard J. Martell, 4929 Orangeport Rd., Brewerton, N.Y. 13029, and Donald D. Martell, 103 Colchester Rd., Minoa, N.Y. 13116

Continuation-in-part of Ser. No. 944,658, Dec. 22, 1986. This application Mar. 15, 1988, Ser. No. 168,229
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—323 R **7 Claims**



1. A race condition alerting system for use on a race course to signal racing conditions to all of a plurality of racing motor vehicles proceeding around a closed loop race course, in which a race official monitors race course conditions and signals one of a plurality of conditions including a yellow flag or caution condition and a green flag or safe race condition, to be observed by the operators of said racing motor vehicles with one of said conditions being in effect at any time during a race, comprising:

transmitter means transmitting a carrier which is modulated with a pulse coded racing condition signal to indicate a selected one of said conditions, including manually actuable means permitting the race official to select between said conditions according to the observed race course condition, radiating means for radiating the carrier over a range that encompasses the entire race course, an encoder that pulse encodes the modulated carrier according to an appropriate one of a plurality of preset codes corresponding to said race conditions, and timer means for supplying said pulse coded race condition signal to said radiating means for a predetermined transmission time; and

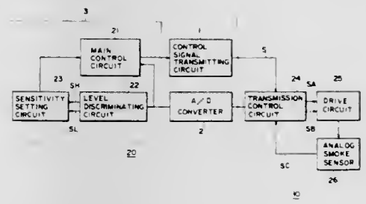
a plurality of receiver units each including means for mounting in a respective one of said racing motor vehicles; antenna means to receive said carrier at all positions on said race course; a demodulator for demodulating said carrier; signal processing means following said demodulator for eliminating stray noise and passing the demodulated signal as a pulse coded signal; decoder means corresponding to the encoder of said transmitter, which includes presetting means preset with said plurality of codes corresponding to said race conditions and providing a plurality of output race course conditions signals when and only when the demodulated pulse coded signal matches an associated one of said preset codes; indicating means providing the operator with respective visible indications corresponding to at least said green flag and yellow flag conditions; and means for actuating said indicating means in accordance with said decoded output race course condition as provided from the decoder means, and maintaining the respective visible indication to the respective operator at least until another said output race course condition signal is provided thereto from said decoder means so that the operator is continuously presented with a positive visible race course condition indication at all times during the race.

4,785,283

DETECTING SYSTEM AND DETECTOR

Sadataka Yuchi, Sagamihara, Japan, assignor to Hochiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1987, Ser. No. 25,503
Claims priority, application Japan, Mar. 18, 1986, 61-60095
Int. Cl.[4] G08B *23/00, 17/10*
U.S. Cl. 340—501 **16 Claims**



1. A detecting system for detecting a change in an environmental phenomenon comprising:

an analog sensor in a detector for sensing said change in a quantity of said environmental phenomenon and having an output signal;

said analog sensor having a detection range classified into a plurality of areas correlating with the quantity of said phenomenon;

a receiver for receiving and processing a signal corresponding to a detection level of an output from said analog sensor;

sensitivity setting means changing automatically a detection sensitivity of said analog sensor when said detection level changes and belongs into another area;

said sensitivity setting means comprising:

level discriminating means for emitting a discrimination signal indicating which one of areas the output signal from said analog sensor is included in;

setting signal emitting means for emitting a sensitivity characteristic level setting signal according to said discrimination signal;

correcting means which can hold the output signal level being emitted from said analog sensor so as not to change when the sensitivity characteristics of said analog sensor is changed and so as to prevent the corresponding relationship between the output signal level from the analog sensor and the quantity of the phenomenon from being discontinuous; and

drive means for driving a sensing element in said analog sensor to vary according to said setting signal;

whereby, said sensitivity of said analog sensor is moved up to a higher level than a current level so as to accomplish a more detailed and precise detection in an area wherein the detection is required, sensitivity of said analog sensor being lowered in the other area wherein a more rough detection than the current level is required.

4,785,284

FIRE MONITORING SYSTEM

Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Ltd., Tokyo, Japan

Filed May 1, 1987, Ser. No. 44,757
Claims priority, application Japan, May 16, 1986, 61-110581
Int. Cl.[4] G08B *26/00, 29/00*
U.S. Cl. 340—505 **4 Claims**

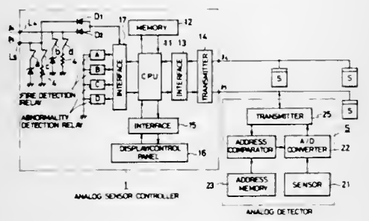
1. A fire monitoring system for monitoring a plurality of fire warning zones, said system comprising:

a receiver having a plurality of signal/power supply zone lines connected thereto, each zone line leading to a different one of said plurality of fire warning zones;

a plurality of sensors, each sensor being capable of detecting

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an environmental abnormality characteristic of the presence of fire, each sensor connected to said receiver by a respective signal/power supply zone line and being respectively disposed in one of said fire warning zones, and each sensor including means for short-circuiting a zone line connected thereto with a low impedance in the event said environmental abnormality is sensed;



at least one analog sensor having an address and disposed at one of said warning zones and connected to one of said signal/power supply zone lines; and

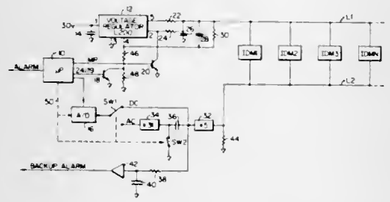
an analog sensor controller connected to said signal/power supply zone line of said at least one analog sensor, said analog sensor controller including means for polling the address of said at least one analog sensor and for calculating an analog signal from said analog sensor.

4,785,285

PARALLEL BUS ALARM SYSTEM

Rudor M. Teich, South Orange; Keith Guillaume, Edison, and Ram Shalvi, Teaneck, all of N.J., assignors to Tracer Electronics, Inc., Bloomfield, N.J.

Filed Mar. 18, 1987, Ser. No. 27,311
Int. Cl.[4] G08B *26/00*
U.S. Cl. 340—518 **9 Claims**



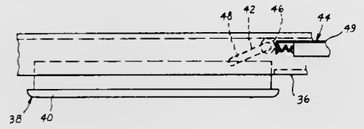
1. A parallel bus alarm system comprising a bus; a plurality of alarm means connected in parallel across said bus; and control means for causing a DC quiescent current to flow in said bus and for pulsing the potential across said bus to extend addressing signals to said alarm means; each of said alarm means including means for changing said DC quiescent current upon the occurrence of an alarm condition, and means responsive to addressing of the alarm means for controlling the current flowing in said bus to change by a variable increment whose magnitude is a function of an associated analog measurement to be reported; said control means including means for detecting a change in said DC quiescent current to determine the occurrence of at least one alarm condition, and means responsive to subsequent addressing of said alarm means for measuring the current in said bus so as to ascertain the magnitude of the current change controlled by an addressed alarm means.

4,785,286

ALARM UNIT FOR PANIC BAR TYPE DOOR OPERATOR

Frank J. Martin, 2240 Gale Rd., Ann Arbor, Mich. 48105

Filed Jan. 31, 1986, Ser. No. 824,483
Int. Cl.[4] G08B *13/08*; E05B *65/10*
U.S. Cl. 340—545 **39 Claims**



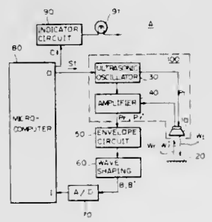
5. In a panic bar door operator assembly of the type comprising a push bar moveably mounted on a housing for causing an associated door to be unlatched when the push bar is operated, the improvement comprising an alarm unit disposed on the housing in cooperative assembly relationship with the push bar for giving an alarm in response to operation of the push bar, in which said alarm unit is selectively operable to armed and disarmed settings so that when in the disarmed setting, operation of the push bar will not cause an alarm to be given but when in the armed setting, operation of the push bar will cause an alarm to be given, said alarm unit comprises a key-switch assembly via which the alarm unit is selectively operable to armed and disarmed settings, said key-switch assembly comprises a rotary actuator disk having a cooperative association with an electrical switch assembly to move said electrical switch assembly bodily on the alarm unit selectively to armed and disarmed positions corresponding to said armed and disarmed settings, said electrical switch assembly being disposed for actuation by operation of the push bar when in the armed position but not when in the disarmed position, said alarm unit comprises an alarm assembly which contains said electrical switch assembly and wherein said alarm assembly and said switch assembly are separate self-contained assemblies having separable mounting on the housing but having cooperative association when mounted on the housing.

4,785,287

OIL CONDITION DETECTING APPARATUS

Masahiro Honma, Tokyo, and Tadashi Nagai, Kanagawa, both of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 135,020
Claims priority, application Japan, Dec. 25, 1986, 61-314761
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—631 **14 Claims**



1. An oil condition detecting apparatus for detecting the condition of an oil comprising:

a. ultrasonic wave transmitter and receiver means adapted to be immersed in an oil for transmitting an ultrasonic wave in response to a transmission timing signal, and for responding to an ultrasonic wave received thereby to generate an ultrasonic reception signal;

b. a reflector plate adapted to be immersed in said oil and disposed opposite said ultrasonic wave transmitter and receiver means, for reflecting the transmitted ultrasonic wave from said ultrasonic wave transmitter and receiver means toward said ultrasonic wave transmitter and receiver means;

c. oil condition detector means connected to receive the ultrasonic reception signal generated by said ultrasonic wave transmitter and receiver means in response to the reflected ultrasonic wave, said oil condition detector means being operative to sense a change in the waveform of the ultrasonic reception signal in terms of a change in time, based on the fact that the waveform of the ultrasonic reception signal varies in dependence upon a change in the condition of said oil, and to generate an oil condition signal representative of the condition of said oil in correspondence with the change in time; and

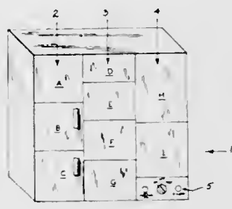
d. indicator means connected to receive said oil condition signal for indicating the condition of said oil on the basis of said oil condition signal.

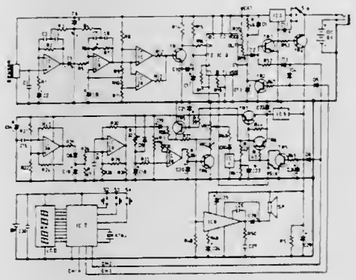
4,785,288

MODULAR SMOKE DETECTOR

G. Erich Heberlein, Jr., Delafield, and Gary P. Bruski, Wauwatosa, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jul. 31, 1987, Ser. No. 80,530
Int. Cl.[4] G08B *17/10*
U.S. Cl. 340—628 **6 Claims**





6. In an electrical equipment cabinet of the type which includes a smoke detector for detecting combustion products from faulty electrical equipment in the cabinet, and which includes a plurality of mounting stations, each mounting station including means for mounting separable electrical equipment modules, the improvement wherein the smoke detector is contained within a frame which includes the same releasable mounting means as the electrical equipment modules to allow separable mounting of the smoke detector in any one of said plurality of mounting stations in substantially the same manner as the electrical equipment modules.

4,785,289

TIMER CONTROLLED FIRE AND BURGLAR ALARM SYSTEM

Jack Y. C. Chen, 841 Chung Shan N. Rd., Sec. 5, Taipei, Taiwan

Filed Apr. 13, 1987, Ser. No. 37,781
Int. Cl.[4] B08B *1/00*
U.S. Cl. 340—527 **1 Claim**

1. A timer controlled fire and burglar alarm system comprising:

a sensor means for detecting both living beings and fire within an area to be protected and for providing an output corresponding thereto;

a control circuit means operatively connected to said sensor means for providing control signals in response to said sensor output;

a music generator means and an alarm generator means both operatively connected to a sound amplifier means, said music generator means and alarm generator means both being controlled by control signals from said control means;

a switch means operatively connected to said control means for selectively switching said alarm system between a normal mode and an alert mode;

wherein when said system is in a normal mode, said music generator means is controlled by said control means so as to provide a music signal to said sound amplifier means for generating audible music;

and wherein when said system is in said alert mode, the detection of a living being or a fire by said sensor means causes said control means to control said alarm generator means so as to generate an alarm signal which is fed to said sound amplifier means so as to generate an audible alarm;

said timer control fire and burglar alarm system further comprising at least a first and a second timer means operatively connected to said control means;

wherein said first timer means causes said control means to not provide an alarm output from said sound amplifier means in the alert mode upon the detection of a living being or a fire by said sensor means when said system is in said alert mode but rather to control said music generator means so as to provide an output to said sound amplifier means to provide an audible music output, said first timer means operating after a predetermined period of time;

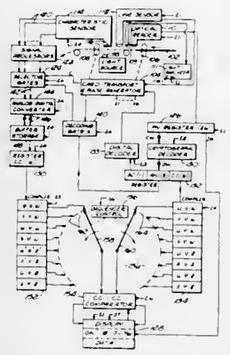
and wherein said second timer means controls said control means when said system is in said alert mode such that an audible alarm is not generated when said sensor means detects a living being or a fire;

said system further comprising a time delay means operatively connected to said control means and having a first time delay when said system is in said normal mode and having a second time delay which is longer than said first time delay when said system is in said alert mode;

wherein said time delay means controls said control means such that said audible alarm is generated for a period of time equal to said first or second time delay subsequent to a living being or a fire no longer being detected by said sensor means.

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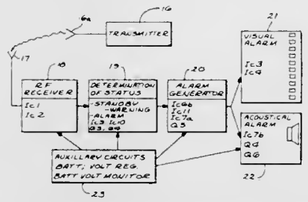
4,785,290
NON-COUNTERFEITABLE DOCUMENT SYSTEM
Robert N. Goldman, Kailua, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.
Division of Ser. No. 728,553, Apr. 29, 1985, Pat. No. 4,663,622, which is a division of Ser. No. 623,654, Jun. 22, 1984, Pat. No. 4,546,352, which is a division of Ser. No. 492,324, Jun. 3, 1983, Pat. No. 4,489,318, which is a division of Ser. No. 276,282, Jun. 22, 1981, Pat. No. 4,423,415, which is a continuation-in-part of Ser. No. 161,638, Jun. 23, 1980, abandoned. This application Apr. 30, 1987, Ser. No. 45,004
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.[4] G06K 5/00; G06F 7/04
U.S. Cl. 340—825.340 20 Claims



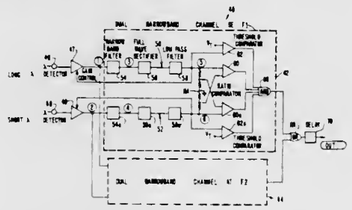
1. A process for producing a card for the personal identification of a specific individual, comprising the steps of:
providing a sheet of medium in card form;
designating a defined space on said card, said space having a depth dimensional anticounterfeit characteristic apparent by irradiation of said defined space on said card;
providing a magnetic stripe on said card remote from said defined space;
formulating individual data regarding the specific individual to be identified by said card;
depositing or printing indicia on said card representative of said individual data as formulated, said indicia being positioned on said card so that at least a portion thereof is within said defined space on said card and whereby said indicia alters said anticounterfeit characteristic at the area it occupies within said defined space, and any change of said indicia will tend to further alter said anticounterfeit characteristic in said defined space; and
recording certain of said individual data on said magnetic stripe as identification data for said individual.

4,785,291
DISTANCE MONITOR ESPECIALLY FOR CHILD SURVEILLANCE
Candy C. Hawthorne, 4616 Esparto Rd., Woodland Hills, Calif. 91364
Filed Mar. 6, 1987, Ser. No. 22,994
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—573 4 Claims

1. A system for monitoring the position of a person with respect to a monitoring location and for providing at least a visual indication as a function of said position, comprising:
first means including a radio-frequency transmitter associated with said person to be monitored, for radiating radio-frequency waves;
second means including a radio-frequency receiver located at said monitoring location for substantially continuously receiving said radio-frequency waves;
third means within said second means for generating a receiver automatic gain control signal;
a visual distance indicating display comprising N discrete light emitting elements and including circuits for energizing from one to N of said light emitting elements corresponding to the level of said automatic gain control signal at any time, said circuits also being arranged to cause said light emitting elements energized at any one time to flash at a predetermined flash rate as a function of the level of said automatic gain control signal.

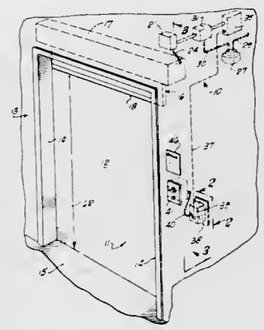


4,785,292
DUAL SPECTRUM FREQUENCY RESPONDING FIRE SENSOR
Mark T. Kern, Goleta, and Kenneth A. Shamordola, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Continuation of Ser. No. 592,611, Mar. 23, 1984, Pat. No. 4,691,196. This application Feb. 11, 1987, Ser. No. 13,576
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Int. Cl.[4] G08B 17/12
U.S. Cl. 340—578 8 Claims



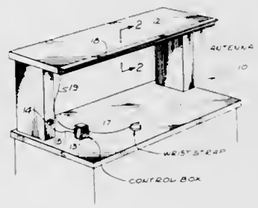
1. A dual spectrum frequency responding fire sensor comprising:
a first detector for generating electrical signals in response to a range of incident long wavelength radiation;
a second detector for generating electrical signals in response to a range of incident short wavelength radiation substantially displaced from said range of incident long wavelength radiation;
first and second dual path narrowband channel stages coupled in parallel to receive electrical signals generated by said detectors, each of said first and second stages comprising first and second signal paths for processing, respectively, the electrical signals from said first and second detectors; each of said signal paths including a narrowband filter with the passbands of the filters in said first narrowband channel stage being approximately 2 to 5 Hz and the passband of the filters in said second narrowband channel stage being approximately 6 to 12 Hz; and
logic means connected to combine the outputs of said stages for developing an output signal upon said detectors receiving radiation from a fire source.

4,785,293
ALARM SYSTEM PRIOR TO FIREDOOR DROP
Leonard Shearer, 1302 Farlington, W. Covina, Calif. 91790; William Paulsen, 4754 Alamo St., Simi Valley, Calif. 93063, and Roger Moody, 10449 Dempsey Ave., Grenada Hills, Calif. 91344
Filed Dec. 5, 1985, Ser. No. 805,967
Int. Cl.[4] G08B 17/10
U.S. Cl. 340—628 20 Claims



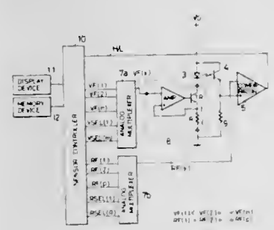
1. A warning system, having a power supply, for generating a warning signal in response to either of two events, detection of smoke by a smoke detector or failure of external power supply to the system, comprising
control means connected to an element to which power is supplied and being responsive to such element when power is not supplied thereto for generating a first control signal,
a first timer means connected to said element and being responsive thereto for generating a second control signal at the end of a first delay interval,
a second timer means connected to said first timer means and being responsive to said second control signal for generating a series of reoccurring control pulses, and
signal means connected to said second timer means and being responsive to said control pulses for generating a series of warning signals.

4,785,294
STATIC MONITORING SYSTEM
Jeffrey D. Campbell, Hawthorne, Calif., assignor to Zero Corporation, Burbank, Calif.
Filed Jun. 24, 1986, Ser. No. 877,873
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—649 9 Claims



1. In a static monitoring system for use with a work station for measuring change in electrostatic potential adjacent the work station, the combination of:
an antenna;
means for positioning said antenna adjacent the work station for producing a change in current in said antenna as a function of movement of a statically charged object in the electrostatic field adjacent the work station;
a first amplifier having at least one input and an output, said first amplifier having a non-linear feedback circuit from said output to said one input thereof;
means for connecting said antenna to said one input of said first amplifier;
a line frequency filter having said output of said first amplifier as an input;
a signal level detector having the output of said filter as an input; and
an alarm unit having the output of said detector as an input;
said first amplifier being a non-linear operational amplifier whereby said alarm unit is actuated when the change in the current in said antenna exceeds a predetermined value.

4,785,295
OPTICAL MEDIA MONITORING DEVICE
Tsutomu Fukui; Shin-ichi Suto, and Kazutoshi Chiba, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1987, Ser. No. 17,209
Claims priority, application Japan, Feb. 27, 1986, 61-40458; Jul. 15, 1986, 61-164731
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—679 12 Claims



1. An optical media monitoring device that detects presence of light-interrupting media between photoemitter component and a photoreceptor component of a sensor provided to operate in cooperation with each other, the optical media monitoring device comprising:
means for driving the photoemitter component at a predetermined level of light emission;
a comparator receiving as one input thereof an output of the photoreceptor component;
means for generating a reference signal at a predetermined level, the reference signal being input to the other input to said comparator;
means for controlling said driving means to cause the photoemitter component to emit a level of light lower than a level normally used for media detection; and
means for determining the degree of dust degradation of the sensor by checking, in a state of no media present and the light emission of the photoemitter component reduced by said controlling means, whether the output of the photoreceptor component is greater than the reference signal level.

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METHOD AND SYSTEM FOR DISPLAYING IMAGE DATA

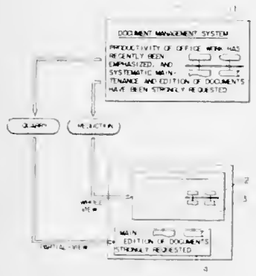
Kuniaki Tabata, Tokyo; Tetsuo Machida; Susumu Tsuhara, both of Sagamibara; Hidefumi Iwami, Yokohama, and Yasuyuki Okada, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 509,395, Jun. 30, 1983, abandoned. This application Feb. 3, 1987, Ser. No. 14,078

Claims priority, application Japan, Jul. 2, 1982, 57-113886; Jul. 7, 1982, 57-116773

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—731 **9 Claims**



1. A multi-window image displaying method comprising:

a first step of writing in an image memory image data forming an original whole image representative of the whole of a page of a document including both character data and image data, said characters being stored in said image memory as data in the form of character font patterns;

a second step of reducing the scale of said original whole image by processing the image data from said image memory in accordance with a selected reduction factor to provide data forming a reduced whole image;

a third step of producing image data forming a partial image representative of a partial area of said document page including only character data concerning the character including in said partial area;

a fourth step of defining the positional correspondence between sadi partial image and said whole image; and

a fifth step of simultaneously displaying said reduced whole image in a first window of a display screen and said partial image including only character data in a second window of said display screen, said reduced whole image being displayed in said first window together with a mark said reduced whole image at the location to which said partial image being displayed in said second window corresponds in accordance with said defined positional correspondence, said partial image being displayed with a higher resolution than said reduced whole image.

4,785,297

DRIVER CIRCUIT FOR MATRIX TYPE DISPLAY DEVICE

Fukuo Sekiya, Tokorozawa, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

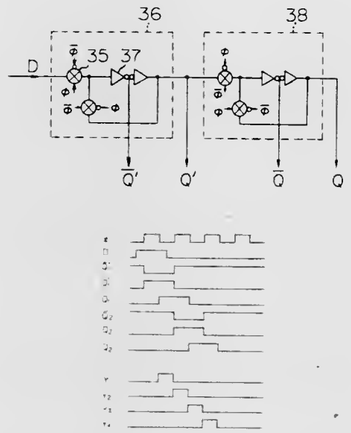
Continuation of Ser. No. 564,992, Dec. 23, 1983, abandoned. This application Nov. 24, 1986, Ser. No. 935,101

Claims priority, application Japan, Dec. 24, 1982, 57-229554

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—802 **10 Claims**

1. In a drive circuit for generating selection signal pulses to sequentially select corresponding conductors of a set of conductors coupled to an array of switching elements of a matrix display device, said drive circuit comprising a shift register formed of a plurality of flip-flop circuits connected in cascade, the improvement wherein said flip flop circuits are master-slave flip-flop circuits each having a msster section and a slave section, each of said master and slave sections having clock and data input terminals, said master section having a first output terminal and said slave section having a second output terminal, said flip-flop circuits comprising means responsive to a signal at the input terminal of the master section and clock signals to said master and slave sections to provide an output at



said first and second output terminals with the output at said second terminal being delayed, in response to the clock signals, by a part of a clock cycle with respect to the output at said first terminal, means applying clock and input signals to said shift register, and means deriving said selection signal pulses for selective application to said conductors from both the first and second outputs of each of a plurality of successive of said flip-flop circuits.

4,785,298

CIRCUIT ARRANGEMENT FOR TELECOMMUNICATIONS SYSTEMS, PARTICULARLY TELEPHONE SWITCHING SYSTEMS, COMPRISING AN INFORMATION INTERROGATING DEVICE WHICH CYCLICALLY DRIVES INQUIRY LOCATIONS

Herbert Jans, Neuried, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 28, 1986, Ser. No. 890,114

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1985, 3529165

Int. Cl.[4] H04Q *9/16, 3/24*

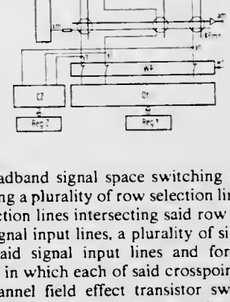
U.S. Cl. 340—825.100 **1 Claim**

1. A circuit arrangement for a telecommunications system, comprising:

a plurality of inquiry locations at which information may be present and may be solicited, each of said inquiry locations assigned an address;

a cyclically operating interrogation device for selective connection to and driving said inquiry locations to solicit information and to modify the frequency of interrogation of the individual inquiry locations depending on the appearance of solicited information to be called in; and

memory means including an interrogation memory comprising a sequence of memory locations with corresponding note bit locations for storing a plurality of selection events within a overall control cycle by storing individual addresses of said inquiry locations a plurality of times at a corresponding number of memory locations regularly distributed within the sequence of memory locations, and for scanning each location a different number of times an interrogation memory selection means for cyclically reading the stored addresses to cyclically access said inquiry



locations for soliciting information and upon failure to receive information from an accessed inquiry location to read the same address from the next memory location storing the same address and store a note bit in the corresponding bit location, and means for suppressing reading of an address in response to the appearance of a note bit for that address and then erasing the note bit.

4,785,299

BROADBAND SIGNAL SPACE SWITCHING APPARATUS

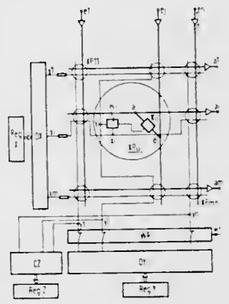
Gerhard Trumpp, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 10, 1987, Ser. No. 13,069

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604605

Int. Cl.[4] H04Q *3/52*; H03K *19/20*

U.S. Cl. 340—825.890 **7 Claims**



1. In a broadband signal space switching apparatus of the type comprising a plurality of row selection lines, a plurality of common selection lines intersecting said row selection lines, a plurality of signal input lines, a plurality of signal output lines intersecting said signal input lines and forming crosspoint locations, and in which each of said crosspoint locations comprises a n-channel field effect transistor switch including a source-drain path connected to the respective input and output lines, and a gate, and in which a respective memory cell is provided at each crosspoint and connected to a corresponding row selection line and a corresponding column selection line, and in which a row selection decoder is connected to said row selection lines and a column decoder is connected to said column selection lines, and in which each memory cell comprises an n-channel transistor including a source-drain path connected to the respective column selection line and a gate connected to the respective row selection line and a pair of cross-coupled inverter circuits each including an input and an output, the improvement wherein:

the input of only one of said inverter circuits is connected to said source-drain path of said n-channel transistor; and

a resistor connects said output of only one inverter circuit to said gate of said n-channel field effect transistor switch.

4,785,300

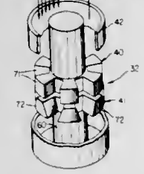
PRESSURE PULSE GENERATOR

Wilson C. Chin, Houston, and José A. Trevino, Richmond, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 805,391, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 545,313, Oct. 24, 1983, abandoned. This application Oct. 28, 1986, Ser. No. 924,171

Int. Cl.[4] G01V *1/00*

U.S. Cl. 340—861 **13 Claims**



1. A pressure pulse generator of the type used for communicating information between points of a wellbore by way of fluid flowing ina tubing string, comprising:

a housing having a fluid passageway therethrough adapted to be connected in the string so that fluid flowing in the string will at least partially flow through said passageway in the housing;

a stator fixedly mounted within the housing;

a rotor rotatably mounted within the housing adjacent to the stator; the stator and rotor each having a plurality of spaced lobes with gaps formed therebetween that present a plurality of ports for fluid passage such that rotation of the rotor relative to the stator will shift alignment of the respective stator and rotor ports from a position providing the greatest fluid passage to a position providing the least fluid passage to cause the generation and transmission upstream of a pressure pulse signal, the rotor being positioned downstream of the stator and said lobes having means for establishing fluid dynamic forces in response to the flow of fluid through the housing that bias the rotor generally into an orientation in which the ports provide the greatest fluid passage and wherein each of the stator and rotor lobes have upstream surface tops and downstream surface bases and respective pairs of oppositely facing sides extending between the tops and bases, and wherein the side to side width of the rotor lobes increases in the downstream direction and the area of the tops of the rotor lobes is smaller than the area of the bases of the stator lobes.

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METHOD FOR PRODUCING A RADAR REFLECTOR

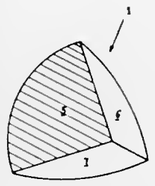
Marlene Schäfer, Mailänder Str. 7, 6000 Frankfurt/Main 70; Wilhelm Schuster, and Jürgen Stahl, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Marlene Schäfer, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 943,721

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3545096

Int. Cl.[4] H01Q *15/18*

U.S. Cl. 342—7 7 Claims



1. A process for producing a spherical radar reflector, comprising:

expansion molding eight individual and identically-shaped eighths of a sphere in a mold having smooth sides, each eighth of a sphere being made of foam material and having three mutually perpendicular plane surfaces;

bonding a material which reflects radar rays to the plane surfaces of each eighth of a sphere; and bonding the eighths of a sphere together to form the spherical radar reflector.

4,785,302

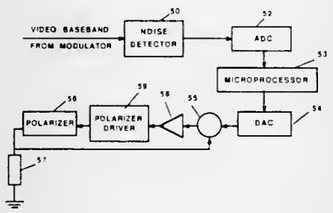
AUTOMATIC POLARIZATION CONTROL SYSTEM FOR TVRO RECEIVERS

John Y. Ma, Milpitas; David H. McCracken, San Jose; Steven Weiss, Los Gatos, and Albert C. Houston, III, Santa Cruz, all of Calif., assignors to Capetronic (BSR) Ltd., Kowloon, Hong Kong

Filed Oct. 30, 1985, Ser. No. 792,780

Int. Cl.[4] H01Q *21/06*

U.S. Cl. 342—362 14 Claims



1. In a TVRO earth station having an antenna for receiving incoming satellite signals and polarizing means associated with the antenna for adjusting the relative alignment of the antenna orientation and the polarization of the incoming signals, an automatic polarization control system comprising

means for producing an electrical control signal for controlling said polarizing means to adjust said relative alignment,

means for detecting the noise level apart from the signal level in the satellite signals received by the antenna, and

means responsive to the detected noise level for adjusting said control signal, and thereby adjusting said polarizing means, to minimize the detected noise level.

4,785,303

OMNIDIRECTIONAL DIPOLE LOOP ANTENNA ARRAY

Reginald E. J. Clark, and Derek J. Clark, both of Kings Lynn, Great Britain, assignors to Maxview Aerials Limited, Kings Lynn, United Kingdom

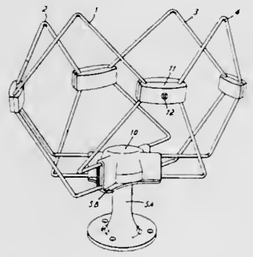
PCT No. PCT/GB85/00579, § 371 Date Oct. 3, 1986, § 102(e) Date Oct. 3, 1986, PCT Pub. No. WO86/03624, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 12, 1985, Ser. No. 905,332

Claims priority, application United Kingdom, Dec. 13, 1984, 8431457

Int. Cl.[4] H01Q *7/00*

U.S. Cl. 343—742 12 Claims



1. An aerial comprising four substantially identical folded dipole elements each element defining a free-standing loop lying in a plane parallel to a common central axis which, in use, is intended to be vertical, the planes of all of said loops being equally spaced from said central axis and the planes of adjacent ones of said loops being relatively angularly displaced by 90° about said central axis such that said dipole elements are arranged in mutually facing pairs disposed on opposite sides of said central axis, all of said dipole elements being connected in common whereby the polar response of said aerial is substantially circular about said axis, characterised in that each folded dipole element consists of a single open ended loop of which the ends are spaced apart in the respective plane in a direction parallel to the said central axis, and that the respective ends of each loop are coupled to common terminal means by means of twin feeders extending from said ends of the loop parallel to one another and radially towards said central axis.

4,785,304

PHASE SCAN ANTENNA ARRAY

Richard A. Stern, Allenwood; Richard W. Babbitt, Fairhaven, and Gerald F. Mikucki, Cinnaminson, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 20, 1986, Ser. No. 932,860

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—770 8 Claims

1. A phase scan antenna array for planar radar scanning in a first plane with a substantially pencil-shaped beam comprising

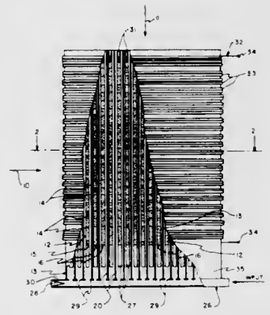
a plurality of ferrite rods, each of said rods having a longitudinally-extending series of longitudinally-spaced apart slots along a first side thereof for radiating

electromagnetic wave energy when the ends of said rods are coupled to a source of millimeter wave energy, each of said slots being substantially perpendicular to the longitudinal axis of said rod, the slots in said series of slots producing a substantially pencil-shaped antenna beam in said first plane and said rods producing a substantially pencil-shaped antenna beam in a second plane which is substantially perpendicular to said first plane and to the longitudinal axes of said rods when said rods are mounted in columnar array;

means for mounting said rods in columnar array with the longitudinal axes of said rods substantially parallel to each other and to said first plane and with the slots of each rod aligned in rows of slots with the corresponding slots of the other rods, said mounting means having

reflector plate means fabricated of an electrically conductive material and facing a second side of each of said rods which is oppositely-disposed from said first rod side for reflecting electromagnetic wave energy radiated from said second rod side to enhance electromagnetic wave energy radiated from said first rod side,

spacer means for spacing the second rod side of each of said rods a predetermined distance from said reflector plate means, and



suppressor plate means fabricated of an electrically conductive material and facing third and fourth sides of each of said rods which are substantially perpendicular to said first and second rod sides for suppressing Faraday rotation of electromagnetic wave energy in each of said rods when a magnetic field is applied along the longitudinal axis of the rod to thereby cause scanning of the antenna beam in said first plane;

means for coupling one end of each of said rods to a source of millimeter wave energy so that each rod is fed substantially in phase with the remaining rods; and

means for simultaneously magnetically biasing all of said rods along the longitudinal axes thereof to cause scanning of the antenna beam in said first plane.

4,785,305

GLASS-MOUNTABLE ANTENNA ASSEMBLY WITH MICROSTRIP FILTER

Don Shyu, No. 957, Po Ai Street, Chu Pei Hsiang, Hsin Chu Hsien, Taiwan

Filed Apr. 20, 1987, Ser. No. 40,038

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—713 1 Claim

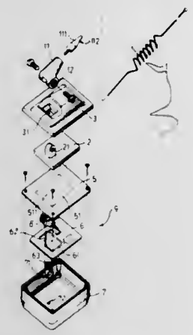
1. In a glass-mountable antenna assembly comprising an electrically-shortened antenna (**1**), an antenna base (**3**), an upper capacitor plate (**2**) capable of receiving an electromagnetic signal from said antenna (**1**) and transmitting said electromagnetic signal through a sheet of glass to a lower capacitor plate (**5**) on the opposite side of said sheet of glass, the improvement comprising:

a metal wire (**62**) being electrically connected to said lower capacitor plate (**5**) on one end thereof;

a microstrip filter (**61**) being electrically connected to said metal wire (**62**) and emulating an inductor;

a variable capacitor (**63**) electrically interacting with said microstrip filter (**61**);

a jack (**8**) which connects electrically with said microstrip filter (**61**) to receive a signal therefrom; and



said housing (**7**) containing said microstrip filter (**61**), said metal wire (**62**), and said lower capacitor plate (**5**) and receiving a portion of said jack (**8**) therein.

4,785,306

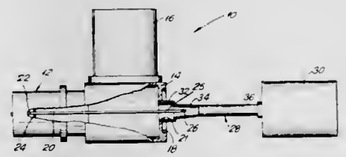
DUAL FREQUENCY FEED SATELLITE ANTENNA HORN

Edwin A. Adams, Simcoe, Canada, assignor to General Instrument Corporation, New York, N.Y.

Filed Jan. 17, 1986, Ser. No. 819,679

Int. Cl.[4] H01Q *13/00*

U.S. Cl. 343—786 12 Claims



1. An antenna feed horn arrangement for feeding first and second amplifiers for amplifying first and second frequency signals, said second frequency signals having a higher frequency than said first frequency signals, said arrangement comprising:

a first frequency feed horn for feeding said first frequency signals to said first amplifier;

a second frequency feed horn for feeding said second frequency signals to said second frequency amplifier; and

curved solid dielectric waveguide means for said second frequency signals, said curved solid dielectric waveguide means having a first portion disposed within said first frequency feed horn and a second portion extending out of a sidewall of said first frequency feed horn and into said second frequency feed horn to thereby launch said second frequency signal within said second frequency feed horn.

4,785,307

CROSSED LOG-PERIODIC DIPOLE ANTENNA AND METHOD OF MAKING SAME

Samuel C. Kuo, Saratoga, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Jun. 15, 1987, Ser. No. 61,624

Int. Cl.[4] H01Q *11/10*

U.S. Cl. 343—792.5 14 Claims

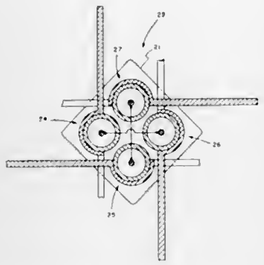
1. In a crossed log-periodic dipole antenna construction having an axis, said construction having:

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first and second orthogonally displaced log-periodic antennas;

each of said antennas having first and second half-dipole structures;

each of said structures comprising an electrically conductive elongated boom having an outer surface and extending parallel to said axis, said structure also having a half-dipole assembly comprising half-dipole elements connected to and extending axially alternately from and perpendicular to opposite sides of said boom, the lengths of said elements of each assembly and the inter-element axial spacing thereof increasing from one end of the boom to the other in increments of a predetermined ratio, each half-dipole



element of each of said assemblies being transversely aligned with a corresponding half-dipole element of the same size of the assembly of the other structures of the same antenna; and

means for electrically feeding each of said booms, said booms being the feed lines for said half-dipole elements, the improvement comprising:

each of sald half-dipole assemblies constituting a unitary piece having a boom portion with said elements projecting therefrom, said boom portion having a thickness substantially less than that of the remainder of the assembly, said boom portion being electrically connected to and tightly engaging at least a portion of said outer surface of the adjacent boom.

4,785,308

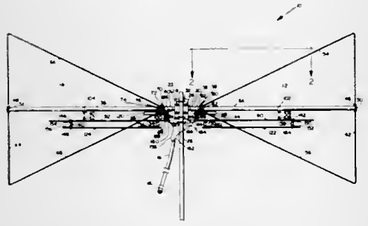
ANTENNA

Donald R. Newcomb, Lockhart, Tex., assignor to Butternut Electronic Company, Lockhart, Tex.

Continuation-in-part of Ser. No. 485,783, Apr. 18, 1983, Pat. No. 4,593,289. This application Jan. 17, 1986, Ser. No. 819,713

Int. Cl.[4] H01Q *9/28*

U.S. Cl. 343—795 **5 Claims**



1. Apex feed swept antenna comprising:

a. cylindrical fiberglass support;

b. two central tubular elements telescoping over said support;

c. end elements substantially perpendicular to said central elements, and means for mechanically and electrically affixing said end elements to each end of said central element;

d. upper and lower swept elements including means for mechanically and electrically securing each of said upper and lower swept elements between ends of each of said end elements and said central elements at junction of said support;

e. spaced dielectric supports secured to each of said central elements substantially adjacent to said fiberglass support;

f. short left stub and short right stub connected to each pair of said dielectric support;

g. capacitors electrically and mechanically secured between an end of each stub and said central element;

h. first shorting bars secured to each of said central element substantially adjacent to said central element and extending downwardly;

i. a short hairpin stub and long hairpin stub connected at one end of said shorting bars;

j. second shorting bars connected between another end of said hairpin stubs and to an inner end of said left and right stubs; and,

k. means for coupling rf power to said inner ends of said left and right stubs.

4,785,309

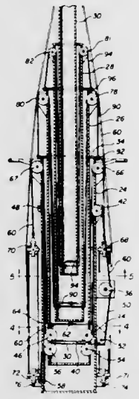
EXTENDABLE ANTENNA MAST WITH INDEPENDENT RETRACTING AND LIFTING CABLES

Ernest J. Gremillion, Post Office Box 556, Larose, La. 70373

Filed May 12, 1986, Ser. No. 862,303

Int. Cl.[4] H01Q *1/10*

U.S. Cl. 343—883 **6 Claims**



1. An extendible and retractable antenna mast comprising a plurality of tubular, telescopic sections including a vertically stationary base tubular section and a plurality of upper tubular sections, a lift cable having one end anchored to the base section adjacent the upper end thereof and extending diametrically of the lower end portion of a first upper tubular section and extending upwardly toward the upper end of the base section in diametrically opposed relation to the point at which the lifting cable is anchored and being connected to a winch means for raising the first upper tubular section in relation to the base section, a retracting cable independent from the lifting cable having one end anchored to the base section adjacent the lower end thereof and extending transversely of the lower end portion of the first upper section and connected to the winch means for retracting the first upper tubular section, said winch means being reversible and winding the lifting cable thereon at the same rate as the retracting cable is unwound therefrom in one direction of rotation and winding the retracting cable at the same rate as unwinding the lifting cable in the other direction of rotation to provide a positive lifting and retracting of the first upper tubular section in relation to the base section, means interconnecting the first upper tubular section to the next adjacent tubular section to simultaneously extend the next adjacent tubular section upwardly when the first upper tubular section is moved vertically upwardly in relation to the base section, and coaxial cable means connected to the first upper tubular section and each additional upper tubular section and connected to a pulley assembly enabling the coaxial cable means to move upwardly and downwardly at the same rate as each upper tubular section, said retracting cable extending downwardly from the winch means and under a pulley located externally of the base section adjacent the lower end thereof with the retracting cable extending inwardly through the base section and diametrically of the lower end portion of the first upper tubular section and then downwardly along the outer surface of the base section and being anchored to the base section adjacent the lower end thereof so that downward force can be exerted on the first upper section when the first upper section has been extended upwardly so that the retracting cable is moved upwardly therewith as it is unwound from the winch means.

4,785,310

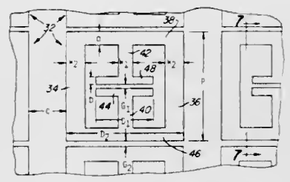
FREQUENCY SELECTIVE SCREEN HAVING SHARP TRANSITION

Harold A. Rosen, Santa Monica, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1986, Ser. No. 896,534

Int. Cl.[4] H01Q *15/00, 19/00*

U.S. Cl. 343—909 **14 Claims**



1. A diplixer for separating first and second frequency bands of a radio frequency signal, comprising:

a substantially planar N×M array of adjacent electrically conductive, discrete elements arranged in N rows and M columns, each of said elements including

(1) a pair of spaced apart side legs each having a preselected width and forming a first inductance,

(2) a pair of spaced apart connecting legs extending between and connecting said side legs, a connecting leg in each of said pairs thereof opposing and being spaced from a connecting leg of an adjacent element a preselected distance to form a first capacitance between at least certain adjacent ones of said elements,

(3) a pair of medial legs respectively extending from said connecting legs toward each other, each of said medial legs having a preselected width and defining a second inductance, and

(4) means on one end of said medial legs defining a second capacitance.

4,785,311

RECORDING HEAD APPARATUS AND METHOD HAVING PLURALITIES OF CROSSED ELECTRODES

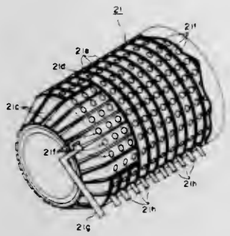
Shuzo Kaneko, Tokyo; Akihiro Mouri, Kokubunji, and Tsutomu Toyono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1987, Ser. No. 7,178

Claims priority, application Japan, Jan. 30, 1986, 61-16747

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—1.1 **19 Claims**



13. A method of recording on a recording medium by transferring ink onto said recording medium, comprising the steps of:

providing an ink containing portion of a recording head having ink therein, said ink containing portion having a first plurality of non-contacting electrodes on the outside surface of said ink containing portion; a second plurality of electrodes on the outside surface of said ink containing portion so as to cross said plurality of first electrodes at a plurality of intersection points; heating means sandwiched between said first and second pluralitites of electrodes at said plurality of intersection points; and a plurality of ink-passing apertures at said plurality of intersection points for directing ink contained in said ink containing portion from an inside thereof to an outside thereof to transfer ink onto said recording medium;

positioning said recording head adjacent said recording medium; and

energizing one of said first plurality of electrodes, and at least one of said second plurality of electrodes to cause ink to flow through the aperture located at the intersection point of the energized first and second electrodes.

4,785,312

ELECTRONIC EQUIPMENT WITH A PRINTER UNIT

Shigeru Toyomura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 827,540, Feb. 10, 1986, abandoned, which is a continuation of Ser. No. 466,519, Feb. 15, 1983, abandoned. This application Jan. 7, 1988, Ser. No. 143,290

Claims priority, application Japan, Feb. 26, 1982, 57-31243

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—76 PH **7 Claims**

1. Electronic equipment having a printer unit adapted to be fed with print paper, comprising:

a print head;

drive means for moving said print head relative to the print paper;

paper feed drive means for feeding print paper to the printer unit in response to movement of said print head;

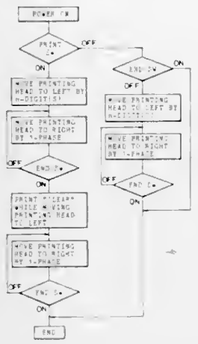
detection means for detecting the presence of said print head at a home position thereof, wherein said paper feed drive means is actuated by the return of said print head to the home position;

a print switch for selectively causing the printer unit to assume a print mode wherein said print head is moved for printing characters and a non-print mode;

a power switch; and

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control means adapted to actuate said print paper feed drive means for feeding print paper, in response to said power switch being in a turned on state, if a first set of conditions are met and not if a second set of conditions are met; the first set of conditions including first and second conditions, the first condition being that said detection means fails to detect the presence of said print head at the home position and the second condition being that said print switch is in the print mode, and the second set of conditions including that said print switch is in a non-print mode.



4,785,313

RECORDING MEDIUM AND IMAGE FORMATION PROCESS USING THE SAME

Masahiko Higuma, Tokyo; Ryuichi Arai; Mamoru Sakaki, both of Sagamihara, and Takashi Akiya, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,507

Claims priority, application Japan, Dec. 16, 1985, 60-282218; Dec. 16, 1985, 60-282219; Dec. 18, 1985, 60-283041

Int. Cl.[4] G01D *15/34*

U.S. Cl. 346—135.1 **38 Claims**

1. A recording medium comprising a light-transmissive ink retaining layer and a light-diffusive ink transporting layer respectively provided on a light-transmissive substrate.

4,785,314

INTERNALLY PRESSURE-REGULATED INK SUPPLY

Koji Terasawa, Mitaka; Akira Miyakawa, Tanashi, and Takehiko Kiyohara, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

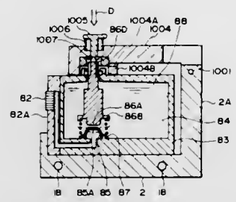
Continuation of Ser. No. 709,298, Mar. 7, 1985, abandoned. This application May 27, 1987, Ser. No. 56,347

Claims priority, application Japan, Mar. 14, 1984, 59-48683; Mar. 14, 1984, 59-48685; Mar. 14, 1984, 59-48686

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **19 Claims**

1. A liquid ejection recording unit comprising:
ink discharge means including means defining an orifice and means for discharging ink droplets from said orifice;
ink containing means for containing ink to be supplied to said ink discharge means;
an ink supply path having an end opening into said ink containing means for supplying ink from said ink containing means to said orifice; and
pressurizing means provided on the inside of said ink containing means, at said end of said ink supply path opening into said ink containing means, for supplying pressurized ink to said ink discharge means in response to an external force acting on said pressurizing means.



4,785,315

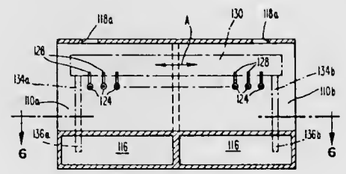
INK SUPPLY SYSTEM FOR AN INK JET APPARATUS

John A. McCormick, Brookfield, and Lisa M. Schmidle, Southbury, both of Conn., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation-in-part of Ser. No. 661,794, Oct. 16, 1984, abandoned. This application Feb. 6, 1987, Ser. No. 11,589

Int. Cl.[4] G01D *15/16*

U.S. Cl. 346—140 R **20 Claims**



1. Ink jet apparatus, comprising:
a scanning print head having a plurality of ink jet chambers, each of said chambers including an ink droplet ejection orifice and an inlet;
means for holding a supply of ink under pressure, said holding means including a pair of fluidically independent reservoirs mounted upon said scanning print head; and
means for feeding ink from said holding means to said chambers, said feeding means including a manifold in communication with each said chamber inlet and a pair of feed tubes each said feed tube connecting a respective one of said reservoirs with said manifold, said feed tubes coupling to said manifold substantially at right angles thereto.

4,785,316

IMAGE RECORDING DEVICE

Takemi Yamamoto; Hitoshi Nakai; Yoichi Horaguchi, and Makoto Suzuki, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

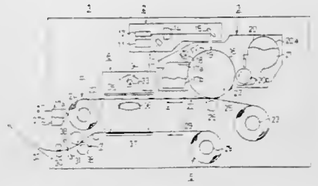
Filed Feb. 18, 1988, Ser. No. 157,740

Claims priority, application Japan, Feb. 18, 1987, 62-35240

Int. Cl.[4] G01U *15/00*

U.S. Cl. 346—156 **14 Claims**

1. An image recording device wherein an image is recorded on a photo-sensitive recording medium and said image is once formed as a light-shield image before recorded on said photo-sensitive recording medium, which comprises:
light-shield image forming means for forming said light-shield image in a reduced size with respect to said image to be recorded; and



enlarged image recording means for recording an image corresponding to said light-shield image in an enlarged size on said photo-sensitive recording medium.

4,785,317

DOUBLE-SIDE PRINTER

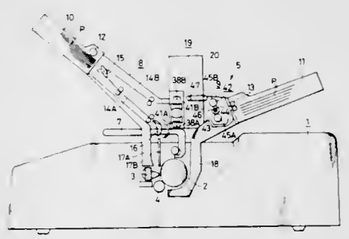
Makoto Tomoyori, Iwate; Sunao Hatanaka, Takizawa, and Keiichi Akiyama, Tamayama, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 21, 1987, Ser. No. 98,845

Claims priority, application Japan, Dec. 1, 1986, 61-284183

Int. Cl.[4] G01D *16/00*

U.S. Cl. 346—150 **5 Claims**



1. A double-side printer having a printer body including a print head disposed oppositely to a platen, a sheet conveying unit mounted in the printer body and including a sheet supplying unit for sequentially supplying sheets stacked on a sheet supply tray one by one to a printing position between the print head of the printer body and the platen, and a sheet exhausting unit for stacking and exhausting the sheet from the printing position to an exhausted sheet tray comprising belt-like latent image forming means narrower than the width of the sheet, a pair of transferring units for transferring toner images formed on the latent image forming means reversely to one another to the sheet, and an electrophotographic processing unit having a pair of sheet passages for inserting the sheet to pass the sheet through the transferring units, arranged between the sheet supplying unit and the sheet exhausting unit of the sheet conveying unit, a fixing unit disposed out of the electrostatic processing unit for fixing the toner images on the sheet on the surfaces of the sheet, and passage switching means disposed in the sheet supplying unit for arriving the sheet of the sheet supplying unit at the fixing unit by selectively passing either one sheet passage of the developing unit.

4,785,318

ELECTROSTATIC RECORDING HEAD

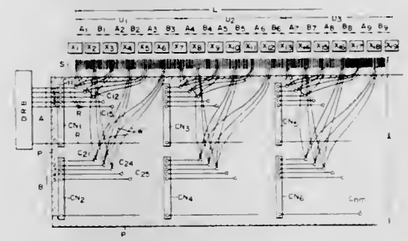
Masaji Nishikawa; Masashi Asano, and Yutaka Adachi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1987, Ser. No. 71,205

Claims priority, application Japan, Jul. 14, 1986, 61-165031

Int. Cl.[4] G01D *15/06*

U.S. Cl. 346—155 **6 Claims**



1. An electrostatic recording head, comprising:
a number of recording electrode styli spaced apart from one another along a row, sets of adjacent electrode styli along the row defining consecutive element regions wherein each of a certain number of consecutive element regions along the row constitutes one of a number of different element groups;
a plurality of block electrodes arranged in corresponding relation to the element regions so that opposite ends of the block electrodes face adjacent element regions;
a wiring board including a plurality of connectors each arranged to receive a driving signal, a plurality of conductor lines extended from each connector and parallel with one another, and a plurality of connecting terminals coupled to the conductor lines; and
wires connecting each of the connecting terminals to a predetermined stylus in each ofthe element regions of a corresponding element group, for transmitting driving signals applied to the connectors to the styli.

4,785,319

ELECTROGRAPHIC APPARATUS

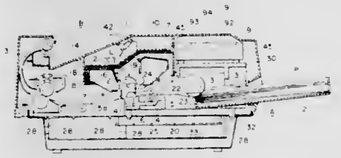
Hitoshi Fujino; Masanobu Kanoto, both of Tokyo; Yutaka Kikuchi, and Yoshinori Sugiura, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 80,010

Claims priority, application Japan, Aug. 5, 1986, 61-183984; Jul. 10, 1987, 62-172477

Int. Cl.[4] G01D *15/00*

U.S. Cl. 346—160 **22 Claims**

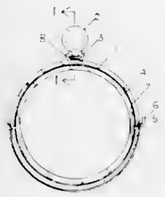


1. An electrographic apparatus, comprising:
a photosensitive member;
an optical unit for projecting onto said photosensitive member image information light formed in accordance with an electric signal; and
an integrally molded frame provided with a first positioning

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portion for positioning the optical unit and a second positioning portion for positioning said photosensitive member.

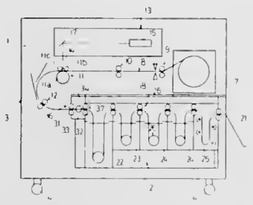
4,785,320
CAMERA LENS FOCUSING AID
Kenneth L. Liberty, II, 1314 Desert Rose Way, Olivenhain, Calif. 92024, and Carl R. Christensen, 5412 Cottage Ave., San Diego, Calif. 92120
Filed Aug. 31, 1987, Ser. No. 91,386
Int. Cl.[4] G03B *3/00, 17/56*
U.S. Cl. 354—195.1 **1 Claim**



1. A finger operable semi-circular band, or ring, frictionally attached to the camera lens focusing ring wherein the improvement comprises:
a, the semicircular ring made of flexible metal or plastic,
b, the flexible band having a width equal to, or less than, that of the focusing ring;
c, the extremities of the ring having hook shaped attaching means;
d, the semi-circular ring having a finger ring centrally attached to the outside periphery;
e, the finger ring rotatably around the hinge pin axial to the semicircular ring;
f, the hinge permitting rotation of the finger ring from a horizontal position parallel to the surface of the semicircular ring to a vertical position;
g, the inside diameter of the finger ring conforming to the tip of a finger;
h, a tension spring, or elastic band,circumferentially,attached, to the hookshaped attaching means on the semicircular ring; and,
i, the length of the tension spring,or elastic band, being less than one half the circumference of the camera lens focusing ring.

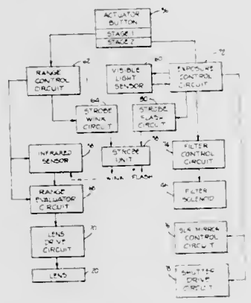
4,785,321
IMAGE FORMING APPARATUS
Sadanobu Murasaki, 823, Itado, Isehara-Shi, Kanagawa-Ken, Japan
Filed Aug. 18, 1987, Ser. No. 86,946
Claims priority, application Japan, Aug. 21, 1986, 61-196393
Int. Cl.[4] G03D *3/13*
U.S. Cl. 354—321 **7 Claims**

1. An image forming apparatus comprising:
means for supplying a photosensitive material,
image forming means including optical members for forming an image on the supplied photosensitive material by exposing the material to an optical image,
developing means containing a liquid developer for developing the photosensitive material having the image formed thereon,
an intermediate chamber provided between the image forming means and the developing means, the intermediate chamber having an inlet opening for receiving therethrough the image bearing photosensitive material transported from the image forming means and an outlet opening for delivering the received photosensitive material to the developing means therethrough,
exhaust means connected to the intermediate chamber for



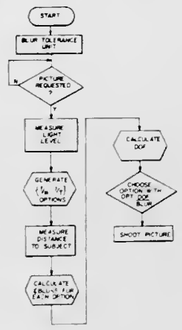
preventing vapors produced by the liquid developer from flowing into at least the image forming means, and
a shutter provided at the inlet opening of the intermediate chamber for opening and closing the inlet opening.

4,785,322
INFRARED WINK RANGING SYSTEM
George C. Harrison, Chelmsford, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Dec. 10, 1987, Ser. No. 131,095
Int. Cl.[4] G03B *3/00, 13/18*
U.S. Cl. 354—403 **6 Claims**



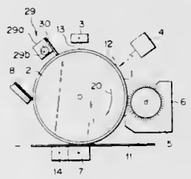
1. In a photographic camera having a strobe unit for emtting a flash containing both visible and infrared light, and means for initiating an exposure cycle including activation of the strobe unit to provide a pre-exposure flash for determining subject distance and an exposure flash for illuminating the photographic scene during film exposure, the improvement comprising:
a filter for blocking visible illumination and passing infrared radiation;
means for mounting said filter on the camera for movement between a first position in which it is in blocking relation to emissions from said strobe unit directed toward the scene and a second position in which it is displaced from said strobe unit to allow unobstructed passage or light emitted by said unit toward the scene; and
means for automatically displacing said filter during a single exposure cycle from its said first to its said second position after activation of said strobe unit to provide the pre-exposure flash, thereby automatically providing illumination of the scene with infrared illumination for distance determination and visible light from said strobe unit for film exposure.

4,785,323
EXPOSURE CONTROL
Cynthia S. Bell, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 28, 1987, Ser. No. 137,898
Int. Cl.[4] G03B *7/097*
U.S. Cl. 354—443 **8 Claims**



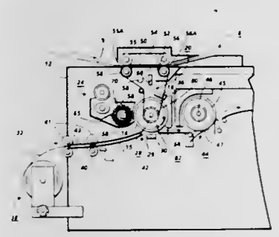
1. An exposure control comprising:
means for measuring the level of ambient light;
means for generating a plurality of aperture-shutter options for said measured level of light;
means for measuring the distance to a subject;
means for determining a parasitic system blur for each of said options at said measured distance;
means for determining a depth of field for each of said options;
means for selecting the option with the optimum depth of field to blur ratio; and
means for controlling an exposure in accordance with the option having said optimum ratio.

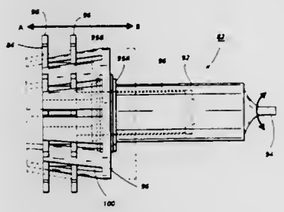
4,785,324
ELECTROPHOTOGRAPHIC APPARATUS AND METHOD FOR PREVENTING THE LOWERING OF A CHARGING VOLTAGE AT A PHOTORECEPTOR
Mutsuki Yamazaki, and Eiichi Kaga, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 13, 1987, Ser. No. 25,588
Claims priority, application Japan, Mar. 26, 1986, 61-67925; Mar. 26, 1986, 61-67926
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **20 Claims**



1. An electrophotographic apparatus, comprising:
a photoreceptor comprising amorphous silicon;
means for charging a surface area of the photoreceptor;
means for forming an electrostatic latent image on the surface area of the photoreceptor;
means for developing the latent image by a developing agent into a visual image;
means for transferring the visual image onto a copying sheet;
cleaning means for removing the agent remaining of the surface area of the photoreceptor after the image transfer has been performed by said transfer means;
means for discharging the surface area of the photoreceptor by a light illumination, said discharging means including a lamp for directing light onto the surface area of said photoreceptor for illumination; and
light shielding means for shielding the light directed from said discharging means onto the surface area of the photoreceptor which has been charged by said charging means, said light shielding means including a plate-like shielding member located in contact with the surface of said photoreceptor and at least a portion of said light shielding member, which is in contact with said photoreceptor, is made of an electrically insulating material.

4,785,325
ADJUSTABLE SPEED CONTROL FOR A DOCUMENT IMAGING SYSTEM
William E. Kramer, Fairport, and John E. Forward, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 16, 1987, Ser. No. 120,908
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—8 **5 Claims**





1. In a document imaging system, in combination,
means for moving a document across an exposure zone formed in an object scanning plane,
means for projecting a flowing light image of the document onto the surface of a photoreceptor moving at the same speed as the document,
an adjustable pulley speed mechanism connected to the moving photoreceptor and adapted to be driven at the same rotational speed,
a timing belt frictionally entrained between said pulley mechanism and said document moving means and
means for changing the effective diameter of said pulley mechanism so as to effect a change in the speed of the document movement across the exposure zone.

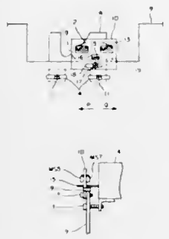
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4,785,326

TABLE START POSITION SELECTING MECHANISM FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Tatsushi Hayashi, Nara; Eiichi Shimizu, Yamatokoriyama, and Tamami Handa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 10, 1986, Ser. No. 905,866
Claims priority, application Japan, Sep. 17, 1985, 60-141809[U]
Int. Cl.[4] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—8 5 Claims



1. A table start position selecting mechanism for a copying machine of the type with a movable document carrying table, said copying machine including a unistructural lamp unit defining an optical axis with a lamp and a primary mirror for initially reflecting light from a document on said table, the position of said lamp unit being adjustable when said copying machine is assembled, said mechanism comprising

a switch-supporting plate which is independent of said lamp unit and adjustable with respect thereto in the direction of motion of said table,

a table start position detection switch attached to said plate, and

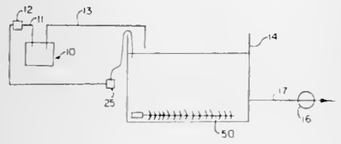
a positioning means affixed to said lamp unit at the center of said optical axis for positioning said plate with respect to said lamp unit in the direction of motion of said table.

4,785,327

PNEUMATIC CHARGE DIRECTOR DISPENSING APPARATUS

Benzion Landa, Edmonton, Canada; Haim Hochman, Ramat Gan, and Yehuda Niv, Rehovot, both of Israel, assignors to Savin Corporation, Stamford, Conn.

Filed Sep. 3, 1987, Ser. No. 92,445
Int. Cl.[4] G03G *15/10*
U.S. Cl. 355—10 8 Claims



1. In a liquid electrophotographic copying machine, an apparatus to dispense a preselected amount of a liquid charge director composition to a reservoir that contains a liquid developer composition, which apparatus comprises:

(a) a charge director reservoir that contains a liquid charge director composition;

(b) a pressure cell arranged within the charge director reservoir below the liquid level of the liquid charge director composition;

(c) said pressure cell including an opening having a first preselected diameter to permit a flow of liquid charge director composition from said charge director reservoir and into the interior of said pressure cell and vice versa;

(d) a controlled source of pulsed air;

(e) a first tubular conduit having a second preselected diameter and connecting said controlled source of pulsed air to the interior of said pressure cell;

(f) a second tubular conduit having a third preselected diameter and providing a fluid flow path from the interior of said pressure cell to said reservoir that contains a liquid developer composition; and

(g) control means to selectively activate said source of pulsed air to discharge a pulse of air having a preselected pressure through said first tubular conduit and into the interior of said pressure cell; said preselected pressure being sufficient to force all of the liquid charge director composition within said pressure cell from said pressure cell, with portions of said liquid charge director composition flowing through each of the opening and the entire length of said second tubular conduit;

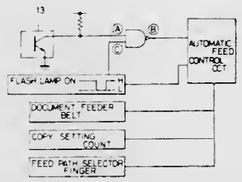
(h) the ratio of the first preselected diameter to the third preselected diameter being fixed such that the preselected air pressure causes said preselected amount of liquid charge director composition to flow through the entire length of said second tubular conduit and into said reservoir that contains a liquid developer composition and causes the remaining portion of said liquid charge director composition to flow through said opening and into said charge director reservoir.

4,785,328

ELECTROPHOTOGRAPHIC COPYING MACHINE

Yoshiyuki Tanimoto, Tokyo; Mutsuo Watanabe, and Takashi Murofushi, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,080
Claims priority, application Japan, Dec. 27, 1985, 60-295790; Feb. 5, 1986, 61-021899; May 13, 1986, 61-107582; May 20, 1986, 61-115647; Jun. 19, 1986, 61-143764
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 20 Claims



1. A.n electrophotographic copy machine comprising:

a flash lamp for emitting a flash of light to illuminate a document thereby to produce an optical image of the document;

a power supply circuit for supplying power to said flash lamp;

a photosensitive body;

means for focusing said optical image onto said photosensitive photosensitive body to form an electrostatic latent image thereon;

an image developing device for developing said electrostatic latent image into a visible image;

an image transfer device for transferring said visible image onto an image transfer member;

a sensor for detecting whether said flash lamp is energized;

a detector circuit for producing a signal representative of whether said flash lamp is actually energized in response to a flash signal commanding energization of said flash lamp and a signal from said sensor at a time when said flash lamp is to be energized;

means for effecting a predetermined operation when said flash lamp fails to be energized; and

a control circuit responsive to the signal from said detector circuit, indicating that said flash lamp fails to be energized, for applying a signal to said effecting means;

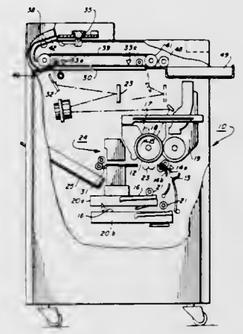
a processing unit for performing a process required to achieve normal copying operation, said effecting means preventing said process from being performed, said processing unit comprising a feed path for passage of the image transfer member therealong, and further including a sheet path selecting means for directing the image transfer member selectively toward a discharge tray and a sorter, said effecting means comprising means for controlling said sheet path selecting means.

4,785,329

MONITORING WINDOW EXPANSION FOR DIAGNOSTICS

Frank R. Walsh, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 9, 1987, Ser. No. 107,124
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 SH 5 Claims



1. A method of sheet feeder diagnostics in a reproduction machine having a control means and a sheet feeder for advancing sheets in seriatim along a sheet path, said sheet path having a sensor for sensing movement of the sheets in said path, said control means including a memory and display for manifesting machine faults and having a logic means providing a first control window time frame for monitoring the movement of the sheets along the sheet path comprising the steps of:

manifesting a plurality of machine faults in said reproduction machine relating to the movement of the sheets along the sheet path,

putting the machine in a diagnostics mode in response to the manifestation of the plurality of machine faults,

providing a second control window time frame for diagnosing the movement of the sheets along the sheet path, the length of time of the second window being greater than the length of time of the first window,

exercising the machine components related to the movement of the sheets along the sheet path, and

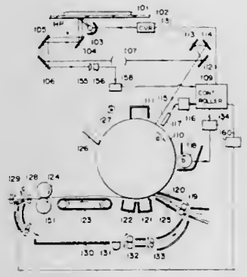
determining the cause of the faults in the machine based upon the monitoring of the sheets during the second window time frame.

4,785,330

MULTIPLE IMAGE FORMING SYSTEM

Nobutoshi Yoshida, Yokohama, and Atushi Takagi, Minami-Ashigara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,280
Claims priority, application Japan, Oct. 23, 1986, 61-253307; Oct. 27, 1986, 61-255105
Int. Cl.[4] G03G *15/04, 15/06*
U.S. Cl. 355—14 R 32 Claims



1. A multiple image forming system comprising:

latent image forming means for projecting a reflected light from an original onto a photo sensitive material and forming an electrostatic latent image onto said photo sensitive material;

developing means for developing said latent image; and

control means for making said latent image forming means and said developing means operative a plurality of times in order to reproduce every gradation characteristic for the different gradation characteristic areas in said original,

wherein said control means changes latent image forming conditions of the latent image forming means or developing conditions of said developing means in accordance with the kind of said gradation characteristic.

4,785,331

ELECTROPHOTOGRAPHIC COPYING METHOD AND APPARATUS

Tateki Oka; Naoki Toyoshi, and Tomoaki Yokoyama, all of Aichi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Nov. 9, 1987, Ser. No. 117,836
Claims priority, application Japan, Nov. 13, 1986, 61-270598; Nov. 13, 1986, 61-270599
Int. Cl.[4] G03G *15/06*
U.S. Cl. 355—14 D 18 Claims

1. An electrophotographic copying apparatus comprising:

an electrostatic latent image bearing member;

first charging means for charging the electrostatic latent image bearing member;

exposing means for exposing the charged electrostatic latent image bearing member to light reflected from an original thereby to form an electrostatic latent image thereon;

second charging means for recharging the electrostatic latent image bearing member on which the electrostatic latent image is formed to obtain an outline image;

developing means for developing the electrostatic latent image;

means for forming a reference image on the electrostatic latent image bearing member;

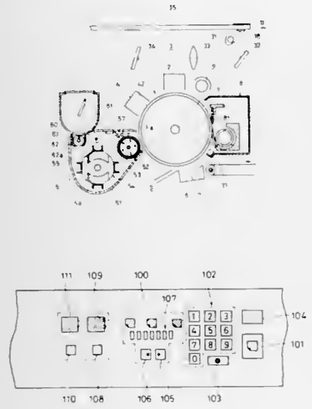
detecting means for detecting an amount of toner adhering to said reference image;

mode designating means for designating either a first copying mode in which said second charging means is not

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operated or a second copying mode in which said second charging means is operated;

first control means for controlling an amount of toner to be replenished to the developing means dependent on the result of detection of said detecting means, when said first copying mode is designated; and



second control means for controlling an amount of toner to be replenished to the developing means to cause said amount to be smaller than the amount determined dependent on the result of detection of said detecting means, when said second copying mode is designated.

4,785,332

PRESSURIZING IMAGE FORMING APPARATUS

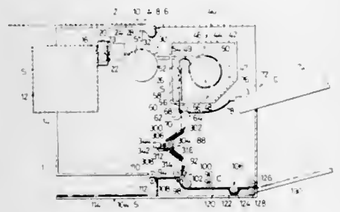
Akihiko Nagumo, and Minoru Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1987, Ser. No. 37,902

Claims priority, application Japan, Apr. 16, 1986, 61-87702

Int. Cl.[4] G03B *27/52*; G03C *5/16*

U.S. Cl. 355—27 **4 Claims**



1. A pressurizing image forming apparatus of the type which makes use of a photo- and pressure-sensitive heat-developable material including a substrate and a layer formed on said substrate from a heat-developable material which enables the developed image to be fixed by the application of pressure, at least part of said heat-developable material being contained in common microcapsules, so that the image on the exposed photosensitive material is developed by application of heat and then fixed by application of pressure, said apparatus comprising:

impact pressurizing means for uniformly fixing the developed image; and

platen means disposed to oppose said impact pressurizing means.

4,785,333

BLIP MARKING RECORDER IN A MICROFILM DUPLICATING APPARATUS

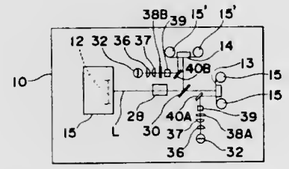
Takeshi Okano, Nishinomiya, and Sadaaki Nakaoka, Osaka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 19, 1987, Ser. No. 64,032

Claims priority, application Japan, Jun. 20, 1986, 61-145639; Jun. 24, 1986, 61-149214

Int. Cl.[4] G03B *27/52*

U.S. Cl. 355—39 **6 Claims**



1. A blip marking recorder for a microfilm duplicating apparatus for duplicating images, recorded on a master film, onto a duplicate film through a photographic optical system, which recorder comprises a blip marking imprinting mechanism disposed between the master film and the duplicate film for imprinting a blip marking for retrieval at a location between each a pair of adjacent image frames of the duplicate film.

4,785,334

IMAGE FORMING APPARATUS

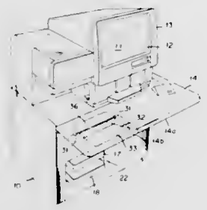
Masatoki Sutou, Okazaki, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1987, Ser. No. 133,296

Claims priority, application Japan, Dec. 17, 1986, 61-300329

Int. Cl.[4] G03B *13/24, 13/26*

U.S. Cl. 355—44 **6 Claims**



1. An image forming apparatus having a work table at the front side thereof, comprising:

means for forming an image on a sheet;

feed means which accomodates therein in a stacked state a plurality of sheets to be fed to said image forming means, said feed means being positioned under said work table;

means for discharging the sheet with the image formed thereon, said discharge means being positioned between said work table and said feed means;

said work table having an upwardly rotatable portion, said rotatable portion being formed with an opening for taking out the sheet discharged from said discharge means; and

means for supporting the sheet discharged from said discharge means, said sheet supporting means being positioned between said discharge means and said rotatable portion of the work table.

4,785,335

METHOD OF PRINTING THROUGH CONTACT EXPOSURE IN STEP-AND-REPEAT MACHINE

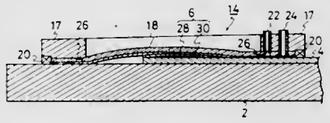
Koichi Fujii, and Masaji Mizuta, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 15, 1987, Ser. No. 96,496

Claims priority, application Japan, Sep. 16, 1986, 61-219014

Int. Cl.[4] G03B *27/02, 27/04*

U.S. Cl. 355—132 **8 Claims**



1. A method of printing through a contact exposure in a step-and-repeat machine, said machine including a photosensitive material holder on which a photosensitive material is supported, an original film holder having a transparent base plate on which an original film is fixedly held and a holder frame defining a first chamber between the photosensitive material holder and the base plate, first suction means for holding the original film on the base plate, second suction means for evacuating air within the first chamber and a light source disposed behind the original film for exposing the photosensitive material through the original film, said method comprising the steps of:

(i) actuating the first suction means to mount the original film fixedly on the base plate of the original holder by means of suction;

(ii) positioning the original holder at a desired position ont he photosensitive material;

(iii) actuating the second suction means to evacuate air within the first chamber;

(iv) decreasing the suction applied from the first suction means so as to effect the higher negative pressure within the first chamber than that applied by the first suction means, by which the original film contacts with the photosensitive material; and

(v) exposing the photosensitive material through the original film.

4,785,336

DEVICE FOR MONITORING CHARACTERISTICS OF A FILM ON A SUBSTRATE

Walter D. McComb, Oregon; Richard D. Schave, Perrysburg; Gregory S. Lee, Bowling Green, and Andrew W. Rudolph, S. Elmore, all of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Dec. 4, 1986, Ser. No. 937,741

Int. Cl.[4] G01B *11/06*

U.S. Cl. 356—382 **32 Claims**

1. An apparatus for determining selected characteristics of a film on a substrate, comprising:

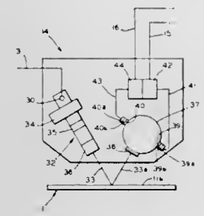
a scanning head mounted for movement along a generally linear path spaced from a surface of a substrate;

a source of light attached to said scanning head;

means for directing a beam of light from said source of light to illuminate the surface of the substrate;

means attached to said scanning head for collecting at least a portion of said beam of light reflected from the surface including an integrating sphere formed as a hollow ball having an entrance port formed in a wall thereof and oriented toward the substrate surface whereby at least a portion of said beam of light reflected from the surface enters said sphere through said entrance port and is collected in said sphere;

means responsive to said collected light for generating output signals representing at least two different characteristics of said beam of light; and



means responsive to said output signals for determining at least one characteristic of a film formed on the surface of the substrate.

4,785,337

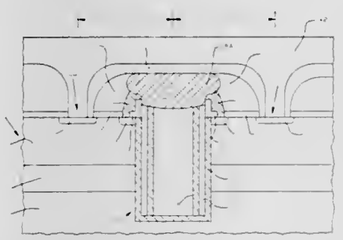
DYNAMIC RAM CELL HAVING SHARED TRENCH STORAGE CAPACITOR WITH SIDEWALL-DEFINED BRIDGE CONTACTS AND GATE ELECTRODES

Donald M. Kenney, Shelburne, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1986, Ser. No. 919,940

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.6 **18 Claims**



1. A one-device dynamic random access memory cell, comprising

a trench formed in an exposed surface of a semiconductor substrate, said trench being filled with at least a first polysilicon layer and at least one dielectric layer for isolating said first polysilicon layer from said substrate, at least a portion of said first polysilicon layer extending above said surface of said substrate to define a mandrel structure thereon;

at least one transistor device disposed on a portion of said substrate adjacent one side of said trench, said transistor having first and second conducting electrodes formed within said surface of said substrate to define a channel region therebetween and a third control electrode disposed above and insulated from said channel region; and

a sidewall-defined bridge contact disposed on said mandrel structure, said bridge contact having a vertical portion in contact with said portion of said first polysilicon layer extending above said surface of said substrate, and a horizontal portion in contact with one of said control electrodes of a respective one of said plurality of transistor devices, said bridge contact comprising a second polysilicon layer selfaligned to said first polysilicon layer.

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4,785,338

SEMI-CONDUCTOR I.C. ELEMENT

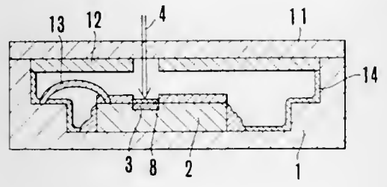
Takao Kinoshita; Shinji Sakai, both of Tokyo; Takashi Kawabata, Kanagawa; Nobuhiko Shinoda, and Kazuya Hosoe, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 726,182, May 23, 1985, abandoned, which is a continuation of Ser. No. 450,744, Dec. 17, 1982, abandoned, which is a continuation of Ser. No. 176,575, Aug. 8, 1980, abandoned. This application Nov. 10, 1986, Ser. No. 930,945

Claims priority, application Japan, Aug. 9, 1979, 54-101664

Int. Cl.[4] H01L *27/14, 23/02, 25/04*

U.S. Cl. 357—30 12 Claims



1. An image pickup device comprising:

(a) photoelectric transducing means having a photoelectric transducing surface for converting light information into an electrical signal;

(b) a package having said photoelectric transducing means sealed therein, said package having at least a part of the walls thereof made of a light-transmitting optical element to have incident light impinge on said photoelectric transducing surface through said optical element, said light-transmitting optical element having a surface opposed to said photoelectric transducing surface; and

(c) light absorbing means containing a substance of high light-absorbing efficiency for absorbing the light reflected on the inside of said package,

said light absorbing means covering said opposed surface of the light-transmitting optical element except a predetermined portion opposing to the photoelectric transducing surface, said portion having approximately the same size as said photoelectric transducing surface.

4,785,339

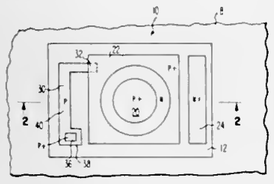
INTEGRATED LATERAL PNP TRANSISTOR AND CURRENT LIMITING RESISTOR

Thomas R. De Shazo, Jr., Kingwood Township, Hunterdon County, N.J., assignor to GE Solid State Patents, Inc., Somerville, N.J.

Filed Oct. 3, 1986, Ser. No. 915,985

Int. Cl.[4] H01L *29/72, 29/06*

U.S. Cl. 357—35 14 Claims



1. A lateral PNP transistor having emitter, base, and collector regions with PN junctions therebetween, including a collector contact and a resistor region arranged so that said resistor region extends contiguously between said collector contact and said collector region, said transistor and said resistor region being in a single active region, wherein said resistor region has a first sheet resistivity and said emitter and collector regions have a second sheet resistivity, said second sheet resistivity being diffent from said first sheet resistivity.

4,785,340

SEMICONDUCTOR DEVICE HAVING DOPING MULTILAYER STRUCTURE

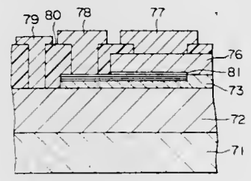
Kiyokazu Nakagawa, Amsterdam-Oost, Netherlands; Akitoshi Ishizaka, Kokubunji, Japan; Yasuhiro Shiraki, Hino, Japan, and Yoshimasa Murayama, Koganei, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 13, 1986, Ser. No. 839,349

Claims priority, application Japan, Mar. 29, 1985, 60-63430; Mar. 29, 1985, 60-63431

Int. Cl.[4] H01L *29/72, 27/12, 29/161*

U.S. Cl. 357—35 6 Claims



1. A bipolar transistor comprising:

a semiconductor substrate;

an emitter layer of a first conductivity type, a base layer of a second conductivity type, opposite to said first conductivity type, and a collector layer of said first conductivity type, formed on said substrate;

an emitter electrode, a base electrode, and a collector electrode for electrically connecting to said emitter layer, said base layer and said collector layer, respectively;

a doping multilayer structure placed in contact with said base layer and with said base electrode for electrically interconnecting said base electrode and said base layer;

wherein said doping multilayer structure has an opening through which said emitter layer is connected with said base layer, and wherein said doping multilayer structure comprises first semiconductor layers doped heavily with impurity of said second conductivity type, and second semiconductor layers formed of a same semiconductor material as that of said first semiconductor layers and doped lightly with impurity of said first conductivity type, said first and second semiconductor layers being alternately stacked, the ratio of impurity concentration in said first semiconductor layers to that in said second semiconductor layers being at least ten, and each of said first and second semiconductor layers having a thickness in a range from 10 Å to 1000 Å.

4,785,341

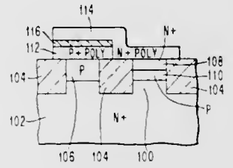
INTERCONNECTION OF OPPOSITE CONDUCTIVITY TYPE SEMICONDUCTOR REGIONS

Tak H. Ning, Yorktown Heights, and Siegfried K. Wiedmann, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 858,091, Apr. 29, 1986, abandoned, which is a continuation of Ser. No. 295,461, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 53,661, Jun. 29, 1979, abandoned. This application Dec. 24, 1987, Ser. No. 136,480

Int. Cl.[4] H01L *27/04*

U.S. Cl. 357—44 2 Claims



1. A semiconductor memory circuit, comprising:

a body of silicon single crystal semiconductor material having at least two cross-coupled bipolar transistors formed in a memory cell therein, wherein each of said transistors includes electrical base, collector, and emitter regions, said transistors being arranged in an improved dense layout, said layout including

a sufficiently low voltage drop electrical interconnection forming said cross-coupling between an electrical base region of one transistor and an electrical collector region of the second transistor, said cross-coupling interconnection comprising:

a refractory metal silicide layer contacting one of said base or collector regions in one of said first and second transistors and forming an electrical contact therewith, and

a polycrystalline silicon layer in contact with the other of said base or collector regions in the other of said first and second-transistors and sufficiently doped to form a sufficiently low voltage drop electrical contact therewith, said polycrystalline layer also being in contact with said layer of refractory metal silicide and forming a multi-level sandwich structure,

an electrical insulation layer formed over said silicide layer and said polycrystalline silicon layer,

a first electrical conductor located on said insulation layer and extending over the area in which said electrical interconnection is formed,

at least one additional electrical conductor formed in the same fabrication level as said first conductor and located laterally outside of the area occupied by said interconnection,

additional bipolar transistors electrically connected to said first conductor and said additional conductor, and to said two bipolar transistors, said additional bipolar transistors being located in said semiconductor material and between said two bipolar transistors.

4,785,342

STATIC RANDOM ACCESS MEMORY HAVING STRUCTURE OF FIRST-, SECOND- AND THIRD-LEVEL CONDUCTIVE FILMS

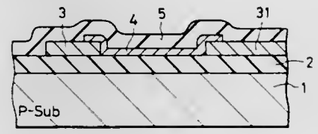
Toshiaki Yamanaka, Hoya; Yoshie Sakai, Shiroyama; Shinpei Iijima, Akishima; Osamu Minato, Hinode, and Shigeru Honjyo, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,325

Claims priority, application Japan, Jan. 29, 1986, 61-15626

Int. Cl.[4] H01L *27/10, 29/04, 49/02, 29/40*

U.S. Cl. 357—51 22 Claims



18. A resistance element comprising:

a substrate;

a first insulator layer provided on said substrate;

a first conductor film provided on said first insulator layer, said first conductor film being formed of heavily doped polycrystalline silicon of a first-level conductive film; and

a second conductor film having a smaller thickness than that of said first conductor film and having a higher resistivity than that of said first conductor film, said second conductor film being formed of polycrystalline silicon having had no impurity doped thereinto, of a second-level conductive film different than the first-level conductive film, said second conductor film being provided in such a manner as to be stacked over at least a part of said first conductor film, said first and second conductor films being electrically connected together at the stacked part.

4,785,343

MIS FET SEMICONDUCTOR DEVICE WITH IMPROVED LEAKAGE CURRENT

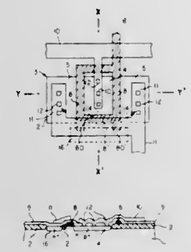
Akio Nezu, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 6, 1986, Ser. No. 871,336

Claims priority, application Japan, Jun. 7, 1985, 60-123646

Int. Cl.[4] H01L *29/78, 29/40*

U.S. Cl. 357—53 9 Claims



1. A MIS FET semiconductor device comprising:

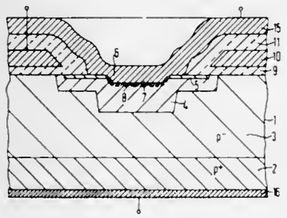
a semiconductor substrate of a first conductivity type;

an active region formed in said substrate and composed of a source region, a drain region and a channel region disposed between said source and drain regions, said source region and drain region of a second conductivity type opposite the first conductivity type;

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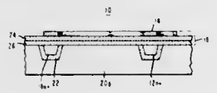
a field oxide film formed on said substrate and surrounding said active region;
a gate insulating film formed on said channel region, and having a thickness thinner than said field oxide film;
a gate electrode formed on said gate insulating film such that said gate electrode extends across the active region and extends onto the field oxide film at one end thereof, and such that a portion of said gate electrode at an opposite end thereof, overlies said field oxide film and is spaced apart from said active region;
an insulating layer covering the entire surface of said substrate;
a drain electrode formed on said insulating layer connected to said drain region through contact holes formed in said insulating layer;
a drain wiring formed on said insulating layer and connected to said drain electrode, said drain wiring extending above two regions, the first region including a first boundary region between the source region and the field oxide region, and a narrow area in the active region abutting said first boundary region, and the second region including a second boundary region between the drain region and the field oxide region, and a narrow area in the active region abutting said second boundary region, said first and second regions being located on both sides of said channel region, where said source and drain regions extend to said first and second boundary regions at said one end, and extend to said field oxide film at said other end;
a suppression gate insulating film formed on at least one of said first and second boundary regions and having a thickness substantially the same as the thickness of the gate insulating film, and;
a suppression gate electrode extending from said gate electrode and disposed over at least one of said first and second boundary regions and on said suppression gate insulating film in said active region near said one end of said gate electrode, said suppression gate formed beneath said insulating layer and substantially under said drain wiring.

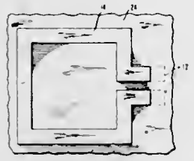
4,785,344
SEMI-CONDUCTOR COMPONENT WITH CONTACT HOLE
Guenther Franz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 18, 1985, Ser. No. 692,757
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402867
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.⁴ H01L *23/48*
U.S. Cl. 357—65 **3 Claims**



1. A semiconductor component comprising:
a P-conductive semiconductor body having a first surface;
an N-conductive first zone embedded in said first surface of said semiconductor body and being of higher conductivity than said semiconductor body;
a P-conductive second zone embedded in said first zone;
an oxide layer on said first surface of said semiconductor body and having a first opening therein, said opening exposing a part of a surface of said second zone;
said second zone having a second opening therein providing an exposed surface area of said first zone beneath said second opening;
an N-conductive layer having an implantation dose of at least 5×10 (EXP14) CM EXP (−2) embedded in said exposed surface area of said first zone, thereby providing a layer having a higher conductivity than said first zone; and
an aluminum contact electrically connecting the exposed surface of said second zone and said N-conductive layer.

4,785,345
INTEGRATED TRANSFORMER STRUCTURE WITH PRIMARY WINDING IN SUBSTRATE
Spencer A. Rawls, Reading, and Luke J. Turgeon, Westlawn, both of Pa., assignors to American Telephone and Telegraph Co., AT&T Bell Labs., Murray Hill, N.J.
Filed May 8, 1986, Ser. No. 860,858
Int. Cl.⁴ H01L *29/34, 27/02, 23/30;* **H01F** *5/00*
U.S. Cl. 357—51 **12 Claims**

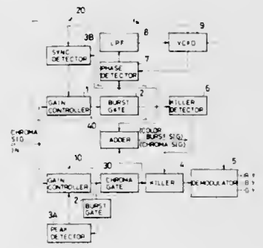




1. An integrated transformer structure comprising
a semiconductor substrate of a first conductivity type defined as including top and bottom major surfaces;
a primary winding comprising a planar spiral configuration of a low resistivity material formed in said top major surface of said substrate;
an insulating region disposed to cover said top major surface including said primary winding; and
a secondary winding comprising a planar spiral configuration of a low resistivity material formed over said insulating region in a manner such that said secondary winding is disposed above said primary winding.

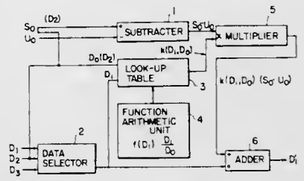
4,785,346
AUTOMATIC COLOR SATURATION CONTROLLER
Shigeru Yoshimochi, Shinagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Feb. 25, 1987, Ser. No. 18,432
Claims priority, application Japan, Mar. 29, 1986, 61-69750
Int. Cl.⁴ H04N *9/68*
U.S. Cl. 358—27 **4 Claims**

1. An automatic color saturation controller connected to a demodulator via a color killer circuit, which comprises:
(a) first automatic color saturation control means responsive to a chrominance signal including a color burst signal, for synchronous-detecting a product signal of a reference chrominance subcarrier and the color burst signal to produce a first constant level chrominance signal on the basis of the synchronous-detected product signal, and applying only the color burst signal to the color killer circuit to activate the color killer circuit when the applied color burst signal drops below a predetermined color killer level;
(b) second automatic color saturation control means also responsive to said chrominance signal including said color burst signal, for peak-detecting the color burst signal to produce a second constant level chrominance signal on the basis of the peak-detected color burst signal; and



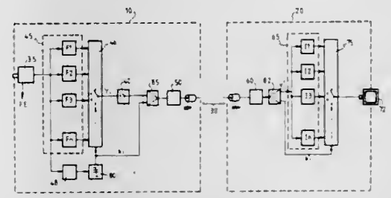
(c) chrominance signal gate means responsive to said second constant level chrominance signal produced by said second automatic color saturation control means, for extracting only said chrominance signal from said second constant level chrominance signal and supplying the extracted chrominance signal to a chrominance signal demodulator.

4,785,347
METHOD FOR EMPHASIZING SHARPNESS OF A PICTURE IMAGE BY FORMING AND PROCESSING SHARP AND UNSHARP SIGNALS FROM A PICTURE IMAGE SIGNAL
Daigo Ezuka, and Osamu Shimazaki, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation-in-part of Ser. No. 622,063, Jun. 18, 1984, abandoned. This application Nov. 25, 1985, Ser. No. 802,343
Claims priority, application Japan, Jun. 20, 1983, 58-110646
Int. Cl.⁴ H04N *1/46, 1/40*
U.S. Cl. 358—75 **2 Claims**



1. A method for enhancing the sharpness of a color image, comprising the steps of:
generating three color separation signals Di (i=1, 2, 3) from a color image, wherein each of the color separation signals represents a different color component of the color image;
selecting one of the color separation signals to be a sharp signal So;
generating an unsharp signal Uo from the color image, wherein the unsharp signal represents the same color component of the color image as the color separation signal selected to be the sharp signal;
subtracting the unsharp signal from the sharp signal to form a difference signal So-Uo;
multiplying the difference signal by three multiplier coefficients k which are functions of the form k(Di, Do) to form three sharpness-enhancement signals k(Di, Do)·(So-Uo), wherein Di is a corresponding one of the three color separation signals and Do is the color separation signal selected to be the sharp signal; and
adding the sharpness-enhancement signals to the corresponding color separation signals to obtain shaprness-enhanced color separation signals representing a sharpness-enhanced color image.

4,785,348
SYSTEM FOR THE TRANSMISSION AND RECEPTION OF HIGH-DEFINITION TELEVISION PICTURES IN NARROW-BAND CHANNELS
Frédéric Fonsalas, Grigny; Jean-Yves Lejard, Paris; Pascal Hayet, Chatenay Malabry, and Marcel Le Queau, Ozoir La Ferriere, all of France, assignors to U.S. Philips Corp., New York, N.Y.
Filed Nov. 3, 1987, Ser. No. 116,612
Claims priority, application France, Nov. 7, 1986, 86 15530
Int. Cl.⁴ H04N *7/12, 7/13*
U.S. Cl. 358—133 **10 Claims**



1. A television picture transmission system in which a transmitting section comprises a picture information components producing member, anti-aliasing filters for filtering said picture information components, a picture movement analyser for producing on the basis of the picture information components a quantity representing the movement therein, an output member of the anti-aliasing filters for coupling the input of a sub-sampling circuit to outputs of the anti-aliasing filters, said output member being controlled by the quantity representing the movement, a transmitter circuit for transmitting the information components from the sub-sampling via a transmission channel and an information multiplexer for applying to the transmitter circuit, in addition to the information from the sub-sampling circuit, output information of a threshold member, in which system a receiving section comprises a receiver circuit for receiving transmitted information components, interpolation filters for oversampling the information received, a receiver member for receiving the quantity representing the movement, an output member of the information filters for supplying the useful information and a demultiplexer circuit for on the one hand applying the samples received to the interpolation filter and on the other hand separating the information originating from the threshold member from the samples received, characterized in that in the transmitting section the number of anti-aliasing filters is at least three and the threshold member also acts on the output member of the anti-aliasing filters, and in the receiving section the number of interpolation filters is at least three and the demultiplexer circuit applies the threshold member output information of the transmitting section to a control input of the output member of the interpolation filters, whilst the filter output members of the transmitting and receiving sections are change-over switches.

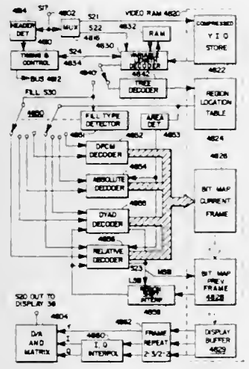
VOL 1096 ISS 3 NO 15 1988 UMI

4,785,349

DIGITAL VIDEO DECOMPRESSION SYSTEM

John M. Keith, Washington Crossing, Pa.; Stuart J. Golin, East Windsor, N.J.; Allen H. Simon, Belle Mead, N.J., and Brian Astle, Cranbury, N.J., assignors to Technology Inc. 64, Princeton, N.J.

Filed Oct. 5, 1987, Ser. No. 104,131
Int. Cl.[4] H04N *7/13*
U.S. Cl. 358—136 **15 Claims**



1. Decoding apparatus, comprising:

means for providing a compressed digital video signal of a type in which each frame thereof comprises a plurality of coded regions, each region being encoded by a region descriptive code and a region fill code, said region descriptive code conveying data representative of the sizes and locations of said regions within said frame, said region fill codes conveying pixel amplitude indications for said regions;

first decoding means, coupled to said providing means, for decoding said region descriptive codes and producing a table of region addresses for an entire frame;

second decoding means, coupled to said providing means, for decoding said region fill codes and providing pixel values;

memory means, coupled to said first and second decoding means for storing said pixel values at said addresses to provide a decoded bit map containing one frame of pixels.

4,785,350

TV INPUT SOURCE IDENTIFIER

William Burdick, Rutledge, and J. Peter Bingham, Knoxville, both of Tenn., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

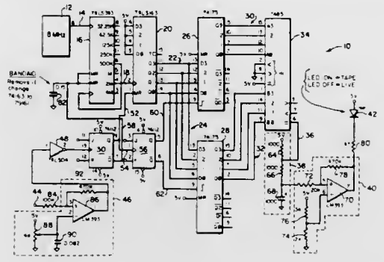
Filed Nov. 12, 1987, Ser. No. 119,603
Int. Cl.[4] H04N *5/44, 17/04*
U.S. Cl. 358—139 **10 Claims**

1. An apparatus for analyzing a video signal having at least one synchronization signal that includes a plurality of synchronization pulses and for determining whether the video signal is from a local video playing device or a broadcast signal source, comprising:

means for receiving the video signal and for generating timing data corresponding to the synchronization signal of the video signal for at least first and second time intervals between the synchronization pulses;

means for comparing the timing data of at least the first time interval to the timing data of at least the second time interval and producing a comparison signal that corresponds to the amount of jitter in said video signal; and

judgment means responsive to said comparison signal for producing a local signal when said comparison signal is within a first predetermined range to indicate that the video signal is from a local video playing device and for generating a broadcast signal when said comparison signal



is within a second predetermined range to indicate that the video signal is from a broadcast signal source.

4,785,351

PICTURE SIGNAL CONVERTING DEVICE

Hisashi Ishikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1986, Ser. No. 933,634
Claims priority, application Japan, Nov. 29, 1985, 60-267283
Int. Cl.[4] H04N *7/01, 7/12, 7/13*
U.S. Cl. 358—140 **22 Claims**

1. A picture signal converting device in which such frame of picture signal as corresponding to one frame of picture plane is constituted with a group of field picture signals corresponding to a plurality of field picture planes each one of which has a prescribed number of scanning lines, and a number of scanning lines of each field picture plane constituting the frame of picture plane is increased, comprising:

(A) input means for consecutively entering such field picture signal as corresponding to each one of said field picture plane;

(B) first interpolating signal forming means for forming a first interpolating signal by using such field picture signal as corresponding to other field picture plane than a first field picture plane entered by said input means;

(C) second interpolating signal forming means for forming a second interpolating signal by using such first field picture signal as corresponding to the first field picture plane entered by said input means;

(D) motion detecting means for detecting an amount of movement of a picture by using such second and third field picture signals as corresponding to second and third field picture planes entered by said input means adjacently to such first field picture signal as corresponding to said first field picture plane;

(E) holding means for holding a detection result at such time as a prescribed period of time beforehand at said motion detecting means; and

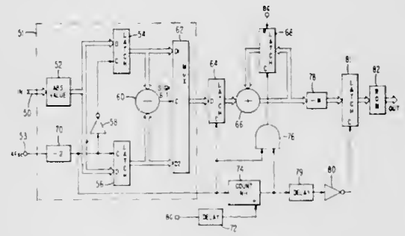
(F) interpolating picture signal forming means for forming an interpolating picture signal for said first field picture plane by using at least one of said first interpolating signal and said second interpolating signal depending on a first detection result in said motion detecting means and a second detection result held in said holding means.

4,785,352

SAMPLED DATA AMPLITUDE DETECTOR AS FOR AN AGC MULTIPLIER

Sherwin D. Burrowes, East Windsor, and Alfred Y. Kwan, Mine Hill Township, Morris County, both of N.J., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Sep. 30, 1985, Ser. No. 782,132
Int. Cl.[4] H04N *5/52, 9/44*
U.S. Cl. 358—174 **9 Claims**



1. In apparatus for processing a sampled data signal representing a time varying signal, means for detecting the amplitude of said sampled data signal comprising:

a signal input port for applying said sampled data signal;

means, coupled to said signal input port, for providing pairs of magnitude samples representing the magnitudes of successive samples of said sampled data signal;

means, coupled to said means for providing, for comparing the magnitudes of each pair of magnitude samples and generating a control signal indicating which of said magnitude samples of each of said pairs of magnitude samples is larger; and

means responsive to said control signal, and said each pair of magnitude samples for producing the larger magnitude sample of each of said pairs of magnitude samples as an output signal corresponding to the amplitude of said sampled data signal.

4,785,353

BLOCK READABLE VIDEO IMAGER HAVING NOISE COMPENSATION

Roy H. Seim, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

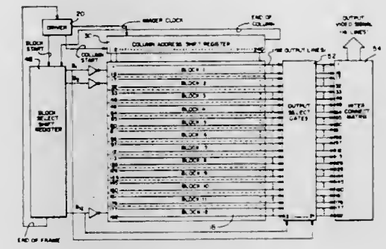
Filed Mar. 13, 1987, Ser. No. 25,449
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.26 **4 Claims**

1. In video imaging apparatus including a sensor having a plurality of photosites arranged in an array of rows and columns, the invention comprising:

sensor readout means for reading out said sensor in sequential blocks of parallel rows of photosites, such that the photosites included in a column are read out simultaneously, to produce an output signal including sequential blocks of video information, wherein each block of video information includes parallel lines of video signals arranged in columns of pixel video signals corresponding to the columns of photosites within a block;

memory means for storing a set of noise compensation signals for at least one block of rows of photosites of said sensor, wherein each noise compensation signal of said set is applicable to all of the photosites in a column of photosites; and

circuit means for reading out said set of compensation sig-



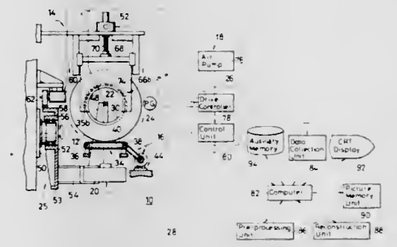
nals from said memory means and for compensating said one block of said output signal by applying to each pixel signal in a column of pixel signals the noise compensation signal corresponding to said column.

4,785,354

TIRE LOAD TEST CT SCANNER

Shigeo Nakamura, Mitaka, and Katsutoshi Nakashima, Hachiooji, both of Japan, assignors to Bridgestone Corporation, Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Dec. 27, 1985, Ser. No. 813,874
Claims priority, application Japan, Dec. 28, 1984, 59-274801; Jan. 30, 1985, 60-14547
Int. Cl.[4] G01N *23/04*
U.S. Cl. 378—4 **17 Claims**



1. A tire load testing CT scanner for reconstructing a computer tomographic image of an overall cross section of a tire based on a radiation transmittance data for the cross section generated by irradiating the tire with fan beams, comprising:

(a) load applying means for applying a load to the tire which is filled with air;

(b) means for supporting the tire filled with air;

(c) radiation imaging means for obtaining radiation transmittance data of an overall cross section of the tire by irradiating the tire with fan beams;

(d) moving means for relatively moving said radiation imaging means and the overall cross section of the tire to which a load is applied by said load applying means such that a cross section of the tire is irradiated with the fan beams within an angle of more than (180 degrees + a fan angle of the fan beam) so as to obtain radiation transmittance data by which a computer tomographic image of the overall cross section is reconstructed; and

(e) drive control means for driving and controlling said load

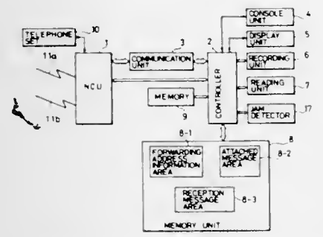
VOL 1096 ISS 3 NO 15 1988 UMI

applying means, said radiation imaging means, and said moving means.

4,785,355
IMAGE COMMUNICATION APPARATUS

Koichi Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 813,514
Claims priority, application Japan, Dec. 28, 1984, 59-276466; Dec. 28, 1984, 59-276467; Dec. 28, 1984, 59-276468
Int. Cl.[4] H04N 1/32
U.S. Cl. 358—257 16 Claims

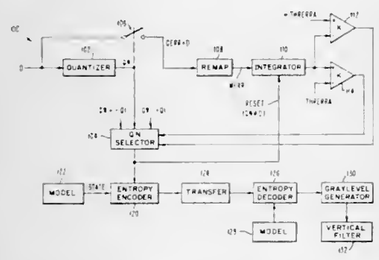


1. An image communication apparatus comprising:
receive means for receiving image data;
transfer means for transferring image data received by said receive means;
set means for manually setting dial information of a transfer destination of said apparatus;
first memory means for storing dial information set by said set means; and
instruction means for instructing said transfer means to execute transfer operation thereof,
wherein said transfer means transfers the image data to a transfer destination stored in said first memory means in response to the instruction by said instruction means.

4,785,356
APPARATUS AND METHOD OF ATTENUATING DISTORTION INTRODUCED BY A PREDICTIVE CODING IMAGE COMPRESSOR

Cesar A. Gonzales, Mahopac, and William B. Pennebaker, Carmel, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 24, 1987, Ser. No. 42,132
Int. Cl.[4] H04N 1/417
U.S. Cl. 358—260 9 Claims

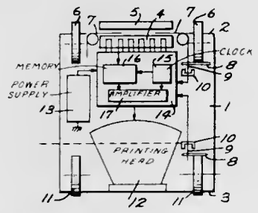


1. In a gray level image data processor which includes (A) a predictive coder which (i) computes a predictive difference value D for the current pixel and (ii) quantizes the difference D to a QN value wherein the number of QN values is less than the number of permitted D values, and wherein ranges of larger D values correspond to QN values of relatively larger magnitudes wherein QN=Q0 corresponds to a region of substantially uniform gay level and (B) an entropy encoder which receives as input and compresses QN value data from the predictive coder, a machine-implemented method for reducing distortion in an image reconstructed from data subjected to compression by predicting coding, the method comprising the steps of:
(a) for each pixel at which QN=Q0, setting a value QERR equal to D;
(b) remapping the set QERR value to a value MERR;
(c) summing the MERR values for successive pixels in a QN=Q0 region; and
(d) for a pixel at which the sum of MERR values reaches a predefined threshold, adjusting the QN value thereof.

4,785,357
DEVICE FOR PHOTOCOPYING PARTS OF DOCUMENTS

Bertrand A. Dreyfus, 114 rue de Damiette, 91190 Gif-Sur-Yvette, and Jaques Godart, 21 rue Nationale, F-91300 Massy, both of France

Filed Dec. 24, 1986, Ser. No. 945,997
Claims priority, application France, Dec. 27, 1985, 85 19281
Int. Cl.[4] H04N 1/10, 1/22
U.S. Cl. 358—285 11 Claims

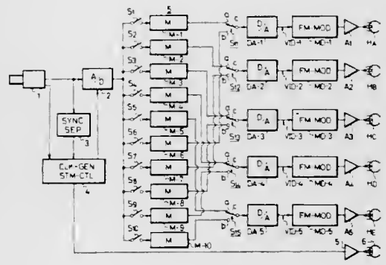


1. A pocket-sized device for photocopying, on a reproduction base material, parts of texts or diagrams by linear displacement of the device with respect to a document, comprising:
at least two incremental wheels, wherein a first wheel rolls without sliding on the base material of the document to be reproduced and a second wheel rolls on the reproduction base material, the rotation of said wheels furnishing a time base for the acquisition and restoration of data;
a matrix pickup for picking up and reading the part of the document to be reproduced;
an electronic device for inputting data from the matrix pickup serially into a memory;
a means for amplifying and multiplexing the data output from the memory;
a matrix printing system controlled by the amplifier-multiplexer the matrix pickup and the matrix printing system having the same matrix arrangement;
a clock controlled by the time base, furnished by the rotation of said incremental wheels, said clock controlling the transfers, at each clock interval, of data acquired by the pickup to the memory in the course of the reading cycle, and then from the memory to the printing system in the course of the printing cycle.

4,785,358
RECORDING APPARATUS FOR RECORDING A VIDEO SIGNAL OBTAINED FROM A HIGH SPEED SCANNING VIDEO CAMERA

Takeshi Ninomiya, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 591,976, Mar. 21, 1984; abandoned.
This application Aug. 19, 1987, Ser. No. 88,502
Claims priority, application Japan, Mar. 25, 1983, 58-49761; Apr. 8, 1983, 58-62703
The portion of the term of this patent subsequent to Sep. 30, 2003, has been disclaimed.
Int. Cl.[4] H04N 5/782
U.S. Cl. 358—335 5 Claims

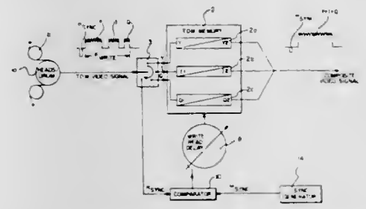


1. Apparatus for recording on a magnetic recording tape a video signal obtained from a high speed scanning video camera having a scanning speed N times the scanning speed of a standard video camera generating a standard television video signal, where N is a natural number equal to 3 or more; said apparatus comprising:
means for driving said magnetic recording tape continuously at a tape speed N times that of a standard type video signal recording apparatus;
means for converting said video signal to a digital video signal;
means for dividing said digital video signal into a plurality of channels of digital video signals;
means for expanding a time axis of each of said plurality of channels of digital video signals;
means for converting each of said time-axis-expanded digital video signals to an analog video signal so that each of said analog video signals has the same frequency band as that of said standard television video signal;
means for modulating said analog video signals; and
means including a rotating drum having a cylindrical surface and N magnetic transducer heads mounted on said cylindrical surface for recording said modulated analog video signals on successive video tracks formed on said recording tape, said rotating drum having a diameter and said recording tape defining a helix angle respectively smaller and larger than the drum diameter and tape helix angle of said standard type video signal recording apparatus, so that said successive video tracks are made to correspond to those of said standard type video signal recording apparatus and said modulated analog video signals as recorded are compatible with said standard type video signal recording apparatus.

4,785,359
DUAL PURPOSE MEMORY FOR TIME DIVISION MULTIPLEXING AND TIME BASE ERROR CORRECTION

William K. Hickok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1986, Ser. No. 915,489
Int. Cl.[4] H04N 5/95, 5/92
U.S. Cl. 360—9.1 4 Claims



1. In a video tape player adapted to reproduce a composite video signal from a previously recorded time division multiplexed video signal characterized by a video line frequency, wherein plural time division video segments of said multiplexed video signal are sequentially written during a write time interval into a memory so as to occupy just a limited memory space therein, and wherein said plural video segments are simultaneously read out of said memory during a read time interval characterized by a read interval repetition frequency, a system for correcting time base errors corresponding to variations in the time between arrival of successive pluralities of said video segments, said system comprising:
means for frequency-locking said read interval repetition frequency to said video line frequency;
means for sensing said time base errors;
means for time-shifting said read interval with respect to said write interval in response to said sensing means so as to compensate said time base errors, and for restricting the time-shift of said read interval to a memory idle time window proportional to the duration of said write time interval, whereby said time-shifting and the reading and writing of said plural video segments occur just within said limited memory space,
wherein said sensing means compares said multiplexed video signal with a stable time reference in order to sense said time base errors, whereby said time-shifting means shifts said read interval with respect to said write interval whenever necessary to maintain the time of commencement of said read interval at least nearly invariant with respect to said stable time reference,
wherein said successive video segment pluralities correspond to successive horizontal video lines of said multiplexed video signal;
said frequency-locking means comprise means for starting said memory read interval after a predetermined delay following the beginning of each one of said horizontal video lines;
said time-shifting means changes said predetermined delay in response to said sensing means, whereby said read interval remains frequency-locked with said horizontal lines even while it is shifted in time with respect thereto,
wherein said read interval starting means comprise:
means for counting through a count cycle up to a maximum count R by a modulus M and a count period T derived from said stable time reference, and for starting said read interval upon the occurrence of said maximum count; and
means for initiating said counting cycle of said counting means in synchronism with said video signal synchronization frequency, whereby the starting of said read

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interval is frequency-locked to said video line frequency;

wherein said time-shifting means comprise:

means for changing said modulus M in response to said sensing means by no more than said maximum count R, wherein (T)(R) corresponds to the duration D of said memory idle time window, so as to permit a maximum time-shift of said read interval at least nearly equal to the duration of said memory idle time window.

4,785,360

RECORDING AND REPRODUCING APPARATUS HAVING TRACKING CONTROL RESPONSIVE TO ERASE HEAD SCANNING

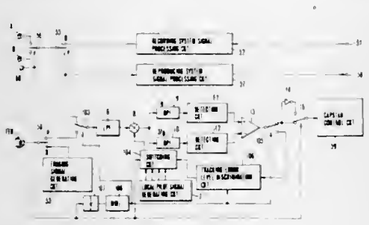
Susumu Kozuki, Tokyo; Hiroyuki Takimoto; Mitsuhiro Otokawa, both of Yokohama; Hiroo Edakubo, Akishima; Kenichi Nagasawa, Kawasaki, and Keiji Satoh, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1986, Ser. No. 914,371

Claims priority, application Japan, Oct. 7, 1985, 60-222002

Int. Cl.[4] G11B *15/087*

U.S. Cl. 360—77 **12 Claims**



1. An information signal recording and reproducing apparatus arranged to record in rotation pilot signals of a plurality of kinds having different frequencies in respective different recording tracks, along with an information signal on a recording medium and to reproduce said information signal from said recording medium, comprising:

(a) a first rotary head arranged to reproduce said information signal;

(b) a second rotary head arranged to erase said information signal on said recording medium;

(c) reference signal generating means arranged to generate in rotation reference signals of a plurality of kinds having different frequencies corresponding to those of said pilot signals;

(d) control means for controlling the relatie positions of said first rotary head and the recording medium by using said reference signals generated by said reference signal generating means and said pilot signals reproduced by said first rotary head; and

(e) skipping means for causing said reference signal generating means to change the reference signal generating sequence thereof by skipping a given number of reference signals according to said pilot signals reproduced by said second rotary head.

4,785,361

METHOD AND APPARATUS FOR FRUSTRATING THE UNAUTHORIZED COPYING OF RECORDED DATA

W. Krag Brotby, Pasadena, Calif., assignor to Vault Corporation, Newbury Park, Calif.

Continuation of Ser. No. 922,824, Oct. 22, 1986, which is a continuation of Ser. No. 439,907, Nov. 8, 1982, abandoned. This application Dec. 16, 1986, Ser. No. 943,389

Int. Cl.[4] G11B *15/04*

U.S. Cl. 360—60 **2 Claims**

1. A method for frustrating the unauthorized copying of protected data that has been recorded in an authorized medium that includes an initializing routine that is executed before any of the protected data is read out of the authorized medium, said method comprising the steps of:

(a) establishing a File X;

(b) initially storing in File X a particular number N_o;

(c) providing an incrementing apparatus that is present only when an authorized medium is used, for generating a series of increments and for successively incrementing the number in File X each time the medium is read, said incrementing apparatus not being present when an unauthorized medium is used and being rendered inoperative when an authorized medium has been tempered with;



(d) establishing a File Y as part of the initializing routine;

(e) initially storing in File Y the number N_o used in step (b);

(f) incrementing the number in File Y successively each time the medium is read, in accordance with the same series of increments that was generated in step (c);

(g) testing to determine whether the number in File X equals the number in File Y;

(h) preventing read-out of the protected data when the number in File X does not equal the number in File Y.

4,785,362

DRIVING FORCE BRANCHING GEAR MECHANISM

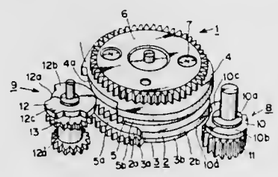
Katsuya Nozawa; Hidenori Muramatsu; Kimichika Yamada; Hitoshi Okada; Yoshihiko Goto, and Hiroyuki Ohkawa, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1987, Ser. No. 83,581

Claims priority, application Japan, Aug. 14, 1986, 61-191101

Int. Cl.[4] G11B *15/665*; F16H *47/00, 55/17*

U.S. Cl. 360—85 **2 Claims**



1. A driving force branching gear mechanism, which drives two gear driving systems by means of a single driving motor, comprising:

a. a driving motor,

b. a driving gear rotated by said driving motor, provided with a first and a second great diameter cam gears, each of which consists of two layers, a cam section and a gear section, the gear section having a cut-off portion corresponding to a projecting portion of the cam section, and

c. a first and a second small diameter cam gears, of which consists of two layers, a cam section and a gear section, linked with the cam section and the gear section, respectively, of the first and the second great diameter cam gears, respectively, each of the cam sections having a recess portion fixed by the projecting portion of the cam section of the first and the second great diameter cam gears.

4,785,363

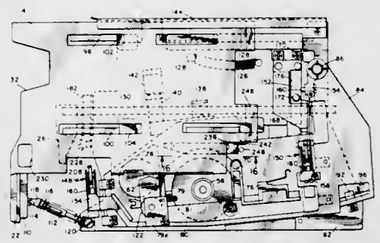
CARTRIDGE ALIGNMENT MECHANISM FOR TAPE DRIVE

Lynn C. Jacobs, Carlsbad; Ronald D. Irvin, Poway, and Karl B. Offerman, San Diego, all of Calif., assignors to Cipher Data Products, Inc., San Diego, Calif.

Continuation of Ser. No. 494,168, May 13, 1983, abandoned. This application Mar. 24, 1986, Ser. No. 842,739

Int. Cl.[4] G11B *15/675, 5/54, 5/008, 15/00*

U.S. Cl. 360—93 **16 Claims**



1. A drive for an elongate, rectangular tape cartridge having a planar bottom plate and an access door along a side edge of the cartridge, comprising:

an elongate housing having an opening at a transversely extending end of thereof for having the cartridge longitudinally inserted through the opening into the housing so that the side edge of the cartridge is substantially parallel to a longitudinally extending side edge of the housing;

means for supporting the cartridge inside the housing in an initial load position;

means for opening the tape access door of the cartridge;

a magnetic head;

means for moving the magnetic head within the housing between operative engagement and disengagement with a length of magnetic tape in the cartridge exposed by opening the access door;

means engageable with the cartridge for moving the length of magnetic tape within the cartridge past the magnetic head;

means for moving the cartridge away from its initial load position in a direction generally perpendicular to the bottom plate;

locating means mounted inside the housing for engaging the cartridge when it is moved from its initial load position to thereby position the cartridge in a predetermined reference plane relative to the magnetic head;

the head moving means and the cartridge moving means including a manual actuator mounted to the transversely extending end of the housing, and linkage means for operatively coupling the head moving means and the cartridge moving means to the manual actuator; and

the manual actuator including a lever and means for mounting the lever to the transversely extending end of the housing for rotational movement about an axis extending substantially parallel to the longitudinally extending side edge of the housing, the lever being rotatable between a locked position in which the lever obstructs the opening in the housing and prevents the cartridge from being withdrawn through the opening to an unlocked position in which the lever is clear of the opening and the cartridge can be withdrawn through the opening.

4,785,364

CASSETTE LOADING APPARATUS WITH IMPROVED SIDE PLATES

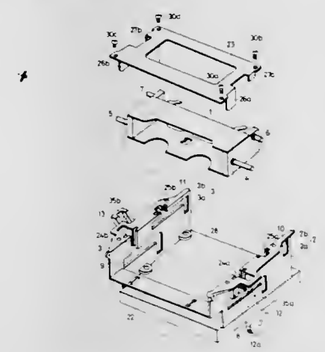
Takashi Ando, and Yoshihiro Makino, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1987, Ser. No. 7,217

Claims priority, application Japan, Jan. 27, 1986, 61-15151

Int. Cl.[4] G11B *15/60*

U.S. Cl. 360—96.5 **7 Claims**



1. A cassette loading apparatus, comprising:

(a) a pair of side plates fixed to a stationary member, said side plates being substantially parallel to each other, L-shaped guide slots and cutouts being formed in each of said side plates such that each L-shaped guide slot is continuous with an associated cut-out;

(b) a cassette holder unit for holding a tape cassette therein and movable between first and second positions, said cassette eholder unit having a plurality of pins projecting in a direction substantially normal to said side plates such that said pins are respectively received by said L-shaped guide slots, said cutouts having an open end so that said pins can be inserted therethrough to be engaged with said L-shaped guide slots when assembling said loading apparatus; and

(c) drive means for moving said cassette holder unit between said first and second positions by applying a driving force thereto.

4,785,365

DOOR ASSEMBLY WITH INNER SHUTTER FOR CLOSING OPENING FOR CARTRIDGE INSERTION IN DISK DRIVE DEVICE

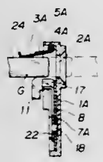
Masao Ohkita, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 20, 1987, Ser. No. 17,474

Claims priority, application Japan, Jun. 14, 1986, 61-137292

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—97 **6 Claims**



1. A door assembly for a disk drive device of the type having

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a housing, front panel arranged upright in a vertical direction and provided with a transverse opening through which a disk cartridge is inserted by its leading end along a horizontal direction rearwardly into the housing to a full insertion position at which the trailing end of the cartridge is disposed within the housing spaced from an inner side of the front panel, and loading means for moving the cartridge vertically downward from the full insertion position to a loading position in the housing for recording and reproducing operations and then vertically upwardly for unloading and ejecting the cartridge from the housing, wherein said door assembly comprises:

a door member supported rotatably on a transverse upper edge defining said opening in the vertical direct ion for closing said opening when no cartridge is inserted for opening inwardly in said housing by abutment with the leading end of a cartridge being inserted therein;

first urging means for normally biasing said door member in a direction toward closing said opening;

a shutter member arranged upright in the vertical direction in parallel with said front panel and supported for sliding movement along the inner side of said front panel between a lowered positon below a transverse lower edge defining siad opening and a raised position closing said opening;

lever means pivotally supported on the inner side of said front panel having a flat shape arranged in parallel with said shutter member, said lever means including a first end connected to a poriton of said shutter member for raising and lowering it reciprocally in the vertical direction, and a second end having a horizontally extending projection which is engaged by the trailing end of the cartridge when the cartridge is moved vertically downward and released from engagement with the cartridge when the cartridge is moved upward; and

second urging means for normally biasing said lever means in a direction toward lowering said shutter member and opening said opening,

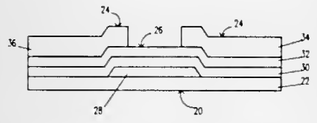
whereby said opening is closed by said shutter member when the cartridge is moved vertically downward and engages said projection on said second end of said lever means to pivot said first end to raise said shutter member, and said opening is opening is opened when the cartridge is moved vertrically upward and released from engagement with said second end of said lever means so that said shutter member is lowered by said second urging means.

4,785,366

MAGNETORESISTIVE READ TRANSDUCER HAVING PATTERNED ORIENTATION OF LONGITUDINAL BIAS

Mohamad T. Krounbi, San Jose, and Otto Voegeli, Morgan Hill, both of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Jul. 9, 1987, Ser. No. 71,491
Int. Cl.[4] G11B *5/39*
U.S. Cl. 360—113 **18 Claims**



1. A magnetic read transducer comprising:

a thin film of magnetoresistive conductive layer formed of magnetic material, said magnetoresistive conductive layer having passive end regions separated by a central active region;

a decoupling layer covering at least said active region of said magnetoresistive conductive layer;

a thin film of soft magnetic material extending over said passive regions and said active region of said magnetoresistive conductive layer, said thin film of soft magnetic material being parallel to and in contact with said decoupling layer and separated from said magnetoresistive layer in said active region by said decoupling layer, said thin film of soft magnetic material being in contact with said magnetoresistive conductive member in the passive regions; and

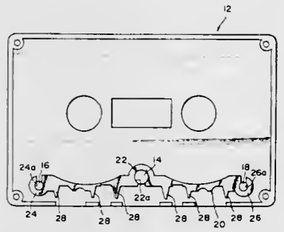
a thin film of antiferromagnetic material in direct contact with and continuously covering the entire thin film of soft magnetic material to produce an exchange bias field, said exchange bias field having the exchange bias oriented substantially longitudinally within the passive segments of said thin film of soft magnetic material and said magnetoresistive conductive member and at a selected angle within the active region of said thin film of soft magnetic material whereby a longitudinal bias is produced in said passive regions and a substantially transverse bias is produced at said selected angle in the active region of said magnetoresistive conductive member.

4,785,367

TAPE GUIDE BLOCK

Kinichiro Ohya, Kanagawa, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Sep. 5, 1986, Ser. No. 903,766
Claims priority, application Japan, Sep. 10, 1985, 60-138622[U]; Jul. 22, 1986, 61-112367[U]
Int. Cl.[4] G11B *15/60*
U.S. Cl. 360—130.21 **11 Claims**



1. An elongated tape guide block of cut drawn metal material and having a direction of drawing, which is to be employed with cassette halves to form a tape cassette, comprising cut opposite surfaces extending in a direction perpendicular to the direction of drawing of the tape guide block and which define parallel planes, a tape guide surface perpendicular to the opposite surfaces, and integrally formed left and right arched tape guide portions for changing the direction of tape running.

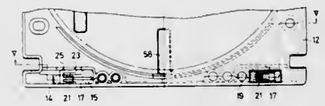
9. A drawn metal blank for making elongated tape guide blocks which are to be employed with respective cassette halves to form tape cassettes, said drawn metal blank having a direction of drawing oriented normal to the length of said guide blocks and comprising a plurality of notches on one side of the metal blank and a plurality of projections on an opposite side of the metal blank, the position of each notch corresponding to that of an extremity of each projection, such that, when two or more of said blanks are laid adjacent one another for being cut in a direction perpendicular to the direction of drawing of the metal blanks, so as to form at least two tape guide blocks at a time, at least one of said metal blanks can support an adjacent metal blank with the extremities of said projections of the one metal blank received in the notches in the adjacent metal blank.

4,785,368

DEVICE FOR SELECTING A SURFACE OF A DISC IN A CARTRIDGE

Kimio Tanaka, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Dec. 16, 1986, Ser. No. 942,496
Claims priority, application Japan, Dec. 18, 1985, 60-0194559[U]
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **19 Claims**



1. A disc cartridge comprising:

a casing comprising an upper cover plate and a lower cover plate joined together to define a space therein;

a disc rotatably housed in said space of said casing;

at least one window provided in said casing;

a shutter for operating said at least one window to permit insertion of a disc drive mechanism of a disc player therethrough into said disc cartridge;

an actuator slidably arranged in said casing and engaged with said shutter to releasably lock said shutter;

a disc receiver operatively connected to said actuator and selectively receiving therein a part of a peripheral portion of said disc, said disc receiver being arranged in said casing to release or receive said disc when moved by said actuator;

a write enable plug, a display section for indicating the operation of said plug and a detection hole provided at each of said upper and lower cover plates;

said display section and detection hole of said upper cover plate being arranged opposite to said detection hole and display section of said lower cover plate, and said write enable plug being arranged so as to be slidable with respect to said detection hole to thereby open or close said detection hole; and

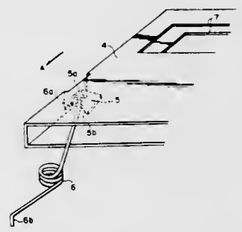
operation means for slidably actuating said write enable plug, said operation means being arranged so as to be operated from outside said casing.

4,785,369

SHUTTER FOR MAGNETIC DISK CARTRIDGE

Sbozo Ommori, and Kengo Oishi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 731,105, May 6, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 117,932
Claims priority, application Japan, Jun. 1, 1984, 59-81443[U]
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **1 Claim**



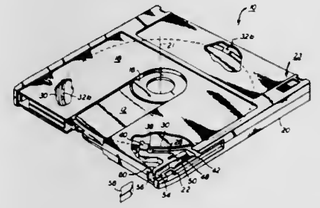
1. In a magnetic disk cartridge including a casing having a magnetic head access window, a disk shaped magnetic media rotatably housed in the casing, and a shutter adapted to be slidably mounted on the cartridge casing to selectively open and close said magnetic head access window and a torsion spring in the casing including a shutter engaging portion extending generally perpendicularly to the plane of said magnetic media, wherein the improvement comprises a guide member formed in said shutter including a notch portion for engagement with said shutter engaging portion of the torsion spring, said guide member including a guide portion extending generally parallel to the plane of said magnetic media and perpendicularly to said shutter engaging portion of the torsion spring, said guide portion being located adjacent said notch portion and positioned to engage the engaging portion of the torsion spring when the shutter is slid into the casing to guide said engaging portion of the torsion spring into the notch position, said guide portion facing said engaging portion of the spring when the shutter is slid into the casing and being slanted to incline at an angle to the sliding direction of the shutter, said engaging portion of the torsion spring engaging said guide portion when it is being fitted to the case, so as to guide said engaging portion toward said notch portion to be reliably retained by said notch portion.

4,785,370

DISK BRAKE MECHANISM FOR A DISK CARTRIDGE

Philip R. Asbe, Hilton; James R. Carey, Rochester, both of N.Y.; Patrick J. Champagne, Cupertino, Calif., and David L. Rowden, Rochester, N.Y., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed Jun. 9, 1987, Ser. No. 60,000
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 **1 Claim**



1. In a cartridge comprising opposed first and second spaced-apart plates defining an internal compartment in which a rotatable information recording disk is disposed, the improvement comprising:

(a) a peripheral wall, joining said spaced-apart plates, having an aperture in a forwardly facing portion thereof communicating with a corner of said internal compartment;

(b) a unitary generally V-shaped brake member mounted in said corner of said compartment on a pivot, disposed at the vertex of the V and connected to one of said first and second plates, for pivotal movement between a disk-braking position and a disk-releasing position, one leg of said V-shaped brake member extending toward said forwardly facing peripheral wall and terminating in an exposed position adjacent to and in alignment with the aforementioned aperture of said peripheral wall and a second leg of said V-shaped brake member terminating in a nook-like nose portion adjacent to and facing a circumferential edge of the disk;

(c) a pair of stationary V-shaped nooks each of which is defined by first and second ramp-like mating portions integral, respectively, with said first and second plates, said pair of nooks being angularly spaced apart from one another facing a circumferential edge of the disk generally diametrically opposed to the circumferential edge of the disk adjacent said nook-like nose portion of said brake member; and

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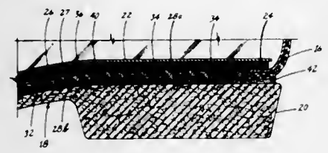
(d) a U-shaped spring mounted to receive the vertex of said brake member with one arm of said spring pressed against a side peripheral wall of said cartridge and the other arm of said spring seated in a slot of said brake member, said spring being arranged to produce a bias force normally pivoting said brake member into its disk-braking position wherein said nook-like nose portion is caused to engage the adjacent circumerential edge of the disk and to thereby urge the opposite circumferential edge of the disk into engagement with said stationary nooks for immovably holding the disk within said cartridge, said spring producing a bias force of a magnitude that is overcome by direct engagement, through the aperture of said forwardly facing peripheral wall, of said first leg of said brake member with a disk drive mechanism when said cartridge is operatively loaded into such drive mechanism, whereby operative loading movement of said cartridge causes the drive mechanism to move said brake member, against the bias force of said spring, from its disk-braking position to its disk releasing position.

4,785,371

ELECTROSTATIC DISSIPATING FOOTWEAR

Robert G. Edwards, St. Louis County, Mo., assignor to Interco Incorporated, St. Louis, Mo.

Filed Nov. 28, 1986, Ser. No. 936,043
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—224 **10 Claims**



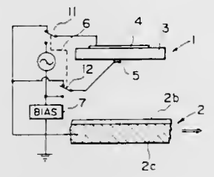
1. An electrostatically dissipating shoe for protection against building up of electrostatic charges by dissipation of electrostatic charges through controlled ohmic path leakage between the wearer's foot and ground, without exposing the wearer to undue risk of injury from electrical contact, said shoe comprising an upper, an outsole including a forepart and a heel normally in ground contact, at least the outsole forepart and heel being formed of a material exhibiting a substantially predetermined electrical resistivity, a dissipating strip, the entirety of which is slightly electrically conductive material, overlying the outsole, the dissipating strip extending substantially along at least a major portion of the length of the shoe continuously from under the forepart of the foot to under the heel of the foot between the toe and heel portion of the shoe to provide portions of the strip underlying both the ball and heel of the foot, the strip being of outsole conformal shape in plan but being proportionately smaller than the outsole, to define a marginal space completely around the periphery of the dissipating strip between the strip periphery and the periphery of the outsole, means for securing the strip to the outsole in electrically conductive relationship, and an insole overlying the strip, the insole providing at least a heel portion layer of material exhibiting a substantial predetermined electrical resistivity and forming a plurality of apertures therein, and at least one further material layer overlying the insole between the foot and insole, the further material layer exhibiting a substantial predetermined electrical resistivity, and means for securing the further material layer to the insole in electrically conductive relationship, and electrically conductive adhesive for filling the heel portion apertures for providing an electrically conductive path between the further material layer and the strip, whereby a continuous ohmic path having precisely controlled resistance within the range of from 10^6 to 10^8 ohms is provided between the foot and ground for conducting electrostatic charges from the foot to ground during all modes of usage of the shoe, said continuous ohmic path being thereby sufficiently resistive that it will not expose the wearer to undue electrical shock risk during wearing of the shoe.

4,785,372

METHOD AND DEVICE FOR CHARGING OR DISCHARGING MEMBER

Nagao Hosono, Hachiohji; Yukio Nagase; Tatsuo Takeuchi, both of Tokyo; Hidemi Egami, Zama, and Hiroshi Satomura, Hatogava, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,250, Jun. 7, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 907,154
Claims priority, application Japan, Mar. 26, 1984, 59-57704
Int. Cl.[4] H05F *3/04*
U.S. Cl. 366—225 **12 Claims**



1. A method of charging or discharging a member comprising the steps of:

providing a discharging member which includes a solid dielectric member having first and second surfaces extending in one direction, an inducing electrode extending in the one direction along and in contact with the first surface of the solid dielectric member and having a width smaller than that of the first surface of the solid dielectric member and a discharging electrode extending in the one direction along and in contact with a second surface of the solid dielectric member, said inducing electrode and said discharging electrodes sandwiching the solid dielectric member therebetween, wherein the discharging electrode has an exposed side and has a width, measured in a direction perpendicular to the one direction, which is smaller than that of the inducing electrode;

positioning a member to be charged or discharged adjacent the exposed side of the discharging electrode;

applying an alternating voltage between the inducing electrode and the discharging electrode to produce a surface discharge on the second surface of the solid dielectric member which is adjacent the discharging electrode;

moving the member to be charged or discharged relative to the discharging electrode to charge or discharge the member to be charged or discharged by the thus formed surface discharge; and

attenuating the alternating voltage at least down to a voltage at which said surface discharge is not produced, when the application of the alternating voltage to the discharging member is to be stopped, and subsequently reducing said alternating voltage to zero, thereby to minimize electric charge retained on the second surface of the solid dielectric member where the surface discharge occurs.

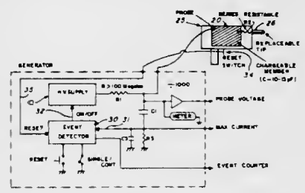
4,785,373

ELECTROSTATIC DISCHARGE SIMULATOR

Glen Dash, 201 Bingham Rd., Carlisle, Mass. 01741

Filed Aug. 7, 1987, Ser. No. 82,685
Int. Cl.[4] H01T *23/00*
U.S. Cl. 361—235 **3 Claims**

1. An electrostatic discharge simulator comprising, a high voltage source, a parallel plate capacitor means, first switch means, means connecting the high voltage source in a series loop with the first switch means and capacitor means for enabling charging of said capacitor means upon closure of said first switch means, a chargeable member, second switch means, an output terminal, and means connecting the second switch means in series with the chargeable member between



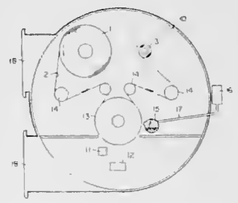
said parallel plate capacitor means nad output terminal, said second switch means, upon closure, providing an output pulse at said output terminal, said capacitor means comprising a plurality of series connected capacitors, and a resistor in parallel with each said capacitor.

4,785,374

ZINC-METALLIZED BASE MATERIAL FOR METALLIZED CAPACITOR AND PROCESS FOR ITS PRODUCTION

Susumu Nagai, Nakatsugawa; Takamasa Ibaraki, Tokyo; Hisatoshi Kamotani, Nakatsugawa; Tsunetatsu Yamauchi, Nakatsugawa, and Makoto Imai, Nakatsugawa, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00607, § 371 Date Jul. 28, 1987, § 102(e) Date Jul. 28, 1987, PCT Pub. No. WO87/03419, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 27, 1986, Ser. No. 86,047
Claims priority, application Japan, Nov. 30, 1985, 60-270565
Int. Cl.[4] H01G *1/01; B05D 5/06*
U.S. Cl. 361—305 **6 Claims**



1. A zinc-metallized base material for metallized capacitors comprising:

a base material composed of film or thin capacitor paper;

a vacuum-deposited zinc layer formed on at least one surface of said base material; and

a surface protective layer deposited on said vacuum-deposited zinc layer, said surface protective layer having a thickness of 7 to 500 Å and consisting essentially of a material having a vapor pressure of 0.1 mmHg at a temperature in the range of 150° to 290° C. and being effective to improve the humidity resistance of said zinc layer.

4,785,375

TEMPERATURE STABLE DIELECTRIC COMPOSITION AT HIGH AND LOW FREQUENCIES

Scott S. Campbell, Youngstown, N.Y., assignor to Tam Ceramics, Inc., Niagara Falls, N.Y.

Filed Jun. 11, 1987, Ser. No. 61,181
Int. Cl.[4] H01G *4/10; C04B 35/46*
U.S. Cl. 361—321 **18 Claims**

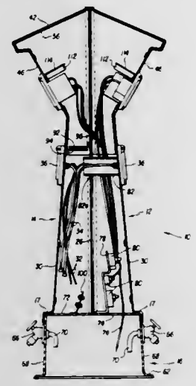
5. A multilayer ceramic capacitor consisting essentially of a sintered mixture of about 35 to 55 mole percent ZrO_2, about 30 to 50 mole percent TiO_2, about 5 to 22.5 mole percent SnO_2, about 0.5 to 10 mole percent ZnO, and about 0.3 to 2.5 mole percent CuO.

4,785,376

UTILITY PEDESTAL CONSTRUCTION

Robert C. Dively, 105 William Allen, Williamsburg, Va. 23185

Filed Apr. 14, 1987, Ser. No. 38,297
Int. Cl.[4] H02B *9/00; H02G 3/18*
U.S. Cl. 361—334 **4 Claims**



1. A utility pedestal construction for servicing, in pairs independently of each other, boats, recreational vehicles and other units, near a dock pier or other suitable foundation, with high-voltage electrical power, water, and low-voltage telephone and cable television services; said utility pedestal construction comprising twin upper shell housing members, shell housing securing means, central inner divider means and base pedestal means; said twin upper shell housing members and base pedestal means being made of suitable plastic material, said shell housing securing means assembling together said twin upper shell housing members in fixed relationship and defining an upper pedestal unit, said central inner divider means dividing said upper pedestal unit into two symmetrical compartments defining high-voltage and low-voltage compartments, said base pedestal means supporting thereon said upper pedestal unit, said base pedestal means having flange means for effecting securement with said dock pier or other suitable foundation, said base pedestal means having bottom and top openings, said bottom opening receiving water service supply lines into said base pedestal means, said base pedestal means having lateral walls exteriorly carrying hose bibb means, said water service supply lines and hose bibb means being operatively connected in communicative relationship, said bottom opening of said base pedestal means receiving therethrough high-voltage electrical power cable means, low-voltage telephone line means and low-voltage television cable means, separated from one another, said high-voltage electrical power cable means leading through said top opening in said base pedestal means and into said high-voltage compartment, said low-voltage telephone line means and television cable means leading through said opening in said base pedestal means and into said low-voltage compartment, said high-voltage and low-voltage compartments having upper portions carrying high-voltage receptacle outlet means, said high-voltage electrical power cable means being operatively connected to said high-voltage receptacle outlet means carried by said high-voltage compartment, said low-voltage compartment and central inner divider means mounting barrier isolating means below said high-volt-

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age receptacle outlet means carried by said low-voltage compartment, said high-voltage electrical power cable means leading from said high-voltage compartment into said low-voltage compartment and aboe said barrier isolating means, and being operatively connected to said high-voltage receptacle outlet means carried by said low-voltage compartment, said high-voltage and low-voltage compartments exteriorly carrying telephone receptacle outlet means and television cable connector means below said barrier isolating means, said low-voltage telephone line means and television cable means being operatively connected to said respective telephone receptacle outlet means and television cable connector means carried by said low-voltage compartment, said high-voltage compartment having electrically isolating conduit means projecting through said cental inner divider means and into said low-voltage compartment, said low-voltage telephone line means and television cable means leading from said low-voltage compartment through said conduit means and being operatively connected to said respective telephone receptacle outlet means and television cable connector means carried by said high-voltage compartment.

4,785,377

INSULATED NEUTRAL TIE STRAP

John M. Rhodes, Roswell, Ga., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

Filed Mar. 25, 1988, Ser. No. 173,522
Int. Cl.[4] H02B *1/20*
U.S. Cl. 361—355 **6 Claims**



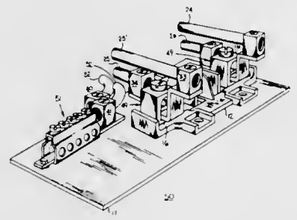
1. An insulating tie strap for supporting and identifying conductor bars in a load center comprising:
an insulating support member including a center body portion, a first end portion and assecond end portion, the center body portion defining a center axis;
the first end portion including a first mounting pad having a first opening for accepting a fastener, a first elevating member for elevating the center body portion above the first mounting pad and a first angle member for attaching the first mounting pad and the first elevating member to the center body portion such that the first opening is offset from the center axis of the center body portion, the first mounting pad being attached to the first elevated member, the first elevated member being attached to the first angle member and the first angle member being attached to the center body portion;
the second end portion including a second mounting pad having a second opening for accepting a fastener, a second elevating member for elevating the center body portion above the second mounting pad and a second angle member for attaching the second mounting pad and the second elevating member to the center body portion such that the second opening is offset from the center axis of the center body portion, the second mounting pad being attached to the second elevated member, the second elevated member being attached to the second angle member and second angle member being attached to the center body portion;
the first and second mounting pads each being adapted to mount to a conductor bar; and
means for identifying the conductor bars.

4,785,378

LOOP-FEED WIRING ARRANGEMENT FOR ELECTRIC CIRCUIT BREAKERS AND SWITCHES

Heidemarie Hinckley, Nicollet, and William M. Childs, Mankato, both of Minn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 24, 1987, Ser. No. 100,506
Int. Cl.[4] H01H *73/10*
U.S. Cl. 361—363 **4 Claims**



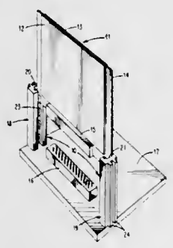
1. A load center comprising:
an insulative support;
a line terminal lug attached to said support;
a first lug electrically connected to said line terminal lug on one side of said line terminal lug and arranged for electrically connecting with a first conductor;
a second lug electrically connected to said line terminal lug on an opposite side of said line terminal lug and arranged for electrically connecting with a second wire conductor; and
a neutral bar including an elongated perimetrically closed tubular conductor having a pair of neutral lugs electrically connected thereto and arranged for electrically connecting with a third and fourth wire conductor, said first lug being attached to a Z-shaped strap, said Z-shaped strap terminating in a pair of offset ends wherein one of said offset ends is attached to said first lug and the other of said offset ends is electrically connected with said line terminal lug.

4,785,379

PRINTED CIRCUIT MODULE RETAINER

Melville A. Goodrich, Brookline, Mass., assignor to GTE Government Systems Corporation, Waltham, Mass.

Filed Dec. 4, 1987, Ser. No. 128,838
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—388 **4 Claims**



1. A printed circuit module retainer comprising:
two elongated guides, each guide having an elongated channel with a first channel wall, and a second channel wall parallel to said first channel wall, each first channel wall having an elongated groove;

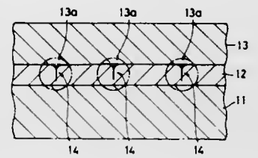
said guides adapted to be mounted in parallel spaced relationship for accepting edges of a printed circuit module; and
an elongated serpentine spring corresponding to each channel, each spring retained by the corresponding groove against the second channel wall of its corresponding channel, for urging an edge of an inserted printed circuit module against the second channel wall of the corresponding channel.

4,785,380

SOLID ELECTROLYTIC CAPACITOR, AND METHOD OF MANUFACTURING SAME

Yoshihiro Harakawa; Koji Izawa; Hidemitsu Takeuchi; Shinji Nakamura, and Sadamu Toita, all of Kawasaki, Japan, assignors to Nitsuko Corporation, Kanagawa, Japan

Filed Aug. 3, 1987, Ser. No. 80,858
Claims priority, application Japan, Jan. 23, 1987, 62-12207
Int. Cl.[4] H01G *9/04*
U.S. Cl. 361—433 **9 Claims**



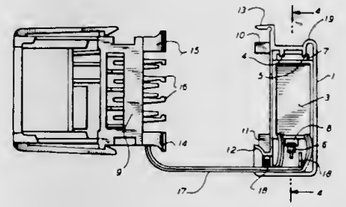
1. A solid electrolytic capacitor having a capacitor element comprising:
a metal plate capable of having a dielectric oxidation layer formed thereon;
a dielectric oxidation layer formed on a surface of said metal plate;
a conductive polymer layer formed on said dielectric oxidation layer which is a polymer layer of a heterocyclic compound selected from the group consisting of pyrrole, furan and thiopene formed by electrochemical polymerization in an electrolyte solution containing said heterocyclic compound and supporting electrolyte which either comprises boric acid and any one of the following organic compounds:
(1) an aliphatic or aromatic carboxylic acid, or a salt thereof;
(2) an aliphatic or aromatic compound having two or more carbonyl radicals, or a salt thereof;
(3) an aliphatic or aromatic compound having at least one hydroxyl radical and at least one carboxylic radical, or a salt thereof; and
(4) an aliphatic or aromatic compound having at least one amine radical and at least one carboxylic radical, or a salt thereof; or comprises a boron compound obtained by chemically combining boric acid and any of the compounds (1) to (4);
a conductive layer formed on said conductive polymer layer, wherein said conductive polymer layer near a defect interface of said dielectric oxidation layer is converted into an insulator; and
terminals provided on each of said plate and conductive layer.

4,785,381

HOLDER FOR CLIP MOUNTING TELEPHONE CIRCUITS TO CONNECTING BLOCKS

Thomas J. Collins, Wall; Richard K. Laird, Lincroft, and Pina Schneider, Ocean Township, Monmouth County, all of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.

Filed May 22, 1987, Ser. No. 53,304
Int. Cl.[4] H05K *7/02*
U.S. Cl. 361—417 **5 Claims**



1. A holder for retaining a circuit adapted for attachment to a connecting block, the connecting block having multiple rows of terminals for terminating wires and fanning strips on each side of outer ones of the rows of terminals, the holder comprising:
a housing having an opening for receiving the circuit;
said housing having snap in mounting means integrally molded in the interior portion of said housing for removably retaining said circuit; said housing having guide means integrally molded in the exterior portion of said housing for engagement between the fanning strips of said connecting block; and said housing having a first tab projecting off of and integrally molded in the exterior portion of said housing for engagement with said fanning strips on one side of said connecting block, and a second tab projecting off of and integrally molded in the exterior portion of said housing for engagement with said fanning strips on the side of said connecting block opposite the side with the fanning strips which engage with said first tab, said first and second tabs provided for snap on engagement with said connecting block.

4,785,382

RETRACTABLE LAMP DEVICE FOR VEHICLES

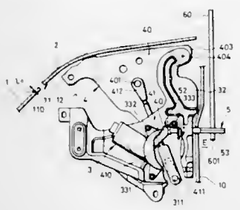
Kenichi Fukura; Hiroki Kondo, both of Toyoda; Yoshinori Kuroyanagi, Okazaki; Morito Kawaguchi; Shinji Miyamoto, both of Toyoda; Eiji Hiramatsu, Aichi; Akira Nishimura, Toyoda; Etsuo Suzuki, Miura, and Kazuo Ikuta, Hiratsuka, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi and Kanto Jidosha Kogyo Kabushiki Kaisha, Kanagawa, both of, Japan, a part interest

Filed Dec. 9, 1987, Ser. No. 130,513
Claims priority, application Japan, Dec. 12, 1986, 61-191972[U]
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—65 **7 Claims**

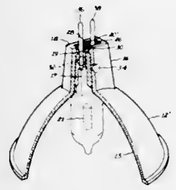
I. A retractable lamp device for vehicles comprising:
a vehicle body having an accommodating space for accommodating a lamp therein;
a cover means rotatably mounted on the body to open and close the accommodating space;
a motor means for rotating the cover means;
a movable means operatively connected to the motor and having the lamp connected therewith; and
an adjusting means for adjusting a surface level between the

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cover means and the vehicle body from outside of the vehicle, the adjusting means including an adjusting member adjustably moving the movable means connected to the cover means.



4,785,383
LAMP UNIT HAVING GLASS REFLECTOR MEMBER WITH MOUNT STRUCTURE
Denes Tarnay, Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 740,616, Jun. 3, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 888,632
Int. Cl.[4] H01R *33/00*
U.S. Cl. 362—226 **7 Claims**



1. An all glass lamp unit consisting essentially of (i) a molded glass reflector member having a front concave reflecting portion terminating in an elongated hollow cavity portion having inner and outer walls and which protrudes rearwardly from said reflector member, said elongated cavity portion terminating at its rearmost end in a recessed opening and having a foremost end which opens into said reflector portion wherein the opening in said rearmost end is smaller in size than the opening in said foremost end, said rearmost end comprising said recessed opening which is formed at said rearmost end by spaced apart shoulders extending from the inner walls of said cavity portion which, when said lamp unit is assembled, provides a recessed engagement surface for mounting said lamp unit, and (ii) a tungsten halogen lamp permanently secured in said hollow cavity portion with cement so that its light source is positioned at the focal point of said reflector member with lamp inleads projecting through said recessed opening, said cement serving as the sole support for said lamp in directly attaching said lamp to said reflector member, wherein the improvement comprises including additional molded depressions located on opposing exterior surfaces of said elongated cavity portion which cooperate with said recessed engagement surface to more accurately position and physically secure the lamp in use and with said entire cavity portion including said recessed engagement surface and additional molded depressions being formed when said reflector member is initially molded, wherein each of said molded depressions is in the form of a dimple and does not extend completely across the surface in which it is formed and located, thereby positively securing said unit from both longitudinal and transverse movement when secured by said depressions in a lamp mount.

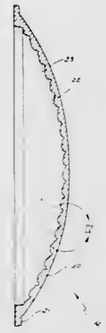
4,785,384
ELECTRIC SIMULATED GASLIGHT ASSEMBLY
John J. Zwald, Marblehead, and John L. Hickey, Jr., Boston, both of Mass., assignors to Gasglo, Incorporated, Marblehead, Mass.
Filed Dec. 9, 1987, Ser. No. 130,404
Int. Cl.[4] F21S *3/10*
U.S. Cl. 302—255 **17 Claims**
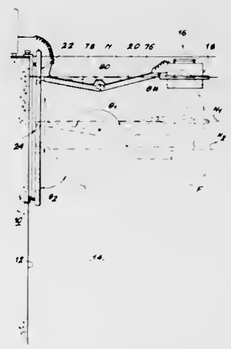


1. An electric lamp assembly for simulating a gaslight comprising:
an electric lamp having a base;
an insulated adapter having a socket on one side for receiving said base of said electric lamp and a conductive base projecting from another side of said adapter, said one side having an upper surface adjacent said socket;
a cover translucent to visible light secured to said upper surface of said adapter and surrounding said lamp; and
a fabric mantle substantially surrounding portions of said cover.

4,785,385
TRAFFIC LIGHT LENS
Barrie J. Holst, Rydalmere, Australia, assignor to Awa Limited, North Ryde, Australia
PCT No. PCT/AU86/00222, § 371 Date Apr. 2, 1987, § 102(e) Date Apr. 2, 1987, PCT Pub. No. WO87/00908, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 6, 1986, Ser. No. 51,630
Claims priority, application Austria, Aug. 6, 1985, PH1806
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—309 **10 Claims**

10. A lens suitable for use with traffic lights comprising a body portion that is a segment of a sphere and an array of lenticular elements formed on a concave inner surface of the body portion arranged in rows extending substantially horizontally across the concave inner surface of the body portion of the lens, characterized in that there is provided between each adjacent lenticular element a relatively smaller recess in the body portion wherein a planar portion is formed between an upper extremity of each lenticular element and an adjacent recess, said planar portion being parallel to an outer surface portion of said body portion.

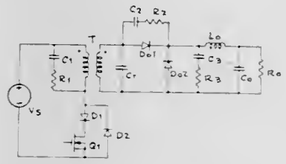


4,785,386
ORIENTABLE LIGHTING APPARATUS FOR A POND CONTAINING RADIOACTIVE MATERIALS
Jean Denis, Sache, and Lucien Leproust, Ivry sur Seine, both of France, assignors to Electricite de France Service National, Paris, France
Filed Aug. 3, 1987, Ser. No. 81,286
Int. Cl.[4] F21V *21/14*
U.S. Cl. 362—428 **9 Claims**



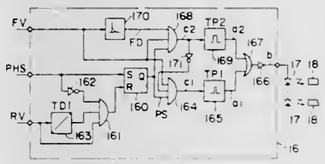
1. An orientable lighting apparatus for equipping a pond containing radioactive materials, wherein it comprises a vertical guide which can be mounted on one side of the pond, a floating, tight box having a transparent lower partition, a floodlight contained in the box and able to emit a substantially parallel beam of light through said lower transparent partition, means contained in the box for orienting the floodlight about two axes which are orthogonal to one another and a floating arm incorporating at least two segments which are articulated to one another about a first axis perpendicular to the vertical plane containing said arm, a first end of the arm being mounted on the guide so as to be able to move in a vertical direction defined by the guide and being able to pivot about a second axis perpendicular to said plane, the box being articulated on a second end of the arm about a third axis perpendicular to said plane.

4,785,387
RESONANT CONVERTERS WITH SECONDARY-SIDE RESONANCE
Fred C. Lee, Blacksburg, and Kwang-Hwa Liu, Drapers Meadow, both of Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.
Filed Apr. 28, 1986, Ser. No. 856,775
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **14 Claims**



1. A quasi-resonant converter comprising:
(a) a voltage source;
(b) a transformer having a primary winding and a secondary winding, said transformer exhibiting a characteristic leakage inductance;
(c) switch means operating periodically at a switching frequency Fs for coupling said voltage source to said primary winding, whereby a charging current is delivered to said secondary winding;
(d) a capacitor exhibiting a characteristic capacitance and directly coupled to said secondary winding to form with said characteristic leakage inductance a resonant circuit therewith having a resonant frequency determined by the values of said capacitor and said characteristic leakage inductance so that its resonant frequency is greater than Fs, said capacitor being selectively charged by said charging current from said secondary winding to establish a resonating voltage on said capacitor, said resonating voltage being applied back through said transformer so that said switch means couples said voltage source to said primary winding at zero current conditions across said switch means;
(e) a load; and
(f) means coupled between said capacitor and said load for rectifying and applying said voltage stored on said capacitor to said load.

4,785,388
GATE PULSE GENERATOR FOR THYRISTOR CONVERTER
Tadashi Takahashi, Kawasaki, Japan, assignor to Kabushiki Kaisha Tosbiba, Kawasaki, Japan
Filed Oct. 30, 1987, Ser. No. 114,759
Claims priority, application Japan, Dec. 18, 1986, 61-302388
Int. Cl.[4] H02H *7/125*
U.S. Cl. 363—68 **18 Claims**



1. A gate pulse generator for a thyristor converter in which in order to fire thyristors of the thyristor converter in which each unit arm is composed of a plurality of series-connected thyristors, a gate pulse signal is generated in response to a gate

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command signal and a thyristor forward voltage signal and is converted into a light signal which in turn is transmitted to the thyristor converter, said gate pulse generator comprising:

first pulse generator means for generating a gate pulse signal with a relatively narrow pulse duration;

second pulse generator means for generating a gate pulse with a relatively wide pulse duration; and

logic circuit means for delivering a gate pulse with a relatively narrow pulse duration from said first pulse generator means when the gate command signal is received after the thyristor forward voltage signal has been already generated and delivering a gate pulse signal with a relatively wide pulse duration from said second pulse generator means when the gate command signal has been already generated or when the gate command signal is generated simultaneously with the generation of the thyristor forward voltage signal.

4,785,389
ASTABLE, MAGNETICALLY COUPLED MULTIVIBRATOR

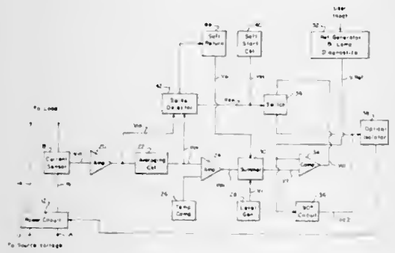
André Kislovski, Bern, Switzerland, assignor to Hasler AG, Bern, Switzerland

Continuation-in-part of Ser. No. 53,367, May 1, 1987. This application Sep. 8, 1987, Ser. No. 93,799

Claims priority, application Switzerland, Sep. 5, 1986, 03574/86

Int. Cl.⁴ H02M *7/537*

U.S. Cl. 363—132 **20 Claims**



1. An astable, magnetically coupled multivibrator circuit comprising

a first power input terminal;

a second power input terminal;

a first power capacitor connected on one side to the first power input terminal;

a second power capacitor connected on one side to the second power input terminal and connected on a second side to a second side of the first power capacitor;

a first switching transistor having two rectifying electrodes including emitter and collector and having a base where a first rectifying electrode of the first switching transistor is connected to the first side of the first power capacitor;

a second switching transistor having two rectifying electrodes including emitter and collector and having a base where a first rectifying electrode of the second switching transistor is connected to the first side of the second power capacitor;

a first transformer winding connected at a first end to the second side of the first power capacitor and to the second side of the second power capacitor and connected at a second end to a second rectifying electrode of the first switching transistor and to a second rectifying electrode of the second switching transistor;

a series connection of an ohmic resistance and of a second transformer winding connected at a first end to the second rectifying electrode of the first switching transistor and to the second rectifying electrode of the second switching transistor and connected at a second end to the base of the first switching transistor and to a base of the second switching transistor;

a current controlled inductor connected in parallel to the series connection for setting the frequency of the multivibrator, where the inductor is an electronic component which can be controlled by a control current and which inductor comprises two ferromagnetic cores, which two ferromagnetic cores are independent of each other, which two ferromagnetic cores have the same properties and are disposed coaxially relative to each other and are formed as a ring each closed in itself, a control winding which winds around the two ferromagnetic cores jointly, and an induction winding, which forms two partial windings connected in series and which winds around the two ferromagnetic cores in each case separately, where the sense of direction of the control winding and of the partial windings is such that currents passing through the control winding and the partial windings generate magnetic fluxes in the cores such that the magnetic fluxes are of the same direction in one of the cores and in opposite direction in a second one of the ferromagnetic cores, where the functional dependence of a magnetic flux density in a core on the magnetic field strength in that core exhibits a course for the core material employed, which course exhibits, over its full region, an about uniform curvature and no saturation bend, where the core is of a soft magnetic material and thereby a course is present which is substantially identical for increasing and decreasing field strength, and where there are two magnetic field strength values such that the ratios of the slope of the course are at least 1 to 100.

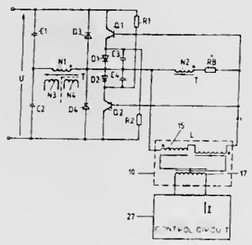
4,785,390
INSTANTANEOUS FAILURE COMPENSATION CIRCUIT

Francis J. Zelina, Lake City, and Thomas E. Olon, Fairview, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Apr. 1, 1987, Ser. No. 33,544

Int. Cl.⁴ G05F *1/455*

U.S. Cl. 323—238 **18 Claims**



1. A compensation circuit for substantially instantaneously reducing the output voltage of a power supply in response to a current spike, said compensation circuit comprising;

means for monitoring the current delivered to a load for producing a switching signal whenever a current spike is detected;

means for providing a first control signal representative of the desired voltage across the load and a second control signal representative of a minimum voltage across the load; and

power supply means for supplying voltage to the load in response to said control signals,

said means for providing being responsive to said switching signal for providing said second control signal when a current spike is detected such that said voltage delivered to the load is substantially instantaneously reduced.

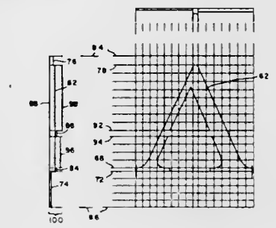
4,785,391
AUTOMATED BITMAP CHARACTER GENERATION FROM OUTLINES

Phillip G. Apley, Allston; David A. Berlow, Boston, both of Mass., and John S. Collins, Montreal, Canada, assignors to Bitstream Inc., Cambridge, Mass.

Filed Feb. 7, 1986, Ser. No. 827,239

Int. Cl.⁴ G06F *3/14*

U.S. Cl. 364—518 **40 Claims**



1. A method for use in generating from an outline representation of a character a bitmap representation therefor, at a selectable point size and resolution, the outline representation being defined relative to a high-resolution em-square and the bitmap representation being defined in terms of a low-resolution em-square, such method comprising the steps of:

a. defining, for at least one dimension, a plurality of zones within the high-resolution em-square, each zone corresponding to a typographic feature of the character; and

b. arranging said zones into a hierarchy, with the position of each zone in the hierarchy corresponding substantially to the relative perceptual importance of the corresponding typographic feature.

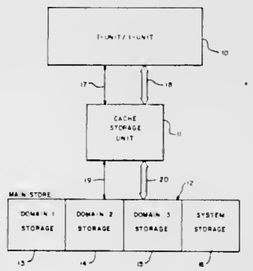
4,785,392
ADDRESSING MULTIPLE STORAGE SPACES

Robert M. Maier; John C. Andoh; Arno S. Krakauer, all of San Jose; Richard J. Tobias, Palo Alto, and Allan J. Zmyslowski, Sunnyvale, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 14, 1986, Ser. No. 918,491

Int. Cl.⁴ G06F *12/00*

U.S. Cl. 364—200 **30 Claims**



1. A data processing apparatus operating under program control in a first state, having a first domain of facilities within the apparatus including first domain storage space, or in a second state having a second domain of facilities within the apparatus including second domain storage space, for processing a sequence of instructions normally in the first state, the sequence of instructions including an instruction that results in a branch to the second state for execution of a program of instructions in the second domain, comprising:

an instruction register, connected to receive instructions in the first and second states, including a plurality of fields, at least one field identifying a location for address information for an operand;

decoding means, responsive to an instruction in the first state, for decoding the instruction to generate a control code, the control code including a branch signal and a domain access activation signal;

means, connected to receive and responsive to the branch signal, for branching program control of the apparatus to the second state to enter the program of instructions in the second domain;

interface means, responsive to the domain access activation signal and the one field in each instruction in the program of instructions, for generating a first domain access signal;

addressing means, in communication with the instruction register, for supplying an address of an operand; and

storage means, connected to receive the first domain access signal and the address, for storing operands at locations identified by addresses from the first and second domain storage spaces including means, responsive to the first domain access signal, for translating the address to first domain address space during processing of an instruction in the second state.

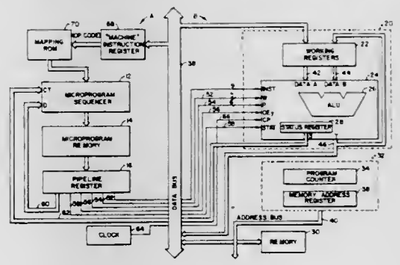
4,785,393
32-BIT EXTENDED FUNCTION ARITHMETIC-LOGIC UNIT ON A SINGLE CHIP

Paul P. Chu, Sunnyvale; Deepak R. Mithani, and Sanjay Iyer, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 9, 1984, Ser. No. 628,921

Int. Cl.⁴ G06F *7/38*

U.S. Cl. 364—200 **16 Claims**



1. In a microprocessor, including memory means for storing a plurality of multi-bit data words arranged into 8 bit "bytes" and sequencer means connected to said memory means for cyclically generating data word memory addresses and generating data processor instructions from a set each instruction of which comprises a word having a plurality of bits arranged into fields, containing at least an operation code field defining the instruction and a data specification field defining the portion of the data words to be processed during the execution of the said instruction, a data processor device connected to said memory means and responsive tc said instruction words for receiving said multi-bit-data words located at said generated addresses and processing selectable portions of said multi-bit data words, said data processor device comprising:

decoder means for receiving said instruction words and for generating therefrom a plurality of control signals;

mask generation and shifting means connected to said decoder means and responsive to said decoder control signals for selectively generating and selectively upshifting a

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multi-bit word generating thereby a multi-bit mask word comprising a selectable portion of ZERO bits and a remaining portion of ONE bits; and

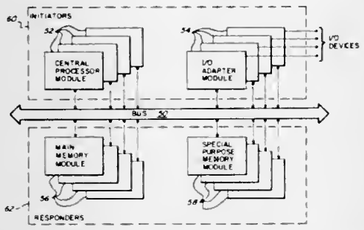
arithmetic-logic means connected to said decoder means and responsive to said decoder control signals having first and second operand inputs connected to said storage means for receiving said multi-bit data words at said first and second operand inputs and having a third operand input connected to said mask generation means for receiving said multi-bit mask word at said third operand input and executing in a single processor clock cycle selectable arithmetic and logic operations on said selected portions of said data words at said first and second operand inputs specified in said operation code field of said processor instruction and generating at an output of said arithmetic-logic means a multi-bit word comprising within the portion corresponding to said ZERO bits within said mask word, the result of said operation on said selected portions of said data words at said first and second operand inputs corresponding to those bit positions in which said mask bits are ZEROs and, within the remaining portion corresponding to said ONE bits within said mask word, that portion of either said data word at said first or second operand input corresponding to said ONE bits within said mask word, depending on said operation code field of said processor instruction.

4,785,394

FAIR ARBITRATION TECHNIQUE FOR A SPLIT TRANSACTION BUS IN A MULTIPROCESSOR COMPUTER SYSTEM

Michael A. Fischer, San Antonio, Tex., assignor to Datapoint Corporation, San Antonio, Tex.

Filed Sep. 19, 1986, Ser. No. 909,773
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **22 Claims**



1. In a computer system comprising a plurality of modules and bus means commonly connected to all of the modules for conducting information signals between the modules, each module including means for transmitting information signals as a transfer over the bus means and while doing so functioning as a master module, each module also including means for receiving the transfer of information signals from the bus means and while doing so functioning as a slave module, a predetermined number less than all of the plurality of modules including means for initiating a transfer over the bus means in response to exogenous or internally generated events and thereby functioning as an initiator module, each module of the plurality other than the initiator modules including means for transmitting a transfer on the bus means only in response to a previous transfer transmitted by an initiator module and thereby functioning as a responder module, means associated with each module for assigning a predetermined priority to each module, the priorities of each module being different from one another, each responder module having a higher priority than any initaitor module, mnans associated with each module for asserting a request signal indicative of the predetermined priority of that module upon that module desiring to become a master module for transmitting a transfer over the bus means, and an improved arbitration means connected to the bus means and responsive to the request signals and operative during each of a plurality of sequential arbitration time periods for determining which of the plurality of modules asserting request signals is to be granted exclusive access to the bus means as a master module for a bus predetermined time period to transmit a transfer to an addressed slave module, said improved arbitration means further comprising:

means responsive to a plurality of request signals and operative for issuing a pending signal upon receipt of two request signals asserted during one arbitration period;

means associated with each initiator module not previously asserting a request signal and operative in response to the assertion fo the pending signal for inhibiting and assertion of its request signal until the pending signal is negated;

means associated with each one responder module for asserting a re-try signal upon detecting an attempt by an initiator module to transmit a transfer to the one responder module while the one responder module is busy processing a previously transmitter transfer, each responder module asserting a re-try signal becoming a busy responder module;

means associated with each initiator module which unsuccessfully attempted a transfer to a busy responder module for recognizing the re-try signal asserted by the busy responder module, each initiator module recognizing the re-try signal becoming a waiting initiator module;

means associated with each busy responder module for asserting a ready signal when the busy responder module ceases being busy upon completing the processing of the previously transmitted transfer;

means associated with each waiting initiator module for asserting its request signal upon receipt of the ready signal;

means associated with each initiator module which is not a waiting initiator module for rescinding any request signal it may have been asserting upon the receipt of the ready signal; and

means operative during each predetermined arbitration period and responsive to the request, pending and ready signals for first granting exclusive access to the bus means to responder modules asserting request signals in the order of their predetermined priorities without regard to the assertion of the request and pending signals from initiator modules, and for thereafter granting exclusive access to the bus means to those initiator modules asserting request signals in the order of their predetermined priorities durigg the predetermined arbitration period when no request signals from responder modules are asserted to thereby give priority to waiting initiator modules over the other initiator modules and to give priority to the non-waiting initiator modules on the basis of precedence in time of their asserted requests while the pending signal is asserted.

4,785,395

MULTIPROCESSOR COHERENT CACHE SYSTEM INCLUDING TWO LEVEL SHARED CACHE WITH SEPARATELY ALLOCATED PROCESSOR STORAGE LOCATIONS AND INTER-LEVEL DUPLICATE ENTRY REPLACEMENT

James W. Keeley, Nashua, N.H., assignor to Honeywell Bull Inc., Waltham, Mass.

Filed Jun. 27, 1986, Ser. No. 879,864
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **25 Claims**

1. A data processing system comprising:

a pair of independently operated processing units, each processing unit being operative to generate cache requests for data, each request including an address having first and second address portions; and

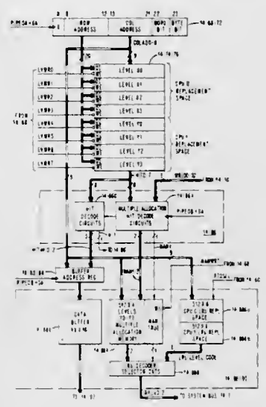
a cache memory subsystem coupled to said pair of processing units for receiving said requests, said cache memory subsystem comprising:

a directory store being divided equally into first and second pluralities of levels, said first and second pluralities of levels each containing groups of storage locations, each location for storing said first address portion of a memory request generated by each of said pair of processing units allocated to said first and second pluralities of levels and each different group of locations within said plurality of directory store levels being defined by a different one of said second address portions;

a data store being divided equally into the same first and second plurality of levels as said directory store and each different group of locations within said data store levels being accessed by a different one of said second address portions;

first and second accounting means being associated with said first and second pluralities of levels of said cache store respectively and each accounting means containing said first plurality of levels for storing information establishing the order for replacing locations within said levels on a least recently used basis; and

multiple allocation memory (MAM) means including said



first plurality of levels of said groups of locations, each different group of locations being accessed by said second address portion; and,

decode and control means coupled to said directory store, to said MAM means, said decode and control means during each allocation cycle generating signals for indicating when the same first address portion stored in a location defined by said second address portion of one of said pluralities of levels allocated to one processing unit is being written into a location defined by the same second address portion in one of said pluralities of levels allocated to the other processing unit resulting in a duplicate entry in said directory store; and

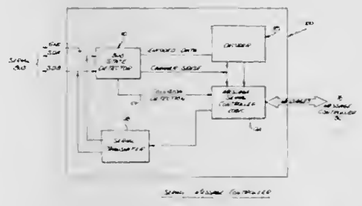
said MAM means storing signals specifying the directory store level of said duplicate entry specified by a cache request from one of said pair of processing units and a signal indicating the occurrence of a multiple allocation in response to said signals from said decode and control means, said MAM means during a next allocation cycle in response to a cache request having the same second address portion reading out said level and multiple allocation signals for immediate replacement of said duplicate entry ensuring that data coherency is maintained in said cache store.

4,785,396

PUSH-PULL SERIAL BUS COUPLED TO A PLURALITY OF DEVICES EACH HAVING COLLISION DETECTION CIRCUIT AND ARBITRATION CIRCUIT

Sean T. Murphy; Narjala Bhasker, both of Portland; Peter D. MacWilliams, Aloha, and Stephen J. Packer, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 823,358, Jan. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 555,026, Nov. 25, 1983, abandoned. This application Jan. 26, 1988, Ser. No. 148,763
Int. Cl.[4] G06F *13/40, 11/00*
U.S. Cl. 364—200 **5 Claims**



1. A high speed serial bus including an SDA line, an SDB line and a ground reference line, for transferring data comprised of a plurality of bits between a plurality of data processing devices ("agents") coupled to said bus, comprising:

message control means coupled between each of said agents and said serial bus for transferring data in the form of digital signals representing said plurality of bits between a transmitting and a receiving agent along said serial bus, said message control means including:

transmitter means coupled to said serial bus for transmitting data provided by an agent, said data in the form of said digital signals being driven on said SDA and SDB lines 180° out of phase with respect to one another such that the combination of said digital signals on each of said SDA and SDB lines relative to said ground reference line represents said bits comprising said data;

bus state detector means coupled to said serial bus for detecting collisions of data transmitted by at least two agents over said bus, said collision being detected in the event said SDA and SDB lines are at a first logical state relative to said ground reference line, said bus state detector sensing an idle bus on which no data has been transmitted when said SDA and SDB lines are at a second logical state inverse to said first logical state relative to said ground reference line;

receiving means coupled to said bus state detector means for receiving said digital signals representing said data and reconstructing said data into the form transmitted by said transmitting agent;

message serial control logic including arbitration means for providing an orderly allocation of access to said serial bus for said transmitting agents, such that said arbitration means initiates an arbitration cycle wherein each agent coupled to said serial bus;

generates a JAM signal driving both of said serial bus lines SDA and SDB to the same logic state for a predetermined time;

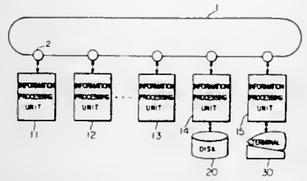
maintains said serial bus idle for a predetermined time such that any residual electrical signals on said bus lines are damped; and

maintains said serial bus in a "WAIT" state to insure that a valid JAM signal has occurred and then maintains said bus in an idle state for an additional "CLEAR" period to permit the resynchronization of all agents;

whereby data is serially transferred between agents coupled to said bus.

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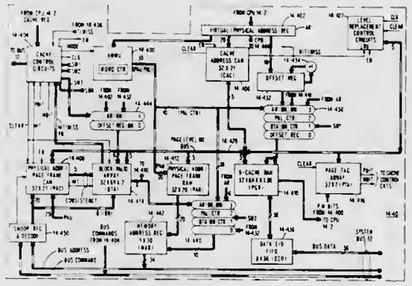
4,785,397
METHOD AND APPARATUS FOR LOADING PROGRAMS IN A DISTRIBUTED PROCESSING SYSTEM
Minoru Koizumi; Kinji Mori, both of Yokohama; Yasuo Suzuki, Ebina; Katsumi Kawano, Fuchu; Masayuki Orimo, Kawasaki; Hirokazu Kasashima, Hitachi, and Kozo Nakai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 13, 1986, Ser. No. 929,914
Claims priority, application Japan, Nov. 15, 1985, 60-254759
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 **7 Claims**



1. A method for loading a program in a distributed processing system including a plurality of information processing units interconnected by a transmission system, comprising the steps of:
storing at least one program and its identifier in a memory of at least one of said information processing units;
transmitting a message from an information processing unit, said message including a request for a program to be loaded into at least one of said information processing units;
receiving said message and retrieving at least one stored program and its identifier based on said message from a memory of at least one information processing unit other than said information processing unit sending said message;
transmitting said at least one stored program and its identifier retrieved from said memory; and
selecting a program on the basis of said identifier from said at least one stored program being transmitted and loading the selected program in a memory of at least one information processing unit other than said information processing unit transmitting said stored program and identifier.

4,785,398
VIRTUAL CACHE SYSTEM USING PAGE LEVEL NUMBER GENERATING CAM TO ACCESS OTHER MEMORIES FOR PROCESSING REQUESTS RELATING TO A PAGE
Thomas F. Joyce, Westford; Ming T. Miu, Chelmsford; Jian-Kuo Shen, Belmont, and Forrest M. Phillips, North Chelmsford, all of Mass., assignors to Honeywell Bull Inc., Waltham, Mass.
Filed Dec. 19, 1985, Ser. No. 811,044
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **22 Claims**

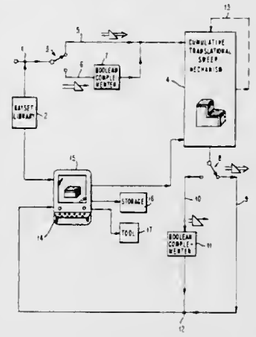
1. A cache memory for use in a multiprocessing system in which a number of processing units connect in common to share a main memory, said main memory being divided into a number of segments in which each segment includes a plurality of pages, each containing a plurality of blocks, each of which has a plurality of words, said cache memory being coupled to one of said processing units for providing fast access information fetched from said main memory in response to requests for information received from said one processing unit, each request including an input address for identifying the information words to be accessed from said cache memory, said cache memory comprising:
a plurality of content addressable memories, each having an input and an output and containing a plurality of locations for storing address information pertaining to each of a predetermined number of said plurality of pages, a first one of said content addressable memories having said input coupled to receive said input address from said one processing unit;
a plurality of directly addressable random access memories, each having an input and an output and containing a plurality of locations for storing address, control and data information pertaining to each of said plurality of pages;
a common internal bus connecting said output of said first one of said content addressable memories, said input of each of the remaining content addressable and said input of each of said directly addressable memories in common; and,
cache control means coupled to receive said requests from said one processing unit, said cache control means being



operative in response to each request for information to apply a first portion of said input address corresponding to an effective address only to said first one of said content addressable memories, said first content addressable memory being operative upon detecting a hit condition indicating that the page containing the requested information resides in cache memory to generate a page level value on said bus identifying where information is stored in said content addressable and directly addressable memories pertinent to said page, said cache control means applying said page level number value together with other portions of said input address as a cache address to other ones of said content addressable and directly addressable memories as required for reading out the requested information words to said one processing unit.

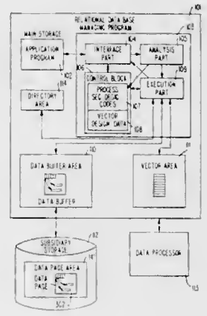
4,785,399
SHAPING GEOMETRIC OBJECTS BY CUMULATIVE TRANSLATIONAL SWEEPS
Roger C. Evans, Yorktown Heights; George M. Koppelman, New York, and Vadakkedathu T. Rajan, Briarcliff Manor, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 3, 1987, Ser. No. 21,388
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—300 **19 Claims**

1. A method for shaping a geometric model, comprising the following steps performed by a computer of:
(a) providing for entry of a parameterized operational rayset of n rays, which rays determine a structuring geometric shape;
(b) applying to the geometric model a translational sweep corresponding to a first ray of said parameterized operational rayset, resulting in a sweptspace for the sweep;
(c) iteratively applying to the sweptspace of the respectively preceding sweep a translational sweep corresponding to a next ray of said parameterized operational rayset, until a sweep corresponding to ray n has been applied, resulting in a final sweptspace which is a desired shaped geometric model; and



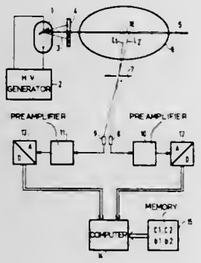
(d) providing the shaped geometric model to a utilization device.

4,785,400
METHOD FOR PROCESSING A DATA BASE
Keiji Kojima, Kodaira, and Shunichi Torii, Musashino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 684,789, Dec. 21, 1984, Pat. No. 4,644,471. This application Feb. 17, 1987, Ser. No. 15,694
Claims priority, application Japan, Dec. 23, 1983, 58-242024
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—300 **12 Claims**



1. A method for processing a data base, which comprises a plurality of groups of data elements, each group of data elements being stored at storage locations within a data storage device whose addresses are not uniformly separated, the method comprising the steps, performed by a computer, of:
fetching one group of data elements to be processed among said plurality of groups of data elements, in response to a command requiring processing of the one group of data elements, and storing the one group of data elements into said storage device so that the one group of data elements is stored as elements of vector data at locations with uniformly separated addresses within said stroage device;
storing vector designating data required for accessing vector data; and
accessing elements of vector data based upon the vector designating data and processing accessed elements of vector data.

4,785,401
METHOD AND DEVICE FOR DETERMINING AN ENERGY-INDEPENDENT X-RAY ATTENUATION FACTOR IN A REGION OF AN OBJECT
Geoffrey Harding, Halstenbeck, and Josef-Maria Kosanetzky, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 22, 1986, Ser. No. 909,807
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1985, 3534702
Int. Cl.[4] G01N *23/201*
U.S. Cl. 364—413.16 **5 Claims**



3. Apparatus for measuring an energy-independent X-ray attenuation factor, A_p, in a region of an object comprising:
X-ray tube means for generating a primary X-ray beam which traverses the region of the object;
first detector means for measuring radiation which is scattered from a first section of the primary beam which lies in said region of the object;
second detector means for measuring scattered radiation which is scattered from a second section of the primary beam which lies in said region of the object, the first and second detector means being disposed with respect to the object so that radiation from said first and second sections of the primary beam reaches the respective detector means along essentially the same paths through the object;
energy determining means for causing each of the detector means to measure radiation which is scattered from the primary beam in each of a first and a second energy spectral range; and
computer means for calculating the attenuation factor from the relationship

$$A_p = |d1 \cdot [\ln Q1 - b1] - d2 \cdot [\ln Q2 - b2]|$$

where d1, d2, b1, and b2, are constants, Q1 is the quotient of the values of scattered radiation measured by the first detector means in said two different energy spectral ranges and Q2 is the quotient of the values of scattered radiation measured by the second detector means in each of said energy spectral ranges.

4,785,402
ULTRASONIC IMAGING APPARATUS FOR COLOR DISPLAY OF FLOW VELOCITY
Satoshi Matsuo, Ootawara, and Yasuo Miyajima, Tochigi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki
Filed Oct. 29, 1986, Ser. No. 924,559
Claims priority, application Japan, Nov. 2, 1985, 60-247796
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413.07 **10 Claims**

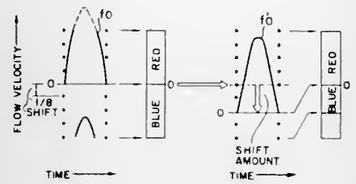
1. An ultrasonic imaging apparatus comprising:
ultrasonic transducer means for emitting an ultrasonic beam onto an object containing flow materials and for converting echoes of said beam from the object into echo signals;
calculation means for processing the echo signals output

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from said ultrasonic transducer means, for calculating a velocity of the flow materials from said echo signals, and for outputting a velocity signal corresponding to the calculated velocity;

zero shift means for zero-shifting, by a predetermined shift amount, the velocity signal output from said calculation means to produce a zero-shifted velocity signal; and

means for displaying in one of a plurality of color levels the



zero-shifted velocity signal output from said zero shift means;

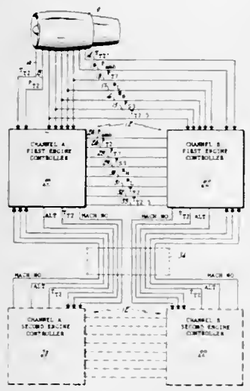
wherein at times when the velocity of the flow materials in one direction exceeds a display limit, the velocity signal corresponds to another velocity of the flow materials in an opposite direction within the display limit, and the production of the zero-shifted velocity signal prevents the display of a color level corresponding to said another velocity in the opposite direction.

4,785,403

DISTRIBUTED FLIGHT CONDITION DATA VALIDATION SYSTEM AND METHOD

Joel F. Kuhlberg, New Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1986, Ser. No. 858,638
Int. Cl.[4] G06F *15/20, 11/16*
U.S. Cl. 364—424.06 **8 Claims**



1. A flight condition data validation system for an aircraft having at least a first engine and a second engine, comprising:

a first engine controller including

means for generating an electrical signal commensurate with the first engine air inlet total pressure,

means for generating an electrical signal commensurate with the first engine air inlet total temperature,

means for generating an electrical signal commensurate with the ambient air pressure local to the first engine,

means for generating an electrical signal commensurate with the engine turbine exhaust total pressure,

means for generating an electrical signal commensurate with the rotor speed of the first engine,

means for generating an electrical signal commensurate with the first engine burner absolute pressure,

means for generating an electrical signal commensurate with the first engine low compressor outlet air total temperataure,

means, responsive to the first engine air inlet total pressure signal, first engine air inlet total temperature signal, and the local ambient air pressure signal, for deriving a first tentative value of a critical flight condition variable selected from the group of aircraft altitude, Mach number, or total air temperature,

means, responsive to the first engine burner absolute pressure signal, first engine rotor speed signal, first engine turbine exhaust total pressure signal, and first engine compressor outlet air total temperature, for synthesizing a second tentative value of the critical flight condition variable;

a data bus directly connecting the first engine controller to a substantially similar second engine controller for passing a third tentative value of the critical flight condition variable determined by the second engine controller to the first engine controller; and

means for determining a final, validated value of the critical flight condition variable for use in regulating a flow of fuel to the first engine, including

means for comparing the magnitude and quality of the first tentative value, the second tentative value, and the third tentative value of the critical flight condition variable, and

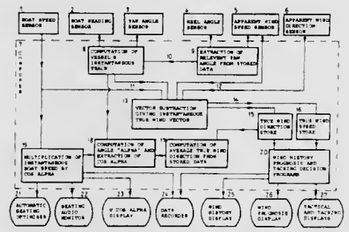
means, responsive to the comparing means, for logically selecting the final, validated value from one of the first, second, and third tentative values.

4,785,404

BEATING AND PASSAGE TIME OPTIMIZATION COMPUTER NAVIGATION SYSTEM FOR SAILING VESSELS

Merrick L. Sims, 7, Ilya Avenue, and Theodore E. Schilizzi, 9, Ilya Avenue, both of Bayview N.S.W. 2104, Australia

Filed May 13, 1985, Ser. No. 733,658
Claims priority, application Australia, May 18, 1984, PG5049
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—443 **16 Claims**



1. A digital computer navigation system for use on a sailing vessel when beating, designed to maximize said vessel's rate of progress in an averaged true wind direction, said system comprising a processing means for vectorially subtracting time sequenced values of said vessel's instantaneous direction of movement relative to the water on which said vessel is sailing and time sequenced values of said vessel's instantaneous speed relative to said water, from time sequenced values of an instantaneous apparent wind direction relative to said vessel and time sequenced values of an instantaneous apparent wid speed relative to said vessel, to produce time sequenced values of an instantaneous true wind direction,

a processing means for averaging said time sequenced values

of an instantaneous true wind direction, to produce an averaged true wind direction,

a processing means for determining time sequenced values of the cosine of an instantaneous angle between said averaged true wind direction and said vessel's instantaneous direction of movement relative to said water,

a processing means for multiplying said time sequenced values of said cosine of said instantaneous angle by said time sequenced values of said vessel's instantaneous speed relative to said water, to produce time sequenced resolutions of said vessel's instantaneous velocity relative to said water in an averaged true wind direction,

an audio frequency generating means for converting said time sequenced resolutions into audio frequency signals,

a sound producing means for making said audio frequency signals audible;

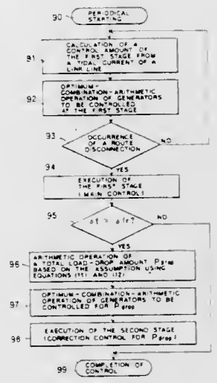
whereby a crew of said vessel is enabled to sail it so as to continually tend toward maximization of the pitch of said audio frequency signals, whereupon said vessel's rate of progress in an averaged true wind direction tends toward maximization when said vessel is beating.

4,785,405

POWER SYSTEM STABILIZER

Taizo Hasegawa, Aichi; Hirotaka Ono, Gifu; Isao Koda, Aichi; Tadahiro Gouda, Hyogo; Hideharu Oshida, Hyogo, and Toshiharu Narita, Hyogo, all of Japan, assignors to Chubu Electric Power Company, Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Jan. 5, 1987, Ser. No. 378
Claims priority, application Japan, Jan. 6, 1986, 61-433
Int. Cl.[4] G06F *15/20, 15/56*
U.S. Cl. 364—480 **6 Claims**



1. A power system stabilizer provided at an individual power system which is to be separated (a separated system) due to an accident cutting off a link line which interconnects a plurality of individual power systems to form a large-scale power system (main system), said plurality of individual power systems including power stations such as power plants, transformer substations and loads, the power system stabilizer comprising:

arithmetic processing means for assuming a total load-drop amount of the separated system caused by a voltage drop during said accident by an arithmetic operation based on a difference between a frequency in a representative power station belonging to said separated system and a frequency at a constant time after the frequency in said representative power station has exceeded a prescribed value; and

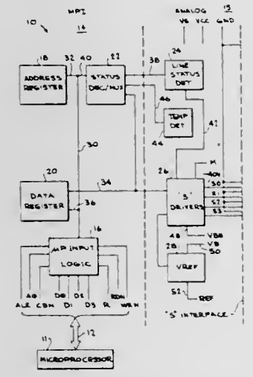
control means for controlling a balance in demand and supply at each power station in said separated system on the basis of an assumption amount obtained by said operation of the arithmetic processing means.

4,785,406

QUAD EXCHANGE POWER CONTROLLER

Erik Lunderius, San Jose; Simon Szeto, South San Francisco, both of Calif., and Jan Johansson, Balsta, Sweden, assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 17, 1986, Ser. No. 908,475
Int. Cl.[4] G06F *15/20;* **G05F** *1/46*
U.S. Cl. 364—483 **4 Claims**



1. A power controller for supplying separately a regulated power source to a plurality of "S" lines and for monitoring line-status conditions on the "S" lines so that each "S" line is controlled independently, said controller comprising:

analog means for delivering power independently to each of the "S" lines and for detecting the line-status conditions on the "S" lines, said analog means including:

(a) a plurality of output drivers for supplying individually the power to said plurality of "S" lines, said plurality of output drivers being formed of a plurality of power transistors, each power transistor having its corresponding collector connected to one of said plurality of "S" lines;

(b) line-status detector means for sensing line-status conditions on the "S" lines to provide a set of status logic signals for each "S" line, said line-status detector means including a plurality of status buffers for monitoring a low voltage condition, a no-current condition, a high-current condition, a reverse-current condition, and an overload-temperature condition on each "S" line so as to generate said set of status logic signals;

microprocessor interface means for communicating with a microprocessor and for controlling said analog means, said interface means including:

(a) microprocessor input logic means having input terminals for receiving control signals from said microprocessor and having bi-directional ports for transmitting data to said microprocessor and for receiving data from said microprocessor;

(b) address register means for storing a plurality of addresses, each address corresponding to one of the plurality of line-status conditions to be monitored on the "S" lines;

(c) data register means formed of a plurality of latches in which each latch corresponds to one of said plurality of "S" lines and being responsive to the control signals for switching off and on independently each of the output transistors to control the power to the "S" line;

(d) status decoder/multiplexing means responsive to said

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plurality of addresses for selecting a particular one of said line-status conditions so that the same line-status condition for all "S" lines is readable simultaneously by said microprocessor; and

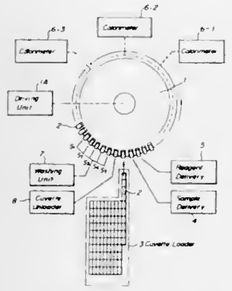
said status decoder/multiplexing means including a plurality of decoder/multiplexers, each decoder/multiplexer being connected to receive said set of status logic signals corresponding to one of said plurality of "S" lines, each of said decoders/multiplexers being further connected to receive said addresses from said address register means, each decoder/ multiplexer generating a data output signal corresponding to the same one of said line-status conditions to be monitored in said set of status logic signals for each corresponding "S" line, the particular line-status condition to be monitored being selected by said addresses of said address register means.

4,785,407

AUTOMATIC CHEMICAL ANALYZER WITH SELECTIVE REMOVAL OF REACTION VESSELS

Toshio Sakagami, Cofu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 928,459
Claims priority, application Japan, Nov. 19, 1985, 60-257542
Int. Cl.⁴ G01N *31/00, 35/06*
U.S. Cl. 364—497 **4 Claims**



1. An automatic chemical analyzer comprising

means for supporting and transporting a plurality of reaction vessels along an endless line;

means for automatically supplying reaction vessels to said supporting means;

means for delivering given amounts of samples to be analyzed into said reaction vessels;

means for delivering given amounts of reagents into said reaction vessels, said samples and said reagents together forming test liquids;

means for measuring a property of said test liquids;

means for washing said reaction vessels;

means for removing said reaction vessels from said supporting means; and

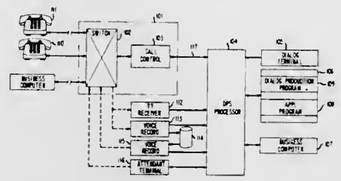
means for controlling the reaction vessel supplying means and reaction vessel removing means, said controlling means comprising a means for detecting a degree of dirtiness for each of said reaction vessels, such that said reaction vessels are selectively removed from positions on the supporting means when the detected degrees of dirtiness of the reaction vessels exceed a threshold level, after which reaction vessels are supplied to said positions on the supporting means by said supplying means.

4,785,408

METHOD AND APPARATUS FOR GENERATING COMPUTER-CONTROLLED INTERACTIVE VOICE SERVICES

James T. Britton, Aberdeen, N.J.; Lorraine Figueroa, Brooklyn, N.Y.; John F. Patterson, Morristown; Robert I. Rosenthal, Wayside, and Richard R. Rosinski, Middletown, all of N.J., assignors to AT&T Information Systems Inc. American Telephone and Telegraph Company, Murray Hill, N.J.

Filed Mar. 11, 1985, Ser. No. 710,605
Int. Cl.⁴ G10L *5/00*; G06F *15/20*
U.S. Cl. 364—513.5 **9 Claims**



1. A method of enabling a system designer to generate a dialog application program for instructing a computer controlled voice response system for providing a user interactive voice service, said method comprising the steps of:

selecting two or more interaction program modules from a group of predefined interaction program modules, each program module including one or more system designer selectable parameters for further defining a particular user transaction function to be performed by said program module and

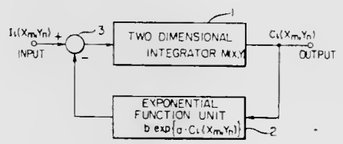
specifying the logical interconnection of said selected two or more program modules to generate said application program to provide said user interactive voice service.

4,785,409

SYSTEM FOR REDUCING NOISE IN A SCREEN DISPLAY

Shinji Badono, and Toshimasa Tomoda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 28, 1986, Ser. No. 823,278
Claims priority, application Japan, Jan. 29, 1985, 60-16255
Int. Cl.⁴ H04N *5/21*; G09G *3/00*
U.S. Cl. 364—518 **9 Claims**



5. A picture processor which processes digitized picture signals and displays a picture composed of an array of pixels produced by such signals on a monitor screen, said picture processor comprising:

receiving means for receiving digitized input picture signals;

two-dimensional means for holding digitized picture signals in succession and for providing signals corresponding to respective pixels, said signals corresponding to respective pixels having a constant relative quantum noise level;

transforming means for receiving the signals corresponding to respective pixels, for producing exponential transforms of the signals corresponding to respective pixels, and for outputting the exponential transforms as transformed signals;

combining means for combining the digitized picture input signals with the transformed signals to produce processed signals;

input means for inputting the processed signals to said two-dimensional means; and

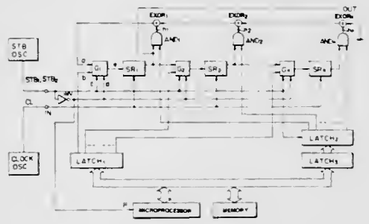
output means for outputting the signals corresponding to respective pixels to a video monitor screen.

4,785,410

MAXIMUM LENGTH SHIFT REGISTER SEQUENCES GENERATOR

Masahiro Hamatsu, and Takao Kurihara, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1986, Ser. No. 870,204
Claims priority, application Japan, Jun. 5, 1985, 60-122070; Jun. 5, 1985, 60-122071
Int. Cl.⁴ G06F *1/02*
U.S. Cl. 364—717 **8 Claims**



1. A maximum length shift register sequences generator, comprising;

a plurality of flip-flops which each have a clock input, a data input and a data output;

a plurality of switching gates which each have first and second data inputs and a data output, said data output of each said switching gate being coupled to the data input of a respective one of said flip-flops;

means for applying a clock pulse to said clock input of each of said flip-flops;

a multiplexer having a plurality of data inputs which are each coupled to the data output of a respective one of said flip-flops, having a data output, and having select inputs which specify which one of said data inputs thereof is to be coupled by said multiplexer to said data output thereof;

a plurality of AND gates which each have first and second input terminals, said first input terminal of each said AND gate being coupled to said data output of said multiplexer, and said AND gates each having an output;

a plurality of feedback circuits which each have one input coupled to the output of a respective one of said AND gates, have a further input coupled to the data output of a respective one of said flip-flops, and have an output, one of said switching gates having its first data input coupled to said data output of said multiplexer and each of the others of said switching gates having its first input coupled to the output of a respective one of said feedback circuits;

a first latch having a plurality of outputs which are each coupled to the second data input of a respective one of said switching gates;

a second latch having a plurality of outputs which are each coupled to the second input terminal of a respective one of said AND gates;

means for applying to each of said switching gates a gate control signal which selects a respective one of said first and second data inputs to be coupled by the switching gate to its data output;

a third latch controlled by said gate control signal and having outputs coupled to said select inputs of said multiplexer; and

a microprocessor responsive to said gate control signal to supply each of said first, second and third latches with instruction words.

4,785,411

CASCADE FILTER STRUCTURE WITH TIME OVERLAPPED PARTIAL ADDITION OPERATIONS AND PROGRAMMABLE TAP LENGTH

Charles D. Thompson; Joseph P. Gergen; Bradley Martin, and Garth D. Hillman, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1986, Ser. No. 901,850
Int. Cl.⁴ G06F *7/38*
U.S. Cl. 364—724.19 **8 Claims**

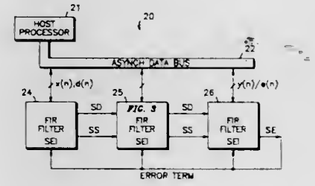


FIG. 3

1. A cascade filter structure having a plurality of rank ordered filter circuits, each of said filter circuits performing predetermined arithmetic calculations on predetermined operands to provide one of a plurality of rank ordered output operands, said rank ordered output operands being serially added by each rank ordered filter circuit except the lowest ranked filter circuit by an interface circuit in each filter circuit, each of said interface circuits comprising:

an input terminal for receiving a rank ordered output operand of immediately lower rank;

data initiation detection means coupled to the input terminal for providing a control signal in response to detection of receipt of the output operand of immediately lower rank for use as a first addend;

control means for providing a second addend resulting from the predetermined calculation of the filter circuit of current rank, said second addend being provided by the control means in response to the control signal and synchronous with receipt of the first addend; and

adder means coupled to the input terminal and the control means, for adding the first and second addends and outputting a sum as the rank ordered output operand of predetermined rank.

4,785,412

DOUBLE PRECISION APPROXIMATE QUOTIENT NETWORK

Richard H. Tran, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jul. 20, 1987, Ser. No. 75,488
Int. Cl.⁴ G06F *7/52*
U.S. Cl. 364—761 **8 Claims**

1. Apparatus for determining a 2n bit partial product of a first 2n bit number and a second n bit number, said n bit number having a value equal to one of $(2^{n-1}-2)$, $(2^{n-1}-1)$, (2^{n-1}) and $(2^{n-1}+1)$, said apparatus comprising:

means for right shifting said first number by one bit to derive a fourth number having a value of either one-half of said first number or one-half of said first number minus 1;

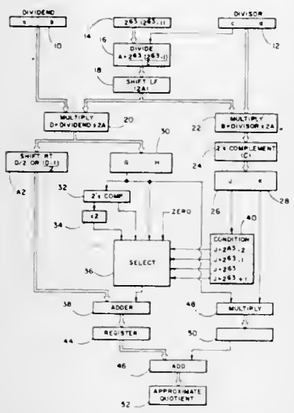
means for determining a third number comprising the n most significant bits of said first number;

means for multiplying said third number by 2 to achieve a value of twice said third number; and

means responsive to said shifting means and said determining

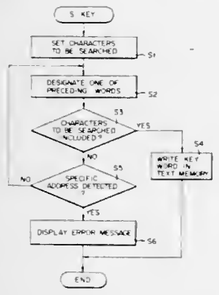
VOL 1096 ISS 3 NO 15 1988 UMI

means and said multiplying means and to the value of said second number for (a) subtracting twice said third number from said fourth number if the value of said second number is $2^{n-1}-2$, (b) subtracting said third number from said



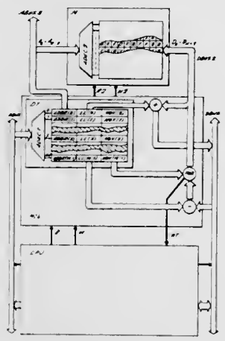
fourth number if the value of said second number is $2^{n-1}-1$, (c) selecting said fourth number if said the value of said second number is 2^{n-1}, and (d) adding said third number to said fourth number if the value of said second number is $2^{n-1}+1$.

4,785,413
CHARACTER INPUT DEVICE IN DOCUMENT PROCESSING APPARATUS
Hiroki Atsumi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 19, 1985, Ser. No. 757,074
Claims priority, application Japan, Jul. 30, 1984, 59-116775[U]
Int. Cl.[4] G06F *3/023*
U.S. Cl. 364—900 **1 Claim**



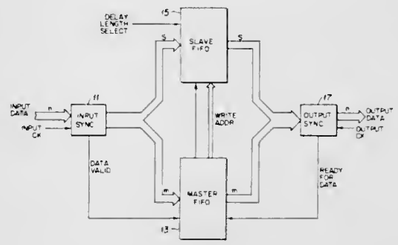
1. A character input device in a document data processing apparatus comprising:
keyboard means having at least a plurality of character keys and a search key;
text memory means for storing document data consisting of a plurality of words;
character memory means, connected to said keyboard means for storing data of at least one character constituting a word;
word search means, connected to said keyboard means and said text memory means, for searching a word previously stored in said text memory means upon detection of the operation of said search key of said keyboard means;
comparison means, connected to said character memory means and said word search means, for comparing whether or not at least one character data stored in said character memory means coincides with at least one character of a word to be searched from among the plurality of words stored in the text memory means; and
a central processing unit, connected between said keyboard means and said comparison means, including means for inputting a word in a predetermined store position in said text memory means, as based upon the comparison result from said comparison means for indicating coincidence.

4,785,414
COMPUTER SYSTEM WITH AUTOMATIC RANGE CHECKING AND CONVERSION OF DATA WORDS
Goran A. H. Hemdal, 10 Sabna Court Parkland Grove, Ashford, Middlesex TW15 2JN, United Kingdom
PCT No. PCT/GB84/00446, § 371 Date Aug. 20, 1985, § 102(e) Date Aug. 20, 1985, PCT Pub. No. WO85/02922, PCT Pub. Date Jul. 4, 1985
PCT Filed Dec. 20, 1984, Ser. No. 774,593
Claims priority, application United Kingdom, Dec. 21, 1983, 8334079
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—900 **10 Claims**



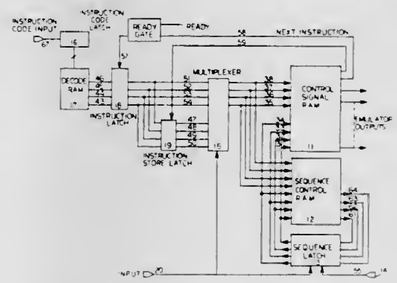
1. A computer system with automatic range checking and conversion of data words, comprising:
a central processing unit;
main memory means for storing information, in binary form; and
master control means interposed between said main memory means and said central processing unit for automatically normalizing data words having logical values from said central processing unit to values within predetermined ranges and transmitting the normalized data words to said main memory means for storage therein and for converting normalized data words from said main memory means to logical values utilizable by said central processing unit and transmitting the converted data words to said central processing unit, said master control means comprising:
secondary memory means including a data descriptor table for storing for each data storage address in said main memory means a first entry specifying a predetermined number of possible consecutive values allowable for a data word stored in such data storage address and a second entry specifying a limiting value of said predetermined number of possible consecutive values;
arithmetic circuit means operatively connected to said secondary memory means, said main memory means and said central processing unit for algebraically combining a data word from any selected data storage address in said main memory means with the limiting value corresponding to said selected data storage address and forwarding a resulting converted data word to said central processing unit and for receiving an incoming data word from said central processing unit to be stored in a given data storage address in said main memory means, algebraically combining said incoming data word with the limiting value corresponding to said given data storage address and operating on said incoming data word with the predetermined number of possible consecutive values corresponding to said given data storage address to obtain a normalized data word and transmitting the resulting normalized data word to said main memory means; and
checking means operatively connected to said central processing unit for checking values of data words to be transmitted to the memory or processor against predetermined data ranges and transmitting to said central processing unit an interrupting signal upon detection of an out-of-range value.

4,785,415
DIGITAL DATA BUFFER AND VARIABLE SHIFT REGISTER
Richard K. Karlquist, Cupertino, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 29, 1986, Ser. No. 901,866
Int. Cl.[4] G06F *3/00;* **364** *200 MS File, 900 MS File, 200, 900;* **370** *53, 84;* **371** *32, 49*
U.S. Cl. 364—900 **8 Claims**



1. A synchronous FIFO buffer memory for converting a variable rate input digital data stream clocked by an external input clock to an output digital data stream synchronized with an external output clock from a downstream device, wherein the external input clock and the external output clock are not synchronized with each other, comprising:
means for producing an internal clock signal with a frequency at least as high as the external clock frequencies, not synchronous with the input clock and the output clock;
an internal data bus;
an input synchronizer for receiving the input digital data stream and producing an output data stream on the internal data bus synchronized to the internal clock signal, said input synchronizer including a logic network that prevents the loss of data and violation of the setup and hold timing of the internal system clock upon occurrence of a metastable state caused by asynchronicity of the input clock and the internal clock;
a first FIFO memory connected to the internal data bus for receiving a first portion of the input digital data stream and temporarily holding the data until the downstream device is ready to receive the data;
a second FIFO memory connected to the internal data bus for receiving a second portion of the input digital data stream, reading data and writing data coincidentally with the first FIFO memory, and temporarily delaying a programmable number of data words, so that the second portion of the input digital data stream is delayed with respect to the first portion of the input digital data stream; and
an output synchronizer connected to the internal data bus for receiving the data read from the first and second FIFO memories and producing an output digital data stream on an output bus connected to the downstream device, synchronized to the clock of the external downstream device.

4,785,416
MICROPROCESSOR TIMING EMULATOR HAVING A "WAIT" STATE
Philip J. Stringer, 170 Brox Road, Ottershow, Chertsey, Surrey, England
Continuation of Ser. No. 619,022, Jun. 11, 1984, abandoned. This application Mar. 16, 1987, Ser. No. 24,857
Claims priority, application United Kingdom, Jan. 6, 1984, 8413933
Int. Cl.[4] G06F *9/44*
U.S. Cl. 364—200 **16 Claims**



1. Apparatus for emulating the timing characteristics of a microprocessor, the apparatus comprising:
(a) a control signal memory storing data representing a plurality of sets of instructions, each instruction set being stored in a respective region of the said control signal memory and each instruction set comprising a plurality of instructions;
(b) a decode memory for receiving a signal specifying a given instruction set to be used for emulating the timing characteristics of a selected microprocessor and for supplying, in response to the instruction set specifying signal, first address signals to the control signal memory to select the region of the control signal memory storing the given instruction set;
(c) a sequence control memory for supplying, in response to the instruction set specifying signal, second address signals to select one instruction in the given instruction set;
(d) a sequence control latch for supplying the second address signals to the control signal memory; and
(e) means for supplying a clock signal to the sequence control latch to actuate the sequence control latch to supply the second address signals to the control signal memory,
wherein the control signal memory stores data for producing a WAIT output and wherein the sequence control latch supplies the second address signals to the control signal memory only in response to an external ready input signal, and wherein a change in the ready input signal suspends the supplying of the second address signals by the sequence control latch and causes the control signal memory to produce the WAIT output, so that, in use, the instructions of the instruction set are supplied to emulate the timing characteristics of a micro-

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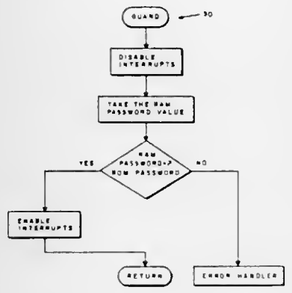
processor in a sequence determined by the sequence control memory.

4,785,417

ELECTRONIC POSTAGE METER HAVING AN OUT OF SEQUENCE CHECKING ARRANGEMENT

Liana Obrea, Greenwich, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,555
Int. Cl.[4] G06F *11/28, 15/20*
U.S. Cl. 364—200 **3 Claims**



1. A method for assuring that a microcomputerized electronic postage meter having a random access memory and a program memory is operating an appropriate selectable routine from said program memory, the method comprising the steps of:

(a) providing a predetermined computer word in program memory in correspondence with a selectable routine;

(b) storing said computer word in the random access memeory whenever said selectable routine is executed;

(c) comparing said word stored in random access memory at least once during the execution of said selectable routine with said predetermined computer word corresponding to the selectable routine; and

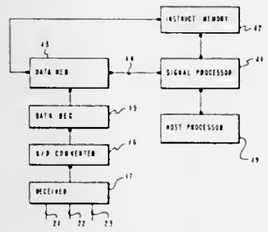
(d) providing an error indication for further processing by the electronic postage meter whenever the compared words differ.

4,785,418

PROPORTIONAL AUTOMATIC GAIN CONTROL

Harold B. Pearce, and Lynn P. West, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1986, Ser. No. 901,904
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—715.01 **18 Claims**



10. In a signal processor, apparatus for providing automatic gain control, comprising:

means for establishing an automatic gain control value;

means for receiving a plurality of samples representing an input signal;

means for multiplying each of said plurality of samples by said automatic gain control value, thereby generating a plurality of sample products;

means for comparing a maximum one of said sample products with a running maximum value;

means for adjusting said maximum value subsequent to said maximum sample product being greater than said running maximum value; and

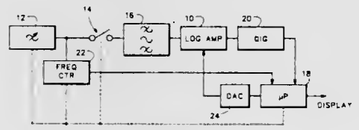
means for adjusting said maximum value subsequent to said running maximum value lying outside a predetermined range of values.

4,785,419

LOGARITHMIC AMPLIFIER CALIBRATOR ✓

Douglas K. Huffman, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 16, 1987, Ser. No. 121,187
Int. Cl.[4] G01C *25/00;* **G06F** *15/46*
U.S. Cl. 364—571.01 **6 Claims**



1. A calibrator for a logarithmic amplifier comprising:

a single pole resonator having an input and an output, a test signal being applied to the input and the output being coupled to an input of the logarithmic amplifier;

means for interrupting the test signal applied to the single pole resonator input to cause the single pole resonator to ring down; and

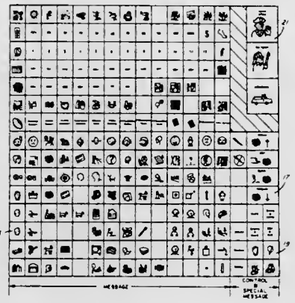
means for determining calibration parameters from an output of the logarithmic amplifier, the output including data in response to the test signal and in response to the ring-down of the single pole resonator.

4,785,420

AUDIO/TELEPHONE COMMUNICATION SYSTEM FOR VERBALLY HANDICAPPED

Paul D. Little, Kilgore, Tex., assignor to Joyce Communications Systems, Inc., Longview, Tex.

Filed Apr. 9, 1986, Ser. No. 849,692
Int. Cl.[4] G10L *5/00*
U.S. Cl. 364—513.5 **15 Claims**



1. An operator controlled audio communication system for

verbally handicapped individuals that also provides two-way telephone communication over a telephone line, comprising

a programmed computer,

input means interconnected to the computer and symbolically displaying for sensory perception and random selection by the operator each of a plurality of control commands and a plurality of message commands associated with a preselected and prerecorded vocabulary of spoken messages and in response to said operator selection generating data signals identifying the selected message and control commands for application to said computer,

memory means interconnected to said computer and having stored therein preselected command data and digital message data representative of said vocabulary,

digital to analog conversion means interconnected to said computer and responsive to said digital message data retrieved by said computer from said memory means for regenerating in response thereto said selected audio messages and responsive to DTMF data received from said computer for generating signals,

a speaker for broadcasting said regenerated audio messages, and

interface circuit means for establishing direct interconnection between said digital to analog conversion means and said speaker and establishing communication between said computer, said digital to analog conversion means and the telephone line for interconnecting the system to the telephone line and permitting telephone communication thereover by transmitting said generated DTMF signals and regenerated audio messages and receiving third-party generated telephone messages in response to a plurality of computer generated phone connect signals,

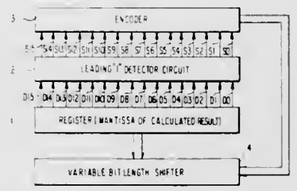
said computer being programmed to receive said data signals from said input means and in response thereto interrogating said memory means to locate and retrieve said digital data representative of said vocabulary messages and said command data including telephone numbers stored therein, applying said digital data to said digital to analog conversion means for generating said telephone number DTMF signals and and regenerating selected audio messages, and in response to said data signals representing said selected command data generating a plurality of phone connect signals for application to said interface circuit.

4,785,421

NORMALIZING CIRCUIT

Toshiya Takahashi, and Junichi Iwasaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 614,911, May 29, 1984, abandoned. This application May 26, 1987, Ser. No. 54,119
Claims priority, application Japan, May 25, 1983, 58-91788
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—715.04 **16 Claims**



8. A normalizing circuit for shifting a bit string consisting of a plurality of binary bits and comprising a leading "one" detector for detecting a bit position of a leading "one" in said bit string and for generating a signal indicating the bit position of said leading "one" bit, means coupled to said leading "one" detector, and a shifter coupled to said producing means and shifting said bit string to an extent designated by said data;

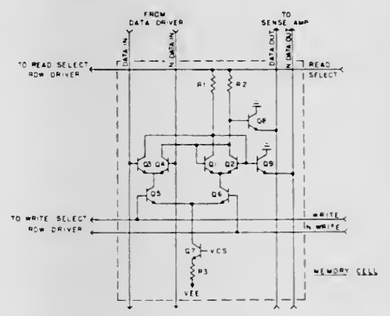
said leading "one" detector including a plurality of logic circuits, each of said logic circuits receiving a respective bit of said bit string at a first input end and an input transmission signal at a second input end and producing an output signal at a first output end when a leading "one" signal is applied, each of said logic circuits except one receiving the least significant bit of said bit string generating an output transmission signal at a second output end, the output transmission signal of one logic circuit being applied to the second input end of the succeeding logic circuit as the input transmission signal thereto, the logic circuit to which the leading "one" bit is applied and its succeeding logic circuit or circuits generating a first level of output transmission signal at said second output end, the other logic circuit or circuits generating a second level of output transmission signal at said second output end, said first level being different from said second level, whereby only that logic circuit which receives the leading "one" bit and the transmission signal having said first level generates an output signal at said first output end as said signal indicating the bit position of said leading "one" bit.

4,785,422

SIMULTANEOUS READ/WRITE RAM

Dale F. Berndt, Plymouth; David L. McCall, Lake Elmo, both of Minn., and Thomas R. Arneberg, Woodland Park, Colo., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 15, 1986, Ser. No. 907,757
Int. Cl.[4] G11C *11/34, 7/00, 7/02*
U.S. Cl. 365—242 **15 Claims**



15. A semiconductor memory including a plurality of bipolar transistor memory cells, wherein each bipolar transistor has a base, an emitter and a collector and wherein each memory cell comprises:

(a) a voltage source;

(b) a current source;

(c) first and second memory transistors, the emitters of which are coupled together and the collectors of which are coupled to said voltage source via intermediate first and second resistors;

(d) current steering means having a first portion coupled to a pair of data input signals and to the collectors of said first and second memory transistors and a second portion coupled to a pair of write control signals and to the emitters of said first and second transistors and said current source, said data input and write control signals being defined by pairs of signals of differential magnitudes, for steering the current of said current source through one or the other of said first and second transistors and said first and second portions relative to said data input and write control signals to establish and maintain a differential

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collector voltage separation at said first and second transistors representative of a binary data condition; and

(e) read select means for selectively varying the absolute magnitude of said voltage source and the collector voltage of each memory transistor of at least one of said plurality of cells without affecting the differential separation therebetween and such that the collector voltage of one of said memory transistors is distinguishable from the other cells coupled to the first and second data buses.

4,785,423

CURRENT LIMITED EPLD ARRAY

Joseph A. Skupnjak, Folsom; Abid Asghar, Davis, and Kirby S. Hallenbeck, Shingle Springs, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 22, 1987, Ser. No. 5,927

Int. Cl.[4] G11C *7/00, 11/34*

U.S. Cl. 365—189 **7 Claims**



1. An erasable programmable logic device comprising:

a plurality of memory cells coupled to various input signal lines;

a first bit line coupled to a first side of each of said memory cells;

a second bit line coupled to a second side of each of said memory cells;

a sensing amplifier coupled to said first bit line such that said sensing amplifier monitors current flow on said first bit line;

current controlling means coupled to said second bit line wherein total current flow through said plurality of memory cells also flows through said sensing amplifier and said current controlling means;

said current controlling means also coupled to said sensing amplifier such that said current flow determines a drive of said current controlling means for maintaining a predetermined current limit on said current flow.

4,785,424

APPARATUS FOR PAGE MODE PROGRAMMING OF AN EEPROM CELL ARRAY WITH FALSE LOADING PROTECTION

Tien-Ler Lin, Sunnyvale, and Dumitru Cioaca, Cupertino, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Filed May 27, 1986, Ser. No. 868,114

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—185 **8 Claims**

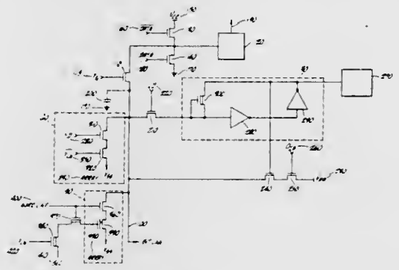
1. An apparatus for page mode programming of an EEPROM memory cell array comprising:

a bit line associated with a plurality of memory cells,

temporary storage means, operatively connected to said bit line, for storing information to be programmed into a memory cell associated with said bit line,

means for determining when no EEPROM memory cell associated with said bit line has been selected form programming during a page mode programming cycle, and

means for discharging voltage on said bit line during a loading cycle of said temporary storage means during said page mode programming cycle when no EEPROM memory cell associatd with said bit line has been selected for programming.



4,785,425

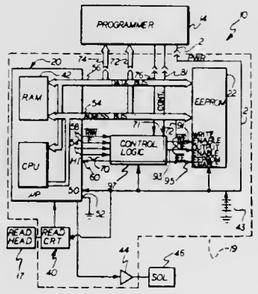
ELECTRONIC LOCKING SYSTEM

Gary E. Lavelle, Avon, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 27, 1987, Ser. No. 20,057

Int. Cl.[4] H04Q *00/00;* **G06F** *1/00;* **G11C** *7/00, 17/00*

U.S. Cl. 365—52 **13 Claims**



1. In an electronic locking system having a processor and an electrically erasable programmable read-only memory (EEPROM) and a random access memory (RAM) supported within said electronic locking system, said processor having address outputs electrically connected to address inputs of said EEPROM and of said RAM to address memory locations within said EEPROM and within said RAM, data inputs electrically connected to data inputs/outputs of said EEPROM and of said RAM to receive data from said EEPROM and from said RAM, and a high-impedence control input for transforming said address outputs of said processor to a high-impedence state and deactivating said processor inputs for isolating said processor, the improvement comprising:

a connector electrically connected to said address inputs of said EEPROM, said data inputs/outputs of said EEPROM, and said high-impedence control input of said processor, and

EEPROM programming means electrically connected to said connector for activating said high-impedence control input of said processor to deactivate said inputs of said processor and render said address outputs of said processor to a high-impedence state during a programming operation, and for solely transmitting address information and data to said address inputs and data inputs/outputs of said EEPROM, respectively during said programming information to write data into said EEPROM, said RAM being unaffected during said programming of said EEPROM.

4,785,426

SUPERCONDUCTING SWITCHING CIRCUIT, MEMORY CELL AND MEMORY CIRCUIT, WITH RESONANCE DAMPING RESISTORS

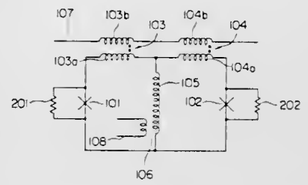
Yutaka Harada, Kodaira; Ushio Kawabe, Tokyo; Eiichi Goto, Fujisawa, and Nobuo Miyamoto, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Rikagaku Kenkyusho, both of Tokyo, Japan

Filed Sep. 19, 1985, Ser. No. 777,585

Claims priority, application Japan, Sep. 21, 1984, 59-196680; Mar. 8, 1985, 60-44802

Int. Cl.[4] G11C *11/44*

U.S. Cl. 365—162 **16 Claims**



1. A superconducting switching circuit comprising:

first and second Josephson junction elements connected in series;

first and second excitation inductors connected in series to each other and connected in series to said first and second Josephson junction elements;

an exciting line magnetically coupled to said first and second excitation inductors;

a load inductor having a first end connected to a connecting point of said first and second Josephson junction elements and having a second end connected to a connecting point of said first and second excitation inductors;

an input signal line coupled to said load inductor; and

first and second resistors connected, respectively, to a first current path including at least said first Josephson junction element and a second current path including at least said second Josephson junction element thereby effecting suppression of unwanted resonance in the current paths, wherein said first and second current paths belonging to the circuit including said first and second Josephson elements, said first and second excitation inductors and said load inductor.

4,785,427

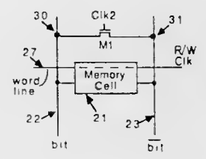
DIFFERENTIAL BIT LINE CLAMP

Kenneth E. Young, Newark, Calif., assignor to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Jan. 28, 1987, Ser. No. 7,957

Int. Cl.[4] G11C *7/00, 7/02, 8/00*

U.S. Cl. 365—189 **12 Claims**



1. A semiconductor memory for storing binary data, said memory comprising:

a pair of differential bit lines for receiving signals corresponding to data;

a semiconductor memory device for storing binary data, said semiconduct memory device being coupled between said pair of differential bit lines to provide said signals corresponding to the binary data when reading said semiconductor memory device during a read cycle;

a clock means for providing a clock signal during said read cycle;

a semiconductor device coupled between said pair of differential bit lines to selectively provide a current path between said pair of differential bit lines and having a control element which controls said current path such that said current path may be closed or open, said control element being coupled to said clock means to receive said clock signal such that when reading said semiconductor memory device said current path is open, whereby the voltage difference between said pair of differential bit lines is maintained during actual reading of said semiconductor memory device and said voltage difference is reduced by said current path.

4,785,428

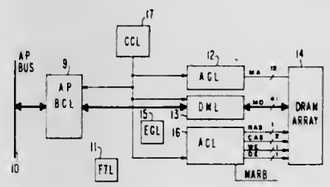
PROGRAMMABLE MEMORY ARRAY CONTROL SIGNALS

Atiq Bajwa, Portland; Robert Duzett, Hillsboro; M. Vittal Kini, Portland; Kent Mason, Portland; Mark S. Myers, Portland, and Sunil Shenoy, Beaverton County, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 18, 1987, Ser. No. 63,468

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—233 **10 Claims**



1. Apparatus for programming a plurality of array control signal lines (**40–48**) between a memory control unit and a memory array (**14**) comprising:

a program RAM (**20**) comprised of memory elements arranged in m columns and n rows;

the m columns of said program RAM (**20**) being a number (m) of timing sequences wherein a timing transition is definable by the presence of a bit in said timing sequence;

the n rows of said program RAM being a number (n) of addressable registers, there being one register for each cycle of programmed access to said memory array (**14**);

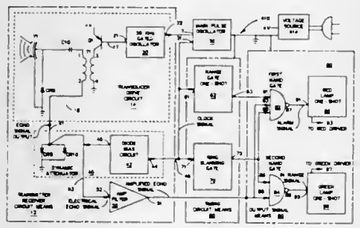
a programmable fractional cycle index register (**28**) for storing a plurality of fractional cycle indexes, one index for said timing transition defined in said RAM, each of said indexes comprising a number (k) of bits, the encoding thereof specifying the particular division of a cycle of said memory array in which said timing transition is defined;

sequence control means (**24**) connected to said RAM (**20**) for sequencing said RAM through said memory array cycles by sequentially selecting said rows of said RAM; and,

signal MUX means (**22**), connected to outputs of said RAM (**20**) for selecting and causing a transition in one of said number array control lines (**40–48**) in response to said bit in said timing sequence for the selected array control line.

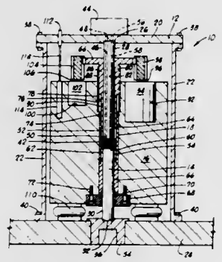
VOL 1096 ISS 3 NO 15 1988 UMI

4,785,429
RANGE CONTROL SYSTEM
Dale E. Folwell, 1113 Wingfoot St., Placentia, Calif. 92670, and William A. Koepsell, 16740 Greenwich Cir., Yorba Linda, Calif. 92686
Filed Mar. 4, 1987, Ser. No. 21,780
Int. Cl.[4] G01S *9/66*
U.S. Cl. 367—98 **14 Claims**



1. A RANGE CONTROL SYSTEM, positioned within a stationary housing mounted at a reference location at a distance from a target and powered from a voltage source referenced to a reference potential such as ground, to provide a signal to indicate the distance of the target from the location of said stationary housing, the RANGE CONTROL SYSTEM comprising:
a MAIN PULSE OSCILLATOR for providing a clock signal;
a TRANSMITTER RECEIVER CIRCUIT MEANS having,
a stepup transformer having a primary having a first and second terminal and a secondary having a first and secondary terminal;
a blocking capacitor having a first and second terminal;
a rectifier diode having a cathode and an anode;
an electrostatic transducer having a first and second terminal;
a gated oscillator means responsive to said clock signal for providing a predetermined number of drive pulses for each clock signal to said stepup transformer primary first terminal;
said stepup transformer secondary first terminal being coupled to said blocking capacitor first terminal;
said blocking capacitor second terminal being coupled to said electrostatic transducer first terminal and to the cathode of said rectifying diode;
the anode of said rectifying diode being coupled to the second terminal of said electrostatic transducer, to said stepup transformer primary second terminal and to said reference potential,
a DIODE CLAMP having a first and second terminal, said first terminal being coupled to said stepup transformer secondary second terminal, said DIODE CLAMP second terminal being coupled to said reference potential;
a DIODE BIAS CIRCUIT responsive to said clock signal for providing a predetermined time dependent unipolar decreasing bias current to said DIODE CLAMP first terminal to bias said diode clamp to provide diminishing attenuation of said electrical echo signal with increasing time; and,
an AMP FILTER CIRCUIT coupled to said DIODE CLAMP first terminal for amplifying electrical echo signals at said DIODE CLAMP first terminal to provide amplified echo signals at a TRANSMITTER RECEIVER CIRCUIT MEANS amplified echo signal output terminal;
a TIMING CIRCUIT MEANS responsive to said clock signal for providing a range gate signal characterized to start with each clock signal and to have a predetermined duration characterized to provide a time for said acoustic pulse to travel to said target and for said echo to return from said target;
OUTPUT SIGNAL MEANS means responsive to the range gate signal and to said amplified echo signal for providing an alarm signal to indicate that an echo signal is received prior to the termination of said range gate signal.

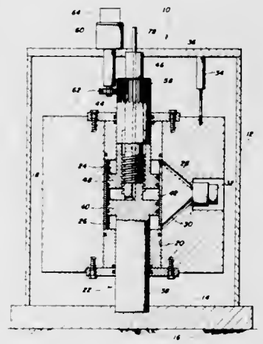
4,785,430
HYDRAULIC VIBRATOR WITH WIDE DYNAMIC RANGE
Jack H. Cole, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Jul. 7, 1987, Ser. No. 70,762
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—189 **11 Claims**



1. Apparatus for generating controlled vibrations, comprising:
a frame means;
piston means extending opposite first and second rod ends which are rigidly secured in said frame means;
a reaction mass having a cylinder bore that is reciprocally disposed on said piston means;
first sleeve means secured between said first rod end and said reaction mass cylinder bore;
threaded adjustable sleeve means positioned between said second rod end and said reaction mass cylinder bore and being spaced from said first sleeve means to define a cylinder space therebetween;
a ring gear affixed to rotate said adjustable sleeve means;
motor means energizable to drive said ring gear and adjustable sleeve means in movement to vary the volume of said cylinder space;
shaft encoder means driven by said ring gear to produce an output indication of adjustable sleeve means position relative to said piston means;
hydraulic means alternating fluid pressure in said cylinder bore on opposite sides of said piston means; and
control means responsive to said output indication of sleeve means position to effect hydraulic centering of said piston means relative to said cylinder bore.

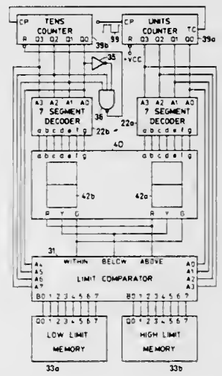
4,785,431
BROAD-BAND HYDRAULIC VIBRATOR
Wilbur J. Myers, Davis, Okla., assignor to Conoco Inc., Ponca City, Okla.
Filed Jun. 25, 1987, Ser. No. 66,390
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—189 **10 Claims**

1. A hydraulic vibrator for producing vibration energy over a broad band of frequencies and transferring the energy into a structure, comprising:
a housing having a base plate and a top member;
a reaction mass having a cylinder bore extending therethrough and positioned within the housing;
fixed piston rod means having a first piston head with upper shaft and lower rod end and extending through the cylinder bore of the reaction mass with said lower rod end fixed to the base plate and the upper shaft end fixed to said top member;
an adjustable piston rod means having a second piston head with an upper rod end and having an axial bore for concentric positioning over the upper shaft of the fixed



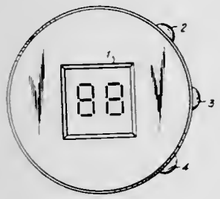
position rod means to dispose the second piston head in the cylinder bore adjacent the first piston head;
first and second rod bushing members sealing said cylinder bore and defining a cylinder chamber; and
adjustment means for axially moving the adjustable piston rod means along the shaft portion of the fixed piston rod means to vary the spacing of said first and second piston heads and thereby vary the cylinder volume.

4,785,432
DIGITAL DISPLAY TIMEPIECE
Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada M6S 4T2
Continuation-in-part of Ser. No. 30,470, Mar. 26, 1987, Pat. No. 4,702,615, which is a continuation-in-part of Ser. No. 946,036, Dec. 24, 1986. This application Oct. 27, 1987, Ser. No. 113,255
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] G04C *19/00*; G09G *1/28*
U.S. Cl. 368—82 **3 Claims**



1. A method of simultaneously indicating a value of time and its relation to a predetermined low time limit and a predetermined high time limit, on a single variable color digital display means, by causing a digital indication of time to be exhibited on said display means, by, comparing said value of time with said low time limit and said high time limit to determine their relation, and by controlling the color of said digital indication in accordance with the relation of said value of time to said low time limit and said high time limit such that said digital indication is illuminated in a first color when said value of time is lower than said low time limit, in a second color when said value of time is higher than said high time limit, and a third color when said value of time is within the bounds of said low time limit and said high time limit, said first, second, and third colors being respectively different.

4,785,433
PET WATCH PROCESS AND CIRCUIT
George Bush, 1675 York Ave., Suite 34B, New York, N.Y. 10128, and Estelle Ross, 41 Buxton St., Lido Beach, N.Y. 11561
Filed Jan. 19, 1988, Ser. No. 145,462
Int. Cl.[4] G04F *8/00*; A01K *15/00*
U.S. Cl. 368—109 **1 Claim**



1. A method of training an animal to return to a person through theuse of an animal-borne timer having an audible alarm and test signal comprising, in the order listed, the steps of:
repeatedly initiating the timer test signal while the person calls the animal until the animal responds by returning to the person, rewarding the animal when it does so;
repeatedly initiating the timer test signal without the person calling the animal until the animal responds by returning to the person, rewarding the animal when it does so;
affixing the timer to the animal;
repeatedly setting the timer to various intervals of time until the animal consistently responds to the audible alarm by returning to the person, rewarding the animal when it does so;
and repeating the previous step with the animal initially located at a site remote from that of the person, rewarding the animal when it returns to the person in response to the alarm.

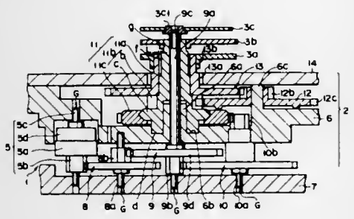
4,785,434
SLIP STRUCTURE OF A TIMEPIECE
Masaru Shoji, Akishima; Wataru Yamada, Tachikawa; Masayoshi Tanazawa, Musashino; Mitsunobu Yatabe, Komae; Kenichi Nakamura, Fussa; Satoshi Fujio, Akishima; Masaki Yokohama, Fussa; Takashi Watanabe, Tachikawa, and Kanenori Ochiai, Kodaira, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 16, 1987, Ser. No. 121,138
Claims priority, application Japan, Nov. 19, 1986, 61-276230; Mar. 7, 1987, 62-32599[U]
Int. Cl.[4] G04B *17/12, 29/00*; F16H *55/17*
U.S. Cl. 368—185 **42 Claims**

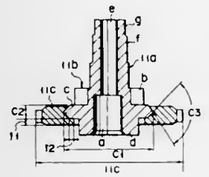
1. A slip structure of a timepiece comprising
a synthetic resin shaft portion, and
a synthetic resin gear portion which is molded on said syn-

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thetic resin shaft portion to be capable of slipping, in which

during a normal timepiece operation, said shaft and gear





portions are integrally rotated, and during a hand setting operation, only said shaft portion is rotated, wherein

at least one of said shaft and gear portions is formed of an oil-containing resin material.

4,785,435

SELF-CHARGEABLE ELECTRONIC TIMEPIECE WITH OPERATING VOLTAGE CHECKING

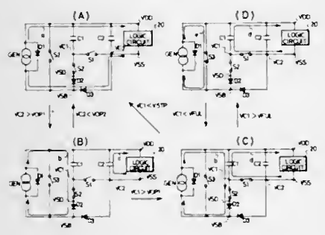
Yuichi Inoue; Chiaki Nakamura; Sbuji Obtawa, and Hiroyuki Masaki, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 35,087

Claims priority, application Japan, Apr. 8, 1986, 61-80717; Apr. 8, 1986, 61-80724; Apr. 9, 1986, 61-81517; Apr. 15, 1986, 61-86567

Int. Cl.[4] G04B *3/00*

U.S. Cl. 368—205 **11 Claims**



1. An electronic analog timepiece having a time-indicating member driven by a step motor with voltage checking function comprising:

oscillation means for generating a time base signal having a given frequency;

frequency dividing means for dividing the frequency of the time base signal to produce a divided signal;

pulse synthesizing circuit means for producing a plurality of control signals in response to the divided signal from the frequency dividing means;

step motor driving means for generating and controlling driving pulses effective to drive the step motor in response to the control signals of the pulse synthesizing circuit means;

power supply means including a primary power source for generating electric energy, and a secondary power source for accumulating the electric energy, the secondary power source being comprised of a first condenser having a relatively large capacity and a second condenser having a smaller capacity than that of the first condenser;

voltage detecting means including a plurality of voltage detectors for detecting a plurality of terminal voltages of the first condenser and the second condenser, respectively, and a sampling signal selecting circuit for producing a first sampling signal having a relatively long period effective to determine a relatively long time interval of the terminal voltage detection when the timepiece is powered by the first condenser having relatively large capacity and a second sampling signal having a relatively short period effective to determine a relatively short time interval of the terminal voltage detection when the timepiece is powered by the second condenser having relatively small capacity; and

charge control means for controlling the accumulation and supply of the electric charge in the power supply means in response to the detecting result of the voltage detecting means.

4,785,436

PHOTOVOLTAIC ELECTRONIC TIMEPIECE

Masahiro Sase, Sayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1987, Ser. No. 13,755

Claims priority, application Japan, Feb. 14, 1986, 61-030466; Feb. 21, 1986, 61-037053

Int. Cl.[4] G04B *1/00*

U.S. Cl. 368—205 **8 Claims**



1. An electronic timepiece, including a base reference signal generator for generating a base reference signal, a time display device, a capacitor power storage means, and a photovoltaic means for charging said capacitor, characterized by:

a first modulated signal generator for generating a first modulated signal to drive said time display to indicate that said capacitor needs to be charged,

a second modulated signal generator for generating a second modulated signal to drive said time display to indicate that said base reference signal generator has stopped,

a voltage detector for generating a low voltage signal in response to a low voltage output of said capacitor power storage means,

detector means for detecting that the signal from said base reference signal generator has stopped and for generating and storing a stop signal indicating that the base reference signal has stopped,

a signal selector for selecting and supplying to said display device the first modulated signal when said low voltage signal is present and for selecting and supplying to said display device said second modulated signal when said stop signal is present.

4,785,437

PROCESS FOR READING-OUT INFORMATION FROM ELECTRICALLY POLARIZABLE DATA CARRIERS BY MEANS OF ELECTRON BEAMS

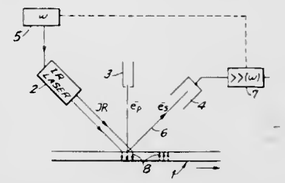
Klaus Dransfeld, Ermatingen, Switzerland, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1985, Ser. No. 806,246

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447208

Int. Cl.[4] G11B *9/02, 9/10, 11/08, 13/04*

U.S. Cl. 369—13 **7 Claims**



1. In a process for reading-out information from a layered, residually polarized data carrier corresponding to recorded information in local domains, including scanning the domains by an electron beam, the improvement comprising:

(a) periodically heating the areas to be read-out at an activation frequency by one of radiating electromagnetic waves and ultrasonic waves to activate the areas to produce potential fluctuations of equal frequency which modulate a secondary electron flow of secondary electrons corresponding to the polarization.

(b) detecting the secondary electrons emitted by the read-out areas by a multiplier and

(c) frequencer selectively amplifying an alternating voltage occurring on the multiplier and evaluating the amplified voltage according to at least one of rate and phase position with respect to the activation frequency.

4,785,438

MAGNETO-OPTICAL DISC REPRODUCING APPARATUS WITH IMPROVED TWO-PART HEAD

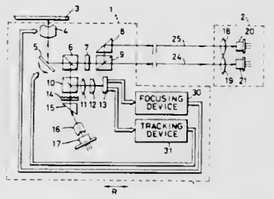
Katsumi Mizunoe, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 30, 1985, Ser. No. 814,438

Claims priority, application Japan, Jan. 9, 1985, 60-01794

Int. Cl.[4] G11B *7/095, 13/04, 11/00*

U.S. Cl. 369—13 **10 Claims**



1. A reproducing apparatus for reproducing a signal recorded on a magneto-optical disc, comprising:

a first head portion;

a fixed second head portion;

said first head portion being movable in one direction relative to said disc and relative to said second head portion;

means disposed on said first head portion for producing a linearly polarized light beam;

an optical system disposed on said first head portion for directing said light beam to said magneto-optical disc;

optical means disposed on said first head portion for dividing light reflected by said magneto-optical disc into two components having different planes of polarization and for directing said two components to said second head portion;

first light intensity detecting means disposed on said second head portion for detecting the intensity of light of one of said two components; and

said light intensity detecting means disposed on said second head portion for detecting the intensity of light of the other of said two components.

4,785,439

OPTICAL MEMORY ACCESSING AND TRACKING APPARATUS WITH PICKUP AND LENS SERVOING DURING TRACKING

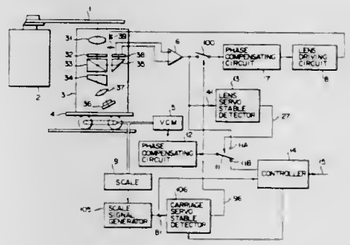
Hiroo Okada, Ina; Yoshiaki Ikeda, and Ken Ohshima, both of Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,937

Claims priority, application Japan, Mar. 8, 1985, 60-45784

Int. Cl.[4] G11B *21/08, 21/10, 7/09*

U.S. Cl. 369—32 **15 Claims**



1. An optical recording/reproducing apparatus having a velocity control mode used for approaching a target from more than a preset distance, and a position control mode used when the target track is relatively close to being reached, said apparatus comprising:

pickup means with a laser source for recording/reproducing data on a storage medium, an objective lens having an optical axis, and lens driving means for adjusting the optical axis of said objective lens relative to an information storage medium;

pickup moving means for moving said pickup means relative to said information storage medium;

lens stable detecting means for detecting that said objective lens is in a stable state in which a given position relative to said information storage medium is maintained; and

tracking means for, in said position control mode, starting a lens servo-tracking operation of said lens driving means in response to a tracking instruction, and for starting a carriage servo-tracking operation of said pickup moving means in response to a detection output from said lens stable detecting means, the detection output representing that the lens is in the stable state.

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4,785,440

METHOD AND APPARATUS FOR DRIVING AN OPTICAL PICKUP OF AN OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

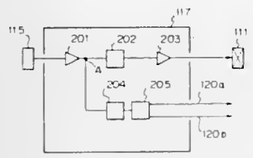
Satoshi Shikichi; Akio Aoki, both of Tokyo, and Kazuo Minoura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,442

Claims priority, applicatioo Japan, May 24, 1985, 60-110101; Sep. 26, 1985, 60-211143

Int. Cl.[4] G11B *21/10*

U.S. Cl. 369—44 **3 Claims**



1. A method for driving an optical pickup of an optical information recording and/or reproducing apparatus in which the optical pickup has an objective lens to be moved along an information track of an optical information recording medium having plural such information tracks formed thereon, said method comprising the steps of:

performing auto-tracking of the objective lens;

detecting whether the objective lens is displaced a predetermined distance from a reference position in the optical head during the auto-tracking; and

moving the optical pickup intermittently a plurality of times in the same direction as that of the displacement of the objective lens from the reference position, when the displacement of the predetermined distance is detected in said detecting step, while maintaining the auto-tracking of the objective lens, a distance of movement in each of such intermittent movements of the optical pickup being set to be smaller than a pitch of the information tracks formed on the recording medium.

4,785,441

TRACKING ERROR CORRECTION APPARATUS UTILIZING PHASE DIFFERENCE INFORMATION DERIVED FROM FOUR PHOTOCELLS

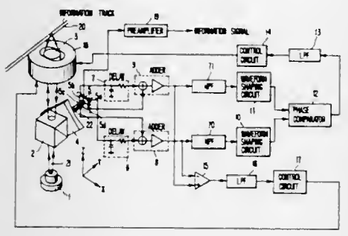
Shinichi Tanaka, Kyoto; Haruo Isaka; Hiroshi Yasuda, both of Hirakata, and Toshiki Itoi, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 16, 1987, Ser. No. 4,139

Claims priority, application Japan, Jan. 16, 1986, 61-6711

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—44 **10 Claims**



1. An optical information reproducing apparatus for optically reading an information recorded as a succession of pits formed on an information track on a recording medium, comprising:

means for forming a light spot on said recording means;

converging means for collecting a reflected light from said light spot to form a far field image of said light spot;

a photodetector for receiving said far field image, said photodetector comprising first through fourth photocells respectively disposed at first through fourth quadrants defined by a first straight line parallel to a direction in which said information track is projected and a second straight line perpendicular to said first straight line, where said first straight line defines a border between said first and fourth quadrants and between said second and third quadrants, and said second straight line defines a border between said first and second quadrants and between said third and fourth quadrants;

means for producing an information signal corresponding to said information from an output signal of said photodetector;

tracking error detecting means comprising: first delaying means for delaying an output signal of said first photocell for a specified time; second delaying means for delaying an output signal of said second photocell for said specified time; first adding means for adding an output signal of said first delaying means and an output signal of said third photocell; second adding means for adding an output signal of said second delaying means and an output signal of said fourth photocell; and phase comparison means for producing, as a tracking error signal, a phase difference signal corresponding to a difference of phases of output signals of said first and second adding means; and

means responsive to said tracking error signal for driving said light spot forming means to correct a tracking error.

4,785,442

LIGHT SPOT POSITION CONTROL SYSTEM AND METHOD BY SAMPLING SERVO

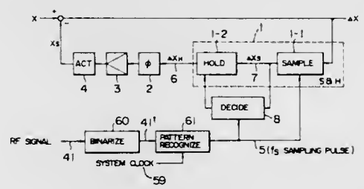
Masatoshi Ohtake, Ome; Seiji Yonezawa, Hachioji; Toshiaki Tsuyoshi, Kokubunji; Wasao Takasugi, Higashiyamato, and Takashi Takeuchi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 72,095

Claims priority, application Japan, Jul. 11, 1986, 61-161837

Int. Cl.[4] G11B *7/00, 21/10*

U.S. Cl. 369—44 **7 Claims**



1. A system for controlling a position of a light spot comprising:

a recording medium in which a servo area and a data area are alternately formed along a track;

error detecting means for irradiating a light spot onto said recording medium and for detecting error signals, as sampled signals, from the lights obtained from said servo areas;

deciding means connected to said error detecting means, for discriminating whether the error signal detected by said error detecting means is correct or incorrect; and

control signal generating means for outputting as a position control signal either the error signal detected by the error detecting means or an error signal based on at least one preceding sample value on the basis of an output of said deciding means.

4,785,443

LIGHT CONTROL CIRCUIT OF OPTICAL DISC SYSTEM

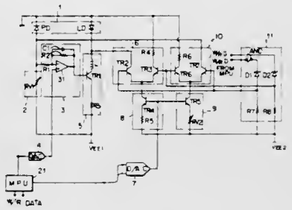
Akira Minami, Yokohama, and Akio Futamata, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,785

Claims priority, application Japan, Nov. 14, 1985, 60-255422

Int. Cl.[4] G11B *7/125*

U.S. Cl. 369—116 **25 Claims**



1. A light control circuit of an optical disc system having an optical disc storing data, a light emitting element used for writing data to and reading data from the optical disc, and a light sensing element sensing light from the light emitting element, comprising:

light control means, operatively connected to the light emitting element and the light sensing element, for energizing the light emitting element and for controlling a light level of the light emitting element at a first predetermined level sufficient for reading data from the optical disc in response to a signal from the light sensing element;

energizing means, operatively connected to the light emitting element and said light control means, for energizing the light emitting element in cooperation with said light control means, at a second predetermined level sufficient for writing data in the optical disc, when data is written to the optical disc; and

subtracting means, operatively connected to the light sensing element and to said light control means in parallel, being synchronously operable with said energizing means, for subtracting a third predetermined level from the signal from the light sensing element.

4,785,444

OPTICAL RECORDING DISC

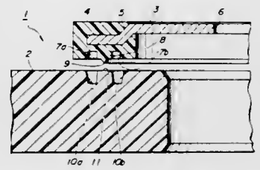
Yasuaki Nakane; Kazumine Ito, both of Tokyo; Sanae Abe, Chiba, and Takashi Naito, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 16,784

Claims priority, application Japan, Feb. 20, 1986, 61-035890

Int. Cl.[4] G11B *23/00, 5/82, 7/00*

U.S. Cl. 369—282 **43 Claims**



1. An optical recording disc on which information is optically recorded or reproduced, the optical recording disc comprising:

(a) a disc substrate made of a synthetic resin and having a light transmittance;

(b) a hub fixed to a substantially center part of the disc substrate and having a magnetic metal plate; and

(c) a groove for absorbing a stress imposed on the optical recording disc and generated due to a difference in thermal expansion rates between the disc substrate made of the synthetic resin and magnetic metal plate, which is located at least at a periphery outside of a part at which the disc substrate and hub are fixed together and is extended on at least either of the disc substrate or hub.

4,785,445

METHOD OF MANUFACTURING $BAPB_{1-x}BI_xO_3$ SINGLE CRYSTAL

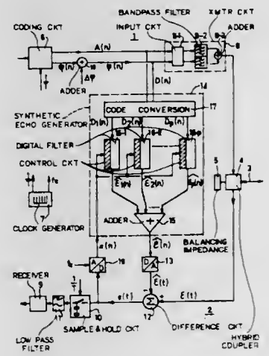
Loïc B. Y. Guidoux, La Queue lez Yvelines, France, assignor to Telecommunications Radioelectriques et Telephoniques T.r.T., Paris, France

Continuation of Ser. No. 582,855, Feb. 24, 1984, abandoned, which is a continuation of Ser. No. 230,848, Feb. 2, 1981, abandoned. This application Feb. 22, 1985, Ser. No. 704,897

Claims priority, application France, Feb. 1, 1980, 8 002274

Int. Cl.[4] H04B *3/20*

U.S. Cl. 370—32.1 **12 Claims**



1. An echo canceller associated with a data transmission modem, the modem utilizing amplitude and phase modulation, the modem including a transmit path and a receive path, such that an undesired echo signal appears in the receive path resulting from a carrier signal in the transmit path, the carrier signal having a phase and amplitude state at each modulation interval, the echo canceller comprising:

(a) first input means coupled to the transmit path for receiving a digital representation of the carrier signal, the representation indicating for each modulation interval the phase and amplitude state of the carrier signal;

(b) code conversion means coupled to receive the representation and having a plurality of parallel outputs, each of the parallel outputs providing one of the values +1, −1, and 0, so that the parallel outputs together provide distinct configurations $D_i(n)$ corresponding to the phase and amplitude states of the carrier signal, said distinct configurations satisfying the equation:

$$E[D_i(n)\cdot D_{i'}(n)]=0$$

where: the operator E represents mathematical expectation; n is an integer representing an instant of time; i and i' represent respective parallel outputs of the code conversion means and are integers between 1 and a number of the parallel outputs; $i\neq i'$; and $D_i(n)$ and $D_{i'}(n)$, are the values provided at the respective parallel outputs;

(c) output means, coupled to the receive path, for providing an analog synthetic echo signal;

(d) means, disposed within the receive path, for subtractively combining the analog synthetic echo signal and the

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undesired echo signal to produce a residual echo signal therefrom;

(e) second input means coupled to the receive path, for supplying a digital representation of the residual echo signal; and

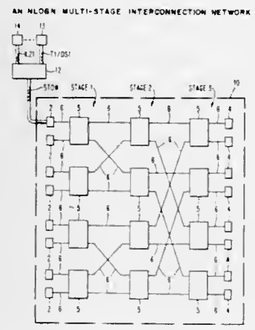
(f) a plurality of adaptive filters, coupled to receive the distinct configurations from respective ones of the parallel outputs of the code conversion means and to receive the digital representation of the residual echo signal from the second input means, having respective outputs coupled with the output means of the echo canceller, and having coefficients which are adjusted in an iterative manner in order to minimize the mean square value of the residual echo signal.

4,785,446

DISTRIBUTED BIT SWITCHING OF A MULTISTAGE INTERCONNECTION NETWORK

Daniel M. Dias, Mahopac; Yeong-Chang Lien, Briarcliff Manor, both of N.Y., and Kiyoshi Maruyama, Campbell, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1986, Ser. No. 927,988
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—58 **10 Claims**



1. A method of controlling a multistage interconnection network for the switching of synchronous and asynchronous data, the network having a number of switch elements used to interconnect a number of conductive links used to forward the synchronous and asynchronous data from selected inputs of the switching elements to selected outputs of the switching elements during each frame of a first sequence of frames, the network also having a number of input adapters so that there is an input adapter for each input of each switching element of a first stage of the multistage interconnection network, the method of comprising the steps:

(a) storing configuration bits in the switch elements by transmitting the configuration bits over the same said links that are used for the transmission of said data, each configuration bit being transmitted from an input adapter of said input adapters without passing through a central controller, each configuration bit (of the configuration bits) being transmitted in any free slot of a frame of the sequence of frames, each said configuration bit being used to indicate the output to be used by an associated switching element in establishing a path through the multistage interconnection network, the association between a switching element (of the switching elements) and a configuration bit (of the configuration bits) being identified according to which frame in a sequence of frames the configuration bit is transmitted; and

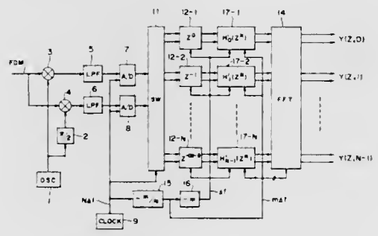
(b) setting the configuration of each of the switch elements during each particular time slot to correspond to the configuration represented by a corresponding set of configuration bits stored in each respective switch element, each configuration of each of the switching elements being used to interconnect selected links, of the links of the network, at the inputs of each respective switch element to selected links at the outputs of each respective switching element, each of the selected links being used to forward data from one of the switch elements to another of the switch elements of the network.

4,785,447

FDM DEMULTIPLEXER USING OVERSAMPLED DIGITAL FILTERS

Osamu Ichiyoshi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 12, 1988, Ser. No. 155,301
Claims priority, application Japan, Feb. 17, 1987, 62-32557; Feb. 17, 1987, 62-32558
Int. Cl.[4] H04J *4/00*
U.S. Cl. 370—70 **6 Claims**



1. An FDM demultiplexer comprising:

means for converting an N-channel FDM (frequency division multiplexed) signal into complex signals of baseband frequencies, the channels of said FDM signal being spaced at frequency Δf;

analog-to-digital converting means for converting said complex signals into digital samples having a frequency $N\Delta f$;

serial-to-parallel converter means for converting a series of N digital samples of said complex signals into N parallel digital signals;

a plurality of first finite impulse response (FIR) subfilter means for respectively filtering said parallel digital signals at frequency Δf to produce a first series of filtered digital signals from each of said first FIR subfilter means;

$(m-1)$ groups of second FIR subfilter means, the second FIR subfilter means of each of said $(m-1)$ groups respectively filtering said parallel digital signals at frequency Δf and delivering a second series of filtered digital samples from each of said second FIR subfilter means at timing displaced with respect to said first series by $a/m\Delta f$, where a is an integer ranging from unity to $(m-1)$ and m is an integer equal to or greater than 2;

a plurality of adders for respectively summing outputs of said first FIR subfilter means with outputs of said second FIR subfilter means to produce N summation outputs at frequency $m\Delta f$; and

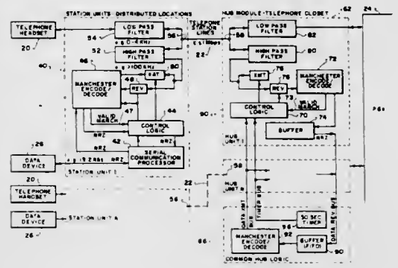
an N-point Fast Fourier Transform (FFT) processor connected to said adders for performing fast Fourier transform on said N summation outputs at frequency $m\Delta f$.

4,785,448

SYSTEM FOR COMMUNICATING DIGITAL DATA ON A STANDARD OFFICE TELEPHONE SYSTEM

Andrew R. Reichert, 176 Shady Grove La., Thousand Oaks, Calif. 91361; William J. Schirmer, 19543 Hart St., Reseda, Calif. 91335; Nicholas M. Esser, 1063 Balsamo Ave., Simi Valley, Calif. 93065; Bradley R. Nelson, 13160 Williams Ranch, Moor Park, Calif. 93021; Lauren T. May, 20110 Kinzie St., Chatsworth, Calif. 91311, and Stewart C. Brown, 2008B W. Ocean, Newport Beach, Calif. 92663

Filed Feb. 25, 1987, Ser. No. 18,924
Int. Cl.[4] H04J *1/02, 1/00*
U.S. Cl. 370—76 **26 Claims**



1. In combination with a local telephone network including a plurality of telephone handsets each located at a different station, and each adapted to be connected by a wire pair to a telephone exchange for communicating voice band signals therebetween, apparatus for enabling a plurality of digital data devices distributed amongst said stations to communicate data signals between one another over said wire pairs without interfering with said voice band signals, said apparatus comprising:

a plurality of station units, each located at a different one of said station, and each having a pair of station network terminals connected to a first end of one of said wire pairs;

low pass filter means in each of said station units for coupling one of said telephone handsets to said pair of station network terminals;

processing means in each of said station units responsive to data supplied by a data device connected thereto for outputting Manchester encoded data nd responsive to Manchester encoded data supplied thereto for outputting data to said data device;

means including high pass filter means in each of said station units for coupling said processing means to said pair of network terminals;

a plurality of hub units each having a pair of hub network terminals connected to a second end of one of said wire pairs;

low pass filter means in each of said hub units for coupling said pair of hub network terminals to said telephone exchange;

processing means in each of said hub units responsive to Manchester encoded data received at the hub network terminals of that hub unit for outputting related data to all other hub units for transmission via wire pairs to station units connected thereto; and

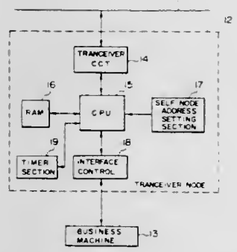
means including high pass filter means in each of said hub units for coupling the processing means therein to the hub network terminals thereof.

4,785,449

NETWORK SYSTEM FOR DATA TRANSMISSION AMONG PLURAL COMMUNICATIONS STATIONS CONNECTED TO A COMMUNICATION MEDIUM

Yasuo Nakamura, Fuchu, and Makoto Chida, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1985, Ser. No. 733,769
Claims priority, application Japan, May 21, 1984, 59-102359; May 21, 1984, 59-102360
Int. Cl.[4] H04J *3/02, 3/16*
U.S. Cl. 370—85 **17 Claims**



1. A network system including a plurality of nodes, connected to each other through a communciation medium, wherein only a node to which a communication right has been assigned is able to perform data transmission between that node and another node, wherein each of the nodes comprises:

means for assigning the communication right to another node of said plurality of nodes;

means for transmitting a specific command which contains data indicating an address of the transmitting node to all of the other nodes of said plurality of nodes, when the communication right is assigned first from any one of the other nodes of said plurality of nodes after its entry into the network system; and

means for recognizing the address of the new entry node into the network system on the basis of the data contained in the specific command, upon receipt of the specific command transmitted from another node.

4,785,450

APPARATUS AND METHOD FOR OBTAINING FREQUENCY AGILITY IN DIGITAL COMMUNICATION SYSTEMS

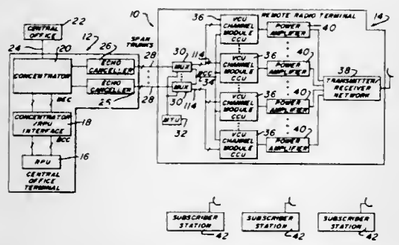
Duane R. Bolgiano, Gladwyne, and Chumlong Deangdeelert, Philadelphia, both of Pa., assignors to International Mobile Machines Corporation, Philadelphia, Pa.

Filed Aug. 6, 1987, Ser. No. 82,238
Int. Cl.[4] H04J *3/16;* **H04Q** *7/00;* **H04B** *7/00*
U.S. Cl. 370—95 **8 Claims**

1. In a communication system provided with a base station that is in communication with a central office and subscriber stations that are connected to said base station by RF channels, said base station having multiple sequentially repetitive time slots and a plurality of frequency channels, said time slots and frequency channels being selectively assignable to said subscriber stations by movement of said subscriber stations to selected vacant time slots or frequency channels in accordance with a predetermined assignment schedule, said system including assignment means for selectively assigning time slots and

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frequency channels to any of the subscriber stations in response to either the coming on line of an additional subscriber or to a



deterioration in transmission between the base station and a subscriber station in communication therewith.

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GENERATOR FOR AN ERROR CORRECTING CODE, A DECODER THEREFORE, AND A METHOD FOR THE SAME

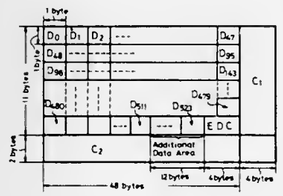
Yoichiro Sako, and Shinichi Yamamura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 5, 1987, Ser. No. 539

Claims priority, application Japan, Jan. 10, 1986, 61-3147; Jan. 24, 1986, 61-13553

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—37 **14 Claims**



1. A generator for generating an error correcting code for correcting possible errors in a predetermined amount of digital data attached to an error detecting code for detecting the possible errors in said predetermined amount of data, comprising:

(a) data block supply means for segmenting said predetermined amount of data into blocks of predetermined data length and for sequentially supplying said data blocks;

(b) error correcting code generator means sequentially supplied with each of said data blocks from the data block supply means for generating separate error correcting codes corresponding to each of said data blocks;

(c) last data block detection means for detecting the last data block supplied from said data block supply means and outputting a detection signal;

(d) error detecting code generating means sequentially supplied with each of said data blocks from the data block supply means for generating a unique error detecting code, which is formed from the plurality of data blocks comprising said predetermined amount of data, in resonse to the detection signal from said last data detection means; and

(e) means for suplying the error detecting code, which is derived from said error detecting code generating means, and said last data block to said error correcting code generating means, said error detecting code being added to said last data block to thereby form the predetermined data length which constructs one of said data blocks.

4,785,452

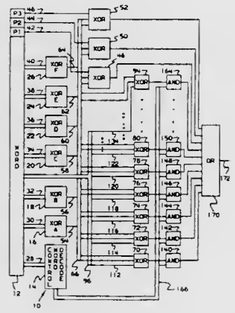
ERROR DETECTION USING VARIABLE FIELD PARITY CHECKING

Bruce R. Petz; Richard P. Rieger, both of Rochester, and Andrew D. Walls, Albert Lea, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1986, Ser. No. 855,645

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—38 **15 Claims**



1. A parity checker for a memory storing variable length multibit words having a variable number of parity bits, the checker comprising:

a decoder for decoding the variable length words to identify the parity bits contained therein, and to identify selected bits to which said parity bits correspond; and

a parity checker coupled to the decoder for checking the parity of the selected bits in said words against the identified parity bits as a function of the variable number of parity bits contained in each word.

4,785,453

HIGH LEVEL SELF-CHECKING INTELLIGENT I/O CONTROLLER

Strikumar R. Chandran, San Jose; Edward J. Rhodes, Los Gatos; Albert S. Lui, and Mark S. Walker, both of San Jose, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 733,679, May 10, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 68,732

Int. Cl.⁴ G06F *11/16*

U.S. Cl. 371—68 **8 Claims**

1. A dual modular redundant processor apparatus for assuring data integrity, said apparatus comprising:

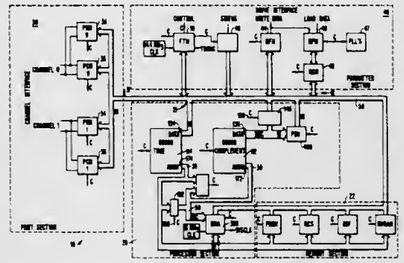
first and second processor means for respectively producing true and complement operating signals in the absence of any abnormal condition in the dual modular redundant processor apparatus;

internal system bus means coupled to the first and second processor means for comunicating the operating signals;

means for producing a periodic clock signal;

synchronizer means coupled to the internal system bus means for synchronizing leading edges of true and complement pairs of the operating signals produced by said first and second processor means, the synchronizer means including means responsive to the periodic clock signal for cyclically sampling the true and complement pairs of the operating signals, and output means coupled to the sampling means and responsive to the clock signal for producing synchronized operating signals having synchronized leading edges and corresponding to the true and complement pairs of the operating signals;

checker means responsive to the synchronized operating signals for determining whether complementation exists therebetween, said checker means generating a dual-railed error signal in the event of absence of such complementation; and



error detector means for receiving the error signals from said checker means, said error detector means generating and transmitting to each of said first and second processor means an error detected signal, whereby said first and second processor means can take appropriate action in response to the true and complement operating signals being detected as not having the predetermined logical relationship.

4,785,454

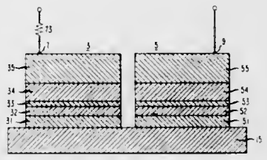
STABILIZED CLEAVED-COUPLED CAVITY LASER

Nils A. Olsson, Berkeley Heights, and Won-Tien Tsang, New Providence, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1983, Ser. No. 494,275

Int. Cl.⁴ H01S *3/10*

U.S. Cl. 372—26 **18 Claims**



1. A light transmitter comprising a cleaved-coupled cavity laser comprising a laser section and a modulator section, means for measuring at least one characteristic of the light output from one of said sections with respect to the current through the modulator section; and feedback means using said at least one characteristic to maintain said output at a desired spectral value.

4,785,455

LIGHT EMITTING DEVICE WITH IMPROVED ELECTRODE STRUCTURE TO MINIMIZE SHORT CIRCUITING

Masaaki Sawai, Takasaki; Masamichi Kobayashi, Maebashi; Shoji Hayashi, Takasaki; Hiroshi Naka, Komoro, and Masahiro Ichiki, Tamamura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

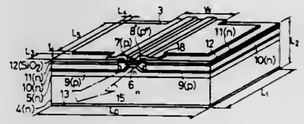
Division of Ser. No. 712,029, Mar. 15, 1985, Pat. No. 4,692,927. This application Jul. 27, 1987, Ser. No. 78,097

Claims priority, application Japan, Mar. 16, 1984, 59-49033; Apr. 13, 1984, 59-72819

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—46 **1 Claim**



1. A light emitting device comprising:

(1) a semiconductor block consisting essentially of:

(a) a first main plane;

(b) a second main plane facing said first main plane;

(c) a first end surface interposed between said first and second main planes;

(d) a second end surface facing said first end surface and interposed between said first and second main planes;

(e) a first side wall interposed between said first and second main planes and said first and second end surfaces;

(f) a second side wall facing said first side wall and interposed between said first and second main planes and said first and second end surfaces; and

(g) a light emitting region having a longitudinal axis extending between said first and second end surfaces so that one of the ends thereof is exposed on said first end surface and the other end thereof is exposed on said second end surface, wherein said second main surface has a periphery including end peripheral edges at intersections of said second main plane and said first and second end surfaces and side peripheral edges at the intersections of said second main plane and said first and second side walls; and

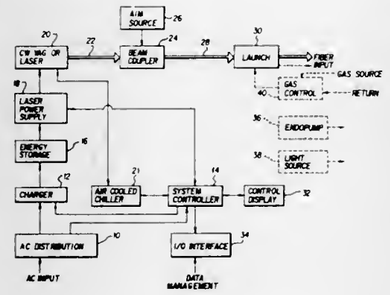
(2) an electrode consisting essentially of:

(a) a first electrode portion disposed on said second main plane of said semiconductor block along said light emitting region, and having the width thereof greater than the width of said light emitting region; and

(b) a second electrode portion disposed on said second main plane of said semiconductor block, connected completely integrally with said first electrode portion, and having a periphery thereof recessed along said second main plane to be out of contact from both the end peripheral edges and the side peripheral edges of the periphery of said main plane, wherein the length of said first electrode portion in a direction parallel to the longitudinal axis of said light emitting region is at least longer than that of said second electrode portion.

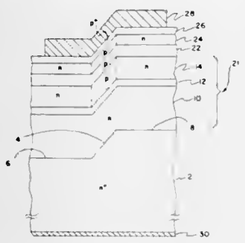
VOL 1096 ISS 3 NO 15 1988 UMI

4,785,456
SELF-CONTAINED LASER SYSTEM
Robert A. Kaplan, Huntington Station, N.Y., assignor to Lasers for Medicine Inc., Hauppauge, N.Y.
Continuation-in-part of Ser. No. 851,245, Apr. 14, 1986. This application Jan. 22, 1988, Ser. No. 147,177
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 **5 Claims**



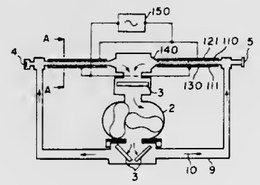
1. An energy management circuit comprising
a laser;
an AC input with a maximum power level;
a DC source of energy operating in conjunction with said AC input and functioning to provide supplementary power as needed for operation of said laser, when the system power drain is more than the maximum power level available from the AC input thus enabling the laser system to operate at an input power level which is higher than said maximum power level of said AC input; and
a charging unit serving to supply energy to the DC source of energy when the system power drain for operation is less than said maximum power level from said AC input.

4,785,457
HETEROSTRUCTURE SEMICONDUCTOR LASER
Peter M. Asbeck, Newbury Park, and David L. Miller, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed May 11, 1987, Ser. No. 48,359
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **15 Claims**



1. In a semiconductor laser:
an epitaxial active layer of a semiconductor;
an epitaxial injection layer of a semiconductor on one side of the active layer;
an epitaxial confinement layer of a semiconductor on the other side of the active layer having a dopant that provides a first conductivity in first crystallographic planes and an opposite conductivity in second crystallographic planes having a different orientation, the confinement layer having a first portion which lies within the first crystallographic planes and another portion which lies within the second crystallographic planes on both sides of the first portion whereby current across the active layer can be confined to the first portion by the change in conductivity type of the confinement layer; and
means for making electrical contact to the injection layer and to the confinement layer.

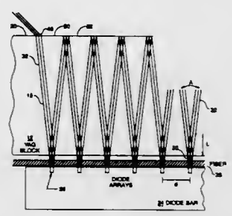
4,785,458
GAS LASER DEVICE
Masaki Kuzumoto, Kawanishi; Shigenori Yagi, Amagasaki; Shuji Ogawa, Nishinomiya, and Koji Yasui, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 7, 1985, Ser. No. 699,126
Claims priority, application Japan, Feb. 13, 1984, 59-24705; Feb. 24, 1984, 59-33656; Sep. 19, 1984, 59-196313
Int. Cl.[4] H01S *3/22, 3/223*
U.S. Cl. 372—58 **36 Claims**



1. A gas laser device, which comprises in combination:
(a) a discharge tube made of a dielectric material;
(b) a laser medium gas which is circulated within said discharge tube in the axial direction thereof;
(c) an optical resonator composed of mirrors disposed in mutual confrontation at both ends of said discharge tube;
(d) a p lurality of electrodes provided on radially opposite sides of the outer periphery of said discharge tube; and
(e) a power source for applying an a.c. voltage to said electrodes to generate silent discharge;
(f) a metal piece provided in the vicinity of the discharge section and extending through said discharge tube wherein a trigger potential is applied to said metal piece through a capacitor to cause a trigger discharge.

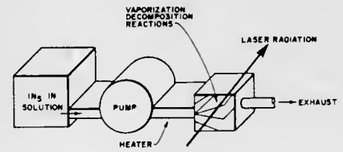
4,785,459
HIGH EFFICIENCY MODE MATCHED SOLID STATE LASER WITH TRANSVERSE PUMPING
Thomas M. Baer, 101 Centre, #21, Mountain View, Calif. 94041
Continuation-in-part of Ser. No. 35,530, Apr. 7, 1987, which is a continuation-in-part of Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056. This application Sep. 30, 1987, Ser. No. 103,557
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—75 **20 Claims**

1. A mode matched diode pumped solid state laser, comprising:
a block of laser material having a pair of opposed sides;
cavity forming means positioned around the block to define a laser cavity having a tightly folded zig-zag resonator portion within the block between the opposed sides at a preselected fold angle;
a plurality of linearly spaced laser diode pumping sources positioned adjacent to one of the opposed sides and substantially aligned with the zig-zag portion of the resonator;



the fold angle being selected to substantially match the mode volume with pump radiation from the pump sources.

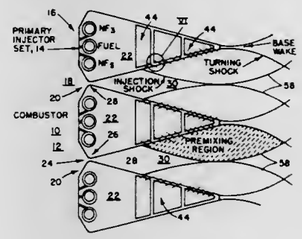
4,785,460
LASER GENERATED BY THE INTERACTION OF MOLECULES CONTAINING THE AZIDE RADICAL AND A MOLECULE CONTAINING A HALOGEN ATOM
Robert A. Young, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Jun. 11, 1987, Ser. No. 60,558
Int. Cl.[4] H01S *3/095*
U.S. Cl. 372—89 **14 Claims**



1. A method for generating a lasing effect in a chemically pumped laser using molecules containing the azide radical and a molecule containing an iodine atom, the method comprising:
(a) providing a replenishable chemical source of N_3 and I;
(b) introducing by mixing gas streams, the N_3 and I into a laser cavity;
(c) reacting the N_3 and I in the laser cavity;
(d) producing excited species within the laser cavity from the reaction of N_3 and I;
(e) generating a lasing effect by the interaction of reactants contained within the laser cavity, said reactants selected from excited species and I; and
(f) cooling the laser system to remove thermal energy.

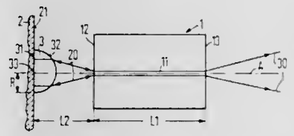
4,785,461
PREMIXED COLD REACTION CW LASER NOZZLE
Dale L. Hook, Rancho Palos Verdes, and James E. Broadwell, Los Angeles, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 5, 1987, Ser. No. 11,084
Int. Cl.[4] H01S *3/095*
U.S. Cl. 372—89 **2 Claims**

1. A combustor for a premixed cold reaction CW chemical laser, said combustor comprising:
a combustion chamber, said combustion chamber containing reaction products forming heated primary gas having therein atomic species of an oxidizer, said combustion chamber directing said reaction products to an output plenum;
a plurality of wedges positioned downstream of said output plenum to form a plurality of primary nozzles, each of said primary nozzles having an input section, a throat section, and an output section, said sections forming a supersonic nozzle to output said reaction products as a supersonic gas;
a plurality of secondary injectors having supersonic jets therefrom, said secondary injectors being located on exit walls substantially parallel to the streamlines of said primary nozzles and located downstream of said throat section of said primary nozzles, said secondary injectors being arranged in substantially parallel rows in a streamwise direction, each of said rows having a plurality of said secondary injectors therein, said plurality of secondary injectors in a row comprising a plurality of groups of secondary injectors, a first group being proximal to said throat section and injecting a diluent, a second group of



secondary injectors downstream of said first group and inputting a fuel therein, said secondary injectors being at an acute angle to said exit walls, said acuteness being in the downstream direction, said supersonic gas and selected products from said secondary injectors mixing in a cold reaction to from a pre-lasing product, lasing of said pre-lasing products being trigger by a bow shock resulting from the interaction of said supersonic gases from said primary nozzle and the supersonic gases from said secondary injectors in said exit walls, and
means for inputting to said combustion chamber and said secondary injectors chemicals necessary to produce lasing action.

4,785,462
DYNAMICALLY ONE-MODE SEMICONDUCTOR LASER
Rudolf Keil, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Aug. 18, 1986, Ser. No. 898,145
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533296
Int. Cl.[4] H01S *3/08; G02B 6/12*
U.S. Cl. 372—92 **9 Claims**



7. A dynamically single-mode semiconductor laser, comprising:
a laser diode having a laser active region along an axis and opposing emitting faces substantially perpendicular to said axis;
an external resonator disposed spaced from a first of said emitting faces, said external resonator including a mirror substantially perpendicular to said axis; and
a collimation optic member in the form of a hemispherical lens mounted directly on said mirror facing said first

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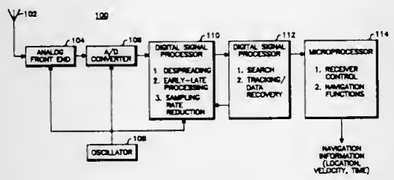
emitting face of said laser diode, a radius of curvature of said hemispherical lens being substantially coincident with said axis.

4,785,463

DIGITAL GLOBAL POSITIONING SYSTEM RECEIVER

Robert V. Janc, Palos Heights, and Steven C. Jasper, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1985, Ser. No. 771,755
Int. Cl.[4] H04K *1/00*
U.S. Cl. 375—1 **38 Claims**



1. An improved substantially digital receiver apparatus for the reception of one or more direct-sequence-coded spread spectrum signals, which exhibit substantially equal carrier frequencies, except for Doppler shifting, said apparatus comprising:

(a) first means for coupling a wideband radio frequency (RF) signal containing said spread spectrum signals to said receiving apparatus;

(b) second means, including preselector and down-converting means, coupled to said first means, for selecting a composite signal containing said spread spectrum signals from said wide-band RF signal and for frequency-translating said composite signal to an intermediate frequency;

(c) digitizing means, coupled to said second means, for converting said translated composite signal to a digital composite signal, at a predetermined sampling rate, wherein the predetermined sampling rate is determined according to the relationship: $m\ f_s = 4f_i$ wherein f_i is said intermediate frequency and f_s is the predetermined sampling rate;

(d) first processing means, coupled to said digitizing means, for separating and despreading each of said spread spectrum signals from said digital composite signal, and for deriving a prompt and auxiliary late-early signal corresponding to each spread-spectrum signal; and

(e) second processing means, coupled to said first processing means, providing for each desired signal, code delay search and tracking and carrier search and tracking processing for each of said doppler shifted signals, and data recovery processing.

4,785,464

METHOD AND DEVICE FOR REGENERATING THE INTEGRITY OF THE BIT RATE IN A PLESIOSYNCHRONOUS SYSTEM

André Judeinstein, St. Remy Les Chevreuses, and Pierre Lagoutte, Issy Les Moulineaux, both of France, assignors to LMT Radio Professionnelle, Boulogne Billancourt, France

Filed Jan. 7, 1987, Ser. No. 1,164
Claims priority, application France, Jan. 10, 1986, 86 00322
Int. Cl.[4] H04L *25/38*
U.S. Cl. 375—3 **17 Claims**

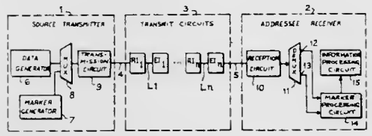
1. A method for the end-to-end regeneration of binary integrity in a link set up through a plesiosynchronous network, comprising the steps of:

transmitting frames consisting of several time intervals from a transmitter over said link;

multiplexing useful data bits with at least one cyclical signal marker bit in synchronism with said data bits to form said frames being transmitted;

receiving said frames from said link at a receiver;

demultiplexing said received frames to separate said useful data bits and said cyclical signal marker bits;



unambiguously identifying the start of a cycle of said cyclical signal bit and detecting errors from the identification of said cyclical signal marker bits; and

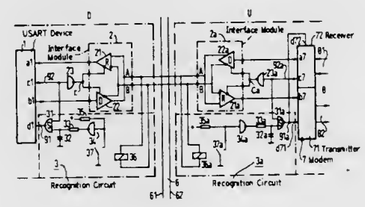
regenerating the bits transmitted utilizing errors detected from the identification of the cyclical signal marker bits.

4,785,465

CIRCUIT ARRANGEMENT FOR SERIAL DATA TRANSMISSION BETWEEN A PLURALITY OF SUBSCRIBER STATIONS

Otto Lang, and Manfred Dombrowski, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 13, 1987, Ser. No. 14,536
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1986, 3604967
Int. Cl.[4] H04B *1/40, 9/00*
U.S. Cl. 375—7 **7 Claims**



1. In a circuit arrangement for the serial data transmission between first and second subscriber stations connected to a respective first and second transmission/receiving device and each of said subscriber stations including a data transmitter and a data receiver, each data transmitter and each data receiver connected to two leads of a data bus via a respective transmission/receiving device, each of said transmitters including a signal input, a control input responsive to control signals such that only one of the transmitters is active at a time to output to the data bus a voltage of a first polarity or of a second polarity dependent on the state of a data signal applied to its signal input by the respective transmission/receiving device, each of the transmitters having a higher internal impedance in the passive condition than in the active condition, and each of the receivers operable in response to the polarity of the voltage on its input received from the data bus to output data to the respective transmission/receiving device, the improvement therein comprising:

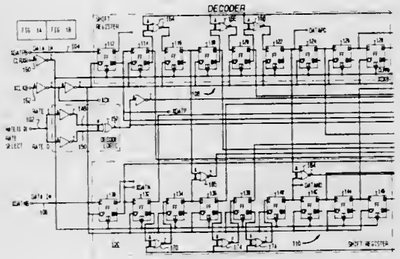
a recognition circuit connected between the two leads of the data bus and the respective transmitter and receiver and operable to output a free signal having a first logic state given approximately identical voltages on the leads of the data bus and output a busy signal having a second logic state given different voltages on the leads of the data bus.

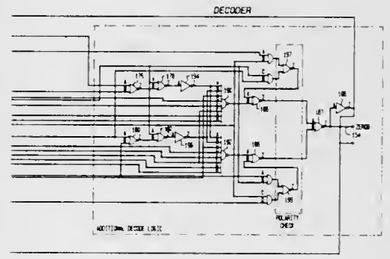
4,785,466

ENCODER/DECODER CIRCUIT FOR B8ZS AND B6ZS APPLICATIONS

Grace H. Lee; Rolf H. G. Wendt; Ardeshir Hadaegh, and Nirmal Virdee, all of Phoenix, Ariz., assignors to Siemens Transmission Systems, Inc., Phoenix, Ariz.

Filed Jun. 18, 1987, Ser. No. 64,145
Int. Cl.[4] H04L *25/34*
U.S. Cl. 375—17 **22 Claims**





1. A circuit for decoding B8ZS and B6ZS line codes comprising:

data input means for receiving both B8ZS and B6ZS input data, said input data including common line code pattern bits;

decoding logic for decoding a rate control input signal for generating an output representative of whether said input data is B8ZS line code or B6ZS line code;

shift register means for temporarily storing said received input data, including means for decoding the last five bits of each data byte to decode said common line code pattern bits in each of the B8ZS and B6ZS line codes;

additional decoding logic means coupled to said input data for decoding the number of logic zeros preceding said last five bits of each data byte in accordance with said rate control input signal; and

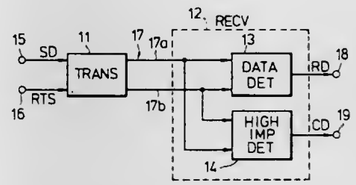
means for substituting either eight logic zeros for a detected B8ZS code or six logic zeros for a detected B6ZS code in accordance with the decoding by said additional decoding logic means.

4,785,467

TRANSMISSION SYSTEM EMPLOYING HIGH IMPEDANCE DETECTION FOR CARRIER DETECTION

Kunihiro Yamada, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 17, 1987, Ser. No. 39,219
Claims priority, application Japan, Apr. 24, 1986, 61-96058; Apr. 24, 1986, 61-96059
Int. Cl.[4] H04L *25/34;* H04B *9/00*
U.S. Cl. 375—17 **11 Claims**



1. A transmission system comprising:

a transmitter comprising a tri-state driver having a data input terminal, an enable terminal and two output terminals, said data input terminal being supplied with a send data signal, said enable terminal being supplied with a request to send signal, said tri-state driver having a high output impedance state when said request to send signal has a first logic value and said two output terminals outputting complementary data signals in accordance with said send data signal when said request to send signal has a second logic value;

a pair of transmission lines each having one end coupled to a corresponding one of the two output terminals of said tri-state driver; and

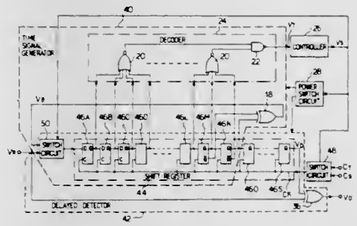
a receiver comprising a data detector for detecting the complementary data signals from the pair of transmission lines to produce a received data signal when the tri-state driver is not in said high output impedance state, and a high impedance state detector for producing a carrier detect signal having a predetermined logic value to indicate that no carrier is present on the pair of transmission lines when a high output impedance state of said tri-state driver is detected.

4,785,468

INTERMITTENT RECEIVER

Osamu Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 12, 1988, Ser. No. 142,942
Claims priority, application Japan, Jan. 12, 1987, 62-5508
Int. Cl.[4] H04L *27/14, 7/02;* H04B *1/18*
U.S. Cl. 375—75 **8 Claims**



1. An intermittent receiver comprising:

a shift register including a plurality of cascaded flipflops and

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having a serial data input, a serial data output, a plurality of parallel data outputs and a clock input;

a time signal generator including a decoder, connected at its inputs at least a portion of the parallel data outputs of the shift register so as to generate a time signal and a first gate means receiving at least a portion of the parallel outputs of the shift register so as to generate a feedback signal;

a first selection circuit having one output connected to the serial data input of the shift register and a first input connected to an output of the first gate means and a second input connected to receive a reception signal;

a second selection circuit having an output connected to the clock input of the shift register and a pair of inputs connected to receive a pair of different clocks, respectively;

a delayed detector including a second gate means having a first input connected to the serial data output of the shift register and a second input connected to receive the reception signal so as to generate a detection signal; and

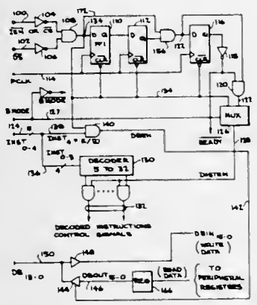
control means receiving the time signal outputted from the decoder for controlling the conditions of the first and second selection circuits in such a manner that, when the time signal is indicative of a wait mode, the second selection means outputs one of the clock signals to the shift register and the first selection means outputs the feedback signal to the shift register so that the time signal generator generates a predetermined time signal, and when the time signal is brought into a condition indicative of a reception mode, the second selection means outputs the other clock signals to the shift register and the first selection means outputs the reception signal to the shift register so that delayed detector operates to execute the delayed detection for the reception signal.

4,785,469

PROCESSOR TO PERIPHERAL INTERFACE FOR ASYNCHRONOUS OR SYNCHRONOUS APPLICATIONS

Sunil Joshi, Campbell, and Venkatraman Iyer, Berkeley, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 12, 1987, Ser. No. 13,845
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—110 **8 Claims**



1. An interface to allow a peripheral device to communicate with either synchronous or asynchronous systems comprising:

means for ANDing and synchronizing a data strobe and a chip select signal from an asynchronous system and converting the combined signal into an instruction enable signal when a BMODE signal is in a first state;

first means for gating an instruction enable signal from a synchronous system through as the peripheral's internal instruction enable signal when said BMODE signal is in a second state; and

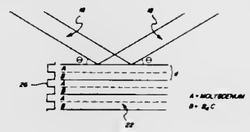
second means for gating one signal on an instruction bus from either a synchronous or an asynchronous system with said combined data strobe and chip select signals as the peripheral's read/write signal.

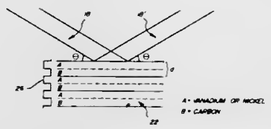
4,785,470

REFLECTIVITY AND RESOLUTION X-RAY DISPERSIVE AND REFLECTIVE STRUCTURES FOR CARBON, BERYLLIUM AND BORON ANALYSIS

James L. Wood, Westland, and Keitb L. Hart, Flat Rock, both of Mich., assignors to Ovonic Synthetic Materials Company, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 547,338, Oct. 31, 1983, Pat. No. 4,693,933, which is a continuation-in-part of Ser. No. 501,659, Jun. 6, 1983, abandoned. This application Apr. 25, 1986, Ser. No. 856,685
Int. Cl.[4] G21K *1/06*
U.S. Cl. 378—84 **2 Claims**





1. In a method for the wavelength dispersive spectroscopic analysis for a light metal chosen from the group consisting of beryllium and boron, comprising the steps of:

providing a sample;

direction a beam of X-rays at said sample, to cause the sample to emit fluorescent radiation X-rays;

directing said emitted X-rays onto an X-ray dispersive structure and reflecting said X-rays from said X-ray dispersive structure to a detector; and detecting said reflected X-rays to perform the analysis;

the improvement wherein said X-ray dispersive structure includes a plurality of layer pairs formed on one another, one layer of said layer pair being formed of B_4C, the other layer of said layer pair being formed of vacuum deposited molybdenum, and said layer pairs having a d spacing of 35 to 200 Angstrom, whereby said layer pairs have X-ray dispersive properties over a predetermined first wavelength range of interest, and a maximum net peak to background ratio at a narrow second wavelength range of 55 to 130 Angstroms within said predetermined wavelength range of interest for the detection of beryllium and boron.

2. In a method for the spectroscopic analysis for carbon comprising the steps of:

providing a sample;

directing a beam of X-rays at said sample, to cause the sample to emit fluorescent radiation X-rays;

directing said emitted X-rays onto an X-ray dispersive structure and reflecting said X-rays from the X-ray dispersive structure to a detector;

the improvement wherein said X-ray dispersive structure comprises a plurality of layer pairs formed on one another, one layer of said layer pair being formed of carbon, and the other layer of said layer pairs being formed of a vacuum deposited transition metal chosen from the group consisting of nickel and vanadium, said layer pairs having a d spacing of 35 to 80 Angstroms, said layer pairs having

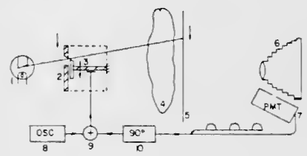
X-ray dispersive properties over a predetermined first wavelength range of interest and a maximum net peak to background ratio at a narrow second wavelength range of 40 to 50 Angstroms within said predetermined wavelength range of interest for the detection of carbon.

4,785,471

RADIOSCOPIC IMAGE DEVICE

Sipko L. Boersma, Delft, Netherlands, assignor to bv Optische Industrie De Oude Delft, Delft, Netherlands

Filed Oct. 22, 1986, Ser. No. 921,946
Claims priority, application Netherlands, Oct. 24, 1985, 8502910
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—146 **5 Claims**



1. An apparatus for slit radiography, which comprises:

an X-ray source;

an X-ray detector for sensing radiation pasing through a body to be radiographed;

a slit diaphragm positioned between said X-ray source and said body for forming a substantially planar X-ray beam;

a plurality of attenuating elements positioned along said slit diaphragm forming corresponding number of attenuating sections;

means to move said elements within said X-ray beam;

means for scanning said body with said planar X-ray beam;

detection means co-operating with said X-ray detector and being responsive to radiation sensed by said X-ray detector to prodice an electric signal representative of intensity of the sensed radiation; and

means for controlling said means to move said attenuating elements during scanning of said body in response to said electric signal, such that the movement of each attenuating element modulates for each corresponding section, the intensity of X-ray radiation at a certain temporal frequency, wherein each attenuating element moves in response to a different frequency or phase than all other attenuating elements.

4,785,472

REMOTE TEACHING SYSTEM

Arthur Shapiro, Hoboken, N.J., assignor to The Trustees of the Stevens Institute of Technology, Hoboken, N.J.

Filed May 11, 1987, Ser. No. 48,158
Int. Cl.[4] H04M *11/08;* **G09B** *5/06, 7/00*
U.S. Cl. 379—96 **12 Claims**

12. A remote teaching system, comprising:

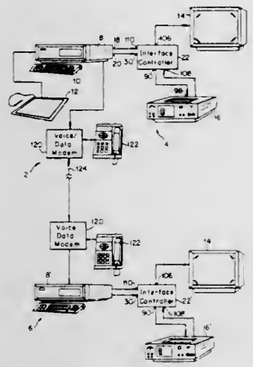
(a) a teacher station including

(a.1) a digital computer having random-access memory for storing data and programs, a central processing unit in communication with the random-access memory for executing programs stored in the memory, a keyboard in communication with the random-access memory for entering data and programs into the memory, and an input-/output channel, the input/output channel including a computer video-signal output port and a digital-signal output port, the input/output channel being adapted to generate at the computer video-signal output port a computer video signal for driving a video display monitor and to generate digital signals at the digital-signal output port in response to output commands from the central processing unit;

(a.2) a video display monitor having a video-display-monitor video-signal input port, the video display monitor being adapted to display visual images in response to video signals applied to the video-signal input port;

(a.3) a video-tape cassette player having a video-player video-signal output port and a video-player control-signal input port, the video-tape cassette player being adapted to play a video tape cassette mounted in the player in response to video-player start/stop control signals applied to the video-player control-signal input port, the video signal obtained from the video tape cassette being produced at the video-player-video-signal output port;

(a.4) an interface controller having a computer video-signal input port, a video-player video-signal input port, a display-monitor video-signal output port, a computer digital-control-signal input port, and a video-player control-signal output port, the interface controller being adapted to connect the display monitor video-signal output port to one of the computer video-signal input port or the video-player video-signal input port in response to a video-signal-selection control signal applied to the computer digital-control-signal input port, the interface controller being adapted to produce video-player start/stop control signals at the video-player control-signal output port in response



to video-player start/stop control signals applied to the computer digital-control-signal input port for controllably starting and stopping the playing of a video tape cassette in the video-tape cassette player;

(a.5) video-signal transmission means connecting respectively (i) the video-player video-signal output port of the video-tape cassette player to the video-player video-signal input port of the interface controller, (ii) the computer video-signal output port of the digital computer to the computer video-signal input port of the interface controller, and (iii) the display-monitor video-signal output port of the interface controller to the video-display-monitor video-signal input port of the video display monitor;

(a.6) control-signal transmission means connecting respectively (i) the digital signal output port of the input/output channel of the digital computer to the computer digital-control-signal input port of the interface controller and (ii) the video-player control-signal output port of the interface controller to the video-player control-signal input port of the video-tape cassette player;

(a.7) a speaker telephone;

(a.8) a voice/data modem having a data-channel port, a voice-channel port and a telephone line connection port adapted to be connected to a telephone system;

(a.9) digital-signal transmission means connecting the input-

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/output channel of the digital computer to the data-channel port of the voice/data modem; and

(a.10) voice-telephonic signal transmission means connecting the voice-channel port of the voice/data modem to the speaker telephone; and

(b) a plurality of student stations, each student station being connectable to the teacher station over a telephone sysem, each student station including:

(b.1) a digital computer having random-access memory for storing data and programs, a central processing unit in communication with the random-access memory for executing programs stored in the memory, a keyboard in communication with the random-access memory for entering data and programs into the memory, and an input-/output channel, the input/output channel including a computer video-signal output port and a digital-signal output port, the input/output channel being adapted to generate at the computer video-signal output port a computer video signal for driving a video display monitor and to generate digital signals at the digital-signal output port in response to output commands from the central processing unit;

(b.2) a video display monitor having a video-display-monitor video-signal input port, the video display monitor being adapted to display visual images in response to video signals applied to the video-signal input port;

(b.3) a video-tape cassette player having a video-player video-signal output port and a video-player control-signal input port, the video-tape cassette player being adapted to play a video tape cassette mounted in the player in response to video-player start/stop control signals applied to the video-player control-signal input port, the video signal obtained from the video tape cassette being produced at the video-player video-signal output port;

(b.4) an interface controller having a computer video-signal input port, a video-player video-signal input port, a display monitor video-signal output port, a computer digital-control-signal input port, and a video-player control-signal output port, the interface controller being adapted to connect the display monitor video-signal output port to one of the computer video-signal input port or the video-player video-signal input port in response to a video-signal-selection control signal applied to the computer digital-control-signal input port, the interface controller being adapted to produce video-player start/stop control signals at the video-player control-signal output port in response to video-player start/stop control signals applied to the computer digital-control-signal input port for controllably starting and stopping the playing of a video tape cassette in the video-tape cassette;

(b.5) video-signal transmission means connecting respectively (i) the video-player video-signal output port of the video-tape cassette player to the video-player video signal input port of the interface controller, (ii) the computer video-signal output port of the digital computer to the computer video-signal input port of the interface controller, and (iii) the display-monitor video-signal output port of the interface controller to the video-display-monitor video-signal input port of the video display monitor;

(b.6) control-signal transmission means connecting respectively (i) the digital signal output port of the input/output channel of the digital computer to the computer digital-control-signal input port of the interface controller and (ii) the video-player control-signal output port of the interface controller to the video-player control-signal input port of the video-tape cassette player;

(b.7) a speaker telephone;

(b.8) a voice/data modem having a data-channel port, a voice channel port and a telephone line connection port adapted to be connected to the telephone system for voice/data communication with the teaching station and with other student stations;

(b.9) digital-signal transmission means connecting the input-/output channel of the digital computer and the data-channel port of the voice/data modem; and

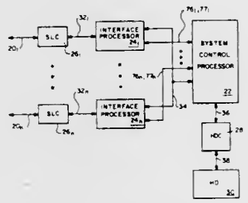
(b.10) voice telephonic signal transmission means connecting the voice-channel port of the voice/data modem and the speaker telephone.

4,785,473

INTERACTIVE AUDIO TELECOMMUNICATIONS MESSAGE STORAGE, FORWARDING AND RETRIEVAL SYSTEM

Randall R. Pfeiffer, and Sandra S. Pfeiffer, both of Roseville, Calif., assignors to Genesis Electronics Corporation, Folsom, Calif.

Filed Nov. 27, 1984, Ser. No. 675,419
Int. Cl.[4] H04M *3/50*
U.S. Cl. 379—89 **15 Claims**



11. A store/forward system for managing the transfer of messages and the receipt of messages and commands with respect to a plurality of full duplex message channels, said system comprising:

(a) storage means for storing messages;

(b) control means for managing the transfer of messages to and from said storage means; and

(c) interface means for transferring messages between said message channels and said control means, said interface means including a plurality of interface processor means, respectively coupled to a like plurality of said message channels, for processing messages into message segments for transfer to said storage means and for processing message segments into messages upon transfer to said message channels, each said interface processor means including means for subtracting out the receipt of a message from a respective message channel where said message is being simultaneously transferred to said respective message channel by its said interface processor means, whereby a command is received in isolation from any message being transferred to the same said message channel.

4,785,474

EMERGENCY SIGNAL WARNING SYSTEM

Bernard Bernstein, Phoenix, and Guy L. Sohie, Chandler, both of Ariz., assignors to Sy/Lert Systems Limited Partnership, Phoenix, Ariz.

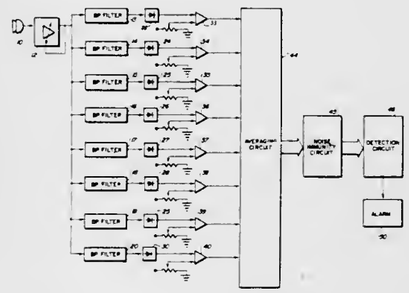
Continuation-in-part of Ser. No. 030,220, Mar. 25, 1987. This application Jul. 31, 1987, Ser. No. 80,545
Int. Cl.[4] H04R *29/00*
U.S. Cl. 381—56 **9 Claims**

1. A system for detecting the presence of sound signals varying in frequency in a predetermined manner over a predetermined frequency range, said system including in combination:

a source of input signals representative of said sound signals;

frequency selective sampling means coupled with the output of said source of input signals for sampling the output thereof at a sampling rate substantially greater than the rate of variation of said input signals for producing a first sample output signal from said frequency selective sampling means when an input signal representative of a sound signal in one of a plurality of different portions of said predetermined frequency range is present on the output of said source of input signals a predetermined number of times during a sampling interval of a predetermined unit of time, and for producing a second output signal therefrom when an input signal representative of a sound signal is present on the output of said source of input sound signals less than said predetermined number of times during such predetermined unit of time;

first counter means responsive to the output of said frequency selective sampling means for counting the number of successive shifts in frequency from one of said different portions of said predetermined frequency range to another as represented by successive first sample output signals to produce an operating signal in response to a predetermined number of successive frequency shifts in the same direction;



second counter means coupled to the output of said first counter means and responsive to successive operating signals from said first counter means for producing an output signal on the output of said second counter means in response to a count of a predetermined number of said operating signals by said second counter means;

interval timing means having a timing interval of "N" seconds coupled with said first and second counter means for continuously resetting first and second counter means to an initial count every "N" seconds;

means coupled with the output of said first counter means and responsive to said operating signals for resetting said first counter means a predetermined time interval after each such operating signal is produced by said first counter means; and

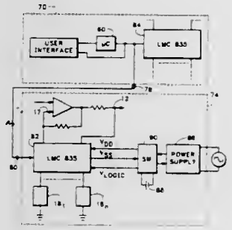
means coupled to the output of said second counter means for producing an indicator in response to the attainment of a predetermined count by said second counter means.

4,785,475

APPARATUS AND METHOD FOR EQUALIZING A SOUNDFIELD

Eugene Rimkeit, 4438 SW. Hewett, Portland, Oreg. 97221, and Richard Schomburg, Rte. 2, Box 444, Hillsboro, Oreg. 97123

Filed Jan. 29, 1987, Ser. No. 8,617
Int. Cl.[4] H03G *5/00*
U.S. Cl. 381—98 **18 Claims**



1. Apparatus for equalizing a soundfield, comprising:

an amplifier,

a gain control circuit for selectively adjusting the frequency response of the amplifier in response to data values received by the gain control circuit, said gain control circuit comprising a plurality of resonators connectd to the amplifier, and means for selectively adjusting the impedance of each resonator in response to said data values,

an input port for receiving data values,

an electronic storage device for storing data values received by way of the input port and applying those data values to the gain control circuit, and

power supply terminals for supplying operating current from an external power source to the electronic storage device,

the stored data values being maintained in the apparatus upon interruption of the supply of operating current to the power supply terminals, and the apparatus having no manually actuable controls for selectively adjusting the stored data values.

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DESIGN PATENTS

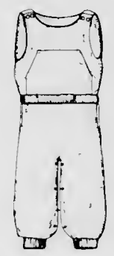
GRANTED NOV. 15, 1988

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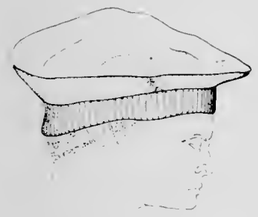
For CLASS	See PATENT NO.
D13-032	298,485

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298,480
GARMENT
Martin W. Bornstein, 23 Woodbine Rd., New City, N.Y. 10956
Filed Jan. 6, 1986, Ser. No. 816,520
Term of patent 14 years
U.S. Cl. D2—29



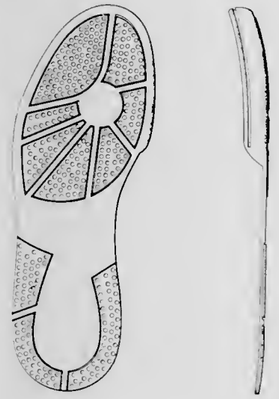
298,482
CAP
Evangeline Collins; Onajean Y. Dennis, and Frank M. Mitchell, Jr., all of Richmond, Va., assignors to Top It Off Incorporated, Va.
Filed Sep. 30, 1985, Ser. No. 781,802
Term of patent 14 years
U.S. Cl. D2—249



298,481
CAP
Evangeline Collins; Onajean Dennis, and Frank Mitchell, Jr., all of Richmond, Va., assignors to Top It Off Incorporated
Filed Sep. 30, 1985, Ser. No. 781,803
Term of patent 14 years
U.S. Cl. D2—244



298,483
SHOE SOLE
Steven Liggett, North Easton; Paul Brown, Hingham; Tuan Le, Cohasset; Andrea Kelly, West Roxbury, and Edward Lussier, Hingham, all of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Apr. 29, 1986, Ser. No. 858,265
Term of patent 14 years
U.S. Cl. D2—320

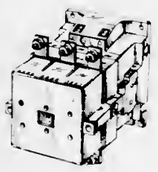


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298,484
WRIST MOUNTED HOLDER FOR PINS AND OTHER METAL OBJECTS
Lloyd W. Austin, 1838 Lakeside, Bellingham, Wash. 98226
Filed Sep. 17, 1985, Ser. No. 776,825
Term of patent 14 years
U.S. Cl. D3—22



298,485
HOUSING FOR ELECTROMAGNETIC SWITCHING DEVICE
Johann Bauer, Ebermannsdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 5, 1986, Ser. No. 860,012
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1985, MR 10/16412
Term of patent 14 years
U.S. Cl. D13—32



298,486
CASE
Ravindra K. Jain, Eastlake, Ohio, assignor to Bud Industries, Inc., Willoughby, Ohio
Filed Jun. 5, 1986, Ser. No. 871,579
Term of patent 14 years
U.S. Cl. D3—76



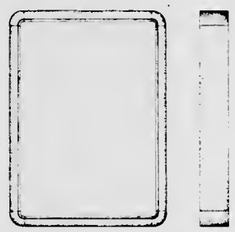
298,487
COMBINED TOOTHPASTE DISPENSING TOOTHBRUSH AND CASE THEREFOR
Larry K. Johnson, 12607 Lamppost La., Austin, Tex. 78727
Filed Feb. 18, 1986, Ser. No. 833,743
Term of patent 14 years
U.S. Cl. D4—108



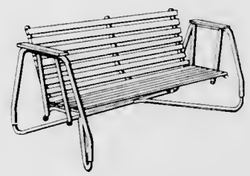
298,488
EMBOSSED TISSUE OR SIMILAR ARTICLE
Roy M. Eliason, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 7, 1985, Ser. No. 803,994
Term of patent 14 years
U.S. Cl. D5—53



298,489
PICTURE FRAME
William E. Sornborger, Los Angeles, Calif., assignor to North Star Company, Inc., Gardena, Calif.
Filed May 12, 1986, Ser. No. 862,592
Term of patent 14 years
U.S. Cl. D6—300



298,490
GLIDER
Charles Pomeroy, and John T. Bycraft, both of South Bend, Ind., assignors to Jack-Post Corporation, Buchanan, Mich.
Filed Aug. 14, 1986, Ser. No. 896,433
Term of patent 14 years
U.S. Cl. D6—347



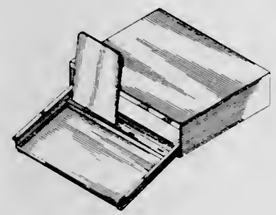
298,491
ADJUSTABLE CHAIR
Ola Haukvik, Stathelle, and Martin Lunde, Stranda, both of Norway, assignors to J.E. Ekornes A/S, Ikornnes, Norway
Filed Apr. 25, 1986, Ser. No. 857,574
Claims priority, application Norway, Oct. 25, 1985, 66716
Term of patent 14 years
U.S. Cl. D6—367



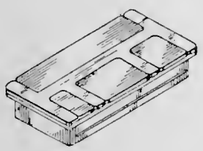
298,492
STACKABLE CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland
Filed Aug. 29, 1986, Ser. No. 902,389
Claims priority, application Hague, May 15, 1986, DM/006 926
Term of patent 14 years
U.S. Cl. D6—379



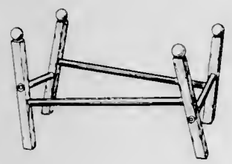
298,493
COMPUTER STAND WITH SLIDABLE SHAFT AND DOCUMENT HOLDER
David O. Hatcher, Eggertsville, and Walter N. Fudula, Cheektowaga, both of N.Y., assignors to Posting Equipment Corporation, Buffalo, N.Y.
Filed Dec. 23, 1985, Ser. No. 812,515
The portion of the term of this patent subsequent to Jan. 13, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—474



298,494
CORD ACCESS GROMMET SET FOR OFFICE FURNITURE USE
Douglas A. J. Mockett, 2634 Via Rivera, Palos Verdes Estates, Calif. 90274
Filed Aug. 27, 1985, Ser. No. 769,972
Term of patent 14 years
U.S. Cl. D6—491

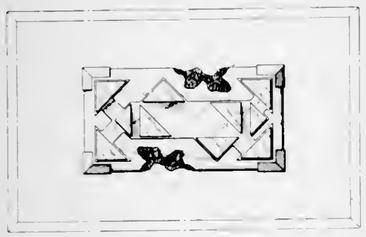


298,495
TABLE SUPPORT OR SIMILAR ARTICLE
Scott Glendinning, 5515 Doyle St., #2, Emeryville, Calif. 94608
Filed Apr. 7, 1986, Ser. No. 850,400
Term of patent 14 years
U.S. Cl. D6—495



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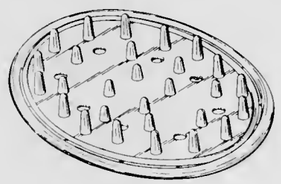
298,496
TABLE BASE
Jeffrey L. Bigelow, Cabin John, Md., assignor to Jeffrey Bigelow Design Group Inc., Rockville, Md.
Filed Aug. 14, 1986, Ser. No. 896,512
Term of patent 14 years
U.S. Cl. D6—495

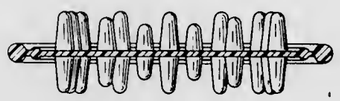


298,497
TABLE BASE
Jeffrey L. Bigelow, Cabin John, Md., assignor to Jeffrey Bigelow Design Group Inc., Rockville, Md.
Filed Aug. 14, 1986, Ser. No. 896,513
Term of patent 14 years
U.S. Cl. D6—495

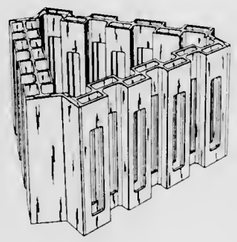


298,498
SOAP BAR HOLDER
Steven E. Greenhut, 2781 Belgrave Rd., Pepper Pike, Ohio 44124, and Sheldon Goodman, 4079 Princeton Blvd., South Euclid, Ohio 44121
Filed Nov. 21, 1986, Ser. No. 933,681
Term of patent 14 years
U.S. Cl. D6—536

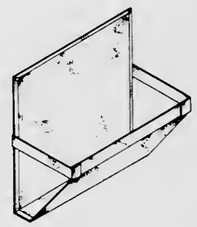




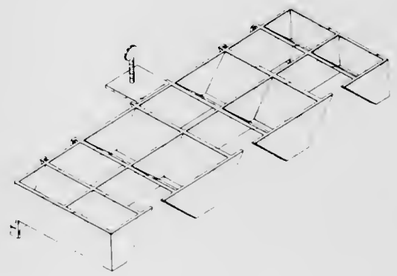
298,499
MODULAR SKI RACK
Randall A. York, 16791 Summer Cloud La., Huntington Beach, Calif. 92646
Division of Ser. No. 704,769, Feb. 21, 1985, Pat. No. D. 294,790.
This application Jan. 12, 1988, Ser. No. 143,145
Term of patent 14 years
U.S. Cl. D6—552

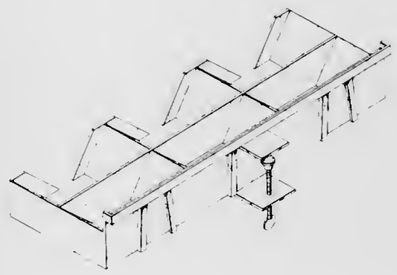


298,500
RACK
Durward A. Hisey, St. Louis, Mo., assignor to HY-C Company, Inc., St. Louis, Mo.
Filed Jun. 27, 1986, Ser. No. 879,565
Term of patent 14 years
U.S. Cl. D6—567

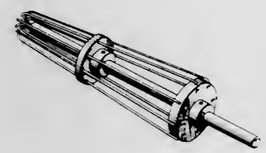


298,501
SHELF EXTENDER ATTACHMENT FOR DISPLAYING MERCHANDISE
David March, New York, N.Y., assignor to Thomson Leeds Company, Inc., New York, N.Y.
Filed Sep. 9, 1985, Ser. No. 774,149
Term of patent 14 years
U.S. Cl. D6—574

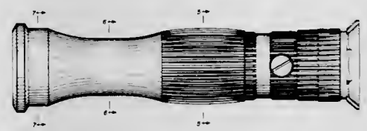




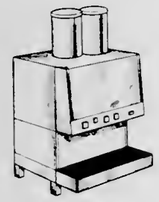
298,502
FISH SCALER
Morris C. Till, Rte. 1, Box 225, Orangeburg, S.C. 29115
Filed Apr. 14, 1986, Ser. No. 852,105
Term of patent 14 years
U.S. Cl. D7—99



298,503
MEAT TRIMMING KNIFE HANDLE
Timothy J. McCullough, 833 Aurora Rd., Vermilion, Ohio 44089
Filed Apr. 25, 1986, Ser. No. 857,462
Term of patent 14 years
U.S. Cl. D7—139

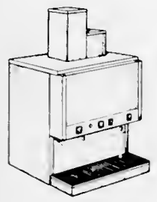


298,504
COFFEE MACHINE
Josef Frech, Gerstetten, Fed. Rep. of Germany, assignor to Wuerttembergische Metallwarenfabrik Aktiengesellschaf, Fed. Rep. of Germany
Filed Dec. 13, 1985, Ser. No. 808,859
Term of patent 14 years
U.S. Cl. D7—308



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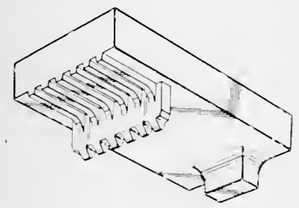
298,505
COFFEE MACHINE
Josef Frech, Gerstetten, Fed. Rep. of Germany, assignor to Wuerttembergische Metallwarenfabrik Aktiengesellschaf, Fed. Rep. of Germany
Filed Dec. 13, 1985, Ser. No. 808,860
Term of patent 14 years
U.S. Cl. D7—308



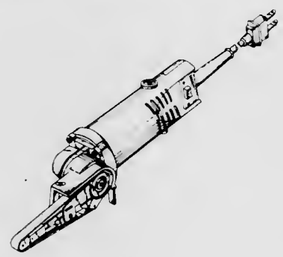
298,506
KNOB FOR THE LID OF A COOKING POT
Young Ok Lee, 1-605 Daerim Apt., Jamwon-dong, Kangnam-gu, Seoul, Rep. of Korea (135)
Filed Feb. 25, 1986, Ser. No. 836,460
Term of patent 14 years
U.S. Cl. D7—393



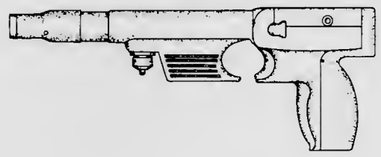
298,507
MOLDED TOOL FOR TERMINATING ELECTRICAL CONNECTORS
Stuart J. Reeves, St. Helens, England, assignor to BICC plc, London, England
Filed Nov. 21, 1985, Ser. No. 805,996
Claims priority, applicatioo United Kingdom, May 23, 1985, 1026935
Term of patent 14 years
U.S. Cl. D8—14



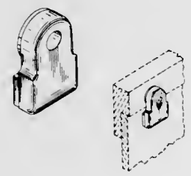
298,508
FILING BELT TYPE GRINDER
Kenji Fukuda; Osamu Tamanaha, and Toshio Mikiya, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 416,485, Sep. 10, 1982, abandoned. This application May 9, 1986, Ser. No. 862,414
Claims priority, application Japan, Mar. 12, 1982, 57-10069
Term of patent 14 years
U.S. Cl. D8—62



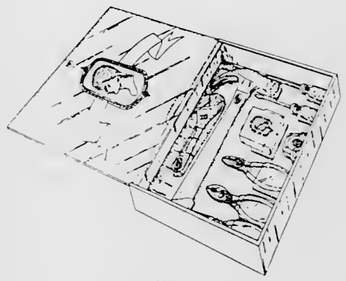
298,509
FASTENER DRIVING TOOL
James R. Brosius, and Ralph C. Brosius, both of St. Louis County, Mo., assignors to Research Plus, Inc., St. Louis, Mo.
Filed Jun. 27, 1985, Ser. No. 749,508
Term of patent 14 years
U.S. Cl. D8—68



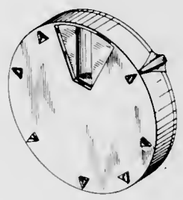
298,510
RETAINER CLIP
Thomas R. Marsh, Winston-Salem, N.C., assignor to Tenn-Tex Plastics, Inc., Kernersville, N.C.
Filed Jun. 10, 1986, Ser. No. 872,763
Term of patent 14 years
U.S. Cl. D8—394



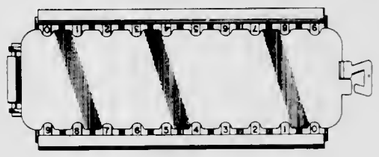
298,511
TOOL KIT
Clara Bryant, Rte. 2, Box 155, Carthage, N.C. 28327
Filed Oct. 25, 1985, Ser. No. 794,044
Term of patent 14 years
U.S. Cl. D9—337



298,512
DISPENSER
Georges Gotlib, New York, N.Y., assignor to Georges Gotlib, Inc., New York, N.Y.
Filed Nov. 12, 1985, Ser. No. 805,055
Term of patent 14 years
U.S. Cl. D9—339



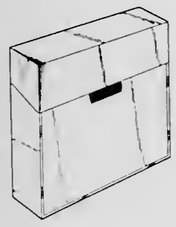
298,513
MULTIPLE TAPE DISPENSER
Michael J. Girardi, and Marilyn A. Girardi, both of 48 Union Blvd., Wallington, N.J. 07057
Filed Jul. 25, 1985, Ser. No. 758,814
Term of patent 14 years
U.S. Cl. D9—341



298,514
SYRUP CONTAINER OR SIMILAR ARTICLE
Charles M. Dole, Purdys, N.Y.; Webster Gary L.; Robert G. Karlis, both of Fairfield, Conn., and Edward L. Jeans, Lydart, Wales, assignors to Cadbury Schweppes, PLC, London, England
Filed Nov. 20, 1985, Ser. No. 805,920
Term of patent 14 years
U.S. Cl. D9—403



298,515
PACKAGING CONTAINER
Jack F. Pennell, West Midlands, United Kingdom, assignor to Ryford Limited, West MIdlands, United Kingdom
Filed Aug. 27, 1985, Ser. No. 769,954
Claims priority, application United Kingdom, Mar. 1, 1985, 1025331
Term of patent 14 years
U.S. Cl. D9—423



298,516
RECTANGULAR WATCH DIALS
Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Bienne, Switzerland
Filed Sep. 26, 1985, Ser. No. 780,346
Claims priority, application Italy, Mar. 26, 1985, 21235/85[U]
Term of patent 14 years
U.S. Cl. D10—125



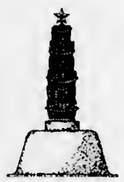
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298,517
ORNAMENTAL DESIGNS FOR WATCH DIAL
Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Blenne, Switzerland
Filed Sep. 26, 1985, Ser. No. 780,345
Claims priority, application Italy, Mar. 26, 1985, 21244/85[U]
Term of patent 14 years
U.S. Cl. D10—126

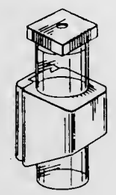


298,518
FINGER RING
Anthony Kim, II, 2717 Sparger Rd., Durham, N.C. 27705
Filed Oct. 17, 1986, Ser. No. 920,308
Term of patent 14 years
U.S. Cl. D11—32

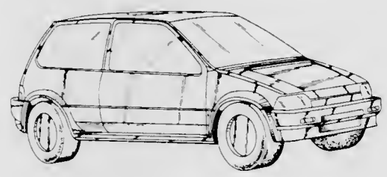
298,519
ARTIFICIAL CHRISTMAS TREE TABLE DECORATION
Albert G. Nackers, P.O. Box 85, Oklahoma City, Okla. 73101
Filed Apr. 11, 1986, Ser. No. 851,654
Term of patent 14 years
U.S. Cl. D11—118



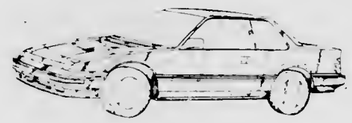
298,520
DETACHABLE FLOWER HOLDER
John H. Pickering, 826 Killdonan Road, Victoria B.C. V8X 1L4, Canada
Filed May 19, 1986, Ser. No. 864,897
Term of patent 14 years
U.S. Cl. D11—146



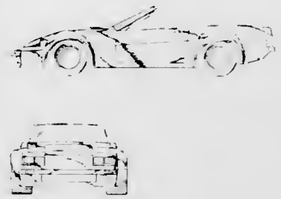
298,521
AUTOMOBILE
Yoshio Ui, Niiza; Tsuyoshi Nishimura, Asaka, and Osamu Akimoto, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 4, 1985, Ser. No. 804,514
Claims priority, application Japan, Aug. 5, 1985, 60-33382
Term of patent 14 years
U.S. Cl. D12—91



298,522
AUTOMOBILE
Masato Nakano, Asaka; Tomoyuki Arai, Tokyo, and Yusuke Saito, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 4, 1985, Ser. No. 804,582
Term of patent 14 years
U.S, Cl. D12—92



298,523
AUTOMOBILE
Gary Cramer, 525 E. 1050 North, Orem, Utah 84057
Filed Dec. 24, 1986, Ser. No. 947,482
Term of patent 14 years
U.S. Cl. D12—92



298,524
BICYCLE STORAGE UNIT
Julie A. De Luca, 2610 Valley Manor, Kingwood, Tex. 77339
Filed Dec. 17, 1986, Ser. No. 942,856
Term of patent 14 years
U.S. Cl. D12—115



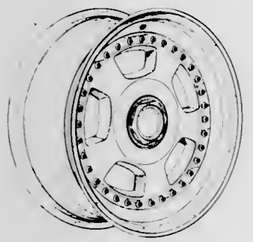
298,525
MOTORCYCLE TIRE
Shigehiko Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Mar. 3, 1986, Ser. No. 840,702
Claims priority, application Japan, Nov. 27, 1985, 60-49578
Term of patent 14 years
U.S. Cl. D12—136



298,526
STEERING WHEEL
Simon R. Green, Hazeldown Farm, Longstock, Nr. Stockbridge, Hampshire, England
Filed Oct. 30, 1986, Ser. No. 925,146
Claims priority, application United Kingdom, May 1, 1986, 1033811; May 1, 1986, 1033812
Term of patent 14 years
U.S. Cl. D12—175

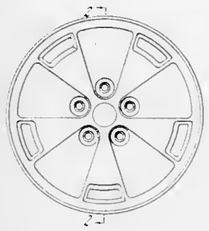


298,527
VEHICLE WHEEL
Manfred Lorinser, Waiblingen, Fed. Rep. of Germany, assignor to Sport-Service-Lorinser Sportliche Autoausrüstung GmbH, Waiblingen, Fed. Rep. of Germany
Filed Apr. 22, 1986, Ser. No. 855,189
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1985, 1058
Term of patent 14 years
U.S. Cl. D12—211

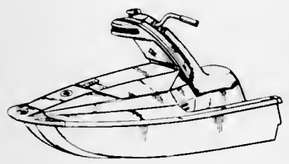


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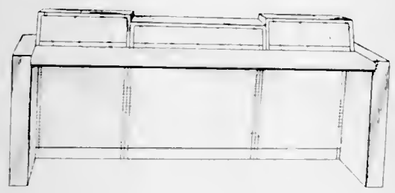
298,528
VEHICLE WHEEL
Dennis W. Burke, Sterling Heights; Norris G. Counts, Clarkston, and John W. Perkins, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 16, 1986, Ser. No. 919,822
Term of patent 14 years
U.S. Cl. D12—211



298,529
MOTORBOAT
Keiji Nakagawa, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed May 23, 1986, Ser. No. 867,297
Claims priority, application Japan, Nov. 27, 1985, 60-49447
Term of patent 14 years
U.S. Cl. D12—307



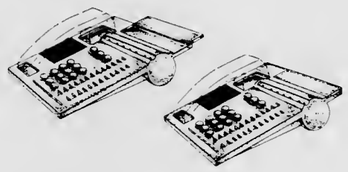
298,530
CONTROL CONSOLE FOR ELECTRONIC SECURITY SYSTEM
Victor J. Vogel, Oak Ridge, N.J., and John D. Howard, Brewster, N.Y., assignors to Mosler Inc., Hamilton, Ohio
Filed Dec. 2, 1985, Ser. No. 803,827
Term of patent 14 years
U.S. Cl. D13—40



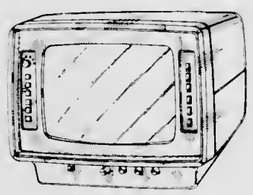
298,531
COMBINED HANDSET TELEPHONE AND STAND THEREFOR
Peggy Kuo, 3-3, Alley 16, Lane 10, Hsiu Lang Rd., Sec. 3, Chung-Ho, Taiwan
Filed Jan. 8, 1987, Ser. No. 1,982
Term of patent 14 years
U.S. Cl. D14—53



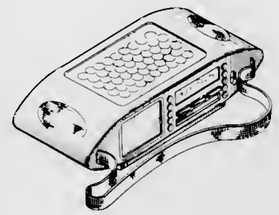
298,532
BASE FOR A TELEPHONE SUBSCRIBER SET
Deane Richardson, Worthington; Gregg Davis, Columbus; Fran Blackman, Dublin, and Peter Koloski, Columbus, all of Ohio, assignors to Trillium Telephone Systems, Inc., Kanata, Canada
Filed Mar. 19, 1986, Ser. No. 845,356
Term of patent 14 years
U.S. Cl. D14—62



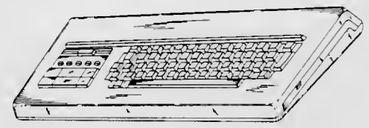
298,533
COMBINED MONITOR AND CONTROL UNIT FOR A TELEVISION SURVEILLANCE SYSTEM
Donald N. Horn, Cold Spring Harbor, N.Y., assignor to Vicon Industries, Inc., Melville, N.Y.
Filed Oct. 24, 1986, Ser. No. 923,722
Term of patent 14 years
U.S. Cl. D14—77



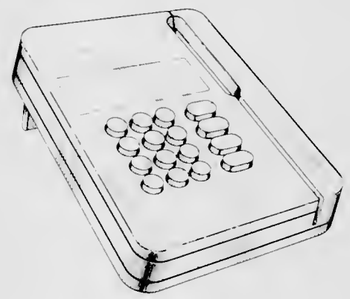
298,534
COMBINED TELEVISION AND RADIO RECEIVER
Kohen L. Turner, P.O. Box 44553, Indianapolis, Ind. 46204
Filed Oct. 6, 1986, Ser. No. 916,094
Term of patent 14 years
U.S. Cl. D14—79



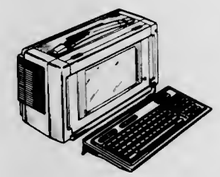
298,535
COMPUTER KEYBOARD
Jae J. Shim, Kyungki, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Feb. 28, 1986, Ser. No. 838,058
Claims priority, application Rep. of Korea, Aug. 31, 1985, 12347
Term of patent 14 years
U.S. Cl. D14—100



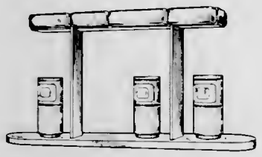
298,536
CREDIT CARD VERIFICATION TERMINAL
Paul E. Brefka, Southborough, Mass., assignor to MasterCard International, Inc., New York, N.Y.
Filed Jun. 13, 1986, Ser. No. 874,349
Term of patent 14 years
U.S. Cl. D14—105



298,537
PERSONAL COMPUTER
Charles F. Walters, II, and Richard V. Haner, both of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Dec. 19, 1986, Ser. No. 944,600
Term of patent 14 years
U.S. Cl. D14—106

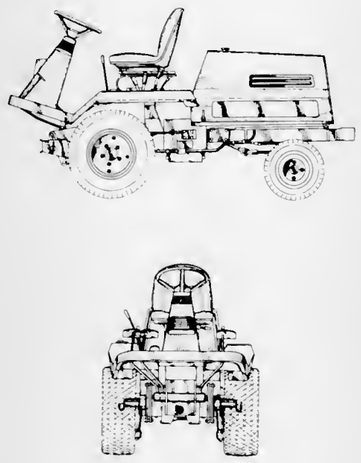


298,538
SERVICE STATION ISLAND
Charles M. Baffo, Wilton, Conn., and Thomas H. Geismar, New York, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 29, 1985, Ser. No. 792,378
Term of patent 14 years
U.S. Cl. D15—9.2



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298,539
TRACTOR
Hisato Katoh, Sakai, and Teruo Shimamura, Nishinomiya, both of Japan, assignors to Kubota, Ltd., Shikitsuhigashi, Japan
Filed Nov. 10, 1986, Ser. No. 929,214
Term of patent 14 years
U.S. Cl. D15—23



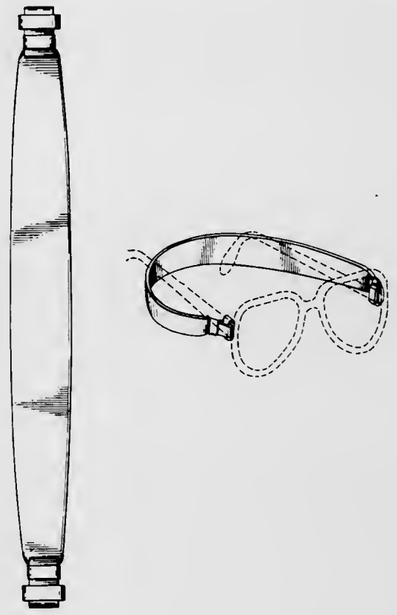
298,540
DRIVER WHEEL FOR A TRACK VEHICLE
Charles E. Grawey; Robert J. Grob, and Cullen P. Hart, all of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed May 9, 1985, Ser. No. 732,486
Term of patent 14 years
U.S. Cl. D15—28



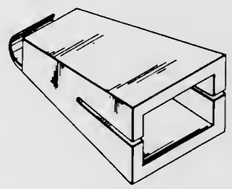
298,541
REEL PLATE FOR A STRAPPING MACHINE
Yasunori Sakaki, Tokyo, and Tsutomu Tagomori, Yokohama, both of Japan, assignors to Strapack Corporation, Tokyo, Japan
Filed Dec. 17, 1985, Ser. No. 809,995
Term of patent 14 years
U.S. Cl. D15—145



298,542
EYEGLASS RETAINER
Keith L. Carlson, and Gregory P. Carlson, both of 628 Lomardi La., Laguna Beach, Calif. 92651
Filed Jun. 13, 1986, Ser. No. 874,371
Term of patent 14 years
U.S. Cl. D16—123



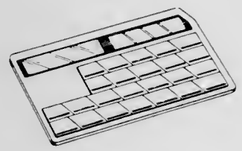
298,543
PERCUSSION MUSICAL INSTRUMENT
Richard A. Benson, and Peter A. Scott, both of Green Hedges, Wrotham Road, Meopham, Kent, England DA13 OHW
Filed Oct. 8, 1986, Ser. No. 916,858
Term of patent 14 years
U.S. Cl. D17—22



298,544
CALCULATOR FOR COUNTING PLAYING CARDS OR SIMILAR ARTICLE
Guy Gerardy, Schaerbeek, Belgium, assignor to Parking Madou, Schaerbeek, Belgium
Filed Apr. 11, 1986, Ser. No. 851,652
Claims priority, application World Int. Prop. O., Oct. 11, 1985, DMA/00429
Term of patent 14 years
U.S. Cl. D18—2



298,545
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko; Keiko Takemata, Tokyo; Akihiko Kobayashi, Mitaka; Takeshi Hasegawa, Yokohama, and Shigeki Mori, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1986, Ser. No. 852,491
Claims priority, application Japan, Oct. 17, 1985, 60-43785
Term of patent 14 years
U.S. Cl. D18—7



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298,546
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko; Keiko Takemata, Tokyo; Akihiko Kobayashi, Mitaka, and Takeshi Hasegawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1986, Ser. No. 852,492
Claims priority, application Japan, Oct. 17, 1985, 60-43786
Term of patent 14 years
U.S. Cl. D18—7



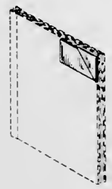
298,547
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Abiko; Keiko Takemata, Tokyo; Akihiko Kobayashi, Mitaka, and Yasuhide Saito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1986, Ser. No. 852,493
Claims priority, application Japan, Oct. 17, 1985, 60-43783
Term of patent 14 years
U.S. Cl. D18—7



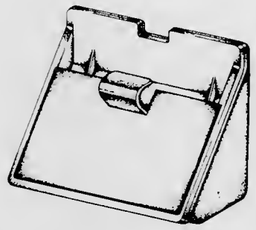
298,548
DESK-TOP ELECTRONIC CALCULATOR
Eiichi Yosbioka, Abiko; Keiko Takemata, Tokyo; Akihiko Kobayashi, Mitaka, and Yasuhide Saito, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 15, 1986, Ser. No. 852,893
Claims priority, application Japan, Oct. 17, 1985, 60-43784
Term of patent 14 years
U.S. Cl. D18—7



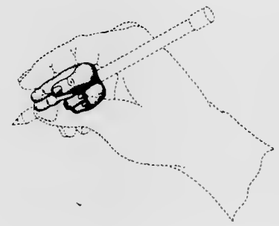
298,549
DOCUMENT ATTACHABLE CALLING CARD
Cheryl E. Lepper, 524 W. 17th St., Spokane, Wash. 99203
Filed Nov. 12, 1985, Ser. No. 805,128
Term of patent 14 years
U.S. Cl. D19—1



298,550
CALENDAR BASE
Kent Tarrant, Springfield, Mass., assignor to Southworth Company, West Springfield, Mass.
Filed Feb. 10, 1986, Ser. No. 827,739
Term of patent 14 years
U.S. Cl. D19—20



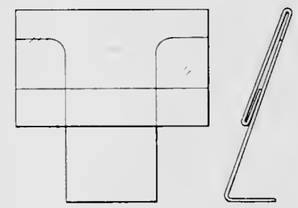
298,551
ARTICLE FOR HOLDING WRITING INSTRUMENTS
Lawrence W. Bright, 432 Scot, Richland, Wash. 99352
Filed Oct. 7, 1985, Ser. No. 785,215
Term of patent 14 years
U.S. Cl. D19—55



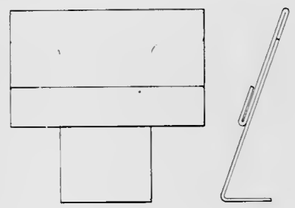
298,552
AUTOMATIC VENDING MACHINE OR SIMILAR ARTICLE
Lien K. Chen, 5th Fl., No. 2, Tung Ning Rd., Tainan City, Taiwan
Filed Dec. 17, 1985, Ser. No. 810,073
Claims priority, application Taiwan, Apr. 29, 1985, 74302089
Term of patent 14 years
U.S. Cl. D20—7



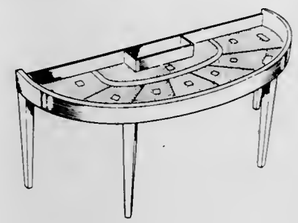
298,553
CARD HOLDER
Joel F. Zobitz, 206 Tamiami Trail, West Lafayette, Ind. 47906
Filed Nov. 12, 1985, Ser. No. 805,042
Term of patent 14 years
U.S. Cl. D20—43



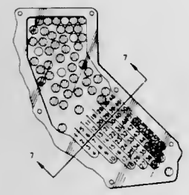
298,554
CARD HOLDER
Joel F. Zobitz, 206 Tamiami Trail, West Lafayette, Ind. 47906
Filed Nov. 29, 1985, Ser. No. 806,845
Term of patent 14 years
U.S. Cl. D20—43



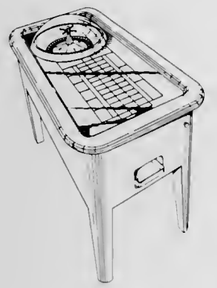
298,555
GAMING TABLE
Margaret Shen, and Barry R. Forrester, both of 21 Bent Street, Sydney, New South Wales, 2000, Australia
Filed Dec. 9, 1985, Ser. No. 806,646
Term of patent 14 years
U.S. Cl. D21—37



298,556
LOTTERY NUMBER GENERATOR
Patrick J. Gigliotti, 6008 College Ave., Oakland, Calif. 94618
Filed Dec. 23, 1985, Ser. No. 812,750
Term of patent 14 years
U.S. Cl. D21—37



298,557
AMUSEMENT ROULETTE GAME TABLE
Gordon McNally, London, England, assignor to McNally Design Group Limited, London, England
Filed Oct. 17, 1985, Ser. No. 788,431
Claims priority, application United Kingdom, Apr. 18, 1985, 1026295
Term of patent 14 years
U.S. Cl. D21—40

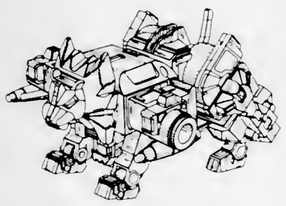


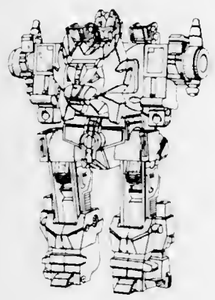
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298,558
ELECTRONIC DRAWING TOY
James C. Wickstead, Mendham, N.J., assignor to The Ohio Art Company, Bryan, Ohio
Filed Dec. 13, 1985, Ser. No. 808,785
Term of patent 14 years
U.S. Cl. D21—59

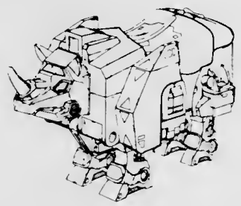


298,559
RECONFIGURABLE ANIMAL TOY LION
Teruo Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,355
Claims priority, application Japan, Dec. 13, 1985, 60-51839
Term of patent 14 years
U.S. Cl. D21—150



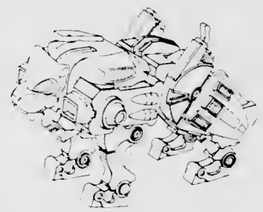


298,560
RECONFIGURABLE ANIMAL TOY RHINOCEROS
Teruo Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,356
Claims priority, application Japan, Dec. 13, 1985, 60-51843
Term of patent 14 years
U.S. Cl. D21—150



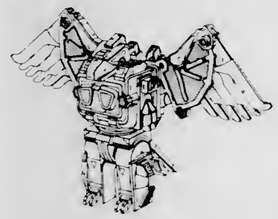


298,561
RECONFIGURABLE ANIMAL TOY TIGER
Teruo Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,357
Claims priority, application Japan, Dec. 13, 1985, 60-51842
Term of patent 14 years
U.S. Cl. D21—150





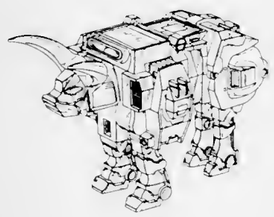
298,562
RECONFIGURABLE ANIMAL TOY EAGLE
Teruo Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,359
Claims priority, application Japan, Dec. 13, 1985, 60-51840
Term of patent 14 years
U.S. Cl. D21—150

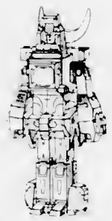




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298,563
RECONFIGURABLE ANIMAL TOY BUFFALO
Teruo Kitamura, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 28, 1986, Ser. No. 823,466
Claims priority, application Japan, Dec. 13, 1985, 60-51841
Term of patent 14 years
U.S. Cl. D21—150





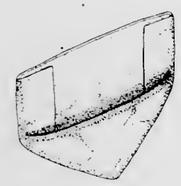
298,564
FAUCET KNOB
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Jun. 26, 1986, Ser. No. 879,139
Term of patent 14 years
U.S. Cl. D23—254



298,565
WATER CLOSET TANK
Herbert V. Kohler, Jr., Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 16, 1986, Ser. No. 820,198
Term of patent 14 years
U.S. Cl. D23—313



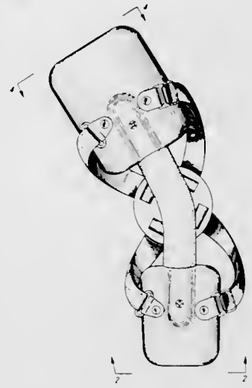
298,566
INCONTINENCE GUARD FOR MALES
Bo A. Runeman, Gothenburg, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Jul. 25, 1985, Ser. No. 758,978
Claims priority, application Sweden, Feb. 4, 1985, 85-0261
Term of patent 14 years
U.S. Cl. D24—50



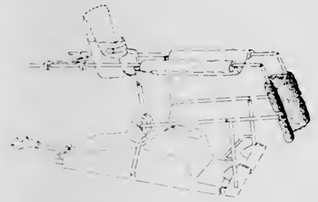
298,567
FLEXIBLE PATIENT FLUID CONTAINER
Livingston B. Morris, Devon, Pa., assignor to McNeilab, Inc., Spring House, Pa.
Filed Feb. 27, 1986, Ser. No. 838,042
Term of patent 14 years
U.S. Cl. D24—58



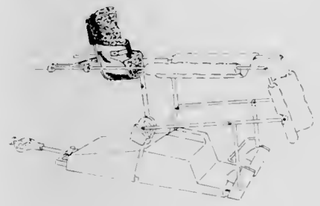
298,568
KNEE ORTHOSIS WITH STRAP
Darryl L. Womack, Lakewood, and Godfrey Harris, Littleton, both of Colo., assignors to Scott Orthotic Labs, Inc., Denver, Colo.
Filed Feb. 27, 1986, Ser. No. 836,602
Term of patent 14 years
U.S. Cl. D24—64



298,569
THIGH SUPPORT PAD FOR A CONTINUOUS PASSIVE MOTION CARRIAGE
Robert H. Nippoldt, Newport, and Thomas C. Wright, New Brighton, both of Minn., assignors to Empi, Inc., St. Paul, Minn.
Filed Apr. 23, 1986, Ser. No. 857,556
Term of patent 14 years
U.S. Cl. D24—64



298,570
FOOT SUPPORT PAD FOR A CONTINUOUS PASSIVE MOTION CARRIAGE
Robert H. Nippoldt, Newport, and Thomas C. Wright, New Brighton, both of Minn., assignors to Empi, Inc., St. Paul, Minn.
Filed Apr. 23, 1986, Ser. No. 857,594
Term of patent 14 years
U.S. Cl. D24—64

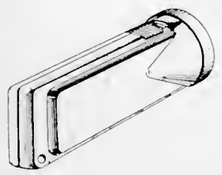


298,571
FOLDING TUBULAR SAWHORSE
Malcolm O. Hodnett, Rte. 1, 23 Whilaway Dr., Gladewater, Tex. 75647
Filed Jan. 10, 1986, Ser. No. 818,095
Term of patent 14 years
U.S. Cl. D25—67



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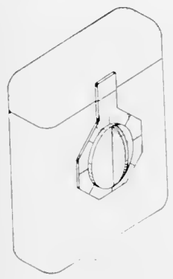
298,572
FLASHLIGHT
Spencer Murrell, Delaware, Ohio, and Bill Moggridge, Palo Alto, Calif., assignors to Black & Decker, Inc., Newark, Del.
Filed Jul. 8, 1986, Ser. No. 883,493
The portion of the term of this patent subsequent to Nov. 8, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—46



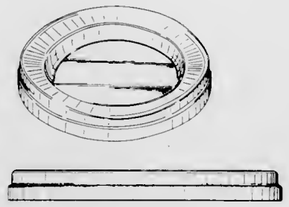
298,573
PORTABLE LAMP
Takeo Komamura, Matsudo, Japan, assignor to Kisho Electronics Co., Ltd., Japan
Filed Dec. 30, 1985, Ser. No. 814,240
Claims priority, application Japan, Jul. 19, 1985, 60-30640
Term of patent 14 years
U.S. Cl. D26—93



298,574
TIME LOCKING CIGARETTE CASE
Larry L. Long, 620 Liberty Ave., and Clifford G. Long, Meadowbrook Dr., both of Johnstown, Pa. 15905
Filed Mar. 16, 1984, Ser. No. 590,515
Term of patent 14 years
U.S. Cl. D27—187



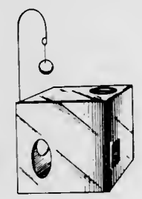
298,575
ASH TRAY LID FOR WASTE RECEPTACLE
Paul E. Delmerico, Winchester, Va., assignor to Rubbermaid Commerical Products Inc., Winchester, Va.
Filed Oct. 17, 1985, Ser. No. 788,380
Term of patent 14 years
U.S. Cl. D27—122



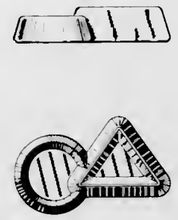
298,576
EYEBROW SHAPER RAZOR
Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.
Filed Jun. 2, 1986, Ser. No. 869,942
Term of patent 14 years
U.S. Cl. D28—45



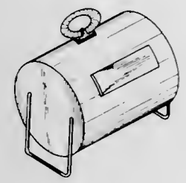
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PET PLAY HOUSE
Sheila H. Faxon, Long Ridge Rd., P.O. Box 148, Pound Ridge, N.Y. 10576
Filed Feb. 28, 1986, Ser. No. 838,054
Term of patent 14 years
U.S. Cl. D30—108



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Larry A. Swartz, and Diane L. Swartz, both of 27893 Mazagon, Mission Viejo, Calif. 92692
Filed Feb. 25, 1987, Ser. No. 18,979
Term of patent 14 years
U.S. Cl. D30—130



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RETRACTABLE ANIMAL LEASH
Carl L. Brummett, 4675 N. Robs La., Bloomington, Ind. 47401
Filed Mar. 16, 1984, Ser. No. 590,491
Term of patent 14 years
U.S. Cl. D30—153



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Nakagawa, Akio; and Watanabe, Kiminori, to Kabushiki Kaisha Toshiba. Conductivity modulated MOS transistor device. Re. 32,784, Cl. 357-23.400.
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Baffo, Charles M.; and Geismar, Thomas H., to Mobil Oil Corporation. Service station island. 298,538, 11-15-88, Cl. D15-9.200.
Bauer, Johann, to Siemens Aktiengesellschaft. Housing for electromagnetic switching device. 298,485, 11-15-88, Cl. D13-32.000.
Benson, Richard A.; and Scott, Peter A. Percussion musical instrument. 298,543, 11-15-88, Cl. D17-22.000.
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Brosius, James R.; and Brosius, Ralph C., to Research Plus, Inc. Fastener driving tool. 298,509, 11-15-88, Cl. D8-68.000.
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156 4,784,244
196 D 4,784,245
218 XL 4,784,246

CLASS 190

126 4,784,248

CLASS 192

58 B 4,784,247
85 V 4,784,249

CLASS 193

34 4,784,250

CLASS 194

209 4,784,251
350 4,784,252

CLASS 198

424 4,784,253
434 4,784,254
456 4,784,255
468.4 4,784,256
594 4,784,257

CLASS 200

61.43 4,785,143
61.55 4,785,144
162 4,785,145
250 4,785,146

CLASS 204

1 T 4,784,728
4,784,729
27 4,784,731
38.3 4,784,732
40 4,784,730
67 4,784,733
81 4,784,734
98 4,784,735
157.15 4,784,736
180.1 4,784,737
182.8 4,784,738
192.2 4,784,739
206 4,784,740
242 4,784,741
243 R 4,784,742
425 4,784,743

CLASS 206

5.1 4,784,258
221 4,784,259
223 4,784,260
256 4,784,261
333 4,784,262
349 4,784,263
387 4,784,264
423 4,784,265
434 4,784,266
438 4,784,267
453 4,784,269
461 4,784,268
586 4,784,270
617 4,784,271
628 4,784,272
634 4,784,273

CLASS 208

48 AA 4,784,744
74 4,784,745
106 4,784,746
111 4,784,747
120 4,784,748
4,784,749
4,784,750
181 4,784,751
251 R 4,784,752
309 4,784,753

CLASS 209

2 4,784,754
136 4,784,755
144 4,784,756
159 4,784,757
214 4,784,758
223.1 4,784,759
4,784,760
294 4,784,761
534 4,784,274
558 4,784,275

CLASS 210

85 4,784,762
90 4,784,763
96.1 4,784,764
169 4,784,765
181 4,784,766
222 4,784,767
321.8 4,784,768
500.21 4,784,769
603 4,784,770
636 4,784,771
638 4,784,772
691 4,784,773
699 4,784,774
712 4,784,775
728 4,784,776

CLASS 211

89 4,784,276
167 4,784,277

CLASS 212

229 4,784,278

CLASS 215

251 4,784,279
252 4,784,280
4,784,281

CLASS 219

10.55 B 4,785,152
10.55 D 4,785,148
10.55 E 4,785,160
10.59 4,785,147
78.01 4,785,154
86.41 4,785,153
111 4,785,159
121.14 4,785,158
121.64 4,785,156
121.69 4,785,161
121.85 4,785,157
125.12 4,785,155
130.21 4,785,149
368 4,785,162
400 4,785,151
543 4,785,150
549 4,785,163

CLASS 220

67 4,784,282
269 4,784,283
270 4,784,284
307 4,784,285
324 4,784,286
403 4,784,287

CLASS 221

4 4,784,288
9 4,784,289
63 4,784,290
101 4,784,292
187 4,784,291

CLASS 222

79 4,784,293
93 4,784,294
148 4,784,295
153 4,784,296
161 4,784,297
350 4,784,298
397 4,784,299
453 4,784,300
505 4,784,301
603 4,784,302
639 4,784,303

CLASS 224

2 4,784,997
202 4,784,304
274 4,784,305

CLASS 227

113 4,784,306
120 4,784,307
130 4,784,308

CLASS 228

37 4,784,309
123 4,784,310
131 4,784,311
157 4,784,312
194 4,784,313

CLASS 229

8 4,784,314
9 4,784,315
52 B 4,784,316
92.3 4,784,317

CLASS 234

2 4,784,318

CLASS 235

64.7 4,785,164
375 4,785,165
441 4,785,166

CLASS 236

46 R 4,784,319
93 R 4,784,320

CLASS 239

83 4,784,321
89 4,784,322
102.2 4,784,323
165 4,784,324
204 4,784,325
265.39 4,784,326
276 4,784,327
432 4,784,328
498 4,784,329
526 4,784,330
698 4,784,331
703 4,784,332

CLASS 241

5 4,784,333
14 4,784,334
20 4,784,335
65 4,784,336
92 4,784,337
101.2 4,784,338
275 4,784,339
301 4,784,340

CLASS 242

18 A 4,784,341
18 PW 4,784,342
46.4 4,784,343
47.01 4,784,344
66 4,784,345
84.1 A 4,784,346
84.21 R 4,784,347
96 4,784,348
131 4,784,349

CLASS 244

3.1 4,784,350
7 C 4,784,351
91 4,784,353
122 AG 4,784,352
135 B 4,784,354
213 4,784,355

CLASS 246

125 4,784,356

CLASS 248

27.1 4,784,357
74.3 4,784,358
274 4,784,359
313 4,784,360
551 4,784,361
562 4,784,362
610 4,784,363
673 4,784,364

CLASS 249

21 4,784,365
91 4,784,366

CLASS 250

214 A 4,785,167
226 4,785,170
227 4,785,171
231 R 4,785,180
237 G 4,785,181
309 4,785,172
4,785,173
310 4,785,182
327.2 4,785,183
338.1 4,785,174
340 4,785,169
343 4,785,184
358.1 4,785,185
360.1 4,785,175
370.14 4,785,186
372 4,785,179
385.1 4,785,168
396 ML 4,785,176
442.1 4,785,177
491.1 4,785,187
492.2 4,785,188
4,785,189
497.1 4,785,178
503.1 4,785,190
548 4,785,192
560 4,785,193
578 4,785,191

CLASS 251

30.01 4,784,367
51 4,784,368

CLASS 252

8.551 4,784,778
4,784,779
8.7 4,784,777
32.5 4,784,795
32.7 E 4,784,780
39 4,784,781
47.5 4,784,782
69 4,784,783
79 4,784,784
79.4 4,784,785
91 4,784,786
95 4,784,787
114 4,784,788
174.12 4,784,790
174.23 4,784,789
299.6 4,784,791
299.61 4,784,792
299.62 4,784,793
313.1 4,784,794
392 4,784,796
4,784,797
544 4,784,798
545 4,784,799
548 4,784,800
554 4,784,801
633 4,784,802
700 4,784,803

CLASS 254

28 4,784,370
45 4,784,369
93 H 4,784,371
277 4,784,372

CLASS 256

8 4,784,373

CLASS 260

349 4,784,804
352 4,784,805
378 4,784,806
405.5 4,784,807
501.16 4,784,808
513 R 4,784,809

CLASS 261

17 4,784,810

CLASS 264

1.4 4,784,811
63 4,784,812
86 4,784,813
102 4,784,814
171 4,784,815
210.2 4,784,816
219 4,784,817
291 4,784,818
328.19 4,784,819
349 4,784,820
510 4,784,821
564 4,784,822

CLASS 266

215 4,784,374

CLASS 267

64.12 4,784,375
64.27 4,784,376
219 4,784,378

CLASS 269

21 4,784,377

CLASS 270

55 4,784,379

CLASS 271

103 4,784,380
268 4,784,381

CLASS 272

25 4,784,382
85 4,784,383
118 4,784,384
130 4,784,385
137 4,784,386

CLASS 273

1 GD 4,784,387
2 4,784,388
26 E 4,784,389
77 A 4,784,390
109 4,784,391
160 4,784,392
187 R 4,784,393
251 4,784,394

CLASS 277

153 4,784,395
235 B 4,784,396
236 4,784,397

CLASS 279

2 R 4,784,398

CLASS 280

5 C 4,784,399
6.1 4,784,400
12 H 4,784,233
40 4,784,401
79.1 A 4,784,402
432 4,784,403
629 4,784,404
655 4,784,405
665 4,784,406
804 4,784,407

CLASS 283

81 4,784,408

CLASS 285

21 4,784,409
133.2 4,784,410
363 4,784,411
387 4,784,412
416 4,784,413

CLASS 292

52 4,784,414
144 4,784,415
341.15 4,784,416
347 4,784,417
348 4,784,418

CLASS 294

67.2 4,784,419
81.4 4,784,420
86.4 4,784,421
106 4,784,422

CLASS 296

65.1 4,784,425
97.22 4,784,423
97.7 4,784,426
98 4,784,427
107 4,784,428
165 4,784,429
180.2 4,784,424
198 4,784,430
218 4,784,431

CLASS 297

28 4,784,432
184 4,784,433
216 4,784,434
440 4,784,436
445 4,784,435
452 4,784,437

CLASS 299

57 4,784,439
86 4,784,438

CLASS 301

37 R 4,784,440
124 R 4,784,441

CLASS 302

255 4,785,384

CLASS 303

15 4,784,442
96 4,784,443
118 4,784,444

CLASS 307

10 R 4,785,194
18 4,785,195
116 4,785,197
154 4,785,198
202.1 4,785,199
279 4,785,200
443 4,785,201
4,785,202
448 4,785,203
451 4,785,204
475 4,785,205
530 4,785,206
577 4,785,207
633 4,785,208

CLASS 310

11 4,785,209
12 4,785,210
57 4,785,211
90.5 4,785,212
116 4,785,213
241 4,785,214
329 4,785,215

CLASS 312

236 4,784,445
317 R 4,784,446

CLASS 313

32 4,785,216
479 4,785,217
579 4,785,218

CLASS 315

3 4,785,219
111.81 4,785,220

CLASS 318

311 4,785,221
565 4,785,222
636 4,785,223
663 4,785,224
811 4,785,225

CLASS 320

21 4,785,226

CLASS 322

1 4,785,227
29 4,785,228

CLASS 323

238 4,785,390
284 4,785,229
313 4,785,230
316 4,785,231

CLASS 324

56 4,785,232
57 SS 4,785,233
61 R 4,785,234
73 PC 4,785,235
120 4,785,236
123 R 4,785,237
173 4,785,238
204 4,785,239
207 4,785,240
208 4,785,241
4,785,242
232 4,785,243
260 4,785,244
308 4,785,245
318 4,785,246
338 4,785,247
457 4,785,248
509 4,785,249

CLASS 328

127 4,785,250
134 4,785,251
151 4,785,252
167 4,785,253
233 4,785,254

CLASS 329

126 4,785,255

CLASS 330

110 4,785,256
149 4,785,257
253 4,785,258
300 4,785,259

CLASS 331

2 4,785,260
82 4,785,261
111 4,785,262
117 FE 4,785,263
4,785,264

CLASS 333

18 4,785,265
21 A 4,785,266
125 4,785,267
157 4,785,268
188 4,785,269
193 4,785,270
204 4,785,271

CLASS 335

213 4,785,272
261 Re.32,783

CLASS 336

61 4,785,273

CLASS 337

49 4,785,274

CLASS 338

5 4,785,275
21 4,785,276
162 4,785,277
4,785,278
314 4,785,279

CLASS 340

52 F 4,785,280
74 4,785,281
323 R 4,785,282
501 4,785,283
505 4,785,284
518 4,785,285
527 4,785,289
545 4,785,286
573 4,785,291
578 4,785,292
628 4,785,288
4,785,293
631 4,785,287
649 4,785,294
679 4,785,295
731 4,785,296
802 4,785,297
825.100 4,785,298
825.340 4,785,290
825.890 4,785,299
861 4,785,300

CLASS 342

7 4,785,301
362 4,785,302

CLASS 343

713 4,785,305
742 4,785,303
770 4,785,304
786 4,785,306
792.5 4,785,307
795 4,785,308
883 4,785,309
909 4,785,310

CLASS 346

1.1 4,785,311
76 PH 4,785,312
135.1 4,785,313
140 R 4,785,314
4,785,315
150 4,785,317
155 4,785,318
156 4,785,316
160 4,785,319

CLASS 350

3.72 4,784,447
6.6 4,784,448
96.13 4,784,449
96.14 4,784,451
96.15 4,784,450
4,784,452
96.16 4,784,453
96.20 4,784,454
4,784,455
96.21 4,784,456
4,784,457
4,784,458
4,784,459
4,784,460
96.23 4,784,461
4,784,462
96.26 4,784,463
4,784,464
96.30 4,784,465
96.33 4,784,466
166 4,784,467
276 R 4,784,468
287 4,784,469
347 E 4,784,470
350 R 4,784,471
354 4,784,472
4,784,474
355 4,784,473
4,784,475
4,784,476
357 4,784,477
413 4,784,478
423 4,784,479
471 4,784,480
529 4,784,481

CLASS 351

169 4,784,482
243 4,784,483

CLASS 354

195.1 4,785,320
321 4,785,321
403 4,785,322
443 4,785,323

CLASS 355

3 R 4,785,324
8 4,785,325
4,785,326
10 4,785,327
14 D 4,785,331
14 R 4,785,328
4,785,330
14 SH 4,785,329
27 4,785,332
39 4,785,333
44 4,785,334
132 4,785,335

CLASS 356

71 4,784,484
124 4,784,485
301 4,784,486
326 4,784,487
346 4,784,488
349 4,784,489
351 4,784,490
376 4,784,491
379 4,784,492
382 4,785,336
394 4,784,493
432 4,784,494

CLASS 357

23.4 Re.32,784
23.6 4,785,337
30 4,785,338
35 4,785,339
4,785,340
44 4,785,341
51 4,785,342
4,785,345
53 4,785,343
65 4,785,344

CLASS 358

27 4,785,346
75 4,785,347
133 4,785,348
136 4,785,349
139 4,785,350
140 4,785,351
174 4,785,352
213.26 4,785,353
257 4,785,355
260 4,785,356
285 4,785,357
335 4,785,358

CLASS 360

9.1 4,785,359
60 4,785,361
77 4,785,360
85 4,785,362
93 4,785,363
96.5 4,785,364
97 4,785,365
113 4,785,366
130.21 4,785,367
133 4,785,368
4,785,369
4,785,370

CLASS 361

224 4,785,371
235 4,785,373
305 4,785,374
321 4,785,375
334 4,785,376
355 4,785,377
363 4,785,378
388 4,785,379
417 4,785,381
433 4,785,380

CLASS 362

65 4,785,382
226 4,785,383
309 4,785,385
428 4,785,386

CLASS 363

21 4,785,387
68 4,785,388
132 4,785,389

CLASS 364

200 4,785,392
4,785,393
4,785,394
4,785,395
4,785,396
4,785,397
4,785,398
4,785,416
4,785,417
300 4,785,399
4,785,400
413.07 4,785,402
413.16 4,785,401
424.06 4,785,403
443 4,785,404
480 4,785,405
483 4,785,406
497 4,785,407
513.5 4,785,408
518 4,785,391
4,785,409
571.01 4,785,419
715.01 4,785,418
715.04 4,785,421
717 4,785,410
724.19 4,785,411
761 4,785,412
900 4,785,413
4,785,414
4,785,415

CLASS 365

52 4,785,425
162 4,785,426
185 4,785,424
189 4,785,423
4,785,427
233 4,785,428
242 4,785,422

CLASS 366

151 4,784,495
162 4,784,496
225 4,785,372

CLASS 367

73 4,785,196
98 4,785,429
189 4,785,430
4,785,431

CLASS 368

82 4,785,432
109 4,785,433
185 4,785,434
205 4,785,435
4,785,436

CLASS 369

13 4,785,437
4,785,438
32 4,785,439
44 4,785,440
4,785,441
4,785,442
116 4,785,443
282 4,785,444

CLASS 370

32.1 4,785,445
58 4,785,446
70 4,785,447
76 4,785,448
85 4,785,449
95 4,785,450

CLASS 371

37 4,785,451
38 4,785,452
68 4,785,453

CLASS 372

26 4,785,454
38 4,785,456
45 4,785,457
46 4,785,455
58 4,785,458
75 4,785,459
89 4,785,460
4,785,461
92 4,785,462

CLASS 375

1 4,785,463
3 4,785,464
7 4,785,465
17 4,785,466
4,785,467
75 4,785,468
110 4,785,469

CLASS 376

272 4,784,823
282 4,784,824
399 4,784,825

CLASS 378

4 4,785,354
84 4,785,470
146 4,785,471

CLASS 379

89 4,785,473
96 4,785,472

CLASS 381

56 4,785,474
98 4,785,475
194 Re.32,785

CLASS 383

43 4,784,497

CLASS 384

45 4,784,498
295 4,784,499
462 4,784,500

CLASS 400

120 4,784,501
248 4,784,502
320 4,784,503
605 4,784,504

CLASS 401

122 4,784,505
132 4,784,506

CLASS 402

13 4,784,507
79 4,784,508

CLASS 403

24 4,784,509
25 4,784,510
169 4,784,511
225 4,784,512
248 4,784,513
391 4,784,514

CLASS 404

6 4,784,515
69 4,784,516
75 4,784,517
79 4,784,518
112 4,784,519

CLASS 405

21 4,784,520
28 4,784,521
132 4,784,522
169 4,784,523
174 4,784,524
191 4,784,525
204 4,784,526
207 4,784,527
226 4,784,528
227 4,784,529
259 4,784,530
261 4,784,531
296 4,784,532

CLASS 406

14 4,784,533

CLASS 407

19 4,784,534

CLASS 408

173 4,784,535
187 4,784,536
222 4,784,537

CLASS 409

35 4,784,538
80 4,784,539
140 4,784,540
186 4,784,541
234 4,784,542
4,784,543
235 4,784,544

CLASS 410

26 4,784,545
49 4,784,546
52 4,784,547
54 4,784,548

CLASS 411

1 4,784,549
32 4,784,550
43 4,784,551
85 4,784,552
247 4,784,553
383 4,784,554
431 4,784,555

CLASS 414

37 4,784,556
45 4,784,557
56 4,784,558
114 4,784,559
142.5 4,784,560
222 4,784,561
225 4,784,562
401 4,784,567
523 4,784,563
728 4,784,564
735 4,784,565
786 4,784,566

CLASS 415

3 4,784,568
174 4,784,569

CLASS 416

170 R 4,784,570
191 4,784,571
213 R 4,784,572
4,784,573
226 4,784,575
241 B 4,784,574

CLASS 417

63 4,784,576
114 4,784,586
219 4,784,577
225 4,784,578
246 4,784,579
295 4,784,580
312 4,784,581
4,784,583
372 4,784,585
375 4,784,582
399 4,784,584
423.6 4,784,587
439 4,784,588

CLASS 420

8 4,784,826
42 4,784,828
47 4,784,827
428 4,784,829
443 4,784,830
540 4,785,092
584 4,784,831
590 4,784,832

CLASS 422

80 4,784,833
100 4,784,834
170 4,784,835
175 4,784,836

CLASS 423

210 4,784,837
226 4,784,838
290 4,784,839
349 4,784,840
613 4,784,841

CLASS 424

9 Q 4,784,589
45 4,784,842
63 4,784,843
65 4,784,844
68 4,784,846
69 4,784,847
71 4,784,848
73 4,784,849
80 4,784,845
87 4,784,850
156 4,784,851
164 4,784,852
195.1 4,784,853
401 4,784,854
436 4,784,855
448 4,784,856
449 4,784,857
468 4,784,858

CLASS 425

72.1 4,784,590
116 4,784,591
121 4,784,592
4,784,593
131.1 4,784,594
144 4,784,595
186 4,784,596
326.1 4,784,597
458 4,784,598

CLASS 426

11 4,784,859
46 4,784,860
74 4,784,861
103 4,784,862
113 4,784,863
115 4,784,864
250 4,784,865
262 4,784,866
309 4,784,867
493 4,784,868
523 4,784,869
573 4,784,870
583 4,784,871

CLASS 427

2 4,784,873
49 4,784,874
96 4,784,872
126.3 4,784,875
150 4,784,876
163 4,784,877
212 4,784,878
213.34 4,784,879
245 4,784,880
255.6 4,784,881
375 4,784,882

CLASS 428

1 4,784,883
26 4,784,884
36 4,784,886
36.8 4,784,885
54 4,784,887
67 4,784,888
100 4,784,889
4,784,890
137 4,784,891
172 4,784,892
209 4,784,893
212 4,784,894
4,784,895
215 4,784,896
219 4,784,897
225 4,784,898
236 4,784,899
265 4,784,900
268 4,784,901
283 4,784,902
299 4,784,903
317.9 4,784,904
321.3 4,784,905
324 4,784,906
328 4,784,907
332 4,784,908
357 4,784,909
389 4,784,910
402 4,784,911
4,784,912
411.1 4,784,913
418 4,784,914
421 4,784,915
423.1 4,784,916
441 4,784,917
447 4,784,918
500 4,784,919
542.8 4,784,920
654 4,784,921
681 4,784,922
698 4,784,923

CLASS 429

15 4,784,924
29 4,784,925
96 4,784,926
196 4,784,927

CLASS 430

58 4,784,928
59 4,784,929
138 4,784,930
203 4,784,931
4,784,932
204 4,784,933
270 4,784,934
321 4,784,935
323 4,784,936
331 4,784,937
505 4,784,938
607 4,784,939

CLASS 431

7 4,784,599
9 4,784,600
153 4,784,601
4,784,602

CLASS 432

5 4,784,603
107 4,784,604

CLASS 433

6 4,784,605
8 4,784,606
90 4,784,607

CLASS 435

4 4,784,940
5 4,784,941
7 4,784,942
4,784,943
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25 4,784,945
29 4,784,946
33 4,784,947
68 4,784,948
4,784,949
4,784,950
4,784,952
125 4,784,953

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172.2	4,784,951		CLASS 445	282	4,785,000	445	4,785,040	23	4,785,085	180	4,785,125
	4,784,954	47	4,784,627	288	4,785,001	528	4,785,045	27	4,785,086	423	4,785,126
	4,784,955		CLASS 446	293	4,785,002	612	4,785,046	111	4,785,087		CLASS 558
172.3	4,784,956	225	4,784,628	307	4,785,003	714	4,785,047		CLASS 540	253	4,785,129
240.4	4,784,957		CLASS 464	311	4,785,004	745	4,785,048	127	4,785,088	277	4,785,130
	CLASS 436	130	4,784,629	312	4,785,005		CLASS 525	144	4,785,091	388	4,785,127
3	4,784,959		CLASS 474	319	4,785,006	61	4,785,049	225	4,785,090	411	4,785,128
8	4,784,960	28	4,784,630	327	4,785,007	66	4,785,050	460	4,785,093	423	4,785,131
63	4,784,961	135	4,784,631	342	4,785,008	71	4,785,051	475	4,785,094		CLASS 560
89	4,784,962		CLASS 493	354	4,785,009	73	4,785,052	523	4,785,089	126	4,785,132
504	4,784,958	43	4,784,632	356	4,785,010	125	4,785,071		CLASS 544	187	4,785,133
	CLASS 437		CLASS 494		4,785,011	146	4,785,053	38	4,785,095		CLASS 568
19	4,784,963	41	4,784,633	374	4,785,012	208	4,785,054	69	4,785,096	910.5	4,785,134
26	4,784,964	52	4,784,634	391	4,785,013	301	4,785,059	71	4,785,097		CLASS 600
30	4,784,965	70	4,784,635	401	4,785,014	356	4,785,055	76	4,785,098	24	4,784,115
40	4,784,967		CLASS 501	411	4,785,015	444	4,785,060		4,785,099		CLASS 604
41	4,784,968	10	4,784,976	415	4,785,016	507	4,785,061	178	4,785,100	22	4,784,636
	4,784,969		4,784,977	456	4,785,017	523	4,785,062	284	4,785,101	32	4,784,637
51	4,784,970	96	4,784,978	510	4,785,018	537	4,785,057		CLASS 546	49	4,784,638
031	4,784,966		CLASS 502	521	4,785,019		CLASS 526	20	4,785,102	53	4,784,639
057	4,784,971	8	4,784,979		CLASS 521	259	4,785,063	78	4,785,103	62	4,784,640
182	4,784,972	25	4,784,980	32	4,785,020	261	4,785,064	144	4,785,104	77	4,784,641
200	4,784,973	111	4,784,983	53	4,785,021	264	4,785,065	171	4,785,114	118	4,784,642
221	4,784,974	209	4,784,981	57	4,785,022	314	4,785,058	178	4,785,105	122	4,784,643
247	4,784,975	410	4,784,982	58	4,785,023		CLASS 528		4,785,106		4,784,644
	CLASS 439	439	4,784,984	60	4,785,024	15	4,785,066	244	4,785,107	141	4,784,648
56	4,784,609		CLASS 512	118	4,785,025	26	4,785,067	283	4,785,108	153	4,784,645
144	4,784,610	25	4,784,985	137	4,785,026	45	4,785,068	293	4,785,109	175	4,784,646
346	4,784,611		CLASS 514	157	4,785,027	51	4,785,069	307	4,785,110	178	4,784,647
367	4,784,612	2	4,784,986		CLASS 523	73	4,785,070	316	4,785,111	240	4,784,649
405	4,784,613	12	4,784,987	130	4,785,028	125	4,785,072	345	4,785,112	272	4,784,650
488	4,784,614	14	4,784,988	153	4,785,029	163	4,785,073		4,785,113	282	4,784,651
496	4,784,615	21	4,784,989	201	4,785,030	353	4,785,074		CLASS 548	295	4,784,652
568	4,784,616	54	4,784,990	205	4,785,031	422	4,785,075	180	4,785,115	307	4,784,653
595	4,784,617	62	4,784,991		CLASS 524		CLASS 530	212	4,785,116	329	4,784,654
620	4,784,618	77	4,784,992	42	4,785,032	317	4,785,078	240	4,785,117	349	4,784,655
724	4,784,619	93	4,784,993	86	4,785,033	351	4,785,077	491	4,785,118	355	4,784,656
751	4,784,620	183	4,784,994	91	4,785,076	399	4,785,079	557	4,785,119	407	4,784,657
793	4,784,621	206	4,784,995	99	4,785,034	402	4,785,080		CLASS 549	410	4,784,658
853	4,784,622	252	4,784,998	101	4,785,035		CLASS 534	240	4,785,120		CLASS 623
872	4,784,623	263	4,784,999	112	4,785,036	575	4,785,083	246	4,785,121	1	4,784,659
	CLASS 440	267	4,784,996	114	4,785,037	598	4,785,081	495	4,785,122	14	4,784,660
2	4,784,624			173	4,785,038	887	4,785,082	532	4,785,123	21	4,784,661
61	4,784,625			188	4,785,039		CLASS 536		CLASS 556	22	4,784,662
	CLASS 441			210	4,785,042	17.9	4,785,084	28	4,785,124		4,784,663
7	4,784,626			265	4,785,041						
				272	4,785,043						
				310	4,785,044						

CLASSIFICATION OF DESIGNS

D2—	29	298,480	536	298,498	423	298,515	D14—	53	298,531		298,548	D23—	254	298,564
	244	298,481	552	298,499	D10—	125	298,516		62	298,532	D19—	1	298,549		313	298,565
	249	298,482	567	298,500		126	298,517		77	298,533		20	298,550	D24—	50	298,566
	320	298,483	574	298,501	D11—	32	298,518		79	298,534		55	298,551		58	298,567
D3—	22	298,484	D7— 99	298,502		118	298,519		100	298,535	D20—	7	298,552		64	298,568
	76	298,486	139	298,503		146	298,520		105	298,536		43	298,553			298,569
D4—	108	298,487	308	298,504	D12—	91	298,521		106	298,537			298,554			298,570
D5—	53	298,488		298,505		92	298,522	D15—	9.2	298,538	D21—	37	298,555	D25—	67	298,571
D6—	300	298,489	393	298,506			298,523		23	298,539			298,556	D26—	46	298,572
	347	298,490	D8— 14	298,507		115	298,524		28	298,540		40	298,557		93	298,573
	367	298,491	62	298,508		136	298,525		145	298,541		59	298,558	D27—	122	298,575
	379	298,492	68	298,509		175	298,526	D16—	123	298,542		150	298,559		187	298,574
	474	298,493	394	298,510		211	298,527	D17—	22	298,543			298,560	D28—	45	298,576
	491	298,494	D9— 337	298,511			298,528	D18—	2	298,544			298,561	D30—	108	298,577
	495	298,495	339	298,512		307	298,529		7	298,545			298,562		130	298,578
		298,496	341	298,513	D13—	32	298,485			298,546			298,563		153	298,579
		298,497	403	298,514		40	298,530			298,547						

CLASSIFICATION OF PLANTS

P.—	68	6,389	6,392	6,395	74	6,398		6,401	78	6,403
		6,390	6,393	6,396		6,399	77	6,402		6,404
		6,391	6,394	6,397		6,400				

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,784,581	4,784,218	4,784,811	4,785,461	10 :	4,784,684	4,783,972
	4,784,637	4,784,230	4,784,842	4,785,469		4,784,693	4,784,011
	4,784,699	4,784,252	4,784,869	4,785,473		4,784,809	4,784,040
	4,784,733	4,784,262	4,784,943	08 :	4,783,941		4,785,038	4,784,068
	4,785,185	4,784,263	4,784,947		4,783,958		4,785,054	4,784,259
04 :	4,783,864	4,784,275	4,784,949		4,783,982		4,785,126	4,784,261
	4,783,922	4,784,296	4,784,952		4,784,248		4,785,268	4,784,268
	4,783,935	4,784,303	4,784,962		4,784,260	12 :	4,783,944	4,784,277
	4,784,098	4,784,317	4,784,965		4,784,657		4,784,012	4,784,299
	4,784,105	4,784,320	4,784,970		4,784,675		4,784,074	4,784,308
	4,784,133	4,784,325	4,784,987		4,784,698		4,784,095	4,784,314
	4,784,382	4,784,355	4,785,012		4,784,940		4,784,141	4,784,324
	4,784,579	4,784,359	4,785,019		4,784,973		4,784,146	4,784,329
	4,784,964	4,784,360	4,785,041		4,785,235		4,784,159	4,784,379
	4,785,200	4,784,385	4,785,077		4,785,245		4,784,160	4,784,381
	4,785,229	4,784,394	4,785,079	09 :	4,783,882		4,784,172	4,784,391
	4,785,259	4,784,398	4,785,112		4,783,916		4,784,202	4,784,405
	4,785,263	4,784,408	4,785,163		4,783,925		4,784,221	4,784,416
	4,785,264	4,784,417	4,785,172		4,783,927		4,784,257	4,784,450
	4,785,466	4,784,426	4,785,186		4,784,033		4,784,294	4,784,454
	4,785,474	4,784,435	4,785,199		4,784,177		4,784,326	4,784,550
06 :	4,783,853	4,784,440	4,785,201		4,784,201		4,784,377	4,784,605
	4,783,859	4,784,447	4,785,205		4,784,354		4,784,390	4,784,609
	4,783,866	4,784,453	4,785,207		4,784,373		4,784,427	4,784,613
	4,783,874	4,784,473	4,785,211		4,784,424		4,784,456	4,784,647
	4,783,909	4,784,476	4,785,216		4,784,452		4,784,571	4,784,654
	4,783,924	4,784,487	4,785,220		4,784,533		4,784,572	4,784,658
	4,783,929	4,784,488	4,785,254		4,784,553		4,784,573	4,784,708
	4,783,936	4,784,489	4,785,291		4,784,591		4,784,576	4,784,775
	4,783,957	4,784,490	4,785,292		4,784,621		4,785,271	4,784,807
	4,783,966	4,784,497	4,785,293		4,784,655		4,785,281	4,784,822
	4,783,991	4,784,508	4,785,294		4,784,674	13 :	4,784,114	4,784,863
	4,783,999	4,784,515	4,785,302		4,784,715		4,784,116	4,784,974
	4,784,015	4,784,528	4,785,307		4,784,785		4,784,555	4,784,980
	4,784,028	4,784,549	4,785,310		4,784,819		4,784,678	4,785,124
	4,784,035	4,784,551	4,785,320		4,784,845		4,784,751	4,785,165
	4,784,037	4,784,564	4,785,353		4,784,849		4,784,758	4,785,242
	4,784,048	4,784,577	4,785,361		4,784,867		4,784,762	4,785,270
	4,784,078	4,784,582	4,785,363		4,784,891		4,784,948	4,785,463
	4,784,080	4,784,586	4,785,366		4,784,934		4,784,959	18	4,783,959
	4,784,082	4,784,600	4,785,392		4,784,998		4,785,036		4,784,067
	4,784,108	4,784,604	4,785,393		4,785,014		4,785,149		4,784,241
	4,784,110	4,784,614	4,785,406		4,785,055		4,785,377		4,784,283
	4,784,122	4,784,649	4,785,415		4,785,078	15 :	4,785,290		4,784,310
	4,784,129	4,784,656	4,785,423		4,785,085	16 :	4,784,099		4,784,369
	4,784,148	4,784,700	4,785,424		4,785,108		4,784,545		4,784,376
	4,784,149	4,784,709	4,785,427		4,785,121		4,784,757		4,784,395
	4,784,158	4,784,712	4,785,429		4,785,145		4,784,851		4,784,409
	4,784,162	4,784,713	4,785,448		4,785,171	17	4,783,855		4,784,414
	4,784,165	4,784,714	4,785,453		4,785,315		4,783,878		4,784,603
	4,784,171	4,784,716	4,785,457		4,785,403		4,783,885		4,784,778
	4,784,199	4,784,738	4,785,459		4,785,417		4,783,917		4,784,779
	4,784,212	4,784,752	4,785,460		4,785,425		4,783,947		4,785,164

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	4,785,214		4,784,389		4,784,744		4,785,370		4,784,000		4,784,796
19	4,783,971		4,784,396		4,784,745		4,785,375		4,784,001		4,784,797
	4,784,056		4,784,406		4,784,746		4,785,399		4,784,169		4,784,815
	4,784,278		4,784,407		4,784,747		4,785,433		4,784,209		4,784,833
	4,784,327		4,784,428		4,784,749		4,785,446		4,784,216		4,784,838
	4,784,392		4,784,430		4,784,780		4,785,456		4,784,233		4,784,882
	4,784,546		4,784,445		4,784,788	37	4,783,926		4,784,267		4,784,900
	4,784,565		4,784,446		4,784,817		4,784,190		4,784,279		4,784,966
	4,784,955		4,784,520		4,784,820		4,784,239		4,784,304		4,785,026
20	4,784,518		4,784,534		4,784,936		4,784,349		4,784,350		4,785,061
	4,784,763		4,784,537		4,784,951		4,784,521		4,784,419		4,785,094
	4,784,960		4,784,552		4,784,967		4,784,623		4,784,425		4,785,125
21	4,784,270		4,784,554		4,784,971		4,784,777		4,784,493		4,785,127
	4,784,696		4,784,640		4,785,015		4,784,885		4,784,524		4,785,227
	4,784,771		4,784,666		4,785,017		4,785,240		4,784,530		4,785,230
	4,785,075		4,784,705		4,785,028	39	4,783,891		4,784,531		4,785,247
	4,785,140		4,784,759		4,785,044		4,783,914		4,784,563		4,785,258
	4,785,218		4,784,799		4,785,060		4,783,964		4,784,672		4,785,279
22	4,783,963		4,784,826		4,785,072		4,783,988		4,784,690		4,785,300
	4,783,995		4,784,879		4,785,120		4,783,990		4,784,707		4,785,308
	4,784,150		4,784,887		4,785,136		4,784,054		4,784,728		4,785,394
	4,784,840		4,784,923		4,785,139		4,784,121		4,784,748		4,785,411
	4,785,123		4,785,047		4,785,156		4,784,151		4,784,828		4,785,418
	4,785,131		4,785,051		4,785,192		4,784,206		4,784,832		4,785,420
	4,785,134		4,785,066		4,785,232		4,784,211		4,784,918	49	4,784,486
	4,785,309		4,785,067		4,785,244		4,784,246		4,784,921		4,784,494
23	4,784,387		4,785,255		4,785,285		4,784,253		4,785,005		4,784,706
24	4,784,031		4,785,286		4,785,304		4,784,269		4,785,022		
	4,784,319	27	4,784,017		4,785,339		4,784,271		4,785,025	50	4,784,042
	4,784,433		4,784,155		4,785,352		4,784,306		4,785,049		4,784,538
	4,784,645		4,784,195		4,785,381		4,784,316		4,785,052		4,785,337
	4,784,660		4,784,205		4,785,408		4,784,331		4,785,101	51	4,783,858
	4,784,765		4,784,264		4,785,454		4,784,348		4,785,118		4,783,877
	4,784,783		4,784,295		4,785,472		4,784,432		4,785,143		4,783,893
	4,784,802		4,784,315	35	4,784,737		4,784,512		4,785,160		4,783,994
	4,784,861		4,784,356		4,785,167		4,784,539		4,785,234		4,784,115
	4,784,908		4,784,400		4,785,261		4,784,575		4,785,269		4,784,132
	4,785,009		4,784,421	36	Re.32,783		4,784,629		4,785,345		4,784,251
	4,785,046		4,784,598		4,783,856		4,784,681		4,785,349		4,784,363
	4,785,062		4,784,636		4,783,883		4,784,769		4,785,390		4,784,383
	4,785,194		4,784,661		4,783,962		4,784,774		4,785,450		4,784,468
	4,785,197		4,784,721		4,784,064		4,784,781	44	4,784,291		4,784,547
25	Re.32,782		4,784,871		4,784,092		4,784,782	45	4,783,977		4,784,632
	4,783,910		4,784,939		4,784,120		4,784,898		4,784,086		4,784,846
	4,783,968		4,785,064		4,784,130		4,784,924		4,784,256		4,785,376
	4,783,997		4,785,070		4,784,135		4,784,979		4,784,403		4,785,387
	4,784,118		4,785,161		4,784,147		4,785,020		4,785,273	53	4,783,911
	4,784,134		4,785,248		4,784,153		4,785,030	46	4,784,568		4,783,987
	4,784,213		4,785,378		4,784,184		4,785,033	47	4,784,214		4,784,006
	4,784,265		4,785,412		4,784,215		4,785,039		4,784,366		4,784,339
	4,784,302		4,785,422		4,784,281		4,785,095		4,784,393		4,784,352
	4,784,399		4,785,452		4,784,337		4,785,097		4,784,610		4,784,353
	4,784,569	28	4,784,429		4,784,345		4,785,115		4,784,686		4,784,412
	4,784,622	29	4,783,921		4,784,374		4,785,144		4,784,875		4,784,436
	4,784,628		4,784,049		4,784,465		4,785,147		4,784,888		4,784,438
	4,784,648		4,784,053		4,784,470		4,785,191		4,784,889		4,784,825
	4,784,650		4,784,288		4,784,491		4,785,243		4,785,133		4,784,941
	4,784,722		4,784,364		4,784,516		4,785,265		4,785,195		4,784,950
	4,784,786		4,784,631		4,784,594		4,785,336		4,785,350		4,785,178
	4,784,880		4,784,876		4,784,599		4,785,383	48	4,783,872	54	4,783,933
	4,784,925		4,785,129		4,784,638	40	4,783,974		4,783,875		4,784,173
	4,784,927		4,785,371		4,784,644		4,784,226		4,783,899		4,784,370
	4,785,003	30	4,784,166		4,784,670		4,784,231		4,783,942		4,784,830
	4,785,084	31	4,784,025		4,784,679		4,784,388		4,783,989		4,784,831
	4,785,086		4,784,227		4,784,685		4,784,500		4,784,023		4,785,142
	4,785,158	32	4,784,511		4,784,703		4,784,543		4,784,039	55	4,783,884
	4,785,182	33	4,783,868		4,784,804		4,784,608		4,784,061		4,783,896
	4,785,184		4,784,004		4,784,844		4,784,704		4,784,107		4,783,923
	4,785,212		4,784,911		4,784,912		4,784,729		4,784,154		4,783,938
	4,785,228		4,785,395		4,784,928		4,784,865		4,784,176		4,783,961
	4,785,322	34	4,783,871		4,784,976		4,784,942		4,784,222		4,784,024
	4,785,373		4,783,900		4,784,977		4,785,196		4,784,224		4,784,057
	4,785,379		4,783,983		4,785,000		4,785,430		4,784,225		4,784,085
	4,785,384		4,784,059		4,785,032		4,785,431		4,784,238		4,784,087
	4,785,391		4,784,123		4,785,040	41	4,783,865		4,784,328		4,784,104
	4,785,398		4,784,139		4,785,048		4,784,027		4,784,380		4,784,106
26	4,783,879		4,784,142		4,785,076		4,784,143		4,784,410		4,784,138
	4,783,880		4,784,156		4,785,080		4,784,346		4,784,483		4,784,174
	4,783,903		4,784,170		4,785,117		4,784,736		4,784,513		4,784,250
	4,783,930		4,784,240		4,785,130		4,784,883		4,784,523		4,784,371
	4,783,932		4,784,258		4,785,135		4,785,154		4,784,526		4,784,386
	4,784,010		4,784,384		4,785,137		4,785,174		4,784,527		4,784,519
	4,784,019		4,784,455		4,785,169		4,785,396		4,784,529		4,784,567
	4,784,096		4,784,458		4,785,189		4,785,419		4,784,626		4,784,578
	4,784,272		4,784,606		4,785,237		4,785,428		4,784,639		4,784,584
	4,784,276		4,784,641		4,785,276		4,785,475		4,784,673		4,784,773
	4,784,285		4,784,642		4,785,282	42	4,783,906		4,784,676		4,784,878
	4,784,305		4,784,653		4,785,323		4,783,928		4,784,720		4,784,890
	4,784,322		4,784,663		4,785,325		4,783,934		4,784,735		4,784,894
	4,784,323		4,784,664		4,785,329		4,783,949		4,784,754		4,784,961
	4,784,358		4,784,677		4,785,341		4,783,967		4,784,755		4,785,288
	4,784,367		4,784,719		4,785,356		4,783,969		4,784,776		4,785,470
	4,784,378		4,784,732		4,785,359		4,783,985		4,784,784	56	4,784,402

06	298,489	18	298,490		298,570		298,514		298,532	49	298,523
	298,494		298,553	29	298,500		298,533		298,572	51	298,481
	298,495		298,554		298,509		298,564	40	298,519		298,482
	298,499		298,579	34	298,513		298,577	42	298,567		298,575
	298,542	24	298,496		298,530	37	298,510		298,574		298,576
	298,556		298,497		298,558		298,511	45	298,502	53	298,484
	298,578	25	298,483	36	298,480		298,518	48	298,487		298,549
08	298,568		298,536		298,493	39	298,486		298,524		298,551
09	298,538		298,550		298,501		298,498		298,537	55	298,488
17	298,534	26	298,528		298,512		298,503		298,571		298,565
	298,540	27	298,569								

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06	6,399		6,404		6,391		6,393		6,394		6,396
09	6,402										
	6,403	12	6,390		6,392	39	6,389		6,395		6,397

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PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*

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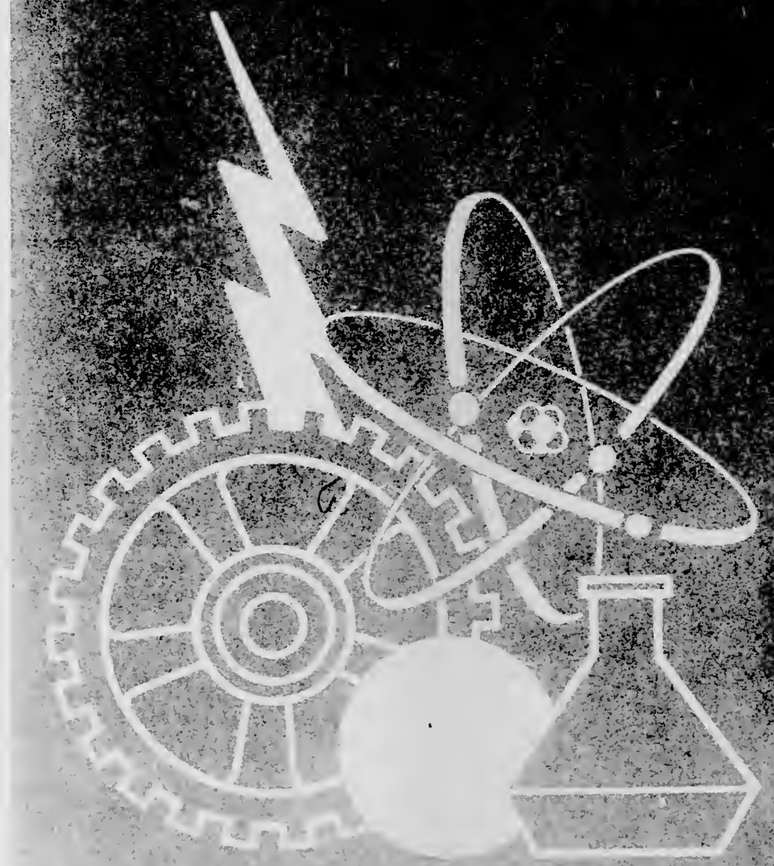
OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 22, 1988



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UNITED STATES PATENT AND TRADEMARK OFFICE
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Oct. 26, 1988. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty (PCT) Update

Withdrawal of the Declaration under PCT Article 64(1)(a) by Norway and Number of Demands Received by the IPEA/EP from U.S. Applicants

Withdrawal of the Declaration under PCT Article 64(1)(a) by Norway Effective Jan. 1, 1989

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) of their receipt on Oct. 1, 1988 of the notification of the withdrawal by Norway of the declaration under PCT Article 64(1)(a) that it shall not be bound by Chapter II of the PCT. Thus, Norway will become bound by Chapter II of the PCT on Jan. 1, 1989.

The withdrawal of the said declaration has the effect that, on Jan. 1, 1989:

(a) Norway may be elected in demands for international preliminary examination or in later elections submitted in request of international applications in which Norway is a designated State;
(b) nationals and residents of Norway may submit demands for international preliminary examination of international applications filed by them;
(c) although demands or later elections concerning Norway may be submitted only on or after Jan. 1, 1989, they may be submitted in respect of international applications irrespective of whether such applications were or will be filed before, on or after Jan. 1, 1989.

Number of Demands for International Preliminary Examination filed by U.S. Applicants with the European Patent Office as International Preliminary Examining Authority (IPEA/EP) as of Sept. 30, 1988

As of Sept. 30, 1988 the European Patent Office acting as International Preliminary Examining Authority (IPEA/EP) had received 131 demands for International Preliminary Examination since July 1, 1988 from U.S. applicants who filed their international applications with the United States Receiving Office.

DONALD J. QUIGG,
Oct. 26, 1988 *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 19, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,553,269 through 4,554,680
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 4, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,468,816	06/473,336	9/4/84
4,468,818	06/494,946	9/4/84
4,468,821	06/473,251	9/4/84

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Patent Number	Serial Number	Issue Date
4,468,822	06/468,906	9/4/84
4,468,823	06/423,994	9/4/84
4,468,828	06/428,571	9/4/84
4,468,835	06/450,928	9/4/84
4,468,840	06/258,375	9/4/84
4,468,841	06/431,353	9/4/84
4,468,843	06/476,664	9/4/84
4,468,875	06/380,097	9/4/84
4,468,876	06/386,590	9/4/84
4,468,880	06/352,003	9/4/84
4,468,881	06/378,617	9/4/84
4,468,882	06/431,841	9/4/84
4,468,886	06/508,940	9/4/84
4,468,889	06/322,701	9/4/84
4,468,894	06/337,726	9/4/84
4,468,895	06/481,382	9/4/84
4,468,897	06/424,384	9/4/84
4,468,899	06/446,448	9/4/84
4,468,902	06/416,648	9/4/84
4,468,904	06/484,856	9/4/84
4,468,905	06/381,249	9/4/84
4,468,908	06/247,632	9/4/84
4,468,926	06/369,496	9/4/84
4,468,932	06/498,705	9/4/84
4,468,941	06/352,267	9/4/84
4,468,942	06/319,069	9/4/84
4,468,944	06/284,132	9/4/84
4,468,946	06/393,663	9/4/84
4,468,948	06/357,324	9/4/84
4,468,952	06/403,791	9/4/84
4,468,964	06/446,159	9/4/84
4,468,967	06/438,675	9/4/84
4,468,969	06/470,306	9/4/84
4,468,971	06/398,808	9/4/84
4,468,973	06/488,479	9/4/84
4,468,978	06/283,796	9/4/84
4,468,980	06/325,499	9/4/84
4,468,995	06/338,290	9/4/84
4,468,998	06/411,427	9/4/84
4,468,999	06/470,716	9/4/84
4,469,002	06/380,357	9/4/84
4,469,003	06/422,239	9/4/84
4,469,010	06/353,142	9/4/84
4,469,020	06/392,654	9/4/84
4,469,029	06/342,495	9/4/84
4,469,034	06/478,446	9/4/84
4,469,036	06/432,510	9/4/84
4,469,037	06/371,382	9/4/84
4,469,041	06/358,660	9/4/84
4,469,051	06/472,816	9/4/84
4,469,056	06/468,321	9/4/84
4,469,060	06/329,003	9/4/84
4,469,075	06/411,415	9/4/84
4,469,076	06/413,219	9/4/84
4,469,077	06/381,436	9/4/84
4,469,091	06/416,259	9/4/84
4,469,093	06/377,672	9/4/84
4,469,096	06/410,716	9/4/84
4,469,105	06/274,825	9/4/84
4,469,110	06/389,393	9/4/84
4,469,114	06/427,993	9/4/84
4,469,123	06/503,774	9/4/84
4,469,135	06/313,467	9/4/84
4,469,145	06/293,306	9/4/84
4,469,151	06/385,848	9/4/84
4,469,153	06/263,873	9/4/84
4,469,154	06/425,925	9/4/84
4,469,165	06/386,132	9/4/84
4,469,166	06/386,423	9/4/84
4,469,167	06/326,814	9/4/84
4,469,168	06/238,040	9/4/84
4,469,171	06/392,620	9/4/84
4,469,173	06/492,907	9/4/84
4,469,174	06/466,185	9/4/84
4,469,182	06/364,526	9/4/84
4,469,185	06/256,643	9/4/84
4,469,191	06/421,512	9/4/84
4,469,192	06/520,990	9/4/84
4,469,195	06/490,130	9/4/84
4,469,196	06/430,962	9/4/84
4,469,201	06/439,716	9/4/84
4,469,202	06/362,207	9/4/84
4,469,203	06/340,692	9/4/84
4,469,208	06/332,232	9/4/84
4,469,211	06/399,461	9/4/84
4,469,214	06/451,536	9/4/84
4,469,231	06/388,745	9/4/84
4,469,232	06/289,520	9/4/84
4,469,233	06/474,139	9/4/84
4,469,236	06/413,314	9/4/84
4,469,237	06/536,535	9/4/84
4,469,242	06/433,982	9/4/84
4,469,245	06/276,711	9/4/84
4,469,256	06/518,389	9/4/84
4,469,257	06/470,215	9/4/84
4,469,258	06/406,102	9/4/84
4,469,260	06/406,083	9/4/84
4,469,265	06/436,997	9/4/84
4,469,268	06/349,634	9/4/84
4,469,273	06/500,476	9/4/84
4,469,277	06/495,022	9/4/84
4,469,281	06/418,170	9/4/84
4,469,286	06/470,442	9/4/84
4,469,287	06/418,728	9/4/84
4,469,289	06/427,548	9/4/84
4,469,296	06/357,990	9/4/84
4,469,299	06/263,484	9/4/84
4,469,309	06/347,935	9/4/84
4,469,315	06/391,352	9/4/84
4,469,316	06/446,244	9/4/84
4,469,325	06/354,660	9/4/84
4,469,326	06/330,849	9/4/84
4,469,327	06/358,511	9/4/84
4,469,331	06/426,870	9/4/84
4,469,332	06/423,200	9/4/84
4,469,333	06/442,796	9/4/84
4,469,343	06/432,335	9/4/84
4,469,344	06/424,156	9/4/84
4,469,353	06/367,258	9/4/84
4,469,359	06/453,037	9/4/84
4,469,360	06/457,210	9/4/84
4,469,361	06/487,109	9/4/84
4,469,370	06/332,721	9/4/84
4,469,371	06/452,291	9/4/84
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4,469,384	06/494,621	9/4/84
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4,469,411	06/291,174	9/4/84
4,469,418	06/435,347	9/4/84
4,469,428	06/402,329	9/4/84
4,469,446	06/391,664	9/4/84
4,469,451	06/392,815	9/4/84
4,469,458	06/366,567	9/4/84
4,469,461	06/410,912	9/4/84
4,469,462	06/394,957	9/4/84
4,469,465	06/300,814	9/4/84
4,469,468	06/302,416	9/4/84
4,469,472	06/399,839	9/4/84
4,469,474	06/281,735	9/4/84
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4,469,488	06/365,899	9/4/84
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4,469,501	06/472,316	9/4/84
4,469,506	06/460,381	9/4/84
4,469,507	06/460,638	9/4/84
4,469,510	06/370,501	9/4/84
4,469,548	06/446,664	9/4/84
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4,469,566	06/527,349	9/4/84
4,469,571	06/519,356	9/4/84
4,469,597	06/272,996	9/4/84
4,469,600	06/493,489	9/4/84
4,469,629	06/251,840	9/4/84
4,469,642	06/480,726	9/4/84
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4,469,668	06/343,911	9/4/84
4,469,672	06/482,796	9/4/84
4,469,686	06/229,912	9/4/84
4,469,687	06/300,561	9/4/84
4,469,691	06/441,161	9/4/84
4,469,696	06/384,469	9/4/84
4,469,697	06/479,016	9/4/84
4,469,699	06/411,558	9/4/84
4,469,704	06/333,772	9/4/84
4,469,709	06/354,593	9/4/84
4,469,711	06/566,182	9/4/84
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4,469,733	06/577,601	9/4/84
4,469,759	06/449,239	9/4/84
4,469,788	06/346,846	9/4/84
4,469,793	06/366,130	9/4/84
4,469,810	06/457,220	9/4/84
4,469,816	06/449,720	9/4/84
4,469,817	06/442,668	9/4/84
4,469,818	06/415,509	9/4/84
4,469,829	06/524,360	9/4/84
4,469,830	06/515,878	9/4/84
4,469,841	06/472,235	9/4/84
4,469,856	06/434,788	9/4/84
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4,469,858	06/305,904	9/4/84
4,469,865	06/423,332	9/4/84
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4,469,915	06/419,788	9/4/84
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4,469,955	06/480,356	9/4/84
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4,469,978	06/529,616	9/4/84
4,469,980	06/332,710	9/4/84
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4,469,989	06/353,354	9/4/84
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4,470,030	06/495,891	9/4/84
4,470,032	06/439,918	9/4/84
4,470,039	06/422,137	9/4/84
4,470,065	06/361,800	9/4/84
4,470,098	06/467,532	9/4/84
4,470,100	06/332,487	9/4/84
4,470,103	06/218,344	9/4/84
4,470,104	06/334,113	9/4/84
4,470,106	06/482,546	9/4/84
4,470,120	06/488,883	9/4/84
4,470,125	06/319,460	9/4/84
4,470,136	06/322,136	9/4/84
4,470,149	06/358,081	9/4/84
4,470,150	06/359,595	9/4/84

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,375,516, Re. S.N. 253,819, Filed Oct. 6, 1988, Cl. 501/84, RIGID WATER-RESISTANT PHOSPHATE CERAMIC MATERIALS AND PROCESS FOR PREPARING THEM, Jeffery L. Barrall, Owner of Record: *Armstrong World Industries, Inc., Lancaster, Pa.*, Attorney or Agent: Herbert M. Wolfson, Ex. Gp.: 113

4,587,240, Re. S.N. 253,579, Filed Oct. 5, 1988, Cl. 514/188, PHARMACEUTICAL COMPOSITIONS, Robert C. Hider, et al., Owner of Record: *National Research Development, London, England,* Attorney or Agent: Norman F. Oblon, Ex. Gp.: 125

4,619,913, Re. S.N. 255,863, Filed Oct. 11, 1988, Cl. 514/2, TREATMENTS EMPLOYING DRUG-CONTAINING MATRICES FOR INTRODUCTION INTO CELLULAR LESION AREAS, Edward E. Luck, et al., Owner of Record: *Matrix Pharmaceuticals, Menlo Park, Calif.,* Attorney or Agent: Bertram I. Rowland, Ex. Gp.: 183

4,677,435, Re. S.N. 253,630, Filed Oct. 5, 1988, Cl. 340/825.31, SURFACE TEXTURE READING ACCESS CHECKING SYSTEM, Bertrand Causse D'Agraives, Owner of Record: *Communaute Europeenne de L'Energie Atomique (EURATOM), Nancy, France,* Attorney or Agent: Gregory J. Maier, Ex. Gp.: 264

4,682,511, Re. S.N. 253,989, Filed Oct. 5, 1988, Cl. 74/681, GEAR ASSISTED CONTINOUSLY VARIABLE TRANSMISSION, Ernest C. Wittke, Owner of Record: *Inventor,* Attorney or Agent: Edward R. Weingram, Ex. Gp.: 352

4,688,388, Re. S.N. 254,852, Filed Oct. 7, 1988, Cl. 62/126, SERVICE STATION FOR REFRIGERATION EQUIPMENT, Ralph C. Lower, et al., Owner of Record: *Sealed Power Corp., Muskegon, Mich.,* Attorney or Agent: Robert C. Collins, Ex. Gp.: 344

4,734,378, Re. S.N. 253,816, Filed Oct. 5, 1988, Cl. 436/175, PRECIPITATION OF INTERFERING PROTEINS IN FLUORESCENCE POLARIZATION IMMUNOASSAY FOR DIGOXIN, Gloria J. Hockerman, et al., Owner of Record: *Abbott Laboratories, Chicago, Ill.,* Attorney or Agent: Robert W. Stevenson, Ex. Gp.: 181

4,758,161, Re. S.N. 254,414, Filed Oct. 5, 1988, Cl. 433/173, COPING INSERT FOR USE WITH A DENTAL IMPLANT, Gerald A. Niznick, Owner of Record: *Core-Vent Corp., Encina, Calif.,* Attorney or Agent: Patrick F. Bright, Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,381,056, Reexam. No. 90/001,619, Requested: Oct. 12, 1988, Cl. 198/696, CONVEYOR APPARATUS ESPECIALLY FOR PRINTED PRODUCTS, Jurg Eberle, Owner of Record: *Ferag AG, Hinwil, Switzerland,* Attorney or Agent: William A. Webb, Ex. Gp.: 310, Requester: Owner

4,391,928, Reexam. No. 90/001,621, Requested: Oct. 17, 1988, Cl. 523/201, OPACIFYING POLYMERIC PARTICLE AND USE, Daniel F. Herman, et al., Owner of Record: *NL Chemical Inc., New York, N.Y.,* Attorney or Agent: None, Ex. Gp.: 150, Requester: Rodman & Rodman, White Plains, N.Y.

4,584,362, Reexam. No. 90/001,622, Requested: Oct. 17, 1988, Cl. 528/55, BISMUTH CATALYST SYSTEM FOR PREPARING POLYURETHANE ELASTOMERS, Arthur R. Leckart, et al., Owner of Record: *Cosan Chemical Corp., Carlstadt, N.J.,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 150, Requester: The Shepherd Chemical Co., Cincinnati, Ohio

4,721,809, Reexam. No. 90/001,618, Requested: Sept. 30, 1988, Cl. 564/82, ALKYLSULFONAMIDO OR PERFLUOROALKYLSULFONAMIO BENZENE-

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NESULFONAMIDES, George C. Buzby, et al., Owner of Record: *American Home Products Corp., New York, N.Y.*, Attorney or Agent: Richard K. Johnson, Ex. Gp.: 120, Requester: Owner

4,733,919, Reexam. No. 90/001,620, Requested: Oct. 14, 1988, Cl. 303/28, INTERGRATED PRESSURE EXHAUST VALVE AND FLUID COUPLING, John D. Jacobs, et al., Owner of Record: *HWP Inc., Commerce, Calif.*, Attorney or Agent: Christie, Parker, et al., Ex. Gp.: 310, Requester: Owner

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Erratum

"All reference to Patent No. 4,775,577 to Ronald A. Sahatjian, et al. of Mass. for 'FLEXIBLE LAMINATED FLUOROPOLYMER CONTAINING COMPOSITES' appearing in the Official Gazette of Oct. 4, 1988 should be deleted since no patent was granted."

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Continental Distilling Corp., Philadelphia, Pa., Reg. No. 857,605, for the mark "BELUGA", Canc. No. 16,800.

Pied Piper Casuals, Inc., New York, N.Y., Reg. No. 978,161, for the mark "STITCHES", Canc. No. 17,054.

McDennan & Co., Ltd., New York, N.Y., Reg. No. 1,239,636, for the mark "PLAK-AWAY", Canc. No. 17,210.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Pavone, El Cerrito, Calif., Reg. No. 1,318,229, for the mark "PAVONE", Canc. No. 17,004.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 22, 1988

D. 291,053	4,714,920	4,733,814	4,748,771
D. 295,369	4,715,545	4,733,908	4,748,848
D. 295,946	4,717,951	4,734,126	4,748,891
D. 297,469	4,718,332	4,734,484	4,748,923
4,463,067	4,719,177	4,734,787	4,748,949
4,579,054	4,719,724	4,735,115	4,748,980
4,588,661	4,719,813	4,735,476	4,749,091
4,596,120	4,719,896	4,735,642	4,749,492
4,605,283	4,720,487	4,737,039	4,749,803
4,606,051	4,722,415	4,737,519	4,750,219
4,613,709	4,722,955	4,737,832	4,750,528
4,627,276	4,723,309	4,738,017	4,751,550
4,636,282	4,723,635	4,738,078	4,751,652
4,641,858	4,724,123	4,738,279	4,751,710
4,643,161	4,724,698	4,738,515	4,752,135
4,652,496	4,724,812	4,738,783	4,752,478
4,654,415	4,725,551	4,739,091	4,752,520
4,660,661	4,726,006	4,739,146	4,752,825
4,668,743	4,726,123	4,739,461	4,752,903
4,672,914	4,726,376	4,740,276	4,753,198
4,674,249	4,726,439	4,740,337	4,753,288
4,676,422	4,726,565	4,740,843	4,753,489
4,679,738	4,726,693	4,741,379	4,753,800
4,681,966	4,727,101	4,741,915	4,753,906
4,684,066	4,727,542	4,743,820	4,754,326
4,687,000	4,727,817	4,743,880	4,754,392
4,689,664	4,728,110	4,744,303	4,754,656
4,690,951	4,728,527	4,744,902	4,754,670
4,693,311	4,729,007	4,745,542	4,755,102
4,693,935	4,729,017	4,745,633	4,756,136
4,694,923	4,729,339	4,745,876	4,756,781
4,696,028	4,730,035	4,745,968	4,756,973
4,699,577	4,731,006	4,746,225	4,757,150
4,703,516	4,731,048	4,746,282	4,757,196
4,704,282	4,731,426	4,746,350	4,758,103
4,707,242	4,731,462	4,746,566	4,758,183
4,708,794	4,732,276	4,747,039	4,758,725
4,713,393	4,732,304	4,747,553	4,758,948
4,714,124	4,732,342	4,747,641	4,763,098
4,714,201	4,732,571	4,747,931	4,774,941
4,714,466	4,733,169	4,748,231	
4,714,919	4,733,813	4,748,637	

Disclaimers

4,734,827.—*James Wong*, Wayland, Mass. TANTALUM CAPACITOR LEAD WIRE. Patent dated Mar. 29, 1988. Disclaimer filed Sept. 23, 1988, by the assignee, *Supercon, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

4,774,231.—*Maurice Petitou*, Paris; *Pierre Sinay*, Orleans; *Jean Choay*, Paris; and *Jean-Claude Lormeau*, Maromme, all of France. DISACCHARIDES FORMED BY PATTERNS HAVING A GLUCOSAMINE AND URONIC ACID STRUCTURE, PREPARATION THEREOF AND BIOLOGICAL APPLICATIONS. Patent dated Sept. 27, 1988. Disclaimer filed Sept. 23, 1988, by the assignee, *Choay S.A.*

The term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Dedication

4,724,621.—*Phillip M. Hobson*, Los Altos and *Paul H. Dick*, San Jose, both of Calif. WAFER PROCESSING CHUCK USING SLANTED CLAMPING PINS. Patent dated Feb. 16, 1988. Dedication filed Sept. 28, 1988, by the assignee, *Varian Associates, Inc.*

Hereby dedicates to the Public the entire term of said patent.

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Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska—Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 22, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-5-87
BIOTECHNOLOGY, GROUP 180—S. N. ZAHARNA, Acting Director	1-17-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-12-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	2-15-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	6-8-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	2-27-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-28-87
DESIGN, GROUP 290—K. L. CAGE, Director	1-3-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	11-10-87
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—VACANT, Director	5-13-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-6-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-16-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-6-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,609,763 to 3,616,462, inclusive
Plant Patents ..... 3,063 to 3,081 inclusive

REEXAMINATIONS

NOVEMBER 22, 1988

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 31,873 (947th)

VENOUS CATHETER DEVICE

Randolph M. Howes, Picayune, Miss., assignor to Janice Kinchen, a part interest

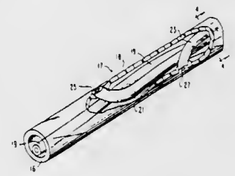
Reexamination Request No. 90/001,368, Nov. 4, 1987.

Reexamination Certificate for Reissue Patent Re. 31,873, issued Apr. 30, 1985, Ser. No. 444,710, Jan. 19, 1983.

Original No. 4,072,146, dated Feb. 7, 1978, Ser. No. 721,215, Sep. 8, 1976.

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—675



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

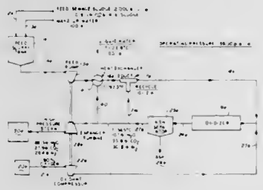
The patentability of claims **7** and **11–14** is confirmed.

Claims **1–6** and **8–10** were previously cancelled.

7. A venous catheter device including an elongated, flexible catheter tube provided with a distal end portion generally circular in cross-section and having a uniform outer diameter constructed for insertion into and capable of being fed longitudinally of a vein, a plurality of independent lumens extending freely through said catheter tube, each of said lumens having a distal terminus adjacent the distal terminus of the catheter tube and spaced from each other, one of said lumens having its distal end substantially coextensive with the distal end of said tube, the other of said lumens exiting at lateral openings in said tube and being joined thereto, at least one of said lumens providing means for infusing fluids into the blood stream, the proximate ends of the lumens extending beyond the proximate end of said catheter tube and being fitted with a lumen adapter for connection to independent fluid devices.

Claims **7**, **9**, **12**, **16**, **17**, **19**, **21**, **23**, **24**, **26**, **28** and **29**, dependent on an amended claim, are determined to be patentable.

New claims **30–36** are added and determined to be patentable.



1. A method of obtaining useful energy and oxidizing organic materials in an oxidizer, said method comprising forming a reaction mixture of said organic material, water and oxygen, and reacting said mixture in a single homogeneous fluid phase under conditions characterized by a temperature of at least 377° C. and a pressure of at least 220 atmospheres to cause said organic materials to be oxidized *within a period of less than about 5 minutes* thereby raising the temperature of said water and oxidation products.

B1 4,338,199 (948th)

PROCESSING METHODS FOR THE OXIDATION OF ORGANICS IN SUPERCRITICAL WATER

Michael Modell, Cambridge, Mass., assignor to Modar, Inc., Natick, Mass.

Reexamination Request No. 90/001,378, Nov. 16, 1987.

Reexamination Certificate for Patent No. 4,338,199, issued Jul. 6, 1982, Ser. No. 147,946, May 8, 1980.

Int. Cl.[4] C02F *1/72*

U.S. Cl. 210—721

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **5** and **10** are cancelled.

Claims **1–4**, **6**, **8**, **11**, **13–15**, **18**, **20**, **22**, **25** and **27** are determined to be patentable as amended.

B1 4,385,899 (949th)

UNIVERSAL JOINT

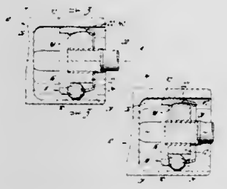
Leonard N. Franklin, Jr., Reese, Mich., assignor to General Motors Corporation, Detroit, Mich.

Reexamination Request No. 90/001,463, Mar. 7, 1988.

Reexamination Certificate for Patent No. 4,385,899, issued May 31, 1983, Ser. No. 182,865, Sep. 2, 1980.

Int. Cl.[4] F16D *3/02*

U.S. Cl. 464—146



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–6** are cancelled.

[**1**. In a universal joint having inner and outer drive members with longitudinal drive grooves, drive balls in the drive grooves for transferring torque between the drive members and a cage for positioning the drive balls which is pivoted on the inner and outer drive members about two respective centers which are on opposite sides of and spaced from the cage center,

the improvement comprising said cage having a cylindrical surface and two axially spaced stop surfaces inside the cage, and

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said inner member slideably engaging the cylindrical surface and being moveable axially and pivotally thereon with respect to the cage between two pivot centers established by the inner member engaging the respective stop surfaces.]

B1 4,528,261 (950th)

PRELAMINATION, IMAGEWISE EXPOSURE OF PHOTOHARDENABLE LAYER IN PROCESS FOR SENSITIZING, REGISTERING AND EXPOSING CIRCUIT BOARDS

William P. Hauser, Cranbury, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Reexamination Request No. 90/000,977, Mar. 31, 1986.
Reexamination Certificate for Patent No. 4,528,261, issued Jul. 9, 1985, Ser. No. 479,494, Mar. 28, 1983.
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—322

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–36** is confirmed.

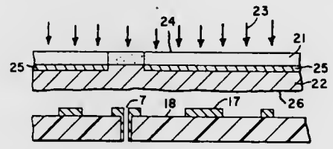
New claims **37–40** are added and determined to be patentable.

1. A process of applying to a substrate and exposing a photohardenable material to obtain discrete areas of photohardened material on the substrate comprising the steps of:

(a) applying to a flexible photomask a photohardenable material which is deformable and which is not present as a solid with said material applied in excess compared to the amount necessary to form a layer in step (c);

(b) exposing a portion of the photohardenable material to actinic radiation through the photomask whereby the surface of the photohardenable material which faces away from the photomask remains deformable;

(c) applying exposed and unexposed material with the photomask to a substrate to form a layer whereby the surface



of photohardenable material which remains deformable faces the substrate by applying pressure to the flexible photomask and advancing the pressure to remove excess photohardenable material between the photomask and substrate to form a registered preimaged laminate; and

(d) reexposing the layer containing photohardenable material to actinic radiation through the photomask whereby bonded discrete areas of photohardened material are obtained on the substrate.

REISSUES

NOVEMBER 22, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,786

NEUTRAL HYDROCARBOXYCARBONYL THIOUREA SULFIDE COLLECTORS

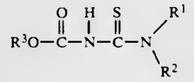
Yun-Lung Fu, Milford, and Samuel S. Wang, Cheshire, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Original No. 4,556,483, dated Dec. 3, 1985, Ser. No. 641,660, Aug. 17, 1984. Application for reissue Jul. 30, 1987, Ser. No. 79,628

Int. Cl.[4] B03D *1/14*

U.S. Cl. 209—166 **15 Claims**

1. A collector composition for froth flotation of base metal sulfide minerals comprising at least one hydrocarboxycarbonyl thiourea compound selected from compounds having the formula:



wherein R^1 is hydrogen [or R^2], R^2 is a saturated or unsaturated alkyl radical; and R^3 is a saturated or unsaturated alkyl radical.

Re. 32,787

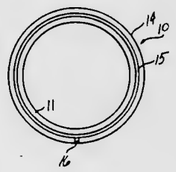
SEALING RING FOR AN ELECTRICAL CONNECTOR

David O. Gallusser, Oneonta; David W. MacAvoy; Stephen Punako, both of Bainbridge, and David L. Frear, Afton, all of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Original No. 4,456,320, dated Jun. 26, 1984, Ser. No. 402,528, Jul. 28, 1982. Application for reissue Feb. 28, 1986, Ser. No. 834,982

Int. Cl.[4] H01R *13/52*

U.S. Cl. 439—271 **5 Claims**



1. In combination with a separable electrical connector assembly of the type having first and second housings, each having a front face and separably connected together in face to face relationship [by a coupling nut mounted on one of the housings], the improvement comprising:

a compressible annular member having a rear face, a forward face, an inner circumferential face and an outer circumferential face;

[an] *a first* annular groove in the rear face of said annular member, [the forward face having an area less than the area of said rear face,] said annular member located in said first housing with the *first* annular groove located against and facing the front face of [first] said *first* housing; [and]

a second groove in said rear face extending radially between the annular groove and the outer circumferential face; and

an annular projection in the front face of said second housing adapted to engage said compressible *annular* member upon connecting together *of* the two housings, said projection having a radial width about the same as the diameter of the groove in said member so that said annular groove accepts material displaced by the projection in the forward face of said second housing when said housings are connected together and said projection is pressed into said annular member [by rotation of said coupling nut].

Re. 32,788

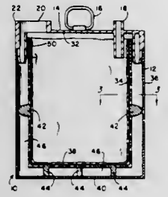
SEPARATION-CHAMBER MEANS

William G. Disanza, Jr., 25 Washington Ave., Hillsdale, N.J. 07642

Original No. 4,523,936, dated Jun. 18, 1985, Ser. No. 634,048, Jul. 25, 1984. Application for reissue Feb. 13, 1987, Ser. No. 16,647

Int. Cl.[4] B07D *45/18*

U.S. Cl. 55—429 **14 Claims**



9. Separation-chamber means, for use in a negative-pressure, collection system, for collecting refuse, such as debris, particulate matter, and the like, comprising:

means defining a chamber in which to collect refuse;

said chamber having an imperforate outer wall and a foraminous inner wall;

said walls being generally concentric defining an annular void therebetween;

a separation-collection area formed within said foraminous inner wall;

means for (a) admitting gas, and refuse suspended in such gas, into said separation-collection area, and for (b) discharging gas from said separation-collection area; wherein

said outer wall has a bottom and an open top;

said admitting and discharging means comprises means for admitting gas into said separation-collection area, as aforesaid, through said open top, and means for discharging gas from said separation-collection area, as aforesaid, also through said open top; and

supply means for supplying a substantially equal negative pressure to said separation-collection area and said annular void, from a common source of negative pressure, to discharge gas from said separation-collection area and to maintain a refuse bag contained in said separation-collection area in an opened condition.

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Re. 32,789

TRANSMISSION TRUNK MULTICHANNEL DISPATCH SYSTEM WITH PRIORITY QUEUING

Charles N. Lynk, Jr., Bedford, Tex., and James J. Mikulski, Deerfield, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Original No. 4,012,597, dated Mar. 15, 1977, Ser. No. 634,962, Nov. 24, 1975. Application for reissue Nov. 4, 1983, Ser. No. 548,793

Int. Cl.[4] H04Q *7/00*

U.S. Cl. 379—58 **46 Claims**

1. Control apparatus in a communication system having a central control station for assigning a limited number of information channels to a plurality of remote stations, each of said remote stations communicating [a message,] *messages, each* comprising a plurality of individual transmissions, on its assigned [channel] *channels*, the apparatus comprising:

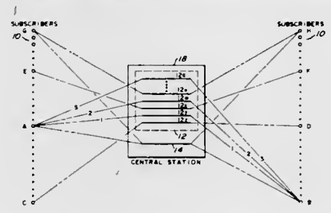
each remote station having means to request a channel assignment from the central station;

means responsive to an assigned channel signal to operate on said channel;

means generating an end of transmission signal at the conclusion of each remote station transmission; and

the central station having

means to assign a channel to a requesting remote station; and



means detecting the end of transmission signal from a remote station and truncating said remote station's channel assignment in response thereto.

PLANT PATENTS

GRANTED NOVEMBER 22, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,405
ROSE PLANT—MEIVROFIX VARIETY

Marie-Louise Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Aug. 11, 1986, Ser. No. 895,489

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of Hybrid Tea rose plant characterized by the following combination of characteristics:

(a) forms in abundance attractive long lasting very double pink blossoms which generally are borne one per stem,

(b) exhibits an excellent capacity for forcing, and

(c) is particularly well suited for growing under greenhouse conditions for the production of cut flowers;

substantially as herein shown and described together with the parts thereof.

6,406
APPLE TREE — HIGRED CULTIVAR

George Higgins, Grandview, Wash., assignor to Stark Brothers Nurseries and Orchards Company, Louisiana, Mo.

Filed Oct. 27, 1986, Ser. No. 923,429

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of Jonathan Apple tree, substantially as illustrated and described, characterized by (a) the formation of variable-sized red fruits which color approximately 10 to 14 days earlier than those of the Snyder cultivar of U.S. Plant Pat. No. 2,650, (b) the formation of fruit having a brighter red appearance than that of the Super Jon cultivar of U.S. Plant Pat. No. 5,086, and (c) the formation of fruit on a more abundant and a more consistent basis than the Super Jon cultivar of U.S. Plant Pat. No. 5,086.

6,407
CHERRY TREE, "TULARE"

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of LeGrand, Calif. 95333

Filed Feb. 9, 1987, Ser. No. 12,648

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of cherry tree substantially as illustrated and described which is somewhat similar to the King Cherry Tree (U.S. Plant Pat. No. 5,478) and the Bing Cherry tree (unpatented), which it most closely resembles, but from which it is distinguished therefrom by bearing fruit which are a uniform and full dark red color, which ripens approximately three days earlier than the King Cherry Tree (U.S. Plant Pat. No. 5,478) and ten days earlier than the Bing Cherry Tree (unpatented) at LeGrand, Calif., and which further has displayed the desirable traits of being virtually non-doubling, and having exceptional handling and shipping characteristics.

6,408
NECTARINE TREE "ZEE GLO"

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Dec. 12, 1986, Ser. No. 941,724

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree as illustrated and described, characterized by its large size, upright growth and being a regular and productive bearer of large, firm, yellow flesh, clingstone fruit with good eating and shipping quality; and in comparison to Late Le Grand Nectarine (U.S. Plant Pat. No. 1,035), maturing 3–5 days earlier, having a greater degree of attractive red skin color and the ability to store thirty days in cold storage and maintain 5–7 days of shelf life with good flavor and eating quality.

6,409
PEACH TREE NAMED 'TASTY ZEE'

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Feb. 6, 1987, Ser. No. 12,047

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—42 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described, characterized by its large size, upright growth and being a productive and regular bearer of large, firm, white flesh, freestone fruit with good flavor and eating quality; the fruit is further characterized in comparison to Giant Babcock Peach (U.S. Plant Pat. No. 1,353) by having firmer white flesh, a higher degree of attractive red skin color and being 4 to 5 days earlier in maturity.

6,410
PEACH TREE ("DOUBLE JEWEL")

Chris F. Zaiger, 537 Rosemore Ave.; Gary N. Zaiger, 1907 Elm Ave.; Leith M. Gardner, 1207 Grimes Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Jan. 20, 1987, Ser. No. 5,265

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree as illustrated and described, characterized by its large size, vigorous, upright growth and bearing large, showy, double, pink flowers in the spring giving the effect of an ornamental flowering tree; the tree is further characterized by being a regular and productive bearer of large, firm, yellow flesh, freestone fruit with good eating quality and attractive red skin color.

6,411
MYRICA CERIFERA VAR. PUMILA NAMED 'GEORGIA GEM'

William H. Craven, III, Waynesboro, Ga., assignor to Twisted Oaks Nursery, Waynesboro, Ga.

Filed Nov. 10, 1986, Ser. No. 929,321

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of dwarf southern waxymyrtle, *Myrica cerifera* var. pumila, as herein shown and described, particularly characterized by its compact, broad spreading, suckering, mounded habit with small, dainty, olive-green leaves that are very closely spaced along the upright stems creating a dense foliage mass; an evergreen constitution with foliage maintaining, olive-green color in cold weather; and with a particular adaptability to dry, sandy soils, with full sun to partial shade tolerance.

6,412
AZALEA PLANT NAMED CACHET

Henry W. Motzkau, Lacey, Wash., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Feb. 26, 1987, Ser. No. 19,307

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct cultivar of Azalea named Cachet, as described and illustrated, and characterized particularly as to novelty by its evergreen foliage, double flower form, fuchsia

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pink flower color, early response, compact growth habit, ease of budding, and excellent cooler and shipping tolerance.

6,413
AZALEA PLANT NAMED ARDENT
Henry W. Motzkau, Lacey, Wash., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Feb. 26, 1987, Ser. No. 19,306
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—56 1 Claim

1. A new and distinct cultivar of Azalea named Ardent, as described and illustrated, and characterized particularly as to novelty by its evergreen foliage, long lasting flowers, hot pink flower color, single hose-in-hose flower form, shiny foliage, resistance to foliage burn and spider mite infestation, ease of budding in a year round controlled program, excellent shipping, and cooler tolerance.

6,414
AZALEA PLANT NAMED BOLERO
Henry W. Motzkau, Lacey, Wash., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Feb. 26, 1987, Ser. No. 19,305
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—57 1 Claim

1. A new and distinct cultivar of Azalea named Bolero, as described and illustrated, and characterized particularly as to novelty by its evergreen foliage, flower form, salmon red flower color, long lasting flowers, ease of budding, spreading growth habit, profuse and uniform flowering in a year round controlled program, and excellent cooler and shipping tolerance.

6,415
DISTINCT VARIETY OF BEGONIA PLANT NAMED PETRA
Jan Man, Lisse, Netherlands, assignor to Oglevee Associates, Inc., Connellsville, Pa.
Filed Jul. 14, 1986, Ser. No. 885,525
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of Begonia characterized by its naturally short, compact plant with extensive and vigorously formed branches which are strong, the contrast between the orange flowers and dark green foliage being very pleasing, and high tolerance to botrytis and powdery mildew as herein shown and described and parts therefor.

6,416
GERANIUM PLANT NAMED SCARLET RED VERONICA
Cleveland Ott, 677 Grater Ave., Graterford, Pa. 19426
Filed Dec. 5, 1986, Ser. No. 938,464
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of geranium plant characterized in that, as distinguished from its parent plant, Veronica, (U.S. Plant Pat. No. 5,054), the major outer portion of the upper side of the petal is Red Group 46B on the RHS Chart, the medial portion is Red Group 44C, a blotch of Red Group 53C is between the areas of Red Group 46B and 44C, the base portion where the petal joins the stem has a white blotch, forming with the other petals of the corolla a white eye, and the under side of the petal is Red Group 41A (RHS), Vermilion HCC18 on the HCC chart.

6,417
STREPTOCARPUS PLANT NAMED PEGASUS
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Jan. 30, 1987, Ser. No. 9,379
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Streptocarpus plant named Pegasus, as illustrated and described, and particularly characterized by its pure white flowers which are long lasting and non-shattering; compact growth habit; ease of propagation; floriferous habit under conditions of both lower light and high temperature, and by its short flexible leaves.

6,418
STREPTOCARPUS PLANT NAMED JANUS
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Jan. 30, 1987, Ser. No. 9,378
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Streptocarpus plant named Janus, as described and illustrated, and particularly characterized by its compact growth habit, rosette form, violet blue flower color, floriferous habit, small pliable leaves, ease of propagation, and by its long lasting and non-shattering flowers.

6,419
LILY PLANT NAMED HILDE
Jacobus A. J. Boon, Venhuizen; Albertus J. Boon, Hem, and Petrus T. Boon, Venhuizen, all of Netherlands, assignors to De vennootschap onder firma Jaap Boon, Hem, Netherlands
Filed Feb. 18, 1987, Ser. No. 16,118
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of lily plant named Hilde, as described and illustrated, and particularly characterized as to uniqueness by its yellow tepals, sturdy stems, excellent disease resistance, retention of buds, excellent bulb production, good shipping qualities, and its ability to be grown in sub-tropical areas with higher soil temperatures.

6,420
DIEFFENBACHIA NAMED "MILLIE WHITE"
Donald J. Stutzman, Longwood, Fla., assignor to A. Duda & Sons, Inc., Oviedo, Fla.
Filed Apr. 11, 1986, Ser. No. 650,780
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of Dieffenbachia plant, substantially as shown and described herein.

PATENTS

GRANTED NOV. 22, 1988

ERRATA

For CLASS	See PATENT NO.
079-007	4,785,511
425-078	4,785,574
060-534	4,785,615
600-018	4,785,795
604-053	4,785,799
156-187	4,785,854
192-000	4,785,917
242-084	4,786,010
351-122	4,786,158
351-132	4,786,159
203-015	4,786,370
273-001	4,786,371
514-363	4,786,627
524-406	4,786,662
524-410	4,786,663
524-417	4,786,664
524-424	4,786,665
523-456	4,786,675
560-302	4,786,746
341-081	4,786,890
341-013	4,786,891
355-003	4,786,924
369-282	4,787,009

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PATENTS

GRANTED NOVEMBER 22, 1988

GENERAL AND MECHANICAL

4,785,476
FACE SHIELD
Uranna Longworth, 5666 La Jolla Blvd., #60, La Jolla, Calif. 92037
Filed Oct. 8, 1987, Ser. No. 105,618
Int. Cl.[4] A45D *4/18*; A42B *1/00*
U.S. Cl. 2—9 **2 Claims**



1. A face shield for selectively positioning and retaining on a forehead of an individual to help protect an individual comprising:

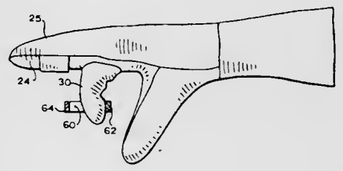
a substantially conical member having a base portion and a top portion displaced a predetermined distance from said base portion for positioning on and covering only the upper face portion of an individual while enabling exposure and ventilation for the individual;

said top portion being formed as a substantially elliptical section projecting through said substantially conical member; and

a slit connecting said top portion with said bottom portion for defining a through opening in said substantially conical member said top portion and slit conforming with full contact to the forehead of an individual in use;

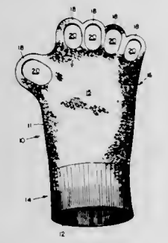
said substantially conical member being constructed of a resilient, heat insulating, polystyrene material for enabling said substantially conical member to be readily adjustable and manually biased to an open position for selectively mounting and retaining said substantially conical member on a forehead of an individual for affixing and retaining said conical member thereon with a resilient force of the biased face shield without further use of an individual's hands to retain the shield on the forehead.

4,785,477
FOREFINGER COMPARTMENT FOR GLOVE
Phillip C. V. Marzo, Guelph, Canada, assignor to Marzo Glove Company Limited, Acton, Canada
Filed May 21, 1987, Ser. No. 52,071
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—159 **3 Claims**



1. In a glove of the type having a mitt portion and a thumb portion made from a thermal insulation material which substantially restricts the tactile sensitivity of the wearer, the mitt portion having a mitt compartment proportioned to accommodate the hand and all four fingers of the wearer, the mitt portion having a proximal end and a distal end, a hand access passage opening into the mitt compartment through said proximal end, the thumb portion having a thumb compartment proportioned to accommodate the thumb of the wearer, a forefinger portion having a forefinger compartment communication with the mitt compartment, said forefinger compartment being proportioned to accommodate and arranged to receive the forefinger of the wearer in use, said forefinger portion being formed from thin flexible material such that it will not significantly restrict the dexterity of the forefinger of the wearer in use and will allow the wearer a substantial degree of tactile sensitivity therethrough, the mitt portion having a palm portion, the forefinger compartment communicating with the mitt compartment through a finger opening formed in the palm portion, the improvement wherein said forefinger portion is attached to the palm portion in such a manner that it will normally assume a relaxed position in which it extends from the finger opening toward the distal end of the mitt in an outwardly overlying face-to-face relationship with respect to the palm portion, and forefinger retaining means on the palm portion the glove for releasably retaining the forefinger portion against the palm of the glove, in said face-to-face relationship when not in use.

4,785,478
SUN GLOVE
Austin W. Mosley, D-308 Petroleum Center, San Antonio, Tex. 78209
Filed Dec. 2, 1987, Ser. No. 127,688
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 R **1 Claim**





1. A covering for the hand of a user comprising:

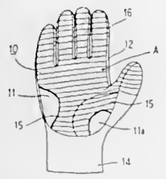
a sheath of material which reduces ultraviolet ray penetration having a top side and a bottom side and an expansible opening at a wrist end adapted to receive said user's hand;

a multiplicity of digit ringlets on said top side of said sheath at a distal end opposite said wrist end, said ringlets adapted to receive and extend along the base of the fingers and thumb of said user's hand so as to secure said covering to said user's hand, said ringlets further adapted to sub-

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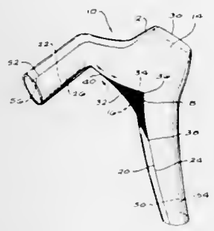
stantially fully expose said user's fingers, thumb, and palm, said bottom side of said sheath having an arcuated recessed portion with the top of said recessed portion near said wrist end of said sheath so as to fully expose the palm of said user's hand.

4,785,479
GLOVE AND THE METHOD OF MAKING THE SAME
Shigeru Watanabe, Karatsu, Japan, assignor to Towa Glove Co., Ltd., Japan
Filed Nov. 23, 1987, Ser. No. 124,258
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—163 **6 Claims**



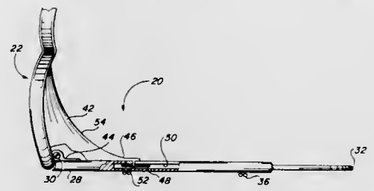
1. A glove comprising a glove base, a reinforcing sheet disposed thereon, and a reinforcing film of rubber or synthetic resin as coated on or impregnated into at least said reinforcing sheet, said glove base comprises a plurality of sheet pieces of required shapes sewn together with seams on the inner side thereof, said sheet pieces being soft, flexible closed-cell foamed rubber or plastic sheet pieces, said reinforcing sheet being a knitted or woven fabric laminated at least to the entirety or a part of the exterior surface of the sheet piece covering the palm of the glove, and the seam cavities of sheet pieces formed on the inner side of said glove base having been filled with rubber or synthetic resin.

4,785,480
NO-BIND PANTS WITH SEAMLESS CROTCH
Bernice B. Polsky, 4300 Via Dolce, No. 316, Marina Del Ray, Calif. 90292
Filed Apr. 3, 1987, Ser. No. 34,401
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—227 **20 Claims**



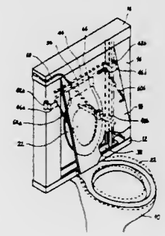
1. A pants garment covering the lower trunk, buttocks, thighs and legs, comprising:
a left and a right front pants portion, which are mirror images of each other, each front pants portion comprising a front waistband edge, a convexly curved outer edge extending from the waistband edge down buttocks, outer thigh and leg segments, and a front inner edge comprising front trunk, inner thigh and inner leg segments, said front inner thigh segment shaped like a first concave arc extending between a front crotch point and the inner leg segment, said front trunk portion extending between said front crotch point and said waistband edge;
a left and a right rear pants portion, which are mirror images of each other, each rear pants portion comprising a rear waistband edge, a first convexly curved outer edge extending from the waistband edge down the buttocks, a second partially convex curved outer edge extending down the thigh between the first curved outer edge to a first substantially first straight leg edge, and an inner edge comprising rear trunk, inner thigh and leg segments, said inner thigh segment shaped like a second concave arc between a rear crotch point and the leg segment, said rear trunk segment extending between the rear crotch point and waistband edge;
a generally polygonal-shaped crotch piece having a pair of identical concave front edges which are the same length and shape as said first concave arc of said front pants portions and a pair of corresponding concave rear edges, which corrspond to said second concave arc of said rear pants portions, said front edges meeting at a first point and said rear edges meeting at a second point opposite said first point, said first point being joined to said front pants portions at said front crotch points, said second point being joined to said rear pants portions at said rear crotch points, each said front edge being joined to said front inner thigh segment of each of said front pants portions, each of said rear edges being joined to said rear inner thigh segment of each of said rear pants portions, and said front trunk segments being joined to each other, said rear trunk segments being joined to each other, said left front outer edges being joined to said right rear outer edges and said left front leg segments being joined to said right rear leg segments, said right front outer edges being joined to said left rear outer edges and said right front leg segments being joined to said left rear leg segments.

4,785,481
EYE PROTECTION DEVICE
Francis R. Palmer, III, and Robyn-Faehnrich Palmer, both of 3901 Los Feliz Blvd., #101, Los Angeles, Calif. 90027
Filed Aug. 3, 1987, Ser. No. 80,910
Int. Cl.[4] A61F *09/02*
U.S. Cl. 2—436 **10 Claims**



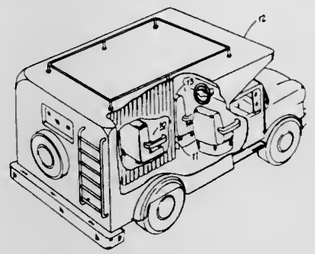
2. An improved eye protection device to prevent eye contact with liquid and solid disease-bearing contaminants, said device comprising, in combination:
(a) a frame adapted to be seated over the eyes of a wearer and comprising a front support and a spaced pair of rearwardly extending side supports connected thereto;
(b) one or more transparent solid eye shields secured in said front support;
(c) means secured to said side supports for releasably sealing said frame and shield firmly in place on a wearer's head; and,
(d) protective means connected to said frame to allow the transmission of air through said frame while blocking the passage of liquid and solid matter therethrough,
(e) wherein said protective means comprise a pair of generally triangular sheets of flexible resilient material capable of transmitting air but not liquid or solid therethrough said sheets being connected to said side supports and to said front support above said side supports to block passage of liquid and solid matter to the front and side of the wearer's eyes.

4,785,482
DEVICE FOR CLEANING A TOILET SEAT
Yves Nelva-Pasqual, 22 rue Georges Clemenceau 78220, 78220 Viroflay, and Denis Alain, 4 rue de l'Abbe Masure 78480, 78480 Verneuil S/Seine, both of France
Filed Oct. 7, 1986, Ser. No. 916,411
Int. Cl.[4] A47K *13/30*
U.S. Cl. 4—233 **7 Claims**



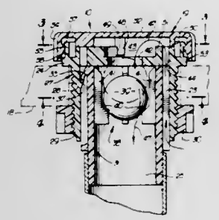
1. In a cleaning device for the seat of a toilet bowl comprising
a chamber extending vertically in a back region of the toilet bowl, said chamber having a trap door with an inside face,
transport means for bringing the seat from a use position, in which it extends horizontally over the bowl, to a cleaning position, in which it extends vertically within said chamber, and for controlling simultaneously opening and closing of said trap door,
cleaning means provided in said chamber for spraying cleaning water on the seat when the seat is in said cleaning position, and
drying means for circulating air in said chamber to dry the seat while in said cleaning position,
the improvements comprising:
said device including only one single toilet seat, said seat having a rear end on a side adjacent said chamber when in said use position;
said transport means of said seat in said chamber extending above and behind said seat, and including a motorized unit having bidirectional vertical movement, a horizontal shaft and two link rods, said single seat being connected at said rear end thereof to said motorized unit,
each said link rod having a first end mounted on said trap door to rotate in correspondence with said bidirectional vertical movement of said motorized unit to open and close said trap door;
said transport means further comprising two vertical lead screws and an electric motor;
said horizontal shaft having two ends, each said end of said horizontal shaft having a respective tapped sleeve which circulates on a respective one of said said two vertical lead screws, said two vertical lead screws being rotated in synchronism by said electric motor to provide said bidirectional vertical movement to said horizontal shaft;
said motorized unit being mounted to rotate around said horizontal shaft during said bidirectional vertical movement; and
said cleaning means including a rotating cleaning arm mounted on said inside face of said trap door.

4,785,483
INTEGRATED PASSENGER SEAT AND TOILET APPARATUS AND METHOD
Paul H. Wise, 1825 S. Camino Seco, Tucson, Ariz. 85710
Filed Jan. 12, 1988, Ser. No. 142,957
Int. Cl.[4] E03D *1/00;* **B60N** *1/10;* **B60R** *15/64*
U.S. Cl. 4—321 **18 Claims**



1. An integrated passenger seat and toilet system for vehicles, comprising:
(a) a passenger seat;
(b) a toilet structurally integrated with said passenger seat;
(c) a toilet seat attached to said toilet;
(d) swivel mounting means for rotatably mounting said toilet to the vehicle floor;
(e) a water supply system connected to said toilet and adapted to be installed within said vehicle; and
(f) a waste system connected to said toilet and adapted to be installed within said vehicle.

4,785,484
CONTROL VALVE
Ronald J. Sargent, Escondido, Calif., assignor to Alopex Industries, Inc., San Marcos, Calif.
Filed Nov. 18, 1986, Ser. No. 932,085
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—542 **24 Claims**



1. A control valve for use in a spa having a wall with inner and outer sides and an opening through said wall, comprising:
a first tubular valve body member having inner and outer end portions and mountable in said opening with said outer end portion outside said wall and said inner end portion inside said wall, said outer end portion being larger than said opening and bearing against the outer side of said wall;
a nut threaded onto said inner end portion to be tightened inside said wall and clamp said outer end portion against said outer side to secure said valve body in said opening;
a second tubular valve body member disposed inside said first valve member and having an open interior defining an outlet passage extending inwardly through said valve from adjacent said outer end portion;

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said first and second valve body members having means on the adjacent sides thereof defining an inlet passage in said valve extending from the inner end portion of said first member to said outer end portion thereof;

a cup-shaped cap fitted over said outer end portion and rotatably mounted thereon;

detent means in said cap and on said outer end portion for limiting rotation of said cap to a preselected angular range;

first and second port means in said cap and on said outer end portion, respectively, for establishing communication between said inlet and outlet passages as said cap is turned from one end of said range toward the other end and progressively increasing the area of such communication to an "open" position during such turning, and for progressively decreasing the area of such communication to a "closed" position as the cap is turned in the opposite direction toward said one end of said range, whereby the position of said cap determines the effective flow area through said inlet and outlet passages for the aspiration of air through said control valve;

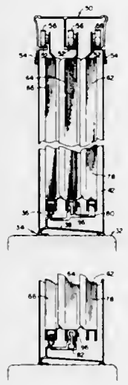
and a one-way valve permitting inward fluid flow through said outlet passage and preventing outward flow therein, comprising a valve port in said outer end portion overlying the interior of said second valve member, a valve ball loosely disposed in said interior and movable into closing relation with said valve port to block outward fluid flow through said outlet passage, and a ball retainer spaced inwardly from said valve port to limit movement of said ball away from the valve port.

4,785,485

THREE PANEL BATH ENCLOSURE

Mehran Etesam, North Miami, Fla., assignor to Keller Industries, Miami, Fla.

Filed Jan. 20, 1987, Ser. No. 5,409
Int. Cl.[4] A47K *3/08, 3/14, 3/22*
U.S. Cl. 4—557 **14 Claims**



1. A shower door for enclosing an area at an edge of a basin and between facing side walls, comprising:

a sill to be disposed along the edge of the basin, the sill having a sill channel defined in cross section by two spaced legs attached together at one edge thereof, the two spaced legs of the sill channel defining a ridge protruding upwardly and a slot opening downwardly toward the edge, one of said legs being attached to the sill and one of said legs projecting freely downwardly and inwardly toward the basin;

a header mounted between the side walls and extending parallel to the sill channel, the header defining a plurality of parallel tracks; and,

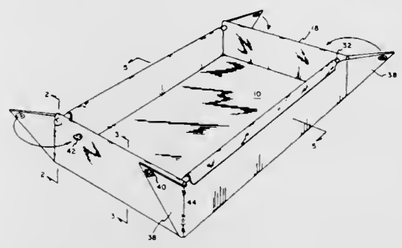
a plurality of door panels slidably mountable to move along the tracks on the header, said door panels having spaced flanges along a lower edge thereof straddling the upwardly protruding ridge defined by the two spaced legs of the sill channel, a second of the door panels having a first guide member with an outrigger slidable in the downwardly opening slot defined by the two spaced legs of the sill channel, said shower door further characterized by at least a third door panel, at least three of said tracks and a second guide member, said second guide member also having an outrigger slidable in said downwardly opening slot defined by the two spaced legs of the sill channel, said second guide member being fixed to said second door panel and having a second outrigger slidable between the spaced flanges of said third door panel.

4,785,486

COLLAPSIBLE BATHTUB

Eric A. Viesturs, Southbury, Conn., assignor to Connecticut Artcraft Corp., Naugatuck, Conn.

Filed Dec. 4, 1984, Ser. No. 678,106
Int. Cl.[4] A47K *3/06*
U.S. Cl. 4—585 **4 Claims**



1. A collapsible bathtub adapted for placement on top of a mattress and comprising:

a horizontal flexible plastic rectangular sheet having two opposite sides and two opposite ends;

first and second flexible plastic parallel side walls, each side wall being integral with the sheet and having a collapsed position at which it is essentially coplanar with the sheet, each side wall having an erect position at which it extends vertically upwards from a corresponding one of the two sides of the sheet, each side wall having an elongated top disposed horizontal conduit open at both ends which extends between both end walls;

first and second flexible plastic end walls disposed at right angles to said side walls and being integral with said sheet, each end of each end wall being secured to a corresponding end of a corresponding side wall, each end wall having a collapsed position at which it is essentially coplanar with said sheet and having an erect position at which it extends vertically upwards from a corresponding one of the two ends of the sheet, each end of each end wall being secured to the adjacent end of the adjacent side wall by a portion of the sheet which is flat and horizontal when the walls are in collapsed position and which is folded upon itself to form a vertical flap when all walls are in erect position whereby four flaps are formed;

first and second elongated members, each member being removably disposed in a corresponding one of said conduits, and, when all walls are in vertical position, extending between the two end walls, each elongated member having one end adjacent one end wall and having an opposite end adjacent the other end wall; and

first, second, third and fourth sockets, each of the first and second sockets being secured to the first end wall and

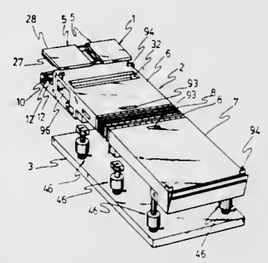
adapted to detachably engage a corresponding one of the adjacent one ends of the corresponding elongated member when all walls are in vertical position, each of the third and fourth sockets being secured to the second end wall and adapted to detachably engage a corresponding one of the adjacent said other end of the corresponding elongated member when all walls are in vertical position, all of said sockets and said elongated members cooperating when engaged to hold said walls in vertical position.

4,785,487

ADJUSTABLE ELECTROBED

Manuel B. Toran, Avda. Erasa, 10-2a fase, Benalmadena (Málaga), Spain

Filed Oct. 21, 1986, Ser. No. 921,590
Claims priority, application Spain, Oct. 30, 1985, 289995
Int. Cl.[4] A61G *7/06*
U.S. Cl. 5—66 **6 Claims**



1. An adjustable electrobed comprising:

(a) a head supported by a spring-mattress, being adjustable in height and in a horizontal position, comprising two independent elements hinged to a spring-mattress support, on axes longitudinal thereto and being able to adopt an adjustable "V" shaped position by the operation of an electric motor which turns two transverse threaded small-spindles to displace two nuts mounted thereon in opposite directions, said nuts being connected to head elements by means of articulated braces, each one of the independent head elements comprising two superimposed plates, the upper one being able to displace along guiding tracks providing at the lower one; a head support comprising two telescopically mounted tubular elements connected by a coaxially mounted spring and a locking mechanism on one of said elements for locking said support at a maximum desired position;

(b) a spring-mattress comprising first and second rigid bodies hinged together at a spring-mattress paracentral area, the first body being nearest the head and having at least one transverse cluster of slots, the spring-mattress being supported upon three pair of legs each having a damping mechanism, two pairs being situated on the second body opposite the head, said third pair being situated at a paracentral area of the first body, an angle between said bodies being made by small-spindles arranged transversely to the spring mattress and as a junction between an upper portion of the pairs of legs being nearest the head and the central pairs of legs, said small-spindles being operated by corresponding independent electric motors which displace pairs of nuts towards or away from each other said nuts being joined by braces to fixed points on the spring-mattress, each brace having two degrees of freedom, the upper end of the legs most opposite the head being pivotally anchored to the spring-mattress; and limit switches for stopping said motors at maximum and minimum displacement positions of the head end of the spring-mattress;

(c) a platform whereon said legs are fixed and supported;

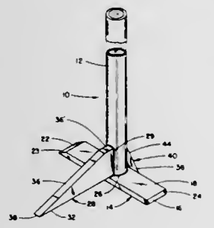
(d) a pneumatic mattress, superimposed on the spring-mattress and provided with a cluster of slots corresponding to that of the latter, said cluster of slots being able to be plugged by a rack closure, said mattress having an elasticity that is adjustable by changing its inflation pressure by means of a manual pump-damper provided at the spring-mattress front body.

4,785,488

LEVER BAR ADAPTED FOR PERFORMING MULTIPLE FUNCTIONS

Arthur Schellas, Baldwin, N.Y., assignor to Palbar, Inc., Baldwin, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,683
Int. Cl.[4] B66F *15/00*
U.S. Cl. 7—166 **13 Claims**



1. An improved lever bar adapted for performing multiple functions, comprising:

a relatively long, rigid handle bar having a straight longitudinal axis;

a generally rectangular, rigid, flat base plate having opposite parallel sides, one of said sides being secured by a rigid joint to one end of said bar in a plane perpendicular to said longitudinal axis thereof, said plate having spaced parallel lateral edges perpendicular to said parallel sides; and

a thick flat foot plate having two long edges diverging from a sharp point to define an acute angle therebetween, said foot plate having a wide end opposite from said point said wide end being secured by another rigid joint to one side of said handle and to said one side of said base plate, said foot plate being disposed in an axial plane of said bar perpendicular to said base plate;

whereby said sharp point of said foot plate may be inserted behind a board to be pried away from spaced beams with said base plate resting on said beams and serving as a fulcrum while said handle serves as a lever.

4,785,489

RESILIENT BROOM AND SCRAPER

Edward P. Von Doehren, Fredericksburg, Iowa, assignor to Midwest Brush, Inc., Fredericksburg, Iowa

Continuation-in-part of Ser. No. 904,959, Sep. 8, 1986, abandoned. This application Oct. 1, 1987, Ser. No. 103,266
Int. Cl.[4] A46B *5/06, 17/08*
U.S. Cl. 15—111 **14 Claims**

1. A broom device, comprising,

an elongated broom block having a top and bottom portion, brush means secured to said bottom portion of said broom block and extending downwardly therefrom,

a one-piece bracket rigidly secured to the center of said top portion of said broom block,

said bracket comprising a flat plate portion secured to the top portion of said broom block, said plate portion having front and rear edges,

a flat connecting flange extending upwardly and rearwardly from the rear edge of said plate portion, and terminating in a flat tongue element,

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said plate portion, connecting flange and tongue element being of integral construction,

an elongated hollow coil spring having upper and lower ends and connected by its lower end to said connecting flange,



said tongue element protruding into the lower end of said coil spring, and

an elongated handle having a lower end frictionally inserting into the upper end of said coil spring.

4,785,490

DEVICE FOR CLEANING GOLF SHOE SPIKES

Everett H. Thomas, 332 North Lyon St., Space 58, Hemet, Calif. 92343

Filed Mar. 19, 1987, Ser. No. 28,123
Int. Cl.[4] A47L *13/02*
U.S. Cl. 15—237 1 Claim

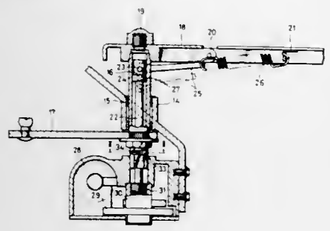
1. A device for cleaning golf shoe spikes comprising: a base member having a planar upper surface, said base member being adapted to be supported on the ground; an upwardly extending handle member removably attached to one end of said planar upper surface; a plurality of roller chains attached to the planar upper surface, said chains extending the length of said upper surface from said handle member and being spaced apart across said upper surface such that as the golf shoe is moved across said chains the spikes are cleaned between the chains and the spaces between the chains are prevented from being clogged with debris.

4,785,491

ROTARY AND RECIPROCATING DRIVE DEVICE

Tokihiko Yamamoto, Toyota, and Nozomu Torii, Hekinan, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 26, 1987, Ser. No. 19,209
Claims priority, application Japan, Mar. 31, 1986, 61-73336
Int. Cl.[4] A47L *1/02;* B60S *1/06;* F16H *25/08*
U.S. Cl. 15—250.20 4 Claims



1. A rotating and reciprocating drive device comprising:

a rotatable drive shaft having a hollow inner bore;

a slide shaft slidably disposed in said hollow inner bore of said rotatable drive shaft for translation along said bore and rotation with the drive shaft;

a screw shaft including a first end and a second end, said first end including an external threaded portion;

a nut member having an internal threaded portion in threaded engagement with said external threaded portion of said screw shaft;

means for rotating said nut member relative to said external threaded portion of said screw shaft to impart translational motion to the screw shaft;

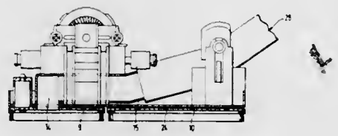
connecting means for connecting said slide shaft to said screw shaft including an opening through said second end of said screw shaft and a pin secured to one end of said slide shaft, said pin engaging said opening through said screw shaft for transmitting the translational motion of said screw shaft to said slide shaft and for permitting the rotation of said slide shaft relative to said screw shaft.

4,785,492

FLOOR CLEANING APPARATUS

Wieland Gühne, Remscheid; Uwe Kemker, Wuppertal; Wolfgang Tröger, Pulheim; Hans-Joachim Birr, Wuppertal; Paul Michel, Ennepetal, and Renate Friedrichs, Wuppertal, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 117,288
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637535
Int. Cl.[4] A47L *5/30*
U.S. Cl. 15—380 11 Claims



1. A floor cleaning apparatus for cleaning a hard floor, the apparatus being movable across the surface of the hard floor by the operator in a desired direction determined by the latter, the apparatus comprising:

a chassis defining a longitudinal axis extending in said desired direction and having a width extending in a direction transverse to said axis;

two work plates for working on said surface of said hard floor, said work plates each having a width corresponding to said width of said chassis and being movably mounted on said chassis so as to perform respective reciprocating movements counter to each other and in a direction transverse to said longitudinal axis thereby causing each of said work plates to perform work on the surface of the floor which corresponds to the whole of the width of said chassis;

one of said work plates being mounted at the forward portion of said chassis and the other one of said work plates being mounted at the rearward portion of said chassis; and,

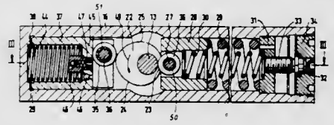
motor means mounted on said chassis for actuating said two work plates to perform said movements.

4,785,493

DOOR CHECK

Horst Tillmann, Ennepetal, and Giselher Sieg, Ratingen, both of Fed. Rep. of Germany, assignors to Dorma-Baubeschlag GmbH & Co. KG, Ennepetal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 678,243, Dec. 5, 1984, Pat. No. 4,658,468. This application Jan. 21, 1987, Ser. No. 5,749
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3345004
The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.
Int. Cl.[4] E05F *3/10, 1/14, 5/02*
U.S. Cl. 16—53 19 Claims



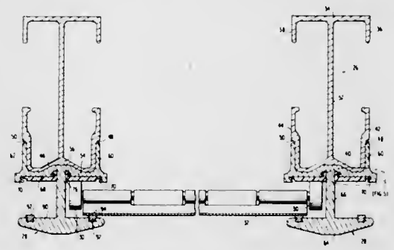
1. In a door check, a housing; a shaft rotatably journalled in said housing; cam means provided on said shaft in said housing and having first and second sections; means for transmitting torque to the first section of said cam means so as to urge said cam means to rotate in a predetermined direction, including a first support movable in said housing at one side of said shaft, a first follower provided on said support and tracking the first section of said cam means, and first resilient means for biasing said support toward said cam means with a first force; and damper means arranged to yieldably oppose rotation of said shaft in said direction, including a second support movable in said housing at the other side of said shaft, a second follower provided on said second support and tracking the second section of said cam means, and second resilient means for biasing said second follower against the second section of said cam means with a second force which at most equals 50 percent of said first force.

4,785,494

TRAILER DOORPOST AND TRACK ASSEMBLY

Gregory J. Adamski, Edison, N.J., assignor to Reliable Trailer and Body, Inc., Florence, N.J.

Filed Apr. 9, 1987, Ser. No. 36,531
Int. Cl.[4] F06B *9/08;* E05D *15/38;* B60J *5/06*
U.S. Cl. 16—95 R 10 Claims



2. A trailer doorpost and track assembly comprising:

a doorpost having an outer end wall;

said outer end wall having opposed side flanges;

a track member having an inner end wall, and outer end wall and a web portion integral with said walls;

said outer end wall of said track member having opposed side flanges forming a U-shaped channel portion for connection to said side flanges of said outer wall of said doorpost; and

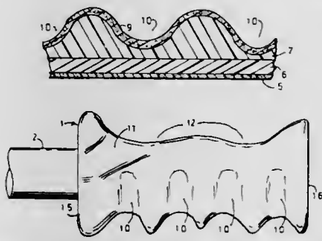
a removable bearing insert for said track member and upon which travel rollers of a door slidable in said track member.

4,785,495

MOLDABLE HAND GRIPS

Edward A. Dellis, 1360 S.W. 17th St., Boca Raton, Fla. 33486

Filed Aug. 17, 1987, Ser. No. 86,386
Int. Cl.[4] B29C *33/40, 71/02;* A63B *53/14*
U.S. Cl. 16—111 R 20 Claims



16. Hand grip means capable of being attached to the handle of a hand-held implement and also capable of being molded to fit the hand of an individual person, comprising:

(a) a heat moldable layer having an inner and an outer surface and capable of plastic forming to the shape of a grasping hand under the pressures of said grasping hand when heated to a temperature that can be grasped safely by said hand and that is capable of retaining said shape after cooling to room temperature;

(b) a surface means covering said outer surface, said surface means including a frictional surface for comfortable direct contact with said hand; and

(c) a resilient layer attached to the inner surface of said heat moldable layer, said resilient layer not heat moldable at the temperature used for molding said heat moldable layer and having resilience and vibration and shock absorbing properties for better fitting of said hand grip means to said implement and to provide a fixed thickness of shock and vibration resistance for reduced trauma to said hand in the use of said implement.

4,785,496

HINGEABLE PLATE ASSEMBLY AND DISPLACEABLE HINGE THEREFOR

Victor Motyka, Attleboro, and James S. Kenworthy, Rockland, both of Mass., assignors to Precision Art Coordinators, Inc., East Providence, R.I.

Filed Nov. 3, 1987, Ser. No. 116,400
Int. Cl.[4] E05D *7/00*
U.S. Cl. 16—223 14 Claims



1. A displaceable hinge assembly comprising a first hinge piece securable to a first member, a second hinge piece securable to a second member, said first hinge piece having an elongated slot therein which faces said second hinge piece, said second hinge piece having a socket therein which faces said first hinge piece, a ball element received in said slot and said socket so that it is captured between said first and second hinge pieces, said ball element being longitudinally repositionable in

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said slot to enable said second hinge piece to be displaced outwardly relative to said first hinge piece in a direction substantially parallel to said slot and being rotatable relative to at least one of said first and second hinge pieces to enable said second hinge piece to be pivoted relative to said first hinge piece, and means maintaining said first and second hinge pieces in closely adjacent relation to thereby maintain said ball in said slot and said socket.

4,785,497

BASE PLATE ASSEMBLY FOR MOUNTING A HINGE BRACKET OF A FURNITURE HINGE OR THE LIKE

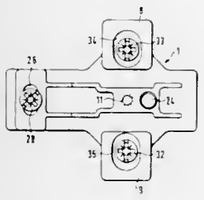
Luciano Salice, Carimate, Italy, assignor to Arturo Salice, Novedrate, Italy

Filed Feb. 24, 1987, Ser. No. 17,448

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3605902

Int. Cl.[4] E05D *7/04*

U.S. Cl. 16—237 **15 Claims**



1. A base plate assembly for mounting a hinge bracket of a furniture hinge, said base plate assembly comprises a base plate, which is adapted to be secured to a carrying wall by mechanical fastners, and a cover plate having an elongated projection, said cover plate at least partly covers the base plate and is guided on the same transversely to the elongated projection and provided with means for fixing the hinge bracket, the cover plate is connected to the base plate by retaining means and by a headed clamp screw, the headed clamp screw is screwed into a tapped bore in the base plate and extends through a slot that is formed in the cover plate and is parallel to the direction in which the cover plate is guided on the base plate, characterized in that the retaining means consist of a rivet, which has a manufactured head and a shank that is riveted to one of the base plate and the cover plate and extends through a second slot, which is formed in the respective other plate to which the shank is not riveted and said second slot is parallel to the direction in which the cover plate is guided on the base plate, and the diameter of the manufactured head exceeds the width of the second slot, further characterized in that the clamp screw extends through a slot formed at a lower end of the intermediate portion of the cover plate.

4,785,498

DOOR AND WINDOW HINGE WHICH IS ADJUSTABLE DURING AND AFTER INSTALLATION

Othmar Brotschi, Grenchen, Switzerland, assignor to Gebr. Brotschi & Co. AG, Grenchen, Switzerland

Continuation of Ser. No. 692,633, Jan. 18, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,649

Claims priority, application Switzerland, Jan. 24, 1984, 292/84

Int. Cl.[4] E05D *7/02, 7/04*

U.S. Cl. 16—238 **12 Claims**

1. An adjustable hinge for pivotably supporting a movable closure on a frame such that the pivot axis of the closure member is adjustable relative to the frame during and after installation, comprising the combination of

a first hinge element including a first hinge body having a central axis with an axially extending pin coaxial with said central axis and first means for attaching said first hinge body to the frame; and

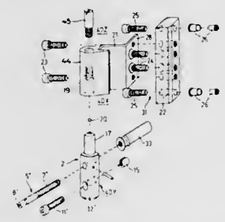
a second hinge element including a second hinge body having an axial passage extending therethrough for receiving said pin in one end thereof so that said second hinge body is rotatably and coaxially supported on said axially extending pin and so that said hinge bodies have a common central axis and second means for attaching said second hinge body to the movable closure member,

said axial passage having means defining internal threads extending substantially symmetrically on opposite sides of a central transverse plane perpendicular to said central axis;

an externally threaded support bolt extending into the opposite end of said axial passage from said pin;

a ball between the inner ends of said pin and said threaded support bolt so that said hinge elements are relatively pivotable about said central axis and are relatively axially adjustable by rotation of said support bolt, said support bolt being selectively threadable into either end of said axial passage so that said first hinge element can be mounted on either side of a frame with said support bolt above said pin;

one of said first and second means for attaching including an adjustment bolt extending rotatably completely through one of said first and second hinge bodies, said



adjustment bolt having a threaded end portion extending into the associated one of said frame and said movable closure member,

means defining threads in said one of said frame and movable closure member for threadedly engaging said adjustment bolt,

means for restraining said adjustment bolt against axial movement in either direction relative to said one of said first and second hinge bodies so that rotation of said adjustment bolt about its longitudinal axis moves said central axis of said hinge elements toward or away from said one of said frame and said movable closure member, and

guide bolt means carried by said one of said first and second hinge bodies and extending parallel with said adjustment bolt and being slidable into said one of said frame and said movable closure member for preventing rotation of said one of said first and second hinge bodies about said longitudinal axis of said adjustment bolt when said adjustment bolt is rotated,

the other of said first and second means for attaching including means for adjusting the location of said central axis of said hinge elements relative to the other of said frame and said movable closure member.

4,785,499

DOOR SHOE FOR GLASS DOORS

Salvatore Giuffrida, and John Giuffrida, both of 28 Catherine Ave., Franklin City, N.Y. 11010

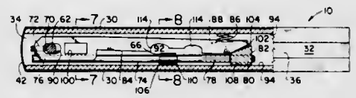
Filed Feb. 1, 1988, Ser. No. 151,287

Int. Cl.[4] E05D *7/04*

U.S. Cl. 16—241 **3 Claims**

1. In combination, a glass door of the type mounted to partake of pivotal traverses about a vertical axis adjacent an end thereof, and a door-positioning mechanism for making adjust-

ments in said door pivotal traverses, said mechanism comprising a door support member positioned in supporting relation beneath said door and having a fixed axis coinciding with said door pivotal traverse vertical axis and extending laterally of said fixed axis, an H-shaped housing for said mechanism having a pair of upper legs bounding an upwardly facing channel and a pair of lower legs bounding a downwardly facing channel, said glass door having an operative position disposed in said upwardly facing channel, said lateral extension of said door support member being disposed in said downwardly facing channel of said H-housing for providing said H-shaped housing with an operative position in an unconnected covering relation thereover, a lead screw and cam means provided in said down-



wardly facing channel in an interposed position between a lower leg of said H-shaped housing and said laterally extending door support member, and a spring means also provided in said downwardly facing channel in an interposed position between an opposite lower leg of said H-shaped housing and said laterally extending door support member so as to urge said glass door in opposite pivotal traverses relative to said laterally extending door support member in response to the operation of said lead screw and cams means, whereby adjustments in the position of pivotal traverse of said glass door are made in accordance with the threaded adjustment of said lead screw which is accessible in the side of said H-shaped housing of said mechanism.

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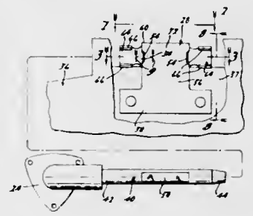
HINGE ASSEMBLY FOR VEHICLE ACCESSORIES

W. T. Langridge, Troy, Mich., assignor to Irvin Industries, Inc., Rochester Hills, Mich.

Filed Jun. 15, 1987, Ser. No. 61,444

Int. Cl.[4] E05F *1/08;* **B60J** *3/00*

U.S. Cl. 16—297 **13 Claims**



1. A hinge assembly for pivotally interconnecting a first member with a second member for relative rotational movement, said hinge assembly comprising: a longitudinally-extending pivot rod member interconnected with the first member; and a longitudinally-extending sleeve member having a sleeve opening with an interior surface extending longitudinally therethrough; said sleeve member being interconnected with the second member for receiving said pivot rod member for relative rotation therewithin, said sleeve member including resilient biasing means for resiliently biasing a portion of said pivot member generally laterally against said interior surface of said sleeve member in order to provide a frictional relative rotational engagement between said pivot rod member and said interior surface of said sleeve member; said pivot rod member having a generally flat rod portion thereon; and said interior surface of said sleeve member further including means for generally flatly engaging said flat rod portion when said first and second members are in a predetermined relatively rotated detent position and for substantially preventing said generally flat engagement with said flat rod portion when said first and second members are in other relatively rotated positions, said sleeve member including lateral support means for laterally and resiliently supporting said pivot rod member in a generally laterally aligned position relative to said sleeve opening in said sleeve member, said lateral support means including a support portion of said sleeve member extending longitudinally outwardly from each longitudinal end thereof, said support portions each being resilient and generally U-shaped in configuration with a pair of support legs extending laterally therefrom for resiliently engaging said pivot rod member, said pivot rod member being frictionally and rotationally received between said support legs of each of said support portions and laterally supported thereby.

4,785,501

CASING PIVOTING MECHANISM FOR A COPYING MACHINE

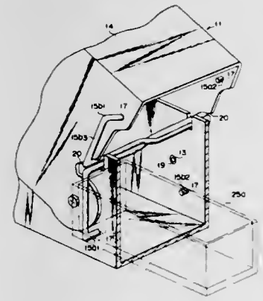
Shigenori Obana, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 25, 1987, Ser. No. 125,154

Claims priority, application Japan, Nov. 29, 1986, 61-284539

Int. Cl.[4] E05F *1/10*

U.S. Cl. 16—308 **2 Claims**



1. A casing pivoting mechanism for a copying machine, comprising:

a first casing block;

a second casing block swingably coupled to the first casing block; and

torsion bar means mounted between the first and second casing blocks, so as to urge the second casing block in a predetermined direction with respect to the first casing block,

pivotal points of said first and second casing blocks being situated away from positions at which the torsion bar means passes through the first and second casing blocks,

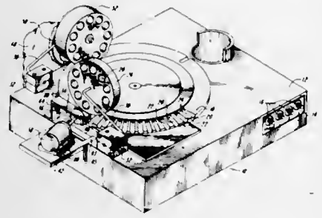
said torsion bar means being formed by twisting at least two torsion rods together at the middle portions thereof,

one and the other end portions of one of said torsion rods engaging first engagement portions of the first and second casing blocks, respectively, and

one and the other end portions of the other of said torsion rods engaging second engagement portions of the first and second casing blocks, respectively.

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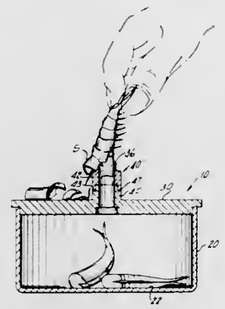
4,785,502
APPARATUS FOR EXTRACTING MEAT FROM CRUSTACEAN APPENDAGES
Peter R. Howard, 71 Semont Rd., Dorchester, Mass. 02124
Filed Feb. 18, 1988, Ser. No. 157,631
Int. Cl.[4] A22C *29/02*
U.S. Cl. 17—71 **18 Claims**



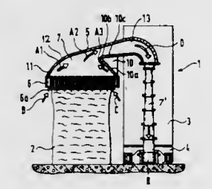
1. Apparatus for removing and collecting meat from crustacean appendages, each appendage having a first end and a second end, the second end being an open end, comprising:
a frame having first, second, third and fourth functional stations located thereon;
means mounted to said frame for holding and transporting each said appendage sequentially from said first to said second to said third to said fourth functional stations, respectively;
said first functional station including means for cutting off said first end of each said appendage to form an amputated end on each said appendage, and
a first gripping means flexibly conforming to each said appendage to secure each said appendage adjacent said cutting means during removal of said first end thereof;
said second functional station including first means to inject pressurized air to interact with said appendage to force said appendage to the preferred location on said means for holding and transporting said appendage;
said third functional station including
second means for injecting pressurized gas to interact with said second end of each said appendage thereby to force said meat out of each said appendage through said amputated end of said appendage, and wherein said pressurized gas injecting means is stationary with respect to and isolated from each said appendage,
a second gripping means flexibly conforming to each said appendage and interacting with said holding and transporting means to create a seal about each said appendage with respect to said pressurized gas injecting means and to secure each said appendage adjacent said pressurized gas injecting means as said meat is forced out of each said appendage; and
said fourth functional station including means for removing each said appendage from said holding and transporting means.

4,785,503
SHRIMP PEELER
Jesus Gomez, 6034 SW. 27 St., Miami, Fla. 33155
Filed Mar. 23, 1988, Ser. No. 172,263
Int. Cl.[4] A22C *29/02*
U.S. Cl. 17—73 **5 Claims**

1. A device for peeling shrimps, comprising:
A. a reservoir member;
B. a cover member cooperatively and removably covering said reservoir member and said cover member including at least one opening connecting the space defined by said reservoir member and said cover member;
C. at least one knife means mounted over said opening and including a tubular member having a diameter that is slightly larger than the diameter of the shrimp being peeled and said tubular member including a knife element rigidly mounted to the inner surface of said tubular member and extending inwardly so that visceral parts of said shrimp can be removed while it is being peeled.

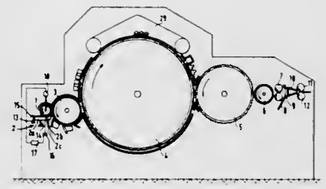


4,785,504
SUCTION DUCT FOR THE PNEUMATIC REMOVAL OF FIBER TUFTS DETACHED BY A BALE OPENER
Ferdinand Leifeld, Kempen, and Josef Temburg, Jüchen, both of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany
Filed Feb. 2, 1987, Ser. No. 10,063
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602898
Int. Cl.[4] D01G *7/10, 7/04*
U.S. Cl. 19—80 R **5 Claims**



1. In a fiber bale opener including a downwardly open housing adapted to be supported above fiber bales to be opened and accommodating an opening roller having an axis and being arranged for detaching fiber tufts from upper bale surfaces and a suction duct through which fiber tufts detached by the opening roller are adapted to be removed by a suction air stream flowing therethrough; said suction duct being bounded by two lateral walls facing one another and being spaced from one another in a direction parallel to said axis; one said lateral wall having an upwardly extending first oblique air guiding face and the other lateral wall having an upwardly extending second oblique air guiding face; the improvement wherein said first oblique air guiding face projects into said suction duct to an extent of between one fourth and one third of a width dimension of said suction duct measured parallel to said axis at a location adjacent said opening roller and further wherein said second oblique air guiding face has a lower guiding face part arranged generally symmetrically to said first oblique air guiding face relative to an imaginary center plane of said suction duct oriented perpendicular to said axis whereby travelling paths of air streams from opposite longitudinal ends of said opening roller towards said center line are of approximately equal length; and further wherein said second oblique air guiding face has an upper guiding face part adjoining an upper end of said lower guiding face part and extending upwardly therefrom at an orientation different from that of said lower guiding face part.

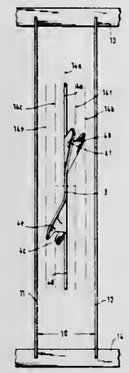
4,785,505
SLIVER OR LAP EVENING APPARATUS FOR A CARDING MACHINE OR THE LIKE
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany
Filed Mar. 16, 1987, Ser. No. 26,489
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608514
Int. Cl.[4] D01G *23/04, 15/40, 19/08*
U.S. Cl. 19—105 **12 Claims**



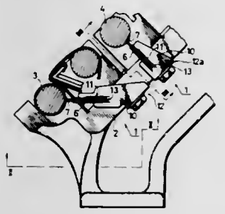
1. In a carding machine including a licker-in and a main carding cylinder cooperating therewith; a feed roller arranged immediately upstream of the licker-in as viewed in a direction of material feed into the carding machine; a feed table cooperating with the feed roller for advancing fiber material to said licker-in; said feed table being arranged for executing excursions towards and away from said feed roller as a function of the material quantity passing between the feed roller and the feed table and measuring means operatively connected with said feed table for generating signals representing said excursions; motor means connected to said feed roller for rotating said feed roller and means for applying setting signals to said motor for controlling said motor as a function of said excursions; the improvement wherein said feed table has a movable first part operatively connected with said measuring means and cooperating with said feed roller to define with said feed roller a measuring location for the fiber material and to execute said excursion towards and away from said feed roller; further wherein said feed table has a second part situated between said movable first part and said licker-in; said second part cooperating with said feed roller for advancing the fiber material to said licker-in.

4,785,506
APPARATUS FOR OPENING PRESSED FIBER BALES OF SPINNING MATERIAL
Akiva Pinto, Gastonia, N.C.; Gunter LucaBen, Haltern, and Reinhard Schmidt, Gescher, both of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany
Filed Jun. 16, 1987, Ser. No. 63,337
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620312
Int. Cl.[4] D01G *7/04*
U.S. Cl. 19—80 R **15 Claims**

1. An apparatus for opening pressed bales of spinning material such as cotton, synthetic fiber and the like, comprising:
(a) parallel first and second grid rods spaced a predetermined distance from each other;
(b) a shaft extending transversely of said grid rods and adjacent thereto; and
(c) a toothed disk having a central portion with an aperture for receiving said shaft, said central portion lying in a plane transverse to the axis of said shaft, said toothed disk being supported by said shaft for rotation in a space between said grid rods, said disk having a plurality of teeth extending at an angle from the plane of said central portion so that the tips of adjacent teeth rotate in different paths within the space between said grid rods so as to act upon the top of said fiber bales in the space between said grid rods when said rods come into contact with the surface of said fiber bales.



4,785,507
CLEARER DEVICE FOR BOTTOM DRAFT ROLLER
Tsutomu Miyazaki, Kariya; Yoshio Kawasaki; Kenji Negishi, both of Fujieda; Masao Wakai, Shimada; Isao Ono, and Isao Arita, both of Hirakata, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Kanpatsu Kogyo Kabishiki Kaisha, Hirakata, both of, Japan
Filed Jul. 21, 1987, Ser. No. 76,075
Claims priority, application Japan, Jul. 28, 1986, 61-177438; Jul. 28, 1986, 61-115849
Int. Cl.[4] D01H *5/62*
U.S. Cl. 19—262 **5 Claims**



1. A clearer device for a bottom draft roller comprising a clearer assembly comprising a retainer frame having a length corresponding to a distance between roller stands and a clearer member formed of a relatively thick plate-like material, said clearer member being arranged in opposed relation to a draft part of said draft roller and being retained by said retainer frame with one end portion of said clearer member projecting from said retainer frame by a fixed length; and a plurality of supporting brackets mounted on said roller stands for supporting said clearer assembly, said supporting brackets being formed with insert grooves for receiving both longitudinal end portions of said retainer frame from a front upper side of said supporting brackets.

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4,785,508

FEMALE MEMBER OF SNAP FASTENER

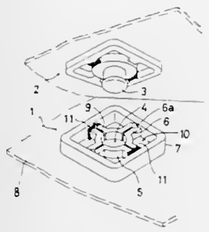
Tadashi Takeda, 12 Banchi, 1 Chome, Kita-kinomoto, Yao-city, Osaka, Japan

Filed Oct. 8, 1987, Ser. No. 105,575

Claims priority, application Japan, Oct. 18, 1986, 61-159863[U]

Int. Cl.[4] A44B *1/18*

U.S. Cl. 24—90 C **4 Claims**



1. A female member of a snap fastener comprising:

a central ring-shaped portion having a through-hole for detachably receiving a projecting portion of a male member of a snap fastener;

a plurality of projecting pieces integrally attached to said central ring-shaped portion and projecting radially outwardly therefrom, each said projecting piece having means for receiving thread thereon when said female member is sewn by thread onto a piece of fabric, and adjacent ones of said projecting pieces defining sewing space portions therebetween;

an outside ring-shaped portion integrally attached to each said projecting piece and surrounding said plurality of projecting pieces and said central ring-shaped portion;

said central ring-shaped portion, said plurality of projecting pieces, and said outside ring-shaped portion being unitary, being substantially flat, and being substantially symmetric with respect to a common plane passing through the middle of said central ring-shaped portion, through the middle of each one of said plurality of projecting pieces, and through the middle of said outside ring-shaped portion;

a reinforcing means integrally attached to each one of said plurality of projecting pieces and integrally attached to said outside ring-shaped portion for strengthening the attachment thereof; and

each one of said plurality of projecting pieces having a radial slit defined therein, each said radial slit extending from said through-hole in said central ring-shaped portion toward said outside ring-shaped portion and terminating before said reinforcing means, each said radial slit allowing elastic deformation of said central ring-shaped portion when said central ring-shaped portion receives the projecting portion of a male member of a snap fastener.

4,785,509

HOOK FOR ROPE USED TO PULL A BOAT INTO A DOCK

Sidney L. Fisher, 16428 S.E. 149th, Renton, Wash. 98056

Filed Nov. 19, 1987, Ser. No. 123,048

Int. Cl.[4] A44B *13/00*

U.S. Cl. 24—230.5 R **17 Claims**

1. A hook, attachable to an end of a rope, comprising:

an elongated shank having first and second ends, and a rope receiving means including an end opening in the first end of the shank;

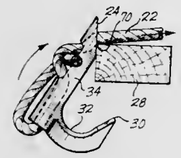
a tine having a first end fixed to the second end of the shank and a second free end spaced from said shank;

said shank and said tine defining a hook throat between them;

said shank having a substantially wide and flat throat surface directed toward the tine; and

said first end of said shank including an oblique end surface surrounding the end opening, said surface intersecting and forming an obtuse angle with the flat throat surface of the shank;

whereby in use the hook is secured to a rope, and the rope



extends out from the opening in the first end of the shank, and the rope is held while the hook is thrown over an object, the rope is then retracted to pull the hook back toward the object and bring said oblique end surface at the first end of the shank into contact with the object, and wherein the oblique end surface and the tine are positioned relative to each other such that the contact of the oblique end surface with the object and the weight of the tine cooperate to rotate the hook such that the tine will engage the object.

4,785,510

METHOD AND APPARATUS FOR THE CONTINUOUS LOOPING OF YARN

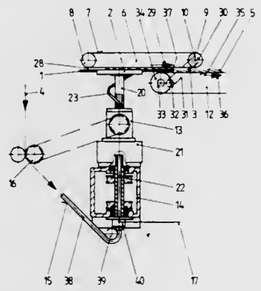
Emil Asfour, Herriberg, Switzerland, assignor to G & W Maschinen AG, Wetzikon, Switzerland

Filed May 12, 1987, Ser. No. 49,726

Claims priority, application Switzerland, May 13, 1986, 01934/86

Int. Cl.[4] B65H *54/82*

U.S. Cl. 28—289 **11 Claims**



1. Apparatus for the continuous looping of a substantially endless yarn, comprising: a substantially horizontal disk rotatable about a generally vertical axis, having a yarn feed channel extending through said disk and opening onto the upper surface thereof in an angular direction toward the periphery of said disk, and an endless moving planar surface mounted above said disk to bear resiliently toward said disk and moving in a direction radially outward of the periphery of said disk; means for feeding the yarn through said feed channel into the space between said rotatable disk and said moving planar surface, said disk and said planar surface being spaced from each other to engage said yarn; means for regulating the relative speed of said disk and said moving planar surface to cooperate to form a series of successive loops in said yarn, each loop being formed beneath the last preceding loop such that said formed loops may be directly uncoiled in the order of their formation and conveyor means located at least in part beneath the radially outward portion of said planar surface on which the successive loops are deposited in the arrangement as formed.

9. Method of coiling a continuous yarn into a plurality of loops comprising the steps of feeding said yarn upwardly through a rotary disk to simultaneously engage the upper surface of the disk and a continuous moving surface, pivotally mounted above said disk to bear by its own weight upon the surface of the disk, the moving surface moving in a radially outward direction from the center of the disk and controlling the relative speed of said disk and moving surface so that the engagement of the yarn by the disk and surface causes the yarn to coil into a successive series of loops, each succeeding loop being formed beneath the preceding one and receiving said loops in the successive series so formed and transporting said loops away from said disk.

4,785,511

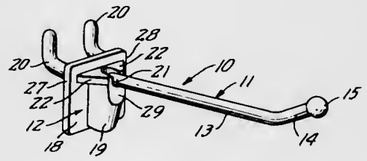
METHOD FOR MANUFACTURING PRE-ASSEMBLED, TWO-PART MERCHANDISE DISPLAY HOOKS AND THE LIKE

Thomas O. Nagel, Blairstown, N.J., assignor to Trion Industries Inc., Wilkes-Barre, Pa.

Filed Apr. 22, 1987, Ser. No. 41,854

Int. Cl.[4] B21K *1/44*

U.S. Cl. 79—7 **8 Claims**



1. The method of forming and assembling a two-part display hook wherein the hook comprises a molded plastic base member and a formed wire hook member, the base member being provided with a socket for the reception of a section of said hook member, which comprises

(a) feeding hook-forming wire lengthwise from a substantially continuous supply thereof into a wire gripping and forming station,

(b) gripping said wire in the vicinity of its free end,

(c) severing said gripped wire at a predetermined distance from said free end to provide a separated hook-forming wire section,

(d) temporarily positioning a bend-forming die element adjacent but spaced a predetermined distance from the severed end of said separated wire section,

(e) bending the severed end of said gripped wire section around said positioned die element, through a substantial angle to form a hook-mounting portion, and thereafter retracting said bend-forming die element while continuing to grip said wire section,

(f) separately supplying individual molded plastic bases to an assembly position offset from and aligned with the hook-mounting portion of said wire section,

(g) said base members having socket portions therein shaped and-sized to have a tight-fitting assembled relation with the hook-mounting portions of said wire sections,

(h) the socket portion of a base member located in said assembly position being substantially aligned with the just formed hook-mounting portion of the gripped wire section,

(i) while continuing to grip said severed wire section, guiding and advancing a base member into assembled relation with said wire section, in which said hook-mounting wire portion is received in the socket portion of said base member, and

(j) thereafter releasing said gripped wire and ejecting the assembled hook.

4,785,512

MACHINE FOR REPAIRING AND SEALING CONDUITS

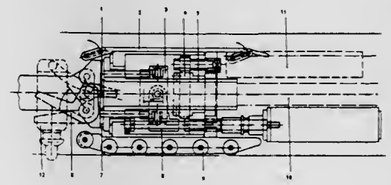
Alwin Sigel, 8418 Schlatt, Switzerland

Filed Jul. 1, 1987, Ser. No. 68,343

Claims priority, application Switzerland, Mar. 31, 1987, 222/87

Int. Cl.[4] B23P *17/00;* **E03F** *3/06*

U.S. Cl. 29—33 T **7 Claims**



1. A remote control device for repairing and/or sealing conduits, said device comprising:

a wheeled undercarriage, said undercarriage being movable into the conduits and having a central longitudinal axis;

a rotatable hollow shaft arranged within said undercarriage and concentric to said undercarriage, said shaft being rotatable around said central axis;

a motor for driving the rotational movement of said shaft; and

a plurality of mounting components for interchangeably mounting the desired repairing and/or sealing equipment, said components being fitted at one end of said shaft, the supply lines for the repairing and/or sealing equipment being torsionally flexible and at least one end thereof being located within said shaft, means providing for at least one of said mounting components to be movable radially from the shaft within the conduit to effect the repair and/or sealing work.

4,785,513

TURRET HAVING ROTATING AND NON-ROTATING TOOLING

Richard C. Lee, Horseheads; Ivan R. Brown, Breesport; Kamalakar K. Rao, Elmira Heights, and Joseph P. Waldron, Horseheads, all of N.Y., assignors to Hardinge Brothers, Elmira, N.Y.

Filed Dec. 16, 1986, Ser. No. 942,310

Int. Cl.[4] B23B *29/32, 39/20*

U.S. Cl. 29—40 **21 Claims**

1. A compound turret for machine tooling, comprising:

(a) a first turret having non-rotating tooling;

(b) a second turret having rotating tooling;

(c) a housing operably associated with said first and second turrets;

(d) a base having an x-axis;

(e) means for rotatably mounting said housing on said base;

(f) said first and second turrets each having turret storage and turret operating positions;

(g) first, second and third indexing means;

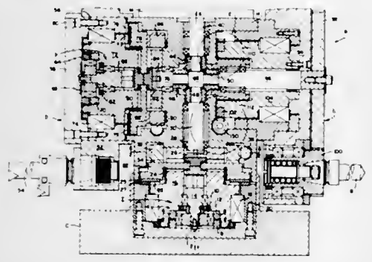
(h) said first indexing means including means for rotating said first and second turrets about said x-axis between said turret storage positions and said turret operating positions;

(i) said second indexing means operably associated with said

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first turret for rotating said first turret about an axis transverse to said x-axis for selecting tooling positioned on said first turret for specific work operations;

(j) said third indexing means operably associated with said second turret for rotating said second turret about an axis



transverse to said x-axis for selecting tooling mounted on said second turret for specific work operations;

(k) a first drive means for driving said first indexing means, said second indexing means and said rotating tooling; and

(l) a second drive means for driving said third indexing means.

4,785,514

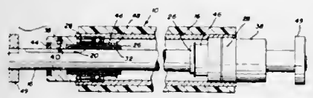
OSCILLATING ROLLER MOUNTED ON A FIXED SHAFT

Kurt R. Kannwischer, Lithonia, Ga., assignor to HH&L Co., Stone Mountain, Ga.

Continuation-in-part of Ser. No. 43,164, Apr. 27, 1987. This application Oct. 7, 1987, Ser. No. 106,177

Int. Cl.[4] B21B *13/02*

U.S. Cl. 29—116.1 **5 Claims**



1. In a roller assembly:

a roller,

a shaft mounted in and through said roller and being fixed against rotation, and bearing means supporting said roller for rotation and reciprocation on said shaft,

said bearing means comprising an inner bearing for longitudinal motion on said shaft so that said roller reciprocates and oscillates during motion

said bearing means comprising and outer bearing which supports said roller for rotation,

said outer bearing being assembled with and mounted on said inner bearing,

said shaft having a keyway adjacent each end thereof and said inner bearing having a portion thereof mounted for movement in said keyway.

4,785,515

METHOD OF MAKING A CENTRIFUGAL PUMP

Russell J. Willette, 718 E. Spruce St., Sault Ste. Marie, Mich. 49783

Division of Ser. No. 883,600, Jul. 9, 1986, Pat. No. 4,717,311. This application Nov. 9, 1987, Ser. No. 117,843

Int. Cl.[4] B21K *3/00*

U.S. Cl. 29—156.8 CF **6 Claims**

1. In a method of making a centrifugal pump the combination of steps including:

(a) providing a pump casing having at least one impeller rotatably mounted therein and an axial fluid inlet opening and an outlet opening of a predetermined area;

(b) providing the impeller with a plurality of radially disposed impeller blades which have tips, and which are evenly disposed, circumferentially, around the impeller so as to provide a circumferential area at the discharge tips of the blade, and which have decreasing widths radially outward; and,

(c) providing a delivery area, in the casing around the impeller into which the impeller discharges fluid, equal in area to the circumferential area of the impeller at the discharge tips of the blades and equal in area to the predetermined area of the casing outlet opening.

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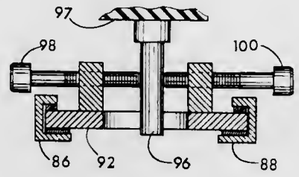
METHOD OF INSERTING TUBES INTO HEAT EXCHANGERS AND APPARATUS THEREFOR

Richard G. Gilbertson, 2464 E. Medicine Lake Blvd., Plymouth, Minn. 55441

Filed Jan. 30, 1986, Ser. No. 824,443

Int. Cl.[4] B21D *53/02*

U.S. Cl. 29—157.3 C **24 Claims**



1. A method of inserting a tube into a heat exchanger comprising:

(1) engaging the tube with at least one endless drive member and supporting the tube on such drive member with no other tube supports between the drive member and the heat exchanger,

(2) advancing and simultaneously rotating the tube on its own axis by rotating the drive member about an axis canted with respect to the tube axis whereby the tube tends to continuously rotate about its axis as it is moved into the heat exchanger to thereby distribute stresses on the tube as it is advanced and reduce the buildup of pressure therein thereby helping to prevent damage to the tube and assist in clearing the tube openings in the heat exchanger.

8. An apparatus for inserting a tube into a heat exchanger comprising at least one drive means having a support surface positioned below and being engagable with a tube to be inserted for advancing such tube axially into the heat exchanger and through a plurality of baffles that exert a drag on such tube, and means operatively associated with the drive means for substantially continuously rotating such tube on its own axis as it is advanced successively through baffles in a heat exchanger to help equalize stresses within a tube being inserted into such heat exchanger and avoid damage to such tube.

4,785,517

APPARATUS FOR MANUFACTURING PIPE JOINT PORTIONS

Kaoru Takano, Tokyo, Japan, assignor to Kabushiki Kaisha Flowell, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,660

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—235 **2 Claims**

1. Apparatus for inserting an annular shape-retaining member having a throughbore with a given inner diameter and

a bulged outer surface having a maximum outer diameter which is greater than said given diameter and a given length, in a throughbore of a semirigid, forcibly radially distensible tubular pipe having a throughbore with an internal diameter, when unstretched, which is approximately the equal to said given diameter, a given distance into said throughbore of said pipe from an open end of the pipe to become located at a predetermined site, so that said throughbore of said annular shape-retaining member acts as a substantially non-constricting axially intermediate, axially aligned continuation of said throughbore of said pipe,

said apparatus comprising:

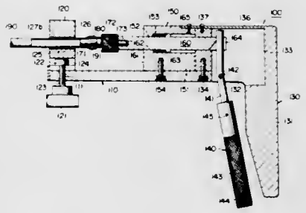
an axially extending base arm having first and second opposite ends;

an openable-closable pipe clamp mounted on said first end of said base arm and arranged for temporarily externally gripping the pipe at a gripping site located axially beyond said predetermined site;

a handgrip disposed on said second end of said base arm and arranged to be manually gripped by a user;

a toggle lever pivotally attached at a pivot joint to said grip so as to have a lower portion thereof below said pivot joint be squeezable toward a lower portion of said handgrip, for forwardly moving an upper portion of said toggle lever located above said pivot joint;

an inserting member, said inserting member including an elongated rod reciprocably mounted on said base arm



for axial movement towards and away from said pipe clamp, said inserting member having a rear end portion engaged with said upper portion of said toggle level to be moved axially forwards thereby, so that squeezing of the lower portion of said toggle lever towards the lower portion of said handgrip causes said elongated rod to be axially thrust towards said pipe clamp;

said inserting member including a leading end portion having a shape-retaining member fitting portion which is cylindrical and has an external diameter approximately equal to said given diameter but is longer than said given length, axially adjacent a radially-stepped stopper portion of abruptly larger external diameter than said given diameter, whereby the annular shape-retaining member can be inserted in the throughbore of the pipe by inserting the pipe in the pipe clamp with said end of said pipe protruding towards, and disposed in axial alignment with said leading end portion of said inserting member, closing the pipe clamp to secure the pipe to the base arm, sliding the annular shape-retaining member onto the inserting member until an end of the annular shape-retaining member abuts said stopper portion, squeezing said lower portion of said toggle lever towards said lower portion of said handgrip so that said leading end portion axially forwardly of said annular shape-retaining member first enters said throughbore of said pipe through said end and, upon further squeezing of said lower portion of said toggle lever towards said lower portion of said handgrip said annular shape-retaining member is forcibly carried into said throughbore of said pipe to said predetermined site, whereupon said inserting member is axially withdrawn, leaving behind said annular shape-retaining member at said site, whereupon said pipe clamp may be opened to free said pipe from said apparatus.

4,785,518

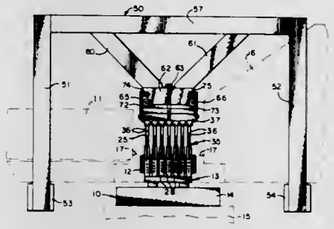
BAFFLE SUPPORT FIXTURE FOR MACHINES FOR ASSEMBLING TUBES IN A HEAT EXCHANGER

Morton F. Zifferer, 536 Owen Rd., York, Pa. 17403, and Richard J. Tarlton, York, Pa., assignors to Morton F. Zifferer, York, Pa.

Continuation of Ser. No. 630,752, Jul. 13, 1984, abandoned. This application May 29, 1985, Ser. No. 738,889

Int. Cl.[4] B25B *27/14*

U.S. Cl. 29—281.1 **5 Claims**



1. A baffle stabilizing fixture for a machine for assembling tubes and perforated baffles in a heat exchanger, said machine including a work table having capacity for selected vertical and horizontal movements, a tube and baffle holding fixture mounted on the work table and guide rod means for advancing selected quantities of tubes from a tube supply to the tube and baffle holding fixture for insertion into the perforated baffles, characterized by

(a) a master plate located in spaced relation to the tube and baffle holding fixture and

(b) plural pairs of closely spaced baffle support plates extending from the master plate to the tube and baffle holding fixture,

(c) each said pair of baffle support plates having a narrow space intermediate the plates of which said pair is constituted to provide a slot for reception of a baffle supported by the tube and baffle holding fixture during tube assembly, said pairs of baffle support plates being operative to stabilize the baffles during insertion of the tubes into the baffles.

4,785,519

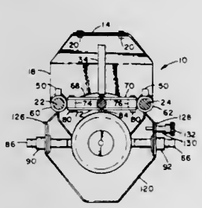
STRUT SPRING COMPRESSOR

Harold Krueger, Barnsville, Minn., assignor to Branick Industries, Inc., Fargo, N. Dak.

Filed Apr. 2, 1987, Ser. No. 34,278

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—227 **10 Claims**



1. An apparatus for use in assembling and disassembling a

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strut assembly of the type having a shock absorber (**104**) axially disposed within a coil spring (**102**), said apparatus comprising:

a frame (**12**);

a first spring connection means (**26,30,38**) connected to said frame for holding said spring in a predetermined alignment within said frame and resisting movement of a first portion of said spring in a predetermined compression direction; means for restraining said first spring connector means from movement in said compression direction;

a compression head (**52**) mounted on said frame and movable toward and away from said compression direction, said compression head including first and second compression elements (**86,88**) for imparting a force on a second portion of said spring and urging said spring to compress as said compression head is moved toward said compression direction, said compression head including a first compression member and a second compression member, means for mounting said compression members to said frame with said members movable in linear spaced apart paths toward and away from said compression direction, said first compression element connected to said first compression member and said second compression element connected to said second compression member;

urging means (**74**) for urging said compression head to move toward said compression direction;

said compression head including connector means (**68**) for connecting said first and second compression elements such that said first and second compression elements movable relative to one another and free to assume unaligned positions as said compression head urges said spring into compression, said connector means including a linkage pivotably connecting said first and second members and accommodating relative movement of said members in spaced apart parallel paths; and a force transmitting end on said urging means, said force transmitting end being pivotably connected to said linkage.

4,785,520

PROCESS FOR LOCATING THE IDEAL SCREWING POSITION OF BOLTS OF LARGE DIMENSIONS

Jean-Claude Bourdonne, Le Breuil, and Alain Briand, Le Creusot, both of France, assignors to Framatome, Courbevoie, France

Filed Oct. 29, 1986, Ser. No. 924,530
Claims priority, application France, Oct. 29, 1985, 85 16061
Int. Cl.⁴ B23Q *17/22*
U.S. Cl. 29—407 **1 Claim**

1. Process for locating the ideal screwing position of bolts of large dimensions, especially for fastening the cover of a vessel having tapped orifices, including the steps, subsequent to fastenign the bolt (**10**) to a screwing/unscrewing device (**20**), of

(a) making a check to ascertain that the bolt (**10**) is vertical and is aligned with the axis of the tapped orifice (**5**);

(b) lowering the bolt (**10**) under control, until it engages in a tapping recess of the orifice (**5**);

(c) rotating the bolt (**10**) in the direction opposite to screwing;

(d) detecting the point of engagement of the threads (**11**) of the bolt (**10**) in the threads of the tapped orifice (**5**);

(e) arresting the rotation of the bolt (**10**) in the opposite direction and controlling the start of screwing by rotating the bolt in the normal direction by a few turns, if possible, and at a low speed;

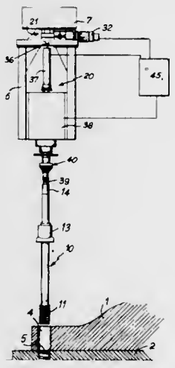
(f) arresting the rotation of the bolt (**10**) if, during this screwing, a first seizure of the bolt (**10**) in the tapped orifice (**5**), when the screwing torque becomes greater than a specific disengaging torque, is detected;

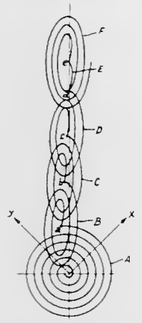
(g) locating the ideal screwing position of the bolt (**10**) according to a circular or square spiral path, as soon as said first seizure is detected;

(h) detecting said ideal screwing position at the moment when the screwing torque again becomes less than the disengaging torque, and recording the coordinates of a new ideal screwing center;

(i) continuing screwing at a reduced speed for a few turns, and, if possible, increasing the screwing speed;

(j) detecting each new seizure during this screwing and af ter each seizure locating the ideal screwing position by means of a suitable path from the center corresponding to the preceding stop previously recorded, the paths of the succeeding location of the ideal screwing positions being either flattened or rectangular spirals, if there is a preferred direction of seizure, or circular or square spirals if there is not;





(k) resuming screwing after each detection of the new ideal screwing center; and

(l) continuing the screwing of the bolt (**10**) at high speed until the end of screwing is detected.

4,785,521

METHOD FOR AUTOMATICALLY LINKING BEADS OR THE LIKE

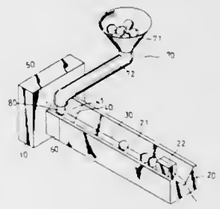
Sheng-Wu Ho, No. 73, Hotsuob St., Seatwen, Taichung City, Taiwan

Filed Mar. 23, 1987, Ser. No. 28,766
Int. Cl.⁴ B23P *19/04*
U.S. Cl. 29—433 **3 Claims**

1. A method of automatically linking a plurality of beads, each said bead having a through-hole, said method comprising the steps of:

dropping said beads, one at a time, onto a guide member, said guide member having a guide surface along a length thereof and a V-shaped cross-section;

pulling a needle, having a thread thereon, so that said needle and thread extend along and are parallel to the length of the guide surface; and



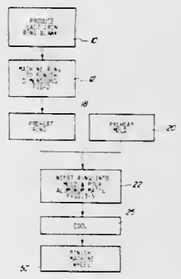
agitating said beads, one at a time, so that said through-hole in each of said beads is aligned with the needle so that said beads are threaded onto said needle and thread and slide along the guide surface.

4,785,522

METHOD OF MAKING A BAND SAW WHEEL

Vincent G. Biro, Lakeside, Ohio, assignor to Biro Manufacturing Company, Marblehead, Ohio

Filed Sep. 4, 1987, Ser. No. 94,158
Int. Cl.⁴ B22D *11/126*
U.S. Cl. 29—527.6 **15 Claims**



1. The method of manufacturing a composite aluminum-cast iron meat cutting band saw wheel, comprising the following steps:

(a) producing a cast iron ring;

(b) machining at least the periphery of said ring to a predetermined dimension;

(c) preheating said ring;

(d) preheating a wheel mold;

(e) inserting said ring within the mold in a predetermined position;

(f) pouring molten aluminum into said mold;

(g) cooling the composite aluminum-cast iron wheel formed in the mold while it is in the mold;

(h) removing the composite wheel from the mold;

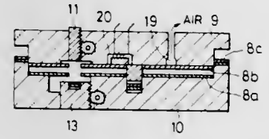
(i) machining the periphery of the composite wheel to final size with the cast iron ring being the exposed working surface for engaging a band saw blade.

4,785,523

METHOD OF MANUFACTURING A COMPOSITE MEMBER OF METAL PLATES AND SYNTHETIC RESIN

Yasuo Koseki; Masamori Higuchi, and Satoru Hirosaki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 98,795
Claims priority, application Japan, Sep. 22, 1986, 61-224223
Int. Cl.⁴ B23P *17/00*
U.S. Cl. 29—530 **6 Claims**



1. A method of manufacturing a composite member composed of metal plates and synthetic resin comprising the steps of:

(a) mounting at least two stacked metal plates between first and second metal molds, said first metal mold having at least one of a fixed piercing punch and a movable piercing punch and said second metal mold having at least one of a fixed piercing die and a movable piercing die corresponding to said piercing punch;

(b) performing pressing work on said metal plates;

(c) separating said first and second metal molds by a predetermined distance while holding said metal plates facing each other to thereby form a gap of a predetermined distance between said metal plates;

(d) injection-pouring melted adhesive synthetic resin into said gap between said metal plates to form a resin layer therein; and,

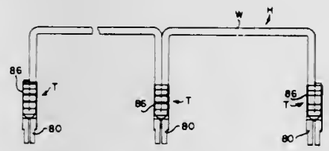
(e) removing a molded product after said resin layer has been hardened.

4,785,524

WIRING HEAD

Georg Grella, Darmstadt-Wixhausen, and Peter Bormuth, Bensheim, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 15, 1988, Ser. No. 168,370
Claims priority, application United Kingdom, Apr. 13, 1987, 8708801
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—564.6 **8 Claims**



1. In Wiring apparatus having means for operatively aligning a wiring head above predetermined cavities in an electrical connector housing to be wired, a wiring head comprising:

an electrical terminal inserter mounted thereto for reciprocating movement through a downward terminal insertion stroke and an upward return stroke;

means on the head for consecutively feeding electrical terminals each having a wire receiving portion, horizontally, and into alignment with the terminal inserter at the end of each return stroke thereof, for the insertion of the terminal

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into one of said cavities by the terminal inserter during its insertion stroke;

a wire inserter mounted to said head for horizontal reciprocating movement through a wire insertion stroke and a return stroke;

means on said head for feeding wire from a wire source, in a wire feed horizontal direction towards the wire inserter and into alignment therewith, transversely of the direction of the wire insertion and return strokes thereof and at the end of each return stroke thereof;

means moveable in said head, parallel to said wire feed direction, prior to the working strokes of the terminal inserter and the wire inserter, for forming the wire fed by said wire feed means, into a loop aligned with the wire receiving portion of a terminal fed to the terminal inserters for insertion of the wire into said wire receiving portion by the wire inserter during its wire insertion stroke;

means horizontally moveable in said head for selectively severing either side of the loop at a position back from the terminal, in accordance with a connector housing wiring program; and

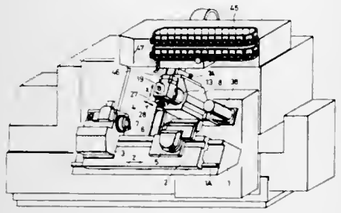
wire pulling means on the head arranged downstream, in said wire direction, of the terminal inserter, for engaging the wire between the terminal and the wire feeding means, following the working stroke of the terminal inserter, to draw further wire from the wire source.

4,785,525

MACHINE TOOL FOR COMPLEX MACHINING

Kenichi Ishida, and Masaki Yoshioka, both of Niigata, Japan, assignors to Tsugami Corporation, Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,719
Claims priority, application Japan, Sep. 12, 1986, 61-213763
Int. Cl.⁴ B23Q *3/157*; B23B *7/14*
U.S. Cl. 29—568 **4 Claims**



1. A machine tool for complex machining, comprising:

a bed;

a table which can be moved relative to said bed in the direction of a horizontal Z-axis;

a Z-axis driver for moving said table back and forth in the direction of said Z-axis;

a workpiece-holding headstock support-on said table so that an axis of said headstock extends in the direction of said Z-axis;

a column secured to said bed and having a guide surface extending in the direction of an X-axis perpendicular to said Z-axis;

an X-axis slider movably supported on said guide surface of said column;

an X-axis driver for moving said X-axis slider back and forth in the direction of said X-axis;

a Y-axis slider supported by said X-axis slider so that said Y-axis slider can be moved in the direction of a Y-axis perpendicular to said X-axis and to said Z-axis;

a Y-axis driver for moving said Y-axis slider back and forth in the direction of said Y-axis;

a B-shaft rotatably supported by said Y-axis slider so that said B-sahft can be rotated about said Y-axis;

a tool arbor head which is attached to an end of said B-shaft and fitted with a rotatable tool arbor; and

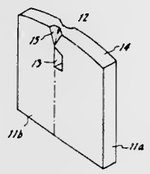
a tool arbor driver for rotating said tool arbor.

4,785,526

METHOD OF MANUFACTURING A MAGNETIC HEAD

Masataka Koyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 802,952, Nov. 27, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 124,427
Claims priority, application Japan, Dec. 1, 1984, 59-252829
Int. Cl.⁴ G11B *5/42*
U.S. Cl. 29—603 **5 Claims**



1. A method of fabricating a magnetic head, comprising the steps of:

providing first and second blocks made of single crystal ferrite, each of said blocks having a mirror-finished surface;

providing a gap-defining spacer on an upper side of said surface of said first block, said gap-defining spacer being made of a non-magnetic ferrite and having substantially the same crystal structure as that of said first and second blocks and substantially comprising the same component as that of said first and second blocks;

faying said surfaces of said first and second blocks with said gap-defining spacer being interposed therebetween; and

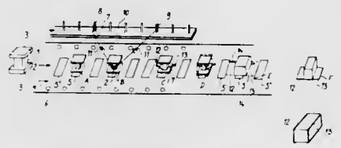
performing a solid-phase welding with respect to the fayed surfaces so that said first and second blocks are integrally welded and said non-magnetic ferrite of said gap-defining spacer is monocrystallized, the solid-phase welding being effected by keeping said first and second blocks at a temperature between about 1250° C. and 1350° C. for about one hour in an atmosphere having an oxygen partial pressure in equilibrium with the content of oxygen in the single crystal ferrite.

4,785,527

METHOD FOR MANUFACTURING AN INDUCTIVE CHIP

Gilles Bernard, Seurre, and Jean L. Zatarra, Dijon, both of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Jan. 20, 1987, Ser. No. 4,397
Claims priority, application France, Jan. 21, 1986, 86 00801
Int. Cl.⁴ H01F *7/06*
U.S. Cl. 29—605 **6 Claims**



1. A method for the manufacturing of a component comprising an inductive chip of the type with a wire wound around a core, the method comprising the following steps:

(a) fixing the core to a connecting strip made of a metallic material, said strip being provided with slots by which electrical connections can be obtained on either side of the component,

(b) winding a wire around the fixed core,

(c) soldering each end of the wire parts of the strip designed to form the electrical connections,

(d) coating the wound core in a molding step, with the connecting strip acting as a mold joint for the molding step,

(e) cutting the connecting strip to define limits of each component including parts of the connecting strip intended to form external electrical connections for the chip,

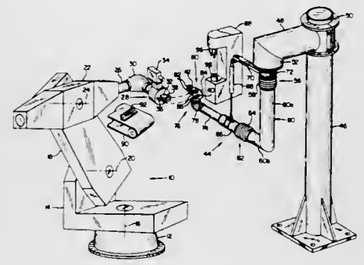
(f) folding the parts to form the connections defined in the previous step and fixing the parts to the component.

4,785,528

ROBOTIC WORK POSITIONING SYSTEM

Mark S. Soderberg, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1986, Ser. No. 944,659
Int. Cl.⁴ B23P *21/00*
U.S. Cl. 29—701 **11 Claims**



1. A handling and assembly system for positioning and joining a first workpiece and a second workpiece, said system comprising:

a first robot arm and a second robot arm cooperable for holding said first workpiece and said second workpiece in adjoining relation,

said first robot arm having engaging means forming a permanent part thereof during operation of said first arm in positioning joining of said workpieces for selectively engaging said second arm to move the same, and for selectively grasping said first workpiece,

said second arm having engaging means for grasping said second workpiece including means cooperable with engaging means of the first arm for movement of said second arm by said first arm to locate the engaging means of said second arm at a fixed position, and

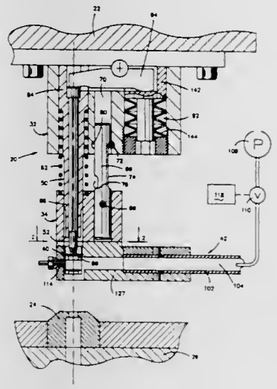
locking means for said second arm characterized by an unlocked condition wherein said second arm is movable by said first arm and a locked condition when said first arm has located said second arm at said fixed position, whereby a workpiece held by said second arm is positionable in accurately predetermined relation with respect to a workpiece held by said first arm.

4,785,529

FASTENER MOUNTING APPARATUS

W. Richard Pamer; James A. Zils, both of Parma, and John L. Barkocy, Hudson, all of Ohio, assignors to RB & W Corporation, Mentor, Ohio

Filed Jun. 16, 1987, Ser. No. 62,860
Int. Cl.⁴ B23P *11/00*; B23Q *7/10*
U.S. Cl. 29—707 **17 Claims**



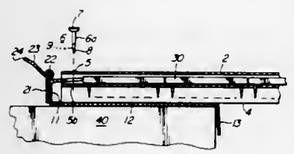
1. An apparatus for use with a press having sections which are relatively movable to mount a fastener in a member as the fastener cooperates with a die to sever a portion of the member during operation of the press from an open condition to a closed condition, said apparatus comprising a base adapted to be connected with one of the sections of the press, a punch connected with said base, a fastener mounting section movable relative to said punch and base along a path extending parallel to a central axis of said punch during operation of the press between the open and closed conditions, a guide post connected with said base and fastener mounting section for guiding relative movement between said base and fastener mounting section during operation of said press between the open and closed conditions, said guide post being offset from the extending parallel to said punch, conveyor means connected with said fastener mounting section for conducting the fastener to said fastener mounting section, said punch including surface means for applying force against the fastener during operation of the press from the open condition to the closed condition to press the fastener against the member and sever a portion from the member due to the cooperation between the fastener and the die, and ejector means for applying force against the member during mounting of the fastener to move the severed portion of the member relative to the remainder of the member, said ejector means including an ejector pin disposed in a coaxial relationship with and at least partially enclosed by said punch, said ejector pin being movable along the central axis of said punch through an opening in the fastener during mounting of the fastener in the member, spring means offset to one side of said punch and ejector pin, and force transmitting means for transmitting force from said spring means to said ejector pin to press said ejector pin against the member at a location which is coaxial with said punch during mounting of the fastener in the member.

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4,785,530
HAND TOOL FOR AIDING CLOSURE OF INTEGRATED CIRCUIT STORAGE CARTRIDGES

Herbert Tomlinson, Belleville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 20, 1987, Ser. No. 75,178
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—758 **2 Claims**



1. A hand tool for assisting closure of elongated storage cartridges of a type used for integrated circuit (IC) packages stored end on end and maintained tightly against one another in a space between inserted closure pin means residing in orifices defined in an elongated storage cartridge, the hand tool comprising:

a base having first and second ends;

a shank extending substantially normal to the base from one of said ends and terminating at a grip formation extending substantially normal to the shank and away from the base;

a pair of tines extending from the second end of the base substantially normal to the base spaced from and along the shank, the tines defining a channel therebetween; and

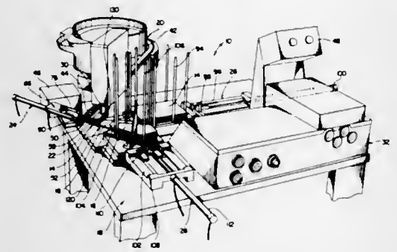
a hinged flap mounted next to the second end and being rotatable to assume a position spaced parallel with and extending along the tines;

whereby in use to assist closure of an elongated storage cartridge having been filled with IC packages, the tines are inserted in an open end of the cartridge with the shank lying along an outside surface of the cartridge and thereafter pressure is manually applied to urge the tines against an IC package to sufficiently displace said packages to clear the holes and permit insertion of the pin means into said holes, said flap being so positionable as to assist in driving the pin into an interference fit relationship with said holes, whereafter said pressure is released and said IC packages are firmly retained within the storage cartridge.

4,785,531
HINGE ATTACHING APPARATUS AND JAW AND FEEDER ASSEMBLY THEREFOR

Armand E. Roy, Attleboro, and Leo T. Roy, S. Attleboro, both of Mass., assignors to Craft, Inc., Attleboro, Mass.

Filed Oct. 23, 1987, Ser. No. 113,667
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—798 **14 Claims**

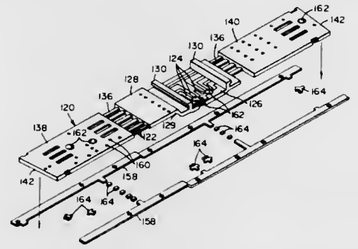


1. An apparatus for attaching a hinge to first and second, substantially flat penetrable members in order to hingeably connect said members, said hinge comprising first and second, substantially flat plate portions having first and second fastening elements thereon, respectively, and a barrel portion hingeably connecting said plate portions, said first and second fastening elements being receivable in piercing engagement with said first and second members for securing said first and second plate portions thereto, respectively, said hinge being receivable in a collapsed disposition wherein said first and second plate portions overlay one another with said fastening elements facing outwardly, said apparatus comprising feed means for feeding said hinge in said collapsed disposition and in a predetermined orientation to a first station, jaw means operable at said first station for releasably engaging said barrel portion to releasably secure said hinge in said jaw means, means for advancing said first member to a predetermined position at a second station, means for advancing said jaw means to advance said hinge to a predetermined position at said second station, wherein said first fastening element is engageable with said first member, means for advancing said second member to a predetermined position at said second station wherein said second fastening element is engageable with said second member, and means for urging said first and second members toward said first and second plate portions, respectively, to secure said first and second members to said first and second plate portions, respectively, with said first and second fastening elements, respectively.

4,785,532
METHOD OF MAKING ELECTRICAL CONNECTOR ASSEMBLY FOR ANTISKID BRAKING SYSTEM

Michael D. Galloway, Middletown; William H. Rose, and David T. Shaffer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 789,999, Oct. 22, 1985, Pat. No. 4,697,863.
This application Jun. 29, 1987, Ser. No. 67,900
Int. Cl.[4] H01R *43/16, 43/24*
U.S. Cl. 29—827 **5 Claims**



1. A method for making a connector harness mountable on wall means of a container having at least one corner, said connector harness having a plurality of path members each including a first contact section, a second contact section and a body section therebetween, said first contact sections of said path members to be disposed on a first portion of said container wall means and said second contact sections to be disposed on a second portion of said container wall means with said at least one corner being situated between said first and second wall portions, comprising the steps of:

stamping a lead frame from a strip of metal, said lead frame including said path members joined to each other at path links and said lead frame being joined to carrier strips;

placing said lead frame into a mold having at least two mold cavities spaced apart, with a first portion of said lead frame having said first contact sections disposed in one said mold cavity, a second portion of said lead frame having said second contact sections disposed in another said mold cavity, and at least a third portion of said lead frame extending between each adjacent pair of said at least two spaced apart mold cavities, and said carrier strips being outside said at least two mold cavities;

molding insulative cover portions over at least said first and second lead frame portions such that said first and second contact sections are exposed, and such that apertures are formed in said cover portions exposing ones of said path links disposed in said at least two mold cavities and said at least a third portion of said lead frame extends between said cover portions;

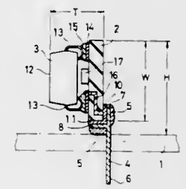
severing all path links desired to be severed from said lead frame whereby said path members are separated from one another; and

severing said lead frame from said carrier strips, whereby said lead frame is bendable between said cover portions and said first and second contact sections are electrically engageable by mating electrical contact members.

4,785,533
HYBRID INTEGRATED CIRCUIT DEVICE, AND METHOD OF AND LEAD FRAME FOR USE IN MANUFACTURING SAME

Mituaki Seino, and Tsuneo Endoh, both of Komoro, Japan, assignors to Hitachi, Ltd. and Hitachi Tobu Semiconductor, Ltd., both of Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,327
Claims priority, application Japan, Feb. 21, 1986, 61-35172; Feb. 21, 1986, 61-35173
Int. Cl.[4] H01R *43/00;* **H05K** *1/11*
U.S. Cl. 29—827 **22 Claims**



1. In a hybrid integrated circuit device comprising:

a plurality of electronic parts;

a wiring board having primary front and rear surfaces on opposite faces thereof and a side edge surface that extends between said faces with means mounting said plurality of electronic parts on the primary front surface thereof; and

a plurality of leads secured to the edge of said wiring board,

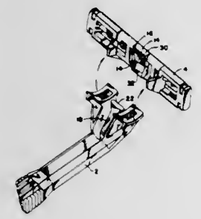
the improvement in that a fixing section of each of said leads has a main fixing portion secured to the primary rear surface of said wiring board, and an auxiliary fixing portion secured to the side edge surface of said wiring board with no fixing portion secured to said primary front surface, the auxiliary fixing portion of said lead being branched from the main fixing portion thereof such that the branched auxiliary fixing portion is bent at an angle of approximately 90° with respect to the main fixing portion.

11. A method of manufacturing a hybrid integrated circuit device of type that a plurality of leads are secured to one edge of a wiring board mounting thereon at least one electronic part, said method comprising the steps of; preparing a lead frame which has an engagement portion to be contacted with another edge of said wiring board, a main fixing portion provided on each of said leads to be opposite to the flat surface of said wiring board, and an auxiliary fixing portion provided on each of said leads to be opposite to the side face of said wiring board; attaching the engagement portion of said lead frame to another edge of said wiring board by means of a clip so that the main fixing portion and the auxiliary fixing portion of each said lead come into contact with said wiring board; securing the main fixing portion and auxiliary fixing portion of each said lead to said wiring board with bonding materials; and removing the useless part of said lead frame.

4,785,534
RAZOR

Daniel B. Lazarchik, Boston, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 7, 1987, Ser. No. 129,473
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—50 **2 Claims**

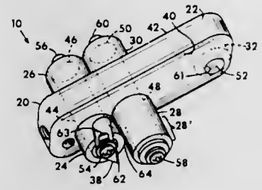


1. A razor comprising a handle and a blade unit mounted on said handle for pivotal movement thereon, said blade unit comprising a housing having blade means, therein, a pair of non aligned projections extending from an underside of said housing toward said handle and a leaf spring extending from said handle toward said blade unit, said leaf spring being fixed at a first end to said handle, a second free end on said leaf spring exceeding in width the distance between said non aligned projections, said spring being in a twisted condition by the free second end of said leaf spring engaging said non aligned projections, said spring having a bias toward an untwisted condition and thereby exercising a force on each of said projections to cause said blade unit to be biased toward a neutral position on said handle.

4,785,535
CUTTER FOR HIGH VOLTAGE INSULATION STRIPPING FROM CONDUCTOR

Tony Nespor, 2515 Glencoe Rd., Baltimore, Md. 21234

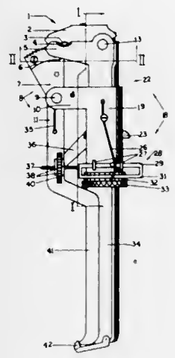
Filed Feb. 8, 1988, Ser. No. 153,820
Int. Cl.[4] B21F *13/00, 15/02;* **B25B** *27/10;* **H01B** *17/24*
U.S. Cl. 30—90.1 **24 Claims**



1. A system for parting insulation on a length of insulated conductor resting against a surface, in preparation for axially stripping the insulation from the insulated conductor, free of need for heating and free of damage to the insulated conductor, comprising: means for constraining the insulated conductor for rolling parallel to itself across the surface, and means connected with the means for constraining and insertable in the insulation in a direction clear of the conductor for cutting the insulation in a radial plane during said rolling across the surface.

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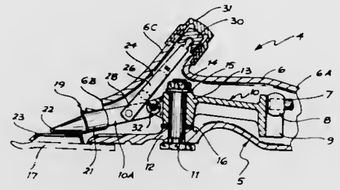
4,785,536
PLIERS-TYPE CUTTING HAND TOOL
Alexander Freyman, 1903 Ocean Ave. Apt. B-8, Brooklyn, N.Y. 11230
Filed Jun. 4, 1987, Ser. No. 57,788
Int. Cl.[4] B25F *3/00*
U.S. Cl. 30—124 **5 Claims**



1. A pliers-type cutting hand tool, comprising:
a pair of pivotally connected elongated members, each having an upper, mid-, and lower portions respectively; one of said elongated members being stationary and provided with a clamp, positioned on the upper portion thereof, said clamp being used for securing an object being cut, the midportion of said stationary member being of elongated cylindrical shape and having a threaded section thereon, and the lower portion of said stationary member forming a stationary handle; the other of said elongated members being laterally movable and carrying a segmental saw blade positioned on the upper portion thereof, said blade being used for cutting an object secured in said clamp, the lower portion of said laterally movable member forming a movable handle positioned at a suitable distance from said stationary handle;
a bracket carrying a pivot pin, whereupon said movable member is pivotally mounted;
a sleeve, incorporated with said bracket and slidably disposed on the midportion of said stationary member;
a nut, supporting said sleeve and rotatably mounted on said threaded section, said nut, when rotated, being capable of moving translationally on said stationary member and imparting translational movement to said sleeve and said bracket towards and away from said clamp.

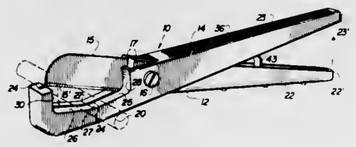
4,785,537
WOOL SHEARS
Moran, Victor A., East Ryde, Australia, assignor to Sunbeam Corporation Limited, New South Wales, Australia
Filed Dec. 16, 1986, Ser. No. 942,500
Claims priority, application Australia, Dec. 18, 1985, PH3929
Int. Cl.[4] B26B *19/00*
U.S. Cl. 30—219 **8 Claims**

1. A shearing handpiece comprising an elongated casing, a drive fork extending throughout the casing, a comb supported upon a forward end of the casing, means for a rear end portion of the drive fork to receive driving power, a cutter held against the comb by a forward end portion of the drive fork, said drive fork causing said cutter to reciprocate across the face of said comb, an intermediate pivot for the fork supported by the casing, an upwardly extending hollow extension on said casing, a frame of inverted Y-shape having an upwardly extending support leg and a pair of downwardly diverging arms at least partly spanning and bearing downwardly upon the forward end portion of the fork and integrally depending from said support leg such that said support leg and said arms form a rigid inflexible member, said support leg extending upwardly



into said hollow extension, and adjustment means threadedly engaged on an upper end of said hollow extension and abutting the upper end of said support leg to impose a closing force between the cutter and the comb through said Y-shaped frame.

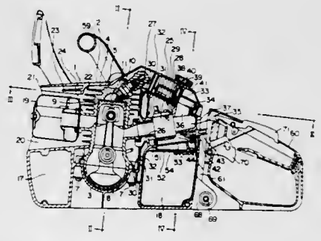
4,785,538
CUTTING TOOL
Fred J. Meyer, 335 W. 75 Place, Hialeah, Fla. 33014
Continuation of Ser. No. 15,551, Feb. 13, 1987, abandoned, which is a continuation of Ser. No. 784,138, Oct. 4, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 73,911
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—258 **11 Claims**



1. A hand held cutter assembly primarily designed to provide a straight line cut through a range of varying diameter plastic or like material tubular conduit, said assembly comprising:
a. an anvil handle having an elongated configuration and comprising and orienting anvil secured to a distal end thereof and being configured to transversely receive a conduit having a range of different sizes therein,
b. a blade handle having an elongated configuration and pivotally connected to said anvil handle and comprising a cutting blade secured to a distal end thereof in cooperative relation to said anvil,
c. said cutting blade having a straight line cutting edge extending along a length thereof and said cutting blade pivotally positionable into and out of cooperative relation to said anvil along a cutting path being substantially perpendicular to the transversely received conduit within said anvil,
d. said anvil comprising an orienting means integrally formed thereon for orienting and maintaining the conduit in substantially perpendicular relation to said cutting blade prior to and during a cutting stroke of the cutting blade and passage therethrough,
e. said orienting means defined by a structural configuration of said anvil comprising a V-shaped base portion and two spaced apart sides each disposed at an opposite end of said base portion,
f. said V-shaped base portion comprising two base sides each extending from a correspondingly positioned one of said two sides at an angular, convergent, straight line orientation to a common junction,

g. said common junction disposed at a substantial center of said V-shaped base portion and at a low point thereof,
h. said base portion further including a sufficient transverse dimension at said common junction to facilitate said orientation and maintenance of the conduit in substantially perpendicular relation to said cutting blade during the cutting stroke,
i. at least one of said handles including a stop element formed thereon in spaced relation to a proximal end of said one handle and disposed to extend into at least contiguous relation to an inner longitudinal boundary of said one handle, and
j. said stop element disposed for interruptive engagement with the other of said handles and structured to prevent nesting engagement of said handles into one another when proximal ends thereof are pivoted towards one another.

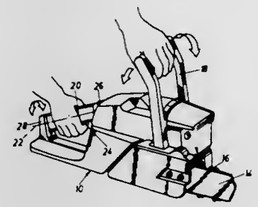
4,785,539
CHAIN SAW HANDLE
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Apr. 23, 1987, Ser. No. 41,617
Claims priority, application Japan, Apr. 23, 1986, 61-586[U]
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—381 **9 Claims**



1. A chain saw comprising:
a body having a lower rear end;
a bracket portion provided at said lower rear end of said body, said bracket portion having an external side;
a rear handle formed separately from said body and having a lower front end and an integral connecting member, said connecting member protruding from said lower front end of said rear handle slantingly upward, said connecting member having a lower end adjacent said bracket portion and an upper end;
a front handle having an upper end adjacent said upper end of said connecting member; and
means for connecting said lower end of said connecting member to said bracket portion of said body and further for connecting said upper end of said connecting member to said upper end of said front handle.

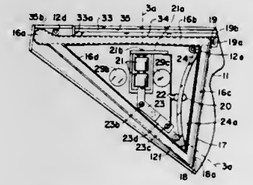
4,785,540
DEVICE IN POWER-DRIVEN HAND TOOLS
Bengt Arvidsson, Huskvarna, Sweden, assignor to AB Electrolux, Stockholm, Sweden
Filed Oct. 29, 1987, Ser. No. 114,617
Claims priority, application Sweden, Nov. 6, 1986, 8602214
Int. Cl.[4] B23D *57/02;* **B27B** *17/00*
U.S. Cl. 30—520 **7 Claims**

1. An improved power driven hand tool having a body containing a driving motor and a tool driven by said driving motor, a handle arrangement to hold and control said hand tool during operation thereof, the improvement comprising said handle arrangement comprising a first grip handle in the form of a bow handle, said bow handle projecting from the hand tool and arranged to be pivoted about an exterior face of said hand tool body about a first pivot axis, and a second grip handle, said second grip handle being mounted on said hand tool for rotational movement about a longitudinal handle axis



for the purpose of allowing the grip on said second grip handle to be retained irrespective of the angular position of said hand tool body relative to said first grip handle.

4,785,541
BOW MOUNTED RANGE FINDER FOR TREE STANDS
Abner P. Lowry, 4512 Hartman Rd., Jacksonville, Fla. 32226
Filed Oct. 16, 1986, Ser. No. 919,657
Int. Cl.[4] F41G *1/46*
U.S. Cl. 33—265 **12 Claims**



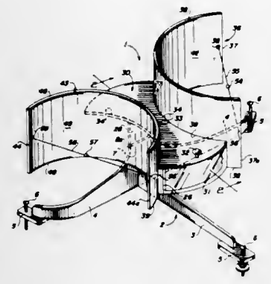
1. A bow mountable range finder for elevated tree stand use comprising a housing, an integrally formed tubular triangular chamber containing a quantity of air and liquid, means mounting said chamber in said housing, said tubular chamber including an elongated horizontal venting section having opposite end portions, a vertically extending translucent indicating section having opposite end portions, an inclined section having opposite end portions and a horizontally disposed reservoir section, respective said end portions of said venting section being connected between said reservoir and one of said end portions of said indicating section, respective said end portions of said inclined section being connected between said reservoir and the other of said end portions of said indicating section, said indicating section and said inclined section being substantially filled with liquid when said venting section and said reservoir section are disposed horizontally, a translucent graduated precalibrated scale having yard marks thereon and positionable rearwardly of said indicating section for reading the liquid level in said indicating section by an archer, means for removably securing said scale to said housing.

4,785,542
SUNDIAL
Carl E. Haskett, 17 Wilana St., Tyler, Tex. 75703
Filed Jun. 22, 1987, Ser. No. 64,532
Int. Cl.[4] G01C *12/34*
U.S. Cl. 33—270 **28 Claims**

1. A sundial comprising base means adapted for mounting on a supporting surface; support bracket means carried by said base means in angularly adjustable relationship; a pair of curved dial means carried by said support bracket means, said dial means each having a concave surface facing in oppositely-disposed, fixed relationship with respect to each other for

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sequentially facing the sun; spaced time marks provided on said concave surface for marking the passage of time; at least one arcuate adjusting plate carried by said support bracket means, a plurality of plate openings provided in said arcuate adjusting plate and pin means adapted for insertion in said plate openings and for engagement with said base means, said arcuate adjusting plate adapted for engaging said base means in adjustable



relationship and vertically adjusting said support bracket means and said dial means in a selected angular relationship with respect to the supporting surface; and a pair of gnomons suspended across a diameter of said dial means, respectively, whereby the shadow cast by said gnomons sequentially traverses said concave surface and said time marks substantially in accordance with clock time, responsive to rotation of the earth.

4,785,543

SIGHTING DEVICE FOR A BALLISTIC PROJECTILE APPARATUS

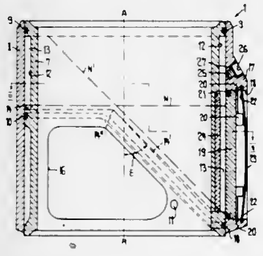
Weber Hans, Bern, Switzerland, assignor to Eidgenossische Waffenfabrik, Berne, Switzerland

Filed Jul. 28, 1987, Ser. No. 78,635

Claims priority, application Switzerland, Aug. 15, 1986, 3293/86

Int. Cl.⁴ G01C *9/200*

U.S. Cl. 33—333 **12 Claims**



1. A sighting device for indicating the degree of inclination of a launcher, having a tubular barrel, comprising:

an annular vessel system surrounding said barrel, said vessel system defining a coherent annular space having a bottom, configured for containing a liquid forming at least approximately on the entire periphery of said annular space a free surface said vessel system further including a displacer disposed within said space for diminishing the volume of said liquid to establish a large free liquid surface relative to the volume of said fluid.

4,785,544

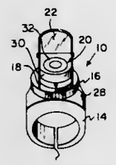
SPIRIT LEVEL ACCESSORY FOR THE ELECTRIC DRILL

Robert Heinslus, George Spector 233 Broadway RM 3815, and George Spector, 233 Broadway RM 3815, both of New York, N.Y. 10007

Filed Feb. 1, 1988, Ser. No. 150,842

Int. Cl.⁴ B23B *45/14;* **G01C** *9/28*

U.S. Cl. 33—334 **4 Claims**



1. A spirit level accessory for an electric drill which comprises:

(a) a clamp member having a gap which fits on standard mounting surface of the electric drill, whereby a clamping force is obtained by deformation of said clamp member nearby the gap;

(b) a dial member having four sixty degree graduation scales, said dial member mounted on said clamp member and is adjustable few degrees and set to obtain a correct position with respect to axis of the electric drill,

(c) a bracket member having an indicator mark thereon, said bracket member and said dial member held together by a spring force for friction therebetween, whereby the indicator mark of said bracket member can be set at any desired angle shown on said dial member; and

(d) a spirit level member held by said bracket member;

(e) a cover member having its inside surface highly polished to function as a mirror, said cover member hinged on said spirit level member to protect said spirit level member against damage when not in use, said cover member can be opened fully at ninety degrees allowing said spirit level member to be viewed directly and said cover member can be opened half way at forty five degrees allowing said spirit level member to be viewed indirectly at the inside surface of said cover member.

4,785,545

MEANS FOR SIMULTANEOUSLY CONNECTING A PLURALITY OF SWITCH-TYPE PROBE HEADS TO THE MEASUREMENT ARM OF A COORDINATE-MEASURING MACHINE

Karl-Eugen Aubele, Gussenstadt, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Oct. 8, 1987, Ser. No. 105,825

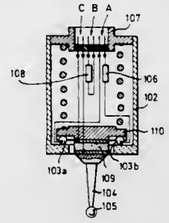
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1986, 3634689

Int. Cl.⁴ G01B *7/00*

U.S. Cl. 33—557 **10 Claims**

1. An arrangement for simultaneously connecting a plurality of switch-type probe heads (**22**; **102**) to the measurement arm of a coordinate-measuring machine, characterized by the fact

that each probe head (**22**; **102**) contains within its housing a resistor (**26**; **106**) in series relation with the switch contact (**23**;



103–110), and the outputs (A) of all probe heads are connected in parallel.

4,785,546

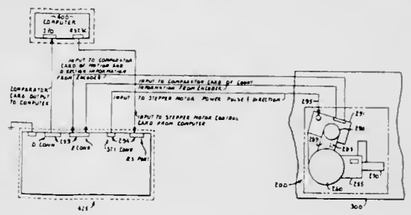
LITHOGRAPHIC PRODUCTION PLANNING SYSTEM

Achilles Tomasini, 20702 Cricket La., Lenexa, Kans. 66220

Filed Jun. 3, 1987, Ser. No. 57,630

Int. Cl.⁴ B43L *13/02*

U.S. Cl. 33—438 **20 Claims**



1. For use in a system for producing color-separated films of a transparency appearing as a final image in a layout, said films used by a lithographic plate maker, said system including a drum-loaded scanner having a preselected axis thereon for separation of said image into said films and storage means for said color-separated films, apparatus for orienting said transparency onto said drum at the desired angle of said final image in said layout relative to said axis comprising:

a digital table having a multiplicity of cursor-readable data positions thereon;

a cursor associated with said table for logging positions of common first and second points on said transparency and said image positioned on said table;

a programmed computer adapted to receive data corresponding to said logged positions from said table, said programmed computer calculating a first angle of a line extending between said points on said final image and between a selected axis passing therethrough, said selected axis corresponding to said axis on said scanner drum, said computer further calculating a position for a base line intersecting a line connecting said points on said transparency;

a T-square assembly on said table having at least one rule;

drive means on said T-square for rotating said rule about an imaginary vertical axis passing therethrough;

means for coupling said programmed computer to said drive means, said coupling means rotating said T-square rule to a position indicative of said base line intersecting said points on said transparency, said base line alignable with said scanner drum axis, whereby to position said transparency on said drum at an angle congruent to said first angle of said final image in said layout.

4,785,547

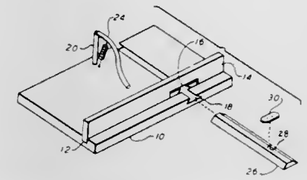
APPARATUS FOR FORMING A LENS PATTERN

Floyd Hover, 116 Hacklebarney, Long Valley, N.J. 07853

Filed Mar. 4, 1987, Ser. No. 21,792

Int. Cl.⁴ G01B *5/00;* **A61B** *3/10*

U.S. Cl. 33—507 **7 Claims**



1. Apparatus for forming a lens pattern for an eyeglass frame, comprising:

a base having a channel;

a slider mounted on said base for sliding longitudinally thereon, said channel being sized to receive said slider;

mounting means for detachably holding said pattern on said slider;

a guide mounted on said base transversely to said slider, said guide comprising a wall mounted on said base perpendicularly to said channel, said wall having an arch over said channel sized to provide clearance for said lens pattern; and

clamping means for holding said eyeglass frame against said guide in a continuously adjustable position, whereby said pattern and eyeglass frame are relatively moveable in two dimensions.

4,785,548

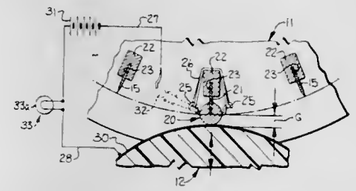
APPARATUS AND METHOD FOR ACCURATELY SETTING THE CUTTING GAP OF A FIBER CUTTING ASSEMBLY

Lotfy L. Saleh, Matthews, N.C., assignor to Celanese Fibers, Inc., New York, N.Y.

Filed Aug. 12, 1987, Ser. No. 84,225

Int. Cl.⁴ G01B *7/04;* **B01G** *1/04*

U.S. Cl. 33—628 **7 Claims**



1. An apparatus for accurately setting the cutting gap of a fiber cutting assembly of the type having a cutter reel with a plurality of radially spaced apart, outwardly facing cutter blades and a presser roll mounted adjacent to the cutter reel and having a peripheral surface positioned at a predetermined distance from the outwardly facing edges of the cutter blades to define said cutting gap, said apparatus comprising:

(a) a gauge member at one of the cutting blade positions and extending radially outward beyond the radial distance of the blades and corresponding to the desired cutting gap setting and

(b) means interconnecting the gauge member and the presser roll for electrically sensing contact of the gauge member with the presser roll.

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4,785,549

METHOD AND APPARATUS FOR PRODUCING AND EDITING MICROFICHE MASTERS

Albert M. B. Brown, 124 Belmont Road, Kenwick, Western Australia, Australia 6107, and Arthur R. Ellis, 10 Cooba Place, Duncraig, Western Australia, Australia 6023

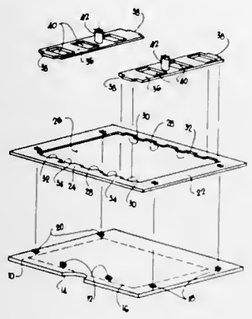
PCT No. PCT/AU86/00072, § 371 Date Nov. 19, 1986, § 102(e) Date Nov. 19, 1986, PCT Pub. No. WO86/05600, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 21, 1986, Ser. No. 1,659

Claims priority, application Australia, Mar. 21, 1985, PG9836; Sep. 4, 1985, PH2275

Int. Cl.[4] B41B *1/00;* **G03B** *27/02*

U.S. Cl. 33—623 **9 Claims**



1. A template apparatus for use with production and editing microfiche masters which comprises a base plate adapted for receiving and retaining a microfiche master to be edited in a precise location, a locating plate including a peripheral portion surrounding an aperture said peripheral portion comprises opposed inner margins having alternating recesses and projections for attachment to said base plate at a precise location, and a moveable template having ends being shaped for interlocking with at least one of said recesses and projections, said template containing at least one aperture arranged to fit over an area of the master so as to provide an adjustable guide for placement of an exposed film frame.

4,785,550

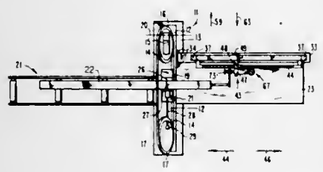
WORKPIECE STOP GAUGE FOR HORIZONTAL BAND SAW

Larry C. Wilkins, 1601 Hedden Ct., New Albany, Ind. 47150

Filed Apr. 28, 1987, Ser. No. 43,534

Int. Cl.[4] B27B *27/10*

U.S. Cl. 33—633 **10 Claims**



1. A workpiece stop gauge assembly for a band saw and comprising:

an elongated mounting adapter for attachment to a horizontal band saw, with the adapter perpendicular to the path of travel of the band saw blade where the workpiece is cut;

an index bar attached to said adapter and extending perpendicular to the said path.

a slide mounted on said index bar and slidable longitudinally thereof;

a locator base associated with said slide and movable therewith longitudinally of said index bar;

an indicator mount secured to said locator base;

a dial indicator fastened to said indicator mount and having an actuating stem extending longitudinally in a cavity in said indicator mount;

a micrometer adjusting screw threaded into said indicator mount and having an end aligned with and operably engagable with said actuator stem;

a stop arm carrier bushing received on said adjusting screw and rotatable thereon about the axis of said screw;

bushing locating collars on said micrometer adjusting screw, to control the longitudinal position of said bushing on said screw;

a stop arm affixed to said bushing and extending radially from the axis of said bushing;

a stop extension mounted near the distal end of said stop arm and extending longitudinally therefrom parallel to the axis of said micrometer adjusting screw and in the direction opposite from said indicator mount; and

a stop post screw threaded into said stop extension and having an end adapted to engagement of the workpiece against it for location of the workpiece;

said stop arm and bushing being rotatable on said adjusting screw about the axis of said adjusting screw to permit movement of the stop from a position useful for engagement by a workpiece, to a position avoiding interference with movement of the workpiece in the direction of the axis of said adjusting screw.

4,785,551

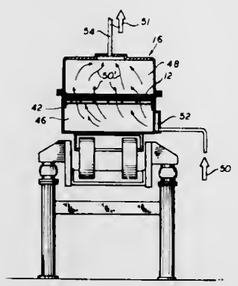
METHOD FOR DRYING CONFECTION PIECES

William J. Meyer, Prospect Heights, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed May 28, 1987, Ser. No. 55,433

Int. Cl.[4] F26B *3/08, 17/00*

U.S. Cl. 34—10 **12 Claims**



1. A method of drying a plurality of aerated, gelatinized confection pieces, the outer surfaces of which are adhesive at elevated temperatures and elevated moisture contents, comprising:

providing a plurality of confection pieces at an elevated moisture content and at a temperature below said elevated temperature;

heating said confection pieces to said elevated temperature;

contacting said confection pieces with a vibrating surface as said pieces are heated so as to impart a repetitive bouncing motion thereto;

forming a fluidized bed of said confection pieces with an air flow as said pieces are heated and repetitively bounced with said vibrating surface; and

maintaining said pieces at said elevated temperature while repetitively bouncing said pieces with said vibrating surface and confining said pieces to the fluidized bed until said moisture content thereof is reduced at least one-half.

4,785,552

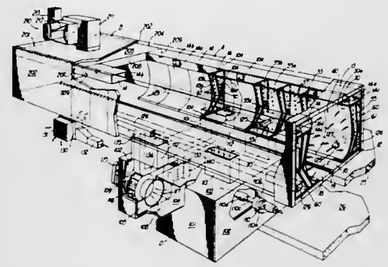
CONVECTION STABILIZED RADIANT OVEN

Willie H. Best, 18C The Heritage, Columbia, S.C. 29201

Filed Jul. 8, 1987, Ser. No. 70,898

Int. Cl.[4] F26B *3/30*

U.S. Cl. 34—30 **38 Claims**



1. A convection stabilized radiant oven comprising:

(a) a housing having an open interior;

(b) conveyor means for moving successive objects along a path of travel through said oven from its entrance end to its exit end;

(c) a pair of spaced opposed radiant emitter walls disposed within said interior of said housing and on opposite sides of said path of travel for defining a longitudinally extending drying chamber with an entrance end and an exit end, said walls directing infrared radiant energy from said radiant emitter walls inwardly toward said path of travel when said radiant emitter walls are heated;

(d) means for heating said radiant emitter walls to prescribed temperatures for causing said radiant emitter walls to emit sufficient radiant energy inwardly toward said path of travel to heat said objects as they pass along said path of travel; and

(e) air control means for adjusting the temperature of the air within said drying chamber to a prescribed and controlled temperature and for moving sufficient air within said drying chamber past said objects as they are heated by said radiant energy for stabilizing the temperature to which said objects are heated by said radiant energy.

4,785,553

MULTILANE OVEN

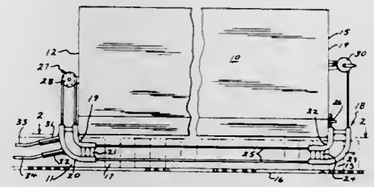
Jimmie Williams, Mexico, N.Y., assignor to Miller Brewing Company, Milwaukee, Wis.

Filed Jul. 7, 1987, Ser. No. 70,360

Int. Cl.[4] F26B *15/18*

U.S. Cl. 34—105 **1 Claim**

1. In a tunnel oven having a top, a bottom, a first end partially closed except for an inlet adjacent the bottom, a second end partially closed except for an outlet adjacent the bottom, and a moving surface arranged for conveying articles to be treated through the oven from the inlet to the outlet, the improvement which comprises divider means which effectively divides the moving surface in the oven into two lanes so that two different types of articles can be simultaneously conveyed without being intermixed, said divider means comprising a first pair of arcuate tubular cable guide members extending down from a portion of the first end into the inlet to a level below an upper extent of the articles being conveyed and above the moving surface; a second pair of arcuate tubular cable guide members extending down from a portion of the second end into the outlet to a level below the top of the articles being conveyed and above the moving surface, each of said members of each of said pair of tubular cable guides being spaced apart from the other member of the pair and parallel thereto; means for anchoring a cable attached to said second end of the tunnel oven and means for adjusting a cable including a ratchet wheel mechanism affixed to one said second end of the tunnel oven; means for reversing the direction of a cable comprising a pulley wheel affixed to the first end to the tunnel oven; and, a cable attached at one end to said means for anchoring said cable, said cable extending therefrom through the lumen of a



first tubular cable guide member of one of said pairs of cable guide members, through the entire length of the oven and through the lumen of a first tunnel cable guide member of the second of said pairs to and about the pulley wheel and back 180° through the lumen of the second tunnel cable guide member of said second pair through the length of the oven and through the lumen of the second tunnel cable guide member of the first pair to the means for adjusting to which the second end of the cable is attached, said divider means effectively providing a vertical barrier for dividing the moving surface of the oven into two lanes without interfering with its movement.

4,785,554

METHOD AND APPARATUS FOR CONDITIONING BULK MATERIAL

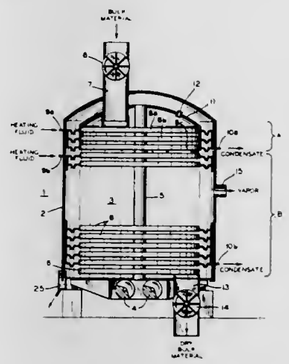
Hartmut Hederer, Dortmund; Manfred Kreft, Wetter, and Wolfgang Hillebrand, Dortmund, all of Fed. Rep. of Germany, assignors to UHDE GmbH, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,230

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640610

Int. Cl.[4] F26B *9/00*

U.S. Cl. 34—164 **23 Claims**



1. A method for conditioning bulk material containing vaporizable ingredients, the material flow being maintained by means of a vibrating plate conveyor and the material being

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treated in a heating section and a downstream drying section using an indirect heat exchange method, comprising the steps of:

(a) providing bulk material to a heating section of a vibrating plate conveyor and heating the bulk material from ambient temperature to a predetermined maximum temperature in the heating section by providing a heating fluid to the heating section and withdrawing vapor generated by the heating fluid from the heating section;

(b) reducing vaporizable ingredients in the bulk material by introducing said vapor withdrawn from the heating section into a drying section and indirectly supplying additional heat and withdrawing vapor from the drying section;

(c) repeatedly separating the bulk material into fine and coarse fractions in the drying section, the fine fractions being immediately recycled and remixed with the coarse fractions between each said separation; and

(d) mixing the bulk material at least twice in both the heating section and the drying section.

4,785,555

FOOT SECURING DEVICE, PARTICULARLY FOR SKI BOOTS

Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna TV, Italy

Filed Aug. 24, 1987, Ser. No. 88,635

Claims priority, application Italy, Sep. 4, 1986, 82752 A/86

Int. Cl.[4] A43B *5/04*; **A43C** *11/00*

U.S. Cl. 36—119 **14 Claims**



1. In a ski boot having a front quarter and a rear quarter pivotally associated with a shell, a foot securing device comprising:

a movable element arranged for abuttment against a front portion of a skier's lower leg;

means for movably mounting said movable element on said front quarter;

at least one presser arranged inside said shell for exerting a clamping action on a skier's foot;

at least one cable for operatively connecting said movable element to said at least one presser;

wherein said means for movably mounting said movable element to said front quarter comprises oscillating means allowing substantially continuous oscillation of said movable element with respect to said front quarter in both forward and backward direction about an oscillation axis extending transversely of said front quarter, said at least one cable extending from a location of said movable element remote from said oscillation axis along a direction at least partially towards said skier's lower leg and extending away from said at least one presser along a direction at least partially towards said skier's foot, whereby said at least one presser is caused to automatically move towards and away from said skier's foot in response to a forward and backward oscillation of said movable element to thereby provide a continuous and proportional variation in said clamping action on said skier's foot upon corresponding increase in flexing of said skier's lower leg during skiing.

4,785,556

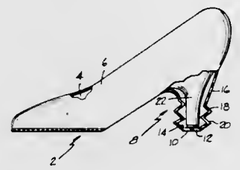
OVER SHOE

Kathy L. Blair, 6618 S. Jackson Ct, Littleton, Colo. 80121

Filed Oct. 29, 1987, Ser. No. 114,033

Int. Cl.[4] A43B *3/16, 3/18*

U.S. Cl. 36—7.3 **11 Claims**



1. An over shoe for protecting an inner shoe having a heel portion from the elements for use with similarly shaped shoes but having differing heel lengths comprising:

an over shoe having a main body portion for receiving the main body portion of an inner shoe;

said over shoe having a heel portion for receiving the heel portion of said inner shoe;

said over shoe formed from a material capable of protecting the inner shoe from deleterious materials;

said heel portion of said over shoe extends downwardly from said main body portion of said over shoe and is integral therewith;

said heel portion of said over shoe having a base tread portion having an outer surface and an inner surface;

said heel portion of said over shoe having a hollow central body portion integral with said main body portion of said over shoe and said base tread portion and having a longitudinal axis extending from said main body portion of said over shoe to said base tread portion;

said heel portion of said over shoe having length extending means so that when said inner shoe has been placed completely within said over shoe, the length of said heel portion of said over shoe will coincide with the length of said heel portion of said inner shoe; and

wherein said length extending means comprises:

a plurality of spaced apart circumferentially extending folds in said central body portion; and

said heel portion of said over shoe comprises a material that will retain its original shape but will yield to a force applied thereto and return to its original shape when said force has been removed.

4,785,557

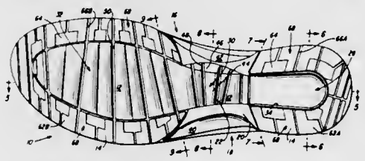
SHOE SOLE CONSTRUCTION

Brenda Kelley, and James K. Tong, both of Portland, Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.

Filed Oct. 24, 1986, Ser. No. 923,119

Int. Cl.[4] A43B *13/04, 13/16*

U.S. Cl. 36—32 R **16 Claims**



1. A shoe sole construction comprising:

means for absorbing shock resulting from foot-initiated ground impact, said shock absorbing means comprising a sole having front and rear portions, lateral and medial peripheral portions and a bottom surface, said bottom surface inclined upwardly and inwardly from said medial peripheral portion and from said lateral peripheral portion to define a lateral concavity between said lateral and medial peripheral portions; and

a convex arch extension disposed between said medial and lateral peripheral portions and located substantially along the longitudinal axis of the sole in the approximate area of the arch of the wearer, said arch extension extending from said sole.

4,785,558

SHOE UPPER OF INTERKNITTED OUTER AND INNER KNIT LAYERS

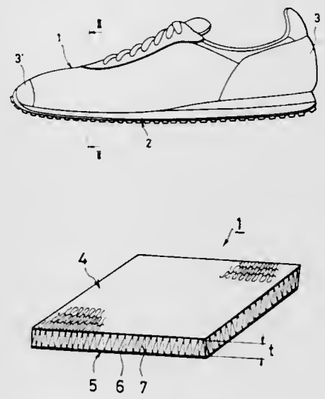
Kazuhiko Shiomura, Osaka, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 22, 1987, Ser. No. 76,443

Claims priority, application Japan, Jul. 31, 1986, 61-118269[U]

Int. Cl.[4] A43B *5/00, 23/00*

U.S. Cl. 36—114 **7 Claims**



1. A shoe comprising a sole and a shoe upper attached to said sole, wherein said shoe upper is comprised of an outer knit fabric layer, an inner knit fabric layer provided opposite to said outer knit fabric layer through a space having a thickness of 1 to 10 mm, and a crossing thread which is interknitted to be bound into said outer and inner knit fabric layers and crosses said space, said crossing thread being provided at a density of 500 to 4500 threads per square inch and having a single yarn fineness of 3 to 50 denier.

4,785,559

EXCAVATOR FOR MAKING A SUBSTANTIALLY VERTICAL SLOT IN THE GROUND

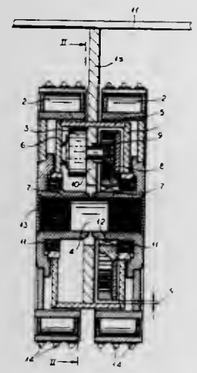
Volker Hentschel, Dorsten, Fed. Rep. of Germany, assignor to Hochtief Aktiengesellschaft Vorm. Gebr. Helfmann, Essen, Fed. Rep. of Germany

Filed Mar. 30, 1987, Ser. No. 32,334

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612020

Int. Cl.[4] E02F *5/08, 3/24*

U.S. Cl. 37—94 **1 Claim**



1. A cutter assembly for an excavator for excavating a substantially vertical slot in the ground, said cutter assembly comprising:

a frame;

a substantially vertical planar support shield extending downwardly from said frame and consisting of a solid plate;

a tubular housing fixed on said support shield and having an axis extending generally perpendicular to said support shield with respective tubular portions lying to opposite sides of a plane of said support shield;

a respective cutting wheel surrounding each of said tubular portions so that said cutting wheels axially overlap said tubular portions and lie close to opposite sides of said shield, the thickness of said plate determining the axial spacing of said cutting wheels;

respective annular covers on opposite axial ends of said housing for closing same;

a respective hub on each of said cutting wheels extending axially into said housing through the respective cover;

a common shaft engaged in both of said hubs for angularly coupling said hubs for joint rotation;

respective bearing means journaling each hub in and on the respective cover;

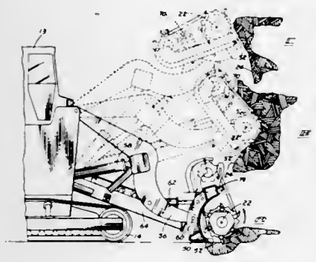
an internally toothed hollow wheel keyed to one of said hubs in said housing;

a motor-support plate fixed in said housing between said portions in the plane of the support shield, said shaft passing with clearance through a hole in said motor-support plate;

a plurality of drive motors mounted on said support plate, spaced around said axis and having respective drive gears meshing with said hollow wheel for driving same and thereby driving said cutting wheels, said bearing means including a conical bearing journaling each hub in the respective core, said shaft having splines on opposite ends and said hubs having splines interfitting with the splines of said ends of said shaft, said motors being hydraulic motors mounted on said motor-support plate and having shafts extending through and journaled in said motor-support plate and carrying said drive gears for meshing with said internally toothed hollow wheel on a side of said motor-support plate opposite that on which said motors are mounted.

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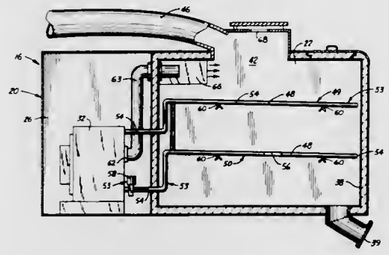
4,785,560
CONTINUOUS EXCAVATING APPARATUS
Raymond A. Hanson, Spokane, Wash., assignor to R. A. Hanson Company, Inc., Spokane, Wash.
Filed Jan. 16, 1987, Ser. No. 4,338
Int. Cl.[4] E02F *3/24*
U.S. Cl. 37—190 **23 Claims**



22. An excavating apparatus for breaking and removing material away from an upright face of material, the apparatus comprising:
a vehicle;
means supporting the vehicle for movement over a surface generally transverse to the upright face;
a boom member mounted to the vehicle for elevational movement relative to the surface;
a rotary cutting apparatus mounted to the boom member, the rotary cutting apparatus comprising:
(a) a rotary cutting head mounted for rotation about a longitudinal axis, the cutting head having peripheral cutter elements that are located between first and second cutting head ends and define a cutting head diameter, the cutting head diameter being substantially less than the height of the upright face of material to be excavated;
(b) power drive means for rotating the cutting head about its axis;
(c) a shroud elevationally movable with the cutting head and partially surrounding the cutting head, the shroud extending between the first and second cutting head ends for confining material broken by the cutting head, the shroud including a longitudinally extending shoe portion having an outer longitudinal edge extending along the length of the cutting head at a location adjacent its peripheral cutter elements and elevationally below its longitudinal axis, the shoe being adapted for engaging and sealing the upright face with respect to the cutting head;
(d) pivotal connection means mounting the shroud to the boom member for enabling pivotal movement of the shroud and cutting head relative to the boom member about a pivot axis, the pivotal connection means including means for selectively varying the pivotal position of the shroud relative to the boom member for locating the outer longitudinal edge of the shoe portion against the upright face; and
conveyor means in communication with the shroud for transferring material broken by the cutting head away from the excavating apparatus.

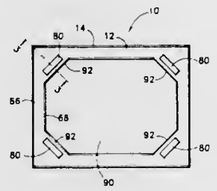
4,785,561
SNOW REMOVAL METHOD
Eleanor V. Swanson, 2135 Indiana Ave., Golden Valley, Minn. 55422
Filed May 18, 1987, Ser. No. 50,876
Int. Cl.[4] E01H *5/10*
U.S. Cl. 37—197 **4 Claims**

1. A method for continuously disposing of snow and ice in ambient temperatures below the freezing point of liquefied snow and ice, the method including the steps of:
(a) providing an insulating snow reduction chamber with at least two generally horizontal, vertically spaced and vertically aligned fields of closely spaced-apart heated tubes, the chamber being provided with a snow and ice entry port above and vertically aligned with the uppermost field;
(b) heating the interior of the chamber and its contents to a temperature greater than the freezing point of the liquefied snow and ice;



(c) introducing sufficient liquid into the chamber to immerse the lowermost field of heated tubes;
(d) discharging snow and ice through the chamber entry port onto the uppermost field of heated tubes;
(e) supplying heat energy through the heated tubes at a rate sufficient to convert the snow and ice to liquid fast enough to prevent bridging over any of the fields of tubes and to maintain the liquid in the chamber above its freezing point; and
(f) withdrawing liquid from the chamber as necessary to prevent the uppermost field from becoming immersed in liquid.

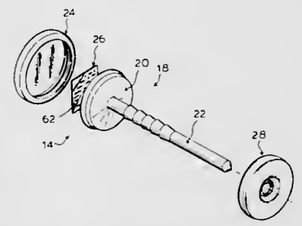
4,785,562
MAGNETIC DISPLAY HOLDER
Richard R. Good, San Diego, Calif., assignor to Good Concepts, Inc., San Diego, Calif.
Filed Jul. 3, 1986, Ser. No. 881,694
Int. Cl.[4] G09F *1/10*
U.S. Cl. 40—159.1 **1 Claim**



1. A display device comprising:
a frame having a front side, rear side, an outer edge, and an inner edge; said inner edge surrounding and defining an interior opening thru said frame; said frame including magnetic attachment means for attaching said frame to a metal surface such that a display piece, such as a photograph, sheet of paper, child's drawing or the like, can be retained in a display position between said frame and a metal surface whereby the display piece in displayed within said interior opening; and wherein:
said inner edge is, in front view, generally rectangular with truncated corner positions, and

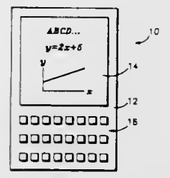
said truncated corner portions of said frame contain magnets.

4,785,563
ANIMAL TAG MICROFICHE INDENTIFICATION SYSTEM
Otto Friedman, 55 Charles St., Apt. 1301, Toronto, Ontario, Canada M4S 2W9
Filed Jul. 27, 1987, Ser. No. 77,793
Int. Cl.[4] G09F *3/00*
U.S. Cl. 40—301 **8 Claims**



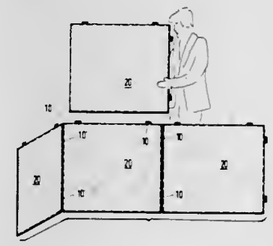
1. A miniature identification tag for securement to a pierced ear of an animal, said tag comprising an inert body portion having a sealed capsule with integral depending stud portion, said body portion being of insignificant size compared to an animal's ear size, means for engaging said stud after said stud is inserted through a pierced ear lobe of an animal to secure thereby said tag on an animal's ear, said engaging means having means for cooperating with said stud and securing said engaging means at one of a plurality of positions along said stud to sandwich an animal's ear between said engaging means and said capsule, said sealed capsule having a container portion and a removable lid portion for said container, said lid having means for securing said lid to said container and means for sealing said lid on said container to preclude thereby moisture entering said container, a miniaturized information moisture sensitive medium having animal identification indicia thereon peculiar to such animal, said medium being stored in said sealed capsule, said identification indicia only being discernable by optical magnification.

4,785,564
ELECTRONIC NOTEPAD
Richard W. Gurtler, Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.
Filed Dec. 20, 1982, Ser. No. 450,876
Int. Cl.[4] G09F *9/00*
U.S. Cl. 40—448 **3 Claims**



1. A liquid crystal display comprising:
a semiconductor substrate;
an array of reflector/field electrodes disposed on said substrate;
a logic cell associated with each electrode, said logic cell being switchable between first and second states and being capable of maintaining either of said first and second states;
address lines and signal lines on said substrate between said electrodes and coupled to said logic cells;
a multi-layer liquid crystal apparatus on said substrate; and
position sensing means coupled to said logic cells through said lines for sensing a position of a stylus with respect to said array and for activating indicating ones of said logic cells, said position sensing means comprising:
a lower layer;
a first plurality of conductive lines arranged in a parallel fashion on said lower layer;
a flexible layer separated from said lower layer by an insulating medium; and
a second plurality of conductive lines arranged in a parallel fashion on an upper layer, said second plurality of lines being substantially perpendicular to said first plurality of lines, whereby pressure from said stylus on said upper layer causes localized contact between said conductive lines, said positioned sensing means being disposed on a top layer of said liquid crystal apparatus.

4,785,565
FRAMEWORK AND CONNECTIVE ELEMENTS FOR DISPLAY SYSTEMS
Reinhold O. Kuffner, Tiroler Strasse 7, Karlsruhe 41, Fed. Rep. of Germany
Filed Apr. 7, 1987, Ser. No. 35,502
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614490
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—605 **18 Claims**



1. A system for interconnecting flat panel sections, each having edges thereon, to form a display wall, said system including in combination:
a flat panel section;
a first interconnecting component attached to an edge of said flat panel section, said first component having an expandible, open groove therein parallel to the edge of said panel section to which said first component is attached; and
a flat connecting member having rib-shaped projections comprising a spring on opposite edges thereof for fitting into and expanding the groove in said component to cause a tight fit between said first component and said connecting member.

4,785,566
BULLET LUBRICATOR DEVICE
James W. Story, R.R. #4, Box 218, Wabash, Ind. 46992
Filed Sep. 14, 1987, Ser. No. 96,596
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **23 Claims**

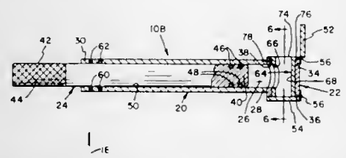
1. A bullet lubricator device, comprising:
an elongated grease-holding cylinder having an elongated bore with a central axis and being open at opposite ends thereof;

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a bullet-holding cylinder being connected in flow communication with one of said opposite ends of said grease-holding cylinder, said bullet-holding cylinder defining a chamber being open at opposite ends thereof and adapted to receive a bullet of a given caliber therein, said chamber having a longitudinal axis extending generally perpendicular to said central axis of said bore of said grease-holding cylinder;

an elongated plunger received within said bore of said grease-holding cylinder and capable of reciprocal movement along said central axis thereof, said plunger having opposite leading and trailing end portions, said leading end portion being disposed within said bore of said grease-holding cylinder between said opposite ends thereof and said trailing end portion thereof being disposed outside of said bore of said grease-holding cylinder adjacent to the other of said opposite ends thereof;

said grease-holding cylinder being adapted to hold a quantity of grease therein between said leading end portion of



said plunger and said one of said opposite ends of said grease-holding cylinder;

said plunger at said trailing end portion thereof forming a handle adapted to be gripped by a user's hand for moving said plunger relative to said grease-holding cylinder to advance said leading end portion of said plunger toward said one end of said grease-holding cylinder and said bullet-holding cylinder connected in communication therewith for pushing grease from said grease-holding cylinder bore through said one end thereof into said bullet-holding cylinder chamber and about a bullet therein; and,

resilient means fitted about and extending within said bore of said grease-holding cylinder adjacent said other end thereof and frictionally engaged with said plunger between said leading and trailing end portions thereof for wiping foreign matter therefrom to prevent migration of foreign matter into and contamination of said bore of said grease-holding cylinder as said plunger is moved relative thereto.

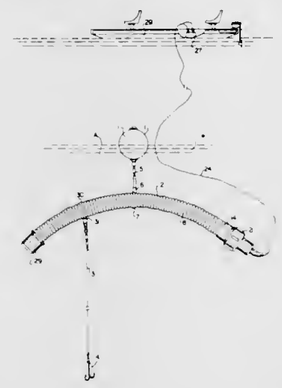
4,785,567

ILLUMINATED FISHING ASSEMBLY

Thomas J. Consiglio, 10780 Wrenfield Dr., St. Louis, Mo. 63123

Filed Jan. 13, 1988, Ser. No. 143,571
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—17.5 **6 Claims**

1. An illuminated fishing assembly comprising a bendable and foldable bar having a transparent exterior wall, illuminable elements carried within said bar for providing light transmissible through said exterior wall, a remotely located power source, means connecting said power source and said illuminable elements, a buoyant member, means engaging said bouyant member to said bar for suspension of the latter within the



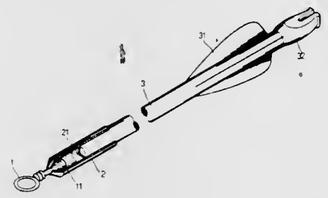
body of the water being fished, and fish attracting means suspended from said bar.

4,785,568

SPECIFIC ARROW FOR FISHING IN SHORE

Anthonyo Wang, 4th Fl., No. 56, Wenchang Rd., Shihlin District, Taipei, Taiwan

Filed Sep. 18, 1987, Ser. No. 99,145
Int. Cl.[4] A01K *91/02*
U.S. Cl. 43—19 **1 Claim**



1. A specific arrow for fishing in shore comprising a ring, a closed arrow sleeve tube and a body of the arrow, characterized by

a metal ball;

said ring being connected to said metal ball;

said closed arrow sleeve tube is hollow, and a hole is positioned at the front end of said arrow sleeve tube;

a partition plate positioned inside said arrow sleeve tube;

said metal ball connected with said ring having been staked in said hole, enabling said ring to spin relative to the closed arrow sleeve tube; and

said body of the arrow being inserted and fixed at the tail end of said arrow sleeve.

4,785,569

FISHING LURE AND LURE RETAINING DEVICE

Cecil L. Thomas, Jr., 16818 Swanmore, Humble, Tex. 77396

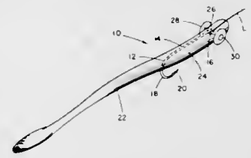
Filed Sep. 14, 1987, Ser. No. 96,465
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.31 **18 Claims**

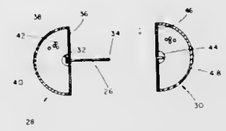
1. An improved fishing device of the type including a metallic hook with an eye at one end of its shank for attaching a fishing line to the hook, and a pliable lure body for attracting

fish and enclosing at least a portion of the hook shank, the improvement comprising:

a rigid metallic pin member for passing substantially radially with respect to an axis of the hook shank through a portion of the fishing lure body, thence through the hook eye, and thence through an opposing portion of the fishing lure body for restricting movement of the fishing lure body along the hook shank;

stop means rigidly attached to one end of the pin member for providing a handle when passing the pin member through the fishing lure body, and for preventing an end portion of the pin member adjacent the stop means from passing through the lure body and the hook eye;





removable retaining means for selectively attaching and detaching from an opposing end of the pin member to prevent removal of the pin member from the hook eye when attached to the pin retaining means and for enabling removal of the pin member from the hook eye when detached from the retaining means;

the stop means and the removable retaining means having a similar geometrical configuration; and

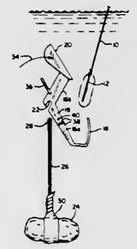
one or more of the stop means and the retaining means defining a selectively-sized water-tight enclosure for housing a gas to obtain a desired buoyancy for the fishing device in water.

4,785,570

CASTING AID

Alexander W. Koch, P.O. Box 847, Winchester, Oreg. 97495

Filed Mar. 21, 1988, Ser. No. 171,418
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.12 **10 Claims**



1. A casting aid for attachment to a fishing line, said casting aid comprising

an elongated body member having forward and rearward ends,

means on said body member arranged to rotate said body member to an upstanding position when submerged,

releasable fishing line attaching means at the rearward end of said body member arranged to hold said body member attached to the fishing line during a cast but to release said body member from the fishing line in its said upstanding submerged position,

a casting weight,

attaching means intermediate the ends of said body member arranged to attach said casting weight to said body member,

and auxiliary fishing line attaching means intermediate said rear fishing line attaching means and said weight attaching means arranged for permanent attachment of the casting aid to a fishing line,

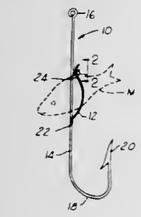
whereby to provide a choice of using the casting aid as a disposable one by attaching the fishing line to said releasable fishing line attaching means and a non-disposable one by attaching the fishing line to said auxiliary fishing line attaching means.

4,785,571

FISH HOOK WITH LIVE BAIT HOLDER

Gilbert F. Beck, 1342 Three Mile Dr., Grosse Pointe Park, Mich. 48230

Filed Feb. 11, 1988, Ser. No. 155,127
Int. Cl.[4] A01K *83/06*
U.S. Cl. 43—44.4 **2 Claims**



1. A fish hook having an elongated shank provided with a return-bent portion terminating in a barb, and means for releasably securing live bait such as a minnow to said shank without harming the bait comprising an elongated elastic strip, first retainer means for securing one end portion of said elastic strip to said shank, and second retainer means spaced from said first retainer means for releasably, adjustably securing the other end portion of said elastic strip to said shank, said second retainer means comprising a pointed prong piercing said strip at a selected point along its length, said strip being stretchable and cooperable with said shank to retain live bait between said shank and said elastic strip.

4,785,572

COMBINED SINKER AND FISHING LURE

John E. Crumley, 6200 Brookville Rd, Lot. 149, Indianapolis, Ind. 46219

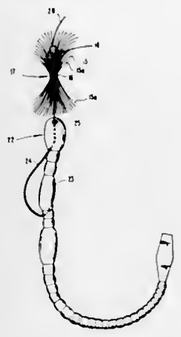
Filed Mar. 14, 1988, Ser. No. 167,582
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.9 **6 Claims**

1. A combination sinker and fishing lure, comprising:

a weighted sinker having a head portion with a head maximum outer diameter, a neck portion having a neck outer diameter less than said head outer diameter, and a knob portion having a knob outer diameter greater than said neck outer diameter, and further having a bore extending continuously through each of said head, neck and knob

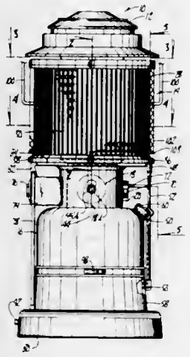
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portions, said bore being adapted to have a fishing line threaded therethrough; and



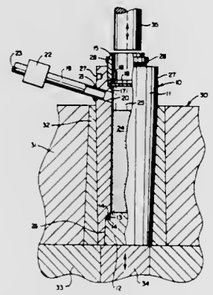
a plurality of resilient strips encircling said sinker and including means for securing said plurality of strips to said sinker at said neck portion.

4,785,573
PORTABLE ELECTRONIC INSECT CONTROLLER
Lance L. Millard, 2820 E. 36th Ct., Des Moines, Iowa 50317
Continuation-in-part of Ser. No. 498,925, May 26, 1983, Pat. No. 4,603,505. This application Aug. 1, 1986, Ser. No. 893,003
Int. Cl.[4] A01M *1/22, 1/04*
U.S. Cl. 43—112 **10 Claims**



1. A portable electronic insect controller, comprising,
an electrified grid means in association with a light-producing camping lantern for electrocuting insects when they move within close proximity of the grid,
a power supply means for supplying a controlled source of electrical energy to the grid,
a safety interconnect means for electrically connecting the power supply means to the grid means and positioned to prevent the refueling of the lantern without disconnecting the grid from the power supply means, and
cooperating indexing means on said grid means and said lantern to require said grid means when installed on said lantern, to be positioned on said lantern in only such a manner that said interconnect means is positioned to prevent refueling of the lantern without disconnecting the grid means from the power supply means.

4,785,574
APPARATUS FOR THE PRODUCTION OF BILLET AND EXTRUDED PRODUCTS FROM PARTICULATE MATERIALS
Robert J. Fiorentino, Worthington, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio
Continuation-in-part of Ser. No. 812,742, Dec. 23, 1985, Pat. No. 4,647,426. This application Mar. 2, 1987, Ser. No. 20,603
Int. Cl.[4] B30B *12/00*
U.S. Cl. 425—78 **7 Claims**

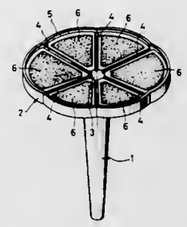


1. Apparatus for use in consolidating particulate materials into useful product at elevated temperatures and pressures in press equipment having a movable ram, a fixed support bed, and an internally tapered receiver means surface, aligned with said movable ram and supported by said support bed, comprising:
a. a tubular canister body having a tapered external surface that corresponds to the tapered surface of the press receiver means and an internal cross section corresponding substantially to the cross section of the press ram;
b. removable sealing closure means closing the lower interior of said canister body;
c. removable shear sealing closure means closing the upper interior of said canister body, said shear sealing closure means being sheared as it is moved by said movable ram into said canister body; and
d. valved vacuum exhaust line means communicating with the interior of said canister body intermediate said removable sealing closure means and said removable shear sealing closure means.

4,785,575
HORTICULTURAL DEVICE FOR RAISING GARDEN PLANTS UTILIZING MAGNETISM
Kazuhiro Shioi, Tokyo, Japan, assignor to Rainbow Yakuhin Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1987, Ser. No. 55,546
Claims priority, application Japan, Jun. 5, 1986, 61-130967; Aug. 12, 1986, 61-187673
Int. Cl.[4] A01C *1/00;* **A01G** *29/00*
U.S. Cl. 47—1.3 **8 Claims**

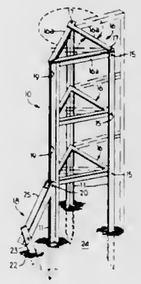
1. A horticultural device utilizing magnetism for insertion into the soil adjacent a plant comprising;
a plate-shaped section for receiving water having top and bottom sides and a plurality of holes extending therethrough;
at least one rod-shaped section extending downwardly from the bottom side of the plate-shaped section and having a liquid flow passageway extending through the rod-shaped section that is open at both ends, said rod-shaped section containing magnetized metal powder, whereby a portion of the water received by the plate-shaped section flows down through the passageway and is magnetized before flowing out into the soil; and

a sheet of compressed fertilizer adhered to the bottom side of the plate-shaped section and covering said holes whereby



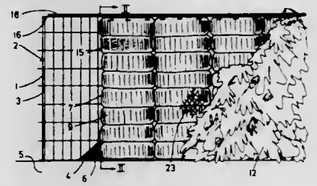
a portion of the water received in the plate-shaped section also passes through said holes and gradually dissolves the fertilizer before passing into the soil as a fertilizer solution.

4,785,576
PLANT SUPPORT AND PROTECTOR
Manfred Morgan, 1500 Clovernoll Dr., Cincinnati, Ohio 45231
Filed Jan. 13, 1986, Ser. No. 817,918
Int. Cl.[4] A01B *17/06*
U.S. Cl. 47—28 R **9 Claims**



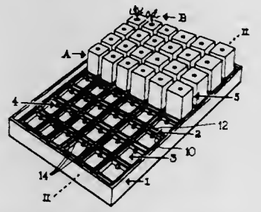
1. An improved collapsible plant support comprising:
(a) a plurality of spaced apart horizontal triangular members,
(b) a plurality of vertical members connecting said triangular members,
(c) attachment means for attaching said vertical legs to said horizontal members, and
(d) an anchor angle attached to one of said vertical legs
wherein the anchor angle comprises:
(a) a first substantially rigid member having a channeled portion along its length and a slotted portion at one end,
(b) said first member having a hole in each of its side portions at the slotted end for acceptance of a fastening means and a hole in each of its side portions at a second end remote from the slotted end,
(c) a second member attached thereto having a generally rectangular cross section with a pointed area at one end,
(d) said second member having a hole to accept a fastening means for fastening to said first member at the holes at its second end for acceptance of said fastening means,
(e) said second member attached to said first member.

4,785,577
NOISE-ABSORBING CONSTRUCTION HAVING LIVE PLANTS
Marion Lederbauer, A-1010 Wien, Dominikanerbastei 6, Austria
Filed Jun. 10, 1987, Ser. No. 67,775
Claims priority, application Austria, Oct. 17, 1985, 3017/85; Oct. 17, 1985, 3014/85; Oct. 17, 1985, 3015/85; Oct. 17, 1985, 3016/85; PCT Int'l Appl., Oct. 16, 1986, PCT/AT86/00066
Int. Cl.[4] A01G *1/00;* **E01F** *8/00, 15/00*
U.S. Cl. 47—33 **46 Claims**



1. A noise absorbing structure adapted for supporting living plants, said structure comprising a framework carrying a plurality of played, worn tires having sidewalls, each of said tires having two ends and being provided with at least one cut extending in each sidewall a selected distance towards teh tread layer, thereby forming a hinge, so that each worn tire is divided into mutually connected tire sectors, the concave sides of said tire sectors facing said framwork, the convex sides thereof defining an outwardly facing surface, fastening means for fixing said tire sectors to said framework, and material suitable for the growth of said plants filling at least the hollow spaces defined between said sidewalls of the tire sectors, and means allowing plants to extend to at least the outwardly facing surfaces from the interior of each tire sector.

4,785,578
PLANT GROWING FRAME
Soren Grene, Lunde, Denmark, assignor to G.W.A. Kaars Sijpesteijn, Ontario, Canada
Continuation of Ser. No. 711,581, filed as PCT DK84/00054 on Jun. 13, 1984, published as WO85/00089 on Jan. 17, 1985 abandoned.
This application Jan. 12, 1987, Ser. No. 6,356
Claims priority, application Denmark, Jun. 20, 1983, 2823/83
Int. Cl.[4] A01G *9/02;* **A47G** *29/00*
U.S. Cl. 47—86 **15 Claims**



1. In combination, a plurality of formstable blocks of plant growing substrate and a frame supporting said blocks therein in spaced relation to control root growth out of said blocks by root air pruning and thereby prevent root growth from one block to another;
each said block having a top, a bottom and side surfaces, said top, bottom and side surfaces being penetrable by roots to thereby enable air pruning to occur;
said frame comprising a planar network of criss-crossing horizontally extending spaced double rib members defining a plurality of air-passage-forming openings and a plurality of vertically extending open-ended block-receiving

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openings for receiving said blocks therein, the space between said double rib members defining said block-receiving openings and the space between each rib of said double rib members defining said air-passage-forming openings, said air-passage-forming openings encircling each block-receiving opening and separating each block-receiving opening from all neighboring block-receiving openings by said air-passage-forming openings;

said rib members defining said block-receiving openings having planar surfaces for frictionally engaging portions of said side surfaces of said blocks to securely hold said blocks in said block-receiving openings to that said blocks do not fall out of said block-receiving openings during handling of said frame, with the entirety of said side surfaces of each said block being spaced from side surfaces of all neighboring blocks;

vertical air passages defined between the spaced side surfaces of neighboring blocks and extending vertically through said air-passage-forming openings, whereby said vertical air passages extend vertically upward along the entire height of each block to its top;

said vertical air passages completely encircling each block, and isolating each block from other blocks by an air space which is of a size sufficient to control root growth out of the blocks by air pruning and prevent root growth between one block and another;

said portions of said side surfaces which said planar surfaces of said rib members securely engage comprising only a small fraction of the surface area of said side surfaces of the block so that a remaining greater fraction of the surface area of said side surfaces is open to said vertical air passages; and

said blocks being securely supported in said frame with an air space under the bottom of each block in communication with said vertical air passages so that the bottom of said block is open to the vertical air passages and air may flow uninterrupted from the air space under the bottom of each block, upward along said side surfaces of each block via said vertical air passages to the top to promote air pruning.

4,785,579

CIRCULAR DOOR OPERATING METHOD AND APPARATUS

Kiyoaki Sugiyama, Akashi; Keizo Fujii, Tokyo, and Shigemitsu Shimoyama, Ageo, all of Japan, assignors to Nippon Air Brake Co., Ltd. and Tajima Junzo Seisakusho Co., Ltd., both of Tokyo, Japan

Filed Feb. 1, 1988, Ser. No. 151,278

Claims priority, application Japan, Mar. 19, 1987, 62-065069; Mar. 19, 1987, 62-065070; Mar. 19, 1987, 62-040748[U]; Mar. 19, 1987, 62-040749[U]; May 21, 1987, 62-076314[U]

Int. Cl.[4] E06B *3/34;* **E05B** *65/10*

U.S. Cl. 49—40 **7 Claims**

2. Apparatus for operating a circular door assembly, which comprises:

a closed curved transom enclosing a curved track;

a closed curved floor channel provided at a passage of a building;

two pairs of door leaves, each pair forming a center-open, sliding curved door provided between said curved transom and said floor channel;

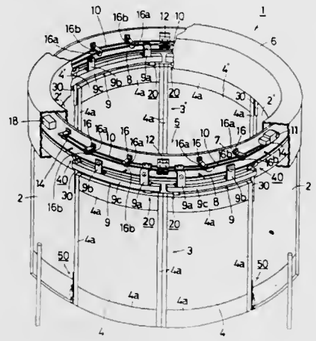
two pairs of curved fixed panels, each pair provided on opposite sides of each of said curved doors so as to form an enclosure defining a wind blocking compartment and on the inside of each of said curved doors so as to allow said door to pivot toward the outside of said building;

two pairs of hanger assemblies, one for each door leaf to slidably mount said door leaf on said curved track;

a pair of pulley mechanisms, one for each door to move a pair of door leaves of said door in opposite directions along said track to thereby open or close said passage;

upper and lower hinge mechanisms secured to a hinged side of each door leaf to pivotally mount said door leaf on said curved transom and said curved floor channel, respectively; and

releasable coupling means for releasably coupling a free end



of each door leaf to each of said hanger assemblies so that a passenger may open said center-open sliding door as a hinged door by simply pushing a central part of said center-open sliding door.

4,785,580

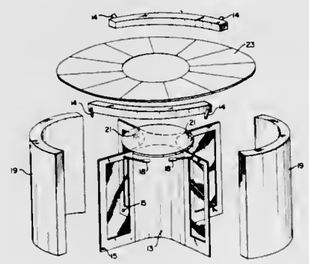
MULTI-FUNCTION REVOLVING DOOR

Jorgen E. Olesen, Charlottenlund, Denmark, assignor to BMT International ApS, Charlottenlund, Denmark

Continuation-in-part of Ser. No. 220,245, Dec. 23, 1980, abandoned. This application Aug. 29, 1983, Ser. No. 527,505

Int. Cl.[4] E05D *15/02*

U.S. Cl. 49—44 **16 Claims**



1. A revolving door, comprising:

first and second side members having arcuate inner walls symmetrically disposed about a door rotation axis;

a door central member mounted for rotation about said axis in a given direction, the transverse diagonal dimension of said member having a value at least equal 0.3 of the distance between said walls as measured along a line extending through said axis, said member having four longitudinal hinge means;

a door panel pivotally secured to each of said hinge means, each door panel having a normal position extending radially of said member and being capable of rotation through a first predetermined angle in said given direction and a second predetermined angle in the opposite direction;

biasing means for urging each said door panel toward the normal position thereof from both of said directions and for opposing deflection of each door panel from said normal position with a predetermined threshold force or torque;

motor drive means for rotating said central member in said given direction; and

a control unit for controlling the operation of said motor drive means.

4,785,581

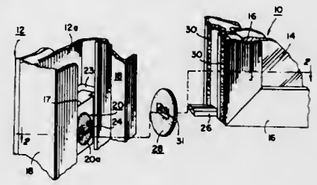
TILT-IN/TILT-OUT WINDOW ASSEMBLY WITH IMPROVED WEATHERSEAL GASKET

Steven R. Abramson, Rochester; Mark Clemenson, Farmington, both of N.Y., and Mark M. Kessler, Youngstown, Ohio, assignors to Pace Window & Door Corporation, Rochester, N.Y.

Filed Jun. 2, 1987, Ser. No. 56,730

Int. Cl.[4] E05D *15/22*

U.S. Cl. 49—176 **11 Claims**



1. A tilt-in/tilt-out window assembly comprising:

a sash having at least a horizontally extending lower frame member, said frame member having a horizontal longitudinal axis and a first end and a second end;

a pivot bar integral with at least said first end and adapted to extend horizontally beyond said first end, said pivot bar being parallel to said longitudinal axis of said lower frame member and having a cross-section and a first end;

at least one vertically erect jamb having a vertical longitudial axis and an integrally formed vertically extending channel, said channel having an opening opposing said sash, said jamb being perpendicular and adjacent to said sash lower frame member;

a shoe, within said channel fo said jamb and positioned at a location directly opposing said pivot bar, for receiving said first end of said pivot bar, said shoe having a surface face opposing said pivot bar and including at least a first member stationary relative to said pivot bar and having a centrally located recess for receiving a rotatable movable member including a centrally located aperture having a configuration shaped to that of said cross-section of said pivot bar, said opposing face of said shoe being in a plane flush with said channel opening; and

a flexible and resilient weatherseal gasket positioned on and entirely encircling said pivot bar between said shoe of said jamb and said first end of said sash frame member, having a centrally located aperture therethrough having a configuration shaped to that of said pivot bar cross-section, said gasket having a diameter or width at least equal to the width of said channel in said jamb, whereby said gasket is adapted to seal the junction between said pivot bar and said shoe, thereby preventing air penetration.

4,785,582

METHOD AND DEVICE FOR REGULATING VEHICLE DOOR WINDOW

Yukiharu Tokue, Yokohama, and Sigeru Nakamura, Odawara, both of Japan, assignors to Nissan Motor Co., Ltd. and OHI Seisakusho Co., Ltd., both of, Japan

Filed Feb. 10, 1987, Ser. No. 13,250

Claims priority, application Japan, Feb. 14, 1986, 61-28915

Int. Cl.[4] E05F *11/52*

U.S. Cl. 49—211 **13 Claims**

1. A window regulator for a vehicle having a hollow structure in which a window pane is disposed in a manner to move between a full-closed uppermost position and a full-open lowermost position, said window regulator comprising:

a base plat stationarily mounted in said hollow structure;

a carrier device mounted to said base plate in a manner to be movable upward and downward with respect to the fixed base plate, said carrier device including first, second, and third sliding units which run on and along given ways defined by said base plate, said first sliding unit being placed between and below said second and third sliding units;



a lifting device mounted in said hollow structure for moving said carrier device upward and downward with respect to the base plate;

a window pane mounting plate mounted to said carrier device in a manner to be movable between outboard and inboard sides in said hollow structure; and

a shifting device mounted to said carrier device for shifting said window pane mounting plate between said outboard and inboard sides when said window pane is at a slightopen position slightly below the full-closed uppermost position.

4,785,583

SEAL FOR A SLIDABLE WINDOW OF A VEHICLE

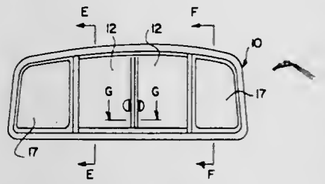
Shigeyuki Kawagoe, Anjo; Haruhiko Terada, Chiryu, and Jyouichi Banjyo, Himi, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Ka Riya and Aisin Keikinzoku Kabushiki Kaisha, Shinmin Ato, both of, Japan

Filed Jul. 16, 1987, Ser. No. 74,292

Claims priority, application Japan, Jul. 22, 1986, 61-112438[U]

Int. Cl.[4] E05D *15/06*

U.S. Cl. 49—404 **8 Claims**



1. A vehicle window assembly, comprising:

channel means including a first pair of upper and lower channel members and a second pair of upper and lower channel members disposed substantially adjacent said first pair of channel members;

a stationary window fixedly mounted within said first pair of channel members;

a movable window slidably mounted within said second pair of channel members, said movable window being adjustably positioned relative to said stationary window;

first weather stripping means formed along a peripheral portion of said stationary window and disposed within

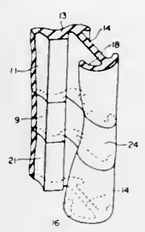
VOL 1096 ISS 4 NO 22 1988 UMI

said first pair of upper and lower channel members for holding said stationary window within said first pair of channel members;

guide run means for slidably supporting said movable window within said second pair of channel members, said guide run means including upper and lower guide run members disposed within said second pair of upper and lower channel members, respectively, said upper guide run member having a bifurcated lip section engaging first and second opposite surfaces of said movable window and said lower guide run member having a single lip section engaging the first surface of said movable window; and

second weather stripping means disposed within said lower channel member of said first pair of upper and lower channel members, said second weather stripping means including a protruding lip for engaging the second surface of said movable window opposite said lower guide run member lip section, said movable window being supported along said second pair of channel members by said protruding lip and said upper and lower guide run member lip sections.

4,785,584
WEATHER STRIP FOR DOOR PANE OF MOTOR VEHICLE
Hisayuki Kisanuki, and Jun Shibasaki, both of Aichi, Japan, assignors to Toyoda Goesi Co., Ltd., Nishikasugai, Japan
Filed May 22, 1987, Ser. No. 52,970
Claims priority, application Japan, Aug. 9, 1986, 61-187555
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—441 **1 Claim**



1. A weather strip for the door pane of a motor vehicle, comprising:

upper and lower strip portions coupled to each other at respective lower and upper ends thereof;

each of said upper and lower strip portions having a nearly U-shaped cross section such that a pane housing groove is defined by inner, intermediate and outer walls of said strip portions when said strip portions are fitted into a channel;

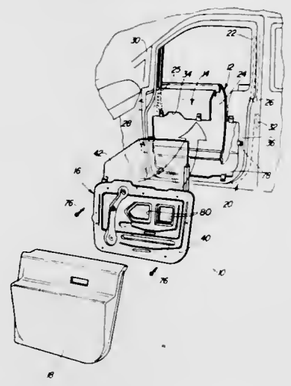
a die-molded portion coupling said upper and lower strip portions to each other;

said upper strip portion having an asymmetric cross section such that at least the inner wall of said upper portion is provided with a curved seal lip extending toward said pane housing groove; and

said lower strip portion having a symmetric cross section such that both the inner and outer walls of said lower portion are provided with curved seal lips extending toward said pane housing groove,

said die-molded portion having inner and outer walls formed so that said curved seal lips extend toward said pane housing groove and are press-deformed so as to integrate with the inner and outer walls of the upper and lower strip portions.

4,785,585
VEHICLE DOOR WITH SEPARABLE DOOR HARDWARE MODULE
Donald A. Grier, Mt. Clemens, and Theodore Nielson, Jr., Troy, both of Mich., assignors to The Budd Company, Troy, Mich.
Filed Apr. 14, 1987, Ser. No. 50,508
Int. Cl.[4] B60J *5/04*
U.S. Cl. 49—502 **14 Claims**



1. A vehicle door comprising:

an outer panel;

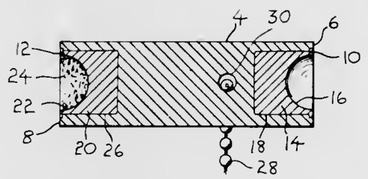
an inner panel having a generally centrally located enlarged opening therein, the inner and outer panel being secured together to form a main door unit defining at least a lower hollow cavity and a window frame portion with upper glass track sections therein;

means for mounting the main door unit to a body of the vehicle whereby the main door unit can be painted simultaneously with the body of the vehicle;

a door hardware module having a plate to which door hardware is attached, said door hardware at least including a window glass and lower glass track sections therefor; and

means for attaching the module to the inner panel so that the door hardware and window glass fit within said cavity, with the lower and upper glass track sections being detachably coupled together thereby bringing them into alignment.

4,785,586
CUE TIP SHAPING DEVICE
Edward R. Kratfel, 8800 Y Kelso Dr., Baltimore, Md. 21221
Filed Mar. 11, 1987, Ser. No. 24,130
Int. Cl.[4] B24B *25/00*
U.S. Cl. 51—181 R **17 Claims**



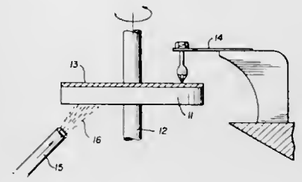
16. A device for shaping a cue stick tip, said device comprising:

an elongate body having a hexagonal cross-section, said body having first and second ends;

a scuffing means mounted on said first end of said body for cutting said cue stick tip to impart a desired overall external contour to said tip;

a tip reforming means mounted in said second end and comprising a smooth, polished, non-abrasive concave surface of correct shape for repeatedly reforming the external contour of said tip.

4,785,587
NOVEL LAP FOR THE POLISHING OF GEM STONES
Shymon Reich, and David Vofsi, both of Rehovot, Israel, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel
Filed Jun. 7, 1982, Ser. No. 386,677
Claims priority, application Israel, Jun. 5, 1981, 63054
Int. Cl.[4] B23F *21/03*
U.S. Cl. 51—209 R **6 Claims**



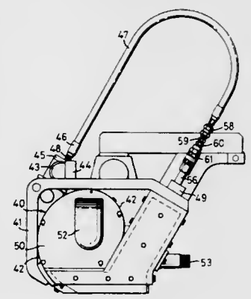
1. A scaife for the polishing of gemstones, comprising a rotatory plane disk provided at or in its upper surface with a frozen liquid matrix containing abrasive powder, said matrix being characterized by

having a phase transition temperature between solid/liquid not appreciably higher than the local temperature created at a point of contact between said matrix and a gemstone being polished, and

a high enthalpy of phase transition from solid to liquid

to thereby constitute means for allowing local melting of said matrix at a point of contact between said matrix and the generated gemstone being polished followed immediately by refreezing.

4,785,588
LIQUID BLASTING SYSTEM
Michael J. Woodward, Houston, Tex., assignor to Weatherford U.S., Inc., Houston, Tex.
Filed Dec. 30, 1986, Ser. No. 947,837
Int. Cl.[4] B24C *3/06*
U.S. Cl. 51—429 **4 Claims**



1. A liquid blasting system for blasting liquid or a liquid-abrasive mixture onto an area to be blasted, the system comprising

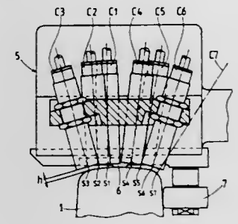
a housing having an interior,

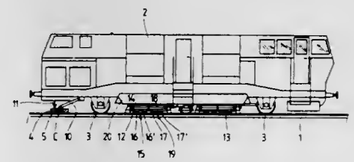
liquid inlet means disposed on and through the housing and communicating with the housing's interior for receiving liquid under pressure and transmitting it to the area to be blasted,

a hollow catcher having an interior and an exit port and comprising an involuted channel of spiral-shaped cross-section, the involuted channel having an opening in communication with the housing's interior and disposed to receive liquid and blasted materials from the area to be blasted, material flowing into the involuted channel passing through a circuitous path in the channel before exiting through the one or more exit connections, and

one or more exit connections on the catcher for attaching vacuum means to and in communication with the catcher for sucking liquid and blasted material out of the catcher.

4,785,589
PROCESS FOR MEASURING AND GRINDING THE PROFILE OF A RAIL HEAD
Fritz Bühler, Ecublens, Switzerland, assignor to Les Fils d'Auguste Scheuchzer S.A., Lausanne, Switzerland
Filed Dec. 31, 1986, Ser. No. 948,031
Claims priority, application Switzerland, Feb. 28, 1986, 00837/86
Int. Cl.[4] B24B *49/04*
U.S. Cl. 51—178 **15 Claims**





1. A process of measuring and grinding the profile of a rail head which comprises simultaneously grinding several facets of the rail head by a plurality of grinding wheels disposed at different predetermined angles of inclination to correspond to the desired profile, continuously measuring distances from a reference base defined by a measuring frame to several generatrices distributed over the profile of the rail head as actual values to determine the actual profile, comparing actual measured values with predetermined desired values during the grinding operation and lifting each of said grinding wheels off to an inoperative position whenever a facet ground by said grinding wheel reaches a position corresponding to the desired distance value in relation to said reference base.

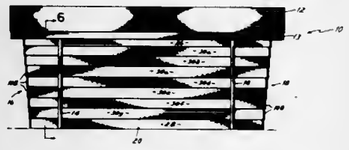
VOL 1096 ISS 4 NO 22 1988 UMI

4,785,590

ENCLOSURE WITH TELESCOPING WALLS

Paul R. Jones, 518 Grand Ave., Cincinnati, Ohio 45205

Filed Jun. 11, 1987, Ser. No. 61,193
Int. Cl.[4] E04B *1/346*
U.S. Cl. 52—64 **5 Claims**



1. An enclosure comprising:
a roof having four corners;
vertical supports mounted to each corner of said roof for supporting said roof above the ground;
a front wall, a back wall and opposed side walls each mounted to said roof, each of said walls including a plurality of vertically oriented, telescoping wall panels comprising:.
(i) a planar top;
(ii) opposed sides connected at each end of said planar top and extending outwardly therefrom;
(iii) a U-shaped channel connected to each of said opposed sides;
(iv) a hanger mounted to said planar top, said hanger being formed with hooks at opposite ends, said hooks of said hanger of one wall panel being formed to seat within said U-shaped channels of an adjacent wall panel so that said one wall panel is supported upon and hangs downwardly from said adjacent wall panel;
said wall panels of said front and rear walls being formed with opposed ends which abut an end of said wall panels of each said side walls;
mounting means for mounting said ends of each of said wall panels of said front and rear walls to said abutting ends of said wall panels of said opposed side walls;
means connected to said opposed side walls for simultaneously moving said wall panels of each said opposed side walls and said front and rear walls between a raised position in which said telescoping wall panels are nested together and an extended position in which said wall panels extend from said roof to the ground.

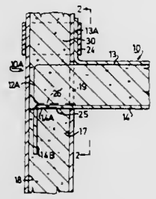
4,785,591

JOINT BETWEEN TWO TUBES OF SQUARE OR RECTANGULAR CROSS-SECTION

Gustav L. Dahlén, Ärlestigen 1, S-703 48 Örebro, Sweden

PCT No. PCT/SE86/00433, § 371 Date May 28, 1987, § 102(e) Date May 28, 1987, PCT Pub. No. WO87/02084, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 26, 1986, Ser. No. 60,389
Claims priority, application Sweden, Sep. 30, 1985, 8504518
Int. Cl.[4] E04B *2/56, 1/38;* F16L *41/08*
U.S. Cl. 52—73 **7 Claims**

1. Two tubes, said tubes being of square or rectangular cross-section, a first of said tubes having two spaced parallel side walls interconnected by two spaced parallel transverse walls, a second of said tubes having front and rear walls and an insertion opening through said front wall, both of said tubes being filled with concrete, said first tube having an end extending through said insertion opening into said second tube, said side walls of said first tube terminating inside said second tube in two anchoring wings, one of said transverse walls terminating in a tongue which lies along and is disposed outside of said front wall, the other transverse wall extending within said second tube toward and adjacent said rear wall of said second tube and terminating in an anchoring tongue with a extends along said rear wall, that portion of said other transverse wall,



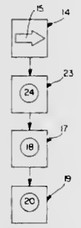
which is disposed within said second tube, having a flow-through hole for said concrete.

4,785,592

METHOD FOR RAISING A MULTI-ELEMENT MAST AND APPARATUS FOR PERFORMING THE METHOD AND MASTS PROVIDED WITH THESE MEANS

Frederic N. B. Hung, St Amand les Eaux, France, assignor to Laboratoire d'Etudes et de Recherches Chimiques (LERC) S.A., St. Amand les Eaux, France

Filed Apr. 23, 1987, Ser. No. 41,449
Claims priority, application France, Apr. 24, 1986, 86 06409
Int. Cl.[4] E04H *12/18, 12/34*
U.S. Cl. 52—118 **16 Claims**



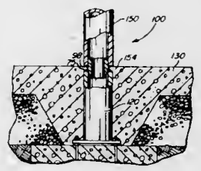
1. A multi-element mast comprising:
a plurality of mast elements joined in an end-to-end manner, said mast being vertically arranged and adapted to support an antenna at an upper portion thereof;
a vertical guide shaft having an opening extending therethrough, said guide shaft housing a lower portion of said mast and having means for securing said lower portion of said mast to prevent vertical downward movement of said mast;
framework ground supporting means for supporting said mast and said guide shaft at a predetermined distance from a ground surface; said supporting means being connected to said guide shaft;
means for progressively raising successive mast elements through said guide shaft, said raising means including
a support plate adapted to receive a bottom of a lower mast element of said mast, said support plate adapted to be raised and lowered in a vertical manner,
a tieline, said tieline having a first and a second end, said first end being affixed to said guide shaft, said second being a free end,
a plurality of pulleys, at least one pulley being attached to said guide shaft and at least one other pulley being supported from said support plate, wherein said free end of said tieline is arranged to pass over said pulleys and wherein said tieline may be used to move said support plate vertically between a position near said ground surface and a position near said guide shaft;
takeup means for engaging said tieline intermediate said first end and said second end, said takeup means further comprising:
a traction device including handle means (**21**) for engaging said tieline to assist at least one operator in exerting a traction force on a free portion of said tieline in a predetermined direction of traction, wherein translation of said tieline in said predetermined direction will cause said tieline to unwind from said pulleys and to cause said support plate to be raised vertically toward said guide shaft;
said tration device further including traction means for gripping said tieline to prevent relative movement between said handle means and said tieline when said traction force is applied in said predetermined direction of traction, said traction means further permitting said handle means to slide freely on said tieline in a direction opposite said predetermined direction when a force is applied by an operator tending to displace said handle means in the direction opposite the predetermined direction; and
locking means (**18**) for selectively locking said tieline to prohibit translation, said locking means disposed to engage said tieline at a position intermediate of said pulleys and said handle means, said locking means being fixed with respect to said guide shaft, said locking means on the one hand allowing said tieline to unwind from said pulleys when said traction force is applied in said predetermined direction, said locking means on the other hand, when said traction force is substantially ceased, being operable to lock said tieline to prohibit translation of said tieline in the direction opposite said predetermined direction.

4,785,593

STRUCTURAL BUILDING SYSTEM

Jose C. Munoz, Jr., 1510 E. Colter #114, Phoenix, Ariz. 85014

Filed Oct. 27, 1986, Ser. No. 923,173
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—126.1 **1 Claim**



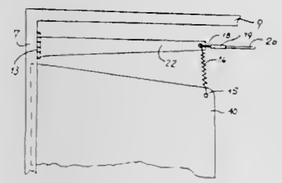
1. A building column structure to be supported on a footing, said structure comprising:
(a) a base on said footing having an upwardly extending tubular support member defining a first connection surface;
(b) a rigid vertical column support member having a lower section defining a generally circular second connection surface;
(c) rigid coupling connector means having third and fourth generally circular connection surfaces, respectively cooperable with said first and second connection surfaces;
(d) one of said third and fourth connection surfaces comprising a smoothly inwardly tapering conical section whereby said vertical column support member can be vertically adjusted and aligned with respect to said tubular support member at said conical section; and
(e) a weldment securing said base, column and coupling connector means as a rigid unit.

4,785,594

DEFORMABLE SEALING ARRANGEMENT FOR THE GAP BETWEEN THE EDGE OF AN OPENING IN A BUILDING AND THE BACK END OF A VEHICLE THAT IS DRIVEN UP TO THE OPENING

Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,170
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629787
Int. Cl.[4] E06B *7/16*
U.S. Cl. 52—173 DS **6 Claims**



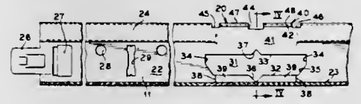
1. A deformable sealing arrangement for the gap between the edge of an opening in a building and the back end of a vehicle that is driven up to the opening; an apron is secured to the sides and top of a U-shaped frame that is open at the bottom, is disposed at a distance from the building, and is also preferably movable in a direction toward said building, with the two side legs of said frame serving to hold the side portions of said apron, with each side portion having a given width and an upper edge, while the horizontal, top leg of said frame serves to hold the upper, transversely extending portion of said apron; said sealing arrangement further comprising:
two support arms, located above the side portions of said apron and at one end thereof respectively, aid support arms being connected to each side leg of said frame in such a way as to be pivotable via a hinge joint about an axis that extends parallel to that side leg, with said upper edge of each side apron portion being connected to a respective one of said support arms in such a way that said side portions can be resiliently pressed-in in the manner of a door accompanied by the formation of a return force,
said upper edge of each side apron portion being connected to its pertaining support arm by a respective tension spring,
each of said support arms having a free end remote from its pertaining side leg of said frame, and
each of said side apron portions, along said upper edge thereof, having a free upper corner remote from its pertaining side leg of said frame, with each of said tension springs being connected to said free end of one of said support arms as well as to said free upper corner of the pertaining side apron portion.

4,785,595

FIRE-RATED MAIN RUNNER

James J. Dunn, St. Charles, Ill., assignor to Chicago Metallic Corporation, Chicago, Ill.

Filed Jan. 29, 1988, Ser. No. 150,239
Int. Cl.[4] E04C *2/52, 2/42;* E04B *5/52*
U.S. Cl. 52—232 **9 Claims**



1. An expansion joint for a runner, said runner having an

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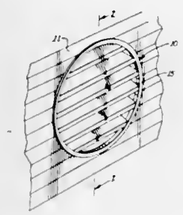
inverted T configuration with a hollow bead having one edge connected by a web portion to two outwardly extending flanges, said joint comprising a portion of the bead being modified with a lower portion of the area of the modified bead having walls being deformed inwardly to a reduced width relative to the walls of the upper portion of the modified bead, said upper portion of the modified bead being sub-divided into two portions by a transverse middle notch and transverse outer notches on each side of the middle notch, an aperture being formed in the web in the region of the modified bead, said aperture extending along the runner a greater distance on each side of the outer notches and approximately to the end of the deformed lower portion, said aperture having means for defining three bend areas in the flange, said means coacting with the notches in the upper portion of the bead to form three bend regions for the web and modified bead so that when the runner is placed under compression due to a fire, the modified bead and a portion of the web will buckle outwardly with bending at said three bend regions and the flange immediately adjacent the aperture will buckle downward with bending at the three bend areas.

4,785,596

ATTIC VENT

Byron C. Wiley; Mary B. Wiley, both of Phoenix, and James C. Luttrell, Scottsdale, all of Ariz., assignors to Metal Products Company Incorporated, Phoenix, Ariz.

Filed Jun. 29, 1987, Ser. No. 67,161
Int. Cl.[4] E04B *1/70*; E06B *7/08*
U.S. Cl. 52—302 **4 Claims**



1. An attic vent comprising:

(a) a seamless frame wall having an outer flange defining an outside diameter and having an inside edge defining an inside diameter smaller than said outside diameter, and formed into a truncated cone with the outer flange and inside edge respectively positioned in parallel spaced apart planes;

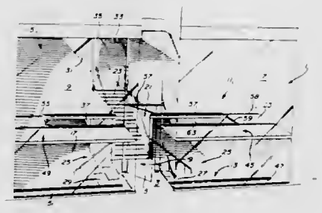
(b) a plurality of louvers mounted within the truncated cone formed by said frame wall, parallel with respect to each other, said louvers sloped with respect to said planes to form parallel downwardly sloping louvers extending across said truncated cone when said vent is mounted.

4,785,597

MULTIPLE STORE STRUCTURE

Eleaizer Gelber, c/o 1550 de Maisonneuve Blvd. West, Suite 1155, Mootreal, Quebec, Canada (H3G 1N2)

Filed Jul. 20, 1987, Ser. No. 75,135
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—236.3 **13 Claims**



1. A structure for accommodation of multiple store units, said structure having a front wall, two side walls, a rear wall, a top wall and a bottom wall to define a confined space, said structure comprising:

an entranceway defined by a gap in said front wall, the entranceway having a threshold at a first level;

a first storefront window arrangement on one side of said entranceway in said front wall;

a second storefront window arrangement on the other side of said entranceway in said front wall;

said first and second window arrangements extending substantially over said front wall;

a first upper landing, in a horizontal plane above said first level, extending behind said front wall and said first storefront window arrangement to accommodate a first store unit, and a first lower landing, coincident with said bottom wall and below said first level, and behind said front wall and said first storefront window arrangement to accommodate a second store unit;

a second upper landing, in a horizontal plane above said first level, extending behind said front wall and said second storefront window arrangement to accommodate a third store unit, and a second lower landing, coincident with said bottom wall and below said first level, and behind said front wall and said second storefront window arrangement to accommodate a fourth store unit;

an entranceway landing having side edges and a rear edge extending within the confined space from the threshold of the entranceway in a horizontal plane at said first level but spaced between the upper and lower landings;

first access means extending from the rear edge of said entranceway landing towards said rear wall and ascending to said upper landings to service said first and third store units;

second access means extending from the side edges of said entranceway landing towards respective ones of said side walls and descending to said lower landings to service said second and fourth store units;

said first storefront window arrangement comprising a first, upper, storefront window and a second, lower, storefront window;

said second storefront window arrangement comprising a third, upper, storefront window and fourth lower, storefront window;

a first store unit being defined by said front wall and said first, upper, storefront window, said first upper landing, one of said side walls, said top wall and said rear wall;

a second store unit being defined by said front wall and said second, lower, storefront window, said first lower landing, said one of said side walls, said top wall and said rear wall;

said third store unit being defined by said front wall and said third, upper, storefront window, said second upper landing, the other one of said side walls, said top wall and said rear wall; and

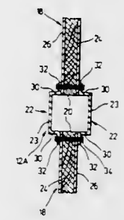
said fourth store window being defined by said front wall and said fourth, lower, storefront window, said second lower landing, said other one of said side walls, said top wall and said rear wall.

4,785,598

WALL PANEL ASSEMBLIES

Frank Stronach, Newmarket, Canada, assignor to Magna International Inc, Markham, Canada

Filed Nov. 8, 1982, Ser. No. 439,674
Claims priority, application Canada, Aug. 11, 1982, 409,197
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—238.1 **2 Claims**



1. A wall panel assembly in a building having a floor and walls, said panel assembly comprising a pair of co-planar panels having adjacent spaced end edges, opposite end edges secured to respective walls and lower edges secured to the floor, a first partial column member extending upwardly from the floor to substantially the height of the panels on one side thereof and also extending transversely across the space therebetween, a second partial column member extending upwardly from the floor to substantially the height of the panels on an opposite side thereof and also extending transversely across the space therebetween, each partial column member comprising a main portion extending transversely across the space between the panels and outwardly spaced from the respective side thereof, and intermediate portions extending from opposite ends of the main portion to transversely and outwardly extending flanges overlying the panels, the main portion of each partial column member being substantially parallel to the transversely extending flanges, and the intermediate portions being substantially perpendicular to the main portion and the transversely extending flanges, first removable bolt means passing through one flange of the first column member, one of the panels and one flange of the second column member to secure the column members to said one panel, and second removable bolt means passing through the other flange of the first column member, the other panel and the other flange of the second column member to secure the column members to the other panel, with the first and second column members forming a vertical hollow column with the adjacent spaced end edges of the panels, said vertical hollow column containing no structural support member.

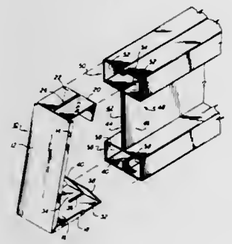
4,785,599

FASCIA END PLATE FOR ROOF SYSTEM

Wesley T. Murphy, 94 Prospect St., Auburn, N.Y. 13021

Filed Dec. 10, 1987, Ser. No. 131,131
Int. Cl.[4] E04C *2/34*; E04F *11/18*
U.S. Cl. 52—302 **6 Claims**

1. A fascia end plate for use with a double-dee type sheet metal beam of the type that has matching right and left halves that fit together to form a double-thickness web and box flange members above and below said web, each of which has an internal channel of substantially rectangular cross section; the fascia end plate being formed unitarily of a rigid sheet material and comprising a rectangular face plate; a lower horizontal plate having one end joined to a lower edge of the face plate at an acute angle; a pair of parallel upper legs extending horizontally from an upper edge of the face plate and joined thereto at an obtuse angle supplementary to said acute angle; and each of said legs having a respective bent down tab at its free end forming an acute angle with the associated leg; and a pair of parallel lower legs continuing substantially in the plane of said lower plate, each having a respective bent-up tab at its free end that forms an acute angle with the associated leg; with said legs and tabs being so dimensioned to permit insertion of the fascia



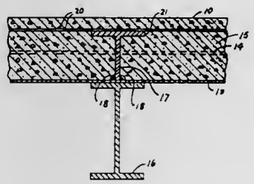
end plate legs into the upper and lower box flanges of said sheet metal beam, but preventing their withdrawal once inserted therein.

4,785,600

BUILDUP COMPOSITE BEAM STRUCTURE

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Feb. 16, 1988, Ser. No. 155,739
Int. Cl.[4] E04B *1/16*
U.S. Cl. 52—334 **3 Claims**



1. In a building floor structure having horizontal steel beams, steel decks supported on said steel beams, a concrete floor covering with shrinkage control wire mesh thereabove, and shear transferring devices enabling said steel beams to coact compositely with said concrete floor, each of said steel beams having a top flange, a vertical web, and a bottom flange, said steel decks having corrugations consisting of alternating ridges and valleys, said steel decks spanning between said steel beams and secured to said top flanges of said steel beams at said valleys, the improvements in the floor structure comprising:

said shear transferring device being connected to said top flange of said steel beam by welding through said steel decks and embedded in said concrete floor and comprising:

(a) a vertical element substantially parallel to said web of said steel beam and having a height greater than the height of said steel decks and extending into said valleys with clearance notches around said ridges and making contact with said steel decks.

(b) a continuous horizontal element having a linear axis substantially parallel to the longitudinal axis of said steel beam and extending laterally away from said vertical element and above said steel decks.

(c) said vertical element (a) being integrally connected with said horizontal element (b).

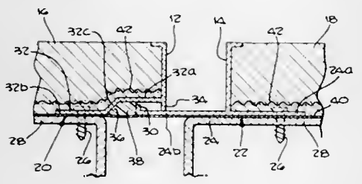
VOL 1096 ISS 4 NO 22 1988 UMI

4,785,601

PLASTER CONTROL SCREED

Thomas G. Tupman, Newport Beach, Calif., assignor to Fry Reglet Corporation, Alhambra, Calif.

Filed Jun. 26, 1987, Ser. No. 66,750
Int. Cl.[4] E04F *13/16*
U.S. Cl. 52—364 **2 Claims**



1. A plaster control screed of channel configuration comprising two separate metal parts each having a uniform cross-sectional configuration;

(a) the first of said metal parts having a base and a channel side projecting upwardly from the central portion of the base, said channel side dividing the base into two contiguous portions on opposite sides of the channel side respectively,

the first of said base portions forming an attaching flange, the second of said base portions forming a channel bottom element, said channel bottom element having a free end;

(b) the second of said metal parts having an offset base formed by a step dividing said offset base into two contiguous portions,

one of said two portions being a mortise portion receiving the said channel bottom element with said free end spaced from said step to form a groove,

the other of said two portions forming an attaching flange,

said second of said metal parts having a channel side, said mortise portion having a terminus at said channel side, said channel side projecting upwardly from said mortise portion terminus; and

(c) thermoplastic sealing material in said groove and adhering to both of said metal parts, said sealing material complementing said base of said first metal part and said base of said second metal part to form a substantially flat attachment to a wall structure or the like and that is elastic whereby thermal stresses in the applied plaster material are relieved by slight relative lateral movement of the said metal parts as said channel sides move towards and away from each other.

4,785,602

CONSTRUCTION PANEL

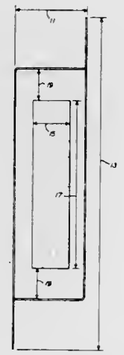
Marco O. Giurlani, Urb. La Castellana, Venezuela, assignor to Corporacion Maramar C.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 922,459, Nov. 23, 1986, abandoned. This applicatioo Nov. 23, 1987, Ser. No. 121,819
Int. Cl.[4] E04C *2/26*
U.S. Cl. 52—309.12 **20 Claims**

1. A construction panel comprised of a wire mesh framework, an insulating core fixedly disposed within said wire mesh framework, and at least 2.0 cross-tie separators per square foot of said construction panel, wherein:

(a) said wire-mesh framework is a closed, four-sided structure comprised of a front side, a back side, a left side, a right side, a first alignment guide, and a second alignment guide, wherein:

1. each of said front side and said back side is longer than each of said left side and said right side,
2. said left side and said right side are equal in length,
3. said first alignment guide is connected to and forms a first, integral, one-piece, L-shaped structure with said front side and said right side.
4. said second alignment guide is connected to and forms a second, integral, one-piece, L-shaped structure with said back side and said left side,
5. said first L-shaped structure and said second L-shaped structure are connected to each other to form said closed, four-sided structure comprised of said first alignment guide and said second alignment guide,
6. said first alignment guide extends past the point where said front side is contiguous with and is connected to said right side, and
7. said second alignment guide extends past the point where said back side is contiguous with and is connected to said left side; and



(b) said insulating core is fixedly disposed within said wire mesh framework by a multiplicity of prongs, wherein:

1. each of said prongs is comprised of a first vertical wire, a second vertical wire, and a mulitplicity of transversely-extending tines, each one of which tines is connected to both of said first vertical wire and said second vertical wire,
2. each of said first vertical wires of said prongs is attached to the front or back side of said wire mesh framework,
3. each of said second vertical wires of said prongs is contiguous with one face of said insulating core, and
4. each of said transversely-extending tines is attached to that side of the wire mesh framework which is opposite to that side of the framework to which the first vertical wire of the prong on which the tine is located is attached.

4,785,603

INTERLOCKING CROSS TEE

William J. Platt, Collingdale, Pa., assignor to National Rolling Mills Inc., Malvern, Pa.

Filed Nov. 28, 1986, Ser. No. 935,762
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—667 **4 Claims**

1. A cross tee having an inverted T cross section for use in a suspended ceiling grid structure, comprising

an elongated central web with a bulb at the top and with a pair of oppositely disposed flanges extending outwardly from the bottom of the web and adapted to support ceiling tiles,

a connecting tongue extending from an end of the web,

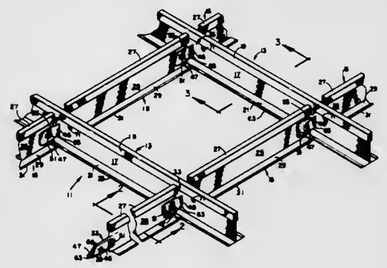
the tongue being offset from the center of the web by approximately one-half the thickness of the web,

locking means formed in the tongue for locking said cross tee to a slot provided in a main beam to which the cross tee is connected in the ceiling grid,

an interlocking means formed in the tongue for interlocking the cross tee with interlocking means of a similarly constructed but oppositely disposed cross tee when the cross tees are inserted into the slot from opposite directions,

and an interlock release means for disengaging the tongues of two similarly constructed but oppositely disposed interlocked cross tees from the interlocked relationship,

wherein the interlock release means comprises an interlock release pocket formed in the bottom portion of the fingernail locking edge by a laterally outward flare of the bottom portion,



the flare being approximately the thickness of the interlocking fingernail,

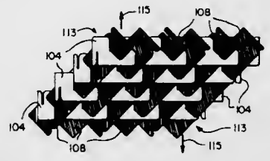
whereby the tongue of the cross tee and the tongue of a similarly constructed but oppositely disposed interlocked cross tee may be disengaged from the interlocked relationship by moving the interlocked cross tees relative to one another so that an interlocking fingernail passes through the interlock release pocket of the opposite cross tee.

4,785,604

COLLAPSIBLE GRIDWORKS FOR FORMING STRUCTURES BY CONFINING FLUENT MATERIALS

Robert H. Johnson, Jr., 320 E. Main St., Lancaster, Ohio 43130

Filed Mar. 17, 1987, Ser. No. 27,281
Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—668 **53 Claims**



1. A collapsible gridwork for confining fluent materials within cells defined by said gridwork to convert said fluent materials into stable columns capable of withstanding substantial vertical and horizontal loading, said gridwork comprising:

a first plurality of longitudinal strips having a second plurality of defined spaced slots alternately formed into the sides thereof;

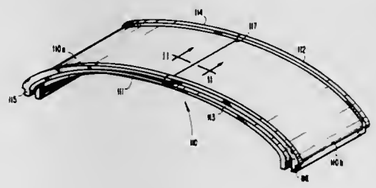
a second plurality of latitudinal strips, equal in number to said second plurality of slots, having a first plurality of defined spaced slots, equal in number to said first plurality of longitudinal strips, alternately formed into the sides thereof, substantially all of said strips being of equal width and sufficiently flexible to be interwoven by engaging slots on one side of said longitudinal strips with corresponding slots on the opposite side of said latitudinal strips to mechanically interlock said strips to form said gridwork, said slots being sized such that said gridwork can be handled without disengagement of aid strips and being of compatible depths such that the sides of said longitudinal and latitudinal strips are in substantial alignment when interwoven, said corresponding slots defining joints capable of both rotational and axial translation movement whereby said gridwork can be collapsed to either a multilayer strip somewhat longer than said longitudinal strips, or a substantially flat rectangular shape.

4,785,605

ROOF STRUCTURE FOR HOUSING UNITS

Louis J. Jenn, Indianapolis, Ind., assignor to Atrium Structures, Inc., Indianapolis, Ind.

Division of Ser. No. 917,781, Oct. 10, 1986, Pat. No. 4,754,458, which is a continuation-in-part of Ser. No. 786,196, Oct. 10, 1985. This application Jan. 25, 1988, Ser. No. 148,275
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—745 **4 Claims**



1. A method of applying a roof to a dwelling unit which includes spaced side walls, said method comprising the following steps:

(a) molding a plurality of substantially identical individual half-roof sections out of synthetic foam, each section having molded therein a leading edge, an opposite trailing edge and means for receipt of a spaced side wall;

(b) selecting two half-roof sections to be joined into a full-roof panel;

(c) reversing the orientation of one of said two half-roof sections relative to the other half-roof section;

(d) joining said two half-roof sections together by the use of a common spline;

(e) repeating steps (b) through (d) until sufficient full-roof panels are fabricated for completing the roof of said dwelling;

(f) placing one joined full-roof panel onto said spaced side walls;

(g) placing another joined full-roof panel onto said spaced side walls;

(h) joining said another full-roof panel to said full-roof panel by interfitting said leading and trailing edges of said panels in a tongue-in-groove manner; and

(i) repeating the placing and joining steps with additional full-roof panels into a joined series until the roof for said dwelling unit is complete.

4,785,606

MECHANIZED ROOF LAYING SYSTEM

Rodney P. Burton, Reynoldsburg, Ohio, assignor to James E. Johnson; Rod Cropper, both of Bolivar, Ohio and William J. Sharp, Fayette, Mo., part interest to each

Filed Sep. 4, 1987, Ser. No. 93,562
Int. Cl.[4] E04D *15/00*
U.S. Cl. 52—749 **10 Claims**

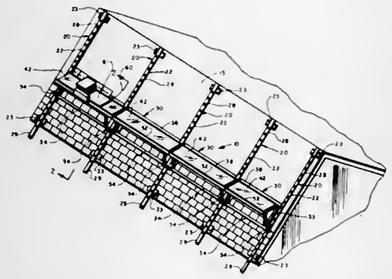
1. A mechanized system for applying shingles to a roof, comprising:

at least a pair of lateral supports attachable to the roof, said lateral supports having a plurality of alignment tabs extending therefrom,

at least one horizontal track section, said horizontal track

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section engaging said alignment tabs, said track section having a front alignment lip guide, said horizontal track sections having a platform, a frame, and spacer bars, said spacer bars connecting said platform to said frame and



positioning said platform in a substantially level position, and

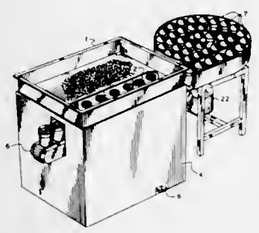
a shingle carriage, said shingle carriage slidably engaging said track section so that shingles can be laid in alignment on the roof against said alignment lip guide.

4,785,607

APPARATUS TO FACILITATE HAND PACKING OF CONTAINERS OF DIFFERENT SIZES

Kent G. Blackman, Sycamore, Ill., assignor to The Suter Company, Inc., Sycamore, Ill.

Filed Oct. 16, 1987, Ser. No. 109,235
Int. Cl.[4] B65B *67/02*
U.S. Cl. 53—391 **13 Claims**



1. Apparatus to facilitate the manual filling of a plurality of containers with a product, said apparatus comprising:

a feed-through conveyor;

a container dispenser station periodically operated to dispense containers onto said feed-through conveyor;

a lifting frame assembly positioned adjacent to said feed-through conveyor;

said conveyor operated to position a first plurality of containers adjacent to said lifting frame assembly;

a top pan, including a replaceable filler plate, said filler plate including a plurality of openings therein said top pan and said plate supporting a quantity of said product;

said openings in said filler plate being positioned over said conveyor, each opening positioned over a different one of said first plurality of containers;

guide plates located adjacent to the underside of said filler plate, adapted to assist in the placement of said containers proper alignment beneath said openings in said filler plate assembly;

said lifting frame assembly operated to raise said first plurality of containers off of said feed-through conveyor and upward against said filler plate;

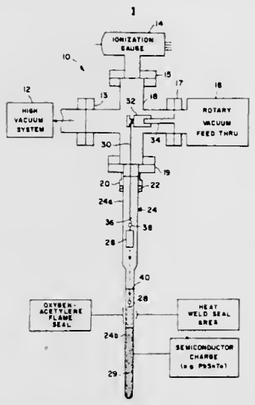
whereby said product can be manually introduced from said plate and said top pan into said plurality of containers and said containers are filled.

4,785,608

AMPOULE SEALING APPARATUS AND PROCESS

William J. Debnam, Jr., and Ivan O. Clark, both of Hampton, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1982, Ser. No. 393,567
Int. Cl.[4] B65B *31/04, 31/06, 51/20, 1/04*
U.S. Cl. 53—432 **7 Claims**



1. Means for precision sealing of an elongated ampoule and precision control of its contents after vacuum evacuation so as to achieve rapid production of precisely repeatable samples comprising in combination:

an ampoule having contents to be utilized under sealed vacuum therein and having an open end for receiving these contents therein,

said ampoule being provided with a first diameter portion at the open end thereof and a reduced diameter portion at the other end with the ampoule contents being disposed in the reduced diameter portion,

means for retaining said ampoule in a vertical open end up position,

means for evacuating said ampoule,

plug means for sealing said ampoule,

retention means for releasably maintaining said plug means adjacent the ampoule open end while said ampoule is evacuated,

positioning means for inserting said plug means into said ampoule while the vacuum therein is retained,

heat sealing means for sealing said plug in position in said ampoule,

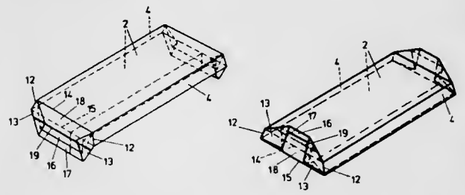
said ampoule and said plug means being constructed from fused quartz, and whereby the sealed ampoule is a homogeneous and continuous unit at the sealed portion thereof.

4,785,609

METHOD OF WRAPPING A FLAT RECTANGULAR ARTICLE

Franz-Joseph Widmann, Hilzingen, Fed. Rep. of Germany, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Feb. 5, 1987, Ser. No. 11,438
Claims priority, application Switzerland, Feb. 6, 1986, 462/86
Int. Cl.[4] B65B *11/02*
U.S. Cl. 53—461 **3 Claims**



1. A method of packing a flat, angular item having two opposite large faces, two opposite side faces and two opposite end faces; each said end face being bounded by two short end face edges, a first long end face edge and a second long end face edge; comprising the following steps:

(a) laying a wrapper sheet about the two large faces and the side faces to obtain superposed longitudinal edge zones of the wrapper sheet and opposite terminal wrapper portions projecting beyond the end faces;

(b) bonding to one another said longitudinal edge zones by a longitudinal seam to obtain a fin seam;

(c) flattening said fin seam against one of said large faces;

(d) folding each terminal wrapper portion by folding a first terminal wrapper portion about said first long end face edge flat onto the respective said end face and folding a second terminal wrapper portion about each of the short end face edges onto said first terminal wrapper portion, whereby each terminal wrapper portion is coplanar with the respective end face and has an end part projecting beyond a respective said second long end face edge;

(e) sealing folded parts of each terminal wrapper portion to one another along a seam on the part of the terminal wrapper portion extending beyond said second end face edge; and

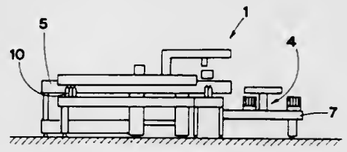
(f) folding said end part of each terminal wrapper portion about said second long end face edge flat against the respective said end face.

4,785,610

AUTOMATIC MACHINE FOR PACKAGING PRODUCTS OF DIFFERENT KINDS IN BOXES

Dante Valenti, Imola, Italy, assignor to In-Pak S.p.A., Italy

Filed Sep. 21, 1987, Ser. No. 99,346
Claims priority, application Italy, Sep. 23, 1986, 3515 A/86
Int. Cl.[4] B65B *5/10, 35/44*
U.S. Cl. 53—537 **20 Claims**



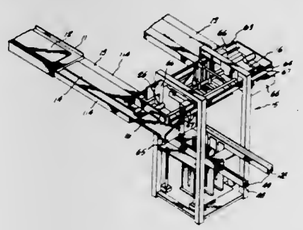
1. An automatic machine for packaging products of different kinds in boxes, said products being insertable in groups into said boxes, each box being made from a single blank having slots and preformed fold lines along its length and breadth, said fold lines defining a central area that forms the bottom of said box, and delimiting said central area from outer areas, including a front area, a rear area and side areas, respectively, of said blank, all said outer areas being provided with a number of flaps and there being a limb on an end of both said front area and rear area that provides a front end and a back end of said box; the machine comprising: a first station for intermittently feeding the blanks into a first flow line, leading into a second, box-filling station; first means, operating along said first line, downstream of said first station, for applying first strips of glue on the edges of the long side of said flaps for gluing to corresponding inner surfaces of said blank; second means, located downstream of said first means, that work in synchrony with translating motion of said blank for folding the glued flaps upwards in sequence; third means, located downstream of said second means, for supporting and guiding said folded flaps; fourth means, that work in synchrony with translating motion of said blank for folding said flaps a second time to form strengthening projections in which said first strips of glue smeared on said long edges of said flaps are positioned face-to-face with corresponding surfaces of said blank; fifth means, that are located after said fourth means for pressing said long edges against said corresponding surfaces of said blank; sixth means that are located after said fifth means and upstream of the box-filling station, for applying second strips of glue on inner portions of long outer faces of said strengthening projections; a second line, located at a lower level than said first line, leading to a third, collating station, for conveying said products, in equally spaced, parallel rows, to said collating station; seventh means, for collating said products at said third station in order to form groups of said products and to convey each said group to the second station, located above said central area of the blank, the blank having already been conveyed to the same second station by the first line; eighth means, located at said second station, for folding upwards said front, rear and side areas, which are pressed against said inner portions of the long sides smeared with said second strips of glue, to make up sides and said ends of said box, with the box containing one of said collated groups of products, the eighth means positioning said box on a third, flow line; ninth means for applying third strips of glue on top edges of said box; and, tenth means, for folding said limbs against said top edges smeared with said third strips of glue, for completing said box.

4,785,611

CARTON PACKAGING

Ralph Hasenbalg, 8635 Rudnick Ave., Canoga Park, Calif. 91304

Filed Dec. 4, 1986, Ser. No. 938,007
Int. Cl.[4] B65B *5/10, 23/02*
U.S. Cl. 53—536 **16 Claims**



1. Apparatus for packing elements into a container comprising:

an escapement conveyor for moving the elements from a delivery conveyor to a movable tray, the escapement conveyor including centering means to align elements prior to loading onto the movable tray;

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the movable tray for delivering the elements from a loading position remote from a container mouth to an unloading position above the container mouth, said container being located at a container filling station;

a movable support at the filling station extending upwardly rom a lower position through the container whereby the free end of the support supports the elements from underneath on removal of the tray from the filling station, the movable support means being a series of tines, and the tines being elongated plates spaced discretely from each other wherein the free ends of the tines fit under grooves in the bottom of the elements, location of the tines being determined relative to the standard groove location in the base of the elements;

a movable press for urging the elements downwardly onto the support and into the container for a discreet distance after removal of the removable tray, the support moving simultaneously progressively downwardly into the container, and the press thereupon being upwardly movable after a predetermined press movement whereupon the movable tray, movable support and movable press sequence is repeatable for another element load to the container filling station; and

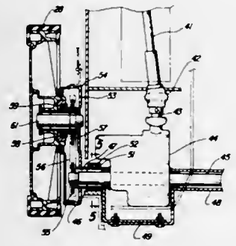
a sensor for determining the element loading state of the container such that upon a predetermined loading of the container, the container is removed from the filling station.

4,785,612

WALK-BEHIND LAWN MOWER

Masahiro Morishita; Kiyotaka Mikome, and Mitsuo Miyazaki, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 24, 1987, Ser. No. 77,617
Int. Cl.[4] A01D *34/74*
U.S. Cl. 56—17.2 12 Claims



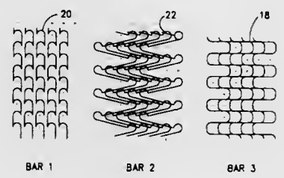
1. A rotary walk-behind lawn mower having an outer housing, a rotating cutting blade contained within said outer housing and rotatable about a generally vertically extending axis, a power unit carried by said outer housing for driving said cutting blade, said outer housing defining a discharge chute through which grass cut by said cutting blade is discharged, a plurality of wheels journaled relative to said outer housing, an axle, a pair of chain drive transmissions for rotatably coupling two of said wheels to said axle, said axle being journaled by said outer housing and extending across and beneath said discharge chute, and means for driving said axle from said power unit, each of said chain drive transmissions being contained within a respective housing which is pivotal about the axis of said axle for changing the cutting height of the lawn mower.

4,785,613

GRASSCATCHER BAG FABRIC

Werner Rhode, Greenville, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 13, 1987, Ser. No. 107,695
Int. Cl.[4] D04B *21/00*
U.S. Cl. 56—202 15 Claims



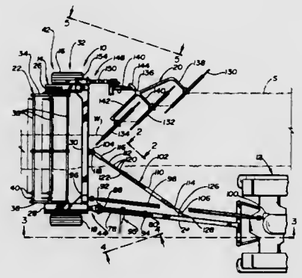
1. Apparatus to mow a lawn comprising: a lawn mower with a discharge outlet and a grasscatcher bag connected to said outlet, said grasscatcher bag being made of a warp knit fabric having a plurality of chain stitches interknit with a plurality of multiple needle lap stitches with adjacent wales connected to one another with a yarn having lower elongation characteristics than the other yarns in said fabric to reduce the elasticity of the fabric at low load conditions in the course direction of the fabric.

4,785,614

COMBINATION RAKE AND TEDDING APPARATUS

Theodore F. Schoenherr, Stratford, Wis., assignor to H & S Manufacturing Co., Inc., Marshfield, Wis.

Filed Jan. 22, 1987, Ser. No. 6,817
Int. Cl.[4] A01D *76/00*
U.S. Cl. 56—365 23 Claims



1. An agricultural implement adapted for being towed by a tractor or the like along a path of travel relative to a swath of hay or the like. comprising:

a base frame adapted for towing behind said tractor or the like;

a pair of opposed, ground engaging wheels aligned along a base frame support axis operably supporting said base frame about said axis for movement of said base frame along said path of travel;

rake means operably coupled to said base frame for forming said swath of hay into a windrow;

tedding means operably coupled to said base frame rearwardly of said rake means for tedding said windrow;

tow means adapted for operably, detachably coupling said base frame to said tractor or the like, said tow means including means for laterally shifting said base frame relative to said tractor or the like;

first height adjustment means operably coupling said tow means and said base frame for selectively pivoting said base frame about said base frame axis, thereby selectively adjusting the height of said tedding means relative to the ground; and

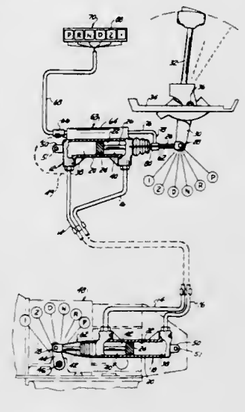
second height adjustment means operably coupling said rake means and said base frame for adjusting the height of said rake means independently of the height of said tedding means.

4,785,615

HYDRAULIC SHIFT FOR MOTOR VEHICLE AUTOMATIC TRANSMISSION

Keith V. Leigh-Monstevens, 5622 Larkins, Troy, Mich. 48098

Filed Nov. 28, 1983, Ser. No. 555,666
Int. Cl.[4] B60T *17/22*
U.S. Cl. 60—534 2 Claims



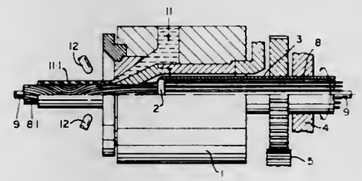
1. A hydraulic apparatus for remotely operating a motor vehicle automatic transmission mode selection arm, said apparatus comprising a master cylinder in the form of a tubular housing, a piston reciprocable in said housing and separating said housing into a first chamber on one side of said piston and a second chamber on the other side of said piston, an input rod connected to an end to said piston and connectable at its other end to an end of an arm attached to an operative mode shift lever whereby angular displacement of said shift lever causes linear displacement of said input rod, a remotely located slave cylinder having a housing identical to the housing of said master cylinder internally provided with a reciprocable piston forming a first chamber on one side thereof and a second chamber on the other side thereof, a first flexible conduit placing said first chamber of said master cylinder in fluid communication with one of said chambers of said slave cylinder, a second flexible conduit placing said second chamber of said master cylinder in fluid communication with the other of said chambers of said slave cylinder, an output member linearly displaceable by said piston in said slave cylinder, means at the end of said output member for connecting said output member to said automatic transmission mode selection arm projecting from said transmission, and hydraulic fluid filling said master cylinder first and second chambers, said slave cylinder first and second chambers and said first and second flexible conduits, whereby linear displacement of said master cylinder input member as controlled by said operative mode shift lever causes a corresponding analog linear displacement of said slave cylinder output member and operates said transmission mode selection arm, said apparatus further comprising a first break-away restraining strap holding said master cylinder input member against extension beyond a finite position prior to installation on a motor vehicle and a second break-away restraining strap holding said slave cylinder output member against extension beyond a finite position, wherein said apparatus is filled with hydraulic fluid after complete assembly of said apparatus and prior to installation in a motor vehicle, whereby said first restraining strap is broken during first extension of said master cylinder input member beyond said finite position and said second restraining strap is broken during first extension of said slave cylinder output member beyond said finite position after installation on a motor vehicle, said master cylinder input rod being displaceable to one of a plurality of selectable transmission operative modes corresponding to "park", "reverse", "neutral", "drive" and at least two additional gear ratio modes, said apparatus further comprising a selected mode visual display, a selected mode transmitter electrically connected to said visual display, said selected mode transmitter comprising a plurality of individually operable switches each closing a circuit through a light indicator mounted behind an annunciator window forming part of said visual display, each of said light indicators being arranged to illuminate an area of said annunciator window provided with a selected mode marking, and means coupled to said master cylinder input member for selectively closing one of said individually operable switches for activating a corresponding light indicator, each of said switches comprising a reed switch, all of said reed switches being disposed end to end in a plane parallel to the longitudinal axis of said master cylinder, and said means for actuating said reed switches comprising a permanent magnet mounted on the end of a rod coupled to said master cylinder input member for displacement thereby for locating said magnet proximate an appropriate reed switch corresponding to a selected operative mode of said transmission.

4,785,616

MANUFACTURE OF CABLES

Clifford Heywood, Essex, England, assignor to Telephone Cables Limited, England

Filed Jul. 2, 1987, Ser. No. 69,097
Claims priority, application United Kingdom, Jul. 31, 1986, 8618662
Int. Cl.[4] D07B *7/14*; H01B *13/24*
U.S. Cl. 57—7 11 Claims



1. A method of manufacturing a cable comprising the steps of:

(a) twisting a plurality of filamentary members in a periodically reversing helical fashion about a central axis;

(b) extruding a protective sheath around the twisted members immediately following the twisting step; and

(c) cooling the extruded sheath immediately following the extruding step so as to cause the material of the sheath to set and thereby retain the twisted members in a twisted condition.

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4,785,617

PRODUCTION OF STEEL CORD

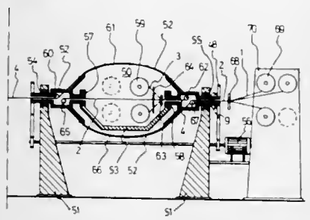
Luc Bourgois, Desselgem, and Luc Sabbe, Deerlijk, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Apr. 20, 1987, Ser. No. 39,987

Claims priority, application United Kingdom, May 27, 1986, 8612835

Int. Cl.[4] D07B 3/00, 3/12

U.S. Cl. 57—58.52 6 Claims



1. A process of producing a steel cord in a first twister, said cord comprising a core and at least one layer of filaments, twisted with the same twist pitch p around the core, the core having a structure comprising a first number m of filaments, and a second number n of filaments in an m+n configuration with a twist pitch 1 different from the twist pitch p, comprising the steps of twisting filaments together into a core bundle by means of said twister having a rotor including a plurality of unwinding coils therein, in which each unwinding coil for a filament of said first number m is locate inside the rotor of said twister, bundling said core bundle that leaves the twister at a first speed together with a number of other filaments from an associated bundling device, said other filaments travelling at the first speed and forming a filament bundle therewith, and leading the filament bundle into a second twister arranged as a double-twist bunching machine and as a winding up unit having at least one flyer and a winding up spool located inside the flyer mounted therein.

4,785,618

METHOD FOR OPERATING AN OPEN-END FRICTION SPINNING MACHINE

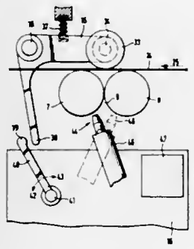
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jan. 20, 1987, Ser. No. 5,074

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601358

Int. Cl.[4] D01H 7/885, 13/26

U.S. Cl. 57—264 16 Claims



1. A process for operating an open-end friction spinning machine having at least one spinning unit with each of said at least one spinning units including:

a yarn forming friction zone formed by at least two friction surfaces moving in opposite directions creating a yarn forming region and forming a wedge-shaped gap, wherein yarn is formed from fibers by means of a friction effect at said friction surfaces, said friction effect comprising at least one of suction effect and friction surface coefficient of friction effect, said friction surfaces including a first friction surface moving into said wedge-shaped gap and a second friction surface moving out of said wedge-shaped gap, said second friction surface over at least a part of the length of the wedge-shaped gap being designed for a friction effect that is higher than a friction effect of said first friction surface,

feeding means for the feeding of fibers to the friction zone,

yarn withdrawal means for withdrawing the forming yarn from the friction zone,

said process comprising:

determining only the friction effect of said first friction surface relative to said second friction surface, said determining including separately monitoring the friction effect of each of said first and second friction surfaces, and

generating a signal when said at least a part of the length of said second friction surface has a friction effect outside the range of 5% to 25% greater than a friction effect of said first friction surface.

4,785,619

APPARATUS FOR PRODUCING A STAPLE FIBER YARN

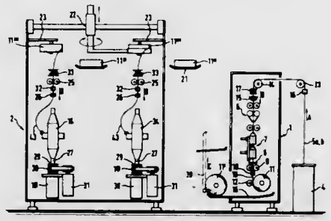
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Feb. 12, 1988, Ser. No. 155,284

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704344; Apr. 29, 1987, 3714214

Int. Cl.[4] D01H 9/18, 1/00, 5/28; D02G 3/22

U.S. Cl. 57—313 17 Claims



1. A compound machine arrangement for producing a staple fiber yarn that is prespun on an air spinning machine segment, the spinning units of which air spinning machine segment each containing a drafting frame, a pneumatic false-twisting nozzle, a withdrawal device and a wind-up device for winding up a spool with prespun yarn, said prespun yarn being subsequently finish-spun on a finish spinning machine segment having spinning units of which each contains at least one spool receiving device and a ring spindle, wherein the air spinning machine segment and the ring spinning machine segment are connected via a conveying device for spools receiving the prespun yarn to form a compound machine system, wherein the ring spinning machine segment and the air spinning segment each have a different number of spinning units (a,b) that are operatively coordinated with one another to produce the staple fiber yarn.

4,785,620

BEARING AND DRIVE FOR A SPINNING ROTOR

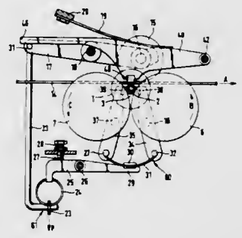
Wolfgang Feuchter, Deggingen-Reichenbach, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,688

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709576

Int. Cl.[4] D01H 1/241, 1/135, 7/885, 7/22

U.S. Cl. 57—406 17 Claims



1. Bearing and driving unit for a spinning rotor of an open-end spinning unit comprising:

at least one spinning rotor unit having a rotor and a rotor shaft attached to said rotor;

braking means for braking said rotor shaft when applied to said rotor shaft with a controlled contact force;

cleaning means for cleaning said rotor shaft when applied to said rotor shaft with a controlled contact force; and

actuating means for activating and deactivating said braking means and said cleaning means to activated and deactivated positions, said cleaning means contact force control being independent of said braking means contact force control.

4,785,621

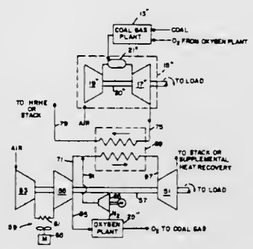
AIR BOTTOMING CYCLE FOR COAL GASIFICATION PLANT

Edgar D. Alderson, Ballston Spa, N.Y., and William M. Farrell, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 28, 1987, Ser. No. 55,213

Int. Cl.[4] F02C 3/28

U.S. Cl. 60—39.12 11 Claims



1. An air bottoming cycle for a coal gasification plant wherein the coal gasification plant includes an oxygen plant for converting pressurized air into oxygen and nitrogen, the oxygen being used in the coal gasification plant: the air bottoming cycle comprising:

at least one air bottoming cycle first compressor;

an air turbine connected to drive the first compressor;

a heat exchanger connected between the first compressor and the air turbine: the heat exchanger for counterflowing the compressor discharge air against a heat source whereby a hot motive fluid is produced for driving the air turbine;

an air bleed line for transferring a portion of the first compressor discharge air to the oxygen plant; and,

a return line for injecting nitrogen from the oxygen plant into the first compressor discharge air.

4,785,622

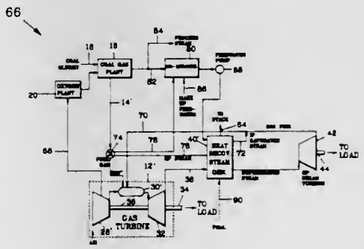
INTEGRATED COAL GASIFICATION PLANT AND COMBINED CYCLE SYSTEM WITH AIR BLEED AND STEAM INJECTION

Donald R. Plumley, Scotia, and Ashok K. Anand, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 677,375, Dec. 3, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 854,370

Int. Cl.[4] F02B 43/00; F02G 3/00

U.S. Cl. 60—39.12 3 Claims



1. An improved integrated coal gas and combined cycle plant including;

a coal gas plant for producing gaseous fuel; an oxygen plant for supplying oxygen to said coal gas plant, a gas turbine plant producing a hot exhaust gas, a heat recovery steam generator receiving said hot exhaust gas and for producing a steam output, a non-condensing steam turbine for receiving said steam generator output; and, wherein the improvement comprises;

means for a portion of the gas turbine plant compressed air to the oxygen plant;

means for delivering substantially all of the steam turbine exhaust to the gas turbine plant combustor whereby the mass flow rate through the gas turbine plant remains substantially constant; and,

a high pressure steam tap from said heat recovery steam generator to a gaseous fuel preheater whereby substantially all of the high pressure steam is converted back to feedwater.

4,785,623

COMBUSTOR SEAL AND SUPPORT

Harold G. Reynolds, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1987, Ser. No. 131,056

Int. Cl.[4] F02C 3/14, 7/20

U.S. Cl. 60—39.32 5 Claims

1. In a gas turbine engine an apparatus for supporting a combustor liner having gas flow therethrough;

a combustor liner forming an annular combustor space;

an outwardly extending circumferential flange located on said- combustor liner adjacent to the downstream end of said liner;

a diffuser case concentrically surrounding said liner;

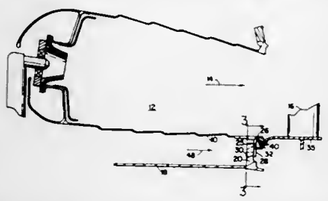
a plurality of inwardly extending diffuser lugs mounted on said diffuser case;

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a plurality of outwardly extending liner lugs mounted on said flange and sliding engaging said diffuser lugs along circumferentially facing and downstream facing radial surfaces;

a vane platform located coaxial with and downstream of said combustor liner and having an upstream edge;

a seal ring surrounding and in axially sliding contact with said combustor liner downstream of said flange;



said seal ring being U-shaped in cross section and being a resilient inwardly biased split ring;

said seal ring having a radial sealing surface in abutable contact with said upstream edge of said diffuser case and;

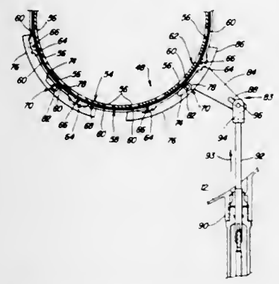
axial biasing means urging said seal ring into sealing contact with said upstream edge of said vane platform.

4,785,624

TURBINE ENGINE BLADE VARIABLE COOLING MEANS

Raymond Smith, Monclova; Quentin Z. Peregoy, Toledo, and George E. Richardson, Sylvania, all of Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jun. 30, 1987, Ser. No. 68,131
Int. Cl.⁴ F02C *7/12*
U.S. Cl. 60—39.75 **16 Claims**



1. In a turbine engine having a housing containing a compressor, a combustion chamber located downstream of said compressor, a turbine rotor positioned downstream of said combustion chamber, passage means for directing a flow of cooling air from said compressor and to the vicinity of said combustion chamber and said rotor, and means rotatably mounting said rotor in said housing so as to define a turbine axis; an apparatus for variably moderating said flow of cooling air, comprising:

means disposed in said passage means for variably obstructing said passage means; and

means for actuating said obstructing means in response to an engine operating condition;

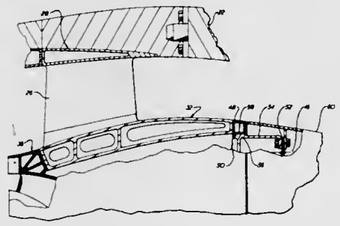
wherein said obstructing means comprises an annular shell of fixed dimension disposed about said turbine axis and having a plurality of radial shell apertures disposed in said passage means, an annular sleeve of fixed dimension disposed about said turbine axis and having a matching plurality of radial sleeve apertures disposed in said passage means, and means permitting relative movement of one of said sleeve and shell with respect to the other of said shell and sleeve so as to allow variable registration of said shell and sleeve apertures at positions between a completely closed position yielding a substantially zero rate of said flow in said passage means, and a fully open position yielding a maximal rate of said flow in said passage means.

4,785,625

DUCTED FAN GAS TURBINE POWER PLANT MOUNTING

Howard Y. Stryker, Glastonbury, Conn., and Thomas Steel, Derby, England, assignors to United Technologies Corporation, Hartford, Conn. and Rolls Royce, London, England

Filed Apr. 3, 1987, Ser. No. 35,815
Int. Cl.⁴ F02K *3/04;* **F02C** *7/20*
U.S. Cl. 60—226.1 **6 Claims**



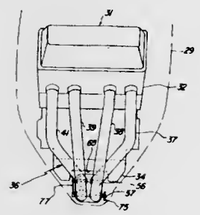
1. A ducted fan gas turbine powerlant including a unitary structure comprising a plurality of mounting struts affixed by their radially inner ends to an annular strengthened outer casing portion of a core gas generator of the powerplant in peripheral alignment thereon and extending radially across the fan duct, a box structure which incorporates the radially outer ends of the struts and is fastened to aircraft structure so as to transmit powerplant loads via said struts to said aircraft structure and wherein the improvement comprises an annular portion of the strengthened outer casing which extends downstream of the struts, an annular portion at the downstream end of said extension and which has a radially inner plain bearing surface, a cyliodrical member affixed to the core gas generator and extending towards said downstream annular portion and having an end portion which includes a radially outer plain bearing surface which nests within said downstream annular portion in close axial sliding relationship therewith.

4,785,626

EXHAUST GAS CONTROL MEANS FOR MOTORCYCLE AND THE LIKE

Shinji Shiraishi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 26, 1987, Ser. No. 113,539
Claims priority, application Japan, Oct. 27, 1986, 61-253640; Oct. 27, 1986, 61-253641; Oct. 27, 1986, 61-253642
Int. Cl.⁴ F02B *27/02*
U.S. Cl. 60—313 **30 Claims**



1. In an internal combustion engine comprised of a crankcase defined of a crankcase housing, a plurality of exhaust ports

formed in a side of said engine, a plurality of exhaust pipes extending from said exhaust ports downwardly and passing beneath said crankcase housing, valve means in said exhaust pipes for controlling the flow therethrough, said valve means lying beneath said crankcase housing, and a recess formed in said crankcase housing through which at least a portion of said valve means in said exhaust pipes pass.

4,785,627

DRIVE DEVICE

Mohammed Y. Al-Jaroudi, Stockholm, Sweden, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1987, Ser. No. 123,676
Claims priority, application Sweden, Feb. 13, 1987, 8700599
Int. Cl.⁴ F03G *7/06*
U.S. Cl. 60—527 **3 Claims**



1. A generator/fan assembly for use in a thermobile engine comprising, in combination,

first and second wheels of dissimilar diameters,

a loop assembly comprising a shape memory alloy wire loop coupling said first and second wheels in a pulley configuration whereby motion of either said wheel will produce rotation of said loop assembly,

said shape memory allow having a transition temperature above which it assumes a rigidity and predetermined configuration and below which it returns to a preset configuration,

a heating medium for raising the temperature of a segment of said loop above said transition temperature, the deformation of said shape memory alloy and motion of said loop causing the rotation of said first and second wheels, and

means for cooling said segment of said loop below its transition temperature as it moves beyond said heating medium to cause said segment to return to its preset configuration,

said cooling means comprising a blade assembly coupled to the shaft of said second wheel which functions as a fan to cool the segments of said loop below said transition temperature.

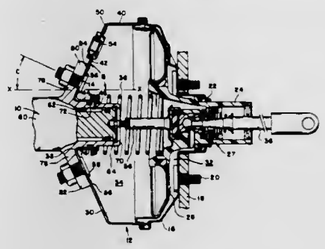
4,785,628

MASTER CYLINDER AND VACUUM BRAKE BOOSTER

Lawrence R. Myers, South Bend, Ind., assignor to Allied-Signal, Inc., Morristown, N.J.

Filed Mar. 27, 1984, Ser. No. 593,787
Int. Cl.⁴ B60T *13/00*
U.S. Cl. 60—547.1 **4 Claims**

1. A master cylinder and vacuum brake booster wherein a rear shell for the booster is disposed adjacent a vehicle fire wall and a front shell for the booster is adapted carry the master cylinder, the booster including a diaphragm which is pressure responsive to generate an input force to assist operation of the master cylinder during braking, the master cylinder including a flange adjacent the front shell and cooperating with a bolt or the like to secure the master cylinder to the front shell so that reaction forces opposing the input force are transmitted from the master cylinder to the front shell, characterized in that said front shell extends from a radial inner portion to an axially-extending radial outer portion to define a substantially unidirectional and substantially frusto-conical uniform profile from said inner portion to said outer portion, said master cylinder flange including a substantially tapered surface matching said profile and said bolt defining a longitudinal axis which intersects a longitudinal axis for said master cylinder and vacuum



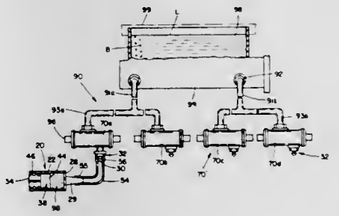
brake booster when said bolt secures said master cylinder to said front shell so that said front shell uniformly distributes the reaction forces over said front shell during braking.

4,785,629

SYRINGE-DISPENSED BRAKE FLUID FOR FILLING AND PURGING MASTER CYLINDER CIRCUIT FROM SLAVE

James F. Ennis, III, Rte. 2, RFD #5, Preston, Conn. 06360, and Joseph L. Caisse, 48 Hunters Ave., Taftsville, Conn. 06380

Filed Jun. 4, 1987, Ser. No. 58,154
Int. Cl.⁴ F15B *7/10;* **B60T** *11/30*
U.S. Cl. 60—584 **14 Claims**



1. In a hydraulic fluid system comprising a master cylinder, a servo cylinder located at a lower elevation than the master cylinder, a hydraulic line connecting the master cylinder and the servo cylinder to conduct hydraulic fluid between the cylinders, and an adjustable bleed nipple at said servo cylinder, said nipple having a normally closed passage opening into said servo cylinder when said nipple is opened, the method of removing air from hydraulic fluid in the hydraulic system, comprising the steps of:

opening said master cylinder to ambient air;

providing a syringe;

filling said syringe with hydraulic fluid;

opening said nipple;

placing said syringe in direct communication and sealing relationship with said nipple and said passage and the interior of said servo cylinder;

pressure feeding said fluid from said syringe directly through said passage, said servo cylinder and said hydraulic line to said master cylinder; and

allowing bubbles of air entrapped in said fluid to rise in said master cylinder and to disperse thereat into ambient air.

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4,785,630

ARRANGEMENT FOR THE CONTROL OF THE CHARGING PRESSURE OF AN EXHAUST GAS TURBOCHARGER

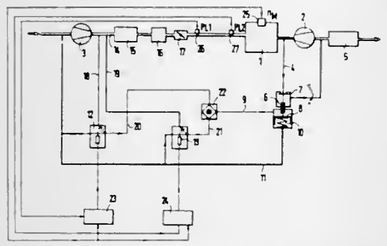
Heinz Dorsch, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 66,535

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621641

Int. Cl.⁴ F02B *37/12*

U.S. Cl. 60—602 **11 Claims**



1. An arrangement for the regulation of the charging pressure of an exhaust gas turbocharger of an internal combustion engine in which the exhaust gas turbocharger includes a turbine and a compressor, comprising further means for selectively conducting exhaust gas flow coming from the internal combustion engine either to the turbine or by way of a by-pass line means having a by-pass valve means around the turbine into an exhaust gas system, electro-magnetic timing valve means, the by-pass valve means being acted upon with a control pressure by said electro-magnetic timing valve means operatively connected to the pressure side and the suction side of the compressor, a control apparatus means for varying a cyclic duration of the electro-magnetic timing valve as a function of the deviation of a measured charging pressure from a desired charging pressure stored in the control apparatus means, and further control means including two control line means each connected to said electro-magnetic timing valve means and the pressure side of the compressor and actuated by a control apparatus means, a control pressure line which is operable to be activated by the electro-magnetic timing valve means for the control of the by-pass valve means, and wherein one control line means is responsive to a higher charging pressure level than the other control line means.

4,785,631

WASTE-HEAT TURBINE UNIT

Helmut Striebich, Karlsruhe, Fed. Rep. of Germany, assignor to Dr. Ing. H.c.f. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,755

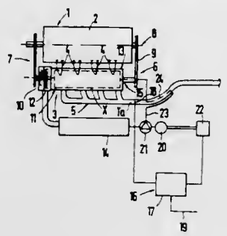
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629494

Int. Cl.⁴ F02B *41/10;* **F02G** *5/02*

U.S. Cl. 60—618 **20 Claims**

1. In a drive unit including an internal combustion engine and a waste heat turbine unit operated by the exhaust gases of the internal combustion engine for utilizing the energy from the exhaust gases,

the waste heat turbine unit comprising a rotatable cylinder member having an exterior and a hollow interior, blading exposed to the exhaust gases and carried on the exterior of the cylinder member, a steam turbine unit, and means for supplying a liquid medium, convertible into steam, to the interior of the cylinder member, the medium being expandable in the steam turbine unit for generating power, wherein the blading extends spirally at the circumference



of the cylinder member and extends over at least a substantial portion of the length of the cylinder member.

4,785,632

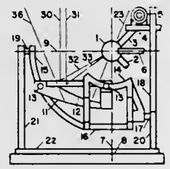
SOLAR ENERGY CONCENTRATOR

Howard D. Brown, Rte. 9, Box 190A, Hagerstown, Md. 21740

Continuation of Ser. No. 548,030, Nov. 2, 1983, abandoned, which is a continuation of Ser. No. 366,998, Apr. 9, 1982, abandoned, which is a continuation of Ser. No. 20,453, Mar. 14, 1979, abandoned, which is a continuation of Ser. No. 803,864, Jun. 6, 1977, abandoned. This application Feb. 19, 1985, Ser. No. 702,508

Int. Cl.⁴ F03G *7/02*

U.S. Cl. 60—641.15 **4 Claims**



1. An improvement in a solar energy concentrator which includes

a generally spherical boiler chamber containing a volatile fluid,

a turbine operatively connected to said boiler chamber,

a stationary power plant structure including cantilever members which support said chamber and said turbine in respectively fixed positions,

a reflector including a frame and a reflecting surface which has both a paraboloidal axis and a focal point, said reflector being positioned so that said point coincides substantially with the center point of said chamber, so that said surface is oriented to face the sun and so that said axis is aligned with said center point and the sun when said surface is so oriented, and

first and second motive means suitable for imparting motions to said reflector; wherein the improvement comprises:

a base having a variable configuration and comprising an upper surface which forms with level ground an angle substantially equal to the latitude of the site of said base, the higher side of said base, when occurring, being oriented toward the nearer pole of the earth, whereby said upper surface lies in a plane substantially parallel to the polar axis of the earth at any latitude of said site, said base being related to said boiler chamber by a boiler axis which passes through said center point substantially perpendicular to said upper surface, and said base supporting on said upper surface

a revolving mechanism comprising an arcuate track and a track support, a pivot and a pivot support, and a first plurality of rollers engaged with said track, said track and said pivot being centered on a fixed axis which lies substantially in the plane of the meridian of said site and passes substantially through said center point substantially perpendicular to said boiler axis, said fixed axis thereby being substantially parallel to said upper surface and to said polar axis at any latitude of said site, said mechanism movably supporting by means of said pivot and said rollers

an oscillating mechanism comprising a frame to which said pivot and said rollers are attached, a plurality of arcuate tracks connected to said frame, and a second plurality of rollers engaged with said tracks, said tracks being centered on a movable axis which passes substantially through said center point substantially perpendicular to said fixed axis, said movable axis thus having rotary motion about said fixed axis in a plane which is substantially parallel to the equatorial plane of the earth at any latitude of said site, and said oscillating mechanism movably supporting said reflector by means of said second plurality of rollers, which are attached to said reflector frame, whereby

said oscillating mechanism in combination with said first motive means imparts to said reflector an annual oscillatory motion about said movable axis, said motion being substantially counter to the seasonal variation in the inclination of said polar axis with respect to the sun, thereby causing said reflecting surface to incline generally northward when the north pole of the earth is inclined toward the sun and generally southward when said pole is inclined away from the sun, with substantially no inclination at the time of an equinox, while

said revolving mechanism in combination with said second motive means imparts to said oscillating mechanism and therewith to said reflector a continuous, diurnal revolutionary motion through a substantially semicircular arc about said fixed axis, said motion being substantially counter to the rotation of the earth, thereby causing said reflecting surface to face generally eastward in a horizontal direction at sunrise, generally upward in a direction in the plane of the meridian at noon and generally westward in a horizontal direction at sunset, the combination of said mechanisms and said first and second motive means thus forming

a carriage which, being supported on said upper surface of said base, movably supports said reflector and imparts to it the simultaneous combination of said motions, the resultant of which is a compound motion of said reflecting surface about said center point, said compound motion being substantially counter to the apparent motion of the sun during the interval between sunrise and sunset on each day of the year; and there is thus included

a coacting combination of said base and a single configuration of said carriage which causes a single configuration of said reflector to follow the sun at any latitude of said site and thereby to concentrate terrestrially received solar energy on said chamber continuously throughout the time from sunrise to sunset on every day of the year at any suitable site in the torrid and temperature zones of the earth.

4,785,633

SOLAR EVAPORATOR

Roelf J. Meijer, and Benjamin Ziph, Ann Arbor, both of Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

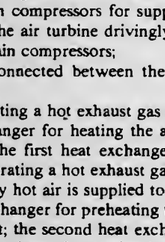
Filed Mar. 10, 1988, Ser. No. 166,322

Int. Cl.⁴ F02G *1/04;* **F03G** *7/02*

U.S. Cl. 60—641.15 **6 Claims**

1. A solar evaporator for a thermal engine, said evaporator comprising a hollow body member having a dish shape wall which receives solar rays for powering the engine, wall means dividing the interior of said body into at least a pair of side by side chambers,

wick means adapted to transport vaporizable fluid, some of said wick means being disposed within said chambers and in heat exchange relation with said dish shape wall for transporting fluid therein; and



other of said wick means in heat exchange relation with said side by side chambers for transferring heat between said chambers so as to maintain the temperatures therein substantially equal when the solar heat received directly by said chambers is unequal.

4,785,634

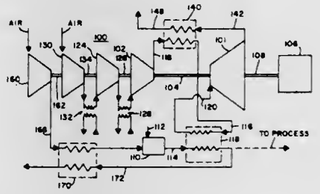
AIR TURBINE CYCLE

Edgar D. Alderson, Ballston Spa, N.Y., and William M. Farrell, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 28, 1987, Ser. No. 55,398

Int. Cl.⁴ F02C *1/04*

U.S. Cl. 60—682 **1 Claim**



1. An air turbine cycle comprising:

an air turbine having an inlet and an exhaust;

at least two main compressors for supplying air to the air turbine inlet; the air turbine drivingly connected, in tandem, to the main compressors;

an intercooler connected between the at least two main compressors;

means for generating a hot exhaust gas stream;

a first heat exchanger for heating the air supply to the air turbine inlet; the first heat exchanger connected to the means for generating a hot exhaust gas stream and the air supply whereby hot air is supplied to the air turbine;

a second heat exchanger for preheating the air supply to the air turbine inlet; the second heat exchanger connected to the air turbine exhaust for passing hot turbine exhaust in heat exchange relationship with the air supply;

a third heat exchanger for preheating a second air supply connected to the means for generating a hot exhaust gas stream; the third heat exchanger connected to the hot exhaust gas outlet of the first heat exchanger; and,

a boost compressor for supplying the second air supply connected to the means for generating a hot exhaust gas

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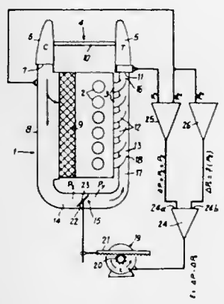
stream; the air turbine drivingly connected to the boost compressor and the main air compressors.

4,785,635

SUPERCHARGED INTERNAL COMBUSTION ENGINES

Jean F. Melchior, and Thierry M. Andre, both of Paris, France, assignors to Etat Francais, France

Filed Jul. 17, 1986, Ser. No. 887,143
Claims priority, application France, Jul. 18, 1985, 85 11009
Int. Cl.[4] F02B *37/00*
U.S. Cl. 60—606 **18 Claims**



1. In an internal combustion engine comprising variable-volume work chambers each provided with at least one air inlet and at least one exhaust gas outlet, a turbocompressor unit for supercharging the engine and comprising at least one compressor having an air inlet and an air outlet and at least one turbine connected to mechanically drive the compressor and having a gas inlet and a gas outlet, each of said air inlets of the work chambers communicating with the air outlet of the compressor, at least one exhaust gas manifold connected to the gas inlet of the turbine, exhaust gas pipes respectively connecting the exhaust gas outlets to the exhaust gas manifold, a junction being provided between each exhaust gas pipe and the exhaust gas manifold, said engine further comprising a bypass pipe which connects the air outlet of the compressor to the gas inlet of the turbine by bypassing the work chambers, throttling means inserted in the bypass pipe and defining a passage of variable section so adapted as to produce such pressure drop that a resulting pressure difference between the air outlet of the compressor and the gas inlet of the turbine substantially only depends on the value of the pressure prevailing in the air outlet of the compressor; the improvements comprising in combination:

a. said work chambers, said exhaust gas outlets, said exhaust gas pipes and said exhaust gas manifold being constructed and arranged to cooperate, with respect to exhaust gas flow orientation and velocity in said manifold, with the cross-sectional area of said exhaust gas manifold, which is a substantially constant section and sufficiently small such that, at any rated running speed of and load on the engine, the velocity of the flow of the gases in the manifold, directly downstream of the last junction between the exhaust pipes and the manifold, relative to the direction of flow of the gases in the manifold, is equal to at least the Mach number 0.3;

b. the junction between the bypass pipe and the gas inlet of the turbine is located downstream of the throttling means and upstream of the first junction between said manifold with said exhaust pipes, relative to the direction of flow of the gases coming from the work chambers and traveling through the exhaust gas manifold toward the turbine inlet;

c. said throttling means are so adapted that the sum of forces due to a pressure drop which they produce and which is applied to said throttling means, is compensated by a balancing force such that the resultant of these forces is substantially nil; and

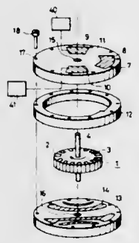
d a control means operably connected to said throttling means and including pressure sensing means operably coupled to said compressor outlet and said turbine inlet for directly sensing the pressure prevailing at said outlet and inlet such that said control means is responsive to a first parameter of operation of the engine related in a bi-univocal manner to the total pressure prevailing directly in the outlet of the compressor and to a second parameter of operation of the engine related in a bi-univocal manner to the total pressure prevailing directly upstream of the turbine, said control means being so adapted that it tends to close said throttling means when said two total pressures tend to approach each other and reciprocally tends to open said throttling means when said total pressures tend to depart from each other and that the difference between said total pressures substantially depends only on the total pressure prevailing in the outlet of the compressor and varies in the same direction as the last-mentioned total pressure.

4,785,636

MAGNETIC REFRIGERATOR AND REFRIGERATION METHOD

Yoshinori Hakuraku, and Hideaki Mori, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 9, 1987, Ser. No. 71,346
Claims priority, application Japan, Jul. 11, 1986, 61-161873
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **11 Claims**



1. In a magnetic refrigerator having a working substance for magnetic refrigeration which generates heat isothermally as a magnetic field is supplied thereto and which absorbs heat isothermally as a magnetic field is released therefrom,

heat exchange means for radiating heat to outside when the working substance generates the heat isothermally and for absorbing heat from the outside when the working substance absorbs heat isothermally;

means for producing a varying magnetic field that is applied to the working substance to produce a magnetic refrigeration cycle; and

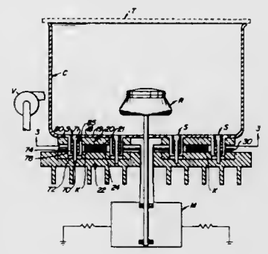
heat transport means made of an anisotropic thermal conductor for establishing a heat path between an isofield stage of high magnetic field and an isofield stage of low magnetic field, or between an iosmagnetization stage of high magnetization and an isomagnetization stage of low magnetization in the two isofield stages or two isomagnetization stages of the magnetic refrigeration cycle.

4,785,637

THERMOELECTRIC COOLING DESIGN

Robert Giebeler, Cupertino, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed May 22, 1987, Ser. No. 53,190
Int. Cl.[4] B04B *15/02*; F25B *21/02*
U.S. Cl. 62—3 **3 Claims**



1. A thermoelectrically cooled can for a centrifuge comprising in combination:

a thermal conductive can having flexible walls;

at least one can heat sink for placement to the walls of said can, said can heat sink attached at a first side to said can to form a unitary and locally rigid structure with said can at the point of attachment and having a flat surface for contact with a thermoelectric cooler on a second side:

at least one thermoelectric cooler having a first heat receiving side communicated to said second side of said can heat sink and having a heat discharge side for passing heat energy away from said can:

a second discharge heat sink communicated to each said thermoelectric cooler at said heat discharge side for dissipating the heat energy from said can and the heat energy from said thermoelectric cooler: and.

means for urging said second discharge heat sink over said thermoelectric cooler towards said can heat sink, said means comprising at least first and second spring bias connectors fastened at one end to said can heat sink and attached to said second discharge heat sink at the other end whereby said spring bias connectors trap said thermoelectric cooler in firm engagement with said can heat sink and said discharge heat sink to discharge heat energy.

4,785,638

REFRIGERANT FLUID TRAP FOR VACUUM EVAPORATORS FOR THE DEPOSIT OF THIN METAL FILMS

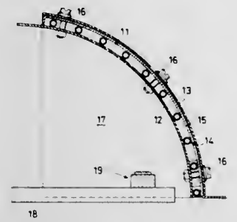
Orazio Viscuso, Catania, Italy, assignor to SGS-Thompson Microelectronics S.p.A., Catania, Italy

Filed Jul. 10, 1987, Ser. No. 71,909
Claims priority, application Italy, Aug. 6, 1986, 21421 A/86
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **3 Claims**

1. A refrigerant fluid trap for a vacuum evaporator for depositing a thin film onto a substrate, comprising:

a U-shaped structure including a base and two laterally-spaced limbs each having a free end and an end joined with a respective end of the base, whereby a trapping space is defined laterally intermediate said limbs of said U-shaped structure;

means defining an internal duct in said U-shaped structure, including an inlet, an outlet, and respective portions extending on said base and said limbs whereby, as refrigerant fluid is circulated in said internal duct, said trapping space functions as a cold chamber; and



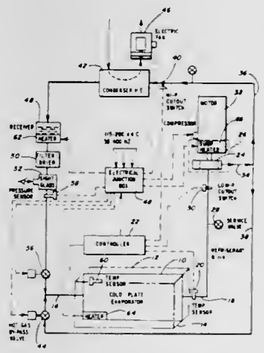
an evaporation source for a metal to be deposited on a substrate, said evaporation source being disposed in said trapping space.

4,785,639

COOLING SYSTEM FOR OPERATION IN LOW TEMPERATURE ENVIRONMENTS

Guido Biagini, Cherry Valley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 864,870, May 20, 1986, abandoned.
This application Apr. 4, 1988, Ser. No. 178,874
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—132 **5 Claims**



1. A cooling system subject to operation in low temperature environments comprising:

a load to be cooled;

an evaporator in heat transfer relation to said load and having an inlet and an outlet;

a compressor connected to said outlet for receiving vaporized refrigerant and compressing the same;

a condenser for receiving compressed vaporized refrigerant from said compressor and condensing the same;

a receiver for receiving condensed refrigerant from said condenser;

an expansion valve interconnecting said receiver and said inlet;

a first heater in said evaporator for vaporizing refrigerant in said evaporator to thereby generate a pressure within said system to facilitate operation thereof; and

a second heater in said receiver for vaporizing refrigerant therein to generate a pressure sufficient to enable said system to initiate operation.

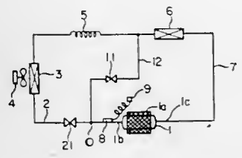
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4,785,640

FREEZING APPARATUS USING A ROTARY COMPRESSOR

Nobutaka Naruse, Toyoake, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Jun. 1, 1987, Ser. No. 59,855
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—196.4 **6 Claims**



1. In a freezing apparatus for performing a cooling operation, the apparatus having a closed loop freezing circuit through which refrigerant circulates in a refrigerant flow direction,

the circuit including, in the following sequence with respect to said flow direction, a compressor operable for circulating the refrigerant in said flow direction to initiate said cooling operation, a refrigerant outlet of the compressor from which the refrigerant flows from the compressor, a condenser, an expansion means, an evaporator and a refrigerant inlet of the compressor through which the refrigerant flows to the compressor, the improvement comprising:

temperature elevation means for causing the temperature of the compressor to rise during the initiation of the cooling operation when the temperature of the refrigerant in the circuit prior to initiation of the cooling operation is below a predetermined value, said value being one at which the refrigerant is unsatisfactory in facilitating the cooling operation, to raise the temperature of the refrigerant during the initiation of the cooling operation to one above said predetermined value that is satisfactory to facilitate the cooling operation,

said temperature elevation means comprising a bypass conduit connected at one end thereof to the freezing circuit between said refrigerant inlet of the compressor and said condenser and at the other end thereof to the freezing circuit between said expansion means and said evaporator, first valve means disposed in said bypass conduit and movable between a first position at which said bypass conduit is open and a second position at which said bypass conduit is closed, sensor means disposed at the outlet side of said compressor for sensing one of the pressure and the temperature of the refrigerant in the freezing circuit at the initiation of the cooling operation, and control means operatively connected between said sensor means and said first valve means for moving said first valve means from said second position to said first position when the value sensed by said sensor means during the initiation of the cooling operation is indicative that the temperature of the refrigerant is below said predetermined value thereby allowing the refrigerant circulated by the compressor to bypass said condenser and said expansion means.

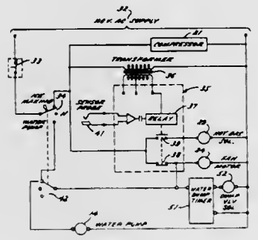
4,785,641

DRAIN VALVE CONTROL FOR ICE CUBE MACHINE

Gregory S. McDougal, Two Rivers, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Aug. 19, 1987, Ser. No. 86,854
Int. Cl.[4] F25C *1/04*
U.S. Cl. 62—233 **5 Claims**

1. In an ice making machine having separate ice making and ice harvesting cycles and having an evaporator and an ice mold, a water circulation system comprising a pump for circulating water over the mold during the ice making cycle, a reservoir for supplying water to the pump and for holding water which has flowed over the mold and fresh water that is added to the system, a circuit for stopping the pump at the end of the ice making cycle to preclude water from circulating over the mold and to initiate the ice harvesting cycle, a circuit for starting the pump at the end of the ice harvesting cycle to initiate the next ice making cycle, and means including a dump



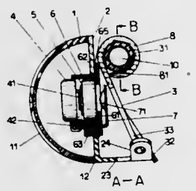
valve and a circuit for purging the reservoir of water that has flowed over the mold and for diverting the flow of water from the mold during the ice making cycle, the circuit including a timing device for opening the dump valve at the start of the ice making cycle so that the ice making cycle starts with a period for purging the reservoir of water that has flowed over the mold and for cooling the mold before fresh water is circulated thereover.

4,785,642

DECORATIVE CLIP WITH PERFUME DISPENSER

Yu-Mei Chin, Taoyuan Hsien, and Ming-Chi Huang, Taipei, both of Taiwan, assignors to Eric Chiao Shih, Pasadena, Calif.

Filed Jan. 13, 1987, Ser. No. 2,879
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—1.1 **19 Claims**



19. A decorative clip for use as an article of jewelry, comprising:

a decorative housing;

a light emitting device, with first and second terminals, disposed behind said decorative housing;

a fixed sheet substantially corresponding to the shape of and in contact with the back of said decorative housing, said fixed sheet containing a planar portion with a central opening including a notch in one side and an extension sheet substantially perpendicular to said planar portion, said extension sheet forming symmetrically disposed protruding sheets, wherein each of said protruding sheets contains a small hole;

a cell with first and second terminals;

a cell housing holding said cell and fitting through said central opening of said fixed sheet such that said first terminal of said cell contacts said first terminal of said light emitting device, wherein said cell housing comprises a cylindrical member with an inner and an outer protruding edge at one end, said inner protruding edge supporting said cell and said outer protruding edge preventing said cell housing from passing completely through said central opening; and a protruding block on said outer protruding edge, said protruding block containing a rectangular hole parallel to the axis of said cylindrical member, wherein said protruding block fits into said notch in said central opening to fix the position of the cell housing such that said cell housing cannot rotate in the plane of said fixed sheet;

an L-shaped conductive spring sheet with first and second en portions, said first end portion of said conductive spring sheet passing through said rectangular hole in said protruding block and connecting to said second terminal of said light emitting device, said second end portion of said conductive spring sheet containing a convex portion displaced by a small distance from said second terminal of said cell, wherein current flows through said light emitting device when said convex portion is brought into contact with said second terminal of said cell, said contact occurring when said decorative clip is being used;

a clamping sheet with first and second end portions, said first end portion of said clamping sheet comprising symmetrically disposed L-shaped prongs which fit into said small holes in said protruding sheets such that said clamping means rotates in a plane substantially perpendicular to said planar portion of said fixed sheet, said first end of said clamping sheet further comprising a straight spring sheet which applies a recoiling force to said clamping sheet when said clamping sheet is moved away from said fixed sheet, wherein said second end portion of said clamping sheet forms a cylindrical cavity; and

a fragrance dispenser disposed within said cylindrical cavity comprising a cylinder which fits into said cylindrical cavity; a cylinder cap made of a flexible material, said cylinder cap containing a small hole; and an absorbing means, said absorbing means filled with a fragrance and placed inside said cylinder and covered by said cylinder cap such that said fragrance escapes through said small hole in said cylinder cap.

4,785,643

BASKET ACCESS FOR AUTOMATIC WASHER

Kurt Werner, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 8, 1986, Ser. No. 939,150
Int. Cl.[4] D06F *37/24*
U.S. Cl. 68—3 R **30 Claims**



1. In an automatic washer comprising a cabinet, a tub within said cabinet, a basket rotatably mounted in the tub for receiving wash and an agitator in said basket for agitating said wash, a lid in an upper surface of said cabinet above said basket and having a horizontal axis of rotation, and drive means for rotating selectively said agitator and said basket, an apparatus for tilting said tub upon opening of said lid by a user to provide improved access to said basket, comprising:

means for resiliently mounting said tub on a support surface within said cabinet; and

a coupling means including a cable, means for securing one end of said cable to said lid and an opposite end of said cable to said tub and means for maintaining said cable in tension,

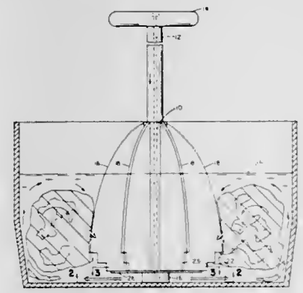
said coupling means tilting said tub on said resilient mounting means in response to an opening of said lid.

4,785,644

CLOTHES WASHING MACHINE AND THE LIKE

Richard R. Walton, Ten West Hill Pl., Boston, Mass. 02114; Robert W. Young, Locust Valley, N.Y., and George E. Munchbach, Roslindale, Mass., assignors to Richard R. Walton, Boston, Mass.

Filed Nov. 18, 1986, Ser. No. 932,038
Int. Cl.[4] S06F *15/00*
U.S. Cl. 68—122 **31 Claims**



1. A clothes washer of the type that is reciprocated vertically toward and away from the bottom of a container of washing water,

said washer having, for action during its downwardly stroke,

an array of tucking points about the washer for tucking downwardly articles of clothes that lie about the washer,

and a water displacement device for creating an outward flow of washing water against the clothes at the lower part of the washer,

said tucking points and water displacement device cooperating to cause a turning movement of the articles of clothes,

wherein said water displacement device comprises:

a peripherally unconfined washing water-propelling diaphragm means positioned near the bottom of said washer, mounted to have an extended orientation during downward stroke for displacing washing water and a relatively collapsed orientation during upward stroke for enabling relatively free passage of said washer up through the water,

said diaphragm means mounted to permit its close approach to the bottom of said container during the final portion of its downward stroke,

and a volume-outlining, clothes-restraining open upper structure extending upwardly from said diaphragm means so that at least a part of said open structure lies above the normal liquid level when said washer is in its lowest position,

during said downward stroke, said open structure, in following behind said diaphragm means, being effective to restrain articles of clothes from moving inwardly over said diaphragm means while allowing washing water to move inwardly through the clothes and through said open structure to fill in behind the downwardly moving diaphragm

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means, said volume-outlining, clothes restraining open structure at its periphery, having at least 80% open area whereby liquid can freely flow through substantially all of the exposed surface of articles of clothes restrained by said open structure during said downward stroke,

said unconfined diaphragm means, as it closely approaches the bottom of said container during downward stroke of said washer, being capable of applying an effective outward clothes-washing jet of liquid from between the diaphragm means and the bottom surface of said container to prevent tangle of the downwardly tucked clothes,

and said open structure and diaphragm means being free to move in upward stroke with relatively low resistance,

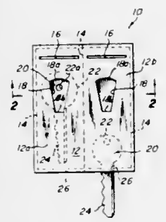
whereby an effective washing action is achieved with a simple washer construction.

4,785,645

KEY RETAINER

Donald F. Dengel, 190 East Division St., Fond du Lac, Wis. 54935

Filed Jun. 15, 1987, Ser. No. 61,532
Int. Cl.⁴ A47G *29/10*
U.S. Cl. 70—456 R **10 Claims**



1. A key retainer, particularly having the facility for manually manipulating keys for stored inoperative positions to partially stored operative positions, comprising:

a first planar member having a first edge and a second edge, said second edge opposing and parallel to said first edge;

a second planar member opposing said first planar ember and having substantially identical size and configuration to that of said first planar member;

joining means, at least along said first and second edges, for joining said first planar member to said second planar member;

key storing means, defined between said first and second planar members and between said first and second edges, for retaining a key positioned therein;

a key receiving slot, integral with said first planar member and positioned parallel and proximate to said first edge, for inserting said key into said key storing means;

an opening, located in one of said first or second edges and defined between said first planar member and said second planar member, for receiving the working end of said key therethrough, said opening being in a direct longitudinal path with said key receiving slot; and

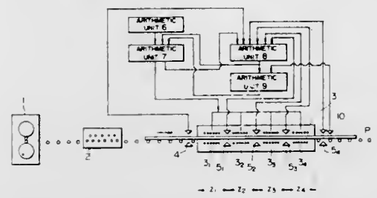
a finger-manipulating aperture, integral with said first planar member and positioned between said key receiving slot and said opening, for allowing a user to manually manipulate said key retained in said key storing means to a position of operation through said opening.

4,785,646

METHOD OF COOLING HOT-ROLLED STEEL PLATE

Hiroshi Uekaji; Kiyoshi Tanehashi, both of Oita; Masanao Yamamoto, Kimitsu; Hiroki Miyawaki, Tokyo; Harutoshi Ogai, Tokyo, and Sumitada Kakimoto, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,118
Claims priority, application Japan, Dec. 28, 1985, 60-297539
Int. Cl.⁴ B21B *37/10, 45/02*
U.S. Cl. 72—13 **13 Claims**



1. A method of cooling a hot-rolled steel plate in which, while a hot-rolled steel plate P is being advanced lengthwise, the distribution of cooling water supplied to the opposite surfaces of said steel plate P is controlled along the length and width of said steel plate P through a plurality of nozzles disposed adjacent to said opposite surfaces of said steel plate P and in the lengthwise and widthwise directions of a predetermined cooling zone provided along a passage through which said steel plate P is advanced, thereby water cooling said steel plate P to a predetermined temperature at a predetermined cooling velocity, which comprises the steps of:

detecting, at a first group of temperature measurement points which are present over the width of said steel plate P, the temperatures in a plurality of cross-sectional areas in the thicknesswise direction at predetermined lengthwise positions of said steel plate P; and further detecting temperatures at a second group of temperature measurement points which are present along said width in said cross-sectional areas, before, during and after water cooling;

calculating the temperature differences between said detected temperatures at said first and second temperature measurement points in the direction of said width and said thickness along said width, each time the detection is performed;

forecasting the extent of bending deformation in widthwise and lendthwise directions of said steel plate P after said cooling process, on the basis of said obtained temperature differences, each time the calculation is performed; and

controlling and correcting, by means of said plurality of nozzles, the distribution of the rate at which cooling water is being supplied to a steel plate and the rate at which said cooling water should be supplied to the ensuing steel plates whenever said forecasted extent of deformation exceeds an allowable range.

4,785,647

METHOD AND APPARATUS FOR SIZING RINGS

Sammy L. Coleman, 5125 Highway 16, Rapid City, S. Dak. 57701

Filed Oct. 8, 1987, Ser. No. 107,005
Int. Cl.⁴ B21B *5/00;* **B21D** *53/44*
U.S. Cl. 72—74 **12 Claims**

1. An improved ring sizer for ring having a shank portion, comprising,

a base portion having post projection therefrom;

first gear means rigidly mounted on said post;

first cylindrical roller means rigidly mounted on said post;

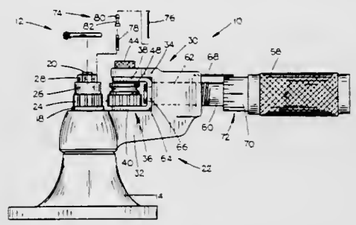
a handle assembly rotatably mounted on said post for rotation about the longitudinal axis of said post;

second gear means rotatably connected to said handle assembly and slidably mounted for radial movement relative to said post, for selective engagement with said first gear means;

second roller means connected to said second gear means for rotatable and slidable movement therewith;

rotatable handle means mounted on said handle assembly and operably connected to said second gear means for selectively, adjustably sliding said second gear means towards and away from engagement with said first gear means;

said second roller means further characterized as having an annular groove in its circumferential surface, said groove lying within a plane perpendicular to the longitudinal axis of said second roller means and having a cross-section which matches the circumferential curve of the cross-secion of the ring;



said second roller means having a highly polished groove and circumferential surface, whereby rolling of the roller on a ring's shank will not cause marring of the shank's surface; and

means for holding the shank portion of said ring in a generally horizontal plane around said first roller means in alignment with said groove in said second roller means, whereby the movement of said handle assembly about said post will cause the groove on said second roller means to engage the shank and lengthen it;

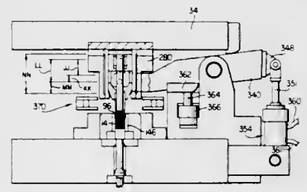
said ring holding means including a pair of generally vertical pins mounted on said handle assembly for rotation therewith, one said pin located in the nip on each side of said first and second roller means, said pins positioned to resiliently bias the shank of a ring against said first roller means during sizing thereof.

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METHOD AND APPARATUS FOR EMBOSSING THE INSIDE SURFACE OF A CUP-SHAPED ARTICLE

John D. Budrean, DeMotte, Ind., and John A. Kirkpatrick, Chicago Heights, Ill., assignors to Allied Products Corporation, Chicago, Ill.

Filed Mar. 23, 1987, Ser. No. 29,460
Int. Cl.⁴ B21D *24/00*
U.S. Cl. 72—77 **25 Claims**



1. Apparatus for embossing the inside surface of a cylinder, comprising:

an emboss die for receiving the cylinder;

an emboss punch insertable into said cylinder;

embossing means on one of said emboss die or said emboss punch for impressing a design on the cylinder;

means for positioning said emboss punch with respect to said emboss die so as to form a space therebetween defining an annular opening having an inside and outside surface, one said surface having said embossing means, said opening being somewhat smaller than the thickness of a sidewall of said cylinder;

a pressure sleeve for forcing said cylinder through said annular opening;

a first power source for moving said emboss punch downwardly so as both to carry said article into a mouth of said emboss die and to form said annular opening, and for holding said emboss punch stationary once said annular opening is defined, and for withdrawing said punch from said article once said article is embossed; and

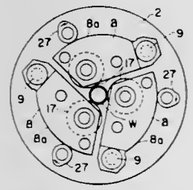
a second power source connected to said pressure sleeve in such a manner that said pressure sleeve moves downwardly with said emboss punch a first distance in nonforcing engagement with said pressure sleeve, and said pressure sleeve is caused to be moved by said second power source a remaining second distance to force said cylinder through said annular opening while said emboss punch remains stationary.

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TAPERED THREAD ROLL-FORMING MACHINE

Takashi Watanabe, Warabi, and Shigeyoshi Tanaka, Osaka, both of Japan, assignors to Kabushiki Kaisha Watanabe Kogyo, Saitama, Japan

Filed Nov. 28, 1986, Ser. No. 935,720
Int. Cl.⁴ B21H *3/02, 9/02*
U.S. Cl. 72—104 **6 Claims**



5. An apparatus for forming tapered threads to a workpiece such as a pipe comprising:

a casing;

a non-rotatable support member or ring shape secured to one side of said casing;

at least three support plates each pivotably attached to said support member and provided with a cam surface;

at least three cam means rotatably supported to said support member so as to abut against said cam surfaces provided to said support plates, respectively;

at least three rolling dies rotatably attached to said support plates, respectively; and

means connected to each of said rolling dies for driving said rolling dies through a power transmission mechanism thereby to rotate said rolling dies.

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4,785,650

TUBE PIPE BENDER ASSEMBLY

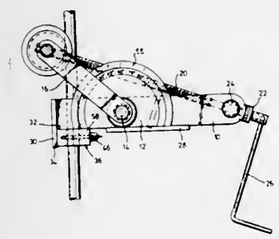
Michael W. Lusty, Braintree, England, assignor to M. W. Lusty Limited, Worthing, England

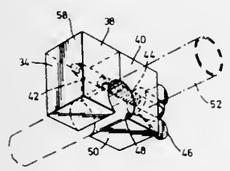
Continuation of Ser. No. 839,428, Mar. 13, 1986, abandoned. This application Jan. 6, 1988, Ser. No. 143,229

Claims priority, application United Kingdom, Mar. 15, 1985, 8506727

Int. Cl.[4] B21D *7/024, 7/14*

U.S. Cl. 72—217 **5 Claims**





1. A pipe bender assembly comprising a pipe bender and a separate pipe clamp operatively co-operable therewith, the pipe bender including a body, a main die forming part of, or mounted on said body, an at least part annular concave groove on the periphery of said main die, a circular shaping die rotatable about its own axis, which is parallel to the axis of the main die, an annular groove on the periphery of said shaping die, a mounting supporting the shaping die so that it is rotatable about the axis of the main die, a reduction gear operatively associated with said mounting to move said shaping die around the periphery of the main die, and two abutment surfaces on the body of the pipe bender extending adjacent and perpendicular to one another, the pipe clamp comprising a clamp body separate from said pipe bender, a pipe receiving bore through said body, whereby said pipe clamp can be initially clamped on a pipe to be bent, while said pipe is positioned on a separate drawing, an axis to said bore and an outer surface of said body including at least first and second faces each subsequently selectively engagable accurately with said two abutment surfaces effective to position temporarily the pipe clamp with respect to the pipe bender, said first face extending accurately parallel to said axis of said bore and said second face extending accurately perpendicular to said axis of said bore.

4,785,651

DEVICE FOR AXIAL DISPLACEMENT OF ROLLS IN A ROLLING STAND

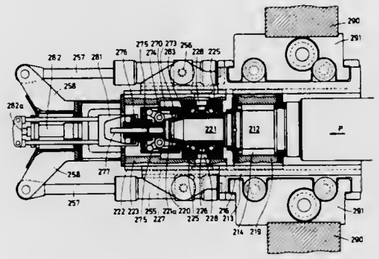
Helmut Kühn, Siegen, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 828,069

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504415; Jun. 13, 1985, 3521180

Int. Cl.[4] B21B *31/18*

U.S. Cl. 72—247 **6 Claims**



1. A device for axial displacement of a roll in a rolling stand, the roll having an axis and a neck portion, the rolling stand defining a roll housing, comprising a chock mounted axially slidable in the roll housing, axially extending support means attached to said chock, radially inwardly facing guide means formed in said support means, a support piece mounted axially slidable in said guide means, a roll bearing adapted for supporting the roll mounted in said support piece, and a sliding carriage axially slidable in said guide means, said sliding carriage axially spaced from said support piece, a coupling means mounted in said sliding carriage, said coupling means adapted for coupling with the roll neck portion, and at least one hydraulic piston-cylinder assembly connected to said sliding carriage for axially displacing said sliding carriage, a deep-groove-type radial ball bearing mounted in said sliding carriage for receiving said coupling means, wherein said deep-groove-type radial ball bearing receives the roll neck and has a bearing bushing, said coupling means arranged on the side of said bushing facing away from the roll neck portion, said coupling means including another support piece connected to said bushing, said another support piece having coupling means engageable in an annular groove defined in the roll neck portion, and a sliding sleeve axially slidable over said another support piece, said sliding sleeve effecting a radial displacement of said coupling members.

4,785,652

INDIRECT EXTRUSION PRESS WITH RAM-MOUNTED TURRET SUPPORTING TOOLING

Charles L. Stewart, 1733 Addison Rd., Palos Verdes Estates, Calif. 90274

Filed Jul. 18, 1986, Ser. No. 887,059

Int. Cl.[4] B21C *23/20*

U.S. Cl. 72—263 **15 Claims**

1. An arrangement for an indirect extrusion press having an extrusion axis, comprising:

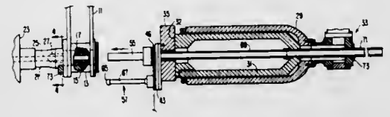
a container with first and second opposite axial ends and an axial cavity for receiving a billet, said container being mounted for aligning said axial cavity with the extrusion axis;

bolster means disposed adjacent said first axial end for blocking movement of a billet out of the cavity when a force is applied against the billet from said second axial end;

a ram mounted on the side of said container adjacent said second axial end for movement in the axial direction of said container, said ram having an axial passage therethrough aligned with said extrusion axis;

a rotatable turret mounted on said ram; and

a hollow pressing stem mounted on said turret, said turret being rotatable for placing said hollow pressing stem in a first position aligned with said extrusion axis and in a second position off of said extrusion axis, wherein when said hollow pressing stem is in said first position its interior



communicates with the passage through said ram and said hollow pressing stem can be moved axially, via said ram, to press a die through said cavity to extrude a billet disposed therein through such die to form an extrusion product which exits the container via said hollow pressing stem and the passage through said ram, and when said hollow pressing stem is in said second position it permits other tooling to perform operations on the extrusion axis.

4,785,653

WIRE ROD BLOCK

Kurt Danielsson, Smedjebacken, Sweden, assignor to Centro-Morgardshammar AB, Smedjebacken, Sweden

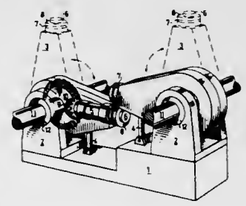
PCT No. PCT/SE86/00456, § 371 Date May 28, 1987, § 102(e) Date May 28, 1987, PCT Pub. No. WO87/02280, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 7, 1986, Ser. No. 64,308

Claims priority, application Sweden, Oct. 15, 1985, 8504782

Int. Cl.[4] B21B *35/12, 31/02, 31/16*

U.S. Cl. 72—249 **1 Claim**



1. A wire rolling machine comprising a pair of parallel drive shafts, a housing mounted for swinging movement on each drive shaft, a first gear within each housing secured to each drive shaft, a second gear within each housing driven by the first gear, a driven shaft within each housing bearing at one end a said second gear and emerging from said housing and bearing at an end opposite said second gear a driven roll, each driven roll having a peripheral groove, said peripheral grooves being adapted to be brought into registry with each other when said housings are swung toward each other, said driven shafts swinging in a common plane, and means to swing said housings relative to each other about said drive shafts.

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HANDLING STRIP OR SLAB MATERIAL

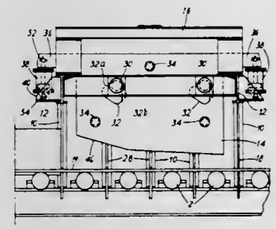
Geoffrey R. Reed, Tadworth, and William R. Laws, Worcester Park, both of England, assignors to Encomech Engineering Services Limited, Epsom, England

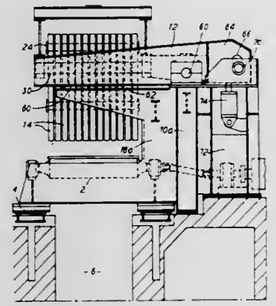
Filed Oct. 7, 1986, Ser. No. 916,395

Claims priority, application United Kingdom, Oct. 7, 1985, 8524640

Int. Cl.[4] B21B *39/16, 45/02*

U.S. Cl. 72—250 **14 Claims**





1. In an apparatus for use in handling a strip or slab of material in a rolling mill comprising supporting means for the material, said supporting means having an entry end and a longitudinal travel path provided for the material by said supporting means extending from said entry end, an entry guide structure at aids entry end comprising a support, mounting members secured to said support to extend transversely over said travel path, at least one massive contact member suspended above the material path by said mounting members, downwardly directed faces of said at least one contact member engaging said mounting members, said faces having a dimension in the direction of said travel path substantially greater than the dimension at the engagement of said faces of the mounting members in said direction, each said face being upwardly and forwardly inclined relative to said travel path, at least a major part of the length of said face being at an angle less than 45° to the horizontal, a rest position of engagement with its mounting member being provided at a forward region of said face whereby said inclination of said face provides freedom for oblique movement of said contact member forwardly and upwardly relative to said material path when said member is struck by the material entering onto the supporting means.

11. In an apparatus for use in handling a strip or slab of material in a rolling mill comprising supporting means for the material and a longitudinal travel path being provided for the material by said supporting means extending from an entry end thereof, an entry guide structure at said entry end comprising a cantilevered support, at least one contact member of large mass displaceably suspended over the material path by said support there being free space in a region immediately beneath

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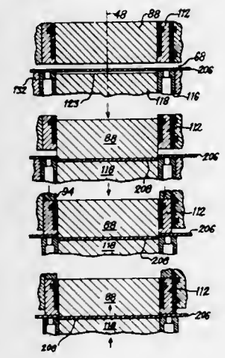
said support between the support and said at least one member whereby said member is upwardly displaceable on said support from a freely dependent position thereon, said member and support leaving the material path at said entry guide laterally accessible from one side, pivot mounting means to the opposite side of the material path, said support being upwardly pivotable about said pivot mounting means, whereby the support and said at least one contact member suspended therefrom are jointly displaceable upwards from a normal operating position when subject to an upward force of sufficient magnitude from the material passing the entry guide structure.

4,785,655

METHOD AND ARRANGEMENT FOR PRODUCING KNOCKOUTS FOR ELECTRICAL EQUIPMENT CABINETS

Tino J. Pistritto, Waterford, and John H. McIver, Farmington, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Jan. 5, 1987, Ser. No. 300
Int. Cl.[4] B21D *28/10*
U.S. Cl. 72—326 **10 Claims**



1. The method of forming a knockout of multiple cut portions in a planar portion of sheet metal to be formed into wall members of equipment cabinets such that the multiple portions of the knockout surround one another and are cut about their periphery except for one or more retaining anchors, comprising the steps of:

(a) providing a hydraulic press having a plurality of punch sets of differing cutting perimeters, each having a cutting punch and an embedding punch displaced on opposing sides of the planar portion of sheet metal;

(b) sequentially positioning the planar portion of sheet metal with respect to different punch sets of successively increasing cutting perimeter for sequentially cutting portions that surround previously cut portions of the sheet metal; and

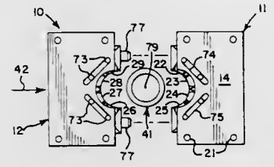
(c) at each of the sequential positions of the sheet metal displacing the cutting punch in a direction orthogonal with respect to the plane of the planar portion of sheet metal to cut a portion of sheet metal about its periphery except for one or more retaining anchors and subsequently displacing the embedding punch in a direction opposite to the displacement of the cutting punch to restore the cut portion into the plane of the sheet metal sufficiently to preclude occlusions between the cut portion and the remaining portions of the sheet metal.

4,785,656

CRIMPING MACHINE FOR HOSE AND FITTING ASSEMBLIES

Robert L. Kennedy, Fort Worth, Tex., assignor to Stratoflex, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 914,191, Oct. 1, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 78,259
Int. Cl.[4] B21D *39/04, 41/04*
U.S. Cl. 72—402 **10 Claims**



1. A crimp head of a crimp machine for crimping fittings, said head comprising two die halves at least one of which is movable on a line of movement toward and away from the other, each of said die halves comprising a web and a support for said web, and each web forming a plurality of die guideways, said head further comprising a set of substantially identical dies, half of the dies being slidably mounted in the guideways of each web, said support comprising a pusher having a substantially V-shaped surface for engaging said dies and pushing them against the fitting, said halves being movable on a line of movement between an open position wherein a fitting to be crimped may be positioned on a fitting axis between said two halves, and a crimp position wherein said halves close together and crimp the fitting, said axis of the fitting being substantially perpendicular to said line of movement of the halves, said dies being movable in said webs radially of said axis, said support of each of said halves further comprising plate means on opposite sides of said web and said dies and fixed to said pusher, said web and said dies of each half being movable relative to said support, spring means between each support and web for urging each web out of the support therefore, and projection means separate from said spring means interconnecting each of said dies and said plate means for retaining said dies in said web and maintaining said web in said support.

4,785,657

TRANSFER FEED MECHANISM FOR POWER PRESSES

Ronald Votava, North Riverside, Ill., assignor to Connell Limited Partnership, Boston, Mass.

Division of Ser. No. 735,437, May 17, 1985, Pat. No. 4,630,461. This application Jul. 30, 1986, Ser. No. 891,871
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—405 **11 Claims**

1. A transfer feed mechanism for use in combination with a power press, said mechanism comprising the combination of

multiple finger units for moving successive workpieces along a plurality of different axes so as to transfer the workpieces to desired work stations in desired positions and attitudes,

a plurality of cams driven in synchronism with said power press for controlling the movement of said finger units along said plurality of axes,

a plurality of rocker arms having cam followers riding on said cams, each of said rocker arms including a slidable adjustment mechanism for adjusting the point of connection of coupling means to any point within a predetermined range and thereby providing a range of adjustment for the length of the stroke of said finger units effected by movement of the rocker arm, said coupling means connecting each of said rocker arms to said finger units for effecting movement of said finger units along different axes in response to the movement of different ones of said cam followers,

said slidable adjustment mechanism including,

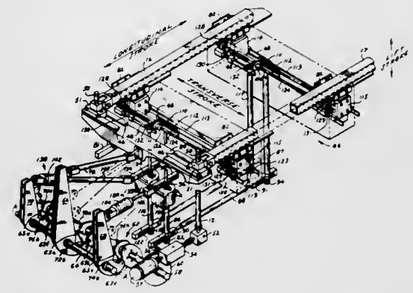
a hinged connector assembly coupled to said finger units,

a hollow elongated member into which a portion of said hinged connector assembly transversely extends for longitudinal translation along said elongated member,

a threaded member rotatably mounted in said hollow elongated member and coupled to said hinged connector assembly such that rotation of said threaded member positions said hinged connector assembly within a predetermined range,

sensing means for determining the relative position of said hinged connector assembly within said predetermined range, and

drive means for rotating said threaded member and moving said hinged connector assembly along said hollow elongated member into position to activate said sensing means.

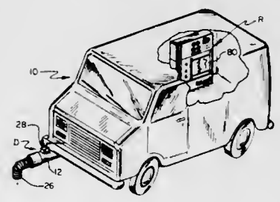


4,785,658

METHOD AND APPARATUS FOR SENSING HYDROCARBON GASES

John Jackson, 1401 E. Girard Ave., Englewood, Colo. 80110

Filed Dec. 2, 1985, Ser. No. 803,604
Int. Cl.[4] G01N *31/00*
U.S. Cl. 73—23 **4 Claims**



1. A method of locating a subterranean reservoir of hydrocarbon material, said method comprising the steps of: is

attaching a sensor to a vehicle so that the sensor adjacent the ground, which sensor is sensitive to migrating hydrocarbon gas in the ambient air;

traversing the vehicle over a land area suspected of having the subterranean reservoir of hydrocarbon material;

sensing total gamma count;

sensing gamma high energy:

sensing hydrocarbon gas in the ambient air with the sensor;

simultaneously producing a readout on a graph of the total gamma count, the gamma high energy and the hydrocarbon gas;

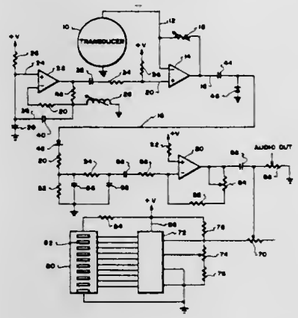
comparing the respective readouts for total gamma count, gamma high energy and hydrocarbon gas which indicate the existence of the subterranean reservoir of hydrocarbon material, which is correlated to the distance traveled by the vehicle over the land area to establish the location of high concentrations of migrating hydrocarbon gas.

4,785,659

FLUID LEAK DETECTOR

H. Barry Rose, 8585 O'Hare Rd., Las Vegas, Nev. 89131, and Travis D. Maxwell, 5222 Eugene, Las Vegas, Nev. 89108

Filed Nov. 19, 1987, Ser. No. 122,676
Int. Cl.[4] G01M *3/24*
U.S. Cl. 73—40.5 A **3 Claims**



1. A fluid leak detector comprising:

noise pickup means producing a first signal within the range of twenty to thirty-five thousand hertz;

a first amplifier for receiving said first signal, a reference signal within the range of twenty to twenty thousand hertz is applied to said first amplifier, said first amplifier emitting an output signal within the range of twenty thousand to thirty-five thousand hertz, said output signal being altered by subtracting said reference signal from said first signal transferring the twenty thousand to thirty-five thousand hertz portion of said output signal into the audible range to fifteen thousand hertz, whereby the said ultrasonic portion of said first signal which is normally not hearable by a human being is now hearable;

a second amplifier for receiving and amplifying said output signal; and

annunciator means for receiving said output signal from said second amplifier.

4,785,660

PROCESS AND INSTALLATION FOR ON-LINE ANALYSIS OF A LIQUID PRODUCT BY LIQUID PHASE CHROMATOGRAPHY

Claude Guillemin, Paris, France, assignor to Rhone-Poulenc Recherches, Courbevole Cedex, France

Filed Mar. 10, 1987, Ser. No. 24,177
Claims priority, application France, Apr. 25, 1986, 86 06228
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—61.1 C **14 Claims**

1. Apparatus for on-line analysis of a liquid product by liquid phase chromatography, comprising:

sampling and treatment means disposed within said product to be analyzed for taking and treating a sample thereof,

a chromatograph,

means for transferring said sample to said chromatograph,

means for establishing on-line a chromatogram of said sample,

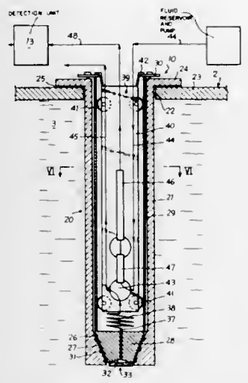
means for selecting a noteworthy peak from a reference chromatogram of the same product made under given conditions of temperature and flow rate;

means for comparing the relative positions of corresponding

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noteworthy peaks on said reference chromatogram and sample chromatogram, respectively,

means for determining a correction factor in accordance with any difference between said positions, and



means for applying said correction factor to other peaks of said sample chromatogram.

4,785,661

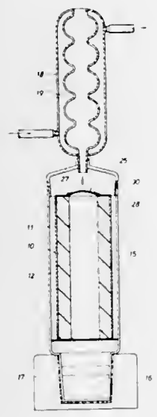
METHOD FOR ANALYZING SOLVENT EXTRACTED SPONGE CORE

William E. Ellington, and Clayton L. Calkin, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 6, 1987, Ser. No. 35,111

Int. Cl.[4] E21B *49/00*

U.S. Cl. 73—153 **7 Claims**



1. For use in solvent extracted sponge core measurements of the oil saturation of earth formations, a method for quantifying the volume of oil in the fluids resulting from such extraction, comprising:

(a) separating the solvent/oil mixture from the water in the extracted fluids,

(b) distilling at least a portion of the solvent from the solvent/oil mixture substantially without co-distillation or loss of the light hydrocarbons in the mixture,

(c) determining the volume contribution of the solvent remaining in the mixture, and

(d) determining the volume of oil removed from the sponge by substracting the determined remaining solvent volume.

4,785,662

DIRECT-HEATED GAS-FLOW MEASURING APPARATUS

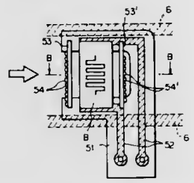
Minoru Ohta, Okazaki; Kazuhiko Miura, Aichi; Seizi Huzino, Anjyo; Kenji Kanehara, Aichi, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation-in-part of Ser. No. 724,337, Apr. 17, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 929,309

Claims priority, application Japan, Apr. 26, 1984, 59-82815; May 10, 1984, 59-91804

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204.21 **19 Claims**



1. A direct-heated type gas-flow measuring apparatus comprising:

a flow passage for the gas flow to be measured;

a film resistor, disposed in said flow passage parallel with the gas flow, for generating heat within said flow passage;

a shield, disposed upstream of said film resistor in the coaxial plane of said film resistor, for reducing the accumulation of deposits on said film resistor, said shield including a heating element for burning off dirt, said shield having substantially the same thickness as that of said film resistor, said shield being sized and positioned so as to satisfy the condition:

$$l_1/t \leqq 50$$

where "l_1" is the distance between said shield and said film resistor, and "t" is the thickness of said shield and said film resistor;

means for heating said heating element of said shield; and

feedback control means, connected to said film resistor, for providing power to and controlling the heat generated by said film resistor and generating a control signal indicative of the temperature of said film resistor;

measuring means for providing, in response to said control signal, an indication of the rate of the gas flow.

4,785,663

LEVEL CONTROL INSTRUMENT

Eberhard F. Hermann, Sonnenweg 3, D7888 Rheinfelden-Eichsel, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 57,548

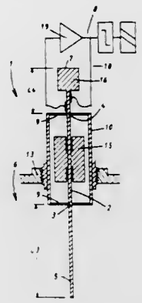
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619678

Int. Cl.[4] G01F *23/28*

U.S. Cl. 73—290 V **13 Claims**

1. An apparatus for indicating the level of a material in a container having a space for receiving the material comprising, a rod having two free ends supported so that one free end extends into the space in said container and its opposite free end extends outside of the container, means connected to vibrate said rod in a bending vibration, and means connected to measure the vibration of said rod, the improvement comprising a pair of spaced supports secured to said rod to support said

rod in the container with each support being located a predetermined distance from the free ends of said rod and, each of



said supports being located at a natural nodal point of vibration along the length of the rod.

4,785,664

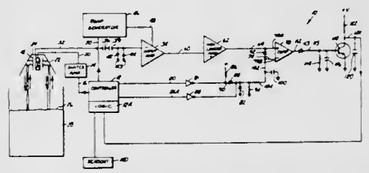
ULTRASONIC SENSOR

Stephen R. Reebs, Bellevue, Wash., assignor to Kay-Ray, Inc., Arlington Heights, Ill.

Filed Apr. 28, 1986, Ser. No. 856,812

Int. Cl.[4] G01F *23/00*

U.S. Cl. 73—290 V **6 Claims**



2. An improved ultrasonic system for determining a distance to an ultrasonic reflecting surface comprising:

ultrasonic transducer means for transmitting ultrasonic signals and controlled to cease transmission of signals after a selected time period but which transducer means continues to vibrate, ring down, and send ultrasonic signals having a decreasing magnitude after the transducer means has been controlled to cease transmission, and including means for receiving ultrasonic signals, the time interval between the transmission of the transmitted ultrasonic signals and the receipt of a respective reflected return signal representing the distance from the transducer means to the ultrasonic reflecting surface;

reference means coupled to the transducer means for generating a reference signal;

means coupled to the transducer means for comparing the received signals to the reference signal, and providing a comparator output when a received signal is greater than the reference signal;

means for controlling the reference signal at a level that is substantially representative of the magnitude of signals which emanate from the transducer means after the transducer means has been controlled to cease transmission, such that signals due to ring down are substantially eliminated as a source of comparator outputs but reflected return signals provide comparator outputs even before ring down ceases; and

means for measuring the time between the transmission of a transmitted signal and a corresponding comparator output and for providing an indication of the distance from the transducer means to the reflecting surface.

4,785,665

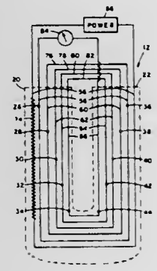
MEASURING INSTRUMENT THAT SENSES HEAT TRANSFER ALONG A PROBE

Reg W. McCulloch, 321 W. Heritage Dr., Farragut, Tenn. 37922

Filed Jan. 16, 1987, Ser. No. 4,325

Int. Cl.[4] G01F *23/22*; G01N *25/00*

U.S. Cl. 73—295 **15 Claims**



1. A measuring instrument that senses heat transfer along a probe that is inserted at least partially into an environment, the heat transfer occurring between the probe and the environment, comprising:

a main probe unit having first and second legs disposed in a side-by-side spaced apart substantially parallel relationship;

a heater circuit having a heater segment for heating at least said first leg of said main probe unit and being disposed in an orientation extending along said first leg;

heated sensor means disposed in sid first leg in positions proximate to said heater segment for being heated by said heater segment and for sensing temperatures at a plurality of positions along said first leg;

second sensor means disposed in said second leg in a position for sensing temeratures at a plurality of positions along said second leg; and

circuit means connected to said heated sensor means and said second sensor means for producing an output signal proportional to the temperatures sensed by said heated sensor means and said second sensor means whereby the output signal is proportional to the heat transfer measured along the probe and is an indication of environmental conditions.

4,785,666

METHOD OF INCREASING THE SENSITIVITY OF A LEAK DETECTOR IN THE PROBE MODE

Lyle E. Bergquist, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Dec. 19, 1986, Ser. No. 944,321

Int. Cl.[4] G01M *3/20*

U.S. Cl. 73—40.7 **23 Claims**

1. An apparatus for detecting gas leakage from a test object comprising:

(a) container means for receiving or enveloping test objects containing a first gas, said container means having a second gas at approximately 1 atmosphere which surrounds the test object;

(b) conducting means in communication with said container means for conducting a flow of said first and said second gases from said container means directly to a separator means;

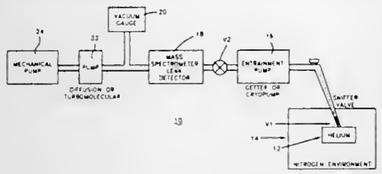
(c) said separator means arranged to receive all of said first and second gases flowing through said conducting means

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and configured for separating said first gas from said second gas and for entraining a sufficient quantity of said second gas to greatly increase the ratio of said first to said second gases exiting said separator means therby enabling continuous detection of said first gas by a mass detector means.

(d) said mass detector means connected in direct unobstructed fluid communication with said separator means for detecting the first gas exiting from said separator means and providing an output signal indicative of the presence of and amount of the first gas if there is leakage of said first gas from the test object;

(e) a pump means connected in direct fluid communication with the mass detector and which functions to exhaust the



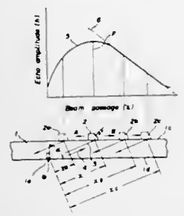
measured first gas to the atmosphere; wherein the first gas is helium, the second gas is purified nitrogen which is helium-free, said separator means is a cryogenic pump configured to separate the nitrogen gas from the helium gas by pressure reduction of said nitrogen by expansion, cooling and adsorption and to pump essentially all of the helium entering the conducting means directly to the mass detector means to detect the presence of a leak in the test object; wherein said cryogenic pump contains no helium-entrapping material and comprises a housing defining a chamber; a first cooling surface disposed interior to said housing maintained at about 80° K.; a second cooling surface maintained at about 10° K.-22° K. for adsorbing nitrogen and therby separating the nitrogen gas from the helium gas.

4,785,667

METHOD OF MEASURING INCLINING ANGLE OF PLANAR DEFECT OF SOLID MATERIAL BY ULTRASONIC WAVE

Takeshi Miyajima, Makabe, and Takayuki Oshiro, Niihari, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00225, § 371 Date Feb. 11, 1987, § 102(e) Date Feb. 11, 1987, PCT Pub. No. WO86/06486, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 22, 1985, Ser. No. 10,083
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—618 **7 Claims**



1. A method of measuring an angle of a planar defect within a plate-like solid material with ultrasonic waves wherein said defect opens or substantially opens at a location of a first surface of said solid material with an angle of up to 90 degrees with respect to said first surface, and wherein an angle beam probe is applied on a second surface opposite to the first surface of the solid material, and ultrasonic wave beam pulses are transmitted into the solid material while said angle beam probe is traversed along said second surface in a direction towards and away from the planar defect, said traversing being carried out at least within a region where said beam is incident to and irradiates said location at which said defect opens or substantially opens comprising the steps of:

receiving with said probe each reflected wave which is reflected mainly from said location of the planar defect corresponding to each beam path;

detecting each echo height of each reflected wave;

obtaining a polygonal line forming an echo envelope in an orthogonal coordinate system defined by the echo heights and the logarithmic values of the each beam path distances and obtaining an inclination of a portion of the echo envelope corresponding to a substantially straight line in a region wherein the echo height decreases gradually from a maximum height position as the echo beam path distance increases; and

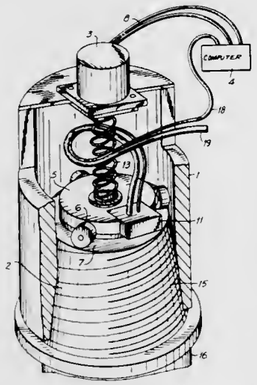
determining the angle of the planar defect by comparing the obtained inclination of the straight line portion of the echo envelope and predetermined reference inclinations of the planar defect.

4,785,668

DRILL COLLAR TESTER

Dominick A. Pagano, 10 Sasqua Trail, Weston, Conn. 06883

Filed Apr. 14, 1987, Ser. No. 38,134
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—622 **5 Claims**



1. An apparatus for ultrasonically inspecting the structural integrity of a drill collar coupling, said apparatus responsive to electrical signals provided by a computer, said apparatus comprising:

(a) a substantially cylindrical housing;

(b) a positioning means mounted on a portion of said housing;

(c) a circular platform disposed adjacent to said housing, a plurality of cam followers mounted symmetrically around said platform, said cam followers having contact surfaces substantially parallel to the top surface of said platform;

(d) a substantially rigid connecting member joining said positioning means to said platform;

(e) an ultrasonic transducing means for transmitting ultrasonic waves in response to a first electrical signal and receiving echoes of said ultrasonic waves and converting them to a second electrical signal; said transducing means mounted proximate a portion of the arcuate edge of said platform and projecting radially from said edge;

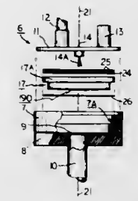
said housing being removably engageable to said drill collar coupling whereby said contact surfaces of said cam followers contact the mouth of said coupling rotatably supporting said platform thereupon.

4,785,669

ABSOLUTE CAPACITANCE MANOMETERS

Richard A. Besson, Bedford, and John A. Denner, Lynn, both of Mass., assignors to MKS Instruments, Inc., Andover, Mass.

Filed May 18, 1987, Ser. No. 50,898
Int. Cl.[4] G01L *9/12*
U.S. Cl. 73—718 **16 Claims**



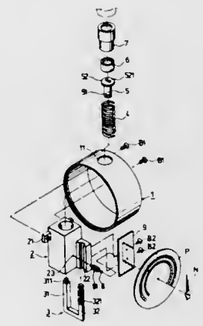
1. Capacitive pressure transducer apparatus having a diaphragm in fluid-tight separating relation to regions exhibiting different fluid pressure conditions, said diaphragm including electrically-conductive capacitor electrode surfaces movable therewith, and composite capacitor means disposed in one of said regions, said composite capacitor means including a flexible member having electrically-conductive capacitor electrode surfaces movable therewith in closely-spaced relation to said electrode surfaces of said diaphragm and forming a first variable capacitor therewith, and a relatively rigid member mounting relatively stationary electrically-conductive capacitor electrode surfaces in spaced relation to said electrode surfaces of said flexible member and forming a second variable capacitor therewith, and means mounting said composite capacitor means in position relative to said diaphragm for said diaphragm to physically deflect said flexible member in response to and by amounts related to differences in pressures between said regions beyond a predetermined range, whereby said first variable capacitor exhibits cpacitances related to said differences in pressures within said predetermined range and said second variable capacitor exhibits capacitances related to differences in pressures beyond said range.

4,785,670

COMPACT PRESSURE GAUGE

Ten T. Huang, No. 4, Lane 30, Wu-Chang St., Pan-Chiao City, Taiwan

Filed Mar. 1, 1988, Ser. No. 162,578
Int. Cl.[4] G01L *7/16*
U.S. Cl. 73—744 **5 Claims**



1. A pressure gauge including:

an outer housing:

a rotating shaft journalled in said outer housing and including a pinion fixed on said rotating shaft, and an indicator secured to said rotating sahft for displaying rotational degree of said rotating shaft;

a cylinder, fixed on said outer housing, adapted to be communicated with an interior of a hollow article to be measured, having a piston and a U-shaped piston rod which has generally parallel first and second arms, said first arm extending into said cylinder, said second arm being positioned outside said cylinder and including a rack secured to said second arm for meshing with said pinion of said rotating shaft;

a channel member, secured to said cylinder, having an open-ended guide slot therein for sliding movement of said second arm of said piston rod in said guide slot; and

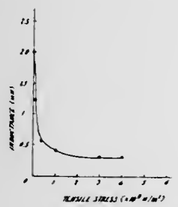
a spring unit connected to said piston in said cylinder for biasing said piston against compressed gas pressure exerted on said piston.

4,785,671

STRESS-SENSITIVE SENSORS UTILIZING AMORPHOUS MAGNETIC ALLOYS

Masayuki Wakamiya, Osaka; Ichiro Yamashita, Kyoto; Hiroyuki Hase, and Yukihiko Ise, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 925,476, Oct. 3, 1986, abandoned, which is a continuation of Ser. No. 711,014, Mar. 12, 1985, abandoned. This application Oct. 2, 1987, Ser. No. 103,743
Claims priority, application Japan, Mar. 13, 1984, 59-48915
Int. Cl.[4] G01B *7/24*
U.S. Cl. 73—779 **16 Claims**



13. A stress-sensitive sensor, comprising

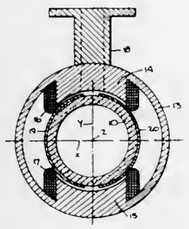
means for generating a magnetic flux;

a thin sheet of an amorphous magnetic alloy of high corrosion resistance, tensile strength and saturation magnetostriction which is positioned in said flux, wherein said sheet is capable of being physically deformed in response to an external force to be measured while inducing a variation in said flux, and said alloy consists essentially of $Fe_aCr_bSi_cB_d$, wherein a is 69 to 79 atomic %, b is 4 to 6 atomic %, c is 10 to 15 atomic %, d is 6 to 10 atomic %, and a+b+c+d=about 100 atomic % and has a tensile strength of >300 Kg/mm^2; and

means for detecting the variation of said flux; wherein said stress-sensitive sensor has high corrosion resistance, tensile strength and saturation magnetostriction characteristics for use under high stress, oil or oil mist conditions.

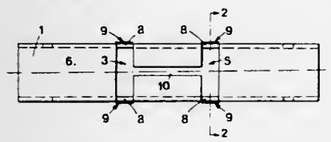
VOL 1096 ISS 4 NO 22 1988 UMI

4,785,672
PRINTED CIRCUIT CAPACITANCE ELECTRODES
Thomas L. Picone, Holland, Pa., assignor to Fischer & Porter Co., Warminster, Pa.
Continuation-in-part of Ser. No. 329,302, Feb. 14, 1986, Pat. No. 4,658,652. This application Jun. 8, 1987, Ser. No. 59,412
Int. Cl.[4] G01F *1/58*
U.S. Cl. 73—861.12 **11 Claims**



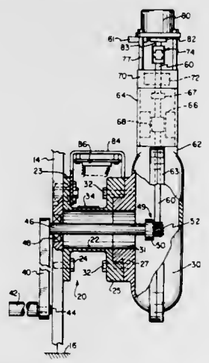
1. A magnetic flowmeter comprising:
A. a cylindrical spool of dielectric material functioning as a flow tube for the fluid to be metered coaxially supported within a cylindrical casing to define an inner chamber;
B. a pair of electromagnets mounted within the inner chamber at opposing positions therein on a magnet axis perpendicular to the longitudinal flow axis of the spool to establish an electromagnetic field therein whose lines of flux are intercepted by fluid flowing therethrough to induce a voltage in the fluid; and
C. a pair of flexible printed circuit boards conforming to and secured to the outer surface of the spool and symmetrically disposed on either side of said magnet axis, said boards being so printed as to define capacitance metering electrodes having enlarged surfaces which extend under the electromagnets at diametrically-opposed positions on the spool on an electrode axis at right angles to the magnet axis and at right angles to the longitudinal flow axis whereby the voltage induced in the fluid is picked up by the electrodes to produce a signal which depends on the flow rate of the fluid, each electrode forming one plate of a capacitor whose dielectric is the spool and whose other plate is the fluid.

4,785,673
STRAIN-GAUGE SENSOR FOR MEASURING FORCES
Jean-Pierre Aumard, Annemasse, France, assignor to S.C.A.I.M.E., Annemasse, France
Filed Dec. 10, 1986, Ser. No. 940,516
Claims priority, application Switzerland, Dec. 17, 1985, 5381/85
Iot. Cl.[4] G01L *1/22*
U.S. Cl. 73—862.65 **7 Claims**



1. A strain-gauge sensor for measuring forces, comprising:
a hollow profile (1) of substantially rectangular cross section and having at least a first two transverse notches (2, 3) in opposite side walls (6) of the profile arranged symmetrically relative to one another and each passing through the thickness of the side wall thereof for leaving intact two mechanically weakened, planar regions (8) of the profile therebetween,
wherein the cross section of the profile (1) is a non-square rectangle for the profile to have, alternating circumferentially, two large and two small side walls (6, 7), and
wherein the transverse notches (2, 3) are elongated rectangles on the two large side walls (6) of the profile with their elongated directions perpendicular to the two small side walls (7) of the profile and extend wholly across the large side walls (6), whereby the weakened regions (8) are formed by symmetrical strips of the small side walls (7) between the transverse notches (2, 3); and
a strain-gauge (9) fixed to one of the weakened regions (8) of the profile.

4,785,674
TORQUE SENSOR
Gary M. Orman, 5001 E. Orchid La., Paradise Valley, Ariz. 85253; Rodney E. Schwartz, 2404 E. Geneva Dr., Tempe, Ariz. 85282, and Gary C. Jorgensen, 2108 E. Vista Dr., Phoenix, Ariz. 85022
Filed Jan. 20, 1987, Ser. No. 5,037
Int. Cl.[4] G01L *3/22*; A61B *5/22*
U.S. Cl. 73—862.17 **18 Claims**

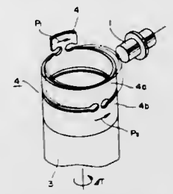


1. Torque measuring apparatus for an exercise machine of the type including a stationary member supported on the ground, comprising:
means rotatable by a user for receiving a force provided by the user,
means for providing a resistance to oppose the force provided by the user, said resistance providing means being constructed to permit application of a predetermined resistance force, while permitting rotation of said rotatable means,
means for coupling said rotatable means to said resistance providing means,
said coupling means also rotating by an amount and direction corresponding to the amount and direction of force applied by the user to said rotatable means,
torque responsive means having one end connected to said coupling means and the other end to said stationary member, the portion between said ends twisting in response to the rotation of said coupling means,
and means for sensing the amount of twisting of said portion and producing an electrical signal corresponding thereto.

4,785,675
METHOD OF AND DEVICE FOR DETECTING TORQUE
Shuuhei Takasu; Takao Terabayashi; Isao Takahashi, all of Yokohama, and Yoichi Daiko, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 20, 1987, Ser. No. 40,124
Claims priority, application Japan, Apr. 21, 1986, 61-89913
Int. Cl.[4] G01L *3/14*
U.S. Cl. 73—862.33 **7 Claims**

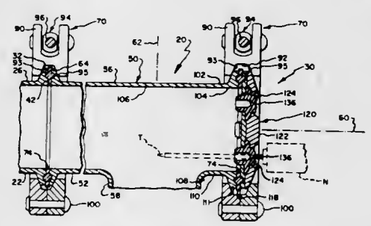
4. A method of detecting torque exerted on a torque-transmitting shaft system, comprising the steps of:

providing a cylindrically shaped elastic member in said torque-transmitting shaft system at a predetermined position thereof, said elastic member being elastically deformable in a radial direction in response to the torque;
rotating said torque-transmitting shaft system; and



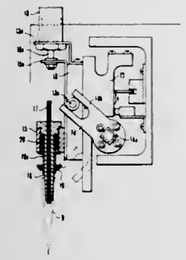
detecting an amount of radial deformation of said cylindrical elastic member by means of a non-contact displacement sensor disposed in face-to-face relationship with said elastic member.

4,785,676
ASEPTIC SAMPLE FITTING
Henry M. DeOca, 1596 S. Bead La., Lakeview, N.Y. 14085, and Robert C. McNally, 57 Adamwood Dr., East Aurora, N.Y. 14052
Filed Aug. 19, 1987, Ser. No. 86,798
Int. Cl.[4] G01N *1/10*
U.S. Cl. 73—863.85 **14 Claims**



1. A sampler fitting for in-line connection between two pipes comprising:
means defining a conduit having two opposite ends each adapted to be connected to a corresponding one of the two pipes so that fluid exiting one of the pipes is directed into the other of the pipes through said conduit-defining means;
means defining a neck portion associated with said conduit-defining means, said neck portion having an opening providing access to the interior of the conduit of said conduit-defining means;
a cover for covering said access opening;
gasket means positionable between said neck portion and said cover for maintaining a complete physical separation between said cover and said neck portion, said gasket means defining a central opening therethrough which is aligned with said access opening when operatively positioned in engagement with said neck portion; and
clamping means for operatively clamping said cover over said access opening with said gasket means operatively positioned between said neck portion and said cover,
said cover including two platen members positioned in a face-to-face arrangement with one another and each having a central portion and a boundary portion bordering the central portion of the corresponding platen member, the central portion of each platen member defining a through-opening which is aligned with the through-opening of the other platen member and the central opening of the gasket means when said cover is operatively clamped to said neck portion, said cover further including means defining a pierceable, self-closing stopper having a body of elastomeric material and of relatively small mass in comparison to the mass of the platen members and associated with said platen members so that the stopper body generally spans the aligned through-openings of the platen members and so that a hypodermic needle or the like can be directed through the stopper body and into the interior of said neck portion for the purpose of extracting a sample amount of fluid flowing through the conduit of said conduit-defining means, said stopper body having a platen portion and a nipple portion joined centrally of and extending from one side of the platen portion, the through-opening of one platen member snugly accepting the nipple portion of the stopper body so that the stopper body is securely retained within said one platen member as surfaces of the nipple portion pressingly engage the walls of the through-opening of said one platen member, the central portion of the other platen member having a side face which generally faces said one platen member and including a detent in the form of a recess defined in said side face and located about the through-opening of said other platen member, said recess snuggly accepting the platen portion of the stopper body so that the stopper body is securely retained within said other platen member as surfaces of the platen portion pressingly engage the walls of the recess of said other platen member and so that the platen members are held in the aforesaid face-to-face arrangement and in an assembled condition as each platen member is retainably secured to the stopper.

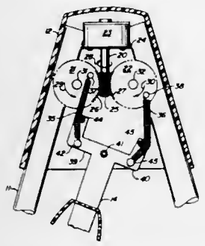
4,785,677
PIPETTING DEVICE HAVING AN AUTOMATIC MECHANISM FOR REPLACING NOZZLE TIPS
Yuji Higo, Nagoya, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan
Filed May 21, 1987, Ser. No. 52,053
Claims priority, application Japan, May 21, 1986, 61-117110; Jul. 7, 1986, 61-159474
Int. Cl.[4] B01L *3/02*
U.S. Cl. 73—864.14 **9 Claims**



1. A pipetting device comprising:
a supporting frame;
a slider mounted on said supporting frame for vertical movement;
first power driving means for vertically moving said slider by a large stroke;
a plunger type stem having a lower end fittable within the upper end of an approximately inverted cone shaped nozzle tip, said stem being mounted for vertical movement on said slider;
means for communicating said lower end of said stem with an air supply and exhaust means, whereby said nozzle tip may be supplied with air or air may be sucked therefrom; and
second power driving means independent from said first power driving means for vertically moving said stem in two directions on said slider by a small stroke as compared to said large stroke.

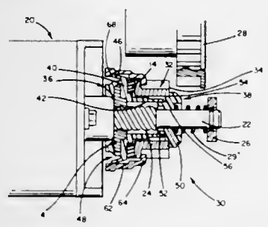
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4,785,678
SWING DRIVE MECHANISM
Ian J. McGugan, Newbury Park, Calif., and Robert L. Quinlan, Jr., Stow, Ohio, assignors to Gerber Products Company, Fremont, Mich.
Filed Apr. 6, 1987, Ser. No. 32,821
Int. Cl.[4] F16H *21/38, 21/40;* A63B *9/16*
U.S. Cl. 74—42 23 Claims



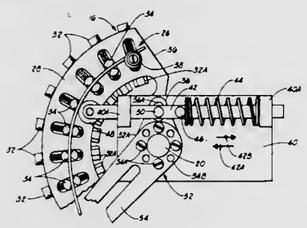
1. A drive mechanism for a swing suspended by a suspension arm, comprising:
a motor-driven rotating drive shaft;
a gear wheel coupled to said drive shaft through meshed gears; and
an extension spring joined at one end to said gear wheel and at the other end to said suspension arm, to resiliently lengthen and shorten as said suspension arm swings.

4,785,679
STARTER MOTOR PINION ASSEMBLY
John H. Weber, Victoria, and Larry W. Schmidt, Farmington, both of Minn., assignors to The Toro Company, Minneapolis, Minn.
Filed Sep. 3, 1987, Ser. No. 92,971
Int. Cl.[4] F02N *11/14*
U.S. Cl. 74—7 R 8 Claims



1. An improved pinion assembly suitable for use on electrical starter motors having an axially extending metallic output shaft, which comprises:
(a) a metallic pinion nut threadedly received on a portion of the output shaft for axial movement along the output shaft;
(b) a first plastic bushing fixed to the nut for movement therewith, wherein the bushing comprises:
(i) a cylindrical shell which is positioned around and extends axially along the output shaft; and
(ii) an annular flange which extends radially outwardly from the shell a sufficient distance to completely cover the pinion nut;
(c) a metallic drive pinion supported on an outside diameter of the shell to one side of the annular flange so that the drive pinion is separated from the output shaft by the shell and from the nut by the annular flange to electrically insulate the drive pinion from the metallic output shaft and pinion nut;
(d) a rubber clutch ring received between one face of the annular flange and an annular face of the drive pinion to transmit torque therebetween; and
(e) means for retaining the drive pinion on the cylindrical shell during operation of the pinion assembly.

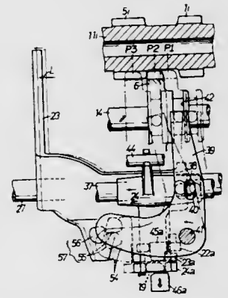
4,785,680
CHARACTERIZING LINKAGE ASSEMBLY
James L. Jones, Winfield, Kans., assignor to Gordon-Piatt Energy Group, Inc., Winfield, Kans.
Filed Mar. 19, 1987, Ser. No. 27,841
Int. Cl.[4] F16H *21/44, 53/04*
U.S. Cl. 74—96 8 Claims



1. A characterizing linkage assembly activated by a modulator motor and responsive thereto for proportionately motoring selected elements, the linkage assembly comprising:
a support frame;
a drive shaft bearingly supported by the support frame, the drive shaft rotatable by the modulator motor;
a linkage actuator arm rotatably supported by the drive shaft by a central hub portion thereof and having a follower arm portion extensive from the central hub portion of the linkage actuator arm;
a follower rod slidingly supported by the support frame for reciprocal movement in a first direction and in an opposite second direction, the follower rod disposed in pivotal engagement with the follower arm portion so that movement of the follower rod rotates the linkage actuator arm;
biasing means for biasing follower rod in the first direction; and
cam means attached to, an rotatable by, the drive shaft and cooperating with the biasing means for moving the follower rod in the first and second directions in response to rotation of the drive shaft, the cam means characterized as comprising:
a cam support member having a hub portion having a bore and attachable to the drive shaft extensible through the hub portion bore;
cam band means supported by the cam support member for forming an adjustable curvilinear stop band rotatable with the drive shaft; and
wherein the follower rod is biased by the biasing means so that one end of the follower rod is slidably restrained along the stop band whereby the rotational position of the follower arm portion and the linkage actuator arm is determined by the rotational position of the drive shaft and the selected adjustment of the curvilinear stop band.

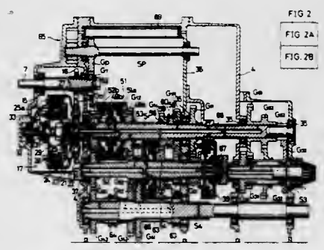
4,785,681
GEAR-CHANGE APPARATUS FOR VEHICLE TRANSMISSION
Hideki Kuratsu; Yoshihiro Yoshimura; Noboru Sekine, and Yasuo Kima, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 24, 1986, Ser. No. 855,831
Claims priority, application Japan, Apr. 24, 1985, 60-88145; Apr. 24, 1985, 60-88146
Int. Cl.[4] F16H *3/38*
U.S. Cl. 74—339 8 Claims
1. In a gear-change apparatus for a vehicular transmission

having a plurality of forward gear trains each established through an associated synchronizing mechanixm, and a reverse gear train established by axial movement on a shaft of a reverse idler gear, an improvement comprising:
a cam mechanism having a first cam fixed in place on a reverse shift fork for shifting said reverse idler gear from an inoperative position to an engaged reverse gear train position thereof and, a second cam fixed in place on a forward shift fork for establishing one forward gear train, said first and second cams being arranged such that when said reverse shift fork is moved in a direction which causes said first cam to engage said second cam said forward shift fork is shifted by a predetermined small stroke sufficient



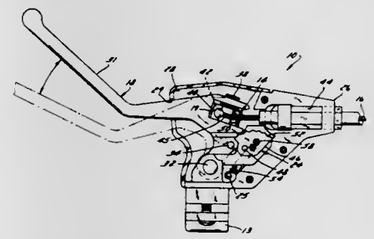
for the synchronizing mechanism of that one forward gear corresponding to said forward shift fork to effect only the synchronizing action thereof in response to the movement of said reverse shift fork from the inoperative position of said reverse idler gear to a position immediately before the engaged reverse gear train position of said reverse idler gear; and
a recess having a depth corresponding to the small stroke provided in an interlocking plate which faces a shift piece of said forward shift fork when said apparatus is shifted to the reverse position for allowing said forward shift fork to be shifted the small stroke.

4,785,682
POWER TRANSMISSION DEVICE
Sadanori Nishimura; Yuji Kishizawa, both of Saitama, and Yukio Kato, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 20, 1987, Ser. No. 52,312
Int. Cl.[4] F16H *3/08, 37/00*
U.S. Cl. 74—359 10 Claims



1. A multistage gear shifting device for a motor vehicle in which first speed to fourth speed gear trains and reverse gear trains are arranged between two shafts in an order such that a low speed gear train comes first, one gear of each gear train being able to engage with and disengage from one of the two shafts through a hydraulic clutch, the gear shifting device including a manual valve which has operating positions correspnding to first speed to fourth speed and reverse and which is adapted to selectively operate hydraulic clutches for the respective gear trains, said one gear of the fourth speed gear train and one gear of the reverse gear train being integrally formed with each other and loosely fitting on said one of said two shafts and detachably engaged with said one of said two shafts through a common hydraulic clutch, the other gears of the fourth speed and reverse gear trains being loosely fitting on said other shaft, said multistage gear shifting device including a selector for selectively engaging said other gears of the fourth speed and reverse gear trains, an actuator for actuating said selector in response to the action of said manual valve, and a switching valve annexed to said actuator, said switching valve guiding hydraulic oil from said manual valve to said common hydraulic clutch when said manual valve is brought to an operating position corresponding to fourth speed or reverse and discharging the hydraulic oil in said common hydraulic clutch to a drain through said manual valve when said manual valve is brought to another operating position, said selector engaging said other gears of said reverse gear train to said other shaft when said manual valve is in an operating position corresponding to first speed, second speed, or reverse, and engaging said other gears of said fourth speed gear train to said other shaft when said manual valve is in an operating position corresponding to third speed or fourth speed.

4,785,683
HAND OPERATED BRAKE ACTUATOR
James A. V. Buckley, Whitefish Bay, and Donald D. Brown, Thiensville, both of Wis., assignors to Hayes Industrial Brake, Inc., Mequon, Wis.
Filed Jul. 9, 1987, Ser. No. 71,409
Int. Cl.[4] G05G *9/00, 5/06;* F16D *65/30*
U.S. Cl. 74—489 9 Claims



1. A brake actuator for the brakes of a vehicle comprising
a housing adapted to be mounted on a handle bar,
a lever arm pivotally mounted on said housing,
means on said lever arm for connecting said lever arm to the brake cables for the wheel brakes,
cam means pivotally mounted on said housing for movement between locked and unlocked positions with respect to said lever arm, and over center spring means for biasing said cam means toward the locked position, whereby said lever arm is blocked in the locked and unlocked position to maintain the brakes in the set position.

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4,785,684

VEHICLE STEERING MECHANISM

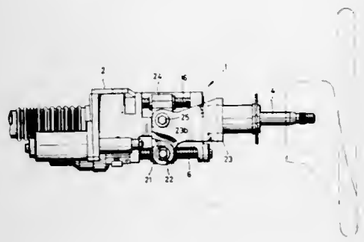
Masumi Nishikawa, Toyoake, and Hiroshi Watanabe, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 21, 1987, Ser. No. 98,958

Claims priority, application Japan, Sep. 30, 1986, 61-231936; Sep. 30, 1986, 61-231937

Int. Cl.⁴ B62D *1/18*; F16H *25/24*

U.S. Cl. 74—493 **7 Claims**



1. A tiltable and telescopically extensible steering shaft assembly including lower main shaft means, stationary bracket means journalling the lower main shaft means, upper main shaft means having a first shaft portion connected with said lower main shaft means for telescopic movements with respect to the lower main shaft means through spline means and a second shaft portion connected with said first shaft portion for pivotable movements with respect to the first shaft portion through pivot means having a pivot point, first screw shaft means rotatably carried by said stationary bracket means and engaged with first nut means, second screw shaft means rotatably carried by said stationary bracket means and engaged with second nut means, upper bracket means provided on said second shaft portion of the upper shaft means and connected with the second nut means for pivotable movements with respect to the second nut means about a transverse tilting axis passing through the pivot point and extending in a transverse direction, said first nut means being carried on said upper bracket means so that a rotation of the first screw shaft means produces an axial movement of the first nut means causing a tilting movement of the second shaft portion of the upper main shaft means and rotations of the first and second screw shaft means produce axial movements of the first and second nut means causing telescopic movement of the upper main shaft means with respect to the lower main shaft means.

4,785,685

RACK GUIDE OF SYNTHETIC RESIN FOR A RACK AND PINION TYPE STEERING DEVICE

Nobuo Kobayashi, Toyota; Shigeo Aiba, Aichi; Shigetoshi Miyoshi, Toyota; Takahiro Iwase, Anjo; Tsutomu Sugiura; Takeshi Onogi, both of Toyota, and Taisuke Nakamura, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 9, 1987, Ser. No. 36,451

Claims priority, application Japan, Apr. 9, 1986, 61-052072[U], Jul. 9, 1986, 61-104283[U]; Mar. 13, 1987, 62-035956[U]

Int. Cl.⁴ B62D *3/12*; F16H *19/04*

U.S. Cl. 74—498 **7 Claims**

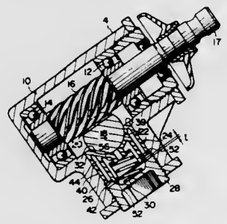
1. A synthetic resin rack guide to be housed in a steering gear box for a rack and pinion type steering device, comprising:

a generally semi-cylindrical head having a concave semi-cylindrical surface which has an axis, and positionable in a steering gear box for slidably pushing a semi-cylindrical back surface of a rack bar;

an outer cylinder connected at a radially outer portion of said generally semi-cylindrical head and extending away from said generally semi-cylindrical head at a right angle with respect to said axis of said generally semi-cylindrical head to define a rack guide axis coincident with an axis of said outer cylinder, said outer cylinder including a plurality of slits which extend along said axis of the rack guide, said slits dividing said outer cylinder in a circumferential direction of the rack guide;

an inner cylinder connected at a radially inner portion of said generally semi-cylindrical head in parallel with said outer cylinder, said inner cylinder defining, in cooperation with said outer cylinder, a circumferentially extending space between said cylinders which extends over an entire circumference of said rack guide;

a plurality of ribs protruding radially inwardly from an inside surface of said inner cylinder and extending in



parallel with said axis of said rack guide in the axial direction of the rack guide,

a spring seat formed integrally with said generally semi-cylindrical head and positioned radially inside of said inner cylinder, wherein said spring seat may receive a pushing force from a coil spring which pushes said rack guide toward a pinion housed in the gear box; and

a spring guide which is formed integrally with said generally semi-cylindrical head and is positioned at a radially central portion of said generally semi-cylindrical portion, said spring guide extending away from said generally semi-cylindrical head and protruding from a seat surface of the spring seat away from said generally semi-cylindrical head,

wherein said plurality of the ribs continuously extend from a seat surface of the spring seat to an end portion of said inner cylinder.

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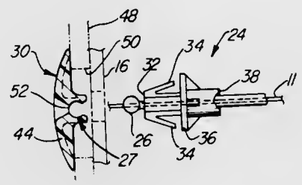
CABLE MOUNTS

Robert M. Thomas, S. Lyon, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Oct. 1, 1986, Ser. No. 913,969

Int. Cl.⁴ F16C *1/10*

U.S. Cl. 74—502.4 **4 Claims**



1. A cable mount for guiding a cable through an aperture in a panel comprising:

a tubular body defining a bore dimensioned to slidably receive the cable therethrough, said body including means for entraining said tubular body within the aperture in the panel;

an axial extension unitarily formed on said tubular body including a first part of a two-piece ball and socket connection, dimensioned to be insertable through the aperture in the panel;

a mating member including a second part of said two piece ball and socket connection and including an opening in registering communication with said bore in said tubular body; and

wherein said mating member comprises a cover having an expanded body radially dimensioned to extend outwardly beyond the periphery of the aperture in the panel to cover the aperture in the panel.

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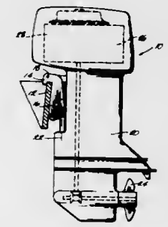
MARINE PROPULSION DEVICE INCLUDING COMPRESSIVELY SECURED FLYWHEEL

Heinrich E. Luksch, Kenosha, Wis., and Richard M. McChesney, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 18, 1986, Ser. No. 830,230

Int. Cl.⁴ G05G *1/10*; B25G *3/08*

U.S. Cl. 74—543 **27 Claims**



1. A marine propulsion device comprising a lower unit including a rotatably mounted propeller, and an internal combustion engine drivingly connected to said propeller, said engine including an engine block, a flywheel including a frustroconical aperture defined by a tapering surface, a crankshaft rotatably supported by said engine block and including a generally cylindrical main portion and a tapered end portion connected to said main portion, projecting from said engine block, received in said frustroconical aperture, and defined by a tapering surface engaging said tapering surface of said flywheel, and means engaging said flywheel and said main portion of said crankshaft and without direct force transmission between said tapered end portion and said engaging means for compressively engaging said tapered end portion of said crankshaft against said tapered portion of said flywheel so as to compressively secure said flywheel to said crankshaft.

25. A crankshaft and flywheel assembly comprising a flywheel including a frustronconical aperture defined by a tapering surface, a crankshaft including a generally cylindrical main portion, and a tapered end portion connected to said main portion, received in said frustroconical aperture, and defined by a tapering surface engaging said tapering surface of said flywheel, and means engaging said flywheel and said main portion of said crankshaft for compressively engaging said flywheel and said crankshaft and including a bolt having a head engaging said flywheel, extending through said end portion of said crankshaft without direct force transmission therebetween, and threadedly engaging only said main portion of said crankshaft so as to effect compressive engagement between said tapered end portion of said crankshaft and said flywheel.

26. An engine including an engine block, a crankshaft rotatably supported by said engine block and including a generally cylindrical main portion and a tapered end portion connected to said main portion and projecting from said engine block, a flywheel including an aperture having a tapered portion receiving said tapered end portion in engaged relation, and a bolt having a head engaging said flywheel, extending through said end portion of said crankshaft without direct force transmission therebetween, and threadedly engaging only said main portion of said crankshaft.

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TORQUE LIMITER FOR PAPER FEEDING DEVICE OF OFFICE MACHINE AND THE LIKE

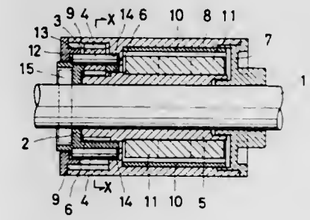
Takeshi Shiozaki, Kasugai, and Atsuo Takeuchi, Nagoya, both of Japan, assignors to Nippo Sangyo Kabushiki Kaisha Co Ltd, Japan

Filed Mar. 27, 1987, Ser. No. 30,500

Claims priority, application Japan, Aug. 15, 1986, 61-191909

Int. Cl.⁴ F16H *1/44, 1/42*

U.S. Cl. 74—710.5 **3 Claims**



1. A torque limiter for an office machine paper feeder comprising

(a) a cylindrical casing (8) having an inner inwardly- and radially-directed annular support surface (14),

(b) a circular lid member (12) connected to said casing (8) and having an inner annular projection (13),

(c) a central rotary shaft (1) extending through said casing (8),

(d) a substantially-annular support member (2) fixedly mounted on said shaft (1),

(e) at least three needle rollers (4) rotatably supported in recesses provided in the outer circumference of said support member (2), said rollers (4) extending coaxially with said shaft (1) and being exposed to the outside of said support member (2) at their circumferences,

(f) each said roller (4) being in contact with an inwardly and radially-directed support surface of said inner annular projection (13) of said lid member (12) and said inwardly- and radially-directed annular support surface (14) of said casing (8) at the circumferences of opposed end portions of said roller (4),

(g) a planetary gear (3) supported on and around at least one of said rollers (4), said gear (3) being rotatably relative to the roller (4),

(h) a hollow cylindrical member (5) supported on and around said shaft (1), said member (5) being rotatable relatively to said shaft (1),

(i) one end portion of said cylindrical member (5) being formed of a sun gear (6) which engages said planetary gear (3),

(j) a side plate member (7) supported on and around said shaft (1), said member (7) being adjacent to the other end portion of said cylindrical member (5) and being rotatable relatively to said shaft (1),

(k) said side plate member (7) being connected to said casing (8),

(l) an integral gear (9) formed in the inner surface of said casing 8 and engaging said planetary gear (3),

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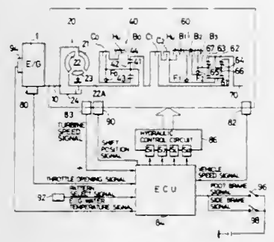
(m) a cylindrical member (11) connected to the outer circumference of said cylindrical member (5),
(n) a cylindrical member (1) connected to the inner circumference of said casing (8) and surrounding said cylindrical member (11), and
(o) said cylindrical members (11) and (1) constituting a means for transmitting a magnetic force having a hysteretic characteristic.

4,785,689

FAILSAFE SYSTEM IN AUTOMATIC TRANSMISSION

Kunihiro Iwatsuki, and Yoshio Shindo, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 23, 1986, Ser. No. 945,483
Claims priority, application Japan, Dec. 24, 1985, 60-291459
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—866 **8 Claims**



1. A failsafe system in an automatic transmission for a vehicle, comprising:
means for detecting an output shaft rotary speed of said automatic transmission;
means for detecting engine rotary speed;
means for detecting engine load;
means for detecting whether a lockup clutch of said automatic transmission is engaged;
means for detecting whether a prescribed period of time has elapsed from either a shift judgment or a shift command of said automatic transmission;
means for determining a correlation between said output shaft rotary speed and said engine rotary speed when said engine load is higher than a predetermined value, said lockup clutch is engaged, and said prescribed period of time has elapsed from either of said shift judgment or shift command of said automatic transmission;
means for judging whether said correlation is abnormal; and
means for increasing oil pressure in a hydraulic control device of said automatic transmission when said correlation is judged to be abnormal.

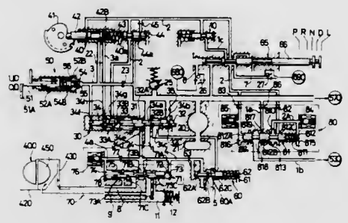
4,785,690

PRESSURE REGULATING SYSTEM FOR USE IN AN AUTOMATIC TRANSMISSION

Shoji Yokoyama, Anjo, and Shiro Sakakibara, Toyokawa, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 488,840, Apr. 26, 1983, abandoned.
This application Aug. 5, 1986, Ser. No. 892,749
Int. Cl.[4] B60K *41/14*
U.S. Cl. 74—867 **2 Claims**

1. Pressure regulating system for an automatic transmission including a belt drive continuously-variable speed transmission mechanism having an input shaft, an input variable-pitch pulley mounted on the input shaft and having a fixed pulley flange and a movable pulley flange, an output shaft, an output variable-pitch pulley mounted on the output shaft and having a fixed pulley flange and a movable pulley flange and a belt interconnecting the input and output variable-pitch pulleys, comprising a regulator valve for regulating the discharge pressure of a hydraulic pump according to input pressures to provide a line pressure in a line pressure passage, a first passage communicating at a first end thereof with said line pressure passage through an orifice and at a second end thereof with a reduction ratio detecting valve, the reduction ratio detecting valve having a cylinder provided within one of the input and output shafts of said belt drive continuously-variable speed transmission mechanism and communicated at one end thereof with said first passage, a spool having at least one land axially slidably fitted within said cylinder for receiving the pressure prevailing in said first passage on one face of said land, a detecting rod axially slidably supported in said cylinder and having an engaged pin at one end thereof for engaging with the movable flange mounted on said one of the shafts, a compression spring provided between facing ends of said spool and said detecting rod for counteracting resilient force thereof to the pressure acting on the one face of said land and a drain port provided on a wall of said cylinder and adapted to be opened or closed by said land for exhausting and maintaining the



pressure acting on the face of said land wherein said reduction ratio valve regulates the pressure prevailing in said first passage into a reduction ratio pressure according to and proportional to the displacement of the movable flange, a throttle pressure valve for regulating the line pressure supplied thereto from said line pressure passage according to the degree of throttle opening to provide a first throttle pressure into a second passage connecting said regulator valve with said throttle pressure valve and a plunger provided in said throttle pressure valve for receiving said reduction ratio pressure prevailing in said first passage and supplying thereof to said regulator valve through a third passage as a second throttle pressure when the degree of throttle opening exceeds a predetermined value and for exhausting said second throttle pressure in said third passage when the degree of throttle opening falls below the predetermined value, wherein said regulator valve receives said first throttle pressure from said second passage, said reduction ratio pressure from said first passage and said second throttle pressure from said third passage as input signal pressures.

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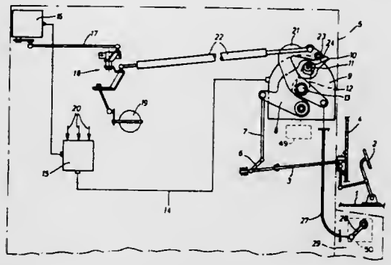
DEVICE FOR REGULATING AN INTERNAL COMBUSTION ENGINE IN A MOTOR VEHICLE

Dieter Papenhagen, Backnang, and Klaus-Achim Schneider, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 10, 1987, Ser. No. 24,069
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609849
Int. Cl.[4] B60K *41/04*; F02D *11/04*
U.S. Cl. 74—877 **6 Claims**

1. A device for regulating the fuel flow to an internal combustion engine in a motor vehicle, with an electrical desired-value transmitter means adjustable between an idling position and a full-load position by an accelerator pedal, with an actuator means for actuating a regulating member, said regulating

member being coupled mechanically to said actuator means, electrical control means connected between said desired-value transmitter means and said actuator for receiving set position signals from said transmitter means and sending output control signals to control said actuator means, and a mechanical transmission element of variable length connected between a connecting lever connected to said desired-value transmitter and said regulating member, the improvement comprising:
drag lever means for connecting said accelerator pedal to said desired-value transmitter means, and for moving said connecting lever with said drag lever means during adjustment of said drag lever means in the direction of said full-load position;



adjusting means for adjusting said connecting lever independently of said drag lever means if said drag lever means is not a full-load position;
wherein said connecting lever is further connected to transmission signal output means for controlling the power transmission between said internal combustion engine and a vehicle drive, wherein said transmission signal output means is connected to a gear-change circuit for changing gears of an automatic transmission for controlling said circuit, wherein said mechanical transmission element is a connecting rod which has no play when moved in one direction and which is shortened in a step-increasing manner in an opposite direction by a resistance means.

4,785,692

RAILROAD TIE PLUG DRIVER

Dennis W. Holmes, 280 N.W. 83rd, Redmond, Oreg. 97756

Continuation of Ser. No. 799,572, Nov. 19, 1985, abandoned.
This application Sep. 12, 1986, Ser. No. 908,868
Int. Cl.[4] B25B *9/02*
U.S. Cl. 81—27 **18 Claims**



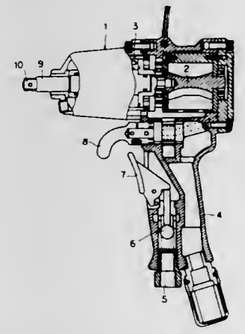
1. A manually operated tool for driving wooden plugs into railroad ties, comprising:
(a) an elongated rod;
(b) collar means affixed to said elongated rod for engagement by a drving weight;
(c) a driving weight defining an aperture extending therethrough slidably mounted on said rod;
(d) cap means fixedly located at a first end of said rod and retaining the driving weight on said rod between said collar means and said cap means;
(e) tip means located at a second end of said rod for continuously maintainng contact with a wooden plug being driven;
(f) stop means associated with said tip means, for engaging an upper surface of a railroad tie plate when a plug has been driven to a predetermined countersunk depth and limiting the depth to which said wooden plug can be countersunk below said upper surface into said railroad tie by said tool.
(g) a tip aligning sleeve mounted slidably on said second end, said sleeve being movable between a position in which said sleeve extends beyond said tip means, and a position in which said tip means extends beyond said sleeve.

4,785,693

HYDRAULIC TORQUE WRENCH

Toshimasa Minamiyama; Masaaki Ohkubo, and Isao Tomioka, all of Osaka, Japan, assignors to Fuji Kouki Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1987, Ser. No. 78,936
Claims priority, application Japan, Jul. 30, 1986, 61-117089[U]
Int. Cl.[4] B25B *19/00*
U.S. Cl. 81—465 **4 Claims**



1. A hydraulic torque wrench comprising:
(a) a rotor driven for rotation,
(b) an oil cylinder operatively connected to said rotor, said oil cylinder having a cove at least one end thereof,
(c) a main shaft installed for relative rotation in said oil cylinder, said main shaft having a shoulder portion,
(d) two blades disposed about 180 degrees out of phase from each other circumferentially of said main shaft and retractably urged radially outwardly of said main shaft,
(e) main shaft seal surfaces formed on the outer peripheral surface of said main shaft and circumferentially disposed about 90 degrees out of phase from said blades,
(f) first seal surfaces formed on the inner peripheral surface of said oil cylinder so that they oil-tightly contact said main shaft seal surfaces in only two particular phase conditions obtained during each revolution of said oil cylinder,
(g) second seal surfaces formed on the inner peripheral surface of said oil cylinder so that they oil-tightly contact the projecting ends of said blades in said two particular phase conditions and wherein one of said particular phase conditions one side of each of said blades defined a high

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pressure chamber while the other side defines a low pressure chamber, and

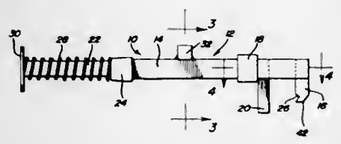
(h) a communication passageway comprising notched grooves formed in the end surface of a cover member for said oil cylinder contacting the axial end surface of the shoulder portion of said main shaft and communication holes formed in the main shaft and open to the axial end surface of the shoulder portion of said main shaft said notched grooves in the end surface of said cover member being opposed to said high and low pressure chambers so that in the other one of said two particular phase conditions, said communication passageway establishes communication between said high and low pressure chambers to thereby equalize their pressures.

4,785,694

SPRING CLIP EXTRACTOR

Kenneth M. Burmester, Oshkosh, Nebr., assignor to Platte River Welding-Tool Division, Oshkosh, Nebr.

Filed Apr. 16, 1986, Ser. No. 852,701
Int. Cl.[4] B25B *27/00*
U.S. Cl. 81—485 **4 Claims**



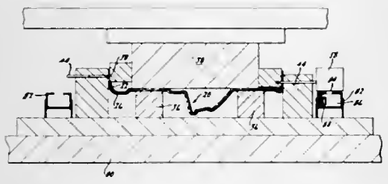
1. For use limited to removing a retainer from a surface of a part having an edge extending transversely from the surface, am extractor tool comprising an elongated body, a deforming jaw fixed to the body and projecting laterally therefrom, abutment means movably mounted on the body and projecting laterally therefrom beyond the jaw for establishing a reaction point on said edge in response to displacement relative to the jaw while in engagement with the retainer, handle means for exerting a displacing force on the abutment means causing said displacement thereof into engagement with the edge of the part establishing said reaction point thereon and spring biased displacing means connected to the handle means for continued transmission of the displacing force to the abutment means following said establishment of the reaction point causing displacement of the jaw relative to the abutment means along the surface of the part to deform the retainer while in engagement with the jaw.

4,785,695

TRIMMING APPARATUS AND METHOD

Wayne F. Riley, Warren, Mich., assignor to Reflex Trim, Inc., Sterling Heights, Mich.

Filed Oct. 7, 1986, Ser. No. 916,213
Int. Cl.[4] B26D *1/09, 5/16*
U.S. Cl. 83—49 **27 Claims**



1. A method of trimming excess covering material from a workpiece along a contour comprising:

positioning said workpiece adjacent a blade assembly comprising a plurality of blade segments arranged side by side and along a line defined by said contour;

sequentially pressing said blade segments into cutting contact with said workpiece to sever said excess covering material from said workpiece;

sequentially lifting said blade segments out of cutting contact with said workpiece following said sequentially pressing step; and

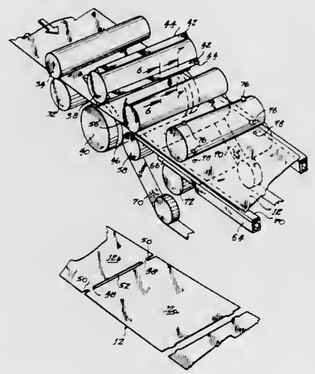
separating said workpiece from said excess.

4,785,696

HIGH-SPEED APPARATUS FOR FORMING SHEETS FROM A WEB

Michael L. Martiny, Evanston, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Apr. 3, 1987, Ser. No. 34,270
Int. Cl.[4] B26D *1/62, 9/00, 3/00*
U.S. Cl. 83—152 **3 Claims**



1. A apparatus for processing a web having opposed edges spaced apart by a preselected width and defining a serial succession of sheet portions with intermediate portions therebetween, to provide a continuous succession of cut sheets downstream of said web, comprising:

a first work station downstream of said web;

web feeding means for feeding a first sheet portion downstream of said first work station to present to said first work station an intermediate portion interposed between said first sheet portion and an adjacent following sheet portion;

partial severing means at said first work station for severing said intermediate portion along a plurality of spaced-apart generally colinear line segments extending between the opposed edges of said web, said line segments including outer line segments extending toward each other from the opposed edges of said web and at least one medial line segment therebetween having end portions spaced from the outer line segments for forming at least a pair of spaced-apart tabs for interconnecting said first and following sheet portions, one tab intermediate each end of the at least one medial line segment and an outer line segment, each tab extending along the severing line;

a second station downstream of said first work station;

web transport means bridging the outer liae segments for feeding said first sheet portion downstream of said second work station so as to present said tabs thereto; and

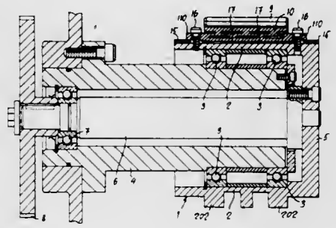
breaking means at said second station for breaking said tabs along said severing line while engaging said first sheet with said web transport means, to thereby free said first sheet for independent movement with respect to said web, the breaking means including first and second opposed rollers for receiving said web therebetween, one said roller having at least one projecting portion for each tab, the projecting portions receivable in at least one mating recess of said other roller, said first and second rollers aligned so that said projections push said tabs into said recess to thereby break said tabs.

4,785,697

APPARATUS FOR DIVIDING A CONTINUOUS WEB OF MATERIAL INTO SUCCESSIVE SINGLE SECTIONS

Gian L. Gherardi, Medicina, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Apr. 30, 1987, Ser. No. 44,427
Claims priority, application Italy, Jun. 13, 1986, 12491 A/86
Int. Cl.[4] B26D *1/62*
U.S. Cl. 83—346 **19 Claims**



1. An apparatus for dividing a continuous web of material into successive single segments, comprising:

a rotary cutter having a first axis of rotation extending in an axial direction and a radial periphery;

a cutting blade at said radial periphery, said blade having a cutting edge for cutting the web, extending parallel to said first axis;

a rotary counter-roller for supporting the web, having a second axis of rotation and having an anvil, and being position so that said anvil cooperates with said cutting edge as said rotary cutter and said counter-roller rotate about their respective axes;

a plurality of supports including two end supports and an intermediate support between said end supports, on said rotary cutter; and

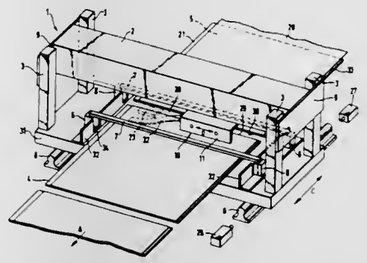
a blade holder on said plurality of supports holding said blade on said rotary cutter, such that said blade is held elastically yieldable in a radial direction with respect to said first axis, said blade holder having first and second radially spaced apart of slots extending transversely to said axial and radial directions through said blade holder so as to provide elasticity to said blade holder in said radial direction which is substantially uniform in said axial direction, the slots in said first row of slots being axially offset with respect to the slots in said second row of slots, said blade holder having end surfaces at opposite axial ends thereof, the slots of said first row including shortened slots which open into said end surfaces and at least one interior slot between said shortened slots, said shortened slots being shorter in said axial direction than said at least one interior slot, said interior slots of said first row having protuberances respectively projecting toward solid portions of said blade holder between the slots of said second row and the slots of said second row having protuberances respectively projecting toward solid portions of said blade holder between the slots of said first row.

4,785,698

SEPARATING DEVICE FOR PLATES

Martin Stork, Muehlheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1986, Ser. No. 921,486
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538117
Int. Cl.[4] B26D *5/04, 5/28*
U.S. Cl. 83—368 **18 Claims**



1. A separating device for plates being conveyed in a machine direction, said plates being arranged at a distance from one another in the machine direction and onto which at least one continuous strip composed of a dry resist layer has been laminated, comprising:

(a) a carriage for guiding said strip and said plates in the machine direction;

(b) a cross-cutting means mounted over said carriage, said cross-cutting means comprising a pair of cutting members spaced apart from and parallel to one another in the machine direction;

(c) a means for moving said cross-cutting means in a direction transverse to the machine direction;

(d) means for moving said carriage in the machine direction in response to movement of said strip; and

(e) means for simultaneously severing the strip along the respective trailing and leading edges of two adjacent plates, including means for moving said cutting members with respect to one another in the machine direction, and means for automatically positioning one of said cutting members adjacent said trailing edge and one of said cutting members adjacent said leading edge of said adjacent plates in response to the distance between said adjacent plates prior to activation of said means for moving said cross-cutting means.

4,785,699

WINDSHIELD WIPER BLADE SLITTING DEVICE

Fred G. Oblinger, and Arnold E. Anderson, both of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1986, Ser. No. 945,146
Int. Cl.[4] B26D *1/24*
U.S. Cl. 83—425 **19 Claims**

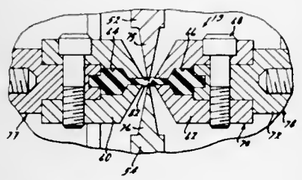
1. A slitting device for separating into two substantially identical halves an elastomeric strip formed to produce a pair of strips having a cross-sectional configuration which includes a tip portion of generally rectangular cross-section for defining an automotive windshield wiper blade, the slitting device comprising:

a base portion having upstanding support walls;

strip drive means having at least one drive roller journalled between spaced apart portions in the support walls, drivingly engageable with the strip and having a drive motor fixedly carried by the support walls and drivingly engaging the drive roller;

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disc drive means including a drive motor fixedly carried by the support walls and a pair of cutting discs carried for rotation by a cutter housing mounted for adjustable positioning with respect to the rotary axes of the discs on portions of the support walls, the drive motor drivingly engaging the cutting discs and the rotary axes of the discs being located to define an operative cutting area of the discs and including means for permitting the outer peripheral cutting tips of the discs to be placed closely adjacent each other; and



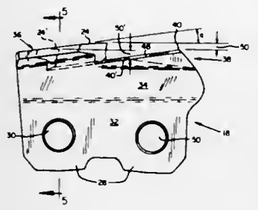
stationary guide means having a pair of die members each having a cavity formed therein for slidingly receiving outer surfaces of the strip and being carried in a portion of the support walls in juxtaposition to one another and being mounted to provide a space therebetween positioned in registration with the operative cuttting area of the discs whereby the extruded strip is forced through the dies by the drive roller and is sliced into two identical wiper blade strips by the cutting discs.

4,785,700

CUTTER LINK FOR SAW CHAIN HAVING GUIDE SURFACE FOR SHARPENING

Michael V. Petrovich, Portland; Duane M. Gibson, Milwaukie; Kent L. Huntington, Molalla, and Kenneth R. Day, Clackamas, all of Oreg., assignors to Blount, Inc., Portland, Oreg.

Filed May 19, 1987, Ser. No. 51,286
Int. Cl.[4] B27B *33/14*
U.S. Cl. 83—834 **5 Claims**



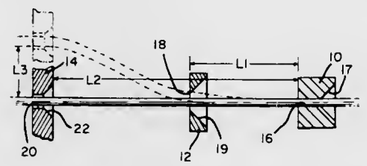
1. A cutting link adapted for cutting in a forward direction with an upper cutting edge thereof comprising: a lower body portion having means for accommodating pivotal interconnection with preceding and following links in a saw chain, and in an upper body portion configured into a cutter portion and a depth gauge portion, said cutter portion including a top plate having a leading cutting edge, said top plate extending downwardly and rearwardly at a determined angle from the cutting edge toward said lower body portion, the depth gauge portion having a depth gauge peak that is lower in heighth than the cutting edge by a determined distance thereby establishing a depth gauge setting, and a guide edge extending from the depth gauge peak toward the cutting edge at substantially the same angle as the top plate angle, said guide edge being adapted to guide a file along a non-abrading guide surface for sharpening the cutting edge and for substantially abrading away the cutter portion along a path substantially paralleling said angle of the top plate, and said guide edge angle defines a rearwardly directed downward slope and the lengthwise distance between the cutting edge and the depth gauge peak is determined by a value obtained by dividing the difference between the heighth of the cutter portion above the guide edge at the point of intersection and the depth gauge setting by the slope of the guide edge.

4,785,701

NOTCHING APPARATUS FOR OPTICAL FIBER IN WHICH THE FIBER FUNCTIONS AS A SPRING

Edvardus F. A. ten Berge, Drunen, and Marinus H. J. Krevveld, G.C. Sint Oedenrode, both of Netherlands, assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 590,233, Mar. 16, 1984, abandoned.
This application Aug. 13, 1985, Ser. No. 765,562
Int. Cl.[4] B26D *3/08*
U.S. Cl. 83—879 **3 Claims**



1. Apparatus for notching an optical fiber at a notch location in preparation for breaking the fiber, the apparatus comprising a fiber holder for holding the fiber at a fiber support location and a notching edge which is located on one side of the fiber axis of a fiber held in the fiber holder and which is urged against the fiber at the notch location with a force which is within a predetermined range, the apparatus being characterized in that:

the notching edge is spaced from the fiber holder along the fiber axis by a first distance,

a fiber deflector is located beside the fiber axis and is spaced from the fiber holder by a second distance, the fiber deflector being effective to move a fiber held in the fiber holder laterally of the fiber axis to deflect the fiber by a third distance at the second distance from the fiber holder, the deflection being relatively towards the notching edge,

the fiber functioning as a spring when it is deflected, the first, second and third distances being selected to deflect the fiber at the notch location and urge the notching edge against the fiber at the notch location with a force which is within the predetermined range, the second distance being greater than the first distance and the notching edge being circular and surrounding the fiber axis,

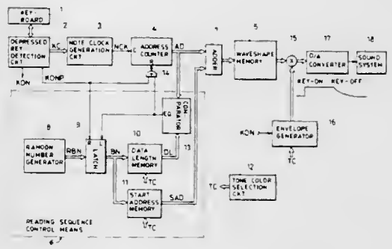
the fiber deflector comprising a deflector block having an opening extending therethrough which receives the fiber, and a deflector actuator which moves the deflector block laterally of the fiber axis along a closed circuit path which includes a segement that extends over the notching edge, the deflector actuator comprising a rotatable guide which is coaxially mounted with respect to the fiber axis, the deflector block being slidably mounted in the guide, and a cam which causes the movement of the deflector block in the guide when the guide is rotated.

4,785,702

TONE SIGNAL GENERATION DEVICE

Mitsumi Katoh, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 21, 1985, Ser. No. 789,471
Claims priority, application Japan, Oct. 22, 1984, 59-220465
Int. Cl.[4] G10H *7/00*
U.S. Cl. 84—1.01 **12 Claims**



1. A tone signal generation device comprising:

waveshape memory means for storing waveshape sample data corresponding to plural waveshapes each of which contains plural periods and a fixed number of samples, wherein the waveshapes are different from each other and form portions of a single tone to be produced;

reading sequence control means for indicating waveshapes to be read out from the memory means and the readout order thereof; and

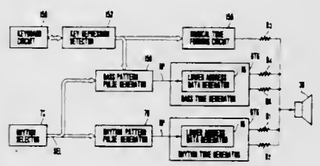
reading means for reading said designated waveshape date in said designated readout order to form a tone comprised of the combination of the plural waveshapes.

4,785,703

POLYTONAL AUTOMATIC ACCOMPANIMENT APPARATUS

Tetsuji Ichiki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 24, 1987, Ser. No. 29,605
Claims priority, application Japan, Mar. 25, 1986, 61-66799
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 **7 Claims**



1. An automatic accompaniment apparatus, comprising:

accompaniment pattern generation means for generating a plurality of accompaniment patterns which represent timing of generation of a plurality of accompaniment tones to be generated respectively, said accompaniment patterns corresponding to said accompaniment tones;

tone input means for inputting said accompaniment tones to be generated and for changing said accompaniment tones into a plurality of tone data respectively;

first memory means;

second memory means having a plurality of storage locations corresponding to said accompaniment patterns respectively;

writing means for writing sequentially said tone data in said first memory means and for writing a plurality of area information identifying respectively storage areas of said first memory means in which said tone data are stored, into corresponding ones of said storage locations; and

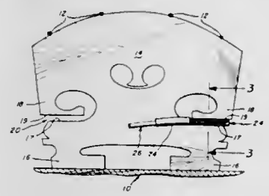
reading out means for reading out said area information from said storage locations corresponding to said accompaniment patterns and for reading out said tone data from said storage area identified by said area information read out whereby accompaniment tones can be produced in accordance with said tone data read out.

4,785,704

MUSICAL INSTRUMENT TRANSDUCER

Lawrence R. Fishman, Green St. 5 Rear, Woburn, Mass. 01801

Filed Jun. 19, 1986, Ser. No. 876,989
Int. Cl.[4] G10H *3/18*
U.S. Cl. 84—1.16 **23 Claims**



1. A transducer for a stringed instrument having a bridge which at least in part defines an opening, said transducer adapted to be at least partially disposed in the opening and comprising;

an electrically conductive base plate,

a piezoelectric crystal having one and another side,

a conductive adhesive for fixedly securing said one side of the piezoelectric crystal to the base plate while providing electrical conductivity therebetween,

electrical lead means for coupling signals from the piezoelectric crystal,

said electrical lead means including a pair of conductors, one of which is conductively connected to said base plate and the other of which is conductively connected to said piezoelectric crystal,

spring means for biasing the piezoelectric crystal against the bridge at said opening with the base plate in facing contact with said bridge at said bridge opening,

said spring means comprising a spring base and a resilient spring leaf integral therewith,

adhesive means for securing the spring base to said another side of the piezoelectric crystal,

said instrument opening having opposed facing surfaces between which the base plate, crystal and spring means are disposed with the base plate in facing contact with one of said surfaces while the resilient spring leaf is in facing contact with the other of said surfaces.

4,785,705

COMPONENT MULTI-NECK STRINGED INSTRUMENT SYSTEM

Jeffrey D. Patterson, 1207 S. Lincoln Ave., Lakeland, Fla. 33803

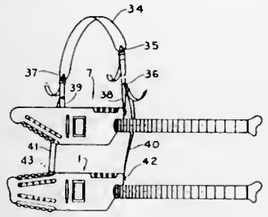
Filed Jul. 14, 1986, Ser. No. 884,984
Int. Cl.[4] G10D *1/08, 3/00;* **G10G** *5/00;* **G10H** *3/18*
U.S. Cl. 84—1.16 **15 Claims**

1. A multinecked stringed instrument device, comprising:

(a) at least two stringed instruments, wherein said instruments are adapted to be played adjacent each other in close proximity and in substantially vertical coplanar alignment, where each of said instruments comprise a body having first and second ends, a front side and a back side and a neck connected to said first end of said body, and wherein at least one of said instruments is reverse strung and having tuning means mounted near the second end on a surface angled towards the body's back side, said

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surface being recessed from the body's front side, said tuning means being linearly aligned at an acute angle to a longitudinal axis of the said body;



(b) flexible connecting means connecting said instruments, said flexible connecting means further comprising spatial adjusting means for adjusting said proximity between said instruments.

4,785,706

APPARATUS FOR GENERATING A MUSICAL TONE SIGNAL WITH TONE COLOR VARIATIONS INDEPENDENT OF TONE PITCH

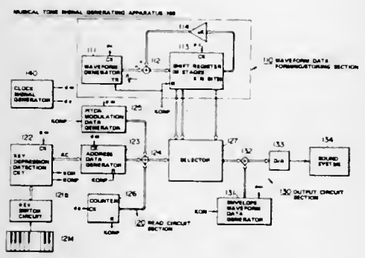
Kunimoto Toshifumi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 12, 1986, Ser. No. 940,779

Claims priority, application Japan, Dec. 17, 1985, 60-284103

Int. Cl.⁴ G10H *1/12, 7/00*

U.S. Cl. 84—1.19 **13 Claims**



1. A musical tone signal generating apparatus comprising:

(a) a memory means for storing tone wave data in the form of plural sampled values of a tone wave;

(b) pitch data generating means for generating pitch data representative of a tone pitch of a musical tone signal to be generated;

(c) readout means responsive to said pitch data for repeatedly reading out said tone wave data from said memory means at a rate corresponding to said tone pitch to form said musical tone signal;

(d) modification means for modifying said tone wave data for outputting modified tone wave data representative of a modified tone wave; and

(e) replacing means for replacing said tone wave data with said modified tone wave data in said memory means at a time interval independent of said rate, whereby said musical tone signal has said tone pitch and varies in waveshape at said time interval independent of said tone pitch.

4,785,707

TONE SIGNAL GENERATION DEVICE OF SAMPLING TYPE

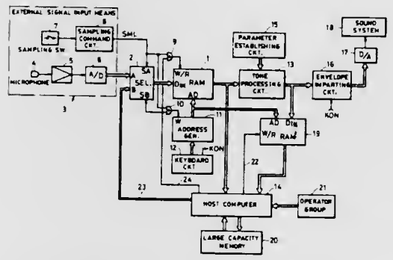
Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 16, 1986, Ser. No. 919,859

Claims priority, application Japan, Oct. 21, 1985, 60-233560

Int. Cl.⁴ G10H *1/02, 1/12, 7/00*

U.S. Cl. 84—1.19 **13 Claims**



1. A tone signal generation device comprising:

first memory means, capable of reading and writing, for storing data of waveshape sample point amplitude values of a tone of first specific tone color;

external signal input means for sampling waveshape amplitude data from a waveshape signal provided from outside of said device and writing the sampled waveshape amplitude data in said first memory means;

readout means for reading out the waveshape data stored in said first memory means;

waveshape processing means for processing the waveshape data read out from said first memory means into data of waveshape sample point amplitude values of a tone having a second tone color different from said first tone color;

second memory means for storing the processed waveshape data; and

transfer control means for transferring the waveshape data from said second memory means to said first memory means.

4,785,708

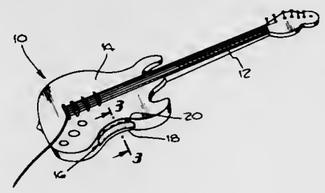
PICK HOLDER FOR STRINGED INSTRUMENTS

Stephen Vaughan, 16185 Alcima Ave., Pacific Palisades, Calif. 90272

Filed Dec. 24, 1986, Ser. No. 946,600

Int. Cl.⁴ G10D *3/16*

U.S. Cl. 84—329 **10 Claims**



1. A pick holder for a stringed musical instrument comprising:

a flexible body having a plurality of pick storage pockets, said body having a flexibility sufficient to conform to the contours of the body of the stringed musical instrument, each pick storage pocket having a slot-like receiving portion for receiving a pick, the receiving portion being dimensioned to cover a substantial portion of a pick while providing another portion of the pick uncovered on both a first and a second side of said pick to enable grasping thereof;

a means for removably fastening said flexible body to the musical instrument body, said means for fastening being thick enough to allow a sufficient clearance between the body of the stringed musical instrument and each pick when stored in said pick storage pockets so that each said pick may be readily grasped by the thumb and forefinger of a user.

4,785,709

BRAIDER

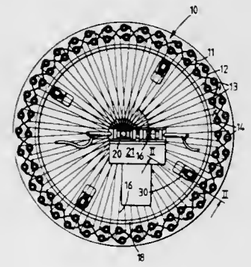
Glenn A. Freitas, Easton, Mass., assignor to Albany Research (UK) Limited, England

Filed Jan. 19, 1988, Ser. No. 145,534

Claims priority, application United Kingdom, Jan. 19, 1987, 8701108

Int. Cl.⁴ D04C *3/06, 3/40, 3/48*

U.S. Cl. 87—33 **5 Claims**



1. A braider for use in the braiding of yarns having a degree of surface tack in which the yarns pass from a yarn package on a carrier of the braider to an article being braided, the braider including a braider ring placed for the yarns to pass over moving to the article being braided;

a plurality of vibrators are circumferentially spaced about the ring to apply vibration to the ring during braiding sufficient to allow passage of the crossing or intersecting filaments over the ring during braiding, the vibrations being of a frequency and amplitude sufficient to reduce the effective coefficient of friction between the yarns and the ring to allow passage of yarns thereover.

4,785,710

HELICOPTER

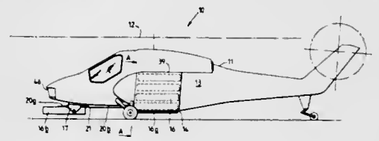
James W. Schofield, Sherborne, England, assignor to Westland plc, Yeovil, England

Filed Jul. 21, 1986, Ser. No. 887,532

Claims priority, application United Kingdom, Jul. 25, 1985, 8518794

Int. Cl.⁴ F41F *3/04, 3/06*

U.S. Cl. 89—1.801 **12 Claims**



1. A helicopter having a fuselage, storage means for storing a plurality of missiles longitudinally of the fuselage, reloadable turret means beneath the fuselage for movement in azimuth and elevation, transfer means for transferring a missile from said storage means to said turret means, said storage means comprising generally vertical tracks in the side walls and lower wall of the fuselage, spaced apart adaptors attached to the missiles, support channels slidably supporting said adaptors and missiles, and longitudinal spaced-apart attachment lugs on said support channels located in said generally vertical tracks.

4,785,711

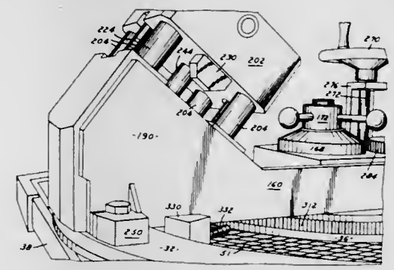
WEAPON MOUNT USEFUL FOR COMBAT VEHICLE

Theodore A. Jackson, Utica, Mich., assignor to Cadillac Gage Textron Inc., Warren, Micb.

Continuation of Ser. No. 659,812, Oct. 11, 1984, abandoned. This application Mar. 13, 1987, Ser. No. 25,637

Int. Cl.⁴ F41F *19/02*

U.S. Cl. 89—43.01 **11 Claims**



1. An energy absorbing mount comprising a support means having multiple bore means therein spaced apart in a pattern, a slide means for supporting an energy transmitting means and having multiple pin means fixedly connected at one end to the slide means in said pattern for movement therewith and such that a respective one of the pin means is slidably received at the other end in a respective one of said bore means of said support means, said pin means spacing the slide means from the support means and sliding into said bore means when energy is absorbed from said transmitting means, absorber means between the slide means and support means, said absorber means having a fluid cylinder body disposed on said support means and a plunger extending in cantilever fashion from the cylinder body in the path of the slide means for movement along an axis transverse to the slide means for absorbing a substantial portion of the energy from said transmitting means as the slide means moves toward the support means as guided by said pin means entering said bore means, and means for orienting said transmitting means relative to the axis of movement of said plunger such that a portion of a force transmitted thereby is not coaxial with said axis, said plunger being disposed within the pattern of bore means and pin means in the path of said slide means for movement in an in and out manner relative to the fluid cylinder body whereby said pin means are positioned and sized to absorb said portion of transmitted force that is not coaxial with said axis of movement of said plunger to protect said plunger from damage.

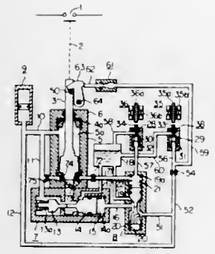
VOL 1096 ISS 4 NO 22 1988 UMI

4,785,712

HYDRAULIC OPERATING APPARATUS FOR ELECTRIC CIRCUIT BREAKER

Toshiaki Yoshizumi, and Tsutomu Sugiyama, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 27, 1986, Ser. No. 867,215
Int. Cl.[4] H01H *35/38, 33/30;* **F15B** *13/043, 15/17*
U.S. Cl. 91—43 **16 Claims**



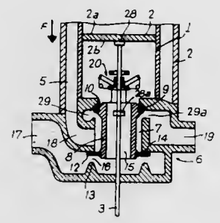
1. A hydraulic operating apparatus comprising:
a source of high pressure fluid;
a source of low pressure fluid;
a hydraulic pressure control circuit connected to said sources of pressure fluid;
a cylinder;
a differential piston drive unit movable in said cylinder between retracted and advanced positions and having a small end face continuously supplied with high pressure fluid and a large end face selectively supplied with high pressure fluid and low pressure fluid from said sources by said hydraulic pressure control circuit;
a valve included in said hydraulic pressure control circuit having an actuating piston and a pilot chamber continuously connected to said high pressure fluid source and receiving said valve actuating piston;
a first input unit connected to said hydraulic pressure control circuit and operable to shift said valve to supply low pressure fluid to said large piston face and cause said drive unit to move from the advanced to the retracted position;
a holding device engageable with said drive unit upon movement of the latter to the retracted position;
said holding device being releasable to allow the drive unit to move to the advanced position in response to concurrent application of high pressure fluid to both end faces of said drive unit;
said first input unit also being operable to disconnect said pilot chamber from said low pressure fluid source while the connection of said pilot chamber to said high pressure fluid source is maintained; and
a restricted orifice in the connection between said pilot chamber and said high pressure fluid source, said restricted orifice causing a delay in the supply of high pressure fluid to said pilot chamber, upon operation of said first input unit to disconnect said pilot chamber from said low pressure fluid source, until after said holding device is completely engaged to hold said drive unit against forward thrust generated due to the difference in area between the large and small piston faces when high pressure fluid is concurrently applied thereto, the high pressure fluid being at a pressure high enough to substantially prevent gas dissolved in the fluid from forming gas bubbles.

4,785,713

DRIVING DEVICE, IN PARTICULAR FOR A PROPORTIONING PUMP OF THE PISTON-FLOWMETER TYPE

Jean Cloup, Beaugey, Carignan, 33360, France

Filed Aug. 22, 1986, Ser. No. 899,050
Claims priority, application France, Sep. 5, 1985, 8513200
Int. Cl.[4] F01L *23/00*
U.S. Cl. 91—341 R **7 Claims**



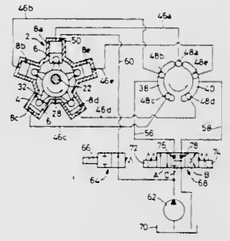
1. A driving device of the piston-flowmeter type, in particular for a proportioning pump, said device comprising:
a cylinder;
a piston slidably mounted within said cylinder, and provided with at least one motion transmission rod, said piston dividing said cylinder into first and second chambers located on each side of said piston;
a two-piston four-way distributor controlled by said rod and piston so that, in a first position, a communication is established between said first chamber and a supply of fluid under pressure while communication is established between said second chamber and an outlet nozzle and so that, in a second position, a communication is established between said second chamber and said fluid supply while a communication is established between said first chamber and said outlet nozzle;
said distributor being provided with a body having two pairs of fixed valve-seats located in concentric relation to a direction which is coaxial with said transmission rod and a tubular valve traversed by said rod, said tubular valve being provided at the ends thereof with two peripheral seals for cooperating alternately with each pair of fixed valve-seats, said tubular valve cooperating in tightly applied relation with at least one valve-seat of each said pair, which valve-seat constitutes an end-of-travel stop for said tubular valve;
two fixed abutments;
a slide-block assembly mounted on said rod and abuttable with said two fixed abutments;
a bistable resilient mechanism coupling said slide-block assembly to said tubular valve, said bistable resilient mechanism having a point of reversal which tends to move said tubular valve away from said slide-block assembly in a first position and to move said tubular valve towards said slide-block assembly in a second position;
two abutments rigidly fixed to said rod in order to move said slide-block assembly in the vicinity of top and bottom dead centers of said piston away from a bearing surface of said slide-block on which a respective abutment is applied by said bistable resilient mechanism and to cause displacement of said slide-block assembly until it passes beyond said point of reversal of said bistable resilient mechanism.

4,785,714

POSITIVE-DISPLACEMENT FLUID MOTOR HAVING SELF-STOPPING FUNCTION, AND METHOD AND CONTROL CIRCUIT FOR STOPPING THE MOTOR

Toshiro Tamada, Gifu, and Kei Hattori, Tokoname, both of Japan, assignors to Technol Inc., Aichi, Japan

Filed Jul. 27, 1987, Ser. No. 77,860
Claims priority, application Japan, Nov. 29, 1986, 61-285291
Int. Cl.[4] F01B *1/06*
U.S. Cl. 91—491 **35 Claims**



1. A method of stopping a positive-displacement fluid motor at a desired one of at least one predetermined angular position, the fluid motor having a rotating member which is rotated continuously by means of flows of a pressurized fluid to and from a plurality of fluid chambers, said method comprising:
the step of supplying the pressurized fluid into at least one advancing fluid chamber of said plurality of fluid chambers which serves to rotate said rotating member in an operating direction of the motor, while causing the fluid to be discharged from at least one reversing fluid chamber of said plurality of fluid chambers which serves to rotate said rotating member in a direction opposite to said operating direction, if a motor stop command is generated when said desired determined angular position is ahead of a current position of said rotating member in said operating direction of the motor;
the step of supplying the pressurized fluid into said at least one reversing fluid chamber while causing the fluid to be discharged from said at least one advancing fluid chamber, if said motor stop command is generated when the current position of said rotating member is ahead of said desired angular position in said operating direction of the motor; and
causing said rotating member to control the fluid flows into and from said at least one advancing fluid chamber and said at least one reversing fluid chamber, depending upon said current position of said rotating member relative to said desired angular position.

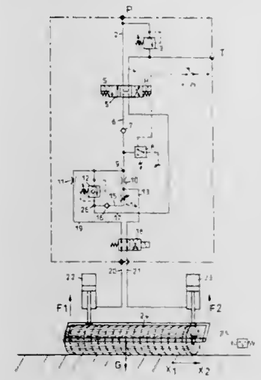
4,785,715

HYDRAULIC CONTROL MEANS FOR A SWEEPING ROLLER HELD BY TWO CYLINDERS IN A SWEEPING MACHINE

Deian Bosniac, Lohr am Main, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr am Main, Fed. Rep. of Germany

Filed Jul. 31, 1987, Ser. No. 80,952
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626201
Int. Cl.[4] F15B *11/00, 13/00*
U.S. Cl. 91—514 **5 Claims**

1. Hydraulic control means for a sweeping roller held by two cylinders in a sweeping machine spaced at different distances from the roller ends, characterized in that between a fluid source and a tank a distributing circuit is provided which consists of a pressure-limiting valve and parallel to said pressure-limiting valve a series circuit of a nozzle and an adjustable throttle, one of said cylinders being connected to the inlet of the distributing circuit and the other of said cylinders being connected between said nozzle and such adjustable throttle, each cylinder being supplied with a respective constant and different pressure from the pressure-limiting valve and the throttle respectively.

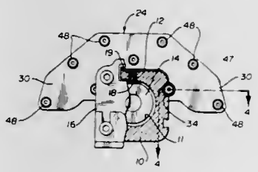


4,785,716

PNEUMATIC CYLINDER AND BRAKE MECHANISM THEREFOR

Jerry E. Vaughn, Bloomington; Gary W. Rosengren, Brooklyn Park, and Jeffrey A. Naab, Minneapolis, all of Minn., assignors to Tol-O-Matic, Inc., Minneapolis, Minn.

Filed Feb. 27, 1987, Ser. No. 20,093
Int. Cl.[4] F15B *15/26*
U.S. Cl. 92—23 **19 Claims**



1. A pneumatic cylinder comprising:
an elongated cylinder member having an elongated bore extending therethrough;
a piston disposed within said bore and adapted for reciprocal movement therein;
transfer means connected with said piston for transferring reciprocal movement of said piston to a workpiece including a carrier bracket having a combination guide and brake means for selectively guiding the reciprocal movement of said carrier bracket relative to said cylinder member and braking said carrier bracket relative to said cylinder member, said combination guide and brake means including a pair of spaced leg portions extending outwardly from a central portion wherein each of said leg portions includes an elongated bearing member, said bearing member cooperating with a corresponding bearing surface on an exterior surface portion of said cylinder member to selectively guide the reciprocal movement of said carrier bracket relative to said cylinder member, said combination guide and brake means further including
a first brake surface formed by a portion of each of said bearing members, a second brake surface formed by a portion of each of said corresponding bearing surfaces and

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brake actuation means for selectively causing movement of said first and second brake surfaces into braking engagement with one another to selectively brake said carrier bracket relative to said cylinder member.

4,785,717

BRAKE ACTUATION UNIT WITH SLACK ADJUSTMENT

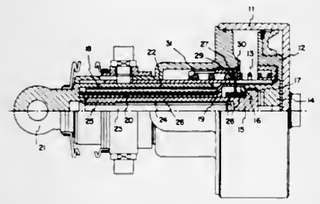
Hans Rocholl, and Horst Klein, both of Remscheid, Fed. Rep. of Germany, assignors to Bergische Stahl-Industrie, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,447

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621639

Int. Cl.[4] F01B *31/00*

U.S. Cl. 92—29 **7 Claims**



1. A brake actuation unit comprising a fluid pressure operated cylinder and piston combination, particularly for rail vehicles for controlling an installed single action linkage setter for maintaining a clearance between the braking surfaces, said unit comprising two telescoping parts, one of said telescoping parts being formed as a threaded spindle and the other comprising a tubular part having a nut portion which is threaded to said spindle, said threaded connection comprising a non-self-locking thread, said nut tubular part having coupling surfaces spaced apart in the direction of braking and said piston having cooperating coupling surfaces which oppose said coupling surfaces of said nut disposed in the direction of braking, said unit including an output head, a tension-actuating spring arranged between said piston and said output head, said nut tubular part having a stop thereon fixed in an axial direction but easily turnable relative to said tubular part, said stop extending in a radial direction, said cylinder having two spaced abutments arranged on respective sides of said stop at least parallel to the direction of the brake force.

4,785,718

SPRING BRAKE CYLINDER

Yasuhisa Hata, Akashi, and Osamu Akamatsu, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Mar. 27, 1987, Ser. No. 32,104

Claims priority, application Japan, Mar. 28, 1986, 61-71601

Int. Cl.[4] F01B *9/00*

U.S. Cl. 92—29 **7 Claims**

1. A spring brake cylinder assembly, said assembly comprising:

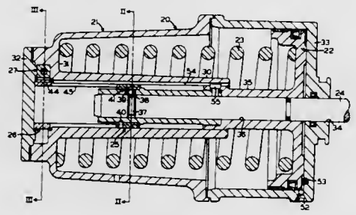
(a) a body portion having a pair of axially opposed end walls, said body portion including a fluid pressure connection adjacent a first end wall;

(b) a piston positioned for reciprocal axial movement within said body portion, said piston having a face portion adjacent said first end wall of said body portion and a stem portion extending in an axial direction from an inner surface of said face portion of said piston, said stem portion including a plurality of apertures extending a sidewall thereof, said piston further including an axial bore extending through said face portion and said stem portion;

(c) a generally hollow piston guide means having an inner surface engageable with an outer surface of said stem portion of said piston and a second end wall of said body portion for guiding said piston in an axial direction during reciprocal axial movement of said piston;

(d) a brake spring caged between said inner surface of said face portion of said piston and said second end wall of said body portion to supply a predetermined braking force to said assembly;

(e) a pushrod slidably positioned through said bore in said face portion and said stem portion of said piston and extending coaxially out of a bore in said first end wall of said body portion, said pushrod including a groove formed around an outer surface thereof adjacent one end;



(f) a clutch means including a plurality of balls positioned for engagement with said apertures in said stem portion piston and said groove in said pushrod and said piston guide means for making a connection and disconnection of said piston with said pushrod thereby controlling their relative displacement in an axial direction;

(g) a clutch control means engageable with said clutch means for controlling said clutch means between an engaged and disengaged state; and

(h) a clutch operating means positioned adjacent said second end of said body portion and engageable with said clutch control means for manually releasing said assembly from a brake application.

4,785,719

DIAPHRAGM FOR HIGH PRESSURE PUMPS, COMPRESSORS OR THE LIKE

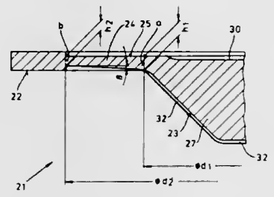
Fritz Bachschmid, Friedrichshafen, and Wilfried Goes, Immenstaad, both of Fed. Rep. of Germany, assignors to J. Wagner GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 264,812, May 18, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,884

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018687

Int. Cl.[4] F04B *9/08*

U.S. Cl. 92—95 **7 Claims**



1. A one piece molded plastics material diaphragm for high pressure pumps, compressors and the like which comprises a membrane having an outer peripheral margin providing an annular clamping area, an annular bending zone adjacent thereto, and a thickened central work area, said thickened central work area projecting from a rear face of the membrane, said bending zone increasing in thickness from the clamping area toward the work area, radially narrow transition zones between the work area and the bending zone and between the bending zone and clamping area, the thickness of the bending zone increasing from the transition zone between the bending zone and the clamping area to the transition zone between the bending zone and work area, and wherein the thickness of the bending zone adjacent the transition to the clamping area and adjacent the transition to the work area are determined according to the equation:

$$\frac{d_1 \cdot \pi \cdot \alpha}{360 \cdot 6} \cdot h_1^2 = k \cdot \frac{d_2 \cdot \pi \cdot \alpha}{360 \cdot 6} \cdot h_2^2$$

wherein k represents a factor from 1.1 through 5, h_1 and h_2 are thicknesses adjacent the clamping and working area respectively, d_1 and d_2 are the inner and outer diameters of the bending zone respectively and α represents any assumed angular section extending from the center of the diaphragm through the transition zones.

4,785,720

LUBRICATION MECHANISM FOR PISTON PIN AND SNAP RING

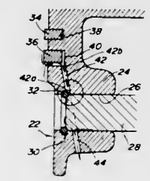
Takio Kojima; Mitsuyoshi Kawamura, and Shigeaki Akao, all of Aichi, Japan, assignors to NKG Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 11, 1987, Ser. No. 60,538

Claims priority, application Japan, Jul. 7, 1986, 61-158920

Int. Cl.[4] F01R *31/10*

U.S. Cl. 92—159 **16 Claims**



1. A lubrication mechanism for an internal combustion engine comprising:

a piston having a piston boss formed with a bearing surface;

a piston pin journalled in said bearing surface;

a groove cut in said bearing surface;

means installed in said groove in contact with an end of said piston pin for preventing endwise movement of said piston pin;

said piston boss having an oil inlet hole formed therein for collecting oil flowing downward along said piston and allowing it to flow toward said groove; and

said groove being semi-circular in crosssection and having a maximum diameter portion, said oil inlet hole having an outlet end communicating in part with a portion of said groove offset from said maximum diameter portion inwardly of said piston, and communicating in part with said bearing surface.

4,785,721

HYDRAULIC CYLINDER ANNULAR INSERT FOR RETAINER MEMBER

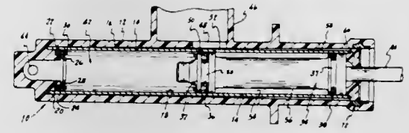
Keith V. Leigh-Monstevens, 5622 Larkins Dr., Troy, Mich. 48098, and David K. Mienko, 108 S. Custer, Clawson, Mich. 48017

Filed Jul. 15, 1986, Ser. No. 885,672

Int. Cl.[4] F16J *10/00*

U.S. Cl. 92—171 **4 Claims**

1. In an hydraulic cylinder assembly of the type including a cylinder having a closed forward end and an open rearward end for passage of a pushrod, means defining a working bore within said cylinder extending axially from a location adjacent the closed end thereof to a location adjacent the open end thereof, and a piston mounted for reciprocal axial movement in the working bore, the improvement wherein said cylinder is formed of a non-metallic material; and annular metallic insert having an axial length less than the axial length of said piston is molded as a solid continuous closed ring in the internal bore of the cylinder and is positioned within said cylinder bore



adjacent but totally forwardly of the open rearward end of said cylinder and proximate the rearward end of said working bore during the molding of said cylinder; said insert has an internal continuous annular groove positioned rearwardly of the rearward end of said working bore; and an elastic spring steel ring is disposed in said groove for forming an abutment preventing said piston being pushed rearwardly from the open rearward end of said cylinder.

4,785,722

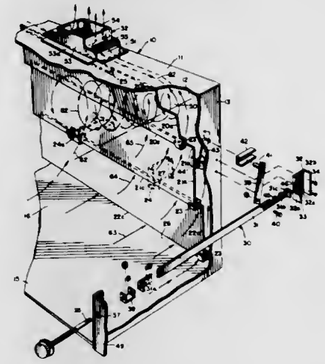
FUME HOOD WITH STEP BAFFLES

Norman K. Dollhopf, Sheboygan, and Roger J. Duffek, Two Rivers, both of Wis., assignors to Hamilton Industries, Two Rivers, Wis.

Filed Jul. 28, 1987, Ser. No. 78,594

Int. Cl.[4] F23J *11/00*

U.S. Cl. 98—115.3 **27 Claims**



1. A fume hood having top, front, side and rear panels defining a chamber, a horizontal work surface within said chamber, means defining an exhaust opening in said top panel, an inlet opening beneath said front panel, and a baffle system, for directing gases in said chamber to said exhaust opening; said baffle system including upper, lower, and intermediate baffle plates of generally rectangular outline arranged in a vertical series with upper and lower edges thereof spaced apart to define horizontal exhaust slots for the flow of gases from said chamber to said exhaust opening; wherein the improvement comprises

said upper baffle plate being generally vertically disposed and being fixed in position with its upper edge extending along aid to panel between said exhaust opening and aid front panel and with its side edges disposed adjacent said side panels of said hood; said exhaust opening being rect-

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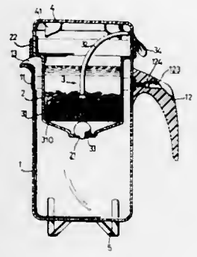
angular in shape with its forward limits extending along the upper edge of said upper baffle plate and with its rearward limits extending along the vertical plane of said rear panel; and blower means communicating with said exhaust opening for drawing gases from said chamber into said exhaust opening; said means defining said exhaust opening including an exhaust collar mounted upon said top panel and having front, rear, and side walls; said front and rear walls being planar and being generally vertically aligned with said upper baffle plate and said rear panel, respectively; said side walls of said exhaust collar having upper, intermediate, and lower portions; said upper portions extending generally vertically, said intermediate portions curving downwardly and outwardly, and said lower portions extending generally horizontally and engaging said top panel on opposite sides of said exhaust opening, whereby, in vertical transverse section said rectangular exhaust collar is of bellmouth configuration.

4,785,723

SEPARATIVE TEA BREWING APPARATUS

Shuenn T. Sheen, No. 328, Sec. 1, Chung Shan Rd., Pu Li Chen, Nan-Tou Hsien, Taiwan

Filed Mar. 24, 1988, Ser. No. 172,440
Int. Cl.[4] A47J *31/10*
U.S. Cl. 99—279 **3 Claims**



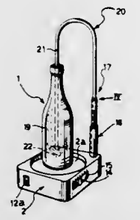
1. A separative tea brewing apparatus, comprising:
a lower container having a spout on an upper edge thereof;
an upper container, a circumferential wall thereof being stepped with a diameter of a lower portion thereof slightly smaller than that of an upper portion thereof, and a bottom face of said upper container being inclined from a periphery thereof to a center thereof and being provided with a dripping hole in said center thereof;
a ball-activated sieve disposed on said bottom face of said upper container, comprising:
sieve being semispherical and a securing ring encircling a peripheral edge of said sieve for securing said ball-activated sieve disposed on said bottom face of said upper container;
an arched hollow stem being threaded on a center of said sieve;
a steel wire being encompassed by said stem;
a steel ball and a suspending element being connected by said steel wire, said steel ball being secured to a distal end of said steel wire inside said sieve for sealing said dripping hole, and said suspending element being secured to another distal end of said steel wire opposite to said steel ball and outside said upper container for remotely controlling movements of said steel ball;
a top cover being disposable on a top edge of said upper container;
a handle attached to said lower container, one end of said handle contacting with said lower container, being arched and provided with lateral groove, and an aperture being provided on said handle from said lateral groove to an outer part of said handle; and
a binding ring enclosing said lower container, said binding ring being provided with a hole on each end thereof, and said binding ring, together with a tightening screw, binding said handle onto said lower container.

4,785,724

APPARATUS FOR AERATING BOTTLED WINE

Domenico A. Vassallo, Westwood, N.J., assignor to Euromark, Inc., N.J.

Filed Mar. 16, 1987, Ser. No. 26,328
Claims priority, application Italy, May 16, 1986, 53423/86[U]
Int. Cl.[4] B01F *3/04;* **C12H** *1/00*
U.S. Cl. 99—323.1 **5 Claims**



1. Apparatus for aerating bottled wine, comprising:
a housing,
a compressor driven by an electric motor located in the housing; and
a delivery tube associated with the compressor and having a distal portion which can be inserted into the bottled wine to aerate it characterized by the combination of the following features:
(a) the housing has an upper wall for supporting the bottle,
(b) the delivery tube includes an adjustable height telescopic base portion projecting upwardly from the upper wall, the distal portion having an inverted U shape with an ascending arm lower end of which is releasably connected to the base portion by means of a detachable press fit connection, and a descending arm which can be inserted into the bottle for a substantial part of its length,
(c) the descending arm of the delivery tube terminates in a delivery bulb having an upwardly-tapered configuration, a tapered lateral surface, and a plurality of outlet apertures solely in said tapered lateral surface,
(d) a battery for supplying the electric motor is located in the housing.

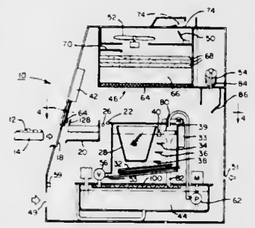
4,785,725

AUTOMATIC COOKING MACHINE

Maurice Tate, Orange County, Fla.; Robert L. Thompson, and John H. Wilbur, both of Benton County, Wash., assignors to U1 Group, Salt Lake City, Utah

Continuation of Ser. No. 683,114, Dec. 17, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 834,206
Int. Cl.[4] A47J *37/12*
U.S. Cl. 99—330 **5 Claims**

1. An apparatus for automatically frying food stored in an open-top cartridge, the apparatus comprising:
a cooking vat containing a cooking medium;
a basket for holding the food in the vat;
a receptacle for bolding a cartridge, the receptacle being accessible from the exterior of the apparatus to allow insertion of a cartridge therein;
means for automatically dumping the food out of the cartridge and into the basket for cooking;
means for automatically dumping the cooked food out of the basket and back into the same cartridge; and
means for automatically deactivating the apparatus at regular, apparatus-preset time intervals to render the apparatus temporarily inoperative for cooking, and automatically draining and flushing the cooking vat during such inoperative state to replenish the cooking medium within the cooking vat.

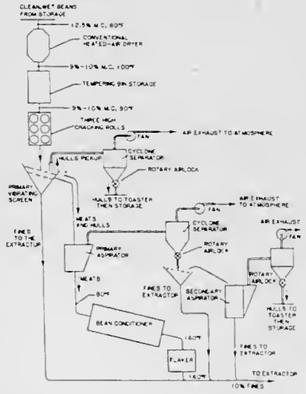


4,785,726

OILSEED CONDITIONING SYSTEM

Frederick C. Wear, St. Louis County, Mo.; Hal E. Bland, Raleigh, N.C., and Sadru Dada, Freehold, N.J., assignors to McDonnell Douglas Corporation, St. Louis, Mo.; Aeroglide Corporation, Raleigh, N.C. and Continental Grain Company, New York, N.Y.

Division of Ser. No. 756,356, Jul. 15, 1985, Pat. No. 4,728,522. This application Jul. 20, 1987, Ser. No. 75,150
Int. Cl.[4] A23L *1/20, 3/16*
U.S. Cl. 99—451 **11 Claims**



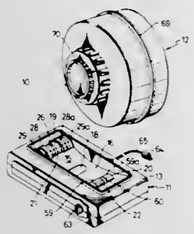
1. A system for processing oilseeds including
(a) a microwave dryer in which oilseeds are heated to about 160° F. and about 0.5 to 1.0% moisture is removed,
(b) a two-high cracking roll which receives the heated oilseeds directly from the microwave dryer at the temperature of about 135° to about 160° F. and where the heated oilseeds are crushed to remove the hulls without the production of large quantities of fines,
(c) a primary aspirator and primary cyclone system which receives separating air and which directly receives the crushed, heated oilseeds and where the hulls and fines are separated from the seed meats,
(d) means for heating the separating air for the aspirator to maintain the temperature of the seed meats at about 135° to about 160° F. during separation,
(e) a secondary aspirator and secondary cyclone system where the hulls are separated from the fines,
(f) a flaking roll where the seed meats are flaked,
(g) means for moving the seed meats directly from the primary aspirator in heated condition at the temperature of about 135° to about 160° F. to the flaking roll, and
(h) means for combining the fines with the flaked oilseed meats to form a feed for an oil extraction system.

4,785,727

ROTARY PICKLES MAKING DEVICE

Makoto Miyata, Yawata; Yoshihiko Shigeno, Neyagawa, and Yoshiyuki Ishida, Kawanishi, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 28, 1987, Ser. No. 113,738
Claims priority, application Japan, Nov. 15, 1986, 61-272430; Nov. 15, 1986, 61-272432; Feb. 6, 1987, 62-26695
Int. Cl.[4] A23B *7/10;* **A23L** *1/218*
U.S. Cl. 99—535 **13 Claims**



1. A rotary pickles making device comprising:
a base body,
a drive roller rotatably mounted in said base body and at least partially exposed therefrom,
a motor for rotating the drive roller,
a guide roller rotatably mounted in said base body and at least partially exposed therefrom, said guide and drive rollers being rotatable about parallel axes, said guide roller spaced from said drive roller in a direction laterally of said axis of
said drive roller, an uppermost portion of an outer peripheral surface of said guide roller disposed higher than an uppermost portion of an outer peripheral surface of said drive roller, and
a drum-shaped pickling casing having an outer periphery resting on said drive and guide rollers so as to be rotatable about an axis disposed parallel to said axes of said rollers in response to frictional contact between said pickling casing and said drive roller, whereby a pickling paste and foodstuffs to be pickled are agitated in said pickling casing,
the place of contact between said pickling casing and guide roller being disposed at a higher location than the place of contact between said pickling casing and drive roller such that the loading of said drive roller is greater than the loading of said guide roller to increase the frictional driving forces applied to said pickling casing by said drive roller.

4,785,728

ROTARY PICKLES MAKING DEVICE

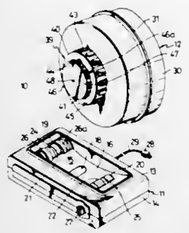
Makoto Miyata, Yawata, and Yoshiyuki Ishida, Kawanishi, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 28, 1987, Ser. No. 113,509
Claims priority, application Japan, Nov. 15, 1986, 61-272429; Dec. 23, 1986, 61-306744
Int. Cl.[4] A23B *7/10;* **A23L** *1/218*
U.S. Cl. 99—535 **9 Claims**

1. A rotary pickles making device comprising a pickling

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casing defining therein a compartment for containing a pickling paste and foodstuffs to be pickled, and means for rotating said casing to mix the paste and foodstuffs, said casing including an opening to said compartment for enabling said compartment to be loaded and emptied, a closure cap detachably mounted to said opening, said cap including a wall, and a gas and liquid adjuster allowing internally generated gas and liquid



to pass therethrough for adjusting the amounts of gas and liquid within said compartment, said gas and liquid adjuster comprising a sheet extending across said opening and retained between said cap and said casing, said sheet being spaced from said cap wall to define therewith a reservoir, said sheet including small through-holes for enabling gas and liquid to pass therethrough between said compartment and said reservoir.

4,785,729

PRODUCE PEELING MACHINE, PARTICULARLY FOR SHELLING NUTS

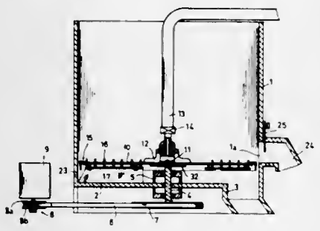
Suzanne Latreyte, 5 avenue de Villeneuve, Saint-Sylvestre-Sur-Lot, 47140 Penne D'Agenais, France

Filed Jan. 20, 1987, Ser. No. 4,566

Claims priority, application France, Jan. 22, 1986, 86 00888

Int. Cl.[4] A23N *7/00*

U.S. Cl. 99—536 **14 Claims**



1. A machine for treating produce for peeling it, comprising a tank (1) having a substantially smooth internal wall, a rotary disk (10) near the bottom thereof, means (4–9) for causing rotation of said disk, means (12, 14) for distributing a liquid in the tank, means (24) for recovering processed produce and means (2, 3, 15) for evacuating wastes and liquid comprising a passage (15) in the periphery of the disk between the edge of the disk and the tank wall, said liquid distributing means comprising a distributor (12) at the center of the disk (10) and provided with orifices (12*a*) arranged to eject the liquid at the disk in the centrifugal direction, and said rotary disk (10) having a plurality of teeth (16) projecting therefrom.

4,785,730

NEEDLE-PROTECTING SYSTEM FOR BALER

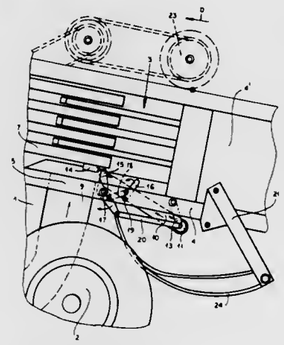
Karl-Heinz Kretschmer, Neustadt; Jürgen Röllich, Ehrenberg; Boto Kritzner, Neustadt; Gerhard Schindler; Egon Vilbrandt, both of Abtshagen; Günter John, Neustadt, and Christian Steglich, Grimmen, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt Landmaschinen, Neustadt, German Democratic Rep.

Filed Dec. 11, 1987, Ser. No. 131,880

Claims priority, application German Democratic Rep., Dec. 15, 1986, 297553

Int. Cl.[4] B65B *13/06*

U.S. Cl. 100—19 R **6 Claims**



1. A baling machine comprising:

a frame having walls defining an elongated compaction chamber having a front end provided with a transversely open intake;

means for feeding a stream of crop substantially continuously through the intake to the compaction chamber;

at least one compacting member displace able in the chamber between a front position forward of the intake and a back position rearward of the intake;

compactor drive means for periodically displacing the member from its front to its rear position and thereby rearwardly compacting crop in the chamber;

a plurality of pushers each displaceable between an advanced position projecting into the chamber and only partially blocking the intake and a retracted position substantially out of the chamber;

link means on the frame for advancing the pushers into their advanced position only when the member is rearward of the intake and of the pushers, whereby advance of the pushers into the advance position immediately after movement of the compacting member rearward past the pushers parts the stream of crop between the pushers and compacting member;

a plurality of tie needles engageable across the chamber rearward of the pushers in the advanced position thereof; and

needle drive means connected to the needles for advancing same across the chamber and thereby pulling respective ties across only when the pushers are in the advanced position.

4,785,731

BUNDLE COUNT VERIFIER

Nhac Nguyen, Oakton, Va., assignor to American Newspaper Publishers Association, Reston, Va.

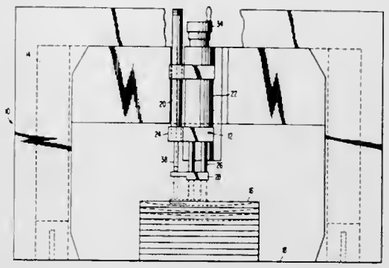
Filed Sep. 25, 1987, Ser. No. 100,862

Int. Cl.[4] B65B *13/20*

U.S. Cl. 100—4 **16 Claims**

1. An apparatus for determining respective deviations in the total number of signatures in each of a plurality of individual successive stacks from a given number of signatures, comprising:

means for compressing a plurality of individual stacks of signatures including a standard stack having said given number of signatures in succession to a predetermined pressure;



means for detecting variations between the height of said compressed standard stack and the height of each individual successive compressed stack; and

means responsive to the detected variations for indicating a number of signatures in each of said successive stacks different from said standard stack.

4,785,732

PUSH ROD STROKE ADJUSTMENT DEVICE FOR A PRESS

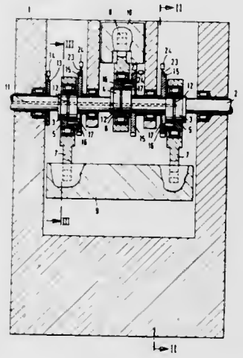
Robert Czapka, Eislingen, and Alfred Bareis, Uhingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Jun. 3, 1987, Ser. No. 57,358

Claims priority, application European Pat. Off., Jun. 6, 1986, 86107769.1

Int. Cl.[4] B30B *1/26*

U.S. Cl. 100—257 **11 Claims**



1. An arrangement in a press having a driving connection between an eccentric drive shaft and a ram for adjustment of the ram stroke including: an eccentric means; an eccentric bushing means releasibly supported on said eccentric means; a connecting rod means supported on the eccentric bushing means; actuating means for selectively releasing the eccentric bushing from the eccentric means and fixing the eccentric bushing means in a direction of rotation on the eccentric means; the eccentric bushing means, when released, being non-rotatably held with respect to the eccentric shaft while the eccentric shaft is being rotated for adjusting said ram stroke; and wherein eccentric bushing means is supported on the eccentric means with a press-fit connection utilizing plural cylindrical fitting surfaces between said eccentric means and said eccentric bushing means; and wherein said actuating means releases said press-fit connection by supplying pressure oil by way of at least one groove associated with at least one of said cylindrical fitting surfaces.

4,785,733

ARRANGEMENT IN PRINTING MACHINES WITH ADJUSTMENT MEANS FOR CIRCUMFERENTIAL, AXIAL AND DIAGONAL REGISTER

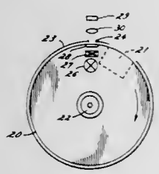
Winfried Hartung, Offenbach am Main, and Valentin Gensheimer, Muhlheim/Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,986

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1987, 3703998

Int. Cl.[4] B41F *13/14, 5/06*

U.S. Cl. 101—181 **21 Claims**



1. In a printing machine having means for adjusting the circumferential, axial and diagonal register of a plurality of plate cylinders on which printing plates are secured, wherein each plate cylinder is mounted on a shaft for rotation and each printing plate has register markers disposed thereon outside of its respective printing and inking zone, the improvement comprising:

a register marker detection system comprising at least one illuminating means disposed on one side of each plate for generating and projecting light to illuminate said register markers; at least one photo-detecting means disposed on the other side of each plate for periodically detecting said light projecting through the register markers as the cylinder rotates the printing plate and for generating measurement signals in response thereto; and circuit means connected to said photo-detecting means for generating signals to control said cylinder register adjustment means;

said register markers comprising at least first and second accurate-register apertures; said illuminating means and said photo-detecting means being positioned such that the light generated by said illuminating means is detected by said photo-detecting means after passing through said apertures; and said circuit means being responsive to said measurement signals from said photo-detecting means related to light passing through said apertures.

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4,785,734

APPARATUS FOR CONTROLLING PAPER TRANSFER SPEED OF A PRINTING SECTION OF A FORM PRINTING MACHINE

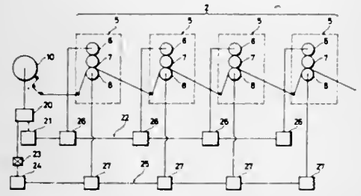
Fujio Kawana, Kure, and Akinobu Hanyu, Higashihiroshima, both of Japan, assignors to Fuji Kikai Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 29, 1987, Ser. No. 114,807

Claims priority, application Japan, Nov. 4, 1986, 61-263522; Nov. 4, 1986, 61-263523

Int. Cl.⁴ B41F *5/04*

U.S. Cl. 101—219 **2 Claims**



1. An apparatus for controlling paper transfer speed of a printing section of a form printing machine in which a plurality of printing units each comprising a plate cylinder, a blanket cylinder and an impression cylinder are arranged on a printing line so as to constitute the printing section, characterized in that a first and second drive shafts driven by a motor as a drive source are provided so as to extend over all of the printing units, the plate cylinder and the blanket cylinder of each printing unit being interlockingly connected to the first drive shaft and the impression cylinder being interlockingly connected to the second drive shaft, and at the end of the second drive shaft on the side of the drive source, a speed change means is provided for changing the rotation speed of the second drive shaft independently of the first drive shaft.

4,785,735

LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 420,755, Sep. 21, 1982, abandoned, which is a division of Ser. No. 193,553, Oct. 3, 1980, abandoned, which is a division of Ser. No. 653,403, Jan. 29, 1976, Pat. No. 4,249,973, which is a division of Ser. No. 540,051, Jan. 10, 1975, Pat. No. 3,952,652, which is a division of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Dec. 21, 1983, Ser. No. 563,842

Int. Cl.⁴ B41F *1/46*

U.S. Cl. 101—348 **2 Claims**

1. A one-piece hub section for an ink roll comprising

a roll-mounting portion,

a flange,

mounting means for rotatably mounting said hub section, said mounting means including a stub end, and

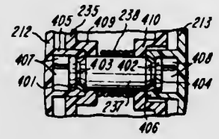
a projection adapted to mount another flange, wherein the minimum transverse dimension of said projection is not substantially larger than said stub end,

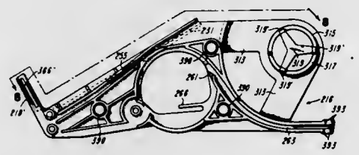
said first-mentioned flange being disposed between said roll-mounting portion and said stub end,

said projection extending outwardly of one end of said roll-mounting portion, said projection being opposite and generally aligned with said stub end,

said roll-mounting portion and said first-mentioned flange and said stub end and said projection being formed of plastics material and being integrally molded portions of said hub section,

said hub section being rotatable about an axis of rotation that passes through said stub end and said roll-mounting portion and said projection and said first-mentioned flange, said stub end being adapted to be snapped into and rotatably received by a snap-socket and





said roll-mounting portion being adapted to receive an ink-receptive tubular porous roll adjacent said first-mentioned flange.

4,785,736

DEVICE FOR TENSIONING A FLEXIBLE PRINTING PLATE MOUNTED ON A PLATE CYLINDER

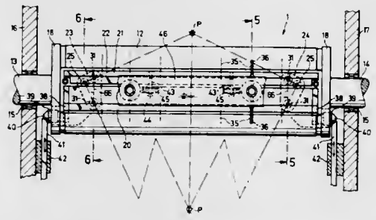
Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Feb. 10, 1987, Ser. No. 13,010

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1986, 3604209

Int. Cl.⁴ B41L *29/06*

U.S. Cl. 101—415.1 **13 Claims**



1. Device for tensioning a flexible printing plate mounted on a plate cylinder of a rotary printing machine having a device for pivoting the printing plate on the plate cylinder so as to provide a register correction, the printing plate having ends which are clamped in tensioning rails, comprising respective pivot levers mounted by a respective pivot on a cylinder body at or near either end of the plate cylinder and connecting the tension rails by respective connections to one another at or near both ends of the tension rails, said connections being ofset from the pivot so that movement about the pivot causes one end of the printing plate to move in one direction and the other end thereof in the opposite direction, and cam means for tipping and displacing the tensioning rails in common relatively to one another so that the printing plate is pivotable about a precisely defined pivot point.

4,785,737

BUFFERED LEAD-IN GUIDE FOR CABLEWAY VEHICLES

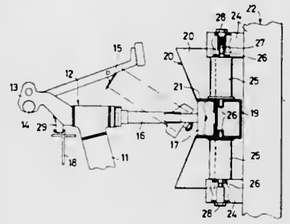
Otto Pabst, Meransen, Italy, assignor to Leitner, S.p.A., Bolzano, Italy

Filed Oct. 9, 1986, Ser. No. 917,174

Claims priority, application Italy, Oct. 9, 1985, 2336/85[U]

Int. Cl.⁴ B61B *7/00*

U.S. Cl. 104—173.1 **4 Claims**



1. A buffered lead-in guide for rotary wheels of cableway vehicles, said buffered lead-in guide comprising:

(a) a cantilevered enlarged mouth section that is C-shaped in cross-section, that gradually decreases in height from an open first end to a second end, and that has a planar rear surface;

(b) a guide portion that is C-shaped in cross-section, that is of at least substantially constant height, that has a first end that merges with the second end of said enlarged mouth section and a second end, that has a rear planar surface that merges with the rear planar surface of said enlarged mouth section, and that opens laterally in the same direction as said enlarged mouth section;

(c) a rigid beam that has a planar front surface that makes planar supporting contact with the planar rear surfaces of said enlarged mouth section and said guide portion;

(d) an outer support that is C-shaped in cross-section, that surrounds said guide portion and said rigid beam, and that opens laterally in the same direction as said enlarged mouth section;

(e) a first at least approximately vertically disposed elastic element disposed between the top of said rigid beam and said outer support; and

(f) a second at least approximately vertically disposed elastic element disposed between the bottom of said rigid beam and said outer support,

whereby vertical oscillation of said rigid beam due to impacts of the rotary wheels of cableway vehicles on said enlarged mouth section and said guide portion are at least partially absorbed by said first and second elastic elements.

4,785,738

DETACHABLE GONDOLA LIFT OR CHAIR-LIFT

Alain Mollet, Seyssins, France, assignor to Pomagalski S.A., France

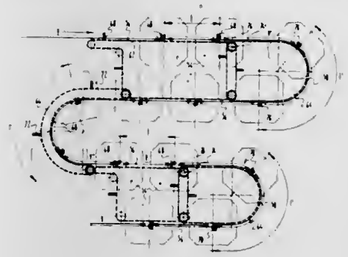
Filed Apr. 27, 1987, Ser. No. 42,781

Claims priority, application France, May 6, 1986, 86 06687

Int. Cl.⁴ B61B *11/00*

U.S. Cl. 104—173.2 **6 Claims**

1. An aerial ropeway transport installation, in particular a gondola lift or chair-lift, having terminal stations equipped with transfer and/or parking tracks, grips for coupling to a rope, having roller sheaves, said grips being able to be detached from the aerial ropeway in the terminals and to run on the transfer and/or parking track before being recoupled to the rope, said track comprising straight sections and curved sections, vehicles, in particular cars or chairs, suspended from the grips and a means for driving the vehicles arranged so as to drive the vehicles following one another closely or almost touching on the straight sections at a first speed, and on the curved sections at a greater speed than said first speed so as to



increase the distance between vehicles with a clearance sufficient for the curved sections to be passed through without the risk of the vehicles following one another colliding.

4,785,739

TRACKED TRANSPORTATION SYSTEM COMPRISING EMERGENCY CAR BRAKING SYSTEM

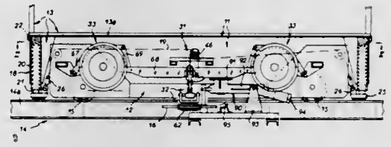
Jean Huon de Kermadec, Le Chesnay, France, assignor to Soule, Bagneres de Bigorre, France

Filed Nov. 4, 1986, Ser. No. 926,557

Claims priority, application France, Nov. 5, 1985, 85 16360

Int. Cl.⁴ B61B *9/00, 12/12;* **B61K** *7/20;* **B61F** *1/00*

U.S. Cl. 104—208 **19 Claims**



1. Transportation system comprising a track, at least one car adapted to be driven along said track and comprising a chassis adapted to roll on said track and a cabin, suspension members whereby said cabin is suspended from said chassis, braking means on a lower part of said cabin, and release means on said cabin, said suspension members are attached to a load summing mechanism incorporating said release means and said release means is adapted to release said suspension members and to cause lowering of said cabin and operation of said braking means.

4,785,740

DUAL PURPOSE WEAR PLATE

Robert S. Grandy, Hinsdale, Ill., assignor to General Standard Company, Bensenville, Ill.

Filed May 19, 1987, Ser. No. 51,905

Int. Cl.⁴ B61F *5/32*

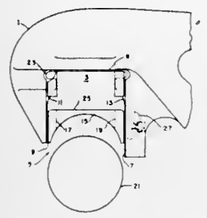
U.S. Cl. 105—225 **7 Claims**

1. In a pedestal side frame of the type having a downwardly facing jaw including a roof portion and opposed sidewall portions extending downwardly from said roof portion, a first lug located on one of said sidewall portions, a second lug located on the other of said sidewall portions opposite the first lug, a bearing adapter adapted to be received in said jaw including a first vertically extending channel for slidably receiving the first lug and a second vertically extending channel for slidably receiving the second lug thereby to retain the bearing adapter in the jaw, and, disposed between said jaw and said bearing adapter, an improved wear plate, comprising:

a base portion abutting said roof portion;

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a first leg formed integrally and extending downwardly from said base portion and located in said first channel between said first lug and said bearing adapter, said first leg comprising two faces extending from a central connecting face at an angle of less than 180 degrees, said leg enclosing the first leg to prevent all contact between said first lug and said bearing adapter; and



second and third legs extending downwardly from said base portion and disposed one each on either side of said second lug such that the engagement of said second lug with said second and third legs limits movement of the wear plate in a plane parallel to said base portion.

4,785,741

EMERGENCY EXIT IN VEHICLES, PARTICULARLY IN AIRCRAFT AND SPACECRAFT

Werner Grooow, Blagnac, France, assignor to Deutsche Airbus GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,330
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1986, 3632122
Int. Cl.[4] B60N *5/00*; B61D *1/00*
U.S. Cl. 105—348 **10 Claims**



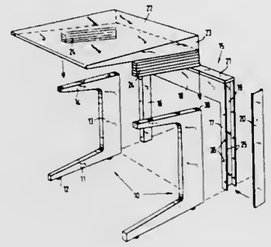
1. An emergency exit in vehicles, particularly in aircraft or spacecraft, wherein a wall of the vehicle defines an emergency exit opening, a door sealingly placable against and lockable with the vehicle wall, the door capable of being moved outwardly through the opening for completely opening the emergency exit, the opening and the door defining first and second longitudinal sides and a top side, and an upper corner at the top of the second side and a diagonally oppositely located lower corner at the bottom of the first side, the improvement comprising first and second pretensionable expanding elements each having first and second ends, the first end of the first element attached to the door on the second longitudinal side near the upper corner and the second end releasably attached to the vehicle wall at a point located on the top side approximately diagonally upwardly across the upper corner, the first end of the second expanding element attached to the door on the first longitudinal side near the lower corner and the second end releasably connected to the vehicle wall at a point on the first longitudinal side approximately one-fourth from the top side, so that the second expanding element extends essentially parallel to the first longitudinal side.

4,785,742

WORKTABLE WITH WORK SURFACE AND TABLE MOUNT

Hartmut H. Esslinger, Grenzweg, Fed. Rep. of Germany, assignor to Konig & Neurath Kommanditgesellschaft, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,444
Int. Cl.[4] A47F *5/12*
U.S. Cl. 108—6 **17 Claims**



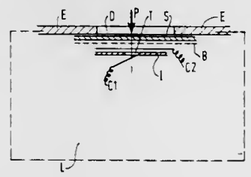
1. A worktable with a work surface adjustable in inclination, which is connected to a table mount by means of an adjustment mechanism, characterized by the fact that said table mount comprises a unitary base frame (**15**) having two supporting columns (**16, 17**) spaced at a distance from each other corresponding to the width of said worktable, said supporting columns (**16, 17**) firmly connected to each other by means of at least one transverse connecting member (**18**) and two unitary leg members (**10**) each comprising a central joining portion (**13**), with a base leg (**11**) and a supporting leg (**14**) extending from said central joining portion, said central joining portions (**13**) of said unitary leg members (**10**) detachably fastened to said supporting columns (**16, 17**) of said unitary base frame (**15**) and said adjustment mechanisms (**24**) mounted on the underside of said work surface (**22**) adjacent said supporting legs (**14**) of said leg members (**10**) and connected to said supporting legs (**14**) of said leg members (**10**).

4,785,743

PROTECTED ROOM WITH AN ELECTRICAL INTERRUPTOR AND ITS APPLICATION

Claude Dalphin, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1986, Ser. No. 944,294
Claims priority, application France, Dec. 20, 1985, 85 18918
Int. Cl.[4] G08B *19/00*; E05G *3/00*
U.S. Cl. 109—40 **13 Claims**



1. Apparatus for protecting a closed space, the apparatus comprising:

a plurality of walls defining an interior and an exterior of the space, at least one of the walls containing at least one interruptor which includes first and second conductors and means for producing electrical contact between the first and second conductors in response to a movement, so that binary signals are transmitted from the exterior to the interior of the closed space; and

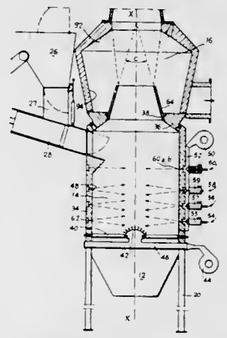
a probe for detecting attempts at unauthorized intrusion into the space, which probe comprises a comparatively conductive track having at least one relatively thin and flexible part for covering the interruptor, the thin and flexible part acting as a barrier through which the movement is transmitted, so that the probe improves protection in the wall which contains the interruptor without impairing functioning of the interruptor.

4,785,744

INCINERATOR OF URBAN WASTES

Claude Fontaine, Olmede-l'Honor de Cos, 82130 Lafrancaise, France

Filed May 15, 1987, Ser. No. 50,142
Claims priority, application France, May 15, 1986, 8607001
Int. Cl.[4] F23B *5/02*; F23G *5/32*
U.S. Cl. 110—214 **11 Claims**



1. Incinerator comprising a combustion chamber having a floor or lower grate under which is placed an ash box and an outer wall in heat-resistant material, a supply device for introducing the materials to be incinerated, a primary air supply circuit comprising a blower casing situated substantially in the center of the grate, and a secondary air supply circuit comprising injection nozzle means distributed around the periphery of said combustion chamber and located within at least one stage within the height of the burning stack, at least part of said nozzle means comprising a plurality of mutually spaced nozzle pairs each nozzle pair being oriented according to a first predetermined angle (a), one above and one under a horizontal plane, as well as according to a second predetermined angle (b) on either side of a vertical diametral plane of the combustion chamber with adjacent nozzles in each pair being oriented in opposite directions relative to the horizontal plane and the vertical diametral plane.

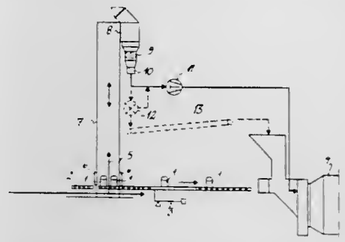
4,785,745

METHOD FOR WASTE TREATMENT

Jorma Hanni, Espoo; Mauri T. Rantanen, Vihti; Matti Vattulainen, and Syrjämäki, both of Riihimäki, all of Finland, assignors to Outokumpu Oy, Helsinki and Ekokem Oy Ab, Riihimaki, both of, Finland

PCT No. PCT/FI86/00107, § 371 Date May 26, 1987, § 102(e) Date May 26, 1987, PCT Pub. No. WO87/02119, PCT Pub. Date Apr. 9, 1987
PCT Filed Oct. 3, 1986, Ser. No. 64,307
Claims priority, application Finland, Oct. 3, 1985, 853834
Int. Cl.[4] F23G *7/04*
U.S. Cl. 110—346 **21 Claims**

1. A method for treating waste contained in vessels such as barrels and the like, particularly hazardous waste, the said method including transporting the vessels (**1**) containing the waste by means of a charging conveyor (**2**), and burning the waste in a furnace, characterized in that the vessels (**1**) are shifted from the charging conveyor (**2**) into a shearing device (**9**), where the vessels are cut up and/or pressed to crush so



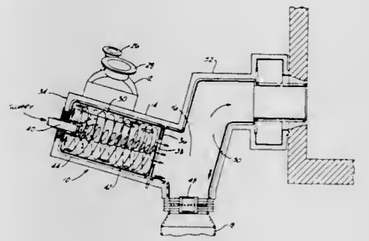
that the waste can be treated with a paste pump (**11**), metal is separated from the waste before the waste is pumped into the kiln furnace (**4**) by means of the paste pump (**11**), and the separated metal is transported, by means of a band conveyor (**13**), into the same furnace as the waste proper.

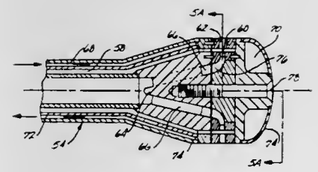
4,785,746

CARBONACEOUS SLURRY COMBUSTOR

Gabriel D. Roy, and Douglas B. Sheppard, both of Torrance, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 725,859, Apr. 25, 1985, abandoned, which is a continuation of Ser. No. 670,412, Nov. 13, 1984, abandoned. This application Aug. 1, 1986, Ser. No. 891,975
Int. Cl.[4] F23D *1/00*
U.S. Cl. 110—347 **7 Claims**





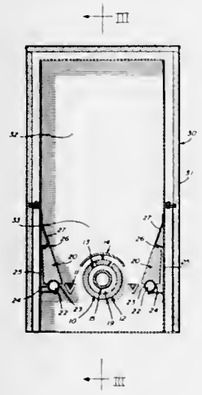
1. In a method of combusting pulverized carbonaceous fuel suspended as a slurry in a flow of carrier liquid wherein combustion of the carbonaceous fuel occurs in an elongate combustion zone having a contained tangential and axial flow field of a heated oxidant, the steps of:

(a) flowing said slurry longitudinally of a first conduit extending a substantial distance into the tangential and axial flow field of heated oxidant contained in the combustion zone;

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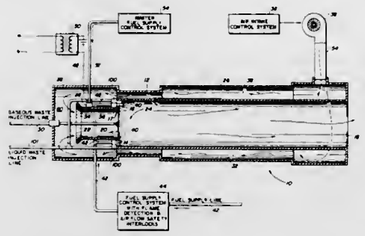
(b) diverting the flow of said slurry into a flow pattern divergent from and at an angle to the direction of longitudinal flow and about a flow diverting bend extending transversely of the longitudinal axis thereof;
(c) intercepting the divergent flow of slurry after passing said bend, with a relatively high velocity flow of atomizing gas flowing through a second conduit annularly surrounding said first conduit, said atomizing gas intercepting and breaking said flow of slurry into minute droplets, and wherein said droplets pass in a divergent pattern into the combustion zone, said droplets being small enough for the carbonaceous fuel to be ignited closely adjacent said conduit.

4,785,747
GASIFYING BURNER FOR A SOLID FUEL HEATING APPARATUS
Andre Landreau, Fontenay Le Comte, France, assignor to Chaubois Technologie Inc., Canada
Filed Apr. 22, 1987, Ser. No. 41,603
Claims priority, application Canada, Apr. 25, 1986, 507586
Int. Cl.[4] F23B 7/00
U.S. Cl. 110—234 **22 Claims**



1. A gasification burner for a heating apparatus using a solid fuel and comprising a hearth having a base, a lower part of said hearth being defined by a fire grate, the gasification burner comprising:
(a) an outer enclosure comprising a series of openings which communicate with the base of the hearth;
(b) a burner duct distinct from said outer enclosure and which runs longitudinally inside said outer enclosure, said burner duct comprising an inlet located at one end thereof and an outlet located at another end thereof, a space defined between said burner duct and said outer enclosure communicating with said inlet of said burner duct; and
(c) a secondary air inlet located near said inlet of said burner duct.

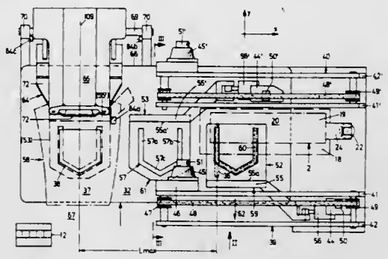
4,785,748
METHOD SUDDEN EXPANSION (SUE) INCINERATOR FOR DESTROYING HAZARDOUS MATERIALS & WASTES
Mark L. Sujata, Northridge; Thomas D. Burnette, Westlake Village; H. Clyde Long, Jr., Simi Valley, and Raymond E. Wieveg, Ventura, all of Calif., assignors to The Marquardt Company, Van Nuys, Calif.
Filed Aug. 24, 1987, Ser. No. 88,558
Int. Cl.[4] F23G 7/04
U.S. Cl. 110—238 **16 Claims**



1. An improved method of incinerating fluidizable materials, said method comprising:
(a) providing a sudden expansion burner having a housing with a relatively small diameter waste, air and fuel inlet component, a relatively larger diameter, elongated combustion chamber, and a plurality of fuel nozzles and waste injection nozzles extending radially about said inlet component,
(b) introducing air into said inlet component,
(c) injecting fluidized waste material from said waste injection nozzles directly inwardly to a combustion zones at the axis of rotation of said burner housing and combustion chamber and in an area immediately downstream of said burner housing,
(d) simultaneously injecting fuel from said fuel nozzles directly inwardly to said combustion zone,
(e) igniting the air, fuel and waste material in said combustion zone,
(f) passing said fluidized material and fuel downstream through said zone until consumed by combustion; and,
(g) continuing to inject additional of said air, fuel and fluidizable material until a predetermined amount of said fluidizable material is totally flame consumed in said burner without production of toxic or polluting gases.

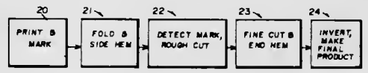
4,785,749
AUTOMATIC SEWING MACHINE
Jochen Fischer, Detmold, Fed. Rep. of Germany, assignor to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany
Filed Mar. 15, 1988, Ser. No. 168,221
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709251
Int. Cl.[4] D05B 21/00, 3/04
U.S. Cl. 112—121.12 **7 Claims**

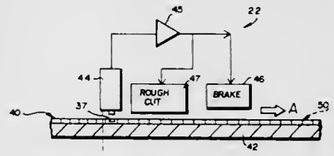
1. Automatic sewing machine comprising
a sewing head (2) having an upper arm (20) and a needle (31) which is movable up and down relative to the upper arm (20);
a feeding device (39, 40) for first and second workpieces (37, 38) which are arranged on one another and are to be sewn together and the second workpiece (38) of which is a pocket piece which is to be sewn to the first workpiece (37) whith an approximately U-shaped seam (60);
a workpiece holder (52, 53) being a part of the feeding device (39, 40) and having a U-shaped slot (57) adapted to the path of the seam (60) to be sewn and comprising two longitudinal slots (57*a*, 57*b*) approximately parallel to one another and comprising a transverse slot (57*c*) which connects these longitudinal slots at one end;
means for transferring the workpieces (37, 38) from a transfer position (58) some distance from the sewing head (2) to a sewing position (59) at the sewing head (2) in a feeding direction (x-direction) which runs perpendicular to the direction (y-direction) of the longitudinal slots (57*a*, 57*b*);
means for moving the sewing head (2) and the workpiece holder (52, 53) relative to one another in the sewing position (59) in a sewing plane (x-y plane) running perpendicular to the needle (31) and following a preset path of the seam (60);



a folding device (64) for folding the pocket piece (second workpiece 38) being arranged ahead of the transfer position (58) and having a sword (80);
means for moving the sword (80) in the direction (y-direction) of the longitudinal slots (57*a*, 57*b*); and
a common stand (1) on which the folding device (64), the feeding device (39, 40) and the sewing head (2) are arranged; wherein
means are provided for displacing the folding device (64) on the stand (1) in the feeding direction (x-direction) relative to the sewing head (2); and
means are provided for locking the folding device (64) relative to the stand (1).

4,785,750
AUTOMATIC MEANS OF ACCURATELY DETECTING AND CUTTING FABRIC PANELS
Robert H. Best, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Jul. 14, 1986, Ser. No. 885,443
Int. Cl.[4] D05B 97/00, 13/00, 37/04, 35/00
U.S. Cl. 112—262.1 **28 Claims**





1. A method of forming pattern printed textile products having the pattern properly positioned at desired locations on the textile product, comprising the steps of:
(a) printing a pattern on a fabric web susceptible to stretching or shrinking moving in a first direction;
(b) in synchronization with step (a), disposing a magnetic mark on the textile in a known position adjacent the pattern in the first direction;
(c) subsequently detecting the magnetic mark on the fabric web and cutting the web at a known position with respect to the mark to form a web section with a known position of a pattern thereon, the position of the cut relative to the known position of the mark lying closely adjacent one another such that the pattern is properly positioned on the cut web section; and
(d) forming the web section into a final textile product.

9. A method of forming a pattern printed pillow case comprising the steps of:
(a) printing a pattern on a fabric web while moving the web in a first direction, the fabric web being susceptible to stretching or shrinking;
(b) in synchronization with step (a) disposing a magnetic mark on the fabric web in a known position adjacent each pattern in the direction of fabric movement;
(c) providing a portion of the fabric web so that it has a width generally comparable to the width of the pillow case to be formed;
(d) folding over the web portion so that the pattern face of the web portion is folded in half, with the pattern faces abutting each other;
(e) forming a side hem on the web portion;
(f) detecting the magnetic mark on the web portion and rough cutting the web portion at a known position with respect to the mark, the cutting being performed in a direction perpendicular to the first direction to form a cut; and
(g) fine cutting the web portion and forming an end seam at the cut, the position of the cut as set forth in step (f) relative to the known position of the mark lying closely adjacent one another and at least within a discrete pattern length.

12. A method of forming a pattern printed textile product comprising the steps of:
(a) printing a pattern of a fabric web while moving in a first direction, the fabric web being susceptible to stretching or shrinking;
(b) in synchronization with step (a) disposing magnetic marks on the fabric web to define perimeter cut lines for subsequent use in manufacture of the textile fabric product from the fabric web;
(c) subsequently detecting the magnetic mark perimeter cut lines on the fabric, and cutting the fabric along the perimeter cut lines to produce fabric panels, the position of the cut lines relative to the position of the marks lying closely adjacent one another and at least within a distance less than the length a discrete panel extends in said first direction; and
(d) forming the fabric panels into a final textile product.

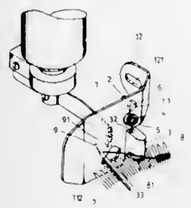
4,785,751
NEEDLE PLATE ASSEMBLY FOR SEWING AND THE LIKE MACHINES
David L. Kun-Horn, No. 343, Hwa-Tzong Rd., Shyue-Jea Jenn, Tainan, Taiwan
Filed Apr. 10, 1987, Ser. No. 36,855
Int. Cl.[4] D05B 7/00
U.S. Cl. 112—27 **2 Claims**

1. A needle plate assembly for sewing and the like machines, said assembly comprising:
a walled needle plate having a major portion with a compound needle hole for passage therethrough of a thread, and having a minor attachment arm portion to provide a lateral right angle aperture in said walled needle plate for a respective thread staying block, said minor attachment arm portion having attachment holes respectively positioned above said compound needle hole when considered in the installed position at a sewing machine;
a fulcrum lever block with a flat upper terminus adapted to

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be secured to said needle plate and a column-shaped lower terminus;

a thread staying block of oval cross section having a fulcrum lever hole for receiving said column-shaped lower terminus of said fulcrum lever, and having a spring retaining hole forwardly spaced from said fulcrum lever hole when considered in the installed position; said thread staying block being adapted to be secured at said needle plate in such a way that it projects from the forward wall of said



needle plate and through said right angle aperture to be proximally engaged by respective needles of said machine; and

a spring having an upper hook-shaped terminus for securement at said needle plate and having a straight terminus adapted to be operatively connected in said spring retaining hole of said thread block; said spring allowing operative movement of said thread staying block with respect to the moving path of respective needles but precluding damage of needles.

4,785,752

MATERIAL FEEDER OF SEWING MACHINE

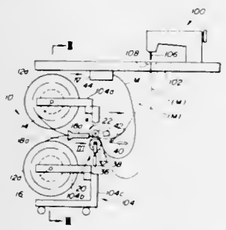
Yoshiro Soma, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 30, 1987, Ser. No. 67,886

Claims priority, application Japan, Aug. 29, 1986, 61-132264[U]

Int. Cl.⁴ D05B *47/04*

U.S. Cl. 112—278 **12 Claims**



1. In a sewing machine for sewing a narrow and long material which is drawn from a bobbin, a material feeder which comprises:

first means for drawing a predetermined length of the material from said bobbin when actuated; and

second means for actuating said first means when the length of the material drawn from the bobbin is reduced to a predetermined degree.

4,785,753

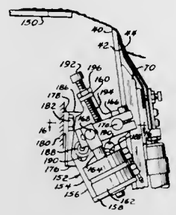
LATCH TACKER

Robert L. Kosrow, Hoffman Estates, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Jun. 30, 1987, Ser. No. 68,587

Int. Cl.⁴ D05B *53/00*

U.S. Cl. 112—253 **13 Claims**



1. An apparatus for positioning a chain of stitches for stitching onto material in a sewing machine having a needle and a throat plate, comprising:

means for positioning the chain of stitches forwardly of the needle;

means separate from the positioning means for grasping the chain in the forward position; and

means for moving the grasping means between a first position adjacent a forward end of the throat plate when the chain is being grasped, and a second position away from and forward of the throat plate after the chain has been grasped to tighten the grasped chain.

4,785,754

DEVICE FOR AVOIDING CAPSIZING OF CATAMARANS

Michele Barberis, Via Garessio, 18, Turin, Italy

Filed Jun. 25, 1987, Ser. No. 66,867

Claims priority, application Italy, Mar. 27, 1987, 67234 A/87

Int. Cl.⁴ B63B *39/00*

U.S. Cl. 114—39.1 **14 Claims**



1. A safety device used with a catamaran for avoiding capsizing of the catamaran, the catamaran having a mast pivotally mounted at its base on a transverse beam of connection of two hulls of the catamaran, comprising

a hollow cylinder mounted on the mast having a first end portion and a second end portion,

a piston rod slidably mounted in the cylinder having a first end portion and a second end portion,

shrouds mounted on the second end portion of the piston rod and extending to the top of the mast,

pulley means mounted on the catamaran for tensioning and positioning the shrouds, and

means for biasing the piston rod toward the first end portion of the cylinder maintaining the mast of the catamaran in an erect position up to a predetermined value of force and for permitting the mast, when the force of the wind exceeds the predetermined value of force, to bend relative to the catamaran and to resume its erect position when the force of the wind decreases below the predetermined value, the predetermined value being determined by the piston rod biasing means.

4,785,755

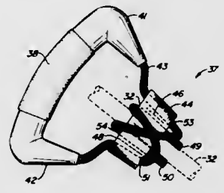
SAIL BOARD HANDGRIP

Robert E. Markison, 464 Alvarado St., San Francisco, Calif. 94114

Filed Nov. 24, 1986, Ser. No. 934,506

Int. Cl.⁴ B63H *9/08*

U.S. Cl. 114—39.2 **8 Claims**



8. In a sailboard comprising a board, a sail and a boom, the improvement comprising a handgrip extension attached to the forward end of the boom, said extension being rotatably mounted to allow 360° rotation of the forward hand, said handgrip extension comprises a gripping surface, a boom binder, and means connecting the gripping surface to the boom binder.

4,785,756

VESSEL HAVING PROPELLER ARRANGED ON VERTICAL HULL CENTER PLANE

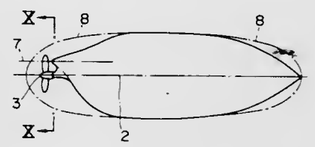
Norihiro Matsumoto, Tokyo, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1987, Ser. No. 68,943

Claims priority, application Japan, Aug. 6, 1986, 61-183474

Int. Cl.⁴ B63B *1/00*

U.S. Cl. 114—57 **5 Claims**



1. A vessel comprising a hull having a vertical hull center plane, and a single crew propulsion system, comprising:

said single screw propulsion system including a rotatable propeller shaft positioned on said vertical hull center plane; and a propeller coupled to said shaft, said propeller, when rotated by said shaft, forming a propeller disc plane of given diameter;

said hull including an upper deck portion arranged substantially symmetrically with respect to said vertical hull center plane;

said hull further including a stern portion coupled to said upper deck portion, said stern portion having a longitudinal plane passing through a stern end of said vessel; and

said longitudinal plane of said stern portion being positioned laterally offset from said vertical hull center plane by 5 to 25% of said diameter of said propeller disc plane.

4,785,757

APPARATUS FOR BOAT SAILS

Ulf B. Östholm, Hildurs väg 26, S-198 00 Bålsta, Sweden

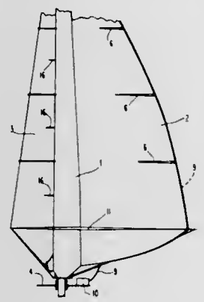
PCT No. PCT/SE86/00229, § 371 Date Dec. 30, 1986, § 102(e) Date Dec. 30, 1986, PCT Pub. No. WO86/06697, PCT Pub. Date Nov. 20, 1986

PCT Filed May 15, 1986, Ser. No. 22,806

Claims priority, application Sweden, May 17, 1985, 8502452-9

Int. Cl.⁴ B63H *9/08, 9/04*

U.S. Cl. 114—102 **5 Claims**



1. Apparatus for stretching the leech of a sail which may be rolled into or round the mast of a boat, characterized in that the apparatus comprises a plurality of separate, elongate, fluid-tight containers (6;16), inserted in mutually spaced pockets (5) made at vertical spacings in the sail (2;3), said containers extending substantially horizontally from the leech of the sail to a place at a distance from the luff of the sail, the edges of the containers situated in the vicinity of the leech of the sail being connected to a pump (10) common to all of said containers for inflating said containers into a substantially stiff shape, and said containers being connected to each other and the pump (10) by a hose (9) running along the leech of the sail (2) and affixed thereto.

4,785,758

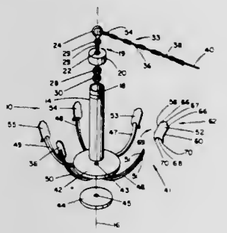
RELEASABLE MARINE ANCHOR

Philip T. Eichelberger, Sr., 1415 Kathy, Arcola, Tex. 77583

Filed May 9, 1986, Ser. No. 861,278

Int. Cl.⁴ B63B *21/46*

U.S. Cl. 114—299 **3 Claims**



1. A marine anchor for engaging the bed of a body of water and mooring a vessel to an interconnecting line and capable of being dislodged from engagement with a submerged object by use of the line, comprising

an elongated anchor stem having a proximal and distal end and defining a longitudinal axis,

an odd numbered plurality of curved anchor arms equally spaced about said anchor stem and having one end attached to said distal end thereof and extending radially

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outwardly and upwardly therefrom, said arms terminating in free ends angularly disposed with respect to said longitudinal axis intermediate said proximal and distal ends of said anchor stem,

an odd numbered plurality of fluke elements each having a generally flat body portion with an outermost end and an innermost end, said outermost end being adapted for engaging the bed of the body of water and the innermost end having depending therefrom a pair of spaced projections disposed in a plane angularly intersecting the plane of said generally flat body portion, each of said projections having a predetermined maximum width, one each of said fluke elements being mounted on one of said anchor arm free ends with said fluke outermost end projecting beyond said free end of said anchor arm and orienting said generally flat body portion angularly facing said anchor stem, said innermost end positioning one of said pair of spaced projections on either side of said anchor arm and extending in a direction away from said proximal end of said anchor stem, and

a chain connected at one end to said proximal end of said anchor stem and having a predetermined length that exceeds the distance from said proximal end of said anchor stem to each of said anchor flukes, each of the links of said chain having openings therein exceeding said predetermined width of said fluke projections, the free end of said chain interconnected to the anchor link attached to the vessel,

wherein when the anchor is disposed in engagement with the bed of the body of water, the bed will be engaged by a lower pair of said arms and flukes for positioning one of said remaining arms and attached fluke in a generally vertical orientation, above the bed, and

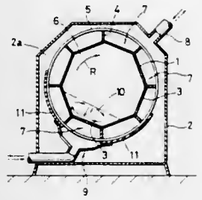
wherein when at least one of said pair of lower arms and flukes engage a submerged object, the line may be manipulated from the vessel to move said chain into contact with said vertically oriented anchor arm and attached fluke for causing one of said chain links to engage one of said fluke projections,

whereby the anchor line may then be raised to lift said engaged fluke and anchor arm for shifting the mass distribution of the anchor and causing said proximal end of said anchor stem to move downwardly and move said engaged anchor arms and flukes out of engagement with the submerged object to free the anchor for retrieval.

4,785,759
APPARATUS FOR TREATING POWDERY AND GRANULAR MATERIAL

Shimesu Motoyama, Asaka; Siuri Yamada, Kawagoe, and Narimichi Takei, Sugito; Koji Nagaka, Saitama, all of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,714
Claims priority, application Japan, Sep. 2, 1986, 61-206305
Int. Cl.⁴ B05C *5/00*
U.S. Cl. 118—19 **11 Claims**



1. A powdery and granular material treating apparatus comprising:

a rotary drum formed at least at one portion of the outer periphery thereof with ventilating perforations;

seal means for gas fed to or exhausted from said rotary drum;

sliding frames provided on the sides of the outer periphery of said rotary drum, said sliding frames being in sliding contact with said seal means; and

partition means provided on the side of the outer periphery of said rotary drum at positions spaced apart equidistantly in the circumferential direction of said rotary drum from one another;

said sliding frames each being of a circular outer shape, provided on the sides of the outer peripheral edges at axially opposite ends of said rotary drum;

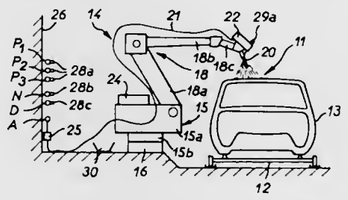
said seal means, being in sliding contact with said sliding frames at portions for feeding gas to or exhausting gas from said rotary drum, prevents gas from leaking through said portions; and

said rotary drum, sliding frame, and partition means define a plurality of ventilating spaces, through which gas is fed to or exhausted from said drum when one of said ventilating spaces comes to said positions for feeding gas to or exhausting gas from said rotary drum by rotating said rotary drum, sliding frame, and partition means all together.

4,785,760
SPRAYER INSTALLATION

Roger Tholome, La Tronche, France, assignor to S A M E S S.A., Meylan, France

Filed Dec. 22, 1987, Ser. No. 136,844
Claims priority, application France, Jan. 2, 1987, 87 00007
Int. Cl.⁴ B05B *1/28*
U.S. Cl. 118—323 **24 Claims**



1. Sprayer installation comprising at least one multi-axis robot, a sprayer carried by said robot, a conveyor adapted to carry objects to be sprayed past said robot, respective circuits for distributing products to be sprayed, like first connection means for each of said distribution circuits at fixed locations within range of said robot, a storage tank for product to be sprayed carried by said robot at least during a spraying phase and connected to said sprayer to supply thereto product to be sprayed, and first complementary connection means equipping or communicating with said storage tank and cooperable with said first connection means of any of said distribution circuits.

4,785,761
MOBILE SEED CLEANING APPARATUS

Neville J. Greenbank, 127-135 Gillies St Sth, Ballarat, Victoria, Australia (3350)

Filed Dec. 2, 1986, Ser. No. 937,095
Int. Cl.⁴ B05C *9/10, 11/10;* **B07B** *9/00, 13/14*
U.S. Cl. 118—682 **14 Claims**

1. A mobile seed cleaning apparatus which comprises

a mobile chassis for mounting a plurality of cleaning or separating stations sequentially interconnected so as to cause seed to be cleaned to pass from a first station to a last station;

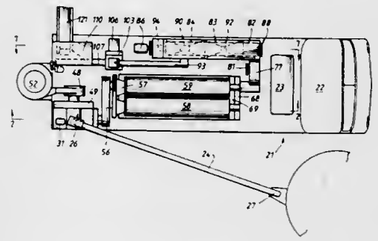
coarse screen means onto which the seed is fed having a predetermined screen size for separating material larger than said screen size by permitting the seed to pass through the screen;

air separator means having an air duct means and a blower means for removing relatively light material;

pocket cylinder means comprising two hollow cylinders having internal surfaces formed with a plurality of pockets to receive individual seeds, and being rotatable at predetermined speeds about their respective axes, the axes being inclined downwardly from an inlet end to an outlet end of said cylinder, and having means to vary the axis inclination of each cylinder;

a collector trough in each of said cylinders extending longitudinally therethrough, each collector trough having a seed auger therein;

means for moving the trough about a longitudinal axis to vary the position of an upper, open side of the trough relative to the cylinder, the outlet end of each cylinder



opening into a first chamber and the outlet of each collector trough opening into a second chamber, each of the first and second chambers having waste outlet passages and seed outlet passages;

door means for directing material in each chamber to either of the passages;

screen cylinder means having interchangeable screen cylinders rotatable about a longitudinal axis and internal scraper means to urge the seed through the screen cylinders; and

conveyor means continuously moving the seed from one station to the next.

13. Apparatus as claimed in claim 1 further including pickling means operable in accordance with measured amounts of cleaned seed to deposit a predetermined amount of fungicide, pesticide, mold inhibitor or other chemical onto the measured amount of seed.

4,785,762
APPARATUS FOR FORMING FILM

Toshihiko Miyazaki, Tokyo; Etsuko Sugawa, Machida; Yoshinori Tomida; Hirohide Munakata, both of Yokohama; Yukuo Nishimura, Sagamihara, and Ken Eguchi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 723,924, Apr. 16, 1985, abandoned.
This application Nov. 30, 1987, Ser. No. 129,364
Claims priority, application Japan, Apr. 19, 1984, 59-77531; Apr. 19, 1984, 59-77534
Int. Cl.⁴ B05C *3/10*
U.S. Cl. 118—402 **5 Claims**

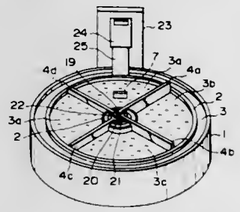
1. An apparatus for forming on a substrate a heterogeneous built-up film made of different monomolecular layers, comprising:

a vessel for holding a liquid;

a frame located within the vessel for confining the surface of the liquid on which monomolecular layer-forming molecules are to be spread;

a plurality of means for isolating on the liquid surface at least two monomolecular layers that differ from one another;

means for moving each isolated monomolecular layer on said liquid surface while maintaining a surface pressure of said monomolecular layer at a desired value by moving said plurality of isolating means in the same direction; and

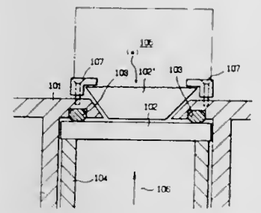


means for transferring a moved monomolecular layer onto said substrate.

4,785,763
APPARATUS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM USING MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION PROCESS

Keishi Saitoh, Nagahama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

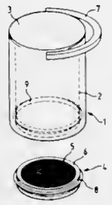
Filed Dec. 3, 1987, Ser. No. 128,213
Claims priority, application Japan, Dec. 9, 1986, 61-291514
Int. Cl.⁴ C20C *16/50*
U.S. Cl. 118—723 **2 Claims**



1. An improved apparatus for the formation of a functional deposited film using a microwave plasma chemical vapor deposition process comprising a substantially enclosed deposition chamber having a deposition space, a supporting means for a substrate on which a functional deposited film is to be formed being placed in the deposition space, a means for supplying a raw material gas, a means for evacuating the inside of the deposition chamber, a microwave introducing means being provided with the wall of the deposition chamber and a waveguide being extended from a microwave power source, characterized in that said microwave introducing means is comprised of laminated two or more microwave transmissive plates made of a dielectric material and the surface of the outermost transmissive plate to become faced to the deposition space is of a roughened surface.

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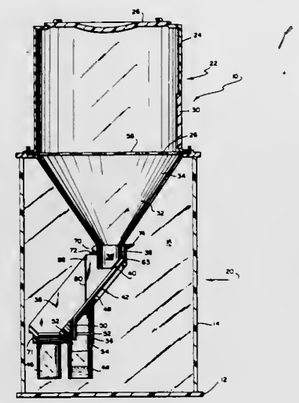
4,785,764
APPARATUS FOR RECEIVING AND STORING USEFUL ORGANISMS AND PROCESS FOR THE PRODUCTION THEREOF
Hans-Rudolf Müller, Zürich, Switzerland, assignor to Zucher Beteltuchfabrik AG, Ruschlikon, Switzerland
Filed Jun. 5, 1986, Ser. No. 871,104
Claims priority, application Switzerland, Jun. 6, 1985, 2407/85
Int. Cl.[4] A01K *1/00*
U.S. Cl. 119—15 **8 Claims**



1. An apparatus for receiving and storing useful organisms for control or destruction of harmful bacteria, other harmful organisms or harmful materials, comprising a hollow solid casing having an opening, said casing being adapted to receive and store said useful organisms, and a cover having at least one opening which has a dimensionally defined cross-sectional surface, said cover being mounted on the casing so as to close the opening in the casing; the opening in the cover serving to permit exit from the interior of the casing of only those useful organisms smaller than said opening, the casing and cover being formed from a material which decomposes without substantial detriment to the environment and which is selected from the group consisting of polyamide, cellulose, polyethylene, polypropylene, and polyester, said material having been treated prior to use as casing and cover with ultraviolet or beta radiation or with an oxidizing agent for a sufficient period to adjust the period during which the cover and casing will remain intact during use to a desired time so that when subjected to weathering the treated material will remain intact for said desired time and will then break down into products substantially non-detrimental to the environment.

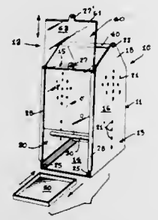
4,785,765
METABOLIC CAGE UNIT FOR A LABORATORY ANIMAL
Neil E. Campbell, Hasbrouck Heights, and John V. Oldham, River Vale, both of N.J., assignors to Lab Products, Inc., Maywood, N.J.
Filed Oct. 3, 1986, Ser. No. 914,901
Int. Cl.[4] A01K *1/03*
U.S. Cl. 119—17 **30 Claims**

10. A metabolic cage unit for a laboratory animal comprising means for receiving material excreted by said laboratory animal; said material including feces and urine; said laminar diffuser for separating said feces and said urine; said laminar diffuser including an angled serrated ramp including a series of serrations, said serrations having an effective pitch for supporting said feces and for permitting said urine to move therebetween, said peak to peak distance of each of said serrations being about equal to the height of each said serration; said angled serrated ramp including means for permitting said urine to discharge therefrom and for conducting said feces to a



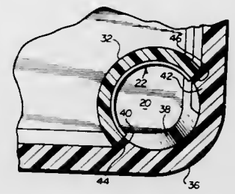
separate feces collecting location, whereby said urine is separated from said feces.

4,785,766
AVIAN CARRIER APPARATUS
Robert R. Blalock, Jr., 4550 - 4th Place North, Salem, Oreg. 97303
Filed Jul. 16, 1987, Ser. No. 74,211
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—17 **7 Claims**



1. A portable avian carrier apparatus comprising:
a housing unit including a generally rectangular, rigid integral, apertured housing member having a generally rectangular floor panel, a generally rectangular roof panel, a pair of elongated side panels, and a rear panel; wherein the roof panel is shorter in length than said floor panel and the rear panel extends downwardly and outwardly relative to said roof panel;
a pair of perch members associated with the housing member and comprising an interior perch member and an exterior perch member wherein the exterior perch member forms a carrying handle for the apparatus;
a closure unit comprising an elongated rectangular closure member operatively associated with the housing member to define an interior chamber within the apparatus wherein the closure member comprises: an elongated sheet of rigid material having an apertured lock receiving tang formed on the top edge of the closure member; and,
a tray member selectively disposed on said floor panel or said roof panel.

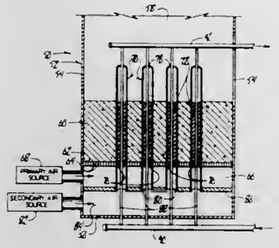
4,785,767
INSULATED WATER CONTAINER
Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.
Filed Oct. 24, 1986, Ser. No. 922,869
Int. Cl.[4] A01K *7/00*
U.S. Cl. 119—73 **9 Claims**



1. An insulated water container comprising: an enlarged, receptacle member formed of a thermal insulating material having an open top and defining a substantial interior volume, a given depth and a given cross-sectional area at said open top thereof; a cover member also formed of said thermal insulating material and of cross-sectional dimensions similar to said open top of said receptacle member for providing a closure for the same; said cover member defining an access opening therethrough, said access opening being formed adjacent a peripheral edge portion of said cover member over a minor fractional portion of the area thereof; and an insulating wall member also formed of said thermal insulating material surrounding and depending from a portion of the periphery of said access opening and extending inwardly of said cover member and into said receptacle member to a predetermined depth and having opposite free edges located closely adjacent to spaced apart locations along an interior surface of said receptacle for thermally isolating a minor fractional portion of a volume of water in said receptacle member defined between said insulating wall member and said interior surface of said receptacle such that an upper surface of said minor fractional portion is exposed to external conditions from a remaining major fractional portion of the volume of water in said receptacle member such that the latter volume is insulated from external conditions, so as to permit said major fractional portion of said volume of water to act as a thermal mass for substantially retarding temperature changes in the volume of water within said insulating wall means and accessible by way of said access opening, and particularly of a portion thereof adjacent the surface.

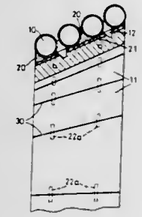
4,785,768
MEANS AND METHOD FOR CONTROLLING LOAD TURNDOWN IN A FLUIDIZED BED COMBUSTOR
Robert C. Brown, and William H. Buttermore, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Continuation-in-part of Ser. No. 907,110, Sep. 15, 1986. This application Jul. 20, 1987, Ser. No. 75,633
Int. Cl.[4] B09B *3/00*
U.S. Cl. 122—4 D **9 Claims**

1. A method of controlling the load turn-down in a fluidized bed combustor comprising the steps of: combusting fuel in a fluidized combustion bed; positioning and separately fluidizing non-combustible particle
material and free combustible material in one or more heat transfer beds positioned within the fluidized combustion bed; positioning and circulating a heat conducting and absorbing



medium through each heat transfer bed; and adjusting the fluidization of the heat transfer bed to
control the load turn-down.

4,785,769
REFRACTORY LINED BODIES
William B. Black, Bridge of Weir, Scotland, assignor to W. B. Black & Sons (Holdings) Limited, Scotland.
Filed Mar. 5, 1987, Ser. No. 22,013
Claims priority, application United Kingdom, Feb. 18, 1987, 8703799
Int. Cl.[4] F22B *37/00*
U.S. Cl. 122—6 A **7 Claims**



1. A generally arcuately shaped body comprising a generally arcuate cage of tubes in which access to the cold side thereof is restricted; an inner lining of fitting refractory tiles laid in circular courses along the axis of the arcuate cage of tubes; each course having a plurality of joining means between abutting tile edges to prevent relative movement of said tile edges; the arcuately shaped body having a plurality of non-permanently fixed and adjustable retaining means located between the tubes and tiles so as to exert an abutting force radially inwards on the tiles and thereby retain them in position.

4,785,770
COAXIAL PUMP AND MOTOR CYLINDER ENGINE
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan
Continuation-in-part of Ser. No. 791,461, Oct. 25, 1985. This application Jan. 8, 1986, Ser. No. 817,251
Int. Cl.[4] F02B *33/10*
U.S. Cl. 123—71 R **1 Claim**

1. A two-cycle internal combustion engine, comprising:
an engine block having an upper cylindrical gas chamber and a lower cylindrical gas chamber, a bottom portion of said upper gas chamber serving as a compression chamber for a fuel/gas mixture introduced into said lower gas chamber, said lower chamber serving as a combustion chamber;

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a fuel/air source for providing a fuel/air mixture to said lower chamber;

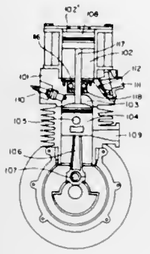
a piston assembly comprised of a lower piston located in said lower gas chamber, an upper piston located in said upper gas chamber and dividing said upper chamber into two portions including a top upper chamber portion and the bottom upper chamber portion, and a shaft connecting said upper and lower pistons for moving both upper an lower pistons in phase with one another;

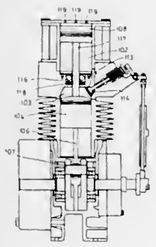
sealing means for permitting reciprocating movement of said connecting shaft within said upper and lower chambers and for providing a seal between said upper and lower chambers;

cooling means jacketing said sealing means for cooling said sealing means;

upper chamber intake means for allowing the fuel/air mixture to be introduced into said bottom portion of said upper gas chamber;

one-way upper chamber intake means for preventing gas from exiting from said bottom portion of said upper gas chamber through said upper chamber intake means;





an inter-chamber passageway in said engine block for permitting flow of the fuel/air mixture from said bottom portion of said upper chamber directly to said lower chamber, said inter-chamber passageway located near the top of said upper chamber;

crankshaft-cam controlled lower chamber intake valve means for controlling flow of the fuel/air mixture from said inter-chamber passageway to said lower chamber;

lower chamber exit means for permitting the contents of said lower gas chamber to be discharged from said chamber, said lower chamber exit means located near the bottom of said lower chamber and controlled by travel of said lower portion thereby facilitating exhaustion of the combustion products of the fuel/air mixture from said lower gas chamber when a fresh fuel/air mixture enters said lower gas chamber from said crankshaft-cam controlled lower chamber intake valve means directly from said inter-chamber passageway;

wherein the fuel/air mixture from the fuel/air mixture source passes in sequence through said one-way upper chamber intake means, said lower portion of said upper chamber, said inter-chamber passageway in said engine block, and said crankshaft-cam controlled lower chamber intake valve means prior to entry into said lower chamber;

ignition means for igniting the gaseous contents of said lower chamber, said ignition means automatically periodically being energized and unenergized in coordination with the automatic operation of said crankshaft-cam controlled lower chamber intake valve means.

4,785,771

FUEL INJECTION CONTROL APPARATUS WITH FORCED FUEL INJECTION DURING ENGINE STARTUP PERIOD

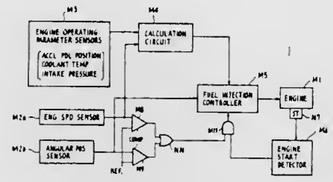
Noritaka Ibuki, Oogaki; Eiji Takemoto, Oobu; Takahiro Hayakawa; Takashi Hasegawa, both of Tajimi, and Masaomi Nagase, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 9, 1986, Ser. No. 861,577

Claims priority, application Japan, May 10, 1985, 60-100253

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—179 L **3 Claims**



1. A fuel injection control apparatus for an internal combustion diesel engine which is started by an engine starter, comprising:

engine operating parameter detecting means for detecting operating parameters of said engiue, the operating parameter detecting means including an engine speed sensor which generates by electromagnetic induction an engine speed indicating sinusoidal signal having a frequency indicating the speed of said engine when said speed is higher than a predetermined speed value and an amplitude variable as a function of the speed of said engine when said speed is lower than said predetermined speed value and a substantially constant amplitude when the engine speed is higher than said predetermined speed value;

fuel injection quantity of calculating means for calculating the quantity of fuel to be supplied to said engine in accordance with said detected operating parameters of said engine;

engine start detecting means for detecting when said engine starter is being operated and generating an output signal indicating the operation of said engine starter;

verifying means for verifying that said speed indicating signal is valid or invalid depending on whether said amplitude is higher or lower than a predetermined threshold, respectively; and

fuel injection control means for effecting the injection of fuel in accordance with the calculated fuel quantity when said speed indicating signal is detected as being valid and forcibly effecting the injection of a fixed amount of fuel when said speed indicating signal is detected as being invalid during the presence of said output signal of said engine start detecting means, said fuel injection control means including a housing having a fuel inlet passage, a fuel relief passage and fuel outlet passages connected respectively to cylinders of said engine, a reciprocating shaft defining a compression chamber at one end thereof with an inner wall of said housing and including a spill port, a delivery port and a passage communicating said compression chamber to said fuel relief passage through said spill port and communicating said compression chamber to each of said fuel outlet passages through said delivery port, said compression chamber being arranged to communicate with said fuel inlet passage when said end of the shaft is in a position away from said inner wall and out of communication therewith when said end is in a position proximate to said inner wall, means for causing said shaft to provide both rotary and reciprocating movements with the rotation of an output shaft of said engine, and a solenoid valve responsive to an output signal from said calculating means when said speed indicating signal is detected as being valid for closing and opening said fuel relief passage and forcibly closing said fuel relief passage when said speed indicating signal is detected as being invalid in the presence of the output signal of said engine start detecting means.

4,785,772

CRANKSHAFT OF A FERRO-METALLIC MATERIAL FOR RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES

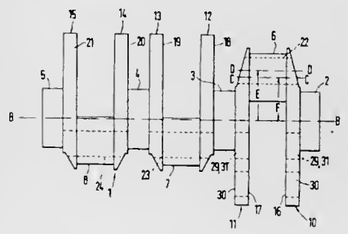
Peter Krotky, Simmozheim, and Herbert Ampferer, Sachsenheim, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1987, Ser. No. 42,782

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614227

Int. Cl.⁴ F02B *75/06*

U.S. Cl. 123—192 B **13 Claims**



1. A crankshaft of ferro-metallic material for reciprocating piston engines, particularly for six cylinder internal combustion engines having two rows of cylinders extending in a V-shape, comprising bearing pin means extending in a crankshaft longitudinal center axis, crank pin means offset with respect to said bearing pin means, web means extending substantially transversely to the crankshaft longitudinal axis for delimiting said crank pin means, said web means being constructed as counterweights, said crank pin means being provided with hollow relief bores extending substantially in the direction of their center axes, said counterweights including counterweight bores having heavy-metal bodies fixed therein, and at least a portion of said counterweight bores and said hollow relief bores of said crank pin means having common machining directions.

4,785,773

CYLINDER HEAD FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

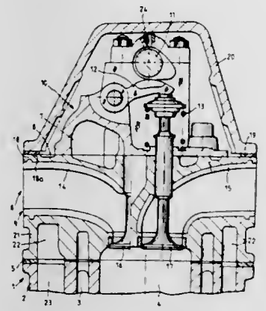
Klaus-Hagen Schreiber, Meine/Wedelheine, and Dieter Pundt, Calberlah, both of Fed. Rep. of Germany, assignors to Volkswagen AG, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 883,363

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524217

Int. Cl.⁴ F02F *1/42*

U.S. Cl. 123—193 H **4 Claims**



1. In a cylinder head for a water-cooled internal combustion engine, including a lower cylinder head portion and an upper cylinder head portion fitting over the lower cylinder head portion along a parting plane traversing cooling chambers complementally formed in the lower and upper cylinder head portions; said lower cylinder head portion having intake and exhaust ports and walls extending exclusively from said intake and exhaust ports; said walls having engagement faces for being tightened to a cylinder block of the engine; said walls bounding liquid-guiding chambers formed in said lower cylinder head portion; said upper cylinder head portion carrying a valve operating assembly of the engine; the cylinder head further having a cylinder head cover situated above the upper cylinder head portion and covering said valve operating assembly; the improvement wherein said lower cylinder head portion has a circumferential lower wall bounding a liquid-guiding chamber provided in said lower cylinder head portion and serving exclusively for returning oil from said upper cylinder head portion; and a circumferential upper wall constituting an upward continuation of said circumferential lower wall and extending from said intake and exhaust ports; said circumferential upper wall having a circumferential seating face supporting said cylinder head cover and constituting the sole support therefor; said upper cylinder head portion being out of contact with said cylinder head cover and being accommodated substantially in its entirety in a space surrounded by said cylinder head cover.

4,785,774

PISTON FOR AN INTERNAL COMBUSTION ENGINE

Noriyuki Tokoro, Gotenba, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 17, 1986, Ser. No. 920,064

Claims priority, applicatioo Japan, Oct. 18, 1985, 60-158709

Int. Cl.⁴ F02F *7/00*

U.S. Cl. 123—193 P **9 Claims**

1. A piston for an internal combustion engine comprising:

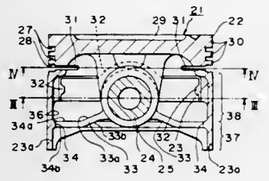
a crown having a circumferentially extending oil-ring groove in an outer portion of the crown, the oil-ring groove having slits on thrust and thrust-opposing sides of the piston;

a skirt integrally connected to the crown and extending downward, the skirt having a circumferentially extending

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faucet rib on an inside surface of a lower portion of the skirt;

a pair of opposed bosses protruding inward from an inside surface of the piston and extending in a direction perpendicular with a thrust and thrust-opposing direction of the piston, the bosses being opposed to each other; and



reinforcing ribs formed on the inside surface of the piston and protruding inward from the inside surface of the piston, the reinforcing ribs extending straight in a plane extending in the thrust and thrust-opposing direction of the piston from the faucet rib to the bosses, each reinforcing rib being integrally connected to the faucet rib and to a boss.

4,785,775

WEAR LAYER FOR PISTON AND CYLINDER OF AN INTERNAL COMBUSTION ENGINE

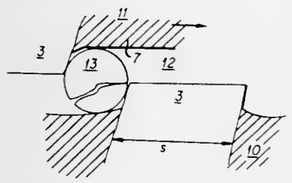
Roger Dekumbis, Saint-Sulpice; Marc-Olivier Borel, Winterthur; Ulrich Ritter, Buch am Irchel, and Gerard Barbezat, Zell, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 31, 1985, Ser. No. 761,041

Claims priority, application Switzerland, Dec. 20, 1984, 6070/84

Int. Cl.⁴ F02F *1/18, 3/10;* **B32B** *15/04*

U.S. Cl. 123—193 CP **12 Claims**



1. In an internal combustion engine having a cylinder including a first surface and a piston movably mounted in said cylinder with a second surface in contact with said first surface, a wear layer metallurgically bonded on each said surface, each wear layer being of a thickness greater than one millimeter and having

at least one hard phase of a hardness greater than 1900 HV in at least 80% thereof with a mean chord length in the direction of movement of said second surface of from 30 to 200 μm, and

a second phase metallurgically bonded to said hard phase with greater toughness than said hard phase and a hardness less than said hard phase.

4,785,776

DIESEL ENGINE HAVING SHAPED FLAME DISPERSING RECESS IN PISTON CROWN

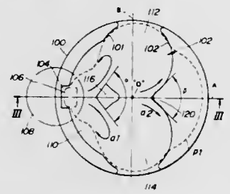
Naomi Tokura, Yokosuka; Toshiaki Tanaka, Fujisawa, and Motohiro Shinzawa, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 24, 1987, Ser. No. 80,508

Claims priority, application Japan, Aug. 8, 1986, 61-186205; Nov. 13, 1986, 61-174591[U]

Int. Cl.⁴ F02B *19/16, 19/08*

U.S. Cl. 123—269 **21 Claims**



1. In an internal combustion engine

a piston reciprocatively disposed in a bore to define a variable volume combustion chamber; and

a chamber into which fuel is supplied, said chamber being fluidly communicated with the combustion chamber by a transfer port; said piston comprising:

a first flame deflecting surface defined in a cavity formed in the crown of said piston, said first flame deflecting surface being located in the path of a flame which is ejected from said transfer port while said piston is relatively close to a TDC position;

a second flame deflecting surface, said second flame deflecting surface being defined in the cavity and comprises a portion of a peripheral wall defining said cavity, said second flame deflecting surface being positioned directly opposite said transfer port and located in the path of said flame after said piston has descended from said TDC position by a given amount, said first flame deflecting surface being arranged with respect to said second flame deflecting surface so that while said pistion is close to TDC said first flame deflecting surface is interposed between said transfer port and said second flame deflecting surface whereby only said first flame deflecting surface deflects the flame which issues from said transfer port until such time as the piston has descended by said given amount.

4,785,777

ELECTRICAL CONTROL DEVICES FOR REGULATING AN INTERNAL COMBUSTION ENGINE

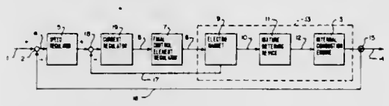
Gerhard Hock, and Hilmar Strenzke, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 822,004, Jan. 24, 1986, abandoned. This application Sep. 23, 1987, Ser. No. 100,255

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1985, 3502255

Int. Cl.⁴ F02D *41/14*

U.S. Cl. 123—352 **1 Claim**



1. In an electric control device regulating the r.p.m. of a piston internal combustion engine, having integral r.p.m. regulating means for metering of the fuel mixture, said regulating means having an output electrically connected to a final control element regulator, said final control element regulator electrically connected to an electromagnet that actuates an adjusting element connected to the internal combustion engine, said internal combustion engine provided with a tachometer whose signal is fed, together with a nominal-value signal, to the r.p.m. regulating means, the improvement comprising a current regulator electrically connected between the r.p.m. regulating means and the final control element regulator, summation means delivering to the current regulator a signal representing the magnitude of the current flowing through the electromagnet, said summation means also delivering the output signal of the r.p.m. regulating means to the current regulator whereby the current regulator is acted upon by both the signal from the electromagnet and the r.p.m. regulating means to control the final control regulator which acts on the electromagnet.

4,785,778

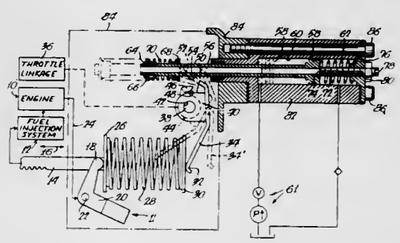
ENGINE GOVERNOR WITH DUAL REGULATION

Dennis H. Gibson, Edelstein, and Ralph Tegg, Jr., Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 261,120, Sep. 15, 1980, abandoned. This application Jan. 31, 1984, Ser. No. 575,345

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—373 **8 Claims**



1. In a governor (**11**) for providing at least two different regulation factors for an internal combustion engine (**10**) wherein regulation factor is defined as the percent difference between no-load speed and loaded speed for the same throttle setting, the engine (**10**) including a fuel injection system (**12**) and a throttle linkage (**36**), the governor (**11**) being of the type having a rotatable flyweight assembly (**18, 20, 22**) adapted to be driven by the engine (**10**), a first spring (**28**) disposed to be compressed by the flyweight assembly (**18, 20, 22**) proportional to engine speed, and a control lever (**34**) associated with the first spring (**28**) for opposing the force of the flyweight assembly (**18, 20, 22**), said control lever (**34**) compressing the first spring (**28**) proportional to a desired engine speed, the flyweight assembly (**18, 20, 22**) and the first spring (**28**) being adapted to be connected to the fuel injection system (**12**), the improvement comprising:

a second compressible spring (**70**); and actuator means (**56, 58, 60, 62, 64, 66, 68**) for selectively engaging and disengaging said second spring (**70**) from said control lever (**34**) to provide a first regulation factor based on the combined chosen spring rates of said first and second springs (**28, 70**) when said second spring (**70**) is engaged with said control lever (**34**) and a second different regulation factor based on the chosen spring rate of said first spring (**28**) alone when said second spring (**70**) is completely disengaged from said control lever (**34**).

4,785,779

INTERNAL COMBUSTION ENGINE CONTROL APPARATUS

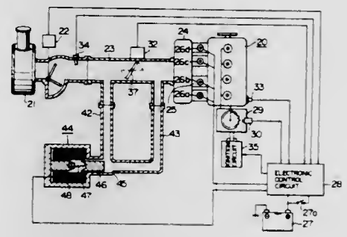
Mitsunori Takao; Takashi Arimura, and Masao Yonekawa, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 807,025, Dec. 9, 1985, abandoned. This application Mar. 11, 1987, Ser. No. 23,985

Claims priority, application Japan, Dec. 11, 1984, 59-262447

Int. Cl.⁴ F02M *3/00*

U.S. Cl. 123—339 **3 Claims**



1. An internal combustion engine control apparatus comprising:

idling operation condition detection means for detecting an idling operation condition of an internal combustion engine in which said engine is idling;

rotational speed detection means for detecting a rotational speed of the engine;

comparing means for comparing the rotational speed detected by said rotational speed detection means with a predetermined target idle rotation value at a time when said idling operation condition detection means detects said idling operation condition;

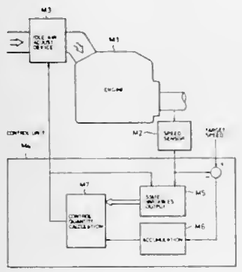
control means, responsive to a comparison result of said comparing means, for controlling an idling speed of said engine such that the detected rotational speed coincides with said predetermined target rotating value;

operation parameter detection means for detecting an operation parameter indicative of amount of air intake into cylinders of the engine when said idling operation condition detection means detects said idling operation condition and said rotational speed detected by said rotational speed rotational speed detection means is lower than a preset rotational speed; and

correction means for correcting the target idle rotation value used by said comparing means by increasing said target rotating value when a loss of ignition region is detected, said loss of ignition region indicated by said operation condition parameter detected by said operation condition parameter detection means being lower than a predetermined value, wherein said control means includes means for increasing said target rotating value when said operation parameter becomes lower than a first predetermined value, and means for continuously increasing said target rotating value until said operation parameter exceeds a second predetermined value greater than the first predetermined value.

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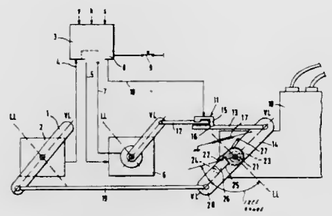
4,785,780
CONTROL APPARATUS
Katsuhiko Kawai, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan
Filed Jul. 2, 1987, Ser. No. 69,514
Claims priority, application Japan, Jul. 8, 1986, 61-159918; Dec. 4, 1986, 61-289423; Feb. 26, 1987, 62-43968
Int. Cl.[4] F02D *41/16*
U.S. Cl. 123—339 7 Claims



1. A control apparatus comprising:
(a) means for detecting a state value related to operating state of a controlled object;
(b) an actuator adjusting the operating state of the controlled object; and
(c) means for determining a target control quantity of the actuator on the basis of the detected state value and controlling the actuator in accordance with the determined target control quantity;
wherein the determining/controlling means comprises:
means for storing the detected state value and the determined target control quantity; and
means for calculating a new target control quantity of the actuator on the basis of a vector of predetermined optimal feedback gain and a vector of state variables, wherein the optimal feedback gain depends on model constants in a dynamic model which is an approximation to the operating state of the controlled object, and wherein the state variables are composed directly of the state value stored in the storing means and the control quantity stored in the storing means.

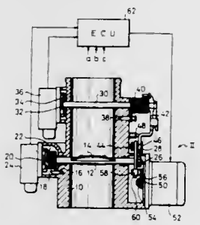
4,785,781
DEVICE FOR TRANSMITTING THE POSITION OF A CONTROL ELEMENT WHICH CAN BE ACTUATED BY THE DRIVER OF A VEHICLE
Manfred Pfalzgraf, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany
Filed Dec. 3, 1987, Ser. No. 128,463
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641275
Int. Cl.[4] F02D *11/10*
U.S. Cl. 123—396 11 Claims

1. In a device for transmitting the position of a control element for operation of the engine of a motor vehicle which control element is actuatable by the driver of a vehicle between an idling position and a full-gas position, there being a setting member and an electric transmission means and an electric set-value transmitter, which set-value transmitter is operated in response to the control element via said electric transmission means for displacing said setting member between an idling position and a full gas position in correspondence with displacement of the control element, said device comprising an actuating member which controls the fuel/air mixture of an internal combustion engine, said setting member being coupled by coupling means to said actuating member, there being at least one mechanical safety transmission element arranged between the control element of the set-value transmitter and the actuating member, by which transmission element the position of the control element can be transmitted to the actuating member; the improvement wherein



said coupling means is formed as a controllable coupling arranged between the setting member and a lever of the actuating member, the coupling being responsive to a control signal for automatically opening in the case of a disturbance.

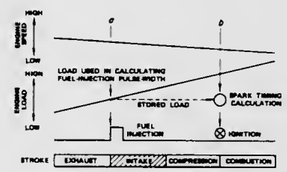
4,785,782
CONTROL APPARATUS OF A THROTTLE VALVE IN AN INTERNAL COMBUSTION ENGINE
Sinichiro Tanaka; Sinichi Matsumoto, both of Susono; Yukiya Katoh, Chita; Sunao Kitamura; Takeru Yasuda, botb of Nagoya, and Keiji Aoki, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jun. 12, 1987, Ser. No. 61,289
Claims priority, application Japan, Jun. 26, 1986, 61-148071; Feb. 4, 1987, 62-022584
Int. Cl.[4] F02D *9/02*
U.S. Cl. 123—399 17 Claims



1. A control apparatus of a throttle valve in an internal combustion engine having a manually operable accelerator means, said control apparatus comprising:
a spring means biasing said throttle valve in the direction in which said throttle valve is caused to open;
a first operating means mechanically connected to said manually operable accelerator means and selectively engageable with said throttle valve against said spring means for restricting the opening position of said throttle valve; and
a second operating means selectively engageable with said throttle valve against said spring means independently of said first operating means for restricting the opening position of said throttle valve;
said first operating means and said second operating means being engageable with said throttle valve independently of and parallel to each other to determine a throttle opening of said throttle valve by one of said first and second operating means being engaged with said throttle valve, the other of said first and second operating means being disengaged from the throttle valve;

said other disengaged operating means thereby defining an upper limit of a degree of opening of said throttle valve, and said one engaged operating means defining the degree of opening of said throttle valve within said upper limit.

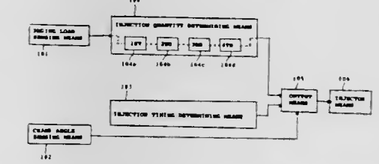
4,785,783
ENGINE CONTROL APPARATUS
Katsunori Oshiage, Yokohama, and Yasutoshi Nanyoshi, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan
Filed Oct. 14, 1987, Ser. No. 108,987
Claims priority, application Japan, Oct. 15, 1986, 61-158794[U]
Int. Cl.[4] F02P *1/00, 5/04;* F02B *31/00*
U.S. Cl. 123—417 6 Claims



1. An apparatus for controlling an internal combustion engine including fuel control means for controlling the amount of fuel supplied to the engine and ignition control means for controlling the timing of the sparks supplied to the engine, comprising:
sensor means for generating an electrical signal indicative of the load on the engine; and
a control circuit coupled to the sensor means, the fuel control means and the ignition control means, the control circuit including means for sampling the electrical signal to provide a sampled value of engine load, means for calculating an appropriate value corresponding to a setting of the fuel control means as a function of the sampled engine load value, means for converting the calculated value into a setting of the fuel control means, means for storing the sampled engine load value used in calculating the value corresponding to a setting of the fuel control means, means for reading the stored engine load value, means for calculating an appropriate value corresponding to a setting of the ignition control means as a function of the read engine load value, and means for converting the calculated value into a setting of the ignition control means.

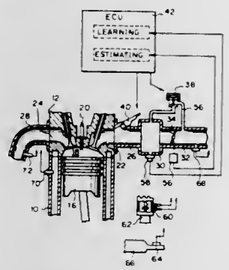
4,785,784
FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE
Yasutoshi Nanyoshi, Yokosuka, and Katsunori Oshiage, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan
Filed Nov. 16, 1987, Ser. No. 121,351
Claims priority, application Japan, Nov. 18, 1986, 61-276159; Nov. 27, 1986, 61-283920
Int. Cl.[4] F02D *41/26;* F02M *51/00*
U.S. Cl. 123—478 11 Claims

1. A fuel injection control system for an internal combustion engine, comprising;
means for sensing a load of the engine,
means for sensing a crank angle of the engine,
injection timing determining means for determining a timing of a first fuel injection to be performed in each operating cycle of the engine, and a timing of a second fuel injection to be performed after the first fuel injection in each cycle of the engine,
injection quantity determining means for determining a first injection quantity of fuel to be supplied by the first injection and a second injection quantity of the fuel to be supplied by the second injection, said injection quantity determining means comprising first means connected with said load sensing means for determining a desired fuel quantity in accordance with the load of the engine, second means for determining said first injection quantity from said desired quantity, third means for determining a compensation quantity for compensating for a change in said desired quantity between a time of the first injection and a time of the second injection, and fourth means for determining said second injection quantity from said compensation quantity,



output means connected with said crank angle sensing means, said timing determining means and said quantity determining means for producing a first fuel injection signal indicative of said first injection quantity, and a second fuel injection signal indicative of said second injection quantity, and
injector means for supplying the fuel to the engine by spraying the fuel twice in each cycle in response to said first and second injection signals.

4,785,785
FUEL INJECTION CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE WITH THROTTLE OPENING DETECTION MEANS
Hidehiro Oba, Aichi, and Senji Kato, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Dec. 4, 1987, Ser. No. 128,709
Claims priority, application Japan, Dec. 8, 1986, 61-291732
Int. Cl.[4] F02D *41/18, 41/04*
U.S. Cl. 123—488 11 Claims



1. A fuel injection control device for an internal combustion engine having an intake air passage with a throttle valve and a fuel injector arranged therein, said device comprising:
a first detecting means for detecting a degree of opening of said throttle valve;
a second detecting means for detecting a flow of intake air in said intake air passage in units of a certain physical quantity;
a third detecting means for detecting whether or not the engine is operating in a steady state;
means for estimating a load of the engine from an output of

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said first detecting means in accordance with a predetermined estimation to provide a load estimation value represented by said units;

learning means for correcting the load estimation value provided by the estimating means based on the output of said second detecting means when said third detecting means detects that the engine is operating in a steady state; and

means for calculating an amount of fuel to be injected in response to the most recently corrected load estimation value obtained from the output of said first detecting means.

4,785,786

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

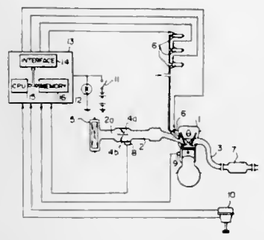
Akihito Nagao; Sadashichi Yoshioka; Hiroyuki Oda, and Takashige Tokushima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 678,580, Dec. 5, 1984, abandoned. This application Jun. 13, 1986, Ser. No. 874,783

Claims priority, application Japan, Dec. 7, 1983, 58-232164

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—488 **7 Claims**



1. A fuel injection system for an internal combustion engine having a crankshaft and a combustion chamber, said system comprising (a) an intake passage for introducing an intake gas into said combustion chamber and provided with an intake valve; (b) a fuel injection valve for injecting fuel into said intake passage in the vicinity of said combustion chamber; (c) operating condition detecting means for detecting the operating condition of the engine and outputting a signal corresponding to the thus detected operating condition; (d) fuel injection amount determining means which receives an output signal of said operating condition detecting means, thereby determining the amount of fuel to be supplied to the combustion chamber, and outputs a signal corresponding to thus determined amount; (e) crankshaft angle detecting means for detecting the rotation angle of said crankshaft; (f) injection timing control means which receives signals from said fuel injection amount determining means and crankshaft angle detecting means, outputs a start signal for actuating said fuel injection valve and a termination signal for terminating the actuation of said fuel injection valve, and actuates said fuel injection valve for the duration between said start and termination signals, thereby supplying an amount of fuel determined by said fuel injection amount determining means; (g) said start and termination signals being set against the crankshaft angle so that the whole fuel injection from said injection valve to said intake passage under light load operation of the engine reaches said combustion chamber substantially in the latter half of the intake stroke before said intake valve is closed; and (h) injection timing correction means which detects the magnitude of blow-back occurring in said intake passage and corrects said start and termination signals against the crankshaft angle in response to the thus detected magnitude so that said start and termination signals advance against the crankshaft angle when the magnitude of blow-back is large under low speed operation of the engine; (i) thereby effectively attaining stratification of air-fuel mixture in said combustion chamber under light load operation of the engine.

4,785,787

FUEL INJECTION MECHANISM FOR AN INTERNAL COMBUSTION ENGINE

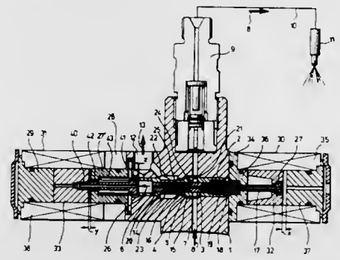
Reda R. Riszk, Cologne, and Hans-Gottfried Michels, Erftstadt, both of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Apr. 20, 1987, Ser. No. 40,139

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614495

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—506 **13 Claims**



1. The fuel injection mechanism for an internal combustion engine having a casing with a borehole in which a first valve component is guided axially between an open position and a closed position in which the valve component is sealingly seated in a valve seat in the borehole to close a first connecting channel between a high pressure channel extending from an injection pump to an injection nozzle and a dumping passage wherein the valve component is spring biased toward its closed position and moved to its open position by a spring loaded impact bolt shiftable to a retracted position by an electromagnetic actuator, and further comprising

a second connecting channel interconnecting said high pressure channel with said dumping passage including

an axial borehole in said first valve component,

a first transverse passage in said first valve component placing said axial borehole in fluid communication with said high pressure channel and

a second transverse passage in said first valve component connecting said axial borehole in fluid communication with said dumping passage and

a second valve component operatively disposed in said second connecting channel and shiftable between open and closed positions in which fuel flow is permitted and prevented, respectively, in said second connecting channel.

4,785,788

SUPERCHARGER SYSTEM FOR USE WITH HEAT ENGINES

Juan Targa Pascual, Benet Mercade, 17, Barcelona, Spain

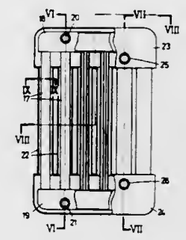
Division of Ser. No. 736,797, May 22, 1985, Pat. No. 4,688,383. This application May 19, 1987, Ser. No. 51,932

Claims priority, application Spain, Jan. 4, 1984, 533434; Jun. 4, 1984, 533435

Int. Cl.⁴ F02B *37/00*

U.S. Cl. 123—563 **4 Claims**

1. A supercharger system for use with a heat engine, comprising: a first heat exchanger having a gaseous phase and a refrigerant liquid phase, said gaseous phase being provided so as to supply the engine from a supercharger compressor, and said refrigerant liquid phase being provided so as to cool said gaseous phase and eliminate excessive heat generated by the supercharger compressor; a refrigeration unit for providing refrigerant liquid to said first heat exchanger; a piping system provided so as to connect said refrigeration unit to said first heat exchanger; an independent refrigerant liquid pump for



providing liquid flow; means controlling said pump as a function of supercharger pressure and having a time delay for providing a functional dephasing; a second heat exchanger for heat exchange between said refrigerant liquid phase of said first heat exchanger and surrounding air; and an expansion chamber for said refrigerant liquid phase.

4,785,789

METHOD AND SYSTEM FOR CONTROLLING THE SPARK IGNITION OF IGNITION ELEMENTS IN AN INTERNAL COMBUSTION ENGINE

Hans Johansson, and Jan Nytomt, both of Åmål, Sweden, assignors to Saab-Scania Aktiebolag, Sweden

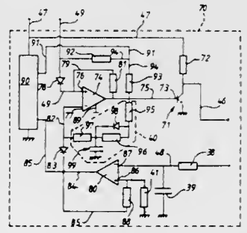
PCT No. PCT/SE87/00238, § 371 Date Jan. 7, 1988, § 102(e) Date Jan. 7, 1988, PCT Pub. No. WO87/06979, PCT Pub. Date Nov. 19, 1987

PCT Filed May 13, 1987, Ser. No. 143,137

Claims priority, application Sweden, May 14, 1986, 8602182

Int. Cl.⁴ F02P *3/06*

U.S. Cl. 123—596 **16 Claims**



1. An ignition system for spark ignition a multi-cylinder four-stroke internal combustion engine having at least two cylinders, pistons of which simultaneously assume a top dead center position, the system comprising:

an ignition capacitor;

an electric control means;

at least two discharging circuits each comprising, in series, a primary winding of an ignition coil and a first circuit breaker element which can be switched from the electric control means;

a charging circuit comprising a coil in series with a second circuit breaker element which can be switched from the control means and a means for connection to a direct current source; and

the electric control means including means for producing first through fourth signals when the above-mentioned pistons pass through the same crankshaft angle close to the top dead center position, the first signal being sent to a respective first circuit breaker element of a first of the discharging circuits for triggering ignition in one of the above-mentioned cylinders, the second and third signals being sent to the second circuit breaker element for starting and interrupting, respectively, current supply to the charging circuit, and the fourth signal being sent to the first circuit breaker element of the second discharging circuit for triggering ignition in a second of the above-mentioned cylinders, the ignition capacitor being charged between the second and third signals during a first time period which is shorter than a second tme period between the first and fourth signals.

4,785,790

VARIABLE COMPRESSION HEIGHT PISTON ARRANGEMENT

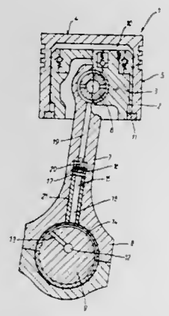
Viktor Pfeffer, and Friedrich Wirbeleit, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 118,052

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642524

Int. Cl.⁴ F02B *75/04*

U.S. Cl. 123—78 B **8 Claims**



1. An arrangement for controlling the oil feed into a control chamber of a piston with variable compression height, particularly for internal-combustion engines, said control chamber being arranged between an interior piston part coupled to a connecting rod and an exterior piston part that is guided at the interior piston part on the outside, and the oil feed being controlled by a control valve that is inserted into a longitudinal bore of the connecting rod, said control valve having a valve body that can be moved in a valve chamber between a bore portion of the longitudinal bore on the side of the crank pin and a bore portion of the longitudinal bore on the piston side, said valve body closing off the bore portion on the side of the crank pin when resultant forces act in the direction of the crankshaft, wherein the valve body is guided in the bore portion on the piston side and is provided with a flow-through bore that determines the oil inflow volume from the idling operation to the nominal rotational speed, as well as with an additional control bore that is opened only during the starting process for the control of an additional oil inflow volume.

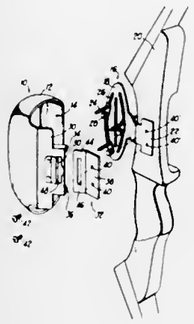
VOL 1096 ISS 4 NO 22 1988 UMI

4,785,791

BOW SIGHT TRANSPORTATION COVER

John R. Sloop, 122 Pinetree Dr., Dothan, Ala. 36301

Continuation of Ser. No. 793,236, Oct. 31, 1985, abandoned.
This application Feb. 11, 1988, Ser. No. 154,803
Int. Cl.[4] F41B 5/00; B65B 11/00, 65/02
U.S. Cl. 124—88 5 Claims



1. A bow sight transportation cover for covering and protecting a protruding portion of a bow sight which is mounted by its other portion to a bow, said bow sight being of a type in which said protruding portion of said bow sight extends outwardly beyond said bow, said bow sight cover comprising:

(a) a cup shaped protective housing having a side portion and a top closing one end of said side portion, said side portion and said top defining a hollow interior with an open end, so that when said housing is installed in its protective position over said protruding portion of said bow sight, said housing will encompass a portion of the protruding portion of said bow sight, said housing having an interior depth from said open end to said top sufficient for a portion of said bow sight to be received within the interior of said housing when said housing is in said protective position;

(b) a mounting bracket connected to said housing and for mounting on said bow, said mounting bracket when mounted on said bow having a first portion thereof on said bow and a second portion thereof secured to said housing, for supporting said housing in a spaced relationship to said bow;

(c) securing means connected to said first portion of said mounting bracket for holding said first portion of said mounting bracket in a prescribed position with respect to said bow sight; and

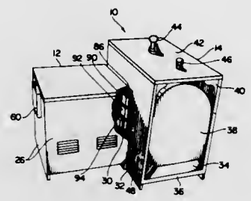
(d) detent means connected to said securing means for releasably securing said securing means in said prescribed position on said bow, whereby said mounting bracket supports said housing in its protective position in which said housing is in a stationary position with respect to said bow and encompasses a portion of said bow sight with the interior of said housing being spaced from said portion of said bow sight and said securing means being releasable by said detent means to permit said mounting bracket to be released from said bow so that said housing and said mounting bracket can be removed from said bow and from the protective position of said housing with respect to said portion of said bow sight.

4,785,792

MODULAR OUTDOOR HEATING SYSTEM

F. Richard Saint Laurent, 36 Blanding Rd., Rehoboth, Mass. 02769

Filed Jul. 6, 1987, Ser. No. 69,716
Int. Cl.[4] F24H 1/00
U.S. Cl. 126—344 3 Claims



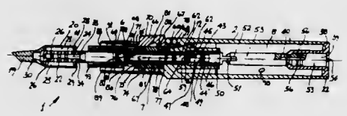
1. An outdoor hydronic home oil heating system including a heating module and a fuel module adapted for side to side operative positioning with each other, said modules being weatherproof and insulated, said heating module containing a complete hydronic heating unit including an insulated hot water boiler, an oil burner, a water circulation system, a forced combustion air draft system and an electrical system for energizing said heating unit, said fuel module containing an oil storage tank with associated fill and vent means, and capacity gauge, both said modules having panel openings adapted for contiguous disposition such that the same interior atmosphere environment is shared by said modules so that the heat generated by said heating module will provide heat to the interior of said fuel module.

4,785,793

A SOLDERING TOOL

Alfred P. Oglesby; Elizabeth A. Oglesby, both of Springhill; John P. Oglesby, Anneville, and Derek W. Butler, Carlow, all of Ireland, assignors to Oglesby & Butler Technology Limited, Carlow, Ireland

Continuation-in-part of Ser. No. 584,368, Feb. 28, 1984, abandoned. This application Feb. 3, 1986, Ser. No. 824,943
Claims priority, application Ireland, Mar. 2, 1983, 442/83; Oct. 22, 1985, 2607/85; Jan. 27, 1986, 221/86
Int. Cl.[4] B23K 3/02
U.S. Cl. 126—414 12 Claims



1. In a gas powered soldering tool comprising:

a handle;

a soldering tip mounted to said handle,

said soldering tip comprising;

a solid soldering portion body of heat conductive material having a tubular catalytic housing extending rearwardly therefrom to form a combustion chamber;

a gas catalytic combustion element provided within the combustion chamber; and

fuel supply means in the handle for selectively delivering fuel gas to the catalytic combustion element;

the improvement comprising; a heat conductive support member having a gas passage forming a gas inlet and a gas outlet, said support member extending through the combustion chamber with said gas outlet opening to said combustion chamber for delivering fuel gas to the catalytic combustion element, said support member having one end directly coupled to the tip solid soldering portion body for conducting heat from the support member to the solid soldering portion body of the soldering tip internally of the catalytic combustion element and for solely supporting the soldering tip, and said support member having the opposite end coupled to the handle and to the fuel supply means.

4,785,794

METHOD FOR PROCESSING AQUEOUS SUGAR JUICE FOR SEPARATING KETOSE

Louis F. Jo; Marie E. Borredon, both of Toulouse; Michel Delmas, Auzeville, and Antoine Gaset, Toulouse, all of France, assignors to Institut National Polytechnique de Toulouse, Toulouse, France

Filed Jan. 20, 1987, Ser. No. 4,451
Claims priority, application France, Jan. 17, 1986, 86 01123
Int. Cl.[4] C13D 3/00, 3/12; C13K 11/00
U.S. Cl. 127—46.1 11 Claims

1. A process for the treatment of aqueous sugar juice containing a mixture of ketose and aldose sugars for separating the ketose sugar therefrom comprising:

preparing a reactive hydro-organic medium containing water by mixing the sugar juice with an active methylene ketone compound, a catalyst consisting essentially of a calcium salt, and an alcohol selected from the group consisting of ethanol and methanol,

heating said medium to a temperature between 40° C. and the reflux temperature of said medium for a period of about four to eight hours for producing a condensation of the ketone compound and the aldose with the formation of corresponding furanic polyols,

cooling said medium to precipitate the furanic polyols, and

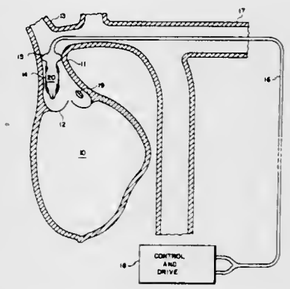
separating the resulting precipitate from the residual liquid medium containing the ketose.

4,785,795

HIGH-FREQUENCY INTRA-ARTERIAL CARDIAC SUPPORT SYSTEM

Param I. Singh, Lexington, Mass., assignor to Abiomed Cardiovascular, Inc., Danvers, Mass.

Continuation of Ser. No. 755,107, Jul. 15, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 8,061
Int. Cl.[4] A61B 19/00
U.S. Cl. 600—18 12 Claims



1. A high-frequency intra-arterial cardiac support system comprising a balloon pump which may be positioned in a major artery downstream, with respect to the normal blood flow, of a natural heart, said balloon pump comprising a pumping balloon, of small displacement, mounted upon and cyclically inflatable and deflatable by fluid flow through a catheter having a lumen connected fluidically to the pumping balloon and leading to the outside of the body, said balloon pump further comprising a collapsible and erectable valve permitting blood flow in said major artery predominantly in the direction of normal blood flow both when said pumping balloon is inflated and deflated, said valve being composed of thin eleastomeric material and mounted upon said catheter at a position downstream, with respect to normal blood flow, of said pumping balloon and having a generally circular cross section of maximum erected outside diameter just sufficient to substantially occlude said major artery, said system further comprising a control and drive mechanism connected fluidically to said lumen outside of the body providing cyclical fluid flow to said lumen of said catheter for cyclical inflation and deflation of said pumping balloon,

said control and drive mechanism comprising drive means for fluidically driving said cyclical flow and said cyclical inflation and deflation of said pumping balloon during both systole and diastole of the natural heart, at a pumping frequency which is at least three times the normal beating frequency of the natural heart; and

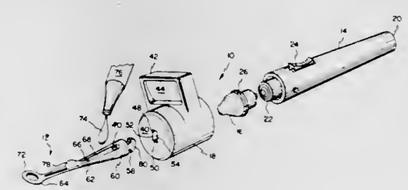
said small displacement of said pumping balloon being much smaller than the normal stroke volume of the natural heart.

4,785,796

OTOSCOPE AND FLEXIBLE, DISPOSABLE CURETTE FOR USE THEREWITH

Philip D. Mattson, 1776 Plantation Way, El Cajon, Calif. 92020

Filed Sep. 12, 1986, Ser. No. 907,190
Int. Cl.[4] A61B 1/22, 17/22; F21V 33/00
U.S. Cl. 128—9 15 Claims



1. In combination with a curette fabricated from a light-guiding, flexible material, wherein said curette has a base, a head portion and a shank that connects said base and said head portion, said base including coupling means extending in opposition to said shank, an otoscope for examining a small cavity in the body, said otoscope comprising:

a tubular handle portion having a closed end and an open end;

a lamp located in said handle portion and being connectable to a power source for providing illumination forwardly thereof;

a cap including a front wall and a rear, open end, said rear, open end telescopically fitting over said lamp and said open end of said handle portion in enclosing relationship thereto, said front wall having an opening therein;

coupling means located in said opening for receiving said corresponding coupling means on said curette; whereby said open end of said cap, said opening through said front wall and said light-guiding material in said curette define an optical path from said lamp to within the cavity; and

lens means disposed on said cap, said means providing a view path longitudinally of said otoscope and said curette.

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4,785,797

METHOD AND APPARATUS FOR THERAPEUTIC MOTION AND SOUND TREATMENT OF INFANTS

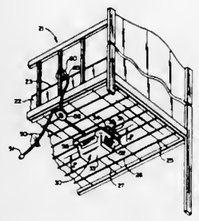
Armando A. Cuervo, 710 E. Walnut St., Westerville, Ohio 43081

Continuation-in-part of Ser. No. 553,317, Nov. 18, 1983, abandoned, and a continuation-in-part of Ser. No. 712,561, Mar. 15, 1985, abandoned, and a continuation-in-part of Ser. No. 848,454, Apr. 4, 1986, Pat. No. 4,681,096. This application Jul. 14, 1987, Ser. No. 72,969

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—33 **9 Claims**



1. An apparatus for soothing and pacifying, specifically in infant suffering from colic, said apparatus adapted to be supported on a support means such as an infants crib, and comprising in combination:

a. means for imparting a rhythmic cyclic motion of displacement to the support means and creating on the surface of the support means a frequency of displacement between about ten and about forty-three cycles per second, with the amplitude of the displacement between being about one hundredth and about one eighth of an inch; and

b. means for, selectively and simultaneously with the means of step a, imparting a steady or unpulsed sound within the hearing range of the infant, and means for controlling the sound range within an intensity range of substantially between about sixty decibels and about eighty decibels within a frequency range of substantially between about two hundred Hertz and about four thousand Hertz.

4,785,798

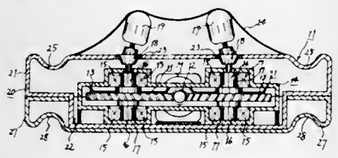
COMPACT MASSAGING APPARATUS FOR A SEAT HAVING FOLDABLE, HINGED HOUSING

Yoshikiyo Yamasaki, Osaka, Japan, assignor to Kabushiki Kaisha Fuji Iryoki, Osaka, Japan

Filed Mar. 3, 1987, Ser. No. 21,117

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—46 **5 Claims**



1. A compact massaging apparatus, such as for a seat, comprising:

a substantially closed outer housing means including upper and lower housing sections which are hingedly connected together for relative hinging movement between a closed position wherein the upper and lower housing sections directly oppose and engage one another to define a substantially closed housing and an open position wherein the upper and lower housing sections are relatively hingedly moved away from the closed position through an angle of about 180°, said upper housing section including a concave part which projects therefrom into the lower housing section when the upper and lower housing sections are in said closed position, said upper housing section including an top wall section which is positioned above and overlies the concave part when in said closed position;

a massaging unit mounted in said concave part so as to be disposed substantially below said upper wall section when in said closed position;

said upper and lower housing sections cooperating to define handle parts disposed adjacent opposite sides of said housing means;

said massaging unit including an inner box-like housing which is positioned within said concave part below said top wall section, said inner housing having a worm rotatably supported therein and a pair of worm gears rotatably supported therein and disposed in meshing engagement with opposite sides of said worm so that the worm gears simultaneously rotate in opposite directions, a pair of support shafts rotatably supported in said inner housing and nonrotatably and coaxially coupled to said worm gears, and bearing means rotatably supporting said support shafts on said inner housing, each support shaft having a coaxial shaft part which projects upwardly through said inner housing and into an opening through said top wall section, and a motor drivingly coupled to said worm for effecting rotation thereof;

a pair of rounded ball-like massaging elements positioned outside said housing means adjacent said top wall section for simultaneous orbital rotation in opposite directions, each massaging element being nonrotatably coupled to a respective one of said shaft parts for rotation therewith and disposed in offset relation relative to rotational axis of the respective support shaft so as to undergo an orbiting circular rotation;

a flexible sheet-like cover of a soft material attached to said upper housing section and disposed so as to extend over and enclose said massaging elements; and

belt-receiving fixtures mounted on said housing means adjacent opposite sides thereof and adapted to receive belts to permit hanging of the massaging apparatus on a seat back.

4,785,799

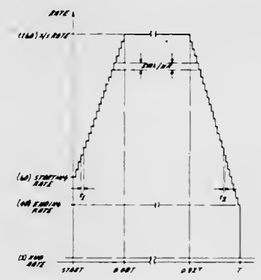
METHOD AND APPARATUS FOR AUTOMATIC PROFILED INFUSION IN CYCLIC TPN

JoAnna Schoon, Santa Ana; Robert R. Weyant, Claremont, and Gregory B. Zobel, Laguna Niguel, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 94,012, Sep. 4, 1987, abandoned, which is a continuation of Ser. No. 763,922, Aug. 8, 1985, abandoned. This application Feb. 18, 1988, Ser. No. 159,443

Int. Cl.[4] A61M *37/00*

U.S. Cl. 128—53 **11 Claims**



1. In a programmable medical infusion system including pumping means for pumping an infusion fluid into a patient, means for controlling the pumping means in response to an infusion profile, programmable means for outputting an infusion profile to said means for controlling the pumping means, and input means for inputting data to said programmable means, the improvement comprising:

computing means in said programmable means, responsive to data from said input means of total infusion time and total infusion volume, for calculating, as a function of said time, volume, and predetermined criteria including starting rate, ending rate, and percentage of total infusion time allocated to tapering, an infusion profile having a steady rate preceded by a rate tapering upward from said starting rate to said steady rate, and followed by a rate tapering downward froms aid steady rate to said ending rate, which rates together result in the infusion of said total volume in said total time.

4,785,800

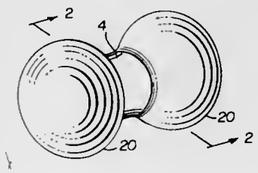
STRUCTURAL BALANCE DEVICE FOR RELIEVING STRESS

Robert L. Stilson, 9978 Wagner La., Westminster, Colo. 80030

Filed Jan. 27, 1988, Ser. No. 148,943

Int. Cl.[4] A61H *15/00*

U.S. Cl. 128—57 **1 Claim**



1. A structural balance device for relieving stress by reducing the torque of the skull and rotation of the cervical spine of the user, said device comprising of two solid spherical modules measuring 2½ inches in diameter and connected by a short solid connecting shaft measuring ½ inch in length and 3¾ inch in circumference, said device having an overall length of 4¾ inches, all said dimensions having a tolerance of +/−2%, wherein said device is molded as a single solid embodiment having an approximate weight of 8 ounces, 227 grams (+/−2%) and having the shape of a dumbbell, wherein said device comprises of urethane rubber having a durometer measurement of 55A (+/−2%) whereby: said device is placed at the back of the head, just above the opening of the ears in the small depressions or saucers in the squama of the occipital bone on each side of the skull and allowing the weight of the head to rest on the side device while in the supine position on a firm, flat surface, said device causing the deepening of the saucers in the squama which normalizes the torque of the skull, thus relieving the stress in the head, neck and spine.

4,785,801

VERTEBRAE AND RIB MANIPULATION DEVICE

Conrad A. Speece, 10477 Silverock Dr., Dallas, Tex. 75218

Filed Oct. 28, 1987, Ser. No. 114,126

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—69 **5 Claims**

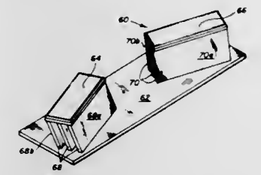
1. A device for localized bone manipulation in the human body having facet joints, comprising

a base member;

support spaced apart from said base member by a distance and disposed generally parallel to said base member for supporting the bone being manipulated;

force generating means extending between said base member and said support members for generating superiorly and anteriorly directed forces on the bone being manipulated; and

said force generating means including a plurality of upwardly extending, spaced apart projections interconnecting said base member and said support members, said force generating means is further being flexible so as to be angularly disposed in a direction generally parallel to a plane containing the facet joints to apply a force to said support members to thereby move said support members generally parallel to said base member and in the direction toward the head of the human body, such that the distance between said base member and said support members decreases as the bone is being manipulated.



4,785,802

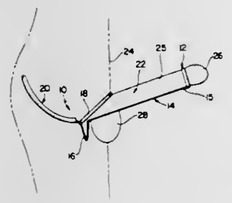
PROSTHESIS

Luther H. Blount, 1 Shipyard La., Warren, R.I. 02885

Filed Jul. 29, 1987, Ser. No. 79,873

Int. Cl.[4] A61F *5/41*

U.S. Cl. 128—79 **8 Claims**



1. A prosthesis for use by a human male for supporting the penis in an erected disposition during sexual intercourse comprising an open ring-like end portion having opposite first and second ends, said end portion being expandable by separating said first and second ends and being receivable in snug engagement on the shaft of said penis so that it extends substantially therearound adjacent the base of the glans with said first and second ends disposed in closely adjacent relation on the underside of said penis, a pair of elongated, substantially rigid support wire elements, said support wire elements extending rearwardly from said first and second ends in closely adjacent relation along the underside of the shaft of said penis and rearwardly along opposite sides of the scrotum to points therebehind when said end portion is assembled on said penis, a resilient band and means for securing said band to said wire elements at a point behind said scrotum, said band being receivable on said penis in a resiliently expanded disposition so that it extends forwardly from said securing means and across the upper side of said penis adjacent the base thereof and being operable through said wire elements and said end portion for resiliently urging said penis forwardly to maintain it in said erected disposition.

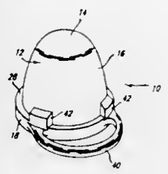
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4,785,803
SHOULDER TRUSS
Gerrit J. Benckhuijsen, Schaan, Liechtenstein, assignor to Temova Establishment, Schaan, Liechtenstein
PCT No. PCT/EP86/00361, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO86/07534, PCT Pub. Date Dec. 31, 1986
PCT Filed Jun. 19, 1986, Ser. No. 19,592
Claims priority, application Switzerland, Jun. 20, 1985, 02606/85
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—87 R 13 Claims



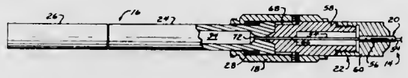
11. A shoulder bandage comprising a back part for covering a substantial portion of the upper back of the user, said back part including an upper edge having spaced apart portions for disposition on opposite sides of the neck of a user, each said portion having a pull band extending therefrom in a forward direction when said shoulder bandage is placed on a user, each said pull band having a length permitting each band to extend over the front side of the shoulder joint of a user and under the shoulder around to said back part, each said pull band having a free end and said back part having means for fastening said free ends of said pull bands to said back part, said pull bands being made of elastic material having a pull back force of approximately 3.92 to about 11.77 Newtons with a 10% stretching on a 5 centimeter wide by 10 centimeter long band portion at a displacement rate of 5 centimeters per minute measured transversely across the back and longitudinally across each said pull band and a pull back force of about 1.96 to about 4.9 Newtons measured on the 5 centimeter wide by 10 centimeter long pull band portion with a 10% stretching and a displacement rate of 5 centimeters per minute measured longitudinally across the back part and transversely across the pull bands.

4,785,804
DISPOSABLE CERVICAL CAP
Janet M. Tlapek, Saranac, Mich., and Margaret D. Tlapek, Prairie Village, Kans., assignors to Page Hanes, Inc., Saranac, Mich.
Filed Jul. 20, 1987, Ser. No. 78,253
Int. Cl.[4] A61F *5/46*
U.S. Cl. 128—841 9 Claims



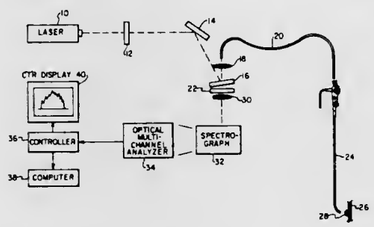
1. An improved disposable cervical cap comprising:
a form-assuming non-resilient pliable dome having an interior and exterior surface, said dome comprising an apex portion and a base portion, and
a flexible rim integrally-molded to said base portion said rim including an inner and outer surface and a bottom surface, said inner surface having an annular groove descending acutely from said inner wall toward said bottom surface of said rim, whereby said annular groove defines an ascending lip on said inner surface of said rim.

4,785,805
TWO-PIECE DISPOSABLE LASER DELIVERY SYSTEM
Stephen N. Joffe, Cincinnati; John Osborn, Loveland, both of Ohio, and Richard L. Studer, Villa Hills, Ky., assignors to Surgical Laser Technologies, Inc., Malvern, Pa.
Continuation of Ser. No. 738,555, May 28, 1985, abandoned.
This application Jun. 23, 1987, Ser. No. 65,661
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 7 Claims



1. A laser delivery system for insertion into the output port of a laser source having a laser interlock mechanism therein, the laser source generating laser energy when the interlock mechanism is actuated, and for coupling and transmitting of laser energy therefrom through a laser optic fiber; the delivery system including a reusable portion and a generally disposable portion; the disposable portion including an optic fiber for passing laser energy and fiber retaining means on one end thereof, means for affixing the retaining means on the optic fiber whereby said one end of the optic fiber remains exposed with respect to the retaining means; the reusable portion including means for engaging the laser output port whereby laser energy from the laser source may enter the delivery system reusable portion; coacting means on the fiber retaining means and on the reusable portion for detachably coupling said reusable portion to said retaining means, the coacting coupling means including means for positioning the optic fiber and retaining means in predetermined fixed orientation with respect to the reusable portion whereby laser energy entering the reusable portion may enter the disposable portion optic fiber; said laser output engaging means including means for actuating the laser source interlock mechanism only when the disposable portion retaining means is coupled to the reusable portion; said coacting coupling means permitting attachment or removal of the disposable portion from the reusable portion by non-trained persons at the site of the laser source whereby laser energy entering the delivery system reusable portion is coupled into and transmitted through the optice fiber without adjustment of the reusable or disposable portions of the delivery system.

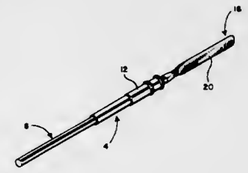
4,785,806
LASER ABLATION PROCESS AND APPARATUS
Lawrence I. Deckelbaum, Woodbridge, Conn., assignor to Yale University, New Haven, Conn.
Filed Jan. 8, 1987, Ser. No. 1,376
Int. Cl.[4] A61N *5/06*
U.S. Cl. 128—303.1 9 Claims



1. Apparatus for ablating atherosclerotic tissue in blood vessels, comprising:
a source of low power ultraviolet laser energy having a wavelength outside the band of visible wavelengths,

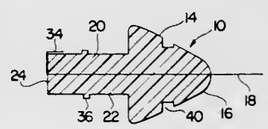
fiberoptic means for directing said low power laser energy at a section of tissue of said blood vessel to cause said section to fluoresce,
spectrum analyzing means for determining whether a laser induced fluorescence frequency spectrum is representative of normal or atherosclerotic tissue,
a source of high power laser energy for producing pluses, the pulse duration and energy per unit area of which are selected to cause ablation without charring of tissue that would obscure the fluorescence pattern of the tissue,
fiber optic means for directing the output of said high power ultraviolet laser at said section of tissue, and
means responsive to said spectrum analyzing means for enabling atherosclerotic tissue to be progressively ablated by said high power laser energy while said tissue is caused to fluoresce by said low power ultraviolet laser until said spectrum analyzing means indicates that the fluorescence pattern of said tissue is no longer indicative of atherosclerotic tissue thereby to ablate said atherosclerotic tissue only.

4,785,807
ELECTROSURGICAL KNIFE
G. Marsden Blanch, Sandy, Utah, assignor to American Medical Products, Inc., Murray, Utah
Filed Feb. 24, 1987, Ser. No. 17,876
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.14 7 Claims



1. An electrosurgical instrument for use with a source of radio-frequency electrical energy during surgery to cauterize tissue, said instrument comprising:
a. a stainless steel portion of said instrument for receiving said radio-frequency energy and having at least one flesh contacting surface formed thereon,
b. a first coat of primer material covering at least all of said flesh contacting surface, and
c. a second coat of fluorinated hydrocarbon material entirely covering the primer material to cause a total thickness of the first and second coats of about 3 mils thereby enabling said radio-frequency energy to be transported across said coatings to said flesh by capacitive coupling.

4,785,808
DISPOSABLE ELECTROLYSIS NEEDLE
Harry W. Cary, III, 46 Arnold St., Riverside, R.I. 02915
Filed Nov. 9, 1987, Ser. No. 118,792
Int. Cl.[4] A61B *17/41*
U.S. Cl. 128—303.18 3 Claims



1. A disposable electrolysis needle assembly comprising an electrical insulating body formed of molded plastic and including a shaped forward end and an extremely fine uninsulated metal needle adapted to be inserted through the epidermis layer of skin of a human patient outwardly forwardly projecting from said forward end, said body further including a rearwardly extending shank portion of a regular geometric configuration in turn adapted to extend into a receiving socket in the front of the insulated hand grip portion of an electrolysis instrument, said needle further including a wire portion extending through said body and including a portion outwardly projecting from the shank portion thereof so as to form an electrical connection with said instrument, said needle and said body integrally connected into a single-use, throw away unit said shank portion having a base through which said needle wire portion extends to form an electrical contact tail radially extending across at least a portion of said base and wherein said forward end is generally conically-shaped for ease in grasping and said shank portion is in the form of a rearwardly extending generally centrally disposed stem, said stem is of a reduced cross-section with respect to the adjacent generally conically shaped forward end.

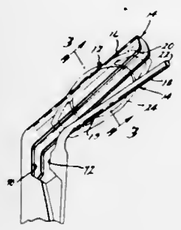
4,785,809
ARTERIOTOMICAL DEVICE
Harry P. Weinrib, 2644 West Estes Ave., Chicago, Ill. 60645
Filed Apr. 23, 1986, Ser. No. 855,136
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305 13 Claims



7. An arteriotomical device for severing an opening in a vessel wall having an interior lumen and an interior surface on the vessel wall, said device comprising:
a body having a pair of pivotally mounted legs movable from an open position to a closed severing position,
a lifter mounted on the body for vertical movement relative to the legs,
cutters on lower ends of each leg movable from the open position to the severing position to a portion of the vessel therebetween, and
a hook on the lifter for insertion through the vessel wall and hooking the interior surface of the vessel wall for lifting a hooked portion of the vessel interior surface relative to the cutters through a predetermined distance, pivoting of the cutters from the open position toward the severing position causing the lowermost edges on the cutters to pass through the vessel wall along a path to sever an aperture of a predetermined size in the vessel's interior surface and to sever a hole through the vessel wall.

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4,785,810
INTRAOCULAR LENS FOLDING AND INSERTION APPARATUS
Vincent J. Baccala, and Charles A. Bonte, Sr., both of St. Louis, Mo., assignors to Storz Instrument Company, St. Louis, Mo.
Filed Oct. 14, 1986, Ser. No. 918,711
Int. Cl.[4] A61B 17/28
U.S. Cl. 128—321 11 Claims

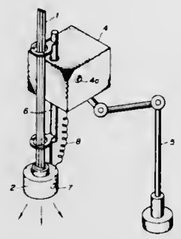


1. A lens folding and insertion apparatus for use in eye surgery for insertion of an intraocular lens through an incision of approximately 3 to 4 millimeters in an eye, said lens folding and insertion apparatus comprising:

forceps means having a first elongated jaw member and a second elongated jaw member, said forceps means having means for actuating said first jaw member and said second jaw member into open and closed positions,

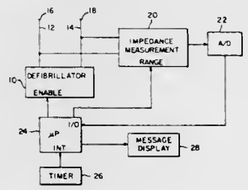
said first jaw member including a substantially smooth elongated concave surface and said second jaw member having a substantially smooth elongated convex surface, said first jaw member and said second jaw member being in operable alignment wherein said first jaw member and said second jaw member are actuated toward one another into said closed position with the intraocular lens positioned between said first jaw member, and said second jaw member, said first jaw member and said second jaw member folding the intraocular lens upon itself by engagement between said elongated concave surface and said elongated convex surface, said elongated concave surface defining an open generally U-shaped elongated trough having lateral side edges and a circular bottom, and said second jaw member being a rod having a circular cross-section defining said convex surface, the lateral width of said elongated trough being substantially greater than the diameter of said circular cross-section of said rod, said rod being aligned within said elongated trough and disposed laterally between said lateral side edges when in said closed position, said forcep means including means for substantially preventing full engagement of said rod and said elongated trough in order to define a lens folding space between said rod and said elongated trough when said jaw members are in said closed position, and the diameter of said rod being sufficiently small relative to the depth of said elongated trough such that at least one-half of the diameter of said rod is disposed within said trough when said jaw members are in said closed position with the intraocular lens therebetween in said lens folding space in order to allow the intraocular lens to be gripped, folded and inserted into the approximately 3 to 4 millimeter incision in the eye.

4,785,811
SOLAR RAY ENERGY RADIATION DEVICE FOR USE IN MEDICAL TREATMENT
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan
Filed Mar. 3, 1987, Ser. No. 21,086
Claims priority, application Japan, May 13, 1986, 61-109232
Int. Cl.[4] A61N 3/00; F21V 7/00, 7/04; H05B 37/02
U.S. Cl. 128—397 9 Claims



1. A medical treatment device utilizing the visible light ray component of solar rays, comprising optical conductor means receiving and transmitting therethrough light rays corresponding to the visible light rays component of solar rays and excluding ultraviolet and infrared rays, said conductor means having a light-emitting end portion, a projector means on which said light-emitting end portion is mounted, a light-sensor means on said projector means for detecting the intensity of the rays emitted from said optical conductor means, actuating means operable to move said projector means towards and away from a person's body to be treated, and control means operably connected to said actuating means and to said light-sensor means for controlling the position of said projector means relative to said person's body depending on the value of the intensity of the solar rays detected by said light-sensor means.

4,785,812
PROTECTION SYSTEM FOR PREVENTING DEFIBRILLATION WITH INCORRECT OR IMPROPERLY CONNECTED ELECTRODES
James M. Pihl, Bothell, and Denny C. Edwards, Bellevue, both of Wash., assignors to First Medical Devices Corporation, Bellevue, Wash.
Filed Nov. 26, 1986, Ser. No. 935,248
Int. Cl.[4] A61N 1/36
U.S. Cl. 128—419 D 7 Claims



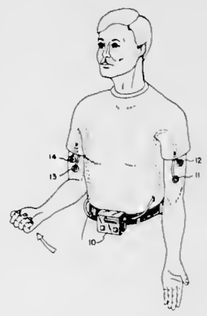
1. In a defibrillator adapted to selectively monitor and defibrillate electrodes, respectively, said defibrillator having an enable input allowing said defibrillator to defibrillate when an enable signal is present on said enable input, a protection system for preventing said defibrillator from defibrillating when said defibrillator is improperly connected to the correct electrodes through a pair of electrode leads or properly connected to the incorrect electrodes through said electrode leads, said protection system comprising:

impedance measurement circuit means connected between said electrode leads, said impedance measurement circuit generating an output signal indicative of the impedance between said electrodes;

processor means receiving the output signal from said impedance measuring circuit means and generating said enable signal when said output signal is indicative of an impedance within a range of impedances characteristic of a defibrillator electrode properly connected to said electrode leads; and

range adjusting means for causing said output signal to have a magnitude that is proportional to a relatively large multiple of said impedance in a low impedance range and to a relatively small multiple of said impedance in a high impedance range, thereby increasing the range of said impedance measurement circuit for a predetermined sensitivity and range of output voltages.

4,785,813
APPARATUS FOR ASSISTING MUSCULAR CONTRACTION
Jerrold S. Petrofsky, Beavercreek, Ohio, assignor to Wright State University, Dayton, Ohio
Filed Feb. 18, 1986, Ser. No. 829,890
Int. Cl.[4] A61N 1/00; H05G 1/00
U.S. Cl. 128—421 13 Claims



1. Apparatus for assisting muscular contraction comprising:

electrode means for sensing voluntary electromyographic signals

amplifier means connected to said electrode means for receiving and amplifying said electromyographic signals to produce a corresponding higher amplitude control signal,

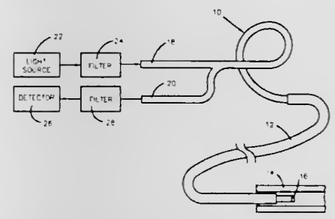
said control signal having a level varying in accordance with said electromyographic signals,

signal limiting means connected between said amplifier means and said electrode means for limiting the level of signals applied by said electrode means to said amplifier means,

stimulator means connected for receiving said control signal and comprising means responsive to said varying control signal level for generating and delivering to said electrode means a series of stimulation pulses each having an energy level which depends variably upon changes in the level of said control signal, and

means for preventing said amplifier means from amplifying said stimulation pulses.

4,785,814
OPTICAL PROBE FOR MEASURING PH AND OXYGEN IN BLOOD AND EMPLOYING A COMPOSITE MEMBRANE
James Kane, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Aug. 11, 1987, Ser. No. 84,301
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—634 9 Claims



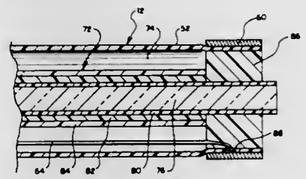
1. An optical probe for use in measuring pH and oxygen in blood within a blood vessel of a living body, comprising:

an elongated, flexible optical fiber means having a proximal end and a distal end with said distal end adapted to be inserted into a said blood vessel;

membrane means secured to said distal end of said optical fiber means for receiving light from the distal end thereof and returning light therethrough to the proximal end thereof; and

said membrane means being constructed of hydrophilic porous material, pH sensitive dye carried by said porous material, a plurality of microspheres constructed of hydrophobic material embedded in and carried by said membrane means, said microspheres carrying a fluorescent dye quenchable with oxygen, whereby light supplied to said proximal end is conveyed to said membrane means causing the pH sensitive dye to react to the light and transmit light back to the proximal end thereof at an intensity level dependent upon the pH level in the blood and causing the oxygen sensitive dye to fluoresce and emit light varying in intensity as a function of the partial pressure of oxygen in the blood with the emitted light transmitted through said optical means to the proximal end thereof.

4,785,815
APPARATUS FOR LOCATING AND ABLATING CARDIAC CONDUCTION PATHWAYS
Donald Cohen, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Oct. 23, 1985, Ser. No. 790,315
Int. Cl.[4] A61B 5/04; A61N 5/00
U.S. Cl. 128—642 24 Claims



1. Apparatus for locating and ablating cardiac conduction pathway tissue within a heart, comprising:

an elongated catheter tube having a proximal end and a distal end, said distal end adapted to be inserted into a

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passageway and advanced therethrough into a heart chamber proximate to a cardiac conduction pathway in the heart wall,

conduction pathway locating means carried adjacent the distal end of said catheter tube and including at least one electrode means for being positioned proximate to a conduction pathway for electrically sensing the membrane potential at that site, and

conduction pathway ablation means independent of said locating means and carried by said catheter tube adjacent the distal end thereof for ablating at least a portion of the conduction pathway at the located site.

4,785,816

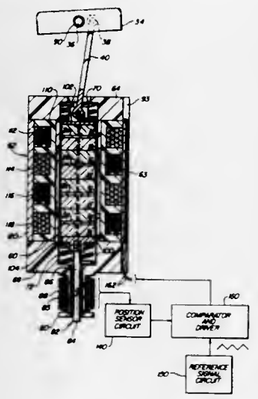
ULTRASONIC TRANSDUCER PROBE ASSEMBLY

Julian Dow, San Clemente, and Paul F. Meyers, San Juan Capistrano, both of Calif., assignors to Johnson & Johnson Ultrasound Inc., New Brunswick, N.J.

Division of Ser. No. 691,319, Jan. 14, 1985, Pat. No. 4,688,576. This application Aug. 24, 1987, Ser. No. 88,628

Int. Cl.⁴ B61B *10/00*

U.S. Cl. 128—660.10 **10 Claims**



1. In an ultrasonic transducer probe, in which an ultrasonic transducer is to be arcuately moved through translation of reciprocal motion; a motor for providing said reciprocal motion comprising:

an electromagnet assembly, including a plurality of axially aligned coils, and each coil having a central aperture;

a magnet stack assembly, generally located within said electromagnet assembly aperture, and including a plurality of magnet pairs with like poles opposing and separated by a ferrous spacer, ones of said magnet pairs with spacers being correspondingly disposed with respect to ones of said coils;

bearing means for allowing said magnet stack assembly to slideably move in a reciprocating manner within said electromagnet assembly; and

means for connecting said magnet stack assembly to said ultrasonic transducer so that motion of said magnet stack assembly is translated into motion of said transducer.

4,785,817

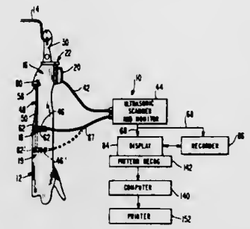
METHOD AND APPARATUS FOR ULTRASONIC GRADING OF MEAT

James R. Stouffer, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 10, 1986, Ser. No. 917,562

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660.07 **22 Claims**



13. A transducer system incorporating a positioning device for locating at least one transducer adjacent a predetermined region of an animal to be evaluated, the system comprising:

at least one ultrasonic transducer probe;

a transducer support unit having an elongated arm, engagement means to a first end of said arm for engaging a predetermined first region of an animal to be evaluated and for positioning said elongated arm along the backbone of the animal; and bracket means mounted at a second end of said arm for receiving and securing said at least one transducer probe so as to direct ultrasonic signals from said probe into a preselected, fixed second region of the animal adjacent its backbone to obtain an ultrasonic image of the back fat and meat quality and quantity in said second region;

display means electrically connected to said at least one transducer probe and responsive to said probe for displaying a cross-sectional image of said second region for real-time evaluation of the animal;

pattern recognition means responsive to said cross-sectional image for providing measurements of the thickness of the back fat and the area and quality of the meat in said second region; and

means responsive to said pattern recognition means measurements for providing detailed analysis and evaluation of the animal.

4,785,818

METHOD AND MEANS OR DYNAMICALLY WEIGHTED TEMPORAL AVERAGING OF PIXEL DATA

William R. Hardin, Folsom, Calif., assignor to General Electric Company, Milwaukee, Wis.

Filed Jun. 30, 1986, Ser. No. 880,572

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660.07 **11 Claims**

1. In an ultrasonic scanner system in which video scanned data is defined for a plurality of addressable pixels in an electron beam display, a method of selectively updating stored pixel intensity data in response to repetitive ultrasonic beam scans whereby moving tissue imaging is enhanced while suppressing random noise comprising the steps of

storing pixel data to be displayed in a first memory,

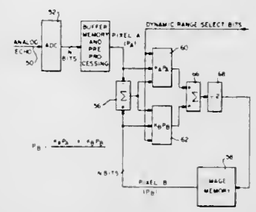
storing first weighted values of pixel intensity data in a second memory and second weighted values of pixel intensity data in a third memory,

establishing a present intensity value for a pixel in response to an acoustic beam scan,

obtaining from said first memory a stored intensity value for said pixel,

obtaining a measure of the difference between said present intensity value and said stored intensity value,

addressing said second memory using said present intensity value and said measure of difference as a memory address,



addressing said third memory using said stored intensity value and said measure of difference as a memory address, and

updating said first memory using addressed values from said second memory and said third memory.

4,785,819

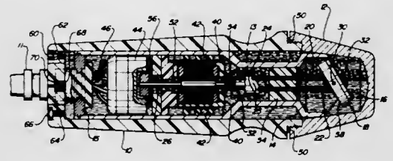
ULTRASONIC IN-LINE SECTOR PROBE

Thomas Pearce, Littleton, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Mar. 30, 1984, Ser. No. 595,191

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—660.10 **16 Claims**



1. In an ultrasonic transducer probe for mechanical sector scanning, apparatus for oscillating a transducer comprising:

an ultrasonic transducer having a front ultrasonic energy transmitting surface and an opposing back surface, and mounted for oscillation about a first axis;

a cam, mounted for rotation about a second axis normal to said first axis, said cam having a cam surface opposing said back surface of said transducer which cam surface is obliquely oriented with respect to the the plane of said first axis which is normal to said second axis; and

a pair of pins, located between said cam surface and said back surface of said transducer, and driven by said cam in a reciprocating manner so as to oscillate said transducer about said first axis.

4,785,820

METHOD AND APPARATUS FOR SYSTOLIC BLOOD PRESSURE MEASUREMENT

James R. Brooks, Hillsboro, Oreg., assignor to SpaceLabs, Inc., Bothell, Wash.

Filed Dec. 22, 1986, Ser. No. 944,892

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—681 **4 Claims**

1. A method for measuring systolic blood pressure, comprising the steps of:

attaching a pressure cuff to a patient adjacent to a blood vessel;

pressurizing the cuff sufficiently to occlude the blood vessel;

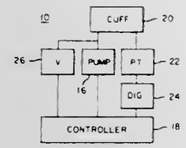
alternately measuring counter pressure pulses in the cuff and decrementing the cuff pressure;

forming a table of raw, unsmoothed data measurements from the measured counter pressure pulses corresponding to the decremented cuff pressure;

selecting an upper systolic threshold limit and a lower systolic threshold limit on either side of approximately 50% of a maximum measured counter pressure;

scanning the table from the maximum measured counter pressure towards larger corresponding cuff pressures and finding a first measured counter pressure less than the lower systolic threshold, a first measured counter pressure greater than the lower systolic threshold and interpolating therebetween to arrive at a lower threshold result;

associating the lower threshold result with a lower systolic pressure;



scanning the table from the maximum measured counter pressure towards larger corresponding cuff pressures and finding the first measured counter pressure less than the upper systolic threshold, a first measured counter pressure greater than the upper systolic threshold and interpolating therebetween to arrive at an upper threshold result;

associating the upper threshold result with an uppersystolic pressure; and

averaging the upper and lower systolic pressure to arrive at a systolic pressure, whereby an accurate systolic pressure is obtained from raw, unsmoothed measured counter pressure data, even including random respiration artifacts, without smoothing the raw data.

4,785,821

PRESSURE MONITOR AND REGULATING DEVICE FOR ADMINISTRATION OF MEDICAMENT

Irving C. Udell, Northbrook, and Arnold M. Schacter, Vernon Hills, both of Ill., assignors to Ethitek Pharmaceuticals Co., Skokie, Ill.

Filed May 15, 1987, Ser. No. 50,532

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 128—674 **6 Claims**

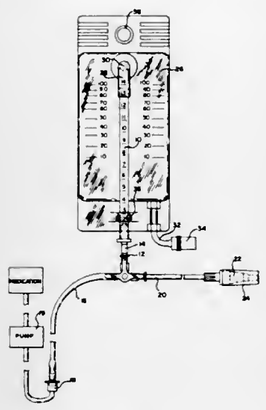
1. A device for monitoring and regulating the fluid pressure to a patient receiving a driven fluid through a catheter comprising:

(a) a tube means for communicating the driven fluid from a supply to a patient;

(b) a manometer in circuit with said tube means for indicating the fluid pressure therein;

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(c) overflow means comprising a manometer bag for limiting the fluid pressure to a selected value, said manometer bag



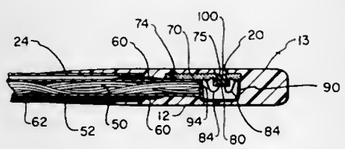
communicating with said manometer to receive fluid when the fluid pressure exceeds said selected value.

4,785,822

DISPOSABLE INTRACOMPARTMENTAL PRESSURE TRANSDUCER

William D. Wallace, Salt Lake City, Utah, assignor to Utah Medical Products, Inc., Midvale, Utah

Filed Apr. 1, 1987, Ser. No. 33,420
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—675 **22 Claims**



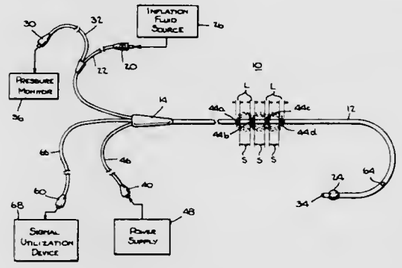
1. An intracompartmental pressure transducer apparatus, comprising:
- a pressure transducer having a diaphragm with first and second sides;
- a protective cushion means for enclosing said pressure transducer therein;
- means for communicating pressure pulses to the first side of said diaphragm through said protective cushion means;
- means for venting the second side of said diaphragm to atmospheric pressure; and
- electrical cable means for electrically connecting the pressure transducer to a monitor device for displaying data corresponding to intracompartmental pressure sensed by said pressure transducer, said electrical cable means having a leading end adapted for insertion into a body compartment, said pressure transducer and said protective cushion means being mounted at said leading end, said electrical cable means further comprising stiffener means premanently encased in said electrical cable means for imparting a desired degree of rigidity to said electrical cable means to facilitate intracompartmental insertion of said transducer using said electrical cable means.

4,785,823

METHODS AND APPARATUS FOR PERFORMING IN VIVO BLOOD THERMODILUTION PROCEDURES

Philip E. Eggers, San Francisco, Calif., and Robert F. Shaw, 1750 Taylor St., Suite 2401, San Francisco, Calif. 94133, assignors to Robert F. Shaw, San Francisco, Calif.

Filed Jul. 21, 1987, Ser. No. 75,945
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—692 **39 Claims**



1. Apparatus for use in in vivo blood thermodilution procedures comprising:
- a first electrode insertable in a blood vessel so that the first electrode is in electrical contact with the blood flowing in the blood vessel;
- a second electrode insertable in the blood vessel so that the second electrode is spaced from the first electrode and in electrical contact with the blood flowing in the blood vessel;
- first means for conveying a first electrical potential to the first electrode;
- second means for conveying a second electrical potential to the second electrode so that when the first and second electrical potentials are different from one another, electrical current flows between the first second electrodes through the blood flowing in the blood vessel to heat the blood through which said current flows; and
- a temperature sensor insertable in the blood vessel at a temperature sensing location downstream from the first and second electrodes for producing an output indication of the temperature of the blood at the temperature sensing location.

4,785,824

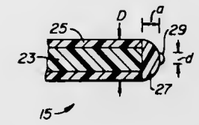
OPTICAL FIBER PROBE FOR MEASURING THE TEMPERATURE OF AN ULTRASONICALLY HEATED OBJECT

Kenneth A. Wickersheim, Menlo Park, and Mel H. Sun, Los Altos, both of Calif., assignors to Luxtron Corporation, Mountain View, Calif.

Filed Jun. 22, 1987, Ser. No. 65,316
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[4] A61B *5/00;* **G01J** *5/08;* **G01K** *11/20, 13/00*
U.S. Cl. 128—736 **17 Claims**

6. A temperature sensing probe especially adapted for being implanted into a volume of material that is being heated by absorption of ultrasonic energy directed into said volume from its outside, comprising:
- a length of optical fiber transmission medium that includes both a core and surrounding cladding made of plastic material,
- a substantially optically transparent element affixed to an end of said fiber medium and having a degree of hardness significantly greater than that of said fiber medium core or cladding material, and

an optical temperature sensor held by said element in a position removed a distance from said fiber medium end



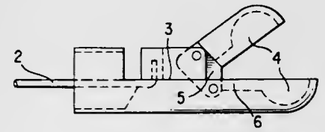
but in optical communication therewith through said element.

4,785,825

SAFETY BIOPSY FORCEPS

Paul Romaniuk; Jürgen Speder; Hans-Peter Dübel, all of Berlin, and Siegfried Müller, Jena, all of German Democratic Rep., assignors to Humboldt—Universitaet zu Berlin, Berlin, German Democratic Rep.

Continuation of Ser. No. 53,570, May 21, 1987, abandoned, which is a continuation of Ser. No. 810,468, Dec. 18, 1985, abandoned. This application Feb. 4, 1988, Ser. No. 154,505
Claims priority, application German Democratic Rep., Dec. 28, 1984, 2720554
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—751 **2 Claims**



1. Safety biopsy forceps comprising a head, first and second opposed grasping and/or cutting elements connected to said head, said first opposed element being pivotally mounted to said head at a pivot point adjacent said second opposed element for pivotal movement toward and away from said second opposed element, a hollow flexible shaft, means for detachably fastening together the head and the flexible shaft, an elongated pulling element axially displaceably and coaxially received in the hollow shaft and connected to said first opposed element for acting upon said first opposed element to effect said pivotal movement, said first and second opposed elements each having a free end of spoonlike configuration with mutually facing concavities and each having a recess communicating with said concavity and extending to said pivot point, whereby during actuation of said forceps to effect said pivoted movement to cause tissue to be grasped by and a specimen thereof to be cut out by said opposed elements, said recesses prevent said tissue from jamming between said opposed elements.

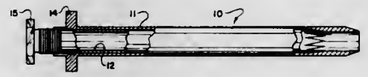
4,785,826

BIOPSY INSTRUMENT

John L. Ward, 1006 Barnwell St., Columbia, S.C. 29201

Filed Mar. 2, 1987, Ser. No. 20,858
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—754 **8 Claims**

1. An instrument for gathering tissue for biopsy, comprising:
- a first elongate, hollow, thin wall, right circular cylindrical member having an open tissue penetrating end and a predetermined inside diameter;
- a second elongate, hollow, thin wall, right circular cylindrical member having an open tissue penetrating end and a predetermined outside diameter slightly less than said inside diameter for reception of said second member within said first member, said second member having a flexible tissue capturing portion adjacent said open tissue penetrating end thereof;
- coupling means for coupling said first and second members at respective ends thereof opposite from said respective open tissue penetrating ends thereof and for controllably moving said members axially one relative to the other; and
- capturing means situated within said first member and proximate said open tissue penetrating end thereof, for engaging and inwardly deforming said flexible tissue capturing



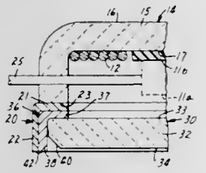
portion of said second member upon advancing axial movement of said second member relatively into said first member, so as to close said open tissue penetrating end of said second member; whereby
- said flexible tissue capturing portion of said second member, following penetration of the instrument into tissue from which a sample is to be taken for biopsy and reception of tissue within said hollow first and second members, may be closed for reliably capturing and retaining a specimen of tissue upon subsequent withdrawal of said instrument from the subject tissue.

4,785,827

SUBCUTANEOUS HOUSING ASSEMBLY

David J. Fischer, Arden Hills, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

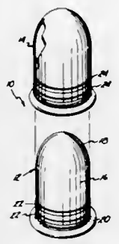
Filed Jan. 28, 1987, Ser. No. 7,722
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—783 **11 Claims**



1. A housing assembly adapted for receiving electronic circuitry, which housing assembly can be sealed shut and used subcutaneously, said housing assembly comprising:
- a container sub assembly and a base sub assembly each comprising:
- a ceramic portion having a periphery and inner and outer surfaces melting at said periphery and
- a continuous metal sealing flange having first and second portions, said first portion being bonded to said ceramic portion along its entire length around said periphery and said second portion being spaced from said ceramic portion;
- the ceramic portion of said container sub assembly being dish-like with its inner surface defining a cavity, and having a plurality of electric leads brazed to and extending therethrough between said inner and outer surfaces; and
- said second portions of said sealing flanges being adapted to be positioned closely adjacent with the inner surfaces of said ceramic portions of said sub assemblies facing each other and to be bonded together entirely around said sealing flanges.

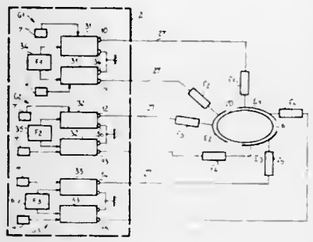
VOL 1096 ISS 4 NO 22 1988 UMI

4,785,828
VAGINAL STIMULATOR FOR CONTROLLING URINARY INCONTINENCE IN WOMEN
Donald D. Maurer, Anoka, Minn., assignor to Empi, Inc., Fridley, Minn.
Filed Oct. 6, 1986, Ser. No. 916,118
Int. Cl.[4] A61N 1/00
U.S. Cl. 128—788 **18 Claims**



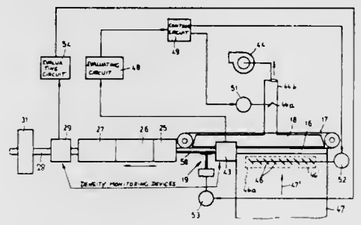
1. A vaginal stimulator adapted to be inserted into a woman's vagina to stimulate and constrict muscles therein and prevent the flow of urine through the urethra, comprising:
a rigid vaginal plug adapted to be inserted into the vagina and including:
a generally cylindrical body having a tapered tip at a first end, and a second end;
terminals mounted to the body for receiving a train of electric pulses; and
at least one pair of spaced-apart electrodes mounted on an exterior surface of the plug body and coupled to the terminals; and
a collapsible condom fabricated and stretchable, pliable and impermeable material removably unrolled onto and surrounding the body of the vaginal plug and including at least one pair of spaced-apart, integral, conductive polymer elements positioned in electrical contact with the pair of electrodes on the plug body to carry the electric pulses to the muscles.

4,785,829
APPARATUS FOR HYPERTHERMIC TREATMENT
Guy Convert, Vincennes; Guy Azam, La Celle St. Cloud; Jean P. Mabire, Gif Sur Yvette; Claude Jasmin, Paris, and Joel Sidi, Paris, all of France, assignors to C.G.R Mev, Buc, France
Filed Dec. 3, 1986, Ser. No. 937,559
Claims priority, application France, Dec. 10, 1985, 85 18258
Int. Cl.[4] A61B 1/00
U.S. Cl. 128—804 **8 Claims**



1. Apparatus for hyperthermic treatment comprising high-frequency generating means connected to electrodes capable of being attached to a patient wherein the said generating means comprise at least two generators operating at different frequencies, the values of which are sufficiently distant from each to prevent the generators from mutually driving or interfering with one another's frequencies, the operating frequencies of the generators having values such that they do not constitute a harmonic frequency of one and the same fundamental frequency, and wherein the said generators comprise two outputs each linked to one electrode, at least one of the said outputs of at least one generator being connected to the said electrode by means of a bandpass filter, the resonance frequency of the said filter corresponding substantially to the operating frequency of the generator to which it is connected.

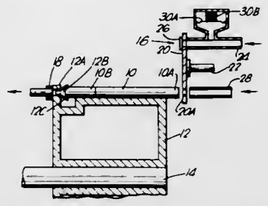
4,785,830
METHOD AND APPARATUS FOR MONITORING AND EVALUATING THE DENSITY OF A TOBACCO STREAM
Henning Möller, and Werner Hartmann, both of Hamburg, Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany
Filed Jan. 18, 1984, Ser. No. 572,563
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302058
Int. Cl.[4] A24C 5/14
U.S. Cl. 131—84.1 **50 Claims**



1. A method of forming and processing a stream of fibrous material, particularly a stream of tobacco particles for the making of cigarettes and analogous smokers' products, comprising the steps of building a continuous stream including delivering fibrous material into an elongated path to thus form successive increments of the stream and moving such increments along the path, said building step being a function of a plurality of different parameters including the rate of delivery of fibrous material into the path, the dimensions of fibrous material and the orientation of fibrous material in the path; monitoring the density of the moving stream at a plurality of different distances from a reference plane which is at least substantially parallel to the path; generating signals which denote the monitored density at such different distances from the reference plane; and varying at least one of said parameters as a function of variations of at least one of said signals.

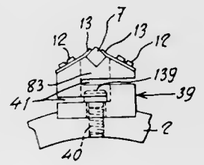
4,785,831
METHOD AND APPARATUS FOR MINIMIZING LOOSE ENDS IN CIGARETTES
Dennis Hinchcliffe, London, England; Francis A. M. Labbe, Neuilly-sur-Seine, France; Desmond W. Molins, and Paul R. Wiese, both of London, England, assignors to Molins PLC, London, England
Continuation of Ser. No. 767,341, Aug. 21, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 909,234
Claims priority, application United Kingdom, Aug. 22, 1984, 8421320
Int. Cl.[4] A24C 5/60
U.S. Cl. 131—88 **27 Claims**

1. A method of treating cigarettes in which the cigarettes are conveyed sideways past an adhesive applicator whereby a measured quantity of foamed adhesive is applied to the tobacco end of each cigarette by pneumatically transferring a measured quantity of the foamed adhesive from said adhesive applicator



toward and onto the tobacco end of each cigarette to secure the tobacco in the cigarette.

4,785,832
DEVICE FOR DIVIDING A CONTINUOUS WEB OF WRAPPING MATERIAL INTO SUCCESSIVE SINGLE SECTIONS
Gian L. Gherardi, Medicina, and Valter Spada, Bologna, both of Italy, assignors to SASIB S.p.A., Bologna, Italy
Filed Oct. 8, 1986, Ser. No. 916,733
Claims priority, application Italy, Oct. 30, 1985, 12592 A/85
Int. Cl.[4] A24C 5/56
U.S. Cl. 131—94 **17 Claims**

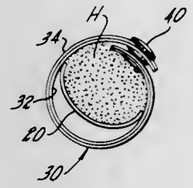


1. A device for dividing a continuous web of wrapping material into single successive sections of a same length, comprising:
a driving shaft having a longitudinal axis of rotation;
a rotary cutting roller having a skirt fixed on said shaft;
a peripheral radial blade having a cutting edge located outside the periphery of said roller, extending parallel to said axis; and
a blade-carrying member for said blade fixed to said roller and fastened to said blade, and having a cavity radially inward of said blade with respect to said axis and extending through said blade-carrying member in a direction parallel to said axis so that said blade-carrying member is elastically yieldable in a radial direction through said cavity toward said axis.

4,785,833
PROCESS FOR THE AROMATIZATION OF TOBACCO
Günter Holzner, Grand-Lancy; Gérald Uhde, Confignon, and Giuseppe Salvadori, Satigny, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland
Filed Jan. 28, 1987, Ser. No. 7,855
Claims priority, application Switzerland, Feb. 5, 1986, 438186
Int. Cl.[4] A24B 3/12
U.S. Cl. 131—310 **6 Claims**

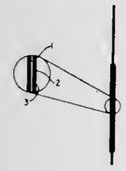
1. A process for the aromatization of tobacco in a form selected from among leaves, particles, powders and films of natural or artificial origin by a volatile, water-immiscible active flavor, which process comprises intimately contacting said flavor with the tobacco by directly spraying onto an exposed surface thereof an emulsion consisting of the flavor, an aqueous solution of a hydrosoluble carrier and an emulsifier.

4,785,834
HAIR GRIPPER DEVICE
Miriam E. Gonzalez, 605 NW. 72 Ave., Miami, Fla. 33126
Filed May 19, 1987, Ser. No. 51,511
Int. Cl.[4] A45D 8/00
U.S. Cl. 132—275 **3 Claims**



1. A hair gripper device, comprising:
A. an elongated flexible sheet having an inner surface and two ends;
B. an elastic member shorter than said flexible sheet and said elastic member being affixed to said flexible sheet at its ends only thereby providing the necessary gripping pressure to the hair and said elastic member being affixed to said inner surface on stretched state;
C. cooperating fastening means mounted to said ends so that said ends may be secured against each other.

4,785,835
NAIL FILE
David Bray, 2198 Corsair Rd., Mississauga, Ontario, Canada L5A 2L8
Filed Oct. 14, 1986, Ser. No. 918,511
Claims priority, application Canada, Nov. 8, 1985, 494963
Int. Cl.[4] A45D 29/04
U.S. Cl. 132—76.4 **11 Claims**



1. A nail file comprising:
(a) a long narrow core of aluminum; and
(b) a layer of abrasive material laminated under heat and pressure to at least one surface of said core by means of a film of heat sensitive adhesive disposed between said abrasive and said core, said heat sensitive adhesive being a random co-polymer of ethylene and acrylic acid.

4,785,836
SPRAY WASHER
Soichiro Yamamoto, 100 Ferrier Street, Markham, Ontario, Canada L3R 2Z5
Filed Jul. 17, 1987, Ser. No. 74,758
Int. Cl.[4] B08B 3/02
U.S. Cl. 134—56 R **9 Claims**

1. A cleaning apparatus for automatic cleaning of paint spray gun assemblies, comprising:
a cleaning cabinet having a bottom opening,

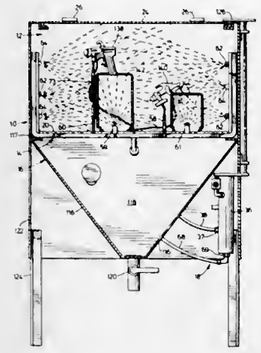
VOL 1096 ISS 4 NO 22 1988 UMI

a paint cleaning fluid flow-line system comprising a fluid distribution system, a pneumatically actuated fluid pump and a housing for cleaning fluid, said housing being below said bottom opening for circulating flow of fluid through said bottom opening to said housing,

said fluid pump being adapted to effect circulation of cleaning fluid under pressure, through said flow-line system,

said fluid pump having a fluid inlet and a fluid outlet, a fluid delivery line for flow of cleaning fluid from said fluid outlet to said fluid distribution system, and a return line for flow of cleaning fluid from said housing to said fluid inlet,

a plurality of cleaning fluid outlets in said fluid distribution system for ejection of cleaning fluid under pressure within



said cabinet, a sub-plurality of said outlets defining means for supporting a spray gun in said cabinet with a paint passage interior of the gun in direct fluid flow communication with a said outlet,

an air-flow system having an air delivery line, said fluid pump having an air inlet in air flow communication with said air delivery line,

said air-flow system and said fluid flow-line system having separate independent flow lines, and

time control means in said air-flow system adapted to interrupt the action of the fluid pump and thence circulation of fluid in said fluid flow-line system within a predetermined time.

4,785,837

CEILING SUSPENDED BED CANOPY

Victoria S. Hansen; Oleen J. Hansen, both of 5840 S. W. 205, Aloha, Oreg. 97007, and Millie J. Laferriere, Aloha, Oreg., assignors to Victoria and Oleen Hansen, Aloha, Oreg.

Continuation of Ser. No. 822,572, Jan. 27, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 96,225

Int. Cl.⁴ E04H *15/04;* **A47C** *29/00*

U.S. Cl. 135—90 **2 Claims**

1. A bed canopy comprising:

a body portion having opposite ends, side edges, and top and bottom surfaces,

said body portion being arranged to receive and support a canopy cover,

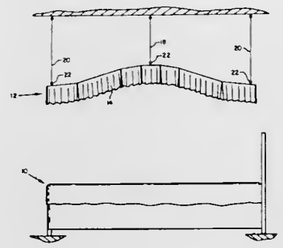
said body portion being formed of a substantially rigid laminated board comprising an inner core of plastic foam and top and bottom layers of high tensile strength paper secured integrally thereto,

said body portion having a substantially horizontal central section with opposite ends, downwardly angled sections leading from said central section in connected joints at least one said downwardly angled section between said central section and each of said opposite ends,

the paper layer and core being crimped transversely on the bottom surface at said joints to allow said sections to assume their angular position,

said body portion also having upwardly angled end sections leading from said downwardly angled sections in connected joints and terminating in said opposite ends,

the paper layer and core in the connected joints between said downwardly angled sections and said upwardly angled sections being crimped transversely on the top surface of said joints to allow said upwardly angled sections to assume their angular position,



and line means comprising first suspension lines attached to said central section for supporting the latter from a ceiling and second suspension lines attached to said end sections adjacent said opposite ends,

said second suspension lines being longer than said first suspension lines wherein said jointed sections are arched between said opposite ends,

said arched configuration of said body portion between at least some of said sections being maintained at least partly by the tensile strength of said paper layer on the opposite surface of said body portion from said crimp and by compression of said plastic foam at said joint.

4,785,838

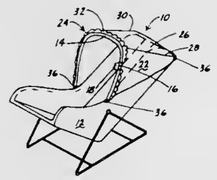
MULTIPURPOSE INFANT SHADE

Viki R. Negahdari, 1064 Almarida, San Jose, Calif. 95128

Filed Feb. 8, 1983, Ser. No. 465,005

Int. Cl.⁴ E04H *15/58*

U.S. Cl. 135—117 **7 Claims**



1. A multipurpose infant shade comprising:

a flexible support arch member including an elongated cylindrically formed structural foam encased within a tube;

a left side panel, a right side panel and a top panel, each said panel comprising material which is at least semi-opaque to electromagnetic radiation and attached to the same side of the support arch so as to form therewith a hollow hemiconical shade; and

attachment means situated at various positions on the periphery of said hollow shade for attaching said hollow shade to selected articles.

4,785,839

PILOT VALVES FOR TWO-STAGE HYDRAULIC DEVICES

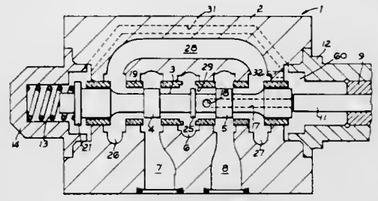
Kenneth G. Cleasby, Cobham, England, assignor to Vickers Systems Limited, Havant, England

Division of Ser. No. 903,401, Sep. 3, 1986, Pat. No. 4,719,944. This application Aug. 13, 1987, Ser. No. 85,637

Claims priority, application United Kingdom, Oct. 26, 1985, 8526442

Int. Cl.⁴ F15B *13/043*

U.S. Cl. 137—1 **4 Claims**



1. A method of controlling a pilot valve for a two-stage hydraulic device, the pilot valve comprising a housing, an inlet port and two service ports provided in said housing, a spool slidably mounted in said housing, first and second metering means provided on said spool, said spool being movable in opposite directions from a normal null position in order to deliver, under the control of said first or second metering means, fluid under pressure from said inlet port through one of said two service ports to the second stage of the device to actuate the latter in one of said opposite directions from a normal null position, and an electrically-actuated spool control device, associated with one end of said spool, said pilot valve spool being movable beyond its normal operating range to an offset zero flow position in the event of a failure of said control device, wherein the improvement comprises the steps of:

(a) providing the pilot valve spool with third metering means,

(b) providing resilient means disposed at one end of said pilot valve spool and operable, in the event of said failure, to move said spool to a predetermined position,

(c) providing stop means for said resilient means operable to prevent further movement of said spool by said resilient means beyond said predetermined position,

(d) allowing pressure fluid to react on said pilot valve spool so that when said resilient means engages said stop means, this reaction results in further movement of said spool to move said spool fully to the offset zero flow position in which both said service ports are connected to tank,

(e) and arranging for said third metering means to inhibit flow of fluid under pressure from said inlet port through the service port which would otherwise be subjected to such flow in such offset position of said pilot spool.

4,785,840

METHOD OF AND APPARATUS FOR CONTROLLING MATERIAL FLOW

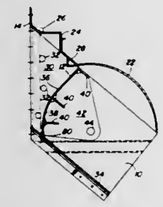
Anthony B. Cremen, 81 Mount Pellan Drive, Glenvista Extension, 5 Transvaal, South Africa

Filed Mar. 2, 1987, Ser. No. 20,596

Int. Cl.⁴ G05D *7/01*

U.S. Cl. 137—2 **5 Claims**

1. A method for controlling the flow of material through a flow passage using a door which is movable in the passage and which has a generally curved outer wall of a size to substantially block the passage when it is in one position, and which includes a passage which has an upper wall which is substantially dome-shaped, comprising closing the passage by resting a lower end of the door on the lower wall of the passage while permitting some flow between the door and the dome-shaped portion of the upper wall of the passage, and disposing entraining elements on the door on the interior thereof so that the



flow contacts the entraining elements and biases the door into a closed position.

4,785,841

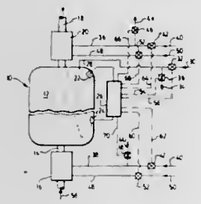
BLADDER VALVE

Raymond A. Breckner, Richmond, Canada, assignor to Innovac Technology Inc., Vancouver, Canada

Filed Apr. 5, 1988, Ser. No. 177,988

Int. Cl.⁴ F16K *7/07;* **B08B** *3/04, 9/02*

U.S. Cl. 137—15 **8 Claims**



8. A method of operating a bladder valve having concentric inner and outer bladder sleeves with an annular chamber therebetween and a passage for material through said valve concentric with said sleeves and extending through said inner sleeve, there being aperture means through said inner sleeve connecting said annular chamber with said passage, said method comprising closing said valve by a first means for applying flushing fluid under pressure to said annular chamber at a rate faster than said flushing fluid escapes from said annular chamber into said passage through said aperture means, increasing the pressure in said annular chamber sufficiently to force said inner sleeve to move into and constrict said passage while flushing said passage with flushing fluid entering said passage through said aperture means for flushing said passage and completing the closing of said valve by a second means for applying operating fluid under pressure at a selected time against the outside of said outer sleeve to force said outer sleeve toward said inner sleeve and thereby close said passage to stop flow therethrough.

4,785,842

RESETTABLE VIBRATION-ACTUATED EMERGENCY SHUTOFF MECHANISM

Ayres W. Johnson, Jr., 22560 Jefferson Point Rd. NE., Kingston, Wash. 98346

Filed Aug. 7, 1987, Ser. No. 83,745

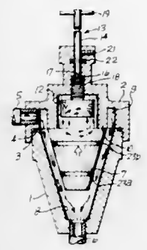
Int. Cl.⁴ F16K *17/36*

U.S. Cl. 137—38 **5 Claims**

1. In vibration-actuated emergency shutoff mechanism, a casing, a shutoff member received in the casing and movable elevationally between a lower shutoff position and an elevated

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position, the improvement comprising supporting means for the shutoff member including magnetic means having a magnet component and a magnetizable armature component which cooperate for holding the shutoff member in its elevated position by a magnetic force acting between said magnet component and said armature component, one of said magnetic means components being movable with the shutoff member means supporting the other component from the casing and including



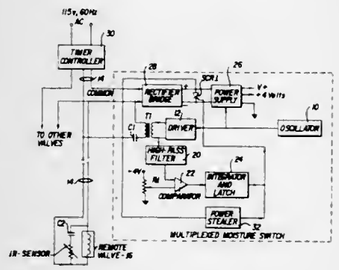
a stem extending downward through the upper portion of the casing for lowering the magnetic means component supported from the casing into cooperative relationship with the magnetic means component movable with the shutoff member when the shutoff member is in its lower shutoff position, and said stem being movable upward to move the shutoff member with the magnetic means component movable with the shutoff member from its lower shutoff position upward to an elevated position.

4,785,843

MULTIPLEXED AUTOMATIC CONTROL SYSTEM

Laurence R. Nicholson, 14328 Lookout Road, Nevada, Calif. 95959

Filed Feb. 29, 1988, Ser. No. 162,015
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—78.3 **11 Claims**



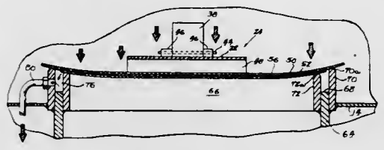
1. A control system for controlling at least one actuator having a relatively low impedance at low frequencies comprising: a source of energy of relatively low frequency for energizing the actuator; a pair of leads connecting the source of energy to the actuator; a sensor having a relatively high impedance at low frequencies connected to the leads; an oscillator for generating a sensing signal of relatively high frequency, and means coupling the high frequency signal from said oscillator to said leads to be supplied to said sensor over said leads; switching means connected to at least one of said leads for controlling the energization of the actuator by the energy from said source; and control circuitry connected to said leads and responsive to said high frequency sensing signal flowing in the leads and through the sensor for operating said switching means to energize the actuator when the impedance of said sensor means reaches a predetermined value.

4,785,844

DOUBLE-SEAL FLEXIBLE GATE VALVE

Ivan Pankov, Willowbrook, Ill., assignor to C & S Valve Company, Westmont, Ill.

Filed Aug. 26, 1987, Ser. No. 89,575
Int. Cl.[4] F16K *3/18, 25/00*
U.S. Cl. 137—242 **8 Claims**



1. A gate valve for controlling flow in an axial direction, comprising:

an axially-extending valve body having a discharge orifice of preselected diameter;

a gate assembly including a spacer disk, a rigid backup plate of diameter substantially less than that of said discharge orifice joined to upper and lower flexible sealing disks spaced apart by the spacer disk, each of said sealing disks having an outer diameter greater than that of said backup plate and of said spacer disk;

valve seat means comprising radially inner and outer annular valve seating rings, with said inner ring having a sealing surface below that of said outer ring so as to be offset therefrom, said rings attached to said valve body adjacent said discharge orifice for sealingly engaging said sealing disks such that the upper sealing disk forms a pressure-tight seal with said outer ring and a separate pressure-tight seal is formed with said lower sealing disk and said inner ring, the upper and lower sealing disks being deflected when seated against the seating rings so as to have concave configurations for achieving a wiping action across the sealing surfaces which is defined by the offset of said sealing rings;

valve positioning means for moving said backup plate in downstream and upstream directions so as to bring said upper and lower sealing disks into and out of engagement with said outer and inner valve seat rings, respectively; and

said valve seat means defines chamber means between the pressure-tight seals formed with said upstream and said downstream sealing disks, for receiving seepage flowing past at least one of said seals.

4,785,845

FAUCET MIXING BATTERY

Avraham Kochal, 4 Anna Frank St., Kfar Saba, Israel

Filed Nov. 16, 1987, Ser. No. 121,109
Claims priority, application Israel, Nov. 28, 1986, 80806
Int. Cl.[4] F16K *49/00*
U.S. Cl. 137—341 **15 Claims**

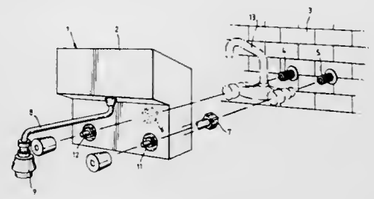
1. A self-contained faucet mixing battery adapted to be secured to respective existing hot and cold water outlets of a water flow path, in combination comprising:

a casing adapted to be fixed to a surface having the existing hot and cold water outlets of the water flow path;

first and second coupling ports carried by said casing adapted to be coupled, respectively, to said existing hot and cold water outlets of the water flow path, such that water flowing from said existing outlets is received by the respective coupling ports and passes therethrough being directly received in the casing;

a mixing spout directly secured to, carried by and extending from said casing;

an electric water heating unit located entirely within said casing and having a unit inlet coupled to at least one of said coupling ports and having a unit outlet coupled to said mixing spout; and



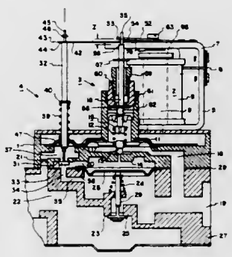
manual control means mounted on and carried by said casing for controlling the flow of water received in the casing from said coupling ports to said mixing spout such that the mixing spout selectively provides hot and/or cold water even when the water flowing from the existing outlets is cold.

4,785,846

GAS CONTROL APPARATUS WITH A PRESSURE REGULATOR

Cornelis A. Kragten, Emmen, Netherlands, assignor to Honeywell B.V., Netherlands

Filed Nov. 5, 1987, Ser. No. 116,998
Claims priority, application European Pat. Off., Dec. 24, 1986, 86118069.3
Int. Cl.[4] G05D *16/20*
U.S. Cl. 137—489 **9 Claims**



1. A gas control apparatus having a main valve which can be controlled by means of a pressure regulator with a closure member of the main valve being biased in closing direction by means of a spring comprising

a diaphragm of the pressure regulator which is exposed to the pressure to be controlled carries a closure member of a bleed valve which connects a control pressure chamber of the main valve to an outlet of the control apparatus,

a control spring determining the setpoint of the gas pressure biasing said diaphragm,

an adjustable abutment for an end of said control spring opposite said diaphragm,

a switch-on valve biased by a closure spring and located in the gas path between the inlet of the gas control apparatus and the pressure regulator,

a solenoid consisting of a coil, a magnetic core and a tiltable armature has its armature on the one side contacting a valve rod of said switch-on valve and on the other side contacting a pin carrying said abutment of said control spring which is opposite said diaphragm and

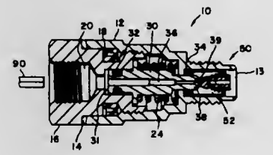
an armature reset spring has a stationary abutment for one of its ends and engages said armature with its other end after said armature has moved through a dead zone stroke which is sufficient for opening said switch-on valve.

4,785,847

UNITARY POPPET VALVE ASSEMBLY FOR A PROPORTIONING VALVE

John E. Steer, South Bend; Donald A. Crumb, Granger, both of Ind., and Richard A. Zander, Niles, Mich., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 27, 1987, Ser. No. 44,378
Int. Cl.[4] F16K *16/04*
U.S. Cl. 137—505.25 **14 Claims**



1. A poppet valve assembly disposed within a body of a porportioning valve structure, the assembly comprising an annular retainer having an opening at one end thereof, a poppet extending longitudinally and slidably through the opening in the one end and into an interior cavity within said annular retainer, the poppet having a poppet head at an end disposed opposite from an abutment located at the other end, the poppet head located entirely within the cavity, resilient means extending between a cavity shoulder located within the cavity and said poppet head, the abutment engaging a retainer shoulder of said annular retainer disposed adjacent said opening in the one end, and at least one lateral retainer extension extending away from an outer surface of the annular retainer, the lateral retainer extension engaging the body of the proportioning valve structure so that the poppet valve assembly is retainably positioned thereby, the other end of the annular retainer comprising a retainer opening for permitting fluid flow therethrough, the retainer opening having a width substantially the same as a maximum width of the interior cavity, the proportioning valve structure having a piston end with a valve seat, and the piston end extending within the retainer opening and movable therethrough to position said valve seat relative to the poppet head.

4,785,848

ELECTROMAGNETIC DIRECTIONAL CONTROL VALVE ASSEMBLY

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,732
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634349
Int. Cl.[4] F15B *13/08*
U.S. Cl. 137—596.17 **23 Claims**

1. An electromagnetic directional control valve assembly comprising:

a common base element having fluidic pressure connection paths, a plurality of sockets, a valve sealing seat in each of said sockets fluidically between one pressure connection path and at least one load connection path;

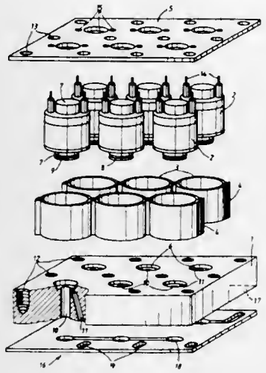
a common cover plate;

a plurality of electromagnetic directional control valves between said common base element and said common cover plate, each including a valve body, valve actuator,

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said valve actuator including an armature and magnetic tube surrounding said armature and forming a fluid tight contact with said sockets;

a plurality of magnetic jackets between said common base element and said common cover plate, separate from and for each valve actuator, said magnetic jackets joined to



form a coherent magnetic jacket component common to several actuators, the distances between the individual magnet jackets corresponding to distance between said sockets; and

clamping means for clamping said valve actuators and said magnetic jacket components between said common base element and cover plate.

4,785,849

PRESSURE REDUCING VALVE ASSEMBLY

Kenji Masuda, Settsu, Japan, assignor to Daikin Industries Ltd., Osaka, Japan

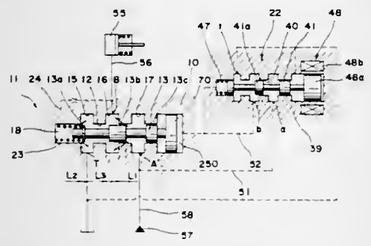
PCT No. PCT/JP86/00282, § 371 Date Dec. 17, 1986, § 102(e) Date Dec. 17, 1986, PCT Pub. No. WO86/07476, PCT Pub. Date Dec. 18, 1986

PCT Filed Jun. 6, 1986, Ser. No. 2,754

Claims priority, application Japan, Jun. 12, 1985, 60-128476; Jul. 16, 1985, 60-157772; Jul. 16, 1985, 60-157773

Int. Cl.⁴ F15B *13/043*

U.S. Cl. 137—625.64 **5 Claims**



1. A pressure reducing valve assembly comprising

a main valve, wherein a valve housing (**10**) defines a cylindrical chamber (**12**) provided with annular grooves (**17, 16, 15**), each of which has an inlet port (A), an outlet port (B), and a return port (T), respectively, a spool (**13**) having at least three lands (**13***a*, **13***b*, **13***c*) being slidably accommodated in said cylindrical chamber (**12**), so that at one end of said spool (**13**) is formed a pilot chamber (**18**) communicated to said outlet port (B) by way of a passage (**24**) while at the other end thereof is formed a control chamber (**25, 250**), whereby the fluid flow passing from the inlet port (A) to the outlet port (B) and between the corner of said land (**13***b*) in the center and the rim of the end face of the annular groove (**16**) provided with said outlet port (B) diverges relative to the axial core of the spool (**13**) in the form of a trumpet, and the fluid flow passing from the pilot chamber (**18**) to the return port (T) and between the corner of said land (**13***a*) on the side of said pilot chamber (**18**) and the rim of the end face of the annular groove (**15**) provided with said return port (**7**) diverges relative to the axial core of the spool (**13**) in the form of a trumpet; and

a pilot valve, wherein a valve housing (**39**) defines a cylindrical chamber (**40**) provided with an inlet port (a), an outlet port (b), and a return port (t), a spool (**41**) equipped with lands being slidably accommodated in the chamber (**40**), so that at one end of the spool (**41**) is formed a chamber (**45**) communicated to said outlet port (b) by way of a passage (**46**) while an adjustable pushing means to push the other end of said spool is disposed at said other end,

the chamber (**45**) containing a pressed biasing spring (**47**) to press the pilot spool (**41**) toward the adjustable pushing means (**48**), and the outlet port (b) being normally closed to the inlet port (a);

wherein the inlet port (a) of said pilot valve (**22**) is connected with the inlet port (A) of said main valve (**11**) by way of a passage (**51**), while the outlet port (b) of said pilot valve (**22**) is connected with the control chamber (**25, 250**) of said main valve by way of a passage (**52**).

4,785,850

CYLINDRICAL VALVE SOAP DISPENSER

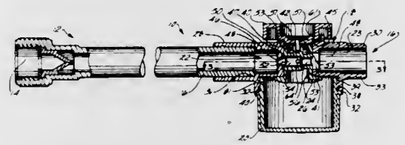
George Sanchez, Northridge, Calif., assignor to Clyde Industries Limited, Australia

Continuation-in-part of Ser. No. 900,838, Aug. 27, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 77,754

Claims priority, application Taiwan, Nov. 7, 1986, 75-105259

Int. Cl.⁴ F16K *11/076*

U.S. Cl. 137—894 **29 Claims**



1. A fluid dispenser comprising:

a housing having a top side and a bottom side, the bottom side comprising means for coupling to a container to form a fluid reservoir;

a valve cavity through the housing from the top side to the bottom side;

a cylindrical valve mounted and rotatable in the valve cavity, the cylindrical valve comprising a valve member extending outwardly beyond the valve cavity into abutting relation with the bottom side;

a main passage through the housing and cylindrical valve substantially transverse to the valve cavity;

means for coupling an upstream portion of the main passage to a high pressure fluid source;

an exposed control knob connected at the top side of the housing for manually rotating the cylindrical valve;

separate upstream and downstream housing grooves in the valve cavity, each of the grooves extending to a different position on the bottom side of the housing;

an upstream valve passage extending from an upstream portion of the main passage through the cylindrical valve to the upstream housing groove;

a downstream valve passage extending from a downstream portion of the main passage through the cylindrical valve to the downstream housing groove;

a first rotational position of the knob and cylindrical valve causing the cylindrical valve to block the flow of fluid through the main passageway of the housing;

a second rotational position of the control knob and cylindrical valve providing communication of fluid through the main passage of the housing and the cylindrical valve, and communication of fluid through the upstream valve passage and groove, through the reservoir and through the downstream groove and valve passage and back to the main passageway; and

a third rotational position of the control knob and cylindrical groove providing fluid communication through the main passageway of both the housing and cylindrical valve and the valve member obstructing the opening of at least one of the grooves to the reservoir.

4,785,851

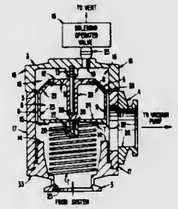
VACUUM SECURITY VALVE HAVING A BUFFER VOLUME

R. Norman Peacock, Lafayette, Colo., assignor to MKS Instruments Inc., Andover, Mass.

Filed Jul. 20, 1987, Ser. No. 76,714

Int. Cl.⁴ F16K *31/124, 31/128, 31/02*

U.S. Cl. 137—907 **18 Claims**



1. A vacuum security valve, comprising:

a valve body having an interior, a selectively openable vent means connected to a fluid source at a predetermined pressure, a first port means, and a second port means;

a normally open, movable valve piston means for movement within said valve body between a first, open, position and a second, closed position; said first and second port means being in communication when said movable piston means is in said first, open, position; said movable piston means blocking communication between said first and second port means when in said second, closed, position;

a valve seat means for seating of said movable valve piston means in said second, closed, position to close communication between said first and second port means;

said selectively openable vent means being openable, when said interior of said valve body is under a vacuum pressure less than said predetermined pressure of the fluid source, to cause movement of said movable piston means from said first, open position to said second, closed position;

said movable valve piston means having an internal buffer volume, a first orifice, and a second orifice which communicates with said first orifice via said internal buffer volume;

a blocking means for preventing fluid communication between said selectively openable vent means and said second port means;

said buffer volume communicating with said interior of said valve body via said second orifice;

said selectively openable vent means being in communication with said first orifice;

said buffer volume being sufficiently large that, under said vacuum pressure inside said valve body and upon opening of said selectively openable vent means, said first port means is closed by said movable valve piston means before significant fluid leakage occurs from said buffer volume via said second orifice;

whereby, upon opening of said selectively openable vent means, the fluid from the fluid source pressurizes the movable valve piston means to cause the piston means to close the first port means while at the same time the fluid passes through the first orifice, the buffer volume and the second orifice of the movable valve piston means to initiate venting of a device adapted for connection to said first or second port means, the time for initiation of venting being significantly increased with respect to the time for the piston means to close the first port due to said buffer volume.

4,785,852

CONDUCT PIPE COVERED WITH ELECTRICALLY INSULATING MATERIAL

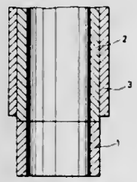
Kazuo Okahashi, and Ichiro Takahashi, both of Osaka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 427,342, Sep. 29, 1982, abandoned. This application Mar. 21, 1984, Ser. No. 591,249

Claims priority, application Japan, Oct. 12, 1981, 56-162246

Int. Cl.⁴ F16L *9/02*

U.S. Cl. 138—109 **5 Claims**



1. A hot water resistant conduct pipe produced by the process comprising:

(1) winding a polyether ether ketone resin film around the outside of a metal conduct pipe,

(2) carrying out impregnation treatment in a vacuum and then under pressure using an impregnant resin obtained by blending a mixture of:

(a) an epoxy resin,

(b) a reactive diluting agent, and

(c) a catalyst capable of forming a three-dimensional network structure by forming ether bonds between the molecules of the epoxy resin, wherein said epoxy resin is selected from the group consisting of bisphenol epoxy resin, alicyclic epoxy resin, glycidyl ester epoxy resin, novalak epoxy resin and cresol novalak epoxy resin and wherein said catalyst is selected from the group consisting of a metal salt of dialkyldithiocarbamic acid, a metal salt of carboxylic acid, imidazole compounds, triethanolamine titanatetriphenyl borate complex, boron trifluoride-amine complex, trimethoxy-boroxine and boric acid anhydride, and thereafter

(3) hardening by heating,

wherein said conduct pipe has an electrode on an end thereof, wherein said conduct pipe is useful in an electrode apparatus for collecting underground hydrocarbon resources by an electrically heating method and, wherein said electrically heating method is conducted by applying a high electric potential to both electrodes attached to a pair of said conduct pipes situated on an oil sand layer.

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4,785,853

CONDUCT PIPE COVERED WITH ELECTRICALLY INSULATING MATERIAL

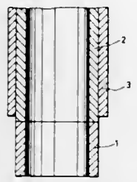
Kazuo Okahashi, and Ichiro Takahashi, both of Osaka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 427,378, Sep. 29, 1982. This application Mar. 21, 1984, Ser. No. 591,894

Claims priority, application Japan, Oct. 12, 1981, 56-162244

Int. Cl.[4] F16L *9/02*

U.S. Cl. 138—109 **1 Claim**



1. A hot water resistant conduct pipe useful in an electrode apparatus for collecting underground hydrocarbon resources by an electrically heating method, produced by the process comprising:

(1) producing a metal conduct pipe; and

(2) attaching a polyether ether ketone resin to the outside surface of the metal conduct pipe by means of pressure of 30–1000 g/cm^2 with fusing at a temperature of 350°–400° C., wherein said polyether ether ketone resin is in the form of a powder, a tube or a film, wherein said conduct pipe has an electrode on an end thereof and wherein said electrically heating method is conducted by applying a high electrical potential to both electrodes attached to a pair of said conduct pipes situated on an oil sand layer.

4,785,854

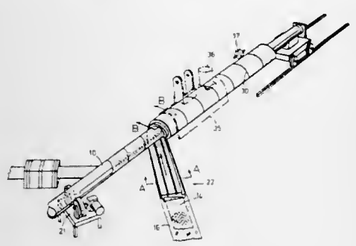
METHOD OF COATING METAL PIPE HAVING BENDING CAPABILITY

Harold F. Jarvis, Moffat, and Frederick S. Gelfant, Oakville, both of Canada, assignors to Shaw Industries Ltd., Rexdale, Canada

Division of Ser. No. 934,840, Nov. 25, 1986, Pat. No. 4,759,390. This application Feb. 23, 1988, Ser. No. 159,335

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—187 **3 Claims**



1. A method of applying a protective coating to a metal pipe which comprises

forming an inner, water-impermeable corrosion barrier layer bonded to the surface of the pipe,

forming a strip of impact-resistant and penetration-resistant cladding material having embedded therein a layer of mesh reinforcing material extending along a plane defining inner and outer portions of said strip,

molding one or more longitudinally extending grooves in said outer strip portion, the grooves extending substantially to the depth of the reinforcing layer,

molding one or more longitudinally extending grooves in said inner strip portion substantially to the depth of the reinforcing layer, said grooves being aligned with the grooves formed in said outer layer portion,

applying a strength killing solution to the grooves formed in said inner strip portion, thereby to modify the compressive strength of the cladding material adjacent said grooves,

supporting the strip on a carrier tape,

feeding the carrier tape to the pipe under tension, and

compressively wrapping the strip of cladding material onto the pipe with said inner strip portion adjacent the corrosion barrier layer, whereby the grooves formed in the inner strip portion become filled with, said cladding material of reduced compressive strength.

4,785,855

WEFT YARN STORE FOR LOOMS HAVING A BRAKING DEVICE

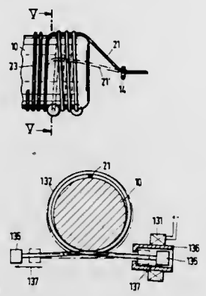
Rolf Benz, Cachnang, Switzerland, and John D. Griffith, Ru, England, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 8, 1987, Ser. No. 47,127

Claims priority, application Switzerland, May 15, 1986, 01977/86

Int. Cl.[4] D03D *47/36*

U.S. Cl. 139—452 **7 Claims**



1. A weft yarn store for looms, yarn being supplied to the store from a weft package and being drawn off from the store intermittently for picking into the shed of a loom, a drum being provided to store a weft yarn supply, a brake device being provided which comprises a rotationally symmetrical braking surface, at least one resiliently deformable low-mass brake element movable relatively to the braking surface, and means for moving the brake element relatively to the braking surface, said means for moving the brake element being an electromagnet which is in direct operative engagement with low-mass brake element parts engaging intimately with the braking surface periphery.

4,785,856

APPARATUS FOR PRESENTING WEFT THREADS TO A GRIPPER IN SHUTTLELESS LOOMS

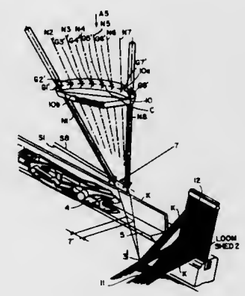
Fritz Gehring, Lindau-Bodolz; Valentin Krumm, Hergensweiler; Siegbert Gsell, Wangen, and Walter Lindenmueller, Lindau, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau/Bodensee, Fed. Rep. of Germany

Filed May 26, 1987, Ser. No. 54,404

Claims priority, application Fed. Rep. of Germany, May 31, 1986, 3618445

Int. Cl.[4] D03D *47/38*

U.S. Cl. 139—453 **9 Claims**



1. An apparatus for presenting weft threads to a gripper in a shuttleless loom, comprising a plurality of weft thread presenting needles each having an eye for holding a weft thread, needle guide means for movably holding and guiding each of said needles, needle guide carrier means for said needle guide means, mounting means for securing said needle guide carrier means to said loom, said needle guide carrier means having a longitudinal axis extending at a slant to a gripper path and toward heald shafts of said loom, said needle guide means having longitudinal axes with a skew in space relative to each other for locating and guiding said weft thread presenting needles in a fan type plane twisted or curved in space so that said needle eyes assume thread presenting positions all of which are located close to each other on a straight line (7) extending approximately in parallel to said gripper path.

4,785,857

METHOD AND AN APPARATUS FOR FITTING A STOPPER IN A PIPE, TUBE, WALL PASSAGE OR THE LIKE, AND A CONTAINER CONSISTING OF AT LEAST TWO COMPARTMENTS FILLED WITH INTERMIXABLE SUBSTANCES

Jan Baars, Montfoort, Netherlands, assignor to Chemische Industrie Filoform B.V., Netherlands

Filed Mar. 3, 1987, Ser. No. 21,123

Claims priority, application Netherlands, Mar. 10, 1986, 8600619; Mar. 18, 1986, 8600689

Int. Cl.[4] F16L *55/12*

U.S. Cl. 141—9 **8 Claims**

1. A method of foaming in place a stopper directly in an aperture, including a pipe, wall passage or the like, comprising:

(1) providing a two-compartment flexible wall container with the two compartments being closed relative to each other by a detachable closing element, and wherein one compartment contains a foamable resin and the other contains an activator agent for the foamable resin;

(2) providing a nipple, which is attachable on a wall of the container, said nipple having a passage therethrough and having at least partially disposed around the said passage rupturing elements which are capable of rupturing a wall of said container;

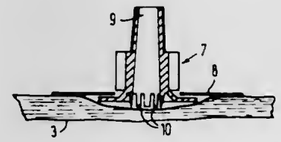
(3) providing a supply hose connected to said nipple at the end thereon opposite to the end thereof having the said rupturable elements;

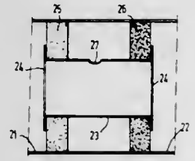
(4) removing the detachable closing element to provide communication between the said two compartments;

(5) mixing the said resin with the said activator agent;

(6) attaching the said nipple to a wall of the container and rupturing the wall of the container where the nipple is attached, whereby a passageway is provided from within the container, through the passage in the nipple and through the said hose; and

(7) applying pressure to the flexible container to cause the mixed resin and activator agent to flow from the container, through the nipple, through the hose, out of the hose and into the aperture so that a foamed in place stopper in the aperture is provided.





6. A method of foaming in place a stopper directly in an aperture including a pipe, wall passage or the like, comprising:

(1) providing a tubular member having a tubular wall with the wall having a radially directed filling opening therein;

(2) providing outwardly extending flanged ends for said tubular member;

(3) placing the tubular member with the said flanged ends into the aperture to be stoppered;

(4) flowing a liquid mix of a foamable resin and an activator therefor through the said opening and into the said tubular member, either before or after placing the tubular member in the said aperture; and

(5) allowing the said resin to foam and fill the space in the tubular member and the space between the tubular member and the said aperture so that a foamed in place stopper in the aperture is provided.

4,785,858

DEVICE FOR FIRMLY LOCKING A SYRINGE ON A BODY WHICH MAY BE COUPLED THERETO

Luigi Valentini, Milan, and Mario Coccia, Cesano Boscone, both of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jul. 20, 1987, Ser. No. 75,683

Claims priority, application Italy, Jul. 25, 1986, 22648/86[U]

Int. Cl.[4] B65B *3/02*

U.S. Cl. 141—27 **6 Claims**

1. A device for transferring liquids, said device comprising:

(a) a syringe having a working end, the working end of said syringe having a radially inwardly facing surface and a radially outwardly facing surface;

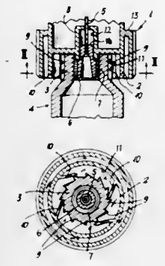
(b) a syringe needle projecting from the working end of said syringe;

(c) a body having a seat sized, shaped, and positioned to receive the working end of said syringe;

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(d) said seat having a radially inwardly facing surface, a radially outwardly facing surface, and a hole sized, shaped, and positioned to allow said syringe needle to pass therethrough;

(e) one of said radially inwardly facing surface and said radially outwardly facing surface of the working end of said syringe and said radially inwardly facing surface and said radially outwardly facing surface of said seat having threads for coupling said syringe to said body; and



(f) the working end of said syringe and one of said radially inwardly facing surface and said radially outwardly facing surface of said seat having:

(i) complementary and cooperating teeth and

(ii) slanted and resilient fins that permit the threading of the working end of said syringe into said seat but that permit the unthreading of the working end of said syringe from said seat.

4,785,859

VARIABLE VOLUME VESSEL HAVING A RIGID COVER AND A FLEXIBLE PART RECEIVABLE INTO THE COVER

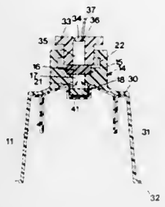
Bengt Gustavsson, Bergsbogatan 29, S-421 79 Västra Frölunda; Ingvar Andersson, PL.80, S-450 34 Fiskebäckskil, and Lars-Erik Linder, Valebergsvägen 319, S-427 00 Billdal, all of Sweden

Continuation of Ser. No. 786,963, filed as PCT SE 85/00056 on Feb. 6, 1985, published as WO 85/03433 on Aug. 15, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 65,098

Claims priority, application Sweden, Feb. 6, 1984, 8307141

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—313 **16 Claims**



1. In combination, a vessel, and a material stored therein in concentrated form which is to be dissolved or diluted by a solvent prior to use, said vessel comprising:

a flexible part having a closed end and an opposite open end, the open end having a peripheral edge, said flexible part defining an interior surface and an exterior surface;

a rigid cup-shaped part having downwardly extending side walls, and an open bottom end, and defining interior and exterior surfaces, the peripheral edge of the opening in the flexible part being tightly attached to the rigid cup-shaped part such that said interior surface of the flexible part and said interior surface of the rigid cup-shaped part define a closed interior space;

an upwardly-extending connection member on the rigid cup-shaped part, the connection member having an opening therethrough and a perforable, resilient, self-sealing membrane extending across said opening, through which membrane said interior space is accessible by a puncturing member for adding solvent to said material stored in said interior space or removing dissolved or diluted material from said interior space; and

a protection member supported by said rigid cup-shaped part within said interior space adjacent said opening of the connection member, for receiving such puncturing member inserted through said opening and preventing such puncturing member from contacting the flexible part, the protection member having at least one opening therein in communication with said interior space;

said concentrated material only taking up a small part of said interior space, said flexible part being configured and dimensioned such that when said interior space is at least partly evacuated, the flexible part is, because of vacuum pressure, drawn up against said interior surface of the rigid cup-shaped part and totally contained therein, and after adding solvent into said interior space for dissolving or diluting said concentrated material, said flexible part may expand towards said open bottom end of said rigid cup-shaped part.

4,785,860

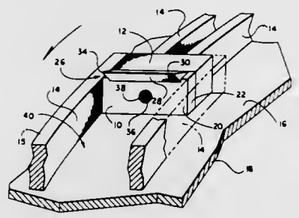
WOOD PROCESSING MACHINE HAVING ANNULAR RINGS

Stanley Arasmith, P.O. Box 2458, Rome, Ga. 31064

Continuation-in-part of Ser. No. 917,855, Oct. 14, 1986. This application Sep. 18, 1987, Ser. No. 99,338

Int. Cl.[4] B27C *1/00*

U.S. Cl. 144—174 **13 Claims**



1. An apparatus for processing wood, comprising:

a supporting surface;

spacing means mounted on said surface for maintaining a wood member spaced apart a first distance from said surface such that a gap is maintained intermediate said wood member and said surface;

a cutting element for removing wood from said wood member, said cutting element defining a cutting edge and being mounted to said surface such that said cutting edge is spaced apart from said surface a second distance from said surface, said second distance being greater than said first distance;

means for urging said cutting member along a cutting path relative to said wood member such that said cutting edge engages said wood member and removes a wood chip; and

means for directing said wood chip into said gap and away from said cutting edge.

4,785,861

HIGH PERFORMANCE TIRE

Kenichi Fujiwara, Miki, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

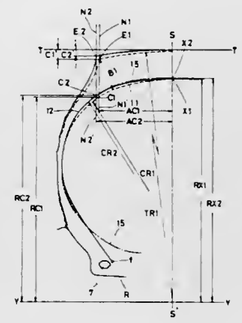
Filed Apr. 23, 1986, Ser. No. 854,783

Claims priority, application Japan, Apr. 24, 1985, 60-89514

The portion of the term of this patent subsequent to Nov. 5, 2005, has been disclaimed.

Int. Cl.[4] B60C *11/03*

U.S. Cl. 152—209 R **5 Claims**



1. A pneumatic radial ply tire comprising

a carcass layer reinforced by at least one ply of substantially radially arranged substantially unstretchable parallel cords;

a tread on said carcass layer, having at least two main grooves extending circumferentially in a zigzag, wavy, or straight line to divide the tread into two shoulder parts and a crown part therebetween having width of about 30 to 65% of the tread width;

a belt layer, arranged between the tread rubber and said carcass layer adjacent to the carcass layer, and including at least two plies of parallel cords laid at an angle of 10° to 70° to the tire circumferential direction so as to be crosswise with each other;

said tread, when the tire is mounted on a rim officially specified for use therewith and inflated with air, having a radially outer profile curved in a plane including the tire axis, and the radius of curvature thereof increasing with an increase in inflation air pressure and satisfying a relation

$$1.2 \leqq TR2/TR1 \leqq 1.5$$

wherein **TR1** is the radius when the tire is inflated to a pressure of 5% of the specified maximum pressure, and **TR2** is the radius when inflated to the specified maximum pressure;

said tread shoulder parts each being provided with a plurality of axially extending narrow grooves of less than 6 mm in width so that a volume index of the narrow grooves is in a range of 2.5 to 15, and a circumferential stiffness index in each shoulder part in a range of 30 to 70, wherein the circumferential stiffness index in the shoulder part and the volume index of the narrow grooves are defined as follows:

$$\text{Volume Index} = V/(SXd) \times 100$$

V: total volume of the narrow grooves in the shoulder part

S: surface area of the shoulder part

d: depth of the main groove

$$\text{Circumferential Stiffness Index} = (Kpt/Kpo) \times 100$$

Kpt: circumferential stiffness in the shoulder part after the narrow grooves are provided

Kpo: circumferential stiffness in the shoulder part before the narrow grooves are provided

$$\text{Circumferential Stiffness} = F/y$$

F: tangential force in the circumferential direction of the tire at the ground contacting surface of the shoulder part

y: variation of the ground contacting surface in the circumferential direction of the tire.

4,785,862

DUAL TIRE MOUNTING METHOD

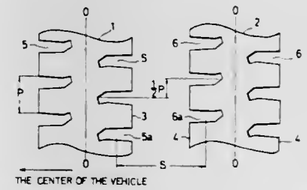
Satoshi Konishi; Hiroshi Yamaguchi, both of Tokorozawa; Toshiyuki Watanabe, Kodaira, and Shigehito Kishinami, Higashiyamato, all of Japan, assignors to Bridgstone Corporation, Japan

Filed Sep. 11, 1986, Ser. No. 906,311

Claims priority, application Japan, Sep. 11, 1985, 60-201282

Int. Cl.[4] B60C *11/00*

U.S. Cl. 152—209 R **9 Claims**



1. A method of mounting dual tires on a motor vehicle in which said tires have lateral grooves in the circumferential direction of said tires and in which said tires of the dual tires have the same tread pattern,

said mounting method characterized in that said tires are mutually separated by a predetermined distance along a direction of a wheel shaft on which said tires are mounted, and the neighboring lateral grooves on the respective tires that lie on the inside and the outside of the faces of the dual tires nearest one another, are positioned in the circumferential direction so that said neighboring lateral grooves are shifted with respect to one another by substantially one half of a pitch of the grooves in the circumferential direction.

4,785,863

PNEUMATIC RADIAL TIRE WITH ASYMMETRIC TREAD

Toru Tsuda, and Toshio Hayakawa, both of Higashimurayama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,341

Claims priority, application Japan, Nov. 7, 1986, 61-264085

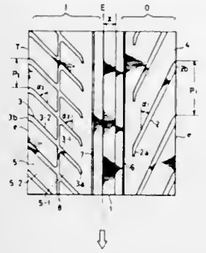
Int. Cl.[4] B60C *11/08*

U.S. Cl. 152—209 A **7 Claims**

1. A pneumatic radial tire having a radial carcass extending between two tire sidewalls through a tire crown portion in toroidal shape; a belt layer arranged along an outer circumferential of a crown portion of the carcass; and a tread formed with at least one main circumferential groove located at a central portion of the tread substantially in parallel to a tire equator, a plurality of inclination grooves arranged on both sides of a tire tread at substantially regulr intervals along a tire circumference and extending from both tread ends toward the main circumferential groove to form an acute angle with a line parallel to the tire equator, each of said first and second inclination grooves increasing in width toward respective tread ends, and tire land portions partitioned by the main groove and said

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inclination grooves, wherein a ratio of P_1/P_2 lies within a range between 1.5 and 3.0 and α_2 is greater than α_1, where: P_1 denotes a first circumferential pitch length of said first inclination groove and, where, α_1 denotes a first average inclination angle of first inclination grooves with respect to said line parallel to the tire equator both in a first tire tread area defined between the main circumferential groove and a first tread end;



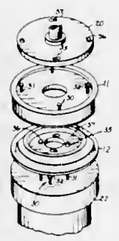
and P_2 denotes a second circumferential pitch length of second inclination grooves and α_2 denotes a second average inclination angle of said second inclination grooves with respect to said line parallel to the tire equator both in a second tire tread area defined between the main circumferential groove and a second tread end where P_1 and P_2 are measured at the tread edge in the circumferential direction from the edge of one groove to the same edge on an adjacent groove.

4,785,864

RIM MOUNT FOR TIRE UNIFORMITY MACHINE

Barry D. Cargould, Akron, and James C. Beebe, Kent, both of Ohio, assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Feb. 26, 1988, Ser. No. 160,695
Int. Cl.[4] B60C *25/00*
U.S. Cl. 157—20 **4 Claims**



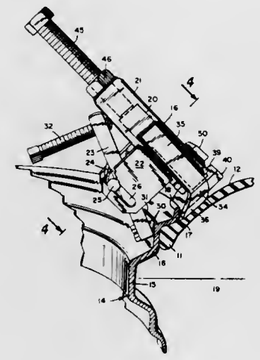
1. The rim mount for a tire uniformity machine comprising,
upper and lower rim supports,
upper and lower rims mounted on said rim supports,
a plurality of bolts securing said rims to said rim supports, each said bolt having a head and a threaded shank,
one of said rims and rim supports having said plurality of bolts partially threaded in it,
the other of said rims and rim supports having a plurality of keyhole slots for receiving said bolts,
each said keyhole slot having a large portion of a size sufficient to pass said bolt head, and a small portion of a size sufficient to receive said bolt shank but insufficient to pass said bolt head.

4,785,865

MECHANICAL DEVICE FOR RELEASING TIRE BEADS FROM WHEEL RIMS

Lowell C. Folstad, Rte. 1, Box 123, Harwood, N. Dak. 58042

Filed Jun. 24, 1987, Ser. No. 66,046
Int. Cl.[4] B60C *25/06*
U.S. Cl. 157—1.17 **3 Claims**



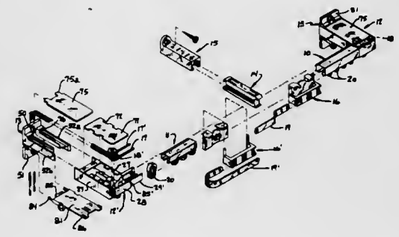
1. A bead breaker apparatus for loosening a tire bead that is seated on a rim, said rim having a substantially annular bead seat shoulder forming a surface on which a tire bead is seated, said shoulder having an opposite surface from the surface supporting the tire bead, and the rim having a radial flange portion to the outside of said shoulder, said bead breaker comprising a frame formed as a rectilinear cross-section tube member, jaw means on said frame including a first jaw member fixed to said frame and extending outwardly from one end thereof, said first jaw member comprising two laterally spaced apart claw members on said frame, a second jaw member, means for pivotally mounting the second jaw member on said frame at a position spaced from said first jaw member, said first jaw member and said second jaw member being adapted to fit over the radial flange of a rim, with a first end of the second jaw member under the shoulder, the means for pivotally mounting the second jaw member to the frame comprising a pair of plates fixed to sides of the tube member comprising the frame, said second jaw member being positioned between the plates, said plates having slots therein extending in longitudinal direction of the tube member, and a pivot pin slidably mounted in the slots and coupled to the second jaw member for pivotally mounting the second jaw member so the pivot axis for the second jaw member can be adjusted along the slots to accommodate rims having shoulders of different configurations, said second jaw member being elongated to have a lever portion extending on the opposite side of the pivot pin from the first end, threadable means threaded through the lever portion of said second jaw member and positioned to directly bear against said frame to pivot the first end of said second jaw member toward said first jaw member, said threadable member being on the same side of the frame as the second jaw member, and a pusher member having a head movable from a first position between the claw members of the first jaw member, said pusher member having a tang carrying the head slidably mounted in said tube member forming said frame for axial movement from its first position toward a tire mounted on a rim on which the first and second jaw members are clamped, a screw threadably mounted at an end of the tube member forming the frame to bear against the tang of the pusher member and push the pusher member toward a tire, said pusher member thereby bearing against a tire and exerting a load generally perpendicular to the plane of a rim on which such tire to be removed is mounted while the claw members engage and retain the bead breaker on such rim, and means defining a region on the tube member forming the frame on a side of the tube member opposite the second jaw member for receiving hammer blows to tend to wedge the claw members and head of the pusher member between such a tire and the rim on which the bead breaker is used.

4,785,866

TRAVERSE ROD AND SUPPORT ASSEMBLY

Ronald G. Darner, Fort Atkinson, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Dec. 16, 1986, Ser. No. 943,378
Int. Cl.[4] A47H *5/02*
U.S. Cl. 160—345 **17 Claims**



1. A drapery traverse rod and support assembly comprising, a traverse rod having a lengthwise extending trackway, master carrier means mounted for movement along the trackway, traverse cord means for moving the master carrier means along the trackway, at least one pulley housing, and a mounting bracket for mounting the pulley housing on a support surface, the pulley housing having a bottom wall and inner and outer side walls and a front wall, the pulley housing having an open area at a top side thereof and an open area at a rear side thereof and rod engaging means for supporting an end of the traverse rod with the rod extending transverse to the inner side wall of the pulley housing adjacent the front wall of the latter, the pulley housing having first cord guide means for guiding the traverse cord means fom the end of the rod rearwardly toward the mounting bracket, the mounting bracket having mounting pad means at a rear end thereof adapted for attachment to a support surface and pulley housing support means extending forwardly from the mounting pad means and adjustably received in the pulley housing through said open rear end thereof, the pulley housing support means having second cord guide means for guiding the traverse cord means downwardly adjacent said mounting pad means, a pulley housing cover detachably mounted on the pulley housing and overlying said first cord guide means, a mounting bracket cover detachably mounted on the mounting bracket and overlying the pulley housing support means, the mounting bracket cover being adapted to overlap the pulley housing cover to accommodate adjustment of the pulley housing relative to the mounting bracket.

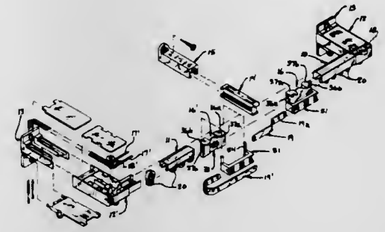
4,785,867

TRAVERSE ROD WITH UNIVERSAL MASTER CARRIER

Ronald G. Darner, Fort Atkinson, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Dec. 16, 1986, Ser. No. 943,379
Int. Cl.[4] A47H *5/02*
U.S. Cl. 160—345 **17 Claims**

1. A traverse rod including a hollow rod having a lengthwise extending slot at the bottom thereof, forward and rear carrier guide rail means along opposite sides of the slot having upper carrier guide edges, at least one master carrier movable along the rod, and means including a traverse cord for moving the master carrier along the rod, the master carrier comprising a carrier body having first and second sides and adapted to be received between the forward and rear carrier guide rail means, the carrier body having first carrier guide means extending laterally from the first side of the carrier body and second carrier guide means extending laterally from the second side of the carrier body, the carrier body being adapted to be selectively and reversibly mounted in the rod with the first carrier guide means guidably engaging the upper guide edge on either the forward or the rear carrier guide rail means, cord engaging means on the first carrier guide means for supporting



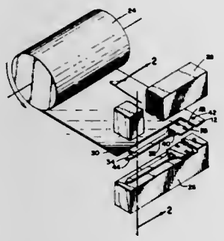
the traverse cord at a location laterally offset from said first side of the carrier body, an elongated arm support bracket, means for detachably and reversibly mounting the arm support bracket on the carrier body with the elongated arm support bracket selectively positioned at either the first side or the second side of the carrier body, a drapery support arm, and means for detachably and reversibly mounting the drapery support arm on the arm support bracket.

4,785,868

MEDICAL NEEDLE AND METHOD FOR MAKING

Marvin E. Koenig, Jr., Roseville, Minn., assignor to Titan Medical, Inc., Arden Hills, Minn.

Filed Jun. 4, 1987, Ser. No. 58,178
Int. Cl.[4] B21G *3/28*
U.S. Cl. 163—5 **4 Claims**



1. A method for manufacturing from a roll of sheet metal medical needles unitarily attached to a carrier strip, each of said medical needles being longitudinally oriented with proximal and distal ends, each of said medical needles having a tip at the distal end, a holding portion at the proximal end, and a cannulated portion between said tip and said holding portion, said holding portion being attached to said carrier strip, said cannulated portion having opposite longitudinal edges, said method comprising the steps of:
forming a flat blank in unitary attachment with said carrier strip and coining edges of said tip;
forming with a set of first dies said blank into an arcuate shape; and
closeably forming with a set of second dies said arcuately shaped blank to form said holding portion, said cannulated portion and said tip, said blank being shaped so that said

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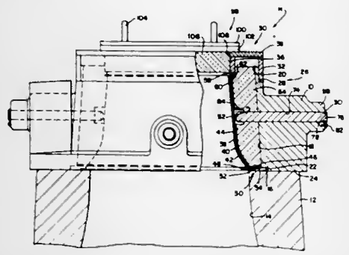
opposite edges of said cannulated portion are moved into facing proximity with one another.

4,785,869

METHOD OF SIZING A HOT TOP LINER AND ASSEMBLING A HOT TOP

Charles B. Childs, Jr., Marietta, Ga.; Enn Vallak, Geneva, Switzerland, and Hannes Vallak, Grythyttan, Sweden, assignors to Re-Top USA, Inc., Arlington, Va., by said Charles B. Childs, Jr. and Re-Top International Limited, St. Helier, Channel Islands, by said Enn Vallak and Hannes Vallak

Division of Ser. No. 918,314, Oct. 14, 1986, Pat. No. 4,721,278.
This application Jan. 14, 1988, Ser. No. 143,725
Int. Cl.[4] B22D *7/10*
U.S. Cl. 164—4.1 **19 Claims**



1. The method of assembling a hot top, comprising the steps of:
(a) selecting the volume of a sinkhead of an ingot mold;
(b) determining the mass, specific heat, and pouring and solidification temperatures of a metal which will fill the mold and the sinkhead;
(c) calculating the free energy of the metal which will fill the sinkhead by assuming the dimensions of a liner sized to achieve the selected sinkhead volume and calculating the maximum temperature which the liner would achieve upon the sinkhead being filled with the molten metal and determining whether the calculated temperture exceeds the melting point of the liner;
(d) maximizing the free energy by repeating step c until the mass of the liner is minimized at a calculated temperature less than the melting point of the liner;
(e) forming a liner having dimensions corresponding to those of the calculated minimum mass liner; and,
(f) inserting the liner into a surrounding support structure which will rest on the mold in order to position the liner.

4,785,870

EVAPORATIVE PATTERN CASTING PROCESS

Robert L. Snook, Houston, Tex., assignor to Ashland Oil, Inc., Dublin, Ohio

Filed Aug. 28, 1987, Ser. No. 90,758
Int. Cl.[4] B22C *7/02, 9/04*
U.S. Cl. 164—34 **14 Claims**

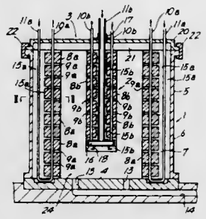
1. In the process for the preparation of metallic castings by the evaporative pattern casting process wherein an expendable pattern is coated with refractory material prior to the pouring of molten metal to form a casting of the desired shape an improvement comprising coating the expendable pattern with refractory material comprising a sufficient amount of substantially spherical refractory material to support the pattern during the pouring of the metal and to vent the gases formed by the evaporation of the pattern so as to obtain a casting of the desired shape and surface.

4,785,871

MANUFACTURING METHOD FOR HOLLOW CAST PRODUCT WITH BOTTOM

Shiro Nakamura, Ashiya; Katsuya Inoue, Aichi, both, Japan; Friedrich Werner, Krefeld, and Franz E. Schilling, Kemper, both of Fed. Rep. of Germany, assignors to Kubota Ltd., Osaka, Japan

Division of Ser. No. 909,059, Sep. 18, 1986, Pat. No. 4,729,419.
This application Oct. 27, 1987, Ser. No. 112,963
Claims priority, application Japan, Dec. 18, 1985, 60-286339
Int. Cl.[4] B22D *27/04*
U.S. Cl. 164—122 **7 Claims**



1. A casting method for a hollow cast product having a bottom by utilizing a static casting mold comprising a top lid, a core and an outer mold section, the core being attached to the top lid and disposed inside the outer mold section, the outer mold section including a lateral mold section and a lower mold section having an upwardly directed sprue, the lateral mold section being formed at its inner peripheral wall portion with a composite cooling section by stacking chiller blocks and interposing therebetween refractory sands and at its outer wall portion with refractory sands, cooling pipes extending longitudinally through the inner wall portion and being in contact with at least a part of each of the chiller blocks, comprising the steps of;
pouring molten metal through the upwardly directed sprue filling the entire casting cavity,
feeding cooling water into the cooling pipes to rapidly cool the molten metal, wherein the supply of water is continued until completion of solidification of the molten metal,
stopping the water supply immediately upon completion of solidification of molten metal, and
immediately thereafter discharging the water remaining in the pipes.

4,785,872

CASTING POWDER FOR USE IN BOTTOM POUR INGOT STEEL PRODUCTION AND METHOD FOR EMPLOYING SAME

Maharaj K. Koul, Pennington, N.J., and Richard Paul, Philadelphia, Pa., assignors to Atlantic Metals Corporation, Philadelphia, Pa.

Continuation of Ser. No. 896,067, Aug. 13, 1986, abandoned.
This application Sep. 25, 1987, Ser. No. 102,297
Int. Cl.[4] B22D *27/00*
U.S. Cl. 164—56.1 **7 Claims**

1. A method for increased efficiency of protecting a steelmaker's mold and a steel ingot as bottom poured into the mold, including protecting against excessive piping of the steel which tends to occur when the molten steel cools too rapidly in the mold, comprising
introducing into the mold a predetermined quantity of a casting powder, comprising chemical components combined to produce a bottom pour flux, and including an expandable graphite as at least 4.0% by weight of the composition of said casting powder,
pouring molten steel into said mold and covered with said casting powder to cause a substantial portion of said casting powder to rise to the vicinity of the top of said mold,

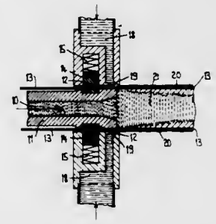
thinly coating the side walls of said mold as it rises, and expanding into a thick insulative blanket on top of the molten steel of a sufficient insulative quality of avoid a need for a hot topping compound, limiting the steel's rate of cooling and thereby minimizing the piping of the ingot;
wherein said insulative quality is achieved through use of an expandable graphite that expands to 100–300 times its volume and comprises 4.0 to 12.0% by weight of the composition of said casting powder.
6. A casting powder employed in a mold for bottom pour steel ingot production, comprising
a flux mixture of chemical components to produce a bottom pour flux which coats and protects the top and sides of molten steel as it is introduced into the mold, including an expandable graphite component as at least 4.0% by weight of the composition of said mixture, and
which flux expands to form a thick insulative blanket on top of the molten steel of sufficient insulative quality to avoid need for a hot topping compound, limiting the steel's rate of cooling and thereby minimizing piping of the ingot;
wherein said insulative quality is achieved through use of an expandable graphite that expands to 100–300 times its volume and comprises 4.0 to 12.0% by weight of the composition of said mixture.

4,785,873

SEALING BETWEEN A CASTING NOZZLE AND AT LEAST ONE CONTINUOUS TRAVELING CASTING BELT

Wilhelm F. Lauener, Gerlafingen, Switzerland, assignor to Larex AG, Recherswill, Switzerland

Filed Feb. 26, 1987, Ser. No. 19,204
Claims priority, application Switzerland, Mar. 10, 1986, 972/86
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—481 **25 Claims**



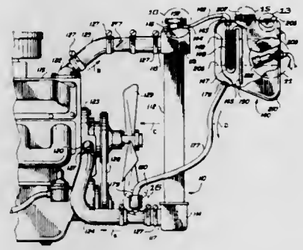
1. A method of sealing a mould for a twin belt continuous casting apparatus comprising the steps of:
providing a pair of casting belts, each having a casting width, in contacting relation with a casting nozzle so as to form a mould space at an exit of said casting nozzle;
providing a pair of rail means for applying pressure along an entire extent of each of said casting widths, respectively; and
applying a yielding load to each of said rail means, so as to induce a pressure sufficient to achieve a gap free seal between said casting nozzle and each of said casting belts.
22. A continuous casting sealing apparatus comprising:
a casting nozzle means for providing molten metal;
a pair of continuous casting belts, each having a casting belt width, positioned in contact with said casting nozzle means so as to form a mould space for receiving molten metal emanating from said casting nozzle means;
a pair of rail means for applying pressure along an entire extent of said casting belt widths;
a yielding load means for selectively applying pressure to each of said rail means.

4,785,874

METHOD AND APPARATUS FOR CONTINUOUSLY PURGING GASEOUS MATTER FROM THE COOLING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Walter C. Avrea, 1405 Whalers Way, Tempe, Ariz. 85283

Continuation of Ser. No. 768,494, Aug. 22, 1985, which is a continuation-in-part of Ser. No. 632,526, Jul. 19, 1984, abandoned, which is a continuation of Ser. No. 372,915, Apr. 29, 1982, Pat. No. 4,961,342. This application Aug. 8, 1986, Ser. No. 879,387
Int. Cl.[4] F01P *11/02*; F28D *15/00*
U.S. Cl. 165—1 **14 Claims**



9. In the cooling system of an internal combustion engine, which system includes:
a coolant jacket carried by said engine,
a radiator,
circulation means communicating between said jacket and said radiator,
liquid coolant normally carried within said system for circulation through said jacket and said radiator in response to said circulation means,
said coolant absorbing heat within said jacket and relinquishing said heat within said radiator,
improvements therein for continuous maintenance of said system and for removal of gaseous matter which may be present in said system, said improvements comprising:
first means establishing an alternate path of circulation for said coolant between a selected first location and a selected second location in said system;
first valve means being normally closed and opening in response to pressure with said system exceeding a predetermined maximum value for flow of coolant from said system into said alternate path;
means for maintaining a second pressure with said alternate path with said alternate path which is lessor than said maximum value and greater than ambient pressure; and
second means in series with said first means for separating gaseous matter from said coolant.

4,785,875

HEAT PIPE WORKING LIQUID DISTRIBUTION SYSTEM

Roelf L. Meijer; Robert P. Verhey, and Benjamin Ziph, all of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

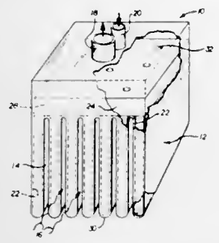
Filed Nov. 12, 1987, Ser. No. 119,731
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.25 **17 Claims**

1. A heat pipe system comprising:
an evaporator where a working fluid is evaporated and transmitted away from said evaporator and returned thereto as a condensed liquid, said evaporator having a plurality of hollow fins which communicate with a head space area of said evaporator,
a vapor pipe for transporting working fluid vapor from said evaporator,

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a liquid return pipe for returning condensed working fluid to said evaporator head space,

a distribution wick disposed within said head space in communication with capillary means lining said fins,



duct means within said head space transmitting liquid working fluid returned by said liquid return pipe to said distribution wick whereby said liquid is returned to said hollow fins.

4,785,876

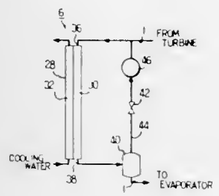
HEAT RECOVERY SYSTEM UTILIZING NON-AZETOTROPIC MEDIUM

Hiroyuki Sumitomo, and Akira Horiguchi, both of Osaka, Japan, assignors to Hisaka Works, Limited, Osaka, Japan

Division of Ser. No. 3,010, Jan. 13, 1987. This application Mar. 16, 1988, Ser. No. 168,793

Int. Cl.[4] F28B *1/02*

U.S. Cl. 165—111 **1 Claim**



1. A condenser apparatus of a non-azeotropic mixture comprising a condenser through which the non-azeotropic mixture being condensed and cooling water flow in a full counter-current, a vapor-liquid separator connected to non-azeotropic mixture outlet of the condenser, a reflux pipe extending from a vapor phase outlet of the vapor-liquid separator to a non-azeotropic mixture inlet of the condenser and a variable restrictor provided in the reflux pipe, wherein the amount of refluxing vapor is adjusted by said variable restrictor to maintain the optimum thermodynamic concentration of the non-azeotropic mixture in the condenser.

4,785,877

FLOW STREAMLINING DEVICE FOR TRANSFER LINE HEAT EXCHANGES

Carlton K. Shen-Tu, Pasadena, Calif., assignor to Santa Fe Braun Inc., Alhambra, Calif.

Filed May 16, 1986, Ser. No. 864,018

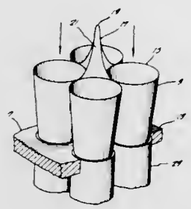
Int. Cl.[4] F28F *19/00*

U.S. Cl. 165—134.1 **15 Claims**

1. A flow streamlining device for an inlet end of an indirect shell-and-tube transfer line heat exchanger whose heat exchange tubes are contained within a tubesheet, comprising:

(1) flared end means, each flared end means having a smaller end and a larger end, the flared end means extending away from the tubesheet having their smaller ends in alignment with and mated to inlet ends of heat exchange tubes, and

(2) peaked gas guide means, proximate to the flared end means, having sides sloping upwardly from and enclosing



spaces between rims of the larger ends of the flared end means, wherein the peaked gas guide means comprise closed, concave gables having a height from about three to about twelve times an inside diameter of the heat exchange tubes.

4,785,878

DOUBLE-SPIRAL HEAT EXCHANGER

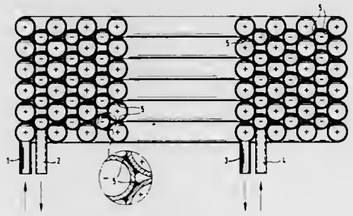
Markku V. Honkajärvi, and Tero T. Tiitola, both of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Oct. 8, 1986, Ser. No. 916,619

Claims priority, application Finland, Oct. 14, 1985, 853990

Int. Cl.[4] F28D *7/02*

U.S. Cl. 165—163 **3 Claims**



1. A heat exchanger comprising two distinct pipe systems each defining an interior space, the interior spaces of the two pipe systems being mutually isolated with respect to fluid communication, and each pipe system comprising a plurality of pipes that are circular in cross-section and are formed into respective flat coils each defining a general plane and having a central axis, the flat coils being arranged with their general planes substantially parallel to each other and with their central axes being substantially coincident and with at least one flat coil of each pipe system being disposed between and in intermeshing relationship with two flat coils of the other pipe system, whereby a thermally-conductive metallic contact is created between the two pipe systems.

4,785,879

PARALLEL WRAPPED TUBE HEAT EXCHANGER

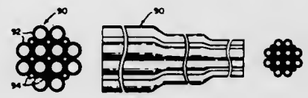
Ralph C. Longsworth, Allentown, and William A. Steyert, Center Valley, both of Pa., assignors to APD Cryogenics, Allentown, Pa.

Division of Ser. No. 818,832, Jan. 14, 1986, Pat. No. 4,697,635, and a continuation-in-part of Ser. No. 627,958, Jul. 5, 1984, Pat. No. 4,567,943. This application Jul. 16, 1987, Ser. No. 74,301

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[4] F28D *7/02*

U.S. Cl. 165—164 **7 Claims**



1. A heat exchanger of the type having a first confined path for conducting high pressure fluid from an inlet to a point wherein said high pressure fluid is expanded to a lower pressure and a second confined path for returning the expanded fluid from the point of expansion comprising in combination:

a plurality of low pressure tubes and a plurality of high pressure tubes, said low pressure tubes and said high pressure tubes are of reduced diameter in a stepwise fashion or progressively flattened from end to end and arranged alternately in a bundle array.

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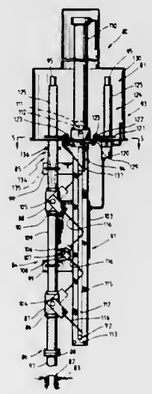
APPARATUS FOR DISPENSING CHEMICALS INTO OIL AND GAS WELLS

Robert Ashton, 630 Hassler Rd., Spring, Tex. 77379

Filed Jun. 12, 1987, Ser. No. 62,126

Int. Cl.[4] E21B *23/08, 33/068, 37/06*

U.S. Cl. 166—53 **16 Claims**



1. An apparatus for automatically dispensing chemicals into a well bore of a well comprising:

an elongate length of pipe, having upper and lower ends, in communication with the well bore;

at least two valves associated with the length of pipe, each of the valves having a handle associated therewith for opening and closing the valve, one of the at least two valves being normally in a closed position, and the other of the at least two valves being normally in an open position;

means for selectively actuating the handles of the at least two valves to alternately open and close the at least two valves, the selective actuation means including a valve operator member which is moveable in a direction substantially parallel with the longitudinal axis of the elongate length of pipe;

means for filling a portion of the elongate length of pipe with the chemicals, the filling means including at least one container of the chemicals; and

means for actuating the filling means, the actuating means for the filling means being operable by the valve operator member; whereby movement of the valve operator member in a direction substantially parallel with the longitudinal axis of the elongate length of pipe, in turn, closes one of the at least two valves to isolate a portion of the length of pipe from the well bore, opens the other of the at least two valves to place the portion of the length of pipe in communication with the filling means, and engages the actuating means for the filling means to fill the portion of the pipe with the chemicals; and further movement of valve operator member returns the at least two valves to their normal closed and open positions whereby the portion of the length of pipe is in communication with the well bore and the chemicals fall into the well bore.

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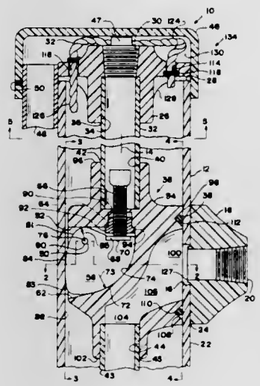
PLASTIC WELL WITH PLASTIC WELL ADAPTER

Cecil H. Paulus, Rte. 2, Box 495, Leesburg, Ind. 46538

Filed Apr. 20, 1987, Ser. No. 39,942

Int. Cl.[4] E21B *33/03*

U.S. Cl. 166—88 **25 Claims**



1. An adapter plub assembly (**38**) for making fluid communication between a well pipe (**43**) and a hole (**16**) that is disposed transversely through a well casing (**12**) having a longitudinally-disposed casing axis (**14**), which adapter plug assembly comprises:

a plug body (**54**) having a cylindrically-shaped surface (**98**) that is disposed coaxially with said casing axis, having a top (**96**), having a bottom (**102**) with an inlet port (**104**) therein, and having an outlet port (**100**) that communicates with said inlet port and that opens through said cylindrically-shaped surface;

sealing means (**56**) being disposed circumferentially around said outlet port, for providing a fluid seal between said plug body and said casing that circumscribes said outlet port and said hole in said casing;

locking means, comprising a recess (**62**) in said plug body, comprising a locking cam (**58**) that is disposed in said recess, and comprising an arcuately-shaped surface (**72** or **74**), guiding said locking cam in an arcuately-shaped path around a pivot axis (**76**), for engaging said casing distal from said outlet port, and for forcing said plug body

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toward said hole in said casing, whereby said sealing means is forced into sealing engagement with said casing;

retaining means, comprising a retaining pin (60) that is disposed coaxially with said pivot axis, for retaining said locking cam in said recess, and for permitting said locking cam to slide around said arcuately-shaped path while generally rotating around said pivot axis; and

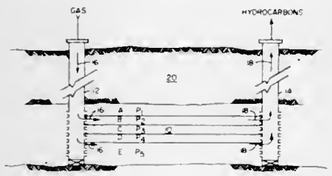
adjusting means (66) for forcing said locking cam to slide around said arcuately shaped path.

4,785,882

ENHANCED HYDROCARBON RECOVERY

Eve S. Sprunt, Farmers Branch, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 24, 1987, Ser. No. 66,803
Int. Cl.[4] E21B *43/16, 49/00*
U.S. Cl. 166—252 **6 Claims**



1. A method for enhanced hydrocarbon recovery from a subterranean reservoir, comprising the steps of:

(a) determining the in-situ crushing pressure of the subterranean hydrocarbon reservoir to be produced,

(b) producing hydrocarbons from the reservoir during a first production period while injecting gas into said reservoir to maintain reservoir fluid pressure so that the effective pressure on the reservoir from the pressure of the overling formation and the reservoir fluid is less than the determined reservoir crushing pressure,

(c) lowering reservoir fluid pressure by reducing gas injection following said first production period to allow the effective pressure on the reservoir to exceed the reservoir crushing pressure such that said reservoir crushes with a resulting lowering of reservoir permeability, and

(d) producing hydrocarbons from the reservoir during a second production period following the lowering of reservoir permeability.

4,785,883

POLYSILICATE ESTERS FOR OIL RESERVOIR PERMEABILITY CONTROL

Dennis H. Hoskin, Lawrenceville, N.J., and Louis D. Rollmann, Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 697,098, Feb. 1, 1985, Pat. No. 4,660,640. This application Dec. 10, 1986, Ser. No. 940,305
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] E21B *33/138, 43/24*
U.S. Cl. 166—270 **19 Claims**

1. A method of controlling the permeability of a subterranean, oil-bearing formation comprising the following steps:

(i) acidifying an aqueous solution of an alkali metal silicate;

(ii) reacting the product of step (i) with an organic, hydroxyl group-containing compound;

(iii) injecting the polysilicate product of step (ii) into the high permeability region or regions of the formation to decrease the permeability thereof;

(iv) injecting into the formation a flooding liquid or subjecting the formation to miscible displacement or thermal oil recovery processes; and

(v) recovering the oil from the formation.

4,785,884

CONSOLIDATION OF PARTIALLY CURED RESIN COATED PARTICULATE MATERIAL

David R. Armbruster, Forest Park, Ill., assignor to Acme Resin Corporation, Westchester, Ill.

Continuation-in-part of Ser. No. 866,440, May 23, 1986, abandoned. This application Jan. 28, 1988, Ser. No. 149,569
Int. Cl.[4] E21B *43/04, 43/267*
U.S. Cl. 166—280 **10 Claims**

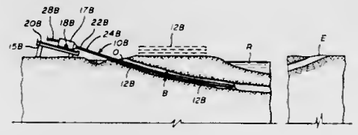
1. In a method for propping a fracture or controlling sand in a subterranean formation comprising placing in said fracture particulate material coated with a solid curable resin and then curing said curable resin, wherein the improvement comprises using particulate material coated with a thermosetting resin capable of curing with an acid catalyst below about 130° F. and then curing said thermosetting resin by contacting it with an acidic catalyst dissolved in a solvent system capable of softening the resin.

4,785,885

METHOD AND APPARATUS FOR CEMENTING A PRODUCTION CONDUIT WITHIN AN UNDERGROUND ARCUATE BORE

Martin D. Cherrington, 8600 Emperor Dr., Fair Oaks, Calif. 95628, and William D. Cherrington, 833 Keysport Dr., Citrus Heights, Calif. 95610

Filed May 13, 1987, Ser. No. 49,662
Int. Cl.[4] E21B *7/04, 7/08, 33/14*
U.S. Cl. 166—285 **15 Claims**



6. A method of boring an arcuate underground pilot bore hole along a predetermined path between two spaced surface locations in a single boring operating of a single constant diameter utilizing a drill bit on a leading drill pipe section of a drill string; said method comprising the steps of:

advancing the drill string having the drill bit thereon from a surface entrance location to a surface exit location;

discharging drilling fluid from said leading drill pipe section during the boring operation;

removing the drill bit from the drill string at the surface exit location;

attaching a reamer to the drill string at the exit location;

pulling the drill string and reamer back through the pilot bore hole from the exit opening to the entrance opening in an opposite direction of travel while rotating said reamer with the reamer forming an enlarged opening;

pushing the reamer back through the reamed hole from said entrance opening to said exit opening;

connecting the production conduit to the reamer at said exit opening;

then pulling the reamer and production conduit back through the reamed opening from said exit opening to said entrance opening for installing the production conduit within the enlarged reamed hole; and

discharging cement from said reamer into the annulus between the production pipe and the adjacent surface of the enlarged reamed hole simultaneously with the pulling of the production conduit within the reamed opening.

9. In combination with a drill string having a bit on its leading end for boring an arcuate underground bore hole along a predetermined inverted arcuate path between two spaced surface locations in one direction of travel from an entrance opening to an exit opening, and means to supply drilling fluid

through the drill string for discharge at its leading end into the bore hole;

means adjacent said entrance opening for moving said drill pipe string through said bore hole between said entrance opening and said exit opening after the boring of the bore hole and removal of said bit; and

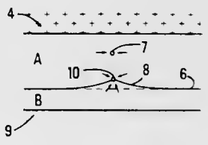
means separate from said means to supply drilling fluid and adjacent said entrance opening, for supplying cement to said drill string for discharge from the leading end of the drill string into the annulus adjacent the leading end of the drill string simultaneously with the movement of the drill string along the bore hole between said entrance opening and said exit opening for setting of the cement in the annulus about a conduit therein.

4,785,886

METHOD OF PRODUCING A FLUID CONTAINED IN A GEOLOGICAL FORMATION COMPRISING SEVERAL FLUIDS

Gérard Renard, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 15, 1984, Ser. No. 671,919
Claims priority, application France, Nov. 18, 1983, 83 18353
Int. Cl.[4] E21B *43/12*
U.S. Cl. 166—370 **14 Claims**



1. A method for producing at least a first fluid, or desired fluid contained in a geological formation, this formation further comprising at least a second fluid or undesired fluid which risks hindering the production of the desired fluid, this latter being produced by means of at least one deflected or substantially horizontal drain, which method consists in disposing a second deflected or substantially horizontal drain in said geological formation, situating the second drain between the first drain and the undesired fluid for drawing off part at least of the undesired fluid and allowing the first drain to produce said desired fluid at least partially.

4,785,887

ADJUSTABLE FIRE SPRINKLER HEAD SUPPORT SYSTEM

Peter Miller, Arlington, Va., assignor to Lifesaving Systems, Inc., Alexandria, Va.

Filed Mar. 3, 1987, Ser. No. 21,336
Int. Cl.[4] A62C *37/08*
U.S. Cl. 169—37 **11 Claims**

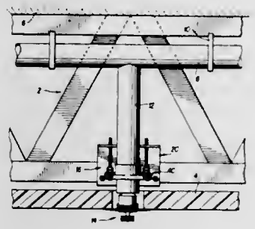
1. An apparatus for three dimensionally adjustably supporting a member, comprising:

a first bracket having means for permitting free passage of said member therethrough and three threaded aperture means evenly spaced around said free passage means, wherein said first bracket comprises an angle-shaped member and wherein said means for permitting free passage comprise a first cut-out in one leg of said angle shape, said first cut-out defining a pair of opposing first ears on opposite sides of said first cut-out, each of said first ears having one of said threaded aperture means therein;

a second bracket having means for supporting said member and three holes evenly spaced around said supporting means;

three threaded bolts, each said bolt loosely passing through one of said holes and being threaded in one of said threaded aperture means; and

stop means mounted on each of said three bolts between said first and second brackets,



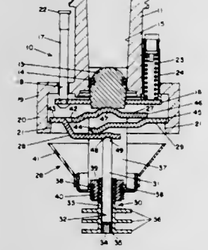
whereby said second bracket may pivot about two orthogonal axes and move along a third orthogonal axis relative to said first bracket within limits established by said stop means.

4,785,888

DECORATIVE QUICK RESPONSE SPRINKLER

Leonard Blum, Montvale, N.J., and Falco Delmerico, Dobbs Ferry, N.Y., assignors to The Reliable Automatic Sprinkler Co., Inc., Mount Vernon, N.Y.

Filed Mar. 2, 1987, Ser. No. 20,768
Int. Cl.[4] A62C *37/08*
U.S. Cl. 169—39 **8 Claims**

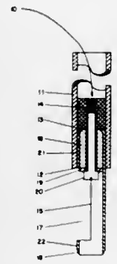


1. A quick response sprinkler comprising a valve housing a valve bore having an axis and an open end adapted to supply fire extinguishing liquid, a valve sealing element adapted to seal the open end of the bore in the valve housing, a deflector supporting the valve sealing element and movable between a closed position in which the valve sealing element seals the bore of the valve housing and an open position in which the fire extinguishing liquid emerging from the valve bore is distributed over a large area by the deflector, projection means formed in the valve housing extending transversely to the axis of the valve bore, and separable valve-retaining means normally engaging the projection means and retaining the valve sealing means in position to seal the valve bore and responsive to an elevated temperature condition to be released from the projection means and separated completely from the valve housing to permit the valve sealing means to open the valve, the valve-retaining means comprising thermally responsive means positioned substantially coaxially with the valve bore and spaced form the deflector and responsive to an elevated temperature condition to move away from the deflector, first lever means engaging the thermally responsive means, second lever means laterally spaced from the first lever means engag-

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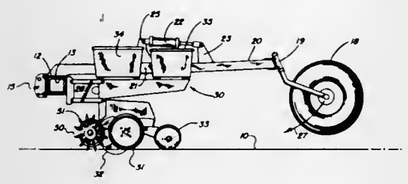
ing the valve sealing means and third lever means engaging the projection means and interposed between the first and second lever means to maintain them in spaced-apart relation and one of the first and second lever means also engaging the projection means when the thermally responsive means is held in spaced-apart relation to the valve sealing means and being releasable from the projection means when the thermally responsive means moves away from the valve sealing means.

4,785,889
TURF CORING TOOL
Marvin L. Killion, P.O. Box 180, Gretna, Nebr. 68028
Filed Sep. 11, 1987, Ser. No. 95,350
Int. Cl.[4] A01B *45/02;* **F16B** *2/04*
U.S. Cl. 172—22 **3 Claims**



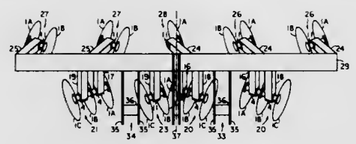
1. A generally tubular turf coring tool for attachment to a force imparting member of a turf aerator, comprising:
a generally tubular body portion,
an intermediate cut-out wall section, a tine securing and force imparting end portion having a longitudinal slit in the tubular wall extending from the end to the cut-out wall section, and an annular turf cutting tip portion.

4,785,890
GROUND-DRIVEN ROTARY ROW CLEANER
Howard D. Martin, Elkton, Ky., assignor to Deere & Company, Moline, Ill.
Continuation-in-part of Ser. No. 906,612, Sep. 10, 1986, which is a continuation of Ser. No. 705,144, Feb. 27, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 40,280
Int. Cl.[4] A01B *5/00, 49/04;* **A01C** *5/00*
U.S. Cl. 172—29 **16 Claims**



1. Apparatus, adapted for propulsion by a tractor along a predetermined path of travel, for selectively cleaning organic mulch from the surface of minimally tilled or untilled soil comprising:
an earth engaging mulch cutting device,
a pair of pointedly toothed wheels in front of said cutting device operating in lateral opposition to one another, said toothed wheels being journaled for rotation about respective axes and positioned with the centers of said toothed wheels above said surface on opposite sides of and, angled relative to an imaginary vertical plane passing through the path of travel of said cutting device and the teeth thereof in shallow contact with the ground ahead of said cutting device,
wherein the profiles of teeth in contact with the ground present no major soil disturbing surfaces,
whereby the forward motion of said apparatus rotatably drives said toothed wheels about their respective axes of rotation, the teeth of said wheels simultaneously pulling surface organic mulch in laterally opposite directions away from the path of the advancing cutting device.

4,785,891
TILLING RIDGER
Ronald D. Noland, Rte. 1, Box 321, Advance, Mo. 63730
Filed Oct. 8, 1986, Ser. No. 916,951
Int. Cl.[4] A01B *13/02, 39/14*
U.S. Cl. 172—579 **8 Claims**



1. An improved disc ridger of the type having a leading rank and a trailing rank of ridge-forming disc gangs for ridging a set of rows, in which each gang has a concave ridging disc and a concave furrowing disc, which are mounted on a gang axle being held in a rotary mount attached to one end of a gang support arm that is attached at the other end to a transverse frame having means for tractor attachment; and one of the leading-rank, ridge-forming disc gangs is positioned on one side of each row of the set with one of the trailing-rank, ridge-forming disc gangs positioned on the other side; and the concave face of each disc is set at an effective forward cutting angle while facing generally toward the center of the row it is positioned on whereby soil is cut and rolled toward the center of each row of the set so as to build a set of ridges as the ridger is drawn foward by a tractor, wherein the improvement comprises;
(a) a concave ridge-tilling disc for each leading-rank, ridge-forming disc gang;
(b) a common gang axle for each leading-rank, ridge-forming disc gang, which has a greater length then its gang axle and is installed to replace its gang axle, on which the ridge-tilling disc is mounted over the central part of the row and adjacent to the ridging disc of the leading-rank, ridge-forming disc gang but with the concave side facing away from the adjacent ridging disc whereby the ridge-tilling disc is mounted in position and faced at an effective forward cutting angle to cut a furrow slice from the central part of the row and roll it away from the adjacent ridging disc; the combination of the ridge-tilling disc with the leading-rank, ridge-forming disc gang on a common axle being called a leading-rank, ridge-forming-tilling disc gang;
(c) an arrangement of the leading-rank, ridge-forming-tilling disc gangs, in which one gang is positioned over the inner half of each row of the set, except the row adjacent to a parting line on a first side, with the concave side of each of its discs faced generally away from the parting line;
(d) a leading-rank, ridge-forming-tilling, partial disc gang having a concave ridging disc and a concave ridge-tilling disc, which is mounted in the leading rank with its ridge-tilling disc located over the central part of the row that is adjacent to the parting line on the first side; and its ridging disc is located between its ridge-tilling disc and the parting line; and both of its discs are set at an effective forward cutting angle while facing generally outward from the parting line;

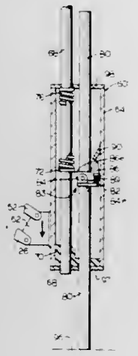
(e) a parting-furrow-complemental disc gang having a concave furrowing disc, which is mounted in the trailing rank over the parting line with the concave face of its furrowing disc set at an effective forward cutting angle and faced generally outward from the parting line in the same direction as the leading-rank, ridge-forming-tilling, partial disc gang it complements whereby the parting-furrow-complemental disc gang in combination with the leading-rank, ridge-forming-tilling partial disc gang and the leading-rank, ridge-forming-tilling disc gangs till and move soil outward from the inner half of each row to form tilled inner slopes for a set of ridges; and
(f) an arrangement of the trailing-rank, ridge-forming disc gangs, in which one gang is positioned over the outer portion of each row of the set with the concave side of each of its discs facing generally in toward the parting line in order to till and move soil inward from the outer half of each row to form tilled outer slopes for the set of ridges.

4,785,892
PILE DRIVER, PILE DRAWER AND/OR DRILLING MACHINE
Lam M. Luen, 5000 Marine Parade Rod, Laguna Park, Blk., G04-27, Singapore, Singapore 1544
Continuation of Ser. No. 796,365, Nov. 8, 1985, abandoned. This application Feb. 29, 1988, Ser. No. 165,366
Claims priority, application United Kingdom, Nov. 8, 1984, 8428285; Sep. 25, 1985, 8523644
Int. Cl.[4] E21B *7/02*
U.S. Cl. 173—28 **28 Claims**

1. A machine comprising a chassis carrying a turntable rotatably mounted for rotation about a vertical axis on said chassis, an elongated lifting and/or tool carrying means and support means for the lifting and/or tool carrying means, wherein the support means is mounted to a surface of the turntable so as to be rotatable with said turntable and rotatable relative to the turntable about first and second non-parallel axes irrespective of the orientation of the lifting and/or tool carrying means relative to the said surface, the orientation of the first said axes of rotation being dependent on the rotation of the support means about the second of the axes, wherein the lifting and/or tool carrying means is rotatable with respect to the support means.

4,785,893
BOOM OPERATED DEMOLITION APPARATUS AND METHOD OF BREAKING COMPOSITE MATERIAL
David Kistner, Dayton, Ohio, assignor to Caterpillar Inc., Peoria, Ill.
PCT No. PCT/US86/02760, § 371 Date Dec. 24, 1986, § 102(e) Date Dec. 24, 1986, PCT Pub. No. WO87/05064, PCT Pub. Date Aug. 27, 1987
Continuation-in-part of Ser. No. 831,481, Feb. 20, 1986, abandoned. This PCT application Dec. 24, 1986, Ser. No. 109,361
Int. Cl.[4] B25D *17/00*
U.S. Cl. 173—119 **13 Claims**

1. Demolition apparatus adapted to be carried by a movable boom-like member which moves the demolition apparatus toward and away from a surface to be demolished comprising:
support structure adapted to be attached to a boom-like member;
an axially movable power plunger supported by the support structure for movement with respect to the support structure, a resilient member, means joining the resilient member to the support structure and to the power plunger whereby the resilient member urges the power plunger in a direction from the support structure;
an actuator plunger supported by the support structure adjacent the power plunger and substantially parallel thereto, the actuator plunger and the support structure being relatively movable, a latch attached to the actuator plunger and engageable with a portion of the power plunger to maintain the position of the power plunger with respect to the position of the actuator plunger, the actuator plunger having an extending portion extending from the support structure;
an abutment member attached to the support structure and engageable with the latch with movement of the support structure; and
whereby the support structure is movable toward the surface to be demolished as the extending portion of the actuator plunger engages the surface to be demolished,



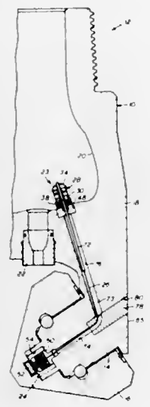
additional movement of the support structure toward the surface forcing relative movement between the support structure and the plungers, such movement being against the forces of the resilient member, additional movement of the support structure toward the surface forcing the abutment member against the latch, whereby the latch is released from engagement with said portion of the power plunger, and the resilient member forces rapid movement of the power plunger which strikes the surface for demolition of the surface.

4,785,894
APPARATUS FOR DETECTING DRILL BIT WEAR
Albert P. Davis, Jr., Houston, and Joseph W. Stolle, Wharton, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Mar. 10, 1988, Ser. No. 166,592
Int. Cl.[4] E21B *12/02*
U.S. Cl. 175—39 **21 Claims**

1. A rotary cone drill bit, comprising:
a main bit body, said main bit body defining a central chamber;
at least one port in said main bit body establishing a fluid pathway between said central chamber and the exterior of said main bit body;
at least one spindle secured to said main bit body;
a rotatable cone on said spindle;
a tensioned linkage extending through said spindle and said main bit body, said tensioned linkage having first and second ends;
a tensioned linkage termination element secured to said tensioned linkage first end, said termination element being supported by said spindle;
means for twisting said termination element in response to said cone rotating with a predetermined degree of eccentricity, said termination element and tensioned linkage being adapted to part from one another in response to twisting of said termination element; and
means for altering the fluid flow resistance of said at least one port in response to a decrease in the tension of said tensioned linkage.

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16. A drill bit, comprising:
a main bit body defining a central chamber;
at least one port in said main bit body establishing a fluid pathway between said central chamber and the exterior of said main bit body;
a sensor connected to a selected location on said drill bit to detect wear of said drill bit proximate said selected location;
a blocking element within said main bit body, said blocking element being adapted to at least partially block fluid flow

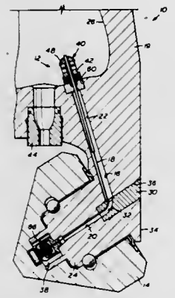


through said port in response to said blocking element being released within said main bit body, said blocking element defining a slot extending therethrough;
means for releasably retaining said blocking element at an initial position within said bit body, said retaining means including a retainer; and
a tensioned linkage connected between said wear sensor and said retainer element, said tensioned linkage extending through the slot in said blocking element, whereby on relieving the tension on said tensioned linkage, said blocking element will fall away from said tensioned linkage.

4,785,895
DRILL BIT WITH WEAR INDICATING FEATURE
Albert P. Davis, Jr., Houston, and Joseph W. Stolle, Wharton, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Mar. 10, 1988, Ser. No. 166,593
Int. Cl.[4] E21B *12/02*
U.S. Cl. 175—39 **10 Claims**

1. A drill bit, comprising:
a main bit body defining a central chamber;
at least one port in said main bit body, said port establishing a fluid pathway between said central chamber and the exterior of said main bit body;
at least one spindle extending from said main bit body;
a cutting element rotatably secured on said spindle;
a sensor secured to said spindle to detect wear of the interface between said spindle and cutting element;
means for altering the fluid flow resistance of said port in response to said sensor detecting a predetermined degree of wear;
a first passageway segment extending through said spindle;
a second passageway segment extending through said main bit body from a position proximate said central chamber to a position proximate said first passageway segment;
a guide element inserted into said main bit body, said guide element defining a passageway connecting said first and second passageway segments to one another; and
a tensioned linkage element extending through said first passageway segment, said guide element and said second passageway segment, said tensioned linkage having a first end secured to said sensor and a second end secured to said flow resistance altering means.

9. A method for installing a bearing wear indicator in a rotary-cone drill bit, comprising the steps of:
drilling a first passageway segment through a spindle of said bit;
drilling a second passageway segment extending from a central chamber of said bit to a position proximate said first passageway segment;
drilling a bore in said bit, said bore commencing at a shirt-tail portion of said bit and intersecting both said first and second passageway segments;



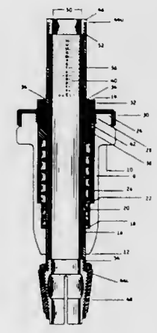
inserting a guide element in said bore, said guide element defining a curved guide passageway having a first end aligned with said first passageway segment and a second end aligned with said second passageway segment;
extending a wire through said first passageway segment, said guide element passageway and said second passageway segment;
connecting a bearing wear sensor to a first end of said wire proximate the entrance to said first passageway segment;
connecting a second end of said wire to means for altering the drilling fluid flow resistance of said bit in response to a change in the tension of the wire; and
tensioning said wire.

4,785,896
LOAD SENSING STRUCTURE FOR WEIGHING APPARATUS
Walter E. Jacobson, Meriden, Conn., assignor to Revere Corporation of America, Wallingford, Conn.
Filed Oct. 13, 1987, Ser. No. 107,972
Int. Cl.[4] G01G *3/14, 3/08;* **G01L** *1/22*
U.S. Cl. 177—211 **18 Claims**



1. A load sensing structure including a platform and a planar deck provided in spaced parallel relationship to the platform, at least one strain sensitive flexure member having oppositely facing attachment portions and an intermediate portion therebetween, one said attachment portion fixedly connected to said platform and capable of absorbing forces having components parallel said platform, an oppositely facing attachment portion fixedly connected to said deck and capable of absorbing forces having components parallel said deck, said intermediate portion having a generally U-shape with generally parallel flexure legs connected in cantilever fashion to said attachment portions respectively, said legs extending away from said attachment portions in generally parallel relationship to one another, said intermediate portion having a generally rigid base, said base connecting the ends of said cantilevered flexure legs to one another so that said legs are also cantilever mounted to one another by said base.

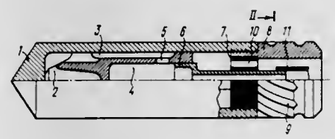
4,785,897
PORTABLE SCALE
Albert O. Keinert, Jr., 409 Morningside Dr., Lakeland, Fla. 33803
Filed Sep. 28, 1987, Ser. No. 101,849
Int. Cl.[4] G01G *3/02, 19/56*
U.S. Cl. 177—232 **20 Claims**





1. A portable scale for mounting on and cooperating with an object to be weighed, comprising:
a tubular outer housing having a central bore with a shoulder annularly positioned therein;
a tubular inner housing having a central bore, said inner housing being coaxially received and confined within said bore of said outer housing for telescoping axial movement with respect thereto and having an annular collar on its outer periphery;
means located between said collar and said shoulder for biasing said collar away from said shoulder;
means for limiting the extent of axial movement of said collar in a direction away from said shoulder;
means for releasably connecting said inner housing to an object received within said bore of said inner housing; and
means for indicating the extent of axial movement of said inner housing relative to said outer housing;
whereby when said inner housing is secured to the object and said outer housing is restrained, the weight of the object can be determined from the axial movement shown on said indicating means.

4,785,898
DEVICE FOR MAKING HOLES IN SOIL
Alexandr D. Kostylev; Alexei D. Terskov; Konstantin B. Skachkov, and Vladimir D. Plavskikh, all of Novosibirsk, U.S.S.R., assignors to Institut Gornogo Dela SO AN SSSR, Novosibirsk, U.S.S.R.
PCT No. PCT/SU86/00043, § 371 Date Dec. 11, 1987, § 102(e) Date Dec. 11, 1987, PCT Pub. No. WO87/06638, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 30, 1986, Ser. No. 159,970
Int. Cl.[4] E21B *11/02, 7/26*
U.S. Cl. 175—19 **4 Claims**



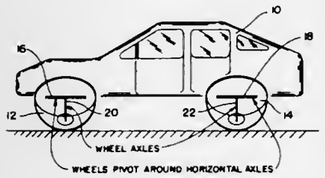
1. A device for making holes in soil, comprising a body (1) which internally accommodates a percussion member (2) adapted for reciprocating motion and forms in the body a front chamber (3) communicated through ports (5) of the percussion member (2) with a rear chamber (4) formed by a space of the percussion member (2) and an air distributing sleeve (6) associated through an elastic element (7) with a threaded bushing (8) mounted in a tail portion of the body (1), characterized in that the threaded bushing (8) external surface has at least two grooves (9) arranged diametrically oppositely to each other and at an angle to the axis of the device, the direction of inclination of the grooves being coincident with the hand of thread of the threaded bushing (8).

4,785,899
VEHICLE WITH SPHERICAL-SHAPED WHEELS FOR STEERING AND SPEED CONTROL PURPOSES
Emil H. von Winckelmann, 3108 Blossom La., Redondo Beach, Calif. 90278
Filed May 4, 1987, Ser. No. 45,393
Int. Cl.[4] B62D *57/00*
U.S. Cl. 180—7.1 **2 Claims**

1. A vehicle comprising: a frame; first and second drive shafts rotatably mounted on said frame on opposite sides thereof and extending along said frame parallel to one another; two front wheels and two rear wheels each having a spherical configuration; four axles coupling respective ones of said wheels to said drive shafts and angularly movable about the respective axes of rotation of said drive shafts; means coupling said drive shafts to respective ones of said wheels to impart rotational movement to said wheels about the axes of respective ones of said axles; a drive motor coupled to said drive shafts to impart rotational motion to said drive shafts about the respective longitudinal axes thereof; and a steering and speed control unit coupled to said axles to move said axles on one side of said frame about the axis of rotation of one of said drive

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shafts in unison to selected angular positions, and independently to move the axles of the other side of said frame about



the longitudinal axis of the other side drive shafts in unison to selected angular positions.

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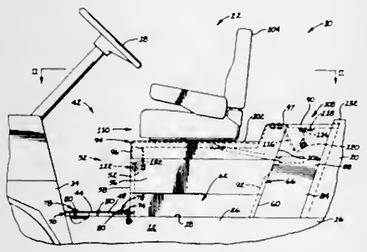
VEHICLE COMPARTMENT CLOSURE ARRANGEMENT

Daniel J. Nasky, Concord, Ohio, assignor to Caterpillar Industrial Inc., Mentor, Ohio

Filed Dec. 17, 1987, Ser. No. 134,420

Int. Cl.[4] B62D *33/06*

U.S. Cl. 180—89.14 **15 Claims**



1. A work vehicle having a frame, said frame having first and second spaced apart side portions defining a compartment therebetween, comprising:

a floor member releasably connected to said frame and covering a first portion of the compartment;

a cowl member pivotally connected to said floor member and pivotally movable in a first direction from a first position, at which said cowl member is supportably engaged with said frame and defines boundaries of a second portion of said compartment, to a second position, at which said cowl member is supported on said floor member and spaced from being supportably engaged with said frame, said floor member being pivotally movable relative to said cowl member between a first position, at which said floor member covers the first portion of the compartment, and a second position, at which the floor member is spaced from covering the first portion of the compartment, said floor member being pivotally movable between said first and second positions subsequent to said floor member being released from connection with said frame;

a supporting member connected to the frame; and

a lid member pivotally connected to said supporting member and pivotally movable in a second direction opposite said first direction, from a first position, at which said lid member covers said second portion of said compartment, to a second position, at which said lid member is spaced from covering the second portion of said compartment.

4,785,901

RACK AND PINION STEERING GEAR WITH ELECTRIC POWER ASSISTANCE

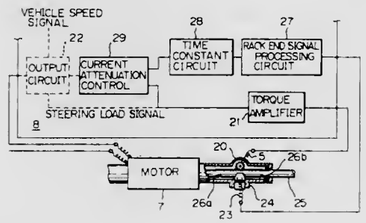
Naoyuki Maeda, Aichi, Japan, assignor to Tokai TRW & Co. Ltd., Aichi, Japan

Filed Jul. 8, 1987, Ser. No. 71,094

Claims priority, application Japan, Jul. 17, 1986, 61-109996[U]

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—142 **2 Claims**



2. In a rack and pinion steering gear having an electric motor for power assistance:

a rack end proximity sensor to detect respective end portions of the rack when the rack approaches an end of its movement during a steering operation; and

an electronic control circuit for controlling a motor driving current which is applied to the motor for effecting power assistance in response to a steering load characteristic and/or a vehicle speed characteristic, said electronic control circuit comprising:

a current attenuation control circuit for attenuating the motor driving current to a predetermined level when the rack approaches an end of its movement during a steering operation;

a rack end signal processing circuit activated in response to said proximity end sensor detecting a respective end portion of the rack; and

a time constant circuit for applying a control signal to said current attenuation control circuit in response to said rack end signal processing circuit being activated to cause said current attenuation to occur over a predetermined amount of time.

4,785,902

SUCTION TYPE TRAVELING CARRIAGE

Nobutoshi Ochiai, Kashiwa, Japan, assignor to Ishikawajima Kensa Keisoku Kabushiki Kaisha, Tokyo, Japan

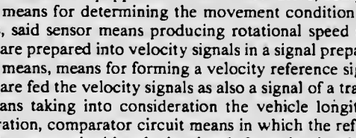
Filed Oct. 9, 1987, Ser. No. 107,567

Claims priority, application Japan, Feb. 6, 1987, 62-25664

Int. Cl.[4] B62D *57/02*

U.S. Cl. 180—164 **13 Claims**

1. A suction type traveling carriage comprising suction cup means including a disc-shaped, rigid suction-cup main body having a circumferential projection axially extending from a whole outer periphery of one major surface of said suction-cup main body, a flexible member fitted over said suction-cup main body such that a leading end of said flexible member extends beyond said circumferential projection, and a shaft inclined at a predetermined angle by which said suction-cup main body is rotatably supported such that a portion of said circumferential projection contacts a wall or ceiling and a whole leading end of said flexible member intimately contacts said wall or ceiling,



a carriage body disposed in parallel with said wall or ceiling, said shaft being securely joined to said carriage body, and said suction-cup main body being rotatably supported by said shaft through bearing means, and

a vacuum source communicated to a space defined by said suction-cup main body and said circumferential projection.

4,785,903

ARRANGEMENT FOR THE PROPULSION REGULATION OF MOTOR VEHICLES

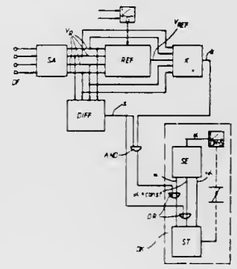
Heinz Leiber, Oberriexingen; Hans Ohnemueller, Reutlingen, and Klaus Kastner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 136,955

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644138

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **18 Claims**



1. An arrangement for the propulsion regulation in the sense of reducing undesired slippages of the wheels to be regulated in motor vehicles equipped with four-wheel drive, comprising sensor means for determining the movement condition of the wheels, said sensor means producing rotational speed signals which are prepared into velocity signals in a signal preparation circuit means, means for forming a velocity reference signal to which are fed the velocity signals as also a signal of a transmitter means taking into consideration the vehicle longitudinal acceleration, comparator circuit means in which the reference signal is compared with velocity signals from the signal preparation circuit means and which produces an output signal when a velocity signal is greater than the reference signal, the output of the comparator circuit means being operatively connected with an AND-element which, in its turn, is connected with its output to an adjusting means for controlling the driving torque of the vehicle engine, all vehicle velocity signals prepared from the rotational speed signals being fed to the reference-signal-forming means and to the comparator circuit means as also to a differentiating element, the reference-signal-forming means initially forming the reference signal having a predetermined slope, from the velocity signal corresponding to the mimimum wheel velocity, the comparator circuit means producing an output signal when a velocity signal exceeds the reference signal by a predetermined difference which initiates at the adjusting means by way of the AND-element a first regulating cycle for the reduction of the driving torque of the vehicle engine, a blocking signal being present in the output of the differentiating element when a negative acceleration value derived from the velocity signal exceeds a predetermined negative acceleration value, said blocking signal being fed, on the one hand, to an inverting input of the AND-element whereupon the output thereof blocks, and on the other, effects at the adjusting means the keeping constant of the driving torque during the regulating cycle phase of the negative acceleration, upon the disappearance of the blocking signal, when the negative acceleration value falls below the predetermined negative acceleration value, the adjusting means being operable again to increase the driving torque in the direction toward a value specified by a drive pedal, and the reference signal-forming means being operable during the regulating cycle phase of the negative acceleration when the velocity signal drops below the reference signal, to correct the reference signal to the velocity signal corresponding to a smaller minimum wheel velocity with a new slope for the following regulating cycle.

4,785,904

INSTALLATION FOR THE PROPULSION REGULATION IN MOTOR VEHICLES

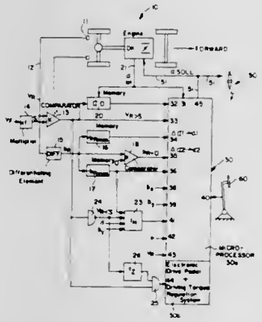
Heinz Leiber, Oberriexingen; Hans Ohnemueller, Reutlingen, and Klaus Kastner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 136,931

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644136

Int. Cl.[4] B60K *31/00*

U.S. Cl. 180—197 **10 Claims**



1. An installation for the propulsion regulation in motor vehicles in the sense of a prevention of the undesired slippage of driven vehicle wheels, comprising regulating circuit means responding to the movement condition of at least one driven wheel which is operable to effect a reduction of the output torque of a driving aggregate in case of a slippage tendency, measuring means detecting the vehicle velocity and the wheel circumferential velocities of the driven wheels and producing output signals, and comparing means responding at least to one threshold value coordinated to the vehicle velocity, said regulating means including means for storing the instantaneous value of a magnitude determining the output torque, means for

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reducing the magnitude substantially to its minimum value when a value coordinated to the velocity of a driven wheel exceeds the threshold value coordinated to the vehicle velocity, and further means for changing said magnitude to a value which is smaller than that of the instantaneous value stored in a respective regulating cycle by a value dependent on the stored instantaneous value, on the engine rotational speed, on the ratio of the engine rotational speed to the rotational speed of the driven wheel and on the maximum value of the wheel acceleration which has occurred since exceeding the threshold value coordinated to the vehicle velocity, when the acceleration of the driven wheel passes over into a deceleration, and for changing said magnitude to another value which is larger than the value previously kept constant by a value dependent on the stored instantaneous value, on the engine rotational speed, on the ratio of the engine rotational speed to the rotational speed of the driven wheel and on the maximum value of the wheel deceleration that has occurred since the beginning of the wheel deceleration, when the value coordinated to the velocity of the driven wheel has dropped below the threshold value coordinated to the vehicle velocity.

4,785,905

SUSPENSION DEVICE FOR A MOTORCYCLE FRONT WHEEL

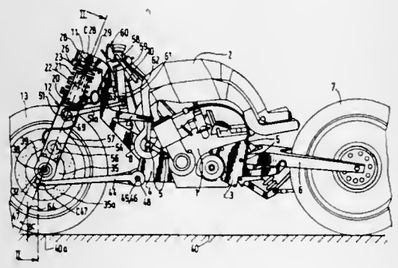
Daniel Trema, Bezons, France, assignor to Elf France, Courbevoie, France

Filed Dec. 22, 1986, Ser. No. 945,039

Claims priority, application France, Dec. 27, 1985, 85 19306; Feb. 21, 1986, 86 02394

Int. Cl.⁴ B62K *25/04, 21/02, 21/10*

U.S. Cl. 180—219 **8 Claims**



1. A front suspension device for a front wheel of a motorcycle, said front wheel mounted on an axle about a rotational axis and said motorcycle having a longitudinal plane and a chassis with a front peak, said front suspension device comprising:

support arm means for laterally supporting the front wheel and for rotationally steering the front wheel about a steering axis substantially orthogonal to the rotational axis of the front wheel, said steering axis being located substantially centrally in the longitudinal plane of the motorcycle, said support arm means including an upper portion and a C-shaped bent lower portion encasing a portion of the front wheel;

a telescopic block secured between the upper portion of said support arm means and the front peak, said telescopic block including a suspension spring, a shock absorber and a plate at the upper end of the shock absorber, the suspension spring abutting the plate and the shock absorber having a telescopic cylinder connected with the upper portion of the support arm means and a movable rod substantially in alignment with the steering axis and pivoted at its upper end to the front peak of the chassis such that the upper portion of the support arm means is connected to the front peak by means of the movable rod and the upper end of the suspension spring;

a lower connecting arm having one end connected to the lower portion of the support arm means by a ball and socket joint having a pivoting center located substantially in alignment with the steering axis and having an opposite end rotatably mounted along an axis of the chassis substantially perpendicular to the median plane of the motorcycle;

wherein said support arm means is connected to the chassis by a movable suspension linkage comprised of the connecting arm and the telescopic block.

4,785,906

SEAT BELT BUCKLE HAVING A BUILT-IN MICROSWITCH

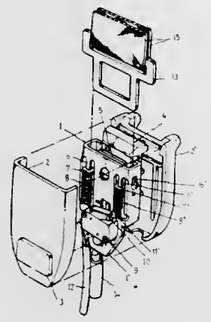
Choong S. Kang, #1558-1 Bongchun-dong, Kwanak-ku, Seoul, Rep. of Korea

Filed Jul. 17, 1987, Ser. No. 74,626

Claims priority, application Rep. of Korea, May 29, 1987, 8721

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 180—270 **2 Claims**



1. A seat belt buckle for vehicles comprising:

a buckle body **1** being housed by the front and rear outer covers **2**, **2'**,

a vacillating lever assembly having a support arm **20** on the one side and a push lever **21** on the other side is provided on the lower part of said buckle body **1** by means of a pintle **19**, wherein said vacillating lever assembly is fitted with torsion coil spring **22** which pushes up said support arm **20** against the lower part of a key plate **4**,

a latch plate **5** having a latch hook **17** formed on the front upper part thereof and a pair of eared upper ends on both sides thereof, wherein said eared upper side-ends are each movably received through respective side apertures **16**, **16'** of said buckle body **1** to be guided therein, and said latch plate **5** is pushed forwards (left-wards in FIG. **4**) from behind by a plate spring **18**,

a pair of guide bars **6**, **6'** formed in parallel at a proper interval on the front wall of said buckle body **1**, wherein both guide bars **6**, **6'** are each fitted with respective coil springs **8**, **8'** on the tops of which a pair of push plates **7**, **7'** are each slidably mounted on said respective guide bars **6**, **6'**, said push plates **7**, **7'** being integrally formed,

a fixing cord **14** rigidly connected to said lower end plate **1'** of said buckle body **1**, wherein the other end of said fixing cord **14** is fixed to the vehicle bottom plate on the right or left side of the driver's seat, and

a microswitch **9** having a switch lever **11** and a switch button **10** which is provided on the lower end plate **1'** of said buckle body **1**, wherein the lever end **11'** of said microswitch **9** is connected to the lower end of said coil spring **8'**, and said lever end **11'** will activate said switch button **10** when said fastening ring **13** of the seat belt **15** is inserted into the belt buckle, between said latch plate **5** and the front wall of said buckle body **1**, whereby the forehead of said fastening ring **13** pushes down on said push plates **7**, **7'** together with said coil springs **8**, **8'**, thereby activating said lever end **11'** and at the same time said switch button **10**,

characterized in that said microswitch **9** is electrically interconnected with the ignition switch as well as the starter motor.

4,785,907

EMERGENCY UNLOCK ASSEMBLY FOR ONBOARD LOCK MECHANISM

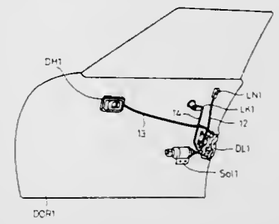
Kohji Aoki, Nagoya, and Tomio Yasuda, Kasukabe, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 10, 1987, Ser. No. 131,403

Claims priority, application Japan, Dec. 12, 1986, 61-295990

Int. Cl.⁴ B60R *25/00;* **B62H** *5/00*

U.S. Cl. 180—274 **8 Claims**



1. An emergency unlock assembly for onboard lock mechanism comprising

an onboard opening cover which can be opened and closed to cover an opening of a vehicle;

a lock mechanism for blocking an opening movement of the onboard opening cover;

means for detecting an impact applied to a vehicle;

means for detecting the presence or absence of an occupant; and

control means responsive to the detection of an impact applied to unlock the lock mechanism only when the presence of an occupant has been detected.

4,785,908

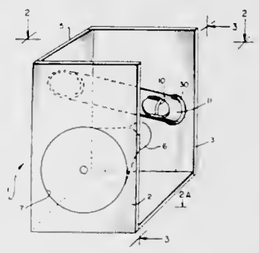
VENTED LOUDSPEAKER

Richard L. Rothenberg, 52 Maple St., Florence, Mass. 01060

Filed Dec. 21, 1987, Ser. No. 135,840

Int. Cl.⁴ H05K *5/00*

U.S. Cl. 181—156 **29 Claims**



1. A vented loudspeaker, which comprises an enclosure having top, bottom, front, rear and opposed side walls, one of said walls having an aperture therein and one of said walls having an opening therein, a speaker within said enclosure and mounted on said wall having said opening for outward projection of sound through said opening, and an elongated, straight vent tube within said enclosure and mounted on said apertured wall for outward projection of sound through said aperture, said vent tube having a longitudinally extending axis, said vent tube being arranged with said axis at an oblique angle with respect to said apertured wall and extending to, but spaced from, a said wall opposite said apertured wall, said vent tube having a length greater than a distance between said apertured wall and said opposite wall.

4,785,909

NOISE SILENCING SYSTEMS

Robert E. Young, 12 Whitnash Road, Leamington Spa, Warwickshire CV31 2HN, England

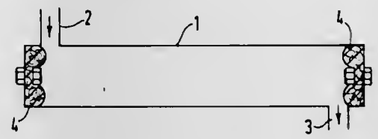
PCT No. PCT/GB85/00139, § 371 Date Dec. 3, 1985, § 102(e) Date Dec. 3, 1985, PCT Puh. No. WO85/04688, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 2, 1985, Ser. No. 805,468

Claims priority, application United Kingdom, Apr. 14, 1984, 8409744

Int. Cl.⁴ F01N *1/10*

U.S. Cl. 181—252 **18 Claims**



1. A silencer device comprising an elongate chamber having two ends and generally defining a straight-line transmission path, said transmission path leading generally from one end of the chamber to the other, and being substantially uninterrupted by physical obstruction, the chamber being provided adjacent said ends with inlet and outlet apertures defining paths of entry to and exit from the chamber and communicating with the transmission path to provide a through-going transmission path, the chamber being principally occupied by a fluid having a predetermined characteristic impedance and being provided, at said ends, with acoustic energy absorbing means for providing energy dissipating acoustic impedance type terminations to said chamber, the acoustic impedance of the said terminations being substantially equal to the characteristic impedance of the fluid in the chamber.

4,785,910

VEHICLE BUMPER STEP

Kenneth E. Tonkovich, 19 Longshore, Irvine, Calif. 92714

Filed Aug. 24, 1987, Ser. No. 88,859

Int. Cl.⁴ B60K *3/00*

U.S. Cl. 182—92 **6 Claims**

1. A bumper step, comprising:

a rigid base having an upper base surface and a longitudinal edge portion extending between opposite first and second end portions of the base;

a pair of first and second elongated hook members adapted to be mounted on an upper portion of a bumper in spaced apart relationship, each one of the hook members extending between a hook-shaped end portion and an opposite end portion of the hook member, which hook-shaped end portion is adapted to removably engage the upper portion of the bumper with the elongated portion extending outwardly from the bumper;

a pair of first and second brackets with which to support the

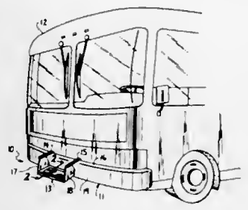
VOL 1096 ISS 4 NO 22 1988 UMI

base from the hook members, each one of the brackets having opposite upper and lower end portions;

the lower end portion of each one of which brackets is mounted on a respective one of the first and second end portions of the base to enable each one of the brackets to be pivoted approximately ninety degrees between a folded position in which the bracket lies generally flat against the upper base surface and

an extended position in which the bracket extends generally perpendicular to the upper base surface; and

the opposite end portion of each one of which hook members is mounted on the upper end portion of a respective one of the first and second brackets in a fixed position relative to the respective one of the first and second brackets such that with the hook members engaging the upper portion of the bumper and the brackets in the extended position, the brackets extend downwardly from the hook members toward the base, the longitudinal edge portion of the base is disposed toward the bumper, the base extends



outwardly from the bumper, and the upper base surface is disposed in a position facing generally upwardly to provide a surface upon which to stand;

the bumper step further comprising:

a pair of protruding members, each of which protruding members is attached to a respective one of the first and second end portions of the base to extend an adjustable distance from the longitudinal edge portion toward the bumper and bear against the bumper to enable adjustment of the position of the upper base surface;

wherein:

the protruding members are a pair of bolt members utilized to mount the lower end portions of the brackets on the base;

each one of the bolt members includes a head adapted to bear against the bumper; and

the head of each one of the bolt members is covered with a material that is more compliant than the metal alloy in order to inhibit damage to the bumper.

4,785,911

SAWHORSE ROLLER ATTACHMENT

Dennis J. Kayl, R.R. 1, Box 22A, Burbank, S. Dak. 57010

Filed Jan. 14, 1988, Ser. No. 143,680

Int. Cl.[4] B25H *1/06*; B27B *21/02*

U.S. Cl. 182—129 **10 Claims**

1. A roller attachment for a workpiece support member which is generally rectangular in cross section, having opposite long and short sides, comprising,

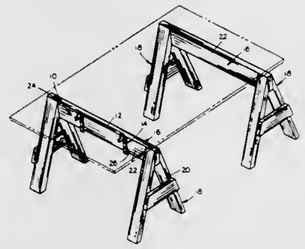
an elongated roller,

bracket means for rotatably supporting said roller on said workpiece support member,

said bracket means including an elongated fastening plate having an interior face and an exterior face and alternate first and second roller support means positioned interiorly of said fastening plate for supporting said roller for rotation about respective first and second axes extended parallel to and transversely of said fastening plate, and fastening means for securing said fastening plate to a workpiece support member,

said first roller support being arranged relative to said fastening plate for supporting said roller with the top of the roller adjacent the plane of the top edge of the workpiece support member upon positioning of the workpiece support member with the long sides upright and upon securement of said fastening plate to an upright long side with said exterior face facing said long side, and

said second roller support means being arranged relative to said fastening plate for supporting said roller with the top



of the roller adjacent the plane of the top edge of the workpiece support member upon positioning of the workpiece support member with the short sides upright and upon securement of said fastening plate to the long bottom side of the workpiece support member with said interior face facing said long bottom side whereby a workpiece overlying said workpiece support member may be supported on said roller for rolling movement relative to said workpiece support member.

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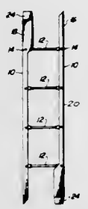
FOLDING LADDER

José A. Lopez, 2317 Pinnacle Dr., Martinez, Calif. 94553

Filed Dec. 14, 1987, Ser. No. 133,597

Int. Cl.[4] E06C *1/383*

U.S. Cl. 182—160 **3 Claims**



1. A folding ladder having a pair of upright, parallel side rails and a plurality of cross rungs, each rung having horizontal pivots at its opposite ends hinging the rung respectively to the rails so as to enable the rails and rungs to function selectively in an open mode with the rails spaced apart and the rungs disposed horizontally or in a closed mode with the rails shifted vertically and swung closely together about the rung pivots to dispose the rungs in acutely angled relation to the rails, characterized in that each rail includes a top portion, a lower portion and an intermediate portion and at least the intermediate portion has a substantially semi-circular transverse section giving that portion the shape of a C as seen in plan, the rails being symmetrical and with the open sides of the Cs facing toward each other, each rung is a rigid element and the rung pivots and opposite ends of the rungs lie within the bight of the C, whereby, in the closed mode the intermediate portions of the rails complement each other to form a vertically elongated,

hollow substantially cylindrical closed shell enclosing the rungs there within each rung pivot comprises a bearing block of semi-cylindrical section configured to nest within its associated rail, said block further having a gap therein facing the opposite rail, the proximate end of the end of the associated rung is received within the gap, a cross pin is carried by the block and passes through the received end of said rung and each rail having horizontally alined holes respectively coaxial with each cross pin and each block has coaxial portions projecting respectively into the associated holes.

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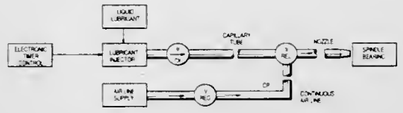
SPINDLE LUBRICATING SYSTEM

T. J. Maurer, Grosse Pointe; Patrick L. Jeakle, Washington; Clifford Willner, New Baltimore, and James Goodsmith, Rochester, all of Mich., assignors to Orsco Incorporated, Madison Heights, Mich.

Filed Nov. 19, 1986, Ser. No. 941,747

Int. Cl.[4] F01M *1/00*

U.S. Cl. 184—6.26 **14 Claims**



1. Lubricating system comprising the method steps of cyclically positively displacing accurate liquid lubricant injections through a pressure resisting check valve into a pressurized oil filled delivery tube passage leading through a second pressure resisting check valve at a nozzle directed toward a lubrication target, and continuously supplying air under regulated pressure at less than line pressure at the outlet of said second valve to atomize, entrain, and scour each injection of lubricant from surfaces at second said check valve and nozzle in order to deliver an accurate quantity of atomized lubricant mist over a substantial period of time following each injection of lubricant into the nozzle.

4,785,914

ELEVATOR SYSTEM LEVELING SAFEGUARD CONTROL AND METHOD

Jeffrey W. Blain, Scenic Lakes Township, Sussex County, and Richard H. Ludwig, West Caldwell, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1987, Ser. No. 64,913

Int. Cl.[4] B66B *5/02*

U.S. Cl. 187—105 **11 Claims**

1. An elevator system leveling safeguard comprising:

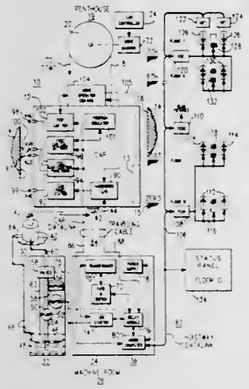
a structure having a plurality of floors, each of said floors having an associated floor landing zone defined by a preset distance on either side of said floor,

an elevator car mounted for movement in said structure to serve the floors,

door means for said car having a door adapted to be controlled to open and close on signal,

motive means for causing said elevator car to make a run and stop at a target floor,

and control means including channel circuit means remotely located from said car and being adapted to shut down said car motive means upon failure of said control means, said control means being interactive with said motive means and with said door means including means for directing said elevator car to land and then remain at the target floor with its said door means signalled to open for door opening and remain open only within said floor landing zone, so that a failure of said control means after said door means has been signalled to open will result in the motive means causing the car to stop within the floor landing



zone of the target floor without moving the car therebeyond in the door opened condition.

4,785,915

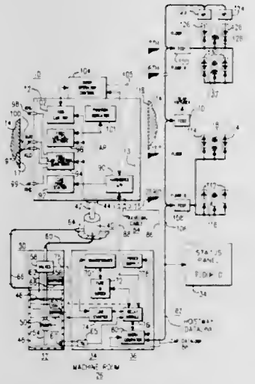
ELEVATOR SYSTEM MONITORING COLD OIL

Denis D. Shah, Union, N.J., and Richard L. Thomas, Slocum Township, Luzerne County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1987, Ser. No. 64,915

Int. Cl.[4] B66G *1/04*

U.S. Cl. 187—110 **11 Claims**



1. An elevator system in a structure, with the elevator being adapted to be hydraulically driven with prewarmed hydraulic oil obtained by operationally recirculating the cold oil in a reservoir, the oil otherwise being available for driving an in-service elevator car in the structure, said system comprising:

motor drive means having an output shaft for providing an output torque when said motor drive means is energized;

pump means movably coupled to the output shaft of said motor drive means for drawing through its intake the available hydraulic oil from the oil reservoir and being adapted to expel pressurized oil from its output;

hydraulic jack means having an oil input and output and a fluid chamber therebetween adapted to move the elevator

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car upwardly and downwardly to serve floors in the structure;

valve means including up and down control valves connected between the output of said pump means and the input of said hydraulic jack means, and said valve means being capable of returning oil to the reservoir;

thermostat means reponsive to the temperature of hydraulic oil for signaling a cold oil condition when the temperature of the oil is below an operating standard; and

control means, responsive to the cold oil temperature signal from said thermostat means, through a control program module which interacts with the cold oil signal to activate the operation of said pump means for a time interval of a minimum program timer, through energization of said motor drive means for pumping oil to recirculate the oil from one portion of the reservoir, bypassing said hydraulic jack means, and return the oil to another portion of the reservoir during a predetermined sequence of timing counts so that the temperature of the recirculating oil is warmed up to the temperature minimum for elevator operation.

4,785,916

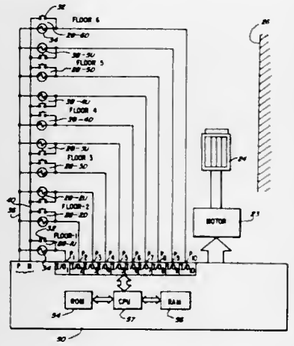
CALL REGISTRATION AND ACKNOWLEDGEMENT SYSTEM FOR AN ELEVATOR AND METHOD OF TESTING SUCH SYSTEM

John E. Jaster, Rock Island, Ill., assignor to Montgomery Elevator, Moline, Ill.

Continuation of Ser. No. 567,560, Jan. 3, 1984, abandoned. This application May 8, 1986, Ser. No. 860,887

Int. Cl.[4] B66B *1/00*

U.S. Cl. 187—121 **8 Claims**



1. In an elevator system having an elevator control for controlling an elevator car in a hoistway, a call registration and acknowledgement system, comprising:

call registration means remote from the elevator control for transmitting a request signal to request elevator service;

the elevator control inluding an input/output port and means for latching the port at a voltage level when a signal is coupled thereto, the latching means including a triac connected between the input/output port and ground potential having a gate electrode and means coupled to the gate electrode for generating a gating signal, the elevator control further including a resistor connected to the input/output port, a switch for selectively coupling the resistor to either first or second voltage levels, and means coupled to the switch and to the triac for operating the elevator control in a test mode to determine the operability of the elevator control and the call acknowledgement means;

a single wire connecting the call registration means to the input/output port so that the port is latched at the voltage level when a request signal is developed; and

call acknowledgement means remote from the elevator control connected to the single wire and actuable in response to the latching of the port to acknowledge a request for elevator service.

4,785,917

CONTROL MECHANISM FOR AUTOMATIC TRANSMISSIONS

Toshiaki Tateno; Shigeki Fukushima, both Yokohama; Tomoytuki Iwamoto, Kawasaki, and Nobuo Kijima, Inagi, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

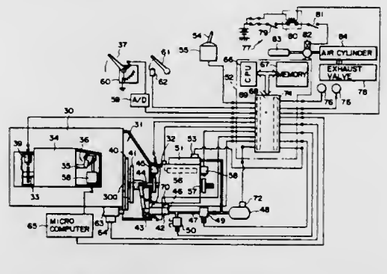
PCT No. PCT/JP86/00064, § 371 Date Oct. 7, 1986, § 102(e) Date Oct. 7, 1986, PCT Pub. No. WO86/04865, PCT Pub. Date Aug. 28, 1986

PCT Filed Feb. 14, 1986, Ser. No. 925,095

Claims priority, application Japan, Feb. 16, 1985, 60-28747; May 21, 1985, 60-106922; Jun. 18, 1985, 60-91663; Jul. 8, 1985, 60-103833; Jul. 26, 1985, 60-165201

Int. Cl.[4] B60K *41/28*

U.S. Cl. 192—0.08 **6 Claims**



1. An automatic transmission apparatus for a vehicle comprising: a friction clutch coupled to an output shaft of an engine; a clutch actuator for operating said friction clutch; a parallel shaft type gear transmission, having an input shaft coupled to said friction clutch; gear position change-over means for changing the speed ratio of said transmission; a rack actuator for operating the control rack of a fuel injection pump for supplying fuel to said engine; and a control apparatus having a drive state-detection means for detecting the drive state of the vehicle; gear change-judging means for judging in accordance with a signal from said drive state-detection means when the speed ratio of said transmission is to be changed; fuel quantity decrease-control means for operating said rack actuator to gradually move said control rack to an idling speed position when the gear change-judging means judges that the speed ratio of said transmission is to be changed, clutch disengagement means for operating said clutch actuator after the operation of said fuel quantity decrease-control means, to disengage said friction clutch; gear change control means for operating said gear position change-over means in accordance with the disengagement of said friction clutch, so that the speed ratio of said transmission coincides with that determined by said gear change-judging means; fuel quantity increase-control means for moving said control rack after the operation of said gear position change-over means is completed, so that the rotational speed of said output shaft substantially coincides with that of said input shaft; clutch control means for operating said clutch actuator in accordance with a signal from said fuel quantity increase-control means, to gradually move said friction clutch in the engagement direction; and rack-return control means for operating said rack actuator, to gradually move said control rack to a position corresponding to the degree of depression of an accelerator pedal as detected by said drive state-detection means when said rack-return control means detects that a difference in the rotational speed of said output shaft and said input shaft as obtained from said drive state-detection means has decreased below a predetermined value due to the repeated operation of said fuel quantity increase-control means and said clutch control means.

4,785,918

PNEUMO-HYDRAULIC CONVERTER FOR DISC BRAKE CALLIPERS

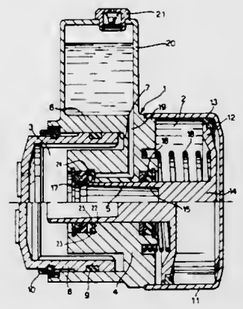
Franco Biamino, Collegno, Italy, assignor to Iveco Fiat S.A., Turin, Italy

Filed Dec. 16, 1986, Ser. No. 942,106

Claims priority, application Italy, Mar. 6, 1986, 53077/86[U]

Int. Cl.[4] F16D *55/18;* **B60T** *11/00, 11/28;* **F15B** *7/00*

U.S. Cl. 188—72.4 **2 Claims**



1. A pneumo-hydraulic converter for disc brake callipers, particularly for commercial vehicles, comprising a body intended for application directly to a disc brake calliper and having a first end, a second end and a central axial cavity, a first piston sealingly slidable within the cavity of said body, a pneumatic chamber adapted to be connected to a pressurized air supply is formed at the first end of said body, a second piston sealingly slidable in said chamber and fixed to said first piston, return spring means for the first and second pistons contained within said chamber between the first end of said body and said second piston, a hollow slider guided axially within said body between an operative position for operating said brake calliper and an inoperative position, said slider defining a hydraulic chamber formed at the second end of said body and in which said first piston is operatively associated, hydraulic fluid reservoir means operatively associated with said body and having cut-off valve means for communicating the reservoir means with the atmosphere for keeping said reservoir under pressure and a passage formed in said body for connecting said hydraulic chamber to said reservoir means, adjacent said cavity whereby communication between said hydraulic chamber and said passage is controlled by movement of said first piston in said cavity so as to provide communication from said reservoir means to said chamber only in the inoperative position of said hollow slider when said second piston attached to said first piston is biased by said return spring means to a position in said pneumatic chamber remote from said first end of said body.

4,785,919

ROTARY FLYWHEEL SKID SENSING MEANS FOR VEHICLE HYDRAULIC BRAKING SYSTEMS

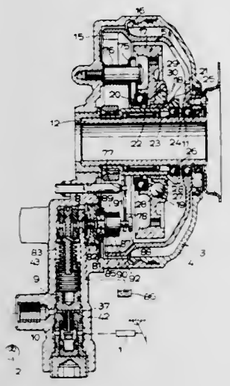
Ivan Mortimer, West Midlands, England, assignor to Lucas Industries Public Limited Company, England

Filed Jul. 27, 1987, Ser. No. 78,044

Claims priority, application United Kingdom, Aug. 8, 1986, 8619418

Int. Cl.[4] B60T *8/34*

U.S. Cl. 188—181 A **6 Claims**



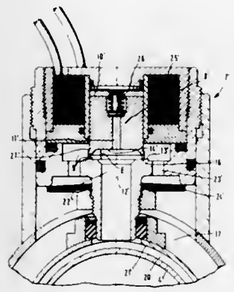
1. A rotary flywheel skid sensing means for an hydraulic braking system for a vehicle having a wheel adapted to be braked, comprising means for modulating the supply of brake pressure to said brake, a flywheel assembly, clutch means through which said flywheel assembly is adapted to be driven from said wheel, and a driven member, adapted to be driven by said wheel, upon which said flywheel assembly is located and from which said flywheel assembly is adapted to be driven, said flywheel assembly comprising a flywheel member, a reaction member, and a ball and ramp mechanism co-operating with both said flywheel member and said reaction member, said ball and ramp mechanism being responsive to the relative angular movement between said flywheel and reaction members which occurs when the deceleration of said braked wheel exceeds a predetermined value to cause relative axial movement between said flywheel and reaction members to urge said ball and ramp mechanism into an expanded condition to actuate in turn said means for modulating said brake pressure, with said clutch means slipping at a predetermined torque so that said flywheel and reaction members can continue to rotate together in the expanded condition, wherein said flywheel member has a conical surface, said reaction member is provided with a conical surface complementary to said conical surface on said flywheel member, said ball and ramp mechanism is provided between said complementary conical surfaces, said reaction member is supported on said driven member to locate said flywheel assembly both rotationally and axially, and said clutch means is defined by direct engagement between said driven member and said reaction member.

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4,785,920
HYDRAULIC ADJUSTABLE SHOCK ABSORBER

Heinz Knecht, Eitorf, and Alfred Preukschat, Königswinter, both of Fed. Rep. of Germany, assignors to Boge AG, Eitorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 915,265, Oct. 3, 1986, Pat. No. 4,749,069. This application Apr. 9, 1987, Ser. No. 36,307
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612796
Int. Cl.[4] B60G *13/08*; F16F *9/46*
U.S. Cl. 188—299 15 Claims

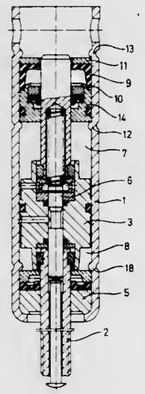


1. A shock absorber for motor vehicles, said shock absorber comprising a cylinder assembly having an arrangement for varying damping of a piston assembly disposed therein, said piston assembly dividing said cylinder into at least two chambers, each for containing damping fluid, said shock absorber comprising:
means for throttling said damping fluid when said damping fluid moves from one of said chambers into another;
said piston assembly having a piston rod and piston;
said piston rod having first means for attachment of said piston rod at one end thereof;
said cylinder assembly having second means for attachment at a portion thereon other than said first means for attachment at said piston rod;
means for bypassing damping fluid;
means for accepting bypassed damping fluid;
said bypassing means being disposed to bypass said damping fluid from one of said damping fluid-containing chambers to said accepting means;
said bypassing means including valving means for regulating flow of said damping fluid in said bypassing means;
said valving means including:
an electromagnetically-displaceable component for effecting flow cross section in said valving means, said electromagnetically-displaceable component having a first and a second end surface means;
electromagnetic means for displacing said electromagnetically-displaceable component, said electromagnetic means having means for connection to electrical controlling means;
valve seat means including a stationary seating surface means and a first portion of said first end surface means of said electromagnetically-displaceable component;
said first portion of said first end surface means for making contact with said stationary seating surface means;
said electromagnetically-displaceable component being axially displaceable along a first axis;
said seating surface means having at least one portion being disposed substantially at a right angle to said first axis;
a second portion of said first end surface means of said electromagnetically-displaceable component being disposed within said first portion of said first end surface means and a predetermined distance (E) away from said first portion of said first end surface means, to form a cavity; and
said second portion of said first end surface means to form said cavity being disposed to form during flow of fluid through said valving means a pressure reduction to assist in closing said electromagnetically-displaceable component against said valve seat means.

4,785,921
TEMPERATURE-COMPENSATING HYDRAULIC POSITIONER

Hans-Josef Hosan, Neuwied, and Martin Siemann, Bad Breisig, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Dec. 31, 1985, Ser. No. 815,446
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 8500855
Int. Cl.[4] F16F *9/52*
U.S. Cl. 188—300 7 Claims

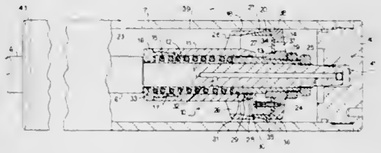


1. A hydraulic positioning element comprising a cylinder member (1) having an axis and two end portions, namely a first end portion and a second end portion and a cavity (8, 7) within said cylinder member (1) axially between said first and said second end portions;
a first guiding and sealing arrangement at said first end portion and a second guiding and sealing arrangement at said second end portion;
a piston rod member (2) extending inwards and outwards of said cavity (8, 7) through said first guiding and sealing arrangement;
a piston unit (3) within said cavity (8, 7) fixed to said piston rod member (2) and dividing said cavity (8, 7) into two working chambers, a first working chamber (8) adjacent said first end portion and a second working chamber (7) adjacent said second end portion;
a volume compensating rod member extending inwards and outwards of said cavity (8, 7) through said second guiding and sealing arrangement and fixed to said piston rod member (2) for common axial movement therewith;
a volume of hydraulic fluid within said first and said second working chambers (8, 7);
a fluid passage extending across the piston unit (3) and interconnecting said first and said second working chambers (8, 7) for fluid exchange therebetween;
valve means (6) associated with said fluid passage;
valve means operating means associated with said valve means (6) for opening and closing said fluid passage means; and
fluid expansion compensating means, said fluid expansion compensating means comprising at least one axially movable partition unit (14, 15) being part of at least one of said first and said second sealing and guiding arrangements and sealed with respect to both said cylinder member (1) and a respective one of said piston rod member (2) and said volume compensating rod member, said partition unit (14, 15) being supported in axial direction through an axially deformable compensating body (9) by abutment means (13, 16, 17) fixed with respect to said cylinder member (1), said compensating body having a deformation force-deformation path characteristic which is responsive to temperature within an operational range between room temperture and about 80° C. so that said compensating body is relatively rigid at room temperature and more deformable at about 80° C.

4,785,922
GUN RECOIL MECHANISM

Lawrence R. Kiebart, 122 Lake Breeze Cir., Marblehead, Ohio 43440

Filed Oct. 2, 1987, Ser. No. 103,941
Int. Cl.[4] F16F *9/34*
U.S. Cl. 188—316 2 Claims

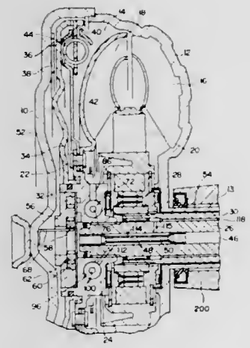


1. In a hydraulic shock-absorbing device including a fluid cylinder, a piston adapted for reciprocating movement in the cylinder to include a shock-absorbing extension stroke caused by an impulsive force and a retraction stroke, the piston dividing the interior of the cylinder into a high-pressure chamber toward which the piston moves during the extension stroke, and a low-pressure chamber on the opposite side of the piston, the improvement which comprises:
an annular cylindrical member carried by said piston to define with the inner wall of said fluid cylinder, an annular fluid bypass space, said annular member having a discontinuous ring with interfitting end portions and with a cylindrical bypass passage-defining surface portion and an adjacent frustoconical exterior surface portion of smaller diameter than the pass-defining surface portion, said annular member being capable of radial expansion and contraction to vary the size of said bypass space;
means biasing the annular member toward radial expansion;
means responsive to a fluid pressure increase in said high-pressure chamber caused by the impulsive force for radially contracting the annular member to increase the size of the annular bypass space an amount representative of the magnitude of the pressure increase, said means for radially contracting the annular member having a first piston element engaging said ring on one axial end thereof, a second piston element axially movable relative to said first piston element and engaging said ring on the other axial end thereof, one of said piston elements having a frustoconical interior surface portion that operatively engages said exterior frustoconical surface portion of said ring, whereby relative axial movement of said first and second piston elements toward one another cams said frustoconical surface in a manner that contracts said ring and enlarges the bypass space, and means for transmitting fluid pressure from said high-pressure chamber to said piston elements in a manner urging said elements axially toward one another;
whereby the fluid pressure in the high-pressure chamber remains relatively constant during the extension stroke of the piston.

4,785,923
SLIPPAGE CONTROL SYSTEM FOR LOCK UP CLUTCH ASSEMBLY FOR FLUID COUPLING, PROVIDING NON-ELECTRONIC MECHANICAL/HYDRAULIC SLIPPAGE CONTROL

Fumihiro Ushijima, Toyota, Japan, assignor to Toyota Jidosha Kabusbiki Kaisha, Toyota, Japan

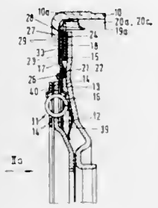
Filed May 6, 1987, Ser. No. 46,289
Claims priority, application Japan, May 27, 1986, 61-121439
Int. Cl.[4] F16H *45/02*
U.S. Cl. 192—3.3 3 Claims



1. For a fluid coupling comprising a housing including a front cover portion and a pump outer shell portion, a fluid torque converter incorporated in said housing adjacent said pump outer shell portion and including a pump impeller supported by said pump outer shell portion, a turbine member and a stator member, a lock up clutch incorporated in said housing adjacent said front cover portion and including a first friction member supported by said front cover portion and a second friction member adapted to be selectively frictionally pressed against said first friction member by a fluid pressure supplied to a chamber space defined on one side of said second friction member remote from said front cover portion, a shaft member disposed along a common central axis of said housing, said torque converter and said lock up clutch being rotatable thereabout, and a hub member mounted on said shaft member and supporting said turbine member so as to transmit rotational torque between said turbine member and said shaft member, said hub being also connected with said second friction member of said lock up clutch so as to transmit rotational torque between said second friction member and said shaft member;
a slip control system for said lock up clutch, comprising:
pump means in said hub for providing a delivery of fluid according to a rotation of said housing relative to said turbine member; and
a fluid control system including:
(a) a first spool element slidably received in a first bore formed in said hub,
(b) a fluid passage formed through said hub and connecting said chamber space to a drain via said first bore,
(c) means for biasing said first spool element by the fluid delivered by said pump means so as to increasingly throttle said fluid passage as said pump means provides a larger delivery, and
(d) an override system for selectively supplying a fluid pressure from an outside fluid pressure source to said first spool element so that said first spool element is biased so as to completely interrupt said fluid passage.

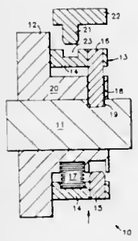
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4,785,924
TORQUE TRANSMITTING ASSEMBLY
Johann Jäckel, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany
Filed Jun. 10, 1987, Ser. No. 61,298
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623433; Sep. 13, 1986, 3631274
Int. Cl.[4] F16H *45/02*; F16D *3/66*
U.S. Cl. 192—3.29 **32 Claims**



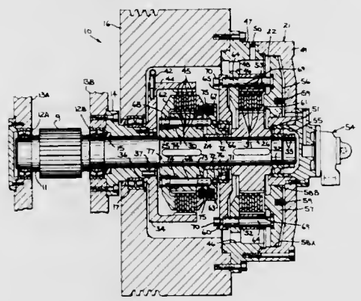
1. A hydrodynamic torque converter and lock-up clutch assembly, particularly for motor vehicles, comprising a housing; a clutch apply member in said housing; two walls flanking and being rotatable relative to said clutch apply member; an input element affixed to and rotatable with said walls; energy storing means interposed between said walls on the one hand and said clutch apply member on the other hand and arranged to yieldably oppose rotation of said walls and said clutch apply member relative to each other; and a friction disc non-rotatably and axially movably mounted on one of said walls.

4,785,925
MECHANICAL CLUTCH
Milo W. Frisbie, and Mavin C. Swapp, both of Mesa, Ariz., assignors to Motorola Inc., Schaumburg, Ill.
Filed Sep. 24, 1987, Ser. No. 101,305
Int. Cl.[4] F16D *11/02*
U.S. Cl. 192—17 R **8 Claims**



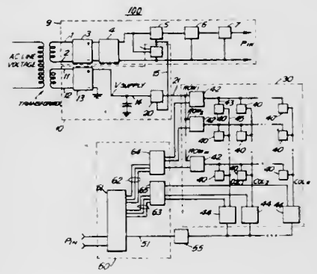
1. A mechanical clutch comprising:
a shaft having a notch disposed therein;
a wheel having a hub and being disposed about said shaft, said hub defining a first hole extending from an outer wall to an inner wall and a second hole extending from said outer wall toward said inner wall;
a clutch ring being disposed about said outer wall of said hub of said wheel;
a drive pin being coupled to said clutch ring and being disposed such that when said mechanical clutch is engaged, said drive pin extends through the first hole of said hub into the notch of said shaft, and when said mechanical clutch is disengaged, said drive pin extends partly into the first hole of said hub;
spring means for exerting a force on said clutch ring causing said mechanical clutch to be engaged, said spring means being disposed within the second hole of said hub and contacting an inner wall of said clutch ring; and
drive means for exerting a force on said clutch ring causing said mechanical clutch to be disengaged, said drive means being disposed to exert a force on an outer wall of said clutch ring.

4,785,926
CLUTCH/BRAKE
Robert C. Matson, Waukesha, Wis., assignor to Industrial Clutch Corporation, Waukesha, Wis.
Filed Apr. 15, 1987, Ser. No. 38,867
Int. Cl.[4] F16D *67/04*
U.S. Cl. 192—18 A **9 Claims**



1. A clutch/brake for alternatively connecting a rotatably driven shaft to a driving member and a stationary member, comprising:
clutch plates operatively connected respectively to said driven shaft and said driving member;
brake plates operatively connected respectively to said driven shaft and said stationary member;
a clutch operator for urging said clutch plates together, said clutch operator being connected to rotate with the driving member;
a brake operator for urging said brake plates together, said brake operator being connected to rotate with the driven shaft;
a linkage for connecting the clutch and brake operators to move axially together, said linkage including an anti-friction bearing which is static when the brake plates are fully disengaged and dynamic when the clutch plates are fully disengaged;
actuating means for moving said clutch and brake operators in a first axial direction, said actuating means being connected for rotation with the driving member; and
means for biasing the clutch and brake operators in a second axial direction opposite to the first axial direction;
wherein a force exerted by the actuating means is transmitted through the bearing in the first axial direction to move one of the operators to a fully disengaged position and a force exerted by the biasing means is transmitted through the bearing in the second axial direction to move the other of the operators to a fully disengaged position.

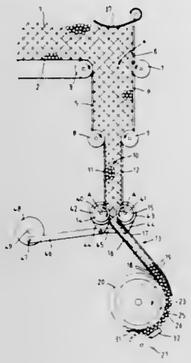
4,785,927
VENDING MACHINE CONTROL WITH PRODUCT DELIVERY MOTOR HOME DETECTION, MOTOR SPEED CONTROL AND POWER SUPPLY
Bob M. Dobbins, Villanova, Pa., assignor to Mars Incorporated, McLean, Va.
Filed Mar. 2, 1987, Ser. No. 20,371
Int. Cl.[4] G07F *9/02*
U.S. Cl. 194—200 **13 Claims**



1. A vending machine apparatus comprising at least one product delivery means, said product delivery means comprising an electrically operated actuator for delivery of products, said actuator having a home position, an impedance element and a circuit opening switch responsive to the position of the actuator, the impedance element and the switch being connected electrically in series with each other and in an electrically parallel circuit with the actuator; the circuit comprising the actuator, the impedance element and the circuit opening switch being a motor module; a first modulated DC power supply for supplying a single modulated power signal to the electrically operated actuator for regulating its speed during delivery of products, said first modulated power supply comprising a power supply for providing a power signal and a means for modulating said power signal dependant on at least one of the line voltage and load; opening and closing of the switch in said motor module being controlled by the operation of the actuator such that when the actuator is in the home position the switch and the impedance element will pass the modulated DC power signal and such that when the actuator is not in the home position, the switch is open and the modulated DC power signal is filtered by the actuator; and means electrically connected to said motor module for detecting the operational condition of the actuator and the home position of the actuator by detecting the single modulated power signal at the output of said motor module.

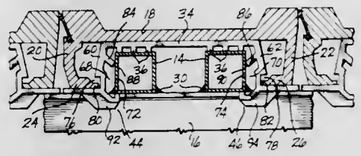
4,785,928
FEEDING ROD-LIKE ARTICLES
Dennis Hinchcliffe; Desmond W. Molins, and Stanley V. Starkey, all of London, England, assignors to Molins PLC, Milton Keynes, England
Filed May 13, 1986, Ser. No. 862,737
Claims priority, application United Kingdom, May 18, 1985, 8512621
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—450 **16 Claims**

1. A method of forming a regular single row of cigarettes moving transversely to their axes, comprising the steps of forming a stream two rows deep and with adjacent cigarettes in each row substantially in abutting relationship; accelerating the two rows to provide a space of less than the diameter of a cigarette between each pair of adjacent cigarettes in each row and so that each cigarette in one row nests against two such spaced adjacent cigarettes in the other row; sequentially removing said cigarettes from alternate of said two rows and simultaneously further accelerating the cigarettes to increase



their spacing to at least one cigarette diameter so as to form a single row.

4,785,929
BEARING SYSTEM FOR RECIPROCATING FLOOR CONVEYOR
Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741
Continuation-in-part of Ser. No. 680,069, Dec. 10, 1984, Pat. No. 4,679,686, which is a continuation-in-part of Ser. No. 346,865, Feb. 8, 1982, Pat. No. 4,492,303. This application Jun. 4, 1987, Ser. No. 59,376
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—750 **15 Claims**



1. In a reciprocating floor conveyor of a type comprising a plurality of elongated floor members, each of which is a metal extrusion of channel form comprising a top panel, a pair of opposite side panels extending downwardly from the top panel, and a pair of bottom flanges projecting inwardly from the side panels and defining a space between them, and each of which is supported on and guided by an elongated metal guide beam means, said guide beam means comprising two laterally spaced apart guide beams and a plurality of spaced apart plastic guide bearings on the guide beam means, and wherein in use the floor members are moved in one direction along the guide beam means and bearings, for advancing a load, and are retracted in the opposite direction, an improved bearing system for the floor members characterized by:
each said plastic slide bearing having a top positioned above the guide beam means, a side part on each side of the bearing depending from the top outwardly adjacent the sides of the guide beam means, a bottom lock flange projecting inwardly from each side part below the guide beam means, and a wing on each side of the bearing, extending laterally outwardly from the bearing, said wings being in coplanar parallelism with each other and being spaced below and in parallelism with the top of the bearing, said bearing top being of a width smaller than the

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space between the two bottom flanges of the floor member, and each side part of each bearing including a sidewall which slopes downwardly and outwardly to a lower edge, with a space being defined between each sidewall and an adjoining side of the guide beam means, said bearing having a width at the level of the lower edges of said sidewalls which is wider than the width of the space between the two bottom flanges of the floor member, each said sidewall lower edge being spaced above the upper surface of the wing on its side of the bearing, to define with the wing a space in which an inner edge portion of the bottom flange of the floor member on its side of the bearing is received, each said sidewall being resiliently connected to the bearing and being movable inwardly into the space between it and the adjoining side of the guide beam means, such that the floor member can be set down on top of the bearing, with the top of the bearing positioned in the space between the two bottom flanges of the floor member, and the floor member can then be pushed downwardly, and the downward force applied by the flanges of the floor member on said sidewalls of the bearing will cause the sidewalls to swing inwardly to allow the floor member to move downwardly until the bottom flanges are in the slots defined between the bottom edges of the sidewalls and the top surfaces of the wings, at which time the sidewalls will swing outwardly into positions placing their lower edges above the bottom flanges of the floor member.

4,785,930

AMMUNITION CONTAINER

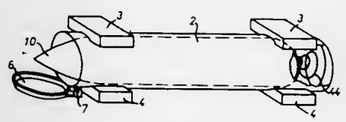
Marco Fischer, Hochwald; Hans Kaspar, Aesch, and Heinrich Wohlgemuth, Arlesheim, all of Switzerland, assignors to Muller AG Verpackungen, Munchenstein, Switzerland

Filed Aug. 26, 1987, Ser. No. 89,547

Claims priority, application Switzerland, Sep. 17, 1986, 3720/86

Int. Cl.[4] F42B *37/00, 39/00;* **B65D** *85/62*

U.S. Cl. 206—3 **11 Claims**



1. A stackable ammunition container which comprises:

an ammunition container tube wherein an elongated round of ammunition may be disposed, the tube being closed at a rear end thereof and being provided with a hinged lid at a front end thereof; and

stacking means mounted on said tube, said stacking means comprising one pair of parallel stacking surfaces opposing one another positioned on the side of said tube adjacent the front end thereof and a like pair of parallel stacking surfaces positioned on the side of said tube adjacent the rear end thereof, whereby a multiplicity of ammunition tubes resting on their sides may be stacked in stacking surface to stacking surface contact;

the hinge of said hinged lid being within the space encompassed by said stacking means, allowing the hinged lid to be opened for removal of ammunition from any tube in a stacked array of ammunition container tubes.

4,785,931

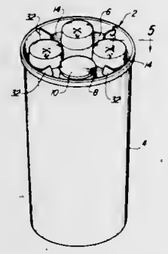
MOLDED PLASTIC CLOSURE HAVING INTEGRAL STACKING SUPPORT RIBS AND RUPTURABLE MIX COMPARTMENTS

Dixie L. Weir, Rochester, and Don F. Yeager, Lake Orion, both of Mich., assignors to Letica Corporation, Rochester, Mich.

Filed Sep. 24, 1987, Ser. No. 100,534

Int. Cl.[4] B65D *25/08, 21/00*

U.S. Cl. 206—222 **6 Claims**



1. A molded plastic closure for a mixing container comprising:

a base having a vertical axis of substantial symmetry when in a normal storage disposition;

inner and outer spaced, substantially-parallel, circumferentially-continuous wall portions, said inner and outer wall portions being joined at the uppermost extremities thereof to define an inverted U-shaped channel to receive the rim of said container therein;

the plane of said base being offset along said axis a predetermined distance below the upper extremities of said wall portions;

at least one downwardly opening ingredient compartment formed contiguous with said base and extending upwardly therefrom to an upper wall;

rupturable sealing means closing the bottom of said compartment; and

a plurality of circumferentially spaced, substantially rigid ribs formed on said base and contiguous to the inner wall portion of said U-shaped channel and extending inwardly toward the center of said closure; said ribs extending axially at least as high as the upper wall of said compartment such that a container may be stacked thereon without collapsing said ingredient compartment along said axis.

4,785,932

MEDICINE DISPENSER

Amedeo Checke, 4 Cherry St., Middletown, N.Y. 10940

Filed Jun. 15, 1987, Ser. No. 61,410

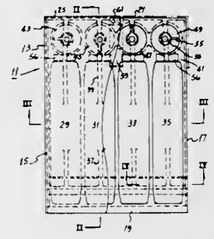
Int. Cl.[4] B65D *83/04*

U.S. Cl. 206—232 **4 Claims**

1. A container for medicine comprising a plurality of receptacles, each one having an arcuate longitudinal cross-sectional shape and a semi-circular transverse cross-sectional shape; a simulated clock face with numerals thereon mounted adjacent each said receptacle; a spinner with finger pivotally mounted and axially aligned longitudinally with each receptacle; a cover over said receptacles that is hinged; an open-ended compartment having a bottom aligned longitudinally substantially across and disposed beneath said receptacles; and resilient means mounted in said open-ended compartment contacting said bottom of said open-ended compartment

wherein said resilient means comprises a leaf type spring

adapted to frictionally engage a document inserted into said open-ended compartment and entrap the document



between said spring and said bottom of said open-ended compartment.

4,785,933

POUCH PRODUCED FROM A FLEXIBLE SHEET BLANK

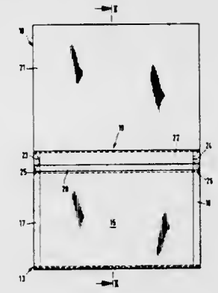
Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Jun. 22, 1987, Ser. No. 64,473

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621813

Int. Cl.[4] B65D *85/10*

U.S. Cl. 206—260 **3 Claims**



1. Pouch made of a flexible sheet blank, especially a roll-up pouch for receiving cut tobacco, and comprising:

a sheet blank (**10**) provided with an outer coating (**11**) and an inner coating (**12**) of differing coordinated thermal sealability;

a pouch part (**13**), having a front wall (**15**) and rear wall (**16**), for receiving the pouch contents and closed by means of a pull-open, peel-seal closing seam (**20**);

said closing seam (**20**) being located in the region of a closing strip (**22**) formed by a folding over of the sheet blank (**10**) so that the inner and outer coatings (**11, 12**) of the sheet blank (**10**) rest against one another and are joined to one another by the closing seam (**20**); and

recesses (**23, 24**) at opposite ends of the closing strip (**22**) and located such that, at said opposite ends, said inner coating on an inner side of said front wall (**15**) and said inner coating on an inner side of rear wall (**16**) rest directly against one another and are permanently joined to one another by sealing.

4,785,934

ARROW FLETCH COVER

Hugh H. Hogle, 1627 Wasatch, Salt Lake City, Utah 84108

Filed Feb. 1, 1988, Ser. No. 151,236

Int. Cl.[4] B65D *85/20*

U.S. Cl. 206—315.11 **3 Claims**



1. An arrow fletch cover for fletched ends of arrows, comprising

a generally tubular sheath, having one closed end and one elasticized open end; and

a semi-rigid release string having one end fixed to the closed end of the sheath and projecting upwardly and projecting from said closed end.

4,785,935

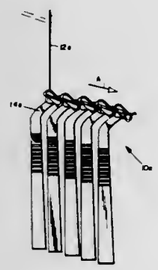
RAZOR PACKAGING

Clemens A. Iten, Fisherville, Va., assignor to American Safety Razor Company, Verona, Va.

Continuation-in-part of Ser. No. 86,481, Aug. 18, 1987, Pat. No. 4,735,312. This application Feb. 2, 1988, Ser. No. 151,532

Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—372 **17 Claims**



1. Razor packaging comprising

a plurality of razors, each of said razors having a razor head with elongated forward and rear edges and a handle projecting from the head;

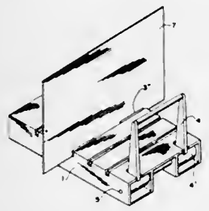
a display tag; and

means for serially connecting said razors one to the other and to said tag, said tag being connected to one of said razors with the rear edge of each razor head beyond said one razor in a direction away from said tag lying above or below the forward edge of the preceding razor head

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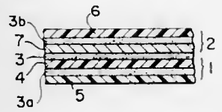
whereby said razor heads lie in stepped relation one to the other.

4,785,936
DEVICE FOR HOLDING FLAT OBJECTS SUCH AS PRINTED CIRCUIT BOARDS
David Shpigelman, 1 Mavo Gilat, Ramont Zahala, Tel Aviv, Israel
Filed May 13, 1987, Ser. No. 49,731
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—454 **16 Claims**



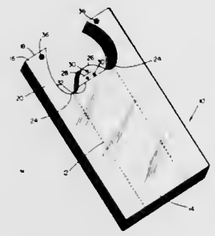
1. A device for holding boards, such as printed circuit boards, or other flat bodies, comprising:
a tray including a pair of tubular members and means interconnecting said tubular members in laterally spaced parallel relationship, each said tubular member having plural laterally extending slot means each opening upwardly and laterally aligned with a respective slot means in the other tubular member for receiving the lower edge portion of respective board to be held in the device;
a pair of shifting members respectively inserted in and movable longitudinally in said tubular members, each said shifting member having a top surface and plural laterally extending ridges on the top surface;
plural resilient means normally interposed longitudinally between respective ones of said ridges and ones of said slot means in said tubular members for resiliently engaging boards received in said slot means to clamp the boards resiliently against back edges of said slot means upon rearward longitudinal shifting of said shifting members in said tubular members, and means for effecting said rearward longitudinal shifting of said shifting members.

4,785,937
RETORTABLE POUCH AND PACKAGING MATERIAL FOR THE RETORTABLE POUCH
Tadao Tamezawa, Chiba, and Yoshiji Moteki, Kitaadachi, both of Japan, assignors to Kabushiki Kaisha Hosokawa Yoko, Japan
Filed Apr. 6, 1987, Ser. No. 34,713
Claims priority, application Japan, Apr. 7, 1986, 61-51583[U]
Int. Cl.[4] B65D *65/90*
U.S. Cl. 206—484 **6 Claims**



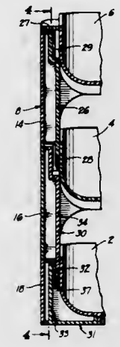
1. A packaging material for a retortable pouch comprising:
(a) a laminated base film formed by laminating together a polyester film and an inelastic polypropylene film with a first adhesive layer;
(b) a laminated cover film formed by laminating together a polyester film and an aluminum foil with a second adhesive layer;
(c) a third adhesive layer detachably bonding the polyester film of the laminated base film to the aluminum foil of the laminated cover film, thereby bonding together the laminated base film and the laminated cover film, the bonding strength of said third adhesive layer being lower than the adhesive layer bonding together the polyester film and the aluminum foil of the laminated cover film.
3. A retortable pouch for accommodating cooked food therein, which forms a bag sealed at its periphery, the bag being made of sheet-like packaging material, the packaging material comprising:
(a) a laminated base film formed by laminating together a polyester film and an inelastic polypropylene film with a first adhesive layer;
(b) a laminated cover film formed by laminating together a polyester film and an aluminum foil with a second adhesive layer;
(c) a third adhesive layer detachably bonding the polyester film of the laminated base film to the aluminum foil of the laminated cover film, thereby bonding together the laminated base film and the laminated cover film, the bonding strength of said third adhesive layer being lower than the adhesive layer bonding together the polyester film and the aluminum foil of the laminated cover film.

4,785,938
THERMOPLASTIC BAG PACK
Gordon L. Benoit, Jr., Macedon, and R. Stuart Smith, Jr., Palmyra, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 925,752, Oct. 30, 1986, abandoned. This application Apr. 30, 1987, Ser. No. 44,273
Int. Cl.[4] B65D *33/14*
U.S. Cl. 206—554 **7 Claims**



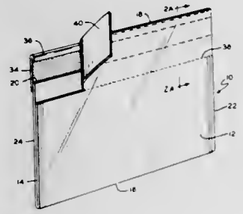
1. A pack of bags comprising a plurality of stacked bags made from thermoplastic film, each bag comprising front and rear walls; a bottom; an open mouth portion having handles which are integral extensions of said walls, said handles being located at opposite ends of said mouth portion; a pair of superimposed single film tab members extending above said front and rear bag walls and above said open mouth portion; the front tab being coplanar with said front wall land completely unconnected thereto or (2) comparatively weakly connected thereto, the rear tab being coplanar with said rear wall and connected thereto through a localized line of film weakening which is comparatively stronger than the front tab-front wall connection.

4,785,939
STACKING TRAY
Robert R. Huerto, Long Beach, and Cory A. Saulsberry, Lomita, both of Calif., assignors to Eldon Industries, Inc., Inglewood, Calif.
Filed May 26, 1987, Ser. No. 54,375
Int. Cl.[4] B65D *21/02*
U.S. Cl. 206—511 **13 Claims**



1. In a stacking tray combination in which a plurality of trays, including an upper most tray and a bottom most tray, are located overlying one another in vertically spaced relationship for providing a plurality paper sheet storage bins and in which each of said trays contains a pair of side post means integrally connected therewith, one of said side post means located on one side of said tray and the other of said side post means being located on the other side of said tray, and in which said side post means of an overlying one of said plurality of trays extends vertically downwardly below the surface of said attached tray and is supported atop the corresponding side post means of an underlying one of said plurality of trays; whereby the stacked side post means on each side of said trays simulate a single long support post; and wherein said each side post means associated with the overlying ones of said trays comprises further:
a hollow channel shaped member having an open top end, and an open bottom end, two side wall portions and a back wall between said ends, said back wall being spaced from the side of the associated tray, said channel member further having an open side portion facing toward said associated tray, whereby the inside hollow of said channel shaped member is exposed to view along a portion of the length of said channel shaped member below the surface of said tray, the improvement therein comprising:
key means located within said side post means, said key means being separate from and insertable within said side post means from said upper end of said side post means, said key means having a protruding portion extending out the bottom end of said side post means with the protruding portion thereof extending into the underlying side post means of an underlying one of said plurality of trays for preventing lateral movement between said trays;
and said key means having a flat surface portion for closing said open side of said channel shaped member and cooperating therewith to simulate a solid post joining said overlying tray with said underlying tray.
9. In a stacking tray combination containing a series of trays overlying one another in vertical spaced relationship and containing support means for holding said trays in the relationship described, the improvement therein wherein at least a portion of said support means comprises:
a hollow channel shaped member, said channel member connected to the side of a tray and further containing an open side portion;
insertable key means positioned within said channel shaped member, said key means containing a key portion for linking said channel member within another portion of said support means and said key means further having a surface for closing the open side portion of said channel shaped member and together with said channel shaped member simulating a thick solid post.

4,785,940
FLEXIBLE BAG WITH A PRESSURE SENSITIVE ADHESIVE CLOSURE STRIP
Shari J. Wilson, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 2, 1987, Ser. No. 69,673
Int. Cl.[4] B65D *3/26, 33/20*
U.S. Cl. 206—632 **8 Claims**



1. A bag comprising:
(a) a back panel having a front and rear surface, a front panel having a front and a rear surface, said back panel and said front panel being joined to form the bottom and sides of the bag;
(b) a pressure sensitive adhesive closure strip adhered to said back panel and to said rear surface of said front panel, said closure strip having a bond strength to said back panel greater than the bond strength of said closure strip to said rear surface of said front panel; and
(c) said front panel including a transverse separation line intermediate said closure strip and said bottom edge of the bag, whereby said front panel may be divided at said separation line and a portion of said front panel above the separation line removed from the bag to expose said closure strip for adhesively securing said back panel to said front surface of said front panel to close the top of the bag.

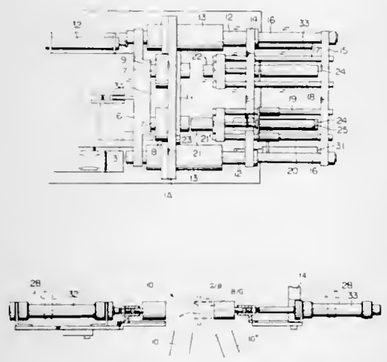
4,785,941
APPARATUS FOR AUTOMATICALLY SELECTING ACCEPTABLE OR UNACCEPTABLE HOLLOW CYLINDRICAL PRODUCTS SUCH AS BUSHES
Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Kita Ku Nagoya, Japan
Filed Mar. 25, 1986, Ser. No. 843,647
Claims priority, application Japan, Apr. 17, 1985, 60-81584
Int. Cl.[4] B07C *5/02*
U.S. Cl. 209—601 **20 Claims**

1. An apparatus for automatically selecting hollow, cylindrical-shaped products such as bushes on the basis of inner and outer diameters of the products, said products having end surfaces, said apparatus comprising;
a rotatable index plate;
a plurality of guide bushes provided circumferentially on said index plate for receiving hollow, cylindrical-shaped products such as bushes, said guide bushes having end surfaces;
a GO ring gauge and a NOGO ring gauge secured to a frame of said apparatus and operable to engage with the end surfaces of said guide bushes, said GO ring gauge and said NOGO ring gauge having inner bores;
a discharge mechanism for discharging said hollow, cylin-

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drical-shaped products from the corresponding guide bushes, said GO ring gauge, said NOGO ring gauge and said discharge mechanism being arranged in order circumferentially of said index plate;

a pusher mechanism for pushing one of the end surfaces of said hollow, cylindrical-shaped products through said guide bushes into the inner bores of said GO and NOGO ring gauges at a predetermined pressure for the judgment of GO and NOGO of said hollow, cylindrical-shaped products;



a plug gauge mechanism for pushing plug gauges into the bores of said hollow, cylindrical-shaped products at a predetermined pressure for the judgment of GO and NOGO of said hollow, cylindrical-shaped products;

a retractable knockout pusher mechanism for pushing a second of the end surfaces of said hollow, cylindrical-shaped products from the other ends of said GO and NOGO ring gauges to the outside in a direction opposite to the direction of advancement of said pusher mechanism and said plug gauge mechanism at a fluctuating pressure.

4,785,942

SWITCH PROVIDED WITH ONE OR MORE VANES AND USED FOR A SORTING DEVICE

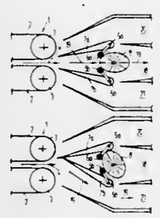
Harro M. Van Leijenhorst, Zoetermeer; Geert J. Prins, Delft; Joseph E. H. Smeets, The Hague, and Jan F. Suringh, Rotterdam, all of Netherlands, assignors to Staat der Nederlanden (Staats dedrijf der Posterijen, Telegraphie en Telefonie), The Hague, Netherlands

Filed Apr. 15, 1986, Ser. No. 852,355

Claims priority, application Netherlands, Apr. 18, 1985, 8501131

Int. Cl.[4] B07C *3/00*

U.S. Cl. 209—657 **10 Claims**



1. Switch for a sorting device for items, which items flow in a flow direction from one inlet towards three outlets of said sorting device switch, comprising two vanes for guiding said items towards one of said outlets, which vanes are pivoted independently with respect to each other and are pivotable by driving means causing movement of each of said vanes in a direction transverse to said flow direction, characterized in that said driving means comprise a first cam disc (**8**) being rotatable by rotation means (**12**) and two first cam followers (*6a, b*) being firmly connected each with a respective one of said vanes (*7a, b*) and being in contact with said first cam disc.

4,785,943

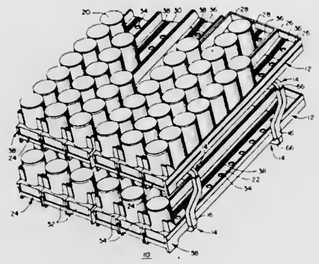
EXPANDABLE STORAGE AND DISPENSING SYSTEM

John F. Deffner, Lisle, and Jack H. Michaelis, Hoffman Estates, both of Ill., assignors to Visual Marketing, Inc., Chicago, Ill.

Filed Dec. 9, 1986, Ser. No. 939,741

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—59.2 **10 Claims**



1. A rack for storing and dispensing articles comprising:

a plurality of discrete tray modules, each tray module having a top side for storing and dispensing articles, and a bottom side;

a connector receiving means attached to the bottom side of each tray module; and

a connector means for joining a plurality of the discrete tray module in a side-by-side relationship to form a rack, the connector means including a first connecting member adapted to pass through a first side of a first connector receiving means to a second side of the first connector receiving means, a second connecting member adapted to pass through the second side of the first connector receiving means to the first side of the first connector receiving means, and means for preventing relative motion between the tray modules and the first and the second connecting members.

4,785,944

COLLAPSIBLE DISPLAY AND DISPENSING DEVICE

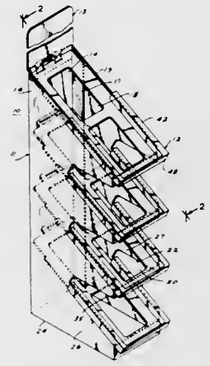
David March, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,385

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—59.2 **15 Claims**

1. A display device comprising a vertical rack collapsible to a lay flat condition and including a vertically extending rear wall and a plurality of vertically spaced pairs of laterally spaced arms hinged to and projecting forwardly from respective opposite edges of said rear wall, the arms of each pair having bottom edges and parallel coplanar track defining forwardly downwardly inclined top edges and a shelf member supported by each pair of said arms in a forwardly downwardly inclined position and including a base section having laterally spaced side edges and downwardly open channel sections extending along said side edges and longitudinally slidably embracing respective tracks of a respective pair of arms, and coupling means interconnecting said shelves and said rack to restrict the longitudinal movement of said shelf member, said arm bottom edges being spaced above the directly underlying shelf member.



4,785,945

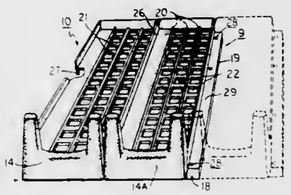
ASSEMBLY OF VARIABLE-WIDTH GRAVITY-FEED BEVERAGE-CONTAINER DISPENSER ARRAY FROM SINGLE-LANE COMPONENTS

Samuel B. Rowse, Brookline, and Robert Y. Grant, Mason, both of N.H., assignors to New England Apple Products Co., Inc., Littleton, Mass.

Filed Jun. 18, 1987, Ser. No. 64,218

Int. Cl.[4] A47F *1/00*

U.S. Cl. 211—59.2 **3 Claims**



1. A shelf module for assembly with at least one like module to form a wider selectable-width shelf on which at least one row of beverage containers may be arranged to slide under influence of gravity to a front of said shelf module for removal therefrom when said shelf is mounted on a rack with a forward incline, comprising a relatively long and narrow one-piece molded-plastic modular element having a substantially flat floor with a plurality of openings therethrough and an elongated guide wall of relatively-low height upstanding in relations to and integral with said floor extending substantially without interruption directly along one elongated marginal side edge of said modular element, the opposite parallel marginal side edge of said element being free of an upstanding wall and not extending substantially above the level of said floor, said floor having parallel rails of lower height than said guide wall extending substantially fully longitudinally therealong parallel with said guide wall and forming therewith a relatively long and narrow lane adapted to have beverage containers slide forward in said lane under influence of gravity when said lane has said forward incline, a front wall extending upwardly at the forward end of said lane and serving as a stop to limit sliding movements of beverage containers in said lane, said modular element having vertically-extending side surfaces alongside both of said marginal side edges disposed to abut with vertically-extending side surfaces of other like modular elements when they are fitted in substantially contiguous side-by-side relationship, and complementary cooperating interlocking provisions disposed along each of the two sides of said modular element and integral therewith, said interlocking provisions including male and female connector means proportioned and arranged for those along each of the two sides of the modular element to engage and hold firmly with like connectors along the sides of other substantially identical modular elements fitted therewith by way of vertical relative motion between the modular elements which brings said side surfaces into said side-byside relationship, whereby shelving of desired width may be assembled by vertically fitting said modular element with others like it in a laterally-interlocked rigid composite structure by way of said interlocking provisions and without use of auxiliary fasteners.

4,785,946

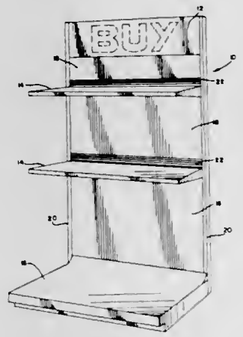
GONDOLA MERCHANDISING DISPLAY SYSTEM

Gerald R. Sorensen, Elgin, Ill., assignor to National Creative Merchandising Corp., Arlington Heights, Ill.

Filed Oct. 3, 1986, Ser. No. 915,242

Int. Cl.[4] A47F *5/00*

U.S. Cl. 211—187 **11 Claims**



1. A structural member for merchandising displays, the displays having a plurality of interlocking and engaging gondola shelving display components, comprising:

an elongated component support extrusion for suspending display components, the support extrusion including a single column of vertically stacked generally L-shaped longitudinal channels for receiving portions of display components, the component support extrusion having L-shaped channels opening to one side of said extrusion and L-shaped channels opening to an other side of said extrusion,

the elongated component support extrusion having a plurality of vertically aligned notches on the one side and the other side of the extrusion, said notches for receiving portions of other differently configured extrusions.

4,785,947

MARKER CADDY

Frederick M. Avery, 3502 E. Cochise Rd., Phoenix, Ariz. 85028

Continuation-in-part of Ser. No. 899,129, Aug. 22, 1986. This application Jan. 28, 1987, Ser. No. 7,924

Int. Cl.[4] A47F *7/00*

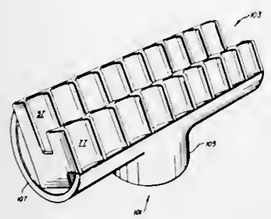
U.S. Cl. 211—695 **8 Claims**

1. A marker caddy comprising

a rigid body;

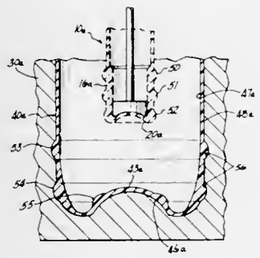
VOL 1096 ISS 4 NO 22 1988 UMI

a well extending into said body;
a first arcuate indentation in said body adjacent to and extending above the top of said well;
a second arcuate indentation integral with said body substantially aligned with, displaced from and extending above the top of said well opposite said first arcuate indentation,



the distance between the opposed extremity of said first indentation and said second indentation being greater than the diameter of the top of said well so as to provide a shelf adjacent to the top of said well; and
support means for holding said body at a preselected inclined angle relative to said support means.

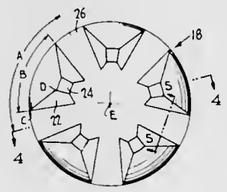
4,785,948
BLOW MOLDED PLASTIC CONTAINER HAVING A REINFORCED WALL STRUCTURE AND PREFORM THEREFOR
Herbert Strassheimer, 9722 Wild Oak Dr., Windermere, Fla. 32786
Continuation-in-part of Ser. No. 10,459, Feb. 3, 1987, abandoned. This application May 1, 1987, Ser. No. 44,469
Int. Cl.⁴ B65D *1/02, 23/00, 1/42*
U.S. Cl. 215—1 C **19 Claims**



7. A plastic preform for forming blow molded plastic bottles which comprises: a neck portion defining an opening; a tubular body portion depending therefrom; and an integral bottom structure depending from the tubular body portion; said preform having an outside wall face and an inside wall face, with at least one of the inside wall face and the outside wall face of the tubular body portion adjacent the bottom structure and extending into said bottom structure having a plurality of flat faces, including at least one continuous, thickened portion in discrete locations on the outside wall face adjacent the bottom structure extending completely around the circumference of said outside wall face.

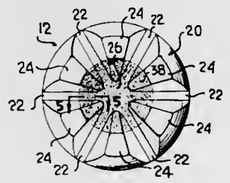
16. A blow molded plastic container comprising: a neck portion defining an opening; a bottom portion; a tubular body portion interconnecting said neck and bottom portions, said bottom portion having an internal, axially inwardly directed conical part; said container having an inside wall face and an outside wall, with the inside wall face of said tubular body portion adjacent said bottom portion and extending onto said bottom portion having circumferentially spaced, radially extending, continuous alterations in wall thickness with a regularly undulating cross-section across the entire circumference of the inside wall face wherein said alterations in wall thickness are progressive and gradual, including at least one continuous, thickened portion at discrete locations on at least one of the inside and outside wall face adjacent the bottom portion extending completely circumferentially around the periphery thereof.

4,785,949
BASE CONFIGURATION FOR AN INTERNALLY PRESSURIZED CONTAINER
Suppayan M. Krishnakumar, Nashua; Wayne N. Collette, Merrimack, both of N.H., and Bryan H. Miller, Florence, Ky., assignors to Continental PET Technologies, Inc., Norwalk, Conn.
Filed Dec. 11, 1987, Ser. No. 131,467
Int. Cl.⁴ B65D *1/02*
U.S. Cl. 215—1 C **12 Claims**



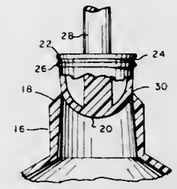
1. A base configuration for an internally pressurized container, said base configuration being generally circular in outline and comprising a maximum of five radiating legs each terminating in a foot recessed radially inwardly of the circular outline of said base configuration, and said legs being separated by a radially extending rib, said base configuration being improved by said legs and feet being generally of the same outline of ribs and legs in a base configuration having six legs and feet and said ribs being of a greater width than like ribs in a base configuration having six legs and feet.

4,785,950
PLASTIC BOTTLE BASE REINFORCEMENT
Bryan H. Miller, Nashua, and Lawrence G. Jerry, Merrimack, both of N.H., assignors to Continental PET Technologies, Inc., Norwalk, Conn.
Filed Mar. 12, 1986, Ser. No. 838,816
Int. Cl.⁴ B65D *1/02, 1/42, 23/00*
U.S. Cl. 215—1 C **10 Claims**



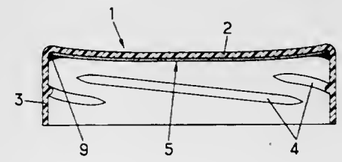
1. A blow molded plastic container for packaging products under pressure, said container having a base including generally hemispherical portions disposed in circumferential alternating relation with projecting feet defining portions, said base having a roughened external surface defining means for effecting dispersal of surface energy due to internal pressures.

4,785,951
CONTAINER WITH RESEALABLE CAP
Robert Bennett, 170 Sturbridge Rd., Easton, Conn. 06425
Filed Feb. 8, 1988, Ser. No. 153,009
Int. Cl.⁴ B65D *17/28*
U.S. Cl. 215—32 **5 Claims**



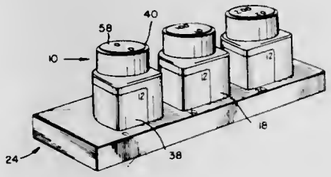
1. In combination with a container having a neck with a flexible open end having a circular chamfered edge, a cap comprising:
a first hollow member having an upper end, a vertical axis and a downwardly extending curved outer surface, said first member having a cross section which, as viewed in any horizontal plane which includes any point disposed on the vertical axis, defines a circle, said first member having a circular horizontal groove in the outer periphery of the first member adjacent its upper end; and
a second vertical member aligned with said axis, the second member being secured in the first member and having an upper end disposed above the first member;
a lower portion of the outer curved surface of the first member being initially disposed in the opening in said neck with the groove spaced outwardly from the opening in the neck and said edge peripherally engaging the first member and forming a first seal therewith;
when said first seal is broken, said first member can be removed from the neck and then can be resinserted into the opening in the neck to a depth at which said edge peripherally engages said groove to form a second seal therewith.

4,785,952
THERMOPLASTIC CAP WITH INTERNAL OXYGEN IMPERVIOUS SHEET AND PLASTISOL RING SEAL
Jacques Obadia, Paris, France, assignor to RICAL S.A., Longvic, France
Filed Feb. 16, 1988, Ser. No. 156,442
Claims priority, application France, Feb. 19, 1987, 87 02163
Int. Cl.⁴ B65D *53/00*
U.S. Cl. 215—329 **5 Claims**



1. Leakproof screw stopper device for receptacles such as bottles and jars containing products which must be kept protected from oxygen, comprising a cup-shaped cap with a bottom and a skirt with an internal thread, the bottom of the cap having, in the vicinity of its connection to the skirt, a ring seal intended to function together with the edge of the mouth or neck of the receptacle and consisting of a plastisol cast in the liquid state and gelled, characterized in that the cap (1) is made of an oxygen-permeable, injection-moulded thermoplastic, that the bottom (2) of the cap is covered internally with an oxygen-impervious composite sheet (5) comprising a layer of paper (6) and a layer (8) of PVC and adhering to the bottom because of the injection of the cap onto the said sheet, on the paper side, and that the plastisol seal (9) is cast on the said composite sheet (5) on the PVC side so as to adhere to the PVC layer (8) after gelling.

4,785,953
REAGENT CONTAINER
John F. Buchholz, Boston; Robert S. Potts, Sherborn, and Henry J. Rahn, Sharon, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.
Filed Sep. 9, 1983, Ser. No. 531,159
Int. Cl.⁴ B01L *3/00*
U.S. Cl. 215—365 **14 Claims**



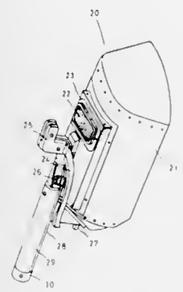
1. A method for holding a container in a single predetermined orientation comprising the steps of:
providing a container which includes a body having an external surface a portion of which has an asymmetric perimeter which has mirror symmetry about at most one axis, said perimeter lying in a plane substantially parallel to the base of the container; and
providing means for holding the container which includes an aperture for receiving the container, said aperture having (1) a perimeter of essentially the same shape as the perimeter of the asymmetric portion of the external surface of the container, and (2) a size such that the container is received in the aperture and releaseably secured thereby such that the asymmetric portion of the container is adjacent to the asymmetric portion of the holding means aperture.

4,785,954
WELDING MASKHOLDER
Edward K. Li, No. 3, Lane 21, Sec. 2 Jong-Iang Road, Tuu Cherng Hsiang, Taipei Hsien, Taiwan
Filed Oct. 22, 1986, Ser. No. 921,614
Int. Cl.⁴ B23K *9/32*
U.S. Cl. 219—147 **3 Claims**

1. A welding head shield and welding rod pliers characterized in that said shield and said pliers can be combined into one unit, and said pliers and said shield can also be separated from each other as discrete units;
said head shield comprising
a shield body with a window opening formation;
a transparent window pane in said window opening formation;
a shield handle operatively connected at said shield body;
a hook seat secured at said shield handle;
a pressure ball seated at said shield handle;
a spring located at said shield handle to bias said pressure ball into a lock position, and said spring being adapted to be compressed to allow release of said pressure ball from the lock position into a neutral position;
a welding rod pliers with a pair of plier jaws for operatively securing a welding rod therebetween, said pliers also including a pliers handle with an engaging groove formation, said pliers also including a lever handle connected at

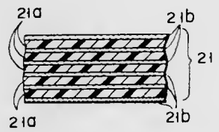
VOL 1096 ISS 4 NO 22 1988 UMI

least at one pliers jaw for actuation of said pliers, and said pliers jaws each having a zigzag profile surface;
a fixed hook at said pliers adapted to be connected at said hook seat for securing said pliers at said head shield;
a fixed ring for securing said shield handle and said plier handle at conterminous ends thereof;
a protective layer on said pliers jaws;
a conductor connected to said jaws;
at least one pivot shaft for said jaws; and
a control mechanism for selectively covering and uncovering said transparent window pane, said control mechanism including
a rod seat secured at said shield handle;
a rod, said rod having a first end and a second end, with said first end being connected at said rod seat; p1 a window control key reciprocatingly movable arranged on said rod and adapted to be moved between a first position in which said window pane is covered and a second position in which said window pane in uncovered;
a plurality of movable balls for guiding said window control key during its movement on said rod;
a pulley connected at the second end of said rod;
at least one colored goggle pane slidingly arranged at said



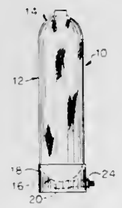
head shield body for covering and uncovering said window pane in said shield body;
a frame connected at said goggle pane, said frame having guide formations for respective slide rods;
a pair of goggle slide rods for guiding said goggle frame when moving said colored pane for covering and uncovering said transparent window pane;
for each slide rod, a spring adapted to bias said goggle frame;
a steel cord connected with one end to said goggle frame and connected with its other end to said control key;
wherein upon said control key being moved along said rod, said steel cord pulling said frame and said colored goggle into the uncovering position along said goggle slide rods against the tension of respective spring at a respective slide rod, said transparent window pane is uncovered and a welder can see the work piece through said transparent window pane under full protection of his eyes and face; and
wherein upon said control key being released, said colored goggle is moved to cover said transparent window pane in response to the action of a respective spring at a respective slide rod, and the welder can see the welding portion and the welding rod flame without being injured by the welding flame.

4,785,955
VACUUM CONTAINER FOR HEAT-VACUUM TEST CHAMBER
Tatsuo Sasaki, Kodaira, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation-in-part of Ser. No. 669,734, Nov. 8, 1984, abandoned, which is a continuation of Ser. No. 533,885, Sep. 20, 1985, abandoned, which is a continuation of Ser. No. 274,289, Jun. 15, 1981, abandoned. This application Jul. 31, 1987, Ser. No. 79,992
Claims priority, application Japan, Jun. 24, 1980, 55-85448
Int. Cl.[4] A47J *41/00*
U.S. Cl. 220—3 **5 Claims**



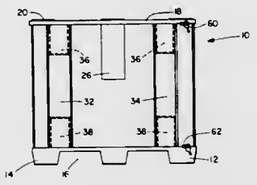
1. A vacuum container which is highly permeable to electromagnetic waves for simulating a thermal environment and a vacuum environment in space of about 10^{-10} Torr, said container comprising walls having;
an inner voidless layer consisting of epoxy resin layers and glass film layers which are alternately laminated;
an outer layer of a thermosetting resin fiber reinforced plastic, the thermosetting resin of said outer layer being different from the epoxy resin of said inner voidless layer;
a core layer disposed between said inner voidless and said outer layers, said core layer consisting of a low gas emission layer of epoxy resin fiber reinforced plastic; and
said inner voidless, outer and core layers being adhered to one another to form a unitary structure.

4,785,956
TANK FITTING FOR A FILAMENT-WOUND VESSEL
Arthur M. Kepler, Atwater; Edward T. LeBreton, Mentor, and Clyde W. Groves, Madison, all of Ohio, assignors to Essef Industries, Inc., Mentor, Ohio
Filed Aug. 23, 1982, Ser. No. 410,417
Int. Cl.[4] B65D *25/14*
U.S. Cl. 220—3 **6 Claims**



1. A filament-wound vessel for containing corrosive and pressurized fluids, comprising a thermoplastic resin inner liner having a cylindrical sidewall and integral, oblate, ellipsoidal end sections, axially aligned access openings at each end of said vessel, one of said openings having a relatively wide diameter compared to the other opening, a tank fitting comprising a fiber-reinforced plastic female member mounted in the wide diameter opening, said tank fitting having a cylindrical end projecting into said wide diameter opening, and a cylindrical neck projecting from said opening, a cylindrical threaded opening through said tank fitting, an annular boss between said cylindrical end and said cylindrical neck and resting on an exteriorly facing annular portion surrounding said wide diameter opening, means fusing and sealing said boss to said exteriorly facing annular portion, said sealing means comprising a substantially uniform mixture of thermoplastic material and ferromagnetic particles, a resin-impregnated, cylindrical fibrous winding covering the axial extent of the cylindrical sidewall, and a resin-impregnated, helical fibrous winding covering the axial extent of the cylindrical sidewall and the end sections, each wrap of said helical winding over said end sections being substantially tangential and covering said annular boss, said helical winding further being wrapped around said neck.

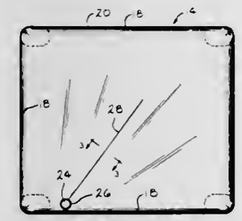
4,785,957
COLLAPSIBLE SHIPPING CONTAINER
James R. Beck, 1665 Paullus Ave., Memphis, Tenn. 38127, and John D. Sunderland, 7207 N.W. Donovan Dr.-Apt. 1623, Kansas City, Mo. 64153
Filed Aug. 19, 1987, Ser. No. 86,885
Int. Cl.[4] B65D *6/16*
U.S. Cl. 220—4 F **12 Claims**



1. A collapsible shipping container, comprising:
(a) base means of generally rectangular form;
(b) wall catch means projecting upwardly from said base means;
(c) a plurality of generally planar wall elements each forming upper and lower pocket means therein, said wall catch means of said base means being received within said lower pocket means to establish interconnected relation between said base means and said wall elements, said wall elements defining vertical external structural rib means, said upper and lower pocket means being defined within respective upper and lower ends of said external structural rib means;
(d) top cover means of generally rectangular form; and
(e) wall catch means depending from said top cover and being received within said upper pocket means to establish interfitting relation between said top cover means and said wall elements.
8. A collapsible shipping container comprising:
(a) base means of generally rectangular form, said base means defining a plurality of upstanding wall catches spaced along the outer edges thereof;
(b) a cover structure of generally rectangular form having a plurality of wall catches depending therefrom;
(c) side wall means forming upwardly and downwardlly directed pockets for receiving respective wall catches of said base means and said cover means; and
(d) in the collapsed condition of said shipping container said wall means being stacked on said base means and said cover means being assembled to said base means, bringing said wall catches into force transmitting structurally interfitting relation, in said collapsed condition said shipping container being of significantly reduced height for conservation of storage and shipping space in the collapsed condition thereof.

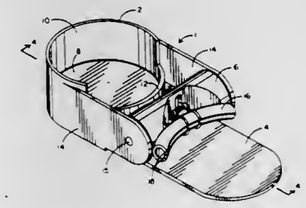
4,785,958
TANK WITH SLOPED BOTTOM
Andrew W. Snyder, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.
Filed Mar. 28, 1988, Ser. No. 174,134
Int. Cl.[4] B65D *87/00*
U.S. Cl. 220—5 A **3 Claims**

1. A portable tank for liquid storage and transport having generally vertical sides and a sloped bottom for complete drainage of fluid from the tank, said bottom having upturned side portions that merge with upwardly extending wall portions terminating in a substantially horizontal upper edge, said bottom comprising:
a generally flat, rectangular bottom plate having a plurality of edges;
a discharge opening through said bottom plate near one of said edges;
a bend in said bottom plate radiating from said discharge opening in a direction extending away from said one edge;



a closed seam connecting said one edge with said opening, said seam formed from a divergent gap in the plate extending from the opening to said one edge, said gap converging at the opening so that when the gap is closed the bottom plate at the opening is moved downwardly to position said opening at the lowest point in said plate whereby liquid in said tank will be caused by gravity to flow into said bend and along said bend to said discharge opening to cause complete drainage of the tank contents without tipping of the tank.

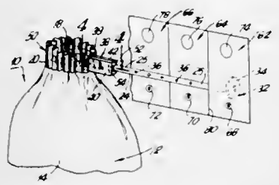
4,785,959
COMBINATION CUP AND PLATE HOLDER
Charles T. Kleiner, P.O. Box 17879, Anaheim, Calif. 92817
Filed Oct. 19, 1987, Ser. No. 111,496
Int. Cl.[4] B65D *21/02*
U.S. Cl. 220—23.83 **20 Claims**



1. A combination cup and plate holder having a supporting frame and comprising:
means located at one end of said supporting frame for receiving a cup;
means located at the opposite end of said supporting frame for receiving a plate; and
means interconnected with said plate receiving means for rotating said plate receiving means between an open position projecting in a direction away from said cup receiving means for receiving a plate thereon and a closed position extending over the top of said cup receiving means for forming a compact arrangement.

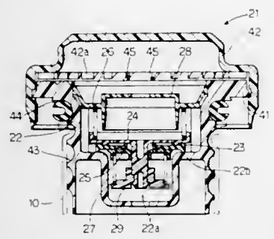
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4,785,960
MAILBOX SECURITY BAG
Brice Belisle, 36 Powers St., Brooklyn, N.Y. 11211
Filed Feb. 5, 1987, Ser. No. 12,784
Int. Cl.[4] B65D *33/16, 91/00*
U.S. Cl. 220—23.83 **16 Claims**



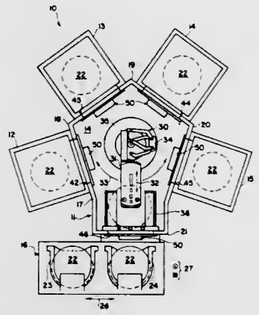
1. A security bag comprising a pouch with an open mouth; a closure member for sealing said mouth of said pouch; a strap extending from said pouch; and an anchor coupled to a distal end of said strap; said anchor being of a size to be locked within a mailbox with said strap extending to an exterior through a slit associated with the mailbox; such that a postman can deliver mail and the like into said pouch, seal said pouch and depend said pouch from the mailbox by means of said anchor locked within the mailbox; said strap extending about said mouth of said pouch to close said pouch; a folded over hem being provided about said mouth of said pouch to provide a sleeve for receiving said strap; and an exit from said sleeve being provided through which said strap passes so that said strap can slide through said sleeve; said strap being secured to said pouch at one point; a first end of said strap being opposite said distal end of said strap; said first end of said strap being secured to said pouch at said hem; said distal end being free, whereby pulling of said distal end gathers said mouth of said pouch to seal said mouth and close said pouch.

4,785,961
CAP WITH VALVE
Joji Kasugai, Ichinomiya; Satoshi Toki, Inazawa; Masayuki Ide, Toyota, and Makoto Miura, Owariasahi, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Filed Dec. 24, 1987, Ser. No. 137,780
Claims priority, application Japan, Dec. 26, 1986, 61-313584
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—203 **4 Claims**



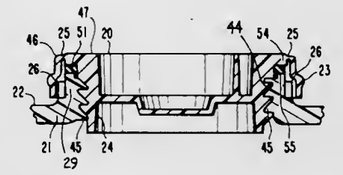
1. A cap with valve comprising:
(a) a cap body installed at an opening portion a container and provided with a fluid flow path and an annular projection projecting inward at an inner circumference of said fluid flow path;
(b) an annular valve body provided with an inner circumferential lip element projecting upward at inner circumferential edge and an outer circumferential lip element projecting downward at outer circumferential edge, said inner circumferential lip element being positioned at inside of the annular projection of the cap body and said outer circumferential lip element being capable of abutting on an upper surface of the annular projection of the cap body;
(c) a first disk-shaped support plate arranged at upper side of said valve body and provided at a lower surface with a seal member of the inner circumferential lip element of the valve body and with a support member supporting the outer circumferential lip element of the valve body from upper side of the valve body and provided with a fluid flowing hole penetrating the upper and lower surfaces between the seal member and the support member;
(d) a first spring means arranged within the fluid flow path of said cap body at upper side of said first support plate and biasing the first supprt plate downward;
(e) a second annular support plate arranged at lower side of the valve body and at inside of the annular projection of the cap body and provided at an upper surface with a support member supporting the inner circumferential lip element of the valve body from lower side of the valve body, and at the center with a fluid flowing hole penetrating the upper and lower surface; and
(f) a second spring means arranged within the fluid flow path of the cap body at lower side of said second support plate and biasing the second support plate upward.

4,785,962
VACUUM CHAMBER SLIT VALVE
Masato Toshima, Campbell, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.
Filed Apr. 20, 1987, Ser. No. 40,287
Int. Cl.[4] B65D *43/14*
U.S. Cl. 220—260 **11 Claims**



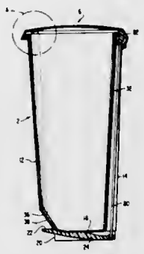
1. A slit valve mechanism for selectively closing an opening in a wall, comprising:
a slit valve body pivotally mounted on the wall adjacent said opening for selectively closing said opening;
means connected to the slit valve body for biasing the slit valve body normally open;
means for closing the slit valve body comprising at least one cam block mounted on the side of the slit valve body opposite said wall and having a camming surface; a swing arm having a cam follower on one end thereof, said swing arm being mounted for pivotal movement in first and second directions for engaging the cam follower against the cam block during movement in the first direction to cam the slit valve body closed and for releasing the camming force during movement in the second direction to permit the biasing means to open the slit valve body; and
actuator means connected to said swing arm for reciprocally pivoting said swing arm.

4,785,963
TAMPER-EVIDENT BUTTRESS PLUG CLOSURE
Robert E. Magley, Auburn, Ind., assignor to Rieke Corporation, Auburn, Ind.
Filed Jan. 11, 1988, Ser. No. 142,510
Int. Cl.[4] B65D *41/34*
U.S. Cl. 220—266 **19 Claims**



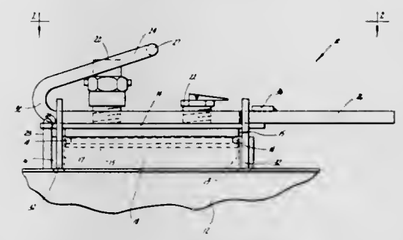
1. A tamper-evident buttress plug closure for use in closing the internally threaded and externally ratcheted outlet of a container comprises:
an externally threaded plug body threadedly engageable with the interior of said outlet and including means for advancing and withdrawing said plug body relative to said outlet;
a one-piece, continuous interlocking ring including a plurality of ratchet teeth engageable with said externally ratcheted outlet; and
a connecting frangible element initially and integrally joining said interlocking ring to said plug body with said plug body received by said outlet and severable upon retrograde movement of said plug relative to said outlet.

4,785,964
STEP-ON WASTEBASKET
David C. Miller, Ridgefield, and Thomas J. Pendleton, Danbury, both of Conn., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 19, 1987, Ser. No. 109,879
Int. Cl.[4] B65D *43/00*
U.S. Cl. 220—263 **13 Claims**



1. A wastebasket, which comprises:
a container having a top opening formed therein;
a lid mounted on the container and adapted to pivot about a pivot axis to cover and uncover the top opening; and
means for actuating pivotal movement of the lid with respect to the container between positions covering and uncovering the top opening, the lid movement actuating means including a generally horizontal operating lever pivotally mounted on the container at a lower portion thereof, means defining a slot mounted on the lid and situated thereon generally at the lid pivot axis, and link means interconnecting the operating lever and slot defining means;
the operating lever having an intermediate portion pivotally mounted on the container, and front and rear portions disposed on opposite sides of the intermediate portion, the front portion including an operating pedal;
the link means being joined to the operating lever at the rear portion thereof and extending upwardly therefrom to the slot defining means, the link means including an upper end portion slidably engageable in the slot, the link means being adapted to be raised and lowered by pivotal movement of the operating lever;
the slot being defined with an elongated channel, and with first and second enlargements situated at opposite ends of the elongated channel and disposed on opposite sides of the pivot axis;
the slot defining means including a ridge protruding inwardly of the slot and situated at the end of the channel near the first enlargement, and defining the channel with a portion which is upwardly turned at an angle toward the second enlargement;
wherein the upper end portion of the link means is received by the first enlarged and guided by the ridge into engagement with the lid flange at the top of the first enlargement when the link means is raised by the operating lever to pivot the lid to the open position, the upper end portion sliding through the channel from the first enlargement to the second enlargement when the lid is in the open position and pressure on the operating pedal is released, and wherein the upper end portion engages the slot defining means at the top of the second enlargement when the link means is raised by the operating lever to pivot the lid to the closed position, the upper end portion sliding through the channel from the second enlargement to the first enlargement when the lid is in the closed position and pressure on the operating pedal is released.

4,785,965
APPARATUS FOR STORING PRESSURIZED MATERIALS
Larry D. Thomas, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.
Filed Jul. 20, 1987, Ser. No. 75,423
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—316 **8 Claims**

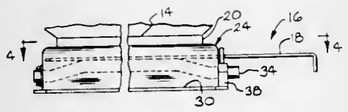


1. Apparatus for containing material under pressure comprising:
a tank for said material, said tank having a tubular neck at its upper end providing an opening to receive said material;
a lid operable to close the opening and having an extension extending downwardly in said neck in sealing engagement therewith to thereby enable said tank to be pressurized;
retaining means removably mounted on said tank directly above and adjacent said lid for engagement with said lid to prevent removal of the lid when said tank is pressurized; and
coacting means on said tank and said retaining means operable to prevent movement of said retaining means when said tank is pressurized, said coacting means being opera-

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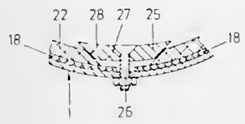
ble by upward movement of said lid while maintaining said sealing engagement of said lid with said neck.

4,785,966
SLIDE GATE ASSEMBLY
David L. Waltke, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.
Filed Nov. 5, 1987, Ser. No. 117,281
Int. Cl.[4] B67D *5/60*
U.S. Cl. 220—345 **6 Claims**



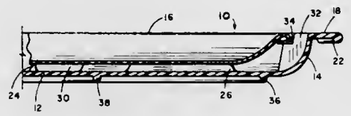
1. In a container for bulk material having a bottom discharge terminating in a downwardly extending discharge passage member, a closure assembly for said discharge passage member comprising:
a slide gate slidably supported at a position below said discharge passage member;
seal means between said discharge passage member and said slide gate having an inwardly and downwardly protruding lip yieldably engageable with said slide gate to form a fluid tight passage between said container and said slide gate when said slide gate is in a first upper closed position engaged with said seal means and second slide position located below said first position;
means for movably supporting said slide gate for movement of said slide gate between said first and second positions and a third open position to one side of said discharge passage member allowing material discharge therethrough; and
actuating means engageable with said slide gate for urging said slide gate into firm engagement against said seal means when said slide gate is in said first position.

4,785,967
LINER FOR A MIXER CONTAINER
Werner Christen, Mannheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany
Filed Feb. 4, 1986, Ser. No. 825,873
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1985, 3503896
Int. Cl.[4] B65D *90/04*
U.S. Cl. 220—400 **5 Claims**



1. A mixer for continuous mixing of solids with liquids, tending to adhere, comprising:
a hollow cylindrical container with an inner wall, having a substantially horizontal axis and an inlet end and an outlet end, said container being driven during operation so as to rotate about said horizontal axis;
said container having an inlet opening at said inlet end and an outlet opening at said outlet end;
said inner wall being provided with a plurality of lifting strips extending substantially along the axial length and parallel to the axis of the container, said lifting strips each having a lifting arm extending approximately radially into the container and a securing arm being disposed approximately parallel to the inner wall, and said lifting strips each extending from an upstream end near said inlet end to a downstream end near said outlet end;
each said securing arm being secured to the wall of the container by a plurality of bolts distributed along the length of each securing arm;
the inner wall of the container being provided with substantially rectangular plates of a liner, said plates having side edges located beneath the securing arms of the lifting strips extending near to the bolts and being secured to the inner wall of the container by the securing arms of the lifting strips with the plates forming a free space betwen adjacent edges of adjacent plates, with said bolts extending through the free space and the free space being covered by the securing arms;
an upstream plate-like tension ring extending along and covering said inner wall from said inlet end to said upstream end of said lifting strips, and a downstream plate-like tension ring extending along and covering said inner wall from said downstream end of said lifting strips to said outlet end, said plate-like tension rings covering the free spaces between adjacent plates and parts of the inner wall not covered by said rectangular plates, said tension rings pressing said rectangular plates against the inner wall of the container adjacent the ends of the container; and
said rectangular plates and said plate-like tension rings consisting of plastic material, preventing adhesion of solids with liquids.

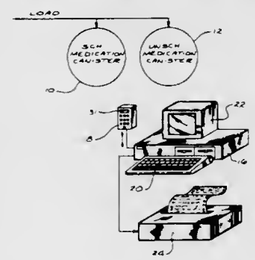
4,785,968
SERVING PLATTER FOR PIZZA PAN
Eugene T. Logan; Richard A. Barlow, and James E. Logan, all of Salina, Kans., assignors to Logan-Barlow, Inc., Saline, Kans.
Filed Apr. 20, 1987, Ser. No. 40,057
Int. Cl.[4] A47J *37/01*
U.S. Cl. 220—410 **13 Claims**



1. A serving platter for circular pizza pans comprising,
a dish shaped member with an upwardly and outwardly curved rim from a flat bottom having inside and outside surfaces to a top edge, diametric opposite outer rim handles extending outward of said top edge of said dish shaped member,
a plurality of circumferentially spaced radial risers extending upwardly from said inside bottom surface
a plurality of circumferentially spaced radial ribs around the inner periphery of said rim, an indented ledge in each of said radial ribs to support the outer periphery of said pizza pan away from said inner periphery of said rim, and
a plurality of concentric support rings extending below the outside of said bottom surface.

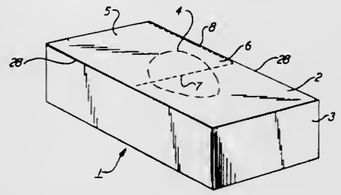
4,785,969
MEDICATION DISPENSING SYSTEM
John T. McLaughlin, Costa Mesa, Calif., assignor to Pyxis Corporation, Newport Beach, Calif.
Filed Nov. 10, 1986, Ser. No. 928,809
Int. Cl.[4] B65D *83/04*
U.S. Cl. 221—2 **37 Claims**

1. A medication dispensing system, comprising:
a first medication canister for receiving at least one scheduled medication for administration to a patient in accordance with a prescribed time schedule;
a second medication canister for receiving at least one unscheduled medication for administration to the patient on an as needed basis;
a dispensing unit for individual association with the patient and including housing means for locked reception of said first and second canisters to prevent unauthorized removal of said canisters from said unit;
first accesss means for restricting access to the at least one scheduled medication within said first canister to authorized personnel and further to predetermined medication doses during time windows of selected duration at intervals in accordance with said prescribed time schedule;



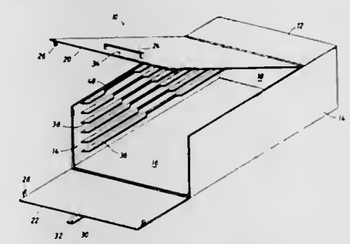
second access means for restricting access to at least one unscheduled medication within said second canister to said authorized personnel on an as needed basis by the patient; and
means for detecting removal of medications from said first and second canisters and for creating a record thereof;
said first canister including a plurality of cassettes containing said at least one scheduled medication, said first access means restricting access to said cassettes for removal from said first canister one at a time by said authorized personnel, and said detecting means sensing such cassette removal.

4,785,970
TISSUE PACK
Gerhard Engelmayer, Baden, Austria, assignor to Pakotex Hygiene-Papier Vertriebsgesellschaft m.b.H., Vienna, Austria
Filed Dec. 1, 1986, Ser. No. 936,414
Claims priority, application Austria, Dec. 4, 1985, A3521/85
Int. Cl.[4] A47K *10/42;* **B65H** *1/04*
U.S. Cl. 221—47 **17 Claims**



1. A paper handkerchief pack comprising:
a stack of folded handkerchiefs;
a foil envelope enclosing said stack of folded handkerchiefs on all sides and having broad top and bottom surfaces, said foil envelope having a line of weakness for forming a dispenser opening upon tearing, said line appearing only on the broad top surface of said foil envelope;
each of said handkerchiefs (3) of said stack having a fold whereby a corner (6) at the outside of folded handkerchief (3) lies free with two edges (7, 8) extending from it, one edge (7) of these two edges (7, 8) lying approximately in the middle of the longitudinal extent of the surface of the folded handkerchief from one longitudinal edge thereof to the other longitudinal edge thereof and the other edge (8) of these two edges (7, 8) running along a longitudinal edge of the folded handkerchief, the fold being a Z-shaped preliminary fold (10), the fold lines (11, 12) of which run parallel to each other and parallel to an edge (15) of the handkerchief;
said preliminary fold (10) being folded around a fold line (16) extending through the midst of the preliminary fold and perpendicularly to said fold lines (11, 12) of the preliminary fold, which creates two halves of the preliminary fold one laid upon the other, said two halves of the preliminary fold being folded together around a pair of fold lines (17) both extending through the midst of said two halves perpendicularly to said fold lines (11,12) of said preliminary fold; and
said line of weakness (4) defining a geometrical surface figure extending over the middle of said broad upper surface (5) of the foil envelope, said geometrical figure being generally centered in the middle of the broad upper surface (5) of the foil envelope (2).

4,785,971
BAG STORAGE AND DISPENSING APPARATUS
Michael A. Konarik, St. Rte. 1, Box 16, Ganado, Tex. 77962
Filed May 6, 1985, Ser. No. 731,455
Int. Cl.[4] B65G *59/00*
U.S. Cl. 221—312 R **28 Claims**



13. Apparatus for storing and dispensing bags, comprising:
a. a container having a cavity and including two substantially opposed interior surfaces defining said cavity in part;
b. access means to said cavity;
c. a plurality of pairs of mutually opposed longitudinal members disposed along said two interior surfaces and defining, at least in part, parallel opposed compartments along said surfaces whereby bags may be positioned within said cavity and retained by means of said members, and may be selectively removed from said container; and
d. a slide which may be disposed within said container, extending into one said pair of opposed compartments to cooperate with said members for so retaining bags by holding such bags against at least one of the container, another slide or a pair of said opposed members.

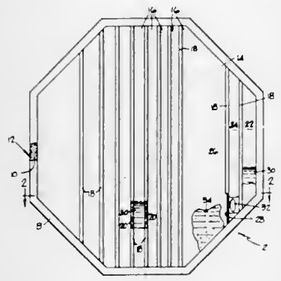
4,785,972
PRESSURE GENERATING SYSTEM FOR A DISPOSABLE CONTAINER
Paul H. LeFevre, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.
Filed Jul. 14, 1987, Ser. No. 73,756
Int. Cl.[4] B65D *83/14*
U.S. Cl. 222—1 **36 Claims**

1. A self-generating gas pressure apparatus for placement within a container from which a fluid in the container is to be dispensed under pressure exerted on the fluid by the gas pressure apparatus and wherein said gas pressure apparatus comprises a closed expandable vessel having a plurality of individ-

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ual compartments formed by respective pressure-rupturable seal means therebetween, said compartments containing respective chemical compounds which when mixed upon the rupture of respective interfacing seal means produce a gas, and wherein at least two adjacent compartments respectively contain a first chemical compound aqueous solution and a second chemical compound aqueous solution which, when mixed upon the rupture of the seal means between said adjacent compartments, react with each other to produce a gas, and wherein an insoluble nucleating agent is included with at least one of the first and second chemical compound aqueous solutions.

31. A method for producing gas in a gas pressure generation apparatus for placement within a container from which a fluid



in the container is to be dispensed under pressure exerted by the apparatus, wherein the apparatus comprises a closed expandable vessel having a plurality of individual compartments formed by pressure-rupturable seal means therebetween, the method comprising:

(a) placing a first chemical compound and a nucleating agent in a first compartment, and placing a second chemical compound in a second compartment disposed adjacent the first compartment, with said first and second chemical compounds reactable with each other when mixed to produce a gas; and

(b) causing the rupture of the seal means between the first and second compartments to thereby mix the first and second chemical compounds and produce gas.

4,785,973

ATTACHMENT FOR USE IN LIQUID FILLING CONTAINERS

Susumu Kobe, Tokyo, Japan, assignor to The Coca-Cola Company, Atlanta, Ga.

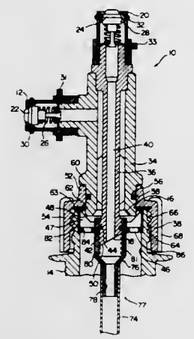
Filed Sep. 4, 1986, Ser. No. 903,502

Claims priority, application Japan, Sep. 4, 1985, 60-193787

Int. Cl.⁴ B67B *7/24*

U.S. Cl. 222—82 **4 Claims**

1. An attachment for use in discharging a liquid from an upright container filled with the liquid having a threaded portion at the neck and an opening at the end of the neck sealed with a thin sealant, said attachment comprising a gas inlet for causing gas to flow into the container through an inflow conduit connected to a gas source, a gas outlet for causing gas to effuse into said container, a fluid inlet for causing a liquid to flow into the attachment from the internal part of the container and a fluid outlet for causing the fluid to effuse into an outflow conduit to which said fluid outlet is connected, the attachment comprising: a first tube, a second tube arranged coaxially relative to the first tube and inside the first tube, and a threaded part supported by the first tube to be screwed onto the threaded portion of the container; the inner part of the second tube being connected to the liquid outlet; one end of the second tube projecting beyond one end of the first tube having a cutting edge to sever said sealant and forming said fluid inlet; an outer diameter of the portion of the second tube projecting beyond said one end of the first tube being larger than that of the portion inboard of said portion of the second tube; an



annular space formed between the first and second tubes communicating with said gas inlet, and said one end of the second tube and outer wall of the first tube forming the gas outlet.

4,785,974

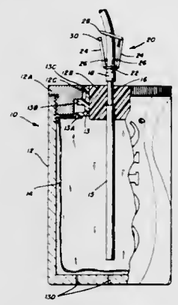
SYSTEM FOR SERVING A PRE-MIX BEVERAGE OR MAKING AND SERVING A POST-MIX BEVERAGE IN THE ZERO GRAVITY CONDITIONS OF OUTER SPACE

Arthur G. Rudick, Marietta; Richard H. Heenan, Atlanta, and William S. Credle, Jr., Stone Mountain, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 26, 1985, Ser. No. 769,464

Int. Cl.⁴ B65D *35/56*

U.S. Cl. 222—105 **26 Claims**



1. A drinking cup for a beverage, said drinking cup comprising:

(a) a substantially rigid container having a removable lid, said removable lid having an opening therein; and

(b) a disposable container insert removably received within said substantially rigid container comprising:

a collapsible bag for containing the beverage having an open end;

a collar adapter connected to said open end of said collapsible bag wherein said collar adapter includes a quick release means for quickly and easily releasably connecting said collar adapter into said opening in said removable lid;

a plug disposed within said collar adapter; and

a drinking tube extending through said plug from outside the drinking cup into said disposable container insert.

4,785,975

MANUALLY ACTUATED PUMP

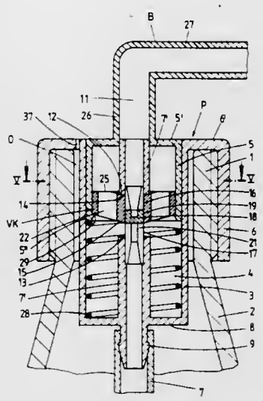
Peter Keller, and Jurgen Koch, both of Juchen-Gierath, Fed. Rep. of Germany, assignors to Bramlage Gesellschaft mit beschrankter Haftung, Lohne, Fed. Rep. of Germany

Filed Jan. 13, 1987, Ser. No. 2,790

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1986, 3600680

Int. Cl.⁴ B67D *5/42*

U.S. Cl. 222—321 **3 Claims**



1. A manually actuated pump that dispenses liquids in measured quantities from the contents of bottles and containers, comprising:

a handle capable of being axially displaced;

a piston connected to the handle and capable of being displaced by the handle;

a cylinder, for slidably receiving said piston, and having a pump space whose volume is capable of being displaced by said piston;

a spring, disposed in said cylinder and in contact with said piston during displacement of said pump space, said spring returning said piston to its position in the cylinder before said piston was displaced by said handle;

a feed tube connected to said cylinder; and

a valve-closing body comprising a perforated disc disposed transverse to said pump space, said perforated disc having an inner hub cavity for sliding engagement with said feed tube, said sliding engagement activated by the piston which moves in said cylinder and said valve-closing body having two valve-closing surfaces for alternately opening and closing passages leading from said cylinder to said feed tube and from said cylinder to a discharge duct, said valve-closing body is driven through friction grip by said piston so that during a displacement of said handle and subsequent volume reduction of said pump space, said valve-closing body is carried along by the movement of said piston into a closing position sealing said feed tube with the first of said valve-closing surfaces and opening said passage leading to said discharge duct, and during the return stroke of said handle and the subsequent volume increase of said pump space, said body moves into a position to seal said discharge duct with the second of said valve-closing surfaces and opens said passage leading to said feed tube, said valve-closing body further including a means for stopping said spring return of said piston in said position in the cylinder before the displacement thereof by said handle.

4,785,976

DISPENSER FOR FLUENT MATERIALS

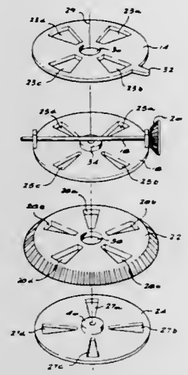
John E. Bennie, Wembly Farm, and Kevin N. A. Cockburn, Dean's Farm, both of Greytown, Natal, South Africa

Continuation-in-part of Ser. No. 774,825, Sep. 11, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 85,838

Claims priority, application South Africa, Sep. 17, 1984, 84/7304

Int. Cl.⁴ G01F *11/10;* **B05B** *1/14;* **A01C** *17/00*

U.S. Cl. 222—370 **7 Claims**



1. A continuous flow dispenser for granular fluent materials, the dispenser comprising:

a. a first, upper plate having a central axis and a plurality of substantially similar first orifices disposed about said axis and communicating in use with a hopper containing fluent material which is to be dispensed, the first orifices being spaced angularly apart at equal circumferential intervals about the central axis;

b. a second, lower plate which is fixed with respect to the first plate and which has a central axis coincident with the central axis of the first plate and which is formed with a plurality of substantially similar second orifices spaced angularly apart at equal circumferential intervals about the central axis, the second orifices being circumferentially out of register with the first orifices so that each of the orifices in the upper plate is opposed by a solid portion of the lower plate; and

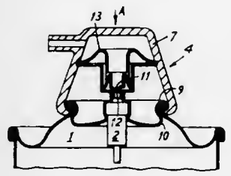
c. an intermediate member which is disposed between and rotatable relative to the first and second plates about a central axis which is coincident with the central axis of the first and second plates and which is formed with a plurality of substantially similar third orifices spaced at equal circumferential intervals apart about the central axis, the number of third orifices being different from the number of first orifices and the number of second orifices and being neither a multiple nor a factor of the number of first orifices or the number of second orifices;

the arrangement of the orifices being such that relative rotation of the intermediate member relative to the first and second plates causes the third orifices to move into and out of register with the first orifices and the second orifices so as to receive material from the first orifices and to dispense that material through the second orifices, and wherein the circumferential extent of the orifices in the plates and in the intermediate member is chosen with respect to the particular granular material to be dispensed such that the circumferential extent of each of the orifices in the upper plate is less than that of the opposed solid portions of the lower plate by an amount at least equal to the quantity 2t/tan r, wherein t is the spacing of the fixed plates and r is the angle of repose of the granular material

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to be dispensed, whereby direct flow of the material from the hopper through the first upper plate, the intermediate member and the lower plate is avoided, and whereby at all times during such relative rotation of said intermediate member in operation of the dispenser, material flow through the second plate is substantially continuous.

4,785,977
AERATED LIQUID STORAGE/DISPENSING APPARATUS
Martin F. Ball, Wantage, Great Britain, assignor to Metal Box Public Ltd. Co., Berkshire, England
Filed Sep. 18, 1986, Ser. No. 908,992
Claims priority, application United Kingdom, Sep. 24, 1985, 8523575
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—399 **8 Claims**



1. Apparatus for storing and dispensing a quantity of aerated liquid for maintaining the carbonation of a beverage in a container in which the extent of aeration is maintained as said quantity is progressively dispensed, said apparatus comprising a vessel containing a source of gas; a valve closing said vessel; a pressure regulator coupling said valve to said container, said regulator being capable of delivering said gas to said container at a substantially constant pressure substantially lower than said pressure under which said gas is kept in said vessel; said regulator comprising a housing, a diaphragm, and means supporting the diaphragm in the housing, said diaphragm having a ratio of the area downstream thereof to the area upstream thereof so that the gas is caused to be delivered to said container at said constant pressure lower than said pressure under which said gas is kept in said vessel and flow control means which permit delivery of said gas to, and dispensing of said liquid from, said container, said vessel being an aerosol can having a closure cup and containing carbon dioxide, and said regulator having a skirt portion arranged for engagement with said closure cup, the arrangement being such that in a transit condition of the apparatus said valve is closed and in an operational condition of the apparatus said skirt portion is engaged with said cup and said pressure regulator engages said valve, thereby causing said valve to be open.

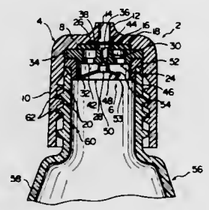
4,785,978
CONTAINER CLOSURE PROVIDED WITH AUTOMATIC OPENING-CLOSING MECHANISM
Yuji Kano; Tsurusaburo Okamura, both of Chigasaki; Seiji Fukushi, Hiratsuka, and Fumio Kinoshita, Niiza, all of Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan
Filed Feb. 23, 1988, Ser. No. 159,159
Claims priority, application Japan, Mar. 2, 1987, 62-45354
Int. Cl.[4] B05B *11/04*
U.S. Cl. 222—482 **11 Claims**

1. A closure adapted to be applied to the mouth-neck portion of a container for holding a liquid at least a body portion of which can be elastically pressed out of shape,

said closure comprising an automatic opening-closing mechanism to be mounted on the mouth-neck portion of the container and an outside closure member covering the automatic opening-closing mechanism and having a pour opening,

said automatic opening-closing mechanism comprising a plug member having a centrally formed air introduction hole and a plurality of liquid discharge ports formed around the air introduction hole, a first valve member for opening and closing the liquid discharge ports and a second valve member for opening and closing the air introduction hole,

said first valve member being formed of a flexible material and annular in shape and disposed over the plug member, and said first valve member being adapted to normally close the liquid discharge ports but when the pressure in the container is increased as a result of its body portion



being pressed out of shape, to be elastically bent at its inside circumferential edge portion and to open the liquid discharge ports, and

said second valve member having a base portion and a central valve portion connected to the base portion via an elastically bendable linking portion and disposed beneath the plug member, and said second valve member being adapted to normally close the air introduction hole by its central valve portion, but when the body portion of the container elastically returns to its original shape from its pressed state and a negative pressure is created in the container, to be elastically bent at its linking portion thereby displacing the central valve portion and thus to open the air introduction hole.

4,785,979
FLOW CONTROL NOZZLE FOR BOTTOM-POUR LADLES
John M. Svoboda, Arlington Heights, and Raymond W. Monroe, Prospect Heights, both of Ill., assignors to Casteel Technology Associates, Ltd., Des Plaines, Ill.
Filed Jul. 28, 1987, Ser. No. 78,782
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—591 **5 Claims**



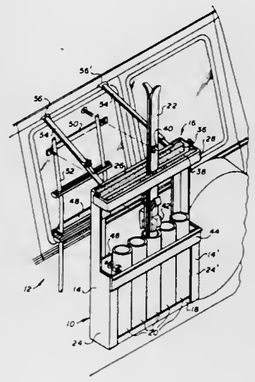
1. A flow control nozzle for bottom-pour ladles to control the flow of liquid steel from the ladel to a steel casting mold, said ladle being formed of a steel shell having a refractory lining, an aperture at the bottom of the ladle for receiving and positioning therein the nozzle and a stopper-rod coupled to said ladle, said nozzle comprising:

a castellated entrance positioned in the aperture of the ladle wherein the top of the castellated entrance is flush with the inner surface of the ladle, said castellated entrance being suitable for receiving the stopper-rod to inhibit the flow of liquid steel through the nozzle;

a cruciform shaped exit positioned outside of the ladle; and

a tapered path positioned between and separating the castellated entrance and the cruciform exit.

4,785,980
SKI CARRIER
Ronald L. Redick, 18033 N. Shore Estates, Spring Lake, Mich. 49456
Filed Mar. 16, 1987, Ser. No. 26,146
Int. Cl.[4] B60R *9/06*
U.S. Cl. 224—42.03 A **7 Claims**



1. A carrier for skis and the like, comprising:

a frame comprising spaced vertical side frame members, a lower frame member extending horizontally between the lower ends of said side frame members, and an upper frame member extending horizontally between the upper ends of said side frame members, said upper frame member including locking means to releasably secure skis to said upper frame member;

a plurality of elongated tubes mounted between said side frame members, under said locking means; and

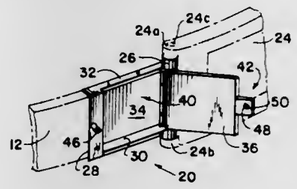
a pair of intermediate frame members extending between said side frame members, positioned below said upper frame member and above said lower frame member, said tubes being retained in the carrier by an interference fit between said intermediate frame members;

mounting means for releasably mounting said carrier on a vehicle;

whereby skis can be placed in said elongated tubes and held in said carrier by said locking means.

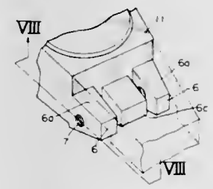
4,785,981
JEWELRY ARMBAND WITH INVISIBLE STORAGE COMPARTMENT
Harry Rodman, 2500 Johnson Ave., New York, N.Y. 10463
Filed Dec. 29, 1986, Ser. No. 946,941
Int. Cl.[4] A44C *11/00*
U.S. Cl. 224—165 **12 Claims**

1. A jewelry band to be worn around the arm generally defining oppositely facing external and internal surfaces, said external surface facing outwardly and being accessible and visible when the band is worn around the arm, and abutting against the arm when worn, the band including at least one receptacle disposed along the length of the band, said receptacle having a door mounted for movement between an open condition for exposing the interior of said receptacle in the direction of said external surface, and a closed condition for concealing the interior of said receptacle and preventing any item placed with said receptacle from falling out; and locking means for selectively locking said door in said closed condition and for releasing said door for movement to said open condition; the band comprising a watch band having opposing ends



attachable to a watch, said at least one receptacle being disposed at one end of said watch band and being provided with connecting means for connecting said at least one receptacle to a watch, said at least one receptacle being provided with pin receiving means for receiving a pin extending between opposing lugs of a watch, said door being mounted on said pin between said opposing lugs.

4,785,982
WATCH CASE AND BAND ATTACHMENT STRUCTURE
Michihiro Iwamura, Sayama; Eiichi Kitabayashi; Masataka Matsumoto, both of Tokorozawa; Toshio Murata, Higashikurume; Tadao Enomoto, Higashimurayama, and Junichi Nishikawa, Higashikurume, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1987, Ser. No. 11,038
Claims priority, application Japan, Feb. 21, 1986, 61-37050; Jul. 25, 1986, 61-114155[U]
Int. Cl.[4] A44C *5/14*
U.S. Cl. 224—177 **1 Claim**



1. A structure comprising:

a watch case having front and back surfaces and at least two sides;

a pair of lugs each extending from one of said sides of said watch case and being provided with a threaded hole and having a top surface which is lower in position than said front surface of said watch case;

a band having a top side and an underside;

a pair of cone point screws;

a connector secured to the underside of an end portion of said band, said connector being bent into a U-shape to define a base wall and a pair of side walls and being secured in a direction of a width of the band, with said side walls extending downwardly as viewed from said top side of said band, said side walls being provided with a pair of attachment openings, said band being closely attached to the watch case by placing said end portion of the band on the top of the surfaces of the lugs and tightening the cone point screws respectively into the threaded holes of the

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side lugs so that the cone points engage with the pair of engagement openings provided in said connector; and

a bending preventing member provided between said pair of said walls of said connector for preventing said side walls from being bent by force exerted from said cone point screws towards the inside, said bending preventing member comprising an extension extending from said watch case between said pair of lugs having a top surface in a lower position than the top surface of said pair of lugs, said extension supporting said base wall and also supporting said pair of side walls with a fixed base between said side walls.

4,785,983

UNIVERSAL HOLSTER

Eugene DeSantis, 149 Denton Ave., New Hyde Park, N.Y. 11040

Continuation of Ser. No. 943,062, Dec. 18, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,956

Int. Cl.[4] A45F *5/00*

U.S. Cl. 224—206 **20 Claims**



1. A universal holster for carrying a handgun and adapted to be worn in any of a plurality of substantially concealed positions, the holster comprising a holster body providing a pocket for receiving a handgun therein, said pocket comprising a muzzle enclosing portion, trigger enclosing portion and a hammer encircling portion, each of said portions provided with an adjacent associated quick release fastener means for connection to one or more holster supporting elements; said holster body further comprising an elongated slot adapted to receive a belt, said slot and each of said quick release fastener means being located peripherally outside said pocket to facilitate connection and disconnection of the holster to the one or more holster supporting elements.

4,785,984

ATHLETIC RADIO HOLDER

Kimberly Seitz-Gangemi, 40 Whaler La., North Quincy, Mass. 02171

Filed May 20, 1987, Ser. No. 51,779

Int. Cl.[4] A45F *3/04*

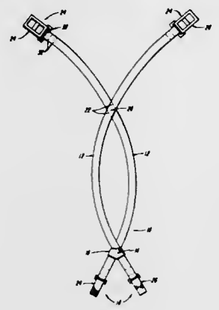
U.S. Cl. 224—259 **8 Claims**

1. A device for carrying an article such as a radio while walking, jogging, cycling or the like, the combination comprising,

said article,

an elasticized harness constructed and arranged to be worn under tension on the upper torso of a person so that a portion of said harness will press against a person's back, said harness comprising a pair of elasticized members of equal length, said elasticized members attached in diagonal relation so as to overlap along a region defining said portion of said harness, and

means carried by said portion for attaching said article to said portion, said attachment means constructed and arranged such that said article when attached may be positioned between said portion and a person's back and whereby said harness and attachment means are further constructed and arranged such that said article may be





held in place by the combined action of said tension and said attachment means.

4,785,985

APPARATUS FOR CONTACTLESS GUIDING OF WEBS OF MATERIAL, IN PARTICULAR, METAL STRIPS, BY MEANS OF A GAS MEDIUM

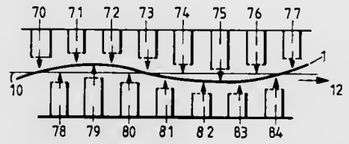
Johann Hürtgen, Nideggen-Schmidt, Fed. Rep. of Germany, assignor to Otto Junker GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 829,775, Feb. 13, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 111,101

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1985, 3505256

Int. Cl.[4] B65H *20/14*

U.S. Cl. 226—97 **6 Claims**



1. Apparatus for contactless, wave form-guiding of a relatively stiff metal strip by means of a gas medium, comprising:

a plurality of nozzle boxes disposed above and below and spaced apart from the metal strip, each of said nozzle boxes having a nozzle outlet plane; and

a plurality of gas discharge channels, one said channel being disposed between adjacent pairs of said nozzle boxes;

wherein said nozzle outlet planes are vertically spaced from a substantially horizontal plane corresponding to the direction of transport of the metal strip by distances which vary individually, the positions of said nozzle outlets planes being vertically adjustable to adapt to the wave form; and

wherein each wave trough and each wave crest of the wave form faces and is formed by at least two adjacent nozzle boxes on each side of the metal strip which face their respective wave trough or wave crest and discharge gas against one surface of their respective wave trough or wave crest.

4,785,986

PAPER WEB HANDLING APPARATUS HAVING IMPROVED AIR BAR WITH DIMENSIONAL OPTIMIZATION

Robert A. Daane, and Roy E. Downham, both of Green Bay, Wis., assignors to Advance Systems, Inc., Oneida, Wis.

Filed Jun. 11, 1987, Ser. No. 61,328

Int. Cl.[4] B65H *20/14;* **F26B** *13/20*

U.S. Cl. 226—97 **6 Claims**



3. Web drying apparatus for floatingly suspending a running web while being dried, including an elongated dryer housing through which the web passes, and air bars in said housing and located in spaced apart relationship along each of the upper and lower sides of the web and transversely across said web, the upper bars being in staggered spaced relationship along said web with respect to the lower air bars to thereby result in a sine wave form of the running web, said bars being spaced apart a distance of about twelve to fifteen inches from one another along the upper side of the web and also spaced apart a distance of about twelve to fifteen inches along the lower side of the web, said air bars each having a pair of slot nozzles extending transversely of the web and through which pressurized air is directed against the web for drying and floating thereof, the slot nozzles of an air bar being spaced apart from one another a distance of about three and one-half inches when measured in a direction along the length of the web, said bars including an air distributing member defining an air distributing chamber within said bar and having an outer wall located between said slot nozzles and spaced outwardly therefrom to provide an air pressure supporting surface for a web, said distributing member having a pair of opposed and inclined side walls, one adjacent each of said slot nozzles, said inclined walls having a plurality of holes therethrough and along their length to provide air turbulence for air passing through said holes to said slot nozzles; said distributing member also having a perforated inner plate spaced inwardly from said outer wall and located immediately adjacent the inclined walls and through which perforated inner plate pressurized air passes from the interior of said bar.

4,785,987

HAND-HELD TAG ATTACHER AND METHOD OF ATTACHING TAGS

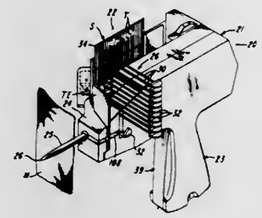
Larry D. Strausburg, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 6,858, Jan. 27, 1987, Pat. No. 4,715,521, which is a division of Ser. No. 654,333, Sep. 25, 1984, Pat. No. 4,673,120. This application Dec. 22, 1987, Ser. No. 136,303

Int. Cl.[4] B65C *7/00;* **A43D** *69/00*

U.S. Cl. 227—67 **3 Claims**

1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fastener having a bar section and a button section joined by a filament section, the attacher comprising: an attacher body, a hopper connected against relative movement to the body during use and adapted to receive a stack of tags, and a handle on the attacher body graspable by the user's one hand, a hollow needle mounted on the attacher body and having an elongate needle bore and an elongate side opening communicating with the needle bore, means for advancing one bar section at a time into alignment with the needle bore, a push rod engageable with a bar section of a fastener for driving the bar section through the needle bore while its filament section extends through the side opening, means for feeding an endmost tag in the hopper from the stack to an attaching position into alignment with the needle, means for making a slit in the tag at the attaching position, wherein the tag feeding means includes a tag feeder, wherein the tag



feeder includes a slide movable between spaced positions, a second needle mounted on the slide and engageable with the endmost tag, and means controlled solely by the user's one hand and operatively connecting the bar section advancing means, the push rod and the tag feeding means for operating the bar section advancing means, the tag feeding means, and the push rod to effect attachment of a tag to merchandise.

4,785,988

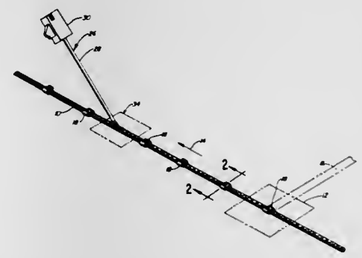
ATTACHMENT OF LEAD TO ELONGATED CONDUCTOR

Edward C. Topel, Worth, and Mario Garritano, Oak Lawn, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Nov. 20, 1986, Ser. No. 927,257

Int. Cl.[4] B23K *31/02, 35/14*

U.S. Cl. 228—122 **5 Claims**



1. The method of attaching a solder button to an elongated, linear conductor, which comprises:

moving the end of a strip of solder in a transverse direction into engagement with said elongated, linear conductor; cutting a mass of solder from the end of said strip of solder; attaching said mass of solder into substantially surrounding and affixed relation with the elongated conductor, said strip of solder containing an internal flux enclosed within the solder of said strip, said cutting step of the mass of solder from the end of the strip of solder being performed to keep a substantial amount of said flux sealed within said solder as the mass of solder is attached to the elongated conductor; moving one of said linear conductor and strip of solder along the axis of said conductor; cutting a second mass of solder from the end of said strip of solder; attaching said second mass of solder into substantially surrounding and affixed relation with the elongated con-

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ductor in such a manner that a substantial amount of said internal flux within the solder of said strip is sealed within said solder as the mass of solder is attached to the elongated connector, said second mass of solder being spaced from the previous mass of solder; and thereafter heat welding the masses of solder attached to said elongated conductor to a pane of glass.

4,785,989

CLAD SYSTEM FOR BRAZING TO ALUMINA

Howard Mizuhara, Hillsborough, and Eugene Huebel, Union City, both of Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 16, 1987, Ser. No. 121,205
Int. Cl.[4] B23K *31/02, 35/22*
U.S. Cl. 228—122 **4 Claims**

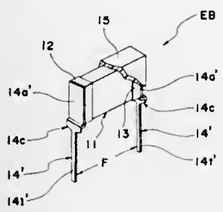
1. The method of bonding alumina to a cushioning metal which is high blushing to an active brazing filler metal comprising the steps of: roll bonding a thin layer of a lower blushing metal to a thicker layer of the cushioning metal and rolling the combination to a predetermined thickness; disposing a thin layer of an active brazing filler metal between the lower blushing metal and the alumina; and melting the active brazing filler metal to bond the alumina to the cushioning metal.

4,785,990

ELECTRONIC COMPONENT WITH LEAD TERMINALS AND METHOD OF MANUFACTURING SAID ELECTRONIC COMPONENT

Kunikazu Nakahara, and Kazuhiro Yasuda, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 29, 1986, Ser. No. 891,557
Claims priority, application Japan, Jul. 31, 1985, 60-170503; Jul. 31, 1985, 60-170506
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—170 **6 Claims**



1. A method of manufacturing an electronic component including lead terminals respectively connected to electrodes formed on opposite end faces of an electronic component element, said method comprising the steps of

preparing a metallic plate having predetermined width and length,

forming a plurality of openings elongated in the widthwise direction of the metallic plate and arranged at equal intervals along a lengthwise direction of said metallic plate,

thereafter, forming a film of a metallic material superior in soldering and oxidation preventing properties over the surface of said metallic plate,

cutting said metallic plate in the widthwise direction through each of said elongated openings so as to form narrow lead plates each having large width portions respectively at opposite ends thereof,

bending each of said lead plates approximately at its central portion into a U-shape so that said large width portions thereof confront each other,

causing said lead plate to be held on a holder member in a tape-like configuration in such a manner that opposite side portions of the bent portion of said lead plate are directed generally at right angles with the longitudinal direction of said holder member, and

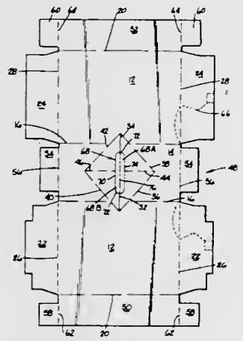
then, inserting the electronic component element between the confronting large width portions of the lead plate so that said large width portions contact said electrodes of said electronic component element for electrical connection.

4,785,991

SLEEVE-TYPE CARRIER WITH IMPROVED HANDLE

Richard L. Schuster, Monroe, La., assignor to Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 794,823, Nov. 1, 1985, abandoned. This application Sep. 22, 1986, Ser. No. 910,040
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 B **23 Claims**



1. A sleeve-type article carrier, comprising:

a top panel;

a bottom panel;

side panels integral with and foldably connected to the top and bottom panels; and

end panels between the top, bottom and side panels;

the top panel containing a handle opening comprising two elongated spaced edges extending transversely of the foldable connections between the side panels and the top panel, each of the elongated spaced edges having an end located relatively near one of the foldable connections and another end located relatively near the other foldable connection, the ends of the elongated spaced edges located relatively near each of the foldable connections being adjacent ends, the handle opening further comprising two short edges connecting the adjacent ends of the elongated edges;

the handle opening being covered by a tab of similar shape to that of the handle opening, the tab being connected to the top panel by a fold line along one of the elongated edges of the handle opening;

the tab containing a fold line intermediate of and generally parallel to the elongated edges thereof, whereby when the fingers of a person lifting the carrier press down against the tab, the tab is pivoted down along its fold line to expose the handle opening and when the pivoting movement is prevented due to contact with an adjacent article in the carrier, the tab folds upon itself about its intermediate fold line;

the top panel containing slits extending from the short edges of the handle opening transversely of and through the foldable connections between the side panels and the top panel, the slits ending in the side panels;

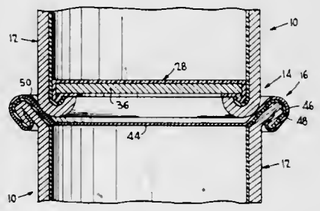
the side panels containing score lines extending from the ends of the transversely extending slits, across the foldable connections between the side panels and the top panel, and into the top panel, the score lines comprising a pair of score lines extending from the ends of the transversely extending slits and meeting in the top panel between the tab fold line and the nearest end panel.

4,785,992

CONTAINER AND METHOD OF MAKING THE SAME

Ronald R. Goeppner, Clarendon Hills, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Aug. 24, 1982, Ser. No. 411,124
Int. Cl.[4] B65D *3/14*
U.S. Cl. 229—5.6 **5 Claims**



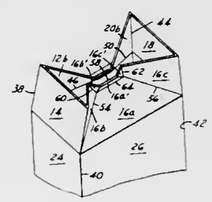
1. A container comprising a cylindrical body having a plastic material interior surface, and a bottom closing an open lower end of said body, said bottom comprising a plastic material closure member telescoped within a bottom portion of said body and being bonded to said plastic material surface, said bottom portion including an extreme bottom part terminating in a transversely extending extreme end, and said extreme bottom part of said body being rolled radially inwardly and axially upwardly beneath said closure member, said closure member having seated therein a reinforcing disk, said extreme end of said body opposing said reinforcing disk, said closure member having a portion positioned between said body extreme end and said reinforcing disk.

4,785,993

LOW STRESS FLAT END CLOSURE ARRANGEMENT FOR THERMOPLASTIC COATED PAPERBOARD CARTON

Robert E. Lisiecki, West Bloomfield, Mich., assignor to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Dec. 7, 1987, Ser. No. 129,661
Int. Cl.[4] B65D *5/06, 5/08*
U.S. Cl. 229—137 **3 Claims**



1. In a blank for constructing a container adaptable to being folded into a flat end container, wherein the blank includes five body portion panels interconnected by vertical score lines, five rectangular end closure panels, each connected at one end thereof via a row of horizontal score lines to respective ends of the body portion panels at the sides thereof and to each other by extensions of said vertical score lines, with the other end thereof constituting a free edge; the improvement involving said five end closure panels and comprising a centrally disposed panel having score lines formed thereon converging from the corners thereof adjacent the center body portion panel to the free edge thereof spaced a predetermined distance apart defining a central fold-in panel segment and two adjacent fold-back panel segments, two score lines formed on the respective fold-back panels from the respective converging score lines to said free edge parallel to each other and to said vertical score lines extensions, and a score line formed on said central fold-in panel segment connecting between said parallel score lines at their junctures with said converging score lines; an outer closure panel on each side of said centrally disposed panel; and a panel adjacent each outer closure panel, each having a diagonal score line formed from the corner thereof adjacent the respective outer closure panels to the free edge thereof a distance from the side thereof which is spaced apart from the respective outer closure panels one each side of said centrally disposed panel substantially equal to the predetermined distance between said converging score lines.

4,785,994

SLIDING JOINT FOR WELDED RAIL SECTIONS

Walter G. Crone, 1599 Vinton Ave., Memphis, Tenn. 38104, and Harry B. Cundiff, No. 1 George Wythe Pl., Atlanta, Ga. 30318

Filed Jul. 13, 1987, Ser. No. 72,599
Int. Cl.[4] E01B *11/00*
U.S. Cl. 238—171 **9 Claims**



1. In a sliding joint having a continuous base member underlying adjacent ends of a pair of longitudinally extending rail sections wherein a rail point extends from one of said adjacent ends in a direction toward the other of said adjacent ends, the other of said adjacent ends defined by a wing rail, said rail point including a bearing portion along one side thereof for slidable movement of said wing rail along said bearing portion in response to expansion and contraction of said rail sections, the improvement comprising:

a limit stop member on said sliding joint at a location adjacent to the juncture of said one adjacent end and said rail point whereby to limit slidable movement of said wing rail along said bearing portion of said rail point; and

said rail point including a reinforcing wall extending fowardly from one of said adjacent ends toward the other of said adjacent ends of said rail sections, said reinforcing wall spaced laterally of said bearing portion on a side opposite to said wing rail.

4,785,995

METHODS AND APPARATUS FOR CONDUCTING ELECTROSTATIC SPRAY COATING

Takakazu Yamane; Yoshio Tanimoto, and Tadamitsu Nakahama, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

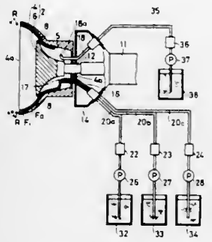
Filed Mar. 16, 1987, Ser. No. 26,487
Claims priority, application Japan, Mar. 18, 1986, 61-60090; Mar. 18, 1986, 61-60091; Mar. 18, 1986, 61-60092; Mar. 18, 1986, 61-60093; Mar. 18, 1986, 61-60094
Int. Cl.[4] B05D *1/04;* **B05B** *5/04*
U.S. Cl. 239—3 **15 Claims**

1. A method of conducting electrostatic spray coating comprising:

driving a rotary spray head device for electrostatic spray coating which is provided with a funnel-like body having an inner wall surface for guiding coating material and an open end portion at the side of larger diameter thereof, to turn on an axis of rotation surrounded by said inner wall surface of the funnel-like body, and

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supplying plural kinds of coating material to said inner wall surface of the funnel-like body of the rotary spray head device at a substantially common location thereon simultaneously through respective separate paths so that said



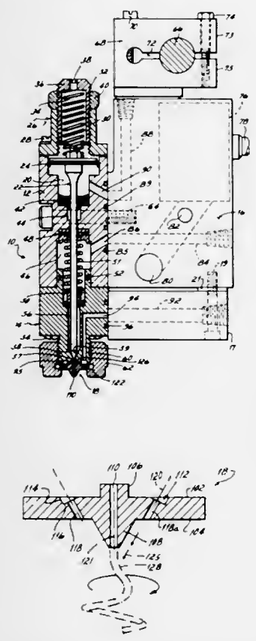
plural kinds of coating material form their respective layers superimposed on each other and on said inner wall surface of the funnel-like body and so that said plural kinds of coating material move toward said open end portion of the funnel-like body.

4,785,996

ADHESIVE SPRAY GUN AND NOZZLE ATTACHMENT

Roger A. Ziecker, Lawrenceville; Bentley J. Boger, Atlanta, and Dwayne N. Lewis, Smyrna, all of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Apr. 23, 1987, Ser. No. 41,712
Int. Cl.[4] B05B *1/34*
U.S. Cl. 239—298 **8 Claims**



1. A nozzle attachment for use in an apparatus for spraying hot melt adhesive which includes a gun body having a nozzle formed with an adhesive passageway for conveying heated hot melt adhesive and an air delivery passageway for conveying pressurized air, said nozzle attachment comprising:

a one-piece annular plate formed with a first surface on one side of said plate, and a second surface on an opposite side of said plate having a nozzle tip extending outwardly therefrom;

said plate being formed with a throughbore extending between said one side and said nozzle tip, said plate being adapted to mount to said nozzle of said gun body so that said throughbore communicates with said adhesive passageway in said nozzle for receiving heated hot melt adhesive, the hot melt adhesive being ejected from said nozzle tip in said annular plate to form an adhesive bead;

said plate being formed with a substantially V-shaped annular groove forming first and second sidewalls each extending inwardly from said first surface toward said second surface and intersecting one another, said annular groove being adapted to communicate with said air delivery passageway in said nozzle of said gun body;

said plate being formed with a plurality of bores extending from said annular groove in communication with said air delivery passageway to said second surface for transmitting air therethrough, said bores each having a longitudinal axis extending substantially perpendicular to one of said first and second sidewalls of said V-shaped annular groove, said bores being formed at an angle with respect to said throughbore in said plate to direct pressurized air flowing therethrough substantially tangent to the outer periphery of said adhesive bead ejected from said nozzle tip to form said adhesive bead in elongated adhesive fibers and to impart a twisting motion to said elongated adhesive fibers to form a spiral spray pattern of elongated adhesive fibers for deposition on a substrate.

4,785,997

HYDRAULIC MOTOR FOR USE WITH AIRLESS PAINT SPRAYER SYSTEM

Miroslav Liska, Northbridge, and Anthony Tomsicek, Woodland Hills, both of Calif., assignors to Durotech Co., Moorpark, Calif.

Filed Nov. 2, 1987, Ser. No. 115,335
Int. Cl.[4] B05B *9/03*
U.S. Cl. 239—332 **11 Claims**

11. A hydraulic motor for use in an airless paint sprayer system wherein said motor is connectable to a paint piston rod pluger adapted to move paint from a container to an area for painting, said motor including:

a housing including an upper closed end portion and a lower closed end portion, said lower closed end portion having a centrally formed piston receptive passage extending therethrough wherein said passage communicates with the interior of said housing;

a spool means fixedly mounted in said upper closed end portion and suspended within said housing;

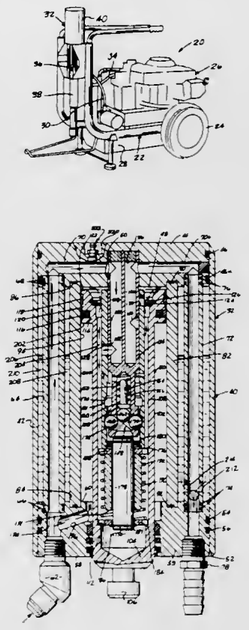
a slidable sleeve encasing said spool means adapted to move up and down said on spool means;

a reciprocating hydraulic fluid actuated piston mounted within said housing, extending through said piston receptive passage within said lower closed end portion, said piston surrounds said slidable sleeve and spool means and is capable of moving on an upward and downward stroke during reciprocation;

a piston cylinder extending between said upper and lower closed end portions surrounding said reciprocating piston and encasing the same whereby a hydraulic fluid chamber is created therein that communicates with said hydraulic system and fluid therein will cause reciprocation of said piston;

cooperating releasable stop means associated with said spool means and said sleeve adapted to releasably retain said sleeve in one of two locked positions and define the end of each of said upward and downward strokes of said piston; and

linking means suspended from said slidable sleeve which has an at rest position where no linking occurs, and a linked position caused by the downward movement of said piston, when said piston engages a portion of said linking means whereby said linked position causes simultaneous movement of said slidable sleeve and said piston.

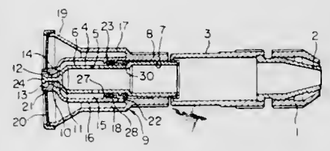


4,785,998

WATER SPRAYING NOZZLE

Toshio Takagi, No. 3-5-1305, Shiragane 1-chome, Kokurakita-ku, Fukuoka-ken, Japan

Filed May 26, 1987, Ser. No. 53,968
Claims priority, application Japan, Jun. 9, 1986, 61-133152; Sep. 24, 1986, 61-225461; Mar. 28, 1987, 62-75366
Int. Cl.[4] B05B *1/16, 1/32*
U.S. Cl. 239—440 **5 Claims**



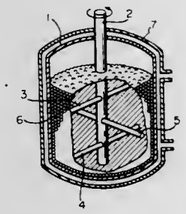
1. In a water spraying nozzle including a tubular nozzle body which is provided with a water inlet at its rear end while closed at its front end, and a controlling sleeve into which said nozzle body is inserted and connected thereto, the improvement wherein: said nozzle body is provided with a first communication hole at its peripheral wall while closed at its front end to projectively form a controlling bar portion behind which is formed a first valve portion, a rear portion of said nozzle body being connected with a rear portion of said controlling sleeve so as to permit them to conduct an axial relative movement therebetween; said controlling sleeve is provided with an inner and an outer sleeve portions at its front portion to form an outer fluid path between said inner and said outer sleeve portions, while between said inner sleeve portion of said controlling sleeve and said peripheral wall of said nozzle body is formed an inner fluid path, said inner sleeve portion of said controlling sleeve being provided with a nozzle opening at its front end and a valve seat provided behind said nozzle opening together with a second communication hole provided at its peripheral wall behind said valve seat, in which nozzle opening is received an expanded head portion of said controlling bar portion of said nozzle body, which valve seat is provided at a position opposite to said first valve portion of said nozzle sleeve, while a second valve portion is provided between an outer peripheral surface of said nozzle body and an inner peripheral surface of said inner sleeve portion of said controlling sleeve; a porous plate is mounted in a front end opening of said controling sleeve, at least one of said controlling sleeve and said nozzle body being able to travel between a first position and a second position, in which first position said first valve portion of said nozzle body is abutted on said valve seat of said inner sleeve portion of said controlling sleeve to close a fluid path formed therebetween while said second valve portion shuts off a water flow between said first and second communication holes, in which second position said first valve portion of said nozzle body is separated from said valve seat of said inner sleeve portion of said controlled sleeve to open said fluid path formed therebetween while said second valve portion closes a fluid path formed between said first communication hole of said nozzle sleeve and said nozzle opening of said inner sleeve portion of said controlling sleeve, said first communication hole being fully opened together with said second communication hole of said inner sleeve portion of said controlling sleeve so as to be communicated with each other in said second position; a gripping sleeve is connected to the rear end of said controlling sleeve which is inserted into a sleeve-like element in front of said gripping sleeve, said sleeve-like element being provided with a spiral groove in its inner surface so as to keep said controlling sleeve not axially movable but rotatable, provided that said controlling sleeve is provided with an axially extending linear slot at a position corresponding to that of said spiral groove of said sleeve-like element and that a pin is provided in a peripheral surface of said nozzle body so as to be brought into a slidable contact with each of said spiral groove and said axially extending linear slot to permit said nozzle body to axially move relative to said controlling sleeve.

4,785,999

PROCESS FOR PRODUCING GROUND CRUDE PIGMENT

Shunjiro Takijiri, Tokyo, Japan, assignor to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 406,966, Aug. 10, 1982, abandoned. This application Dec. 31, 1984, Ser. No. 686,629
Claims priority, application Japan, Aug. 14, 1981, 56-126644
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—26 **18 Claims**



1. In a process for producing a ground crude pigment by

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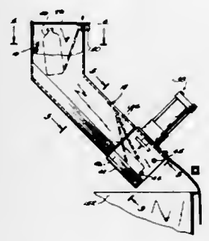
grinding in a dry state unsubstituted β-form copper phthalocyanine, the improvement which comprises dry grinding the crude pigment in a grinding apparatus comprising a cylindrical receptacle having a side wall and a bottom wall and having an axis in a longitudinal direction, a stirrer having a rotating shaft disposed along the axis of the receptacle and at least two pairs of arms, each pair having arms fixed to the rotating shaft and extending outwardly toward the side wall of the receptacle, and steel balls as a grinding medium filled in the receptacle until the ratio of the α-form crystals to the β-form crystals become 50%-80% to 50%-20%.

4,786,000

BOTTLE BREAKING APPARATUS

Eric P. Weil, Greenfield, and Matthew T. Boswell, Pewaukee, both of Wis., assignors to Galland Henning Nopak, Inc., Milwaukee, Wis.

Filed Jan. 29, 1987, Ser. No. 8,649
Int. Cl.[4] B02C *19/14*
U.S. Cl. 241—36 **11 Claims**



1. A bottle breaking apparatus comprising
means for supporting a bottle,
a bottle breaking member,
means for applying to said member alternative first and second forces respectively moving said member toward and away from said supporting means, said force applying means including a cylinder, a piston connected to said member, said piston being slideably received in said cylinder and dividing said cylinder into first and second chambers, and means operating at a certain frequency for alternatingly supplying fluid to said first and second chambers, and
manually operable means for selectively increasing said first force, said means for increasing said first force including means for decreasing said frequency.

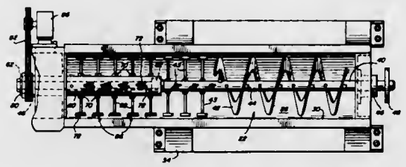
4,786,001

COFFEE GRINDER-MIXER ASSEMBLY FOR PRODUCING BOTH REGULAR AND HIGH YIELD GROUND COFFEE

Max Ephraim, Evergreen Park; Daniel R. Ephraim, Glencoe, and Philip C. Ephraim, Chicago, all of Ill., assignors to Modern Process Equipment, Inc., Chicago, Ill.

Filed May 30, 1986, Ser. No. 869,040
Int. Cl.[4] A47J *42/00*
U.S. Cl. 241—101 B **7 Claims**

1. A coffee grinder-mixer assembly for producing high yield coffee and regular yield coffee comprising:
a grinding head,
an elongated mixer box for receiving ground coffee from said grinding head adjacent one end and for discharging ground coffee therefrom adjacent the other end,
a first elongated shaft means mounting auger means and supported for rotation in said mixer box, said auger means being disposed to drive ground coffee along said elongated mixer box from said one end towards said other end,
second elongated shaft means concentric with said first shaft means for rotation relative to said first shaft means, said second shaft means being disposed adjacent said other end of said box and downstream of said auger means,
a plurality of paddles mounted on said second shaft means, and



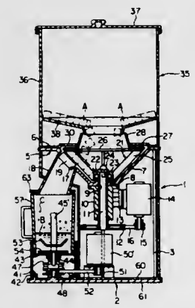
means for driving said first shaft means and for driving said second shaft means, one relative to the other.

4,786,002

METHOD OF MAKING SOFT ICE-DRINK AND APPARATUS OF MAKING THE SAME

Yoshihiko Mitsubayashi, and Toshio Ando, both of Kuwana, Japan, assignors to Chubu Industries, Inc., Kuwana, Japan

Division of Ser. No. 53,971, May 26, 1987, abandoned. This application Nov. 9, 1987, Ser. No. 118,139
Claims priority, application Japan, Jun. 18, 1986, 61-141754; Feb. 17, 1987, 62-21594[U]; Feb. 17, 1987, 62-21595[U]; Feb. 17, 1987, 62-21596[U]; Feb. 17, 1987, 62-21597[U]
Int. Cl.[4] B02C *19/00*
U.S. Cl. 241—101 B **3 Claims**



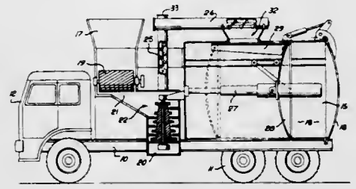
1. An apparatus of making a soft ice-drink comprising:
a mixing mechanism including a container containing a liquid material such as syrup and into which shaved ice pieces are discharged, rotary blades, rotatably supported within said container, for mixing together the liquid material and shaved ice pieces and smashing said ice pieces into granules of ice, and a drive motor for rotating said rotary blades at high speeds; and
an ice shaving mechanism, disposed on an apparatus bed and above said mixing mechanism, including a shaver casing having a slit to which a shaving blade is exposed and a shaved ice discharge chute opened to above said container, and rotatable blades, provided within said shaver casing, for cooperating with said shaving blade to shave ice blocks charged into said shaver casing, wherein a soft lid for covering the opening of said container is detachably mounted to a lower end portion of said shaved ice discharge chute of said ice shaving mechanism.

4,786,003

MATERIALS PROCESSING UNIT

Raymond N. Johnson, Unit 4/77 Gould Street, Bondi, New South Wales, Australia

Filed Oct. 21, 1986, Ser. No. 921,585
Claims priority, application Australia, Oct. 22, 1985, PH3022
Int. Cl.[4] B02C *21/02*
U.S. Cl. 241—101.7 **9 Claims**



1. A materials processing unit comprising:
a container having an outlet doorway at one end,
a door closable on said doorway,
an inway opening in said container for admission of material to be stored in said container,
a breaker unit including a casing having an inlet to admit material to be broken to said casing, and an outlet to permit discharge of broken material from said casing, said breaker unit comprising a drum mounted for rotation about a first axis and having fixedly mounted thereon a plurality of radially protruding cogs adapted to crush material entering the unit against said breaker casing during rotation of said drum, said drum being mounted transverse of said breaker unit inlet so that material entering therethrough approaches said cogs radially thereof,
a pulveriser unit mounted for rotation about a second axis below said breaker unit and including a further casing having an inlet to admit material processed by said breaker unit and an outlet to permit discharge of pulverised material from said further casing, said pulveriser casing including a pair of end walls, the inlet thereof comprising an aperture adjacent one of said end walls, and the outlet thereof comprising a duct in a portion of the other of said end walls,
said breaker unit having its outlet connected to the inlet of the pulveriser unit by a chute positioned below the breaker unit and to one side of the pulveriser unit, said first and second axes being angularly related so that said chute provides a collection area for output material from the breaker unit and prevents blow-back of material from the pulveriser unit into the breaker unit,
an open-ended hopper mounted by one end on the inlet to said breaker casing and having its other end positioned to accept material to be processed by said vehicle,
transfer means whereby material discharged from said pulveriser outlet is transferred to said inway opening to fall therefrom into said container.

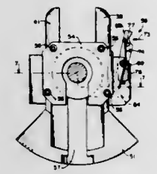
4,786,004

ARMATURE WINDING MACHINE WITH REMOVABLE SHROUDS

Arie Boers, Plymouth, Minn., assignor to Micafil, Inc., Englewood, Ohio

Division of Ser. No. 782,431, Oct. 1, 1985, Pat. No. 4,708,297. This application Apr. 24, 1987, Ser. No. 20,438
Int. Cl.[4] H02K *15/09*
U.S. Cl. 242—705 B **22 Claims**

1. In a machine having means for winding coils of wire onto a slotted armature core: core holding means for locating the armature core in a position to receive coils of wire from the means for winding coils of wire onto the armature core, shroud means for guiding wire into selected slots in the armature core, support means for holding the shroud means adjacent the armature core, and means for releasably mounting the shroud means on said support means whereby the shroud means can be removed as a unit from the support means, said means for releasably mounting the shroud means on the support means includes a head on the support means, said head having outwardly directed flange means, said shroud means having a groove for accommodating the head and flange means, and releasable lock means on the shroud means engageable with the head for holding the shroud means in the assembled relation with the support means, said lock means being releasable whereby the shroud means can be removed from the head.

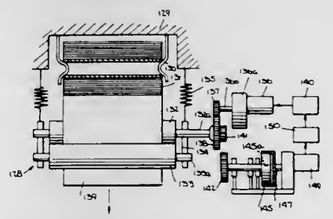


4,786,005

APPARATUS FOR DISPENSING SHEET MATERIAL

Louis S. Hoffman, Morristown; William Bohmer, Flanders; Ralph J. DeVito, Bound Brook; Brian R. Langille, Great Meadows; Richard D. Watkins, Whippany; Charles B. Sanders, Cedar Grove; Martha E. Kerch, Flanders, and Marc Shanko, Cedar Nolls, all of N.J., assignors to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 798,552, Nov. 15, 1985, Pat. No. 4,666,099. This application Mar. 27, 1987, Ser. No. 32,117
Int. Cl.[4] B65H *19/00*; B25C *5/02*
U.S. Cl. 242—55.53 **16 Claims**



1. Apparatus for dispensing sheet material comprising:
structure forming a housing having a discharge opening;
means disposed within the housing for storing a supply of sheet material with a portion of the sheet material positioned within the housing adjacent the discharge opening;
advancing means disposed within the housing for advancing the sheet material through the discharge opening, said advancing means including an electric motor;
means for activating the advancing means for a predetermined period of time to advance a predetermined length of the sheet material through the discharge opening, said predetermined length of sheet material being grippable by a user to enable the user to withdraw a length of the sheet material from the dispensing apparatus;
means for enabling the activating means for permitting the activating means to supply electrical energy to the advancing means;
said enabling means and said activating means being associated with the housing and being responsive to the proximity of a portion of a hand of a user with respect to the housing without the user contacting the dispensing apparatus for enabling the activating means and thereafter

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activating the advancing means for advancing a predetermined length of the sheet material through the discharge opening; and

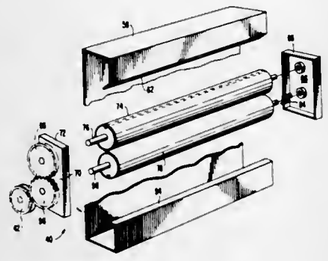
means responsive to the withdrawal of sheet material by the user for storing energy to energize said electrical motor.

4,786,006

TRANSFER CARTRIDGE WITH LIGHT SEAL

Daniel P. White, Honeoye Falls, and Michael A. Brookmire, Pittsford, both of N.Y., assignors to Itek Graphix Corp., Waltham, Mass.

Filed Oct. 17, 1986, Ser. No. 920,193
Int. Cl.[4] B65H *18/08;* **G03B** *17/26;* **B65D** *85/38*
U.S. Cl. 242—67.3 R **23 Claims**



1. A transfer cartridge for receiving and storing a length of photosensitive material therein comprising:

an elongated enclosure closed at both ends and on all sides except for an entry slot defined in one side thereof said entry slot being substantially free from light sealing means;

a first roller rotatably supported within said enclosure in proximity to said entry slot and substantially parallel to said entry slot;

a second roller rotatably supported within said enclosure substantially parallel to said first roller, a space being provided between said rollers adjacent to said entry slot;

a flexible opaque belt attached at one end thereof to said first roller and attached at the other end thereof to said second roller, said flexible opaque belt being wrapped at least partially around said first roller in a first direction, said flexible belt traversing said space between said first and second rollers and being wrapped around said second roller in a second direction opposite to said first direction;

drive means connected to at least one of said rollers for rotating said rollers as a length of photosensitive material enters said enclosure through said entry slot and engages said flexible belt so that the length of photosensitive material is wrapped, in sandwich-like light-tight fashion, around one of said rollers between layers of said flexible belt.

4,786,007

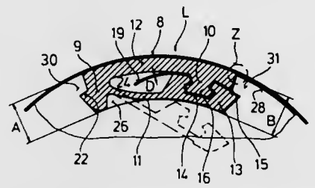
CLAMP FOR FLEXIBLE STRIP MATERIAL AND A HUB THEREFOR

Klaus Schoettle, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 22,746
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 8606398
Int. Cl.[4] B65H *75/28;* **G11B** *15/60*
U.S. Cl. 242—74 **3 Claims**

1. A clamp for clamping a flexible strip material, in particular a tape, on a hub having a recess, in such a way that the clamp itself provides the anchor point for winding the flexible strip material on the hub, said clamp comprising

a generally U-shaped part having legs extending substantially in a direction concentric with the periphery of said hub, the legs of said part being provided with interengageable locking means in the form of a protrusion at the free end portion of one of said legs and a cooperating indentation at the free end portion of the other of said legs so as to releasably lock said legs together in a clamping position, with said strip material clamped therebetween in a



generally wavelike configuration to prevent said material from being pulled out from between said legs; and also comprising

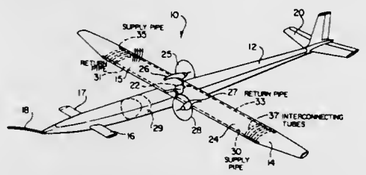
two end portions which are spaced from each other along the periphery of the hub, and a clamp locking element formed at each end portion for releasably securing the clamp in said recess so as to provide said anchor point.

4,786,008

NUCLEAR POWERED DRONE

Marshall J. Corbett, E. Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 24, 1986, Ser. No. 855,238
Int. Cl.[4] B64D *27/00*
U.S. Cl. 244—53 R **3 Claims**



1. An aircraft for extended flights comprising:

a nuclear reactor cooled by a gas which includes a helium component;

at leat one turbine which receives expanding heated gas from the reactor;

a propeller driven by the turbine;

heat-radiating tubes located within wings of the aircraft and connected in a closed loop with the turbine for radiating waste heat from the gas to space;

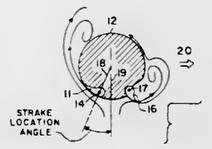
the tubes extending along substantially the entire length of the aircraft wings and directly attached to an inner surface of the upper portions of the wings, covering almost the entire inner surface thereof, to facilitate heat radiation to space without intermediary radiating fins.

4,786,009

YAW AND PITCH CONTROL OF AIR VEHICLES AT HIGH ANGLES OF ATTACK

Dhanvada M. Rao, Hampton, and Daniel G. Murri, Grafton, both of Va., assignors to Vigyan Research Associates, Inc., Hampton, Va.

Filed Jan. 5, 1987, Ser. No. 453
Int. Cl.[4] B64C *19/00*
U.S. Cl. 244—75 R **8 Claims**



1. A method for controlling the yaw of an air vehicle, including a forebody which is the extended nose portion of the fuselage forward of the forward-most lifting surface of the air vehicle, at high angles of attack when the rudder of the air vehicle becomes ineffective comprising the steps of:

providing two symmetrically hinged conformal strakes on either side of the forebody of the air vehicle and with each hinged near the outer surface of the forebody at equal and opposite strake location angles for altering the flow separations and resulting vortex patterns around the forebody; and

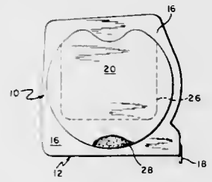
anti-symmetrically controlling the deflections of the two strakes to produce asymmetric vortex patterns around the forebody thereby producing yaw side forces on the forebody which provide yawing moments that are used as a yaw control for said air vehicle.

4,786,010

TAPE MEASURE

Michael V. Dynan, P.O. Box 757, Orleans, Mass. 02653

Filed Oct. 23, 1986, Ser. No. 922,193
Int. Cl.[4] B65H *75/16;* **G01B** *3/02;* **B43L** *1/00*
U.S. Cl. 242—84.8 **9 Claims**



1. A tape measure comprising:

(a) a housing having an outer flat surface,

(b) a measuring tape coiled and enclosed in said housing, the tape being extendable and retractable into the housing, and

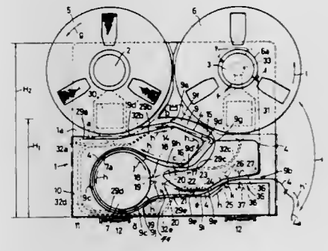
(c) a writing tablet formed of a solid and rigid polymer block with abrasive properties, the abrasive properties being a characteristic of the tablet's composition which contains inorganic filler of abrasive particles, the tablet having an inner surface, an edge surface and a flat outer surface, said inner surface being attached to said outer flat surface of the housing, the tablet being sufficiently hard and abrasive to permit said outer surface to be inscribed by a standard graphite pencil, said tablet being softer than sandpaper to enable the inscribed outer surface to be abraded with sandpaper, whereby the outer surface is renewed and receptive to further inscription after subsequent and repeated abrading by sandpaper.

4,786,011

LOADING DEVICE FOR DIRECTING A TAPE-LIKE ELEMENT FROM A SUPPLY REEL TO A TAKE-UP REEL AND ABOUT A GUIDE DRUM THEREBETWEEN

Jiro Fujiwara; Yoshiaki Sugiyama; Hisayoshi Chino, all of Kanagawa, and Hiroaki Ohishi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,876
Claims priority, application Japan, Dec. 26, 1986, 61-310266; Dec. 26, 1986, 61-310268; Jan. 24, 1987, 62-008895[U]
Int. Cl.[4] G11B *15/32, 5/027*
U.S. Cl. 242—195 **15 Claims**



1. A loading device for loading a tape-like element in an apparatus having supply and take-up reels which are disposed side-by-side with their axes substantially horizontal in a normal operating position of the apparatus, and a guide drum under said supply reel in said normal operating position, said loading device comprising:

means defining a path for the tape-like element and having an inlet adjacent said supply reel for receiving the tape-like element paid out from the latter and an outlet arranged near to said take-up reel, said path including a peripheral path portion extending around at least part of the periphery of said guide drum, a supply side path portion extending from said inlet to said peripheral path portion and a take-up side path portion extending from said peripheral path portion to said outlet, said supply side, peripheral and take-up path portions having respective lower wall sections facing upwardly in said normal operating position;

a plurality of air outlets opening at said lower wall sections of said supply side, peripheral and take-up path portions, respectively, for directing air under pressure into said path along the respective lower wall sections;

an additional air outlet opening at said lower wall section of the supply side path portion near to said peripheral path portion for directing air under pressure into said peripheral path portion; and

blower means operative for supplying air under pressure to said plurality of air outlets and said additional air outlet so that the tape-like element paid out from said supply reel is conveyed by air under pressure issuing from said plurality of air outlets and is wound about said guide drum by air under pressure issuing from said additional air outlet for transporting of the tape-like element from said inlet to said outlet of the path.

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4,786,012

MINIATURE TYPE TAPE CASSETTE

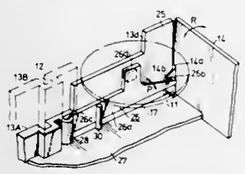
Masahiko Ino; Hitoshi Takahashi, both of Mito, and Hiromichi Hirayama, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 23, 1987, Ser. No. 76,709

Claims priority, application Japan, Jul. 26, 1986, 61-175983; Jul. 26, 1986, 61-175985

Int. Cl.[4] G11B *23/087*

U.S. Cl. 242—198 **11 Claims**



1. A miniature type tape cassette comprising:

a cassette case having an upper half and a lower half, said cassette case having a cutout part formed on a side wall thereof;

a supply reel hub and a take-up reel hub provided side by side within said cassette case, said take-up reel hub being exposed through said cutout part;

a lid for protecting a predetermined length of a tape path extending along the front of said cassette case, said lid being supported so as to be freely rotatable to open and close, said lid including a first hook formed on a side flange thereof;

a spring means for urging said lid in a lid closed position; and

a lid locking member having a projecting part, a second hook and a rear part, said projecting part passing through a through window formed at said side wall of said upper half and projecting therefrom, said second hook being located at an end of said lid locking member so as to engage with said first hook of said lid when said lid is in a closed position, said rear part being located at a position which is away from said lid and which is in the vicinity of said cutout part of said cassette case, and said rear part having a fixed part which is fitted into a supporting part formed on said side wall of said upper half so as to be affixed to said side wall,

said fixed part at the rear end of said lid locking member being a projection, and said supporting part projecting from said side wall so as to tightly receive said projection of said fixed part, said supporting part defining a chamber extending in a generally crossing relation with said side wall.

4,786,013

FLAP DRIVE WITH VARIABLE TORQUE LIMITING

Ulrich Pohl, Bremen, Fed. Rep. of Germany, assignor to MBB GmbH, Bremen, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 64,325

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620886

Int. Cl.[4] B64C *13/24*

U.S. Cl. 244—75 R **5 Claims**

1. In a drive arrangement for a landing flap on an aircraft wing which includes structure for variable torque limiting and position fixing, the particular flap being mounted on at least one carriage, the improvement comprising:

a principal drive shaft for operating the particular and other landing flaps;

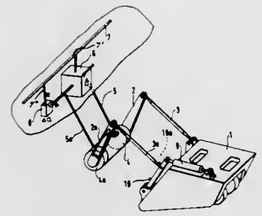
a differential and branching gear having a common input connected to said principle drive shaft and having two output shafts to establish two load transmitting paths;

two additional differential gears respectively connected to and driven by said two output shafts;

two crank drives respectively connected to and driven by said two additional differential gears;

two thrust rods respectively connected to said crank drives;

one of the thrust rods being directly connected to the flap carrying carriage;



the other thrust rod being connected through a connecting rod and a load switch to said carriage, there being a variable test point connection provided between the other thrust rod and said connecting rod; and

a mechanical delta alpha brake being interposed between said principle shaft and one of the output shafts of the branching differential gear.

4,786,014

HELICOPTER RAPID SECURING & TRAVERSING SYSTEM

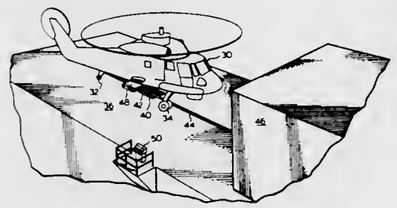
Mario Pesando, and Boris Velman, both of Mississanga, Canada, assignors to Indal Technologies Inc., Mississauga, Canada

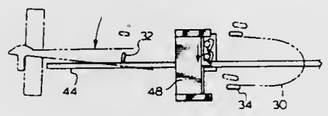
Filed Oct. 6, 1986, Ser. No. 915,698

Claims priority, application Canada, Nov. 4, 1985, 494,567

Int. Cl.[4] B64F *1/22*

U.S. Cl. 244—115 **116 Claims**





1. A helicopter rapid securing and traversing system for securing a helicopter upon landing on the deck of a ship for subsequently traversing it from its landing position, said system comprising a housing reciprocal from a position remote the landing area to a position adjacent the landing area of the helicopter, the housing carrying a shock absorber and sensing means extending across the housing for contacting a probe or other projection extending from the helicopter on the exterior of the helicopter when the helicopter has landed on the deck of the ship and the housing is brought to engage the probe or other projection, the shock absorber and sensing means for slowing and stopping the movement of the housing when the probe or projection is engaged and for cushioning the engagement and for sensing the position of the probe or projection, means for reciprocating the housing towards and away from the landing area, a carrier on the housing extending across the housing and carrying securing means thereon for securing the housing to the probe or projection on the helicopter, the securing means being normally secured at one side of the housing on the carrier and being moved laterally along the carrier across the housing when the carrier is activated to capture the probe or projection, the securing means carrying a laterally opening mouth opening in the direction towards the probe, and means to operate the carrier whereby when the probe or projection engages the shock absorber and sensing means, the impact of the probe is cushioned and the position of the probe or projection is sensed relative to the mouth of the securing means whereby when the probe is sensed as positioned in line with the mouth of the securing means, the carrier moves the securing means to grasp and secure the probe or projection and when the probe is sensed not to be appropriately positioned, the system is activated to cause the helicopter rapid securing system to be appropriately positioned relative to the probe.

4,786,015

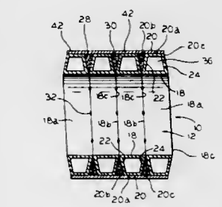
STRUCTURAL COOLING UNIT

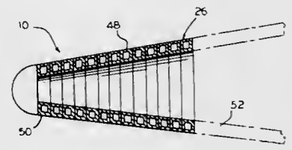
Richard E. Niggemann, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 31, 1986, Ser. No. 948,109

Int. Cl.[4] B64C *1/38*

U.S. Cl. 244—117 A **25 Claims**





1. A structural cooling unit, comprising:

a load bearing structure of hollow construction defining a fluid flow path therethrough, said load bearing structure having a fluid inlet at one end of said fluid flow path and a fluid outlet at the other end of said fluid flow path and being formed into an elongated tubular configuration having at least one substantially continuous heat exchanging surface, said fluid flow path comprising a tortuous path through said load bearing structure;

said load bearing structure being defined by at least two hollow metal tubes each having spaced generally parallel bottom and top walls joined by a pair of spaced side wall, said hollow metal tubes being helically wound in side-by-side relation into said elongated tubular configuration to have an inner surface defined by said bottom walls forming said substantially continuous heat exchanging surface;

each of said hollow metal tubes defining a fluid flow path therethrough, said hollow metal tubes each having a fluid inlet at one end thereof and a fluid outlet at the other end thereof.

4,786,016

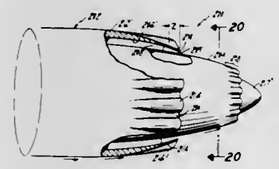
BODIES WITH REDUCED SURFACE DRAG

Walter M. Presz, Jr., Wilbraham, Mass.; Robert W. Paterson, Simbury, and Michael J. Werle, W. Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 857,909, Apr. 30, 1986, abandoned. This application Nov. 5, 1987, Ser. No. 117,765

Int. Cl.[4] B64C *1/38*

U.S. Cl. 244—130 **5 Claims**



1. An annular nacelle adapted to surround a gas turbine engine, said nacelle having an inner surface and an external surface, said external surface including an upstream portion and a downstream portion adapted to receive an unbounded flow of fluid thereover in the downstream direction, said inner and outer surface extending downstream and forming a thin trailing edge of said nacelle, said trailing edge defining an outlet of said nacelle of cross-sectional area C, a plurality of alternating, adjoining, smoothly undulating generally U-shaped ridges and troughs formed in said downstream portion of said external surface, said ridges and troughs extending downstream from said upstream surface portion to said trailing edge, wherein said trailing edge is wave-shaped, said troughs in said external surface defining corresponding ridges in said inner surface and said ridges of said external surface defining corresponding troughs in said inner surface, and wherein said troughs and ridges are sized and contoured such that under a selected operating condition no significant streamwise two-dimensional boundary layer separation occurs on said external surface over the length of said troughs and ridges,

wherein a prior art non-undulating smooth convexly curved surface blending smoothly with said upstream portion external surface, extending to said trailing edge and having the same cross-sectional outlet area C would have streamwise boundary layer separation over said downstream portion of said external surface during said selected operating condition.

4,786,017

HIGH TEMPERATURE-RESISTANT FIBROUS SILICON DIOXIDE MATERIAL

Arno Wegerhoff, Worth, and Hans-Dieter Achtsnit, Elsenfeld-Eichelsbach, both of Fed. Rep. of Germany, assignors to AKZO NV, Netherlands

Continuation of Ser. No. 729,123, May 1, 1985, abandoned. This application Sep. 9, 1987, Ser. No. 96,251

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416503; Mar. 25, 1985, 3510753

Int. Cl.[4] B64G *1/58*; C04B *35/14*

U.S. Cl. 244—158 R **7 Claims**

1. A fibrous silicon dioxide material resistant to high temperatures, said material comprising silicon dioxide fibers obtained by dry-spinning water glass into water glass fibers and converting the water glass fibers into silica fibers, followed by dehydration of said silica fibers, said silicon dioxide fibers consisting essentially of silicon dioxide in a content of more than 95% by

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weight, a density of 1.9 to 2.4 g/cm^3, a microcrystalline cristobalite content of more than 5% and a shrinkage at high temperatures, measured as area shrinkage in a mat made of silicon dioxide fibers after one-hour treatment at 1500° C., of less than 5%.

7. The heat shield for spacecraft, comprising the fibrous silicon dioxide material of claim 1.

4,786,018

SATELLITE ATTITUDE CONTROL

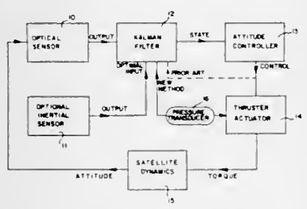
Paul E. G. Cope, Fareham, England, assignor to The Marconi Company Limited, England

Filed Jul. 1, 1987, Ser. No. 68,968

Claims priority, application United Kingdom, Jul. 4, 1986, 8616385

Int. Cl.^{4} B64G 1/26

U.S. Cl. 244—164 **5 Claims**



1. An attitude control system for a satellite, comprising:

(a) thrusters for altering the attitude of the satellite;

(b) a sensor for generating output signals in response to variations in the attitude of the satellite;

(c) a Kalman filter for modeling the dynamic state of the satellite to which the sensor output signals are applied;

(d) an attitude controller responsive to said Kalman filter for generating control signals for controlling said thrusters; and

(e) pressure transducers associated with said thrusters so as to be responsive to the actual physical response of the thrusters alone for providing feedback to said Kalman filter.

4,786,019

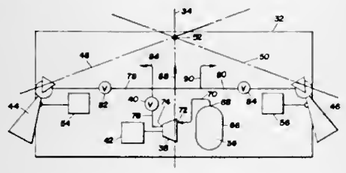
ENERGY EFFICIENT SOLID PROPELLANT ATTITUDE CONTROL SYSTEM

Arthur H. Uken, Brigham City, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 731,703, May 8, 1985, abandoned. This application Nov. 4, 1986, Ser. No. 927,290

Int. Cl.^{4} B64G 1/26, 1/42

U.S. Cl. 244—169 **3 Claims**



1. An energy efficient solid propellant attitude control system for a post boost space vehicle having an aft end comprising,

a solid propellant gas generator for generating a flow of generated gas,

a plurality of nozzles mounted on the aft end of the post boost space vehicle for providing attitude control of the post boost space vehicle,

means directing said flow of generated gas through said nozzles to the environment to control the attitude of the post boost space vehicle, said nozzles being highly vectorable hinged nozzles having a side gas inlet through which the said flow of generated gas is admitted for flow through said nozzles to the environment,

means operative to extract surplus energy from the said flow of generated gas, before the said flow of generated gas is directed through said nozzles,

said means to extract energy from the said flow of generated gas comprising a gas turbine, a first conduit connecting said gas generator to said turbine for driving said turbine by the said flow of generated gas, said turbine having an effluent gas exit opening, and an alternator driven by the gas turbine to produce electrical power, and

means utilizing such extracted surplus energy to orient said nozzles relative to the post boost space vehicle,

wherein said means to direct said flow of generated gas through said nozzles to the environment includes a second conduit connecting the turbine gas effluent exit opening to the side gas inlet of said nozzles,

wherein said means utilizing energy that is extracted from said flow of generated gas to orient said nozzles relative to the post boost space vehicle is an electromechanical actuator that is energized by the electrical power produced by said alternator,

wherein said post boost space vehicle has a center of gravity and includes a moment arm axis associated with each of said nozzles, all of said moment arm axes passing through the center of gravity of said post boost space vehicle,

wherein each of said nozzles is vectorable substantially 90° in either direction from the associated moment arm axis of the post boost space vehicle and includes externally mounted opposed cylindrical posts rigidly formed with said nozzles with at least one of said posts being hollow and forming a side gas inlet of said nozzles, and

further including a bracket associated with each of said nozzles in which the opposed posts of the nozzle are mounted for pivotal movement, said bracket being fixedly attached to the aft end of said post boost space vehicle.

4,786,020

SYSTEM FOR BOUNDARY LAYER CONTROL THROUGH PULSED HEATING OF A STRIP HEATER

Milton E. Franke, Dayton, Ohio, and Lawrence Kudelka, Fruit Heights, Utah, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 29, 1988, Ser. No. 149,814

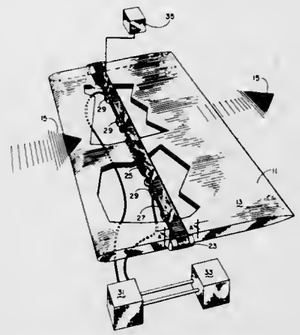
Int. Cl.^{4} B64C 21/00

U.S. Cl. 244—204 **4 Claims**

1. A system for controlling the transition between laminar and turbulent flow of an air stream across a surface, comprising:

(a) a thin narrow strip heater disposed adjacent said surface and extending substantially transversely of the flow of said air stream across said surface;

(b) means for resiliently tensioning said heater along the length of said heater; and



(c) electrical means operatively connected to the ends of said heater for applying pulsed voltage of preselected amplitude and frequency to said heater.

4,786,021

ARTICLE OF FURNITURE HAVING A BASE FITTED WITH CASTORS

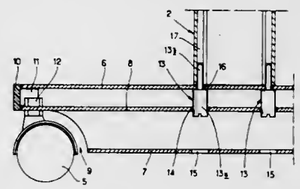
Claude Vattier, rue Lavoisier B.P. n° 78, 76200 EU, France

Filed Feb. 18, 1987, Ser. No. 16,040

Claims priority, application France, Feb. 19, 1986, 86 02234

Int. Cl.^{4} A47B 91/00

U.S. Cl. 248—188 **9 Claims**



1. An article of furniture having a base fitted with castors, constituted by at least two bars substantially parallelepiped in form, each comprising an upper web and a lower web and side webs therebetween forming, respectively, the upper and lower and side surfaces of the bar, and each equipped with at least one castor, wherein each bar also has an intermediate web parallel to and situated between said upper and lower webs and extending between said side webs and having a cutaway portion in said bottom web and side webs and extending upward to said intermediate web at the ends of said parallelepiped for the accommodation of each castor each of said castors being fixed to said intermediate web in a said cutaway portion, said article of furniture further having two columns, one of said columns being fixed to one of said bars and the other of said columns being fixed to the other of said bars, said columns being connected together by at least one connecting element and supporting a tray or the like at their top, each of said columns being fixed to each of said bars by at least two barrel screws, the lower web and the intermediate web or each of said bars having corresponding apertures substantially of the same diameter as the barrel of said screw and the upper web of said bars having an aperture substantially equal in diameter to the threaded portion of said barrel screw, the barrel screw having a barrel at least equal in height to the distance between the upper web and the intermediate web.

4,786,022

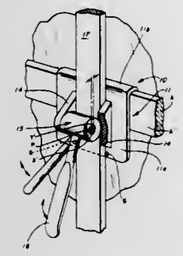
ATTACHING DEVICE

Herman R. Grieshaber, Glenview, Ill., assignor to Grieshaber Manufacturing Co., Norridge, Ill.

Filed May 22, 1987, Ser. No. 53,322

Int. Cl.^{4} F16M 13/00

U.S. Cl. 248—287 **10 Claims**



1. An attaching device for securing a first support element with a first surface, a second surface substantially parallel to said first surface and a third surface disposed between said first and second surfaces to a second support element disposed substantial perpendicularly relative to said first support element, said first support element having a medial portion and end portions; said device comprising a base member having a first section for disposition adjacent the first surface of said first support element, and a second section extending angularly from said first section for engaging the third surface of said first support element, said second section including an offset portion for disposition adjacent the second surface of said first support element; a first cam means adjustably mounted on said first section of said base member and extending angularly therefrom, said cam means being in spaced relation with said base member second section and when in one position of adjustment coacting with said base member second section for assembling said attaching device on the medial portion of said first support element and when in a second position of adjustment coacting with said base member second section for dissembling said attaching device from said first support element medial portion, said assembly and disassembly effected by lateral rather than endwise relative movement of said attaching device with respect to said first support element; and a second cam means adjustably mounted on the base member first section for securing said second support element in a position substantially perpendicular to said first support element, said first and second cam means being disposed on opposite sides of said base member first section, said second cam means when in one position of adjustment coacting with said base member first section for wedging therebetween a selected portion the second support element; both said first cam means and said second cam means being provided with means for effecting independent adjustment thereof, each cam means is rotatably adjustable about an independent axis, said independent axes being angularly disposed relative to one another.

4,786,023

DRAFTING IMPLEMENT HOLDER

Leverett D. Harris, 26 Madison St., New York, N.Y. 10038, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Aug. 19, 1987, Ser. No. 87,027

Int. Cl.^{4} A47F 5/00

U.S. Cl. 248—309.1 **4 Claims**

1. A drafting implement holder especially suitable for mounting on an angularly adjustable table top of a drafting table, said holder comprising:

(a) a receptacle for holding drafting implements therein;

(b) means for mounting said receptacle to one edge of the

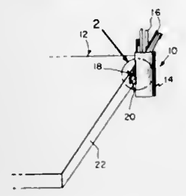
VOL 1096 ISS 4 NO 22 1988 UMI

angularly adjustable table top of the drafting table so as to maintain said receptacle in a substantially vertical position regardless of the angular position of the table top, wherein said mounting means includes:

(c) a bracket attached to the edge of the table top;

(d) a stud affixed to said bracket so as to extend outwardly therefrom, said stud having a threaded free end;

(e) said receptacle having an aperture therethrough, so as to be received onto said stud;



(f) an internally threaded stop washer inside said receptacle adjustably threaded onto the threaded free end of said stud; and

(g) an internally threaded cap inside said receptacle threaded onto the threaded free end of said stud against said stop washer to keep said stop washer thereon allowing said receptacle to maintain the substantially vertical position.

4,786,024

ADJUSTABLE SEAT

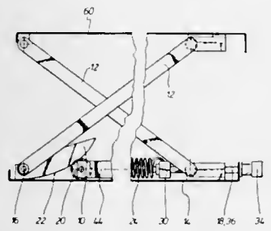
Leo Goetz, Kuemmersbruck, Fed. Rep. of Germany, assignor to Grammer Sitzsysteme GmbH, Amberg, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,591

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611512

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—422 **6 Claims**



1. A seat comprising:

base frame means;

a seat portion;

first and second support assemblies connecting the seat portion to the base frame means in a variable-height manner, each said assembly including first and second mutually crossing support arms each having first and second ends, the first end of each said arm being connected slidably to one of said seat portion and said base frame means and the second end of each said arm being non-slidably connected to the other of said seat portion and said base frame means, the second ends of said arms of said support assemblies being interconnected by a shaft;

a cam lever operatively connected non-rotatably to said second ends of the arm of each assembly, said cam lever being fixedly mounted on said shaft intermediate said second ends of said arm;

a slider having first and second ends, the first end thereof co-operating with said cam lever;

a spring means having first and second ends, the first end being secured to one of said seat portion and said base frame and the second end of said spring means being secured to the slider, thereby to support said seat portion in relation to said base frame means; and

means for heightwise adjustment of the seat portion, including means for adjusting the slider in respect of its length.

4,786,025

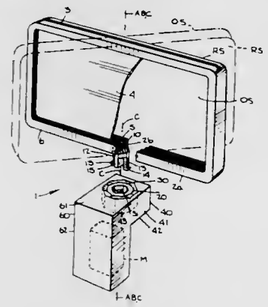
ANTI-TWIST SIGNHOLDER SUPPORT ASSEMBLY

Bernard Shuman, Merrick, N.Y., assignor to EEE Corporation, Port Washington, N.Y.

Filed Aug. 27, 1987, Ser. No. 90,166

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—558 **17 Claims**



1. Anti-twist signholder support assembly, which comprises

a male attachment insert arranged for connection of an overlying signholder thereto, and having a central generally vertical axis, and including an upper generally horizontal multi-sided anti-twist plate, and a lower lock formation integrally connected to the plate and including a pair of diametrically arranged, vertically extending and horizontally resilient catch fingers, each having one end integrally connected to the plate and another end disposed as a catch containing free end, and

a mating female mounting socket having a central generally vertical axis, and including a platform portion containing an upper generally horizontal multi-sided anti-twist entrance recess having a perimetric shape corresponding to the shape of the plate and sized for receiving the plate non-rotatably therein, and a lower internal multiple slot formation extending from the recess and having a diametrical arrangement and shape corresponding to the arrangement and shape of the lock formation and sized for receiving the lock formation, including the horizontally resilient fingers, non-rotatably and completely within the lateral confines thereof, and provided with an internal catch engaging edge formation disposed completely within the lateral confines of the internal slot formation for releasable self locking of the horizontally resilient fingers thereat, the platform portion, recess and slot formation being integrally interconnected,

such that the insert is alternatively coaxially insertable in the socket with the lock formation in the slot formation in more than one interchangeable relative angular rotational position, with respect to the axis, and such that in any alternative insertion position the recess will engage stationarily the plate for providing an anti-twist connection therebetween in which all external rotational forces about the axis acting on the insert will be transmitted directly by the plate to the recess remote from the lock formation and slot formation.

4,786,026

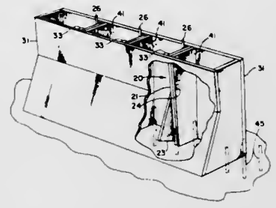
REMOVABLE, COLLAPSIBLE BULKHEAD ASSEMBLY

Augustus W. Bailey, Barberton, Ohio, assignor to James W. Smith, Jr., Richfield, Ohio

Continuation of Ser. No. 001,650, Jan. 8, 1987, abandoned. This application Apr. 11, 1988, Ser. No. 180,001

Int. Cl.⁴ E01C *19/50*

U.S. Cl. 249—9 **10 Claims**



8. A removable, collapsible concrete bulkhead assembly in combination with a framework, comprising:

the bulkhead assembly containing a bulkhead plate, a divider plate, and an arm connected to said divider plate, the width of said divider plate being the same or less than the width of said bulkhead plate and said divider plate being located juxtaposition to, pivotally attached to, and movable in a lateral direction with respect to said bulkhead plate;

the framework having a top opening and an offset, said bulkhead assembly located transversely in said framework, said arm extending upwardly out of said top opening and being capable of imparting to said divider plate lateral movement into and out of said offset prior to removal of said assembly from said framework, and said bulkhead assembly being removable from said top opening when said divider plate is located juxtaposition to said bulkhead plate.

4,786,027

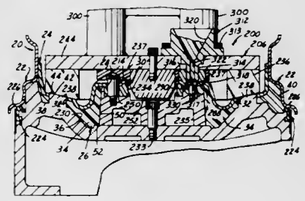
APPARATUS FOR MOLDING COMPOSITE METAL-ELASTOMER WHEELS

Robert J. Stalter, Sr., Bowling Green, Ohio, assignor to Motor Wheel Corporation, Ohio

Filed Feb. 17, 1987, Ser. No. 15,165

Int. Cl.⁴ B29C *39/26, 45/27, 45/34*

U.S. Cl. 249—56 **8 Claims**



1. In apparatus for molding a composite styled wheel of the type comprising a metal part consisting of a metal disc and rim subassembly operable as metal street wheel when a pneumatic tire is mounted on said rim, and a decorative urethane plastic body permanently molded to said metal part at the outboard face thereof, said molding apparatus comprising a base mold part configured to receive said metal part thereagainst and having an annular lip adapted for sealing engagement against an annular portion of the outboard face of said metal wheel radially outwardly of the center of the disc in the closed condition of said molding apparatus, said base mold part having a mold cavity surface to provide an ornamental configuration for the outboard face of the plastic body of the composite wheel, said mold cavity surface in said closed condition defining with at least part of the outboard face of said metal part a mold cavity axially adjacent the outboard face of said metal part, and a clamp adapted to seat in closed condition against the inboard face of said metal part at least adjacent the outer perimeter of said disc for urging said metal part into said sealing engagement with said base mold part, said mold parts being axially separable from one another to open said molding apparatus and to clear said metal part from said clamp and base mold parts, the improvement wherein said clamp includes funnel means adapted for registry with a liquid urethane reaction mixture injection nozzle coupled with injection mixing apparatus, said funnel means having a nozzle passage registering with the inboard side of a pour opening in said disc in the closed condition of said mold, and sprue pin means affixed to said base mold part in juxtaposed relation to said disc pour opening, said sprue pin means being adapted to cooperate with said disc pour opening to define a restricted annular access opening to said mold cavity during the injection pour of said urethane reaction mixture, said sprue pin means being operable to restrict back-flow of said reaction material via said pour opening during gelation of the same in the cure cycle, said sprue pin means being adapted to cooperate with said disc in the vicinity of said pour opening to define a zone of weakness in the cured urethane reaction mixture operable to induce fracture in said zone upon separation of said clamp funnel means from said metal part to thereby cause cleavage of said urethane reaction material adjacent the inboard surface of said metal part.

4,786,028

FLUID FLOW CONTROL VALVE

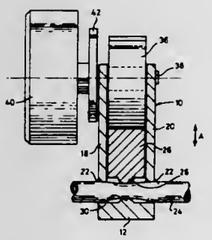
Brian W. Hammond, Coltishall, United Kingdom, assignor to Heatrae-Sadia Heating Limited, Norwich, England

Filed Feb. 24, 1987, Ser. No. 17,861

Claims priority, application United Kingdom, Mar. 5, 1986, 8605436

Int. Cl.⁴ F16K *13/08;* **F16L** *55/14*

U.S. Cl. 251—7 **8 Claims**



1. A fluid flow control valve comprising

a valve housing,

a deformable tube passing through the valve housing and for receiving a flow of fluid,

a valve plunger slidably mounted within the housing, and

a cam operable for causing sliding movement of the plunger to deform and constrict the tube, wherein

the plunger and the valve housing each have respective convex part-cylindrical tube-contracting surfaces, the axes of which are parallel and generally transverse to the direction of extent of the tube at the point of contact, the tube-contacting surfaces being opposed to one another on either side of the tube so that the sliding movement of the plunger towards the tube compresses the tube between the two tube-contracting surfaces,

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the cam is mounted for rotation about an axis transverse to the direction of sliding movement of the piston and having a circumferential cam surface of varying radius from the said axis of rotation, and

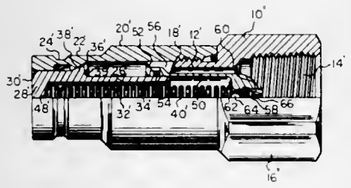
the plunger has a part cylindrical upper face and the control cam comprises a generally cylindrical member mounted for rotation about an axis transverse to the direction of sliding movement of the plunger and having a peripheral face ramped over a peripheral arc of substantially 360 degrees with an end region of minimum radius about said axis of rotation arcuately adjacent an end region of maximum radius about said rotation axis, the two said end regions being separated by a step which constitutes a rotation-limiting stop, and said ramped peripheral face directly engaging the part-cylindrical upper face of the plunger to cause progressive sliding movement of the plunger on rotation of the cam, thereby progressively to compress the tube from a fully open condition to a fully closed condition when said cam has been rotated through substantially 360 degrees and from a fully closed condition to a fully open condition when said cam has been rotated through substantially 360 degrees in an opposite direction to an orientation where the step engages one side of the plunger.

4,786,029

CONNECT-AGAINST-PRESSURE COUPLING

Robert A. Laipply, Jackson; Brian A. Mack, Horton, both of Mich., and Phillip G. Fuerst, Kalida, Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 9, 1987, Ser. No. 118,565
Int. Cl.⁴ F16L *37/28*
U.S. Cl. 251—149.6 **2 Claims**



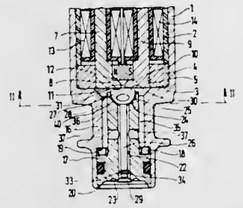
1. A connect-against-pressure coupling for a pressurized medium comprising, in combination, a tubular body having an axial passage, a conduit attachment end and a connection end, an annular valve seat defined within said passage adjacent said connection end, an elongated valve axially displaceable within said passage between open and closed positions, said valve having an accessible end adjacent said body connection end for engagement with a coupling probe during connection and a head engageable with said valve seat when in said closed position, a pressure face defined on said head exposed to pressurized medium within said passage wherein medium pressure imposed thereon biases said valve toward said closed position, said valve having a concentric chamber defined therein, a compression spring received within said chamber biasing said valve toward said closed position, a guide defined in said passage having an axially extending guide surface defined thereon, said valve engaging said guide surface and guided thereby during displacement between said open and closed positions, said guide comprising a tubular shell within and concentric to said passage having an open end disposed toward said body connection end and a cylindrical bore, said valve including a cylindrical skirt telescopingly received within said bore, an annular seal interposed between said bore and valve skirt adjacent said guide shell open end, said guide shielding substantially all transversely disposed surfaces defined on said valve facing away from said valve accessible end from exposure to pressurized medium within said passage except said face whereby the axial force exerted on said valve toward said closed position by the medium is substantially confined to that exerted upon said face, and a unidirectional bleed valve defined in said shell in communication with said body passage and said valve chamber permitting medium flow from said chamber into said passage.

4,786,030

ELECTROMAGNETICALLY ACTUATABLE FUEL INJECTION VALVE

Max Greiner, Gerlingen; Udo Hafner, Lorch; Waldemar Hans, Bamberg; Heinrich Knapp, Leonberg; Wolfgang Kramer, Kemmern; Rudolf Krauss, Stuttgart; Ferdinand Reiter, Markgroningen; Peter Romann, Stuttgart, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,528
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641469
Int. Cl.⁴ F16K *31/08*; F02M *51/06*
U.S. Cl. 251—129.15 **6 Claims**



1. An electromagnetically actuatable fuel injection valve having a valve housing, a valve seat body disposed in the valve housing, at least one magnet coil, a core and an armature interposed betwen said housing and said valve seat body, the armature being connected to a spherical guide section which carries a valve needle, the circumferences of which spherical guide section is slidably supported in a guide bore of the valve seat body and the stroke movement of which spherical guide section in the direction away from the core can be limited by means of a stop opening which adjoins the guide bore and is aranged to taper progressively from the guid bore on, at least two flat faces (**40**) spaced apart equally from one another on the circumference of the spherical guide section (**28**), whereby when the spherical guide section (**38**) is resting on the stop opening (**24**) said flat faces decrease the contact surface area between the spherical guide section (**28**) and the stop opening (**24**).

4,786,031

FIBER REINFORCED THERMOPLASTIC BUTTERFLY VALVE ELEMENT

Joe R. Waldrop, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 13, 1987, Ser. No. 120,293
Int. Cl.⁴ F16K *1/22*
U.S. Cl. 251—368 **9 Claims**

1. A valve element for controlling fluid flow in a butterfly valve comprising:

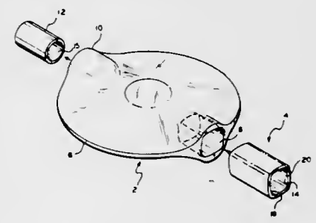
(a) a flattened disk-like member having an outer circumference and comprised of a thermoplastic polymer matrix containing random fiber reinforcement.

(b) said disk-like member having a channel defined therein, said channel being diametrically extending and having side walls extending radially inward from said outer circumference, said disk-like member being transversely thickened in the region of said channel, and

(c) a tubular sleeve insert member

(1) comprised of a thermoplastic polymer matrix containing filament wound fiber,

(2) having circumferential walls defining outside and inside circumferential wall surfaces, and



(3) located matingly in, and integrally associated with, said channel,

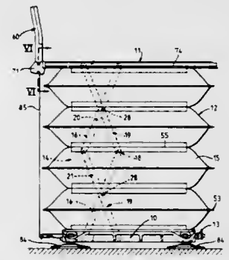
(d) said circumferential walls being noncylindrical and said channel so associated therewith having its said side walls matingly configured thereto.

4,786,032

LIFTING APPARATUS

David E. T. Garman, and Richard M. Rimington, both of Powys, Wales, assignors to Mangar Aids Limited, Prestelgne, Wales

Continuation-in-part of Ser. No. 794,502, Nov. 1, 1985, Pat. No. 4,688,760. This application May 21, 1987, Ser. No. 52,397
Claims priority, application United Kingdom, Nov. 6, 1984, 8428009; Feb. 6, 1985, 8502950; Oct. 9, 1985, 8524851
Int. Cl.⁴ B66F *3/24*
U.S. Cl. 254—93 HP **23 Claims**



1. A lifting apparatus comprising:

(a) thrust means located between a first side of a base means and a first side of a platform means to move the platform means with respect to the base means,

(b) platform stabilizing means for maintaining the base means and the platform means in fixed relationship with respect to one another,

(c) the platform stabilizing means being enclosed within the thrust means and including a stabilizing linkage assembly being separate from the thrust means and wholly devoid of lifting forces,

(d) said linkage assembly including first pivot means extending along a first common pivotal axis at one end thereof, said first common pivotal axis being fixed with respect to the platform means and second pivot means extending along a second common pivotal axis at the other end thereof, said second common pivotal axis being fixed with respect to the base means,

(e) a first pair of mutually opposed guide means disposed on the platform means and a second pair of mutually opposed guide means disposed on the base means with each said guide means being located outside said linkage assembly to prevent horizontal and vertical movement of the linkage assembly with respect to the guide means,

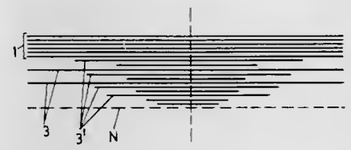
(f) said linkage assembly including third pivot means extending along a third common pivotal axis at said one end thereof, said third pivot means being slidably mounted in said first pair of guide means on the platform means and fourth pivot means extending along a fourth common pivotal axis at said other end thereof, said fourth pivot means being slidably mounted in said second pair of guide means on the base means.

4,786,033

LEAF SPRING OF COMPOSITE FIBRE PLASTICS MATERIAL

Walter Kofler, Tschiggfreystrasse 40, A-6020 Innsbruck, Austria

Filed Nov. 13, 1986, Ser. No. 929,810
Claims priority, application Austria, Nov. 14, 1985, 3317/85
Int. Cl.⁴ F16F *1/18*; B29L *67/14*
U.S. Cl. 267—47 **13 Claims**



1. A leaf spring of composite fibre plastics material, said leaf spring having longitudinal ends spaced apart in a longitudinal direction and a thickness which decreases towards at least one of said ends from a region of maximum thickness and with a width which is substantially the same over at least part of the entire length, comprising a plurality of fibre material layers which are disposed in superposed relationship and which are embedded in a synthetic resin matrix, said layers including outer fibre material layers which extend over the entire length of the leaf spring in said longitudinal direction and which are associated with tension and compression zones which are located on opposite sides of a neutral zone of the spring, said layers further including shorter inner fibre material layers having lengths in said longitudinal direction which are stepped in a direction towards the neutral zone, and said layers further including intermediate layers arranged in the region between the neutral zone and the tension and compression zones respectively, said intermediate layers being between adjacent inner layers of fibre material, each of said intermediate layers having a length which is greater than the length of the adjacent inner layers of fibre material, the length of at least one of the intermediate layers of fibre material being substantially equal to the length of the outer layers of fibre material and the lengths of the remainder of the intermediate layers of fibre material being shorter than the outer layers of fibre material and being stepped in a direction towards the neutral zone.

4,786,034

APPARATUS FOR DAMPING COURSES OF MOVEMENT

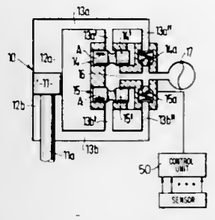
Gerhard Heess, Tamm, Fed. Rep. of Germany, and Dean Karnopp, Davis, Calif., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 5, 1987, Ser. No. 11,657
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1986, 3610937
Int. Cl.⁴ F16F *5/00*; B60G *17/04*
U.S. Cl. 267—64.15 **12 Claims**

1. An apparatus for damping courses of motion of two bod-

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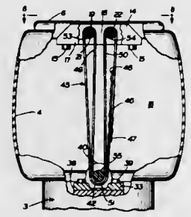
ies or masses moving relative to one another and in their absolute positions with variable velocities, in particular for damping resilient wheel suspension systems in vehicles, road vehicles, buses, rail systems and the like, comprising a piston-cylinder unit, said piston-cylinder unit including a piston cylinder, a piston in said piston cylinder, a rod connected to said piston extending to the outside of said piston cylinder, said piston dividing said piston cylinder into an upper work chamber and a lower work chamber, said piston-cylinder unit being connected on one end to a first mass, said piston rod extending from said piston cylinder being connected to a second means, a valve means, said valve means including first and second independently operated control valves, a first pressure line connected to said upper work chamber and to said valve means, a second pressure line connected to said lower work chamber and to said valve means, first and second one-way check valves connected with said first and second pressure lines and to said valve means, said first one-way check valve opening in a direction of fluid flow toward said upper work chamber, said second one-way valve opening in a direction of



fluid flow toward said lower work chamber, a valve control unit generating active and passive damping signals for triggering said valve means to control fluid flow from said upper work chamber to said lower work chamber and from said lower work chamber to said upper work chamber, sensors for sending different parameters related to said first and second mass and directing sensor control signals into said valve control unit for controlling said valves in accordance with the sensed signals, said sensor signals being obtained from the relative velocity of said first and second masses to each other, the absolute velocities of the masses independently of one another, the load status, load distribution of the axles, vehicle speed, acceleration in the longitudinal and transverse directions, roadway unevenness, and steering deflection are supplied to the control unit, said valve means being triggered by said valve control unit for active and passive damping, whereupon the active damping signals are referred to the absolute velocity of the bodies or masses to trigger said valve means and the passive damping signals are referred to the relative velocity of the two bodies or masses to effect damping.

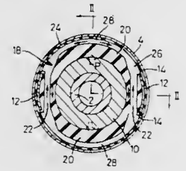
4,786,035
AIRSPRING WITH INTERNAL RESTRAINT
Robert F. Elliott, Westfield, Ind., assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Nov. 21, 1986, Ser. No. 933,423
Int. Cl.[4] F16F *5/00, 9/04*
U.S. Cl. 267—122 **7 Claims**

1. An improved airspring construction including:
(a) a pair of spaced end members adapted to be mounted in a spaced relationship on a vehicle and movable towards and away from each other between jounce and extended positions upon a wheel of the vehicle encountering variations in a rod surface;
(b) a fluid pressure chamber formed between the end members by a flexible sleeve sealingly connected at opposite ends thereof to said end members for absorbing shock loads on the vehicle wheels;
(c) a pair of strap mounting brackets mounted on one of the end members and a single strap mounting bracket mounted on the other of said end members each of the strap mounting brackets includes a clevis and a cylindrical rod which is fixedly now rotatably mounted on each of said clevises; and
(d) a continuous strap of flexible high strength, water resistant material operatively connected to and extending between the end members within the fluid pressure cham-



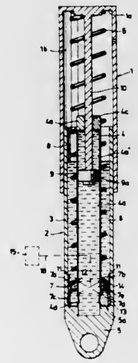
ber to limit the movement of said end members away from each other, said strap having an intermediate portion looped about the said one mounting bracket and forms a pair of looped ends opposite of said one mounting bracket with the rods of each of the said pair of mounting brackets directly engaging a respective one of the formed looped ends for mounting said strap on the end members.

4,786,036
RESILIENT BUSHING STRUCTURE FILLED WITH VISCOUS FLUID
Ryouji Kanda, Inuyama, Japan, assignor to Tokai Rubber Industries, Ltd., Aichi, Japan
Filed Jul. 14, 1987, Ser. No. 73,286
Claims priority, application Japan, Jul. 16, 1986, 61-167440
Int. Cl.[4] F16F *1/36*
U.S. Cl. 267—140.1 **13 Claims**



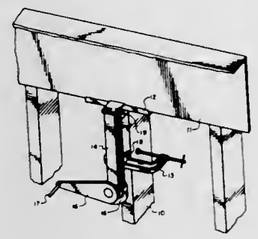
1. A fluid-filled resilient bushing comprising:
an inner sleeve;
an outer sleeve disposed in radially outwardly spaced apart relation with said inner sleeve;
a generally annular resilient member interposed between said inner and outer sleeves, so as to resiliently connect the inner and outer sleeves, said generally annular resilient member including an axially intermediate portion which has a generally annular recess open in an outer circumferential surface thereof, said outer sleeve fluid-tightly closing said annular recess, and thereby cooperating with said resilient member to define a generally annular fluid chamber filled with a viscous fluid; and
gap-forming means for defining a pair of shearing gaps as two opposite portions of said annular fluid chamber which are opposite to each other diametrically of said inner sleeve, in a first diametric direction perpendicular to a second diametric direction (P) in which the bushing receives a vibrational load, said pair of shearing gaps extending substantially in said second diametric direction, each shearing gap defined by a first face and an opposite second face, and each shearing gap having a dimension as measured in said first diametric direction, which dimension is determined to be small enough to enable masses of said viscous fluid in said shearing gaps to provide a viscosity resistance upon application of shearing stresses to said masses due to said vibrational load received by the bushing, the first and second faces being moved relative to each other parallel to the second diametric direction upon application of a vibrational load to the bushing in the second diametric direction.

4,786,037
ARRANGEMENT FOR A SPRING SUSPENSION SYSTEM
Mike Mills, 2, Vicarage Stables, Poulton Cirencester, Glos. GL7 5HS, England
PCT No. PCT/SE85/00534, § 371 Date Oct. 15, 1986, § 102(e) Date Oct. 15, 1986, PCT Pub. No. WO86/04125, PCT Pub. Date Jul. 17, 1986
PCT Filed Dec. 19, 1985, Ser. No. 916,677
Claims priority, application Sweden, Jan. 11, 1985, 8500134
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—226 **9 Claims**



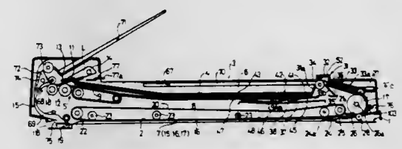
1. A device for a spring suspension system, comprising:
a unit having a first and a second part, said second part including an outer cylinder and an inner cylinder disposed inside said outer cylinder, said outer and inner cylinders defining therebetween a first space filled with incompressible fluid and being connected with a second space in contact with surrounding atmosphere, said first and second space being under atmospheric pressure;
a main spring disposed on said inner cylinder for compressing said incompressible fluid;
a piston with an associated piston rod for providing a damping function, working in said incompressible fluid in a third working space defined inside said inner cylinder, said piston being supported in a bearing so dimensioned as to allow leakage of said incompressible fluid from said third working space into said second space under atmospheric pressure upon return strokes of said piston;
a movable device located in said first space between said inner and outer cylinders with main spring acting on one side, and said incompressible fluid acting on another side of said movable device and against said spring, said movable device including a one-way valve allowing flow of said incompressible fluid from said first space into said third working space at the side below said piston whenever low pressure occurs inside said space.

4,786,038
HANGER'S HELPER TOOL
Frank A. Ammons, 3246 W. 4960 South, Salt Lake City, Utah 84118
Filed Feb. 17, 1987, Ser. No. 15,433
Int. Cl.[4] B23Q *3/18*
U.S. Cl. 269—60 **3 Claims**



1. An apparatus for positioning wallboard vertically along a wall from a vertically oriented wall construction stud, comprising in combination:
an elongated, hollow, vertically oriented support housing having an elongate aperture extending the length of the housing;
an adjustment mechanism disposed within said housing for raising and lowering a positioning bracket, said mechanism having a combination rotary threaded shaft and spool which are driven by the rotations of the handle disposed at the base of said housing;
a positioning bracket for supporting and positioning wallboard, said bracket being disposed exteriorly of said housing, along the housing aperture and having engagement means with said adjustment mechanism to raise and lower the bracket as the adjustment mechanism is rotated; and
a support clamp secured to said housing for clamping the housing to a vertically oriented wall construction stud for support.

4,786,039
RECIRCULATING DOCUMENT FEEDER
Kenshi Ito, Ramsey, N.J., assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 17, 1987, Ser. No. 122,124
Claims priority, application Japan, Nov. 18, 1986, 61-274382; Dec. 6, 1986, 61-291150; Dec. 6, 1986, 61-291151; Dec. 6, 1986, 61-291152; Dec. 6, 1986, 61-291153; Dec. 6, 1986, 61-291154
Int. Cl.[4] B65H *31/20*
U.S. Cl. 271—3.1 **10 Claims**



1. A recirculating document feeder adapted to circulate each document sheet from a stack of such sheets to an exposure position, said feeder comprising:
means for supporting the stack of sheets,
means for sending out the sheets from the front end of said supporting means one by one,
sheet transport means for transporting the sent-out sheet to the exposure position and returning the sheet from the

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exposure position toward said supporting means after exposure,

sheet discharge means for receiving the returned sheet from said transport means, moving the sheet through a passage under a rear portion of said supporting means and thereafter delivering the sheet from said passage to said supporting means thereabove, said sheet discharge means having a plurality of sheet delivery openings arranged longitudinally of said feeder at different positions, and

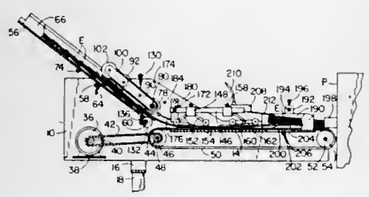
means for guiding the sheet traveling through said passage so as to discharge the sheet from one of said sheet delivery openings.

4,786,040

METHOD AND APPARATUS FOR FEEDING ENVELOPES TO A PRINTING PRESS

Elmer R. Thomsen, 1021 NE. 135th Ave., Portland, Oreg. 97230

Filed Mar. 30, 1987, Ser. No. 31,644
Int. Cl.[4] B65H *5/02*
U.S. Cl. 271—3.1 **15 Claims**



1. Apparatus for feeding envelopes to a printing press having envelope infeed mechanism operable to delivery envelopes one at a time to the press, the apparatus comprising:

(a) a frame having an envelope delivery end adapted to be positioned adjacent the infeed of a printing press,

(b) an envelope storage tray on the frame,

(c) an envelope delivery conveyor on the frame operable to move envelopes toward the envelope delivery end of the frame,

(d) an electric drive motor on the frame engaging the delivery end of the frame,

(e) an envelope feed roll on the frame coupled to the drive motor for operation concurrently with the delivery conveyor for feeding envelopes from the storage tray to the delivery conveyor,

(f) spacer means on the frame adjustable toward and away form the feed roll for adjusting the space therebetween for limiting the number of envelopes movable through said space at the same time to two envelopes, the spacer means engaging the underlapping envelope and retarding its forward movement relative to the overlapping preceding envelope, whereby to feed envelopes forwardly to the delivery conveyor in a succession of lapped envelopes with each succeeding envelope underlapping the next preceding envelope,

(g) an envelope stacking station on the frame at the envelope delivery end thereof for receiving said lapping envelopes one at a time from the delivery conveyor and forming a vertical stack of a plurality of said envelopes, and

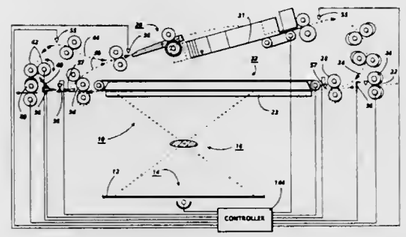
(h) elevating means at the stacking station arranged to raise the rear end of the bottom envelope of the stack for receiving the next succeeding underlapping envelope under said bottom envelope, whereby to form a vertical stack of envelopes from the bottom and allowing the envelopes to be delivered to the printing press one at a time from the top of the stack.

4,786,041

DOCUMENT HANDLER JAM CLEARANCE AND JOB RECOVERY SYSTEM

Thomas Acquaviva, Penfield; Michael B. Tanaka, Rochester, and Charles E. Smith, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 6, 1987, Ser. No. 117,762
Int. Cl.[4] B65H *7/06*
U.S. Cl. 271—3.1 **7 Claims**



1. In a recirculating document handler for repeatedly sequentially presenting documents to the platen of a copier for copying, comprising a document stacking and restacking tray spaced from the platen and adapted to receive for copying a set of documents loaded therein, first feeding means for feeding the documents from said stacking tray to the platen, second feeding means for feeding the documents over the platen for copying, and third feeding means for feeding the documents from said platen back to said stacking tray after they have been copied, to complete a document recirculation path, sensing means for sensing document jams and for sensing the position of jammed documents in said document recirculation path, and control means connecting with said sensing means and the copier for controlling the operation of said recirculating document handler, including stopping the recirculating document handler in response to sensing of a jam by said sensing means, said control means determining which documents had been copied before a jam occured and providing instructional displays to the operator for operator jam clearance (document removal) and job recovery, and wherein said recirculating document handler has an additional, separate, document input means for normally sequentially feeding documents to said platen to be copied other than documents from said stacking tray and other than for precollation copying, in a seperate document feeding path; the improvement comprising an improved jam clearance and job recovery system for recovering from document jams in said recirculating document handler document recirculation path, wherein:

after said recirculating document handler has stopped in response to said sensing of a jam by said sensing means, said control means thereby determines whether a document jam has resulted in a jammed document being present in a first, second or third jam zone, wherein said first jam zone includes said first feeding means, said second jam zone includes said platen and said second feeding means, and said third jam zone includes said third feeding means;

when said control means so determines that a document jam has resulted in a jammed document being present in said first or second jam zones, said control means automatically provides a first job recovery mode with a said instructional display to the operator instructing the operator to remove documents present in said first or second jam zones and to place those documents into said separate document input means, and said control means then automatically operates said recirculating document handler to feed those documents from said seperate document input means onto said platen and to said stacking tray via said third feeding means, but wherein those documents in said second jam zone which had already been copied before said jam occured are fed across said platen without being copied, and other said documents from said first or second jam zones are copied;

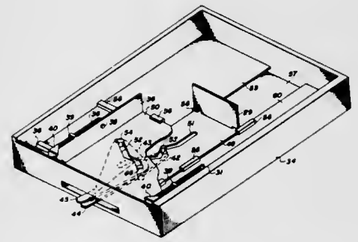
when said said control means so determines that a document jam has resulted in a jammed document being present in said third jam zone, said control means automatically provides a different job recovery mode with a different said instructional display to the operator instructing the operator to remove documents present in said third jam zone and either to to place those document into said stacking tray or to place those documents into said separate document input means, and said control means then automatically operates said recirculating document handler to feed those documents from said separate document input means past said platen and to said stacking tray via said third feeding means without copying them.

4,786,042

ADJUSTABLE SIZE SENSING SHEET CASSETTE

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1987, Ser. No. 32,654
Int. Cl.[4] B65H *1/12*
U.S. Cl. 271—9 **35 Claims**



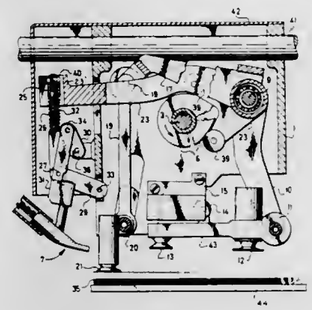
18. Automatic printing apparatus including a station for printing an image on a sheet, means for supporting a removable, adjustable sheet cassette containing sheets in a cooperative position in said apparatus, means for feeding a sheet from said adjustable sheet cassette to said printing station, said apparatus including at least one other supply of sheets, said adjustable cassette comprising a sheet stack support platform, said platform being capable of supporting various stacks of sheets of a plurality of length and width dimensions, sheet width and length dimension representing members each independently movable to a plurality of positions representing a plurality of sheet width and length dimensions, a pair of side edge sheet guides in opposed relationship to each other at least one of said side edge sheet guides being movable relative to the other side edge sheet guide, a movable rear edge sheet guide, said at least one movable side and rear edge guides being adjustable to accommodate various stacks of sheets of a plurality of width and length dimensions and means automatically responsive to movement of said at least one movable side and rear edge guides respectively to move said sheet width and length representing members to positions respectively representing a sheet width and a sheet length dimension of the stack of sheets on the platform, the position of said width and length dimension representing members being detectable by detector means on said apparatus, said apparatus including detector means to detect the respective positions of said sheet width and length representing members, said apparatus further including control means to determine the length and width dimensions of a copy sheet in said cassette from the detected respective positions of said sheet width and length dimension representing members to enable said apparatus to automatically select said sheet cassette to supply sheets for a printing operation.

4,786,043

DEVICE FOR FEEDING SINGLE PAPER SHEETS FROM A PILE

Jaroslav Jiruse, Blansko; Milan Konecny, Olomoucany, and Vladimir Drlik, Bilovice nad Svitavou, all of Czechoslovakia, assignors to ZVS - Adamovsky strojirny koncernovy podnik Adamov, damov, Czechoslovakia

Filed Oct. 10, 1986, Ser. No. 918,170
Int. Cl.[4] B65H *3/08*
U.S. Cl. 271—103 **3 Claims**



1. A feeding device for feeding paper sheets from a pile, these sheets being fed from a pile of sheets by means of pneumatic suckers which are operatively mounted in said device, comprising a driving shaft which is operatively mounted in the feeding device, first, second and third sets of pairs of cams fastened on the driving shaft, a supporting shaft mounted in said feeding device, a double lever provided with a first pair of rollers is pivotally mounted on said supporting shaft, the first rollers bearing against the surfaces of the first set of a pair of cams, a control fork provided with a pair of second rollers is pivotally mounted on said supporting shaft, said second rollers bearing against the surfaces of the second set of a pair of cams, a lever provided with a pair of third rollers is pivotally mounted on said supporting shaft, said lever having a pair of arms at the free ends of which said third rollers bearing against the surfaces of the third set of a pair of cams; there is operatively mounted a supporting tube member at one free end of said control fork, a sucker bar mounted on the support tube member, and front forwarding sucker means mounted upon the sucker bar, a guiding roller mounted on the sucker bar, said guiding roller reciprocally travels in a guide fastened to the feeding device.

4,786,044

INSERT FOR ADJUSTABLE SHEET GUIDE

Philip L. Moody, Cranbury, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1987, Ser. No. 22,844
Int. Cl.[4] B65H *1/06*
U.S. Cl. 271—171 **6 Claims**

1. A sheet material stack adjustable guide insert for providing an unobstructed stacking region for said stack on a support comprising:

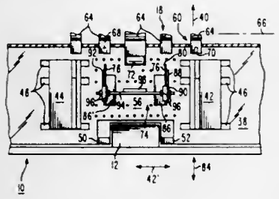
a first stack aligning member having a stack aligning surface and adapted to rest on said support;

a second stack aligning member having a stack aligning surface and adapted to rest on said support; and

a third stack aligning member having a stack aligning surface, said first and second members including means for adjustably receiving the third member so that the first and second members are secured with their aligning surfaces parallel to each other and normal to the aligning surface of the third member, said means for adjustably receiving including adjustment means for adjusting the spacing

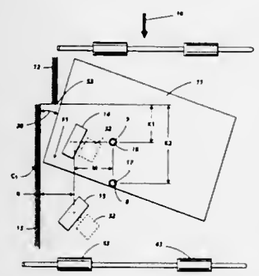
VOL 1096 ISS 4 NO 22 1988 UMI

distance between the first and second members in a first direction and the position of the third member in a second direction parallel to the first and second member aligning surfaces, the footprint of all said members on said support being relatively small compared to the stacking space region defined by said aligning surfaces so that said latter space is substantially unobstructed in a direction parallel to all said aligning surfaces;



said first and second members each comprising a sheet material element having a slot extending in said second direction, and a second sheet material element having a U-shaped section straddling the first element, and said third member including a rod releasably secured to the Ushaped section and passing through said slot.

4,786,045
OFFSETTING AND REGISTRATION PAPER TRANSPORT
Ronald W. Sam, Oxnard, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed May 4, 1987, Ser. No. 45,961
Int. Cl.[4] B65H *9/16*
U.S. Cl. 271—251 **7 Claims**



1. A mechanism for offsetting and registering a sheet of paper as it is traveling in a forward direction so that the outboard edge of said paper is brought into contact with a registration edge, comprising,

first means for urging said sheet forward and in the outboard direction, the distance between said first means for urging and said registration edge being less than half the width of the leading edge of said sheet, said first means comprising a paddlewheel comprising a central hub and a plurality of vanes, said vanes being relatively short and numbering between two and four to allow a period of no contact between said paddlewheel and paper between succesive contacts between said paper and paddlewheel vanes, and

second means for retarding the motion of said sheet comprising a retainer, and a ball which is retained within said retainer, and retainer comprising surfaces on all sides of said ball to restrain the translational movement of said ball while allowing said ball to move vertically and rotationally, said second means located between said first means for urging and the inboard edge of said sheet.

4,786,046
HANDLING OF SHEET MATERIALS
Michael A. Freeman, Clacton-on-Sea, and Brian Nicholson, St. Osyth, both of England, assignors to John Waddington PLC, England
Filed Mar. 13, 1987, Ser. No. 25,440
Claims priority, application United Kingdom, Mar. 15, 1986, 8606436; Mar. 18, 1986, 8606629
Int. Cl.[4] B65H *29/54*
U.S. Cl. 271—276 **6 Claims**

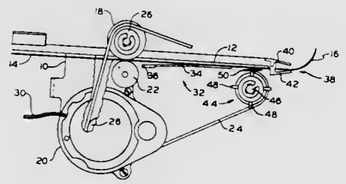


1. A method of detaching a sheet element from a support surface wherein the support surface has a plurality of apertures through which air under pressure can be applied, comprising the steps of:

supplying low pressure air to some of said plurality of apertures in a region which is inwardly spaced from an edge of the sheet element to be detached, and

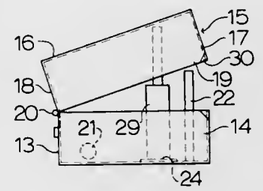
injecting air at a pressure higher than said low pressure air through other of said plurality of apertures over which the edge of the sheet element to be detached overlies, following said step of supplying low pressure air, so as to detach said edge from a detachment location of the support surface.

4,786,047
DOCUMENT PRESENTOR
Charles Bickoff, Avon; William J. Smith, West Hartford, and Donald L. Suprise, Waterbury, all of Conn., assignors to Magnetec Corporation, Bloomfield, Conn.
Filed Sep. 2, 1986, Ser. No. 903,403
Int. Cl.[4] B65H *29/54*
U.S. Cl. 271—281 **13 Claims**



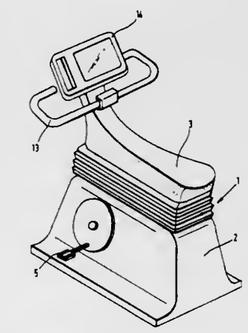
1. An apparatus for consecutively conveying a plurality of sheets of paper or the like from a powered feeder downstream to an exit point and for clearing an impeded sheet of paper from blocking the exit point, said apparatus comprising a frame and means on said frame for guiding each of said moving sheets along a preselected path from said feeder to said exit point, the sheet guiding means including flexible sheet means between said feeder and said exit point for normally biasing each moving sheet in a flat configuration along said preselected path, said sheet biasing means allowing a sheet to buckle in a direction normal to the plane of and away from said preselected path in response to an obstruction to said moving sheet between said exit point and said biasing means and means for clearing the buckled sheet from the sheet path.

4,786,048
NOVELTY ITEM
Johan L. Lahti, Box 249, Asquith, Saskatchewan, Canada S0K 0J0, and Lawrance Michayluik, #317c-207 Tait Place, Saskatoon, Saskatchewan, Canada S7H 5L8
Filed Apr. 28, 1986, Ser. No. 856,194
Int. Cl.[4] A63J *23/00;* **G09F** *19/08;* **A63H** *33/26*
U.S. Cl. 272—27 N **9 Claims**



1. A novelty item comprising in combination an enclosure, a cover component hinged by one side thereof to the rear side of said enclosure, a source of an electrical power in said enclosure, and an electronic control unit within said enclosure operatively connected selectively to said source of electrical power, a display screen in said enclosure for displaying images thereon, and being operatively connected to said control unit, said display screen being situated adjacent the front side of said enclosure and extending into said cover component when same is in the closed position but being visible form the front of said enclosure when said cover component is in the open position, said images comprising a pair of spaced apart illuminated circles simulating a pair of eyes, and moveable across said screen in a predetermined pattern selected by said control unit, and means operatively connected to said control unit to open and close said cover component.

4,786,049
BICYCLE ERGOMETER
Peter Lautenschlager, Gonbach, Fed. Rep. of Germany, assignor to Keiper Dynavit GmbH & Co., Postfach, Fed. Rep. of Germany
Filed Aug. 26, 1987, Ser. No. 89,410
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629808
Int. Cl.[4] A63B *69/16*
U.S. Cl. 272—73 **16 Claims**



1. A bicycle ergometer, comprising:

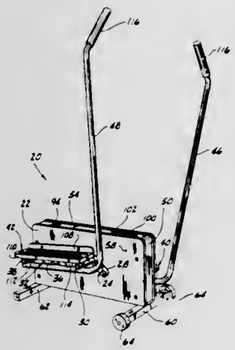
computer means for controlling the braking force of a controllable brake which controllabe brake may be automatically adjusted in response to the number of pedal revolutions of said bicycle, said computer means being operative with at least one selected reference value program of the product of a weight value of the user's weight and the gradient of the road;

display means arranged within the field of view of the user of said bicycle ergometer, said display means comprising a representation in the form of at least one line curve of each selected reference value program for the braking force, the course of each such line curve serving to make the size of the reference value of the braking force discernible;

said display means comprising light-emitting diodes arranged along each line curve such that the length of the line curve from its starting point to the points marked by said light-emitting diodes corresponds to predetermined values of the number of pedal revolutions, such associated light emitting diodes being illuminated when said predetermined values are reached; and

each of said line curves being constituted by a road in a landscape depicted on said display means.

4,786,050
EXERCISE MACHINE
Robert C. Geschwender, 3855 Orchard, Lincoln, Nebr. 68503
Filed Nov. 6, 1986, Ser. No. 927,396
Int. Cl.[4] A63B *21/00, 67/18*
U.S. Cl. 272—73 **18 Claims**



1. An exercise machine comprising:

a two-sided frame;

front and back crank mechanisms supported by the frame;

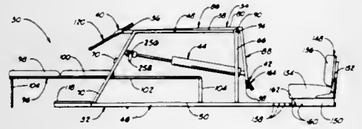
each crank mechanism comprising a crankshaft journaled in the frame for rotation about a generally horizontal axis, a pair of cranks on the crankshaft extending generally radially outwardly from the crankshaft in generaly opposite directions on opposite sides of the frame, and a crank pin extending laterally outwardly from each crank, generally parallel to but radially offset from the axis of rotation; and,

a pair of elongate pedals supported on the crank pins of the front and back crank mechanisms, at opposite sides of the frame, the pedals being operable in a cyclic manner to turn the crank mechanisms;

the crank pins of one of the crank mechanisms being journaled to the pedals generally adjacent one end of the pedals to permit relative rotation between the pedals and the crank pins as the pedals are operated to turn the crank mechanisms, and the crank pins of the other crank mechanism supporting the pedals generally adjacent the other end of the pedals and being reciprocally movable in front-to-back direction along the pedals as the pedals are operated to turn the crank mechanisms.

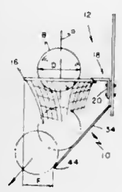
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,051
EXERCISING APPARATUS
Joe E. Mullican, P.O. Box 1977, Elk City, Okla. 73648
Filed Oct. 30, 1986, Ser. No. 924,997
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—134 28 Claims



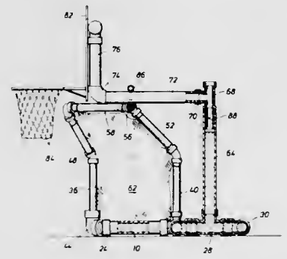
1. An exercising apparatus, comprising:
a frame;
an exercise bar having a first end and a second end, said exercise bar being pivotally attached between said first and second ends to said frame;
a first exercise station comprising:
first exercising means attached to said first end of said exercise bar for allowing the user of said apparatus to move said exercise bar relative to said frame; and
first user support means positioned adjacent said first exercising means for supporting said user while said user operates said first exercising means to move said exercise bar;
a second exercise station comprising:
second exercising means attached to said second end of said exercise bar for allowing said user to move said exercise bar relative to said frame; and
second user support means positioned adjacent said second exercising means for supporting said user while said user operates said second exercising means to move said exercise bar; and
a hydraulic ram disposed between said exercise bar and said frame for providing resistance to movement of said exercise bar relative to said frame in one direction, but providing substantially no resistance to movement of said exercise bar relative to said frame in the other direction.

4,786,052
BASKETBALL RETURN
Kurt E. Zinger, 449 Zehnder Dr., Frankenmuth, Mich. 48734
Filed Aug. 7, 1986, Ser. No. 894,036
Int. Cl.[4] A63B 63/08
U.S. Cl. 273—1.5 A 2 Claims



2. In combination:
a generally planar, vertical backboard;
a forwardly extending, generally horizontal, annular hoop having a basketball receiving opening, having a vertical axis, through which a basketball can pass in a vertical path;
bracket means for mounting said hoop on said backboard;
a ball deflector including
an upper, rearward mounting portion, sandwiched between said mounting bracket and said backboard, and
a downwardly extending, forwardly inclined portion, integral with said mounting portion, disposed below and in vertical alignment with said hoop opening so as to be engaged by a basketball so as to forwardly deflect said basketball from a vertical path of travel;
said downwardly extending forwardly inclined portion including a terminal and disposed forwardly of the vertical axis of said hoop and rearwardly of the forwardmost portion of said hoop.

4,786,053
PORTABLE FREE-STANDING APPARATUS FOR MULTIPLE ATHLETIC BALL GAMES
Donald B. Barnes, Jr., Missouri City, Tex., assignor to McKenzie Brothers Products, Inc., Houston, Tex.
Filed Feb. 17, 1987, Ser. No. 15,696
Int. Cl.[4] A63B 63/08, 63/04
U.S. Cl. 273—1.5 R 6 Claims



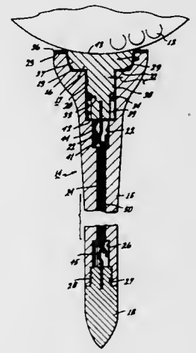
1. A portable, free-standing apparatus for playing one or more athletic ball games, comprising
a generally "U" shaped base comprised of relatively large diameter pipes adapted to be supported on a horizontal surface with its open side adjacent the side of a pool, and having means through which ballast may be added to or removed from the interior of the pipes,
a first open frame mounted on and extending upwardly from and forwardly toward the open side of the "U" shaped base,
a backboard mounted on the base near its upper end and supporting a basketball net above the horizontal surface,
a second open frame having upright sides mounted on the base and a cross member extending between the upper ends of the sides, and
a back-up net attached to the upright sides and cross member of the second frame and the base for disposal rearwardly of the basketball net.

4,786,054
GOLF TEE WITH ROTATABLE HEAD
Francis J. Keys, 9532 Cortada, El Monte, Calif. 91733
Filed Apr. 16, 1987, Ser. No. 38,946
Int. Cl.[4] A63B 57/00
U.S. Cl. 273—33 12 Claims

1. A golf tee comprising:
an elongated body including a hollow head portion with an axial bore providing an internal sidewall, a lower end, and an axial hole extending from the axial bore through the lower end thereof;
a pointed bottom member having an upper end removably connected to the lower end of said elongated body;
a rotatable support member having a lower end seated within said hollow head portion and having a sidewall spaced with a clearance from the internal sidewall of said hollow head portion;
annular friction means positioned to lie in the clearance space between said rotatable support member and said hollow head portion; and

an elastic element extending through the axial hole of said elongated body and connecting the lower end of said rotatable support member to the upper end of said pointed bottom member;





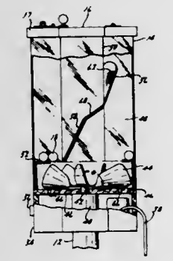
whereby said rotatable support member can be manually rotated relative to said hollow head portion to store energy in said elastic element which can thereafter be used to rotate said rotatable support member and a golf ball carried thereon about a vertical axis.

4,786,055
SPORTS RACQUET
James P. Darling, 316-½ 8th St., Seal Beach, Calif. 90740
Filed Jun. 19, 1986, Ser. No. 876,982
Int. Cl.[4] A63B 51/10
U.S. Cl. 273—73 D 16 Claims



1. A sports racquet comprising:
(a) a handle
(b) a frame attached to or integral with said handle, said frame having an inner perimeter and an outer perimeter, and having a plurality of spaced frame passages disposed in the frame and extending between the inner perimeter and the outer perimeter thereof for receiving strings;
(c) strings disposed within said frame in a generally cross-networked array to form a playing surface; said strings extending through said frame passages; and
(d) a plurality of elements contacting and resting on the outer perimeter of said frame, the surface of said elements that contacts the outer perimeter of said frame being convex, such that the location of each element with respect to the frame is fixed, each element having a passage extending through said element for receiving said strings, each of said elements being aligned with one of said frame passages such that each of said strings passes through said frame passage and said element passage so that said strings are prevented from contacting the frame, said elements being positioned such that the axis of said element passage moves, but the location of said element with respect to the frame does not change, when a sufficient force is applied to said playing surface in a direction generally perpendicular to said playing surface.

4,786,056
RANDOM NUMBER GENERATOR
Richard P. Dunnigan, 6201 - 25 Mile Rd., Apartment #6, Washington, Mich. 48094
Filed Oct. 30, 1987, Ser. No. 114,723
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—144 A 13 Claims



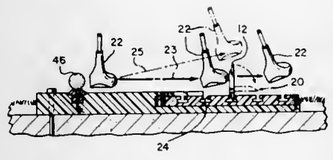
1. A random number generator comprising:
a substantially transparent mixing chamber having an exit aperture;
blower means disposed below a perforated floor of said mixing chamber for directing air into said mixing chamber;
ramp means positioned within said mixing chamber in a predetermined relationship with said aperture for causing a plurality of objects provided with random event indicia to be propelled upwardly by displaced air from said blower means and circulated within said mixing chamber;
and storage means in communication with said aperture for receiving objects exiting said mixing chamber through said aperture.

4,786,057
GOLF SWING TRAINING DEVICE
Larry G. Brown, 262 Victoria Dr., Greenville, Ohio 45331
Filed Sep. 23, 1987, Ser. No. 99,820
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—186 R 20 Claims

1. A golf training apparatus comprising:
(a) a base;
(b) a golf tee mounted on said base;
(c) a flap;
(d) means for pivotably supporting said flap on said base so that said flap moves from a vertical to a horizontal position when struck by a golf club, said flap supporting means being positioned on said base with respect to said

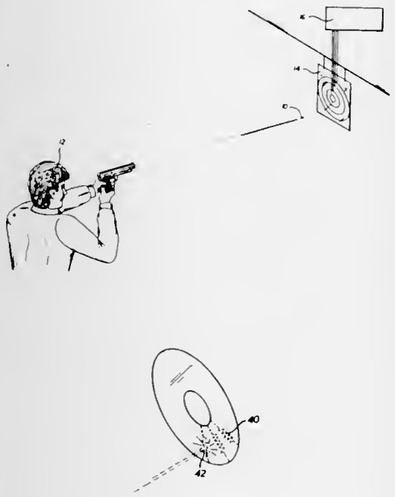
VOL 1096 ISS 4 NOV 22 1988 UMI

tee so that said flap is struck by the golf club during a backswing of the club;



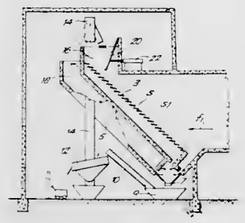
(e) a stop adapted to support said flap in a vertical position until said flap is struck by the golf club.

4,786,058
ELECTRIC TARGET AND DISPLAY
James S. Baughman, 1935 Dodge Rd., Deford, Mich. 48729
Filed Jun. 22, 1987, Ser. No. 64,662
Int. Cl.[4] F41J *5/00*
U.S. Cl. 273—371 **16 Claims**



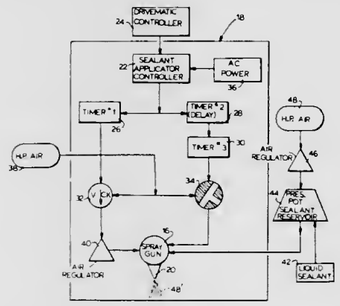
1. A target for use in shooting practice including:
a substantially planar member having electrical resistance means supported on one face thereof, said resistance means including a plurality of sectors electrically insulated from one another, each sector having the property of its resistance increasing when a portion thereof is penetrated by a projectile, whereby an increase in resistance of a sector is indicative of a shot hitting said sector.

4,786,059
EQUIPMENT WITH ENERGY KNOCKING-DOWN SEPTUM FOR BULLETS, TO BE INSTALLED IN SHOOTING RANGES
Alberto Barini, Florence, Italy, assignor to A B C Appalti Bonifiche e Costruzioni di Elio Floria & C.s.a.s., Italy
Filed Dec. 16, 1986, Ser. No. 942,501
Claims priority, application Italy, Dec. 20, 1985, 9551 A/85; May 16, 1986, 9395 A/86
Int. Cl.[4] F41J *1/12;* **G01L** *5/14*
U.S. Cl. 273—410 **18 Claims**



1. An apparatus for installation in shooting ranges comprising an energy knocking-down septum for bullets having opposite bullet entry and bullet exit sides, the septum including a shutter structure having slats arranged one above another and a braking mass of unconfined granular material resting on the slats of the shutter structure in the natural angle of repose and thereby being retained as a continuous upstanding wall portion, the shutter defining the exit side of the septum with an exit face free of the braking mass in bullet receiving condition.

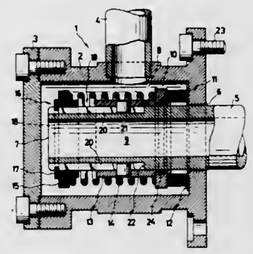
4,786,060
SEALANT SPRAY APPLICATOR SYSTEM AND METHOD EMPLOYING SAME
Keith B. Davis, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Sep. 16, 1987, Ser. No. 97,135
Int. Cl.[4] E21B *33/00;* **B05C** *9/02;* **B23P** *25/00*
U.S. Cl. 277—1 **11 Claims**



7. A system for applying liquid sealant in holes of a structural member, which comprises:
a spray gun having a spray nozzle,
means forming separate air and liquid sealant paths to said spray nozzle for mixing said air and sealant to form an air-sealant spray adapted to be directed into said holes,
a sealant applicator controller,
a source of high pressure,
a first timer actuated by said controller,

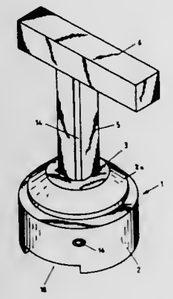
a first valve means actuated by said first timer to permit said high pressure air to flow to said spray nozzle,
a source of liquid sealant,
a second timer activated by said controller,
a second valve means actuated by said second timer to permit a flow of liquid sealant to said spray nozzle,
said first timer being controllable with respect to said second timer to permit continued flow of high pressure air to said nozzle and adapted to be impinged on the sealant deposit in said holes after said second timer has deactivated said second valve means to cease flow of liquid sealant to said spray nozzle.

4,786,061
SAFETY ROTARY TRANSMISSION WITH FACE SEAL
Artur Buchalla, Bobingen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 9, 1987, Ser. No. 60,111
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619630
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—81 R **7 Claims**



1. In a safety rotary transmission for fluid media for the communicating connection of at least one space in a stationary casing with at least one space in a rotatable hollow shaft, in which the sealing of the hollow shaft and stationary casing is carried out by means of face seals, axially displaceable sleeve bodies on the hollow shaft being pressed by the action of compression springs onto sliding sealing rings and against supporting surfaces of the stationary casing, the improvement comprising that the hollow shaft (5) open at the face is introduced into a pressure-tight closable, stationary casing (1) and sealed only at the point of entry (6) by means of a single face seal (10) with sealing ring (11), the displacement of the sleeve body (13) on the hollow shaft (5) being limited by means of a compression spring (14) in the direction of the supporting surface (12) by a blocking device (19) such that a direct contact of sleeve body (13) and supporting surface (12) is prevented, that the counter-bearing of the compression spring (14) is provided by a retaining ring (15) and a fixing device (16), and that the stationary casing (1) has a pressure-tight closure (3), which is to be opened, opposite the open face (7) of the hollow shaft (5).

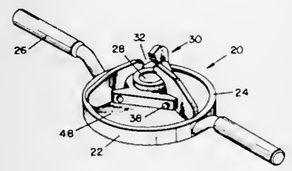
4,786,062
APPARATUS FOR CLAMPING NON-ROTATING WORK PIECES
Rudolf Schneider, Gondiswinkel, CH-5734 Reinach, Switzerland
Filed Dec. 11, 1986, Ser. No. 940,628
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1986, 3618521
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] B23B *31/02*
U.S. Cl. 279—83 **11 Claims**



1. An apparatus comprising:
a nonrotating part which includes an elongate portion with substantially square cross-sectional shape and comprising substantially mutually perpendicular first, second, third, and fourth side wall and an oblique side wall extending between the third and fourth side walls of said elongate portion;
a clamping body member for receiving the nonrotating part therein, said clamping body member including:
a hollow clamping chamber in said clamping body member, said clamping chamber having a substantially square cross-sectional shape and including substantially mutually perpendicular first, second, third, and fourth inner side walls complimentary to said first, second, third, and fourth side walls of said elongate portion and an oblique inner side wall extending between said third and fourth inner side walls and extending substantially parallel to the oblique side wall of said elongate portion and substantially perpendicular to a median line bisecting the angle between the first and second inner side walls, and at least one opening through which the elongate portion of the part may be inserted into said clamping chamber;
reference means in said clamping chamber, cooperating with the elongate portion of the part to define the position of the elongate portion at least in X- and Y-directions as well as an angular orientation thereof;
said reference means compromising first and second webs spaced from each other and projecting from said first inner side wall toward the interior of said clamping chamber, and a third web projecting from said second inner side wall toward the interior of said clamping chamber, and
clamping means for clamping the elongate portion of the part in said clamping chamber, said oblique inner side wall having a threaded bore extending therethrough along said median line, and said clamping means comprising a clamping screw extendable through said threaded bore for engaging the oblique side wall of said elongate portion of said part to clamp the elongate portion against said first, second and third webs.

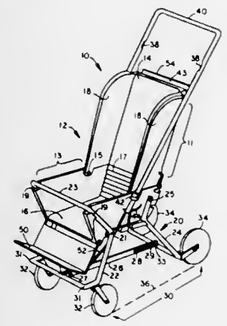
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4,786,063
BONE VISE
John A. Engelhardt, and Richard R. Tarr, both of Warsaw, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.
Filed Oct. 7, 1987, Ser. No. 106,054
Int. Cl.[4] B25B *5/04, 5/08*
U.S. Cl. 279—106 15 Claims



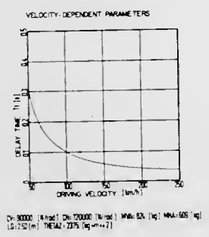
1. A bone vise for releasably holding a bone to be operated upon comprising:
a base member having a substantially planar bearing surface;
platform means being a unitary member adapted to supportively receive a bone thereon to be operated upon mounted for selective movement toward and away from said bearing surface; and
jaw means pivotally mounted on said platform means and freely engageable with said bearing surface, said jaw means movable between a first position for freely receiving the bone to be operated upon when said platform means is distant from said base member and a second position for firmly gripping the bone and preventing relative movement between the bone and said base member when said platform means is proximate to said base member.

4,786,064
CONVERTIBLE INFANT SEAT
Varouj G. Baghdasarian, 1103 S. Stelling Rd., Cupertino, Calif. 95014
Filed Jul. 15, 1987, Ser. No. 73,594
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—30 9 Claims



1. An infant seat, converting from a car seat which can be secured to an automobile seat to a stroller, comprising:
a chair, having a back, and a bottom;
a wheel frame connected to said chair, wherein said wheel frame further comprises a front wheel strut configured as a loop, said loop being continuous and unitary, said loop having a generally rectangular shape consisting of two horizontal portions and two vertical side portions, along two of the corners of which said rectangle shape, front wheels of said wheel set are mounted, and having a frontal barrier portion, said frontal barrier portion extending across the front of said chair while said wheel frame is deployed, said loop generally being bent along said side portions into a generally L-shape, said loop pivotally connected to chair side panels near the apex of said bends in said side portions; and
a wheel set mounted to said wheel frame including said front wheels and rear wheels, said wheel frame configured into a stowed position when the infant seat is secured to the automobile seat and configured into a deployed position to convert the infant seat into a stroller, said wheel frame connecting said front wheels to said rear wheels such that said wheel set is synchronized to deploy said front wheels and said rear wheels simultaneously as the infant seat is converted from a car seat into a stroller.

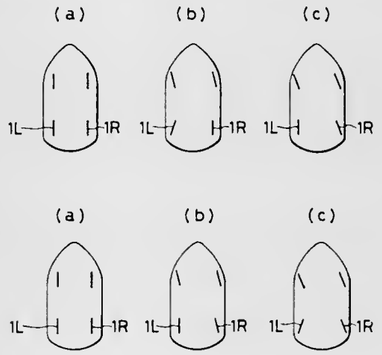
4,786,065
ARRANGEMENT FOR THE CONTROL OF THE REAR WHEELS OF MOTOR VEHICLES IN DEPENDENCE ON A STEERING DEFLECTION OF THE FRONT WHEELS
Edmund Donges, Fuerstenfeldbruk; Reinhard Auffhammer, Munich, and Benedikt Mueller, Raubling, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Jul. 20, 1987, Ser. No. 75,721
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624457
Int. Cl.[4] B62D *6/00, 7/14*
U.S. Cl. 280—91 8 Claims



1. An arrangement for steering the rear wheels of motor vehicles in dependence on a steering deflection of the front wheels, comprising mechanically decoupled steering means for the front wheels and the rear wheels, and transmission means for the adjustment of the steering means of the rear wheels in dependence on the steering deflection of the front wheels, said transmission means being operable with a steering deflection of the front wheels to deflect the rear wheels in the same direction as the direction of the front wheels, only after a lapse of a brief delay time, and the delay time becoming the smaller and the steering deflection of the rear wheels the larger in relation to that of the front wheels, the higher the driving velocity.

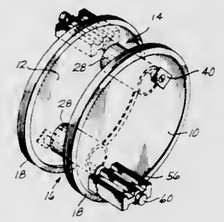
4,786,066
REAR WHEELS STEERING APPARATUS FOR VEHICLES
Toshiro Kondo, Hiroshima, and Tadanobu Yamamoto, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Feb. 1, 1988, Ser. No. 151,317
Claims priority, application Japan, Feb. 5, 1987, 62-25468; Feb. 5, 1987, 62-25469; Feb. 5, 1987, 62-25470; Feb. 5, 1987, 62-25471
Int. Cl.[4] B62D *7/14, 5/06*
U.S. Cl. 280—91 21 Claims
1. A rear wheels steering apparatus for a vehicle comprising

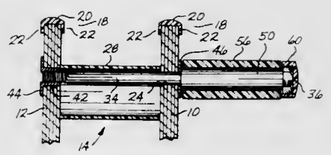
left rear wheel steering means capable of shifting a left rear wheel in a toe-in direction, right rear wheel steering means capable of shifting a right rear wheel in a toe-in direction, steering operation detecting means for detecting a steering stage of the front wheels of said vehicle and toe control means for actuating one of said left and right rear wheel steering means to shift only one of said left and right rear wheels in a



toe-in direction at an initial steering stage of said front wheels in accordance with a detected signal of said steering operation detecting means and actuating at least the other of said left and right rear wheel steering means to shift the other of said left and right rear wheels in a toe-in direction at a later steering stage of said front wheels in accordance with a detected signal of said steering operation detecting means.

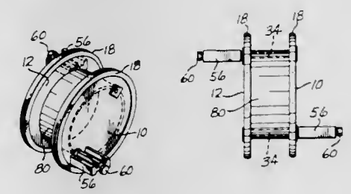
4,786,067
UNICYCLE
Chun-Yi Tang, 12 Diamond S. Ranch, Bellevue, Wash. 98008
Continuation-in-part of Ser. No. 879,985, Jul. 30, 1986. This application Dec. 15, 1986, Ser. No. 941,829
Int. Cl.[4] B62K *1/00*
U.S. Cl. 280—221 8 Claims





1. A unicycle comprising a pair of axially spaced apart disk wheels and a pair of pedal assemblies spaced apart diametrically which also serve to secure the two wheels together and make the unicyle a unitary structure, each said pedal assembly comprising:
an elongated one piece tie bolt having a head at one end and a threaded portion at its opposite end,
a pair of aligned bolt receiving openings in the wheels, with the opening in a first of the wheels being sized to snugly receive a midportion of the tie bolt and with the opening in the second wheel being internally threaded to mate with the threads at the end of the tie bolt,
a tubular first spacer between the wheels, surrounding the tie bolt, said tubular spacer being substantially larger in diameter than the tie bolt and presenting an edge at each of its ends,
abutment means axially outwardly of the first wheel surrounding the bolt receiving opening in said wheel, said tie bolt being movable relative to the abutment means during tightening of the tie bolt,
said bolt head being spaced axially outwardly from said abutment means,
a second spacer on the tie bolt between the bolt head and the abutment means, said second spacer extending between the bolt head and the abutment means and being an enlarged diameter portion of the tie bolt, said second spacer presenting a radial shoulder surface towards said abutment means,
a pedal surrounding said second spacer, said pedal being freely rotatable on said second spacer, and
said disk wheels having rim portions positioned radially outwardly of the tie bolts of the two pedal assemblies, and wherein when the tie bolts are tightened the tie bolts are put into tension, the tubular first spacer is put into compression between the two wheels, and the edges at the ends of the first spacer dig into the wheels, and the shoulder surface the second spacer is drawn tight against the abutment means, and wherein the compression is of such a magnitude that the two wheels are secured together and the position of each to the other is fixed, by the two pedal assemblies.

4,786,068
UNICYCLE
Chun-Yi Tang, 12 Diamond S. Ranch, Bellevue, Wash. 98004
Filed Jun. 30, 1986, Ser. No. 879,985
Int. Cl.[4] B62K *1/00*
U.S. Cl. 280—221 7 Claims



1. A unicycle comprising a pair of axially spaced apart disk wheels and a pair of pedal assemblies spaced apart diametrically which also serve to secure the two wheels together and make the unicycle a unitary structure, each said pedal assembly comprising:
an elongated one piece tie bolt having a head at one end and a threaded portion at its opposite end,
a pair of aligned bolt receiving openings in the wheels, with the opening in a first of the wheels being sized to snugly receive a midportion of the tie bolt and with the opening in the second wheel being internally threaded to mate with the threads at the end of the tie bolt,
abutment means axially outwardly of the first wheel including a bolt receiving opening coaxial with the bolt receiv-

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ing opening in said wheel, through which the tie bolt extends, said tie bolt being slidable in position relative to the abutment means,

said bolt head being spaced outwardly from said abutment means,

a tubular sleeve spacer closely surrounding the tie bolt between the bolt head and the abutment means, said tubular sleeve spacer sleeve extending axially between the bolt head and the abutment means,

a pedal surrounding said tubular sleeve spacer, said pedal being freely rotatable on said tubular sleeve spacer,

said disk wheels having rim portions positioned radially outwardly of the tie bolts of the two pedal assemblies,

said tie bolts for the two pedal assemblies being spaced apart diametrically of the wheels, and

said unicycle further comprising a tubular spacer member between the wheels, of a diameter slightly larger than the diametrical spacing of the tie bolts, said tubular spacer member closely surrounding both tie bolts and presenting an edge at each of its ends, and

wherein when the tie bolts are tightened the tie bolts are put into tension, the tubular spacer member is put into compression between the two wheels, and the edges at the ends of the tubular spacer member dig into the wheels, and each tubular sleeve spacer is put into compression between its first wheel and its bolt head, and wherein the compression is of such a magnitude that the two wheels are secured together and the position of each to the other is fixed, by the two pedal assemblies.

4,786,069
UNICYCLE
Chun-Yi Tang, 12 Diamond S. Ranch, Bellevue, Wash. 98008
Continuation-in-part of Ser. No. 879,985, Jul. 30, 1986, and a continuation-in-part of Ser. No. 941,829, Dec. 15, 1986. This application Feb. 9, 1987, Ser. No. 12,722
Int. Cl.[4] B62K *1/00*
U.S. Cl. 280—221 **9 Claims**

1. A unicycle comprising a pair of axially spaced apart disk wheels and a pair of pedal assemblies spaced apart diametrically which also serves to secure the two wheels together and make the unicycle a unitary structure, each said pedal assembly comprising:

an elongated one piece tie bolt having a head at one end, a threaded portion at its opposite end,

a pair of aligned bolt receiving openings in the wheels, with the opening in a first of the wheels being sized to snugly receive a midportion of the tie bolt and with the opening in the second wheel being internally threaded to mate with the threads at the end of the tie bolt,

a first tubular spacer between the wheels, surrounding the tie bolt, said first tubular spacer comprising an annular wall with inside and outside diameter which are both substantially larger than the tie bolt diameter, said annular wall presenting an edge at each of its ends, said annular wall having a thickness dimension that is smaller than the tie bolt diameter,

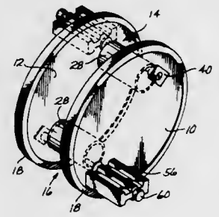
abutment means axially outwardly of the first wheel surrounding the bolt receiving opening in said wheel, said abutment means including an opening in which the tie bolt is slidably received,

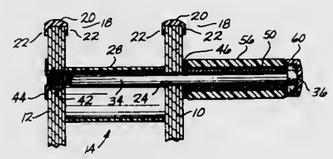
said bolt head being spaced axially outwardly from said abutment means,

a second tubular spaced closely surrounding the tie bolt between the bolt head and the abutment means, said second tubular spacer extending axially between the bolt head and the abutment means,

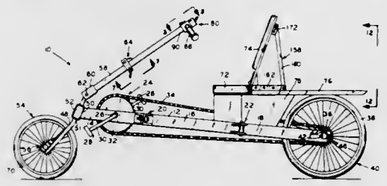
a pedal separate from said second tubular spacer surrounding said second tubular spacer, said pedal being freely rotatable about said second tubular spacer, and

wherein the threads at the end of the bolt are of sufficient length that when the tie bolt is tightened the tie bolt is put into tension, the first tubular spacer is put into compression between the two wheels, and the annular edges at the ends of the first spacer dig into the wheels, and the second tubular spacer is put into compression between the abutment means and the bolt head, and wherein the compression of the two tubular spacers is of such a magnitude that the two wheels are secured together and the position of each to the other is fixed, by the two pedal assemblies.





4,786,070
FOLDING RECUMBENT BICYCLE
Grover M. Adee, 1150 Janes Rd., Medford, Oreg. 97501
Filed Jan. 25, 1988, Ser. No. 148,043
Int. Cl.[4] B62K *15/00*
U.S. Cl. 280—281 LP **6 Claims**



1. A folding recumbent bicycle, comprising:

a main frame member, having a front section, a middle section, and a rear section, each said section having a front end and a rear end, wherein there is a hinged joint between the front section and the middle section, and a hinged joint between the middle section and the rear section;

a crank assembly, including a front sprocket and foot pedals, which is mounted intermediate the front end and the rear end of the front section of the main frame member;

a front fork member pivotally attached at the front end of the front section of the main frame member, said front fork member having an upper end and a lower end;

a front wheel assembly, including a front axle and a front wheel, attached to and rotatably supported by the lower end of the front fork member;

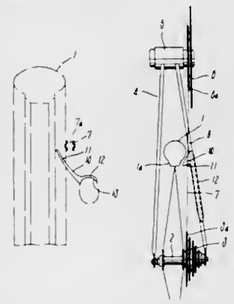
a steering bar member, having an upper and lower end, attached pivotally at its lower end to the upper end of the front fork member and forming an extension thereto; said steering bar member having a hinged joint intermediate its upper and lower end;

two handgrip members, each having an inner end and an outer end, which are hingedly attached at their inner ends to the upper end of the steering bar member so as to, in an unfolded position, extend transversely to the steering bar member in opposing directions, and in a folded position, to lie essentially parallel to the steering bar member;

a rear wheel assembly attached and supported at the rear end of the rear section of the main frame member, including a rear wheel axle rotatably supporting a rear wheel sprocket and a rear wheel; and

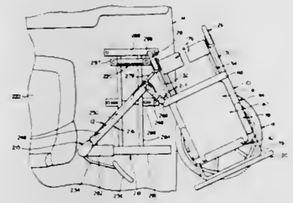
a drive chain member extending between the front sprocket of the crank assembly and the rear wheel sprocket.

4,786,071
PROTECTIVE DEVICE FOR A DRIVING BICYCLE CHAIN
Masashi Nagano, Izumi, Japan, assignor to Shimano Iodustrial Company Limited, Osaka, Japan
Filed Jul. 10, 1987, Ser. No. 72,138
Claims priority, application Japan, Jul. 21, 1986, 61-111958
Int. Cl.[4] B62J *13/00*
U.S. Cl. 280—289 G **4 Claims**



1. A protective device for a driving chain stretched across a rear gear mounted on a hub of a rear wheel of a bicycle and a front gear mounted on a frame of the bicycle and transported by rotation of said front gear so as to drive said rear wheel, said device comprising a guard body adapted to be positioned along a driving side chain path at a driving side of said chain traveling from said rear gear to said front gear through rotation of said front gear, said guard body including a chain guide portion including a chain guide surface for guiding axially outwardly of said rear wheel said chain traveling on said driving side path and a mounting member for mounting said guard body on said frame of said bicycle; said mounting member comprising means for mounting said guard body on the frame of the bicycle between said rear gear and said front gear such that said chain guide surface is disposed below said driving side path of said chain, said chain guide portion having a plate-like shape and comprising means for extending slantwise relative to the bicycle from an inside portion of the chain at the driving side path thereof downwardly outwardly relative to a vertical direction of the bicycle, said chain guide surface being located at a surface of said chain guide portion oriented outwardly relative to the frame of the bicycle, whereby said chain traveling from said rear gear to said front gear is guided by said chain guide surface axially outwardly of said rear wheel, and wherein said mounting member comprises an elongate semicylindrical member comprising means for extending along said frame of said bicycle to cover the outer surface of said frame on which said mounting member is mounted.

4,786,072
COLLAPSIBLE WHEELCHAIR AND LIFT ASSEMBLY
Robert H. Girvin, Holliston, Mass., assignor to K G Engineering, Inc., Woonsocket, R.I.
Filed Jun. 15, 1987, Ser. No. 62,467
Int. Cl.[4] B60P *1/46*
U.S. Cl. 280—289 WC **8 Claims**

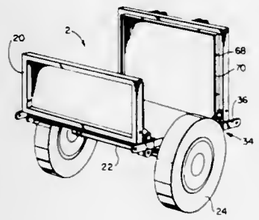


1. A vehicle wheelchair and lift assembly including a vehicle having a door opening and a chair station adjacent said door opening, a collapsible wheelchair and lift means permanently mounted in said vehicle and operable for lifting said wheelchair and an occupant thereof into said vehicle so that said wheelchair is positioned in said chair station, said wheelchair comprising a chair member, a pair of front wheels, means mounting said front wheels on said chair member so that they are normally disposed beneath said chair member and operable for movably supporting the front portion of said chair member on a supporting surface but so that they are movable to raised positions thereof wherein they do not extend downwardly significantly beneath said chair member, a pair of rear wheels, and means mounting said rear wheels on said chair member so that they are normally positioned adjacent opposite sides thereof and operative for movably supporting the rear portion of said chair member on a supporting surface but so that they are movable to collapsed positions thereof wherein they are removed from the opposite sides of said chair member, said lift means comprising a column member mounted in said vehicle in a substantially vertical disposition at a point inboard of said chair station, an elongated main pivot arm attached to said column member so that it is pivotable in a substantially horizontal plane about the axis of said column member, said main pivot arm terminating in an outer end, an outer pivot arm pivotably attached to said main pivot arm adjacent the outer end thereof so that said outer pivot arm is pivotable in a substantially horizontal plane with respect to said main pivot arm, said outer pivot arm terminating in an outer end, coupling means for detachably coupling the outer end of said outer pivot arm to said wheelchair so that said wheelchair is pivotable in a substantially horizontal plane with respect to said outer pivot arm, said main and outer pivot arms being dimensioned so that the combined length thereof is sufficient to extend across said chair station and through said door opening to enable said coupling means to be positiond on the exterior of said vehicle, and column lift means operable for vertically repositioning said main pivot arm on said column member for thereby vertically repositioning said wheelchair and an occupant thereof with respect to said vehicle, whereby said wheel-

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chair and said occupant can be lifted by said lift assembly and then swung into said vehicle through said door opening thereof with said occupant passing feet first through said door opening.

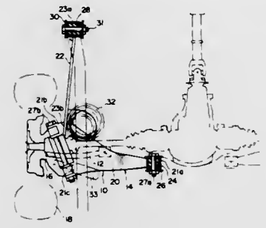
4,786,073
FOLDABLE TRAILER
Cliff Harper, 1123 40th St., S.E., Calgary, Alberta, Canada T2A 1J7
Filed Dec. 30, 1986, Ser. No. 947,852
Int. Cl.[4] B62D *63/00*
U.S. Cl. 280—656 **12 Claims**



1. In a foldable trailer comprising a normally horizontal frame having sides and front and rear ends, a platform secured to and carried by the frame in normally horizontal position, the frame being circumscribed by an upstanding flange, the flange to removably receive base portions of wall sections for enclosing a predetermined space above the platform, an axle secured to the frame intermediate the front and rear ends, and extending laterally with respect to the frame, wheels rotatably secured to the axle, and a hitch secured to the front end of the frame, the improvement characterized by the frame and platform being laterally divided into front, rear and central sections, the axle being secured to the central section, the central section being pivotably connected respectively to the front and rear sections by hinge means whereby the front and rear sections fold up into storage positions normal to that of the central section, releasable locking means being provided to secure the front and rear sections in the same plane as that of the central section during operative use of the trailer, and impermeable gasket means being secured to the frame below the platform, the gasket means being positioned where the frame and platform are laterally divided to provide a seal, when the sections are positioned in the same plane for operative use, against moisture, dust or foreign objects entering the upper platform surface from below.

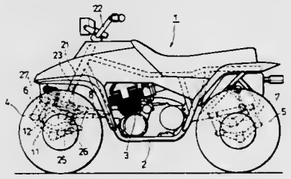
4,786,074
REAR SUSPENSION OF AUTOMOBILE
Tadao Muramatsu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Feb. 13, 1987, Ser. No. 14,594
Claims priority, application Japan, Feb. 17, 1986, 61-30629
Int. Cl.[4] B60G *3/28*
U.S. Cl. 280—690 **6 Claims**

1. A rear suspension of an automobile provided with a suspension arm for supporting an axle carrier characterized in that said suspension arm has a first arm portion disposed laterally of a car body and having an inner end pivotably connected to the car body through a first bushing and an outer end pivotable connected to said axle carrier, the inner end being located behind a rotary axis of a rear wheel supported by the axle carrier and a second arm portion disposed longitudinally of the car body and having a front end pivotably connected to the car body through a second bushing and a rear end connected to



said first arm portion, the second arm portion being undeformable vertically and deformable laterally of the car body.

4,786,075
SADDLE-TYPE FOUR-WHEEL VEHICLE FOR RUNNING ON UNLEVELED GROUND
Hirotake Takahashi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 29, 1986, Ser. No. 947,299
Claims priority, application Japan, Dec. 28, 1985, 60-299113; Jan. 31, 1986, 61-19745; Jan. 31, 1986, 61-19746
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—696 **4 Claims**

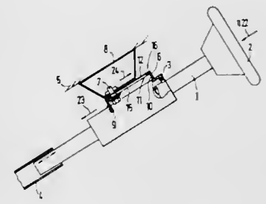


1. A saddle-type four wheel vehicle for running on unleveled ground, said vehicle having right and left front wheels, a vehicle body and an engine each of said wheels being suspended on said vehicle body independently of the other of said wheels by a suspension system having upper and lower arms, each suspension system having a shock absorber connected at one of its ends to an upper arm, intermediate the ends of said upper arm and at its other end to said vehicle body, said shock absorber being connected to said upper arm by a linkage which comprises a first link attached at one of its ends to the vehicle frame and, at its other end, to the intermediate portion of a second link, said second link being connected at one of its ends to said shock absorber and, at its other end, to said upper arm and drive means connecting said front wheels to said engine.

4,786,076
STEERING COLUMN FASTENING ARRANGEMENT FOR A MOTOR VEHICLE
Franz-Rudolf Wierschem, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed May 14, 1987, Ser. No. 49,468
Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616246
Int. Cl.[4] B62D *1/18*
U.S. Cl. 280—777 **7 Claims**

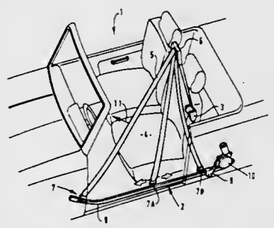
1. A steering column fastening arrangement for a motor vehicle, comprising an energy-absorbing deformation means which is arranged between a steering bracket retained at a relatively fixed vehicle part and a tubular protective steering

member, the deformation means including an approximately U-shaped member secured to the tubular protective steering member and a plate securely connected with the U-shaped member, said plate being provided with slot-like deformation sections which are arranged to cover corresponding elongated



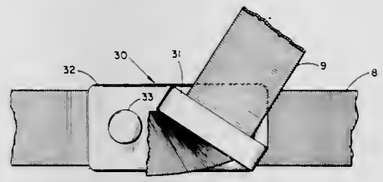
apertures in the U-shaped member, displacement bolt means guided in said apertures and extending through openings in the deformation sections, and said displacement bolt means retaining the tubular protective steering member at the steering bracket and causing tearing of said deformation sections of said plate for energy absorbing purposes.

4,786,077
SAFETY BELT SYSTEM
Bengt O. J. S. Morner, Hovas, Sweden, assignor to Autoliv Development AB, Vargarda, Sweden
Filed Nov. 13, 1986, Ser. No. 929,848
Claims priority, application United Kingdom, Nov. 14, 1985, 8528149
Int. Cl.[4] B60R *22/06, 22/22*
U.S. Cl. 280—801 **35 Claims**



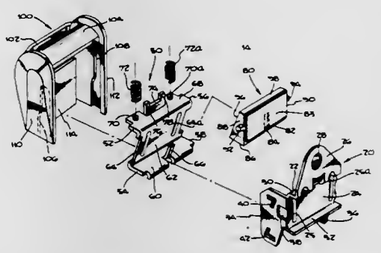
9. A safety belt arrangement for use in a motor vehicle, said safety belt arrangement incorporating a safety belt attached to a carriage movable along a rail associated with a locking station adapted lockingly to receive the carriage in such a position that under accident conditions the force applied to the said carriage by said safety belt defines an axis making an acute angle with said rail, a housing being provided with a detent adapted to cooperate with part of the carriage, said carriage being adapted to be moved into and out of the housing and along the rail without said part of the carriage coming into engagement with said detent, said carriage being adapted to move from its normal position within the housing when subjected to a force applied to said carriage by said safety belt under accident conditions to bring said part of the carriage into engagement with said detent to prevent the carriage from emerging from the locking station.

4,786,078
SHOULDER BELT ADJUSTER
Steven E. Schreier, 817 Belland Ave., Vadnais Heights, Minn. 55110, and John E. Schreier, 5641 21st Avenue South, Minneapolis, Minn. 55417
Filed Jun. 22, 1987, Ser. No. 64,668
Int. Cl.[4] B60R *22/12, 22/30*
U.S. Cl. 280—808 **6 Claims**



1. A shoulder belt adjuster for positioning the lower end of a shoulder belt/lap belt combination to prevent the shoulder belt from rubbing on the neck of a shorter person comprising:
- a housing for attaching to a lap, said housing including a first clamp plate for engaging a first surface of a lap belt and a second clamp plate for engaging a second surface of a lap belt;
- means for temporarily clamping said housing to a lap belt to hold said shoulder belt adjuster in a fixed position on said lap belt;
- a further member connected to said housing, said further member forming a loop for slideably supporting a shoulder belt to permit a user to move forward in the seat;
- said first clamp plate and said second clamp plate coacting to permit a user to laterally position the lower end of the shoulder with respect to the user's body to alter the angle that the shoulder belt extends upward to thereby prevent the shoulder belt from rubbing on the user's neck.

4,786,079
WEB GUIDE AND EMERGENCY LOCKING ASSEMBLY
Manfred Wyder, Rowland Heights, and William Hollowell, Pacific Palisades, both of Calif., assignors to American Safety Corporation, Troy, Mich.
Filed Nov. 26, 1986, Ser. No. 934,953
Int. Cl.[4] B60R *22/42, 21/00*
U.S. Cl. 280—808 **12 Claims**



1. A seat belt system for use in vehicles having a seat, said system having a seat belt retractor means mounted adjacent to the seat to maintain the belt in a coiled form when not in use and in an unslackened form during use, a web guide and emergency locking means mounted at the upper area of the B-pillar of an automobile for normally guiding a chest belt above the shoulder of an occupant from the retractor to a floor anchor and for preventing movement of the chest belt such that the

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occupant will be restrained in an approximately upright position during an emergency stopping condition and a buckling means for fastening the chest belt to the anchor, wherein said web guide and emergency locking means comprises:

a mounting frame having a front bearing face against which the chest belt may be clamped;

a wedge block and means for mounting it to said frame for clamping the chest belt against said face when the belt is entrained between said block and said face and said block is moved into engagement with said belt; and

a wedge block actuator means for moving said wedge block into engagement with said belt, said actuator means including a light weight one piece molded shell having a belt entraining means for entraining said belt thereover, a block camming means for camming said block into engagement with said belt on a downward pull of said belt entrained thereover and biasing means in contact with said shell normally biasing said shell in an upward position wherein said block is not cammed into engagement with said belt.

4,786,080

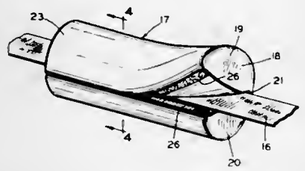
CUSHION FOR VEHICLE SAFETY BELTS

Lawrence C. Jay, 1202 South St., Fremont, Ohio 43420

Filed Dec. 28, 1987, Ser. No. 138,797

Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—808 **8 Claims**



1. A cushion apparatus for attachment to harness-type passive restraints in automotive vehicles for decreasing passenger resistance to utilization thereof, said harness including a belt adapted to extend over the shoulder, along the neck and across the chest of the passenger, comprising an elongated generally cylindrical body of soft, resilient material, said generally cylindrical body being partially severed along its longitudinal axis to define first and second semi-cylindrical sections interconnected along one edge by a hinge portion, said belt being adapted to be received between said semi-cylindrical sections with the edge of said belt facing the neck of said passenger adjacent said hinge portion, and means releasably securing said semi-cylindrical sections together along their free edges to secure said cushion apparatus on said belt at selected locations therealong.

4,786,081

VERTICALLY ADJUSTABLE MOTOR-VEHICLE SAFETY-BELT MOUNT

Gudrun Schmidt, Dr. Paul-Müller-Str. 36, D-5940 Lennestadt 11, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 58,264

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1986, 3618973; Jun. 26, 1986, 3621380; Mar. 17, 1987, 3708564

Int. Cl.[4] B60R *22/20*

U.S. Cl. 280—808 **16 Claims**

1. An adjustable mount for anchoring a safety belt on a vertical surface of a motor vehicle, the mount comprising:

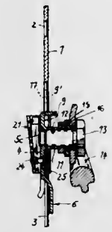
a vertically elongated guide rail adapted to be fixed to the surface and with a front face turned away from the surface and a rear face turned toward the surface, the rail being formed with a longitudinally extending throughgoing slot and generally along the full length of the slot with a vertical row of stops at the rear face and having upwardly and downwardly directed stop edges;

a slider displaceable along the rail and having

a rear portion engageable forward with the rear face of the rail and having abutments engageable between the stops with the edges thereof,

a front portion engageable rearward with the front face of the rail,

a connecting portion extending between and unitarily interconnecting the front and rear portions;



a guide fixed to the rear portion, extending forward therefrom through the slot, and formed with a forwardly open threaded bore;

a bolt threaded into the bore;

a spring braced between one of the faces and the slider for urging the rear portion forward against the rear face, the rear portion being displaceable rearward on loading of the spring to a position with the abutments clear of the stops and with the slider displaceable longitudinally along the slot; and

a buckle traversed by the belt and mounted on the slider.

4,786,082

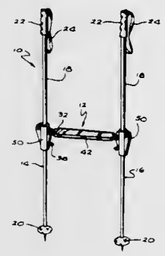
SKIER'S SEAT

Daniel A. Swietlik, 3109 Goodview Trail, Hollywood, Calif. 90068

Filed Nov. 13, 1987, Ser. No. 120,323

Int. Cl.[4] A63C *11/00*

U.S. Cl. 280—812 **21 Claims**



1. A skiers' seat for use with standard ski poles, the seat comprising;

a first rigid seat component;

means for attaching the first seat component to a first pole to permit pivotal movement of the first seat component between a first position which permits normal use of the first pole during skiing, and a second position;

a second rigid seat component;

means for attaching the second seat component to a second pole to permit pivotal movement of the second seat component between a first position which permits normal use of the second pole during skiing, and a second position; and

means for connecting the first seat component and the second seat component with each in its respective second position, to form a rigid seat extending between the first and second poles.

4,786,083

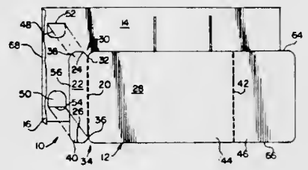
TICKET PACK FOR PASSENGER TICKETS AND METHOD FOR ASSEMBLING SAME

Stephen H. King, Schaumburg, Ill., assignor to Rand McNally & Company, Skokie, Ill.

Filed Jun. 3, 1987, Ser. No. 57,604

Int. Cl.[4] B42D *5/00, 15/00;* **B42F** *3/00;* **G09F** *3/04*

U.S. Cl. 281—15 R **5 Claims**



1. A ticket pack for passenger tickets, the ticket pack comprising

(a) a plurality of tickets of a uniform shape, each ticket being made of card stock and having a line of weakness with opposite ends, the line of weakness of each ticket dividing such ticket into a stub portion with opposite ends and a main portion separable from the stub portion along the line of weakness, each stub portion forming a tab on each end of such stub portion, the tabs projecting oppositely,

(b) a support panel having a pair of slots spanning a distance less than the distance between the ends of the tabs of each ticket, the tickets being stacked on one another so that the lines of weakness of the tickets overlie one another, the tabs being inserted into the slots of the pair so that each slot of the pair receives the tab on one end of the stub portion of each ticket, said support panel having a third slot proportioned to allow the main portion of a selected one of the tickets, if torn from the stub portion of the selected one of the tickets, to be slipped through the third slot until an end of the main portion of the selected one of the tickets engages at least one of the tabs extending through the slots of the pair.

4,786,084

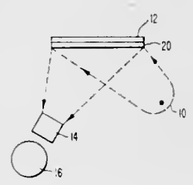
VOLUMETRIC HOLOGRAPHIC PHOTOCOPY PREVENTION FILM

James L. Karney, Sunland, and Roland Handy, Northridge, both of Calif., assignors to Copyguard, Inc., Calabasas, Calif.

Filed Nov. 18, 1985, Ser. No. 799,097

Int. Cl.[4] G03H *1/24;* **G03G** *21/00*

U.S. Cl. 283—91 **1 Claim**



1. A photocopy prevention film applied to a document comprising a holographic refraction grating, attached to the document, said grating adapted to provide a complex refractive index such that, when placed in a photocopy device, the light directed toward the document is substantially totally reflected and/or refracted toward or away from a light receiving device of the photocopy device.

4,786,085

COUPLING DEVICE FOR TUBULAR MEMBERS

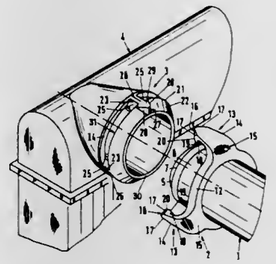
Heinz Sauer, Ronneburg, and Wilfried Heise, Bad Nauheim, both of Fed. Rep. of Germany, assignors to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Jan. 21, 1988, Ser. No. 146,730

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702246

Int. Cl.[4] F16L *35/00, 37/12*

U.S. Cl. 285—24 **14 Claims**



1. A device for sealingly and separably coupling two tubular members, comprising a first annular coupling element on one of the tubular members and a second annular coupling element on the other of the tubular members, one of said coupling elements including a first front end, an annular external rib with a conical first flank diverging outwardly from said front end and a substantially radial second flank facing away from said front end, said one coupling element further including at least one bridge extending from said first flank substantially radially and axially of said rib between said front end and said second flank, the other of said coupling elements including a tubular body portion having a second front end movable into sealing engagement with said one coupling element in the general region of said first front end and a plurality of deformable prongs each having a rear portion rigid with said body portion behind said second front end and a front portion provided with a substantially radially inwardly extending claw slidable over said first flange, with attendant outward flexing of the respective prong, and engageable with said second flange to thereby hold said second front end in sealing engagement with said first front end, said bridge and each of said front portions having complementary means for turning said first coupling element relative to said second coupling element in response to axial movement of said coupling elements toward each other when in such angular positions that one of said front portions abuts said bridge.

4,786,086

FUEL CELL STACK ELECTRICALLY INSULATED FLUID CONNECTOR

Robin J. Guthrie, East Hartford, and Anthony P. Mientek, Glastonbury, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Nov. 16, 1987, Ser. No. 121,028

Int. Cl.[4] F16L *11/12, 21/00*

U.S. Cl. 285—49 **1 Claim**

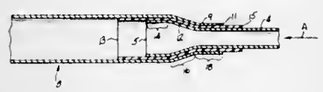
1. An electrically insulated joint for supplying a fluid reac-

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tant to the power section of a fuel cell power plant, said joint comprising:

a. first tubular conduit for containing a pressurized fluid stream, said first conduit being of substantially constant diameter except for an integral end portion which is formed with a cylindrical terminal portion which is larger in diameter than the remainder of said first conduit, and a tapered medial portion joining said terminal portion with the remainder of the first conduit;

b. a second tubular conduit connected to said first tubular conduit as said joint, said second conduit having a constant diameter bore which is larger than said cylindrical terminal portion of said first conduit, said second conduit being telescoped over said first conduit with said cylindrical terminal portion of said first conduit being telescoped into the bore of said second conduit, and said second conduit having an integral cylindrical end part which has a bore diameter which is smaller than the constant diameter bore of the remainder of said second conduit, but larger than the outside diameter of said first conduit, said cylindrical end part being swaged onto a portion of said first conduit adjacent to said tapered medial portion thereof and said second conduit including a tapered medial part connecting said cylindrical end part of the second conduit with the remainder of the second conduit, said tapered medial part of said second conduit overlying said tapered medial portion of said first conduit; and



c. a one piece smooth walled tubular sleeve of dielectric material sandwiched between overlapped parts of said first and second conduits, said sleeve including a first cylindrical end segment overlying the outside surface of said first conduit, said first cylindrical end segment extending over said first conduit beyond an end surface of said overlying cylindrical end part of said second conduit a distance sufficient to prevent arcing between the conduits, said sleeve also including a second enlarged cylindrical end segment having an outside diameter which substantially equals the bore diameter of said second conduit, said second cylindrical end segment being disposed within the bore of said second conduit and extending beyond the corresponding end surface of said cylindrical terminal portion of said first conduit a distance sufficient to prevent arcing between the conduits, and said sleeve further including a medial tapered segment extending between said first and second end segments and sandwiched between said tapered portion of said first conduit and said tapered part of said second conduit.

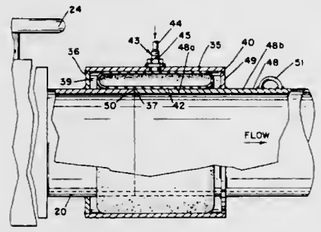
4,786,087

QUICK DISCONNECT COUPLING

Duane E. Thewlis, Norton, and Eugene W. Brown, North Canton, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 27, 1987, Ser. No. 126,050
Int. Cl.[4] F16L *33/16*
U.S. Cl. 285—97 **4 Claims**

1. A quick disconnect coupling for use in the transfer of ingredients under pressure between an outlet pipe and a flexible dispensing hose, said outlet pipe having a cylindrical end portion with an annular edge at the end thereof, an annular flange secured to the exterior of said end portion spaced rearwardly from said annular edge, a longitudinally extending cylindrical rigid tube having one end secured to said annular flange and having the other end projecting axially a substantial distance beyond said annular edge, said cylindrical rigid tube having an inner circumferentially extending surface, one end of said inner circumferentially extending surface cooperates with said end portion of said outlet tube and said annular flange to define an annular chamber open at one end, a flat circumferentially and axially extending inflatable tube secured to said inner circumferentially extending surface and having a portion thereof located with said annular chamber, said flat inflatable tube extends for less than the full distance of said inner circumferentially extending surface, a rigid cylindrical pipe connected



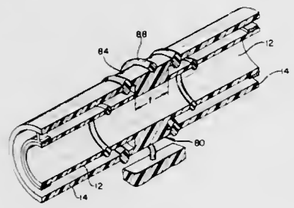
to one end of said dispensing hose, said cylindrical pipe having an exterior diameter equal to the diameter of said outlet pipe, inflation means connected to said inflatable tube that is operative upon inflation to secure said outlet pipe to said rigid cylindrical pipe in sealing engagement, and said rigid cylindrical pipe has a flange secured onto the outer surface thereof to facilitate centering of said rigid cylindrical pipe into said cylindrical rigid tube and to define a closed annular chamber therewith.

4,786,088

DOUBLE-CONTAINMENT THERMOPLASTIC PIPE ASSEMBLY

Christopher G. Ziu, Charlestown, Mass., assignor to Asahi/America, Inc., Medford, Mass.

Filed Jun. 25, 1987, Ser. No. 66,936
Int. Cl.[4] F16L *21/00*
U.S. Cl. 285—138 **13 Claims**



1. A double-containment thermoplastic pipe assembly comprising:

a plurality of substantially linear containment pipe sections secured to one another in end to end relationship;

at least one substantially linear array of carrier pipes desposed within said containment pipes, said array of carrier pipes comprising a plurality of substantially linear carrier pipe sections secured in end to end relationship;

a plurality of spaced apart support means disposed intermediate said carrier and containment pipes for keeping said carrier pipe in spaced generally parallel relationship to said containment pipe, each said support means comprising a generally arcuate mounting means extending through an arc of less than 360° for partly surrounding and engaging said carrier pipe and means extending outwardly from said mounting means and into supporting contact with said containment pipe; and

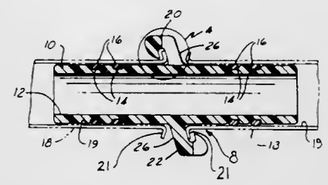
a plurality of spaced apart restraint couplings, each said restraint coupling comprising at least one carrier pipe portion and a containment pipe portion disposed respectively to be secured in end to end relationship with corresponding carrier and containment pipes, each said restraint coupling further comprising a connecting portion rigidly joining the carrier and containment portions thereof.

4,786,089

AUTOMATICALLY LOCKING TUBING COUPLER

William W. McConnell, Hagerstown, Ind., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1986, Ser. No. 931,769
Int. Cl.[4] F16L *27/08, 37/12*
U.S. Cl. 285—281 **1 Claim**



1. A fluid-tight, free-rotating tubing joint, including two lengths of tubing and a coaxial barrel slidably inserted into the end regions of said lengths of tubing, said joint further comprising:

means provided on the external surface of said barrel for sealing with each of said lengths of tubing; and

retention means for automatically retaining said tubing lengths in axial registry with said barrel once said barrel has been fully inserted into the end regions of said tubing lengths, wherein said retention means comprises two or more sets of locking lugs with one set of lugs oriented so as to automatically grip a radially outwardly directed annular flare integrally formed from a continuous end portion of a first one of said tubing lengths, and at least one other set of lugs oriented so as to automatically grip a radially outwardly directed annular flare integrally formed from a continuous end portion of a second one of said tubing lengths, with said lugs being circumferentially spaced from each other, and with each of said lugs comprising an outwardly extending stem portion and an inwardly extending barb portion, whereby each of said annular flares will be positively retained between the stem and barb portions of one set of lugs.

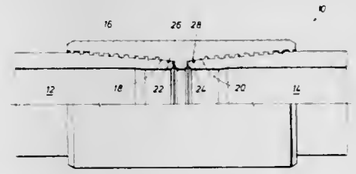
4,786,090

PEAKED-TOP RESILIENT SEAL RING AND CONNECTION THEREWITH

Keith C. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Filed Dec. 4, 1986, Ser. No. 937,683
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—332.3 **4 Claims**

1. A threaded tubular connection comprising a box having internal threads and a pin having external threads for mating with the internal threads of the box to make up the connection, said pin having a frusto-conical surface with a taper angle of about 8° or less between the end of the pin and the threads and said box having a frusto-conical surface with a taper angle slightly greater than the taper angle of the frusto-conical surface on the pin to engage the frusto-conical surface on the pin and form a metal-to-metal seal between the box and the pin when the connection is made up, said pin further having an annular groove in the frusto-conical surface, said groove being rectangular in cross section having parallel side walls and a bottom wall, a resilient seal ring located in the groove to be compressed between the box and the pin and to provide a seal there between when the connection is made up, said seal ring having side walls and a top portion that protrudes from the groove, said side walls being substantially the same width as the side walls of the groove so that the side wall of the seal ring



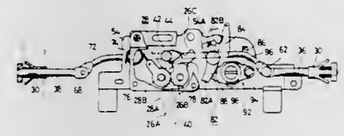
facing the end of the pin will not engage the frusto-conical surface of the box as the pin moves axially into the box as the connection is made up, said protruding portion of the seal ring having an inclined surface extending from the top of the side wall of the seal member facing the end of the pin, said surface being inclined at an angle such that when it is engaged by the frusto-conical surface on the box the seal ring will be compressed into the groove and not sheared off as the pin moves further into the box as the connection is made up.

4,786,091

DEVICE FOR LOCKING DETACHABLE ROOF IN MOTOR VEHICLE

Daiichi Shiraishi, Seto, and Shingo Satoh, Sagamihara, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 19, 1987, Ser. No. 27,952
Claims priority, application Japan, Mar. 20, 1986, 61-063557
Int. Cl.[4] E05C *9/04*
U.S. Cl. 292—36 **8 Claims**



1. A device for locking a detachable roof in a motor vehicle, comprising:

first and second levers rotatably mountable to said detachable rood in contact with each other in a manner to be rotatable in synchronism with each other in directions opposite to each other;

first and second lock pins axially, linearly, movably supportable on said detachable roof by means of guides mounted at positions opposite to each other on said detachable roof and with the first and second levers therebetween, connected to the first and second levers, respectively, through connecting mechanisms, and insertable at forward ends therof into lock holes formed in a motor vehicle body and opposed to the lock pins; and a control lever connected to one of the first and the second levers to rotate the same, wherein said device further comprises:

a pawl rockingly supported by a rotary shaft, a forward end of which can take an abutting position where the forward end thereof abuts against at least one of the first and the second levers in a locked state in which the first and the second lock pins are projected, so as to prevent the levers from being rotated in a direction unlocking the detachable roof, and a releasing position where the forward end thereof is not engaged with the lever;

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a spring for biasing said pawl in a direction in which the forward end of said pawl abuts against the at least one of said levers;

a release lever rockingly journaled and made engageable with said pawl only in a direction of driving the forward end of said pawl to the releasing position; and

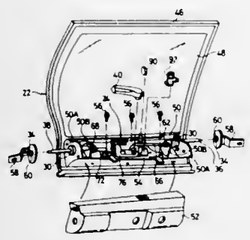
a key-locking device provided contiguously to said release lever and having a key cylinder, said key cylinder having a key cylinder lever which can take a locking position wherein said key cylinder lever abuts against said release lever to prevent said release lever from rocking in a direction of driving said pawl, and a releasing position wherein said key cylinder lever does not interfere with said release lever.

4,786,092

DEVICE FOR LOCKING DETACHABLE ROOF IN MOTOR VEHICLE

Daiichi Shiraishi, Seto, and Shingo Satoh, Sagamihara, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 19, 1987, Ser. No. 27,948
Claims priority, application Japan, Mar. 20, 1986, 61-63555
Int. Cl.⁴ E05C *9/04*
U.S. Cl. 292—36 **16 Claims**



1. A device for locking a detachable roof in a motor vehicle, comprising:

first and second levers mounted on rotary axes mountable to said detachable roof in contact with each other in a manner to be rotatable in synchronism with each other in directions opposite to each other;

first and second lock pins axially, linearly, movably supportable on said detachable roof by means of guides mountable at positions opposite to each other on said detachable roof with the first and the second levers interposed therebetween, said first and second lock pins being connected to the first and the second levers, respectively, through connecting mechanisms, and insertable at forward ends thereof into lock holes formed in a motor vehicle body and opposed to the lock pins; and

a control lever connected to one of the first and second levers to rotate the same,

wherein the first and the second levers are arranged such that the turning paths of connecting portions of said connecting mechanisms are spaced from each other in directions of the rotary axes of the first and second levers.

4,786,093

FRONT BUMPER ASSEMBLY FOR RETRACTABLE HEAD LAMP-EQUIPPED VEHICLE

Shigetoshi Nishii, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 8, 1987, Ser. No. 59,528
Claims priority, application Japan, Jun. 24, 1986, 61-147594
Int. Cl.⁴ B60R *19/03*
U.S. Cl. 293—120 **7 Claims**

1. A front bumper assembly for a vehicle having a retractable head lamp and an engine hood, comprising:

a bumper outer cover of a U-like cross section, including an upper wall having a nearly horizontal rear end portion and a concealing flange cooperative with the engine hood to conceal said rear end portion;

a bumper backing member having an upper flange on which said rear end portion is placed;

a retainer placed on said rear end portion;

said rear end portion, said upper flange and said retainer being fastened together, with bolts and nuts, in the places that are concealed by said concealing flange and the engine hood even when the head lamp is moved to its projected position; and



an energy absorbing member received within said outer cover and abutting said backing member;

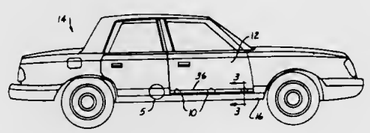
said rear end portion, said upper flange and said retainer being formed with relief cuts in the place opposing to the head lamp so as to not only provide an increased clearance between the bumper assembly and the head lamp but remove part of said rear end portion and its corresponding parts of said retainer and said upper flange that are otherwise exposed to view when the head lamp is moved to its projected position.

4,786,094

MOUNTING CLIP INCLUDING BREAK-AWAY SPACER ELEMENT

Billy J. Barton, Royal Oak; Dale R. Daugherty, Fraser; Ronald C. Johnson, Rochester, and Scott J. Priest, Royal Oak, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Oct. 6, 1987, Ser. No. 117,719
Int. Cl.⁴ B60R *13/02*
U.S. Cl. 293—128 **5 Claims**



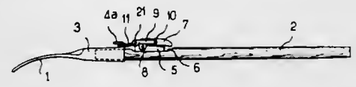
1. A clip for mounting a vehicle body exterior molding, or the like, comprising a clip body including means for securement to a molding, fastening means for securing the clip body to a vehicle body, a spacer element integral with the clip body, the spacer element having a locator portion spaced from the clip body a distance equal to the desired distance of the clip body from a pre-existing structure on the vehicle body exterior, the spacer element being joined to the clip body by a frangible joint whereby the spacer element may be easily broken away from the clip body after the clip body has been located on the vehicle body exterior and fastened in place the desired distance from said pre-existing structure on the vehicle body exterior.

4,786,095

GARDENING HAND TOOL FITTED WITH A HANDLE AND VARIOUS TOOLS WHICH CAN BE INTERCHANGEABLY MOUNTED ON SAID HANDLE

Alain Dumont, 25, Rue Hoche, F-92240 Malakoff, France

PCT No. PCT/FR87/00186, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07111, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 159,596
Claims priority, application France, May 30, 1986, 86 07785
Int. Cl.⁴ B25F *1/02*
U.S. Cl. 294—51 **23 Claims**



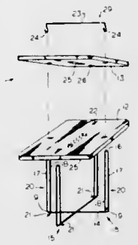
1. A gardening band tool comprising a handle and a number of different tools proper which can be interchangeably mounted on said handle as well as a device for retaining the tool proper on a handle, wherein each tool proper is provided with a hollow mounting end-piece fitted externally with a hook-shaped or channel-shaped member, the opening of which is directed towards the working end of the tool proper, wherein the lower end of the handle has dimensions such as to permit engagement thereof with slight friction within said end-piece and wherein the device for retaining the tool proper on the handle is placed directly on said handle near the lower handle-end which is engaged within said end-piece, said device being provided with an element in the form of a resilient loop to be engaged within said hook-shaped or channel-shaped member provided on said end-piece as well as means connected to said loop for stretching or slackening said resilient loop after the engagement aforesaid has taken place in order to ensure a rigid assembly between the handle and the tool proper or to permit separation of these latter.

4,786,096

DISH CARRIER

John Stanfield, 425 Riverbill Dr., Atlanta, Ga. 30328

Filed Aug. 28, 1987, Ser. No. 90,548
Int. Cl.⁴ B25H *3/04*
U.S. Cl. 294—137 **16 Claims**



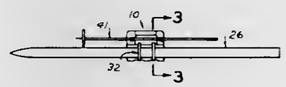
1. A dish carrier comprising a base and a pair of generally U-shaped, resilient wires each having two generally parallel arms that extend from a connecting bight, said pair of wires being mounted to said base with said wire bights extending mutually transversely along a bottom surface of said base and with said wire arms extending upwardly from an upper surface of said base adjacent a periphery thereof whereby dishes may be stacked upon the base and held by the arms of the resilient wires.

4,786,097

SKI AND SKI POLE CARRYING HANDLE

Joe D. Howard, Bethany, Okla., assignor to Nancy J. Cornett, Bethany, Okla.

Filed Nov. 5, 1987, Ser. No. 116,852
Int. Cl.⁴ A63C *11/02*
U.S. Cl. 294—147 **2 Claims**



1. A hand held carrier for a pair of skis, comprising:

handle means including a unitary rectangular planar body having top and bottom surfaces and vertical ends and opposing side surfaces and having a hand opening adjacent its top surface, opposing side surfaces of said body having a coextensive longitudinal groove between the hand opening and its bottom surface,

each said groove being characterized by an outwardly bowed elongated convex bottom surface for respectively contiguously contacting the bottom surface of and intermediate portion of each ski of a pair of skis; and,

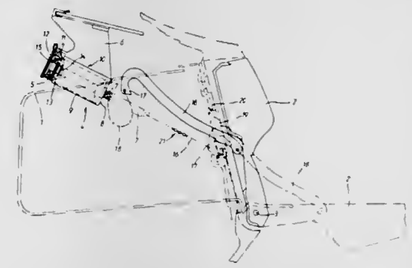
elongated resilient strap means including a fastener on one end thereof secured to said body within the hand opening and tautly surrounding and binding an intermediate portion of a pair of skis to the body when placed within the respective said groove.

4,786,098

BRAKE MECHANISM FOR THE OPENING MOVEMENT OF LIDS AND COVERS

Ingo Jobmann, Grafenau; Ulrich Bruhnke, Ehningen; Helmut Fischer, Böblingen; Santiago Duenas, Rottweil, and Hans Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,795
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628555
Int. Cl.⁴ B60R *7/06*
U.S. Cl. 296—37.12 **11 Claims**



1. A brake arrangement for limiting the movement of a pivotal member such as a cover or a lid from a closed to an open position; said pivotal member having a pivot axis located in the lower area thereof; comprising a piston-cylinder unit having a throttled outlet and a piston rod, a guided retention member pivotally connected with the pivotal member, and a band means operatively connecting an end of the piston rod and a free end of the retention member; the band means during an opening operation, being at first transferred into a stretched position; and the piston being displaced against the force of a spring only just prior to the pivotal member reaching the open position.

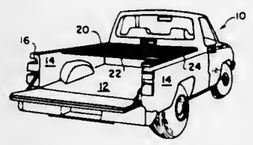
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,099

TRUCK BED COVER DEVICE

Richard Mount, Idyllwild, Calif., assignor to Seco Engineering, Highland Park, Ill.

Filed May 1, 1987, Ser. No. 45,839
Int. Cl.[4] B60J 7/10
U.S. Cl. 296—98 21 Claims



1. A retractable cover device for enclosing a truck bed having two side walls comprising:
- a cover means comprising a plurality of interconnected slats and interstices between said slats, said cover means having a leading edge, a trailing edge, and two side edges;
- a movable means directly engaging said cover means, said movable means comprising a rotating sprocket means having a plurality of projections, said projections being sized and spaced to directly engage said cover means to said interstices between said slats;
- a drive means for moving said cover means between a retracted position and an extended position, said drive means comprising a power source in cooperative relationship with said movable means such that when said movable means is actuated by said power source the movement thereof is transmitted to said cover means and said cover means is caused to extend or retract; and
- a support means for supporting said cover means when said cover means is in said retracted position.

4,786,100

VEHICLE SIDE DOOR

Wolfgang Kleemann, Starnberg; Bernd Woite, Munich; Ludwig Bolte, Kirchheim, and Franz Guertler, Unterschleissheim, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 7, 1987, Ser. No. 46,688
Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615436
Int. Cl.[4] B60J 5/04
U.S. Cl. 296—146 14 Claims



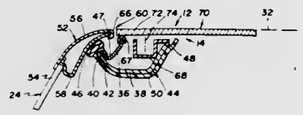
1. A vehicle side door having inside energy dissipating section means facing a vehicle seat and constructed to be variably deformable along its height under energy dissipation in case of an impact of a body of a passenger seated on the vehicle seat, wherein the the energy dissipation sections means has portions with varying rigidity and wherein the rigidity of these portions is matched to differing resistance capabilities of individual adjacent body regions of a vehicle passenger to safely accept an impact and has smaller rigidity values in the area located adjacent where an abdominal area of a vehicle passenger sitting on the seat would be located than in the area adjacent where the pelvis and chest area would be located.

4,786,101

EXTERNALLY RETRACTABLE SUNROOF ASSEMBLY

David L. Draper, Whitmore Lake, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.

Continuation of Ser. No. 866,595, May 23, 1986, Pat. No. 4,695,090. This application May 12, 1987, Ser. No. 49,134
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.[4] B60J 7/047
U.S. Cl. 296—216 7 Claims



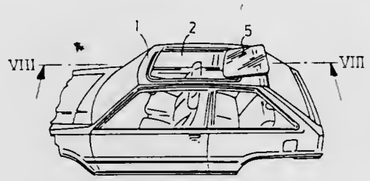
1. In a vehicle body including an outer roof panel having side edges and also having inner rails that cooperate with the side edges of the outer roof panel to provide a pair of hollow side rails, and side doors having upper edges located adjacent the side edges of the outer roof panel, an externally retractable sunroof assembly comprising: a roof opening in the outer roof panel; said roof opening having forward and rearward edges and having side edges exposing the interior of the side rails of the roof; a track mounted within each side rail; and a sunroof having side edge portions extending over the side rails and being respectively mounted by the tracks therein for movement between a closed position closing the roof opening and an externally retracted position above the outer roof panel to the rear of the roof opening to thereby open the roof opening, and the sunroof having the side edge portions thereof respectively juxtaposed with respect to the upper edges of the closed side doors to provide a continuous door-to-door appearance.

4,786,102

SUNROOF APPARATUS OF VEHICLE ROOF

Hiroshi Sakamoto, Higashi-Hiroshima; Akefumi Takeda, Hiroshima, and Manabu Sumitani, Kure, all of Japan, assignors to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,498
Claims priority, application Japan, Apr. 15, 1986, 61-87298
Int. Cl.[4] B60J 7/047, 7/11
U.S. Cl. 296—216 12 Claims



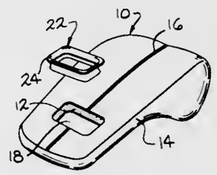
1. Vehicle roof with a sunroof apparatus, comprising a fixed roof structure having a roof opening therethrough and a pair of cover panels by which respective front and rear portions of the roof opening can be selectively closed and at least partially opened, said panels, in a closed position, being arranged one behind the other in a longitudinal direction of the vehicle roof, wherein said roof opening extends over approximately the full length of the fixed roof structure, wherein a rear one of the cover panels is a stationary panel that is attached with the fixed roof structure in a position closing the rear portion of the roof opening and is detachably removable from its attached position to expose the rear portion of the roof opening, and wherein a front one of the cover panels is mounted by tilting and sliding means for upward tilting and, while upwardly tilted, for rearward sliding to a position in which at least a rear portion of the front cover panel projects over the rear cover panel when said rear cover panel is in said attached position and over a rear edge of the roof opening when said rear cover panel has been detached.

4,786,103

VEHICLE SEAT TRIM ASSEMBLY

Alan J. Selbert, Tecumseh, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Mar. 21, 1988, Ser. No. 170,786
Int. Cl.[4] A47C 31/00
U.S. Cl. 297—218 6 Claims



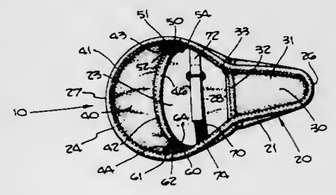
1. A trim assembly for a seat back of the type having a hole formed therethrough comprising;
- a trim cover for said seat back having sections covering the front and rear of said seat back in the area surrounding said hole,
- a break-over strip affixed to one of said seat back sections, and
- a halo ring having an outwardly flared flange and a reversely bent edge channel, said flared flange preventing said halo ring from being pulled completely through said seat back hole, said break-over strip insertable within said edge channel whereby said halo ring can be inserted within said hole wherein said flange supports one of said seat back sections while said break-over strip is affixed to the other of said seat back sections and is insertable within said edge channel.

4,786,104

BICYCLE SEAT COVER ASSEMBLY WITH TRIANGULAR ELASTIC UNDER FLAP MEMBERS

Ernest S. Fellenbaum, 4121 W. Jefferson Blvd., Los Angeles, Calif. 90016

Filed Mar. 24, 1988, Ser. No. 172,567
Int. Cl.[4] B62J 1/00
U.S. Cl. 297—224 3 Claims



1. A bicycle seat cover assembly which is configured for rider comfort as well as for ease of installation and use, comprising:
- a seat cover of a generally flat triangular configuration narrowed to a tongue at its forward end and having both its forward and rearward extremities smoothly curved in a horizontal plane, including a cushion member, a top cover liner pulled tightly over said cushion member, a bottom cover liner adapted to engage the bicycle seat, and an exterior trim member extending about the entire periphery of said seat cover and attached to both said top cover liner and said bottom cover liner;
- a front under flap member extending horizontally beneath said tongue portion of said seat cover with its peripheral edge secured to said exterior trim member, and having an under trim member secured along its rearward edge, the ends of said under trim member also being secured to said exterior trim member;
- said seat cover being transversely bent throughout its length so as to be concave on its under surface, and said front under flap member together with said under trim member being in tension for maintaining said seat cover in its transversely bent condition;
- a crescent-shaped back under flap member extending transversely beneath the rearward end portion of said seat cover with its convexly curved rearward edge secured to said exterior trim member, said back under flap member normally lying loosely against said concave under surface of said seat cover, said back under flap member having its forward corners cut off to provide truncated ends, and having a back strap extending transversely of said seat cover and secured to said back under flap member along the concavely curved forward edge thereof;
- a pair of essentially triangular, highly elastic members disposed between said exterior trim member and respective truncated ends of said back under flap member, each of said triangular elastic members having one edge thereof secured to said exterior trim member and another edge thercof secured both to the associated truncated end of said back under flap member and to the associated end of said back strap, the remaining edge of each triangular elastic member being longitudinally stretchable so as to effectively provide a hinged support for the associated truncated end of said back under flap member;
- said seat cover assembly being installed upon a bicycle seat by first placing said front under flap member underneath the tongue of the bicycle seat;
- said back under flap member being adapted to be placed underneath the rearward end portion of the bicycle seat, whereupon said triangular elastic members are stretched to allow a hinged movement of the truncated ends of said back under flap member relative to said exterior trim member; and
- an adjusting strap disposed intermediate to said under trim member and said back strap, having respective end portions secured to said exterior trim member at respective sides of said seat cover assembly, a ring attached to one of its end portions, and its other end portion being of a hook and pile construction and being adapted to be pulled through said ring and fastened to itself in order to finely adjust the securing action of said adjusting strap.

4,786,105

CONTINUALLY POSITIONABLE CHAIR WITH ADJUSTABLE LUMBAR SUPPORT

Kelly J. Sheehan, Minnetonka, and Dennis A. Woggon, Rice, both of Minn., assignors to All Day Chair Company, St. Cloud, Minn.

Filed Feb. 24, 1988, Ser. No. 159,700
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—258 7 Claims

1. A continually positionable chair, positionable between a rear rest position and selected forward positions suited to a user's task, and with a backrest providing support to a user's

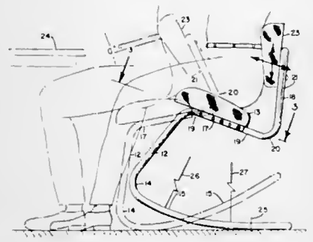
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lumbar region if said chair is positioned near said rear rest position, said chair comprising:

a seat cushion having a base surface separated from a seating surface by a greater amount at locations toward its front facing end than at locations near its rear facing end;

a support frame, attached to said seat cushion base surface, having a pair of legs extending away from said seat cushion base surface and supported by a pair of non-parallel, curved rails spaced further apart from one another toward rear portions thereof than they are toward front portions thereof, said rails extending forward sufficiently such that said chair can be tilted forward therealong on a horizontal surface until said seat cushion base surface slopes downward, and extending rearward sufficiently that said chair can be tilted rearward therealong until said seat cushion base surface again slopes downward; and

a backrest having a backrest frame extending from said seat cushion base surface to curve upward, and having a backrest cushion with a back surface separated from a support surface thereof by a greater amount at locations near its upward facing end surface than at locations near its downward facing end surface, said backrest cushion being adjustably attached to said backrest frame such that said backrest cushion can be adjusted upwardly and downwardly along said backrest frame within a selected range so that it may be positioned to support a user's lumbar region.



4,786,106

ROCKING CHAIR CONSTRUCTION AND METHOD OF MAKING SAME

Donald L. Bottemiller, Wadena, Minn., assignor to Homecrest Industries Incorporated, Wadena, Minn.

Filed May 11, 1987, Ser. No. 48,598
Int. Cl.⁴ A47C *3/025*
U.S. Cl. 297—265 **3 Claims**



1. An improved rocking chair construction having a seat portion, a ground-engaging base and a pair of coil springs attaching the base to the chair portion and for providing rocking action to the chair, the improvement comprising:

the chair portion having at least two tubular ends disposed proximate a lower portion thereof, each tubular end having a passage;

each coil spring having an outwardly-extending member having a diameter equal to or substantially less than the passage and extending into one of the passages, each outwardly-extending member having a notch defined by first and second spaced axially apart shoulders; and

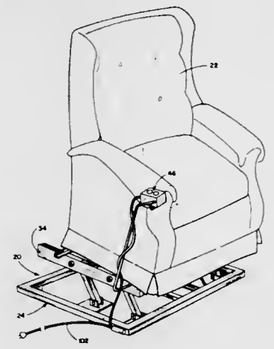
first and second set screws threadably engaging each tubular end, the first set screw having an end portion disposed between the first and second spaced axially apart shoulders for engagement of the shoulders to define the axial travel of the tubular end portions with respect to the outwardly-extending member of the coil springs, and the second set screw having an end frictionally engaging the coil spring to retain the coil spring in a fixed position with respect to the tubular member.

4,786,107

LIFTING APPARATUS FOR A SEATING STRUCTURE

Foy Crockett, H.C. 79, Box 578, Hugo, Okla. 74743

Filed Nov. 6, 1986, Ser. No. 927,815
Int. Cl.⁴ A47C *1/02*
U.S. Cl. 297—330 **19 Claims**



1. An apparatus for elevating and lowering a freestanding seating structure, such as a house chair, recliner, or sofa, the freestanding seating structure having an understructure or legs for contacting a generally planar surface, such as a floor, the understructure supporting the seating surface of the freestanding seating structure in a position spaced away from the planar surface, comprising:

a base having a front, a rear, and two sides;

an elevator means for releasably receiving, supporting, elevating, and lowering the freestanding seating structure without addition to or modification of the freestanding seating structure, the elevator means having a front, a rear, and two sides oriented in correspondence with the like-named features of the base;

power means, connected between the base and the elevator means, for providing power and for supportingly moving the elevator means between a lowered position and an elevated position relative to the base; and

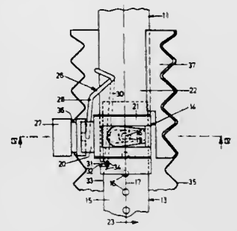
control means for controlling the power means and for controlling the position of the elevator means relative to the base, the control means being accessible to and operable by an occupant of the seating structure.

4,786,108

CHAIR, IN PARTICULAR OFFICE CHAIR, WITH A VERTICALLY ADJUSTABLE BACK REST SUPPORT

Elke Dauphin, Offenhausen bei Nürnberg, Fed. Rep. of Germany, assignor to Bürositzmöbelfabrik Friedrich-W. Dauphin GmbH & Co., Offenhausen bei Nürnberg, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 105,894
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635244
Int. Cl.⁴ A47C *1/00*
U.S. Cl. 297—353 **10 Claims**



1. A chair, in particular an office chair, comprising:

a pedestal,

a seat supported on said pedestal,

a back rest,

a back rest support for vertically adjustably supporting said back rest, the back rest support being connected to the back rest and to the seat, said back rest support being telescopically composed of an inner and an outer support member,

an interlocking device for detachably interlocking the two support members in varying positions relative to one another provided on the back rest support, and

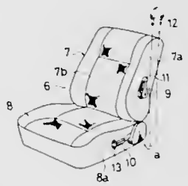
a prestressed spring for detachably pressing the interlocking device into an interlocking position, said spring acting as an extension safeguard for the support members and having one end being flexibly prestressed, entering a slot in the outer support member, wherein said slot is associated with a locking recess in the inner support member.

4,786,109

ARRANGEMENT FOR PROTECTING SEAT OPERATION LEVER AGAINST SEAT BELT IN VEHICLE SEAT

Shinichi Toya, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Mar. 1, 1988, Ser. No. 162,674
Int. Cl.⁴ A47B *95/02*
U.S. Cl. 297—355 **10 Claims**



1. An arrangement for protecting a seat operation lever against a seat belt in a vehicle seat, in which an operation lever is provided on a lateral side of said seat and a seat belt is extended over said lateral side as well as adjacently to said operation lever, said arrangement comprising:

a protector provided on said lateral side of said seat in such a manner that it is disposed in the vicinity of said operation lever as well as at a point allowing said operation lever to be moved,

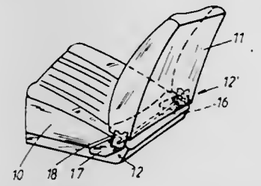
whereby, said operation lever is protected against its being entangled with or caught by said seat belt.

4,786,110

HINGE JOINT FOR SEATS OF MOTOR VEHICLES AND THE LIKE

Horst Mahling, Remscheid; Bernd Klüting, Radevormwald; Hans-Walter Busch, Hilden, and Hans-Joachim Berghof, Remscheid, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Remscheid, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 70,923
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1986, 3624018
Int. Cl.⁴ B60N *1/02*
U.S. Cl. 297—362 **20 Claims**



1. A hinge joint, particularly for changing the mutual positions of two parts of a seat in a motor vehicle, comprising a first section connectable to the first part of a seat; a second section connectable to the second part of a seat; a shaft pivotably mounting said second section on said first section; means for rotating said shaft; a transmission interposed between said sections and operative to change the position of said second section with reference to said first section in response to rotation of said shaft; and means for locking said second section in a selected position with reference to said first section, including a braking member provided on one of said sections and having an internal surface, a resilient brake shoe including a flat radially expandible ring normally in frictional engagement with said internal surface and having two motion transmitting portions, a coupling device operatively connected with said rotating means and including a disengaging portion cooperating with said motion transmitting portions to reduce friction between said ring and said braking member in response to rotation of said shaft by said rotating means, and a blocking element provided on said shaft and having an engaging portion cooperating with said motion transmitting portions to urge said ring against said internal surface in response to application to said second section of a force tending to change the position of said second section and said shaft relative to said first section.

4,786,111

APPARATUS AND METHOD FOR DELIVERING LIQUID COOLANT TO DRUM MOUNTED CUTTING TOOLS

Zekeriya Yargici, 1219 Oakcrest Ave., Roseville, Minn. 55113

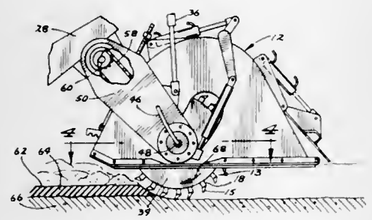
Filed Sep. 26, 1983, Ser. No. 535,724
Int. Cl.⁴ E21C *35/22;* **E01C** *23/12*
U.S. Cl. 299—10 **31 Claims**

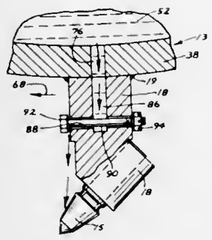
25. A method of milling natural and man laid material with cutting tools mounted on rotatable means with tool holders having liquid coolant discharge openings comprising: rotating the rotatable means to move the cutting tools into engagement with the material whereby the cutting tools cut said material, continuously supplying liquid coolant to said tool holders during rotation of the rotatable means, continuously discharging liquid coolant from the tool holders toward the cutting tools during rotation of the rotatable means whereby said

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liquid coolant continuously cools said tool holders and cutting tools during the cutting of said materials with the cutting tools, and limiting the continuous discharge of liquid coolant from the liquid coolant discharge openings with rod means located therein to prevent excess discharge of liquid coolant from the tool holders.

31. A machine for milling natural and man laid material comprising: a frame; rotatable means for milling the material; means rotatably mounting the rotatable means on the frame,





power means for rotating the rotatable means, said rotatable means including a rotatable support, material cutting tools, and tool holder means for mounting the tools on the support, and means for continuously supplying a liquid coolant to said cutting tools during the rotation thereof, each of said tool holder means having a passage for accommodating liquid coolant and an outlet opening open to said passage for controlling the rate of continuous flow of liquid coolant toward the cutting tool.

4,786,112

DRIVING ARRANGEMENT FOR DRIVING THE CUTTING ROLLS OF A DRIFT ADVANCING MACHINE

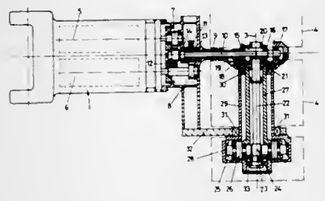
Erich Brandl, Knittelfeld, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 16, 1987, Ser. No. 74,060

Claims priority, application Austria, Jul. 23, 1986, 1999/86

Int. Cl.⁴ E21C *27/24*

U.S. Cl. 299—76 **8 Claims**



1. Driving arrangement for driving cutting rolls of a drift advancing machine comprising at least one cutting roll being subdivided in axial direction and being in engagement over at least part of its circumference with the material to be excavated and being movable over the drift face in transverse direction to its axis of rotation, characterized in that two separate cutting rolls are rotatably supported at both sides of a swivellable cantilever arm being, in particular, swivellable around a swivelling axis extending in parallel relation to the axis of rotation of the cutting rolls, that said both cutting rolls are connected with drive motors via separate drive means and that the drive motors are arranged in the cantilever arm carrying the cutting rolls, the drive motors being in meshing engagement via drive shafts extending in parallel relation one relative to the other and via bevel gears with driven shafts extending in parallel relation to the axis of rotation of the cutting rolls, and the drive shafts being coaxially arranged, with one drive shaft being hollow and surrounding the other drive shaft.

4,786,113

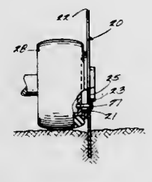
FARM EQUIPMENT STABILIZER DISC

Douglas N. Vandenberg, 4041 100 Hwy. U, DePere, Wis. 54115

Filed Oct. 23, 1986, Ser. No. 922,501

Int. Cl.⁴ B60B *15/00*

U.S. Cl. 301—41 R **1 Claim**



1. A stabilizing disk for attachment to wheels of a farm crop harvester, comprising

a flat, rigid disc having on one side thereof a first ring concentric with the outer edge of the disc and extending laterally away therefrom to provide means for centering the disc with respect to a wheel of a first size, said disc further having a second ring concentric with both the outer edge of the disc and the first ring on the opposite side of the disc and extending laterally way therefrom to provide means for centering the disc with respect to a wheel of a second size, said second ring having a smaller diameter than that of said first ring,

a first plurality of holes extending through the disc, disposed between the first and second rings for receiving means for fastening the disc to said first size wheel, and a second plurality of holes extending through the disc within said second ring for alteratively receving means for fastening the disc to said second size wheel, whereby the disc can be attached to either a wheel of the first size or a wheel of the second size,

said disc having a diameter greater than that of either of said wheels.

4,786,114

STABILIZING MECHANISM FOR A FOLLOWER GUIDE AXLE OF A VEHICLE TRAILER

Helmut Steiner, and Karl-Erich Holländer, both of Wiehl, Fed. Rep. of Germany, assignors to Bergische Achsenfabrik Fr. Kotz & Söhne, Wiehl, Fed. Rep. of Germany

Filed May 21, 1987, Ser. No. 52,778

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3616998

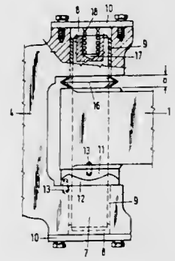
Int. Cl.⁴ B60B *35/00, 25/00*

U.S. Cl. 301—124 R **5 Claims**

1. A stabilizing mechanism for a follower guide axle of a vehicle trailer, with the wheels of said axle being mounted on the axle body of the latter via respective knuckle arms, and with said wheels being interconnected via respective guide levers and a tie bar; said stabilizing mechanism comprises:

respective pressure mountings that are disposed between each of said knuckle arms and said axle body, and that have cooperating sliding surfaces which have a wavelike configuration; and

spring means for stabilizing said pressure mountings in a starting position that is associated with straight-ahead



travel, each of said pressure mountings comprising an upper pressure disk that is attached to said axle body, and a lower pressure disk that is attached to said knuckle arm, said sliding surfaces of said pressure disks of a given pressure mounting being provided with at least one pair of intermeshing wave crests and wave troughs, said axle body having a maximum movement stroke within each knuckle arm, with said maximum stroke being less than the depth of said wave troughs of said pressure disks.

4,786,115

WHEEL BEARING UNIT FOR REAR WHEEL DRIVE

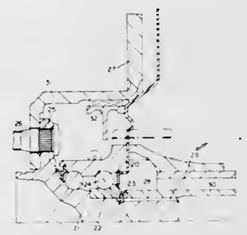
Sture Ashberg, Vastra Frolunda, Sweden, assignor to SKF Nova, Gothenburg, Sweden

Filed Jan. 21, 1987, Ser. No. 5,835

Claims priority, application Sweden, Feb. 5, 1986, 8600504

Int. Cl.⁴ F16C *35/00*

U.S. Cl. 301—124 R **7 Claims**



1. A wheel bearing unit incorporating outer race ring (20) having an outer raceway and means for attachment of the unit to a vehicle, inner race ring (21) having an inner raceway and incorporating a flange or the like for direct mounting of wheel and brake disc, and rolling bodies (24) arranged between raceways of said rings, said inner race ring (21) having a projecting portion (28) extending axially from said inner ring to one side of said raceways, attachment means on the outer surface of said projection for attaching a drive joint intended for attachment of the inner race ring to a drive shaft (30), said projecting portion (28) being integral with the inner race ring (21) and projecting axially rearwardly therefrom to facilitate assembly of a drive joint to the projecting portion in radial overlying relation.

4,786,116

TRAILER CONTROL VALVE DEVICE FOR THE TRAILER BRAKES OF A TRACTOR-TRAILER VEHICLE

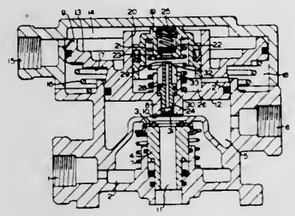
Hans-Joachim Schulz, Wedemark, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 27, 1987, Ser. No. 30,790

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620121

Int. Cl.⁴ B60T *15/02*

U.S. Cl. 303—40 **11 Claims**



1. A fluid pressure control valve device comprising:

(a) first and second inlets, an outlet, and a vent port, said first inlet being connected to a control fluid under pressure and said second inlet being connected to a first source of fluid under pressure;

(b) a differential piston abutment having a first pressure area subject to said control fluid pressure to urge movement of said piston abutment in one direction;

(c) valve means operative in response to movement of said piston abutment for controlling fluid pressure communication between said second inlet and said outlet and between said outlet and said vent, said outlet fluid under pressure acting on a second pressure area of said piston abutment to urge movement of said piston abutment in a direction opposite said one direction;

(d) an auxiliary piston subject to one side to said control fluid under pressure and subject on the opposite side to a spring;

(e) auxiliary valve means carried by said auxiliary piston and operable for connecting said control fluid under pressure to a third pressure area of said piston abutment to urge movement thereof in said opposite direction;

(f) an adjustable member spaced apart relative to said auxiliary valve means an adjustable distance so as to effect said operation of said auxiliary valve means when the force of said control fluid pressure acting on said auxiliary piston is sufficient to compress said spring a predetermined amount corresponding to the distance said adjustable member is spaced apart from said auxiliary valve means; and

(g) a stop fixed relative to said adjustable member to limit the maximum adjustable distance said adjustable member can be spaced apart from said auxiliary valve means.

4,786,117

VARIABLE LOAD VALVE

James E. Hart, Trafford, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Filed Jul. 9, 1987, Ser. No. 71,437

Int. Cl.⁴ B60T *8/18, 15/52, 11/34*

U.S. Cl. 303—22.6 **24 Claims**

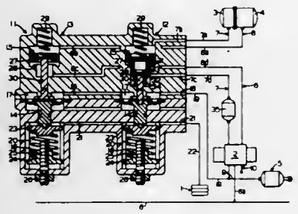
1. A vehicle brake control system comprising:

(a) braking means;

(b) a brake pipe normally charged to a certain chosen pressure;

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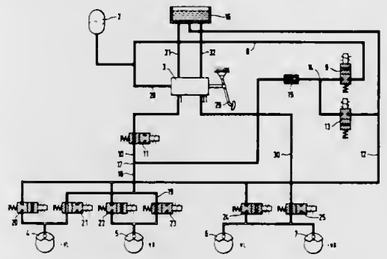
(c) an auxiliary reservoir;
(d) control valve means for establishing fluid pressure communication between said brake pipe and said auxiliary reservoir to effect charging of said auxiliary reservoir to the pressure of said brake pipe during a brake release and thereby provide a first source of supply fluid under pressure;
(e) a first fluid pressure supply path between said control valve means and said auxiliary reservoir;
(f) a fluid pressure delivery path between said control valve means and said braking means;
(g) a supplemental volume reservoir in said first fluid pressure supply path charged to the pressure of said auxiliary reservoir to provide a second source of fluid under pressure, said control valve means being operative during



brake application to establish fluid pressure communication of said auxiliary and supplemental volume reservoirs with said braking means via said first supply path and said delivery path, whereby an unmodulated buildup of brake pressure is realized at said braking means in accordance with the combined supply of said first and second sources of fluid under pressure thereto; and
(h) variable load valve means for interrupting said first supply path upstream of said supplemental volume reservoir to isolate said auxiliary reservoir from said braking means, whereby a modulated buildup of brake pressure is realized at said braking means is accordance with the supply of said second source of fluid pressure thereto in the absence of said supply of said first source of fluid pressure.

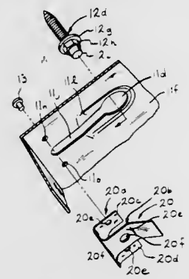
4,786,118
TRACTION-SLIP-CONTROLLED BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES
Jochen Burgdorf, Offenbach-Rumpenheim; Dieter Kircher, Frankfurt am Main, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany
Filed Jun. 15, 1987, Ser. No. 62,444
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3621000
Int. Cl.[4] B60T *8/62*
U.S. Cl. 303—110 **6 Claims**

1. A traction slip-controlled brake system for automotive vehicles, said system comprising an auxiliary pressure source providing the sole source of pressure for the brake system and a pedal operated brake valve through which pressure fluid from the auxiliary pressure source can be applied to wheel brakes of an automotive vehicle, a pressure fluid conduit leading from the auxiliary pressure source to the wheel brakes and a first electromagnetically drivable 2-way/2-position valve in said pressure fluid conduit being capable of switching over from a locking position into a pasage position, a brake conduit interconnecting the wheel brakes and the brake valve, a second electromagnetically drivable 2-way/2-position valve in said brake conduit being capable of switching over from a passage position into a locking position, a check valve provided in the line section interconnecting the first valve and the wheel



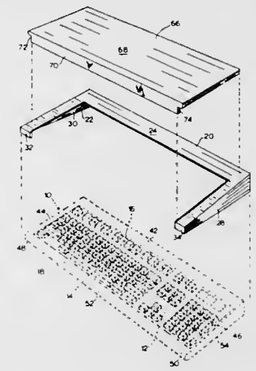
brakes precluding pressure fluid from flowing back from the wheel brake to the said first valve.

4,786,119
LOCKING CLIP FOR SECURING A BOLT HOLDING PANEL MEMBERS TOGETHER
Raymond J. Smuda, Manistee, Mich., assignor to Metalworks, Inc., Ludington, Mich.
Filed Dec. 23, 1987, Ser. No. 137,157
Int. Cl.[4] A47B *19/00*
U.S. Cl. 312—195 **14 Claims**



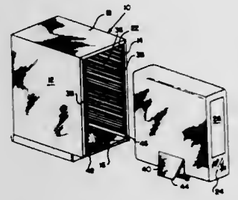
1. A device for use in locking two panel members having spaced apart surfaces together by means of a bolt having opposed ends with threads adjacent one of the ends of the bolt along a shaft defining a longitudinal axis of the bolt mounted by the threads on one member with the axis perpendicular to the surface and with a head projecting from the shaft along the axis of and at the other of the ends of the bolt which inserts into an opening so that a portion of the shaft slides into a slot connected to the opening in the other panel member which engages the head of the bolt to hold the panel members together which comprises:
(a) an integral clip for locking the bolt in the slot, wherein in a locked position the clip has a U-shaped so that there are two spaced apart sides perpendicular to the axis of the bolt, wherein the clip is mounted on the surface of the other panel member over the slot adjacent the head of the bolt with spaced apart first and second legs on one of the sides of the U to be secured to the other panel member on either side of the slot and with a third leg on the other side of the U which extends over the head of the bolt between and spaced from the first and second legs and with a hole in the third leg which engages the head of the bolt when the panel members are in the locked position, wherein the third leg moves up and over the head of the bolt and shape into the locked position with the head in the hole when the shaft of the bolt is moved in the slot into the locked position, wherein the third leg has a tab extending away from the other member and wherein the tab can be lifted to disengage the hole in the third leg of the clip from the head of the bolt so that the shaft of the bolt can be slid in the slot towards the opening in the other member to disengage the panel members; and
(b) the head of the bolt having a truncated shape with a smaller cross-section at the other of the ends of the bolt so that the head can engage the hole at a larger cross-section of the truncated shape spaced from the other end in the locked position, with a flange adjacent to the head which can engage the surface of the other panel member around the slot and with a portion of the shaft engaging the slot.

4,786,120
KEYBOARD ENCLOSURE ASSEMBLY
Jeffrey L. Sparks; Mark S. Ferguson, and William C. Duke, all of Durham, N.C., assignors to Casica Corporation, Durham, N.C.
Filed Oct. 14, 1987, Ser. No. 108,378
Int. Cl.[4] A47B *21/00*
U.S. Cl. 312—208 **6 Claims**



4. An enclosure assembly, comprising:
(a) a U-shaped member, comprising a main U-shaped top wall, with side leg portions joined to a rear base portion, from which downwardly depend (i) a back wall, extending along a rear edge of the base portion of the top wall, (ii) side walls, extending along outermost side edges of the leg portions of the top wall, and (iii) front walls, extending along front edges of the leg portions of the top wall; and
(b) a cover member comprising a main top portion joined at a front edge thereof to a front flange portion downwardly depending therefrom, the cover member being cooperatively matable with the U-shaped member, with an upper surface of said U-shaped top wall providing support for side portions of said cover member, with a bottom surface of said cover member at said side portions thereof being reposable on said upper surface of said U-shaped top wall, and with said front flange portion of said cover member being of a length equal to the spacing between said front walls of said U-shaped member, and flushly positionable with respect to said front walls when said cover member is cooperatively mated with said U-shaped member.

4,786,121
COMPUTER PROTECTIVE ENCLOSURE
Charles D. Lyons, P.O. Box 29730, Elkins Park, Pa. 19117
Continuation of Ser. No. 907,023, Sep. 15, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 133,163
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—214 **1 Claim**



1. A protection enclosure for computers comprising
a stationary protector, the protector being defined by a base panel, a roof panel and right and left sidewall panels extending from the base panel to the roof panel, the base, roof and right and left sidewall panels defining a hollow interior of size and configuration to receive a computer therein,
the right and left sidewall panels each comprising interior surfaces,
the protector having an open front to permit easy access to the computer when stored within the enclosure,
the protector having an open back to allow air to flow through the said hollow interior;
insulation materials lining discrete interior portions of the hollow of the enclosure,
the insulation material being affixed to the interior surfaces of the right and left sidewall panels,
the insulation material substantially covering the interior surfaces of the right and left sidewall panels,
the insulation covering the right and left sidewall panels defining a clearance space there between sufficient to receive a computer therein,
the insulation material extending downwardly from the roof panel and terminating a short distance above the base panel,
the insulation material defining laterally opposed, left and right track areas above the base panel at the interconnections between the floor panel and the left and right sidewall panels,
the left and right track areas comprising uninsulated bottom portion of the left and right sidewall panels; and
a movable computer supporting bracket in sliding contact with the base panel,
the movable bracket comprising a base and integral left and right feet, the feet being spaced apart by a distance that is less than the distance between the left and right sidewalls panels, the feet being spaced apart by a distance that is greater than the width of the said clearance space, at least one of the bracket feet being positioned within one of the track areas to permit the bracket feet to slide within the track area; whereby the insertion and withdrawal of a computer into and out of the enclosure can be facilitated.

4,786,122
CABINET CONSTRUCTION
Donald L. Nichoalds, Libertyville, Ill., assignor to Luxor Corporation, Waukegan, Ill.
Filed Oct. 30, 1986, Ser. No. 924,982
Int. Cl.[4] A47B *43/00*
U.S. Cl. 312—257 SK **13 Claims**

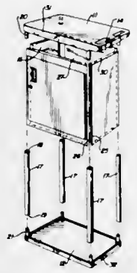
1. In a cabinet construction having top and bottom walls, a plurality of upright panels each of which defines opposite

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vertical side edges, top and bottom edges, and an intermediate wall portion, the improvement comprising:

cylindrical upright corner posts captured between said top and bottom walls; and

means for securing said panels in a space-enclosing array comprising angularly returned flanges on said edges of said panels defining acute angles with said intermediate



wall portions thereof, each flange abutting an associated post only outwardly of a radius of the post extending parallel to the wall portion of the panel whereby the panels are prevented from moving inwardly by the engagement of said flanges with said posts, and flanges on said top and bottom walls outwardly of and engaged by said top and bottom edges of said panels respectively for preventing outward movement of said panels.

4,786,123

DRAWER

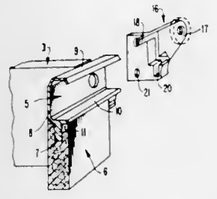
Erich Röck, Höchst, and Felix Schwärzler, Hohenems, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Nov. 24, 1987, Ser. No. 124,689

Claims priority, application Austria, Dec. 9, 1986, 3253/86

Int. Cl.[4] A47B *88/00*

U.S. Cl. 312—341 R **11 Claims**



1. In a drawer including a bottom, a rear wall, a front plate and two side walls, the improvement wherein each said side wall comprises:

a lower part made of an organic material, said lower part having formed therein an upwardly open groove;

an upper part made of metal and having a substantially U-shaped configuration including upper and lower flanges defining a running groove and a downwardly projecting flange extending from said lower flange and fitting into said upwardly open groove in said lower part, thereby anchoring said upper part to said lower part; and

a roller carrier attached to said rear wall, said roller carrier having formed therein a groove into which fits a rear end of said downwardly projecting flange of said upper part, and said roller carrier having extending forwardly therefrom a guiding projection extending into said running groove.

4,786,124

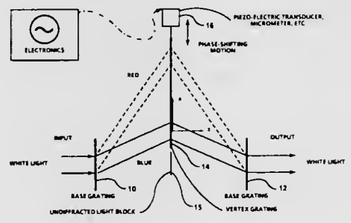
BROAD-SPECTRUM ACHROMATIC PHASE SHIFTERS, PHASE MODULATORS, FREQUENCY SHIFTERS, AND FREQUENCY MODULATORS

Thomas W. Stone, Rochester, and Nicholas George, Pittsford, both of N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Apr. 27, 1987, Ser. No. 43,124

Int. Cl.[4] G02B *5/32, 5/18;* **G02F** *1/11;* **G01B** *9/02*

U.S. Cl. 350—3.7 **36 Claims**



1. An optical system for processing light having a broad spectrum of wavelengths in which the optical phase of the light is changed achromatically which comprises a diffraction element on which a beam of input waves of said light is incident and from which diffracted light exits, displacement providing means for displacing said diffraction element transversely to said beam of input waves, and means for providing an output beam of said diffracted light in which the spatial form of the input waves is not substantially disturbed in response to a displacement of said element in a direction transverse to said beam of input waves to change the phase of said diffracted light achromatically.

4,786,125

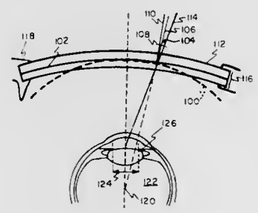
OCULAR PROTECTIVE APPARATUS

Jose Magarinos, and Daniel Coleman, both of Thornwood, N.Y., assignors to Farrand Optical Co., Valhalla, N.Y.

Continuation-in-part of Ser. No. 525,116, Aug. 22, 1983, abandoned. This application Aug. 13, 1984, Ser. No. 639,661

Int. Cl.[4] G02B *5/18, 5/32;* **G02C** *7/10;* **G03H** *1/02*

U.S. Cl. 350—3.65 **24 Claims**



1. A light shield for protecting against light of a given wavelength comprising:

(a) a substrate having a physical configuration defining a first shape;

(b) a first layer disposed on said substrate;

(c) a diffractive array being disposed in said first layer, said diffractive array forming a filter which reflects light having a wavelength at or close to said given wavelength, said filter exhibiting reflective characteristics along a curved optical surface defining a second shape, said second shape being positioned, dimensioned and configured with respect to said first shape in such a manner that the angle made by an incident light beam travelling toward an element to be protected with respect to the normal to said second shape is less than the corresponding angle made by said incident light beam with respect to the normal to said first shape at the point of incidence to said first shape; and

(d) support means for supporting said substrate in front of an element to be protected.

4,786,126

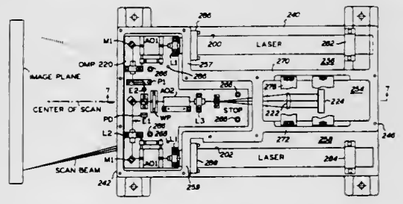
HOLOGON SCANNER SYSTEM

Charles J. Kramer, Pittsford, N.Y., assignor to Holotek, Ltd., Rochester, N.Y.

Filed Nov. 25, 1987, Ser. No. 125,306

Int. Cl.[4] G02B *26/10, 27/28*

U.S. Cl. 350—3.71 **14 Claims**



1. A scanning system which comprises means for providing first and second light beams of the same wavelength and which are polarized in orthogonal directions, means for combining said beams along paths extending in the same direction, means along said paths for circularly polarizing said beams, and a deflector for scanning said combined circularly polarized beams across an image surface.

4,786,127

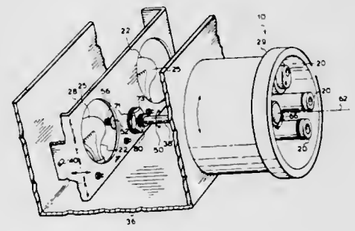
LIGHT SOURCE FOR FIBRE OPTIC INSTRUMENTS

Bohuslav Molnar, 56 Milbourne Cres., Oakville, Ontario, Canada L6H 4E9

Filed Dec. 14, 1987, Ser. No. 132,806

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.10 **10 Claims**



1. A light source device for illuminating receptor ends of a plurality of fibre optic cables, comprising:

a plurality of fibre optic cable receptacles each having an aperture therein for respectively receiving and removably securing therewithin the receptor end of one of the fibre optic cables;

a light source means for providing on an axis extending from said light source means a concentrated point source of light a given distance from said light source means;

movable selector means for aligning a selected one of the apertures of the receptacles along said axis; and

adjustable positioning means for adjustably displacing said point source of light and said selected aperture relative to each other along said axis to focus said point source of light on said receptor end secured within said selected aperture.

4,786,128

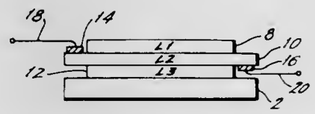
DEVICE FOR MODULATING AND REFLECTING ELECTROMAGNETIC RADIATION EMPLOYING ELECTRO-OPTIC LAYER HAVING A VARIABLE INDEX OF REFRACTION

Curtis A. Birnbach, Bronx, N.Y., assignor to Quantum Diagnostics, Ltd., Hauppauge, N.Y.

Filed Dec. 2, 1986, Ser. No. 936,761

Int. Cl.[4] G02B *6/10*

U.S. Cl. 350—96.14 **13 Claims**



1. A device for modulating and reflecting light, comprising:

(a) a layer of electro-optical material having a variable index of refraction sandwiched between two layers of dielectric material having a pre-determined index of refraction; and

(b) electrodes mounted on the outer edge portions on opposite faces of said electro-optic layer for applying a potential laterally across said electro-optic layer to vary the index of refraction of said electro-optic layer which controls the reflectance and transmittance of light through said device in a direction orthogonal to said layers.

4,786,129

OPTICAL COUPLING ASSEMBLY

Roderick Webb, Woodbridge, England, assignor to British Telecommuncations, London, England

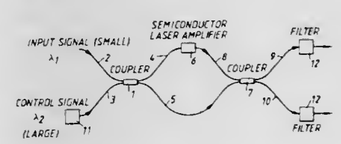
PCT No. PCT/GB86/00352, § 371 Date Feb. 18, 1987, § 102(e) Date Feb. 18, 1987, PCT Pub. No. WO86/07642, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 18, 1986, Ser. No. 14,050

Claims priority, application United Kingdom, Jun. 19, 1985, 8515500; Jun. 19, 1985, 8515583

Int. Cl.[4] G02B *6/26*

U.S. Cl. 350—96.15 **12 Claims**



1. An optical coupling assembly comprising:

a first optical coupling means having a first and a second input port and a first and a second output port;

a conversion means having an input, an output coupled to the first input of the first optical coupling means, and an optical path length which is dependent on the amplitude of an optical signal passing through it; and

a splitting means couplable to a source of an optical input signal for coupling a first portion of the optical input signal to the input of the conversion means, and a second portion of the optical input signal to the second input of the first coupling means;

whereby the proportion of the input signal output from each

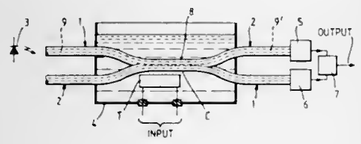
VOL 1096 ISS 4 NO 22 1988 UMI

output port of the first optical coupling means is selectable by coupling an optical control signal of appropriate amplitude to the conversion means.

4,786,130
FIBRE OPTIC COUPLER

George A. Georgiou, London, and Anthony C. Boucouvalas, Middlesex, both of England, assignors to The General Electric Company, p.l.c., England

Filed May 19, 1986, Ser. No. 864,802
Claims priority, application United Kingdom, May 29, 1985, 8513542
Int. Cl.[4] G02B *6/02, 6/26*
U.S. Cl. 350—96.15 14 Claims

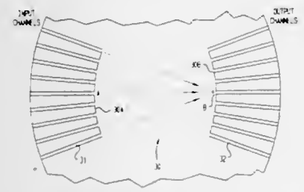


1. A fibre-optic coupler of the type comprising at least two optic fibres, each having a central core surrounded by a cladding of lower refractive index and in which the claddings of the optic fibres are fused together over part of their length to define a fused biconical coupling region such that light injected along one of the fibres into the coupling region is split between the fibres, wherein a single body of light-transmissive material is disposed in contact with the fused claddings at the coupling region, the refractive index of the body being variable in response to changes in temperature so as to vary the splitting ratio at the coupling region.

4,786,131
STAR COUPLER

Amaresh Mahapatra, Acton, and James M. Connors, Buzzards Bay, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 28, 1987, Ser. No. 78,592
Int. Cl.[4] G02B *6/26, 6/28*
U.S. Cl. 350—96.16 8 Claims

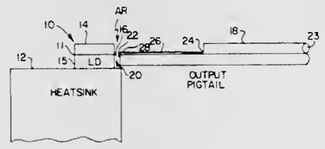


1. An M×N optical waveguide coupler comprising:
a planar waveguide having a pair of opposed edges that serve as entrance and exit facets for introducing and extracting electromagnetic radiation from said waveguide, said waveguide being structured to confine radiation propagating therein in a single mode in its depth without confining it in its width so that, in its width, radiation propagates as an expanding wavefront as it travels further along said waveguide;
at least one (M) single mode channel waveguide optically coupled to said input facet of said planar waveguide for introducing radiation into said planar waveguide to travel across said planar waveguide toward said exit facet thereof as a single mode in the depth of said planar waveguide and as an expanding wavefront in the width thereof; and
an array of (N) single mode channel waveguides optically coupled to said exit facet of said planar waveguide at spaced apart widthwise locations therealong to receive predetermined amounts of energy from the expanding wavefront of the input radiation.

4,786,132
HYBRID DISTRIBUTED BRAGG REFLECTOR LASER

Eugene I. Gordon, Convent Station, N.J., assignor to Lytel Corporation, Sommerville, N.J.

Filed Mar. 31, 1987, Ser. No. 33,026
Int. Cl.[4] G02B *6/34*
U.S. Cl. 350—96.19 14 Claims

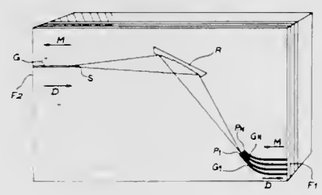


1. A combination comprising:
a semiconductor laser diode including a front emission facet having an anti-reflection coating,
an optical fiber coupled to said front emission facet of said laser diode to receive radiation emitted therein and to transmit at least a portion of the received radiation away from the laser diode, said transmitted radiation forming the output of said combination, and
a periodic reflector grating formed adjacent the core of the fiber near the front emission facet of the laser diode to produce a substantially single wavelength output.

4,786,133
MULTIPLEXER-DEMULTIPLEXER USING AN ELLIPTICAL CONCAVE GRATING AND PRODUCED IN INTEGRATED OPTICS

Pierre Gidon, Echirolles; Jean-Pierre Jadot, Meylan, and Serge Valette, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 18, 1987, Ser. No. 135,134
Claims priority, application France, Dec. 31, 1986, 8618434
Int. Cl.[4] G02B *6/34*
U.S. Cl. 350—96.19 1 Claim

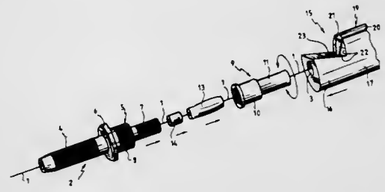


1. Multiplexer-demultiplexer in integrated optics, for operating at a plurality of different wavelengths, characterized in that it comprises a guidance structure formed by a substrate (20) covered by a stack of three transparent layers, a first layer (22), a second layer (24) and a third layer (26), the second layer (24) having a higher refraction index than that of the first (22) and third (26) layers surrounding it, said guidance structure comprising:
a plurality of optical microguides (G1, G2 . . . . . , GN), whose number (N) is equal to the number of operating wavelengths, said microguides having first ends which are level with the surface of one of the faces (F1) of the guidance structure with an adequate spacing to permit coupling to the same number of optical fibres, said microguides being drawn towards one another whilst penetrating the structure and having second drawn together ends (P1, P2 . . . . . , PN) distributed along a segment;
a single microguide (G) having a first end level with the surface of another face (P2) of the guidance structure and a second end (S) disposed within the structure;
a reflecting, concave diffraction grating (R) constituted by facets etched in the stack of layers, the facets having as the cross-section ellipse portions, whereof the two foci coincide respectively in the one case with the second end of the single optical guide (S) and in the other with the different second ends (P1, P2 . . . . . PN) of the plurality of optical guides (G1, G2 . . . . . , GN) for each of the operating wavelengths of said guides.

4,786,134
QUICK FIT CONNECTOR FOR OPTICAL FIBERS

Francois Fort, Paris, and Michel Maindron, St. Martin de Bretheneourt, both of France, assignors to Fort, Fibres Optiques Recherche et Technologie, Paris, France

Filed Mar. 18, 1986, Ser. No. 840,869
Claims priority, application France, Mar. 18, 1985, 8503928
Int. Cl.[4] G02B *6/40*
U.S. Cl. 350—96.20 12 Claims

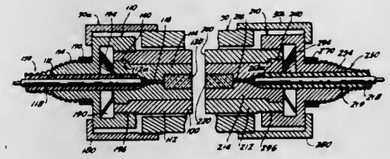


1. A combination of a connector for quick connection of an optical fiber and of a tool for cutting said optical fiber, wherein said connector comprises:
a first and a second tubular body through which an optical fiber passes and which are axially aligned and joined together by means of a nut partially enveloping said second tubular body and screwed about said first tubular body,
means for fixing and centering said optical fiber, said second tubular body comprising:
a rear portion closed at a proximal end thereof by a bottom pierced centrally for passing said optical fiber and having an outer face, which is slightly recessed with respect to said proximal end of said rear portion, so as to protect a proximal end of said optical fiber, and
a front portion intended to be screwed about said proximal end of said first tubular body, and wherein said tool for cutting said proximal end of said optical fiber comprises a cutting element cooperating with said outer recessed face of said rear portion, so as to cut by cleavage said optical fiber.

4,786,135
CONNECTOR FOR OPTICAL FIBER CABLES

Paolo Boero, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Dec. 18, 1986, Ser. No. 943,618
Claims priority, application Italy, Dec. 18, 1985, 23268 A/85
Int. Cl.[4] G02B *6/36*
U.S. Cl. 350—96.21 9 Claims

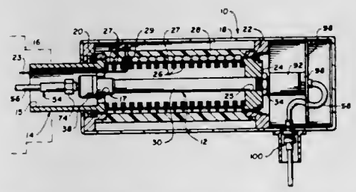


1. A connector for an optical fiber cable which comprises at least an optical fiber surrounded by a tension resisting member comprising at least one yarn, said connector comprising:
a hollow cylindrical body having a first end and a second end;
means for securing said body to another body;
a lens support mounted in said hollow cylindrical body for sliding movement axially of the latter in the direction from said first end toward said second end of said body, said support having an axially extending bore for receiving said optical fiber and said lens support being securable to the outer surface of said optical fiber for causing axial movement of said lens support with axial movement of said optical fiber;
a lens mounted in said bore at the end thereof nearer said first end of said body for receiving an end of said fiber in energy coupling relation;
elastic means acting between said hollow cylindrical body and said lens support and urging said lens support toward said first end of said body; and
means for securing said tension resisting member to said hollow cylindrical body;
whereby with forces applied to said cable which tend to pull the optical fiber out of said hollow cylindrical body, said lens support moves axially against the force of said elastic means until slack in said tension resisting member is taken up at which time the pulling force is applied to the hollow cylindrical body by said tension resisting member.

4,786,136
OPTICAL FIBER ROTARY COUPLER

Vernon W. Cannon, Austin, Tex., assignor to IEC Corporation, Austin, Tex.

Continuation of Ser. No. 406,072, Aug. 6, 1982, abandoned. This application Mar. 13, 1986, Ser. No. 840,472
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 5 Claims



1. In an electrical slip ring assembly comprising a casing, shaft means rotatably mounted in said casing, cooperating slip ring and contact means supported by respective ones of said shaft means and said casing for transmitting electrical signals between conductor means connected to said slip ring and said contact means, respectively, an optical fiber rotary coupler

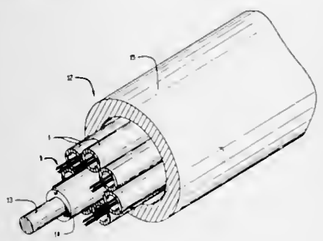
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associated with said slip ring assembly and comprising a support member disposed on said shaft means and adapted for supporting respective opposed ends of two optical fibers for relative rotation of one fiber with respect to the other fiber about the axis of rotation of said shaft means for transmitting light signals from said one fiber to said other fiber during rotation of said shaft means with respect to said casing.

4,786,137
OPTICAL CABLE WITH FILLING COMPOUND AND PARALLEL FIBERS

Kenneth E. Cornelison, Overland Park, and Michael E. McGuire, Shawnee Mission, both of Kans., assignors to Ericsson, Inc., Overland Park, Kans.

Filed Dec. 31, 1984, Ser. No. 687,601
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **3 Claims**



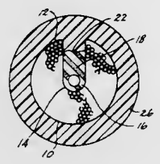
1. An optical fiber transmission cable assembly for grouping optical fibers comprising at least one buffer tube, at least two optical fibers within each said buffer tube capable of transmission of light in a single mode especially in wavelength regions longer than 1300 nm, said optical fibers within each said buffer tube having substantially the same overlength and each said buffer tube having an inner dimension larger than an area occupied by said optical fibers, a filler material within each said buffer tube, said filler material having a consistency softer than the material of each said buffer tube and optical fibers, said optical fibers supported by said filler material within each said buffer tube in a random, substantially parallel arrangement one to another and in a manner that each optical fiber is capable of movement both freely and independently while relatively free of net compression or tensile stress under potential cable operating conditions, and a central strengthening member, each said buffer tube strand about said central strengthening member at a predetermined pitch, said arrangement of optical fibers supported by said filler material each with substantially the same overlength being rendered less subject to mechanical stress to enhance operation of said cable in said wavelength regions.

4,786,138
OPTICAL-FIBER CABLE CONSTRUCTION

David L. Buckley, Monrovia, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 702,801, Feb. 19, 1985, abandoned. This application Feb. 14, 1986, Ser. No. 829,801
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **14 Claims**

1. An optical-fiber cable construction having a central axis comprising a ruggedizing core providing a wall surface and at least one channel of a predetermined width, extending from within the core to the external surface of the core, said channel containing at least one optical fiber suspended in a surrounding

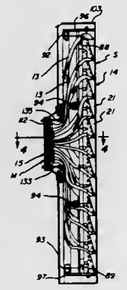


gel which at least is partially contained in the channel by means of a cured skin extending the width of the channel.

4,786,139
OPTICAL FIBER LIGHT TRANSFER APPARATUS, METHOD AND APPARATUS FOR MAKING SAME

Steven R. Sedlmayr, Golden, Colo., assignor to Advance Display Technologies, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 25,385, Mar. 12, 1987. This application Nov. 19, 1987, Ser. No. 122,407
Int. Cl.[4] G02B *6/08*; F21V *7/04*
U.S. Cl. 350—96.27 **36 Claims**



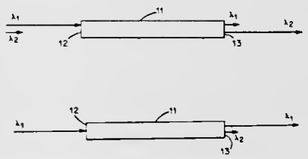
1. In a method of making light transfer apparatus, the steps for making a screen row assembly comprising:
applying an adhesive to selected surfaces of a plurality of screen units, said surfaces contacting when said units are side by side, said screen units having a fiber ribbon along one side and a spacer portion along an opposite side,
placing said plurality of screen units side by side in a row with the side fiber ribbon of one abutting the spacer portion of another for adjacent screen units and face down on a bottom row clamp with an alignment rib between each adjacent screen unit,
inserting at least one alignment rod through a transverse hole in each screen unit and through at least one first transverse hole in each alignment rib,
placing a top row clamp on the row of said ribs and a pair of end row clamps at opposite ends of said bottom and top row clamps, and
securing said row clamps together in an oblong configuration to provide a selected length dimension between said end row clamps for clamping said row of screen units together in a straight row and to a preselected row length dimension with substantially uniform spacing between the fiber ribbons in each screen unit and adjacent connected screen units to form a substantially straight screen row assembly.

5. A combination for making a light transfer apparatus having a screen row assembly, the combination comprising:
a bottom row clamp on which a plurality of screen units are disposed face down and side by side in a row, said screen units having an adhesive applied to selected surfaces which contact one another when said units are side by side, said screen units having a fiber ribbon along one side and a spacer portion along an opposite side,
an alignment rib between adjacent screen units,
a top row clamp disposed on said ribs,
a pair of end row clamps at opposite ends of said top and bottom row clamps,
at least one alignment rod extending through a first transverse hole in each rib, and
means for clamping said row clamps together in an oblong configuration with a preselected length dimension between said end row clamps thereby clamping said row of screen units together in a straight row to a selected length dimension with substantially uniform spacing between the fiber ribbons in each screen unit and adjacent connected screen units.

4,786,140
METHOD OF MODULATING LARGE-POWER LIGHT BEAMS USING FIBER RAMAN AMPLIFICATION

Paul Melman, Newton, and Mark L. Dakss, Sudbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 30, 1987, Ser. No. 114,938
Int. Cl.[4] G02F *1/35*
U.S. Cl. 350—96.29 **6 Claims**



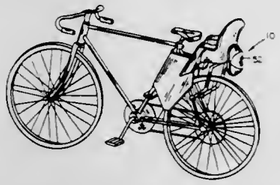
1. A method of modulating a continuous-wave large-power light beam with Raman amplification comprising the steps of
providing a length of low-loss optical fiber having an input end and an output end;
applying said large-power light beam at a pump wavelength λ_1 to said input end of said optical fiber, whereby
said output end of said fiber normally provides a first continuous-wave output beam at said pump wavelength λ_1 and a second output beam at a wavelength λ_2, where the intensity of said first output beam is much higher than the intensity of said second output beam; and
then, applying said large-power light beam at said pump wavelength λ_1 to said input end of said optical fiber, and applying a weak modulated optical signal at said wavelength λ_2 to said input end of said optical fiber, whereby said optical fiber, at said output end, provides a significantly modulated large-power light beam at said pump wavelength λ_1.

4,786,141
VISUAL SIGNAL DEVICE INCLUDING AN EXPANDABLE BELLOWS-LIKE ELEMENT

John V. Kitrell, 4639 Holdrege St., Lincoln, Nebr. 68503

Filed Jan. 21, 1988, Ser. No. 146,487
Int. Cl.[4] G02B *5/12*
U.S. Cl. 350—99 **6 Claims**

1. A visual signal device comprising,
a first generally semi-elliptical housing member, said first housing member dwelling in substantially a vertical plane and having a substantially horizontal lower end portion, an arcuate upper end portion, and rearward and forward ends,
a second generally semi-elliptical housing member pivotally secured to said first housing member and being movable from a first closed position to a second open position with respect to said first housing member, said second housing member being positioned closely adjacent the rearward end of said first housing member and having a substantially horizontal lower end portion, an arcuate upper end portion, and rearward and forward ends, when in said closed position,
means pivotally securing the lower end portions of said housing members together whereby said second housing member will be positioned directly below said first housing member when in said open position,
means for selectively maintaining said second housing member in said closed and open positions,

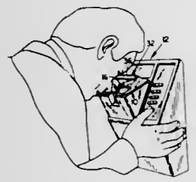


said second housing member having a visual signal material on its rearward end,
a flexible bellows-like member, having a visual signal material thereon, secured to said first and second housing members and being positioned therebetween when said second housing member is in its closed position,
means for expanding said bellows-like member rearwardly into a multidimensional visual signal means when said second housing member is moved to its open position,
means for maintaining said bellows-like member in its expanded position,
and means for mounting said first housing member on a supporting member.

4,786,142
OPTICAL INSTRUMENT LINE OF SIGHT ALIGNING DEVICE

Marion R. Karecki, Portland, Oreg., assignor to Eyedentify, Inc., Portland, Oreg.

Filed Jun. 16, 1986, Ser. No. 874,705
Int. Cl.[4] G06K *9/32*; G02B *27/00*
U.S. Cl. 350—319 **7 Claims**



1. For use with an optical instrument having a viewing opening requiring precise alignment with the line of sight of the viewer, a line of sight aligning device comprising:
(a) a body member having an eye opening and a nose recess in operative position relative to each other,
(b) positioning means on the body member for releasably securing the body member to the optical instrument with the eye opening of the body member in operative position registering with the viewing opening of the optical instrument, providing the body member with a front face and a back face, and
(c) on the body member front face a straight edge positioned above the nose recess but within the field of vision of the

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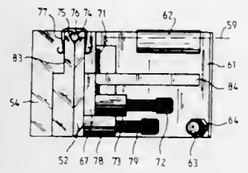
viewer, and disposed substantially at right angles to the longitudinal axis of the nose recess in the body member.

4,786,143

DEVICE FOR ORIENTING AN OPTICAL COMPONENT

Jean-Claude Vial, Grenoble, and André Carminati, Saint-Martin le Vinoux, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Aug. 29, 1985, Ser. No. 770,430
Claims priority, application France, Aug. 30, 1984, 84 13466
Int. Cl.⁴ G02B *27/00, 7/02*
U.S. Cl. 350—321 **23 Claims**



1. A device for orienting an optical component, said device comprising:
- a first plate forming a fixed base having first and second faces;
- a second plate separable from said first plate and having first and second faces, for receiving the optical component relative to said first plate; and
- a first hinge means for rotating said second plate and the optical component relative to the first plate about a first axis of relative rotation and for maintaining the optical component at a selected orientation, said first hinge means including,
- first and second grooves formed in facing portions of the first face of the first plate and the first face of the second plate, respectively, said grooves formed along an edge of each of said first faces along said first axis of relative rotation between said first and second plates,
- a first body of revolution constituting the first axis of relative rotation between said first and second plates, said first body of revolution cooperating with surfaces of said first and second grooves,
- a first resilient return means including a U-shaped clip fitted astride said first body of revolution and bearing against the second face of the first plate and the second face of the second plate, said first resilient return means insuring contact between said first body of revolution and the surfaces of said grooves and urging return rotation between said first and second plates to a closed parallel position, removal of said first resilient return means permitting an easy replacement of said first and second plates; and
- a first adjustable abutment means opposing the return action of the first resilient return means of said first hinge means.

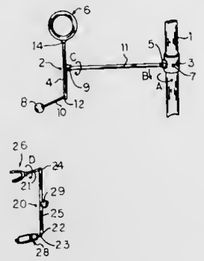
4,786,144

CONTACT LENS HOLDER

Arthur B. Epstein, 24 Ravine Rd., Great Neck, N.Y. 11023

Filed Jan. 22, 1987, Ser. No. 13,332
Int. Cl.⁴ G02B *7/02*; G01N *21/01*
U.S. Cl. 350—321 **19 Claims**

1. A contact lense holder comprising:
- holding means including central and peripheral lens support means capable of alternately supporting the central portion and the peripheral portion of a contact leans in a manner leaving the unsupported portion of the lens uncovered on both sides thereof allowing for visual inspection through the lens; and
- means for supporting said holding means in a desired position so that the lens may be visually inspected with an optical instrument, said means for supporting said holding means including a means for rotating said holding means



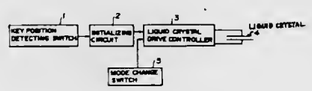
with respect thereto in a plane generally perpendicular to a surface supporting said contact lens holder.

4,786,145

LIQUID CRYSTAL ANTIDAZZLE MIRROR

Hiroshi Demura, Toyota, Japan; Akira Kawahashi, Stanford, Calif.; Yasuo Ohyama, Toyota, Japan; Sadao Kokubu, Aichi, Japan; Kouji Takizawa, Aichi, Japan, and Shigeru Iguchi, Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Tokai Tika Denki Seisakusho, both of Aichi, Japan

Filed Jun. 20, 1986, Ser. No. 876,922
Claims priority, application Japan, Jun. 21, 1985, 60-94202[U]
Int. Cl.⁴ G02F *1/13*; G02B *17/00*
U.S. Cl. 350—331 R **4 Claims**



1. A liquid crystal antidazzle mirror having a key position detecting switch for supplying power to a liquid crystal drive control circuit when a key plate is inserted into the key cylinder, the mirror comprising:
- an initializing circuit having a preset capacitor and a preset resistor connected between the key position detecting switch and the liquid crystal drive control circuit for initializing the liquid crystal drive control circuit to a preselected one of predetermined antidazzle and dazzle states upon receiving a detection signal of the key position detection switch.

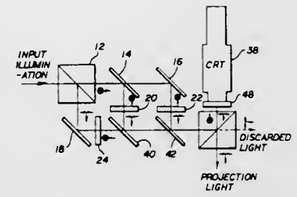
4,786,146

COLOR SEQUENTIAL ILLUMINATION SYSTEM FOR A LIQUID CRYSTAL LIGHT VALVE

Arno G. Ledebuhr, Pleasanton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 11, 1987, Ser. No. 13,307
Int. Cl.⁴ G02F *1/13*; G02B *27/14*; G03B *21/14*
U.S. Cl. 350—331 R **20 Claims**

1. A color sequential system for illuminating a liquid crystal light valve with a first beam having a first color and a first polarization state and second beam having a second color and said first polarization state, said system comprising:
- first means for providing a first beam along a first optical path having a first color and said first polarization state;
- second means for providing a second beam along a second optical path having a second color and said first polarization state;
- optical switch means for selectively transmitting said first and second beams by changing the polarization state thereof;



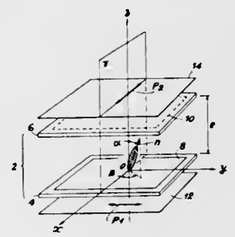
- third means for directing said first beam onto said liquid crystal light valve and
- fourth means for directing said second beam onto said liquid crystal light valve.

4,786,147

NEMATIC LIQUID CELL WEAKLY DOPED BY A CHIRAL SOLUTE AND OF THE TYPE HAVING ELECTRICALLY CONTROLLED BIREFRINGENCE

Jean-Frédéric Clerc, Reylan, and Laurence Rabas, Saint-Maclin-D' Héres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 756,059, Jul. 17, 1985. This application Feb. 29, 1988, Ser. No. 165,376
Claims priority, application France, Jul. 26, 1984, 84 11896
Int. Cl.⁴ G02F *1/137*
U.S. Cl. 350—337 **3 Claims**



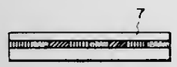
1. An electrically controlled birefringence effect liquid crystal cell comprising a system having a liquid crystal layer, two parallel transparent plates on either side of the layer, a transparent electrode on each plate, and two crossed linear polarizers on either side of the system, wherein the liquid crystal is a nematic liquid crystal having a negative dielectric anisotropy and is weakly doped by a chiral solute in such a way that the resulting cholesteric liquid crystal twist exceeds approximately twice the thickness of the layer and is less than approximately 8 times said thickness and the liquid crystal molecules are substantially perpendicular to the plates in the absence of voltage between the electrodes and wherein one of the polarizers is arranged in such a way that its maximum absorption direction is substantially parallel to the projection on it of the alignment direction taken by the liquid crystal molecules located at the center of the layer in the presence of a voltage between the electrodes exceeding the threshold voltage of the cell.

4,786,148

COLOR FILTER HAVING DIFFERENT PRIMARY COLOR PIGMENT DENSITIES, INTER ALIA

Nobuyuki Sekimura, Kawasaki; Hideaki Takao, Sagamihara; Masaru Kamio, Atsugi; Tatsuo Murata, Ohme, and Miki Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,610
Claims priority, application Japan, Dec. 10, 1986, 61-294361; Dec. 27, 1986, 61-309070; Dec. 27, 1986, 61-309072
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—339 F **41 Claims**



1. A color filter comprising a substrate and colored resin films, disposed on a support, including a blue resin film containing blue colorant particles dispersed therein, a green resin film containing green colorant particles dispersed therein, and a red resin film containing red colorant particles; wherein the average particle volume of the blue colorant particles V_B, the average particle volume of the green colorant particles V_G and the average particle volume of the red colorant particles satisfy the relation of:

$V_B < V_G < V_R$.

18. A color filter comprising a substrate and colored resin films, disposed on a support, including a blue resin film containing a blue colorant dispersed therein, a green resin film containing a green colorant dispersed therein and a red resin film containing a red colorant dispersed therein; wherein the surface roughness of the colored resin films successively increases in the order of the blue resin film, the green resin film, and the red resin film.

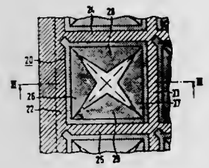
29. A color filter comprising a substrate and colored resin films, disposed on a support, including a blue resin film containing a blue colorant dispersed therein, a green resin film containing a green colorant dispersed therein and a red resin film containing a red colorant dispersed therein; wherein the colored resin films have a ratio P/V of the weight of the colorant (P) to the weight of the resin (W) in the resin films, which ratio P/V increases in the order of the blue resin film, the green resin film and the red resin film.

4,786,149

ARRANGEMENT FOR OPTICAL IMAGE PROCESSING

Eckhardt Hoenig, Erlangen, and Burkhard Lischke, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 20, 1987, Ser. No. 52,548
Claims priority, application Fed. Rep. of Germany, May 22, 1986, 3617167
Int. Cl.⁴ G02B *27/42, 26/02*; G02F *1/03, 1/00*
U.S. Cl. 350—356 **4 Claims**

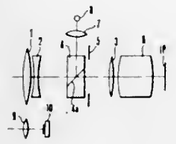


1. An arrangement for optical image processing by spatial filtering, particularly for converting electronic image information into optical image information and for Fourier transformation, comprising a two-dimensional optical filter comprising a

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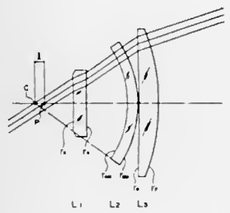
microstructured grid having windows, the windows being provided with electrostatically movable thin-film terminations, and further comprising electron beam means for controlling the position of the thin-film terminations thereby opening and closing the windows.

4,786,150
ZOOM LENS WITH BEAM SPLITTER
Sadahiko Tsuji, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 18, 1986, Ser. No. 909,125
Claims priority, application Japan, Sep. 19, 1985, 60-207028; Sep. 19, 1985, 60-207029; Sep. 21, 1985, 60-209439
Int. Cl.[4] G02B *23/04, 13/06*
U.S. Cl. 350—427 **10 Claims**



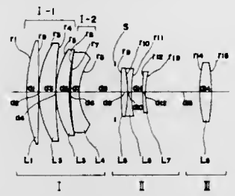
1. A zoom lens having a front and a rear, comprising:
a plurality of lens units each movable for zooming along an optical path, one of said lens units being located toward said zoom lens front and another of said lens units being located toward said zoom lens rear;
light beam splitting means in a fixed location between said one and such other of said lens units for splitting said optical path to provide a further optical path split-off from said optical path; and
an optical device arranged in said further optical path.

4,786,151
SCANNING LENS SYSTEM FOR A LIGHT BEAM SCANNING DEVICE
Akiyoshi Hamada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Jan. 11, 1988, Ser. No. 142,797
Claims priority, application Japan, Jan. 12, 1987, 62-4270
Int. Cl.[4] G02B *27/10, 3/06*
U.S. Cl. 350—434 **5 Claims**



1. A scanning lens system for a light beam scanning device in which a light beam emitted from a light source is shaped by a beam shaping optical element into a linear image to enter a surface of a deflection member and the beam deflected by the deflection member is restored to a circular-like image and projected onto an objective surface by the scaning lens system, the scanning lens system consisting of from the deflection member side a first, second and third single lens, the first single lens being a spherical lens with a positive refractive power, the second single lens being a toric lens with a negative refractive power in a scanning plane and with a positive refractive power in a plane perpendicular to the scanning plane, and the third single lens being a spherical lens with a positive refractive power.

4,786,152
TELEPHOTO LENS SYSTEM
Tetsuya Arimoto, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 6, 1987, Ser. No. 35,068
Claims priority, application Japan, Apr. 7, 1986, 61-79484
Int. Cl.[4] G02B *13/02*
U.S. Cl. 350—454 **4 Claims**



1. A telephoto lens system comprising:
(a) a first positive lens unit consisting of
a first component which consists of, from the object side, a first positive lens element, a second and a third positive meniscus lens element having a convex surface to the object side; and
a second component which comprises a fourth negative meniscus lens element having a convex surface to the object side;
(b) a second negative lens unit including cemented elements with a positive and a negative lens element, the second lens unit alone moving in case of focusing, namely to the image side upon focusing from an infinite to a close distance; and
(c) a third positive lens unit, wherein the telephoto lens system fulfills the following conditions:

$$0.15 < r_6/r_7 < 0.85$$

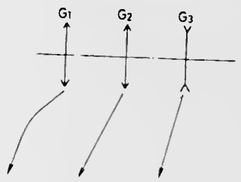
$$0.0045f < d_6 < 0.0105f$$

$$0.85 < f_{I\text{-}1}/|f_{I\text{-}2}| < 1$$

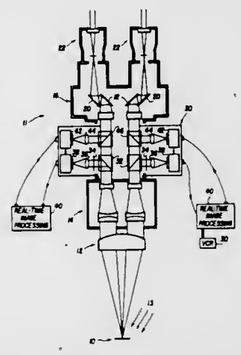
wherein,
r_6 represents the radius of curvature of the image side surface of the third lens element of the first lens unit;
r_7 represents the radius of curvature of the object side surface of the fourth lens element in the first lens unit;
d_6 represents the axial distance between the third and fourth lens elements in the first lens unit;
f represents the whole focal length of the whole lens system when the lens system is in focus on an infinite object;
$f_{I\text{-}1}$ represents the compound focal length of the first component of the first lens unit, and
$f_{I\text{-}2}$ represents the compound focal length of the second component of the first lensunit.

4,786,153
LARGE-APERTURE MACRO LENS SYSTEM
Yasuji Ogata, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1987, Ser. No. 17,672
Claims priority, application Japan, Feb. 24, 1986, 61-37472
Int. Cl.[4] G02B *9/00, 15/00*
U.S. Cl. 350—463 **11 Claims**

1. A large-aperture macro lens systems comprising a first lens group having positive refractive power, a second lens group having positive refractive power, and a third lens group having negative refractive power in the order from the object side, said large-aperture macro lens system being arranged that, when focusing from an infinite distance object to a short distance object is performed, the airspace between said first and second lens groups is varied in a pattern that said airspace is increased and, then, decreased by changing the varying direction near the position of the intermediate photographing magnification.

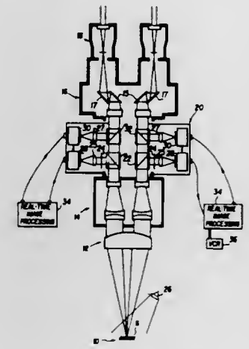


4,786,154
ENHANCED-IMAGE OPERATING MICROSCOPE
Stephen D. Fantone, 11 Grant Rd., Lynnfield, Mass. 01940, and Robert A. Pearlstein, 37 Knowles St., Newton Center, Mass. 02159
Filed Dec. 16, 1986, Ser. No. 942,257
Int. Cl.[4] G02B *21/36, 21/22*
U.S. Cl. 350—508 **16 Claims**



1. An improved operating microscope, comprising:
optical means for defining a first optical path for a visible image of an object through said microscope from an object location to an eyepiece; and
image enhancement apparatus, comprising:
beamsplitter means located in said first optical path for splitting said visible image of said object into first and second portions;
filter means, disposed in a second optical path connecting said beamsplitter means with an image formation means, for removing a part of said visible image from said first portion;
image formation means for forming an image of the part of said first portion of the image not removed by said filter means, said image formation means and said beamsplitter means defining said second optical path;
image enhancement means for enhancing the image formed by said image formation means;
display means for displaying the enhanced image; and
means for combining the displayed enhanced image with the second portion of the visible image and for permitting viewing of the combined images by way of said eyepiece means.

4,786,155
OPERATING MICROSCOPE PROVIDING AN IMAGE OF AN OBSCURED OBJECT
Stephen D. Fantone, 11 Grant Rd., Lynnfield, Mass. 01940, and Robert A. Pearlstein, 37 Knowles St., Newton Center, Mass. 02159
Filed Dec. 16, 1986, Ser. No. 942,254
Int. Cl.[4] G02B *21/22, 21/36, 21/06, 27/14*
U.S. Cl. 350—516 **40 Claims**



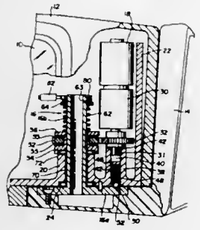
1. A microscope for providing an image in the visible spectrum of an object obscured from direct view by a layer of material which is substantially opaque to visible light, comprising:
means for illuminating the object with radiation including visible light and penetrating radiation, wherein the layer of material obscuring the object is substantially transparent to said penetrating radiation;
means for forming a visible image of the obscured object;
means for detecting penetrating radiation reflected from the object obscured by the layer of material and for producing a penetrating radiation image;
means for displaying a converted image of said object corresponding to said penetrating radiation image; and
means for combining the visible image of the obscured object and the converted image to provide an overlaid image in the visible spectrum of the object.

4,786,156
REMOTE CONTROL SIDE MIRROR DEVICE FOR VEHICLE
Kunio Kotani, Isehara; Tatsuo Nakamura, Tokyo, and Masagoro Kushida, Atsugi, all of Japan, assignors to Ichikoh Industries Limited, Tokyo, Japan
PCT No. PCT/JP85/00011, § 371 Date Sep. 9, 1985, § 102(e) Date Sep. 9, 1985
PCT Filed Jan. 11, 1985, Ser. No. 776,970
Claims priority, application Japan, Jan. 12, 1984, 59-2675
Int. Cl.[4] G02B *7/18, 5/08;* **B60R** *1/06*
U.S. Cl. 350—637 **27 Claims**

1. A remote control side mirror device for a vehicle comprising a mirror housing for rotatably supporting a mirror, a mirror base having a support shaft, said mirror base adapted to be fixedly secured to an automotive body for supporting said mirror housing rotatably substantially in a traveling direction of the vehicle, drive means fixedly secured to said mirror housing for rotating said mirror housing under remote control at the support shaft as a center, a reduction gear mechanism connected to said drive means, first gear means connected to

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said reduction gear mechanism and having an axis of rotation, second gear means held coaxially with the support shaft and engaged in mesh with said first gear means, first means for releasably engaging said support shaft with said second gear

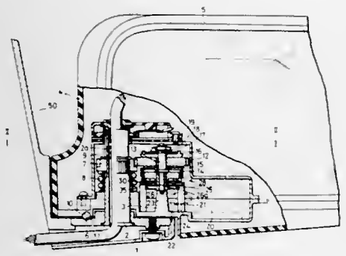


means so that the engagement is released when receiving a predetermined or larger external force to vary the relative angular position to the support shaft of said second gear means and second means for releasably engaging said housing with said base at a location on said axis of rotation.

4,786,157
ELECTRICALLY OPERATED AUTOMOBILE MIRROR ASSEMBLY

Keiji Mori, Kariya, and Nozomu Torii, Hekinan, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Feb. 27, 1987, Ser. No. 19,611
Claims priority, application Japan, Mar. 1, 1986, 61-42833
Int. Cl.⁴ B60R *1/06*; G02B *7/18*
U.S. Cl. 350—637 **10 Claims**

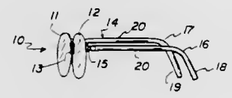


1. An electrically operated automobile mirror assembly including a first shaft fixed to an automobile body, a movable member mounted on said first shaft for rotation about said shaft and carrying a reflector, stationary gear means secured to said first shaft, motor means mounted on the movable member and having output means, means for connecting said output means of the motor means through the stationary gear with said movable member, said connecting means including speed reduction gear means and friction means, said reduction gear means including a rotatable gear mounted on a second shaft provided on the movable member, said rotatable gear being in meshing engagement with said stationary gear on the first shaft, a planetary gear unit having a first element connected with said output means of the motor means and a second element engaged through said friction means with said rotatable gear.

4,786,158
PROTECTIVE COVER FOR EYEGLASS TEMPLE PIECES AND METHOD

Glen A. Barfus-Shanks, and Irving Barfus, both of 2028 Dracena Dr., Los Angeles, Calif. 90027

Filed Feb. 10, 1986, Ser. No. 828,135
Int. Cl.⁴ G02C *5/14*
U.S. Cl. 351—122 **5 Claims**

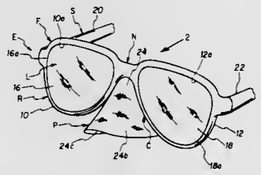


1. A removable temple covering comprising:
a hollow tube having a thin wall formed of a plastic material and defining a first end and a second end and a longitudinal passage therebetween; and
a resilient ring for securing said covering to said temple having a center aperture supported upon and encircling said tube at a point a predetermined distance from said first end, the portion of said tube between said ring and said first end of said tube defining a first end portion of said tube captivating said resilient ring to said tube, said first end portion having an outwardly extending flare of a diameter which increases from the point at which said resilient ring encircles said tube and is folded outwardly from said ring and back upon said tube so as to cling to the underlying portion of said tube to secure said ring upon said tube.

4,786,159
EYEGLASSES WITH PROTECTOR MEMBER

Rocco C. Piazza, Sr., and Rocco C. Piazza, Jr., both of Austin, Tex., assignors to Improved Glasses, Inc., Houston, Tex.

Filed Oct. 15, 1986, Ser. No. 918,988
Int. Cl.⁴ G02C *5/12*
U.S. Cl. 351—132 **19 Claims**

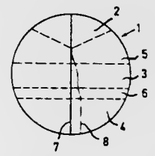


1. An improved pair of sunglasses for use by a wearer, comprising:
a frame member including first and second lens rim portions, a nose bridge portion interconnecting said first and second lens rim portions, and a contour surface formed by lower surfaces of said first and second lense rim portions and a lower surface of said nose bridge portion, with said contour surface substantially conforming to the nose of the wearer;
first and second lens members adapted to be fitted within said first and second lens rim portions, respectively;
securing means for securing said frame member with the wearer when in use by the wearer; and,
protector means mounted with said frame member substantially continuous along said contour surface and adjacent said nose bridge portion for protecting the nose of the wearer from harmful environmental effects, said protector means being movable between a first position substantially covering the nose of the wearer and a second position wherein said protector means is substantially stowed adjacent said nose bridge portion, as is desired by the wearer.

4,786,160
MULTI-FOCAL SPECTACLE LENS HAVING AT LEAST ONE PROGRESSIVE SURFACE

Gerhard Fürter, Ellwangen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenhim/Brenz, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 859,695
Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517321
Int. Cl.⁴ G02C *7/06*
U.S. Cl. 350—169 **17 Claims**



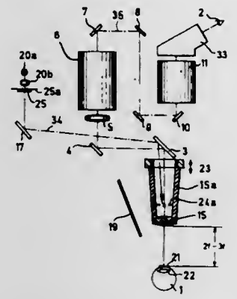
1. A multi-focal continuous-focus spectacle lens with at least one progressive surface of progressively varying power which is so shaped that spaced lens regions of different but constant viewing distances pass progressively and continuously into each other, characterized by the fact that said lens has two separate progressive zones (**5,6**) of continuously varying optical power, which zones are spaced from each other and change the dioptric powers of three viewing-distance regions (upper **2**, middle **3**, lower **4**) continuously into each other, each of said viewing-distance regions being of substantially constant dioptric power, and that the progressive surface is twice continuously differentiable nasally and temporally at least up to a horizontal viewing angle of substantially 25°.

4,786,161
APPARATUS FOR EXAMINATION AND SURGERY OF THE ANTERIOR AND POSTERIOR PORTIONS OF THE EYE

Ortwin Müller, Aalen; Albrecht Vogel, Oberkochen; Ulrich Lemcke, Heidenheim; Gerhard Hanemann, Oberkochen; Fritz Strähle, Heubach-Lautern; Franz Muchel, Konigsbronn, and Erich Blaha, Essingen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 1, 1986, Ser. No. 892,714
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528356
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—205 **2 Claims**

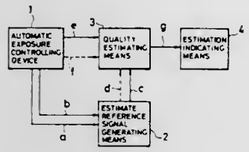
1. Apparatus for examination and surgery of the anterior and posterior portions of the eye, said apparatus comprising an operation microscope having a main objective (**5**), an opthalmoscopic objective (**15**) located in front of said main objective and positioned and dimensioned to produce, on an intermediate image plane (**24***a*) lying between said two objectives, an image of each plane of the eye lying between the cornea (**21**) and the fundus (**24**) thereof, said apparatus having an optical system in which back focus and focal length and magnification are infinitely variable, said apparatus further comprising an optical system (**11**) for lateral interchange of pupils with simultaneous image inversion in a stereoscopic ray path, and means for eliminating reflections occurring in an illumination ray path, wherein said apparatus includes means producing an illumination ray path, and a field stop (**25***a*) in said path, and wherein said apparatus includes means producing an illumination ray path, and a field stop (**25***a*) in said path, and wherein said means for eliminating reflections comprises at least one glass plate (**25**) located in said illuminating ray path close to said field stop, said glass plate being mounted for fine adjustment in three coordinate directions and having an opaque pair of points on said plate.



4,786,162
RETINAL CAMERA

Hiroshi Fujiwara, Hachiouji, and Kazuyuki Minami, Musashino, both of Japan, assignors to Olympus Opitical Co., Ltd., Tokyo, Japan

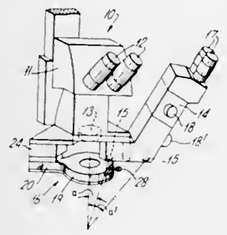
Filed Dec. 17, 1986, Ser. No. 942,826
Claims priority, application Japan, Dec. 20, 1985, 60-287400
Int. Cl.⁴ A61B *3/14*; G03B *7/00*
U.S. Cl. 351—206 **15 Claims**



1. A retinal camera comprising:
automatic exposure controlling means for emitting a flash emission starting signal to initiate a flash output, a flash emission stopping signal indicative of a predetermined amount of light from said flash being received, and an exposure data signal indicative of exposure conditions;
estimate reference signal generating means, connected to said automatic exposure controlling means, for producing an estimate reference signal indicative of a time that should elapse between said flash emission starting signal and said flash emission stopping signal if a proper subject is exposed by said camera, based on said exposure data signal and said flash emission starting signal from said automatic exposure controlling means;
quality estimating means, connected to said automatic exposure controlling means and said estimate reference signal generating means, for determining whether said flash emission stopping signal from said automatic exposure controlling means is produced within a predetermined time threshold of said estimate reference signal and producing an estimating signal indicative thereof, thereby estimating if a proper subject is exposed by said camera; and
estimation indicating means connected to said quality estimating means, for indicating said estimation result on the basis of the estimating signal emitted from said quality estimating means.

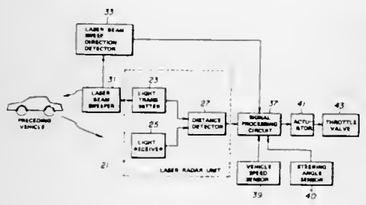
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,163
AUTO-KERATOMETER
Masatsugu Imamichi, and Takashi Nishiguchi, both of Kyoto, Japan, assignors to Sun Contact Lens Co. Ltd., Japan
Filed Dec. 19, 1986, Ser. No. 944,741
Claims priority, application Japan, Jul. 22, 1986, 61-113110[U]
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—212 **7 Claims**



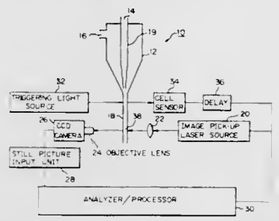
1. An auto-keratometer which is adapted to be attached to an operating microscope having an optical axis, a main body, an eyepiece in an upper region of said main body, and an objective lens in a lower region of said main body for measuring the corneal refraction or corneal astigmatic condition by detecting light from a light source reflected by a cornea through the intermediary of said objective lens and a beam splitter, said auto-keratometer comprising:
(A) an annular light source unit having an axis and a circular slit formed in a horizontal plane for irradiation of light downwardly therethrough; and
(B) means for holding said annular light source unit on said main body of said operating microscope in such a manner that said annular light source unit is movable in a horizontal plane between
(i) an irradiation position at which the axis of said annular light source unit is aligned with the optical axis of said operating microscope, and
(ii) a laterally retracted position at which said annular light source unit is removed from a workspace beneath said objective lens of said operating microscope.

4,786,164
SYSTEM AND METHOD FOR DETECTING INTERVEHICLE DISTANCE OF TWO VEHICLES MOVING IN THE SAME TRAFFIC LANE
Hiroshi Kawata, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan
Filed Jul. 12, 1985, Ser. No. 754,180
Claims priority, application Japan, Jul. 13, 1984, 59-144148
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—4 **7 Claims**



1. A system for detecting an inter-vehicle distance between first and second vehicles travelling on a road having a plurality of traffic lanes, comprising:
(a) first means for transmitting an electromagnetic wave toward said second vehicle along a direction of forward movement of the first vehicle and sweeping the transmitted electromagnetic wave from the first vehicle forward movement direction to both predetermined left and right direction limits;
(b) second means for receiving a reflected wave from a reflecting object on which the electromagnetic wave transmitted from said first means falls;
(c) third means for calculating and storing a distance to the reflecting object on the basis of a propagation delay time between a time at which said first means transmits the wave and a time at which said second means receives the reflected wave whenever said first means sweeps the transmitted wave at a given angle;
(d) fourth means for determining on which traffic lane of a road the first vehicle moves on the basis of respective sweep angles of the electromagnetic wave transmitted by said first means and received by said second means between a center axis which accords with the first vehicle's forward movement direction and wave reflecting objects present on both sides of the road;
(e) fifth means for determining whether the second vehicle is present on the road along a direction area toward which the first vehicle moves from among the wave reflecting objects on the basis of a change in the distance derived for each given sweep angle with respect to time;
(f) sixth means for determining a traffic lane of the road on which the second vehicle determined by said fifth means moves on the basis of sweep angles of the transmitted and reflected wave between the center axis and each reflecting object present on the corresponding side of the road, each reflecting object having the same distance as the intervehicle distance to the second vehicle; and
(g) seventh means for outputting a value of the intervehicle distance from the first vehicle to the second vehicle calculated and stored by said third means upon determination of said sixth means that the second vehicle determined by said fifth means is moving in front of the first vehicle on the same traffic lane of the road as the first vehicle.

4,786,165
FLOW CYTOMETRY AND APPARATUS THEREFOR
Hiroshi Yamamoto, and Atsuo Tomioka, both of Hyogo, Japan, assignors to TOA Medical Electronics Co., Ltd., Kobe, Japan
Filed Feb. 4, 1987, Ser. No. 10,777
Claims priority, application Japan, Jul. 10, 1986, 61-238827
Int. Cl.[4] G01P *3/40;* **G01N** *33/48*
U.S. Cl. 356—23 **2 Claims**



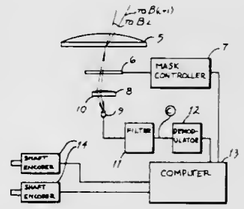
1. An apparatus for flow cytometry comprising:
a flow cell through which a sheathed stream flows;
a triggering light source which continuously emits a light beam on the sheathed stream;
a cell sensor for generating a cell detection signal upon sensing that a cell has traversed the light beam from said triggering light source;
a delay circuit for transmitting the cell detection signal to an image pick-up laser pulse light source after delaying the cell detection signal for a fixed period of time;
said image pick-up laser pulse light source emitting a pulse of laser light onto the flow cell to illuminate the cell sensed by the cell sensor;
a condenser lens for condensing laser light emitted by said image pick-up laser pulse light source;
means arranged downstream of said condenser lens and immediately upstream from said flow cell for reducing the coherence of the laser light emitted onto the flow tube from said image pick-up laser pulse light source;
an objective lens and a CCD camera for taking a still picture of cells flowing through the sheathed stream when the cells are illuminated by the pulse of laser light condensed by said condenser lens; and
a picture processor for processing and analyzing the still picture obtained.

4,786,166
DETERMINATION OF FOCAL PLANE FOR A SCANNING PROJECTION ALIGNER
Catherine G. Kroko, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 1, 1987, Ser. No. 56,192
Int. Cl.[4] G01B *9/00*
U.S. Cl. 356—123 **10 Claims**



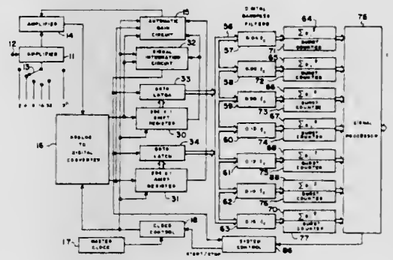
1. A method of determining the location of the best focus surface of a scanning projection resist/aligner system having minimum resolvable features, comprising:
(a) exposing an image in a resist layer formed on a polished side of a wafer through a wedged mask patterned with a plurality of opaque lines and clear spaces of widths nearly the size of the minimum resolvable features of the resist-/aligner system;
(b) developing the resist; and
(c) determining the location of the best focus "plane" or surface by selecting the center of the resulting patterns.

4,786,167
OPTICAL NAVIGATION SYSTEM
Richard R. Rothbone, 1800 Whitney Ave., Hamden, Conn. 06517; Robert A. Valley, Jr., 511 George St., New Haven, Conn. 06511; Peter J. Kindlman, 126 Birch Rd., Guilford, Conn. 7, and Robert A. Valley, Sr., 32 Meadow Wood Rd., Branford, Conn. 06405
Filed Oct. 3, 1985, Ser. No. 783,578
Int. Cl.[4] G01B *11/26, 3/00*
U.S. Cl. 356—141 **7 Claims**



1. A first navigational system for identifying and determining the angular location of a plurality of light radiating beacons comprising:
(a) a number of non-polarized light radiating beacon means; a light from said beacon being modulated according to a set of predetermined, identifiable patterns
(b) a planar multizoned photodetecting device capable of detecting the light from said beacons and its modulation, and distinguishing at which zones the light from said beacons is detected,
(c) an optical means for focusing the light from the beacons on the photodetecting device throughout the angular displacement of the beacons with respect to the photodetecting device,
(d) a first ancillary computing means connected to the planar photodetecting device for identifying the particular beacons through their pattern of modulation, and determining the absolute position in space of the photodetecting device or the beacons through the process of triangulation through the determination of two or more beacons' angular position by relating the presence or absence of a beacon signal to a given zone of the photodetecting device.

4,786,168
FREQUENCY DOMAIN LASER VELOCIMETER SIGNAL PROCESSOR
James F. Meyers, Newport News; John W. Stoughton, Virginia Beach; James I. Clemmons, Jr., Newport News; Sharad V. Kanetkar, and Andreas E. Savakis, both of Norfolk, all of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.
Filed Nov. 24, 1986, Ser. No. 933,941
Int. Cl.[4] G01P *3/36;* **G01R** *23/02, 23/16*
U.S. Cl. 356—28.5 **27 Claims**



1. A method of processing a succession of random output burst signals from a laser velocimeter to measure an oscillation frequency within each of said random output burst signals comprising the steps of:
converting at a sequence of times with short time intervals each of said random output burst signals from said laser velocimeter to a number L of parallel digital bits forming a pulse train representing the amplitudes of each of said random output burst signals at each of said respective sequences of time;
serially storing a number of bits M from each of said pulse trains of L parallel digital bits;
detecting and sensing from the number of M bits entering said storage when a random output burst signal is contained within storage;
transferring out of storage the said number of M stored bits when a random output signal is detected within storage; and
processing the transferred number of M bits to measure the oscillation frequency within each of said detected random

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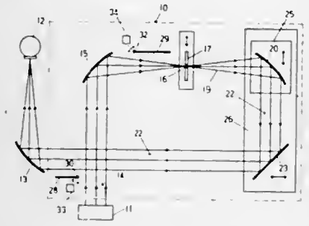
output burst signals prior to processing a next succeeding random output burst signal.

4,786,169

OPTICAL ANALYTICAL INSTRUMENT FOR TESTING THE TRANSMISSION AND REFLECTION OF A SAMPLE

Philip R. Brierley, and Doug Pfrang, both of Madison, Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Aug. 8, 1985, Ser. No. 763,919
Int. Cl.[4] G01N *21/01*
U.S. Cl. 356—244 **31 Claims**



1. In an analytical instrument designed for testing the transmission and reflection of a sample, the instrument being of the type having a source providing a collimated beam of analytical radiation, a support for supporting the sample to be analyzed, a detector for detecting the analytical radiation, and means for focusing analytical radiation on the detector, the improved beam directing system comprising:

primary focusing means, mounted in position to receive the incoming beam from the source, for focusing the beam so received on a sample held in the sample support means,

focusing-collimating means for focusing a collimated beam of analytical radiation which is incident thereon onto a sample supported in the sample support and for receiving analytical radiation reflected from the sample and collimating it into a beam which is directed to the means for focusing analytical radiation onto the detector, and

intercept means for selectively redirecting a portion of the collimated beam of analytical radiation from the source into the focusing-collimating means such that the redirected portion of the beam will be focused on the sample without moving the sample and the radiation reflected from the sample will be collimated by the focusing-collimating means and directed back past the intercept means to the means for focusing analytical radiation on the detector, wherein the intercept means is activated to test the reflection of the sample, and such that substantially the same focusing-collimating means is used in testing both the reflection and transmission of the sample.

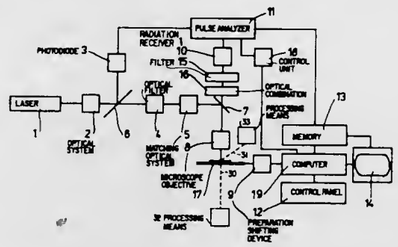
4,786,170

APPARATUS FOR THE GRAPHIC REPRESENTATION AND ANALYSIS OF FLUORESCENCE SIGNALS

Bernhard Groebler, Jena-Lobeda, German Democratic Rep., assignor to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed May 13, 1986, Ser. No. 862,734
Claims priority, application German Democratic Rep., Jul. 26, 1985, 2790077
Int. Cl.[4] G01J *3/443*; G01N *21/64*
U.S. Cl. 356—318 **9 Claims**

1. In an apparatus for the graphic representation and quantitative analysis of fluorescence signals, comprising a source of exciting light for exciting a preparation to fluoresce and photoelectric means for analyzing and recording the resulting fluorescing pulses, wherein the preparation can be shifted relative to the exciting light, the improvement comprising means for presenting at least one time-limited portion of a fluorescing pulse for further processing, means for fixing the timelimited portions by the selection of the times of starting and ending each portion, means for storing a quantity corresponding to the energy of at least one of said fluorescing pulses in elements of



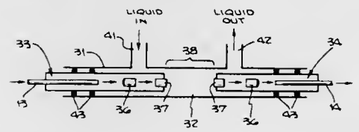
an image memory, wherein the memory elements are allocated in pairs to the irradiated preparation sites, and wherein all the desired sites of the preparation are evaluable by shifting the preparation, and means for pictorially representing the contents of the image memory.

4,786,171

SPECTRAL ANALYSIS APPARATUS AND METHOD

David A. LeFebre, and Roger E. Schirmer, both of Folsom, Calif., assignors to Guided Wave, Inc., El Dorado Hills, Calif.

Filed Jul. 29, 1986, Ser. No. 891,273
Int. Cl.[4] G01J *3/42*; G01N *21/05*
U.S. Cl. 356—326 **7 Claims**



6. In an apparatus for determining the spectral absorbance of a sample:

a light source;

single strand optical waveguide means for directing light from said light source through the sample;

light intensity measuring means;

optical waveguide means for coupling light which has passed through said sample to said light intensity measuring means;

means for varying the length of the path of the light passing through the sample to control the amount of light absorbed by the sample without changing the length of the optical path from said light source to said sample and from said sample to said measuring means;

means for determining the length of the path and the corresponding intensity as measured by said measuring means, whereby the sample absorbance may be calculated;

said means for passing light through the sample and coupling light to said measuring means including a pair of optical waveguides having end portions separated by a gap and aligned for transmitting and receiving light through the sample, and the means for varying the length of the path including means for moving one of the waveguides to adjust the width of the gap; and

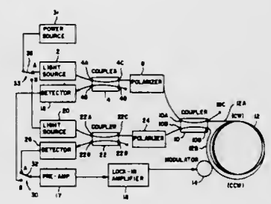
said apparatus including means defining a chamber for the sample, a pair of probes connected to the waveguides and positioned in axial alignment within the chamber on opposite sides thereof, fluid inlet and outlet means for delivering the sample to and from the chamber, and means for moving one of the probes to vary the spacing between the probes.

4,786,172

FIBER-OPTIC ANGULAR RATES SENSOR HAVING ENHANCED RELIABILITY

David A. Zomick, Teaneck, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Feb. 24, 1987, Ser. No. 18,362
Int. Cl.[4] G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **12 Claims**



1. A fiber-optic angular rate sensor, characterized by:

a first light source for providing a first light beam;

a second redundant light source for providing a second light beam;

a rotatable multi-turn fiber-optic coil;

a first light beam transmitting channel coupled to the first light source and to the coil;

a second redundant light beam transmitting channel coupled to the second redundant light source and to the coil;

switching means for selectively actuating one of the first and second light sources, with the corresponding one of the first and second channels being responsive to the light beam from the one light source for transmitting two counterpropagating light beams around the coil so that upon rotation of the coil the counterpropagating light beams are phase shifted with respect to each other, with a resulting phase difference between the beams being proportional to the rotational rate of the coil;

a first detector connected to the first channel and a second redundant detector connected to the second channel, said first and second detectors detecting the counterpropagating light beams transmitted by the corresponding first and second channels and providing electrical signals;

means for measuring the electrical signals commensurate with the phase difference between the counterpropagating light beams; and

switching means for selectively connecting the measuring means to a corresponding one of the first and second detectors so that said measuring means measures the electrical signal provided by the one detector.

4,786,173

METHOD AND APPARATUS FOR PHASE MODULATING A FIBER-OPTIC ROTATION SENSOR

Joseph T. Fournier, Glastonbury, Conn., and Timothy J. Bailey, Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.

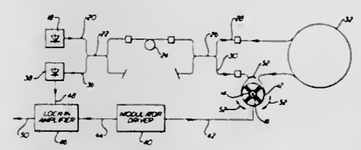
Filed Nov. 21, 1985, Ser. No. 799,780
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—350 **7 Claims**

1. A method employing a SAGNAC interferometer for measuring rate of rotation, comprising the steps of:

providing counter-propagating coherent light beams along a fiber-optic light path at least part of which path consists of a first coil of optical fiber for use as a sensing coil;

providing means for recombining the counter-propagating beams to produce an interferometric output signal the intensity of which varies with rotation rate according the SAGNAC effect;

providing a second separate coil of optical fiber for use as a modulator coil, the second coil being coiled around as a rim on a spoked wheel and being located in the optical path of the counter-propagating beams near one end of the first coil, the second coil rim being free to rotate independently of the first coil about an axis through a rigid hub of the wheel;



oscillating the second coil rim about the hub by bending the spokes in mechanical synchronism in response to a piezoelectrically induced motive force for introducing a time varying phase shift between the counter-propagating beams for causing the intensity of the output signal containing the rotation rate information to be modulated at the frequency of the oscillation;

detecting the interferometric output signal and providing an electrical output signal indicative thereof; and

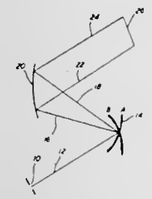
demodulating the electrical output signal to recover a signal from which the rotation rate may be inferred.

4,786,174

POLYCHROMATOR

Wolfgang Witte, deceased, late of Überlingen, Fed. Rep. of Germany (by Inge Witte, heiress), assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,559
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1985, 3544512
Int. Cl.[4] G01J *3/18*
U.S. Cl. 356—328 **21 Claims**



1. A polychromator comprising,

an inlet slit for introducing a beam of light from a light source,

a concave grating for spectrally dispersing light from said inlet slit into a wavelength spectrum,

a locally resolving detector means for simultaneously detecting radiation at different points in a plane, said detector means defining a detection plane, and

imaging mirror means for deflecting spectrally dispersed light from said grating to image a wavelength spectrum of slit images on said detector means,

said grating and said mirror means being disposed to define a predetermined path of rays between said inlet slit and said detector means for imaging a wavelength spectrum of slit images on said detector means with said grating being

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disposed along said path between said inlet slit and said mirror means and said mirror means being disposed along said path between said grating and said detector means, and

said grating and said mirror means being configured and relatively positioned so that the image plane of the slit images formed by said mirror means is substantially adapted to said detection plane at the wavelengths of said spectrum and the slit images are substantially linearly disposed along said detection plane relative to wavelength.

4,786,175

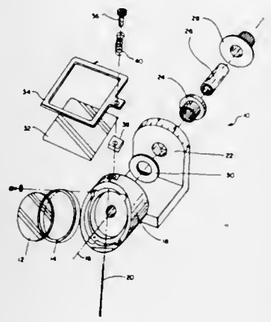
ROTATABLE SHEAR PLATE INTERFEROMETER

Richard C. Duffus, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 26, 1986, Ser. No. 911,605

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—353 **7 Claims**



1. A rotatable shear plate interferometer comprising a tubular member which defines a central axis and is rotatably supported by a bracket means around said central axis, a transparent shear plate obliquely mounted in said tubular member at a fixed angle with respect to said axis, and a viewing screen rotatably attached to said tubular member so as to be able to assume a viewing position such that an interference pattern of a light beam made incident on said shear plate along said central axis can be observed on said viewing screen placed in said viewing position at any angular position of said tubular member around said central axis, whereby defocus, astigmatism and coma in said incident light beam can be measured in any direction.

4,786,176

METROLOGICAL APPARATUS AND METHOD USING POLARIZATION MODULATION

Keith D. Froome, Hampton, Great Britain, assignor to Rank Taylor Hobson Limited, Great Britain

Filed Jan. 6, 1987, Ser. No. 895

Claims priority, application United Kingdom, Jan. 6, 1986, 8600202; Feb. 22, 1986, 8604427

Int. Cl.[4] G01B *11/14*; G01C *3/00*

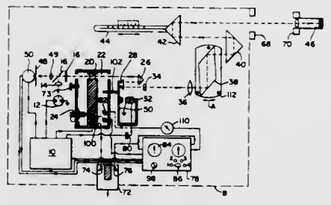
U.S. Cl. 356—373 **21 Claims**

1. Metrological apparatus comprising:

means for projecting a beam of polarised radiation having components in first and second orthogonal directions such that the beam can be returned back along substantially the same path;

means for modulating a phase difference between said components in the projected portion of the beam and in the returned portion of the beam;

means for detecting the returned portion of the beam after modulation; and



phase shift means for introducing an adjustable unmodulated relative phase shift between the components of the beam.

4,786,177

METHOD AND APPARATUS FOR MEASURING THE WEFT OR MESH SERIAL POSITION IN TEXTILES

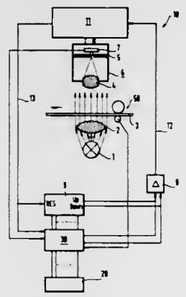
Hellmut Beckstein, Bad Abbach, and Siegfried Wild, Regensburg, both of Fed. Rep. of Germany, assignors to Mahlo GmbH & Co. KG, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,059

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633439

Int. Cl.[4] G01N *21/84*

U.S. Cl. 356—429 **15 Claims**



1. A method for measuring a weft or mesh serial position in textiles, in which an angular position of the weft/mesh series is measured for determining an angle of distortion passing over a partial amount of the length thereof, comprising the steps of:

(a) measuring a substantially linear range of values of said textiles with regard to light transmission or reflective properties thereof;

(b) reciprocally and oscillatingly rotating said linear range about a central angle in discrete units;

(c) carrying out one of:

(i) the rotation movement of said linear range in discrete units, and

(ii) the measurement of the reflection or transmission values in several discrete angular units; and

(d) comparing the measurements obtained for each one of the angle units to determine the distortion angle.

4,786,178

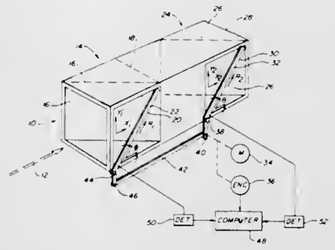
APPARATUS AND METHOD FOR DETECTING THE POSITION AND ORIENTATION OF A REFERENCE BEAM OF LIGHT

Ted L. Teach, Dayton, Ohio, assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Dec. 15, 1986, Ser. No. 941,848

Int. Cl.[4] G01B *11/00*

U.S. Cl. 356—400 **16 Claims**



1. Apparatus mountable on a machine, such as a tunnel boring machine, for detecting the position and orientation of the machine with respect to a reference beam of light, comprising:

first means for detecting the intersection of said beam with a first reference plane,

second means for detecting the intersection of said beam with a second reference plane, said second reference plane being spaced from and substantially parallel to said first reference plane, and

means, responsive to said first and second detector means, for determining the orientation of said beam with respect to said first and second reference planes.

4,786,179

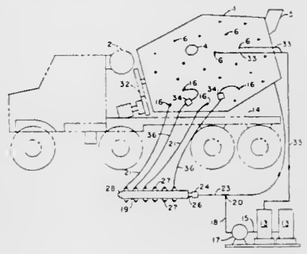
EMERGENCY PROTECTION APPARATUS AND METHOD FOR CONCRETE MIXER TRUCKS DISABLED IN THE FIELD

Myron Kaminski, 1700 Noble St., Pittsburgh, Pa. 15215

Filed Aug. 14, 1986, Ser. No. 896,412

Int. Cl.[4] B28C *5/18, 7/12*; B01F *1/00*; C08L *91/06*

U.S. Cl. 366—2 **20 Claims**



1. Apparatus including a concrete mixer having means for inhibiting the hardening therein of a charge of concrete mix comprising:

(a) a rotatable concrete mixer drum;

(b) plugs spaced apart and located throughout the entire length and circumference of said drum;

(c) a channel bored in each plug, said channel providing a conduit to the interior of said drum;

(d) at least one hydraulic hose capable of transferring a fluid under pressure;

(e) connecting means on said plugs for attaching said hydraulic hose to communicate hydraulically with said channel; and

(f) a pump for transporting said fluid under pressure through said hydraulic hose at a pressure sufficient for injecting said fluid through said channel and into a bottom location of said drum when filled with a charge of concrete mix and further sufficient for hydraulically inhibiting the hardening of the charge of concrete mix.

4,786,180

BACK-PRESSURE BEARING ARRANGEMENT FOR TWIN-SCREW EXTRUSION DEVICES

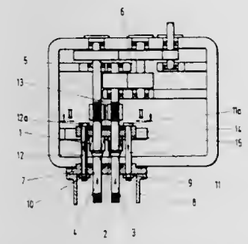
Siegfried Chszaniecki, Hanover, and Manfred Dienst, Burgdorf, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed May 22, 1987, Ser. No. 53,124

Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617379

Int. Cl.[4] B29B *7/18*

U.S. Cl. 366—83 **4 Claims**



1. A back pressure bearing arrangement for a twin-screw extrusion apparatus comprising:

(a) an extrusion housing having an end wall including an inner surface facing an extrusion chamber,

(b) a pair of screw shafts rotatably mounted in said extrusion housing,

(c) gear housing means including a gear arrangement for rotatably driving said screw shafts,

(d) bearing plate means mounted between said extrusion housing and said gear housing means and formed with openings through which said screw shafts extend for driving connection with said gear arrangement, said bearing plate means including a first surface facing said gear arrangement and an opposed, second surface facing said extrusion housing,

(e) adjustment bolts interposed between said bearing plate means and said end wall, each said adjustment bolt having a first end portion separate from, but adapted to engage said first surface of said bearing plate means, and a second end secured to means separate from but engageable with said inner surface of said end wall of said extrusion housing, said adjustment bolts being connected only between said bearing plate means and said end wall, and

(f) back-pressure bearings positioned around both of said shafts and adapted to engage said second surface of said bearing plate means, said shafts being formed so as to contact said bearings when back-pressure forces are exerted on said shafts in the direction of said gear arrangement during operation of said apparatus,

whereby said back-pressure forces exerted on said shafts are transmitted sequentially to said bearing plate means, said adjustment bolts and said end wall of said extrusion housing, thereby preventing such forces from acting on said gear arrangement.

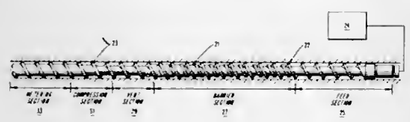
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4,786,181

EXTRUDER SCREW AND METHOD FOR EXTRUDING LIQUID CRYSTALLINE POLYMERS

Keith T. O'Brien, Edison, N.J., assignor to Hoechst Celanese Corporation, Chatham, N.J.

Division of Ser. No. 847,387, Apr. 2, 1986, Pat. No. 4,729,662.
This application Nov. 16, 1987, Ser. No. 121,285
Int. Cl.[4] B28C *1/16, 3/00;* **B29B** *1/04*
U.S. Cl. 366—89 **15 Claims**



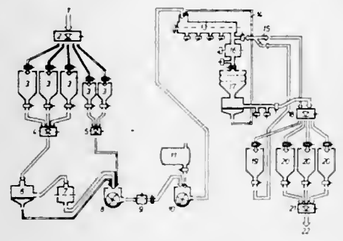
1. An extruder screw for a low melt viscosity polymer which forms an anisotropic melt phase, comprising:
a feed section;
a barrier section having a barrier flight defining a channel, said barrier section extending along a substantial portion of the length of said screw and including means for subjecting at least portions of the polymer to a gradually decreasing channel depth to thereby aid in melting the polymer during passage along the screw;
a vent section for venting the melted polymer;
a compression section including a channel having a gradually decreasing depth for gradually compressing the polymer over a comparatively low ratio, the channel being formed to precise tolerance, an initial channel depth being relatively deep and the ratio of compression within the compression section being relatively small; and
means for rotating said extruder screw at a high rate of speed to generate high pressures in the polymer within the compression section of the screw.

4,786,182

METHOD AND MEANS FOR CONTROLLING A FODDER MIXING PLANT

Ebbe B. Larsen, Slagkrogen 15, Odense SØ, Denmark (5220)

Filed Nov. 24, 1986, Ser. No. 934,021
Claims priority, application Denmark, Apr. 29, 1986, 1967/86
Int. Cl.[4] B01F *15/04;* **A23L** *1/00;* **G06F** *15/46*
U.S. Cl. 366—140 **10 Claims**



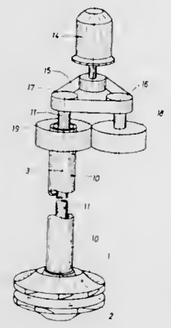
1. A method for controlling a fodder mixing plant which produces fodder pellets according to a recipe, comprising the steps of:
(a) delivering a plurality of separate raw materials to a mixing device at a production rate, at least some of said materials having nutrient content;
(b) measuring the quantity and physical quality (including nutrient content) of each raw material as it is delivered to the mixing device;
(c) mixing together the plurality of raw materials in the mixing device and drawing off the mixed raw materials at the production rate;
(d) sampling and measuring the quantity and composition of the mixed raw material as it is drawn off;
(e) controlling the quantity of each raw material delivered to the mixing device in accordance with the recipe, the measured quantities and qualities of raw material, and the quantity and composition of the mixed raw material;
(f) conditioning the mixed raw material by mixing in additives, wherein the additives are selected from the group of binders, water or steam, and drawing off the conditioned materials at the production rate;
(g) pelletizing the conditioned material to form pellets;
(h) sampling and measuring the physical quality of the pellets, including the nutrient content and water content;
(i) controlling the inclusion of additives and the production rate based on the measurement of physical quality in order to keep the fusion, nutrient content and water content in a range set by the recipe.

4,786,183

MIXING APPARATUS

Angelo Cadeo, Rothrist, Switzerland, assignor to Miteco AG, Zofingen, Switzerland

Filed Mar. 25, 1986, Ser. No. 843,780
Claims priority, application Switzerland, Apr. 3, 1985, 1453/85
Int. Cl.[4] B01F *5/12*
U.S. Cl. 366—265 **2 Claims**



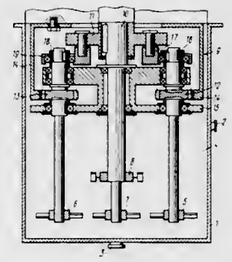
1. A mixing apparatus for intermixing at least one flowing medium and in which at least two component currents (4,5) of the flowing medium are led against each other so as to generate a turbulent current (9), said mixing apparatus comprising at least two centrifugal pump impellers arranged in parallel and coaxial relationship, any two directly adjacent pump impellers (1,2) arranged for counter-rotation relative to each other, and each pump impeller allocated to one of said component currents so that a first laminar component current exits the first pump impeller in the form of a rotating disk shaped body (6) of the medium and a second laminar component current exits the second pump impeller in the shape of a rotating disk shaped body (7) of the medium with the two disk shaped bodies of the medium contacting each other outside said first and second impellers at a point of transition (8) to change the two laminar currents to a turbulent current in a region (9) outside the two impellers, said pump impellers comprising forwardly bent rotor blades.

4,786,184

APPARATUS FOR MIXING HETEROGENEOUS SUBSTANCES

Nina G. Berezkina, Tulskaya; Jury V. Martynov, Moscow; Boris I. Lurie, Tulskaya; Nikolai N. Torubarov, Moscow; Jury N. Chupin, Moscow; Vladimir P. Shevchenko, Moscow; Jury. S. Ryazantsev, Moscow; Vladimir A. Ivanov, Moscow; Igor N. Karasev, Moscow; Nikolai S. Tsaplin, Moscow; Zhan A. Golovanov, Balashikha Moskovskoi, and Alexei N. Rudakova, deceased, late of Moscow, all of U.S.S.R. (by Elena A. Rudakova, administrator), assignors to Institut Problem Mekhainiki, Moscow, U.S.S.R.

Filed Feb. 4, 1987, Ser. No. 10,743
Int. Cl.[4] B01F *9/22*
U.S. Cl. 366—288 **8 Claims**



1. An apparatus for mixing heterogeneous substances comprising:
a casing;
phase inlet and outlet unions mounted on said casing;
a container accommodated in said casing;
at least two shafts carrying agitators, located in said container;
a drive installed on said casing and comprising a driving shaft arranged along the longitudinal axis of said casing, a first carrier rigidly connected with said driving shaft, coaxially thereto; at least one second carrier; a central gear wheel; at least two satellites installed with a specified clearance parallel to the driving shaft and meshing with the central gear wheel; at least one crank located on each of said satellites; pitmans connected movably with said cranks, the connection between each of said satellites and one of said carriers being ensured by the crank movably linked with the pitman; said shafts with agitators are connected with said drive.

4,786,185

APPARATUS AND METHOD FOR AFFECTING THE FLOW PATHS OF FLUID FLOWING IN A PIPE

Chester L. Knief, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 29, 1988, Ser. No. 161,829
Int. Cl.[4] B01F *5/06*
U.S. Cl. 366—340 **20 Claims**

1. An apparatus comprising:
a pipe member which includes a first tubular portion and a second tubular portion, each of said portions having respective interior surfaces which together comprise the interior surface of said pipe member, wherein said first portion has a longitudinal axis and a wall with an opening therethrough, and wherein said second portion has a longitudinal axis, an open end, and a closed end axially opposite said open end with respect to said second portion longitudinal axis, said second portion being connected to said first portion wall at said open end so as to outwardly extend from said wall to said closed end and so that said open end is in communication with the interior of said first portion through said opening;
means for introducing a fluid into said first portion so as to establish a flow of fluid in a direction generally parallel to said first portion longitudinal axis and generally toward said second portion longitudinal axis;
a plate having opposing surfaces, a first end, a second end, and a plurality of apertures which open through said surfaces so that some of said apertures are positioned within said first portion whereas the remainder of said apertures are positioned within said second portion, said

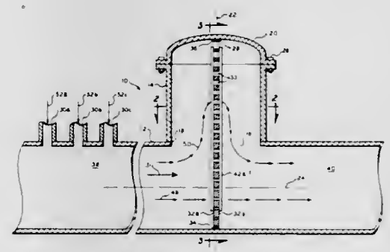


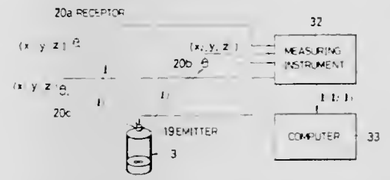
plate being positioned within said pipe member so as to extend from said first end, which is adjacent to the interior surface of said first portion at a location axially opposite (with respect to said second portion longitudinal axis) said closed end, to said second end which is adjacent to the interior surface of said second portion at said closed end, and wherein said plate extends across said pipe member so as to cross said first portion longitudinal axis, and further wherein one of said plate surfaces faces generally in the same direction as said flow direction and said other plate surface faces generally in a direction opposite to said flow direction.

4,786,186

STIRRER FOR USE IN LIQUID STORAGE TANKS, AND A METHOD FOR DETERMINING ITS POSITION IN THE TANK

Katsuji Okumura; Hiroshi Maeda, and Isao Taoka, all of Tokyo, Japan

Division of Ser. No. 861,012, May 8, 1986. This application Jun. 3, 1987, Ser. No. 57,454
Claims priority, application Japan, May 14, 1985, 60-102118; May 14, 1985, 60-102119
Int. Cl.[4] B01F *7/06*
U.S. Cl. 366—348 **11 Claims**



1. A method for determining the position of a motor-driven stirrer which is movable through a liquid in a tank while stirring such liquid, comprising the steps of placing an ultrasonic wave emitter on said stirrer, arranging a plurality of receptors at different locations in said tank, operating motors on the stirrer to move said stirrer within said tank, stopping said motors such that said stirrer rests on the bottom of said tank in a first

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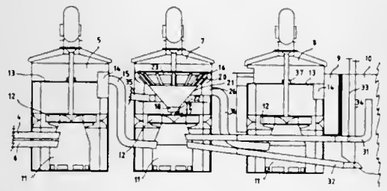
position, emitting ultrasonic pulses from said emitter to said receptor while said stirrer rests on the bottom of said tank in said first position, measuring the time required for said pulses to reach each of said receptors, the time required for said pulses to reach each receptor being related to the distance between said emitter and each of said receptors, disposing a computer outside of said tank, and calculating said first position of said stirrer in said tank based on said measured times by feeding the latter to said computer which computes the position of said stirrer in said tank.

4,786,187

METHOD FOR DISPERSING TWO PHASES IN EXTRACTION AND APPARATUS FOR REALIZING THE METHOD

Bror G. Nyman, Ulvila; Stig-Erik Hultholm, Pori; Launo L. Lilja, Pori, and Valto J. Mäkitalo, Pori all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Nov. 13, 1986, Ser. No. 930,728
Claims priority, application Finland, Nov. 28, 1985, 854726
Int. Cl.[4] B01F *3/08*
U.S. Cl. 366—265 **15 Claims**



1. An apparatus for dispersing two phases in one step of an extraction process and for controlling the desired type of dispersion, comprising a presettler and a settler and a circulation cylinder installed in the bottom part of a mixing chamber and a turbine placed above the circulation cylinder, and including at least two mixers for carrying out an extraction step, at least one of the mixers being provided with a dispersion pump and with return conduits for the phases from a settler of said extraction step, said conduits being connected to said circulation cylinder; and wherein in order to control the type of dispersion and in order to create a double-loop circulation, to a top of the circulation cylinder there are connected both a heavy phase return conduit and a light phase conduit coming from the settler of the same extraction step, that above a pump of the turbine there is installed a dispersion pump coaxially with the turbine, a suction inlet of a suction cylinder of the said dispersion pump being located above the middle of the turbine, that in the suction cylinder which is closed at the top, there are seated at least two rising pipes which form an upwards widening cone, that around the rising pipes there are fitted cone plates which at the bottom extend to below a liquid surface in said mixing chamber and at the top at least to the same level with said liquid surface, that the rising pipes end up to a connecting circular pipe wherefrom the dispersion flow is directed into a next stage through a collecting trough placed above the liquid surface.

4,786,188

PURGE AIR SYSTEM FOR A COMBUSTION INSTRUMENT

Douglas C. Myhre, Eden Prairie; David Y. H. Pui, Plymouth, and Larry V. Miller, Burnsville, all of Minn., assignors to Rosemont Inc., Eden Prairie, Minn.

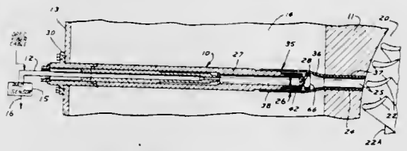
Filed Feb. 27, 1986, Ser. No. 833,976
Int. Cl.[4] G01J *5/02, 5/10*
U.S. Cl. 374—125 **16 Claims**

1. An instrument for sensing radiation representative of a parameter in a contaminating suspension and for providing an output indicative of the parameter, the instrument having a housing receiving a supply of pressurized fluid having particles therein, comprising:

port means formed in the housing and opening to the parameter source for receiving the radiation;

sensing means supported relative to the housing for sensing the received radiation through the port means and for providing the output;

lens means supported relative to the housing between the port means and the sensing means for transmitting the radiation therethrough and for shielding the sensing means from the contaminating suspension, the lens means having a lens surface on an opposite side of the lens means



from the sensing means which is exposed to the suspension; and

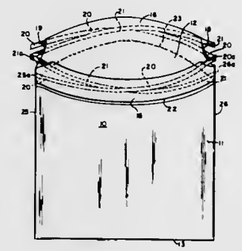
purge means disposed in the housing for maintaining the radiation transmission of the lens means comprising means for establishing a flow path for the pressurized fluid relative to the housing, the means for establishing including means for inertially separating a substantial portion of the particles capable of affecting the radiation transmission from a first portion of the pressurized fluid and for directing such first portion of the pressurized fluid onto the lens surface such that particles from the contaminated suspension are removed from the lens surface by the first portion of the pressurized fluid.

4,786,189

DRAW TAPE BAG WITH TWO SINGLE WRAP AROUND DRAW TAPES AND METHOD OF MANUFACTURE

Kevin Broderick, Victor; Vernon C. Catchman, Palmyra; Fox J. Herrington, Holcomb; Shirley K. Johnston, Sodus Point, all of N.Y.; Robert H. Olson, Beaufort, S.C., and Donald Stell, Palmyra, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 2, 1987, Ser. No. 115,308
Int. Cl.[4] B65D *33/28*
U.S. Cl. 383—75 **5 Claims**



1. A draw tape bag which comprises:

a front wall and a back wall of flexible sheet material joined to each other along the edges of the bag;

tubular channels extending along opposed transverse top edges of said front wall and said back wall, respectively, said channels defining an open mouth for the bag, each of said channels having openings at the opposite ends of said top edges of the bag and;

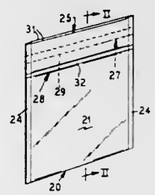
a pair of tapes, each of said tapes extending through both of said channels, one end of each of said tapes being attached to opposite side edges of the bag beneath the opening in one of said channels and the other end of each of said tapes extending through the opening at the corresponding end of the other of said channels so that the tapes cross each other in both channels whereby when the tapes are pulled, the mouth of the bag is drawn tightly together.

4,786,190

RECLOSABLE PACKAGE HAVING OUTER RECLOSABLE CLOSURE AND INNER NON-RECLOSABLE CLOSURE

Donald L. Van Erden, Wildwood, and Hugo Boeckmann, Arlington Heights, both of Ill., assignors to Minigrip, Inc., Orangeburg, N.Y.

Continuation of Ser. No. 895,312, Aug. 11, 1986, abandoned.
This application Mar. 10, 1988, Ser. No. 169,138
Int. Cl.[4] B65D *33/18, 33/20*
U.S. Cl. 383—61 **5 Claims**



1. A bag having opposed wall panels secured together and defining a receptacle space therebetween, and comprising:

a bag mouth defined between upper end portions of said wall panels which extend between opposite sides of the bag;

a one-time openable non-reclosable peel seal closure extending in a narrow band from side-to-side of the bag and securing said panels together substantially below the upper ends of said upper end portions and initially maintaining said mouth fixedly closed;

a reclosable closure means located below said upper ends of said upper end portions, but above said peel seal and functioning for initially maintaining said upper end portions against access to said non-reclosable peel seal closure, and being adapted to be manually pulled open and reclosed for selectively opening and closing said mouth after said non-reclosable peel seal closure has been opened;

said reclosable closure means being openable responsive to digital pullapart force applied to said upper end portions of the wall panels for gaining access to said non-reclosable peel seal closure; and

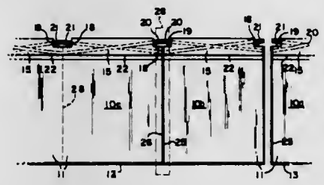
said non-reclosable peel seal closure being openable by continuing pullapart force applied to said upper end portions after said reclosable closure means has been pulled open for gaining complete access into said receptacle space, and said reclosable closure means being thereafter reclosably closable as the sole closure for the bag mouth.

4,786,191

DRAW TAPE BAG WITH TWO SINGLE DRAW TAPES AND METHOD OF MANUFACTURE

Kevin Broderick, Victor; Vernon C. Catchman, Palmyra; Fox J. Herrington, Holcomb; Shirley K. Johnston, Sodus Point, all of N.Y.; Robert H. Olson, Beaufort, S.C., and Donald Stell, Palmyra, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 24, 1987, Ser. No. 100,649
Int. Cl.[4] B65D *33/28*
U.S. Cl. 383—75 **3 Claims**



1. A dual draw tape bag which comprises:

a front wall and a back wall of flexible sheet material joined to each other along the edges of the bag;

tubular channels extending along opposed transverse top edges of said front wall and said back wall, respectively, said channels defining an open mouth for the bag, each of said channels having openings at the opposite ends of said top edges of the bag; and

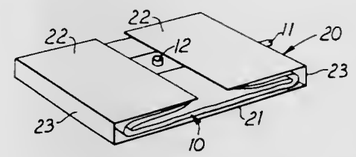
a tape extending through each of said channels, one end of each tape being attached to the opposite side edges of the bag beneath the openings in said channels and the other end of each tape extending through the respective opening at the other end of said chanenls so that the tapes cross in their respective channels whereby when the tapes are pulled, the top of the bag is drawn tightly together.

4,786,192

DEVICE FACILITATING FILLING AND UNFOLDING OF BAG WITHIN OUTER CASING

Stewart M. Graves, Priddbwbll Bonc; Peter J. M. Stuart, Wollaston; Adrian P. Peet, Bredbury, and Peter M. Maple, Worsley, all of United Kingdom, assignors to Sonoco Limited, Stockport, England

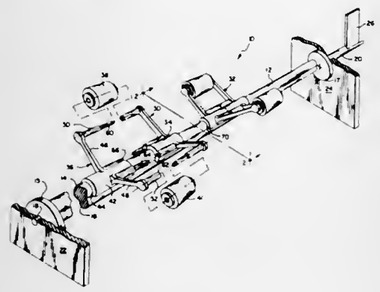
Filed Feb. 26, 1988, Ser. No. 161,134
Int. Cl.[4] B65D *33/02*
U.S. Cl. 383—119 **5 Claims**



1. A device comprising a cartridge in the form of a sheet of material having opposing side regions and provided with flaps extending from said opposing side regions thereof, said flaps being swingable outwardly from a folded position overlying said sheet, and a bag having means defining an inlet port, said bag being folded, positioned upon said sheet and attached at certain locations to said flaps and being designed to unfold and expand and thereby push back said flaps upon reception of fluid through said inlet port.

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4,786,193
PRESSURE ROLLER ASSEMBLY
Richard E. Quinn, Jr., Pepperell, Mass., assignor to Wang Laboratories, Lowell, Mass.
Filed May 24, 1984, Ser. No. 613,677
Int. Cl.[4] B41J *13/048, 13/076*
U.S. Cl. 400—636.3 **4 Claims**



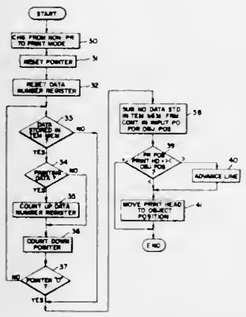
1. In a mechanism for feeding web such as paper in a typing machine, a truck assembly unit comprising two identical roller support members and two identical rollers,

said roller support members including base means for supporting said truck assembly unit on a bar structure spanning a typing machine, and spring arms supporting said rollers on the base means and, when installed in a typing machine, pressing both the rollers against a platen of a typing machine,

the two roller support members including journal means for capturing said rollers between the support members and supporting the rollers so captured,

the roller support members including self complimentary snap locking means for permanently locking two of them together with rollers captured therebetween to provide a permanently assembled unit for installation as a whole in a typing machine.

4,786,194
TYPEWRITER WITH TEXT MEMORY
Hideo Ueno, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Apr. 10, 1984, Ser. No. 598,831
Claims priority, application Japan, Apr. 11, 1983, 58-64193
Int. Cl.[4] B41J *21/16, 3/46*
U.S. Cl. 400—279 **2 Claims**



1. An electronic typewriter having a text memory and being capable of storing input data from a keyboard sequentially in said text memory, said typewriter comprising

a printer have a print head movable along a printing line of a recording paper;

means for feeding sheet of said recording paper;

a display unit having digits of a number smaller than number of characters to be printed in one printing line;

a temporary memory for sequentially storing input data entered from said keyboard;

change over means for selectively changing over operational mode between a non-print mode wherein contents of said temporary memory are indicated on said display unit while said printer remains inactive, and a print mode wherein contents of said temporary memory are indicated on said display unit and are concurrently printed out by said printer;

a printing head position register for storing present position of said print head along a printing line;

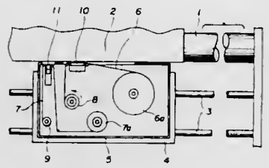
a data number register for storing number of data stored in said temporary memory;

an input position register for storing present input position of present input character in a printing line;

calculating means for calculating a position to which said print head is to be moved in response to said operational mode being changed over by said change over means from said non-print mode to said print mode; and

control means responsive to said print head register, said change over means, said sheet feed means and said calculating means for controlling movement of said print head to said position calculated by said calculating means in response to the present position of said print head stored in said printing head position register being nearer to left margin than said position calculated by said calculating means, and for controlling movement of said print head to said position calculated by said calculating means after sheet feed operation by said sheet feed means in response to said present position of print head stored in said printing head position register being nearer to right margin than said position calculated by said calculating means.

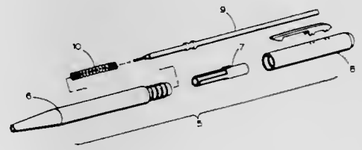
4,786,195
ERASING MEANS FOR THERMAL TRANSFER PRINTER
Ikuo Hibino, Takizawa; Tadashi Nakamura, Morioka, and Koichi Umeki, Tamayama, all of Japan, assignors to Alps Electric Co., Ltd., Japan
Filed May 2, 1986, Ser. No. 858,943
Claims priority, application Japan, May 2, 1985, 60-93576
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] B41J *29/373*
U.S. Cl. 400—696 **3 Claims**



1. In a thermal transfer printer of the type which includes a printing transfer ribbon carrying a layer of thermally fusible ink thereon, a movable carriage, and a printing thermal head mounted on said carriage and operable to generate heat to melt the thermally fusible ink on said printing transfer ribbon to effect transfer recording on record paper, the improvement which comprises an erasing ribbon carrying thereon a layer of a thermally adhesive resin material for lifting off the thermally fusible ink of a symbol printed in error on the record paper, and an erasing thermal head mounted on said carriage and having a heat generating area greater than that of said printing thermal head, said erasing thermal head and said printing thermal head being disposed in a juxtaposed relationship in a direction of movement of said carriage, whereby, during normal recording, said printing thermal head is operated to generate heat to melt the thermally fusible ink on said printing transfer ribbon to effect desired printing by transfer of the ink, but during erasing of a symbol printed in error with the thermally fusible ink, said erasing thermal head is operated to generate heat to melt the thermally adhesive resin on said erasing ribbon sufficient to adhere to the thermally fusible ink of the symbol printed in error to lift off the ink from the record paper.

4,786,196
PENCIL WITH A TAPERED FOLLOWER
Valerie A. Buckle, Wokingham, England, assignor to The Gillette Company, Boston, Mass.
Filed May 22, 1984, Ser. No. 612,930
Int. Cl.[4] B43K *21/06*
U.S. Cl. 401—82 **10 Claims**







1. A pencil comprising an elongate body having an axial bore within which is located a length of writing lead and a lead follower, the lead having a trailing end supported by the follower which is moveable longitudinally of the body to adjust the length of lead projecting at the forward end of the body, and wherein the follower includes a socket having an inner portion in which the trailing end of the lead is engaged with a friction fit, a mouth surrounding the lead with a substantial radial spacing therebetween, and a portion tapering inwardly to the inner portion and having a smooth transition therewith to thereby provide a smooth transition zone where the lead becomes free of lateral support to cushion the lead against shear stresses when the lead is subjected to sudden shock to reduce chances of lead fracturing.

4,786,197
TWIST ACTUATED WRITING INSTRUMENT
Harold E. Koeln, and Michael Lembeck, both of St. Louis County, Mo., assignors to Ritepoint, Fenton, Mo.
Filed Jun. 15, 1987, Ser. No. 61,470
Int. Cl.[4] B43K *24/06*
U.S. Cl. 401—116 **18 Claims**

1. A twist actuated writing instrument comprised of a barrel, a cap, and an actuator and means for maintaining the linear relationship between said barrel and said cap, wherein said barrel, said cap, and said actuator axially encase a writing element and a spring means; said barrel having a first end and a second end, said first end having means for engaging and retaining said cap, and a plurality of circumferentially spaced splines which slidably engage with corresponding circumferentially spaced splines on said actuator, and said second end having an opening through which said writing element may be caused to protrude, said second end further having an internal abutment which interacts with said spring means; said cap having a first end and a second end, said first end being constructed to mate with the first end of said barrel and incorporating engaging and retaining means which engage complementary means on said first end of said barrel, whereby said cap is permitted to rotate with respect to said barrel but is restrained from moving laterally with respect to said barrel, and two-directional cam means, said two-directional cam means being further provided with detent means to ensure positive resistance to rotation of the cap when said writing element is in the extended, writing position; said actuator also having a cam follower which mates with said two-directional cam of said cap whereby said follower can travel on the cam in both a clockwise and counterclockwise direction, and said actuator further having an actuating surface which abuts the non-writing end of said writing element; said twist actuated writing instrument axially enclosing said writing element and said spring means wherein said writing element is maintained in positive relationship between said second end of said barrel and said actuating surface of said actuator and wherein either clockwise or counterclockwise rotation of said cap with respect to said barrel will produce lateral movement of said actuator, which in turn will cause the writing end of said writing element to protrude from said second end of said barrel and opposite rotation will cause the writing end of said writing element to retract with respect to said second end of said barrel.

4,786,198
INK COMPOSITIONS AND WRITING INSTRUMENTS INCLUDING THE COMPOSITIONS
Thomas P. Zgambo, Weymouth, Mass., assignor to The Gillette Company, Boston, Mass.
Continuation-in-part of Ser. No. 812,681, Dec. 23, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 106,201
Int. Cl.[4] B43K *7/08;* **C09D** *11/00*
U.S. Cl. 401—142 **39 Claims**

1. A water-fast, shock resistant shear-thinning ink composition consisting essentially of:

a. from about 50 to about 99 percent by weight of a polar solvent system including at least about 50 percent by weight water,

b. an effective amount of colorant material which is water insoluble when the composition is dry,

c. an amount of a water dispersible, polymeric shear-thinning material sufficient to provide an ink having a shear-

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thinning index between about 0.01 to about 0.6, a viscosity of 50 cPs or greater at a shear rate of 30 sec^{-1} and a viscosity of 100 cPs or less at shear rates produced by writing, and

d. a water soluble polymeric binder material which is effective to improve the shock resistance of the composition and is water insoluble when the composition is dry in an amount ineffective to substantially affect the shear-thinning capability of the polymeric shear-thinning material, said composition providing a colored, water insoluble coalesced residue on drying.

16. A water-fast, shock resistant, shear-thinning ink composition having a shear-thinning index between about 0.01 to about 0.60, a viscosity of 50 cPs or greater at a shear rate of 30 sec^{-1} and a viscosity of 100 cPs or less at shear rates produced by writing and consisting essentially of:

a. from about 50 to about 99 percent by weight of a polar solvent system including at least about 50 percent by weight water,

b. an effective amount of a colorant material which is water insoluble when the composition is dry,

c. from about 0.1 to about 5 percent by weight of a polymeric, shear-thinning material selected from the group consisting of xanthan gum, carageenan gum, locust bean gum, hydroxyethylcellulose, guar gum or mixtures of these, and

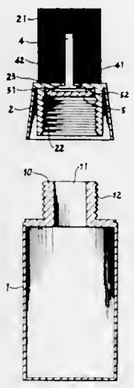
d. from about 1 to about 20 percent by weight of a binder material which is water soluble when maintained at a given pH range and water insoluble when not maintained at that pH range and which is effective to improve the shock resistance of the composition, said composition providing a colored, water insoluble coalesced residue on drying.

4,786,199

SHAVING BRUSH

Teng-Mo Chen, 12-1 Lane 105, Hang-Chow S. Rd. Sec. 1, Taipei, Taiwan

Continuation-in-part of Ser. No. 568,257, Jan. 4, 1984, abandoned. This application Jun. 4, 1985, Ser. No. 741,225
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] A46B *11/00*
U.S. Cl. 401—288 **2 Claims**



1. An improved instant shaving lather forming brush comprising:

a container having an opening with a lip rim on its one upper end and also having threads on its outer periphery, in which a liquid soap or other applicable emulsion is filled and stored;

a brush body having brush hair, inside which brush body threads are provided to mutually engage the threads on the upper end of the container, said brush body also having a central hole provided in its center;

a central flexible guide tube, provided for passage through the central hole, at the lower end of which a ring-shaped protruding loop is provided, and at least one protruding means being provided at left side and right sides of the tube at a place slightly higher than the protruding loop at the lower end of the tube;

a pad plate provided inside the brush body above the opening of the container, the bottom of said pad plate being a plane, the top of said pad plate having ring-shaped non-continuous protruding parts, and the periphery of said pad plate having a plurality of lateral protruding parts provided to serve as a means for controlling opening and closing of the flow of the liquid soap in the container through the tube to the brush hair; and

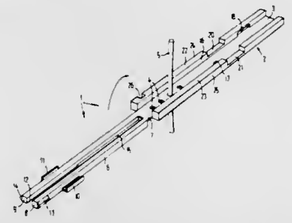
a cover adapted to be secured on the outer periphery of the container.

4,786,200

BINDER STRIP FOR BINDING LOOSE PERFORATED LEAVES

Cornelis P. Nooteboom, Hoogezand, Netherlands, assignor to Atlanta Hoogezand B.V., Hoogezand, Netherlands

Filed Apr. 23, 1987, Ser. No. 41,545
Claims priority, application European Pat. Off., May 22, 1986, 86200898
Int. Cl.[4] B42F *13/06, 13/14, 9/00*
U.S. Cl. 402—16 **2 Claims**



1. A binder strip for use in binding loose leaves, having perforations therein through which flexible wires can be inserted, comprising

a substantially U-shaped rail having a bottom surface with spaced apart holes therethrough to permit flexible wires to be inserted therethrough and a leg extending from each side of the bottom surface, a recess in each leg at an edge thereof remote from the bottom surface and a recess in each leg in an inside wall thereof;

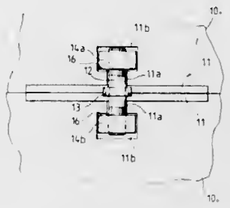
a clamping member formed integrally with and comprising a continuation of the bottom surface and with a section of the clamping member adjacent to the rail being formed to be a flexible bridge section whereby the clamping member will bend to overlie the rail, and said clamping member has a wire receiving groove extending longitudinally therein along a central longitudinal axis of the clamping member for a portion of the length of the clamping member, a pair of spaced apart legs extending from about the wire receiving groove to the end of the clamping member, a thrust face intermediate the length of each leg to provide means for moving said legs together and each positioned to fit into the recess in a leg of a rail that is remote from the bottom surface, and a lug adjacent the end of each leg, each lug to fit into one of said recesses formed in the inside walls of the legs of the rail.

4,786,201

MOUNTING SYSTEM FOR SECURING MODULES TO ONE ANOTHER

Horst Huetter, Tegernsee, and Helga Kreupl, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,432
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641290
Int. Cl.[4] B25G *3/00*
U.S. Cl. 403—22 **7 Claims**



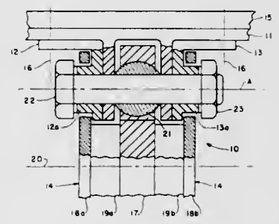
1. A mounting system for securing a plurality of modular units having side walls forming lateral edges, to one another, comprising rapid clamping means including a bolt having two free bolt ends and a tool engaging section between said two free bolt ends, said free bolt ends having oppositely directed threads thereon, and a tying nut on each free bolt end for tying neighboring modular units to each other, recess means in at least certain of said side walls next to said lateral edges of each modular unit, each recess means having a curved bottom portion, said recess means being located in such positions that the recess means of two neighboring aligned modular units match with each other to form a complete cavity with a configuration and dimensions for receiving one of said rapid clamping means, and wherein each of said tying nuts has a respectively curved portion fitting into said curved bottom portion of said recess means for centering said rapid clamping means in said recess means.

4,786,202

DUAL LOAD PATH PIN CLEVIS JOINT

Alison M. Arnold, Greenbank, and Ronald G. Reed, Renton, both of Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 12, 1985, Ser. No. 700,857
Int. Cl.[4] B25G *3/00;* **F16D** *1/00*
U.S. Cl. 403—79 **5 Claims**



1. A dual loading bearing path connector for pivotally joining a movable member to a structural member, comprising:

a pair of spaced apart lugs, each said lug including at a first end thereof means for attachment to one of said movable member and said structural member, each said lug further including at a second end thereof means defining an eyelet and an outwardly projecting boss;

a clevis disposed between said lugs and including means for attachment to said first member, said clevis having an eyelet defined in the end of each leg thereof disposed in registration with a corresponding eyelet in said lugs;

a pivot pin received by the eyelets of said lugs and said clevis;

a self-aligning bearing, supported on said pin between the legs of said clevis;

a first connecting link pivotally supported at a first end on said bearing, and disposed for operative connection at a second end to the other of said movable member and said structural member, said first connecting link, bearing, pin and clevis providing a first load bearing path between said structural member and said movable member; and

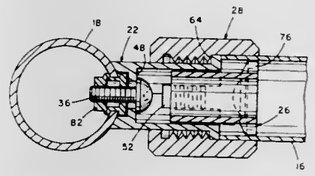
a pair of second connecting links, pivotally supported at respective first ends on a corresponding said projecting boss of said lugs, and disposed for operative connection at respective second ends to the other of said movable member and said structural member, said second connecting links, projecting bosses, and lugs providing a second load bearing path between said structural member and said movable member.

4,786,203

CONNECTOR ASSEMBLY FOR FOOD PREPARATION EQUIPMENT AND METHOD OF ASSEMBLY

John P. Conner, Grandville, and James R. Bouse, Belmont, both of Mich., assignors to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Sep. 16, 1987, Ser. No. 97,504
Int. Cl.[4] F16B *7/08*
U.S. Cl. 403—190 **10 Claims**



1. A connector assembly for joining a substantially horizontal cylindrical tubular member having an interior protuberance adjacent its leading end to a substantially vertical tubular member without the formation of substantial exposed cracks or crevices in which food could collect, said connector assembly comprising:

a base with a generally cylindrical outside surface and having at one end a saddle surface for engaging the outside surface of said vertical member, having at its other end an abutment flange extending outwardly from the outside surface of said base, an aperture extending through said base between said ends, and slot means extending from said other end towards said one end;

fastener means for holding said base to said vertical member;

a locking collar defining a bore for receiving said base with a first end defining an opening having a diameter substantially equal to but slightly greater than the diameter of said base outside surface, a second end having an inside diameter substantially equal to but slightly greater than the outside diameter of said horizontal member, an internal screw thread disposed between said first end and said second end, and abutment means for engaging said abutment flange disposed between said thread and said second end; and

a locking insert including a body sized for reception in the aperture of said base with a leading end and a trailing end, said insert having an outward extension means adjacent

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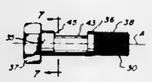
said insert leading end for reception by said base slot means with thread means on the outside surface of said extension means for threadably engaging the screw thread of said collar, and a holding flange for bearing on said protuberance extending outwardly from said body adjacent said trailing end and sized to fit inside said horizontal member whereby with said insert positioned in said horizontal member with said holding flange behind said protuberance and said insert leading end extending from said horizontal tube leading end, and with said base, holding said collar, fastened to said vertical member, threading said collar onto said insert extension means results in said collar abutment means engaging said base abutment flange with the leading end of said horizontal member bearing on said abutment flange of the base and the holding flange of the insert bearing on said protuberance.

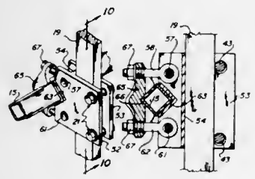
4,786,204

CLAMPING APPARATUS WITH BI-DIRECTIONAL CLAMPING DEVICE

Bruce H. Mayeda, Longmont, Colo., assignor to The Eversman Mfg. Company, Denver, Colo.

Filed Feb. 24, 1986, Ser. No. 832,333
Int. Cl.[4] F16B *2/18, 7/04;* **A01B** *63/04*
U.S. Cl. 403—374 **15 Claims**





1. In a clamping apparatus, the combination comprising an element disposed between a pair of spaced clamping members having free end portions and a transverse stop between said members opposite said free end portions;

a clamping device including an elongated one piece body extending through said free end portions, said body having a pair of axially spaced shaft sections with a common center, said body having a head at one end and external threads on an opposite end portion with a nut threaded on the threads for applying a first clamping force directed along the longitudinal axis of said body which first clamping force through said head and nut provides a pair of opposite inwardly directed clamping forces to said pair of spaced clamping members; and

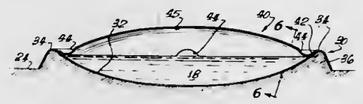
an eccentric section between said shaft sections having a center offset from the center of said shaft sections for applying a second clamping force directed substantially perpendicular to the longitudinal axis of said body to move said element against said stop in a direction substantially perpendicular to said first clamping force upon the rotation of said body from a release position to a clamping position to provide a second pair of opposite inwardly directed clamping forces to said element, said eccentric section being integral with said shaft sections and head for holding said body against rotation in said clamping position to enable said nut to be rotated to change said first clamping forces and said eccentric section to be rotated by the rotation of said head for the selective changing of said second clamping forces, said shaft sections being provided by a bolt shaped body having a substantially uniform diameter and having a generally circular cross section, said eccentric section being provided by having a recessed surface in a side of said body between said shaft sections into which an end portion of said element will slide when said eccentric section is in a release position, said eccentric section being generally smaller than said shaft sections and having an external surface opposite said recessed surface that is the same radius as said shaft sections.

4,786,205

ENVIRONMENTAL WATER CONSERVATION METHOD AND APPARATUS

Dan E. Hisken, 1517 Yolo, Corning, Calif. 96021, and Ed Stricker, 1237 Aloha, Red Bluff, Calif. 96080

Filed Sep. 16, 1982, Ser. No. 419,062
Int. Cl.[4] E02B *1/00;* **B65G** *5/00;* **A01K** *7/00*
U.S. Cl. 405—52 **6 Claims**



1. The method of collecting locally and naturally occurring water from the atmosphere which comprises: placing a water storage container having a upper rim in a remote area; partially covering said water storage container with a removable impervious, segmented elevated cover; attached to said rim providing means associated with said cover for diverting naturally occurring moisture into the container; and providing means for access to water within said container by animals

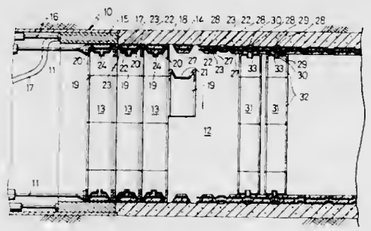
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4,786,206

LINING TUNNEL WALL MADE BY SHIELD TYPE TUNNEL EXCAVATOR

Minoru Yamamoto, and Fumitaka Kumai, both of Tokyo, Japan, assignors to Tekken Construction Co., Ltd. and Minoru Yamamoto, both of, Japan

Filed May 11, 1987, Ser. No. 48,605
Claims priority, application Japan, Feb. 6, 1987, 61-26803
Int. Cl.[4] E21D *11/14*
U.S. Cl. 405—146 **10 Claims**



1. A method of lining a periperhal tunnel wall made behind a shield type tunnel excavator as said excavator is advanced, the method comprising the steps of assembling a plurality of arcuate segments into an annular lining form, each segment having an arcuate recess for forming annular grooves in the outer periphery of the lining form when said segments are assembled, providing in said annular grooves a plurality of reinforcing bars, disposing said outer periphery having said annular grooves of said lining form to oppose said peripheral tunnel wall, and casting a lining material into a space defined between said peripheral tunnel wall and said outer periphery of the lining form to construct in said space a lining having annular beams circumferentially extending and projecting radially inwardly, said beams having said reinforcing bars embedded therein and acting as reinforcing structure.

4,786,207

METHOD OF LAUNCHING LONG PIPELINES AND RETRIEVING SUPPORT MEANS THEREFOR

Arthur W. Morton, Houston, Tex., and Henry A. Bourne, Jr., Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 306,034, Sep. 28, 1981, abandoned, which is a continuation of Ser. No. 258,914, Apr. 30, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,233
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—158 **12 Claims**



1. A method of launching a pipeline from an on-shore site into a body of water, said method comprising the steps of:

supporting said pipeline at said on-shore site with a plurality of ground engaging movable support means spaced along a length of said pipe, said support means being connected together by a support connecting line;

providing a plurality of floats, one of said floats being attached to each of said support means, each of said floats having a buoyancy greater than a combined weight of the float plus the support means to which it is attached, so that said support means will float after it is disengaged from said pipeline;

positioning a launch vessel to a seaward end of said pipelines;

positioning an intermediate floating vessel offshore from said site, deploying a main launching line seaward from a seaward end of said intermediate floating vessel, and providing sufficient buoyancy means to hold such main launching line above said floor of said body of water;

connecting a pipeline launch line between a landward end of said intermediate floating vessel and said seaward end of said pipeline;

connecting a support means launch line between said landward end of said intermediate floating vessel and said seaward end of said support connecting line;

connecting a seaward end of said main launch line to said launch vessel;

moving said launch vessel seaward and thereby towing said pipeline and said support connecting line into said body of water;

applying a retarding force to said pipeline and thereby maintaining a tension force in said pipeline, as said pipeline is towed into said body of water, sufficient to hold said pipeline above a floor of said body of water, and

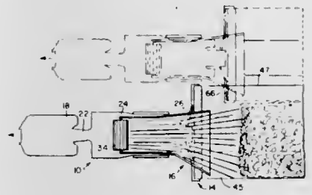
disengaging said support means from said pipeline thereby allowing said support means to float to the surface of said body of water.

4,786,208

METHOD OF AND APPARATUS FOR CONTROLLING FLUID LEAKAGE THROUGH SOIL

Avi Raviv, Rehovot, Israel, assignor to Solmat Systems Ltd., Yavne, Israel

Continuation of Ser. No. 730,257, May 6, 1985, Pat. No. 4,636,112, which is a continuation of Ser. No. 367,886, Apr. 13, 1982, abandoned. This application Jul. 14, 1986, Ser. No. 866,715
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] E02B *3/16;* **F16L** *1/02*
U.S. Cl. 405—176 **19 Claims**



1. An apparatus for treating the surface of the ground in a region with a vehicle having ground engaging means for supporting the same, and means located at the front of the vehicle for digging a groove in the surface each time the vehicle traverses the region and for lifting the earth dug from the current groove onto a strip of sheet material that is laid out over the current groove from a roll at the back of the vehicle when the latter traverses the region, the improvement being in having the width of the strip, when it is laid-out on the current groove, be wider than the width of the ground. engaging means of the vehicle and wider than the periphery of the current groove, whereby said ground engaging means clears an edge of a previously laid-out strip when the next groove is dug parallel to the previously dug groove, and an edge of the next strip laid-out on the next groove overlaps said edge of the previously laid-out strip.

4,786,209

METHOD FOR MAINTENANCE OF VALVES INCLUDED IN A SUBSEA PRODUCTION SYSTEM FOR OIL AND GAS

Tore Nilsson; Chajkiel Pajes; Rolf J. Andersson; Kjell Höglund, all of Västerås, Sweden; Ragnar Husebye, Trondheim, Norway; Sigbjorn Hoyland, Hommersak, Norway; Hans Lindland, Sandnes, Norway; Tore Mong, Randaberg, Norway, and Erling Nesse, Straumsgrend, Norway, assignors to AB ASEA-ATOM, Västerås, Sweden

Filed Oct. 22, 1987, Ser. No. 111,341
Claims priority, application Sweden, Oct. 22, 1986, 8604506
Int. Cl.[4] B63C *11/00;* **F16L** *1/04*
U.S. Cl. 405—188 **3 Claims**

1. A method for replacing an insert unit (**26**) included in an insert valve assembly (**22**) belonging to a subsea production system for oil and gas using a manipulator (**1**) which

by means of a hoisting cable (**3**) can be raised and lowered to the desired depth,

by means of guide wires (**4**, **5**), acting as guidelines passing through guide frames (**6**, **7**) fixed to the manipulator, can be positioned at the desired location on the bottom of the sea,

is mounted on a beam (**8**) with guide slots (**9**, **10**), said guide slots being intended to receive guide posts (**11**, **12**), which are placed on the bottom of the sea and which are provided with spacing sleeves (**13**, **14**) to obtain the proper height above the bottom of the sea for the manipulator,

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has a built-in remotely operable telescopic arm (**15, 16**) provided with a hook (**20**) at the end of the arm,

has a built-in carriage (**18**) movable on the telescopic arm, said carriage comprising a moment-producing tool (**31**) as well as aligning, retracting and fixing devices (**32, 33, 34**) for said carriage and said tool, and that the insert valve assembly with its insert unit is mounted on a valve tree (**17**) which

has a lug (**21**) for receiving the hook of the telescopic arm, and

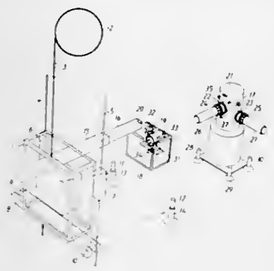
has guide cones (**35, 36, 37**) for aligning, retracting and fixing devices mounted on the carriage, said insert unit comprising a nut (**24**) by which the insert unit is screwed to and unscrewed from, respectively, the rest of the insert valve assembly, and that the moment-producing tool is formed so as to engage and grapple the nut of the insert unit, said method comprising the sequential steps of

lowering the manipulator down towards the bottom of the sea by means of the hoisting cable and guide wires and positioning via the beam, the guide slots, the guide posts and the spacing sleeves so that the tool present in the carriage arrives in front of that insert valve assembly whose insert unit is to be replaced,

bringing the telescopic arm of the manipulator towards the valve tree so that the hook of the arm is secured to the lug on the valve tree,

moving the carriage towards the valve tree,

maneuvering the aligning, retracting and fixing devices in



the carriage into engagement with the respective retraction cones on the valve tree,

guiding the moment-producing tool towards the insert valve assembly so as to engage and grapple the nut of the insert unit,

applying a releasing moment on the nut of the insert unit via the moment-producing tool,

applying a moment for threading the insert unit out of the rest of the insert valve assembly via the moment-producing tool,

detaching the aligning, retracting and fixing devices in the carriage from their respective retraction cones on the valve tree,

moving the carriage with the insert unit back to the manipulator,

replacing the disengaged insert unit by a new insert unit,

moving the carriage with the insert unit towards the valve tree,

maneuvering the aligning, retracting and fixing devices in the carriage into engagement with the respective retraction cones on the valve tree,

maneuvering the moment-producing tool towards the remaining part of the insert valve assembly, the new insert unit being inserted into said part,

applying a moment on the nut of the insert unit for threading in the insert unit via the moment-producing tool,

applying a fastening moment on the nut of the insert unit via the moment-producing tool,

withdrawing the moment-producing tool from the nut of the insert unit,

detaching the aligning, retracting and fixing devices in the carriage from their respective retraction cones on the valve tree,

moving the carriage back to the manipulator,

disengaging the hook on the telescopic arm from the lug on the valve tree,

moving the telescopic arm back to the manipulator, and

raising the manipulator to the surface of the sea by means of the hoisting cable and the guide wires.

4,786,210

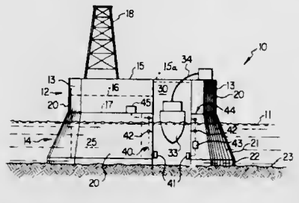
ARCTIC PRODUCTION/TERMINAL FACILITY

Thomas E. Williams, Argyle, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 14, 1987, Ser. No. 96,868

Int. Cl.⁴ E02B *15/02, 17/02*

U.S. Cl. 405—217 **13 Claims**



1. An offshore facility for use in a body of water in an arctic area, said facility comprising:

a main structure having a front and a back and a base adapted to rest on the bottom of said body of water; and

a marine slip formed integral within said main structure, said slip opening through said back of said structure and extending inwardly into said main structure and adapted to receive and moor a vessel therein whereby said vessel shall be completely inside the periphery of said facility when in a moored position within said slip.

4,786,211

FILLING CAVITIES IN MINING

Bernd Leutner, Frankenthal; Berthold Mueller, Bensheim, and Wilhelm Volkenborn, Marl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,732

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629477

Int. Cl.⁴ E02D *3/12;* **E21F** *15/00*

U.S. Cl. 405—264 **7 Claims**

1. A process for filling empty cavities associated with the facing of mine workings which comprises the steps of:

(a) preparing an aqueous slurry for introduction into said cavities which, in addition to water, consists essentially of alpha-hemihydrate, alpha-$CaSO_4.0.5H_2O$ and a metal salt capable of evolving CO_2 when in contact with an acid with said salt being selected from the group consisting of alkaline and alkaline earth metal carbonates;

(b) prior to being introduced into said cavities, admixing said slurry with an aqueous medium which contains a metal bisulfate foaming agent;

(c) conveying the resulting foamable mixture into said cavities; and

(d) allowing the mixture to foam and thereafter solidify to fill the cavities.

4,786,212

PROCESS AND APPARATUS FOR REINFORCING A PREDETERMINABLE AREA IN THE GROUND

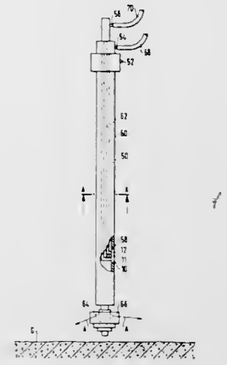
Karlheinz Bauer; Manfred Stocker, both of Schrobenhausen, and Franz X. Abt, Mindelheim, all of Fed. Rep. of Germany, assignors to Karl Bauer Spezialtiefbau GmbH & Co, KG, Schrobenhausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 860,816, May 8, 1986, abandoned. This application Apr. 7, 1987, Ser. No. 35,454

Claims priority, application Fed. Rep. of Germany, May 9, 1985, 3516756

Int. Cl.⁴ E02D *3/12*

U.S. Cl. 405—269 **15 Claims**



1. A process for reinforcing, stabilizing, consolidating and sealing a predeterminable area in the ground comprising the steps of

providing an injection rod;

providing a nozzle carrier having a liquid jet exit port and at least one gas jet exit port oriented radially relative to said injection rod;

rotating said injection rod and forcing said injection rod downwardly so that said injection rod penetrates the ground;

supplying a flush medium to said injection rod so that soil is flushed away from said injection rod as it is rotated and forced downwardly;

discontinuing the supply of flush medium to said injection rod once said injection rod has been forced downwardly into the ground to its final depth;

injecting a liquid material through said liquid jet exit port in a liquid jet into the ground radially relative to said injection rod in a rotatable discharge direction;

simultaneously injecting a discrete jet of gaseous material through said at least one gas jet exit port into the ground, said jet of gaseous material separated from said liquid jet;

guiding said jet of gaseous material radially relative to said injection rod and parallel to said liquid jet in said rotatable discharge direction so that said jet of gaseous material forces said liquid material to penetrate the ground;

rotating and withdrawing said injection rod from within the ground such that said rotatable discharge direction rotates and forms a column of discharged liquid material in the ground, the liquid material subsequently solidifying to stabilize, consolidate and seal the ground.

4,786,213

DEVICE FOR STORING A WIRE IN A WIRE BOLTING MEANS

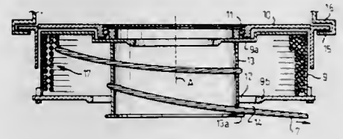
Jarmo Leppänen, Ylöjärvi, Finland, assignor to OY Tampella AB, Tampere, Finland

Continuation of Ser. No. 925,569, Oct. 31, 1986. This application Mar. 7, 1988, Ser. No. 168,521

Claims priority, application Finland, Nov. 7, 1985, 854381

Int. Cl.⁴ E21D *20/00*

U.S. Cl. 405—303 **17 Claims**



1. A device for storing wire for use in a wire bolting means, said device comprising:

a reel for supporting a ring-shaped wire coil, said reel forming a closed housing for enclosing the wire coil, said reel having a first and second surface, said second surface having an opening through which said wire may be completely withdrawn for wire bolting;

a supporter on which said reel is mounted for rotation about an axis, said opening being concentric with said axis; and

a drum provided centrally in said reel around which a portion of said wire rotates, said wire being in engagement with said drum over at least one winding thereof, said wire forcing the reel to rotate relative to the supporter as said wire is withdrawn and, said drum extending through said opening for forming an annular decoiling slot with said opening through which said wire is withdrawn.

4,786,214

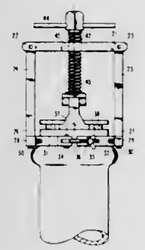
METHOD OF PIPE CAP EXTRACTION

E. Michael Schmidt, Carmel, and P. Michael Price, Greencastle, both of Ind., assignors to Hart Industries, Inc., Carmel, Ind.

Division of Ser. No. 819,284, Jan. 16, 1986, Pat. No. 4,691,424. This application May 7, 1987, Ser. No. 25,077

Int. Cl.⁴ F16L *1/00*

U.S. Cl. 405—303 **5 Claims**

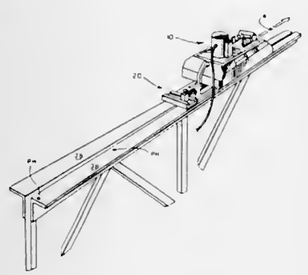


1. A method of preparing a lateral sewer pipe for connection to a sewer outlet pipe, the lateral sewer pipe having a cylindrical cross-section with an inner and outer diameter, an end and an end cap telescopically plugging the end, the end cap having a cylindrical wall portion and a flange spaced from the end and extending uniformly radially outward from the wall portion to points between the inner and outer diameter, comprising steps of:

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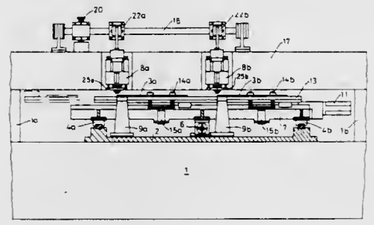
digging a hole to the lateral sewer pipe;
providing a tool having a frame member, a pair of parallel legs depending at upper ends from opposite ends of the frame member, a pipe engaging ring orthogonally depending from lower ends of the legs, a torque screw threadedly extending through the frame member and between the legs, a crank member rotatably mounted at the bottom of the torque screw, and a pair of cap-gripping, hook-shaped fingers pivotally depending from opposite ends of the crank member, the fingers having a length measured from the crank member substantially less than the length of the crank member, and wherein the crank member with depending fingers is freely rotatable through 360° about the torque screw;
manually maneuvering said tool relative to the lateral pipe so that the ring passes over and encircles the end of the lateral pipe;
fixing the ring to the lateral pipe to prevent movement of the device in at least one axial direction along the lateral pipe;
turning the torque screw relative to the frame member until the hook-shaped fingers are partially disposed radially outside of the flange and partially disposed between the flange of the end cap and the end of the lateral pipe;
pulling the end cap axially away from the lateral pipe by turning the torque screw in the appropriate direction relative to the frame member.

4,786,215
PORTABLE HYDRAULIC PUNCH
Richard R. McClure, Basehor, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.
Division of Ser. No. 896,194, Aug. 14, 1986, Pat. No. 4,731,929. This application Sep. 2, 1987, Ser. No. 92,366
Int. Cl.[4] B26F *1/00*
U.S. Cl. 408—1 R **5 Claims**



1. A method of providing a plurality of spaced holes in a roofed panel support member of a building under construction comprising the following steps:
forming a first pilot hole at one end of the roof panel support member;
mounting a portable hydraulic punch apparatus upon the roof panel support member, said apparatus having an adjustable guide structure for affixing the apparatus on a roof panel support member and for guiding the apparatus along the member;
moving the apparatus along the support member until a gauge pin on the apparatus is located in the first pilot hole;
adjusting the guide structure on the apparatus to accommodate the apparatus to the member;
using punching structure of the portable punch apparatus for punching another hole a predetermined distance from the first one;
removing the gauge pin from the first pilot hole, moving the apparatus along the roof panel support member and inserting the gauge pin in the punched hole to relocate the punch structure for forming another hole a predetermined distance from the preceding punched hole; and
repeating the steps of relocating the gauge pin in the last punched hole and then punching a new hole in the roof panel support member to form a plurality of spaced holes along the member.

4,786,216
PRINTED CIRCUIT BOARD DRILLING MACHINE
Hideo Kitagawa, Tokyo, and Toshihiko Mizuno, Mitaka, both of Japan, assignors to Hiraoka Kogyo Kabushiki Kaisha, Saitama, Japan
Filed Apr. 28, 1987, Ser. No. 43,388
Claims priority, application Japan, May 6, 1986, 61-102107
Int. Cl.[4] B23Q *1/18*
U.S. Cl. 408—69 **6 Claims**

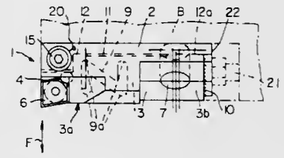


1. A machine for drilling holes in a printed circuit board having parallel, oppositely disposed major surfaces, comprising:
a drive mechanism for supporting a printed circuit board at a peripheral portion thereof and for moving and positioning the printed circuit board in a plane defined by a major surface of said printed circuit board;
a drill provided on one side of said plane, said drill having a drill shaft with the axis of rotation of said drill shaft perpendicular to said plane, said drill being supported for reciprocal movement along said axis of said drill shaft; and
a stand provided on the other side of said plane opposite said one said at or near a position opposing said drill and having a sliding contact surface in sliding contact with the printed circuit board;
whereby substantially all thrust of said drill acting upon the printed circuit board during a drilling operation performed by said drill is borne by the sliding contact surface of said stand.

4,786,217
METAL-CUTTING TOOL
Frank Johne, Lohne, Fed. Rep. of Germany, assignor to J. Kuhn GmbH & Co. Prazisionswerkzeug KG., Dorsten, Fed. Rep. of Germany
PCT No. PCT/DE86/00339, § 371 Date Apr. 28, 1987, § 102(e) Date Apr. 28, 1987, PCT Pub. No. WO87/01319, PCT Pub. Date Mar. 12, 1987
PCT Filed Aug. 23, 1986, Ser. No. 45,057
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530696
Int. Cl.[4] B23B *29/034*
U.S. Cl. 408—156 **20 Claims**

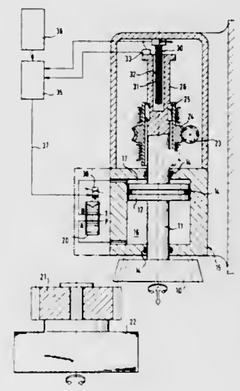
1. In a metal-cutting tool including a holder having a front end and a rear end, at least one cutting plate receiving means on the holder, a hole through the holder in the region between the frontend and rear end for penetration by a securing screw for securing the holder to a boring bar, the holder being resiliently deformable in the cutting plate receiving part, and an adjusting means for adjusting the deformable part of the holder relative to the boring bar, the improvement wherein:

the holder comprises a cartridge having a longitudinally extending base body and a deflectable part, said deflectable part having a front part supporting the cutting plate and a rear end, said rear end being rigidly connected in the region thereof to said base body so that said front part is resiliently deflectable relative to said base body; and



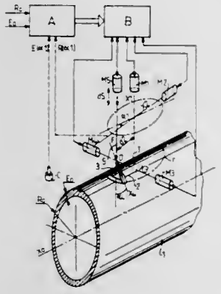
a substantially slot-shaped aperture is provided in said deflectable part having a configuration forming a plurality of joints and a plurality of parallel springs in said deflectable part connecting said front part and rear end thereof so that said front part and cutting plate thereon are adjustable by said adjusting means in a direction substantially radially relative to the boring bar.

4,786,218
MACHINE TOOL COMPRISING A TOOL DRIVEN IN THE AXIAL DIRECTION BY A HYDRAULIC LIFTING CYLINDER, IN PARTICULAR A GEAR SHAPER MACHINE
Alfred Feuser, Lohr-Rodenbach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Fed. Rep. of Germany
Filed Jan. 28, 1986, Ser. No. 823,315
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1985, 3503104
Int. Cl.[4] B23F *5/16*
U.S. Cl. 409—2 **10 Claims**



1. In a machine tool comprising a tool driven in the axial direction by a piston of a hydraulic lifting cylinder and a directional valve for controlling the fluid paths between said cylinder, a fluid source and a reservoir for actuating said piston, characterized by a position pickup for electronically detecting the position of said piston, said directional valve comprising an electrically operated servovalve driven by a controller, said controller being programmed for processing the actual value of the piston position as sensed in said position sensor, a desired value for th piston position and a desired value for the duration and frequency of the stroke of piston for operating said servovalve to achieve said desired value of duration and frequency of piston stroke.

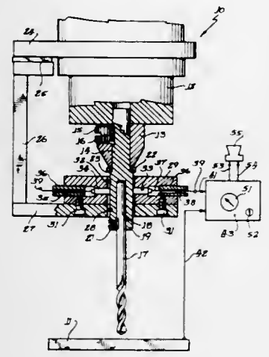
4,786,219
METHOD AND APPARATUS FOR MACHINING THE WALL OF A CYLINDRICAL TUBE BY MILLING A GROOVE THEREIN
Claude Oberlin, Avon; Gérard Dolhen, Ecuelles-Moret S/Loing; Jean-Claude Lemarquis, Moret S/Loing, and Philippe Morand, Puilboreau, all of France, assignors to Electricite de France, France
Filed May 5, 1986, Ser. No. 859,649
Claims priority, application France, May 6, 1985, 85 06838
Int. Cl.[4] B23Q *15/06, 15/22*
U.S. Cl. 409—84 **7 Claims**



1. A method of machining a hollow part by milling along a line of cut which is predetermined relative to a theoretical surface of said part, said milling being performed by means of a cutter mounted at the end of a drive shaft which is carried by a moving support, said support being displaceable with at least two degrees of freedom in tilting and with at least one degree of freedom in translation, the quantity of material to be removed at any point of said line being determined by a reference difference between the end face of the cutter and a real reference surface, which real reference surface may be the inside surface or the outside surface of said part, said method comprising the following:
a first stage of reconnaissance of the outside surface of the part, said stage consisting in causing the cutter to follow a first trajectory at a constant distance from the theoretical surface of the part, said distance being chosen in such a manner as to ensure that the cutter never comes into contact with the part and in performing the following operations at sample points along said line of cut:
measuring the distance between the end face of the cutter and the real outside surface of the part on the axis of the cutter by means of a sensor integrated in the cutter, storing said measured distance, and determining the relative error at each sample point between the real surface and the theoretical surface; and
determining and storing the direction of the normal to the real outside surface at each sample point, said determination being based on the error measured at each point and on the errors measured at the points adjacent thereto;
a machining stage consisting in causing the cutter to follow said predetermined trajectory a subsequent time, with the position and the orientation of the cutter being controlled in such a manner that, at each sample point, the axis of the cutter is at a constant angle relative to the normal to the real surface and to the tangential direction to said line of cut at said point, and the distance between the end face of the cutter and the reference surface of the part is made equal to the reference difference for said point.

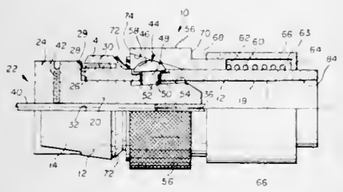
VOL 1096 ISS 4 NOV 22 1988 UMI

4,786,220
CUTTING TOOL WEAR MONITOR
John M. Fildes, Hanover Park, and Robert H. Krueger, Palatine, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Division of Ser. No. 832,616, Feb. 24, 1986, Pat. No. 4,694,688.
This application May 26, 1987, Ser. No. 53,643
Int. Cl.[4] B23C *7/00*; B23B *49/00*
U.S. Cl. 409—134 7 Claims



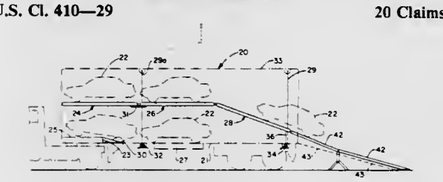
1. Apparatus for detecting tool wear failure in a machine for metal removal including a shaft, shaft rotating means, a tool holder secured on said shaft, a rotary tool bit mounted in said holder for engagement with a workpiece, a nonrotating holder having a central opening through which said tool bit projects, and a circuit between means contacting said nonrotating holder and means contacting said workpiece to ground to measure the current generated by metal removal of said tool bit acting on said workpiece, said circuit providing a low impedance current measurement means including an operational amplifier receiving the current input from the tool, a current booster for the output from the amplifier and a feedback loop containing a resistance and leading to the current input from the amplifier, said circuit balancing the current feedback with the current input and provides a voltage output proportional to the current input.

4,786,221
QUICK RELEASE CHUCK MECHANISM AND METHOD FOR ACHIEVING INTERCHANGE ABILITY OF TOOL INSERTS THEREIN
Kenneth L. March, York, Pa., assignor to Ettco Tool & Machine Co., Inc., York, Pa.
Filed Aug. 25, 1986, Ser. No. 899,884
Int. Cl.[4] B23C *5/26*; B23B *31/04*
U.S. Cl. 409—218 13 Claims



1. A quick release chuck mechanism for releasably holding a tool or the like comprising:
a body member having an axial bore extending therethrough, and an adjustable end surface transverse to said bore;
a tool insert having one end portion insertable in said axial bore, and its opposite end portion provided with a shoulder facing said end surface and engageable therewith;
an adjusting means on said body member for axially varying the position of said adjustable end surface to achieve a predetermined end surface position; and
means for releasably holding said tool insert in said body member with said shoulder in engagement with said end surface.

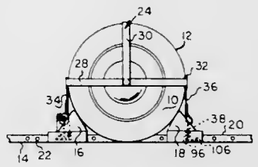
4,786,222
FOLDING AUTOMOBILE STORAGE DECK ASSEMBLY
William W. Blodgett, Fairlawn, Ohio, assignor to Carvan, Inc., Akron, Ohio
Filed May 11, 1987, Ser. No. 48,255
Int. Cl.[4] B60P *3/08*
U.S. Cl. 410—29 20 Claims



16. A convertible automobile storage deck assembly for use with a truck capable of dual, convertible, freight hauling modes comprising:
a folding deck, and
a swivel deck,
both said decks being divided in their centers into longitudinal halves which can be pivoted from a vertical, stored, or general freight carrying mode adjacent the sidewalls of the truck, to a deployed, horizontal, automobile carrying mode wherein said longitudinal halves are fastened together to form an automobile carrying deck, said swivel deck being swivelable vertically up or down about pivot means at its swivel end, and wherein said swivel deck is braced by a plurality of support members which include sleeve members and slider members, said slider members fastening said support members to the sidewalls of the truck when said swivel deck is in its stored mode, or in its deployed mode, but wherein said slider members can be disconnected from said sidewalls and telescoped into said sleeve members when the swivel deck is to be swiveled about its swivel end during automobile loading or unloading, and in which said slider members are connected to said sidewalls by means of perches attached to said sidewalls, each of said perches comprising two parallel side members connected to a turning block, wherein a slider member can be pivotally fastened between said side members by a locking pin extending through aligned pivot holes in said side members and through said slider member and, wherein said slider member rests on said tuning block.

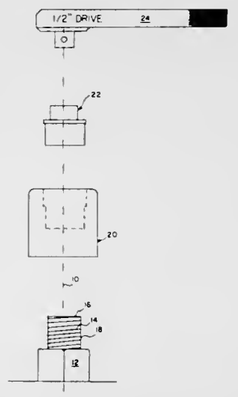
4,786,223
VEHICLE HOLD-DOWN SYSTEM
Charles F. Crissy, and John D. Boland, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Oct. 13, 1987, Ser. No. 107,671
Int. Cl.[4] B60P *3/07*
U.S. Cl. 410—20 9 Claims

1. A vehicle hold-down system for vehicles supported on pneumatic tires having a circumference comprising, in combination, a tire supporting surface, first and second chock means fixed adjacent said supporting surface on opposite sides of the tire in alignment with the tire circumference, a flexible harness adapted to be placed over the tire upper circumference, said harness including first and second straps and a central region, harness tension means interconnecting said first strap to said first chock, a quick release fitting attached to said second strap, said fitting comprising a flat plate, an opening within said plate,



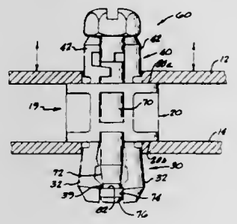
anchor means defined on said second chock, said anchor means being received within said fitting opening for attaching said second strap to said second chock.

4,786,224
WHEEL LUG NUT COVER
Donald J. Wharton, Mishawaka, Ind., assignor to Maron Products, Inc., Mishawaka, Iod.
Continuation of Ser. No. 855,885, Apr. 24, 1986, abandoned.
This application Feb. 22, 1988, Ser. No. 161,309
Int. Cl.[4] F16B *31/00*
U.S. Cl. 411—1 14 Claims



1. A lug nut cover, for use with a wheel lug having external threads and a lug nut threaded thereon with a portion of said external threads extending above said lug nut, to detect removal of said lug nut from said wheel lug and detect tampering with said cover, comprising:
a breakable shroud dimensioned to have a width and a length sufficiently larger than said lug nut so as to enable said shroud to surround said lug nut and said wheel lug to prevent access to said lug nut for removal of said lug nut from said wheel lug;
an inner ledge projecting from said shroud;
a cap member having an internally threaded portion over a length thereof for securing said cap to said external threads of said wheel lug above said lug nut, said length being dimensioned so as to enable said cap to be fully threaded onto said portion of said external threads extending above said lug nut;
a flange projected from said cap which is engagable with said inner ledge when said cap is fully threaded to said wheel lug, the engagement of said flange and said ledge serving to retain said shroud about said lug nut and said wheel lug; and
a non-reversible pawl/ratchet arrangement on the engaging portions of said ledge and said flange for preventing relative rotation between said cap and said shroud as a result of reverse threading of said cap once said cap is fully threaded onto said wheel lug.

4,786,225
STAND-OFF FASTENER
L. Richard Poe, Long Beach, and Raymond E. Harmon, Tustin, both of Calif., assignors to Hartwell Corporation, Placentia, Calif.
Continuation of Ser. No. 13,016, Feb. 10, 1987, abandoned, which is a division of Ser. No. 478,471, Mar. 23, 1983, Pat. No. 4,674,930, which is a continuation-in-part of Ser. No. 330,260, Dec. 14, 1981, abandoned. This application Feb. 5, 1988, Ser. No. 150,441
Int. Cl.[4] F16B *13/04*
U.S. Cl. 411—32 2 Claims



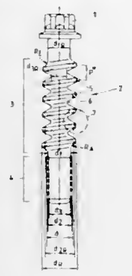
1. A fastener for joining a first structure at a first aperture therein in a fixed relationship to a second structure at a second aperture therethrough, comprising
a fastener body including a first locking element, a second locking element, a spacer between said first and second locking elements and a channel extending therethrough, said first locking element having first movable tabs ans said second locking element having second movable tabs, said fastener body including a first internal ridge in said channel; and
a plunger slidably extending into said channel, said plunger and said channel including first camming surfaces constructed and arranged for moving said first tabs outwardly with axial advancement of said plunger relative to said channel and second camming surfaces constructed and arranged for moving said second tabs outwardly with rotation of said plunger relative to said channel with said plunger advanced in said channel, said plunger having an engagement surface, said engagement surface and said first internal ridge being constructed and arranged to mutually interlock to prevent retraction of said plunger from said channel with said plunger advanced in said channel.

4,786,226
CONNECTING ELEMENT FOR TWO MACHINERY COMPONENTS OR CONSTRUCTIONAL COMPONENTS
Siegfried Jende, Petershütter Allee 1, D-3360 Osterode, Fed. Rep. of Germany
Filed Jun. 16, 1986, Ser. No. 874,603
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1985, 3521755
Int. Cl.[4] F16B *23/00*, *35/06*
U.S. Cl. 411—392 7 Claims

1. An anti-fatigue connecting element comprising a head and a solid elongated shank extending from said head said shank including a threaded portion used for fastening elements together and an anti-fatigue portion positioned between said head and said threaded portion and axially displaced along said

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shank from the threaded portion, said anti-fatigue portion including several elevations and grooves, with the minor diameter of the grooves of the anti-fatigue portion being made smaller than the minor diameter of the threaded portion, wherein the minor diameter (^{d}3R) of the grooves (6) of the anti-fatigue portion (3) is between 80% and less than 100% of the minor diameter (^{d}3) of the threaded portion (4), and



wherein the pitch diameter (^{d}2R) of the anti-fatigue portion (3), the pitch (P^*) and the thread angle (α) substantially satisfy the equation:

$$(^d2R)=(^d3R)+\tfrac{3}{4}\cdot P^*/(2\tan(\alpha/2))$$

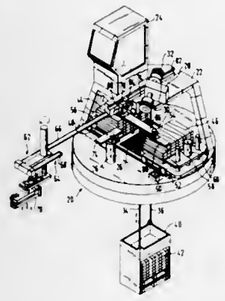
where P^* = the pitch of the threads of the anti-fatigue portion and α is the thread angle.

4,786,227

AUTOMATED APPARATUS FOR LINING THE INSIDE WALL OF A VESSEL WITH BRICKS

Victor Kremer; Michel Kirchen, both of L-Luxembourg, and Emile Lonardi, L-Bascharage, all of Luxembourg, assignors to Paul Wurth, S.A., Luxembourg, Luxembourg

Filed Jun. 5, 1987, Ser. No. 58,460
Claims priority, application Luxembourg, Jun. 5, 1986, 86458
Int. Cl.^{4} C21C *5/44*; E04G *21/16*
U.S. Cl. 414—10 **16 Claims**



1. Automated apparatus for lining the inside wall of a vessel having a verticle axis with bricks comprising:

a work platform vertically movable within the vessel and capable of rotating about the vertical axis of the vessel;

means for raising and lowering brick pallets and depositing them at a predetermined location on said platform;

automatic depalletizing means;

an intermediate storage table, said automatic deplalletizing means adapted to transfer bricks from the pallets towards said intermediate storage table;

handling robot means for picking up the bricks from said intermediate storage table and lining the inside wall of the vessel;

frame means mounted on said work platform; and

wherein said handling robot means comprises;

a main arm having first and second ends, said first end being supported by said frame means, said arm being radially movable with respect to said platform;

an automatic brick-handling grabbing means attached to said second end of said main arm; and

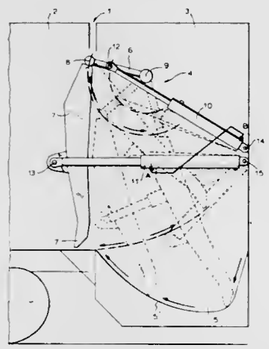
said main arm and said automatic brick-handling grabbing device undergoing circular movements with respect to the vertical axis of the vessel as a result of rotation of said work platform about said vessel vertical axis.

4,786,228

DEVICE FOR LOADING REFUSE INTO A BODY OF A REFUSE COLLECTING VEHICLE AND COMPACTING IR THEREIN

Leuco Mazzocchia; Mario Mazzocchia; Giuseppe Mazzocchia, and Alfio Mazzocchia, all of Via Provinciale 37, 03011 Alatri (FR), Italy

Continuation of Ser. No. 689,551, Jan. 7, 1985, abandoned. This application Aug. 15, 1986, Ser. No. 898,812
Claims priority, application Italy, Jan. 6, 1984, 19052 A/84
Int. Cl.^{4} B65F *3/14*
U.S. Cl. 414—525.1 **4 Claims**



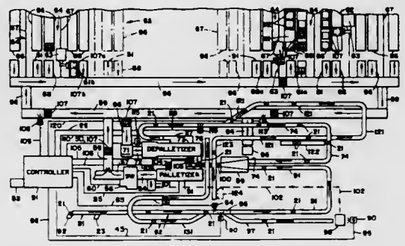
1. A device for loading refuse into, and compacting it inside a container carried by a refuse collecting vehicle, of the type operated to pick refuse out of a receiving trough to feed it to said container, the loading and compacting device comprising a frame receiving refuse and mounted at an open end of said container and lockable therewith and having a front end facing said container and a rear end facing away from said container; a single elongated shovel (7) and a single link (6) both extending throughout the width of the container (2) and hingingly connected to each other by a hinge axis (8), said link (6) also having its other end hinged at a hinge (9) to said frame in such a manner that the link (6) is only enabled to swing about the hinge (9), while the shovel (7) is free at its other end (7') and is able to perform swinging motions about the hinge axis (8) and to perform displacements that are in direct relationship with displacements effected by the hinge axis (8); and means for driving said link and said shovel into motion and operating such that, during the effective loading step, they cause the free end (7') of the shovel (7) to describe a curved path which follows a curvilinear shape (5') of the bottom of the refuse receiving trough (5), said driving means including at least one pair of hydraulic jacks which are positioned behind said shovel, as viewed from said front end, and one of which is interconnected between a center of said shovel and said frame and the other of which is interconnected between a point on said link between said hinge axis (8) and said hinge (9), and a point on said frame located below and rearwardly of said hinge (9) and above the point of connection with said frame of said one jack, so that said hydraulic jacks act substantially on center lines of said link and said shovel, respectively, and react upon said frame, whereby said driving means operate so as to cause, at the commencement of each working cycle, the shovel (7) to perform a swinging motion about the hinge axis (8) towards the rear end of said frame, and then the link (6) to perform a rotation about said hinge (9) so as to bring the whole loading device to a start position for a next working cycle, in which the free other end (7') of said elongated shovel is in its remotest position from said front end of said frame, and then during the working cycle to cause said shovel to swing from said remotest position towards said front end of said frame to load the refuse into said container, wherein the device operates continually and refuse may be admitted into said trough at any position of the device, and wherein the curvilinear shape (5') of the bottom of the refuse receiving trough (5) is in relationship with the path that is described by the free end (7') of the shovel (7) as a result of the construction of said shovel and the action exerted thereon by the driving means so that no guide means are required to enable said shovel to describe said curved path.

4,786,229

DOCUMENT STORAGE AND RETRIEVAL APPARATUS AND METHOD

Thomas R. Henderson, 954 Risa Rd., Lafayette, Calif. 94549

Filed Apr. 30, 1986, Ser. No. 857,723
Int. Cl.^{4} B65G *63/00*
U.S. Cl. 414—786 **11 Claims**



1. A method of minimizing the volume required to store an inventory of containers having articles therein which must be periodically retrieved from said inventory, said method including the steps of storing a plurality of containers each having at least one of said articles therein and each having container identifying indicia thereon in a storage structure having a plurality of locations with location identifying addresses, and periodically retrieving selected containers from said storage structure, wherein the improvement in said method comprises the steps of:

a. prior to said storing step, placing a selected maximum number, in excess of one, of said containers on pallet means, said maximum number corresponding to the volume of said containers and pallet means which can be stored at each of said locations;

b. correlating all of the container identifying indicia of said containers on said pallet means with a location identifying address for a selected location in the storage structure;

c. during said storing step, storing said pallet means in said selected location;

d. during said retrieving step, retrieving said pallet means having a selected container thereon;

e. after said retrieving step, removing all of said containers from the retrieved pallet means;

f. after said removing step, sorting said selected container from the remainder of said containers removed from said pallet means; and

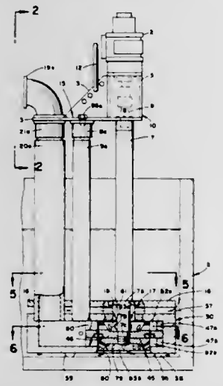
g. returning said remainder of said containers to said inventory by placing said remainder of said containers on a newly selected pallet means, adding containers to said newly selected pallet means until said maximum number of containers is placed on said pallet means, returning the newly selected pallet and containers to a new location in said storage structure, and correlating the container identifying with the address of said new location in said storage structure.

4,786,230

DUAL VOLUTE MOLTEN METAL PUMP AND SELECTIVE OUTLET DISCRIMINATING MEANS

Bruno H. Thut, 9580 Stafford Rd., Chagrin Falls, Ohio 44022

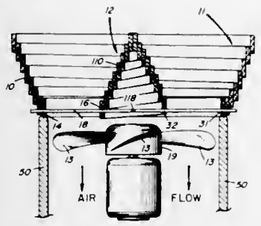
Continuation of Ser. No. 594,241, Mar. 28, 1984, abandoned. This application Nov. 22, 1985, Ser. No. 800,791
Int. Cl.^{4} F04D *1/12*
U.S. Cl. 415—88 **6 Claims**



1. A submersible molten metal pump continuously operable at temperatures in excess of 750° C. comprising a supporting planar base and top, a top horizontal plate substantially separately supported above, spaced apart from but parallel with planar base top; said space defining a separated upper level filter means; a corresponding planar plate bottom of said supporting base having a plurality of downwardly depending volume restricting spacer legs integral therewith, said spacer legs upon submersion of said pump interiorly of a melting-/holding furnace thereby creating a separated lower liquid metal filter ingress means through said intake volume means; interiorly of said supporting base a vertically separated pair of back-to-back volute impeller pumps operably and centrally affixed to a common vertical driven air-cooled shaft extending upwardly of and supported from within the interior of said base to a rigidly mounted air exposed shaft driving means, both of said upper and lower filter ingress intake volumes terminating in oppositely disposed, axially centered cup-like impeller receptacles integral with their respective volute impellers and rotatably interior of upper and lower fixed volute members creating thereby a common molten egress port downstream of said volute pumps discharging into a fluidics diverter valve integral and downstream of said dual volute pumps.

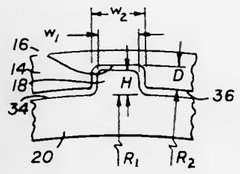
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,231
NOISE ATTENUATING AND AIR STREAMLINING SPIRAL
Winfield L. Kelley, 1581 Brickell Ave., Miami, Fla. 33129
Filed Dec. 1, 1986, Ser. No. 936,391
Int. Cl.[4] F04D *29/66*
U.S. Cl. 415—119 8 Claims



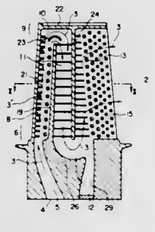
1. An air inlet assembly for a fan unit containing a fan and means to rotate said fan, comprising:
support members attachable at uniformly spaced locations to said fan units;
a first perforated support strip;
a first strip of sound absorbing material mounted on said perforated support strip, said first perforated support strip and first sound absorbing material being bound in a helical overlapping manner to form a frusto-conical configuration, said support members passing transversely through said frusto-conical configuration adjacent the edge of smaller transverse dimensions;
a second perforated strip; and
a second strip of sound absorbing material mounted on said second perforated support strip, said second perforated support strip and second sound absorbing material strip being wound in a helical overlapping configuration to form a cone, said cone configuration being positioned within the frustoconical configuration and shielding in front from inlet air said means to rotate said fan, said support members passing transversely through said conical configuration adjacent the edge of the base, and said support members crossing each other.

4,786,232
FLOATING EXPANSION CONTROL RING
Warren W. Davis, Dunlap, and Michael W. Kipling, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Continuation of Ser. No. 280,381, Apr. 10, 1981, abandoned.
This application Jul. 1, 1986, Ser. No. 880,763
Int. Cl.[4] F01D *11/08*
U.S. Cl. 415—138 4 Claims



1. A turbine shroud assembly having a pair of manifold rings (**28,30**), a spacer ring (**14**) positioned between said manifold rings (**28,30**), said spacer ring (**14**) defining a plurality of notches (**16**) on its inner perimeter, said inner perimeter having a radius R_2, each notch (**16**) having a depth D and a width W_2, the improvement comprising an expansion control ring (**20**) floatingly positioned within said spacer ring, said expansion control ring (**20**) having an outer perimeter with a radius R_1 where R_1 is less than R_2, said expansion control ring (**20**) further having a plurality of lugs (**18**) extending outwardly at said outer perimeter into said notches, each of said lugs (**18**) having a width W_1; where W_1 is less than W_2 so that said expansion control ring has limited freedom for planar movement to an eccentric position relative to the spacer ring.

4,786,233
GAS TURBINE COOLED BLADE
Mitsutaka Shizuya, Hitachi; Kazuhiko Kawaike, Katsuta; Sadao Umezawa, Mito; Katsuo Wada, Hitachi; Nobuyuki Iizuka, Hitachi, and Tomo Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 20, 1987, Ser. No. 5,239
Claims priority, application Japan, Jan. 20, 1986, 61-7926
Int. Cl.[4] B63H *1/14*
U.S. Cl. 416—97 R 17 Claims



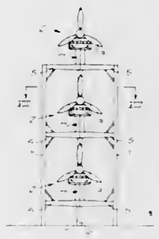
1. A gas turbine cooled blade having a cooling passage of an internal convective cooling arrangement which is defined by a leading edge wall, a suction side wall and a pressure side wall of a blade leading edge region, a first internal; partition and a plurality of extending members disposed inside said cooling passage and extending from at least one of said suction side wall and said pressure side wall facing a flow of a cooling fluid, said extending members being arranged densely in a line and being positioned closer to said first internal partition than to said leading edge wall in such a manner so as to oppose the flow of the cooling fluid, thereby concentrating channelling and turbulence of a main stream of the cooling fluid upon an inner surface of said leading edge wall, and to increase cooling performance at said leading edge wall beyond cooling performance at said first internal position.

4,786,234
TURBINE AIRFOIL
Jack L. Readnour, Toledo, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Jun. 21, 1982, Ser. No. 390,193
Int. Cl.[4] F01D *9/02*
U.S. Cl. 416—97 R 10 Claims

1. A turbine airfoil for use in a high temperature environment comprising:
a center post,
at least one side piece,
means for loosely attaching said side piece to said center post so that said side piece is carried by said center post and so that, at room temperature, a clearance between said center post and said side piece permits limited relative movement between said center post and said side piece, said clearance being dimensioned so that, at said high temperature, thermal expansion of said center post and/or said piece substantially eliminates said clearance and said limited relative movements between said center post and said side piece.

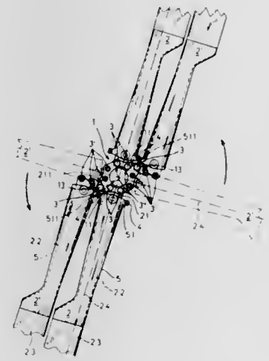


4,786,235
WIND-ENGINE
Germaine Van der Veken, Bruxelles, Belgium, assignor to Gemaro A.G., Zurich, Switzerland
Filed Dec. 2, 1987, Ser. No. 127,374
Claims priority, application Switzerland, Dec. 31, 1986, 05259/86; Jun. 25, 1987, 02384/87
Int. Cl.[4] F03D *1/02*
U.S. Cl. 416—121 5 Claims



1. A wind-engine of the type provided with several wind devices rotatably mounted at several independent stages comprising:
(a) a plurality of vertical props disposed in a circular configuration and defining a center axis;
(b) means forming at least one vertical axis at the center axis of the circular configuration;
(c) a plurality of vertically spaced independent stages connected to the vertical props;
(d) each stage including a plurality of radially extending crossbeams, one end of each crossbeam being connected to the vertical axis means and the other end of each crossbeam being connected to a corresponding vertical prop; and
(e) at least one wind device rotatably supported on the vertical axis means.

4,786,236
ROTOR, ESPECIALLY FOR ROTARY WING AIRCRAFT
Michael Hahn, Ottobrunn, and Gerald Kuntze-Fechner, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany
Filed Oct. 9, 1987, Ser. No. 107,241
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635180622
Int. Cl.[4] B64C *27/50*
U.S. Cl. 416—143 3 Claims



1. A rotor, especially for rotary wing aircraft, comprising a rotor hub and a plurality of rotor blades, each blade having a blade root, a blade neck, a blade wing section, and a torsion stiff blade pitch angle control sleeve, said blade neck being torsionally yielding for allowing a blade pitch angle adjustment movement, said blade neck being arranged between said blade root and said blade wing section, bolts and first bore means (**3'**) connecting each rotor blade root to said rotor hub in an operating position, said torsion stiff blade pitch angle control sleeve extending coaxially around said torsionally yielding blade neck for transmitting blade pitch angle adjustment forces to said wing section, a radially outer end of said torsion stiff blade pitch angle control sleeve being rigidly connected to said blade wing section, means for securing a radially inner end of said torsion stiff blade pitch angle control sleeve to said blade root in a movable relative to said blade root, a blade angle adjustment rod (**4**), pivot means (**5.1.1**) journalling said blade pitch angle adjustment rod (**4**) to said torsion stiff blade pitch angle control sleeve (**5**) near said blade root, said rotor further comprising additional connecting bore means (**13**) for at least one rotor blade of two rotor blades of which one rotor blade follows the other rotor blade, said additional connecting bore means including one bore passing through said rotor hub and another bore passing through said blade root of said at least one rotor blade, said two bores aligning axially with each other along a bore axis for permitting folding the respective blade into a folded position and for holding the respective blade in an operative position, said additional bore means (**13**) being located on the same side as said pivot means and as close as possible to said pivot means, so that the respective blade pitch angle adjustment rod (**4**) with its pivot means can rotate along a circular arc having its center in said bore axis, whereby blade folding is possible without disconnecting said pivot means (**5.1.1**), said additional bore means being adapted for receiving one of said connecting bolts for holding the respective rotor blade in a folded position.

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INDUCTION IMMERSION PUMP, PARTICULARLY FOR ALUMINUM

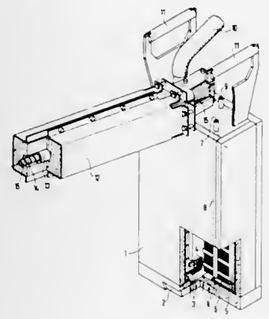
Rainer Hans, Bergisch-Gladbach, Fed. Rep. of Germany, assignor to Interatom International Atomreaktorbau GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,543

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141774

Int. Cl.⁴ H02K *44/00*

U.S. Cl. 417—50 **4 Claims**



1. Induction immersion pump, comprising a temperature-resistant housing extended above and below a given liquid level, a non-metallic channel disposed in said housing at least partially below said given liquid level, said channel having a substantially rectangular cross section with wide and narrow outer surfaces and an upper end, a comb-shaped coil core being disposed in said housing at said wide outer surface of said channel and having teeth pointing toward said channel, copper induction coils disposed on said coil core at said wide outer surface of said channel, at least one feed line and at least one discharge line for inert cooling gas disposed in said housing above said given liquid level, and a tube communicating with said upper end of said channel, said tube being bent off from said channel by an angle of less than 90°.

4,786,238

THERMAL ISOLATION SYSTEM FOR TURBOCHARGERS AND LIKE MACHINES

Jerry Glaser, Playa del Rey, and Frank A. Bescoby, Rancho Palos Verdes, both of Calif., assignors to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 684,242, Dec. 20, 1984, Pat. No. 4,725,206. This application Feb. 17, 1987, Ser. No. 14,947

Int. Cl.⁴ F04B *17/00*; F01D *5/08*

U.S. Cl. 417—53 **9 Claims**

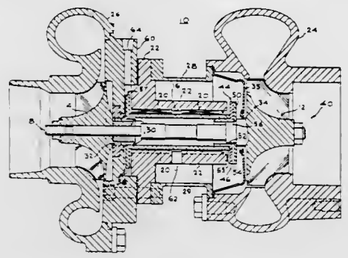
1. The method of protecting turbomachinery bearings against excessive heat comprising the steps of:

forming a bearing of a plurality of pliant foils surrounding a hollow shaft;

coupling the hollow shaft to a turbine wheel to be driven thereby;

mounting thermal isolating support means in the form of a generally cylindrical intermidiate shaft including a generally radially projecting portion extending between the hollow shaft and the turbine wheel for limiting heat transfer to the hollow shaft from the turbine; and

circulating gas through the interior of the hollow shaft and along said intermediate shaft during operation of the turbomachinery to cool the hollow and intermediate shafts and bearing.



4,786,239

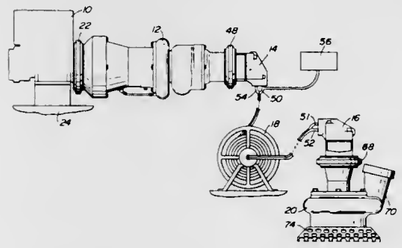
PUMPING SYSTEM SELECTABLY OPERABLE AS A FIRE PUMP OR A HYDRAULIC PUMP

H. Alfred Eberhardt, Paoli, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Jun. 15, 1983, Ser. No. 504,468

Int. Cl.⁴ F04B *39/11*

U.S. Cl. 417—238 **10 Claims**



1. A pumping system adapted to be selectably connected to operate as a fire pump or a hydraulic pump and particularly adapted for use on board ships or similar applications for fire fighting and dewatering operations comprising:

an engine having a power takeoff shaft,

a standby pump having an output shaft,

means connecting said standby pump to the power takeoff shaft of said engine so that said standby pump is driven by said engine such as when the pumping system is connected to operate as a fire pump,

a hydraulic pump having an inlet and a discharge,

means for selectably connecting said hydraulic pump to said output shaft of said standby pump so that said hydraulic pump is driven by said standby pump such as when the pumping system is connected to operate as a hydraulic pump,

a hydraulic motor having an output shaft and an inlet and an outlet,

hose means for providing fluid flow connections between said hydraulic pump inlet and discharge and said inlet and outlet of said hydraulic motor so that said hydraulic motor is driven by said hydraulic pump at a location remote from said standby pump,

a submersible pump,

means connecting said submersible pump to said output shaft of said hydraulic motor so that said submersible pump is driven by said hydraulic motor such as when the pumping system is connected for a dewatering operation,

said standby pump being a centrifugal pump having an impeller and seal means for the impeller, and

means for lubricating and cooling said seal means so that said centrifugal pump is adapted to be run dry.

4,786,240

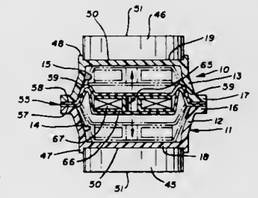
PUMPING APPARATUS WITH AN ELECTROMAGNET AFFIXED TO THE SEPTUM

Michael V. Koroly, and Nathan Ida, both of Akron, Ohio, assignors to Applied Biotechnologies, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 011,746, Feb. 6, 1987, abandoned. This application Aug. 19, 1987, Ser. No. 86,954

Int. Cl.⁴ F04B *43/04*

U.S. Cl. 417—413 **28 Claims**



1. Pump apparatus for the controlled ingress and egress of a fluid comprising, a generally cylindrical rigid housing, flexible septum means disposed within said housing, flexible septum means disposed within said housing and attached to said housing substantially axially medially thereof, electromagnetic means affixed to said septum means, a pair of inlet ports in said housing means with one disposed to either side of said septum means, valve means in said inlet port means permitting only ingress of fluid to said housing, a pair of outlet ports in said housing means with one disposed to either side of said septum means, valve means in said outlet port means permitting only the egress of fluid from said housing, a pair of permanent magnet means with one disposed proximate each of the axial extremities of said housing, and means for selectively energizing said electromagnetic means for flux coupling with each of said pair of permanent magnet means to produce the controlled displacement of said septum means axially of said housing to alternately effect the ingress and egress of fluid from said inlet and outlet ports to either side of said septum means.

4,786,241

RADIAL SEAL OF A ROTARY PISTON ENGINE

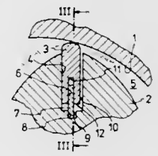
Dankwart Eiermann, Weissensberg-West, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,313

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629143

Int. Cl.⁴ F01C *19/04*

U.S. Cl. 418—123 **3 Claims**



1. A radial seal of a rotary piston engine having a trochoidal-shaped inner peripheral surfacing and a multi-corner piston means, with which sealing strips are arranged in radial grooves in corners of the piston means, which sealing strips under the pressure of operating chambers engage against the casing inner peripheral surfacing and respectively engaging against groove wall means on a suction side thereof, the improvement therewith comprising features including:

a sealing strip along a radial underside thereof having a narrow, deep first groove extending parallel to the sides of the sealing strip;

a sheet-metal strip installed with nominal clearance in this first groove, which sheet-metal strip projects beyond the first groove;

a groove spring arranged in that first groove of the sealing strip between said first groove base and that sheet metal strip;

a further groove arranged in the base of the radial groove for the sealing strip, in which a strip of the sheet-metal strip projecting beyond the sealing strip engages and is supported against a base of this further groove against the pressure of the groove spring; and

said further groove having a groove clearance which equals the groove clearance of the radial grooves for the sealing strip.

4,786,242

APPARATUS FOR THE CASTING OF HOLLOW SLABS OUT OF CONCRETE

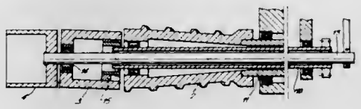
Jaakko O. Barsk, Tampere, Finland, assignor to Oy Partek AB, Toijala, Finland

Division of Ser. No. 607,135, May 4, 1984, Pat. No. 4,608,216. This application Jun. 3, 1986, Ser. No. 870,026

Claims priority, application Finland, May 9, 1983, 83 1606

Int. Cl.⁴ B28B *1/00*

U.S. Cl. 425—63 **12 Claims**



1. A casting apparatus for casting a hollow slab out of concrete, comprising:

walls;

at least one feeder member having a first end, a second end and a central longitudinal axis extending between said first and second ends of said feeder member;

a forming member having a first end, a second end and a central longitudinal axis extending between said first and second ends of said forming member, and being supported on the machine adjacent said second end of said feeder member, the feeder member being adapted to feed concrete mix toward the forming member;

means for moving said central longitudinal axis of said forming member at said first end thereof along a path of movement of a set shape;

means for maintaining a point of said central longitudinal axis of said forming member in a stationary position relative to the longitudinal axis of said feeder member; and

means for moving the casting apparatus relative to the concrete mix fed to the forming member.

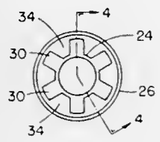
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4,786,243

APPARATUS FOR FORMING AN EDIBLE PRODUCT

Gary S. Kehoe, Ridgefield, Conn., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed May 15, 1986, Ser. No. 864,642
Int. Cl.[4] B29C *47/06*
U.S. Cl. 425—131.1 21 Claims



1. Apparatus for extruding an edible product of the type having an elongated, internal cylindrical core and an elongated annular sheath annularly extending completely around the cylindrical core and defining a longitudinally and annularly extending outside surface, the apparatus comprising:

first supply means for holding a first extrudable edible material;

second supply means for holding a second extrudable edible material;

an inside extruder tube;

an outside extruder tube extending along and around the inside tube, the inside and outside tubes forming an annular passageway continuously extending around the inside tube, between the inside and outside tubes, the outside tube including a forward portion projecting forward of the inside tube to engage and shape the outside surface of the edible product and to guide forward movement thereof;

means connected to the second supply means and to the outside extruder tube to feed the second edible material from the second supply means, to and through the annular passageway, the second material moving through said annular passageway in the shape of an elongated ring;

a plurality of deflector plates connected to at least a selected one of the inside and outside tubes and radially extending at least partially across the annular passageway at a front end thereof, to force the second edible material from said elongated ring and into a plurality of circumferentially spaced apart strands longitudinally extending forward from the annular passageway and radially extending outward from the core of the edible product to the outside surface thereof, and to form a plurality of circumferentially spaced apart zones, between said strands, substantially free of the second edible material and extending forward from the annular passageway; and

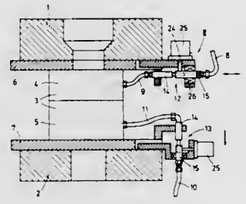
means connected to the first supply means and to the inside extruder tube to feed the first edible material from the first supply means, to and through the inside extruder tube, and radially outwardly into said zones to form the first edible material into the core of the product and into a plurality of strands radially extending outward from the core of the edible product to the outside surface thereof, whereby the annular sheath of the edible product includes alternating longitudinally extending strands of the first and second edible materials.

4,786,244

COUPLING DEVICE

Johann Holzschuh, Meinerzhagen, Fed. Rep. of Germany, assignor to Battenfeld GmbH

Filed Oct. 28, 1987, Ser. No. 114,417
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 8629186[U]
Int. Cl.[4] B29C *45/66*
U.S. Cl. 425—192 R 6 Claims



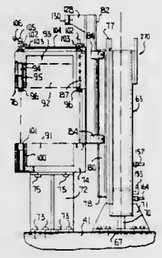
1. In an injection molding machine having a coupling device of the insertion type for coupling lines which supply flowing media to mold halves of a molding tool of the injection molding machine, the injection molding machine including adapter plates for mounting the molding tool, the coupling device comprising first and second coupling members, the first coupling member connected to an adapter plate of the injection molding machine and the second coupling member connected to a mold half of the molding tool, a locking means for fixing the first and second coupling members in an engaged position relative to each other, the locking means being movable between a locking position and a releasing position, a biasing means for biasing the locking means into the locking position, and an electromagnet for moving the locking means against the biasing means from the locking position into the releasing position.

4,786,245

BLOW MOLDING MACHINE

Robert F. Windstrup, Oak Park; Steven A. Bodnar, Harwood Heights, and B. Pershing Larsen, Chicago, all of Ill., assignors to The Continental Group, Inc., Norwalk, Conn.

Division of Ser. No. 103,690, Dec. 14, 1979, Pat. No. 4,650,412.
This application Mar. 13, 1987, Ser. No. 25,633
Int. Cl.[4] B29C *49/56*
U.S. Cl. 425—541 1 Claim



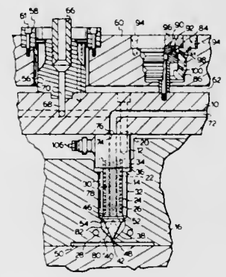
1. In a blow molding machine, a pair of mold holders adapted to have mounted therein mold halves of a mold unit, and means for selectively latching and unlatching said mold holders including at least two locking bolts carried by one of said mold holders at opposite sides thereof, and complementary nuts carried by the other of said mold holders, said locking bolts and said nuts each being formed with partial circumferential thread portions wherein said locking bolts and nuts are first engaged during movement of said mold holders when said respective thread portions of said bolts and nuts are out of alignment with one another and then locked by a partial relative turn of said bolts and nuts effecting complete intermeshing of said thread portions, said partial relative turn being obtained by a cam actuated linkage for simultaneously rotating said bolts, said linkage comprising a shaft portion at one end of each of said bolts and each shaft portion having fixedly secured thereon a lever with said levers being joined by a link, one of said shaft portions being provided with an actuating lever or crank which carries a cam follower for actuation by fixed cams so that said bolts are rotated in unison.

4,786,246

INJECTION MOLDING MULTIPLE NOZZLE VALVE GATING SYSTEM

Jobst U. Gellert, 7A Prince St., Georgetown, Ontario, Canada

Filed Aug. 18, 1987, Ser. No. 86,641
Claims priority, application Canada, Jul. 15, 1987, 542182
The portion of the term of this patent subsequeot to Jun. 2, 2004, has been disclaimed.
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—549 11 Claims



1. In a multi-cavity hot runner injection molding system having a plurality of heated nozzles fixed to a common manifold with a hot runner passage which extends to convey pressurized melt from a molding machine through the manifold and nozzles to a plurality of gates in a cooled cavity plate, the melt passage branching in the manifold from a common inlet to a plurality of outlets, each nozzle having an outer surface and being received in a well with an inner surface in a cavity plate with a space between the outer surface of the nozzle and the inner surface of the well, each nozzle having a rear end fixed to the manifold and a forward end portion with a conical surface leading to a tip which is in alignment with the respective gate, leading to a cavity the improvement wherein:

(a) each nozzle has a melt bore which extends from an inlet at the rear end to at least one outlet on the conical surface of the forward end portion to form part of the hot runner passage, the inlet at the rear end being in alignment with one of the outlets from the manifold,

(b) the manifold and the nozzles are mounted for reciprocal motion according to a predetermined cycle between a closed position in which the tip of each nozzle is seated in a respective gate and a retracted open position,

(c) actuating means are provided to drive the manifold and the nozzles from the open position to the closed position, and

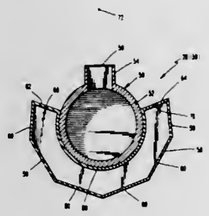
(d) each nozzle has a circumferential sealing and locating flange which extends outwardly to bridge the space between the outer surface of the nozzle and the inner surface of the well to form a melt receiving space around the forward end portion of the nozzle.

4,786,247

METHOD OF LENGTHENING THE FLAME FROM A GAS BURNER

Amal C. Bhattacharjee, Jackson Heights, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 724,533, Apr. 18, 1985, Pat. No. 4,615,895.
This application Jul. 2, 1986, Ser. No. 881,342
Int. Cl.[4] F23C *5/14*
U.S. Cl. 431—8 1 Claim



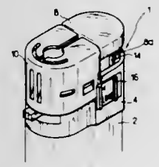
1. A method of lengthening the flame from a gas burner which produces a substantially planar ribbon flame, the method comprising directing two streams of air symmetrically upon the flame from opposed sides thereof inwardly towards the flame, the two streams of air being directed at equal acute angles in the range of from about 10° to about 30° to the plane of the flame, thereby causing the streams of air to impinge upon and lengthen the flame.

4,786,248

GASLIGHTER EQUIPPED WITH A SAFETY LOCK

Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Oct. 21, 1987, Ser. No. 110,906
Int. Cl.[4] F23Q *3/01, 2/16;* F23D *11/36*
U.S. Cl. 431—255 1 Claim



1. A gaslighter comprising: gas storage means having a reentrant space in a top cover; a valve communicating with the gas storage for controlling the flow of gas; an intermediate casing having a protruding part fitted in the reentrant space of the top cover, said intermediate casing having a cross slot opening passing from an interion surface to an exterior surface thereof, a thumb-latch slidably movable in said cross slot opening, the thumb-latch having a head portion adjacent to the interior surface of said intermediate casings, a piezoelectric unit having a movable operating part for generating piezoelectricity, said piezoelectric unit having a top portion and a bottom portion, said bottom portion of said piezoelectric unit being inserted in a hollow interior portion of the protruding part of the intermediate casing and having resilient bias means to resiliently bias said piezoelectric unit outwardly with respect to the hollow interior portion; a thumb-pusher fixed to the top of the piezoelectric unit and slidably fitted in the intermediate casing, said thumb-pusher having an outer surface, said outer surface having a longitudinal groove arranged adjacent and perpendiculr to a portion of the cross slot opening of the intermediate casing, the cross slot opening of the intermediate casing and the longitudinal groove of the thumb-pusher

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being so positioned that when the head portion is displaced to a position in the cross slot opening in alignment with the longitudinal groove the thumb pusher will pass the head portion and move the movable part of the piezoelectric unit against said resilient bias means, and when the thumb-latch is displaced to a different position where the head portion is not aligned with the longitudinal groove the head portion will engage a surface of the thumb-pusher, thereby preventing movement of the thumb-pusher and the movable operating part of the piezoelectric unit; and a linkage connecting the valve with the movable operating part of the piezoelectric unit for opening the valve in response to movement of the movable operating part of the piezoelectric unit by the thumb-pusher.

4,786,249

SPRING HEAT TREATING FURNACE

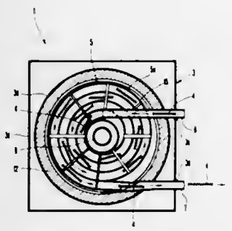
Kazumi Kaji, Osaka, Japan, assignor to Kabushiki Kaisha Asada, Tokyo and Coil Master Kogyo Kabushiki Kaisha, Osaka, both of, Japan, part interest to each

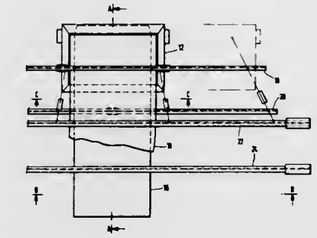
Filed Aug. 13, 1987, Ser. No. 84,992

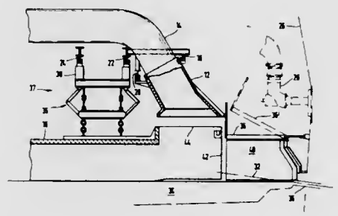
Claims priority, application Japan, Nov. 11, 1986, 61-173836[U]

Int. Cl.⁴ F27B *9/14*

U.S. Cl. 432—121 **10 Claims**







1. A spring heat treating furnace defining a charge port and a discharge port and comprised of:

heating means;

disk-like conveyance means associated with said heating means and defining in a plane a spiral conveyance passageway having a starting end near the center of said passageway and a terminal end at the outermost periphery of said passageway said ends being located generally in the same plane as said passageway, said passageway being associated with said charging port and said discharging port; and

vibrating means for vibrating said passageway, such that untreated springs pass through said charge port to said passageway and are vibrated in a plane along the spiral of said passageway to said discharge port.

4,786,250

INSTALLATION FOR EVACUATING EMANATIONS IN THE TAPHOLE REGION OF SHAFT FURNACES

Arthur W. Cooper, Ancaster, and Carlo M. P. Spedener, Burlington, both of Canada, assignors to Paul Wurth, S.A., Luxembourg, Luxembourg

Filed Nov. 2, 1987, Ser. No. 115,696

Claims priority, application Luxembourg, Nov. 6, 1986, 86.648

Int. Cl.⁴ F27D *1/08*

U.S. Cl. 432—95 **19 Claims**

1. An installation for evacuating emanations in the taphole region of shaft furnaces having a blast connection arrangement around a furnace bosh, together with a blast connection platform for the inspection and servicing of the blast connections, and in which molten metal is periodically tapped with the aid of tapping means and run off through a main tapping spout, further comprising:

a portion of the blast connection platform being tiltable in an upward direction, said tiltable platform portion including opposed vertical side walls which extend vertically downward from two side ends of said platform portion to near the floor, wherein when said tiltable platform portion is in its untilted position, said platform portion together with said vertical side walls form exhaust duct means for the emanations produced in the taphole region;

said installation further comprising;

movable exhaust hood means connected to a stationary suction line; and

mobile tapping spout hood means including an upper surface having a top exhaust opening positioned under said exhaust hood means, said mobile tapping spout hood means further including a lateral end opening, said exhaust duct means communicating with said lateral end opening of said tapping spout hood means, wherein both the emanations produced under the tapping spout hood means and those passing out of said exhaust duct means are drawn off through said top exhaust opening and into said exhaust hood means and said stationary suction line.

4,786,251

DENTAL HANDPIECE AND HIGH SPEED TURBINE ASSEMBLY

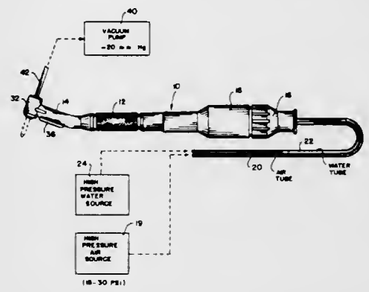
Neil C. Ruegsegger, Torrance, Calif., assignor to James E. Shenberg, Los Angeles, Calif.

Filed Oct. 10, 1986, Ser. No. 917,662

Int. Cl.⁴ A61C *1/05*

U.S. Cl. 433—132 **5 Claims**

1. A dental handpiece comprising: an elongated tubular body; a turbine housing mounted at one end of said tubular body and having an entrance port and an exit port; a rotor rotatably mounted in said housing having a plurality of vanes; means for mounting a dental element on said rotor in coaxial relationship therewith; a source of compressed air; conduit means within said housing; means coupling said conduit means to said source for causing said conduit means to supply compressed air through said entrance port to said vanes to cause said rotor to rotate and impart a driving torque to said dental element; a vacuum pressure source; and means coupling said exit port to said vacuum pressure source for establishing a



vacuum pressure at said exit port so as to increase the torque imparted by said compressed air to said dental element.

4,786,252

ORTHODONTIC APPLIANCE

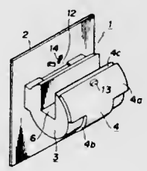
Kinya Fujita, 3998-5, Kamariya-cho, Kanazawa-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation of Ser. No. 711,013, Mar. 12, 1985, Pat. No. 4,655,708. This application Mar. 12, 1987, Ser. No. 25,805

Claims priority, application Japan, Dec. 13, 1984, 59-189449

Int. Cl.⁴ A61L *7/00*

U.S. Cl. 433—10 **5 Claims**



1. An orthodontic appliance wherein a plurality of wire holders is affixed, one to a tooth in a dental patient's mouth, and at least one correcting arch wire is engaged with said wire holders for applying corrective forces to irregular teeth, comprising:

a wire holder having a base for affixiation to a lingual surface of a tooth;

a bracket attached to said base and provided with at least one slot that opens in a direction substantially parallel with the axis of the corresponding affixed tooth for receiving said arch wire therein;

an arch wire locking member rotatably supported along a first portion by said bracket such that in a first predetermined position of said locking member said arch wire may be freely received in said slot or removed therefrom and said locking member has a second predetermined locked position to securely retain said arch wire within said slot; and

locking means integral with said wire holder for positively engaging a second portion of said locking member for secure locking thereof in said second locked position thereby to ensure secure retention of said arch wire in said slot.

4,786,253

DENTAL MODEL ARTICULATOR

Filipe M. L. Morais, Johannesburg, South Africa, assignor to Henneret Properties (Proprietary) Limited, Vereeniging, South Africa

Filed Mar. 9, 1987, Ser. No. 23,720

Int. Cl.⁴ A61C *11/00*

U.S. Cl. 433—60 **9 Claims**



1. A detail model articulator for use with a dental model comprising casts of a set of upper teeth and a set of lower teeth of a person, the articulator including a strip of a flexible material having a region of reduced thickness extending across the strip to divide the strip into two parts, the parts being flexible relative to each other about the region of region thickness; and

an attachment means releasably secured to an end of each part remote from the region of reduced thickness of the strip, each attachment means comprising a substantially spherical member having a spigot-like formation being receivable in a socket at the said end of each part remote from the region of reduced thickness, each attachment means being attachable to one of the casts to enable a user of the articulator to manipulate the casts pivotally and laterally with respect to each other to correlate the casts.

4,786,254

METHOD OF PERMANENTLY RECORDING OCCLUSAL CONTACTS

Philip L. Millstein, 15 Langdon St., Cambridge, Mass. 02138, and Paul Goldberg, 12 Crocker Cir., West Newton, Mass. 02165

Continuation of Ser. No. 829,780, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 715,906, Mar. 25, 1985, abandoned. This application Dec. 31, 1987, Ser. No. 139,949

Int. Cl.⁴ A61C *9/00*

U.S. Cl. 433—71 **2 Claims**

1. A method for permanently documenting an occlusal position comprising:

selecting a light source having an emission range, selecting a photographic film having an exposure range and selecting an impression material having an absorption range wherein the emission range is equal to or included within the absorption range and the exposure range includes some part of the emission range such that micron changes in the thickness of the impression material can result in photographically measurable changes in the percent transmission of light from the light source through the impression material,

forming an impression film of uniform thickness from said impression material, said impression material having flow properties such that the impression material may be displaced at actual and near-occlusal contacts without altering normal occlusion and without altering the density of the material itself when the teeth are brought together upon the material and said impression material having shape-retaining ability at about body temperature and below, said thickness, flow properties and shape-retaining ability allowing said impression material to intra-orally record an occlusal position at virtually unaltered vertical and horizontal dimensions,

placing said impression film intra-orally,

then having the patient make a bite impression into the impression film,

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then removing the impression film from the patient's mouth and,

making a photographic representation of the impression film.

4,786,255

GROUP EDUCATION SYSTEM

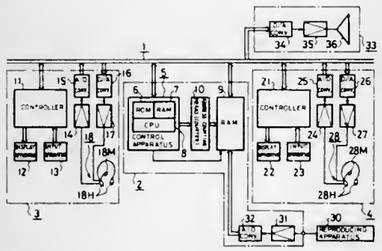
Tamihei Hiramatsu, Kanagawa; Taiji Kitami, Chiba; Tetsuzo Kano; Akira Masuda, both of Kanagawa; Yoshiko Matsushita; Ryuji Suzuki, both of Tokyo; Shigeki Wakatani, and Isao Matsumotn, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,539

Claims priority, application Japan, Jul. 17, 1986, 61-168763

Int. Cl.[4] G09B *5/02*

U.S. Cl. 434—157 **6 Claims**



1. A group education system of the type which selectively records and replays spoken sentences, which are composed of words separated by pauses, wherein the system comprises:

(a) first memory means for storing data representing sentence blocks of a spoken, original sentence group;

(b) second memory means for storing a starting address and an end address of data representing each of said sentence blocks of said original sentence group data stored in said first memory means and data representing pause times between said sentence blocks;

(c) control means for controlling the selection of the order in which said sentence blocks of said original sentence group data are read out from said first memory means and for changing the pause time data stored in said second memory means for one or more selected sentence blocks so as to change the pause time lengths, said control means being connected to said second memory means for selectively reading out the data from said second memory means; and

(d) third memory means, responsive to the control means, for storing the starting address, the end address and the changed pause time data of the one or more sentence blocks selected by said control means.

4,786,256

BURN IN SOCKET FOR FLAT PACK SEMICONDUCTOR PACKAGE

Angelo V. Angeleri, Mesa, and David A. Babow, Scottsdale, both of Ariz., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 3, 1987, Ser. No. 34,303

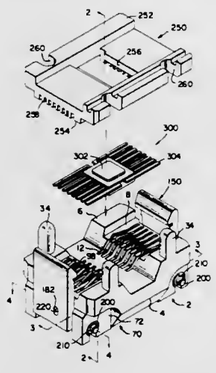
Int. Cl.[4] H01R *13/627, 23/72*

U.S. Cl. 439—72 **12 Claims**

1. An electrical connector for interconnecting a flatpack semiconductor package having a body portion with a plurality of leads extending outwardly therefrom in a common plane, the connector comprising:

an insulative housing member having a package receiving face and a mounting face, a plurality of channels disposed in a side-by-side relationship and opening onto the package receiving face, each channel being defined by a floor, sidewalls and a rear wall, the housing further comprising an aperture in communication with the channels and extending through the mounting face; and

a plurality of terminals disposed within the channels with a tail portion extending through the aperture and beyond the mounting face, each terminal further including a first radius at a corner of the floor and aperture with a first portion of the terminal extending towards the rear wall and adjacent to the floor, the terminal including a second radiused portion adjacent to the rear wall defining a second section of terminal projecting upwardly, the second radiused portion having a cross sectional area greater than the remainder of the terminal causing the second radiused



portion to have a greater moment of inertia about the second radiused portion, and a radiused contact portion extending from the second section of terminal and projecting above the package receiving face of the housing, the contact portion being vertically deflectable downwardly towards the floor, and the increased moment of inertia about the second radiused portion causing a rotation of the terminals within the channels and causing the first portions of the terminals to lift off of the floor, the rotation of the terminals causing the terminals to laterally displace inwardly causing a wiping action between the terminal contact portions and the package leads.

4,786,257

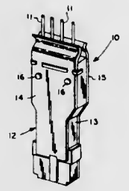
SHIELDED CABLE TERMINATION ASSEMBLY

John N. Tengler, Chico, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 30, 1986, Ser. No. 913,723

Int. Cl.[4] H01R *13/658*

U.S. Cl. 439—76 **34 Claims**



1. A cable termination assembly comprising shielded electrical cable means for transmitting electrical signals, said cable means including at least one wire conductor and an electrical shield therefor, an electrical bus, housing means for supporting therein at least one electrical contact electrically connected to said one wire conductor, and electrical shield means attached to and at least partly surrounding said housing means, said housing means including electrically non-conductive body means molded directly to said cable means, bus and contact to form a unified structure therewith, and said bus having a portion thereof extending externally of said body means and electrically connected to said shield means.

4,786,258

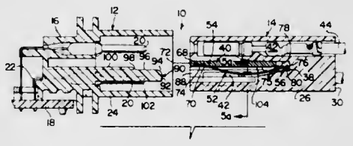
ELECTRICAL CONNECTOR WITH SHUNT

Howard R. Shaffer, Millersburg, and Brent D. Yohn, Newport, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1987, Ser. No. 49,633

Int. Cl.[4] H01R *13/703*

U.S. Cl. 439—188 **19 Claims**



1. An electrical connector assembly comprising first and second connector members, comprising a plug and a receptacle, the first connector member including:

a. first housing means including a mating end,

b. a group of first terminals mounted in said first housing means and including at least one pair of first terminals selected to be commoned, and

c. at least one shunt disposed within said first housing means and including a fixed portion and means securing said fixed portion with in said first housing means at least after assembly of said first connector member along an opening associated therewith extending inwardly from said housing mating end and extending to a said pair of first terminals to be commoned, said at least one shunt associated with a respective said pair of first terminals, each said shunt having a leg section extending into a cam-receiving opening of said first housing means from said fixed shunt portion and including a cam-engageable portion, each said shunt further having a bridging member on said leg section spring biased into engagement with said pair of first terminals across said associated opening to form an electrical commoning connection between the terminals of said pair when said first connector member is at least partially disengaged from said second connector member;

the second connector member including:

d. second housing means adapted to receive said first connector member thereinto during mating,

e. a group of second terminals mounted in said second housing means and engageable with respective said first terminals to form electrical connections when said first and second connector members are mated, and

f. a cam surface associated with each said shunt and adapted to engage during connector mating a said cam-engageable portion of a respective said shunt of said first connector member, whereby upon movement of said first and second connector members together, said first and second terminals engage each other to form electrical connections and said cam surface engages a respective said shunt to deflect said bridging member away from said respective pair of first terminals and break the electrical commoning connection therewith.

4,786,259

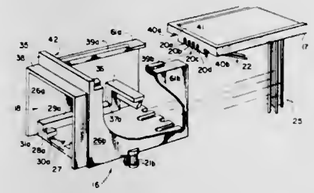
LOW PROFILE MODULAR RECEPTACLE AND METHOD OF MAKING SAME

Roger L. Paul, Conyers, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Feb. 27, 1984, Ser. No. 583,750

Int. Cl.[4] H01R *13/405*

U.S. Cl. 439—344 **6 Claims**



1. A low profile modular receptacle for modular telephone plugs comprising in combination:

a housing comprising a pair of side walls, a bottom plate connected to said side wall, said bottom plate including a plurality of slots in the rear end thereof;

a first transverse support member extending between said side walls and including a portion extending above said side walls;

a second transverse support member extending between said side walls below said first transverse support member and forward of a rear end of a top plate;

said top plate being constructed of an electrical insulating material engaging said first transverse support member and connected to said side walls;

a plurality of longitudinally extending elongated conductors embedded in said top plate so as to be completely surrounded by said insulating material over a substantial portion of the entire length of said top plate and so that said insulating material forming the upper surface of said top plate completely covers said conductors; the rear ends of said plurality of conductors being bent downwardly and engaging said plurality of slots in said bottom plate, said top plate including a plurality of slots below said plurality of conductors characterized by a projection onto said bottom plate substantially equal to said plurality of slots in said bottom plate;

the front ends of said plurality of conductors being bent downwardly and backwardly behind said second transverse support member and being urged against the top of said second transverse support member.

4,786,260

ELECTRICAL CABLE ASSEMBLY

Tedford H. Spaulding, Chicago, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Continuation of Ser. No. 872,583, Jun. 10, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 171,243

Int. Cl.[4] H01R *13/424, 13/648*

U.S. Cl. 439—607 **17 Claims**

1. An electric connector comprising:

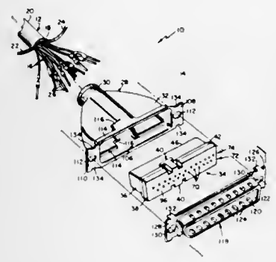
a trough-like dielectric body having a transverse centerline and defining a contact-receiving cavity with an opening disposed in a longitudinal surface of said body and extended across said transverse centerline, said body including an integral array of contact retainer means in said cavity for supporting a corresponding array of electrical terminal contacts in said opening of said cavity;

an elongated dielectric cover means extended over said opening of said cavity and disposed on said surface of said body for forming with said dielectric body a contact-retaining insert having an exterior surface and having a

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transverse centerline coinciding with said transverse centerline of said body, said cover means including an array of aperture means corresponding to said array of contact retainer means and aligned therewith for receiving said array of electrical terminal contacts and maintaining said terminal contacts in predetermined spaced relationship with one another;

first and second dielectric latching and keying means disposed on respective opposing portions of said exterior surface and offset similarly from said transverse centerline



of said insert for orienting said aperture means in said cover means with said contact retainer means in said cavity of said body and for removably securing said cover means to said body; and

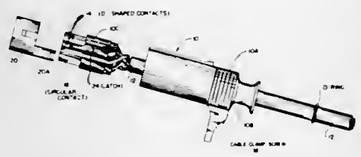
a rigid frame disposed about said exterior surface of said insert and having in opposing sides of said frame respective first and second keyway means aligned with said first and second latching and keying means, respectively, for receiving said first and second latching and keying means and for orienting said array of electrical terminal contacts with respect to said frame.

4,786,261

ELECTRICAL CONNECTOR ASSEMBLY FOR A TRUCK-TRAILER JUMPER CABLE

Phillip M. Ramos, Jr., 16715 Amberwood Way, Cerritos, Calif. 90701

Filed Jan. 20, 1987, Ser. No. 5,147
Int. Cl.[4] H01R *19/28*
U.S. Cl. 439—686 **8 Claims**



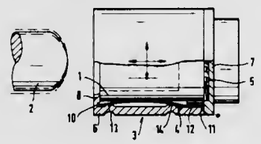
1. An electrical connector for a multiconductor jumper cable comprising: an inner body having a plurality of axially extending channels angularly spaced around the periphery thereof; a plurality of elongated split tubular resilient contacts respectively positioned in said channels having forward portions extending beyond the forward end of said inner body and respectively connected to individual conductors of said cable; a cap having a plurality of axial passages extending therethrough for receiving the forward portions of respective ones of said contacts to separate and insulate said contacts from one another; latch means mounted on said inner body and releasably engaging said cap for removably mounting said cap on said forward end of said inner body in abutting coaxial relationship with the forward end of said inner body; a tubular shaped outer body having an open forward end for receiving said inner body and said cap in coaxial relationship therewith and having an open rear end for receiving the cable; and clamping means mounted adjacent to the open rear end of said outer body for engaging the cable so as to prevent axial movement of said inner body and said cap with respect to said outer body.

4,786,262

ELECTRICAL CONTACT DEVICE

Paul-Rainer Molitor, Muhldorf/Inn, and Bernhard Neumann, Waldkraiburg, both of Fed. Rep. of Germany, assignors to Otto Dunkel GmbH Fabrik fur Elektrotechnische Gerate, Muhldorf/Inn, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,200
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1987, 3704873
Int. Cl.[4] H01R *13/187*
U.S. Cl. 439—843 **9 Claims**



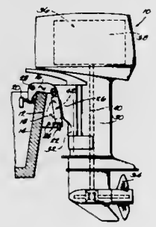
1. An electrical contact device for transmitting high electric current, comprised of a cylindrical contact pin and a spring-loaded contact jack for receiving the pin, wherein a plurality of essentially axially parallel spring-loaded contact elements extend axially on a cylindrical inner wall of the jack; characterized in that, in order to create a conduction path with high tolerances between the contact pin and contact spring jack, the jack is provided with intermediate spring contact elements with spring-loading both axially and radially between it and an outer sleeve body in which said jack is mounted.

4,786,263

MARINE PROPULSION DEVICE POWER TILT AND TRIM MECHANISM

Scott N. Burmeister, Gurnee; Roger B. Whipple, Waukegan; Martin J. Mondek, Wonder Lake, and Duane W. Harris, Lake Villa, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 1, 1987, Ser. No. 103,507
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—53 **14 Claims**



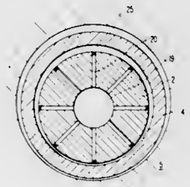
14. A marine propulsion device comprising a transom bracket adapted to be fixedly mounted on the transom of a boat, said transom bracket having mounted thereon a tilt pin and including means permitting selective location of said tilt pin in a plurality of fixed positions relative to said transom bracket, a swivel bracket mounted on said transom bracket for pivotal movement relative thereto about a generally horizontal tilt axis, a propulsion unit mounted on said swivel bracket for pivotal movement relative thereto about a generally vertical steering axis and for common movement with said swivel bracket about said tilt axis, said propulsion unit including a rotatably mounted propeller shaft, and a power head drivingly connected to said propeller shaft, an extendible and contractable linkage including a first link having therein a bore receiving said tilt pin and a second link connected to said first link for telescopic movement relative thereto and connected to one of said swivel bracket and said propulsion unit for relative pivotal movement therebetween, and means for selectively and alternatively extending and contracting said linkage.

4,786,264

STERN TUBE BEARING SYSTEM OF CONTRA-ROTATING PROPELLER

Sadao Asanabe; Kunio Saki; Susumu Matsumoto; Susumu Taniguchi; Shozo Morohoshi, and Masatoshi Koda, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1986, Ser. No. 926,623
Claims priority, application Japan, Nov. 8, 1985, 60-250471; Apr. 4, 1986, 61-50694[U]
Int. Cl.[4] B63H *23/34*
U.S. Cl. 440—83 **7 Claims**



1. A stern tube bearing system in a contra-rotating propeller device of the type in which an inner shaft having a rear propeller and an outer shaft having a front propeller are rotated in opposite directions, said stern tube bearing system comprising

the inner shaft having a substantially central longitudinal bore therein for supplying pressurized oil therethrough; and

a plurality of oil supply holes extending from said longitudinal bore to the outer surface of said inner shaft, and opening thereat, said plurality of oil supply holes being spaced radially around said inner shaft and being spaced longitudinally along said inner shaft, said plurality of oil supply holes directing the pressurized oil supplied into said longitudinal bore outwardly of said inner shaft for establishing an oil bearing film adjacent the outer surface of said inner shaft.

4,786,265

MARINE ENGINE EXHAUST MUFFLER

Victor B. Porter, Decatur, Ind., assignor to Thunderbird Products Corporation, Decatur, Ind.

Continuation-in-part of Ser. No. 887,343, Jul. 21, 1986, Pat. No. 4,744,778. This application May 4, 1987, Ser. No. 46,298
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] B63H *21/32*
U.S. Cl. 440—89 **8 Claims**

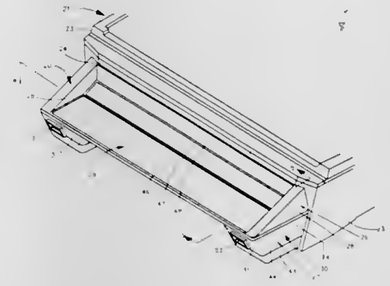
1. An outboard exhaust muffler for a motorboat having an exhaust pipe through which exhaust is emitted through the transom above the water line at the stern, which comprises:

an enclosed housing extending across the stern of the boat over the exhaust pipe into which the exhaust is emitted, the housing being attached to the transom and extending aft of the transom and aft of the boat, the space within the enclosed housing defining muffler means for reducing the noise of the exhaust, the housing comprising:

a pair of sidewalls each adjacent to one of the sides of the boat extending aft of the transom;

a top extending between the two sidewalls above the exhaust pipe;

a bottom extending between the two sidewalls below the exhaust pipe;



a rear wall extending from the top to the bottom between the two sidewalls, the rear wall having an exhaust port through which the exhaust leaves the enclosed housing; and

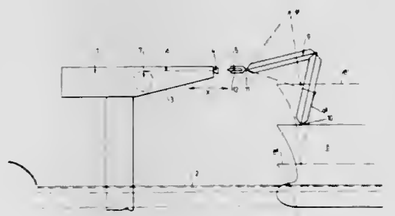
a baffle extending vertically downwardly from the top to the water line within the enclosed housing, the exhaust from the exhaust pipe being directed downwardly beneath the bottom of the baffle and out the exhaust port.

4,786,266

OPEN SEA TRANSFER OF FLUIDS

John W. Fozard; Nigel J. Came; Dennis J. Mottram, and Heinz E. Frick, all of Surrey, United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Jul. 16, 1986, Ser. No. 886,220
Claims priority, application United Kingdom, Jul. 17, 1985, 8518001
Int. Cl.[4] B63B *22/02*
U.S. Cl. 441—5 **10 Claims**



1. An arrangement for effecting open sea transfer of fluid (e.g. oil or gas) from a platform to a receiver vessel, comprising:

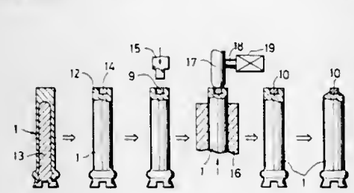
interconnection means through which fluid flow can take place, said interconnection means comprising two parts, a probe and a probe receiver, being capable of engagement or disengagement on relative fore and aft movement;

one said part of the interconnection means being mounted initially upon the platform, the other said part being car-

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ried by an at least partially space-stabilised gantry means mounted upon the receiver vessel;
one said part of the interconnection means being mounted by releasable anchorage means and having extendible hose means for passing fluid to and from said interconnection means connected thereto and such that said hose means is extendible when said anchorage means is released;
the other said part of the interconnection means having non-extendible hose means connected thereto for passing fluid from and to said interconnection means;
the arrangement being such that the receiver vessel can be temporarily placed in an engagement position adjacent to the platform and the two said parts of the interconnection means so aligned that engagement can be effected, and subsequently, the vessel can be moved away from the platform to a more convenient position, releasing said anchorage means, permitting the two said parts of the interconnection means to remain engaged and the extendible hose means to be paid-out accordingly to allow fluid transfer.

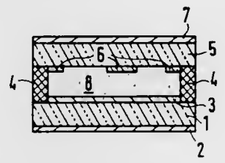
4,786,267
SPARK PLUG
Akihiro Toya; Takashi Yamaguchi; Junichi Kagawa, and Kazunori Yokota, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan
Division of Ser. No. 863,506, May 15, 1986, Pat. No. 4,743,793.
This application Feb. 24, 1988, Ser. No. 159,607
Claims priority, application Japan, Mar. 28, 1986, 61-68545
Int. Cl.[4] H01T *21/02*; B23K *20/10*
U.S. Cl. 445—7 **5 Claims**



1. A method of producing a spark plug having at least one center electrode and at least one ground electrode spaced apart from and opposed thereto and defining a gap therebetween for causing a spark discharge to occur across said gap, comprising the steps of:
providing noble metal powder;
applying said powder to a discharge-related surface area of at least one of said center and ground electrodes; and thereafter
bonding said noble metal powder ultrasonically into said at least one of said center and ground electrodes.

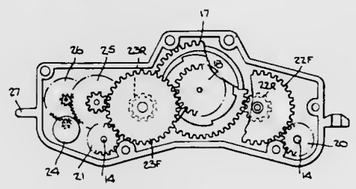
4,786,268
LIQUID-CRYSTAL DISPLAY MANUFACTURING METHOD
Rolf Zoodler, and Jurgen Pottharst, both of Stuttgart, Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany
Filed Sep. 11, 1986, Ser. No. 906,115
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1985, 35324486
Int. Cl.[4] G02F *1/13*
U.S. Cl. 445—25 **6 Claims**

1. A method of manufacturing a liquid-crystal display containing liquid-crystal material between two substrates comprising:
(a) providing a suitably prepared first substrate;
(b) printing a predetermined two-dimensional pattern of unencapsulated liquid-crystal material having a predetermined temperature onto said first substrate, said predetermined temperature being selected to provide an optimal viscosity for printing;
(c) covering said liquid-crystal material with a suitably prepared second substrate; and



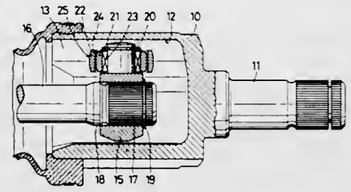
(d) sealing the region between said first and second substrates containing said two-dimensional pattern of liquid-crystal material.

4,786,269
FOUR-WHEEL DRIVE TOY VEHICLE
Dietmar Nagel, Chester, N.J.; Melvin R. Kennedy, Hampton Bays, N.Y., and Avi Arad, Westport, Conn., assignors to Lewco Toys, Ltd., New York, N.Y.
Filed Nov. 30, 1982, Ser. No. 445,507
Int. Cl.[4] A63H *29/00*
U.S. Cl. 446—464 **4 Claims**



1. A four-wheel drive toy vehicle capable of negotiating hills and other obstacles, said vehicle comprising:
A. a chassis to support a vehicle body, said chassis having front and rear axles extending thereacross whose ends have wheels attached thereto, each axis having a drive pinion thereon;
B. a spiral spring motor mounted within the chassis at a position intermediate the axles, said motor having an input gear coupled to the spring through a one-way clutch whereby winding takes place only when the input gear is turned counterclockwise, and an output gear which turns clockwise when the spring winds, said input and output gears lying on a common axis parallel to the axles;
C. first and second dual-section coupling gears on opposite sides of the motor for operatively linking the front and rear axle pinions to the input and output gears, the first dual-section coupling gear having a shaft parallel to said front axle and the second dual-section coupling gear having a shaft parallel to said rear axle, each dual section coupling gear having a front section intercoupling the associated pinion with the input gear and a rear section engaging the output gear whereby when the vehicle is pulled back on the ground by a player to travel in the reverse direction, the pinions then turn counterclockwise to cause the input gear to turn counterclockwise to wind the motor; and when the vehicle is released, the output gear turns clockwise to cause the pinions to turn clockwise to drive the vehicle in the forward direction; and
D. a governor operatively coupled by a gear train to one of said pinions to regulate the speed of rotation of the output gear and prevent rapid unwinding of the spring.

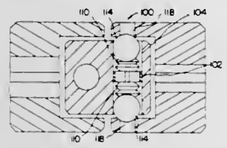
4,786,270
HOMOKINETIC TRIPOD JOINT
Keiji Iwasaki, Yokohama, Japan, assignor to NTN Toyo Bearing Co., Ltd., Osaka, Japan
Filed May 6, 1987, Ser. No. 46,322
Claims priority, application Japan, Sep. 17, 1986, 61-142402[U]; Jan. 31, 1987, 62-21613
Int. Cl.[4] F16D *3/20*
U.S. Cl. 464—111 **4 Claims**



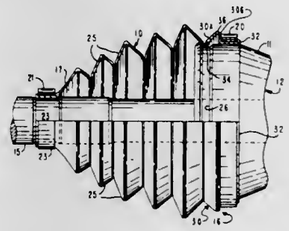
1. A homokinetic tripod joint comprising:
an outer member formed in its inner surface with three track grooves extending axially and equally angularly spaced around its axis, each of said track grooves being formed at each side thereof with a guide surface extending in the direction of the axis of said outer member;
a tripod member having three trunnions projecting radially and equally angularly spaced around its axis, said tripod member being mounted in said outer member with said trunnions received in said respective track grooves in said outer member;
an inside ring mounted on each said trunnion and having a spherical outer periphery;
a plurality of rolling elements mounted between said trunnion and said inside ring;
an outside ring mounted on said inside ring and guided by a guide surface of said respective track groove and having an outer periphery in contact with said guide surface and a cylindrical inner periphery; and
means for preventing said inside ring from sliding axially on said trunnion;
said inside ring and said outside ring rolling around said trunnion in contact with each other between said spherical outer periphery of said inside ring and said cylindrical inner periphery of said outside ring with said outside ring being guided by said guide surface formed on said outer member in a direction parallel with the axis of said outer member.

4,786,271
COUPLING FOR END-TO-END ROTATABLE SHAFTS
Pavel M. Menn, Eight Maverick Ct., Marblehead, Mass. 01945
Continuation of Ser. No. 794,167, Nov. 1, 1985, abandoned. This application May 19, 1987, Ser. No. 54,067
Int. Cl.[4] F16D *3/26, 3/50*
U.S. Cl. 464—140 **14 Claims**

8. A coupling between two end-to-end rotatable shaft means for transmitting torque, said coupling comprising:
an intermediate, torque-transmitting member disposed between and loosely related in male-to-female relationship with each of said shaft means, said intermediate member serving as one portion and the respective shaft means serving as the other portion of a pair of male-to-female joints spaced apart along the axis of said intermediate member, said female joints having an inner walls;
cross bores disposed in the male portion of the respective joint and a translatable device disposed in each of the cross bores, said translatable device comprising end member and spring means therebetween for biasing said end members, each of said translatable devices extending entirely through the male portion of its respective joint and having said end members heated in torque-transmitting relationship upon formations in the inner wall of a female portion of the joint;
each of said translatable devices being perpendicular to the axis of the male portion and lying in a plane perpendicular to the plane of the other of said translatable devices;
the end members of each of said translatable devices being free to move simultaneously in unison in one direction or the other relative to said male portion, unrestrainedly, in said bores on a translational axis relative to the male portion of the joint in which it resides in response to lateral motion of the female portion of said joint upon which said end members are seated, and the male and female portions of each of said joints being free to pivot relative to each other about said translational axis of the translatable device associated with said joint;
whereby, in the event of misalignment between said rotatable shafts, said intermediate member can undergo a free nutating motion, transmitting torque between said two shafts without transmitting side-loads therebetween.



4,786,272
RETENTION OF BOOT ON CV JOINT ASSEMBLY
W. Howard Baker, Hartsville, Tenn., assignor to Precision Rubber Products Corporation, Lebanan, Tenn.
Continuation-in-part of Ser. No. 007,709, Jan. 28, 1987, abandoned. This application Aug. 27, 1987, Ser. No. 90,186
Int. Cl.[4] F16D *3/84*
U.S. Cl. 464—175 **4 Claims**



1. An improved blow-molded convoluted, bellows-shaped boot for use with constant velocity joints and adapted to form a direct attachment to an annular recess formed in an outer surface of the body of a constant velocity joint, comprising:
said boot having an annular convolution adjacent an end thereof,
said convolution having an inside radius proportioned to be received in said recess, said boot further having a clamping extension extending axially of said convolution adapted to overlie the body of said constant velocity joint adjacent said recess and proportioned to receive an encircling clamp thereover, and integral hinge means connecting said inside radius to said clamping extension.

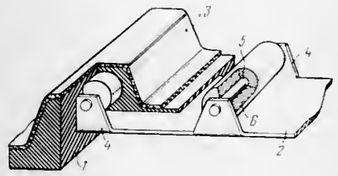
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,273

COGGED BELT WITH REINFORCING MEMBERS

Valery V. Guskov; Gennady G. Kozachevsky; Vladimir P. Boikov; Oleg I. Molodan; Svetlana I. Sizova, and Petr P. Kasperovich, all of Minsk, U.S.S.R., assignors to Belorussky Politekhnichesky Institut, Minsk, U.S.S.R.

PCT No. PCT/SU85/00077, § 371 Date May 11, 1987, § 102(e) Date May 11, 1987, PCT Pub. No. WO87/01778, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 19, 1985, Ser. No. 82,864
Int. Cl.[4] F16G *1/08*
U.S. Cl. 474—268 3 Claims



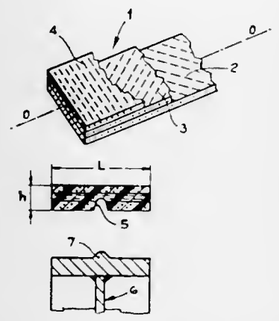
1. A cogged belt comprising an elastic base which incorporated a carrying element in the form of a strip with crimped lugs and inserts for reinforcing cogs of the belt, and which are connected to the strip by the lugs, wherein the lugs are arranged at outer opposite sides of the strip transversely aligned with the cogs and interconnected by respective pins and wherein the respective inserts are mounted on the respective pins.

4,786,274

FLEXIBLE BELT AND ITS ASSOCIATED TRANSMISSION

Edoardo Robecchi, and Renato Dell'Orto, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Apr. 27, 1987, Ser. No. 42,737
Claims priority, application Italy, May 21, 1986, 20510 A/86
Int. Cl.[4] F16G *1/10*
U.S. Cl. 474—263 12 Claims



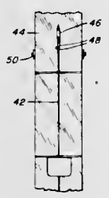
1. Flexible and elastically stretchable belt made from an elastomeric material, adapted for being mounted around at least two pulleys, upon whose outer surfaces there are exchanged frictional forces for transmitting motion, said belt comprising an annular body delimited by two outer base surfaces and by two lateral sides, with at least one of the said base surfaces being active for the exchange of said frictional forces, and with both of the said lateral sides being inactive for the exchange of said frictional forces, said belt comprising at least one group of three layers with discontinuous fibers embedded therein, with one of these layers having fibers directed transversely with respect to the longitudinal direction of the belt, the other two layers having fibers whose direction is inclined and opposed to one another with respect to the longitudinal direction of the belt, the angle of inclination of the fibers of said other two layers relative to the said longitudinal direction being at most 45°, the modulus of rigidity under tensile stress of said other two layers with said inclined fibers, measured in the longitudinal direction of the belt, being equal to each other, the three said layers being directly in contact respectively with one another with said annular body being devoid of any continuous, longiform and inextensible elements and the modulus of rigidity, under the tensile stress, measured in the longitudinal direction of the belt, being uniform over the entire transversal section of the annular body, whereby said belt, subjected to elastic stretching between the two pulleys, has equal tractional states on the different layers of the entire thickness and remains always in a state of traction, before, during and after the winding on the pulleys.

4,786,275

METHOD OF FORMING A COMPARTMENTED BAG

Gregory A. Hoover, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Continuation-in-part of Ser. No. 906,456, Sep. 16, 1986, Pat. No. 4,696,403. This application May 1, 1987, Ser. No. 44,545
Int. Cl.[4] B31B *23/18, 27/64*
U.S. Cl. 493—194 2 Claims



1. A method of forming a severable compartmented T-shirt bag from a tubular web comprising a pair of continuous overlying lengths of web material, said method comprising the steps of longitudinally heat welding the lengths of web material together centrally therealong to define a compartment to each side of the heat welding with each compartment having a side edge seam formed along the edge thereof by the heat welding, said heat welding including slitting the lengths of web material between said compartments and the formed seams thereof and defining heat sealed edges along said seams, forming a line of severance along and between said seams for selective separating of the compartments into separate units, said severance line being formed by reengaging said seams along said heat sealed edges prior to a cooling thereof to form a tack joinder therebetween; and including the steps of transversely seaming said lengths of web material into individual bag units and forming a central cutout area for each bag unit, to define a bag mouth with a handle to each side of said severance line.

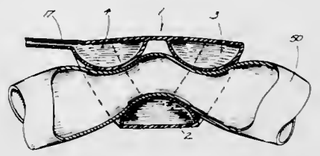
4,786,276

TRIPLE CUSHION SPHINCTERIC WEB

Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Jul. 1, 1987, Ser. No. 68,421
Int. Cl.[4] A61B *19/00*
U.S. Cl. 600—31 10 Claims

1. A prosthetic sphincter to surround a passage of the human anatomy for treating incontinence by restricting the movement of material through said passage, said sphincter comprising a plurality of inflatable pressure cushions, each of said cushions located along said sphincter so as to be spaced from one another in a direction corresponding to the longitudinal axis of the passage to be restricted, and means for supplying fluid to said cushions for causing an inflation thereof, said sphincter being arranged with said passage such that an inflation of said cushions causes forces to be applied to said passage in respective planes which are aligned transversely to the longitudinal



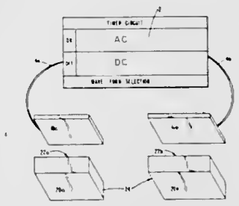
axis of said passage, with no two forces being applied to said passage in the same plane, so as to establish a deflection of said passage to thereby restrict the movement of material therethrough.

4,786,277

ELECTRODES, ELECTRODE ASSEMBLIES, METHODS, AND SYSTEMS FOR TISSUE STIMULATION

Whitney R. Powers, Topsfield, Mass., and Henry Sisun, Pawtucket, R.I., assignors to Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 935,057, Nov. 21, 1986, Pat. No. 4,702,732, which is a continuation of Ser. No. 685,425, Dec. 24, 1984, abandoned. This application Jul. 24, 1987, Ser. No. 77,706
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 18 Claims



2. An active electrode comprising:
a source of energy;
a hydrophilic porous polymeric matrix which supports a confluent aqueous phase and has an initial ohmic resistance not greater than 500 ohms per square inch in the absence of electrically conductive salt solutions above 1.0% in concentration; and
means for conveying said energy from said source to said polymeric matrix.

4,786,278

THERAPEUTIC DEVICE FOR IONTOPHORESING CATION AND ANION

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Dec. 10, 1986, Ser. No. 940,046
Claims priority, application Japan, Dec. 14, 1985, 60-281514
Int. Cl.[4] A61N *1/30*
U.S. Cl. 604—20 3 Claims

1. A therapeutic device for iontophoresing both cations and anions, comprising:
a power source including a power switch, said power source being for electrifying the device;
a first electrode containing an ionized medicament for acting as an active electrode when in use;
a second electrode for acting as a dispersive electrode when in use;
means for oscillating a low-frequency current in which an ac current is superposed on a dc current, said oscillating means having output terminals connected with said first and second electrodes for supplying said low-frequency current via said first and second electrodes and medicament to the head of a user; and
means for switching the output polarity of said oscillating means in association with OFF/ON operation of said power switch, said switching means being provided between said oscillating means and said first and second electrodes, said switching means comprising:
a magnet,



a pair of yokes provided at opposite ends of said magnet,
a pair of coil members provided around the ends of the yokes,
a piece of magnetic body movably provided between the yokes,
means for alternately electrifying the coil members in association with the OFF/ON operation of the power switch, and
a set of electrical contacts openable and closeable in association with the movement of the piece of magnetic body, said electrical contacts being connected with said first and second electrodes in such manner that the polarity of said first and second electrodes is alternately reversed whenever the OFF/ON operation of the power switch is effected.

4,786,279

CONTAINER FOR MIXTURE OF MATERIALS

Kenneth E. Wilkinson, Round Lake; Kenneth H. Knox, Vernon Hills; Marc T. Hedlund, Gurnee, and Mark E. Larkin, Lindenburst, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

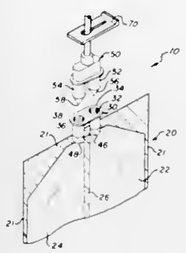
Filed Jul. 31, 1986, Ser. No. 891,099
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—88 12 Claims

1. A container system for mixing two materials, comprising:
a container including first and second compartments;
said first compartment adapted to hold a first material, said first compartment having a first port;
said second compartment adapted to hold a second material, said second compartment having a second port adjacent said first port; and
mixing chamber means having two inlet ports, an outlet and a mixing chamber, each mixing chamber port being connectable to one of said compartment ports;
said mixing chamber comprising a single structure carrying both of said inlet ports and holding said inlet ports in spaced relationship to each other corresponding in distance to the distance between the two compartment ports;
said mixing chamber ports comprising piercing pins with passages therethrough, and wherein said first and second

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compartment ports include pierceable membranes to be pierced by said piercing pins;

whereby said inlet ports can be simultaneously connected to



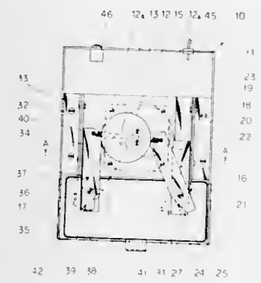
said first and second compartment ports, allowing the materials to flow from said compartment, mix in said mixing chamber, and emerge in a mixed condition from said mixing chamber outlet.

4,786,280

DESTRUCTION APPARATUS FOR SYRINGE

Taichi Maeda, 9-2, Kiyomizu 1 chome, Kokurakitaku, Kitakyu-shu-shi, Fukuoka, Japan

Filed May 12, 1987, Ser. No. 48,693
Int. Cl.[4] A61M *5/00*; B26F *3/00*; B65H *35/00*
U.S. Cl. 604—110 **3 Claims**



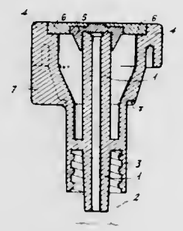
1. A syringe destruction apparatus including a cam plate disposed in a casing and rotated by a motor rotating at a low speed, and a syringe needle shearing section and a barrel breaking section which are driven by the said cam plate, characterized in that the said syringe needle shearing section comprises a movable blade having a shaft part in sliding contact with one side of the said cam plates, a stationary blade paired with the movable blade and a guide part formed in the stationary blade, for guiding a syringe needle, and the said barrel breaking section comprises a movable blade having a shaft part in sliding contact with the other side of the said cam plate and a stationary blade paired with the said movable blade, thereby the movable blades in the said syringe needle shearing section and said barrel breaking section alternately carry out reciprocating rotation in association with the rotation of the said cam plate.

4,786,281

DEVICE FOR CONNECTING ONE END OF A LIQUID MEDICAMENT DELIVERY CANNULA TO AN APPARATUS FOR CONNECTING A SYRINGE TO A VIAL CONTAINING THE MEDICAMENT

Luigi Valentini, Milan, and Mario Coccia, Cesano Boscone, both of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jun. 30, 1986, Ser. No. 879,886
Claims priority, application Italy, Aug. 2, 1985, 21857 A/85
Int. Cl.[4] A61M *5/005*
U.S. Cl. 604—256 **4 Claims**



1. A device for connecting one end of a liquid medicament delivery cannula to an apparatus for connecting a syringe to a vial containing a medicament, comprising:

an elongate annular structure having two ends;

a tubular element positioned inside said annular structure and extending between said ends;

appendix means at one of said ends for attachment of a cannula;

a projecting collar extending radially outward from the other of said ends of said annular structure;

an elastic stopper covering an end of said tubular element at said other end of said annular structure; and

at least three separate fins extending radially outwardly from said annular structure and extending longitudinally from said collar toward said one end, the entirety of a radially outer edge of each of said fins being substantially aligned with a radially outer edge of said collar,

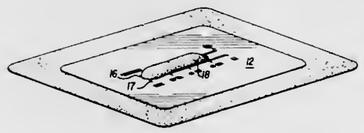
whereby said apparatus for connecting a syringe to a vial may be fitted on said collar and said fins with a cylindrical portion of said apparatus complementarily guided by contact with said collar and said fins.

4,786,282

BANDAGE FOR THE TOPICAL ADMINISTRATION OF CONTROLLED AMOUNTS OF NITROGLYCERIN OINTMENT

Sudhakar S. Wagle, Mequon; George R. Felt, Brown Deer, and Herbert W. Borleis, Brookfield, all of Wis., assignors to Adria Laboratories, Dublin, Ohio

Continuation of Ser. No. 705,771, Feb. 26, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 26,495
Int. Cl.[4] A61F *13/00*; A61L *15/00*
U.S. Cl. 604—307 **3 Claims**



1. A laminated medicinal bandage for the continuous administration of controlled quantities of ointment, such as nitroglycerin, to the skin or mucosa and consisting of two layers:

(a) the first layer comprising a backing sheet member having oppositely facing surfaces and predetermined perimeter dimensions and having a layer of adhesive on one of said surfaces thereof;

(b) the second layer comprising:

1. an internal backing sheet member having predetermined perimeter dimensions less than those of said backing sheet member and having a calibrated scale on one surface thereof for accurate measurement of an ointment dosage applied thereto and adapted for contacting the skin, the surface of said internal backing sheet member opposite said one surface thereof being secured by said adhesive layer on said one surface of said backing sheet member in a position thereon such that an annular portion of said adhesive layer on said one surface of said backing sheet member extends about the perimeter of said internal backing sheet member between the respective perimeters of said internal backing sheet member and said first layer; and

2. an annular releasable backing layer covering said annular portion of said adhesive layer and surrounding the perimeter of said internal backing sheet member, said releasable backing layer and said internal backing sheet member being in the same plane and composed of the same material;

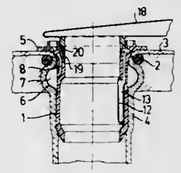
(c) whereby said annular releasable backing layer may be removed and said bandage, with the ointment on said surface of said internal backing sheet member, secured in place on the skin by said annular portion of said adhesive on said one surface of said backing sheet member.

4,786,283

FIXING DEVICE FOR STOMY BAG

Sivert Andersson, Strängnäs, Sweden, assignor to Futuraprodukter HB, Strängnäs, Sweden

PCT No. PCT/SE85/00476, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/03192, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 21, 1985, Ser. No. 83,739
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—328 **4 Claims**



1. A device for fixing a stomy bag to a person having an intestine end opening through an artificial opening provided in the person's outer skin at a site where the intestine end is sewn perimetrically about the opening, to the person's outer skin, said device comprising:

a tubular body having an inner end and an outer end, an outer peripheral sidewall and an inner peripheral sidewall; a radially outwardly extending annular flange provided externally on said tubular body adjacent said outer end, whereby said tubular body may be axially inserted within the intestine, inner end first, into said intestine end through said artificial opening, until said flange abuts said outer skin;

a counter-holding ring adapted to be received in circumferentially surrounding relation to said intestine end beneath the person's outer skin, so that as the inner end of the tubular body is telescoped into the intestine end through said artificial opening, the intestine end becomes radially trapped between the outer peripheral sidewall of the tubular body and the counter-holding ring, and the person's outer skin becomes axially trapped between said annular flange and the counter-holding ring;

means providing an externally-bulgeable, flexible-walled annular cavity means on said outer peripheral sidewall of said tubular body at an axially intermediate location near said outer end, whereby, after said counter-holding ring and said tubular body have been installed in relation to the person's intestine end and outer skin, said cavity means may be inflated and thereby externally bulged for radially outwardly distending a portion of the persons' intestine and axially behind the counter-holding ring for locking the tubular body in place against axially outward detelescoping movement;

one-way valved channel means opening outwardly through said annular flange at a socket and communicating axially and radially through said tubular body with said cavity means for permitting deflatable inflation of said cavity means; and

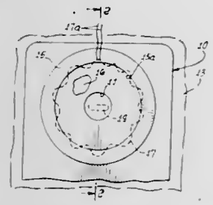
lug means provided on said annular flange so that an externally-worn stomy bag may be removably mounted to the outer end of the tubular body.

4,786,284

DISCONNECTIBLE SECTION OSTOMY APPLIANCE

Arthur L. Silber, 543 Dobbins Dr., San Gabriel, Calif. 91775

Filed Mar. 3, 1986, Ser. No. 835,782
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—342 **9 Claims**



9. In a disconnectible section ostomy appliance, the combination comprising:

(a) a receptacle for body waste discharge,

(b) a first support strip connected to said receptacle,

(c) a second support strip carrying an adhesive which can be pressed onto an area proximate an ostomy orifice in the body for passing said body discharge,

(d) and a releasable attachment interconnecting said first and second strips, so that the receptacle is positioned to receive waste discharge from said ostomy orifice, the attachment being manually manipulatable to free the connection between said strips, whereby the first strip and receptacle are liftable away from the skin without restriction imposed by said adhesive,

(e) said second strip having a perimeter and said first strip extending peripherally of said second strip perimeter, said second strip defining a through opening to pass the waste discharge from said orifice to the receptacle,

(f) the receptacle having an entrance in registration with said second strip through opening,

(g) said attachment comprising stitching extending peripherally about said second strip and interconnecting the strips, and spaced from said opening.

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4,786,285

OSTOMY APPLIANCE AND COUPLING RING ASSEMBLY THEREFOR

Ferenc Jambor, Gurnee, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Dec. 18, 1986, Ser. No. 943,130
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—342 7 Claims



1. An ostomy appliance including a pouch having a stoma opening; an adhesive faceplate having an aperture alignable with said opening; and a coupling ring assembly detachably joining said pouch and faceplate together; said coupling ring assembly including a pouch ring secured to said pouch about said opening and a faceplate ring secured to said faceplate about said aperture; said rings being formed of flexible plastic material each having an annular wall extending about a central opening; wherein the improvement comprises each of said rings having a generally C-shaped portion, when viewed in radial cross-section, defining an axially-facing channel; the C-shaped portion of one of said rings being nested and retained within the channel of the other of said rings when said rings are coupled together, with said one ring constituting an inner ring and said other ring constituting an outer ring in said nested relationship; said outer ring, when viewed in radial cross-section, having an inner surface that is smoothly curved in the shape of an incomplete circle; said inner ring, when viewed in radial cross-section, having an undulating outer surface providing a plurality of circumferential ridges that face inwardly and outwardly in generally opposite radial directions and define circumferential grooves therebetween; said ridges sealingly engaging said inner surface along generally radially opposite sides of said inner ring so that said grooves form circumferentially-extending fluid-isolating reservoirs when said rings are coupled together.

4,786,286

FLUID TRANSFER SYSTEM

David E. Cerny, Crystal Lake, and David V. Bacehowski, Wildwood, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 705,572, Feb. 26, 1985, abandoned. This application Mar. 23, 1986, Ser. No. 868,202
Int. Cl.[4] A61B 19/00
U.S. Cl. 604—406 5 Claims

4. A modular, sealed fluid transfer system assemblable into a selected configuration in response to applied radiant energy comprising:

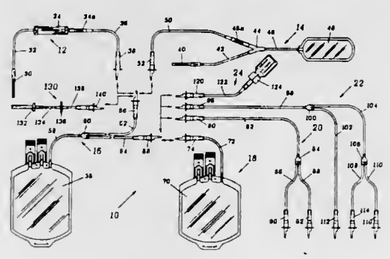
a first flexible container module with integrally attached first and second tubing members, each said tubing member having a free end, first and second shaped, non-piercing plastic connector means, each said connector means coupled to a respective one of said first and said second free ends;

a fluid inflow module selected from a class including

(a) a filter module with a tubular conduit having first and second ends, a piercing needle in fluid flow communication with said first end, a fluid filter element carried by said conduit and a third, shaped, non-piercing plastic connector means coupled to said second end; and

(b) an anticoagulant containing module with tubular conduit flow means having first and second ends, a piercing needle in fluid flow communication with said first end, an anticoagulanat container carried by said conduit flow means, and shaped non-piercing plastic connector means coupled to said second end;

a fluid outflow module selected from a class including



(c) a vial module including a fluid containing vial and a fluid flow conduit with first and second ends, said vial coupled to said first end of said conduit, said second end carrying fourth shaped, non-piercing plastic connector means;

(d) multibranch transfer conduit flow means having an initial conduit member with first and second ends, as well as secondary and tertiary conduit members each with first and second ends, said initial conduit member coupled to said secondary and tertiary conduit members at respective of said second ends, shaped non-piercing plastic connector means coupled to each said first end; and

(e) a fluid receiving container module carrying non-piercing plastic connector means;

said first connector means slidably engageable with connector means associated with said fluid inflow module so as to form a sealed fluid flow path between said connector means in response to applied radiant energy; and

said second connector means slidably engageable with connector means associated with said fluid outflow module so as to form a sealed fluid flow path between said connector means in response to applied radiant energy.

4,786,287

PROCESS FOR DECREASING RESIDUAL ALDEHYDE LEVELS IN IMPLANTABLE BIOPROSTHETIC TISSUE

Aws S. Nashef, Costa Mesa, and Ronald Dieck, Irvine, both of Calif., assignors to Baxter Travenol Laboratories, Deerfield, Ill.

Filed Oct. 10, 1986, Ser. No. 917,503
Int. Cl.[4] C14C 3/32
U.S. Cl. 8—94.21 32 Claims

1. A method for decreasing residual tissue-fixing or tissue-sterilizing aldehyde levels in an implantable biological tissure previously contacted with said tissue-fixing or tissue-sterilizing aldehyde, comprising contacting said tissue with a rinsing solution to effect difusion of said aldehyde out of said tissue into said rinsing solution, said rinsing solution being water, saline or a buffered solution, and continuously or periodically contacting the rinsing solution with an aldehyde-reactive amine which is immobilized on a solid support, thus decreasing the concentration of said aldehyde in said rinsing solution and causing further diffusion of aldehyde out of said tissue.

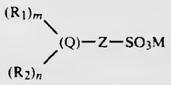
4,786,288

FABRIC TREATING METHOD TO GIVE SHARP COLORED PATTERNS

Nobuyoshi Handa; Yutaka Masuda, and Teruo Nakamura, all of Otsu, Japan, assignors to Toray Industries Incorporated, Japan

Continuation of Ser. No. 887,134, Jul. 17, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 171,156
Claims priority, application Japan, Oct. 7, 1983, 58-18689; Jun. 18, 1984, 59-123823; Oct. 1, 1984, 59-204103
Int. Cl.[4] B41M 1/30; D06P 1/52; B41J 3/04
U.S. Cl. 8—495 3 Claims

1. A method for treating fabrics comprising pretreating a fabirc with a mateiral (B), said material (B) selected from the group consisting of a soluble salt of barium, calcium or potassium and a cationic compound selected from the group consisting of polyamines, amine salts and quaternary ammonium salts and applying, by ink jet or spray, a treating solution to said pretreated fabric whereby said material (B) is coagulated, said treating solution containing water, a water-insoluble dyestuff or pigment and a material (A), said material (A) selected from the group consisting of a copolyester and a dispersant, said copolyester having a molecular weight of 2,000 to 10,000 formed by the copolymerization of a dicarboxylic acid, said dicarboxylic acid selected from the group consisting of terephthalic acid, isophthalic acid and mixtures thereof, a diol, said diol selected from the group consisting of ethylene glycol, diethylene glycol, butylene glycol and mixtures thereof and a bifunctional monomer, said bifunctional monomer selected from the group consisting of sodium salts of sulfoisophthalic acid, sodium salts of sulfoterephthalic acid, sodium salts of sulfophthalic acid and sodium salts of 4-sulfonaphthalene-2,7-dicarboxylic acid, said dispersnat havign a molecular weight of 350 to less than 2,000, represented by the formula



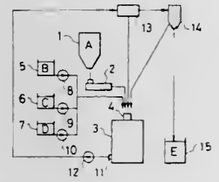
where Q is at least one aromatic ring, said aromatic ring selected from the group consisting of a benzene ring and a naphthalene ring; R_1 is an aromatic ring-containing group; R_2 is lower alkyl or halogen; Z is a divalent alkylene ether or a derivative thereof; M is ammonium, amine or a monovalent metal; m is an integer of 2 to 5; and n is 0 or an integer of 1 to 3.

4,786,289

PROCESS FOR PRODUCING A COAL-WATER SLURRY

Kazunori Shoji, Kure; Hirofumi Kikkawa, Hiroshima; Hiroshi Takezaki, and Yoshinori Ohtani, both of Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 781,011, Sep. 27, 1985, abandoned. This application Feb. 12, 1988, Ser. No. 158,070
Claims priority, application Japan, Sep. 28, 1984, 59-203761
Int. Cl.[4] C10L 1/32
U.S. Cl. 44—51 21 Claims



1. A process for producing a coal-water slurry, which comprises wet-grinding coal by means of a wet vertical ring-roll mill and recycling a part of the coal ground by the mill, as it is, without classifying it, to the mill through a splitter and discharging the coal-water slurry.

4,786,290

QUICK STARTING PACKAGE

Douglas B. Wyer, P.O. Box 2008, Jenks, Okla. 74037

Continuation-in-part of Ser. No. 48,023, May 11, 1987, abandoned. This application Oct. 13, 1987, Ser. No. 107,054
Int. Cl.[4] C10L 11/06, 5/00
U.S. Cl. 44—519 6 Claims

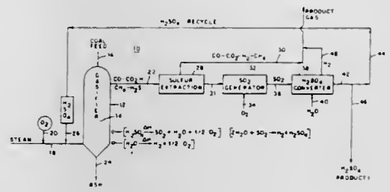
1. A burnable charcoal package comprising an outer package of burnable material containing a plurality of pieces of charcoal therein and an elongated burnable plastic container within the outer package below the pieces of charcoal, the elongated plastic container including a quantity of gel consisting of burnable material, an elongated fuse attached to the plastic container for the full length thereof and having an end portion projecting outwardly beyond the end of the plastic container, the arrangement of the plastic container in the package being such that the end of the fuse projects outwardly from the package itself.

4,786,291

METHOD FOR INCREASING STEAM DECOMPOSITION IN A COAL GASIFICATION PROCESS

Marvin W. Wilson, Fairview, W. Va., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Mar. 23, 1987, Ser. No. 28,921
Int. Cl.[4] C10J 3/00
U.S. Cl. 48—202 6 Claims



1. A method for the gasification of coal in the presence of

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steam and a combustion supporting medium at a temperature less than about 2300° F., comprising the steps of heating coal in a gasifier in the presence of a combustion supporting medium and steam to a temperature less than about 2300° F. and sufficient to effect gasification of the coal and thermal decomposition of a first portion of the steam for producing oxygen and hydrogen, and introducing a sufficient amount of sulfuric acid as a water splitting agent into the gasifier for the thermochemical decomposition thereof while thermally decomposing said first portion of the steam for increasing by a factor of at least two the percent of steam thermally decomposable in the gasifier without the introduction of the sulfuric acid.

4,786,292

MICROCRYSTALLINE ABRASIVE MATERIAL AND METHOD OF MANUFACTURE

Peter Janz; Herwig Winkler, both of Klagenfurt, and Georg Gottschamel, Treibach, all of Austria, assignors to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria

Filed May 15, 1987, Ser. No. 49,924
Claims priority, application Austria, Jun. 3, 1986, 1503/86
Int. Cl.⁴ B24D *3/00*
U.S. Cl. 51—293 **19 Claims**

1. A method of manufacturing a sintered, microcrystalline α-Al_2O_3 abrasive material having a purity of at least 98.5% and a density of at least 95% of theoretical density, the α-Al_2O_3 crystallites of the material being smaller than 4μ, which comprises the steps of

(a) preparing a mixture of finely milled, calcined alumina and 1 to 60%, by weight, of a highly dispersable α-aluminum oxide monohydrate,

(b) reacting said mixture with water and an acid,

(c) homogenizing the reacted mixture until a formable mass has been obtained,

(d) forming the mass into shaped bodies, and

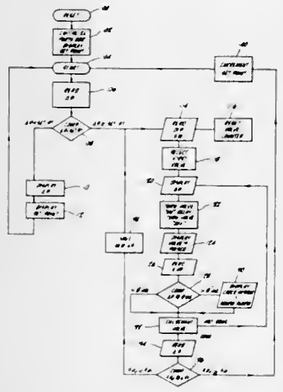
(e) sintering the shaped bodies for 5 minutes to 2 hours at a temperature between 1300° C. and 1700° C.

4,786,293

SMART CONTROLLER FOR REVERSE PULSE AIR FILTER

Paul A. Labadie, Redondo Beach, Calif., assignor to Farr Company, El Segundo, Calif.

Filed Oct. 8, 1987, Ser. No. 106,138
Int. Cl.⁴ B01D *46/04*
U.S. Cl. 55—21 **8 Claims**



1. A gas filter cleaning system comprising:

a housing,

a plurality of filter means disposed within said housing and adapted to remove particulate matter from a gas forced through said filter means in a forward direction;

a corresponding plurality of reverse pulse means disposed within said housing and aligned with said filter means for causing a pressurized gas to flow through said filter means in a reverse direction and remove particulate matter accumulated on said filter means;

pressure sensing means operatively connected to said housing for measuring a pressure differential across said filter means when said gas is forced through said filter means in a forward direction and for generating a pressure differential value; and

control means operatively connected to said pressue sensing means for receiving said pressure differential value and operatively connected to said reverse pulse means for activating one or more of said reverse pulse means, said control means including means for storing a reference set point therein, means for comparing said pressure differential value to said referece set point, means for activating one or more of said reverse pulse means when said pressure differential value approximately equals or is greater than said reference set point thereby causing a cleaning cycle wherein one or more of said filter means are cleaned, means for comparing the pressure differential value generated by said pressure sensing means prior to said cleaning cycle with a pressure differential value generated by said pressure sensing means following said cleaning cycle, means for increasing said reference set point in said storage means by a predetermined amount upon the pressure differential value generated after said cleaning cycle being equal to or greater than the pressure differential value generated prior to said cleaning cycle and means for reactivating said one or more of said reverse pulse means upon the pressure differential value generated after said cleaning cycle being less than the pressure differential value generated prior to said cleaning cycle.

7. A method of controlling the cleaning cycle of filter elements in an air filtration system of the pulse jet type comprising the following steps:

(a) monitoring a pressure differential across the filter elements;

(b) activating a cleaning cycle when the pressure differential across the filter elements equals or exceeds a reference set point;

(c) increasing the reference set point by a predetermined amount to a larger value if the pressure differential across said filter elements after said cleaning cycle is greater than or equal to the pressure differential prior to said cleaning cycle and activating another cleaning cycle when the pressure differential across the filter elements equals or exceeds the larger value of the reference set point; or

(d) activating another cleaning cycle if the pressure differential following said cleaning cycle is less than the pressure differential prior to said cleaning cycle; and

(e) repeating the aforesaid steps.

4,786,294

INTEGRATED GAS PURIFICATION AND THERMAL CONDITIONING SYSTEM UTILIZING MOLECULAR SIEVE ADSORPTION

Michel A. Jonqueres, Torrance, and Robert J. Kay, Redondo Beach, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 21, 1987, Ser. No. 135,872
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—28 **24 Claims**

1. A method for purifying and thermally conditioning airflow to an aircraft cabin, comprising the steps of:

bleeding a fresh airflow from an aircraft engine; cooling the fresh airflow to a desired temperature; delivering the cooled fresh airflow to the aircraft cabin;

delivering a first portion of return airflow being returned from the aircraft cabin to a molecular sieve adsorption bed for removal of CO_2 therefrom, to produce a purified airflow;

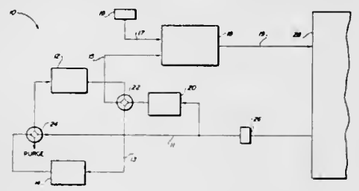
mixing the purified airflow with the fresh airflow being delivered to the aircraft cabin;

heating a second portion of airflow being returned from the aircraft cabin;

delivering the heated second portion of return airflow to the molecular sieve bed for desorption of CO_2 from said bed to regenerate the latter; and

selectively alternating flow of the first portion and second portions of return airflow to said molecular sieve bed to cycle adsorption and desorption of CO_2 in said bed.

2. A gas purification and thermal conditioning system for



removal of an impurity from and temperature control of a gas mixture in a confined area, comprising:

an adsorption/desorption bed;

a cooling pack, said cooling pack cooling the gas mixture for maintaining the mixture generally at a desired temperature within the confined area, said pack heating the gas mixture for enhanced desorption of the impurity from said bed;

means for transmitting the gas mixture to said bed for adsorption and desorption;

means for transmitting the gas mixture to said cooling pack for heating and cooling of the gas mixture;

means for selectively alternating flow of heated gas mixture from said pack and cooled gas mixture from said pack into said bed in order to cycle adsorption and desorption of the impurity as desired.

4,786,295

FILTRATION DEVICE FOR AIRBORNE CONTAMINANTS

Eugene E. Newman, Maple Shade; Anthony Natale, Mt. Holly, and Thomas Natale, Moorestown, all of N.J., assignors to GPAC, Inc., Maple Shade, N.J.

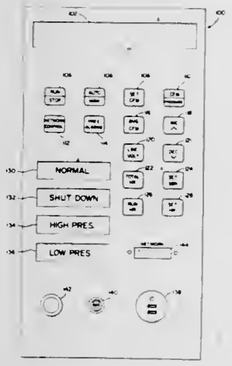
Filed Oct. 1, 1987, Ser. No. 103,477
Int. Cl.⁴ B01D *46/00*
U.S. Cl. 55—213 **16 Claims**

1. In a filtration device for filtering airborne contaminents, such as airborne asbestos fibers, from the air, said filtration device including a housing having an inlet for receiving contaminated air and an outlet for expelling filtered air outside the housing, a filter means within said housing including a HEPA filter in sealed communication across said inlet, a blower means within said housing for drawing air through said filter means and for expelling the filtered air through the outlet to the outside of the housing, the improvement comprising,

piezoelectric pressure sensing means for sensing the differential air pressure within said housing, downsteam of said filter means, from the air pressure outside of the housing, and for providing an electrical output signal indicative of the differential air pressure,

processing means for reading the differential air pressure output signal, determining the air flow rate through said housing based upon the differential air pressure output signal, calculating the average air flow rate through said housing during an operative period of the filtration unit blower means, timing an operative period of the filtration unit blower means, and for providing differential air pressure, air flow rate, average air flow rate, and operative time period information to an alphanumeric display means;

alphanumeric display means for visually displaying information processed and provided by said processing means;



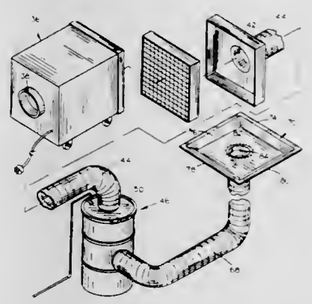
manual control input means for selectively controlling the processing means to provide differential air pressure, air flow rate, average air flow rate, and operative time period information to said alphanumeric display means.

4,786,296

APPARATUS FOR USE IN ASBESTOS REMOVAL

Steven C. Griffis, 2929 Avenue D, Council Bluffs, Iowa 51501

Filed Jun. 23, 1987, Ser. No. 65,871
Int. Cl.⁴ B01D *45/06, 47/02*
U.S. Cl. 55—248 **2 Claims**



1. A system for removing dangerous solid materials from an enclosed area within a building, said system comprising: wall means defining said enclosed area;

said enclosed area having at least one air inlet formed therein to permit air to enter said enclosed area;

said wall means having at least one air outlet formed therein to permit air to exit said enclosed area;

a negative air filtration means located within said enclosed area;

said filtration means having an air inlet and an air outlet;

said air outlet of said filtration means being in communication with the air outlet in said wall means;

a trap means in said enclosed area having an inlet end and an outlet end and a baffle means therebetween;

a predetermined amount of collection fluid in the bottom of said trap means;

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said trap means comprising an upstanding cylinder having upper and lower ends, said air outlet end being formed in the upper end of said cylindrical member, said air inlet end being formed in the side wall of said cylindrical member, said baffle means extending downwardly and laterally from the upper end of said cylindrical member between said air inlet end and said air outlet end and terminating at a point above the lower end of said cylindrical member, for directing solid materials into the collection fluid;

said trap means further including means for supplying collection fluid to the interior of said trap means;

a first flexible conduit connecting said outlet end of said trap means with the air inlet of said filtration means;

a second flexible conduit connected to the air inlet end of said trap means and extending therefrom;

a collector means at the other end of said second conduit means;

said collector means comprising a collector pan means;

and means for drawing air through said collector means, through said second conduit means, through said trap means, thence through said first conduit means and thence into said filtration means whereby airborne solid materials in the vicinity of said collector pan will be drawn thereinto and into said trap means for at least partial collection in the water in said trap means.

4,786,297

GAS SUPPLY AND DISTRIBUTION SYSTEM

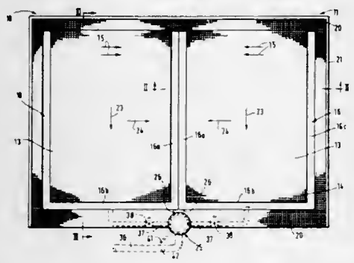
Hans-Gerd Gethke, Auf der Höhe 4, D-5107 Steckenborn; Detlef Eitner, Grünenthal 12, D-5100 Aachen, and Friedel Engelhard, Aiselsfeld 7, D-5204 Lohmar 21, all of Fed. Rep. of Germany

Filed Mar. 20, 1987, Ser. No. 28,417

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634377

Int. Cl.⁴ B01D *47/00*

U.S. Cl. 55—259 **18 Claims**



1. A gas supply and distribution system comprising a gas distribution plate upon which is adapted to be placed bulk material, a plurality of gas ducts extending through said gas distribution plate, a plurality of exit apertures in said gas ducts through which gas exits said gas ducts and enters the bulk material, a collecting channel, said gas ducts being in fluid communication with said collecting channel, an inlet chamber, a first raw gas inlet line for introducing raw gas into said inlet chamber, a second raw gas inlet line between said inlet chamber and said collecting channel for conducting raw gas from said inlet chamber to said collecting channel, means for forming a reservoir for liquid in said inlet chamber, spray means in said inlet chamber having spray nozzles disposed above said reservoir means for wetting the raw gas in the inlet chamber by utilizing the reservoir liquid, and pump means in said reservoir connected by a conduit to said spray nozzles for pumping the reservoir liquid thereto.

4,786,298

FILTER ASSEMBLY

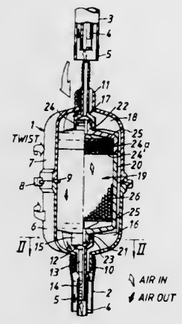
Colin T. Billiet, Durham; David Baggett, Newcastle-upon-Tyne, and Alan Bateman, Biddick Washington, all of England, assignors to Domnick Hunter Filters Limited, Birtley, England

Filed Sep. 18, 1987, Ser. No. 98,291

Claims priority, application United Kingdom, Sep. 20, 1986, 8622706

Int. Cl.⁴ B01D *50/00*

U.S. Cl. 55—269 **9 Claims**



1. A filter assembly comprising

a fluid-tight housing,

a first coupling means on the housing providing a first inlet channel into the housing and a first outlet channel from the housing, said first inlet channel and first outlet channel being adjacent to each other,

a second coupling means on the housing providing a second inlet channel into the housing and a second outlet channel from the housing, said second inlet channel and second outlet channel being adjacent to each other,

a filter element having a fluid-tight external wall, a filter inlet, a filter outlet, and filter means mounted within said external wall in a flow passage between the filter inlet and the filter outlet,

means mounting said filter element within said housing in a location so as to define an unobstructed free space between an outer surface of said external wall of said filter element and an inner surface of said housing,

means connecting said first inlet channel to said filter inlet and means connecting said filter outlet to said second outlet channel to establish a first flow path from the first inlet channel through the filter means to the second outlet channel,

the second inlet channel and the first outlet channel being arranged in direct open communication with the unobstructed free space to establish a second flow path through the housing, said second flow path being unobstructed and being wholly separate from and closed off from communication with the first flow path.

4,786,299

VACUUM LOADER WITH SILENCER BASE

Thomas E. DeMarco, 5815 N. Cicero Ave., Chicago, Ill. 60646

Continuation-in-part of Ser. No. 868,695, May 30, 1985, Pat. No. 4,718,924. This application Mar. 10, 1987, Ser. No. 24,019

Int. Cl.⁴ B01D *46/04*

U.S. Cl. 55—276 **19 Claims**

1. A muffler assembly, comprising:

a silencer base comprising a support housing;

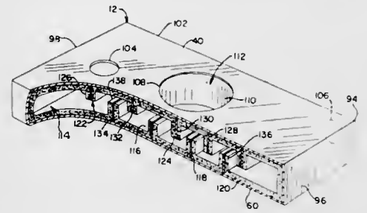
said housing defining an inlet port and an outlet port; and having

an internal composite sound attenuating chamber;

said composite sound attenuating chamber having a channel

communicating with the ports for varying the direction and substantially reducing the noise of gases passing through said channel; and

said composite sound attenuating chamber having an acoustical inner core substantially covered by an external outer



shell, said acoustical inner core comprising a series of offset cantilevered acoustical metal baffles, and said external outer shell comprising sound insulating and absorbing material substantially covering said baffles for dampening the noise of said gases passing through said channel.

4,786,300

AIR CONDITIONER

Masao Uematsu, Fujinomiya, and Yasuo Asakura, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

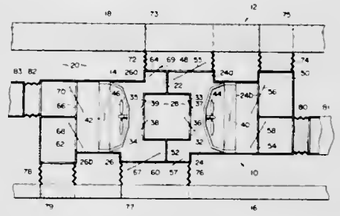
Filed Jul. 20, 1984, Ser. No. 632,654

Claims priority, application Japan, Jul. 20, 1983, 58-132626

The portion of the term of this patent subsequent to Feb. 22, 2003, has been disclaimed.

Int. Cl.⁴ F25D *23/12*

U.S. Cl. 62—259.1 **8 Claims**



1. An air conditioner for installation in a building having a plurality of stories comprising:

a housing which is adapted to be built in a space defined between the ceiling of a first lower story and the floor of a second upper story lying above said first story, and is provided with a first suction port and a first ejection port both communicating with the upper story through the floor thereof and a second suction port and a second ejection port both communicating with the lower story through the ceiling thereof;

a refrigeration cycle system provided with a condensation heat exchanger and an evaporation heat exchanger which are arranged in the housing;

a first blower, which is built near tne condensation heat exchanger in the housing, for conducting the air of the upper story into the housing through the first suction port, and discharging the air into the upper story through the condensation heat exchanger and the first ejection port;

a second blower, which is arranged near the evaporation heat exchanger in the housing, for conducting the air of the lower story into the housing through the second suction port, and discharging the air passing through the evaporation heat exchanger into the lower story through the second ejection port; and

valve means arranged in the first suction and ejection ports and second suction and ejection ports to selectively open the ports.

4,786,301

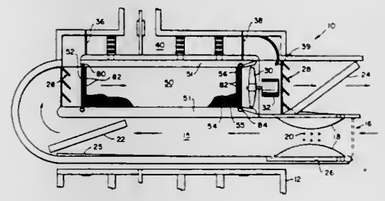
DESICCANT AIR CONDITIONING SYSTEM

Barry V. Rhodes, Route 1, Box 92, Chickamauga, Ga. 30707

Continuation of Ser. No. 750,932, Jul. 1, 1985, abandoned. This applicatioo Aug. 10, 1987, Ser. No. 85,321

Int. Cl.⁴ F25D *23/00*

U.S. Cl. 62—271 **26 Claims**



1. An improved desiccant air conditioning system comprising:

a heat exchanging desiccant bed comprising desiccant material surfaces defining air passageways through the bed for contacting air in an air flow established through the air passageways with the desiccant material surfaces, and heat transfer liquid circulating channels in heat exchange relationship with the desiccant bed for removing heat energy from the desiccant bed and for adding heat energy too the desiccant bed;

said desiccant bed comprising parallel plates having heat conducting surfaces and porous desiccant material granules in the granular size range of approximately 1/32 to ¼ inch (0.08 to 0.65 cm) in diameter, intimately bonded to the heat conducting surfaces by an adhesive bonding layer, with the major portion of said granules being exposed for contacting air in the air passageways;

moisturizing means operatively positioned upstream from the desiccant bed in the air flow of air to be conditioned for moisturizing and cooling air to be conditioned to substantially 100% relative humidity before entering the air passageways of the desiccant bed for enhanced and more efficient utilization of the desiccant bed in conditioning and cooling the air.

4,786,302

METHOD OF PREPARING TUBULAR SILICA GLASS

Haruo Osafune; Sadao Kanbe; Teiichiro Mori, and Masahisa Ikejiri, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 782,333, Oct. 1, 1985, Pat. No. 4,680,045. This application Jul. 13, 1987, Ser. No. 72,503

Claims priority, application Japan, Oct. 4, 1984, 59-208917; Feb. 13, 1985, 60-26002

Int. Cl.⁴ C03B *37/023*

U.S. Cl. 65—3.11 **29 Claims**

1. A method of preparing tubular silica glass, comprising;

preparing a sol of a metal alkoxide hydrolyzed with an acid catalyst;

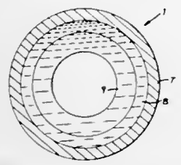
adding ultrafine particles of silica to the sol to yield a sol solution;

placing the sol solution into a cylindrical container;

placing a liquid having a specific gravity higher than the specific gravity of the sol solution into the cylindrical container, said liquid having a higher specific gravity being immiscible with the sol solution, does not dissolve

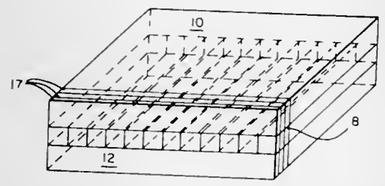
VOL 1096 ISS 4 NO 22 1988 UMI

the sol solution and in which the sol solution does not dissolve;
gelling the sol solution by rotating the container about the cylindrical axis to form a tubular wet gel;



drying the tubular wet gel to a dry gel; and,
sintering the dry gel to yield tubular silica glass.

4,786,303
METHOD OF FABRICATING A GLASS NOZZLE ARRAY FOR AN INKJET PRINTER
Marco Padalino, Dallas County, Tex., assignor to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.
Continuation of Ser. No. 006,773, Jan. 27, 1987, abandoned. This application Apr. 13, 1987, Ser. No. 37,413
Int. Cl.[4] C03B *23/207*
U.S. Cl. 65—4.21 **19 Claims**



1. A method of fabricating a multiple glass nozzle array wafer for use in an inkjet printing apparatus comprising the steps of
forming an assembly comprising a plurality of cored glass fibers along a row for use as nozzles in said nozzle array, and a plurality of solid glass fibers for defining the distance along said row between centers of said nozzles in said nozzle array, all of said fibers having the same softening temperature and coefficient of expansion,
applying uniform pressure to all sides of said assembly,
heating the assembly to a temperature sufficient to soften the glass and fuse the fibers together,
gradually cool the assembly,
cutting the assembly into thin nozzle wafers, and
mounting said thin nozzle wafer in a housing for said inkjet printer.

4,786,304
COMPOSITE MOLDING PROCESS
Otis Y. Chen, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Aug. 10, 1987, Ser. No. 83,348
Int. Cl.[4] C03C *25/00;* **B32B** *5/02*
U.S. Cl. 65—18.1 **2 Claims**

1. A method of making hollow, fiber reinforced glass matrix composite article comprising aligning high temperature stable fibers in a mold cavity in a shape of a hollow composite article preform, heating a billet of high temperature stable glass matrix material above its flow point, transferring the thus heated matrix material into the mold cavity and around the fibers using pressure, cooling the fiber reinforced matrix material to form a hollow composite article, wherein the improvement comprises introducing the matrix material into the mold cavity from at least one point both inside the hollow article preform



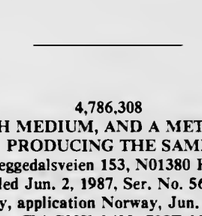
and at the relative midpoint along the vertical axis of the article, resulting in improved article tolerance control and minimized article preform distortion.

4,786,305
HEAT TREATMENT OF FLAT PHOTOCHROMIC SHEET GLASS
Edith M. Ball, Addison; Patricia A. Drake, Big Flats, and David J. Kerko, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Aug. 3, 1987, Ser. No. 80,903
Int. Cl.[4] C03C *4/06*
U.S. Cl. 65—30.11 **8 Claims**

1. A method for heat treating a sheet of potentially photochromic glass to effect the in situ growth of silver halide crystals which impart photochromic properties to the glass, wherein the heat treated sheet of glass exhibiting photochromic properties will be essentially free from thermal deformation and surface defects, and the photochromic properties will be essentially uniform throughout the area of the sheet, which comprises the steps of:
(a) placing a sheet of potentially photochromic glass having a thickness of about 0.5–3 mm atop a carrier sheet of silica-based refractory glass having a thickness of about 1–5 mm and exhibiting a softening point at least 50° C. higher than the temperature at which said potentially photochromic glass is to be heat treated to effect in situ growth of silver halide crystals;
(b) exposing the stacked glass sheets to a temperature and for a period of time sufficient to effect adequate in situ growth of silver halide crystals in said potentially photochromic glass sheet to impart photochromic properties to the glass; and then
(c) removing said photochromic glass sheet from atop said carrier sheet to provide said heat treated sheet of glass exhibiting photochromic properties which are uniform throught the entire sheet, with the heat treated glass being essentially free from thermal deformation and surface defects.

4,786,306
INDIVIDUAL SECTION GLASS FORMING MACHINE
Steven J. Pinkerton, Ridgefield, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed Feb. 5, 1988, Ser. No. 152,694
Int. Cl.[4] C03B *11/16*
U.S. Cl. 65—163 **3 Claims**

1. A multi-gob individual section, glass forming machine comprising
a plurality of parison mold assemblies each including a plunger displaceable from a retracted position to a fully inserted position,
means for displacing each plunger from said retracted to said fully inserted position, said plungers advancing to a parison formation point where the mold cavity has become completely full and then to the fully inserted position as the formed parison cools,
means for starting said displacing means at a predetermined time,



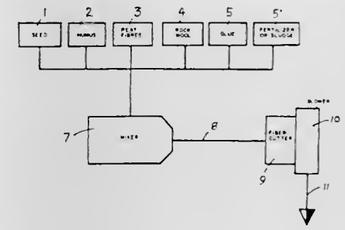
means for sensing the actual position of each of said plungers throughout at least the last portion of its displacement which includes the parison formation point,
means for determining when each plunger, during said portion of its displacement, is located at said parison formation point and for issuing a parison formation point signal, and
means for offsetting the start times of said starting means to synchronize the parison formation points of said plungers.

4,786,307
CHELATED PLANT NUTRIENTS
John R. Maribart, Fresno, Calif., assignor to Pacific Micro Minerals, Inc., Fresno, Calif.
Filed Mar. 23, 1987, Ser. No. 29,500
Int. Cl.[4] C05F *11/02;* **C05G** *3/00*
U.S. Cl. 71—11 **20 Claims**

1. A method for preparing a chelated micronutrient composition suitable for use as a plant nutrient, said method comprising:
obtaining a fulvic acid substantially free from humic acid by extracting a leonardite ore with a chelant at a pH above about 2.5;
combining the acid extract with a cationic metal salt in the presence of a hydroxy acid and/or a hydroxy acid salt to form a reaction mixture, and
combining a sufficient amount of anhydrous ammonia with the reaction mixture to adjust the pH to the range from about 7.5 to 9.

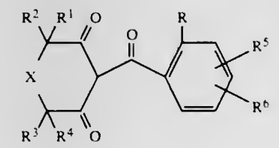
4,786,308
GROWTH MEDIUM, AND A METHOD FOR PRODUCING THE SAME
Knut Colling, Heggedalsveien 153, N01380 Heggedal, Norway
Filed Jun. 2, 1987, Ser. No. 56,639
Claims priority, application Norway, Jun. 2, 1986, 862182
Int. Cl.[4] C09K *3/00;* **C05F** *11/02*
U.S. Cl. 71—24 **6 Claims**

1. A method for providing a growth medium for grass and other plants, comprising the steps of:
mixing long rockwool fiber and vegetable fibers intimately in a dry state until spheres are formed, said spheres containing said materials in an essentially homogenous mixture, cutting said spheres to form a cut medium, and air jetting the cut medium to a destination.



4,786,309
CERTAIN SUBSTITUTED 4-BENZOYL-3,5-DIOXOTETRAHYDROPYRANS AND THIOPYRANS
Charles G. Carter, San Francisco, and Jeff K. Curtis, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.
Division of Ser. No. 872,080, Jun. 9, 1986, Pat. No. 4,728,745. This application Nov. 13, 1987, Ser. No. 119,883
Int. Cl.[4] A01N *43/02*
U.S. Cl. 71—88 **16 Claims**

1. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein
X is oxygen, sulfur or sulfonyl;
R is halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; nitro; cyano; C_1–C_2 haloalkyl; or R^aSO_m— wherein m is 0 or 2 and R^a is C_1–C_2 alkyl;
R^1 is hydrogen or C_1–C_4 alkyl;
R^2 is hydrogen or C_1–C_4 alkyl; or
R^1 and R^2 together are alkylene having 2 to 5 carbon atoms;
R^3 is hydrogen or C_1–C_4 alkyl;
R^4 is hydrogen or C_1–C_4 alkyl; or
R^3 and R^4 together are alkylene having 2 to 5 carbon atoms; and
R^5 and R^6 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy;; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) R^eC-(O)— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined and their salts.

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4,786,310

BENZOTHIAZOLYLAZOLIDINES, AND THEIR PRODUCTION AND USE

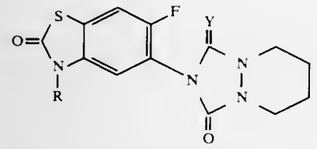
Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Kouichi Morita, and Ryo Sato, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Claims priority, application Japan, Jan. 6, 1986, 61-1172; Mar. 17, 1986, 61-59035

Int. Cl.[4] **C07D** *487/04;* **A01N** *43/90*

U.S. Cl. 71—90 **9 Claims**

1. A compound of the formula:



wherein R is a C_1-C_5 alkyl group, a C_3-C_5 alkenyl group, a C_3-C_5 alkynyl group or a C_1-C_3 alkoxy (C_1-C_3) alkyl group, and Y is a sulfur or an oxygen atom.

4,786,311

HERBICIDAL SULFONAMIDES

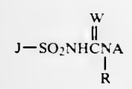
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 934,118, Nov. 24, 1986, Pat. No. 4,746,353, which is a continuation-in-part of Ser. No. 849,618, Apr. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 739,214, May 30, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 114,584

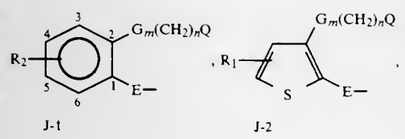
Int. Cl.[4] **C07D** *401/14, 403/14;* **A01N** *43/66, 43/68*

U.S. Cl. 71—90 **83 Claims**

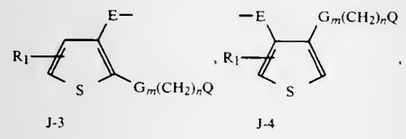
1. A compound of the formula:



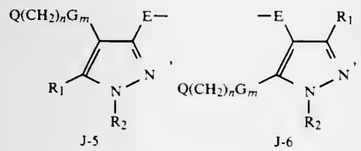
wherein
J is



J-1 J-2

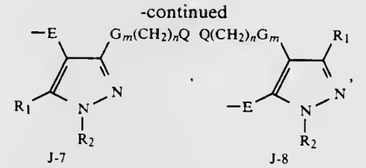


J-3 J-4

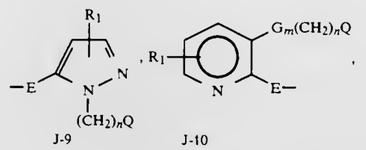


J-5 J-6

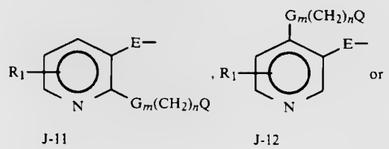
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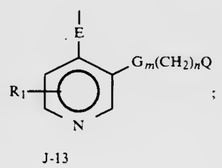
J-7 J-8



J-9 J-10

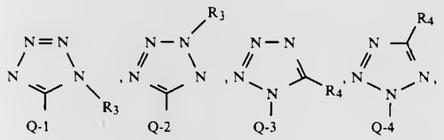


J-11 J-12

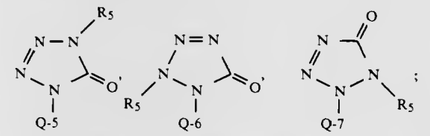


J-13

W is O, S or NR_X;
R_X is H, OH, C_1-C_3 alkyl, C_1-C_3 alkoxy, allyloxy, propargyloxy, C_1-C_3 haloalkyl, C_1-C_3 haloalkoxy or NR_YR_Z;
R_Y is H or C_1-C_3 alkyl;
R_Z is C_1-C_3 alkyl;
G is O, S, SO or SO_2;
m is 0 or 1;
n is 0, 1 or 2;
R is H or CH_3;
E is a single bond, CH_2 or O;
Q is



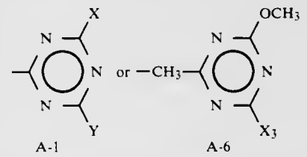
Q-1 Q-2 Q-3 Q-4



Q-5 Q-6 Q-7

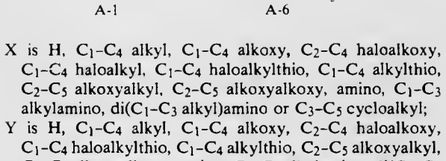
R_1 is H, C_1-C_3 alkyl, C_1-C_3 haloalkyl, halogen, nitro, C_1-C_3 alkoxy, $SO_2NR_aR_b$, C_1-C_3 alkylthio, C_1-C_3 alkylsulfinyl, C_1-C_3 alkylsulfonyl, CN, SCN, CO_2R_c, C_1-C_3 haloalkoxy, C_1-C_3 haloalkylthio, amino, C_1-C_3 alkylamino, di(C_1-C_3 alkyl)amino or C_1-C_2 alkyl substituted with C_1-C_2 alkoxy, C_1-C_2 haloalkoxy, C_1-C_2 alkylthio, C_1-C_2 haloalkylthio or CN;
R_2 is H, C_1-C_3 alkyl, allyl or phenyl;
R_3 is H, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_1-C_6 haloalkyl, CH_2-(C_2-C_5 alkenyl), CH_2(C_2-C_5 haloalkenyl), CH_2(C_2-C_5 alkynyl), CH_2(C_2-C_5 haloalkynyl), C_6H_5 or C_1-C_4 alkyl substituted with C_1-C_2 alkoxy, C_1-C_2 alkylthio, C_1-C_2 alkylsulfinyl or C_1-C_2 alkylsulfonyl;

R_4 is H, halogen, C_1-C_6 alkyl, C_3-C_6 cycloalkyl, C_1-C_6 haloalkyl, C_2-C_6 alkenyl, C_2-C_6 haloalkenyl, C_2-C_6 alkynyl, C_3-C_6 haloalkynyl, C_6H_5, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 alkylthio, C_1-C_4 alkylsulfinyl, C_1-C_4 alkylsulfonyl, OCH_2CH_2O-(C_1-C_2 alkyl) or di(C_1-C_3 alkyl)amino;
R_5 is H, C_1-C_3 alkyl, C_1-C_3 haloalkyl, allyl or propargyl;
R_a is H, C_1-C_4 alkyl, C_2-C_3 cyanoalkyl, methoxy or ethoxy;
R_b is H, C_1-C_4 alkyl or C_3-C_4 alkenyl; or
R_a and R_b may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;
R_c is C_1-C_4 alkyl, C_3-C_4 alkenyl, C_3-C_4 alkynyl, C_2-C_4 haloalkyl, C_1-C_2 cyanoalkyl, C_5-C_6 cycloalkyl, C_4-C_7 cycloalkylalkyl or C_2-C_4 alkoxyalkyl;
A is



A-1 A-6

X is H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_2-C_4 haloalkoxy, C_1-C_4 haloalkyl, C_1-C_4 haloalkylthio, C_1-C_4 alkylthio, C_2-C_5 alkoxyalkyl, C_2-C_5 alkoxyalkoxy, amino, C_1-C_3 alkylamino, di(C_1-C_3 alkyl)amino or C_3-C_5 cycloalkyl;
Y is H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_2-C_4 haloalkoxy, C_1-C_4 haloalkylthio, C_1-C_4 alkylthio, C_2-C_5 alkoxyalkyl, C_2-C_5 alkoxyalkoxy, amino, C_1-C_3 alkylamino, di(C_1-C_3 alkyl)amino, C_3-C_4 alkenyloxy, C_3-C_4 alkynyloxy, C_2-C_5 alkylthioalkyl, C_2-C_5 alkylsulfinylalkyl, C_2-C_5 alkylsulfonyalkyl, C_1-C_4 haloalkyl, C_2-C_4 alkynyl, azido, cyano



or $—N(OCH_3)CH_3$;
p is 2 or 3;
L_1 and L_2 are independently O or S;
R_6 is H or CH_3;
R_7 and R_8 are independently C_1-C_3 alkyl; and
X_3 is CH_3 or OCH_3;
and their agriculturally suitable salts; provided that
(a) when J is J-9 and n is O, then Q is Q-1 or Q-2;
(b) when E is O, then J is J-1;
(c) when W is S, then A is A-1, R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



(d) when the total number of carbon atoms in X and Y is greater than 4, then the carbon content of R_1, R_3, R_4 and R_5 must each be less than or equal to 2;
(e) when J is J-1 and m is 0, then n is 0; and
(f) when n is 0 and m is 1, then Q is Q-1 or Q-2.

64. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid diluent.

4,786,312

1-PHENYLIMIDAZOLE COMPOUNDS AS GROWTH REGULATORS

Roland Schmierer, Todtenweis; Hilmar Mildenberger, Kelkheim, and Helmut Büstell, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

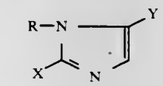
Filed Apr. 24, 1987, Ser. No. 42,265

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1986, 3614364

Int. Cl.[4] **A01N** *43/50;* **C07D** *233/90*

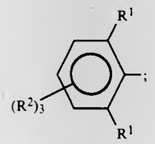
U.S. Cl. 71—92 **6 Claims**

1. A compound of formula I

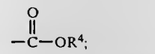


(I)

in which:
R is a radical of the formula



X is hydrogen;
Y is



the substituents R^1 may be the same or different and each is (C_1-C_4) alkyl which may be halogenated, (C_2-C_3) alkenyl, halo(C_2-C_3)alkenyl, acetyl, hydroxy(C_1-C_3)alkyl, (C_1-C_4)alkoxy or halogne, provided that only one substituent R^1 may be (C_1-C_4)alkyl,
the substituents R^2 may be the same or different and each is hydrogen, (C_1-C_4)alkyl, (C_1-C_4)alkoxy or halogen;
R^4 is hydrogen or (C_1-C_{12})alkyl; or
a salt or quaternization product thereof which is acceptable for agricultural purposes.

6. A process for regulating the growth of plants, wherein an effective amount of a compound of the formula (I) as claimed in claim **1** is applied to the plants or to the cultivated area.

4,786,313

HERBICIDAL SULFONAMIDES

James V. Hay, Newark; Barry A. Wexler, Wilmington, both of Del., and Donna F. Zimmerman, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

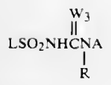
Division of Ser. No. 917,930, Oct. 10, 1986, Pat. No. 4,721,521, which is a continuation-in-part of Ser. No. 768,158, Aug. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 680,549, Dec. 11, 1984, abandoned. This application Oct. 23, 1987, Ser. No. 111,670

Int. Cl.[4] **A01N** *43/66;* **C07D** *401/12*

U.S. Cl. 71—93 **24 Claims**

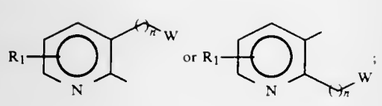
1. A compound of the formula

VOL 1096 ISS 4 NO 22 1988 UMI



I

wherein
L is

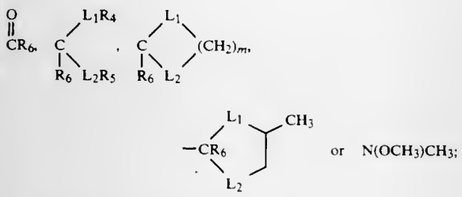


L-1 L-2

R is H or CH_3;
W_3 is O or S;
n is 0 or 1;
R_1 is H, C_1-C_3 alkyl, C_1-C_3 haloalkyl, halogen, nitro, CH_2CN, CH_2OCH_3, CH_2SCH_3, CN, C_1-C_3 alkoxy, $SO_2NR^IR^{II}$, C_1-C_3 alkylthio, C_1-C_3 alkylsulfinyl, C_1-C_3 alkylsulfonyl or CO_2R^{III};
R^I is H, C_1-C_4 alkyl, C_2-C_3 cyanoalkyl, methoxy or ethoxy;
R^{II} is H, C_1-C_4 alkyl or C_3-C_4 alkenyl; or
R^I and R^{II} may be taken together as $-(CH_2)_3-$, $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$;
R^{III} is C_1-C_4 alkyl, C_3-C_4 alkenyl, C_3-C_4 alkynyl, C_2-C_4 haloalkyl, C_2-C_4 cyanoalkyl, C_5-C_6 cycloalkyl, C_4-C_7 cycloalkylalkyl or C_2-C_4 alkoxyalkyl;
W is W_1;
W_1 is C_2-C_8 alkenyl substituted with 1-3 atoms of F, Cl or Br;
A is



X is H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 haloalkyl, C_1-C_4 haloalkylthio, C_1-C_4 alkylthio, C_2-C_5 alkoxyalkyl, C_2-C_5 alkoxyalkoxy, amino, C_1-C_3 alkylamino or di(C_1-C_3 alkyl)amino;
Y is H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_4 haloalkylthio, C_1-C_4 alkylthio, C_2-C_5 alkoxyalkyl, C_2-C_5 alkoxyalkoxy, amino, C_1-C_3 alkylamino, di(C_1-C_3 alkyl)amino, C_3-C_4 alkenyloxy, C_3-C_4 alkynyloxy, C_2-C_5 alkylthioalkyl, C_1-C_4 haloalkyl, C_3-C_5 cycloalkyl, C_2-C_4 alknynyl,



m is 2 or 3;
L_1 and L_2 are independently O or S;
R_4 and R_5 are independently C_1-C_2 alkyl;
R_6 is H or CH_3; and
Z is N;
and their agriculturally suitable salts; provided that

(a) X or Y is other than OCF_2H;
(b) when W_3 is S, then R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$ or $CH(OCH_3)_2$; and
(c) when the total number of carbon atoms of X and Y is greater than four, then the number of carbons of R_1 must be less than or equal to two and the number of carbons of W must be less than or equal to four.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,786,314

HERBICIDAL SULFONAMIDES

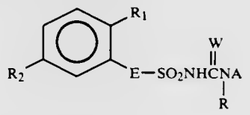
Steven P. Artz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 41,790, Apr. 23, 1987, abandoned, which is a division of Ser. No. 860,229, May 12, 1986, Pat. No. 4,678,498, which is a continuation-in-part of Ser. No. 743,955, Jun. 12, 1985, abandoned. This application Oct. 15, 1987, Ser. No. 108,646

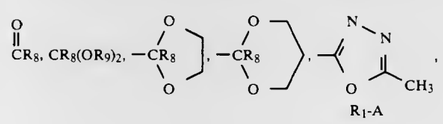
Int. Cl.[4] **A01N** *43/66, 43/70;* **C07D** *401/12, 251/52*

U.S. Cl. 71—93 **24 Claims**

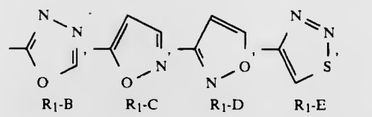
1. A compound of the formula:



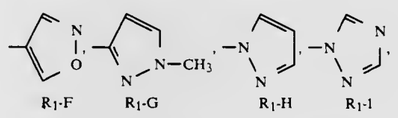
wherein
E is CH_2 or a single bond;
W is O or S;
R is H or CH_3;
R_1 is F, Cl, Br, No_2, C_1-C_4 alkyl, C_2-C_4 alkenyl, C_2-C_4 haloalkenyl, C_2-C_4 alkynyl, C_1-C_4 haloalkyl, C_1-C_4 alkoxy, $OCH_2CH_2OCH_3$, C_1-C_4 haloalkoxy, C_3-C_4 alkenyloxy, C_2-C_4 haloalkenyloxy, C_3-C_4 alkynyloxy, CO_2R_3, $CONR_4R_5$, $SO_2NR_4R_5$, $SO_2N(OCH_3)CH_3$, $S(O)_nR_6$, OSO_2R_7, C_1-C_2 alkyl substituted with C_1-C_2 alkoxy, OH or C_1-C_2 alkylthio, CH_2CN, C_6H_5,



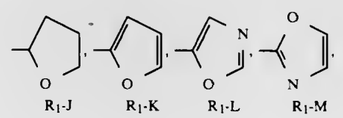
R_1-A



R_1-B R_1-C R_1-D R_1-E

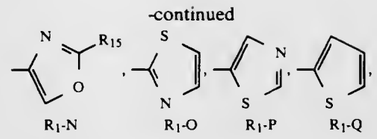


R_1-F R_1-G R_1-H R_1-I

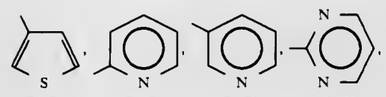


R_1-J R_1-K R_1-L R_1-M

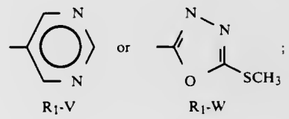
-continued



R_1-N R_1-O R_1-P R_1-Q

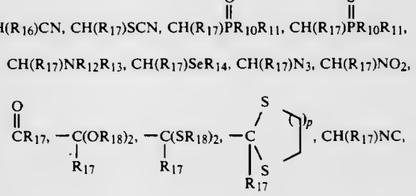


R_1-R R_1-S R_1-T R_1-U



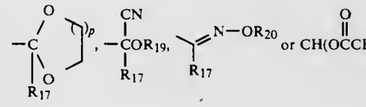
R_1-V R_1-W

R_2 is

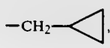


$CH(R_{16})CN$, $CH(R_{17})SCN$, $CH(R_{17})PR_{10}R_{11}$, $CH(R_{17})PR_{10}R_{11}$, $CH(R_{17})NR_{12}R_{13}$, $CH(R_{17})SeR_{14}$, $CH(R_{17})N_3$, $CH(R_{17})NO_2$,

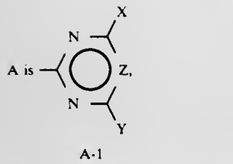




R_3 is C_1-C_4 alkyl, C_3-C_4 alkenyl, C_3-C_4 alkynyl,

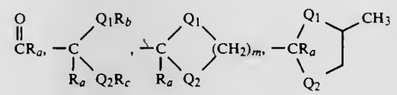


CH_2CH_2Cl, CH_2CH_2F, or C_1-C_2 alkyl substituted with OCH_3 or SCH_3;
R_4 is C_1-C_3 alkyl;
R_5 is H or C_1-C_3 alkyl;
R_4 and R_5 may be taken together to form $(CH_2)_3$ or $(CH_2)_4$;
R_6 is C_1-C_3 alkyl, $CH_2CH{=}CH_2$ or $CH_2C{\equiv}CH$;
R_7 is C_1-C_3 alkyl or $N(CH_3)_2$;
R_8 is H, C_1-C_4 alkyl, C_3-C_4 alkenyl, C_3-C_4 alkynyl, CH_2CH_2Cl, CH_2CH_2F, C_1-C_2 alkyl substituted with OCH_3 or SCH_3 or C_3-C_6 cycloalkyl;
R_9 is C_1-C_2 alkyl;
R_{10} and R_{11} are independently C_1-C_2 alkyl, C_1-C_2 alkoxy, C_1-C_2 alkylthio, $NHCH_3$ or $N(CH_3)_2$;
R_{12} and R_{13} are independently H or C_1-C_2 alkyl;
R_{14} is C_1-C_3 alkyl;
R_{15} is H or CH_3;
R_{16} is H, C_1-C_2 alkyl or F;
R_{17} is H or C_1-C_2 alkyl;
R_{18} is C_1-C_2 alkyl;
R_{19} is H, $Si(CH_3)_3$ or C_1-C_2 alkyl;
R_{20} is H or C_1-C_2 alkyl;
p is 1 or 2;
n is 0, 1, or 2;



A is

X is H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_2-C_4haloalkoxy, C_1-C_4 haloalkyl, C_1-C_4 haloalkylthio, C_1-C_4 alkylthio, halogen, C_2-C_5 alkoxyalkyl, C_2-C_5 alkoxyalkoxy, amino, C_1-C_3 alkylamino or di(C_1-C_3 alkyl)amino;
Y is H, C_1-C_4 alkyl, C_1-C_4 alkoxy, C_2-C_4 haloalkoxy, C_1-C_4 haloalkylthio, C_1-C_4 alkylthio, C_2-C_5 alkoxyalkyl, C_2-C_5 alkoxyalkoxy, amino, C_1-C_3 alkylamino, di(C_1-C_3 alkyl)amino, C_3-C_4 alkenyloxy, C_3-C_4 alkynyloxy, C_2-C_5 alkylthioalkyl, C_2-C_5 alkylsulfinylalkyl, C_2-C_5 alkylsulfonylalkyl, C_1-C_4 haloalkyl, C_2-C_4 alkynyl, C_3-C_5 cycloalkyl, azido, cyano,



or $N(OCH_3)CH_3$);
m is 2 or 3;
Q_1 and Q_2 are independently O or S;
R_a is H or C_1-C_3 alkyl;
R_b and R_c are independently C_1-C_3 alkyl; and Z is, N;
and their agriculturally suitable salts;
provided that
(1) when W is S, then R is H, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or



(2) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of R_1 and R_2 is less than or equal to six;
(3) when R_2 is $C(O)R_{17}$, then R_1 is other than C_1-C_4 haloalkyl or C_2 alkyl substituted with C_1-C_2 alkoxy, OH or C_1-C_2 alkylthio, and Y is other than cyclopropyl;
(4) when Y is C_2-C_5 alkylthioalkyl, C_2-C_5 alkylsulfinylalkyl or C_2-C_5 alkylsulfonylalkyl, then R_2 is other than $CH(R_{17})NO_2$; and
(5) when R_2 is $C(O)R_{17}$ then R_1 is other than $SO_2NR_4R_5$ and $SO_2N(OCH_3)CH_3$.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

VOL 1096 ISS 4 NO 22 1988 UMI

4,786,315

HERBICIDAL COMPOSITIONS

Werner Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

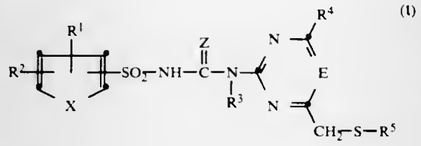
Division of Ser. No. 641,091, Aug. 15, 1984, Pat. No. 4,639,264. This application Nov. 24, 1986, Ser. No. 919,514

Claims priority, application Switzerland, Aug. 26, 1983, 4669/83

Int. Cl.[4] **C07D** *251/16, 251/22, 401/12;* **A01N** *43/66*

U.S. Cl. 71—93 **18 Claims**

1. An N-arylsulfonyl-N'-(4-mercaptomethyl-triazinyl)-urea of the formula I



(I)

wherein

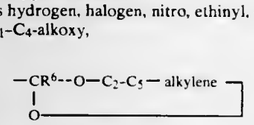
E is nitrogen,

X is oxygen, sulfur, $-NR^3-$, $-N=CR^3-$, $-CH=CH-$ or



Z is oxygen or sulfur,

R^1 is hydrogen, halogen, nitro, ethinyl, $-NR^{16}R^{17}$, $-CR^6$-di-C_1-C_4-alkoxy,



$-CW-R^6$, $-SO_2-NR^7R^8$, $-CO-R^9$, $-Y_m-R^{10}$, $-SO_2-R^{11}$ or $O-SO_2R^{12}$, in which m is zero or 1,

R^2 is hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl or nitro,

R^3 is hydrogen, C_1-C_4-alkyl, C_3-C_4-alkenyl or C_1-C_4-alkoxy,

R^4 is hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-haloalkyl, C_1-C_4-haloalkoxy, C_1-C_4-alkylthio, C_2-C_4-alkoxyalkyl, C_2-C_4-alkoxyalkoxy, cyclopropyl, $-NH_2$, C_1-C_4-alkylamino, di-C_1-C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine

R^5 is cyano, $-CZ-R^{13}$,



or an unsaturated heterocycle selected from imidazole, triazole, pyridine, pyrimidine, thiazole, oxazole, thiadiazole, oxadiazole, pyridazine, thiophene or furan, as well as partially unsaturated derivatives thereof which are unsubstituted or substituted by a radical selected from the group comprising: halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-haloalkyl,

R^6 is hydrogen, C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_3-C_6-cycloalkyl, C_4-C_7-cycloalkylalkyl or C_2-C_4-alkoxyalkyl,

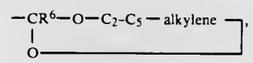
R^7 and R^{16} independently of one another are hydrogen, C_1-C_4-alkyl, C_1-C_4-cyanoalkyl or C_1-C_4-alkoxy,

R^8 and R^{17} independently of one another are hydrogen, C_1-C_4-alkyl, C_3-C_4-alkenyl or C_1-C_4-alkoxy, or

R^7 and R^8 as well as R^{16} and R^{17} independently of one another form, together with the nitrogen atom binding them, a 5- to 7-membered saturated nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,

R^9 is C_1-C_4-alkoxy, C_3-C_6-alkenyloxy, C_3-C_6-alkynyloxy, C_2-C_6-haloalkoxy, C_1-C_4-cyanoalkoxy, C_1-C_4-alkylthio, C_3-C_4-alkenylthio, C_3-C_4-alkynylthio, C_5-C_6-cycloalkoxy, C_4-C_7-cycloalkoylalkoxy, $-NR^7R^8$ or C_2-C_6-alkoxyalkoxy,

R^{10} is C_3-C_4-alkynyl, C_2-C_4-alkenyl, C_1-C_4-alkyl, C_2-C_4-alkenyl mono- or polysubstituted by halogen, cyano, C_1-C_4-alkoxy or $-SO_n-C_1$-C_4-alkyl, or is C_1-C_4-alkyl mono- or polysubstituted by halogen, cyano, nitro, C_1-C_4-alkoxy, C_1-C_4-haloalkoxy, C_1-C_4-haloalkylthio, $-SO_n-C_1$-C_4-alkyl, $-T-CX-R^{18}$,



$-CO-R^6$, $-CO-R^9$ or $-SO_2-NR^7R^8$, in which n is zero, 1 or 2,

R^{11} is C_2-C_4-haloalkoxy,

R^{12} is C_1-C_4-alkyl, C_1-C_4-haloalkyl or $-NR^{16}R^{17}$,

R^{13} is C_1-C_4-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio, phenyl, di-C_1-C_4-alkylamino, or a saturated 5- to 7-membered nitrogen heterocycle selected from pyrrolidine, piperidine, morpholine, thiomorpholine, piperazine and hexamethyleneimine,

R^{14} and R^{15} independently of one another are C_1-C_4-alkyl, C_1-C_4-alkoxy, C_3-C_4-alkoxyalkoxy, C_3-C_4-alkenyloxy, C_1-C_6-alkylthio, C_1-C_4-alkylamino or di-C_1-C_4-alkylamino,

R^{18} is C_1-C_4-alkyl, C_1-C_4-haloalkyl, C_1-C_4-alkoxy, C_1-C_4-alkylthio or $-NR^{16}R^{17}$,

T is oxygen or sulfur,

W is oxygen or $=N-O-R^3$, and

Y is oxygen, sulfur, $-SO-$ or $-SO_2-$;

and the salts of these compounds.

14. A herbicidal and plant-growth-inhibiting composition which contains, as active ingredient, at least one arylsulfonyl-N'-(4-mercaptomethyltriazinyl)-urea of claim 1, together with carriers and/or other additives.

4,786,316

HERBICIDAL ORTHO-SULFAMOYL SULFONAMIDES

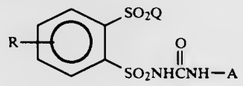
Chi-Ping Tseng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 628,939, Jul. 13, 1984, Pat. No. 4,652,304, which is a continuation-in-part of Ser. No. 533,771, Sep. 19, 1983, abandoned. This application Dec. 12, 1986, Ser. No. 941,713

Int. Cl.[4] **C07D** *251/52, 403/12;* **A01N** *43/66, 43/70*

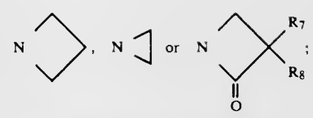
U.S. Cl. 71—93 **16 Claims**

1. A compound of the formula:



wherein

Q is NR_1R_2,



R is H, Cl, Br, F, OCH_3, CH_3 or CF_3;

R_1 is $C(O)R_3$, $C(O)NR_4R_5$, CO_2R_6, $C(O)NHR_9$ or CF_2H;

R_2 is H or C_1-C_3 alkyl;

R_3 is C_1-C_4 alkyl, CF_3 or phenyl optionally substituted with Cl, CH_3, CF_3, NO_2 or OCH_3;

R_4 is H, C_1-C_4 alkyl or phenyl optionally substituted with Cl, CH_3, CF_3, NO_2 or OCH_3;

R_5 is H or C_1-C_4 alkyl;

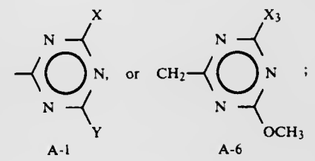
R_4 and R_5 may be taken together to be $-(CH_2)_4-$, $-(CH_2)_5-$ or $-CH_2CH_2OCH_2CH_2-$;

R_6 is C_1-C_4 alkyl;

R_7 and R_8 are independently H or CH_3;

R_9 is A-1;

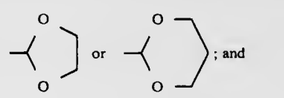
A is



A-1 A-6

X is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3 or CF_3;

Y is H, $NHCH_3N(CH_3)_2$, CH_3, CH_2CH_3, CF_3, OCH_3, OCH_2CH_3, CH_2F, CH_2OCH_3, $CH_2OCH_2CH_3$, $OCH_2CH_2OCH_3$, SCH_3, SCH_2CH_3, OCH_2CF_3, OCH_2CH_2F, OCH_2CH_2Br, OCH_2CH_2Cl, $CH(OCH_3)_2$, $CH(OC_2H_5)_2$,



X_3 is CH_3 or OCH_3;

and their agriculturally suitable salts; provided that

when R_1 is $CONHR_9$, then A must be A-1 and the values of X, Y and Z must be identical for both A and R_9.

9. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,786,317

4-PHENOXY-PYRIDINES HAVING HERBICIDAL ACTIVITY

Rudolf Mengel; Ludwig Schröder, both of Ingelheim; Werner Stransky, Gau-Algesheim; Gerbert Linden, Ingelheim, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

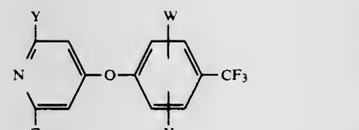
Division of Ser. No. 620,120, Jun. 13, 1981, Pat. No. 4,655,820, which is a continuation of Ser. No. 462,150, Jan. 31, 1983, abandoned. This application Sep. 5, 1986, Ser. No. 904,058

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1982, 3205150

Int. Cl.[4] **A01N** *43/40;* **C07D** *213/63, 213/79*

U.S. Cl. 71—94 **6 Claims**

1. A compound of the formula



wherein

W is hydrogen, chlorine, nitro or trifluoromethyl;

X is hydrogen or chlorine;

Y is hydrogen, fluorine, chlorine, bromine, alkyl of 1 to 4 carbon atoms, fluoro-substituted alkyl of 1 to 4 carbon atoms or chloro-substituted alkyl of 1 to 4 carbon atoms; and

Z is fluorine, chlorine, bromine, alkyl of 1 to 4 carbon atoms, fluoro-substituted alkyl of 1 to 4 carbon atoms, chloro-substituted alkyl of 1 to 4 carbon atoms, —COOH or —COO—(alkyl of 1 to 4 carbon atoms);

or, when Z is —COOH, an alkali metal or alkaline earth metal salt thereof.

6. The method of killing weeds, which comprises contacting said weeds with an effective herbicidal amount of a compound of claim 1.

4,786,318

THICKENING OF GOLD PROCESS SLURRIES

David O. Owen, Aurora, and Lawrence J. Connelly, Oak Lawn, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 895,980, Aug. 14, 1986, abandoned. This application Aug. 26, 1987. Ser. No. 89,710

Int. Cl.[4] **C22B** *7/00*

U.S. Cl. 75—2 **1 Claim**

1. A process for thickening gold ore process slurries or slimes produced by cyanidation which comprises adding to such gold ore slurries or slimes an effective amount of flocculant comprising a terpolymer containing 6.7–13.3 mole % 2-AMPS, 6.7–13.3 mole % sodium acrylate and 73.4–86.6 mole % acrylamide, said terpolymer having an RSV of at least 20.

4,786,319

PROCES FOR THE PRODUCTION OF RARE EARTH METALS AND ALLOYS

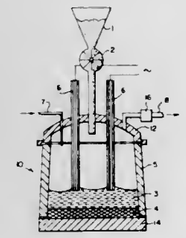
Hans Zeiringer, Krappfeld, Austria, assignor to Treibacher Chemische Werke AG, Treibach, Austria

Filed Aug. 19, 1987, Ser. No. 87,088

Claims priority, application Austria, Aug. 19, 1986, 2226/86

Int. Cl.[4] **C22B** *4/00;* **C21C** *5/52*

U.S. Cl. 75—10.62 **15 Claims**



1. A two phase process for the production of rare earth metals and alloys thereof, in an electric arc furnace, comprising the steps of:

introducing into said furnace, in a first phase, salts selected

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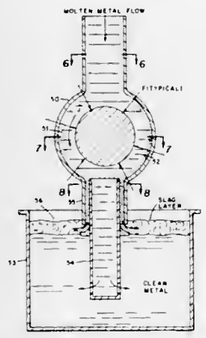
from the group consisting of alkali earth metal salts, alkaline earth metal salts, and a combination thereof;
melting said salts with said electric arc;
replacing the air within said furnace with a gas inert to said rare earth metals alkaline earth metals and compounds thereof;
adding and melting in said furnace in a second phase members selected from the group consisting of alkaline earth metals, rare earth halides, rare earth metal oxides, and a combination thereof, and additional alloying elements after said salt melt has reached a predetermined temperature;
reducing said melt in said furnace with an alkaline earth metal;
agitating the melt with electromagnetic forces caused by a preselected current-to-voltage ratio of said electric arc for a predetermined time; and
tapping said rare earth metals and alloys thereof into a receiver.

4,786,320

METHOD AND APPARATUS FOR REMOVAL OF GASEOUS, LIQUID AND PARTICULATE CONTAMINANTS FROM MOLTEN METALS

David O. Hobson; Igor Alexeff, both of Oak Ridge, and Vinod K. Sikka, Clinton, all of Tenn., assignors to The United States of America as represented by the Deprtment of Energy, Washington, D.C.

Filed Aug. 10, 1987, Ser. No. 83,482
Int. Cl.[4] C22B *4/00, 7/00*
U.S. Cl. 75—10.65 6 Claims



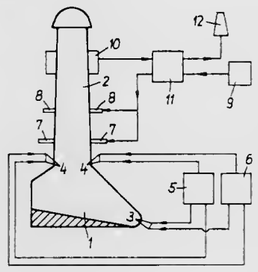
1. A device for removing contaminants from a molten metal composition, said contaminants being characterized
in having less electrical conductivity than said molten metal, comprising a body of toroidal configuration having an outer wall and a toroidal cavity, said toroidal body having inlet and outlet ends adapted to receive and discharge a stream of said molten metal composition and means for applying a magnetic field to said molten metal composition within said toroidal cavity which magnetic field simultaneously induces an electric current which flows perpendicular to said magnetic field so as to impose a force on said molten metal composition at right angles to a plane containing said magnetic field and current flow direction, thereby causing an increase in the apparent density of said molten metal component of said composition in the direction of said force while said contaminants contained in said composition move in a direction opposite to said imposed force.

4,786,321

METHOD AND APPARATUS FOR THE CONTINUOUS MELTING OF SCRAP

Thomas Hoster; Dieter Neuschütz, both of Essen, and Wolf-Dieter Röpke, Wilnsdorf-Obersdorf, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 28,594
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608802
Int. Cl.[4] C21C *1/00*
U.S. Cl. 75—43 20 Claims



1. A method for the continuous melting of an iron-containing material which is at least one of scrap and sponge iron in a melting device, the melting device being composed of a vertical shaft having a central axis, a melting furnace disposed below, and communicating with, the shaft, the melting furnace having a bottom, being asymmetrical to the central axis and being formed to have a region which is furthest removed from the central axis, at least one first nozzle opening into the furnace, located in the vicinity of the furnace bottom in the region furthest removed from the central axis, and at least two second nozzles opening into the furnace and located at a selected level above the furnace bottom, said method comprising:
introducing iron-containing material into the shaft for causing the material to descend through the shaft; and
heating the material which has been introduced into the shaft for melting the material to form a bath of molten material in the melting furnace, which bath has an upper surface located below the selected level;
wherein said step of heating comprises: supplying carbon carrier and oxygen to the first and second nozzles for effecting partial combustion of the carbon carrier in the furnace to generate heat which is supplied to the material and to generate partially combusted exhaust gas; effecting a selected distribution of the carbon carrier and oxygen to the first and second nozzles for causing the combustion arising from the first nozzle to supply superheating heat below the upper surface of the bath and the combustion arising from the second nozzles to supply heat for melting material located above the upper surface of the bath; and effecting post combustion of the partially combusted exhaust gas in the shaft for preheating material in the shaft.

4,786,322

MAGNESIUM AND CALCIUM COMPOSITE

William G. Green, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 822,459, Jan. 27, 1986, Pat. No. 4,705,561. This application Sep. 18, 1987, Ser. No. 98,815
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—58 17 Claims

1. A method of manufacture of an injectable particulate composite for molten ferrous metal comprising the steps of:

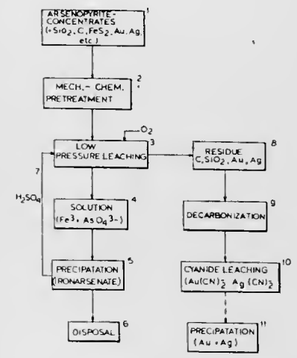
(a) obtaining a specified weigh of magnesium in a molten state at a temperature above about 715° C.;
(b) adding dolime, $CaAl_2O_4$, Al_2O_3 or CaC_2 as a reactant to the magnesium accompanied with mixing and continuing until sufficient reactant has been added that a specified ratio between magnesium and reactant has been achieved and mixing has occurred;
(c) cooling the mixture to solidify and form a precipitant alloy; and
(d) crushing the cooled precipitant alloy to particulate form for subsequent injection into molten metal.

4,786,323

PROCESS FOR THE RECOVERY OF NOBLE METALS FROM ORE-CONCENTRATES

Eberhard Gock, Angerburger Allee 55, 1000 Berlin 19, Fed. Rep. of Germany, and Elias Asiam, University of Science and Technology, Kumase, Ghana

Filed Sep. 23, 1986, Ser. No. 910,519
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1985, 3534224
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 R 36 Claims



1. A process for the wet-chemical recovery of gold and silver from pyrite-free arsenopyrite ore concentrates, which, in addition to silicatic gangue, particularly carry carbon-containing substances, by means of cyanide leaching of the carbon-free residue of the acid decomposition and subsequent precipitation of the noble metals, comprising the steps of:
mechano-chemically treating by vibratory milling the ore concentrates with predominantly impact-stressing with an energy expenditure of 50 to 500 kWh/ton ore concentrate;
oxidizingly decomposing said ore concentrate, in one step, with sulfuric acid with a reaction duration of from 15 minutes to 6 hours at temperatures from 50° to 150° C. in the presence of oxygen with a partial pressure of 0.2 to 20 bar, whereby the arsenic and iron components are almost completely solubilized, whereas the gold, silver and carbon-containing substances almost completely accumulate in the silicatic residue; and
decarbonizing the silicate residue at temperatures from 400° to 1000° C.

4,786,324

NICKEL-PLATING BATH

Franz Rieger, Riedstrasse 1-3, 7924 Steinheim am Albuch, Fed. Rep. of Germany

Division of Ser. No. 818,985, Jan. 10, 1986, Pat. No. 4,699,695. This application Jun. 8, 1987, Ser. No. 59,563
Int. Cl.[4] C25D *3/12*
U.S. Cl. 106—1.27 13 Claims

1. A nickel bath for electroplating heat-resistant articles selected from the group consisting of aluminum and aluminum alloy with a nickel layer, which articles have been given a Licer bath, comprising: concentrations of nickel sulfate within a range between 150 and 300 g/L, an acid within a range between 25 and 50 g/L, which stabilizes the pH values, a fluoride within a range between 2 and 6 g/L, which loosens the oxide layer forming in the Licer bath, a chloride within a range between 1 and 4 g/L, promoting dissolution of nickel anodes, whereby complex chloride formation is negligible, and a phosphite within a range between 1 to 2 g/L, improving the adhesive strength of the nickel layer.

4,786,325

CERIUM/RARE EARTH POLISHING COMPOSITIONS

Pierre Melard, Lagord, and Francis Tastu, La Rochelle, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 610,049, May 14, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 887,389
Claims priority, application France, May 13, 1983, 83 08003
Int. Cl.[4] C09G *1/02*
U.S. Cl. 106—3 86 Claims

1. A process for the preparation of a polishing composition of matter, consisting essentially of (i) simultaneously and continuously intimately admixing a solution of a cerium salt that comprises an aqueous solution of at least one of cerous chloride, cerous nitrate, and ceric nitrate, a basic solution selected from the group consisting of ammonia, sodium or potassium hydroxide and a solution of at least one salt of a trivalent lanthanide or yttrium rare earth, the oxide of which is colorless, with the number of equivalents of base being at least equal to the number of equivalents of cerium and rare earth values and the pH of the reaction medium being greater than 6, (ii) filtering the precipitate which results, (iii) drying said precipitate, and (iv) thence calcining said precipitate.

41. A polishing composition capable of being recycled into glass, provided by a process consisting essentially of (i) simultaneously and continuously intimately admixing a solution of a cerium salt, a basic solution selected from the group consisting of ammonia, sodium or potassium hydroxide and a solution of at least one salt of a trivalent lanthanide or yttrium rare earth, the oxide of which is colorless, with the number of equivalents of base being at least equal to the number of equivalents of cerium and rare earth values and the pH of the reaction medium being greater than 6, (ii) filtering the precipitate which results, (iii) drying said precipitate, and (iv) thence calcining said precipitate.

4,786,326

PROCESS FOR PENETRATING DIFFICULT-TO-TREAT WOOD WITH WOOD PRESERVATIVE LIQUIDS

Scott L. Grove, Lakewood, Ohio, assignor to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 930,133, Nov. 12, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,955
Int. Cl.[4] C09D *15/05;* B05D *3/00*
U.S. Cl. 106—15.05 31 Claims

9. A method of preserving difficult-to-treat wood which comprises contacting the wood in an enclosed vessel under pressure with a mixture comprising
(A-1) a preservative-effective amount of at least one hydrocarbon-soluble transition metal salt of an organic carboxylic acid, wherein the metal is selected from the group

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consisting of transition metals, zinc, mercury, antimony and lead, and

(A-2) a hydrocarbon solvent comprising at least about 50% by weight of at least one paraffinic hydrocarbon having a boiling point above 130° C.

4,786,327

DYE PREPARATION FOR THERMAL INK-JET PRINTHEADS USING ION EXCHANGE

Donald E. Wenzel, Albany; Loren E. Johnson, and Hiang P. Lauw, both of Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1986, Ser. No. 912,868

The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.

Int. Cl.[4] C09D *11/02*

U.S. Cl. 106—22 **24 Claims**

1. A process for preparing an ink composition comprising a vehicle and a dye having associated therewith at least one sulfonate group with which a first cation species is associated, said ink composition suitable for use in ink-jet printing, said process comprising:

(a) replacing at least a portion of said first cation species on said dye with a preselected second cation species comprising at least one member selected from the group consisting of alkali metals, alkaline-earth metals, quaternary amines, protonated primary, secondary and tertiary amines and ammonium, employing an ion exchange resin, to form an ion-exchanged dye; and

(b) admixing said ion-exchanged dye with said vehicle to form said ink.

4,786,328

MAGNESIUM PHOSPHATE CEMENT SYSTEMS

Ed Weill, Baltimore, and L. Joseph Bradik, Bel Air, both of Md., assignors to American Stone-Mix, Inc., Towson, Md.

Division of Ser. No. 74,527, Jul. 16, 1987, Pat. No. 4,756,762.

This application Apr. 1, 1988, Ser. No. 176,656

Int. Cl.[4] C04B *9/02, 24/04, 24/06*

U.S. Cl. 106—85 **18 Claims**

1. A dry mixture capable of forming a hard, bonded cement composition when admixed with water comprising:

magnesium oxide;

monoammonium phosphate;

a retarder selected from the group consisting of polycarboxylic acids and salts of such acids; and

an essentially inert aggregate filler.

4,786,329

ASPHALT COMPOSITIONS CONTAINING ANTI-STRIPPING ADDITIVES PREPARED FROM AMINES OR POLYAMINES AND PHOSPHONATES

Dane Chang, Houston, and Druce K. Crump, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1987, Ser. No. 94,982

Int. Cl.[4] C08L *95/00*

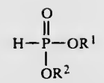
U.S. Cl. 106—284.1 **13 Claims**

1. A composition which comprises a blend comprising:

(A) bituminous material and

(B) the product resulting from reacting at conditions sufficient to complete the reaction of

(1) at least one phosphorus-containing compound represented by the following formula I



FORMULA I

wherein R^1 and R^2 are independently hydrogen or a monovalent hydrocarbyl group having from 1 to about 20 carbon atoms but only one of R^1 and R^2 can be hydrogen;

(2) at least one material selected from

(a) at least one organic amine;

(b) at least one organic polyamine;

(c) at least one hydrohalide salt of an organic amine;

(d) at least one hydrohalide salt of an organic polyamine; or

(e) a combination of any two or more of (a), (b), (c) or (d); and

(3) at least one carbonyl-containing compound which will react with the phosphorus-containing compound;

wherein components (1), (2) and (3) are employed in quantities which provide a ratio of carbonyl groups:phosphorus atoms:amine hydrogen atoms of from about 0.1:0.1:1 to about 2:1.5:1; and

wherein components (A) and (B) are employed in quantities which provide from about 0.05 to about 10 percent by weight of component (B) based upon the weight of component (A).

4,786,330

DIURETHANE LATEX AND PROCESSES

Catherine Beuzelin, Paris, and Claude Senez, Gouvieux, both of France, assignors to Atochem, France

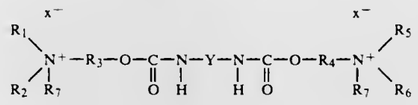
Filed Jan. 16, 1987, Ser. No. 3,790

Claims priority, application France, Jan. 24, 1986, 86 00997

Int. Cl.[4] C09K *3/00;* **C07C** *125/06*

U.S. Cl. 106—287.25 **12 Claims**

1. A sizing agent for paper consisting essentially of a latex consisting essentially of at least one diurethane dispersed in an aqueous medium, said diurethane being of the formula:



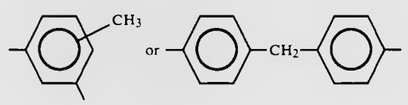
in which:

(a) R_1, R_2, R_5 and R_6 are each alkyl radicals and at least one of them possesses a minimum of 7 carbon atoms;

(b) R_7 and x represent, respectively, the cationic and anionic portions of the quaternizing agent R_7x;

(c) R_3 and R_4 are selected from C_2–C_4 alkylene radicals or polyalkoxylated radicals of a degree of polycondensation of between 1 and 4; and

(d) Y is



4,786,331

CEMENT DISPERSION AGENT

Shigeyuki Ueda; Yoshimitsu Sekiguchi, both of Chiba, and Kazuaki Yamaguchi, Funabashi, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,306

Claims priority, application Japan, Jul. 18, 1986, 61-168104; Oct. 3, 1986, 61-236014

Int. Cl.[4] C04B *24/20*

U.S. Cl. 106—314 **12 Claims**

1. A cement dispersion agent comprising calcium polystyrene sulfonate having a weight average molecular weight of 5,000 to 100,000 and having a degree of sulfonation of 80% or more.

3. A cement dispersion agent comprising (a) a polystyrene sulfonate and (b) at least one component selected from the group consisting of hydroxycarboxylic acids, ketocarboxylic acids, and the salts thereof.

4,786,332

ALKYL-SUBTITUTED CYCLOHEXYL AND CYCLOHEXENYL CARBOXYLIC ACIDS AS ODORANTS AND FLAVORANTS

Martin Rohr, Glan Rock; N. Peter Vallone, Westwood, and Cormack Flynn, Ramsey, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

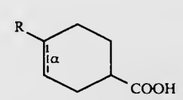
Division of Ser. No. 446,933, Dec. 6, 1982, Pat. No. 4,606,925.

This application Jan. 24, 1986, Ser. No. 822,707

Int. Cl.[4] A24B *3/12*

U.S. Cl. 131—276 **20 Claims**

1. A fragrance composition comprising an olfactorily effective amount of a compound of the formula



I

wherein:

the dotted line designated by α represents an optional bond and

R is an ethyl, propyl or butyl group and at least one other olfactory agent.

4,786,333

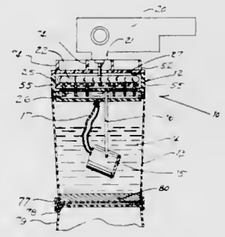
BUFFING PAD CLEANING METHOD AND APPARATUS

Richard A. Kaiser, 7083 Main St., Merton, Wis. 53056

Filed Mar. 14, 1988, Ser. No. 167,737

Int. Cl.[4] A47L *25/00*

U.S. Cl. 134—6 **25 Claims**



1. Apparatus for cleaning power driven buffing pads having a buffing face and edge portion while the pads are mounted on a buffing machine adapted to rotate the buffing pads comprising:

A. hollow enclosure means for receiving and containing buffing pad while attached to a buffing machine;

B. rotatable agitator means mounted within said enclosure for contacting the face of said buffing pad whereby rotation of said buffing pad will cause said agitator means to rotate while contacting the pad buffing face;

C. reservoir means for containing a solution of cleaning fluid; and,

D. pump means for pumping cleaning solution from said reservoir means into said hollow enclosure and onto said buffing pad.

4,786,334

METHOD OF CLEANING THE BOTTOM OF A POOL

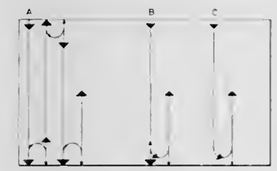
Mikael Nyström, Källängsvägen 8,, S-151 57 Södertälje, Sweden

Filed Aug. 5, 1987, Ser. No. 82,047

Claims priority, application Sweden, Aug. 20, 1986, 8603505

Int. Cl.[4] B08B *5/04*

U.S. Cl. 134—21 **8 Claims**



1. A method of cleaning a bottom portion of a pool with the aid of a self-propelling, motorized pool cleaner, the pool cleaner travelling to and fro, with parallel movement at change of direction, in straight paths between two opposite walls of the pool while collecting material lying at the bottom of the pool, said pool cleaner comprising drive members governing movement of the pool cleaner and control means arranged to emit control signals to the drive members in order to change the direction of travel when encountering a wall, comprising moving the pool cleaner in a straight path towards one wall, turning the pool cleaner a half turn, and simultaneously displacing the pool cleaner laterally perpendicular to the initial direction of travel, driving the pool cleaner thereafter on a path parallel to the initial direction of travel to the opposite wall of the pool, again turning the pool cleaner a half turn and simultaneously displacing the pool cleaner laterally in the same direction as the lateral displacement at the previous turn, and thereafter moving the pool cleaner back to the opposite wall of the pool, and repeating the process until the bottom portion of the pool has been covered.

4,786,335

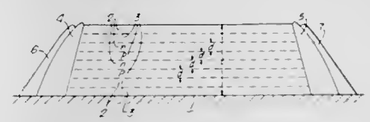
INFRA-RED DETECTOR

Peter Knowles, Watford, and Graham T. Jenkin, Pinner, both of England, assignors to The Marconi Company Limited, England

Filed Oct. 19, 1984, Ser. No. 700,923

Int. Cl.[4] H01L *35/00, 27/14*

U.S. Cl. 136—214 **11 Claims**



1. A photodetector comprising:

(a) a multiplicity of superimposed thin epitaxial layers of semiconducting material deposited on a substrate, said layers being at least partially transmissive to exciting radiation,

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(b) a pair of metallic contacts located adjacent opposite edges of said multiplicity of superimposed layers, and

(c) means for directing said exciting radiation onto said multiplicity of superimposed thin epitaxial layers to generate photoexcited carriers within said layers,

wherein semiconducting material for isolating one set of alternate ones of said layers from the corresponding other set of alternate ones of said layers is interposed between at least alternate ones of said superimposed layers and said metallic contacts, said layers are composed of cadmium mercury telluride and said sets of alternate layers from traps between their interfaces for said photoexcited carriers.

4,786,336

LOW TEMPERATURE SEAL FOR ANODIZED ALUMINUM SURFACES

Glenn C. Schoener, Chalfont; Susan V. Hess, Telford; Anthony J. Malloy, Willow Grove, all of Pa., and Jayne P. Wicklund, Morro Bay, Calif., assignors to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 709,635, Mar. 8, 1985, abandoned. This application Feb. 25, 1986, Ser. No. 831,723

Int. Cl.⁴ C23C *22/34, 22/56*

U.S. Cl. 148—6.27 **29 Claims**

1. A method for sealing an anodized aluminum surface comprising contacting said surface at a temperature of no greater than about 40° C. with an aqueous acidic sealing solution having a pH of about 2 to about 6.5 and comprising at least about 0.18 g/l of dissolved metal selected from the group consisting of zirconium and titanium and a mixture thereof, at least about 0.2 g/l of dissolved fluoride and at least about 0.1 g/l of dissolved silicate (based on SiO_2 content).

4,786,337

METHOD OF TREATING ALUMINUM-LITHIUM ALLOYS

Gardner R. Martin, Redondo Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 25, 1988, Ser. No. 172,876

Int. Cl.⁴ C22F *1/04*

U.S. Cl. 148—11.5 A **17 Claims**

9. A process for heat treating an aluminum-lithium alloy article, to prevent lithium oxide formation during heat treatment, which comprises:

electroplating copper on the surface of said article,

heat treating said article at a temperature above about 900° F.,

contacting said heat treated article with a suitable acid bath which will not degrade the aluminum-lithium alloy base metal, and

stripping said copper plate from said article.

12. The process of claim 9, said heat treatment comprising superplastic forming of said alloy article.

4,786,338

METHOD FOR COOLING ROLLED STEELS

Norio Anzawa; Takeshi Takahashi; Fumitaka Iori; Kouichi Hasegawa; Naoki Watanabe, and Junji Nishino, all of c/o Nippon Steel Corporation, Muroran Works, No. 12, Nakamachi, Muroran City, Hokkaido, Japan

Filed Oct. 30, 1986, Ser. No. 924,816

Claims priority, application Japan, Oct. 31, 1985, 60-242865; Oct. 31, 1985, 60-242866; Dec. 16, 1985, 60-281167; Apr. 14, 1986, 61-84183; Apr. 14, 1986, 61-84184; Aug. 8, 1986, 61-185055

Int. Cl.⁴ C21N *11/00*

U.S. Cl. 148—12.4 **5 Claims**

1. A method of cooling rolled steel comprising the steps of:

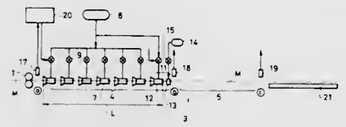
hot-rolling steel to the desired diameter;

subsequently passing the steel along a path and quenching the hot-rolled steel by spraying cooling waters thereon to cool the surface portion of the steel to a temperature within a given range below the bainite transformation temperature, the temperature range being defined as

$$145 \cdot t/r^2 + 130 \leqq T \leqq 152 \cdot t/r^2 + 240$$

where

T=surface temperature of the rolled steel at a temperature measuring point along said path 1 m to 2 m away from the point along said path where quenching ends (°)



t=time required for the rolled steel to travel along said path from the quenching ending point to the temperature measuring point (hr)

r=radius of the rolled steel (m); and

subsequently continuing to pass the quenched steel along said path in ambient atmosphere for causing the temperature of the surface portion of the rolled steel which has been cooled by the quenching to reelevate to a reelevated temperature as a result of the conduction of the heat retained in the inner part of the rolled steel to the surface portion of the steel for tempering the steel.

4,786,339

JACKETING STEEL OBJECTS

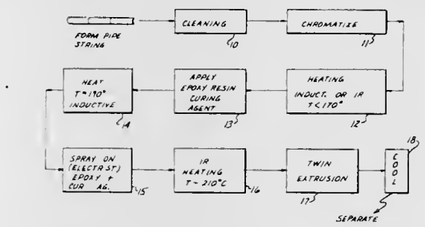
Walter Meyer, Duisburg, and Walter Stucke, Ratingen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 18, 1987, Ser. No. 122,272

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639417

Int. Cl.⁴ B05D *1/36;* **C23C** *22/24*

U.S. Cl. 148—6.2 **8 Claims**



1. In a method for continuously jacketing steel objects particularly tubing including the steps of cleaning the object by means of blasting its steel surface;

chromatizing the cleaned surface by exposing the surface to a silicate containing watery solution of 3 and/or 6 valued chromium compound or compounds, the improvement comprising:

drying the object at a temperature well below a particular temperature applying an epoxy resin curing agent blend to the dried surface as the temperature remains below the particular temperature;

the particular temperature being the temperature where said solution forms a thermally stable chromium iron silicate oxide intermediate layer on said steel surface;

said blend being applied prior to conversion of the chromatized steel object into said intermediate layer; and heating the steel object after the blend has been applied above the particular temperature to cure the blend.

4,786,340

SOLUTION HEAT-TREATED HIGH STRENGTH ALUMINUM ALLOY

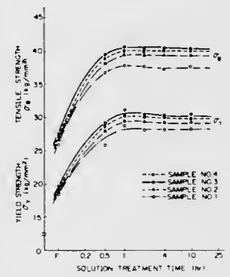
Masahiro Ogawa; Tuneo Ueno, and Hideki Iwai, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Sep. 23, 1986, Ser. No. 910,459

Claims priority, application Japan, Sep. 27, 1985, 60-212674

Int. Cl.⁴ C22C *21/02*

U.S. Cl. 148—439 **5 Claims**



1. A solution heat-treated high strength aluminum alloy for pressure casting, said alloy consisting essentially of 5 to 13 wt % silicon, 1 to 5 wt % copper, 0.1 to 0.5 wt % magnesium, 0.005 to 0.3 wt % strontium, and the balance aluminum and inevitable impurities, said alloy being rendered to substantially a solid solution at elevated temperatures in significantly less than four hours.

4,786,341

METHOD FOR MANUFACTURING CONCRETE STRUCTURE

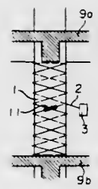
Katsuro Kobatake, Sayama; Hideo Katsumata, Kawaguchi; Kensuke Yagi, Yokohama; Tsuneo Tanaka, Yokohama, and Tatsuo Ando, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Ohbayashi Corporation, Osaka, both of, Japan

Filed Apr. 15, 1987, Ser. No. 38,702

Claims priority, application Japan, Apr. 15, 1986, 61-85056; Apr. 15, 1986, 61-85057; Apr. 15, 1986, 61-85058; Apr. 15, 1986, 61-86757

Int. Cl.⁴ B29C *53/56, 63/04;* **B65H** *81/00;* **E04H** *9/02*

U.S. Cl. 156—71 **8 Claims**



1. A method of manufacturing a concrete structure having improved aseismatic performance, comprising the steps of:

impregnating a fiber with a resin;

spirally winding the resin impregnated fiber as a reinforcing member around the outer periphery of an existing elongate concrete structural member while the resin is in an uncured state;

curing the resin; and

subjecting the structural member to stress,

wherein the spiral winding step is started from the center portion of the concrete structural member and continues to one end thereof, after which the fiber is turned and continuously wound to the other end of the structural member, and thereafter, the fiber is again turned and wound, and finally a starting end and a terminal end of the fiber are joined together to complete the winding step.

4,786,342

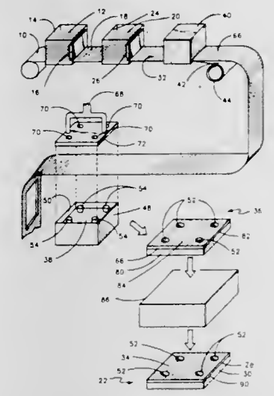
METHOD FOR PRODUCING CAST TAPE FINISH ON A DRY-PRESSED SUBSTRATE

James E. Zellner, Denver, and Robert M. Martin, Golden, both of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Filed Nov. 10, 1986, Ser. No. 929,386

Int. Cl.⁴ B32B *18/00, 31/20*

U.S. Cl. 156—89 **15 Claims**



1. A method of producing a smooth-faced green body ceramic substrate, comprising:

placing a substance comprising powdered ceramic in the cavity of a press;

casting a ceramic tape having at least a smooth first face and a second face, said ceramic tape including a ceramic compatible with said powdered ceramic;

locating a portion of said tape adjacent to said cavity; and

dry pressing said tape portion and said substance to form a integrated smooth-faced green body ceramic substrate.

4,786,343

METHOD OF MAKING DELAMINATION RESISTANT COMPOSITES

Paul E. Hertzberg, San Diego, Calif., assignor to The Boeing Company, Seattle, Wash.

Filed May 10, 1985, Ser. No. 732,753

Int. Cl.⁴ B32B *31/16, 7/08*

U.S. Cl. 156—93 **30 Claims**



1. A method of making a delamination resistant fiber reinforced resin composite comprising the steps of:

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forming a fiber reinforced resin composite panel from a plurality of plies and a resin matrix;
forming a fiber reinforced resin composite reinforcing member from a plurality of plies and a resin matrix; and,
bonding said fiber reinforced resin composite panel to said fiber reinforced resin composite reinforcing member with a high shear strength, high toughness, thermosetting resin adhesive layer, said thermosetting resin being different from the resin used to form said resin matrix of said fiber reinforced resin composite panel and said fiber reinforced resin composite reinforcing member.

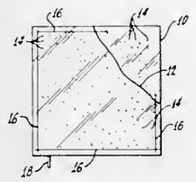
6. The method claimed in claim 1, including the step of crossply stitching the plies of said fiber reinforced resin composite panel to enhance the delamination resistance of said fiber reinforced resin composite panel.

4,786,344

EVACUATED DUAL PANE WINDOW STRUCTURE

Paul D. Beuther, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 27, 1986, Ser. No. 923,460
Int. Cl.[4] E06B *3/24, 7/12*; B32B *17/00*
U.S. Cl. 156—109 **5 Claims**



1. A method of making a multi-pane window structure comprising:
applying a mixture of a liquid and spherical spacing members to a substantially horizontally disposed first glass pane to randomly dispose the spacing members on the pane and to temporarily locate the spacing members on the pane;
evaporating the liquid from the pane and spacing members;
positioning a second glass pane on top of the first pane, the spacing members being located there between;
drawing a vacuum on the space between the panes to bow the panes sufficient to fixedly located the spacing members there between in the absence of fusing or adhesively bonding the spacing members to either pane; and
joining the panes to permanently seal the evacuated space.

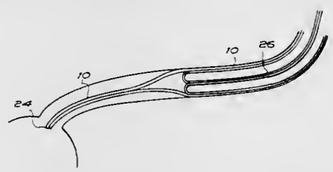
4,786,345

METHOD OF LINING A PASSAGEWAY

Eric Wood, Wellingborough, England, assignor to Instituform Licencees B.V., Netherlands

Continuation of Ser. No. 714,797, Mar. 22, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,574
Claims priority, application United Kingdom, Mar. 24, 1984, 8407706
Int. Cl.[4] B32B *31/08*
U.S. Cl. 156—156 **10 Claims**

1. A method of lining a passageway comprising:
(a) providing a first flat flexible lining tube sized to the passageway to be lined, said first lining tube comprising a resin absorbent tube;
(b) impregnating the resin absorbent layer with the first part of a two-part curable synthetic resin system;
(c) inserting the resin impregnated first lining tube in the passageway while flat;
(d) providing a second flat flexible lining tube sized to the first lining tube;
(e) applying the second part of the two-part curable resin system to the inner surface of the second flexible tube;
(f) inflating the first lining tube while in the passageway from the flat condition to a condition lining the passgeway by everting the second lining tube into the interior of first flat



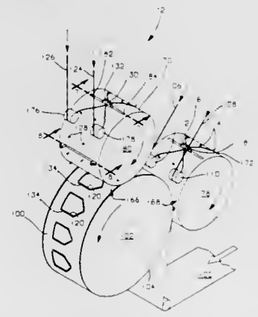
lining tube so that the first and second parts of the resin systems come into contact and the resin system commences curing.

4,786,346

METHOD FOR APPLYING CONTOURED ELASTIC TO A SUBSTRATE

Thomas M. Ales; Jeffrey J. Samida, both of Neenah; Donald F. Arthur, and Ronald H. Wideman, both of Menasha, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 791,885, Oct. 28, 1985, Pat. No. 4,726,873. This application Oct. 22, 1987, Ser. No. 111,968
Int. Cl.[4] B32B *31/04, 31/18*
U.S. Cl. 156—160 **27 Claims**



1. A method of applying elastic to a web comprising providing at least one strand of self-adhering elastic material, stretching said at least one strand of elastic, forming said elastic strand into a contoured loop by applying said at least one strand against a convex pattern of retractable supports, bringing said supports bearing the contoured elastic strand into contact with a web, causing said supports to retract, and transferring said self-adhering elastic to said web.

4,786,347

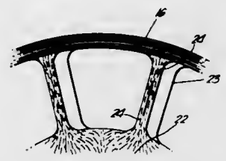
METHOD OF MANUFACTURING AN ANNULAR BLADED MEMBER HAVING AN INTEGRAL SHROUD

James P. Angus, Penrith, England, assignor to Rolls-Royce plc, London, England

Filed Jun. 5, 1985, Ser. No. 741,584
Claims priority, application United Kingdom, Jul. 7, 1984, 8417419
The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.
Int. Cl.[4] B65H *81/00*
U.S. Cl. 156—172 **9 Claims**

1. A method of manufacturing an integral bladed member comprising:
winding a substantially continuous fibre around radially outer extents of an annular array of inserts provided on a

dividable die defining the form of said integral bladed member, said inserts being so configured as to define spaces between adjacent blades on said member, so that said fibre constitutes the reinforcing fibre of an integral shroud interconnecting the radially outer extends of said blades,
closing said die and injecting a mixture of short fibres in a matrix material into the central portion of said die interior so that said mixture fills said central portion and flows



between said inserts so that the majority of said short fibres between said inserts are generally radially aligned to partially inpregnate said wound fibre,
injecting a matrix material into said wound fibre so as to impregnate any part thereof which has not been impregnated by said mixture of a matrix material and short fibres so as to define said integral shroud, and
subsequently opening said die to release the thus produced integral bladed member.

4,786,348

METHOD OF MAKING TRANSPARENT ORIENTED SHEETS

Robert R. Luise, Boothwyn, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 5, 1987, Ser. No. 319
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—181 **3 Claims**

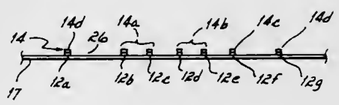
1. A method for preparing a uniaxially oriented sheet comprising hot pressing a warp of melt extruded filaments from polymer capable of forming an optically anisotropic melt at a temperature and pressure sufficient to form a coherent transparent sheet.

4,786,349

METHOD OF APPLYING HEAT ACTIVATED TRANSFER

John E. Mahn, Sr., 6154 Oakhaven Dr., Cincinnati, Ohio 45238

Filed Apr. 23, 1987, Ser. No. 41,866
Int. Cl.[4] B32B *31/00*; B44C *1/17*; B65C *9/25*
U.S. Cl. 156—234 **6 Claims**



1. A method of applying a heat activated transfer to a substrate wherein the transfer comprises a continuous thermoplastic adhesive layer and an upper discontinuous heat resistant layer bonded to said thermoplastic adhesive layer with said transfer positioned on said substrate with said thermoplastic adhesive layer against said substrate and an absorbing sheet positioned against said upper layer, said absorbing sheet being effective to absorb said thermoplastic adhesive when said adhesive is molten; said method comprising
(a) applying heat and pressure against said absorbing sheet towards said substrate thereby softening said thermoplastic layer; and
(b) pressing said transfer against said substrate whereby the portion of said thermoplastic layer not underneath said heat resistant layer is absorbed by said absorbing sheet;
(c) separating said absorbing sheet from said thermoset layer whereby a second portion of said thermoplastic layer underneath said heat resistant layer remains, bonding said heat resistant layer to said substrate.

4,786,350

METHOD OF MANUFACTURING A WEATHERABLE EXTERIOR SIDING

Jeffrey E. Nesbitt, Peach Bottom, Pa., and James E. Pierce, Gloucester, N.J., assignors to Pony Industries, Inc., New York, N.Y.

Continuation of Ser. Nn. 745,151, Jul. 17, 1985, abandoned, which is a continuation of Ser. No. 497,549, May 24, 1983, abandoned. This application Apr. 13, 1987, Ser. No. 38,471
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—244.24 **11 Claims**

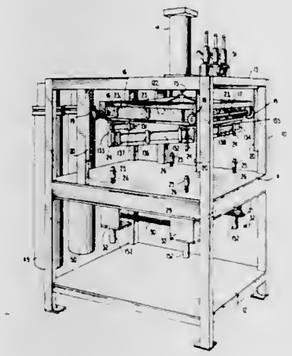
1. A method of producing a thermoplastic resin-based shaped profile having superimposed on at least one of its surfaces a polyvinyl fluoride or polyvinylidene fluoride weatherable layer which method comprises:
(a) extruding a compound comprising a thermoplastic resin through a die set having more than one plane to form a non-planar shaped profile:
(b) flattening the resulting non-planar shaped profile to form a substantially flat substrate;
(c) laminating a preformed weatherable layer comprised of polyvinyl fluoride or polyvinylidene fluoride onto the surface of the flattened substrate; and
(d) shaping the resulting laminated substrate into substantially the shape of the extruded non-planar shaped profile before it was flattened.

4,786,351

PROCESS AND APPARATUS FOR SIMULTANEOUSLY SHAPING FOAM AND LAMINATING FABRIC THERETO

George M. Elliott, Alpharetta; Archie Solomon, Atlanta, and Michael L. Avery, Cumming, all of Ga., assignors to Astechnologies, Inc., Roswell, Ga.

Filed Dec. 31, 1985, Ser. No. 831,514
Int. Cl.[4] B32B *31/06*
U.S. Cl. 156—245 **55 Claims**



1. A process of shaping open cell cushion foam and simultaneously laminating steam permeable fabric thereto, comprising the following steps:
(a) placing a layer of hot melt fabric adhesive over one side of the foam,
(b) overlaying the adhesive with the fabric,

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(c) pressing a contoured die against the fabric-covered side of the foam, thereby creating one or more bends or indentations in the foam, said die being perforated across substantially its entire contact surface and said contact surface being preheated to an elevated temperature, but said temperature being below the melting point of the adhesive,

(d) ejecting a shot of superheated steam through the perforations in the die at a pressure sufficient to drive the steam through the fabric and force some of the adhesive at least part way into the interior of the foam, the temperature of the steam being high enough to melt the adhesive,

(e) passing a cooling gas through the foam, until the adhesive has resolidified, thereby laminating the fabric to the foam and permanently fixing the bend(s) or indentation(s) in the foam, and

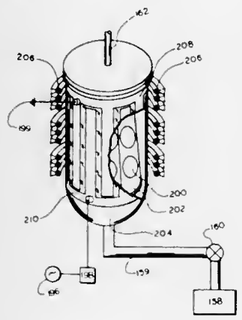
(f) disengaging the die and the resultant laminated, shaped composition.

4,786,352

APPARATUS FOR IN-SITU CHAMBER CLEANING

David W. Benzing, San Jose, Calif., assignor to Benzing Technologies, Inc., San Jose, Calif.

Filed Sep. 12, 1986, Ser. No. 907,044
Int. Cl.[4] C23F *1/02*
U.S. Cl. 156—345 **33 Claims**



1. An apparatus for the in-situ cleaning of the interior surface of the wall therein and/or the tooling or substrates to be disposed therein comprising:

a processing chamber including a chamber wall that is composed substantially of dielectric material;

at least one powered electrode formed from a thin film of conductive material deposited directly on the exterior surface of said chamber wall;

at least one grounded electrode formed from a thin film of conductive material deposited directly on the exterior surface of said chamber wall;

a means for introducing gas into said chamber;

a means for supplying a gas to said gas introducing means;

a means for establishing and maintaining a reduced pressure environment within said chamber;

a means for supplying radio frequency electric power;

said powered electrode, said grounded electrode and said RF power supply means forming an electrical network;

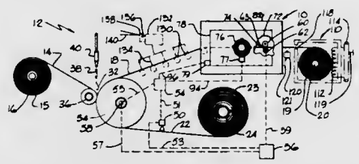
said electrical network formed to create a radio frequency electrical field between said powered electrode and said grounded electrode, whereby a plasma is created in the interior of said chamber by the interaction of said gas and said RF electrical field under sub-atmospheric pressure conditions, said plasma acting to clean unwanted deposits and/or contaminants from the inner surface of the wall of said chamber and/or the tooling or substrates to be disposed within said chamber.

4,786,353

LAMINATING METHOD AND APPARATUS WITH EXTENSIBLE WEB WIDTH CONTROL

Darrell L. Templeton; Eddy Cothren, both of Lawrenceburg, Tenn., and Peter Vischer, Golden, Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Oct. 16, 1987, Ser. No. 109,461
Int. Cl.[4] B65B *41/18*
U.S. Cl. 156—359 **11 Claims**



1. An apparatus for laminating a moving web of plastic film material to a moving web of paper material to form a moving web of laminated composite, the film material passing through the apparatus in a continuous longitudinally extending web having an upstream portion entering the apparatus and a downstream portion exiting the apparatus; and film material normally being extensibly deformable such that the longitudinal distance between any two reference points on the film web may vary significantly during lamination; the apparatus comprising:

paper supply means for providing a continuous supply of paper to be laminated;

film supply means for providing a continuous supply of film to be laminated;

first nip means positioned downstream said film supply means for advancing a first portion of film web passing therethrough at a first film web speed;

laminating means positioned downstream said first nip means for bondingly compressing said film web to said paper web to form a laminated composite continuous with said film web and for advancing a second portion of film web passing therethrough at a second film web speed;

first nip means speed varying means for varying said first film web speed with respect to said second film web speed for selectively stretching or relaxing the portion of said film web positioned between said first nip means and said second nip means;

film length monitoring means for measuring the length of predetermined portions of said film web and for providing a monitor signal to a first data processing means;

first data processing means for comparing said monitor signal to a predetermined design length value and providing command signals responsive thereto to said nip means speed varying means for adjusting said first film web speed relative said second film web speed for imparting a predetermined amount of stretch or relaxation to said film web whereby predetermined portions of said film web are continuously extensibly adjusted to a predetermined length corresponding to said predetermined design length value; and

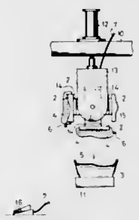
web temperature control means for controlling the temperature of a control portion of said film web positioned between said first nip means and said laminating nip during film web length varying operations for maintaining a substantially constant, preselected web width at said laminating nip.

4,786,354

APPARATUS FOR MANUFACTURING A SEAT

Hiroyuki Makino, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Mar. 26, 1987, Ser. No. 30,116
Int. Cl.[4] B65H *1/00*
U.S. Cl. 156—538 **4 Claims**



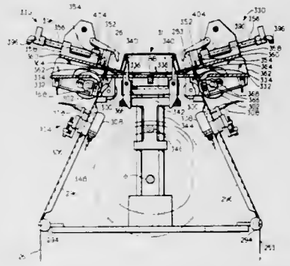
1. An apparatus for manufacturing a seat comprising a pair of upper and lower dies so arranged that the upper die is vertically movable relative to the lower die and that the upper die is adapted to mount a cushion member thereon while the lower die is adapted to mount a top cover member thereon, wherein said cushion member has a metallic frame embedded therein, and wherein said upper die includes at least one electromagnet arranged therein, so that said cushion member is brought into contact with and retained by said upper die, and when said upper die is lowered to and depressed against said lower die, said cushion member is bonded to said top cover member by means of an adhesive, and wherein further, said electromagnet arranged in said upper die comprises a plurality of electromagnets which are arranged in a surface of said upper die in a configuration corresponding to the configuration of said metallic frame in said cushion member.

4,786,355

LABEL APPLICATION APPARATUS

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Aug. 29, 1986, Ser. No. 901,671
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—556 **17 Claims**



1. Label application apparatus for applying labels to a side wall of an article having relatively thin side walls, comprising:

(a) means for automatically successively indexing a series of articles from a supply thereof into position for receiving labels,

(b) means for supplying labels to be applied to said articles,

(c) means for transferring a label from said label supply means to and pressing it against a side wall of said article,

(d) backup platen means movable into position on the other side of and in contact with said article side wall from said label transfer means after the indexing of an article to hold said side wall against substantial movement during the pressing of a label against said side wall,

(e) means for moving said backup platen into said side wall support position in response to the indexing of an article into label receiving position and for moving said backup platen out of said side wall support position in response to the completion of label application to said side wall, and

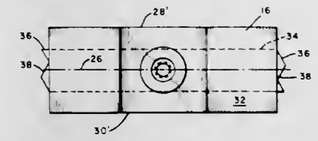
(f) means for moving said article out of label receiving position after said backup platen is removed from the side wall support position.

4,786,356

HIGH FREQUENCY RESONATOR FOR WELDING MATERIAL

Everett A. Harris, Brookfield Center, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed May 21, 1987, Ser. No. 52,839
Int. Cl.[4] B06B *3/00*; B29C *65/08*
U.S. Cl. 156—580.1 **12 Claims**



1. A blade shaped high frequency resonator having an input surface for receiving thereat high frequency vibrations and for transmitting such vibrations to an oppositely disposed output surface, said resonator being dimensioned to cause said input surface and said output surface to be disposed substantially at antinodal regions of vibrations transmitted longitudinally therethrough from said input surface to said output surface, the improvement comprising:

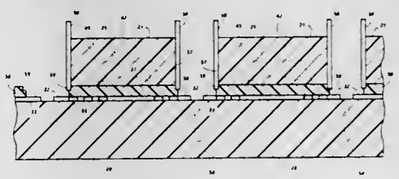
said output surface including two opposed lateral ends, each of said lateral ends comprising a laterally extending ear terminating in laterally disposed end surfaces, each of said ears being dimensioned for causing the sum of the moments of said ear about the lateral axis of said resonator to be substantially zero.

4,786,357

THERMAL INK JET PRINTHEAD AND FABRICATION METHOD THEREFOR

Michael R. Campanelli, Webster, and Donald J. Drake, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 27, 1987, Ser. No. 126,085
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—633 **4 Claims**



1. A method for fabricating a plurality of printheads, each printhead being usable in an ink jet printing device for emitting and propelling ink droplets toward a recording medium, the method comprising the steps of:

(a) cleaning a (100) silicon wafer and a similar sized substrate, each having first and second substantially parallel surfaces;

(b) forming a layer of etch resistant material on at least the first surface of the wafer;

(c) forming a plurality of sets of equally spaced, linear arrays of resistive material on the first surface of the second substrate for use as sets of heating elements, and forming a plurality of sets of addressing electrodes on the same substrate surface for enabling individual addressing of each heating element with current pulse, at least some of the electrodes terminating with a contact pad;

(d) depositing a thick film insulative layer having a thickness

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in the range of 5 to 100 micrometers over the second substrate first surface and heating element and electrode sets thereon;

(e) patterning the thick film insulative layer to produce a via over and in alignment with each heating element and a set of large vias over each set of electrode end portions having the contact pads and etchant removal of the portions of the thick film insulative layer exposed by these vias to form recesses about each heating element and at least one large recessed trough for each set of electrode contact pads to provide access thereto;

(f) photolithographically patterning the etch resistant layer on the first surface of the wafer to produce a plurality of sets of vias of predetermined sizes and at predetermined locations therein;

(g) anisotropic etching of the wafer to produce sets of recesses in its first surface, each recess being bounded by {111} plane side walls;

(h) forming a plurality of sets of equally spaced, parallel grooves through the first surface of the wafer and its etch resistant layer, each groove having a predetermined depth and first and second ends, the first ends of each set of grooves communicating with an associated one of the recesses and the second ends of each set of grooves being open;

(i) aligning and bonding the wafer and the substrate with their first surfaces confronting each other and sandwiching the thick film insulative layer therebetween, the alignment assuring that each groove contains a one of the heating elements spaced a predetermined distance from the second open ends thereof and the bonding permanently attaching the wafer and substrate together, so that each recess in the set of recesses communicating with a set of grooves serves as an ink supplying manifold, while each set of grooves serves as ink channels, with its second open ends serving as nozzles;

(j) removing the silicon material of the wafer aligned with each large trough in the thick film insulative layer by a dicing operation to expose the sets of contact pads, the thickness of the thick film insulative layer providing the clearance necessary to prevent damage to the contact pads, during this silicon removal step; and

(k) dicing the bonded wafer and substrate into a plurality of individual printheads, each printhead having a manifold, a set of channels communicating with the manifold at one end thereof and having nozzles at the other end with heating elements in each a predetermined distance from the nozzles, and addressing electrodes for selectively addressing the heating elements.

4,786,358

METHOD FOR FORMING A PATTERN OF A FILM ON A SUBSTRATE WITH A LASER BEAM

Shunpei Yamazaki, Tokyo; Akira Mase, Atsugi, and Hiroyuki Sakayori, Machida, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Aug. 7, 1987, Ser. No. 82,545

Claims priority, application Japan, Aug. 8, 1986, 61-186200; Aug. 8, 1986, 61-186199; Aug. 8, 1986, 61-186202

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*

U.S. Cl. 156—643 **15 Claims**

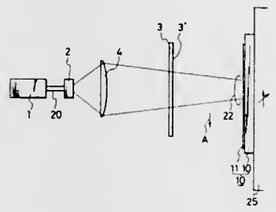
1. A method for forming a pattern of a film provided on a substrate, said method comprising the steps of:

generating a laser beam from an eximer laser;

expanding said laser beam by an expander;

contracting said expanded laser beam through a convex lense;

shaping said contracted laser beam through a mask; and



irradiating said film with said shaped laser beam to remove selected portion of said film.

4,786,359

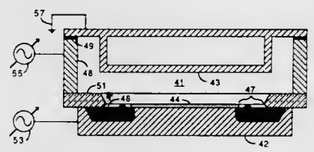
XENON ENHANCED PLASMA ETCH

Mark M. Stark, Kamakura; Shu Nakajima, Fujisawa, both of Japan, and Roger B. Lachenbruch, Sausalito, Calif., assignors to Tegal Corporation, Petaluma, Calif.

Filed Jun. 24, 1987, Ser. No. 65,746

Int. Cl.[4] C03C *15/00*

U.S. Cl. 156—643 **5 Claims**



1. A process for etching a silicon wafer comprising the steps of:

providing a gas mixture comprising CF_3Br and xenon or krypton;

contacting said wafer with a plasma formed from said mixture; and

eroding a carbon bearing object with said plasma for at least a portion of the time said plasma contacts said wafer.

4,786,360

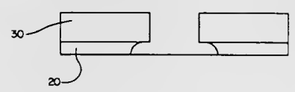
ANISOTROPIC ETCH PROCESS FOR TUNGSTEN METALLURGY

William J. Cote; Karey L. Holland, both of Essex Junction, and Terrance M. Wright, Williston, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1987, Ser. No. 31,813

Int. Cl.[4] B44C *1/22*

U.S. Cl. 156—643 **9 Claims**



9. A method for anisotropically etching a layer of tungsten disposed on a refractory metal-based barrier layer, comprising the steps of forming a refractory metal-based barrier layer on a substrate and a layer of tungsten on said refractory metal-based barrier layer, and exposing said layers to a plasma comprised of Cl_2 and oxygen, wherein said oxygen comprises approximately

25%–45% of the binary mixture of Cl_2 and oxygen, wherein the binary mixture is present in an amount sufficient to provide an active etching agent for the tungsten.

4,786,361

DRY ETCHING PROCESS

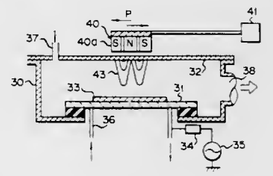
Makoto Sekine, Yokohama; Haruo Okano, and Yasuhiro Horiike, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

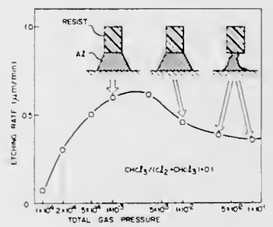
Filed Mar. 5, 1987, Ser. No. 22,368

Claims priority, application Japan, Mar. 5, 1986, 61-47709; Mar. 28, 1986, 61-68666; Aug. 29, 1986, 61-201559

Int. Cl.[4] B44C *1/22*

U.S. Cl. 156—643 **16 Claims**





1. A dry etching process, comprising the steps of:

placing a workpiece with an etching mask formed on the surface thereof, on a first electrode disposed in a container;

generating a magnetic field of a closed loop on that side of a second electrode disposed in said container which faces said first electrode, so as to extend said magnetic field from said second electrode to said first electrode, and applying a high frequency power across said first and second electrodes;

supplying a feed gas containing an etching gas into said container; and

evacuating said container to a set pressure in said container at a level of at least 2×10^{-4} Torrs and of less than 10^{-2} Torrs.

4,786,362

PROCESS FOR PRODUCING DECORATIVE OR INFORMATIVE PATTERNS ON OBJECTS FORMED OF SINGLY OR MULTIPLY PLATED METAL SHEETS

Hermann Ritzenhoff, An der Schäferbucbe 14, D-3550 Marburg-/Lahn, Fed. Rep. of Germany, assignor to Hermann Ritzenhoff, Marburg/Lahn, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,399

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*

U.S. Cl. 156—645 **5 Claims**

1. A process for producing decorative or informative patterns on objects that are made up of singly or possibly multiply plated metal sheets, wherein the outer plated layer is removed in the shape of the desired pattern down to at least one of the underlying plated layers, and the object is subsequently treated to obtain different surfaces, characterised in that plated layers of aluminium alloys of different composition are used for the object and that after the removal of the outer plated layer the object is treated in one and the same surface treatment bath with which the outer and the inner aluminium alloy layers react differently.

4,786,363

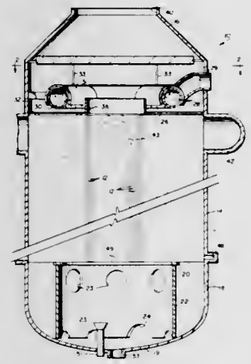
RADIAL SKIN EVAPORATOR

Carl L. Elmore, and Charles W. Dier, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Feb. 20, 1987, Ser. No. 16,939

Int. Cl.[4] B01D *1/22*

U.S. Cl. 159—13.1 **18 Claims**



1. An evaporator assembly comprising:

a plurality of sets of heating elements each comprising a pair of spaced plates defining therebetween an interior volume, said heating elements being spaced arcuately from each other and disposed so that they extend radially with respect to the center of a common circle to terminate in outer edges;

a continuous circumferential vessel wall surrounding said heating elements and secured to said outer edges of the plates of said heating elements to define with and plates fluid tight interior volumes for said heating elements and for structural support from said plates;

a heating fluid inlet for supplying heating fluid to the interior volumes of said heating elements;

liquor distributing means diposed above said heating elements and supported thereby, for introducing liquid to be evaporated so that it flows as a film over the exteriors of the plates of said heating elements, and a portion thereof is evaporated;

said continuous circumferential vessel wall, with a top portion and bottom portion, defining a vessel;

vapor outlet means disposed at the top of said vessel; and

supporting means for supporting said heating elements, disposed adjacent the bottom of said vessel.

4,786,364

DMDAAC/AM COPOLYMERS AS DEINKERS

Edwin R. Tefft, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1984, Ser. No. 637,236

Int. Cl.[4] D21C *5/02*

U.S. Cl. 162—5 **5 Claims**

1. In a method for deinking cellulosic fibrous material impregnated with ink wherein a mixture of said material and water is stirred in the presence of a deinking agent, the im-

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provement wherein said deinking agent is a hydrolyzed copolymer of dimethyldiallyl ammonium chloride and acrylamide, wherein the molecular weight of said copolymer is 2,000,000 to 10,000,000 as determined by gel permeation chromatography, and wherein 0.01 to 0.1%, by weight, of said copolymer is used, based on a dry paper weight.

4,786,365

PROCESS OF MAKING CELLULOSE PULP WITH A SULPHITE COOKING LIQUOR CONTAINING SULPHIDE AND A QUINONE OR HYDROQUINONE COMPOUND

Ants Teder, Täby; Leelo Olm, Saltsjöbaden, and Jan-Erik Wilkén, Täby, all of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Continuation of Ser. No. 876,867, filed as PCT SE85/00321 on Aug. 29, 1985, published as WD86/02393 on Apr. 24, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 158,099

Claims priority, application Sweden, Oct. 10, 1984, 8405061

Int. Cl.⁴ D21C *3/06, 3/20, 3/26*

U.S. Cl. 162—65 **12 Claims**

1. A process for the manufacture of pulp from wood comprising digesting an amount of wood with a sulphite cooking liquor containing sulphide and a quinone or hydroquinone compound, the mole ratio between sulphide and sulphite, calculated as Na_2S and, respectively, Na_2SO_3, amounting to 0.05–0.2.

4,786,366

PROCESS FOR PRODUCING FIBER AGGREGATE

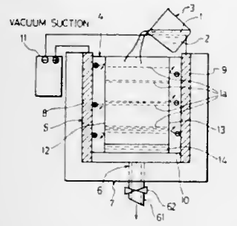
Tomohito Ito, Obbu; Fukuo Gomi, Nagoya, and Renichi Isomura, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Dec. 19, 1986, Ser. No. 945,532

Claims priority, application Japan, Dec. 28, 1985, 60-299558; Jan. 10, 1986, 61-004015; Jan. 17, 1986, 61-008441

Int. Cl.⁴ D21H *5/00*

U.S. Cl. 162—102 **11 Claims**



1. A process for producing fiber aggregate which comprises:
a dispersion step of dispersing fibers in the form of short fiber, whisker, or a mixture thereof into a dielectric liquid;
an orientation step of placing said dielectric liquid containing said fibers dispersed therein between a positive electrode and a negative electrode across which a high voltage is applied, wherein a convection-preventing membrane for stabilizing the electrostatic orientation of the fibers is disposed adjacent at least one of the electrodes on the side of said at least one electrode toward the other of the electrodes, and wherein individual fibers in said dielectric liquid are electrostatically oriented, with one end pointing to the positive electrode and the other end pointing to the negative electrode; and
an aggregating step of aggregating the electrostatically oriented fibers while maintaining the direction of orientation of the fibers wherein fiber aggregate in which said fibers are substantially one-dimensionally oriented is produced.

4,786,367

CHEMICALLY TREATED PAPER PRODUCTS—TOWEL AND TISSUE

Larry Bogart, Penn Valley; James J. Hipkins, Prospect Park, and Nathan A. Edelson, Bala Cynwyd, all of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Aug. 6, 1987, Ser. No. 82,110

Int. Cl.⁴ D21H *3/12*

U.S. Cl. 162—158 **2 Claims**

1. A web of cellulosic fibers comprising lauroamphoglycinate in an amount from 0.1 to 2% by weight of the web.

4,786,368

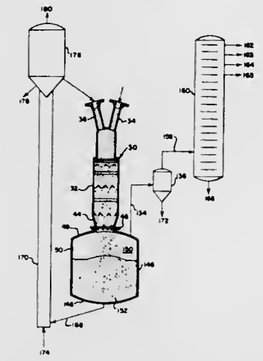
STATIC MIXER RETORTING OF OIL SHALE

Earl D. York, Englewood, Colo.; Jay C. Knepper, Lisle, and John M. Forgac, Elmhurst, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 833,191, Feb. 27, 1986, Pat. No. 4,721,560, which is a continuation-in-part of Ser. No. 782,204, Sep. 30, 1985, Pat. No. 4,597,852. This application Jan. 20, 1987, Ser. No. 5,459

Int. Cl.⁴ C10B *1/04, 53/06*

U.S. Cl. 202—99 **2 Claims**



1. A system for retorting oil shale, comprising:
a static mixer having an upper free-fall section with a domed roof and a lower elongated deflector section, said deflector section having a greater diameter than said upper section, said static mixer having a vertical axis and having only stationary parts and components consisting of six vertically spaced tiers of triangular-shaped internals having upwardly pointing apexes in said deflector section, alternate tiers of said internals being spaced substantially parallel and at about right angles to adjacent tiers as viewed from said roof, said tiers extending substantially horizontally across said deflector section, said six tiers, as viewed from said roof, consisting of first and second tiers having only three triangular-shaped internals of substantially the same size, and third, fourth, fifth and sixth tiers positioned beneath said first and second tiers and having similarly sized triangular-shaped internals, said internals in said first and second tiers being smaller than the internals in said third through sixth tiers, the third and fourth tiers each having three triangular-shaped internals, the first through fourth tiers each having a center internal with an apex positioned substantially along said vertical axis, said first through fourth tiers each having outer internals with the apexes of the outer internals of the third and fourth tiers spaced laterally inwardly of the outer internals in the first and second tiers, the fifth and sixth tiers each having two intermediate triangular-shaped internals and two downwardly and inwardly sloping outer internals with the apexes of the intermediate internals being spaced outwardly and offset from the apexes of said center internals of the first through fourth tiers, said outer internals in said fifth and sixth tiers being spaced outwardly from said outer internals in said third and fourth tiers, said six tiers of internals being arranged to cooperate with each other in the above manner to substantially completely mix and randomly distribute raw and spent oil shale together in said deflector section;
a raw oil shale feed line positioned at an angle of about 30 degrees relative to said vertical axis and connected to said domed roof;
a solid heat carrier material feed line positioned at an angle of about 30 degrees relative to said vertical axis and at an inclusive angle of about 60 degrees relative to said raw oil shale feed line and connected to said domed roof, said feed lines are positioned at an acute angle of about 22.5 degrees relative to said apex of said center internal of said first tier of triangular-shaped internals as viewed from said domed roof;
a surge bin positioned below and communicating with said deflector section for substantially completing the retorting of said raw oil shale;
a combustor connected to said surge bin for combusting said retorted shale; and
a separator connected to said surge bin for separating at least one fraction of shale oil from hydrocarbons liberated from said raw oil shale in said bin.

4,786,369

INTEGRAL DRY ABRASIVE SOAP POWDERS

Joseph S. Kanfer, Akron; James A. Monson, SilverLake Village, and Lucy J. Krieger, Clinton, all of Ohio, assignors to Go-Jo Industries, Inc., Cuyahoga Falls, Ohio

Division of Ser. No. 859,362, May 5, 1986. This application Mar. 26, 1987, Ser. No. 12,806

Int. Cl.⁴ C11D *9/20, 9/30, 13/20, 17/06*

U.S. Cl. 252—120 **3 Claims**

1. A free flowing abrasive soap powder having a density of less than 1 gram/cc, comprising:
abrasive particles and a formed soap, said formed soap coating said abrasive particles, said formed soap containing an acid portion and a base portion;
wherein said acid portion is selected from the group consisting of fatty acids having from about 9 to 30 carbon atoms, said base portion is selected from the group consisting of amines having from about 2 to 6 carbon atoms and said abrasive particles comprise perlite.

4,786,370

DEHYDRATION OF FORMIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715

Filed Jan. 4, 1988, Ser. No. 140,495

Int. Cl.⁴ B01D *3/40;* **C07D** *53/02*

U.S. Cl. 203—15 **5 Claims**

1. A method for recovering formic acid from mixtures of formic acid and water which comprises distilling a mixture of formic acid and water in a rectification column in the presence of about one part of an extractive agent per part of formic acid-water mixture, recovering water as overhead product and obtaining the formic acid and the extractive agent from the stillpot, wherein said extractive agent is a material selected from the group consisting of propylene carbonate and ethylene carbonate.

4,786,371

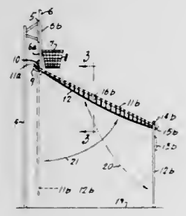
BACKBOARD BASKETBALL-RETRIEVER

John Postol, Lake Hopatcong, N.J., assignor to David Harsanyi, Morris Plains, N.J., a part interest

Filed Mar. 20, 1987, Ser. No. 28,347

Int. Cl.⁴ A63B *69/00*

U.S. Cl. 273—1.5 A **25 Claims**



1. A basketball backboard ball-return device comprising in combination:a basketball-return net; a frame means for suspending said net, said frame means having upper and lower ends and including downwardly-extending laterally spaced-apart elongated supports, said net being mounted on and between each of said spaced-apart elongated supports; pivot means for pivotably attaching said upper end of said frame means to a lower portion of a basketball backboard, said pivot means being attachable to said upper end of said frame means such that when the frame means is attached to said lower portion, said lower end of said frame means is pivotable forwardly outwardly from beneath the basketball backboard on which the upper end is mounted; and retention means for intermittently anchoring said lower end forwardly of said basketball backboard such that when anchored forwardly a basketball bouncing off of said backboard is downwardly and forwardly guidable by said net to said lower end.

4,786,372

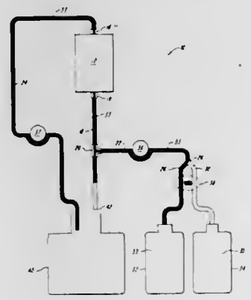
ELECTROCHEMICAL MEASURING

Ronald L. Jones, Newton, N.H.; Alan D. Cormier, Newburyport, Mass., and Melvin S. Weinberg, Nashua, N.H., assignors to Amdev, Inc., Danvers, Mass.

Filed Jul. 22, 1985, Ser. No. 757,648

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—1 T **23 Claims**



10. In a method for analyzing fluid samples using an electrochemical measuring apparatus having an analyzing device with an inlet port and an outlet port, said outlet port connecting with an outlet tube, said inlet port connecting to an inlet tube having a sample-receiving end, and said inlet tube connecting at a junction along its length to one end of a fluid supply tube having two ends, said one end and an opposite end, which fluid

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supply tube is connected at its opposite end to at least one fluid source and which fluid supply tube initially is filled with fluid calibrant, the improvement comprising, a method for isolating the fluid calibrant in the fluid supply tube from fluid drawn proximally through the inlet tube past the junction and to the analyzing device by creating and maintaining an air bubble in the fluid supply tube at the junction by drawing a segment of air from said inlet tube into said fluid supply tube to isolate the fluid calibrant in the fluid supply tube from the junction,

putting the sample-receiving end of the inlet tube in contact with a fluid sample,

and exerting a force to draw the fluid sample proximally through the inlet tube.

4,786,373

VOLTAMMETRIC METHOD OF MEASURING

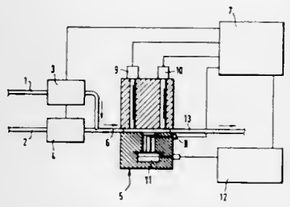
Kari M. O. Saloheimo, and Seppo V. Rantapuska, both of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 844,846, Mar. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 684,748, Dec. 2, 1984, abandoned. This application May 13, 1987, Ser. No. 50,056

Claims priority, application Finland, Dec. 29, 1983, 834847

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—1 T **3 Claims**



1. A stripping analysis method for analyzing a liquid using a measurement device that comprises wall means defining a measurement cell for receiving liquid to be analyzed, and also comprises a solid working electrode and a reference electrode that contact liquid in the cell, said method comprising the following steps, in the order stated:

(a) a preelectrolysis step during which liquid to be analyzed is introduced into the measurement cell at a pulsating rate, the working electrode is vibrated at an ultrasonic frequency, and the voltage potential between the working electrode and the reference electrode is adjusted to a level which allows the substances to be determined to be deposited on the working electrode,

(b) a stripping step during which the voltage potential between the working electrode and the reference electrode is scanned through the potential range where the substances to be determined are dissolved back to the liquid and current is measured while the liquid in the measurement cell remains essentially undisturbed, and

(c) an elimination step during which the voltage potential between the working electrode and the reference electrode is adjusted to a level at which the working electrode is regenerated and the products of the measurement step are removed from the cell by vibrating the working electrode at an ultrasonic frequency and thereby disturbing the liquid in the cell, and introducing liquid into the cell at a non-pulsating rate and thereby displacing liquid from the cell.

4,786,374

ELECTRO-CHEMICAL SENSORS AND METHODS FOR THEIR MANUFACTURE AND USE

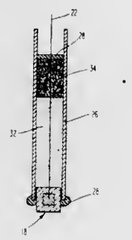
Wayne L. Worrell, Narberth, and Qing-Guo Liu, Pennsylvania, both of Pa., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 891,548, Jul. 29, 1986, abandoned, which is a division of Ser. No. 704,385, Feb. 22, 1985, Pat. No. 4,627,892. This application Sep. 29, 1987, Ser. No. 104,514

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.⁴ G01N *27/58*

U.S. Cl. 204—1 T **35 Claims**



1. An electrochemical sensor for a species comprising:

(a) a shaped body isostatically formed from a blend, said blend comprising a solid solution having a fluorite crystal structure comprising:

a metal oxide; and

admixed with said metal oxide, an oxide of an element from group IIA or IIIB of the periodic table in an amount sufficient to render said blend ionically conductive; and

(b) an electrode in contact with said shaped body, said shaped body having not been subjected to sintering or thermal densification.

24. The method of claim 18 further comprising admixing with the blend a sulfur sensing amount of a sulfide of the element of group IIA, IIIB, or IVB of the periodic table.

4,786,375

MANUFACTURE OF SELF SUPPORTING MEMBERS OF COPPER CONTAINING PHOSPHORUS

John W. Graydon, Toronto, and Donald W. Kirk, Ontario, both of Canada, assignors to Falconbridge Limited, Toronto, Canada

Filed Jul. 21, 1987, Ser. No. 75,896

Claims priority, application Canada, Jnl. 25, 1986, 514722

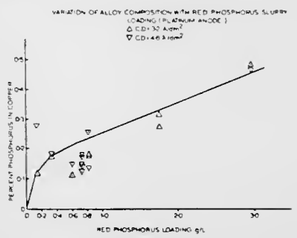
Int. Cl.⁴ C25D *1/12, 3/38, 5/50*

U.S. Cl. 204—3 **14 Claims**

1. A method for manufacturing a self-supporting member comprising copper containing phosphorus, comprising:

providing an electrolyte containing dissolved copper ions and phosphorus bearing particles selected from elemental phosphorus and metal phosphide suspended therein, and having a phosphorus loading of up to about 5 grams per liter;

providing an electrolytic cell having at least one anode and at least one cathode immersed in said electrolyte;



and passing electric current between said anode and cathode for a time sufficient to deposit a desired thickness of copper containing phosphorus onto said cathode.

4,786,376

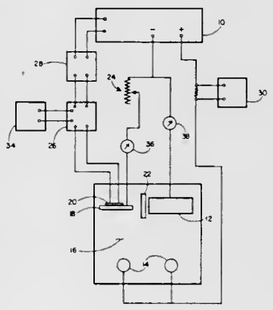
ELECTRODEPOSITION WITHOUT INTERNAL DEPOSIT STRESS

Luther E. Vaaler, Burbank, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 5, 1988, Ser. No. 142,472

Int. Cl.⁴ C25D *1/00, 17/00*

U.S. Cl. 204—3 **3 Claims**



1. An apparatus for electroforming a first electrodeposit onto a rigid mandrel with minimum internal stress during its formation, the mandrel and anode means immersed inside a metal-containing bath; comprising:

(a) a deformable substrate for receiving a second electrodeposit, the deformable substrate immersed inside the bath and having the shape of a thin disk;

(b) a strain gage attached to a back face of the deformable substrate;

(c) a non-conductive coating over the strain gage and the back face of the deformable substrate;

(d) voltage controlled power supply means for supplying direct current through the bath from the anode means to both a front face of the mandrel and a front face of the deformable substrate;

(e) means for controlling the current from the power supply means to both the mandrel and the deformable substrate so that the current densities over the front faces of both the mandrel and the deformable substrate are substantially the same;

(f) an insulated barrier inside the bath separating the anode means from both the mandrel and the deformable substrate, the insulated barrier having a pair of windows each positioned near to and sized slightly smaller than, respectively, the mandrel and the deformable substrate; and,

(g) transducer-controller means for producing an output voltage generally proportional to a strain measured by the strain gage, the transducer-controller means having an input connected to the strain gage and an output connected to the power supply means for changing the output current of the power supply means generally in proportion to strains measured by the strain gage.

4,786,377

PROCESS FOR ELECTROPLATING STEEL WIRES AND COATED WIRES THUS PRODUCED

Domenico De Filippo, Cagliari, and Leo Ambrosio, Quartu Sant'Elena, both of Italy, assignors to Gencord SpA, Assemini, Italy

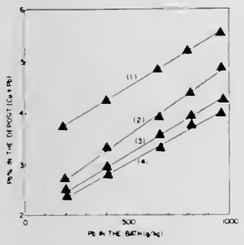
PCT No. PCT/IT86/00056, § 371 Date Mar. 19, 1987, § 102(e) Date Mar. 19, 1987, PCT Pub. No. WO87/00560, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 18, 1986, Ser. No. 44,089

Claims priority, application Italy, Jul. 19, 1985, 48380 A/85

Int. Cl.⁴ C25D *5/50*

U.S. Cl. 204—37.1 **9 Claims**



1. A process for the production of electroplated steel wires, characterized by the following series of operations:

(a) simultaneously electrodepositing copper and lead from an alloy bath onto a steel wire,

(b) electrodepositing zinc from a zinc plating bath,

(c) electrodepositing nickel from a nickel plating bath,

(d) solid state diffusion by Joule effect of the layers obtained by the electroplating steps (a), (b), and (c), a washing step being provided after each one of the electroplating operations (a), (b) and (c).

4,786,378

CHROMIUM ELECTROPLATING BATHS HAVING REDUCED WEIGHT LOSS OF LEAD AND LEAD ALLOY ANODES

Kenneth R. Newby, Berkeley Heights, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Sep. 1, 1987, Ser. No. 91,626

Int. Cl.⁴ C25D *3/10, 3/56*

U.S. Cl. 204—43.1 **8 Claims**

1. A chromium electroplating bath in which solubilizing corrosion of a lead or lead alloy anode used therein is substantially reduced comprising:

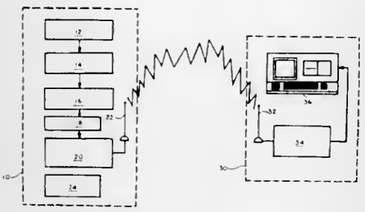
(a) a source of said chromium,

(b) an alkyl sulfonic acid or salt thereof, wherein the S/C ratio is $\geq \frac{1}{3}$, and

(c) a source of bismuth, arsenic or antimony ions as an additive therein, to reduce weight loss or pitting of said anode.

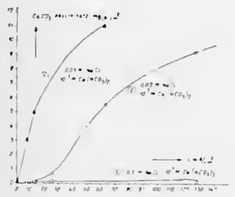
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,379
MEASURING CURRENT DISTRIBUTION IN AN ALUMINA REDUCTION CELL
Wray M. Barnett, Florence, Ala., assignor to Reynolds Metal Company, Richmond, Va.
Filed Feb. 22, 1988, Ser. No. 158,637
Int. Cl.[4] C25B *3/06;* C25C *3/20;* G06F *15/46;* G06G *7/58*
U.S. Cl. 204—67 10 Claims



1. A method for determining current distribution among the anodes of a single alumina reduction cell comprising concurrently measuring individual current levels at a selected plurality of said anodes within said cell, transmitting said individual current levels to an electrically isolated computer and calculating the current distribution within said cell based upon said individual current levels.

4,786,380
METHOD FOR THE ELECTROLYTIC PREPARATION OF HYPOCHLORITE IN FLOWING SALT-CONTAINING WATER
Pieter J. van Duin, Noordwijk, and Antonius M. C. P. de Jong, Pijnacker, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast-Natuurewetenschappelij Onderzoek, Netherlands
Filed Apr. 9, 1986, Ser. No. 849,775
Claims priority, application Netherlands, Apr. 15, 1985, 8501104
Int. Cl.[4] C25B *1/24*
U.S. Cl. 204—95 11 Claims



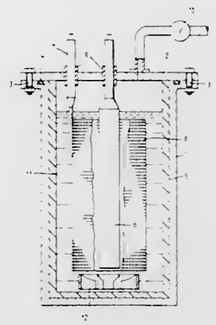
1. Method for the electrolytic preparation of hypochlorite in flowing water containing from about 0.05M to 0.5M chloride ions, comprising converting the chloride ions to hypochlorite utilizing an electrolysis reactor, wherein the cathode of the electrolysis reaction has an open structure and a surface area of at least 100 cm^2/cm^3.

4,786,381
PROCESS FOR ELECTROCHEMICALLY MODIFYING SUPPORT MATERIALS OF ALUMINUM OR ALUMINUM ALLOYS, WHICH HAVE BEEN GRAINED IN A MULTI-STAGE PROCESS AND USE OF THESE MATERIALS IN THE MANUFACTURE OF OFFSET-PRINTING PLATES
Dieter Mohr, Schlangenbad, and Engelbert Pliefke, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 13, 1987, Ser. No. 106,646
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635303
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.75 24 Claims

1. A process for the manufacture of grained support materials of aluminum or an aluminum alloy for use in lithographic printing plates comprising the steps of:
(I) mechanically graining the material;
(II) treating the material;
(III) electrochemically graining the material in an acid-containing electrolyte
(IV) treating the material; and
(V) anodically oxidizing the material; wherein at least one of the treating steps II and IV comprise cathodic modification of the aluminum support material in a solution of aqueous electrolyte comprising at least one member selected from the group consisting of a water-soluble salt in a concentration from 3 g/l up to the saturation limit and an acid in a concentration from 0.5 to 50 g/l, said cathodic modification comprising the steps of:
making the grained support the cathode;
adjusting the pH of the aqueous electrolyte to a value ranging from 0 to 11; and
applying direct current from 30 to 109 A/dm^2 for from 5 to 90 seconds at a temperature ranging from 15° to 90° C. to remove from 0.1 to 10 g/m^2 of material.

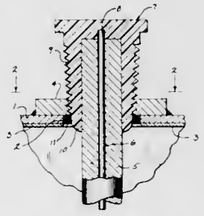
4,786,382
ELECTROCHEMICAL TREATMENT OF LIGNINS
James H. P. Utley, London, and Carment Z. Smith, Essex, both of England, assignors to The Minister of Agriculture, Fisheries and Food in Her Britannic Majesty's Goverment of the United Kingdom of Great Britain and Northern Ireland, London, England
PCT No. PCT/GB86/00699, § 371 Date Aug. 18, 1987, § 102(e) Date Aug. 18, 1987, PCT Pub. No. WO87/03014, PCT Pub. Date May 21, 1987
PCT Filed Nov. 12, 1986, Ser. No. 76,933
Claims priority, application United Kingdom, Jul. 13, 1985, 8527960
Int. Cl.[4] C25F *5/00*
U.S. Cl. 204—132 12 Claims

1. A process for the cleavage of lignin at a yield greater than 6% wherein by passage of an electric current through an aqueous alkaline solution of the lignin at a temperature above



100° C. whilst maintaining mixing of the soluton the lignin is cleaved into smaller molecules than the starting lignin.

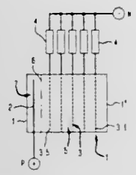
4,786,383
CATHODIC PROTECTION SYSTEM FOR A WATER HEATER TANK
Timothy H. Houle, Wauwatosa, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed Mar. 26, 1987, Ser. No. 30,081
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—148 13 Claims



1. A cathodic protection system, comprising a steel tank having an opening therein, a steel spud secured to the outer surface of said tank and bordering said opening, said spud having a central bore, an anode composed of a metal electropositive to steel and extending from an end thereof through said opening into the interior of the tank, and an electrically conductive plastic cap located on the outside of said tank and connecting said end of the anode to said spud, said cap having a given resistance to the flow of current between said anode and said tank to decrease the consumption of said anode.

4,786,384
ELECTROYTIC CELL FOR TREATMENT OF METAL ION CONTAINING INDUSTRIAL WASTE WATER
Wolfgang Gerhardt, Freigericht; Wolfgang Gehlert, Johannesberg, and Edgar Glück, Flörsbachtal, all of Fed. Rep. of Germany, assignors to Heraeus Elektroden GmbH, Hanau, Fed. Rep. of Germany
Filed Nov. 18, 1987, Ser. No. 121,926
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 3640020
Int. Cl.[4] C02F *1/46;* C25B *15/02, 9/04*
U.S. Cl. 204—149 19 Claims

17. A method of electrolytically removing contaminants, especially metals, present in a liquid, particularly plater's rinse waste water, by circulating the liquid through a cell box (1, 21);
said cell box having a plurality of essentially sheet-like electrodes positioned parallel to each other within the cell box, said electrodes including at least one anode (2, 2', 2'') and at least two apertured cathodes (3, 3.1, . . . 3n; 23.1, 23.2', 23.2'', . . . 23n''), wherein said at least two cathodes (3.1, 3.2, . . . 3n) are located on one side of the anode (2),



at respectively different, increasing distances from the anode;
and comprising, in accordance with the invention, the steps of
controlling the current flow to the respective cathodes, individually, by connecting said cathodes to a constant current source means (19, 19*a*) controllable to provide for essentially uniform current density, in operation of the cell, of current flow from all said respective cathodes.

4,786,385
METHOD OF PREVENTING UNDESIRABLE GAS GENERATION BETWEEN ELECTRODES OF AN ELECTROCOAGULATION PRINTING SYSTEM
Adrien Castegnier, Outremont, Canada, assignor to Elcorsy Inc., St.-Laurent, Canada
Division of Ser. No. 909,729, Sep. 22, 1986. This application Jun. 12, 1987, Ser. No. 61,224
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] G03G *17/00, 13/00;* C25D *13/00*
U.S. Cl. 204—180.1 20 Claims

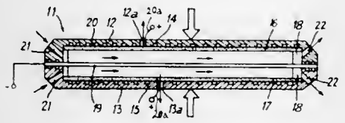
10. In a method of reproducing an image by electrocoagulation of an electrolytically coagulable colloid, wherein a layer of an aqueous colloidal dispersion containing an electrolytically coagulable colloid, water and a soluble electrolyte is interposed between at last one pair of opposite, electrolytically inert negative and positive electrodes spaced from one another by a gap filled with said aqueous colloidal dispersion and said electrodes are electrically energized to pass electric current through the layer at selected points to cause point-by-point selective coagulation and adherence of the colloid on the positive electode and formation of a series of corresponding dots of coagulated colloid representative of a desired image, the improvement which comprises coating the positiv electrode with an olefinic substance to form micro-droplets thereof on the surface of the positive electrode prior to electrically energizing said electrodes such that upon electrical energization hydrogen generated as a result of electrolysis is consumed by reaction with said olefinic substance said reaction being carried out in the presence of a metallic oxide catalyst, thereby preventing undesirable gas generation and accumulation at the between the electrodes.

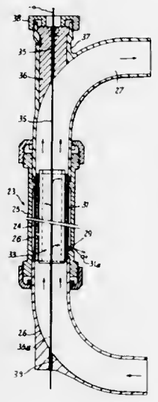
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4,786,386
PROCESS AND APPARATUS FOR THE TREATMENT OF WATER AND EFFLUENTS BY ULTRA-FILTRATION AND ELECTROLYSIS

Michel Rumeau, Montpellier, and Jean-Paul Mangeolle, Arnouville, both of France, assignors to Universite des Sciences et Techniques du Languedoc (Montpelier I), Montpelier, France

Filed Jul. 16, 1985, Ser. No. 755,606
Claims priority, application France, Jul. 19, 1984, 84 11449
Int. Cl.⁴ C02F *1/44, 1/46;* **B01D** *13/02*
U.S. Cl. 204—182.3 **6 Claims**



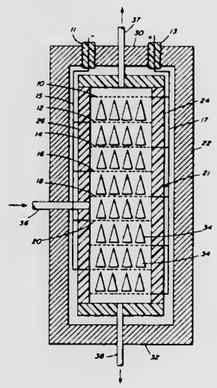


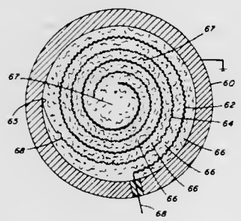
1. A combined electrolytic and ultra-filtration process carried out in one and the same cell for the treatment of a fluid including water and other effluents containing complexing agents and producing permeate and concentrate, comprising the steps of:
providing a single cell;
dividing said cell into a cathodic compartment and and anodic compartment by placing therein an ultra-filtration membrane serving as a diaphragm, a filter and as a means for isolating said anodic compartment from cathodic compartment thus causing a difference in pressure between said permeate and said concentrate;
introducing said fluid in said cathodic compartment;
effecting electrolysis and ultra-filtration of said fluid in said cell with formation of oxygen in said anodic compartment;
circulating said fluid in a recirculation loop through said cathodic compartment;
evacuating concentrate from said cathodic compartment;
evacuating permeate, oxygen and other chemical species formed from said anodic compartment, whereby said oxygen and said species cannot pass into said cathodic compartment owing to the isolation of said anodic compartment therefrom by said membrane, thereby avoiding the use of a retaining tank for the evacuation of oxygen.

4,786,387
SINGLE PHASE ENRICHMENT OF SUPER CRITICAL FLUIDS

David R. Whitlock, 16E Beacon Village, Burlington, Mass. 01803

Filed Sep. 25, 1986, Ser. No. 911,503
Int. Cl.⁴ B03C *9/02, 1/00;* **B01D** *35/06, 17/06*
U.S. Cl. 204—183.1 **33 Claims**



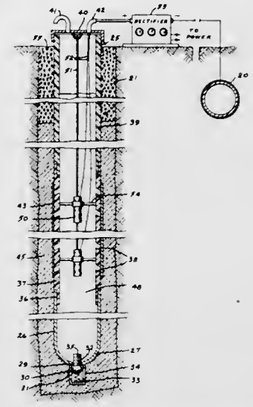


1. The method of treating a fluid solution comprising applying a non-uniform field to said solution while maintaining said solution under near critical conditions of temperature and pressure, and with said field deflecting one of the components of said solution to a greater extent than other components of said solution.

4,786,388
GROUND ELECTRODE BACKFILL COMPOSITION, ANODE BED AND APPARATUS

Joseph F. Tatum, Jr., Hattiesburg, Miss., assignor to Cathodic Engineering Equipment Company, Hattiesburg, Miss.

Filed Sep. 14, 1987, Ser. No. 95,593
Int. Cl.⁴ C23F *13/00*
U.S. Cl. 204—197 **8 Claims**



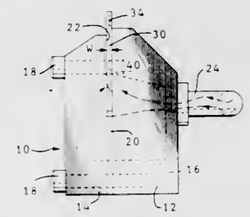
2. A conductive non-porous backfill material for earth anode beds comprising a mixture of the following components:

	Percent by Weight of Total Mixture
Calcined Fluid Petroleum Coke	83.5–85
Portland Cement	15–16
Powdered Graphite	.75–1.25
Surfactant	.25–.5

4,786,389
ELECTROPLATING APPARATUS

Herb J. Moffitt, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 25, 1987, Ser. No. 101,216
Int. Cl.⁴ C25D *17/00*
U.S. Cl. 204—206 **19 Claims**

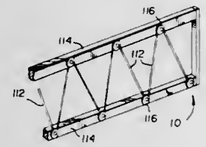


1. An electroplating apparatus for plating only selected regions of parts, said apparatus comprising:
a chamber which defines at least one elongated slot;
means for fixedly mounting the chamber in place such that the slot extends along a translation axis;
means for supplying a plating solution to the chamber;
means for transporting the plating solution through the slot to a region external of the chamber, said transporting means comprising an elongated wick which is fixedly mounted to the chamber to pass through the slot;
an electrode mounted alongside the wick;
means for guiding a plurality of parts to be electroplated for movement along the translation axis past the wick such that plating solution is transferred by the wick from the chamber to the parts; and
means for creating a voltage differential between the electrode and the parts.

4,786,390
ANODE CONFIGURATION FOR NICKEL-PHOSPHORUS ELECTROPLATING

John A. Lichtenberger, Beavercreek; Nancy E. Myers, Kettering, and Rodger L. Gamblin, Dayton, all of Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 732,277, May 9, 1985, Pat. No. 4,673,468, and a continuation-in-part of Ser. No. 923,270, Oct. 27, 1986. This application Jun. 12, 1987, Ser. No. 67,452
Int. Cl.⁴ C25B *9/00*
U.S. Cl. 204—242 **27 Claims**

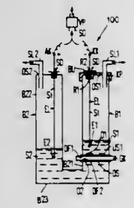


1. Apparatus for electrolytically plating a substrate with a nickel and/or cobalt phosphorus alloy, comprising:
a bath including $NiCl_2$ and/or $CoCl_2$, phosphorous acid, and phosphoric acid;
a work piece to be plated disposed as a cathode in the bath;
an anode immersed in said bath, and comprising a plurality of portions widely spaced and having a small surface area as means for effecting a high current density, and of material selected from the group consisting essentially of platinum and rhodium; and
a source of electrical power operatively connected to the anode and cathode.

4,786,391
ARRANGEMENT FOR HOLDING A GLASS MEMBER

Peter Clemens, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 15, 1987, Ser. No. 108,914
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638752
Int. Cl.⁴ C25C *7/00, 7/04*
U.S. Cl. 204—247 **20 Claims**



1. An arrangement for holding a glass member for a field-assisted ion exchange with anodic and cathodic contacting by salt melts, said arrangement including two salt melt vessels, each of said salt melt vessels having a contact opening surrounded by a sealing surface, each of said vessels having an electrode engagable with the salt melt in the vessel, means for positioning the glass member between the two vessels with the sealing surfaces of the two vesselS engaging opposite surfaces of the members, and means for applying a vacuum in each of the vessels to seal the sealing surfaces on the suface of the glass member by suction.

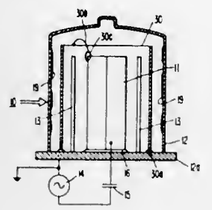
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,392

FIXTURE FOR CLEANING A PLASMA ETCHER

James N. Kruchowski, Eau Claire, Wis., and Robert K. Sakurai, Minneapolis, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 23, 1987, Ser. No. 41,465
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—298 **10 Claims**



1. A fixture, in combination with a plasma etcher which comprises a holding member with a surface which holds wafers that are to be etched, and an enclosing member which encloses said holding member to form a chamber for said plasma;

said fixture operating to produce a large voltage gradient in said plasma near said enclosing member and thereby enable the cleaning of said enclosing member by said plasma;

said fixture being configured to fit inside of said enclosing member, provide a metal surface which surrounds said holding member and is substantially larger than said surface of said holding member, and includes a means shorting said metal surface to said holding member.

4,786,393

LEAK-FREE PLASTIC FLOW SPACERS FOR ELECTRODIALYSIS APPARATUS AND A METHOD FOR THE MAKING THEREOF

Gerald A. Krulik, Laguna Hills, Calif., assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 822,076, Jan. 24, 1986. This application May 27, 1987, Ser. No. 54,541
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—301 **24 Claims**



9. In electrodialysis apparatus comprising fluid containing cells formed of alternate membranes and frame members having border surfaces and stacked and pressed together in face-to-face relation to form a consolidated apparatus,

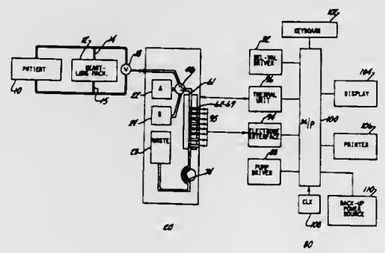
the improvement wherein the border surfaces of adjacent frame members are microroughened and coated with an inert grease for precluding leakage or seepage of fluid between and from said cells of said apparatus.

4,786,394

APPARATUS FOR CHEMICAL MEASUREMENT OF BLOOD CHARACTERISTICS

Steven Enzer, Brooklyn; Bruce M. Burgess, Ann Arbor; Jack S. Wyman, Ann Arbor, and Ricky Hendershot, Ann Arbor, all of Mich., assignors to Diamond Sensor Systems, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 770,740, Aug. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 713,435, Mar. 19, 1985, abandoned. This application Feb. 5, 1987, Ser. No. 14,208
Int. Cl.[4] G01N *27/26, 33/48*
U.S. Cl. 204—401 **17 Claims**



1. A clinical chemistry analyzer system for blood chemistry analysis comprising:

(a) a sensing device or cartridge of a type that is replaceable after a single use, having a box-like body and having a fluid flow tube with a peristaltically pumpable tube section external to the body, the body being adapted to be connected for the single use by insertion in operative engagement with a blood chemistry analysis machine and to be disconnected after the single use and discarded, the body containing therein:

a container filled with a calibration liquid of known chemical characteristics;

inlet means mounted in the body to directly receive a blood sample;

a bank of reference and sensor electrodes mounted on the body, adapted to generate an electrical signal proportional to distinct chemical characteristics of the blood sample;

channel means that are open to the electrode bank and are adapted to be placed in open communication with the inlet means and the liquid container;

multi-position valve means adapted to be driven by the machine and adapted when driven to selectively direct the flow of either the calibration liquid or the blood sample over the bank of electrodes; and

(b) a blood chemistry analysis machine separate from the sensing cartridge, adapted to receive and be connected to the cartridge body of replaceable cartridges of the above type in operative engagement therewith, the machine including:

valve driver means and peristaltic pump means interconnecting with said cartridge when the cartridge is inserted into the machine, the valve driver means being adapted when so connected to control the position of the cartridge valve means for selectively directing the flow of either calibration liquid or the blood sample over the bank of electrodes, the peristaltic pump means when so connected being adapted to contact the pumpable tube section of the fluid flow tube in pumping relation to cause resultant flow of fluid in the tube; and

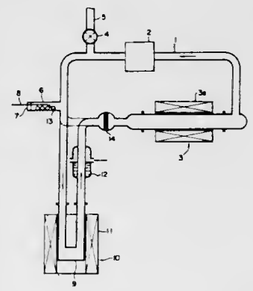
means including an electrode interface for electrical connection with the electrode bank of the body when inserted to receive and analyze electrical signals generated by the bank of electrodes upon exposure to the calibration liquid or the blood sample.

4,786,395

OXYGEN ANALYZER

Shinya Otsuka, Shita, and Zensaku Kozuka, Takatsuki, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP85/00111, § 371 Date Nov. 7, 1985, § 102(e) Date Nov. 7, 1985
PCT Filed Mar. 6, 1985, Ser. No. 803,288
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—409 **5 Claims**



1. A device for analyzing the oxygen content in a sample, comprising:

a closed gas flow path including a carrier gas inlet port, a vacuum formation port and a sample-introducing port for introducing a sample into said closed gas flow path;

a pump for circulating a carrier gas along said closed gas flow path;

an electrochemical oxygen pump for pumping oxygen from said closed gas flow by utilizing a solid electrolyte, said oxygen pump including:

a heating furnace,

a cylindrical solid electrolyte, comprising a zirconia material stabilized with one oxide selected from the group consisting of 5–5 mol % of calcium oxide, 6–10 mol % magnesia, and 4–12 mol % yttria housed in said heating furnace, and

porous electrodes provided inside and outside of said solid electrolyte;

said circulation pump and said electrochemical oxygen pump being provided in series in said closed gas flow path;

a sample-melting furnace provided surrounding said closed gas flow path downstream of said sample-introducing port and upstream of said oxygen pump, said sample melting furnace including:

a sample-melting chamber, and

a heating furnace;

a set of lead wires connected to said oxygen pump;

means for applying a direct current voltage connected to said lead wires;

means, connected to said lead wires, for measuring a quantity of electricity necessary for pumping oxygen from said closed gas flow path;

means, provided so as to surround said closed gas flow path downstream of said sample-melting furnace and upstream of said oxygen pump, for cooling gas flowing in said closed gas flow path; and

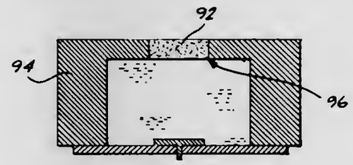
a filter provided in said closed gas flow path downstream of said cooling means and upstream of said oxygen pump.

4,786,396

ION ELECTRODE AND METHOD OF MAKING IT

Sinclair S. Yee, Seattle; Hong Jin, Mill Creek, and Lawrence K. Lam, Seattle, all of Wash., assignors to The Washington Technology Center, Seattle, Wash.

Filed Jun. 26, 1987, Ser. No. 67,513
Int. Cl.[4] G01N *27/30, 27/36*
U.S. Cl. 204—420 **32 Claims**



1. An ion electrode for detecting the ionic concentration of a liquid, the ion electrode comprising:

(a) a body formed of silicon having a cavity that opens into an exterior surface of said body;

(b) a glass membrane attached to said body to substantially cover said cavity opening, said glass membrane being partially coated with a glass material containing mobile ion that attaches said glass membrane to said exterior surface of said body;

(c) a chemical solution in said cavity, said solution filling enough of said cavity to be in contact with said glass membrane; and

(d) electrical conducting means passing through said body between said cavity and the exerior of said body to make contact with said solution.

24. A method of manufacturing an ion electrode, comprising the steps of:

(a) creating a first cavity in the interior of a silicon body by chemically etching from a first side of said body;

(b) sealing said cavity by:

(i) grinding a glass material to a powder form;

(ii) combining said powder with an organic binder to form a glass paste;

(iii) applying said glass paste to said first cavity; and

(iv) evaporating said organic binder out of said glass paste to form a porous glass plug;

(c) creating a second cavity in the interior of said body by chemically etching a second side of said body, said second cavity opening to a second exterior surface of said body and communicating with said first cavity to create a larger single cavity;

(d) filling said larger single cavity with a solution; and

(e) covering said second opening with an electrically non-conductive cover having a chemically coated electrical conductor passing therethrough to contact said solution.

4,786,397

SEAL FOR SINGLE WIRE O_2 SENSOR

Michael G. Barbieri, and Harry P. Wertheimer, both of Findlay, Ohio, assignors to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 9, 1987, Ser. No. 107,619
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—427 **4 Claims**

1. In an oxygen sensor having a solid electrolyte member located in a metal shell and a terminal retaining member located in a sleeve attached to the metal shell, the terminal retaining member positioning an electrical contact on a corresponding lead which connects the electrolyte member to a control-

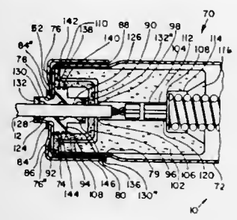
VOL 1096 ISS 4 NO 22 1988 UMI

ler, said sleeve having an end with tabs surrounding a central opening and with a plurality of other openings, said central opening locating the lead connecting said solid electrolyte with a controller while said plurality of other openings allow environmental air to be communicated to a reference chamber located between the terminal member and solid electrolyte, the improvements comprising:

a porous filter having a base with an annular projection that extends into an axial bore in said terminal, said projection having an inwardly projecting lip that forms an axial opening, said lip engaging and holding said lead in a axial position within said sleeve;

a spring that extends from said solid electrolyte member and acts on said terminal member to axially urge said porous filter into direct engagement with said end of said sleeve; and

a seal member having a cylindrical body with a peripheral surface, said peripheral surface having a first groove adja-



cent a flange, said cylindrical body having a second axial bore with a series of grooves that define a corresponding series of lands, said lead passing through said second axial bore and engaging said series of lands to establish multiple sealing surfaces while said flange engages an interior surface on said annular projection of said porous filter to establish a peripheral radial seal, said tabs on said end of said sleeve being located in said first groove of said seal member to position said seal member with respect to said end of said sleeve, said metal shell, sleeve and terminal member responding to the difference in temperature of exhaust gases presented to the electrolyte member and environmental air by expanding, said spring providing a constant force to hold the base of said porous filter against said plurality of opening to assure that no water is presented to said reference chamber while said multiple sealing surfaces on said seal member assure that environment air presented to said reference chamber passes through said porous filter.

4,786,398

SEAL MEANS FOR ISOLATED GROUND O_2 SENSOR

Harry P. Wertheimer, Findlay; John C. Miller, Fostoria; Debojit Barua, Findlay; Kenneth S. Tyree, Tiffin; Craig Bishop, Findlay, and Dave Weber, Toledo, all of Ohio, assignors to Allied-Signal Inc., Morristown, N.J.

Filed Apr. 13, 1987, Ser. No. 37,362
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—427 **5 Claims**

1. In an oxygen sensor having a solid electrolyte member located in a metal shell and a terminal member located in a sleeve, said sleeve being attached to the metal shell to define a reference chamber between said solid electrolyte member and said terminal member, said terminal member retaining first and second contact leads which connect the solid electrolyte member to a controller and third and fourth contact leads that connect a heater associated with the solid electrolyte member with said controller, said first, second, third and fourth contact leads extending through said sleeve, the improvement in the sealing of said reference chamber from the surrounding environment comprising:

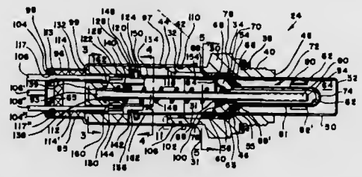
an insulator ring and a sealing ring located between said metal shell and solid electrolyte member for sealing said reference chamber from the communication of exhaust gases when said sensor is located in an exhaust pipe;

a groove located in said metal shell;

a crimped surface extending from said sleeve and located in said groove, said crimped surface establishing a seal to prevent communication of air and water into said reference chamber;

a porous filter located adjacent said terminal member; and

a rubber gasket located between said porous filter and said sleeve, said first, second, third and fourth contact leads passing through said rubber gasket and said porous filter, said first and second contact leads being connected to said solid electrolyte member and said third and fourth contact leads being connected to said heater in said reference



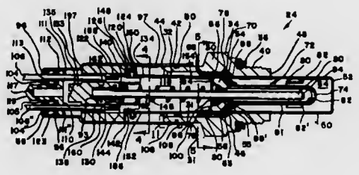
chamber, said rubber gasket axially biasing said porous filter into continual engagement with said terminal member, said porous filter having sufficient resiliency to engage said sleeve and said first, second, third and fourth contact leads to form a barrier to assure that only dry environmental air is presented to the reference chamber by preventing the entry of water into said reference chamber is presented with substantially dry environmental air, said heater maintaining said reference chamber above a present temperature such that changes in the oxygen content in the exhaust gases as compared to oxygen in the reference environmental air cause ions to flow in the electrolyte member, said changes in ion flow being presented to said controller through said first and second contact leads to accurately indicate an operational parameter of an engine as defined by exhaust gases.

4,786,399

SEAL MEANS FOR ISOLATED GROUNDED O_2 SENSOR

Harry P. Wertheimer, Findlay, and David C. Weber, Toledo, both of Ohio, assignors to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 28, 1987, Ser. No. 102,056
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—427 **5 Claims**



1. In an oxygen sensor having a solid electrolyte member located in a metal shell and a terminal member located in a sleeve attached to the metal shell, the terminal member retaining first and second contacts on corresponding leads which connect the solid electrolyte member to a controller and third and fourth contacts on corresponding leads which connect a

heater associated with the electrolyte member with the controller, said sleeve having an end with a plurality of openings for said leads and a central opening, said central opening allowing environmental air to be communicated to a reference chamber between the terminal member and solid electrolyte, the improvements comprising:

a filter having a base member in radial engagement with the sleeve and an axial projection that extends from the base member through said central opening in said end of said sleeve into the surrounding environment, said filter allowing environmental air to be communicated to said reference chamber while excluding water; and

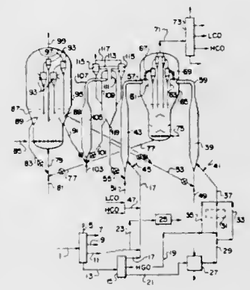
a seal member having an inner and outer periphery, said outer periphery having a first series of pleats that radially engage said sleeve; said inner periphery having a second series of pleats that radially engage said axial projection on said filter, said seal member having a series of opening for said leads, said openings in said seal member having a third series of pleats that engage said leads to prevent environmental air from being communicated through said openings in said seal member to assure that environmental air presented to said reference chamber passes through said axial projection of said filer, said solid electrolyte member being exposed to exhaust gases from a vehicle while said reference chamber is presented with substantially dry environmental air through said filter, said heater maintaining said reference chamber above a preset temperature such that changes in the oxygen content in the exhaust gases as compared to oxygen in the reference environmental air cause ions to flow in the electrolyte member, said changes in ion flow being presented to the controller through said first and second contacts, said seal member axially expanding in response to temperature while retaining said radial engagement with said sleeve and said axial projection on said filter to assure that only dry environmental air is communicated to said reference chamber.

4,786,400

METHOD AND APPARATUS FOR CATALYTICALLY CONVERTING FRACTIONS OF CRUDE OIL BOILING ABOVE GASOLINE

Carl D. Farnsworth, 2401 Sedley Rd., Charlotte, N.C. 28211

Filed Sep. 10, 1984, Ser. No. 648,676
Int. Cl.[4] C10G *51/06, 55/08*
U.S. Cl. 208—80 **17 Claims**



1. In a combination process comprising fluid catalytic cracking of an oil feed in a riser cracking zone and removing hydrocarbonaceous deposits of said cracking in a catalyst regeneration zone, improved method of operation which comprises;

(a) separating a crude oil by atmospheric and vacuum distillation to obtain a middle distillate fraction boiling above kerosene, a light and a heavy vacuum gas oil, and a vacuum resid fraction,

(b) effecting deep solvent deasphalting of said vacuum resid with one or a combination of butane and pentane deasphalting solvents,

(c) combining an oil product of said solvent deasphalting separated from solvent with said heavy vacuum gas oil,

(d) passing regenerated catalyst particules at a temperature in the range of 1400° F. to 1600° F. in a suspending lift gas comprising hydrogen into a first riser hydrocarbon conversion zone and thereafter contacted with an atomized mixture of said heavy vacuum gas oil and said deasphalted oil product under oil feed catalytic conversion conditions providing vaporous hydrocarbon conversion products with suspended catalyst particles,

(e) separating hydrocarbon vaporous products from suspended catalyst particles by tangential introduction of said products and particles into a cylindrical zone positioned within a catalyst particle recovery and collection zone, said cylindrical zone open in the bottom thereof for discharge of centrifugally separated catalyst into said collection zone and removing separated vapors by an upwardly extending central passageway communicating with a sequence of product recovery cyclone separation zones,

(f) passing regenerated catalyst particles suspended in gas comprising hydrogen upwardly through a second riser reactor for contact with an atomized oil feed comprising light vacuum gas oil,

(g) separating a suspension of hydrocarbon vapors and catalyst upon traverse of said second riser conversion zone in a cylindrical zone open in the bottom thereof and within said catalyst recovery and collection zone, said suspension separation effected by tangential introduction into said cylindrical zone and passage of separated vapors sequentially thereafter through cyclone separation zone,

(h) recovering separated vaporous hydrocarbon products of said first and second riser conversion zones and passing the hydrocarbon products to a separation zone for separation of normally gaseous products from gasoline boiling range material, light cycle oil product, heavy cycle oil product and a slurry oil product,

(i) stripping catalyst separated from the hydrocarbon vapors of each riser conversion zone, and

(j) regenerating the stripped catalyst in a sequence of separate catalyst regeneration zones comprising a first regeneration zone containing a dense fluid catalyst bed and a second regeneration zone consisting of a riser containing a rising fluid mass of catalyst particles said regeneration providing, a flue gas product of said first regeneration zone comprising substantial CO and a flue gas product of said second regeneration zone which is CO_2-rich.

4,786,401

LIQUID SLUDGE DISPOSAL PROCESS

Solomon M. Jacob, Cherry Hill; Grant G. Karsner, Voorhees Township, and William J. Tracy, III, Sewell, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1987, Ser. No. 101,092
Int. Cl.[4] C10G *11/18, 17/00, 55/06*
U.S. Cl. 208—85 **3 Claims**

1. A process for the disposal of a hydrocarbon-containing petroleum refinery liquid sludge waste stream in the form of an oil-in-water emulsion, which comprises mixing the sludge with a hydrocarbon oil to cause the oil-in-water emulsion to invert to a water-in-oil emulsion and mixing the water-in-oil emulsion with a feedstock for a fluid catalytic cracking reactor, and feeding the water-in-oil emulsion and the feedstock to the fluid catalytic cracking reactor in which the oil and the feedstock are subjected to catalytic cracking.

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4,786,402

PREPARATION OF MEDICINAL WHITE OILS AND MEDICINAL PARAFFINS

Thomas Anstock, Weisenheim; Walter Himmel, Gruenstadt; Matthias Schwarzmann, Limburgerhof; Heinz Dreyer, Ludwigshafen; Ulrich Lebert, Hettenleidelheim, and Ansgar Eisenbeis, Georgsmarienhuette, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 6, 1987, Ser. No. 82,139

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629631

Int. Cl.[4] C10G *45/04*

U.S. Cl. 208—443 **10 Claims**

1. A process for the preparation of a medicinal white oil or medicinal paraffin from a petroleum fraction containing aromatics and nitrogen, oxygen and sulfur compounds comprising:

treating, in a first stage, a petroleum fraction containing aromatics and nitrogen, oxygen and sulfur compounds with an acid selected from the group consisting of sulfuric acid and oleum, and

hydrogenating, in a second step, over a nickel-containing catalyst under from 50 to 200 bar and at from 160 to 330° C., a space velocity of from 0.1 to 2.0 kg of oil per liter of catalyst per hour and a gas/oil ratio of from 0.1 to 1.0 m^3/kg to form a medicinal white oil or medicinal paraffin, wherein the nickel catalyst, initially present in the oxide form, is first reduced at from 350 to 530° C. with hydrogen or a hydrogen-containing gas, then passivated, without exceeding 450° C., and again activated at above 150° C. with hydrogen, before hydrogenating to said medicinal white oil or medicinal paraffin.

4,786,403

PROCESS FOR HYDROTREATING HYDRO CARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 924,097, Oct. 28, 1986, Pat. No. 4,717,705. This application Aug. 13, 1987, Ser. No. 84,772

Int. Cl.[4] C10G *45/04*

U.S. Cl. 208—217 **42 Claims**

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 850° F. and a pressure in the range of from about 200 psig to about 2500 psig with a hydrotreating catalyst which has a surface area above about 300 m^2/g and at least about 80% of the pore volume in pores having diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) precipitating an aqueous solution of one or more aluminum salt(s) by adjusting the pH to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with dry, water-soluble salts of cobalt and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. to yield a final catalyst having from about 1% w to about 5% w cobalt and from about 8% w to about 32% w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,786,404

PROCESS FOR HYDROTREATING HYDROCARBON FEEDS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 924,227, Oct. 28, 1986, Pat. No. 4,717,707. This application Aug. 13, 1987, Ser. No. 84,724

Int. Cl.[4] C10G *45/04*

U.S. Cl. 208—217 **26 Claims**

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 850° F. and a pressure in the range of from about 200 psig to about 2500 psig with a hydrotreating catalyst which has a surface area above about 300 m^2/g and at least about 80% of the pore volume in pores having diameters less than about 50 Å, wherein said catalyst is prepared by a process which comprises:

(a) precipitating an aqueous solution of one or more aluminum salts(s) by adjusting the pH of said solution to a range between about 5.5 and about 10.0 and a temperature in the range between about 20° C. and about 90° C.,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 11.0 to about 12.5,

(c) washing the precipitate,

(d) mixing the precipitate with a solution containing solubilized salts of a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof and an element selected from the group consisting of nickel, cobalt and mixtures thereof, and a phosphorus-containing compound in an amount of from about 0.2 to about 1.5 moles of phosphorus per mole of heavy metal at a pH in the range between about 4.0 and about 8.0 and a temperature in the range between about 25° C. and about 100° C. until adsorption of the metal salts onto the gel is sufficient to yield a final catalyst having from about 1% w to about 5% w nickel and/or cobalt and from about 8% w to about 32% w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,786,405

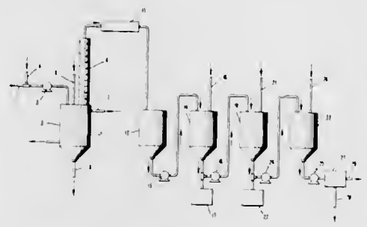
METHOD OF DESULFURIZING AND DEODORIZING SULFUR BEARING HYDROCARBON FEEDSTOCKS

Keloth K. Kutty, and Velamkalam A. James, both of Kerala, India, assignors to Al Sanea Chemical Products, Safat, Kuwait

Filed Mar. 4, 1986, Ser. No. 836,077

Int. Cl.[4] C10G *19/00*

U.S. Cl. 208—230 **7 Claims**



1. A process for producing a substantially sulfur-free liquid hydrocarbon having a boiling range of about 150°–200° C., an aromatic content between about 15–18 percent by weight, and a flash point of 38°–43° C., from sulfur-bearing hydrocarbon liquid boiling in the kerosene range, which comprises the steps of:

(a) contacting the sulfur-bearing liquid hydrocarbon with sodium hydride in an amount ranging from about 0.01 to about 5 percent by weight based on the weight of the sulfur-bearing liquid hydrocarbon, in the liquid phase and in a hydrogen free environment at normal atmospheric pressure, and heating the mixture to boiling to form an insoluble sulfide sludge and a hydrocarbon liquid having a reduced sulfur content;

(b) distilling said hydrocarbon liquid formed in step (a) and collecting a fraction boiling in the range of about 150°–200° C.;

(c) contacting the hydrocarbon fraction from step (b) with sulfuric acid and permitting the mixture of said hydrocarbon and said acid to separate into an acid fraction and hydrocarbon fraction, said contacting being conducted at normal atmospheric pressure;

(d) contacting the hydrocarbon fraction from step (c) sequentially with an alkaline oxidizing agent, a strong alkaline neutralizing agent, and a hot wash water to form a substantially sulfur-free hydrocarbon fraction and an aqueous fraction; and,

(e) recovering said sulfur-free hydrocarbon fraction.

4,786,406

PARTICLE CLASSIFIER WITH WEAR-RESISTANT CLASSIFIER WHEEL

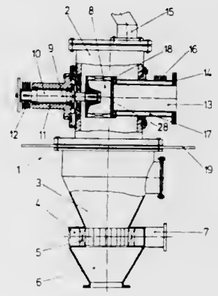
Roland Nied, Bonstetten, and Ekkehart Illigner, Augsburg, both of Fed. Rep. of Germany, assignors to Alpine Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

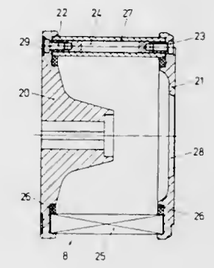
Filed Mar. 12, 1986, Ser. No. 838,990

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1985, 3508889

Int. Cl.[4] B07B *7/08*

U.S. Cl. 209—139.1 **10 Claims**





1. A rotating wheel for an air classifier through which air carried particles flow from outside said wheel to inside said wheel, comprising:

(a) a plurality of blades made entirely of wear resistant ceramic in a crown arrangement running parallel to the axis of rotation of said wheel;

(b) a first disc at a first end of said blades carrying a hub for the classifier wheel;

(c) a second disc defining a central opening for use as an annular shroud disc located at a second end of said blades;

(d) distance bolts positioned between said first and second discs in order to maintain said first and second discs at a predetermined distance of separation;

(e) recesses defined by said first and second shroud disc for receiving and holding opposite ends of said blades without exertion of substantial axial forces on the blades, axial play between said blades and said discs being provided; and

(f) rubbery-elastic, wear resistant inserts disposed in said recesses to radially support said blades between said first and second disc.

4,786,407

PLANT FOR TREATMENT OF SEDIMENT OF NATURAL AND WASTE WATERS

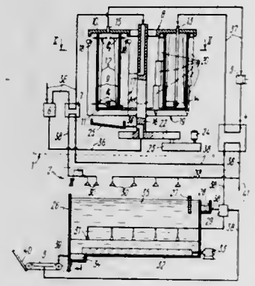
Vladlen M. Ljubarsky, ulitsa Miklukho-Maklaya, 29, korpus 1, kv. 27; Anatoly I. Fedorov, ulitsa Planernaya, 16, korpus 6, kv. 243, both of Moscow; Nikolai V. Fomin, ulitsa Basseinaya, 113, korpus 1, kv. 247, Leningrad; Vladimir F. Dideiko, ulitsa Dimitrova, 22, korpus 1, kv. 11, Leningrad; Boris M. Menin, Vitebsky prospekt, 35, kv. 42, Leningrad; Gennady I. Kravtsov, ulitsa Basseinaya, 70/42, kv. 146, Leningrad; Fedor E. Dovzhko, ulitsa Industrialnaya, 7, kv. 57, Khabarovsk; Vladimir V. Petukhov, ulitsa Pestelya, 25/23, kv. 8, and Vera M. Smirnova, prospekt Kosmonavtov, 29, korpus 1, kv. 49, both of Leningrad, all of U.S.S.R.

PCT No. PCT/SU86/00041, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/06573, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 30, 1986, Ser. No. 153,268

Int. Cl.[4] B01D *9/04*

U.S. Cl. 210—178 **4 Claims**



1. A plant for treatment of sediment of natural and waste waters comprising a crystallizer (**1**), a melter (**2**) located right under the crystallizer (**1**), a condensing heat exchanger (**4**), a compression refrigerating unit (**3**) communicating with the crystallizer (**1**) and, via the condensing heat exchanger (**4**), with the melter (**2**) communicating with a sediment dehydration apparatus (**5**), an evaporator (**8**) of the crystallizer (**1**) having two coaxially-arranged vertical cylinders (**9**) joined at the ends by a base (**11**) and a cover (**10**), a refrigerant feed unit (**13**) and a refrigerant discharge unit (**15**), a planetary gear drive whose shaft (**16**) carries a sediment application unit (**17**) and a sediment removal unit (**19**) characterized in that the crystallizer (**1**) has the recirculation station (**6**) communicated with the sediment application unit (**17**) made in the form of pour-on nozzles (**18**) installed under the cover (**10**) of the evaporator (**8**); installed between the cylinders (**9**) of the evaporator (**8**), at an angle to their vertical walls with clearances (δ_1, δ_2) are the screens (**12**) while the sediment removal unit (**19**) is provided with at least two cutting tools (**20**) with the

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flexible pick-ups (**21**), said tools being arranged one under the other and offset in the direction opposite to the rotation of the sediment application unit (**17**), the refrigerant feed unit (**13**) has a perforated circular header (**14**) installed at the base (**11**) of the evaporator (**8**), the planetary gear drive has a variable speed drive (**23**), the melter (**2**) has sprinkling nozzles **30** and a device for collection and removal of sediment solids, while the condensing heat exchanger (**4**) located outside of the melter (**2**) communicates through the pump (**29**) with the melter (**2**) and the sprinkling nozzles (**30**).

4,786,408

FILTRATION APPARATUS WITH MEANS FOR PREVENTING PEELING OFF OF A PRE-COAT LAYER

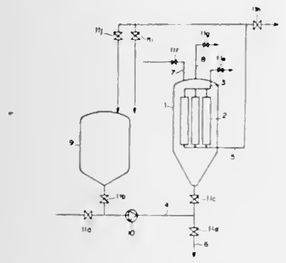
Hirohisa Sahara, Yaizu; Hiroshi Kuroda, Komae; Satoshi Noguchi, Fujieda; Seiichiro Ichikawa, Shizuoka, and Toshio Otsuka, Tokyo, all of Japan, assignors to Sapporo Breweries Limited, Tokyo, Japan

Filed Feb. 11, 1987, Ser. No. 13,447

Claims priority, application Japan, Apr. 16, 1986, 61-56026[U]; May 9, 1986, 61-68850[U]

Int. Cl.⁴ B01D *37/02*

U.S. Cl. 210—193 **11 Claims**



1. A filtration apparatus comprising:

at least one upright tubular filter element mounted in a housing, and having an outer surface on which a pre-coat layer of a filter aid is to be formed such that a liquid to be filtered is passed through said pre-coat layer and through said filter element from said outer surface toward an inner surface thereof;

means for feeding a liquid suspension including a liquid carrying a pre-coat material into said housing and to said at least one tubular filter element for forming said pre-coat layer on said surface of said at least tubular filter element;

means for feeding a liquid to be filtered into said housing such that said liquid to be filtered passes through said at least one precoated filter element;

means for discharging filtrate from said at least one filter element and from said housing;

means for feeding a purging gas into said tubular housing for pressurizing the interior of said housing for removing said liquid carrying said pre-coat material from said tubular filter element;

means for discharging said liquid suspension from said housing; and

purging gas exhaust means including a purging gas exhaust tube coupled to an opening on an upper part of said at least one tubular filter element for removing said purging gas from the inner part of said at least one tubular filter element and from the filter apparatus prior to input of the liquid to be filtered.

4,786,409

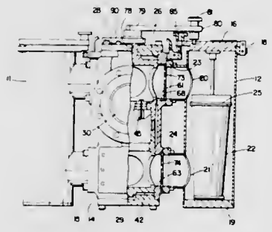
DUPLEX FILTER ASSEMBLY

Daniel W. Miller, Luckey, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 20, 1987, Ser. No. 40,468

Int. Cl.⁴ B01D *35/30;* **F16K** *5/04, 25/00, 35/06*

U.S. Cl. 210—238 **11 Claims**



1. Duplex filter apparatus, comprising

a valve housing with a vertical central bore having an inlet port, an outlet port, a pair of inlet openings communicable with said inlet port and a pair of outlet openings communicable with said outlet port, said inlet and outlet openings comprising short transverse bores in said valve housing,

a pair of filter element housings each having an element inlet port and an element outlet port in fluid communication with said inlet and outlet openings of said valve housing,

a filter element disposed in each element housing between said respective element inlet and outlet ports,

a cylindrical plug valve in said housing central bore, said plug valve having respective upper and lower cylindrical peripheral sealing surfaces surrounding respective upper and lower chambers and having respective upper valve inlets and upper valve outlet and lower valve inlet and lower valve outlets, said plug valve being rotatable in said housing bore to alternatiely dispose said valve inlets and outlets in fluid communication with said housing inlet and outlet ports for alternate fluild flow through said filter elements, said peripheral sealing surfaces being positioned adjacent said respective housing inlet and outlet openings, and

tubular seal means disposed in said housing inlet and outlet openings in engagement with said peripheral sealing surfaces for sealing between said valve housing and said plug valve in both of the alternate positions of said plug valve, said seal means being guided in said inlet and outlet openings for axial movement toward and away from said plug valve, each said seal means being a short tube having a radial outer cylindrical peripheral surface supported and slidably received in a respective transverse valve housing bore and having an axially inner sealing edge formed in a cylindrical curve matching said peripheral sealing surface of said plug valve, and annular wave spring means in engagement with the axially outer edge of said seal means, biasing said seal means toward said plug valve for sealing engagement therewith.

4,786,410

FLUID TREATMENT APPARATUS WITH SEMI-PERMEABLE MEMBRANES, USEFUL AS A HAEMODIALYSER

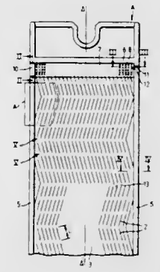
Robert Benattar, Lyons, and Michel Cronenberger, Givors, both of France, assignors to Hospal Industrie, Meyzieu, France

Continuation of Ser. No. 707,669, Mar. 4, 1985, abandoned, which is a continuation of Ser. No. 482,516, Apr. 6, 1983, abandoned, which is a continuation of Ser. No. 314,546, Oct. 26, 1981, abandoned. This application Feb. 6, 1987, Ser. No. 11,996

Claims priority, application France, Dec. 31, 1980, 80 27982

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.72 **8 Claims**



1. Hemodialysis apparatus comprising: means for providing minimum ultrafiltration rates whilst maintaining dialysis performance characteristics, including:

(a) a stack of superposed plates, each plate being of elongate form and having a longitudinal axis;

(b) two opposite major faces on each plate;

(c) a semi-permeable membrane on each of said two major faces of each plate of the stack, the two membranes thus being located between adjacent plates of the stack;

(d) means defining a fluid treatment zone on each of said major faces of each plate, each treatment zone having two ends;

(e) means for feeding fluid to be treated to one end of the treatment zone on each face of each plate and between the two membranes and withdrawing it from between said two membranes at the other end of said treatment zones;

(f) means for feeding a treating fluid at the location of one end of the treatment zone on each major face of each plate and between said major face and the adjacent membrane, and means for withdrawing the treatment fluid therefrom at the other end of the treatment zone;

(g) a plurality of membrane supporting ribs upstanding from the major face of each plate, the ribs being disposed in a zig-zag arrangement on each major face of each plate, and intersecting with the opposite ribs on the adjacent major face, the two membranes between two successive plates being in contact at points where the opposite ribs intersect, at least one rib at each such point having at least one portion of maximum height H only over a length l, the ration l/L being between 0.1 and 0.3, L which is between 5 to 15 mm denoting either the length of a rectilinear rib having only one portion of maximum height H in its length, or the distance between two portions with a maximum height H following each other on a rectilinear rib when the ribs of two adjacent major faces clamp the membranes through the intermediacy of more than one portion of maximum height H on a rectilinear length of a rib, the ribs at each point where they intersect being at an angle α to the longitudinal axis of the plate on one face and being at an angle $-\alpha$ for the face of the adjacent plate, said angles α or $-\alpha$ being between 10° and 45°, in absolute value, with said longitudinal axis.

4,786,411

FLUID TREATMENT APPARATUS WITH SEMI-PERMEABLE MEMBRANES

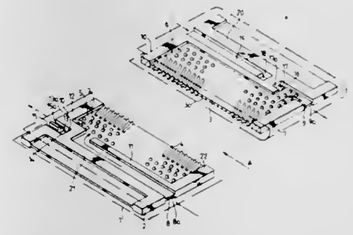
Robert Benattar, Lyons, and Michel Cronenberger, Givors, both of France, assignors to Hospal Industrie, Meyzieu, France

Continuation of Ser. No. 482,617, Apr. 6, 1983, abandoned, which is a continuation of Ser. No. 314,523, Oct. 26, 1981, abandoned. This application Aug. 30, 1985, Ser. No. 770,901

Claims priority, application France, Nov. 13, 1980, 80 24477

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—321.4 **14 Claims**



1. Fluid treatment apparatus comprising:

means for enabling said fluid to be introduced and discharged on the same side of the apparatus, including,

(a) - a stack of superposed essentially imperforate plates, the stack having plates of a type A alternating with plates of type B;

(b) - opposite major faces on each plate;

(c) - a semi-permeable membrane overlying each of said faces of each plate of the stack, the semi-permeable membrane being folded around one edge of each said plate, each edge being superposed in the stack and forming a lateral face of the stack;

(d) - means defining an exchange zone (**3,3***a*) on each of said faces of each plate;

(e) - means defining distribution zones (**5,5***a*) on each of said faces of each plate, with a distribution zone at each opposite end of each exchange zone;

(f) - two first grooves, (**8,9** and **8***a*, **9***a*) formed in each of said faces of each of said plates and emerging from and perpendicular to the side of the edge of each of said plates around which a membrane is folded, each semi-permeable membrane overlying and extending into said first grooves of each of the associated plates, the first grooves (**8,9**) of one face of a plate being in back to back superposed relation to the first grooves (**8***a*,**9***a*) of the opposite face, the first grooves of a plate of type A being superposed with the first grooves of a plate of type **B**, one group of first grooves (**8,8***a*) constituting a flow path for the liquid to be treated which is introduced from the said lateral face of the stack between the membranes, located between adjacent plates and one group of first grooves (**9,9***a*) constituting a flow path for the treated liquid which is removed from the said lateral face of the stack between the membranes, said first grooves communicating with said exchange zones (**3,3***a*) via said distribution zones (**5,6**);

(g) - a first passage (**12**) extending through each plate and connecting one of said distribution zones on one face of that plate with a distribution zone on the opposite face of that plate;

(h) - a second groove (**13**) located on one face of each plate and communicating with said first passage;

(i) - a second passage (**14**) extending through each plate and communicating with said second groove;

(j) - a third groove (**15**) located on the opposite face of each plate to said one face on which the second groove (**13**) is located and communicating with said second passage (**14**), the first and second passages of a plate of type A being

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superposed with the first and second passages respectively of a plate of type B, the second and third grooves of a plate of type A being of the opposite faces of those of a plate of type B, the first passage, second groove, second passage and third groove enabling the withdrawing of a fluid being in contact with the faces of the plates;

(k) - means for enabling the introduction of a fluid being in contact with the faces of the plates;

(l) - means for arranging said location where a fluid to be treated is introduced and location where the treated fluid is discharged on said distribution zones at diagonally opposite ends of each exchange zone.

4,786,412

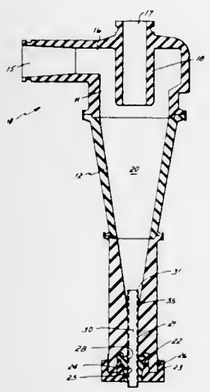
HYDROCYCLONE HAVING DEWATERING TUBE

Roy D. Lister, Keller, and Tommy J. Derrington, Denton, both of Tex., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 23, 1987, Ser. No. 124,263

Int. Cl.[4] B01D *17/038*

U.S. Cl. 210—512.1 **3 Claims**



1. In a hydrocyclone having an upper feed section for introducing a slurry tangentially into said hydrocyclone and having an upper outlet for discharging water, and a lower separating section having a lower downwardly-directed outlet for discharging separated solids and water, the improvement comprising:

a dewatering tube spaced below said feed section extending from said lower outlet into the space above said outlet to further reduce the water content of the materials discharged through said tube, sufficient to provide an underflow through said tube that is up to about 60 percent solids.

4,786,413

PROCESS FOR BIOLOGICAL SEWAGE PURIFICATION

Hans Reimann, and Uwe Fuchs, both of Munich, Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,985

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1986, 3601669

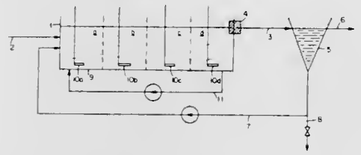
Int. Cl.[4] C02F *3/08*

U.S. Cl. 210—616 **22 Claims**

1. In a process for the biological sewage purification of sewage wastewater containing organic as well as nitrogen-containing pollutants, in which wastewater is aerated with air and/or pure oxygen in a reactor in the presence of a biomass fixed on a support material and then in a secondary sedimentation step, resultant effluent is separated into purified water and sludge, and the separated sludge is at least partially recycled into the reactor and in which free-flowing particles of material are employed in the reactor as supports for the microorganisms, the improvement comprising employing in an elongated undivided reactor a volume load of BOD_5 of about 0.4 to 2.5 $kg/m^3 \cdot d$ and a TKN volume load of about 0.1 to 0.8 $kg/m^3 \cdot d$, and simultaneously conducting BOD_5 decomposition, nitrification and denitrification of the wastewater in the reactor wherein an O_2 concentration in liquid being treated is about 0.5 to 4 mg/l and the support material occupies about 15 to 35% of the reactor volume, so as to simultaneously decompose and remove carbon-containing and nitrogen-containing compounds from said wastewater in said undivided tank.

22. A process for the biological purification of sewage wastewater containing organic and nitrogen-containing pollutants, comprising:

(a) introducing sewage into a first end of a single, elongated, undivided aeration tank, said aeration tank containing a biomass of activated sludge fixed on support particles and free activated sludge;



(b) aerating said sewage in a first zone of said tank at such a rate to perform BOD_5 decomposition and nitrification of said sewage;

(c) delivering sewage from said first zone to a second zone of said tank and aerating said second zone at such a rate to perform denitrification of said sewage;

(d) delivering said sewage from said second zone to additional sequential zones within said tank wherein said sequential zones alternate from zones aerated for BOD_5 decomposition and nitrification to zones aerated for denitrification;

(e) recycling a portion of sewage, activated sludge, and support particles from a final denitrification zone to said first zone; and

(f) discharging purified sewage from a second end of said tank; wherein said tank has a volume load of BOD_5 of about 0.4 to 2.5 $kg/m^3 \cdot d$, a TKN volume load of about 0.1–0.8 $kg/m^3 \cdot d$, the O_2 in the wastewater being treated is about 0.5–4 mg/l and the support particles occupy about 15–35% of the tank volume.

4,786,414

GAS DISPERSED PACKED EXTRACTION COLUMN

Ronald Priestley, 84 Chesterwood Road, Birmingham B13 OQE, United Kingdom

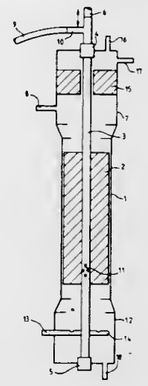
Filed Jun. 26, 1987, Ser. No. 66,610

Claims priority, application United Kingdom, Jul. 26, 1986, 8618275

Int. Cl.[4] B01D *11/04*

U.S. Cl. 210—634 **6 Claims**

1. A liquid extraction process comprising contacting organic and aqueous phase liquids to separate components from said aqueous phase liquid into said organic phase liquid, and dispersing gas in the organic phase to reduce the density of the same, the contacting being promoted by flowing the respective liquids through a stranded bed, said bed supported in position in a column by a pipe connected to the organic phase supply used in said contacting, said pipe having openings in the interior of the bed to deliver the supply to said contacting, wherein the openings of the pipe are set at least as far above the bottom of the bed as the cross-sectional dimension of said pipe, wherein the pipe extends through bearing seals in the column above and below the bed; delivering the gas through a sparge pipe below said bed, and, removing the organic phase containing said components, and the aqueous phase from the column.



4,786,415

SEPARATION AGENT COMPRISING ALIPHATIC ESTER OF POLYSACCHARIDE

Tohru Shibata; Hajime Namikoshi, and Ichiro Okamoto, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Feb. 18, 1987, Ser. No. 18,814

Claims priority, application Japan, Apr. 2, 1984, 59-65323

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **10 Claims**

7. A method for chromatographically separating a mixture of optical isomers which comprises contacting said mixture, under liquid chromatographic separation conditions, with a chromatographic separation material consisting essentially of inorganic carrier particles having a particle size of from 1 μm to 10 mm and coated with from 1 to 100% by weight of resolving agent, based on the weight of said carrier particles, said resolving agent consisting essentially of a cellulose tripropionate.

4,786,416

RESOLVING AGENT

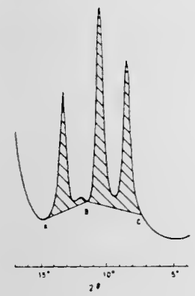
Yoichi Yuki; Ichiro Okamoto; Tohru Shibata, and Hiroyuki Nakamura, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 917,877, Oct. 10, 1986, which is a continuation of Ser. No. 585,799, Mar. 2, 1984, abandoned. This application Nov. 6, 1987, Ser. No. 118,201

Claims priority, application Japan, Mar. 10, 1983, 58-39555

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—635 **7 Claims**



1. A method for resolving a mixture of optical isomers which comprises contacting said mixture with a cellulose triacetate consisting essentially of the type II form, as a resolving agent, to separate said isomers from each other.

4,786,417

MANAGEMENT OF PHOTORESIST MATERIALS CONTAINING WASTE SOLUTION

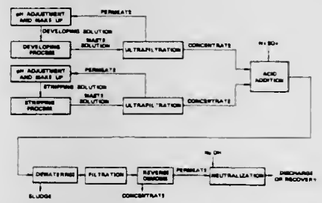
Kohei Miki, and Hiroshi Saito, both of Kanagawa, Japan, assignors to Sumitomo Heavy Industries Ltd., Kanagawa, Japan

Filed Jul. 22, 1987, Ser. No. 76,372

Claims priority, application Japan, Jul. 23, 1986, 61-171894; Jan. 17, 1987, 62-7449

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—639 **4 Claims**



1. A process of management of a photoresist material, containing waste solution discharged from printed circuit boards manufacturing industries, semiconductor manufacturing and printing industries using water soluble photoresist materials, which comprises:

(a) subjecting a waste solution obtained from the treatment of photoresist materials by a treating solution containing an alkalizing agent to an ultrafiltration;

(b) returning each permeate passing through the ultrafiltration membrane to a treating solution so as to recycle the waste solution which has been cleaned by the ultrafiltration; and

(c) adding an alkalizing component, which is the same as the one dissociated or consumed in the treating process, to the

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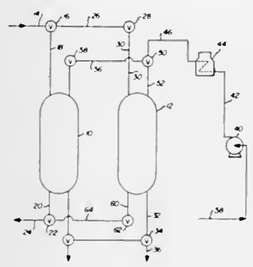
permeate being recycled, until the pH thereof becomes the original pH value of the treating solution, before the treating of the photoresist layer on a substrate occurs.

4,786,418

PROCESS FOR AQUEOUS STREAM PURIFICATION

Desb R. Garg, Fishkill; Carl J. Kjellson, White Plains, both of N.Y.; Brent M. Lok, Ridgefield, Conn., and Craig H. Barkhausen, Denville, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 11, 1988, Ser. No. 167,185
Int. Cl.[4] C02F *1/28*
U.S. Cl. 210—673 **15 Claims**



1. In a process for purifying aqueous media containing dissolved organic impurities which comprises providing an aqueous feedstock containing from about 5 ppb (wt.) to about 20,000 ppm (wt.) of dissolved organic compounds, contacting said feedstock with an adsorptive mass of an organophilic molecular sieve, said molecular sieve having pore diameters large enough to adsorb at least some of said organic compounds whereby said organic compounds are adsorbed thereon producing a purified water product and the molecular sieve adsorbent is regenerated and the adsorbed organic compounds oxidatively destroyed by contact with a regeneration medium comprising an aqueous solution of a compound having a standard oxidation potential of at least 0.25 volt, the improvement which comprises reducing the pH of the aqueous oxidant solution to a value less than about 7 for at least a portion of the time the oxidative regeneration reaction is proceeding.

4,786,419

METHOD AND DEVICE FOR IMPROVING THE REOXYGENATION OF WATER IN LINE WITH BARRAGES

Pâris Mouratoglu, Neuilly sur Seine, and Jean-Claude Borel, Nanterre, both of France, assignors to Energies France and GTM Entrepose, both of France

Filed Jun. 17, 1987, Ser. No. 62,996
Claims priority, application France, Jun. 19, 1986, 86 08861
Int. Cl.[4] B01F *3/04*
U.S. Cl. 210—747 **2 Claims**

1. A method for improving reoxygenation of water in line with a dam, comprising the steps of:

(a) providing a dam,

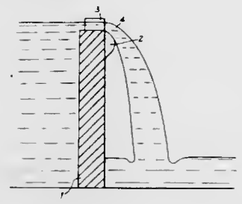
(b) causing a sheet of water to travel over the crown of said dam, and

(c) substantially increasing the penetration of atmospheric oxygen into the sheet of water by providing elements at the crown of said dam spaced sufficient to cause disintegration of said sheet of water.

2. A device for improving reoxygenation of water in line with a dam, comprising:

(a) a dam, and

(b) means at the crown of said dam spaced sufficient for substantially increasing the penetration of atmospheric oxygen into a sheet of water passing over the crown of said dam, said means comprising:



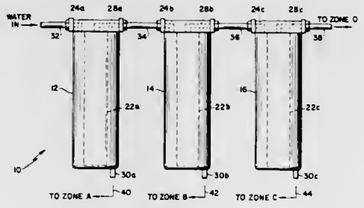
(c) a plurality of projecting elements disposed at the crown of said dam for causing division of a sheet of water flowing over the crown of said dam.

4,786,420

SELF-CLEANING WATER FILTER SYSTEM

Lawrence C. Dalessandro, 278 Roosevelt St., Exeter, Pa. 18643

Filed Sep. 11, 1987, Ser. No. 95,226
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—791 **13 Claims**



1. A self cleaning water filter system for use in a household or the like comprising a plurality of filter means each having a housing, a filter element within said housing, water inlet means connected to said housing on the upstream side of said element, water outlet means connected to said housing on the downstream filtered side of said element, and flushing outlet means connected to said housing on the upstream side of said element; first conduit means connecting the water outlet means of a first of said filter means to the water inlet means of a second of said filter means; second conduit means adapted to connect the flushing outlet means of said first filter means to a first water service zone which uses water of a given quality; third conduit means adapted to connect the flushing outlet means of said second filter means to a second water service zone which uses water of a better quality, whereby as water is routinely drawn from said first and second service zones the filter element of said first and second filter means, respectively, is automatically cleaned to thereby extend the effective life of the elements.

4,786,421

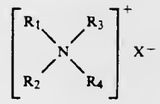
FABRIC CONDITIONING COMPOSITION

Michael R. Butterworth, Schiedam, Netherlands, and John Oakes, Cheshire, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 5, 1987, Ser. No. 82,022
Claims priority, application United Kingdom, Aug. 6, 1986, 8619153
Int. Cl.[4] D06M *11/00*
U.S. Cl. 252—8.8 **2 Claims**

1. A liquid fabric conditioning composition comprising from about 2 to about 25% of a fabric conditioner which is selected

from the group consisting of alkylimidazolinium salts, quaternary ammonium salts having the formula:



wherein R_1 and R_2 represent hydrocarbyl groups from about 12 to about 24 carbon atoms, R_3 and R_4 represent hydrocarbyl groups containing from 1 to about 4 carbon atoms, X is an anion, and mixtures of these salts, the composition being characterised in that it further comprises from about 0.04 to about 2.0% by weight based on the fabric conditioner of a compound containing a transition metal ion, selected from groups 4b–7b, 8 and 1b of the Periodic Table, said composition not containing a bleach.

4,786,422

FABRIC SOFTENING AND ANTISTATIC PARTICULATE WASH CYCLE LAUNDRY ADDITIVE CONTAINING CATIONIC/ANIONIC SURFACTANT COMPLEX ON BENTONITE

Ronald D. Kern, Buttzville, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Filed Oct. 6, 1986, Ser. No. 916,068
Int. Cl.[4] D06M *13/44*
U.S. Cl. 252—8.8 **16 Claims**

1. A fabric softening antistatic particulate wash cycle additive, for use in conjunction with anionic detergent(s) in the wash water of antomatic washing machines to wash, soften and render antistatic laundry washed in such machines and subsequently dried in an automatic laundry dryer, which comprises about 10 parts by weight of a preformed complex of a cationic surfactant and an anionic surfactant, in which complex the molar proportion of cationic to anionic moieties is in the range of about 1:1 to 1:1.5, and 1 to 80 parts by weight of bentonite, said complex being in a coating on said bentonite particles, with the particle size of the combined particles being less than 250 microns in diameter, and which contains from 0.5 to 10 parts by weight of an ethoxylated higher alkylamine in which the higher alkyl is of 12 18 carbon atoms and which contains 10 to 50 moles of ethylene oxide per mole as an emulsifying agent for the cationic/anionic complex.

6. A process for manufacturing the wash cycle additive of claim **1** which comprises mixing bentonite powder and spraying onto the surfaces of such bentonite powder, while continuing mixing thereof, a melt, solution, emulsion or dispersion of a complex of cationic and anionic surfactants, wherein the molar proportion of cationic to anionic moieties in the complex is in the range of about 1:1 to 1:1.5, and continuing mixing thereafter until an agglomerate of bentonite and the complex is formed which is of particle sizes less than 250 microns in diameter.

4,786,423

LUBRICANT COMPOSITION CONTAINING TWO HEAVY METAL CONTAINING COMPOUNDS AND A PHOSPHORUS COMPOUND AND PROCESS OF PREPARING THE SAME

Hartwig Schroeder, Monchen-Gladbach, Fed. Rep. of Germany, assignor to ICI Americas Inc., Wilmington, Del.

Filed Mar. 25, 1987, Ser. No. 30,090
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610205
Int. Cl.[4] C10M *135/18, 137/06*
U.S. Cl. 252—32.7 E **15 Claims**

1. A lubricant composition comprising:

A. between 80 and 97 percent by weight of a lubricant selected from the group consisting of mineral oil, synthetic oil and a lubricant concentrate;

B. first and second heavy metal containing organic compounds wherein said heavy metal is selected from the group consisting of molybdenum, zinc, tungsten and vanadium; and

C. an organic phosphorus compound free of metal and sulfur selected from the group consisting of trialkyl phosphates, triaryl phosphates and alkylphenyl phosphates.

4,786,424

AQUEOUS METAL-WORKING COMPOSITION AND PROCESS

Merlin R. Lindstrom, and Bernard A. Baldwin, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 5, 1985, Ser. No. 804,714
Int. Cl.[4] C10M *135/26*
U.S. Cl. 252—41 **23 Claims**

1. A composition comprising an aqueous metal-working fluid and an alkali metal hydrocarbylthiocarboxylate in an amount sufficient to impart extreme pressure lubricating properties to the metal-working fluid wherein the hydrocarbylthiocarboxylate of the alkali metal hydrocarbylthiocarboxylate is selected from the group consisting of:

$$R—S—R'CO_2^{(-)}$$

and

$$(—R—S—R'CO_2^{(-)})_2$$

wherein R represents an aryl, alkyl, or alkylene group having 1 to 20 carbon atoms, and R′ represents an alkyl or alkylene group having 1 to 6 carbon atoms.

4,786,425

ADDITIVE FOR LUBRICANTS AND HYDROCARBON FUELS COMPRISING REACTION PRODUCTS OF OLEFINS, SULFUR, HYDROGEN SULFIDE AND POLYMERIC SUCCINIMIDE COMPOUNDS

Andrew G. Horodysky, Cherry Hill, and Derek A. Law, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 818,313, Jan. 13, 1986, Pat. No. 4,661,274. This application Apr. 24, 1987, Ser. No. 42,142
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] C10M *135/04, 133/16*
U.S. Cl. 252—47 **18 Claims**

1. A process for making an additive for lubricants comprising co-reacting:

(a) an olefin

(b) sulfur

(c) hydrogen sulfide; and

(d) a polymeric succinimide selected from the group consisting of the reaction products of polymeric succinic anhydride with one or more reactants selected from the group consisting of:

(a) polyethylene amines selected from the group consisting of diethylene triamines, triethylenetetramine, and tetraethylenepentamine;

(b) hydroxyl containing amines, and;

(c) polyols in conjunction with (a) or (b) selected from the group consisting of pentaerythritol, and trimethylol propane

at a temperature between about 130° C. and about 200° C. and a pressure of about 0 psig to about 900 psig, the reactants being reacted in a molar ratio of olefin, polymeric succinimide, and hydrogen sulfide to sulfur of about 3 to about 0.5, about 0.001, to about 0.4, and about 0.5 to about 0.7, respectively.

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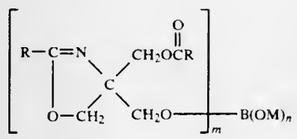
4,786,426

LUBRICANT COMPOSITION

Robert M. Gemmill, Jr., Pitman, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

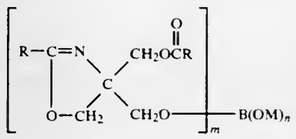
Filed Jan. 7, 1980, Ser. No. 109,951
Int. Cl.[4] C10M *1/54, 1/10*
U.S. Cl. 252—49.6 **12 Claims**

1. A compound of the formula:



wherein R is the same or different hydrocarbyl having 9 to 49 carbon atoms, m is 1 to 3, n is 0 to 2 and M is H or R', R' being an alkyl containing 1 to 6 carbon atoms.

9. A method of reducing fuel consumption in an internal combustion engine comprising lubricating said engine with a lubricant composition comprising a lubricating oil and a fuel consumption reducing amount of a compound of the formula



wherein R is the same or different hydrocarbyl having 9 to 49 carbon atoms, m is 1 to 3, n is 0 to 2 and M is H or R', R' being an alkyl containing 1 to 6 carbon atoms.

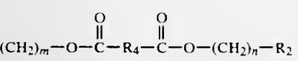
4,786,427

ESTER COMPOUND LUBRICANTS

Martin P. Dare-Edwards, Parkgate, United Kingdom, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 22, 1987, Ser. No. 111,479
Claims priority, application United Kingdom, Nov. 6, 1986, 8626510
Int. Cl.[4] C10M *129/72*
U.S. Cl. 252—56 R **9 Claims**

1. Use as lubricants of esters of general formula II



(II)

wherein m and n are each 0 or 1, R_4 is an alkylene or alkenylene group unsubstituted or substituted by one or more alkyl groups containing from 1 to 4 carbon atoms, such that at most 3 carbon atoms separate the carboxyl groups; and R_1 and R_2 are the same and each represents a cyclopentyl or cyclohexyl group unsubstituted or substituted by C_{1-4} alkyl groups.

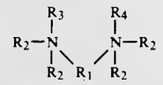
4,786,428

ELECTROLYTE FOR ELECTROLYTIC CAPACITOR

Fumihiko Shinozaki, Fussa, and Yutaka Yokoyama, Saitama, both of Japan, assignors to Nippon Chemi-Con Corporation, Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 19,869
Claims priority, application Japan, Feb. 28, 1986, 61-41738
Int. Cl.[4] H01G *9/07*
U.S. Cl. 252—62.2 **4 Claims**

1. An electrolyte for electrolytic capacitors comprising an aprotic solvent and a fluorocomplex acid salt of an alkylene bisamine compound of general formula



in which R_1 is a linear or branched alkylene group of the formula C_nH_{2n} in which n is an integer from 2 to 6, and each R_2 is independently selected from hydrogen, alkyl groups having 1 to 8 carbon atoms and alkenyl groups having 1 to 8 carbon atoms, R_3 or R_4 is absent or is hydrogen or is the same as R_2.

4,786,429

ELECTROLYTE FOR ALUMINUM ELECTROLYTIC CAPACITOR

Shoichiro Mori; Makoto Ue, and Kazuhiko Ida, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 61,498
Claims priority, application Japan, Jun. 20, 1986, 61-144582; Jun. 20, 1986, 61-144588
Int. Cl.[4] H01G *9/02*
U.S. Cl. 252—62.2 **13 Claims**

1. An electrolyte for an aluminum electrolytic capacitor consisting essentially of a solution of a solute of a quaternary ammonium salt having as an anion component the conjugate base of an inorganic acid compound selected from the group consisting of

(1) H_2BO_3,
(2) phosphoric acid,
(3) phosphorous acid and phosphorous acid monoesters, and phosphonic acids, and phosphonic acid monoesters,
(4) hypophosphorous acid and phosphinic acids,
(5) alkylboric acids and arylboric acids,
(6) silicic acid, and
(7) carbonic acid and carbonic acid monoesters, dissolved in an aprotic solvent mainly composed of γ-butyrolactone.

4,786,430

METHOD FOR PRODUCING HEXAGONAL FERRITES

Gunther Mair, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 13, 1988, Ser. No. 143,189
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702036
Int. Cl.[4] C04B *35/26*
U.S. Cl. 252—62.58 **2 Claims**

1. A method of forming hexagonal ferrite particles having a size below 0.3 μm comprising

dissolving soluble salts of the metal components of the ferrite in water,
precipitating said components with a base,
separating off and washing the precipitate,
dispersing the washed precipitate in an aqueous solution of boric acid or borax,
drying the resulting dispersion to form a solid material of agglomerated particles comprising a homogeneous mixture of the cations of the formula 1

$$M^{2+}[Fe_{(12-2x/3-py/3)}(Me^{2+})_x(Ma^{p+})_y]_m[(M^{2+})_zB]_n \qquad 1$$

where
M=Ba, Sr, Pb
Me=Co, Zn, Ni, Mn, Cu
Ma=Ti, Zr, Hf, Ge, V, Nb, In
p=3, 4, 5
x=0-3
y=0-3
z=0.2-3
m=0.7-1.5
n=0.04-10

and at least one anion comprising at least one thermally decomposable anion,

sintering the solid material at from 400° to 900° C. to form said ferrite dispersed in a glassy borate matrix,
dissolving the glassy matrix with a weak acid, and separating off the ferite particles.

4,786,431

LIQUID LAUNDRY DETERGENT-BLEACH COMPOSITION AND METHOD OF USE

Guy Broze, Grace-Hollogne; Leopold Laitem, Orp-Jaucbe, and Danielle Bastin, Soumagne, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 717,726, Mar. 29, 1985, which is a continuation-in-part of Ser. No. 687,815, Dec. 31, 1984, Pat. No. 4,753,750. This application Jul. 6, 1987, Ser. No. 70,126
Int. Cl.[4] C11D *3/075, 3/39*
U.S. Cl. 252—99 **14 Claims**

1. A non-aqueous liquid detergent composition capable of washing and bleaching soiled fabrics at temperatures as low as about 40° C. or less which comprises a liqiud phase comprising nonionic surfactant and a mono or poly (C_2 to C_3) alkylene glycol mono (C_1-C_5) alkyl ether in an amount of 30 to 70%, a water-soluble inorganic peroxide bleaching agent in an effective amount of up to 25%, a bleach activator to lower the temperature at which the bleaching agent will liberate hydrogen peroxide in aqueous solution in an effective amount of up to 10%, proteolytic enzyme in an amount of from about 0.7 to 2 percent by weight and from about 0.01 to 0.4 percent by weight, based on the total composition, of an hydroxylamine salt capable of inhibiting the enzyme-induced decomposition of the bleaching agent, said enzyme being present in the soiled fabrics.

4,786,432

INTEGRAL DRY ABRASIVE SOAP POWDERS

Joseph S. Kanfer, Akron; James A. Monson, SilverLake Village, and Lucy J. Krieger, Clinton, all of Ohio, assignors to Go-Jo Industries, Inc., Cuyahoga Falls, Ohio

Filed May 5, 1986, Ser. No. 859,362
Int. Cl.[4] C11D *9/20, 11/04, 13/00, 17/06*
U.S. Cl. 252—120 **17 Claims**

1. A free flowing soap powder, comprising:

the in-situ formation of a neat abrasive soap, said neat abrasive soap being the in-situ reaction product on abrasive particles of an initial precursor, selected from the group consisting of acid and base soap forming components and a final precursor selected from the group consisting of acid and base soap forming components, said final precursor being antipodal of said initial precursor; wherein said initial precursor is a liquid, said acid component is selected from the group consisting of fatty acids having from about 9 to about 30 carbon atoms and said base component is selected from the group consisting of morpholine and alkanolamines having from 2 to 12 carbon atoms;
said abrasive particles being present in an amount sufficient for said abrasive soap powder to be free flowing.

14. A process for the in-situ formation of a soap on an abrasive particle to form a free flowing soap powder product, comprising the steps of:

applying an initial precursor to at least one type of an abrasive particle, and in-situ forming an integral abrasive soap powder by reacting said initial precursor with a final precursor, wherein said initial precursor is a liquid selected from the group consisting of acid and base soap forming components and said final precursor is selected from the group consisting of acid and base soap forming components and
wherein said acid component is derived from a compound selected from the group consisting of fatty acids and fatty acid esters having from about 9 to about 30 carbon atoms, and said base component is selected from the group consisting of morpholine and alkanolamines having from 2 to 12 carbon atoms;
said abrasive particles being present in an amount sufficient for said abrasive soap powder to be free flowing.

4,786,433

METHOD OF PREPARING PHOSPHOROUS-FREE STABLE DETERGENT EMULSION

Linda L. Marquardt, Woodbury, and Cheryl A. Hall, Plymouth, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Jul. 2, 1986, Ser. No. 881,088
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—174.24 **20 Claims**

1. A method of manufacturing a storage stable, phosphorous-free caustic detergent emulsion, comprising the steps of:

(a) blending:
(i) about 0.1 to 10 wt-% phosphorous-free hardness sequestering polyelectrolyte comprising a polycarboxylate polymer,
(ii) about 5 to 40 wt-% nonionic surfactant, and
(iii) about 1 to 10 wt-% water, based upon the emulsion, to form a pre-mix;
(b) blending about 5 to 60 wt-%, based upon the emulsion, of a 40 to 60 wt-% first caustic solution and the pre-mix to form a first intermediate mixture;
(c) blending a viscosity modifying and emulsion stabilizing amount of an acrylic resin and the first intermediate mixture to form a second intermediate mixture;
(d) blending about 10 to 50 wt-%, based upon the emulsion, of a 40 to 60 wt-% second caustic solution and the second intermediate mixture to form the emulsion having a viscosity of about 250 to 1000 cp at 70° F.

4,786,434

AGENT FOR THE ELIMINATION OF ACTIVE CHLORINE COMPOUNDS FROM WATER

Ritter Günter, Melle, Fed. Rep. of Germany, assignor to Tetra Werke Dr. rer. nat. U. Baensch GmbH, Melle, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,385
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704295
Int. Cl.[4] C02F *5/12*
U.S. Cl. 252—181 **8 Claims**

1. A composition for use in treating water to remove active chlorine compounds selected from

(a) a mixture comprising
an adduct of hydrogen sulfoxylate anions to an aliphatic, aromatic, or heterocyclic mono- or dialdehyde according to the equation:

$$R—CH{=}O + Me^{n+}(HSO_2^-)_n \rightarrow Me^{n+}(RCH(OH)\text{-}SO_2^-)_n$$

wherein Me^+ is hydrogen ion or a mono-, di- or trivalent metal cation, and
the corresponding amino-, imino-, or nitrilosulfinate formed as a product of said adduct with ammonia;
(b) a mixture comprising
said adduct, and
the corresponding parent aldehyde;
(c) a mixture comprising
said adduct, and
ammonia.

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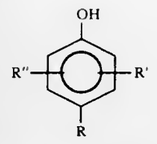
4,786,435

METHOD FOR MAKING A STORAGE STABLE BLEND OF A LONG CHAIN POLYOL AND A SHORT CHAIN DIOL BY INCORPORATING A PHENYL THEREIN AND THE RESULTING BLEND

Timothy A. Tufts, Columbus, Ohio, assignor to Ashland Oil, Inc., Russell, Ky.

Filed Apr. 10, 1987, Ser. No. 36,642
Int. Cl.[4] C09K *3/00*; H05B *33/00*
U.S. Cl. 252—182.27 12 Claims

1. A method for making a storage stable blend of a long chain polyol and a short chain diol which blend phase separates under storage, which comprises incorporating into said blend a stabilizing amount of a phenol wherein said phenol has the following formula:



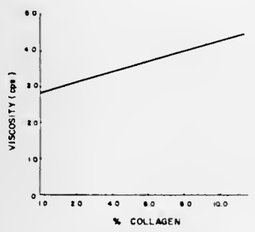
where R, R' and R'' independently represent hydrogen, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkaryl group having from 7 to 20 carbon atoms, hydroxyl, hydroxyalkyl, or hydroxyaryl.

4,786,436

WETTING SOLUTIONS FOR CONTACT LENSES

Lai Ogunbiyi, Fairport, and Francis X. Smith, Walworth, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 824,484, Jan. 31, 1986, abandoned. This application Oct. 14, 1987, Ser. No. 106,961
Int. Cl.[4] B01F *17/00, 17/30*
U.S. Cl. 252—352 6 Claims



1. An aqueous contact lens wetting solution containing collagen in an amount within the range of 0.001% to 1% by weight, at least one other demulcent in addition to collagen, a buffering agent in an amount within the range of 0.05 to 2.5% by weight and a tonicity agent so that the osmotic pressure of the solution approximates normal lacrimal fluids, the viscosity of the solution being less than 15 CPS at 25° C.

4,786,437

ONE-COMPONENT, PARTICLE-FILLED COMPOSITIONS

John E. Ehrreich, Acton, Mass., assignor to Ercon, Inc., Waltham, Mass.

Division of Ser. No. 716,583, Mar. 27, 1985, Pat. No. 4,683,082. This application May 13, 1987, Ser. No. 49,111
Int. Cl.[4] A01B *1/04, 1/06*
U.S. Cl. 252—506 22 Claims

2. In a processable liquid composition subject to conversion to the solid state on drying or curing, said composition being formed of an organic resin binder system and sufficient particulate filler so that, on such solidification, the filler is in particle-to-particle contact within said binder system, the improvement wherein said a quantity of an organotin pacifying agent effective to impart aging stability to said liquid composition is incorporated into said liquid composition.

4,786,438

LIGNOSULFONATE/UREA BINDER FOR PARTICULATE COMPOSITES

Kenneth A. E. Blackmore, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Division of Ser. No. 472,881, Mar. 8, 1983, Pat. No. 4,704,230. This application Aug. 10, 1987, Ser. No. 85,848
Int. Cl.[4] H01B *1/06*
U.S. Cl. 252—510 4 Claims

1. A coherent particulate composite comprising a uniform mixture of particulate material and 5-30% by weight of a binder, said binder comprising approximately equal parts by weight of urea solids and lignosulfonate solids.

4,786,439

TEXTILE TREATMENT COMPOSITION

Uwe Boog, Haan; Günter Uphues, Monheim; Peter Waltenberger, Hollig, and Rudolf Veitenhansl, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 895,606, Aug. 11, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,469
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530302
Int. Cl.[4] C11D *3/30*
U.S. Cl. 252—544 26 Claims

1. A textile treatment composition for use in refining fibers and yarns or in preparations for post-treatment of laundered fabrics, consisting essentially of:

(A) at least one dispersion accelerator present in about 0.5-10% by weight based upon the combined weight of the dispersion accelerator and fatty acid compositon, which is: a natural or synthetic hydrophilic polymer or a mixture thereof;

(B) a fatty acid condensation product obtained by reacting an aliphatic monocarboxylic acid or amide-forming derivative thereof having from 8 to 22 carbon atoms with a polyamine and neutralizing resulting unreacted amino groups, said amide-forming derivative being a lower alkanol fatty acid ester, fatty acid glyceride, or fatty acid halide; and

(C) at least one secondary dispersion aid which may be present in 0 to about 70% by weight, based on the weight of the treatment composition.

4,786,440

DETERGENT COMPOSITIONS USING AN AMINOCARBOXYLIC ACID AS BUILDER

Lance A. Cooper, Lake Jackson; Jaime Simon, Angleton, and David A. Wilson, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1985, Ser. No. 752,707
Int. Cl.[4] C11D *3/30*
U.S. Cl. 252—546 31 Claims

1. A detergent composition comprising a surfactant and a builder wherein the builder is triethylenetetraminehexaacetic acid or a water soluble salt thereof.

4,786,441

PREPARATION OF IODONIUM AND SULFONIUM TRIFLATES

Robert D. Miller, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,779
Int. Cl.[4] C07C *143/02*
U.S. Cl. 260—513 F 6 Claims

1. A process for preparing an iodonium or sulfonium triflate, said process comprising dissolving or slurring a iodonium or sulfonium halide in an organic solvent and reacting it with trimethylsilyl triflate.

4,786,442

ALKYL PERFLUORO(2-METHYL-5-OXO-3-OXAHEXANOATE)

Carl G. Krespan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 355,710, Mar. 8, 1982, abandoned, which is a division of Ser. No. 136,991, Apr. 3, 1980, Pat. No. 4,335,255. This application Jun. 19, 1987, Ser. No. 67,724
Int. Cl.[4] C07C *59/13, 103/16*
U.S. Cl. 260—544 F 3 Claims

1. Compound of the formula

$$CF_2{=}CF{+}OCF_2\underset{\displaystyle CF_3}{\underset{|}{C}}F{\rightarrow}_n OCF\underset{\displaystyle CF_3}{\underset{|}{C}}F_2OCF\underset{\displaystyle CF_3}{\underset{|}{C}}FX$$

wherein X is COF, COCl or $CONH_2$, R is alkyl or 1 to 8 carbon atoms, and n is 1 to 6.

4,786,443

PROCESS FOR THE CARBONYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS WITH A PALLADIUM CATALYST

Eit Drent; Simon A. J. van Langen, and Leonardus Petrus, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 7, 1988, Ser. No. 165,052
Claims priority, application United Kingdom, Mar. 11, 1987, 8705699
Int. Cl.[4] C07C *53/12*
U.S. Cl. 260—549 20 Claims

1. A process for the carbonylation of an olefinically unsaturated compound which comprises reacting said olefinically unsaturated compound with carbon monoxide and a reactant selected from the group consisting of water, an alcohol, a carboxylic acid and mixtures thereof in the presence of a catalyst composition comprising:

(a) a palladium compound,

(b) a protonic acid, and

(c) an organic phosphine of the general formula I

$$R^1{-}\underset{\displaystyle R^3}{\underset{|}{\overset{\displaystyle R^2}{\overset{|}{P}}}}$$

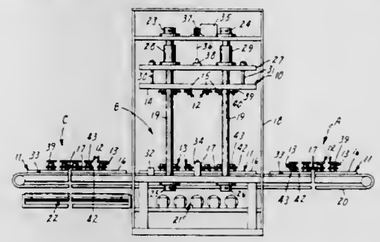
wherein R^1 represents a heterocyclic ring having 5 or 6 carbon atoms in the ring which contains at least one hetero nitrogen atom in the ring and wherein each of R^2 and R^3 has the same meaning as R^1 or represents an aryl group.

4,786,444

METHOD AND APPARATUS FOR MAKING OPTICAL DEVICES

Kirk K. S. Hwang, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 811,158, Dec. 19, 1985, abandoned. This application Jun. 1, 1987, Ser. No. 57,015
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.4 19 Claims



1. A method for the manufacture of optical devices from reactive precursors comprising the steps of:

I. providing

A. a mold which has

(a) a first mold portion which has a first molding surface with a first principal longitudinal axis;

(b) a second mold portion which has a second molding surface with a second principal longitudinal axis and which is adapted to cooperate with said first mold portion to form a cavity to receive said reactive precursors;

B. a molding device which has separate top and bottom mold supports, said mold supports being oriented vertically with respect to one another, and being movable vertically with respect to one another, wherein

(a) said top mold support has a first planar surface for contacting said first mold portion and vacuum means for positioning said first mold portion on said first planar surface so that said first principal longitudinal axis is maintained perpendicular to said first planar surface;

(b) said bottom mold support has a second planar surface for contacting said second mold portion and locating means for positioning said second mold portion on said second planar surface, said second planar surface being maintained in opposed, parallel relationship to said first planar surface;

II. placing said first and second mold portions together to form said cavity and supporting said second mold portion on said locating means of said second planar surface;

III. moving said first planar surface into contact with said first mold portion so as to position the first and second principal longitudinal axes perpendicular to said first and second planar surfaces respectively and place said axes in coincident alignment with each other;

IV. securing said first mold portion to said first planar surface by means of said vacuum means and removing said first mold portion from said second mold portion by moving the mold supports vertically away from one another while maintaining the coincident alignment;

V. injecting reactive material into said second mold portion;

VI. closing said mold by vertically moving said first mold portion into said second mold portion while said first mold portion remains attached to said first planar surface in said coincident alignment thereby causing said reactive material to assume the shape of said cavity;

VII. at least partially reacting said reactive material while said first and second planar surfaces contact said first and second mold portions; and

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VIII. recovering said optical device from said mold.

14. An apparatus for molding optical devices comprising

a top mold support which

has a first planar surface, a vacuum attachment means on said first planar surface comprising (i) a first cavity in said first planar surface, (ii) a cylindrical body in said first cavity having a portion projecting therefrom, (iii) a flange around said projecting portion, and (iv) a passageway therethrough for connection to a vacuum pump;

a bottom mold support which has a second planar surface parallel to said first planar surface, a locating means on said second planar surface comprising (i) a second cavity in said second planar surface, (ii) an outer sleeve in said second cavity, (iii) an inner sleeve in said outer sleeve having a portion that projects above said second planar surface, and (iv) a shoulder portion on said projecting portion,

a frame having guide means thereon, said guide means passing through said top and bottom supports for permitting vertical movement of said top and bottom supports with respect to each other while maintaining said first and second planar surfaces parallel to each other.

4,786,445

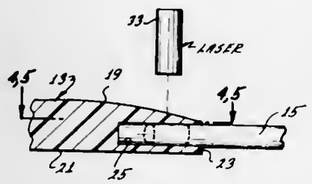
METHOD OF ATTACHING A FIXATION MEMBER TO AN INTRAOCULAR LENS

Vladimir Portnoy, Irvine, and Albert C. Ting, Niguel, both of Calif., assignors to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 754,417, Jul. 11, 1985, abandoned. This application Jan. 22, 1987, Ser. No. 5,934

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—1.4 **11 Claims**



1. A method of attaching a fixation member having an inner end portion to an optic of an intraocular lens wherein the optic has a peripheral edge, said method comprising:

providing the optic with an outwardly opening cavity and with a shoulder within the cavity;

inserting an inner end portion of the fixation member into the cavity;

transmitting laser energy in the near infrared band through the optic to the inner end portion of the fixation member and absorbing the laser energy in said inner end portion sufficiently to heat the inner end portion to cause at least some of the inner end portion of the fixation member to flow behind the shoulder; and

allowing the flowable portion of the fixation member to harden and interlock with the shoulder to resist withdrawal from the cavity.

4,786,446

PROCESS OF FORMING A HYDROXY-SUBSTITUTE POLYMERIC SHAPED ARTICLE

W. James Hammar, St. Paul, and Ronald F. Ofstead, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 735,379, May 17, 1985, Pat. No. 4,673,539, which is a continuation-in-part of Ser. No. 500,784, Jun. 3, 1983, abandoned. This application Feb. 26, 1987, Ser. No. 19,068

Int. Cl.⁴ B29D *11/00*

U.S. Cl. 264—2.6 **39 Claims**

1. A process for preparing a hydroxy-substituted polymeric shaped article comprising the steps:

a. thermoforming an uncrosslinked polymer having a softening temperature of at least 100° C. comprising the product of an ethylenically-unsaturated monomer bearing at least one trihaloacetoxy-substitent group, by heating in a mold or pressing into sheets or films at a temperature in the range of 150° to 400° C. for 5 seconds to 15 minutes, and then cooling the resulting thermoformed polymer, to provide a thermoplastic, hydrogel precursor shaped article,

b. solvolyzing the shaped article by reacting with a nucleophile which causes displacement of said trihaloacetoxy group to provide a hydroxy-substituted polymeric shaped article, said solvolyzing step taking place in the presence of a diluent which is not a solvent for said thermoformed polymer.

4,786,447

METHOD OF MOLDING SKIN-COVERED FOAMED PLASTIC ARTICLE

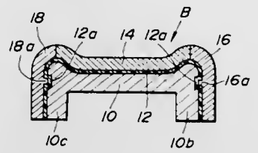
Hiroshi Kouda, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jun. 11, 1987, Ser. No. 60,635

Claims priority, application Japan, Jul. 21, 1986, 61-171362

Int. Cl.⁴ B29C *63/26*

U.S. Cl. 264—46.6 **11 Claims**



1. A method of molding a skin-covered foamed plastic article, comprising the steps of:

(a) putting a skin member on a shaping device in a manner to cover the same thereby to prepare a first temporary unit, said skin member being shaped like a bag so that upon proper putting of said skin member on said shaping device, no creases are produced on the skin member;

(b) attaching shaping dies to said first temporary unit in a manner to cover the skin member thereby to prepare a second temporary unit;

(c) removing said shaping device after said shaping dies are attached from said second temporary unit thereby to prepare a third temporary unit with the skin member supported within said shaping dies;

(d) placing said third temporary unit in a mold in such a manner that a mouth portion of said third temporary unit is directed upward;

(e) pouring a liquid material of foamed plastics into said third temporary unit against the skin member through said mouth portion;

(f) placing a lid member on said mold in a manner to close said mouth portion; and

(g) removing, upon sufficient curing of said material, said lid member from said mold and taking out said third temporary unit from said mold together with the cured material, the skin member and cured material forming said skin-covered foamed plastic article.

4,786,448

PLASTIC PROCESSING METHOD OF PRESSURE OR PRESSURELESS SINTERED CERAMIC BODY

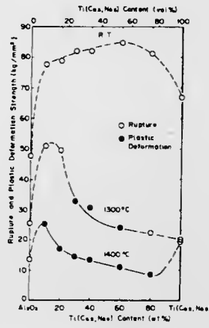
Mikio Fukuhara; Yuji Katsumura; Akira Fukawa; Mutsuo Asakawa; Tomio Urushihata; Isao Miyakawa, and Kazuhiro Sawada, all of Kawasaki, Japan, assignors to Toshiba Tungology Co., Ltd., Kawasaki, Japan

Filed Aug. 27, 1986, Ser. No. 901,052

Claims priority, application Japan, Aug. 29, 1985, 60-188460; Dec. 23, 1985, 60-290092

Int. Cl.⁴ C04B *35/60*

U.S. Cl. 264—65 **6 Claims**



1. In a plastic processing method of a pressure or pressureless sintered ceramic body, the improvement wherein the ceramic body consists essentially of at least one of $Ti(C_x, O_y, N_{1-x-y})$ and $Ti(C_x, N_{1-x})$ wherein $x=0.5$–0.9 and $y=0.05$ and from 5 to 95% by volume of at least one aluminum-containing compound selected from the group consisting of aluminum oxide, aluminum nitride and aluminum oxynitride, and the ceramic body is subjected to plastic deformation at a temperature of 1300° C. or higher, under a stress of 15 kg/mm² or smaller and at a strain rate of 10^{-3}/sec or less in a reducing atmosphere or in vacuum.

4,786,449

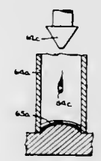
METHOD FOR MANUFACTURE OF MULTI-COLOR MARKING IMPLEMENTS

Adrianus J. Smit, Driebergen, Netherlands, assignor to Clowny Corporation, Hialeah, Fla.

Division of Ser. No. 564,839, Dec. 28, 1983, Pat. No. 4,602,886. This application Apr. 15, 1986, Ser. No. 852,226

Int. Cl.⁴ B29C *41/22*

U.S. Cl. 264—73 **7 Claims**



1. A method for making a multi-colored marking implement comprising providing molten wax-like materials of at least two different colors, dispensing a metered amount of a first of said molten wax-like materials while at a first temperature into a mold and after a predetermined cooling period dispensing a second of said molten wax-like materials while at a second temperature into the mold, so that the two dispensed materials form a discretely-colored material region and form a non-discretely-colored region of blended color substantially randomly distributed in the discretely colored material region, and repeating the above steps a multiplicity of times so as to form a marking implement having a variegated pattern of substantially randomly distributed discrete and blended colored regions.

4,786,450

METHOD FOR THE PRODUCTION OF BUILDING ELEMENTS PARTICULARLY SUITED FOR USE AS BRICK FACINGS

Jorn U. Weidemann, Rudkobing, Denmark, assignor to L. P. Weidemann & Sonner I/S, Rudkobing, Denmark

PCT No. PCT/DK86/00004, § 371 Date Oct. 31, 1986, § 102(e) Date Oct. 31, 1986, PCT Pub. No. WO86/04013, PCT Pub. Date Jul. 17, 1986

PCT Filed Jan. 10, 1986, Ser. No. 915,972

Claims priority, application Denmark, Jan. 11, 1985, 160/85

Int. Cl.⁴ C04B *40/02*

U.S. Cl. 264—82 **18 Claims**

1. A method for producing a building element suitable for use as a brick facing, said method comprising the steps of

(a) forming a mixture of 40–60% by weight of cement, 40–60% by weight of aggregate, 0.5–2% by weight of thickening agent, and water; said cement, aggregate and thickening agent being dry materials and said water being present in an amount of 8–17% by weight, based on the weight of said dry materials,

(b) granulating said mixture formed in step (a),

(c) pressing said granulated mixture from step (b) at a pressure of 50–100 kg/cm² and at a temperature of more than 100° C. in a mold to form a solid intermediate product with a steam film on its surface which acts as a release agent, and

(d) releasing said solid intermediate product from said mold and subjecting it to a humid atmosphere until said cement component therein has partially set, thereby providing said building element.

4,786,451

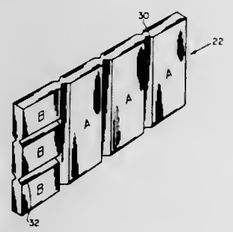
METHOD OF MANUFACTURING A METALLURGICAL ADDITION AGENT

Donald L. Lampus, Pittsburgh, Pa., assignor to Doren, Inc., Pittsburgh, Pa.

Filed Feb. 9, 1984, Ser. No. 578,635

Int. Cl.⁴ B28B *3/00, 3/02*

U.S. Cl. 264—87 **8 Claims**



1. A method of manufacturing a metallurgical addition agent comprising:

A. forming a wet mix of at least 30% by weight fines of a metallurgical addition agent substance, said fines passing a 100-mesh screen, cement in an amount sufficient to bind the solids in a unified mass and at least 20% by weight

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water said water being in excess of that required for complete hydration of the cement;

B. feeding said wet mix to a mold of a press, said mold having a predefined size and shape;

C. pressing and dewatering said mix in the press by causing a ram to pass into the mold and squeezing excess water out so as to leave sufficient water for hydration of the cement;

D. removing said dewatered mix from the mold; and

E. curing said dewatered mix at ambient temperatures thusly allowing for hydration of the cement.

4,786,452

METHOD FOR MANUFACTURING SHEETS OF HIGHLY WEAR-RESISTANT PLASTICS MATERIAL

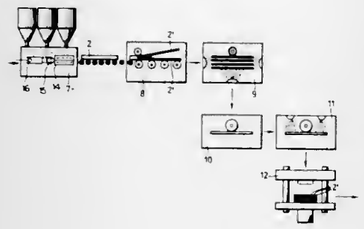
Bodo Günzel, Telgte, Fed. Rep. of Germany, assignor to Cimatec Chemischtechnische Handalsgesellschaft mbH

Filed Oct. 9, 1984, Ser. No. 658,483

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336511

Int. Cl.⁴ B29C *39/20, 33/56, 45/16*

U.S. Cl. 264—129 **5 Claims**



1. A method of manufacturing shoe soles, comprising the steps of high pressure casting a sheet of plastics material from a mixture of polyol and a filler portion in an amount not exceeding 30% with the addition of isocyanate, splitting said sheet along its center plane so that two half sheets having half the wall thickness of said sheet are obtained, said half sheets each having a principal side and an inner side, punching blanks in the form of shoe soles from said sheet, cleaning each principal side prior to splitting, and printing and subsequently varnishing each prinicpal side prior to splitting.

4,786,453

FIBER-MATRIX COMPOSITE MATERIALS WITH EXACTLY POSITIONED AND ORIENTED FIBERS AND THEIR PREPARATION PROCESS

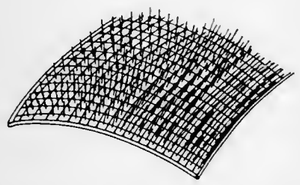
Michel Berger, Castelnau de Medoc, France, assignor to Societe de Droit Anglais: Pradom Limited, London, England

Filed Dec. 29, 1986, Ser. No. 947,379

Claims priority, application France, Dec. 30, 1985, 85 19436

Int. Cl.⁴ B29C *67/14*

U.S. Cl. 264—136 **2 Claims**



1. A process for the preparation of a composite material formed of reinforcing fibers, regularly distributed and oriented in more than two directions, and of a matrix filling up the space between said fibers, said process comprising the steps of: (a) in a first step, producing a convex brush of said reinforcing fibers, regularly distributed and fixed by fixing elements by one of their ends on a convex base, said fibers being subjected to an intensive DC electrostatic field, oriented in parallel to said fibers so that the fibers are immobilized in stretched condition perpendicularly to the surface of the base; (b) in a second step, inserting between said reinforcing fibers layers of fibers, disposed successively at 90° from one another, said inserting being carried out while the reinforcing fibers fixed on said base are subjected to the intensive D.C. electrostatic field; (c) in a third step, removing the fixing elements used for fixing the fibers of the brush leaving a fibrous structure; (d) in a fourth step, impregnating the fibrous structure with a liquid pre-matrix; and (e) finally, in a fifth step, solidifying the liquid pre-matrix into a solid matrix.

4,786,454

PROCESS FOR THE PRODUCTION OF FLEXIBLE CONNECTORS

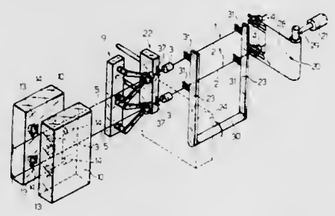
Manrico Oddenino, Buttigliera Alta, Italy, assignor to Illinois Tool Works, Chicago, Ill.

Filed Sep. 16, 1986, Ser. No. 907,885

Claims priority, application Italy, Sep. 17, 1985, 67784 A/85

Int. Cl.⁴ B29C *45/14*

U.S. Cl. 264—157 **2 Claims**



1. A process for the production of connectors comprising a segment of flexible cable and a pair attachment elements of synthetic plastics materials rigidly connected to said cable segment, characterized by the fact that it comprises the steps of:

(a) drawing a continuous flexible cable wound in a coil through a pair of facing relatively moveable mould halves;

(b) closing the mould halves together in such a way as to clamp a section of said flexible cable between them and hot forming directly on said second a pair of spaced apart attachment elements of synthetic plastics material embedding said flexible cable in said pair;

(c) separating said mould halves in such a way as to expel said pair of spaced apart attachment elements rigidly formed on said flexible cable;

(d) advancing said cable parallel to its length in such a way as to unwind said coils and carry a free section of said flexible cable between said mould halves while carrying the previously expelled pair of attachment elements away from these latter to a gripper location;

(e) gripping said cable segment by a pair of grippers;

(f) cutting said section of said flexible cable between said pair of spaced apart attachment elements while maintaining a gripping hold on the attachment element still attached to said continuous flexible cable to maintain the section of flexible cable extending from said coil in a stretched condition;

(g) depositing the detached portion of said flexible cable astride a collection support; and

(h) repeating steps (b) through (g).

4,786,455

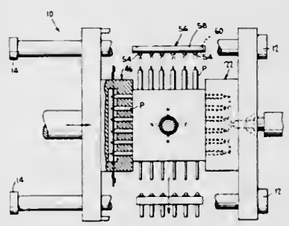
ROTARY INJECTION TURRET AND METHOD OF UTILIZING THE SAME IN THE MAKING OF PREFORMS

Sappayan M. Krishnakumar; Ieuan L. Harry, both of Nashua, and Martin H. Beck, Brookline, all of N.H., assignors to The Continental Group, Inc., Norwalk, Conn.

Filed Feb. 23, 1981, Ser. No. 236,960

Int. Cl.⁴ B29C *45/04, 45/72, 45/76*

U.S. Cl. 264—237 **4 Claims**



1. A method of forming preforms for bottles comprising the steps of providing a multiple cavity injection mold, providing a plurality of sets of cores for sequential presentation of the sets of cores to the cavities, providing a plasticizer having an output capacity at least as great as the total requirements of said cavities, presenting the cores of a first of the sets of cores to the cavities and closing the cavities, utilizing the plasticizer injecting a molten thermoplastic into all of the cavities at a high pressure, and filling the cavities about the cores positioned therein, isolating the plasticizer from the cavities and initiating recovery of the plasticizer while maintaining a lower packing pressure in the injection mold, maintaining the molded preform in the cavities for a time to permit the thermoplastic to set substantially only to the extent that first molded preforms carried by the cores can be removed from the cavities, removing the first set of cores from the cavities and presenting a second of the sets of cores to the cavities, and while injection molding a second set of preforms, cooling the first set of preforms by blowing a coolant thereon, removing the second set of cores and the second set of preforms from the injection mold, presenting a third set of cores to the cavities, while injection molding a third set of preforms, cooling the second set of preforms, and conditioning the cooled first set of preforms, removing the third set of cores and the third set of preforms from the injection mold, presenting a fourth set of cores to the cavities; and while injection molding a fourth set of preforms, conditioning the cooled set of preforms, and removing the first set of preforms from the first set of cores and thereby making the first set of cores available for presentation to the injection mold.

4,786,456

SHAPING MOLD

Karl H. Witte, Hilter, Fed. Rep. of Germany, assignor to Maschinen Witte KG, Hilter, Fed. Rep. of Germany

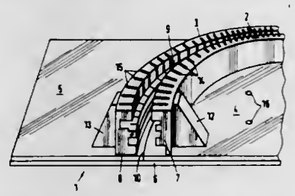
Division of Ser. No. 606,053, May 2, 1984, Pat. No. 4,649,012, which is a division of Ser. No. 269,924, Jun. 2, 1981, Pat. No. 4,468,190. This application Dec. 9, 1986, Ser. No. 939,913

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1980, 3020922; Jun. 3, 1980, 8014748

Int. Cl.⁴ B29C *53/00*

U.S. Cl. 264—285 **10 Claims**

1. A method for changing the elongate shape of an elongated softened plastic product of a complex cross-sectioned shape and having an elongate length with an initial elongate shape, comprising the steps of bending two elongated complementary and bendable mold parts into a desired elongate arcuate configuration corresponding to the desired elongate arcuate configuration of said product, said desired elongate arcuate configuration being different from said initial elongate shape, fixedly mounting said bent mold parts on a mold plate means, moving said softened plastic product longitudinally through said fixedly mounted mold parts as the latter slidingly engages said softened plastic product, slight stretching said softened plastic



product during said moving step, and changing the elongate shape of said product from said initial elongate shape to said desired elongate arcuate configuration corresponding to the arcuate configuration of said mold parts as said softened plastic product slidably engages said mold parts upon being moved longitudinally through said fixedly mounted mold parts.

4,786,457

JIGGERING METHOD AND PROFILE TOOL FOR CERAMIC WARE PLASTIC CLAY

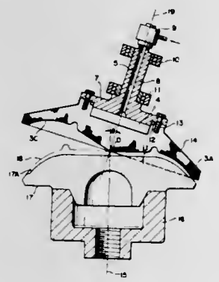
Shigemi Fujii, Handa; Eisuke Kumazaki, Nagoya, and Kazutoshi Shigematsu, Tajimi, all of Japan, assignors to Noritake Co., Limited, Nagoya, Japan

Filed Oct. 7, 1985, Ser. No. 785,355

Claims priority, application Japan, Oct. 8, 1984, 59-209771

Int. Cl.⁴ B28B *1/02*

U.S. Cl. 264—310 **12 Claims**



1. A jiggering method for ceramic ware plastic clay comprising:

(a) providing a charge of said plastic clay on a jigger;

(b) providing a jiggering profile tool disposed relative to said jigger and plastic clay such that during the jiggering operation, the jiggering surface of said profile tool is in contact with less than the entire surface area of said plastic clay charge and said surface of the profile tool is formed of a gas permeable material; and

(c) jiggering said plastic clay charge into ceramic ware by contacting said surface of the profile tool to said plastic clay charge while rotating said profile tool and said plastic clay charge and providing a thin gas film between said plastic clay and said jiggering surface of the profile tool by supplying said jiggering surface of the profile tool with a gas by ejecting the gas through pores in said gas permeable material thereby preventing said plastic clay from sticking to said profile tool.

8. A jiggering apparatus for ceramic ware plastic clay com-

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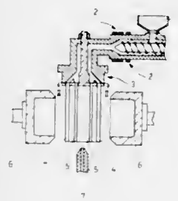
prising a jigger for holding a charge of said plastic clay to be jiggered, a jiggering profile tool having a jiggering surface which contacts less than the entire surface of said plastic clay charge to be jiggered during the jiggering operation, comprising a rotatable tool body, which includes a jiggering surface comprised of a gas permeable material, and a gas supply means for ejecting a gas from said jiggering surface through pores in said gas permeable material of said jiggering surface during the jiggering operation thereby providing a thin gas film to prevent the plastic clay from sticking to said jiggering surface during the jiggering operation.

4,786,458

METHOD FOR FORMING A HOLLOW CONTAINER HAVING SUPPORTS

Toshio Takagi, 3-5, 1-chome, Shiragane, Korkurakita-ku, Kitakyushu-shi, Fukuoka-ken 802, Japan

Filed Aug. 19, 1986, Ser. No. 898,448
Int. Cl.[4] B29C *47/00, 47/30*
U.S. Cl. 264—515 **1 Claim**



1. A method of forming a hollow plastic container having a plurality of solid rod supports and an access opening, comprising extruding a plastic material through an extrusion die having an annular extrusion orifice encircling a plurality of circular extrusion orifices to form a tubular hollow outer member through said annular extrusion orifice and a plurality of solid rod supports through said circular extrusion orifices, said supports being disposed within said hollow outer member and being generally parallel to each other and to said hollow outer member; closing divided mold halves about said outer member thereby forming first and second end walls for said hollow outer member and solid rod supports internally of said hollow outer member, which supports have ends connected to said end walls of said outer member; forming said access opening during said closing step, said access opening being formed in said first end wall formed by the first extruded end of said hollow outer member; said step of forming said access opening comprising forming a protrusion which extends outwardly of said first end wall and has a through passage which defines said access opening; forming said second end wall as a closed wall to define a bottom wall of said container; introduciung a pressurized fluid into said hollow outer member through said access opening, utilizing said pressurized fluid to effect expansion of said hollow outer member so that said hollow outer member is contacted with interior walls defining a mold cavity formed by closing said mold halves, opening said mold halves and removing said container having a plurality of integrally formed internal solid rod supports and an access opening.

4,786,459

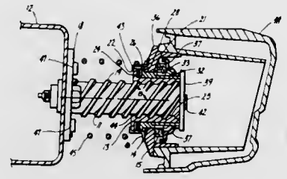
VEHICLE IMPACT ENERGY ABSORBER

James D. Mundo, 6601 Raintree Dr., Canton, Mich. 48187

Filed Jul. 29, 1987, Ser. No. 79,164
Int. Cl.[4] B60R *19/26, 19/36*
U.S. Cl. 293—132 **9 Claims**

1. An energy absorber for preventing vehicle damage during a collision comprising in combination:

(a) an externally threaded spindle adapted for being fixedly mounted in a horizontal position to a vehicle structure;
(b) an internally threaded sleeve carried on said spindle in threaded engagement with said spindle;
(c) a friction member slideably engaging said sleeve such that said friction member is radially constrained but free to move axially on said sleeve; and



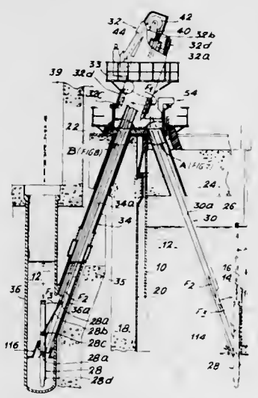
(d) a housing fixedly attached to a vehicle bumper and tightly embracing said friction member, said housing being in cooperative relationship with said sleeve such that when said bumper and housing are inwardly displaced with respect to the vehicle structure said friction member is urged to rotate inside of said housing to provide a force to resist the inward movement of said bumper.

4,786,460

INSTALLATION FOR HANDLING ASSEMBLIES FORMING THE CORE OF A FAST NEUTRON NUCLEAR REACTOR

Roland Jacquelin, Manosque; Henri Venobre, Vinon sur Verdon; Dominique Limouzin, Lyons, and Eric Martin, Villeurbanne, all of France, assignors to Commissariat a l'Energie Atomique and Electricite de France, both of Paris, France

Filed May 29, 1987, Ser. No. 55,702
Claims priority, application France, May 29, 1986, 86 07712
Int. Cl.[4] G21C *19/20*
U.S. Cl. 376—270 **13 Claims**



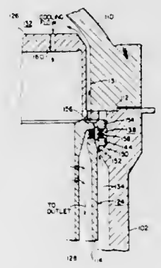
1. An installation for handling assemblies forming a core of a fast neutron nuclear reactor, between a primary station situated in a main vessel containing the core and a secondary station situated in an adjoining vessel, said installation comprising: at least one pivotable transfer hood, means for pivoting the hood around a vertical axis, two inclined ramps for connecting the hood to the primary station and the secondary station respectively, at least one pot for transporting an assembly, means for lifting said at least one pot along guiding means inside each of the ramps and the pivotable hood between the primary station and the secondary station, and means for closing the ramps at their top ends when the reactor is operating, comprising two flaps, the hood being attached to a rotary horizontal platform such that the hood and platform rotate as a unit around said vertical axis, said flaps being mounted on the platform in locations such that the flaps can be simultaneously placed above the top ends of the ramps by said means for pivoting the hood when the reactor is operating, said at least one pot comprising two pairs of wheels cooperating with the guiding means.

4,786,461

REACTOR INTERNALS HOLD DOWN SPRING

Luciano Veronesi, O'Hara Township, Allegheny County, and Stephen N. Tower, Washington Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,040
Int. Cl.[4] G21C *13/02*
U.S. Cl. 376—285 **15 Claims**



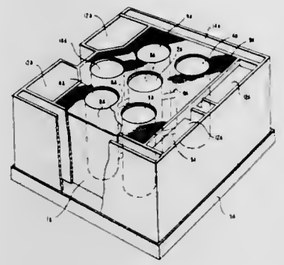
1. A nuclear reactor comprising:
a reactor pressure vessel;
a lower-internals assembly disposed within the reactor pressure vessel including a core barrel having a flange with a plurality of first annularly-spaced coolant passages;
an upper-internals assembly disposed within the reactor pressure vessel including an upper-internals barrel having a flange, axially disposed above said core-barrel flange, with a plurality of second annularly-spaced coolant passages;
each of said plurality of second passages being positioned to be in coolant-passage communication with a corresponding one of said plurality of said first passages;
a plurality of reactor-internals hold-down spring assemblies annularly-spaced about said core-barrel flange, each of said spring assemblies being disposed between said core-barrel flange and said upper-internals barrel flange and being associated with one of said plurality of second passages and said corresponding one of said plurality of first passages;
each said spring assembly comprising:
a resilient biasing device;
a retainer means for carrying said resilient biasing device and having therein a central bore; and
means, disposed in said central bore, for defining a connecting flow passage for coolant between a said second and said corresponding first coolant passages with which said each spring assembly is associated.

4,786,462

SUPPORT STRUCTURE FOR A NUCLEAR REACTOR

George Garabedian, Boston; Robert A. DeLuca, Newton Center; George A. Gurnis, Cohasset; William C. Craig, Cambridge, and James M. Barker, Reading, all of Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Filed Feb. 21, 1984, Ser. No. 582,016
Int. Cl.[4] G21C *13/00*
U.S. Cl. 376—293 **17 Claims**



1. In a nuclear reactor having a nuclear reactor vessel, a support structure comprising:
(a) a basemat and an unitary reinforced concrete core having exterior walls and containing an open vertical void for placement of a nuclear reactor vessel, said void extending from the top of basemat to the top surface of the unitary reinforced concrete core, said concrete core providing structural support to the reactor vessel at the upper end of said reactor vessel and upper end of said core and said core providing shielding for radiation from the reactor vessel;
(b) said reinforced concrete core having concrete ligaments in said unitary reinforced concrete core between said void and the edge of said concrete core, said ligaments extending from the top of said core to the basemat where said core is integrally connected to said basemat and said ligaments being large enough to assure that the deformation of support structure is shear controlled and
(c) said unitary reinforced concrete core and basemat having a distribution of mass and stiffness which provides a fundamental horizontal natural frequency of vibration greater than 10 Hertz for said unitary concrete core and basemat and greater than the fundamental natural frequency of the supported reactor vessel.

4,786,463

EMERGENCY HEAT EXCHANGER FOR COOLING THE PRIMARY FLUID OF A NUCLEAR REACTOR, AND A PROCESS FOR ASSEMBLING THIS HEAT EXCHANGER

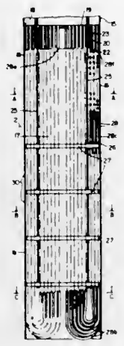
Luis Fernandez, Palaiseau, and Gérard Stalport, Grigny, both of France, assignors to Novatome, Le Plessis-Robinson, France

Filed Jul. 25, 1985, Ser. No. 760,211
Claims priority, application France, Jul. 26, 1984, 84 11858
Int. Cl.[4] G21C *15/18*
U.S. Cl. 376—299 **8 Claims**

1. In a liquid metal cooled pool type nuclear reactor having a vessel filled with liquid metal, a reactor core disposed in said vessel, a slab sealing said vessel, an emergency heat/exchanger comprising a support flange resting on the slab, a bundle of exchange tubes bent into a hairpin shape and fixed to two tube plates, a cylindrical shell with a vertical axis surrounding the bundle which is submerged in the liquid metal and a circuit for feeding the tubes of the bundle with a heat exchange fluid, incorporating a means of cooling the exchange fluid heated by the liquid metal and arranged outside the vessel, the two tube plates being placed coaxially, horizontally and at the same

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level, one of these tube plates, of annular shape, situated peripherally relative to the second, central plate, circular in shape, being fixed to a shell having a vertical axis and ensuring the latter to be borne by the support flange and to a second shell coaxial with the first, situated below the tube plates, and connected to a third shell connected to the central tube plate, the improvement wherein the first shell is located above the tube plate, the second and third shells are connected by a



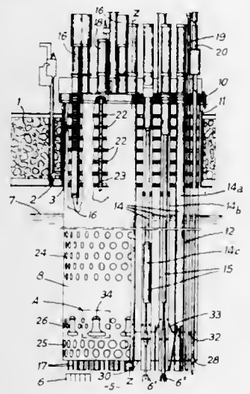
connecting piece at their lower ends, and wherein each of the tubes of the bundle incorporates a vertical straight part connected to the central tube plate, a bent plate for returning the tube, a vertical straight return part, said parts being heat-exchanging parts of the tube, as well as a horizontal circular portion extending over approximately one-third of the circumference, and a vertical part joining the peripheral tube plate.

4,786,464

COVER PLUG OF THE CORE OF A FAST NEUTRON NUCLEAR REACTOR

Alain Bardot, Villers sur-Orge, France, assignor to Novatome, Courbevoie, France

Filed May 5, 1987, Ser. No. 46,008
Claims priority, application France, May 5, 1986, 86 06476
Int. Cl.[4] G21C *15/00, 11/00*
U.S. Cl. 376—352 **5 Claims**



1. In a fast neutron nuclear reactor having a vessel closed by a structure comprising a rotating plug, said vessel containing a core and a coolant liquid, said nuclear reactor having control rods for movement into and out of said core, a cover plug structure for fixing and guiding the control rods and instrumentation of the core and deflecting and dispersing the coolant liquid, said cover plug structure comprising a cylindrical barrel having a vertical axis, a support plate integral with an upper part of the barrel for bearing on a rotating plug closing the vessel of the reactor in which vessel the core is immersed in the coolant liquid, a group of vertical tubes at least a part of which tubes receive control rods of the reactor, fixed in an upper part of the tubes to the support plate and disposed inside the barrel in a plurality of rows coaxial with the barrel, an apertured transverse plate fixed to a lower end of the barrel and allowing passage of the coolant liquid and the vertical tubes the spacing of which it ensures, and at least one transverse plate for deflecting the coolant liquid on which plate are fixed vertical tubes of the group which serve to effect measurements in the core, said deflecting plate the diameter of which is less than the inner diameter of the barrel being located inside the barrel above the apertured plate,

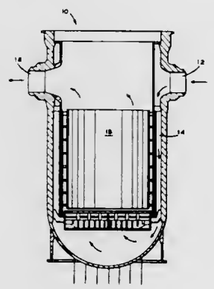
the improvement wherein, for suspending the transverse deflection plate from the barrel, substantially vertical elastically yieldable strips are evenly spaced apart on the periphery of the barrel and welded to the barrel by an upper end of the strips and welded to an edge of the deflection plate by a lower end of the strips, openings being provided in the barrel in regions of the respective strips, said openings having a shape corresponding to the shape of the strips but with a slightly smaller size to allow movement of the strips outwards into the openings and of the deflection plate radially of said vertical axis, the deflection plate being integral with some of the tubes which receive control rods and are disposed in a single row coaxial with the barrel, the tubes thus ensuring the support of the deflection plate.

4,786,465

METHOD FOR CONVERTING A DOWNWARD FLOW OF BYPASS COOLANT TO AN UPWARD FLOW

Matthew W. Ales, Amherst, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 19, 1987, Ser. No. 110,164
Int. Cl.[4] G21C *15/00*
U.S. Cl. 376—400 **12 Claims**



1. A method of converting a vertically downward flow of bypass coolant through a core barrel and former plates in a nuclear reactor to a vertically upward flow, comprising:

a. providing coolant flow holes in the top former plate substantially in coaxial alignment with existing coolant flow holes in the intermediate and lower former plates;

b. plugging coolant flow holes in said core barrel adjacent said top former plate; and

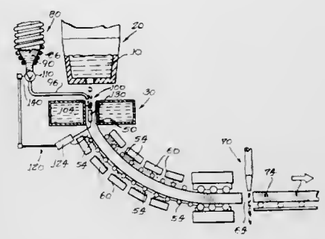
c. plugging selected coolant flow holes in the lower former plate.

4,786,466

LOW-SULFUR, LEAD-FREE FREE MACHINING STEEL ALLOY

Michael O. Holowaty, Crown Point, Ind., assignor to Frema, Inc., Crown Point, Ind.

Filed Feb. 19, 1987, Ser. No. 16,624
Int. Cl.[4] C22C *38/60*
U.S. Cl. 420—84 **13 Claims**



1. A low-sulfur, free-machining steel substantially free of lead and consisting essentially of, in percent by weight

Sulfur : 0.02–0.06
Copper : 0.05–0.40
Bismuth : 0.002–0.15
Nickel : less than about 0.08
Chromium : less than about 0.08
Tin : 0.002–0.05

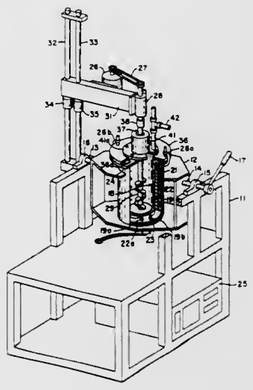
and the balance consisting essentially of iron, and in which the combined concentration of copper, nickel, chromium and tin exceeds the concentration of bismuth.

4,786,467

PROCESS FOR PREPARATION OF COMPOSITE MATERIALS CONTAINING NONMETALLIC PARTICLES IN A METALLIC MATRIX, AND COMPOSITE MATERIALS MADE THEREBY

Michael D. Skibo, Luecadia, and David M. Schuster, La Jolla, both of Calif., assignors to Dural Aluminum Composites Corp., San Diego, Calif.

Filed May 1, 1986, Ser. No. 856,338
Int. Cl.[4] C22C *1/10*
U.S. Cl. 420—129 **25 Claims**



1. A method for preparing a composite of a metallic alloy reinforced with particles of a nonmetallic refractory material, comprising:

melting the metallic material;

adding particles of the nonmetallic material to the molten metal;

mixing together the molten metal and the particles of the nonmetallic material to wet the molten metal to the particles, under conditions that the particles are distributed throughout the volume of the melt and the particles and the metallic melt are sheared past each other to promote wetting of the particles by the melt, said mixing to occur while minimizing the introduction of any gas into, and while minimizing the retention of any gas within, the mixture of particles and molten metal, and at a temperature whereat the particles do not substantially chemically degrade in the molten metal in the time required to complete said step of mixing; and

casting the resulting mixture at a casting temperature sufficiently high that substantially no solid metal is present.

4,786,468

CORROSION RESISTANT TANTALUM AND TUNGSTEN ALLOYS

Rong Wang, Bellevue, and Martin D. Merz, Richland, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Jun. 4, 1987, Ser. No. 60,759
Int. Cl.[4] B32B *15/00*
U.S. Cl. 420—427 **7 Claims**

1. A corrosion resistant alloy consisting essentially of tantalum or tungsten in the range of 60 to 90 atomic percent, balance iron, chromium, and nickel, said iron, chromium, and nickel being present in the relative proportions present in a stainless steel.

4,786,469

GRAIN REFINING METALS

Gerhard Weber, and Winfried Reif, both of Berlin, Fed. Rep. of Germany, assignors to London & Scandinavian Metallurgical Co Limited, London, England

Filed Aug. 11, 1986, Ser. No. 895,502
Claims priority, application United Kingdom, Aug. 23, 1985, 8521134
The portion of the term of this patent subsequent to Nov. 22, 2004, has been disclaimed.
Int. Cl.[4] C22B *15/14*; C22C *9/00*
U.S. Cl. 420—469 **30 Claims**



1. A method of grain refining a copper-based metal, the method comprising preparing a melt of a grain refinable copper-based metal to be grain refined which is deficient in at least one of the following components (a) to (d), said components (a) to (d) consisting essentially of:

(a) zirconium;

(b) at least one substance selected from the group consisting of lithium, sodium, potassium, beryllium, magnesium, calcium, strontium and barium;

(c) at least one substance selected from the group consisting of scandium yttrium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, manganese, technetium, rhenium, iron, ruthenium, osmium, cobalt, rho-

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dium, iridium, nickel, palladium, platinum, silver, gold, zinc, cadmium, mercury and the rare earth elements; and

(d) at least one substance selected from the group consisting of aluminium, gallium, indium, silicon, germanium, tin, lead, phosphorus, arsenic, antimony, bismuth, sulphur, selenium, and tellurium;

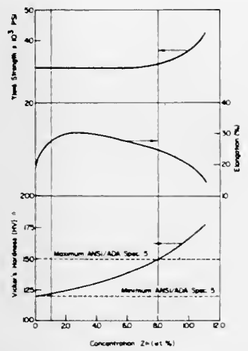
introducing said deficient component of components (a) to (d) into said melt of grain-refinable copper-based metal by means of at least one grain-refining additive which consists essentially of at least one of said components (a) to (d) including said deficient component or components, and thereafter solidifying said melt of grain-refinable copper-based metal which now contains each of said components (a) to (d) to produce grain refined copper-based metal.

4,786,470

ALUMINUM-BRONZE DENTAL ALLOY

Giulio Benetti, Suisun, and Vincent M. Benetti, Benecia, both of Calif., assignors to Aalba Dent, Inc., Concord, Calif.

Filed Jun. 19, 1987, Ser. No. 63,836
Int. Cl.⁴ C22C *9/01*
U.S. Cl. 420—479 **2 Claims**



1. A dental alloy consisting essentially of 7.0 to 9.0% aluminum, 3.0 to 5.5% nickel, up to 5.0% iron, up to 2.5% manganese, 1.8 to 5.75% zinc, and the balance copper.

4,786,471

HETEROGENEOUS IMMUNOASSAY METHOD AND ASSEMBLY

Linda L. Jones, Los Angeles, and Edward T. Maggio, San Diego, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 21, 1983, Ser. No. 544,177
Int. Cl.⁴ B65D *69/00;* **B01L** *3/00*
U.S. Cl. 422—61 **23 Claims**

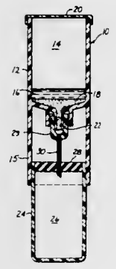
1. A hand-held assembly for the detection and determination of at least one ligand in a sample suspected of containing such ligand, the assembly comprising:

a vessel having a first chamber for receiving a sample suspected of containing the ligand, which first chamber includes an admixture of a binding partner for such ligand and a labeled component selected from the group consisting of binding partner, compound which can bind to the binding partner, compound which can bind to the reaction product of the ligand and binding partner, and compound which can bind to the ligand;

a second vessel having a second chamber separated from the first chamber by a separation means for permitting the passage therethrough of free labeled component of a relatively small size while preventing the passage therethrough of a complex formed from ligand, binding partner and labeled component of a relatively larger size than the free labeled component, when a pressure differential is created across such separation means;

means for creating a pressure differential across the separation means to separate the free labeled component from the complex and collect the free labeled component in the second chamber; and

label detecting reagents in the second chamber.

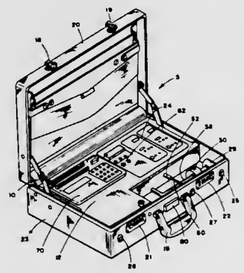


4,786,472

AIR SAMPLING DEVICE

Bain C. McCoanell; Guy B. Oldaker, III, and Richard F. Walsh, all of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 21, 1986, Ser. No. 899,186
Int. Cl.⁴ G01N *7/02, 31/00*
U.S. Cl. 422—61 **18 Claims**



1. An environmental air sampling device which includes (a) a portable outer container having air inlet means; (b) calibrated air flow pumping means connected to the air inlet means; (c) at least one chemical collection means for quantitative determination of predetermined chemicals; (d) means for sampling predetermined particulate matter; (e) means for determining relative conditions of environment including a temperature sensing means for determining environmental temperature and a means for sensing barometric pressure; (f) data storage means including means for recording time periods over which air is sampled and means for recording relative conditions of environment; and (g) power source for operation of components including the pumping means and data storage means;

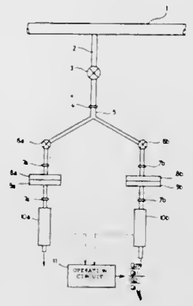
wherein components (b) through (g) are contained within the outer container and the air sampling device is adapted to be employed with the outer container in closed form.

4,786,473

APPARATUS FOR MEASURING IMPURITIES IN PURE WATER

Yasukazu Mukogawa; Katsuhikoa Tamura, and Takaaki Fukumoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 911,353
Claims priority, application Japan, Sep. 24, 1985, 60-211573
Int. Cl.⁴ G01N *33/18*
U.S. Cl. 422—68 **6 Claims**



1. An apparatus for measuring the concentration level of solid impurities in water of at least a predetermined minimum size, comprising

a sampling pipe for guiding water whose concentration level of impurities is to be measured,

branch means for dividing water flowing through said sampling pipe into first pipe means and second pipe means, said branch means being operatively connected to said sampling pipe and said first pipe means and said second pipe means,

a first filter means of a predetermined pore size for filtering water flowing through said first pipe means and operatively connected thereto,

first flow rate detecting means for detecting the flow rate of water filtered through said first filter means, said first detection means operatively connected to said first pipe means at a point near said first filter means,

a second filter means for filtering water flowing through said second pipe means and operatively connected thereto, said second filter means having a smaller pore size than said first filter means;

second flow rate detecting means for detecting the flow rate of water filtered through said second filter means, said second detecting means being operatively connected to said pipe means at a point near said second filter means; and

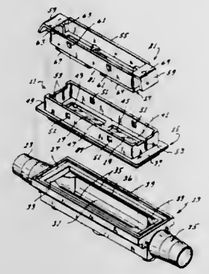
operation means for successively calculating the relative ratio of the time dependent change in the flow rate of water detected by said first flow rate detecting means to the time dependent change in the flow rate of water detected by said second flow rate detecting means, whereby the concentration level of solid impurities which will not pass through said second filter means can be measured.

4,786,474

FLOW-THROUGH HOUSING

Robert P. Cooper, Yorba Linda, Calif., assignor to Cardiovascular Devices, Inc., Irvine, Calif.

Division of Ser. No. 546,493, Oct. 28, 1983, Pat. No. 4,640,820.
This application Jul. 7, 1986, Ser. No. 883,094
The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.
Int. Cl.⁴ G01N *21/05, 33/48*
U.S. Cl. 422—68 **12 Claims**



1. A membrane support apparatus with sensors comprising:

a housing having a flow passage for flow of liquid therethrough and means defining an opening leading to said flow passage;

a tensionable membrane permeable to a constituent of interest and impermeable to another constituent;

means for mounting the membrane on the housing with the membrane extending over the opening;

a sensor support, a section of the sensor support being extendible through the opening;

an optical sensor for sensing a characteristic of a first component of a liquid;

said optical sensor being carried by said section of the sensor support;

means for transmitting an optical signal form the optical sensor; and

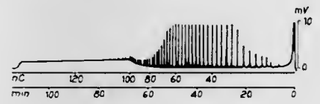
means for mounting the sensor support on the housing with said section of the sensor support extending through the opening and with at least one of said section of the sensor support and said sensor engaging and tensioning the membrane.

4,786,475

EQUIPMENT FOR THE SIMULATED DISTILLATION BY MEANS OF GAS CHROMATOGRAPHY WITH NON VAPORIZING DIRECT INJECTION

Sorin Trestianu, Brussels, Belgium; Fausto Munari, and Carlo Saravalle, both of Milan, Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Division of Ser. No. 810,927, Dec. 19, 1985. This application Dec. 11, 1987, Ser. No. 131,810
Claims priority, application Italy, Dec. 28, 1984, 24278 A/84
Int. Cl.⁴ G01N *30/02, 21/00*
U.S. Cl. 422—89 **6 Claims**



1. A chromatographic analysis apparatus for developing a simulated distillation curve for high-boiling-point and high-molecular-weight petroleum product samples comprising:

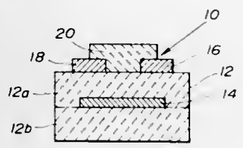
VOL 1096 ISS 4 NO 22 1988 UMI

(a) a capillary column having an inner diameter ranging between 0.2 and 0.6 mm and a length ranging between 1 and 10 m and including a first end and a second end;
(b) a nonvaporizing direct cold on-column injector associated with said first end of said capillary column for injecting said petroleum sample into said column and including temperature control means for preventing vaporization of said sample at said first end of said capillary column during said injecting of said petroleum sample;
(c) a thin-layer stationary phase in said column in a thickness lower than or equal to 0.2 μm;
(d) an oven wherein said column is housed, said oven being programmable to reach temperatures over 400° C., with a programmable rate of increase equal to at least 5° C. per minute; and
(e) a flame ionization detector associated with said second end of said capillary column.

4,786,476
GAS SENSOR ELEMENT USING POROUSLY FIRED MASS OF TITANIA

Fumio Munakata; Masayuki Touda, both of Yokosuka; Masaaki Uchida, Yokohama, and Fumio Yukawa, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 16, 1986, Ser. No. 886,080
Claims priority, application Japan, Jul. 17, 1985, 60-155889; Aug. 23, 1985, 60-184078
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 422—98 **17 Claims**



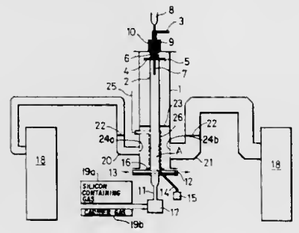
1. A gas sensor element comprising:
a ceramic substrate; and
a mixture of titanium dioxide and a sintering suppressing agent laminated on said ceramic substrate, said agent comprising at least one additional metal oxide selected from the group consisting of Er_2O_3 and Sm_2O_3.

4,786,477
FLUIDIZED BED REACTOR WITH MICROWAVE HEATING SYSTEM FOR PREPARING HIGH-PURITY POLYCRYSTALLINE SILICON

Poong Yoon, Seoul, and Yongmok Song, Chungnam, both of Rep. of Korea, assignors to Korea Research Institute of Chemical Technology, Chungnam, Rep. of Korea

Division of Ser. No. 925,775, Oct. 30, 1986. This application Jan. 30, 1987, Ser. No. 8,899
Claims priority, application Rep. of Korea, Dec. 28, 1985, 9938/1985
Int. Cl.⁴ B01J *8/42*
U.S. Cl. 422—145 **9 Claims**

1. An apparatus for the preparation of high-purity polycrystalline silicon, comprising applicator means, an elongated reactor means installed within said applicator means with the longitudinal axis of the reactor means being vertically disposed, said reactor means having an upper portion a microwave shield disposed between said upper and lower portions of said reactor means, and a lower portion, feeding means at the upper portion of said reactor means for introducing silicon seed into said reactor means, gas inlet means connected to the lower portion of said reactor means for introducing a silicon-reacting gas into said reactor means, gas outlet means in the upper portion of said reactor means a joint-seal means between said gas outlet means and said applicator means, said joint-seal means comprising a spring means and a gasket which is biased by said spring means, gas distributor means at the lower portion of said reactor means connected to said gas inlet means and distributing said gas into said reactor means so as to form a fluidized bed of said silicon particles in the lower portion of said reactor means above said gas distributor means as the gas flows through the reactor to said gas outlet means, a microwave generator, at least two microwave guide tubes connecting said microwave generator to said applicator means at a position opposite said lower portion of said reactor means to thereby

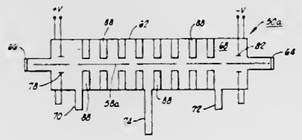


introduce microwave energy on opposite sides of said reactor means to thereby introduce microwaves into opposite sides said reactor means to said lower portion of said reactor means to effect disposition of silicon from the silicon reacting gas into said silicon seed in the fluidized bed to thereby form high-purity polycrystalline particles gas cut-off membrane means in said microwave guide tubes, and cooling means for cooling said gas distributing means to maintain said gas distribution means at a temperature to prevent substantial deposition of silicon on said gas distribution means.

4,786,478
METHOD AND APPARATUS FOR ISOTOPE SEPARATION

Samir Ahmed, New York City, N.Y., and John Gergely, Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 634,773, Jul. 26, 1984, abandoned. This application Nov. 21, 1986, Ser. No. 935,073
Int. Cl.⁴ B01J *19/12*; B01D *59/34*; H01J *27/00*
U.S. Cl. 422—186.03 **9 Claims**

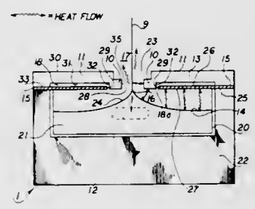


1. Apparatus for separating of a selected isotope from a uranium substance, comprising:
an evacuated envelope defining an interaction volume extending along an interaction axis between first and second light transmissive window elements, and including a feed inlet for input of uranium substance at a point mid-way along said axis;
a plurality of disc aperture members formed from sputtering-resistant material disposed in equal spacing along the interior of said evacuated envelope and defining the interaction axis through the apertures thereby to reduce wall losses and increase efficiency;
inert buffer gas contained in said interaction volume;
a light source of wavelength to excite a selected isotope to a predetermined increased energy level, said light source being focused to direct a light beam through said first window element in alignment with said interaction volume axis to said second window element;
reflector means for reflecting reverberation of said light beam between said first and second window elements;
oven means maintaining said interaction volume at a controlled elevated temperature;
magnet means providing a magnetic field that is concentrated in alignment along the interaction axis;
electrical means for producing an electrical energy differential along said interaction axis to effect gas discharge collisions of said selected isotopes at increased energy levels thereby to produce ionized selected isotopes; and
means for collecting said ionized selected isotopes.

4,786,479
APPARATUS FOR DENDRITIC WEB GROWTH SYSTEMS

Rolv Hundal, Greensburg; Raymond G. Seidensticker, Forest Hills, and James P. McHugh, Wilkins Township, Allegheny County, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 2, 1987, Ser. No. 92,791
Int. Cl.⁴ C30B *35/00, 29/60, 29/06, 15/34*
U.S. Cl. 422—248 **17 Claims**

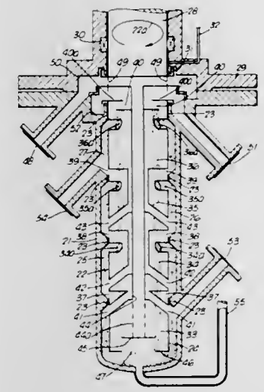


1. An apparatus for growing dendritic web crystals comprising:
a. a susceptor;
b. a crucible for melting silicon, said crucible nesting within said susceptor;
c. a sublid positioned above said susceptor and crucible, said sublid having upper and lower horizontal surfaces, said sublid further having a slot through which a dendritic web crystal may be pulled, said slot defining at least one inner surface in said sublid;
d. a susceptor lid having an upper horizontal surface and a lower horizontal surface, said susceptor lid further having a slot through which a dendritic web crystal may be pulled, said susceptor lid further having a lip disposed downwardly from said susceptor lid lower horizontal surface, said lip extending continuously and peripherally around said susceptor lid slot and having an outer surface facing the inner surface of said sublid, said susceptor lid lower horizontal surface facing said sublid upper horizontal surface;
e. said susceptor lid being positioned above said sublid such that the lip of said susceptor lid fits substantially concentrically within said sublid slot, and providing insulating space between the upper horizontal surface of said sublid and the lower horizontal surface of said susceptor lid and between the outer surface of said susceptor lid lip and the inner surface of said sublid.

4,786,480
TWO-PART FLUID CONTACTOR

Peter D. Martin, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 25, 1986, Ser. No. 899,633
Claims priority, application United Kingdom, Aug. 30, 1985, 8521629
Int. Cl.⁴ B04B *1/06*
U.S. Cl. 422—259 **4 Claims**



1. A centrifugal contactor comprising: a stator; a rotor mounted for rotation within the stator; means for rotating the rotor within the stator; a plurality of annular mixing regions positioned sequentially along the axis of rotation of the rotor, each of said annular mixing regions being located between the rotor and stator; a plurality of annular centrifugal settling compartments carried by the rotor for rotation therewith and disposed sequentially along the axis of rotation of said rotor; said annular mixing regions and said annular centrifugal settling compartments together forming a plurality of centrifugal contactor stages disposed sequentially along the axis of rotation of said rotor, means for introducing a first liquid into an annular mixing region of said centrifugal contactor; means for introducing a second liquid into an annular mixing region of said centrifugal contactor; means carried by said rotor for rotation therewith for transferring mixed liquid from an annular mixing region to an associated centrifugal settling compartment in each respective stage; means carried by said rotor for rotation therewith for transferring a first liquid from a centrifugal settling compartment of a stage to a mixing region of an adjacent stage; means carried by said rotor for rotation therewith for transferring a second liquid from a centrifugal settling compartment of a stage to a mixing region of an adjacent stage; whereby, in operation, first and second liquids introduced into said centrifugal contactor flow sequentially through said stages, are admixed in each of said mixing regions, and are separated in each of said centrifugal settling compartments; outlet means for withdrawing the first liquid from a centrifugal settling compartment after it passes sequentially through said stages; outlet means for withdrawing the second liquid from a centrifugal settling compartment after it passes sequentially through said stages; said rotor, said annular centrifugal settling compartments carried by said rotor, and said transferring means carried by said rotor being constructed such that they are removable as a unit from said stator.

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4,786,481

METHOD FOR ELUTING A METAL ADSORBED ON A CHELATING AGENT

Yushin Kataoka; Masaaki Matsuda, and Masahiro Aoi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 759,104
Claims priority, application Japan, Aug. 3, 1984, 59-164021
Int. Cl.[4] C01G *43/00, 7/00, 15/00, 17/00, 55/00*
U.S. Cl. 423—7 4 Claims

1. In a method for eluting a metal selected from the group consisting of gallium, palladium, germanium, uranium, gold and platinum adsorbed on a chelate resin having at least one functional group selected from the group consisting of =NOH, $-P(OR)_2$, $-P(OR)_2$, $-PH(OR)_3$, $-N(R)_2$ and $-NR^+{}_3$, wherein R may be the same or different and represents hydrogen, phenyl, alkyl or alkenyl, with an eluant, the improvement comprising using as the eluant an aqueous solution containing:

(a) a water soluble inorganic sulfide selected from the group consisting of hydrogen sulfide, alkali metal sulfide, alkaline earth metal sulfide, ammonium sulfide, alkali metal hydrogensulfide and ammonium hydrogen-sulfide at concentrations of 0.005 to 3N, and

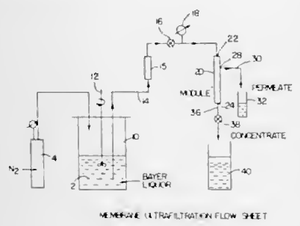
(b) a basic compound selected from the group consisting of an inorganic alkali compound and a water soluble organic amine at concentrations of 0.1N or more.

4,786,482

BAYER PROCESS FOR PRODUCING ALUMINUM HYDROXIDE HAVING IMPROVED WHITENESS

Paul J. The, Murrysville, and Chanakya Misra, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 825,259, Feb. 3, 1986, Pat. No. 4,676,959, which is a continuation-in-part of Ser. No. 816,242, Jan. 6, 1986, Pat. No. 4,678,477. This application Jun. 19, 1987, Ser. No. 64,814
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] B01D *13/00*
U.S. Cl. 423—130 8 Claims



MEMBRANE ULTRAFILTRATION FLOW SHEET

1. A process for producing an improved aluminum hydroxide product characterized by an improved level of whiteness, the process comprising the steps of:

(a) subjecting a caustic solution containing dissolved aluminum hydroxide to a purification step to remove dissolved impurities including color producing humate material therefrom, the purification comprising passing said caustic solution through a semi-permeable membrane substantially inert to a highly caustic solution and capable of separating said humate material from said solution: and

(b) treating the purified solution to precipitate aluminum hydroxide therefrom, the aluminum hydroxide having an improved level of whiteness.

4,786,483

PROCESS FOR REMOVING HYDROGEN SULFIDE AND MERCURY FROM GASES

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1987, Ser. No. 100,869
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—210 26 Claims

23. A process for removing hydrogen sulfide and mercury from a gas comprising flowing said gas through an aqueous solution of an alkali metal peroxomonosulfate compound capable of converting mercury to its oxide form and simultaneously converting hydrogen sulfide to elemental sulfur and recovering a gas substantially reduced in mercury and hydrogen sulfide content.

4,786,484

PROCESS FOR ABSORBING TOXIC GAS

Sidney G. Nelson, Hudson, Ohio, assignor to Sanitech, Inc., Twinsburg, Ohio

Division of Ser. No. 10,449, Feb. 3, 1987, Pat. No. 4,721,582, which is a continuation-in-part of Ser. No. 838,354, Mar. 11, 1986, abandoned. This application Oct. 7, 1987, Ser. No. 105,663
Int. Cl.[4] B01D *53/34*
U.S. Cl. 423—239 4 Claims

1. In a process for removing sulfur oxides, nitrogen oxides, and hydrogen halides from a gas contaminated with same in which the gas is contacted at a temperature below 250° C. with particulate solid acceptor comprising a mineral support having a coating containing divalent metal oxide, hydroxide, or both, the support being water-moistened particles selected from the group consisting of exfoliated vermiculite, expanded perlite, or a mixture thereof, the improvement which comprises:

heating the acceptor before its first use at a temperature of at least about 400° C. until it is conditioned for the accepting purpose;

dampening the conditioned acceptor with water;

contacting contaminated gas with the acceptor; and

separating resulting cleansed gas from the acceptor.

4,786,485

LIGNOSULFONATE-MODIFIED CALCIUM HYDROXIDE FOR SO_2 CONTROL DURING FURNACE INJECTION

David A. Kirchgessner, Chapel Hill, and Jeffrey M. Lorrain, Raleigh, both of N.C., assignors to The United States of America as represented by the United States Environmental Protection Agency, Washington, D.C.

Filed Nov. 12, 1986, Ser. No. 930,689
Int. Cl.[4] B01J *8/00;* C01B *17/00;* C09K *3/00*
U.S. Cl. 423—244 5 Claims

1. A method for removing sulfur oxide sulfur oxide-containing gases from exhaust gases of a fossil fuel-fired combustor comprising the step of introducing into said exhaust gases solid particles capable of reacting with said sulfur oxide-containing gases, said particles comprising a surface-modified sorbent selected from the group consisting of alkali metal lignosulfonate-modified calcium hydroxide and alkali metal lignosulfonate-modified calcium magnesium hydroxide, wherein said alkali metal lignosulfonate comprises up to 5% by weight of the total dry weight of said surface-modified sorbent.

4,786,486

STABILIZED ZIRCONIA PARTICULATES

Jean-Claude Guelen, Clamecy; Jean-Francois Colombet, Rueil Malmaison; Claude Magnier, Paris; Jean-Philippe Browaeys, Paris, and Alain Vesco, Paris, all of France, assignors to Thann et Mulhouse, Thann, France

Filed Mar. 16, 1987, Ser. No. 26,185
Claims priority, application France, Mar. 14, 1986, 86 03654
Int. Cl.[4] C01G *25/00*
U.S. Cl. 423—275 18 Claims

1. A process for the production of zirconia particulates containing a stabilizing amount of yttrium or cerium, which comprises (i) admixing an aqueous suspension of zirconium fluosulfate particles having a pH of from about 0 to 3 with an aqueous solution of a salt of yttrium or cerium, (ii) neutralizing the resulting mixture at a pH of at least 7, (iii) separating a mixture of zirconium and yttrium or zirconium and cerium hydroxides from the medium of neutralization, (iv) washing said mixture of hydroxides to eliminate sulfate and fluoride ions therefrom, and then (v) calcining said mixture of hydroxides.

4,786,487

PREPARATION OF CRYSTALLINE SILICOALUMINOPHOSPHATES

Guenter H. Kuehl, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 816,090, Jan. 3, 1986, abandoned. This application Feb. 3, 1988, Ser. No. 151,737
Int. Cl.[4] C01B *33/28;* B01J *27/14*
U.S. Cl. 423—306 3 Claims

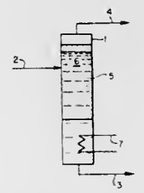
1. A process for preparing a microporous crystalline silicoaluminophosphate, the pores of which are uniform and have nominal diameters of greater than about 3 Angstroms, said process comprising forming an aqueous reaction mixture containing sufficient sources of SiO_2, Al_2O_3, P_2O_5 and an organic templating agent and crystallizing the reaction mixture thus formed at a temperature of at least 100° C. until crystal of silicoaluminophosphate are formed, wherein said reaction mixture further contains a source of fluoride ions in an amount sufficient to complex with silicate in the reaction mixture, whereby the release of silicate into the reaction mixture is controlled according to the mass action law.

4,786,488

PROCESS FOR THE PURIFICATION OF HYDROCHLORIC ACIDS

Gerhard Sticken, Dorsten, Fed. Rep. of Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 466,484, Feb. 15, 1983, abandoned. This application Mar. 12, 1985, Ser. No. 710,673
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207887
Int. Cl.[4] C01B *7/07*
U.S. Cl. 423—488 10 Claims



1. A process for the purification of hydrochloric acid which is contaminated by chlorinated hydrocarbons containing a single carbon atom by stripping with HCl gas, characterized in that the stripping is conducted in a column operating as a bubble column; the column being flooded with the hydrochloric acid and the HCl gas for stripping the chlorinated hydrocarbons being generated by heating the hydrochloric acid to a boiling temperature in the sump of the column, said HCl stripping gas passing upwardly through the bubble column before exiting as overhead together with the chlorinated hydrocarbons.

4,786,489

OZONE-PRODUCING PROCESS

Maurice Grenier, Paris, and Pierre Petit, Chatenay Malabry, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

PCT No. PCT/FR86/00126, § 371 Date Dec. 19, 1986, § 102(e) Date Dec. 19, 1986, PCT Pub. No. WO86/06056, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 15, 1986, Ser. No. 940,812
Claims priority, application France, Apr. 16, 1985, 85 05699
Int. Cl.[4] C01B *13/10*
U.S. Cl. 423—581 12 Claims

1. A process for producing ozone, comprising:

providing first, second and third adsorbent-containing zones each having a first end and a second end and defining a co-current flow direction from said first end to said second end and a counter-current flow direction from said second end to said first end;

partly ozonizing an oxygen stream in an ozonizer to form an ozone-containing effluent;

co-currently circulating a major fraction of said ozone-containing effluent from said ozonizer through said first zone, whereby the ozone present in said effluent is trapped by adsorption;

counter-currently circulating a carrier gas stream through said second zone, whereby ozone previously trapped therein is desorbed;

co-currently circulating a minor fraction of said effluent through said third zone, whereby carrier gas present in said third zone is scavenged from said third zone thereby forming a third-zone effluent; and

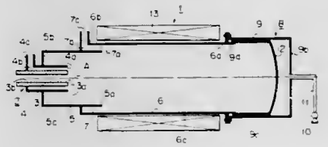
adding said third-zone effluent to said carrier gas stream which enters said second zone.

4,786,490

PROCESS AND APPARATUS FOR PRODUCING HIGH PURITY MAGNESIUM OXIDE FINE PARTICLES

Kozaburo Yoshida; Akio Nishida, and Toru Adachi, all of Ube, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Oct. 22, 1986, Ser. No. 921,489
Claims priority, application Japan, Oct. 29, 1985, 60-243612
Int. Cl.[4] C01B *33/18*
U.S. Cl. 423—636 17 Claims



1. A process for producing high purity magnesium oxide fine particles, comprising the steps of:

introducing a flow of a magnesium vapor-containing gas into a mixing region through a magnesium vapor-containing gas-feeding nozzle;

introducing a flow of an inert gas into said mixing region through an inert gas-feeding nozzle to provide a flow of a mixture gas consisting of said magnesium vapor-containing gas and said inert gas;

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introducing said flow of said mixture gas from said mixing region into an oxidizing region;

flowing a molecular oxygen-containing gas concurrently with said flow of said mixture gas into said oxidizing region through a molecular oxygen-containing gas-feeding nozzle, to provide a flow of a reaction mixture in which molecular oxygen comes into contact with and oxidizes said magnesium vapor into high purity magnesium oxide fine particles in said oxidizing region;

introducing said flow of said reaction mixture containing said resultant magnesium oxide fine particles into a magnesium oxide particle-collecting region; and

collecting said magnesium oxide particles from said reaction mixture in said collecting region.

15. An apparatus for producing high purity magnesium oxide fine particles, comprising:

(A) a nozzle for feeding a magnesium vapor-containing gas, having a front open end thereof and a rear end thereof connected to a supply source of said magnesium vapor-containing gas;

(B) a nozzle for feeding an inert gas, having a front open end thereof and a rear end thereof connected to a supply source of said inert gas;

(C) a mixing tube for mixing said magnesium vapor-containing gas with said inert gas therein, having a front open end thereof and a rear end thereof, into which rear end front open ends of said magnesium vapor-containing gas-feeding nozzle and said inert gas feeding nozzle are inserted, and extending over said front open ends of said magnesium vapor-containing gas-feeding nozzle and said inert gas-feeding nozzle in a concentric circular relationship to said magnesium vapor-containing gas-feeding nozzle;

(D) an oxidizing tube for oxidizing said magnesium vapor therein, having a front open end and a rear end thereof, into which rear end said front open end of the mixing tube is inserted, and extending over said front open end of said mixing tube in a concentric circular relationship to said mixing tube;

(E) a nozzle for feeding a molecular oxygen-containing gas, formed between said inserted front end portion of said mixing tube and said rear end portion of said oxidizing tube and having a front open end thereof opening to said oxidizing tube and a rear end thereof connected to a supply source of said molecular oxygen-containing gas; and

(F) means for collecting said resultant magnesium oxide particles, connected to said front open end of said oxidizing tube.

4,786,491

SWEET EMULSION FOR CHEWING GUM

Mansukh M. Patel, Downers Grove, Ill., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Aug. 5, 1987, Ser. No. 81,907

Int. Cl.[4] A61K *9/68;* **A23G** *3/30;* **A23L** *1/28*

U.S. Cl. 424—48 **34 Claims**

1. A method of adding thaumatin to chewing gum ingredients, said method comprising:

(a) forming an emulsion comprising about 0.008 to about 16 percent by weight thaumatin, about 6 to about 65 percent by weight water, about 0.2 to about 10 percent by weight emulsifier, and about 19 to about 85 percent by weight of a hydrophobic ingredient; and

(b) admixing said emulsion with said chewing gum ingredients.

4,786,492

METHOD AND COMPOSITION FOR PREVENTION AND TREATMENT OF ORAL DISEASE

Perry A. Ratcliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Continuation of Ser. No. 17,241, Dec. 29, 1986, Pat. No. 4,696,811. This application Jul. 22, 1987, Ser. No. 76,379

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] A61K *7/20, 33/20*

U.S. Cl. 424—53 **4 Claims**

1. A method for reducing dental plaque, said method comprising the step of retarding degradation of sucrose into glucose or fructose by killing and by reducing the number of streptococcus mutans to a more than 90% level through topical application within the oral cavity for a period of ten seconds of a solution containing stabilized chlorine dioxide in a concentration in the range of 0.005% to 0.2%.

4,786,493

HAIR PROTECTION COMPOSITION

Walter P. Smith, Head-Of-The-Harbor, and Frederick J. Penna, Ronkonkoma, both of N.Y., assignors to Estee Lauder Inc., New York, N.Y.

Filed Nov. 22, 1985, Ser. No. 800,999

Int. Cl.[4] A61K *7/06, 7/42, 7/44, 9/12*

U.S. Cl. 424—59 **20 Claims**

1. A composition for protecting hair from damage caused by exposure to ultraviolet light, said composition comprising:

(a) an effective amount of first component selected from the group consisting of a material having superoxide dismutase activity, ascorbic acid, Cytochrome C, mixtures of nicotinamide dehydrogenase and lactate dehydrogenase, uric acid, uric acid salts, and mixtures therof;

(b) an effective amount of a second component selected from the group consisting of mannitol, catalase, and mixtures thereof,

(c) an effective amount of a third component selected from the group consisting of a disulfide, a thiol, and mixtures thereof, said disulfide and said thiol each having a molecular weight of at least about 100; and

(d) a cosmetically acceptable carrier.

4,786,494

SHAMPOO COMPOSITION

Hajime Hirota, Tokyo, and Susumu Takaya, Funabashi, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jan. 3, 1986, Ser. No. 815,982

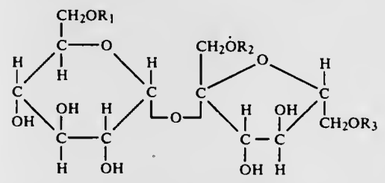
Claims priority, application Japan, Jan. 25, 1985, 60-12248

Int. Cl.[4] A61K *7/06;* **C08B** *37/08, 59/44*

U.S. Cl. 424—70 **9 Claims**

1. A shampoo composition comprising

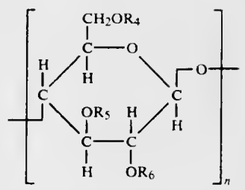
(A) 0.1 to 10 percent by weight of a mixture of mono-, di- and tri-acylated fatty acid esters of sucrose having the formula (1)



(1)

in which R_1, R_2 and R_3 represent hydrogen or a straight-chain or branched, saturated or unsaturated acyl group having 8 to 24 carbon atoms and the weight ratio of mono-acylated esters to the sum of di- and tri-acylated esters is 70/30 to 30/70,

(B) 0.05 to 5 percent by weight of a nonionic cellulose ether compound having the formula (2)



(2)

in which R_4, R_5 and R_6 is a hydrogen atom, $(CH_2CH_2O)_mH$ in which m is 1 to 5, $-CH_3$ or $-C_3H_6OH$, and n is 100 to 10,000,

(C) 5 to 30 percent by weight of a shampoo base comprising one or more members selected from the group consisting of anionic surfactants, cationic surfactants, nonionic surfactants and amphoteric surfactants, and

(D) water.

4,786,495

THERAPEUTIC AGENTS

Graham Bird, and Alan Smith, both of Nottingham, England, assignors to The Boots Company PLC, United Kingdom

Filed Oct. 2, 1986, Ser. No. 914,264

Claims priority, application United Kingdom, Oct. 3, 1985, 85/24421

Int. Cl.[4] A61K *31/19, 31/78*

U.S. Cl. 424—81 **31 Claims**

1. A method of treating inflammation in humans and animals which comprises orally administering to a human or animal in need thereof an anti-inflammatory effective amount of 2-(2-fluoro-4-biphenylyl)propionic acid or a pharmaceutically acceptable salt thereof and an amount of excipient sufficient to produce a rapid release of the active agent into the human or animal, said excipient being one suitable for formulating solid orally administerable pharmaceutical compositions and further being a fatty acid ester which comprises one or more polyol esters and glycerides of natural vegetable oil fatty acids, said excipient having a melting point in the range of 30°–50° C. and an HLB value of at least 10.

4,786,496

IMMUNOPOTENTIATING AGENT HAVING ANTI-TUMOR ACTIVITY

Souichirou Watanabe, Tokyo, and Tadasu Fujita, Kanagawa, both of Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Feb. 18, 1986, Ser. No. 830,544

Claims priority, application Japan, Feb. 27, 1985, 60-40215

Int. Cl.[4] A61K *35/80, 31/195*

U.S. Cl. 424—195.1 **7 Claims**

1. An immunopotentiating agent having anti-tumor activity, said agent containing as the active ingredient, the lipid fraction or the glycolipid fraction of a marine Chlorella selected from the group consisting of *Chlorella minutissima, Chlorella vulgaris* or mixtures thereof.

4,786,497

PROCESS FOR PRODUCING STORABLE CAMOMILE EXTRACTS RICH IN ACTIVE SUBSTANCES

Otto Isaac, Hanau, and Reinhold Carle, Rodermark, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 776,632, Sep. 12, 1985, abandoned. This application Sep. 8, 1987, Ser. No. 96,211

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434342

Int. Cl.[4] A61K *35/78, 31/31, 31/045*

U.S. Cl. 424—195.1 **19 Claims**

1. A process for producing a storable camomile extract rich in active substances including a bisabloid consisting essentially of extracting fresh camomile flowers or frozen camomile flowers with an aqueous or anhydrous C_1–C_4 alkanol having an alkanol content of 40 to 100% and with the absence of subsequent heat treatment, the amount of alkanol being such that the amount of camomile extract produced is at least 4 parts for each part of camomile flowers used, based on the dried weight of the camomile flowers.

4,786,498

PROCESS FOR THE PRODUCTION OF CAMOMILE EXTRACTS RICH IN FLAVONES

Otto Isaac, Hanau; Reinhold Carle, Rödermark, and Bernd Dölle, Langen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengeselischaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 862,178, May 12, 1986, abandoned, which is a continuation of Ser. No. 709,085, Mar. 7, 1985, abandoned. This application Feb. 2, 1988, Ser. No. 153,481

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409619

Int. Cl.[4] A61K *35/78*

U.S. Cl. 424—195.1 **4 Claims**

1. A process of improving the efficiency of extracting camomile and producing a camomile extract rich in flavones comprising extracting a mixture of dried camomile flowering heads and additional camomile wing petals wherein the weight of added camomile wing petals on a dry basis to the camomile flowering heads is 1:9 to 1:2.3 parts by weight with a solvent which is an aliphatic alcohol or solketal or a mixture of such a solvent and water, said extract containing at least 80 mg% of volatile oil.

4,786,499

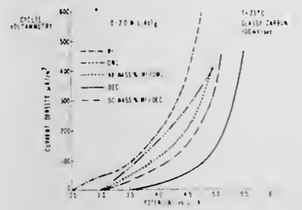
LITHIUM ELECTROCHEMICAL CELL INCLUDING APROTIC SOLVENT-DIALKYL CARBONATE SOLVENT MIXTURE

Steven M. Slane, Neptune; Edward J. Plichta, Freehold; Mark Salomon, Fairhaven, and Michelle C. Uchiyama, Somerset, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1987, Ser. No. 125,642

Int. Cl.[4] H01M *6/14, 4/58*

U.S. Cl. 429—197 **2 Claims**



1. An electrochemical cell comprising lithium as the anode, non-stoichiometric V_6O_{13}, as the cathode, and a solution of lithium salt in a mixed organic solvent of methyl formate and diethylcarbonate as the electrolyte.

4,786,500

PROGRAMMABLE AGENT DELIVERY SYSTEM

Patrick S.-L. Wong, Hayward, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Jun. 26, 1986, Ser. No. 878,947

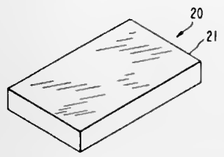
Int. Cl.[4] A61K *31/74;* **A01N** *25/26;* **A61J** *3/00*

U.S. Cl. 424—422 **1 Claim**

1. A delivery system for delivering a beneficial drug at a controlled rate to a biological environment, wherein the deliv-

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ery system is comprised of: (a) a reservoir comprising a first surface and a second surface, which reservoir is dimensioned for use and retention in a biological environment, the reservoir comprising a polymeric formulation that is pervious to the passage of drug; (b) a beneficial drug in the reservoir; (c) a first wall occluding the first surface of the reservoir, the first wall



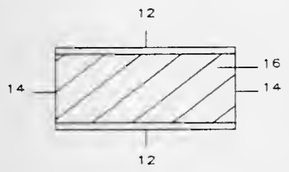
essentially-free of drug and impervious to the passage of drug; (d) a second wall occluding the second surface of the reservoir, the second wall comprising a polymeric formulation substantially impervious to the passage of an osmotically effective solute; and (e) an osmotically effective solute in the second wall.

4,786,501

CYLINDRICAL IMPLANTS FOR THE CONTROLLED RELEASE OF GROWTH HORMONES

Alvin M. Janski, and Ren-Der Yang, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jul. 15, 1985, Ser. No. 755,093
Int. Cl.[4] A61S *3/00*
U.S. Cl. 424—422 **7 Claims**



1. A cylindrical implant for the controlled and continuous administration of growth hormone to a host comprising a compressed composition of an animal growth hormone produced by expression of a gene coding for the hormone in a transformant microorganism, said growth hormone being recovered from said microorganism and processed to produce a growth hormone containing less than 5% salt, and a biocompatible and growth hormone compatible polymer, said composition being surrounded along the length of the cylinder by a microporous polymer film and sealed at its ends by a non-porous polymer film.

4,786,502

PALATABLE SOLID PHARMACEUTICAL COMPOSITIONS

Francis B. Chapura, Hamilton; Charles W. Bishop, Cincinnati; Kenneth Charak, Fairfield; Phillip F. Pflaumer, Hamilton, and David L. Suter, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 6, 1986, Ser. No. 916,062
Int. Cl.[4] A61K *33/08, 33/10*
U.S. Cl. 424—441 **16 Claims**

1. A molded pharmaceutical composition, comprising:

(a) from about 10% to about 50% of a lipid material having a melting point of from about 26° C. to about 37° C.;

(b) from about 10% to about 50% of a particulate dispersant material;

(c) from about 0.1% to about 3% of an emulsifier; and

(d) a safe and effective amount of a pharmaceutical active material;

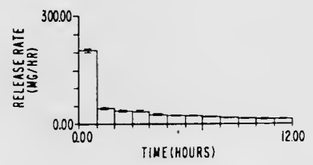
wherein the pharmaceutical materials in said composition have a mean particle size of from about 4 microns to about 10 microns, with less than about 10% of said particulates greater than about 30 microns in size, and wherein further the measured viscosity of said composition is less than about 10,000 cps at about 40° C.

4,786,503

DOSAGE FORM COMPRISING PARALLEL LAMINE

David E. Edgren, El Granada; Judy A. Magruder, Palo Alto, and Gurdish K. Bhatti, Fremont, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Apr. 6, 1987, Ser. No. 34,971
Int. Cl.[4] A61K *9/70, 9/24*
U.S. Cl. 424—443 **26 Claims**



1. A bilaminated system for delivering a beneficial drug to an environment of use, the bilaminated system comprising: 30 weight percent to 90 weight percent of a cellulose ether composition: said composition comprising a first lamina comprising up to 80 weight percent of a cellulose ether selected from the group of hydroxypropylmethylcellulose ethers comprising a degree of polymerization of about 50 to 1260, a viscosity of about 3 to 100,000 centipoises, and a number average molecular weight of 9,000 to 250,000, and a dosage amount of from 0.05 ng to 5 g of a beneficial drug; and, a second lamina in contacting arrangement with the first lamina, the second lamina comprising up to 50 weight percent of a different cellulose ether composition comprising a hydroxypropylcellulose comprising a hydroxyproxyl content of 7% to 16%.

4,786,504

COLORED INTAGLIATED ARTICLES

Sidney F. Forse, Macclesfield, and Raymond C. Rowe, Congleton, both of United Kingdom, assignors to Imperial Chemical Industries, plc, London, England

Division of Ser. No. 780,725, Sep. 27, 1985, Pat. No. 4,661,367, which is a continuation of Ser. No. 499,141, May 27, 1983, abandoned. This application Jun. 20, 1986, Ser. No. 876,408
Claims priority, application United Kingdom, Jun. 10, 1982, 8216816
Int. Cl.[4] A61K *9/44; B44F 1/08*
U.S. Cl. 424—467 **9 Claims**

1. A solid article comprising a pharmaceutical or veterinary unit dosage form which is uniformly coloured over its entire surface and which bears at least one highlighted intagliation on its surface, said article bearing a coating layer over its entire surface including the intagliation and consisting essentially of at least one optically anisotropic substance having a minimum refractive index not greater than 2.00, the colour of the non-intagliated surface of said article being essentially unchanged by said layer while the colour of the intagliation is highlighted against the rest of the surface by said layer, said layer wherein said layer is applied by a coating process that consists essentially of applying a suspension said dosage containing said anisotropic substance on said dosage form in such a way that a

rubbing action takes place between the dosage forms being coated containing no film coating agent.

4,786,505

PHARMACEUTICAL PREPARATION FOR ORAL USE

Kurt I. Lovgren, Mölnlycke; Ake G. Pilbrant, Kungsbacka, both of Sweden; Mitsuru Yasumura; Satoshi Morigaki, both of Hyogo, Japan; Minoru Oda, Ohita, Japan, and Naohiro Ohishi, Fukuoka, Japan, assignors to Aktiebolaget Hassle, Sweden

Filed Apr. 20, 1987, Ser. No. 40,491
Claims priority, application United Kingdom, Apr. 30, 1986, 8610572
Int. Cl.[4] A61K *9/22, 9/32*
U.S. Cl. 424—468 **14 Claims**

1. An oral pharmaceutical preparation comprising

(a) a core region comprising an effective amount of a material selected from the group consisting of omeprazole plus an alkaline reacting compound, an alkaline omeprazole salt plus an alkaline reacting compound and an alkaline omeprazole salt alone;

(b) an inert subcoating which is soluble or rapidly disintegrating in water disposed on said core region, said subcoating comprising one or more layers of materials selected from among tablet excipients and polymeric film-forming compounds; and

(c) an outer layer disposed on said subcoating comprising an enteric coating.

4,786,506

METHOD FOR THE PREPARATION OF GRANULATES SUITED FOR THE PRODUCTION OF SUSTAINED RELEASE COATED TABLETS FOR ORAL USE

Luciano Fontanelli, Pisa, Italy, assignor to Istituto Gentili S.p.A., Pisa, Italy

Filed Mar. 2, 1987, Ser. No. 20,450
Claims priority, application Italy, Mar. 11, 1986, 19693 A/86
Int. Cl.[4] A61K *9/26*
U.S. Cl. 424—470 **9 Claims**

1. A process for the preparation of tablets slowly releasing an active principle which consists essentially of preparing a mixture containing said active principle, a slightly swelling polymer and an excipient, then spraying onto said mixture in step (I) a solution in an organic solvent of a polymer insoluble in physiological fluids granulating said thus sprayed mixture to obtain a granulate; in step (II) adding to said granulate a hydroswelling colloidal polymer to obtain a granulate with increased swelling properties; in step (III) spraying a solution, in an organic solvent, of an entero-soluble polymer onto said granulate from step (II); in step (IV) compressing said granulate to obtain tablets; in step (V) hardening said tablets by washing with an organic solvent.

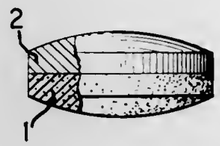
4,786,507

LONG SHELF LIFE TABLET CONTAINING HYDROLYSIS PRONE ACTIVE INGREDIENT

Michael Schmidt, Ingelheim am Rhein, Fed. Rep. of Germany, assignor to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 863,810, May 12, 1986, abandoned, which is a continuation of Ser. No. 693,821, Jan. 22, 1985, abandoned, which is a continuation of Ser. No. 496,456, May 20, 1983, abandoned. This application Mar. 31, 1987, Ser. No. 32,766
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1982, 3221425
Int. Cl.[4] A61K *9/24*
U.S. Cl. 424—472 **7 Claims**

1. A long shelf life pharmaceutical layer tablet comprising a hydrolysis-prone active ingredient, said tablet being composed of (1) one or more placebo layers, each consisting of a mixture of conventional tablet making excipients devoid of said active ingredient, and (2) one verum layer consisting of a mixture of conventional tablet making excipients and said hydrolysis-prone active ingredient, said active ingredient being present in



said verum layer in a concentration sufficient to inhibit hydrolysis thereof during storage.

4,786,508

COATED DOSAGE FORMS

Isaac Ghebre-Sellassie, Stanhope; Robert Gordon, Dover; Maryann Mench, Wharton; Russell U. Nesbitt, Jr., Somerville, and Mary E. Trapold, Morris Plains, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 30, 1986, Ser. No. 869,504
Int. Cl.[4] A61K *9/32, 9/28*
U.S. Cl. 424—482 **5 Claims**

1. A pharmaceutical substance in oral dosage form having a saliva resistant-acid soluble coating, said coating comprising:

(a) a polymeric component containing a cationic copolymer which contains residues of (meth)acrylic esters and dimethyl aminoethyl (meth)acrylate, said coating deposited from an aqueous acidic solution having a pH between 1 and 6.

4,786,509

DRY SUSTAINED RELEASE THEOPHYLLINE ORAL FORMULATION

Richard Chang, Miramar; Robert P. Giannini, Plantation, and Charles Hsaio, Cooper City, all of Fla., assignors to Schering Corporation, Kenilworth, N.J.

Filed May 18, 1987, Ser. No. 51,095
Int. Cl.[4] A61K *9/16*
U.S. Cl. 424—490 **6 Claims**

1. A first order sustained release theophylline composition comprising theophylline-containing micropellets having on the outside surface thereof a coating consisting of a pharmaceutically acceptable water-insoluble single film former present in an amount of from about 0.5% to about 2.0% by weight based on the weight of said micropellets.

4,786,510

CALCIUM-IRON MINERAL SUPPLEMENTS

Gunther M. Nakel, Aurora, Ind.; David C. Heckert, Oxford, Ohio; Haile Mehansho, Fairfield, Ohio, and Sandra L. Miller, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 2, 1987, Ser. No. 69,352
Int. Cl.[4] A23L *1/304*
U.S. Cl. 426—74 **15 Claims**

1. A nutritional mineral supplement, comprising a mixture of:

(i) a nutritionally supplemental amount of a calcium source; and

(ii) a nutritionally supplemental amount of an iron-sugar complex.

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4,786,511

COATINGS FOR CHEWING GUMS CONTAINING GUM ARABIC AND A SOLUBLE CALCIUM SALT

Robert J. Huzinec, Kenvil, and Allan H. Graff, Randolph, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 816,762, Jan. 7, 1986, Pat. No. 4,681,766.
This application Apr. 30, 1987, Ser. No. 45,102
Int. Cl.[4] A23G *3/30;* A23L *1/09*
U.S. Cl. 426—5 **21 Claims**

1. An aqueous coating syrup for use in coating a comestible selected from the group consisting of pharmaceutical preparations, confectionery products, and other solid or semi-solid edible products comprising:

(a) from about 30% to about 80% by weight of the coating syrup of a sweetener;

(b) from about 1% to about 15% by weight of the coating syrup of gum arabic; and

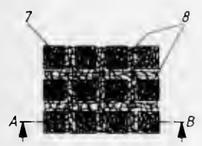
(c) from about 0.05% to about 10% by weight of the gum arabic of a water soluble calcium salt selected from the group consisting of calcium bromide, calcium iodide, calcium nitrate, calcium nitrite, calcium maleate, calcium butyrate, calcium isobutyrate, calcium hypochlorite and mixtures thereof.

4,786,512

CASING FOR RAW SAUSAGE, A PROCESS FOR THE PRODUCTION OF SAID CASING, AND ITS USE FOR SAUSAGE PRODUCTS THAT ARE AIR-CURED

Gayur Erk, and Joachim Kühn, both of Weinheim/Bergstrasse, Fed. Rep. of Germany, assignors to Naturin-Werk Becker & Co., Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Jul. 23, 1986, Ser. No. 888,858
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526394
Int. Cl.[4] A23L *1/00*
U.S. Cl. 426—105 **14 Claims**



1. A raw sausage casing which comprises:

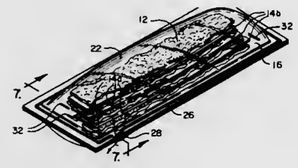
a spun random fleece which forms the sausge casing, with said fleece comprising at least one polyamide which contains no binding agent, and with said fleece being provided with edges and a longitudinal axis, wherein said edges are joined in a longitudinal direction along said longitudinal axis in such a way as to form a tube including webs of uncompressed fleece and areas of compressed fleece to avoid disadvantages of fray encountered during unpeeling of the sausage casing, said fleece further being provided with predetermined areas which are embossed by partial compression, with said partial compression having an area compression ratio V_F, which is a ratio of compressed fleece surface that represents area sum of all predetermined areas compressed by being embossed relative to uncompressed fleece surface representing area sum of all webs, and a depth compression ratio V_T, which is a ratio of embossed depth relative to initial wall thickness, and wherein said area compression ratio falls within a range of 0.12 to 2.3 and said depth compression ratio falls within a range of 0.24 to 0.5.

4,786,513

PACKAGE FOR SLICED BACON ADAPTED FOR MICROWAVE COOKING

Randal J. Monforton, Phoenix, and Burton R. Lundquist, Scottsdale, both of Ariz., assignors to Conagra, Inc., Omaha, Nebr.

Filed Dec. 5, 1986, Ser. No. 938,532
Int. Cl.[4] B65D *81/34*
U.S. Cl. 426—107 **16 Claims**



1. A package of sliced bacon which is adapted to facilitate the cooking of the sliced bacon by microwave energy, which package comprises:

a plurality of bacon slices generally arranged in a stack;

separating sheet means lying between otherwise adjacent bacon slices for maintaining separation of each of the bacon slices from each other during said microwave cooking and for effecting more uniform cooking of the bacon slices and for effecting drainage of the liquids released from the bacon during cooking;

an absorbent blotter means below the stack of bacon slices for absorbing liquids released from the bacon during cooking, said absorbent means further functioning as a heat source, as the absorbed liquids radiate heat, to thereby contribute to the cooking of the bacon slices;

overwrap means for surrounding the stack of bacon slices, the separating sheet means, and the absorbent means during storage and during cooking; and

vent means for venting said overwrap means such that expanding gases are allowed to exit said overwrap means during cooking wherein said package is sufficiently microwave transparent to allow for microwave cooking of the bacon slices therein.

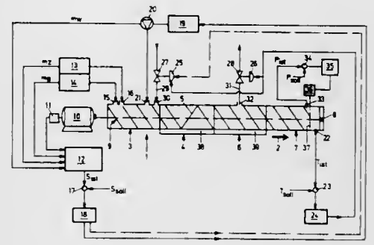
4,786,514

METHOD AND APPARATUS FOR EXTRUDING A FOOD PRODUCT

Werner Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to Werner & Pfleiderer GmbH, Fed. Rep. of Germany

Filed Sep. 2, 1987, Ser. No. 92,157
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1986, 3636867
Int. Cl.[4] G01N *33/02;* B28B *17/00*
U.S. Cl. 426—231 **13 Claims**

1. A method of extruding a food product comprising the steps of continuously introducing starch-containing food ingredients into an extruder, mixing and heating the ingredients in a mixing zone of the extruder by supplying shearing energy, adding a predetermined quantity of water to the ingredients in said mixing zone, further comprising measuring drive power (N) applied by an extruder drive motor to a shaft or shafts of said extruder at a constant speed of rotation, measuring bulk throughput (m) of the introduced ingredients, forming quotient (s) of the drive power (N) and the bulk throughput (m) in a computing device to determine specific energy (s) being consumed, feeding the specific energy (s) as the controlled condition to a controller to keep the specific energy constant in accordance with a preset desired value (s_{Soll}) by adjusting the



supply of water to the mixing zone of the extruder as a correcting variable by the controller.

4,786,515

PROCESS FOR THE TENDERIZATION OF MEAT CUTS

Ronald Miller, London, and David I. Gray, Royston, both of England, assignors to Empire Polymers Limited, London, England

Continuation of Ser. No. 709,318, filed as PCT GB 84/00216 on Jun. 21, 1984, published as WO85/00091 on Jan. 17, 1985, abandoned. This application Dec. 16, 1986, Ser. No. 942,050
Claims priority, application United Kingdom, Jun. 22, 1983, 9316903
Int. Cl.[4] A23L *1/318*
U.S. Cl. 426—281 **3 Claims**

1. A process for the preparation of tenderised cooked dressed livestock or poultry meat cuts, said meat cuts ranging in size from an individual slice to a whole carcass, but not including minced or comminuted meat, which comprises the steps of:

injecting into the meat cuts, prior to cooking, an aqueous brine solution containing 0.05 to 0.3 percent by weight of xanthan gum; and

thereafter cooking said meat cuts.

4,786,516

METHOD OF DRYING MEAT

Ko Sugisawa; Yasusbi Matsumura, both of Nara; Kazumitsu Taga, Nevagawa, and Ryuichi Hattori, Kyoto, all of Japan, assignors to House Food Industrial Company Limited, Japan

Continuation of Ser. No. 767,149, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 544,356, Oct. 21, 1983, abandoned. This application Feb. 19, 1987, Ser. No. 16,246
Claims priority, application Japan, Jan. 9, 1981, 136089/81
Int. Cl.[4] A23L *3/38, 1/31;* F26B *5/06, 5/10*
U.S. Cl. 426—385 **8 Claims**

1. A method of drying raw meat containing a meat portion and a fat portion, comprising the steps of:

deep-frying the raw meat in a tank containing edible oil at a temperature in the range of about 50° to 85° C., under a vacuum, and for about two to about five minutes to obtain predried raw meat having a moisture content of about 35 percent to about 65 percent based on the weight of the meat portion exclusive of the fat portion so that appropriate dehydration and thermal modification occur throughout the meat, whereby flavor-bearing materials of the meat are solidified and locked in, so that growth of ice crystals during vacuum freeze-drying is prevented, and thereafter,

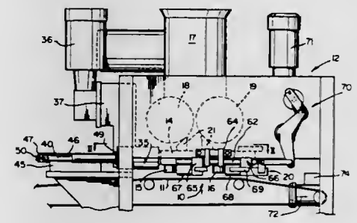
vacuum freeze-drying the predried raw meat.

4,786,517

HIGH VOLUME DOUGH PIECE PRODUCTION METHOD

Albert A. Pinto, White Plains, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 522,293, Aug. 11, 1983, Pat. No. 4,685,878. This application May 7, 1987, Ser. No. 47,876
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] A21D *6/00*
U.S. Cl. 426—503 **3 Claims**



1. A method for producing dough pieces, comprising the steps of:

feeding dough to a pair of extruder nozzles at respective extrusion stations spaced a predetermined distance from one another above a conveyor;

extruding dough at substantially the same rate through said extruder nozzles;

cutting off sections of dough being extruded through said nozzles to form at each nozzle a series of discrete dough pieces, dough pieces being cut off substantially simultaneously at said nozzles;

depositing said dough pieces on said conveyor so that dough pieces formed at either one of said nozzles are spaced from each other on said conveyor by a distance equal to two-thirds of said predetermined distance; and

continuously driving said conveyor at a speed so related to said predetermined distance and to the rate of dough piece formation that a line of equally spaced dough pieces is formed on said conveyor.

4,786,518

IRON MINERAL SUPPLEMENTS

Gunther M. Nakel, Aurora, Ind., and Sandra M. Miller, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 2, 1987, Ser. No. 69,360
Int. Cl.[4] A23L *1/304*
U.S. Cl. 426—531 **12 Claims**

1. An iron-sugar-carboxylate complex suitable for administration to humans or anivals as a mineral supplement.

4,786,519

DELAYED REACTION CARBON DIOXIDE GENERATOR PACKAGE

Ashis S. Gupta, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 504,633, Jun. 15, 1983, Pat. No. 4,636,337. This application Oct. 22, 1986, Ser. No. 921,986
Int. Cl.[4] B65B *29/06;* A23L *2/40*
U.S. Cl. 426—561 **4 Claims**

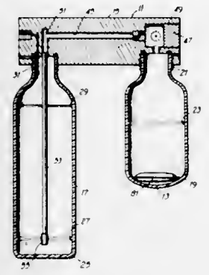
1. A chemical package for a carbonation device including a reaction vessel filled with water, said chemical package comprising:

a mixture of chemicals that react in the presence of water to generate carbon dioxide in an amount sufficient to carbonate a predetermined volume of liquid;

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a water impermeable covering having at least a first edge and a second edge and wherein said first edge is folded over said second edge to enclose said mixture of chemicals; and

a water soluble means for adhering together at least said first and said second edges of said water impermeable covering



to seal said mixture of chemicals within said water impermeable covering, said water soluble means dissolvable in water at a rate that maintains the package sealed and impermeable to water for at least about ten seconds thereby delaying the reaction of said mixture of chemicals with the water.

4,786,520

PROCESS FOR MANUFACTURING COCOA

Isamu Kajihara; Takeshi Morishima, both of Yokosuka, and Shigeo Mori, Narashino, all of Japan, assignors to Morinaga & Co., Ltd., Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,725

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—631 **9 Claims**

1. In a process for manufacturing cocoa, wherein cocoa mass is produced from cocoa beans, said cocoa mass is pressed to prepare a cocoa cake and then said cocoa cake is pulverized into cocoa powder.

the improvements which comprise: feeding a cooling air upward to the cocoa powder, while the fat contained in said cocoa powder is still in a molten state, and the fat is present on the surfaces of cocoa particles, to thereby suspend said cocoa powder in said cooling air at a definite level, thereby forming a fluidized bed in which the suspended cocoa particles sufficiently contact with said cooling air and simultaeously collide with each other, thus resulting in the crystallization of the fat contained therein; further suspending the particles for a sufficient period for the transformation of the crystals thus formed into stable form, said period being from 3 to 60 minutes, whereby the cocoa particles are cooled to 18° to 30° C.; and thus producing a glossy cocoa of a good color tone containing minute and stable fat crystals.

4,786,521

AQUEOUS TABLE SYRUP WITH REDUCED SUGAR CONTENT

Craig J. Bennett, Hazlet, and Sharon J. Malits, Freehold, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 813,437, Dec. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 669,544, Nov. 8, 1984, abandoned. This application Feb. 20, 1987, Ser. No. 17,021

Int. Cl.[4] A23L *1/09*

U.S. Cl. 426—658 **4 Claims**

1. An aqueous table syrup comprising, finished product sugar solids ranging from 15 to 45% by weight; maltodextrin in amounts up to 50%; a gum system consisting of a combination of propylene glycol alginate (PGA) and carboxymethyl cellulose (CMC) wherein the amounts of PGA ranges from 0.1 to 0.5% by weight and the amount of CMC ranges from 0.3 to 0.8% by weight; preservatives ranging from 0.01 to 1.0% by weight; sodium hexamethaphosphate ranging from 0.01 to 0.5%; salt ranging from 0.01 to 1.0% by weight; and sufficient water to produce a finished product viscosity of at least 1000 cps at 25° C.

4,786,522

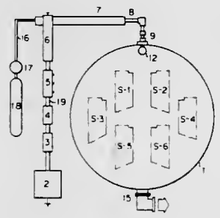
METHOD FOR PLASMA TREATMENT OF RESIN MATERIAL

Kenji Fukuta; Takaoki Kaneko, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabusbiki Kaisha, Toyota, Japan

Division of Ser. No. 931,012, Nov. 17, 1986, Pat. No. 4,690,097. This application Jun. 4, 1987, Ser. No. 58,287

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **4 Claims**



1. A method for applying surface plasma treatment to resin material placed in a substantially cylindrical reaction chamber having first and second plasma introducing ports by irradiating objects to be treated with a microwave discharge plasma, the method comprising the steps of:

introducing said plasma into said reaction chamber through at least one of said first plasma introducing ports mounted on the wall of said reaction chamber;

introducing said plasma through at least one of said second plasma introducing ports located on the wall of said reaction chamber, said second plasma introducing ports being peripherally spaced from said first plasma introducing ports within an angular interval of 45° to 120° along the wall of said cylindrical reaction chamber; and

supplying said plasma through respective ones of said first and second plasma introducing ports intermittently and at different timing between each of said respective first and second plasma introducing ports.

4,786,523

SUBSTRATE HAVING A PATTERN OF AN ALLOY OF GOLD AND A NOBLE AND A BASE METAL WITH THE PATTERN ISOLATED BY OXIDES OF THE NOBLE AND THE BASE METALS

Akihiro Dobya, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 735,508, May 20, 1985, abandoned, which is a division of Ser. No. 444,097, Nov. 24, 1982, Pat. No. 4,268,149. This application Dec. 9, 1986, Ser. No. 940,165

Claims priority, application Japan, Nov. 30, 1981, 56-190518; May 17, 1982, 57-82917

Int. Cl.[4] B05D *5/12*; H05K *1/09*

U.S. Cl. 427—96 **10 Claims**

6. A wired substrate having a pattern of conductive and insulating layers on an insulating surface produced by the process consisting essentially of the steps of:

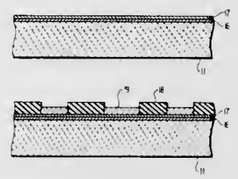
(a) providing a substrate having an insulating surface;

(b) forming a first layer of a base metal directly on said insulating surface;

(c) forming a second layer of palladium to a thickness of 0.025 to 0.3 micron directly on said first layer;

(d) forming a third layer of gold selectively directly on said second layer to a thickness which is thicker than a total thickness of said first and said second layers; and

(e) heat treating at least said first through said third layers in air at a temperature between 850° C. and 950° C. for a duration between 5 and 10 minutes to convert said third



layer and selected portions of said first and second layers to a conductive layer and to concurrently convert remaining portions of said first and said second layers to an insulating layer, said selected portions being those portions of said first and said second layers on which said third layer is formed, said remaining portions being those portions of said first and said second layers which are other than said selected portions, said conductive layer thereby being formed of an alloy of said gold, said base metal, and palladium.

4,786,524

COATING FORMULATION AND METHOD FOR REFINISHING THE SURFACE OF SURFACE-DAMAGED GRAPHITE ARTICLES

Zane L. Ardary, Lenoir City, and Samuel T. Benton, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 8, 1987, Ser. No. 71,102

Int. Cl.[4] B32B *35/00*

U.S. Cl. 427—140 **4 Claims**

1. A method for filling a surface irregularity in a surface of a carbonaceous structure comprising the steps of contacting a surface portion of a carbonaceous structure containing a surface irregularity with a sufficient quantity of a coating formulation comprising a mixture of 70 to 80 wt % carbon-black flour, 30 to 20 wt % of a particulate thermosetting resin precursor dissolved in a solvent therefore with said solvent being in a sufficient concentration to provide the mixture with a paste-like consistency for filling the surface irregularity, removing the solvent from the coating formulation, curing the resin precursor, and pyrolyzing the resulting polymer to provide a carbonaceous coating adherent to said surface portion of the carbonaceous structure.

4,786,525

PIPE LININGS

Charles R. W. Kayser, Nelson, and Kathleen Trippier, Rossendale, both of United Kingdom, assignors to Humes Limited, Australia

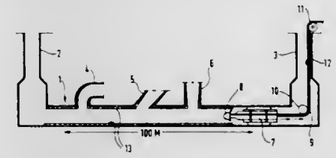
Filed May 16, 1983, Ser. No. 494,749

Claims priority, application United Kingdom, May 14, 1982, 82 14093

Int. Cl.[4] B05D *7/22*

U.S. Cl. 427—236 **16 Claims**

1. A method of forming a new pipe within an existing underground pipe, comprising the steps of moving a spraying means through the existing pipe, pumping a curable thixotropic resin to the spraying means, causing the spraying means to spray continuously the thixotropic resin onto the inner walls of the existing pipe to build up in one pass of the spraying means a predetermined self-supporting thickness of the resin which, while uncured, is supported in position by its thrxotropy and adherence to said walls, and allowing the self-supporting resin to cure and harden, said predetermined thickness being such as



to provide upon curing of the resin a new self-contained pipe having structural strength, within and independent of the existing pipe such that the formed structure would continue to function in the absence of the existing pipe should the existing pipe decay away altogether.

4,786,526

SURFACE TREATING METHOD AND APPARATUS

Tohru Arai; Junji Endo, and Hiromasa Takeda, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

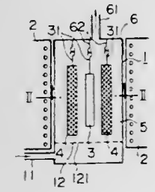
PCT No. PCT/JP86/00360, § 371 Date May 29, 1987, § 102(e) Date May 29, 1987, PCT Pub. No. WO87/02073, PCT Pub. Date Apr. 9, 1987

PCT Filed Jul. 14, 1986, Ser. No. 66,483

Claims priority, application Japan, Oct. 3, 1985, 60-220925

Int. Cl.[4] B05D *1/22*

U.S. Cl. 427—249 **10 Claims**



1. A method of forming a carbide or nitride layer on the surface of material to be treated in a fluidized bed furnace, said method comprising the steps of:

disposing a refractory powder, at least one porous vessel filled with a treating agent, and said material in said furnace in a manner so that said material is spaced apart from said vessel, said treating agent being a powder composed of

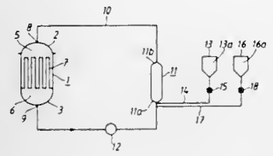
(a) powder of at least one carbide or nitride forming metal or alloy and

(b) powder of at least one compound selected from the group consisting of chlorides, fluorides, bromides, iodides and borofluorides of alkali and alkaline earth metals and/or at least one of an ammonium halide and a metal halide; and

introducing a fluidizing gas into said furnace under heat to fluidize said refractory powder, said steps being reversible in order.

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4,786,527
METHOD OF APPLYING A LAYER OF ION-EXCHANGE RESIN TO A SUPPORT MATRIX, PERMEABLE TO LIQUID, IN A FILTER ELEMENT
Peter Fejes, Västeras, and Eva Sundell, Hägersten, both of Sweden, assignors to AB ASEA-Atom, Västeras, Sweden
Filed Apr. 24, 1987, Ser. No. 42,251
Claims priority, application Sweden, Apr. 28, 1986, 8601956
Int. Cl.[4] B01D *37/02*
U.S. Cl. 427—244 **3 Claims**



1. A method of applying a layer of a homogeneous mixture of small-sized particles of a cation exchange resin and an anion exchange resin on a liquid-permeable support matrix of a filter element which is located in an ion-exchange filter tank, said method comprising the steps of

(a) providing a mixer consisting of a tube having an inlet end, an outlet end and a plurality of stationary mixing elements serially positioned therein which are capable of dividing a single flow of material passing through said tube from said inlet end to said outlet end into a successive number of subflows, which then become united into a single flow at said outlet end,

(b) circulating a flow of water through said mixer from said inlet end to said outlet end, then to and through said ion-exchange filter tank, and then back to said inlet end of said mixer, and

(c) separately supplying cation exchange resin and anion exchange resin to said inlet end of said mixer, said cation exchange resin and said anion exchange resin being homogeneously mixed in said flow of water as it passes through said mixer and, after circulating to the ion-exchange filter tank, being deposited as a layer on the filter element therein.

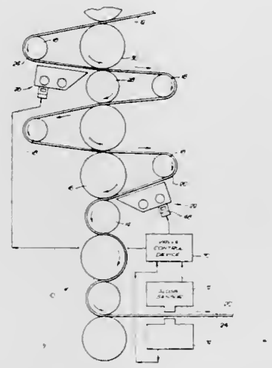
4,786,528
PROCESS FOR TREATING REINFORCED POLYMER COMPOSITE
William J. Amelio, Austin, Tex.; Voya Markovich, Endwell, N.Y.; William J. McCarthy, Binghamton, N.Y.; Allen F. Moring, Endicott, N.Y.; Peter A. Moschak, Chenango Forks, N.Y., and Douglas H. Strope, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 20, 1986, Ser. No. 864,978
Int. Cl.[4] B05D *3/02, 3/12*
U.S. Cl. 427—289 **16 Claims**

1. A method for treating a reinforced, synthetic, polymer composite which comprises:

(a) heating the composite at a temperature and for a time sufficient to obtain a moisture content below that for the relative humidity level at which the composite is to be subjected to drilling subsequently;

and (b) then subjecting the composite to a controlled environment having said relative humidity level for a time sufficient to increase the moisture content of the composite to that for said relative humidity level to thereby obtain a predictable amount of linear expansion.

4,786,529
CROSS DIRECTIONAL GLOSS CONTROLLER
Mathew G. Boissevain, Los Altos, Calif., assignor to Measurex Corporation, Cupertino, Calif.
Filed Jun. 15, 1987, Ser. No. 62,886
Int. Cl.[4] B05D *3/12;* **B05C** *11/02*
U.S. Cl. 427—296 **22 Claims**



15. A method of controlling the formation of a gloss finish on a first surface of a calenderable material, comprising the steps of:

directing a working fluid at a plurality of different sections of the first surface;

individually controlling the amount of working fluid directed at each section of the first surface of the material;

removing, with suction, excess working fluid from the first surface, which fluid is not absorbed by the material; and

pressing the first surface of the material against a hard, polished surface.

4,786,530
FINISHING SIZE COMPOSITION AND METHOD FOR MAKING AND USING SAME
Charles J. Fox, Atlanta, Ga., assignor to Penick & Ford, Limited, Cedar Rapids, Iowa
Filed Aug. 25, 1987, Ser. No. 89,066
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—384 **8 Claims**

1. A method of preparing a finished size fabric said method comprising:

(a) preparing a slurry comprising a noncongealing hydrophilic starch exhibiting a five gram alkali fluidity of from about 10 milliliters to about 97 milliliters and a solvent;

(b) heating the slurry to at least 165° F. to form a finishing size paste;

(c) cooling the finishing size paste of step (b) to at least 140° F.;

(d) padding a fabric with the finishing size paste of step (c);

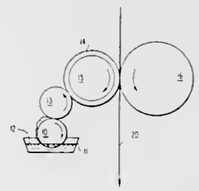
(e) removing excess finishing size paste from the contacted fabric, and

(f) drying the contated fabric.

4,786,531
DEEP PENETRATING WATER RESISTANT SEALER COMPOSITION, ITS PREPARATION AND USE
James V. Hodson, 1650 E. 500 South, Fruit Heights, Utah 84037
Filed Dec. 7, 1987, Ser. No. 129,167
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—387 **19 Claims**

1. A deep penetrating water-resistant sealer composition comprising a mixture of (1) an aromatic hydrocarbon solvent, (2) a chlorinated hydrocarbon solvent, (3) an aliphatic hydrocarbon solvent, and (4) a hydroxy-substituted polyorganosiloxane, the amount of the aromatic hydrocarbon solvent being under 20% by volume, the amount of the chlorinated hydrocarbon solvent being under 65% by volume, the amount of the aliphatic hydrocarbon solvent being under 40% by volume, and the amount of the hydroxy-substituted polyorganosiloxane being under 20% by volume.

4,786,532
FLEXOGRAPHIC PRESS APPLIED PAPER COLOR COATING
Richard C. Brown, Somers, Conn.; Robert E. Lafler, Charlton City, and Joseph M. Murphy, Wilbraham, both of Mass., assignors to Westvaco Corporation, New York, N.Y.
Division of Ser. No. 766,647, Aug. 19, 1985, abandoned. This application May 11, 1987, Ser. No. 48,306
Int. Cl.[4] B05D *1/28*
U.S. Cl. 427—428 **3 Claims**



1. A method of uniformly coloring with a water-based ink one surface of a substantially uncoated, continuous paper supply web to an envelope converting machine comprising the steps of:

passing said continuous supply web tbhrough a flexographic printing apparatus prior to subsequent converting steps;

metering the transfer of water-based ink from a supply pool to said web with a nip linked train of rotating rolls comprising an elastomer covered fountain roll that is partially immersed in said supply pool and in rolling nip contact with an anilox roll, said anilox roll also being in rolling nip contact with an elastomer covered plate roll, said web being passed through a rolling pressure nip between said plate roll and an impression roll;

formulating said water-based ink with 20% to 40% by weight of a water miscible resin binder for color pigment;

adjusting the viscosity of said water-based ink to the approximate range of 15 to 16.5 seconds, No. 2 Zahn Cup;

adjusting the surface tension of said water-based ink to the approximate range of 35 to 39 dynes per centimeter;

forming said plate cylinder elastomer cover with a 50–55 Shore "A" durometer hardness cure, cylindrically trued to a 0.001 concentricity and surface finished to a surface roughness height of about 32 microinches;

forming said impression roll with a 0.001 inch cylindrically trued surface concentricity;

providing said anilox roll with a 400 P engraved surface texture having approximately 17 to 20μ cell depth or a ceramic coating engraved with 19 to 21μ deep cells distributed over an interlaced pattern of 380 to 408 lines per inch; and,

forming said fountain roll elastomer cover with about an 80 to 90 Shore "A" durometer hardness cure and surface finished to a surface roughness height of approximately 64 microinches.

4,786,533
TRANSPARENT POLYPROPYLENE FILM FOR CANDY TWIST WRAPPING
Guenther Crass, Taunusstein, and Lothar Bothe, Mainz-Gonsenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 3, 1986, Ser. No. 915,083
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535472
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—13 **29 Claims**

1. A transparent stretch oriented polymer film, comprising:

a base layer of a propylene polymer containing a low molecular weight hydrocarbon resin in an amount from about 10 to 40% by weight, calculated on the total weight of said base layer; and

at least one polyolefinic top layer situated on said base layer and containing a polydialkylsiloxane in an amount of about 0.3 to 1.5% by weight calculated on total weight of said cover layer,

wherein said base layer has a modulus of elasticity of not less than about 3,000N/mm^2 as measured in both directions of orientation.

4,786,534
DISPOSABLE PACKAGE FOR LIQUID MATERIAL AND METHOD OF MAKING SAME
Radcliffe W. Aiken, Marlboro, N.J., assignor to Business Systems Enterprises, Inc., Metuchen, N.J.
Filed Feb. 2, 1987, Ser. No. 9,472
Int. Cl.[4] B65D *1/24;* **B65B** *7/28*
U.S. Cl. 428—34.2 **11 Claims**



1. A package containing a body of liquid material including a volatile solvent, comprising

(a) a molded sheet plastic tray defining at least one cavity, for receiving a body of liquid material, and having a substantially planar rim completely surrounding said one cavity; and

(b) a lid of sheet material extending entirely over said one cavity and secured to said rim to enclose a body of liquid material received in said one cavity;

wherein the improvement comprises:

(c) a body of liquid material including a volatile solvent, received in said one cavity;

(d) at least facing surface portions of said tray and said lid, including the tray surface portion facing the interior of said one cavity and extending over said rim, being constituted of a polymeric material resistant to attack by said solvent, said polymeric material being acrylonitrile methacrylate; and

(e) the lid and tray being secured as aforesaid by direct bonding of said polymeric material of said lid surface portion to that of said tray surface portion around said rim for providing a bond that seals the contained liquid material within the cavity and is substantially uniformly releasable when subjected to manual peeling forces to enable removal of the lid from the tray.

4,786,535
POMPON
Gordon Young, 1728 Rosemeade Cir., Carrollton, Tex. 75007
Filed Nov. 16, 1987, Ser. No. 121,162
Int. Cl.[4] D04D *7/06*
U.S. Cl. 428—4 **3 Claims**

1. An improved pompon comprising a hollow tubular handle

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of a selected length bounding an internal storage compartment having an upper opening into said compartment and a bottom closure, a cup slidably disposed in said compartment having pompon streamers extending therefrom, a first string with a cooperating first pull ring connected to extend from said cup in the direction of said streamers so that a pulling of said first pull ring urges said cup towards said upper compartment opening and projects said streamers into a display condition through said upper compartment opening, and a second string with a



cooperating second pull ring connected to extend from said cup in an opposite direction, said second string being of the same selected length as said tubular handle so that said second pull ring is adapted to abut against said handle bottom closure to thereby serve as a stop limiting the sliding movement of said cup to a position still within the compartment when said cup is adjacent the upper opening thereof, and whereby said second pull ring is adapted in response to a pulling thereof to urge said cup through sliding movement against said bottom closure and pull said streamers into a storage position within said handle.

4,786,536

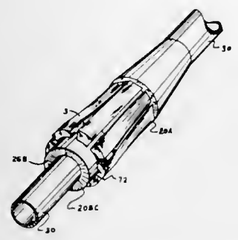
COMPOSITE DEFLECTABLE SPRING STRUCTURE

Charles E. Kaempen, 3202 Larkstone Dr., Orange, Calif. 926695

Division of Ser. No. 33,493, Apr. 1, 1987, Pat. No. 4,740,422, which is a division of Ser. No. 716,565, Mar. 27, 1985, Pat. No. 4,680,923. This application Nov. 9, 1987, Ser. No. 118,522

Int. Cl.⁴ B65H *81/00;* **B27N** *5/02;* **F16L** *9/00, 39/00*

U.S. Cl. 428—36.3 **12 Claims**



1. A composite deflectable spring comprising

a multiple of compacted continuous filament strands each composed of a multiple of individual continuous filament reinforcements, each of said filament strands extending at least generally in the direction of a longitudinal axis thereof to exhibit a center-pull helical frequency and configuration defined by a multiple of revolutions about said axis and about at least one other of said filament strands, each of said filament strands having helixes that are spaced relative to the helixes of the other filament strands in the direction of said axis, and

hardenable adhesive means impregnating said filament strands and forming a hardened bonding matrix for ridgedly maintaining said filament strands as a composite structure and wherein

a multiple of said structures are disposed in at least general parallel relationship relative to each other to form a uniformly thick single ply structure, said structures bonded together by said hardened bonding matrix to form said deflectable spring structure.

4,786,537

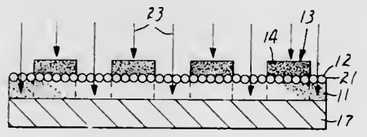
SELF-WEEDING DRY TRANSFER ARTICLE

Makoto Sasaki, Shizuoka, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 30, 1986, Ser. No. 925,730

Int. Cl.⁴ H61F *31/02;* **B32B** *3/00*

U.S. Cl. 428—40 **9 Claims**



1. A dry transfer article comprising an adhesive layer, a graphic layer comprising a predetermined graphic pattern, an actinic radiation-transmissive, ink-receptive layer between said adhesive layer and said graphic layer, wherein said adhesive layer is actinic radiation-responsive.

4,786,538

OPTICAL RECORDING MEDIUM FORMED OF CHALCOGENIDE OXIDE AND METHOD FOR PRODUCING THE SAME

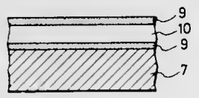
Koichi Saito; Hideki Kobayashi, both of Kurashiki; Junji Nakagawa, Ichikawa, and Yoichi Murayama, Tokyo, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Continuation of Ser. No. 808,572, Dec. 13, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 82,909

Claims priority, application Japan, Dec. 13, 1984, 59-264128; Dec. 13, 1984, 59-264129; Dec. 13, 1984, 59-264130; Dec. 13, 1984, 59-264131; Dec. 13, 1984, 59-264132; Dec. 13, 1984, 59-264133

Int. Cl.⁴ G11B *7/24*

U.S. Cl. 428—64 **7 Claims**



4. An optical recording medium consisting essentially of the following three layers successively formed on a substrate:

(1) a TeO_2 layer,

(2) a TeO_x layer where $0<x<2$, and

(3) a TeO_2 layer,

wherein each of said TeO_x layer and TeO_2 layers is formed by a vapor deposition method wherein tellurium metal is vaporized into a plasma gas containing at least one gas selected from the group consisting of oxygen and an inert gas.

4,786,539

THERMAL INSULATING COMPOSITE LAMINATE

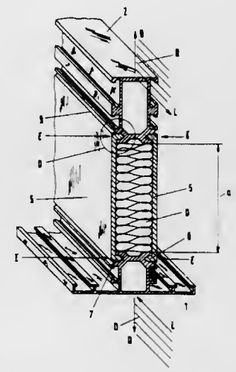
Paul Grether, Seuzach, Switzerland, assignor to Geilinger AG, Winterthur, Switzerland

Filed Feb. 17, 1987, Ser. No. 15,289

Claims priority, application European Pat. Off., Feb. 25, 1986, 86810095-9

Int. Cl.⁴ B32B *1/04, 3/00;* **L04C** *3/30*

U.S. Cl. 428—68 **14 Claims**



1. A thermal insulating composite laminate comprising

a pair of metal parts disposed in parallel spaced relation in a common plane, each said part including a longitudinally extending groove having a pair of parallel walls and a plurality of transverse teeth in each said wall perpendicular to said plane; and

a bar of synthetic material of low thermal conductivity extending between said metal parts and having a pair of angled anchoring strips, each said strip extending into said groove of a respective metal part and having a plurality of teeth on each of two sides perpendicular to said plane and anchored in adhesive-free manner with said teeth on said walls of said groove.

4,786,540

BLOW-MOLDED SUPPORTING BODY

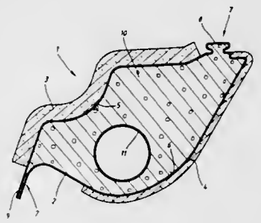
Urlich Bruhnke, Ehningen; Jürgen Körber, Sindelfingen, and Jürgen Pfaffenbach, Hemmingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,687

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1987, 3706640; Dec. 1, 1987, 3740687

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 428—71 **12 Claims**



1. Crash apparatus comprising:

a blow molded supporting body having an interior area;

at least one covering layer means for covering at least a portion of said blow-molded supporting body, said at least one covering layer means being bonded with said blow-molded supporting member;

foamed material disposed in at least a portion of said blow-molded supporting body interior area; and

molded-on fastening means disposed in an area of said blow-molded supporting body devoid of said at least one covering layer means.

4,786,541

FIBER MATERIAL FOR REINFORCING PLASTICS

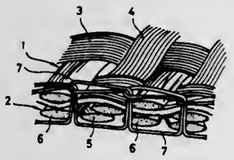
Akira Nishimura, Otsu; Kunio Maeda, Omihachiman, and Kazuo Kito, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 765,989, Aug. 14, 1985, Pat. No. 4,622,254, which is a continuation of Ser. No. 410,054, Aug. 20, 1982, abandoned. This application Sep. 24, 1986, Ser. No. 911,033

Claims priority, application Japan, Aug. 31, 1981, 56-136301

Int. Cl.⁴ B32B *3/06, 9/00;* **D04H** *1/58*

U.S. Cl. 428—102 **15 Claims**



1. A fiber material for reinforcing plastics, which comprises a laminate of:

(1) at least one first fiber substrate consisting of a unidirectional woven fabric having reinforcing fibers extending only in one direction;

(2) at least one second fiber substrate consisting of a unidirectional woven fabric having reinforcing fibers extending only in one direction, the reinforcing fibers of said second fiber substrate being arranged in the laminate at a bias angle of +(25–65) degrees relative to the reinforcing fibers of said first fiber substrate;

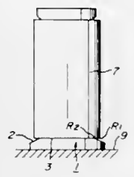
(3) at least one third fiber substrate consisting of a unidirectional woven fabric having reinforcing fibers extending only in one direction, the reinforcing fibers of said third fiber substrate being arranged in the laminate at a bias angle of −(25–65) degrees relative to the reinforcing fibers of said first fiber substrate;

(4) at least one fourth fiber substrate consisting of a unidirectional woven fabric having reinforcing fibers extending only in one direction, the reinforcing fibers of said fourth fiber substrate being arranged in the laminate at an angle of approximately 90° relative to the reinforcing fibers of said first fiber substrate; and

(5) continuous stitch yarns consisting of reinforcing yarn integrating the first, second, third and fourth fiber substrate layers by single chain stitching in which a single yarn engages with itself to form loops and passes through said laminate of substrates at an angle within a range of −15 degrees to +15 degrees relative to the direction of the lamination of the substrates and at a separation and at an interval of 2 to 30 mm, wherein said reinforcing fibers of said substrates are multifilament yarns of carbon fibers having a twist number of at most 20 T/m and a cross-sectional area of 0.07 to 3.5 mm and said stitch yarns have a cross-sectional area of 0.01 to 0.25 mm^2, an elongation at break greater than that of said carbon fibers and a thermal shrinkage at 120° C. of no greater than 2%.

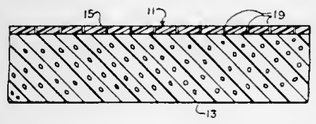
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4,786,542
SETTERS AND FIRING OF CERAMIC HONEYCOMB STRUCTURAL BODIES BY USING THE SAME
Keiji Yasuda, Aichi, and Kazuhiro Miyahara, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan
Filed Feb. 18, 1987, Ser. No. 15,986
Claims priority, application Japan, Feb. 20, 1986, 61-33714; Feb. 20, 1986, 61-33715
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 20 Claims



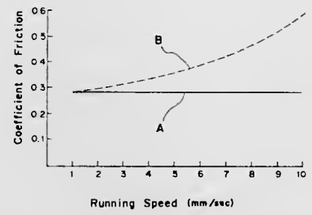
1. A setter used for firing a ceramic honeycomb structural body, comprising a honeycomb structural ceramic plate having a top surface and a bottom surface, longitudinal flow cells passing through said plate in a perpendicular direction to the surfaces, and a bevelled portion at an outer peripheral edge portion of said top surface, wherein said top surface contacts a substantial portion of an end face of the honeycomb structural body.

4,786,543
CEILING TILE OF EXPANDED POLYSTYRENE LAMINATED WITH EMBOSSED VINYL SHEET
Don Ferm, P.O. Box 715, Bentonville, Ark. 72712
Filed Oct. 6, 1987, Ser. No. 104,962
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—138 21 Claims



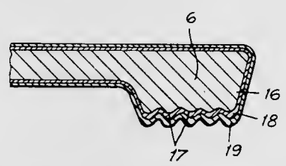
17. A drop-in ceiling tile or the like made by the method of
a. expanding polystyrene to form a cellular block with dimensions at least about two inches by two feet by four feet,
b. using a hot-wire cutter to cut said expanded polystyrene block into substrate sheets approximately one inch by two feet by four feet,
c. preparing a thin vinyl textured plastic sheet for use as a facer on each of said substrate sheets by perforating the plastic sheet at intervals of less than about one inch with apertures less than one-half inch in their greatest transverse dimension,
d. applying an adhesive to at least one of said plastic sheets and said substrate sheets, and
e. adhering each said plastic sheet on a face of one of substrate sheets.

4,786,544
MAGNETIC RECORDING MEDIUM
Osamu Saito, Takatsuki, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan
Filed Apr. 8, 1987, Ser. No. 35,920
Claims priority, application Japan, Apr. 8, 1986, 61-80699
Int. Cl.[4] G11B *5/71*
U.S. Cl. 428—143 7 Claims



1. A magnetic recording medium comprising a substrate, a magnetic layer formed on at least one surface of said substrate and a lubricant layer coated on said at least one magnetic layer comprising a liquid lubricant phase and a solid lubricant phase substantially incompatible with each other wherein said liquid lubricant phase constitutes a continuous phase having an affinity for said magnetic layer and said solid lubricant phase constitutes a discontinuous phase dispersed in said liquid lubricant phase such that said solid lubricant phase is formed at the surface of said liquid lubricant phase such that said solid lubricant forms projections at the surface of the lubricant layer.

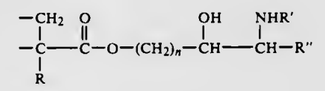
4,786,545
CIRCUIT SUBSTRATE AND METHOD FOR FORMING BUMPS ON THE CIRCUIT SUBSTRATE
Kunio Sakuma, and Sadasumi Uchiyama, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Feb. 24, 1987, Ser. No. 17,419
Claims priority, application Japan, Feb. 28, 1986, 61-43226; Mar. 12, 1986, 61-54424; Nov. 20, 1986, 61-277488
Int. Cl.[4] B32B *3/00*; G03C *5/00*
U.S. Cl. 428—209 64 Claims



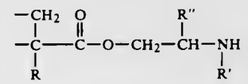
1. A circuit substrate for use in manufacturing integrated circuit devices by the strip-support method in connection with a semiconductor element having conductive pads, the circuit substrate comprising: base means formed of insulating material; circuit means supported on the base means for mechanically and electrically coupling to the conductive pads of a semiconductor device, the circuit means including a plurality of finger leads with a bump at the end of each finger lead for mechanically and electrically coupling to one of the conductive pads, the coupling surface of each bump having a roughness in a range between 5 and 20 microns, with the increase in roughness to bond the bumps and conductive pads firmly by breaking any oxide film formed on the conductive pads of the IC chip.

4,786,546
TWO LAYER POLYVINYL FLUORIDE COATINGS AND PROCESS FOR APPLYING IT
Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 867,159, May 27, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 112,077
Int. Cl.[4] B32B *7/02, 27/08*
U.S. Cl. 428—215 2 Claims

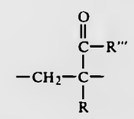
1. A composite comprising a substrate, intimately adhered to said substrate a layer from 0.1–0.5 mil in thickness of a polymeric composition comprising 20–40 weight percent of an acrylic copolymer containing 1–20 weight percent repeating units of the structure



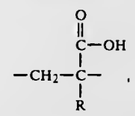
or



where n is 1–6, —R is —H or $-CH_3$, —R′ is —H, $-CH_3$ or $-(CH_2)_m-CH_3$ where m is 1–5, and —R″ is —H, $-CH_3$ or $(CH_2)_xCH_3$ where x is 1–5, 65–99 weight percent repeating units of the structure



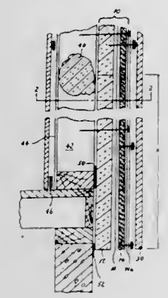
where R‴ is —H, $-CH_3$ or $-(CH_2)_yCH_3$ where y is 1–17 and 0–15 weight percent repeating units of the structure



and 80–60 weight percent of polyvinyl fluoride having topcoat from 0.1–30 mils in thickness which consists essentially of polyvinyl fluoride.

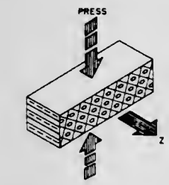
4,786,547
EXTERIOR INSULATING SHEATHING
André St-Michel, Lorraine, Canada, assignor to Domtar Inc., Montreal, Canada
Filed Apr. 9, 1987, Ser. No. 36,501
Int. Cl.[4] B32B *3/26, 7/02/7/12*
U.S. Cl. 428—215 6 Claims

1. An exterior insulating sheathing having a good vapour transmission consisting of a foam polystyrene ply and a second ply of fiberboard, said second ply having at least one side water resistant, said second ply being glued to said polystyrene ply throughout with a continuous layer of glue, so that said continuous layer of glue is sandwiched between said foam polystyrene ply and said second ply, as to continuously fasten said polystyrene ply to said second ply, to form a unitary product defining an exterior insulating sheathing, said exterior insulating sheathing having said at least one water resistant side of said second ply forming one of the exposed side of said exterior insulating sheathing, said exterior insulating sheathing being nailable and mountable on supporting beams and having a racking load according to ASTM E-72 of about 2100±200 lbs, a minimum tensile strength of 65±14 kiloPascal, a linear expansion at 97% relative humidity and 23° C., of less than 0.40%±0.02, a water vapour transmission of at least 96 nonagram per second per meter square ($^{ng}/Pa.s.m^2$), and a modulus of rupture of 0.6±0.1 megaPascal (mPa).



2. The sheathing as defined in claim 1 wherein said polystyrene ply has a density of about 0.6 lbs/cu ft to 1.4 lbs.ft^3 and wherein the thickness of said polystyrene is 1.5±0.5 inch, and the thickness of said fiberboard ply is about 7/16 to 8/16 inch to form a unitary sheathing of about 2 inches in thickness.

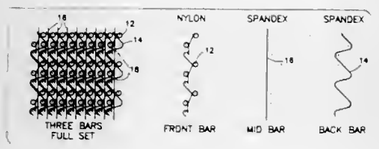
4,786,548
LOW LOSS RADAR WINDOW FOR REENTRY VEHICLE
Thomas M. Place, Jr., Costa Mesa, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Sep. 10, 1987, Ser. No. 95,062
Int. Cl.[4] D03D *3/00*
U.S. Cl. 428—225 5 Claims



1. A composite material for use in a radar window of a reentry vehicle, said vehicle being exposed to temperatures in excess of 2200° C. upon reentry, said composite material comprising:
a yarn of boron nitride, said yarn woven in a selective pattern to form a preform;
boron nitride, said boron nitride impregnated throughout said preform to form a matrix composite; and
silica, said silica being impregnated throughout said matrix composite, said silica being about 2 to about 20 weight percent of said composite material;
whereby said composite material is substantially recession matched to a surrounding surface of tape-wrapped carbon phenolic materials.

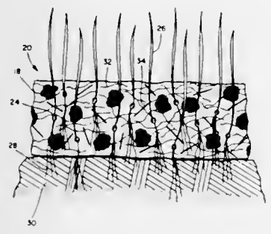
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,549
WARP KNIT FABRIC WITH RAVEL RESISTANT LAID-IN ELASTIC YARNS AND METHOD FOR MANUFACTURING SAME
David T. Richards, Palmyra, Va., assignor to Liberty Fabrics, Inc., New York, N.Y.
Filed Aug. 5, 1987, Ser. No. 82,072
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—253 32 Claims



18. A knitted fabric having ravel resistant laid-in elastic yarns, said fabric comprising:
a plurality of warp knitted inelastic first threads;
a plurality of elastic second threads laid in and interlooped with said first threads;
a plurality of elastic third threads each laid in with said first threads and touching at least one of said second threads at a plurality of contact points, said third threads being fused to said second threads at said contact points.

4,786,550
MELTBLOWN AND COFORM MATERIALS HAVING APPLICATION AS SEED BEDS
Timothy M. McFarland, Neenah, and James J. O'Connor, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed May 6, 1985, Ser. No. 730,620
Int. Cl.[4] A01G *9/10*
U.S. Cl. 428—203 14 Claims



1. An article comprising a meltblown linear polyolefin polymer easily degraded by sunlight and a plurality of seeds embedded in the loose fibrous structure of said meltblown polymer with the proviso that said meltblown polymer comprises the fibers less than about 10 micrometers in diameter.

4,786,551
MAGNETIC RECORDING MEDIUM
Tsuyoshi Ootani, Tochigi; Junsaku Nakajima; Chiaki Abe, both of Utsunomiya, all of Japan, and Ikuko Wada, Dianella, Australia, assignors to Kao Corporation, Tokyo, Japan
Filed Nov. 5, 1987, Ser. No. 116,791
Claims priority, application Japan, Dec. 26, 1986, 61-309862
Int. Cl.[4] G11B *5/71*
U.S. Cl. 428—323 5 Claims

1. A magnetic recording medium having a magnetic layer composed mainly of a magnetic powder and a resin binder, wherein said magnetic layer comprises

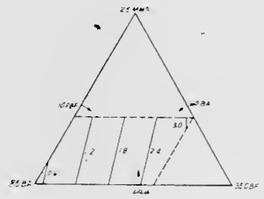
(a) an ester compound comprising (a-1) a compound represented by the following formula (1):

$$R-O-\overset{\overset{O}{\|}}{C}-CH_2+CH_2\rightarrow_{15}CH_3 \quad (1)$$

wherein
R stands for a branched alkyl group having 13 carbon atoms which may be partially substituted with an unbranched alkyl group having 13 carbon atoms, (a-2) butyl stearate and (a-3) butoxyethyl stearate, wherein the amounts of a-1, a-2 and a-3 are 20 to 80 parts by weight, 10 to 40 parts by weight, and 20 to 80 parts by weight, respectively per 100 parts by weight of the sum of a-1, a-2 and a-3; and
(b) carbon black comprising (b-1) carbon black having an average single particle size of 10 to 50mμ and (b-2) carbon black having an average single particle size of 200 to 1,000mμ; and
wherein said ester compound is in an amount of 1 to 15% by weight based on the weight of said magnetic powder

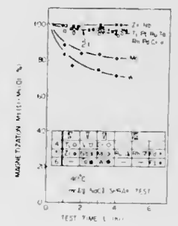
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4,786,552
CURABLE ARCYLIC/FUMARIC PRESSURE-SENSITIVE ADHESIVES
Yukihiko Sasaki, Claremont; Daniel Holguin, Fullerton, and Robert Van Ham, Arcadia, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.
Filed Jul. 7, 1986, Ser. No. 883,491
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—355 33 Claims



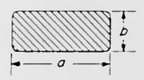
1. A pressure-sensitive adhesive which is a cured pressure sensitive adhesive-layer interpolymer formed on a substrate comprising a pressure-sensitive adhesive polymer having a weight average molecular weight of at least about 100,000 and formed of an interpolymerized amount of a hard-monomer system comprising at least one monomer selected from the group consisting of methacrylate, and alkyl methacrylate containing from 1 to about 6 carbon atoms in alkyl group, an unsaturated carboxylic acid and mixtures thereof, said hard-monomer system being present in an amount up to about 25% by weight, based on the total weight of the monomers; and a soft-monomer system being present in an amount of from about 50% to about 95% by weight, based on the total weight of the monomers, and comprising at least one ester compound selected from alkyl monoesters and diesters of an unsaturated dicarboxylic acid containing 4 carbon atoms wherein each alkyl group independently contains from 4 to about 8 carbon atoms, and in which the ester compound is present in a total amount of up to about 30% by weight, based on the total weight of the monomers, said soft-monomer system further comprising at least one alkyl acrylate.

4,786,553
MAGNETIC RECORDING MEDIUM
Yoshihiro Shiroishi, Hachioji; Sadao Hishiyama, Sayama; Hiroyuki Suzuki, Kokubunji; Norikazu Tsumita, Kanagawa; Tsuneo Suganuma, Tokorozawa; Yoshio Gobara, Hadano; Masaaki Hayashi, Odawara; Makoto Sano, Kanagawa, and Takaaki Shirakura, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 27, 1987, Ser. No. 30,600
Claims priority, application Japan, Mar. 28, 1986, 61-68327; Mar. 28, 1986, 61-68329; Dec. 24, 1986, 61-306421
Int. Cl.[4] H01F *10/10, 10/26*
U.S. Cl. 428—336 26 Claims



18. A magnetic recording medium, which comprises a nonmagnetic substrate and a thin magnetic film formed thereon, the thin magnetic film being consisting essentially of Co, Ni, Hf and Zr, and a concentration of Hf and Zr being 0.1 to 30% by atom on the basis of the total of Co and Ni wherein said Zr and said Hf are concentrated predominantly near the surface of the tine magnatic film.

4,786,554
DRYER FABRIC HAVING WARP STRANDS MADE OF MELT-EXTRUDABLE POLYPHENYLENE SULPHIDE
Samuel M. Baker, Carleton Place; F. Brian Best, Ottawa, both of Canada, and Girish M. Bhatt, Williston, Vt., assignors to JWI Ltd., Ontario, Canada
Division of Ser. No. 822,107, Jan. 24, 1986, and a continuation-in-part of Ser. No. 727,665, Apr. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 605,825, May 1, 1984, abandoned. This application Dec. 23, 1987, Ser. No. 136,945
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—364 9 Claims

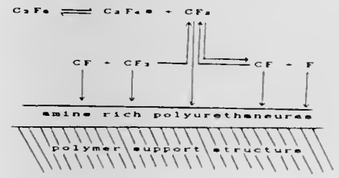


1. A monofilament composed of a blend of polyphenylene sulfide and an effective amount of up to about 20% by weight of an additive which imparts toughness to the monofilament without substantially reducing the hydrolysis resistance inherent in the polyphenylene sulfide, said additive having characteristics of a higher melt viscosity than the polyphenylene sulfide at extrusion temperatures, resistance to thermal degradation at extrusion temperatures, and chemical compatibility with polyphenylene sulfide, and said additive being present in small discrete elongated globules with the long axis of said globules parallel to the axis of the monofilament.

4,786,555
SUPPORT PARTICLES COATED WITH OR PARTICLES OF PRECURSORS FOR OR OF BIOLOGICALLY ACTIVE GLASS
Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 546,152, Oct. 27, 1983, Pat. No. 4,608,350.
This application Jun. 9, 1986, Ser. No. 871,886
Int. Cl.[4] B32B *5/16;* A61F *2/02, 2/28*
U.S. Cl. 428—403 6 Claims

1. A method for making particles of biologically active glass comprising spray-drying an aqueous acid solution showing no substantial amount of precipitation in one hour consisting essentially of precursors that correspond to components of the glass and firing the spray-dried particles to convert the glass precursors to glass, the glass consisting essentially of the components:
SiO_2, 40 to 62 weight percent;
Na_2O, 10 to 32 weight percent;
CaO, 10 to 32 weight percent;
CaF_2, 0 to 18 weight percent;
P_2O_5, 0.1 to 12 weight percent; and
B_2O_3, 0 to 20 weight percent;
wherein Na_2O and CaO taken together, are at least about 30 weight percent.

4,786,556
POLYMERIC ARTICLES HAVING ENHANCED ANTITHROMBOGENIC ACTIVITY
Can B. Hu, Dayton, and Donald D. Solomon, Spring Valley, both of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Division of Ser. No. 843,323, Mar. 24, 1986, Pat. No. 4,720,512.
This application Jul. 24, 1987, Ser. No. 77,468
Int. Cl.[4] B32B *27/08, 27/36*
U.S. Cl. 428—412 13 Claims



1. An article having antithrombogenic properties comprising:
(a) a polymeric support structure;
(b) a polymeric material rich in amine content which serves as a substrate for an antithrombogenic agent, said matrial being selected from the group consisting of primary amines having a carbon chain length of from 2 to 10,000, a polyalkylenimine having 2 to 4 carbon atoms per amine unit and mixtures thereof, said material being bonded to the support structure;
(c) a hydrophobic group covalently bonded to said material; and
(d) an antithrombogenic agent covalently bonded to said material, wherein the activity of the antithrombogenic agent is enhanced by said hydrophobic group.

2. The article of claim 1 wherein the support structure is selected from the group consisting of a polyurethane, polyethylene, polypropylene, polyurethane-silicone, polyurethaneurea, polycarbonate, silicone rubber, polyester, nylon, natural rubber, polyvinyl chloride, acrylic, polystyrene, copolymer of polycarbonate and silicone rubber and mixtures thereof.

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4,786,557
MAGNETIC RECORDING MEDIUM OF CONTINUOUS FORM

Yutaka Kakuishi; Takahito Miyoshi, and Masatoshi Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1987, Ser. No. 39,867
Claims priority, application Japan, Apr. 19, 1986, 61-90610
Int. Cl.[4] G11B *5/702*
U.S. Cl. 428—418 **7 Claims**

1. In a magnetic recording medium in a continuous form comprising a nonmagnetic support, a magnetic recording layer provided on one surface of the support, and a back layer provided on the other surface of the support comprising a binder and nonmagnetic particles dispersed therein, the improvement wherein said binder contains as principal ingredients:

a polyurethane resin containing a repeating unit having at least one polar group selected from the group consisting of $-SO_3M$, $-OSO_3M$, $-COOM$ and $-PO(OM')_2$, wherein M is hydrogen or an alkali metal atom, and M' is hydrogen, an alkali metal atom or a lower hydrocarbon group, in an amount of 0.001-50 mol %; and

a vinyl chloride copolymer containing a repeating unit having at least one polar group selected from the group consisting of $-SO_3M$, $-OSO_3M$, [—COOM] and $-PO(OM')_2$, wherein M and M' have the same meanings as defined above, in an amount of 0.001-5.0 mol %; and

the ratio between the vinyl chloride copolymer and the polyurethane resin being in the range of from 35:65 to 80:20, by weight.

4,786,558
COMPOSITE FILM AND ANTISTATIC COMPOSITE FILM COMPRISING A SWELLABLE INORGANIC SILICATE

Takashi Sumiya, Otsu; Kenji Yabe, Shiga; Takashi Mimura, Otsu, and Satoyuki Minami, Mishima, all of Japan, assignors to Toray Industries, Ltd., Tokyo, Japan

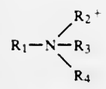
Filed Jan. 30, 1987, Ser. No. 9,300
Claims priority, application Japan, Jan. 31, 1986, 61-17897; Feb. 4, 1986, 61-21182
Int. Cl.[4] B32B *19/02, 19/04, 27/14*
U.S. Cl. 428—454 **28 Claims**

1. A composite film comprising:

a plastic film and

a protective layer which is formed on at least one surface of said plastic film, wherein said protective layer is made of a mixture comprising (a) a swellable inorganic silicate having a layered structure and (b) a compound containing a silanol group at a weight ratio of (a) to (b) of between 1:1000 and 2:1,

wherein said inorganic silicate (a) comprises a phyllosilicate which contains an interlayer ion, which has a ratio of Si:0 of 2:5, which is present in the form of fine particles formed by partial interlayer separation, and in which the crystalline unit lattice is repeated in the thickness direction, with not less than 40% of said interlayer ion comprising,

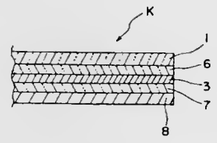


wherein R_1 is an alkyl group having 7 to 50 carbon atoms and R_2, R_3, and R_4 are each a hydrogen atom or an alkyl group having 1 to 10 carbon atoms.

4,786,559
MAGNETOOPTICAL STORAGE ELEMENT

Yoshiteru Murakami, Nishinomiya; Akira Takahashi, Nara; Hiroyuki Katayama, Ikoma; Tomoyuki Miyake, Tenri; Kenji Ohta, Nara, and Michinobu Mieda, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1986, Ser. No. 945,354
Claims priority, application Japan, Dec. 25, 1985, 60-296076; Apr. 1, 1986, 61-76342
The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.
Int. Cl.[4] G11B *7/24*
U.S. Cl. 428—472 **4 Claims**



1. A magnetooptical storage element comprising a recording layer of a multi-layered structure, said structure including a transparent substrate, a first transparent dielectric film on said substrate, a thin film of an amorphous alloy containing rare-earth transition metals on said first transparent dielectric film, a second transparent dielectric film on said thin film, and a reflecting film on said second transparent dielectric film, said reflecting film being made of metals or metalloids is selected from the group consisting of tantalum, lead, zirconium, bismuth, tellurium, and selenium.

4,786,560
ANTISTATIC POLYMERIC ARTICLE

Christopher Crocker, Lancashire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 23, 1985, Ser. No. 812,904
Claims priority, application United Kingdom, Dec. 21, 1984, 8432488
Int. Cl.[4] B32B *27/00;* **D06M** *13/18*
U.S. Cl. 422—500 **8 Claims**

1. An antistatic article comprising a self-supporting thermoplastics polymeric substrate having on at least one surface thereof an antistatic layer wherein the antistatic layer comprises (a) a polychlorohydrin ether of an ethoxylated hydroxyamine and (b) a polyglycol diamine, the total alkali metal content of components (a) and (b) not exceeding 0.5% of the combined weight of (a) and (b).

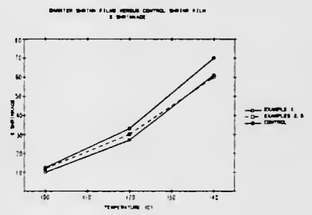
4,786,561
HEAT-SHRINKABLE POLYMERIC BARRIER FILM

Dan S. C. Fong, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 859,204, Apr. 28, 1986, Pat. No. 4,690,865, which is a continuation-in-part of Ser. No. 839,921, Mar. 17, 1986, abandoned. This application Apr. 15, 1987, Ser. No. 39,318
Int. Cl.[4] B32B *27/08;* **B05D** *3/02*
U.S. Cl. 428—502 **11 Claims**

1. A process for making a heat-shrinkable barrier film comprising coating an oriented polyolefin film having a surface energy of at least 35 dynes/cm on at least one side with an aqueous dispersion of vinylidene chloride copolymer, exposing the coated film to heat at a temperature and for a period of time

sufficient to raise the temperature of the film to about 50° C. to about 100° C. and sufficient to remove substantially all of the



water, whereby a film is produced capable of shrinking at least about 10 percent upon heating to about 100° to 120° C.

4,786,562
POLYPROPYLENE MULTI-LAYER FILM

Masahiro Kakugo, Narashino; Tadatoshi Ogawa; Seiichiro Ima, and Teruaki Yoshida, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 2, 1987, Ser. No. 69,223
Claims priority, application Japan, Jul. 11, 1986, 61-164505; May 8, 1987, 62-112718
Int. Cl.[4] B32B *27/00;* **C09J** *7/02*
U.S. Cl. 428—516 **8 Claims**

1. A polypropylene multi-layer film which comprises a crystalline polypropylene substrate layer having laminated to at least one side thereof a sheet of a resin composition consisting essentially of:

(A) 10-90% by weight of a propylene random copolymer satisfying that:

(i) the comonomer content is 4-15% by weight,

(ii) the Vicat softening point is 122° C. or less, and

(iii) the cold xylene-soluble portion content is 15% by weight or less,

(B) 10-90% by weight of a copolymer of propylene and an α-olefin having four or more carbon atoms or a copolymer of propylene, an α-olefin having four or more carbon atoms and ethylene satisfying that:

(i) the content of the α-olefin having four or more carbon atoms is 8-35 mole %,

(ii) the ethylene content is 5 mole % or less,

(iii) the cold xylene-soluble portion content is 15-70% by weight, and

(iv) the Δhaze is 5% or less, and

(C) 0-15% by weight of a highly crystalline polypropylene having a melting point of 150° C. or more.

4,786,563
PROTECTIVE COATING FOR LOW EMISSIVITY COATED ARTICLES

F. Howard Gillery, Allison Park; Russell C. Criss, and James J. Finley, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 812,680, Dec. 23, 1985, Pat. No. 4,716,086, which is a continuation-in-part of Ser. No. 683,458, Dec. 19, 1984, abandoned. This application Sep. 14, 1987, Ser. No. 95,807
Int. Cl.[4] B32B *17/06*
U.S. Cl. 428—630 **8 Claims**

1. A high transmittance, low emissivity article comprising:

a. a transparent nonmetallic substrate;

b. a first transparent anti-reflective film comprising a metal oxide deposited on a surface of said substrate;

c. a transparent infrared reflective metallic film deposited after said first anti-reflective metal oxide film;

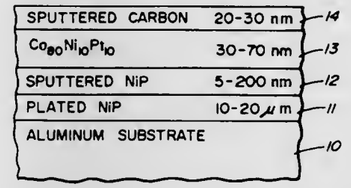
d. a second transparent anti-reflective film comprising a metal oxide deposited after said infrared reflective metallic film; and

e. a protective metal oxide overcoat deposited after said second anti-reflective metal oxide film comprising a metal oxide having a greater durability than said anti-reflective metal oxide at a thickness which does not significantly affect the reflectance and transmittance of the coated article.

4,786,564
METHOD FOR MANUFACTURING A MAGNETIC DISK HAVING REDUCED BIT SHIFT, MINIMIZED NOISE, INCREASED RESOLUTION AND UNIFORM MAGNETIC CHARACTERISTICS, AND THE RESULTING DISK

Tu Chen, Saratoga, and Tsutomu T. Yamashita, San Jose, both of Calif., assignors to Komag, Inc., Milpitas, Calif.

Filed Feb. 25, 1987, Ser. No. 18,650
Int. Cl.[4] H01F *10/30*
U.S. Cl. 428—694 **27 Claims**



1. A method for manufacturing a film of magnetic recording media comprising the steps of:

providing a substrate;

forming a first layer on said substrate by vacuum deposition, said first layer comprising an alloy comprising nickel and phosphorous; and

forming a layer of magnetic recording media directly on sadi first layer wherein said first layer serves to reduce the amount of bit shift exhibited by said media.

12. A structure comprising:

a substrate;

a first layer formed on said substrate by vacuum deposition, said first layer comprising an alloy comprising nickel and phosphorus; and

a magnetic recording medial formed directly on said first layer;

wherein said first layer serves to reduce the amount of bit shift exhibited by said media.

4,786,565
HIGHLY WEATHER-RESISTANT ELECTRODEPOSITION COATING COMPOSITION

Shinji Shirai, Tokyo, Japan, assignor to Yoshida Kogyo K.K., Tokyo and Kansai Paint Co., Ltd., Amagasaki, both of, Japan

Continuation of Ser. No. 784,091, Oct. 4, 1985, abandoned. This application Jun. 19, 1987, Ser. No. 63,705
Claims priority, application Japan, Oct. 6, 1984, 59-209040
Int. Cl.[4] C08L *27/14, 27/16, 27/22, 33/02*
U.S. Cl. 428—421 **10 Claims**

1. A highly weather-resistant electrodeposition coating composition obtained by:

dispersing a mixture of 20 to 90% by weight of an acrylic polycarboxylic resin prepared by copolymerizing an α,β-ethylenically unsaturated carboxylic acid with at least one acrylic monomer, at least one of which having hydroxyl groups, and an ethylenically unsaturated monomer copolymerizable therewith, said acrylic polycarboxylic resin having an acid value of from 30 to 100 and a hydroxyl number of from 20 to 100,

with 10 to 80% by weight of fluorocarbon polymer, which

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is a homopolymer or a copolymer of fluoroolefins and has a particle diameter of from 0.1 to 50 mμ and a melting point not higher than a heating temperature for curing a film formed from said electrodeposition coating compositions,

in the presence of at least one water miscible organic solvent selected from the group consisting of alcohols and cellosolve-type solvents, to form a dispersion,

followed by neutralizing the dispersion with a neutralizing agent selected for the group consisting of ammonia, dimethylamine, trimethylamine, diethylamine, triethylamine, diisopropylamine, butylamine, monoethanolamine, diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine, triisopropanolamine, N-methylethylamine, N-aminoethylethanolamine, N-methyldiethanolamine and polyglycolamine, said neutralizing agent being used in an amount of from 0.3 to 1.2 equivalents with respect to the carboxyl groups on the acrylic carboxylic resin,

and dispersing in water.

4,786,566

SILICON-CARBIDE REINFORCED COMPOSITES OF TITANIUM ALUMINIDE

Paul A. Siemers, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 4, 1987, Ser. No. 10,882
Int. Cl.⁴ B05D *1/10*; B32B *15/14*
U.S. Cl. 428—568 **15 Claims**



1. The method of forming filaments reinforced metal matrix materials which comprises

disposing an array of aligned high strength high temperature filaments on a receiving surface

providing, in powdered form, a particulate titanium base metal of average particle size of at least 100 μm to serve as a matrix to said fibers,

radio frefquency plasma spray depositing said metal particles onto said array of filaments to at least partially impregnate said array and embed said filaments in the metal foil deposit formed by said plasma spray.

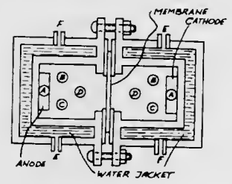
4,786,567

ALL-VANADIUM REDOX BATTERY

Maria Skyllas-Kazacos, Sylvania Heights; Miron Rychick, Bankstown, and Robert Robins, Lindfield, all of Australia, assignors to Unisearch Limited, Australia

Continuation of Ser. No. 849,094, Apr. 7, 1986, abandoned. This application Jan. 12, 1988, Ser. No. 145,640
Claims priority, application Australia, Feb. 11, 1986, PH4536
Int. Cl.⁴ H01M *8/20*
U.S. Cl. 429—19 **110 Claims**

1. An uncharged all-vanadium redox battery having a positive compartment containing a catholyte in electrical contact with a positive electrode, said catholyte comprising an electrolyte containing tetravalent vanadium ions, a negative compartment containing an anolyte in electrical contact with a negative electrode, said anolyte comprising an electrolyte containing tetravalent vanadium ions, and an ionically conducting separator disposed between said positive compartment and said negative compartment and in contact with said catholyte and said anolyte to provide ionic communication therebetween and wherein said catholyte includes a salt of the formula $VO(X)_y$ where y is 2 and X is selected from F, Br or Cl or y is



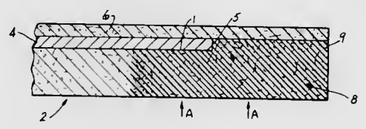
1 and X is selected from SO_4 or O and the concentration of said salt is from 0.25M to 5.0M.

4,786,568

ELECTRODE SUBSTRATE WITH INTEGRAL EDGE SEAL AND METHOD OF FORMING THE SAME

Dan E. Elmore, South Windsor, and Richard J. Roethlein, Stafford Springs, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Mar. 1, 1988, Ser. No. 162,459
Int. Cl.⁴ H01M *2/08*
U.S. Cl. 429—44 **2 Claims**



1. An electrode plate assembly for use in a fuel cell power plant, said assembly comprising:

(a) a porous carbonaceous electrode substrate plate having at least one marginal edge terminating in at least one sidewall, and having a catalyst layer deposited on one surface of said substrate plate, said catalyst layer having at least one marginal edge terminating in at least one sidewall, said sidewall of said catalyst layer being inwardly offset along said one surface of said substrate plate from said side wall of said substrate plate, and said catalyst layer having an exposed surface substantially parallel to said one surface of said substrate plate whereby said sidewall of said catalyst layer extends from said one surface of said substrate plate to said exposed surface of said catalyst layer; and

(b) gas sealing band along each edge of said electrode plate assembly, which band is formed in a single injecting step, and which band includes a first part filling pores in said substrate which first part projects into intimate sealing contact with the surface of said catalyst layer abutting said substrate plate, said band also including a second part formed integral and in one piece with said first part, said second part being disposed in intimate sealing contact with said catalyst layer sidewall and extending above said one surface of said substrate plate to terminate in an exposed surface which is coplanar with the exposed surface of said catalyst layer, said gas sealing band extending from an area of said substrate plate underlying said catalyst layer outwardly to said sidewall of said substrate plate.

4,786,569

ADHESIVELY BONDED PHOTOSTRUCTURABLE POLYIMIDE FILM

Ottmar Rohde, and Armin Schaffner, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 27, 1986, Ser. No. 901,095
Claims priority, application Switzerland, Sep. 4, 1985, 3809/85; Oct. 25, 1985, 4607/85
Int. Cl.⁴ G03C *5/16, 1/80, 1/84*
U.S. Cl. 430—14 **49 Claims**

1. A process for preparing relief images by means of a photolithographic process, comprising the following steps:

(i) coating a substrate surface with a photostructurable negative-working thermostable adhesive.

(ii) applying a self-supporting photostructurable polyimide film to the adhesive-coated surface,

(iii) image-wise exposure of the arrangement with actinic radiation from the side of the polyimide film or of the substrate, and

(iv) developing the system with a suitable developer in order to remove in the unexposed areas both the polyimide film and the adhesive film.

4,786,570

LAYERED, FLEXIBLE ELECTROPHOTOGRAPHIC IMAGING MEMBER HAVING HOLE BLOCKING AND ADHESIVE LAYERS

Robert C. U. Yu, Webster; Anthony M. Horgan, Pittsford; Donald P. Sullivan, Rochester, and John A. Bergfjord, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 21, 1987, Ser. No. 41,019
Int. Cl.⁴ G03G *5/14*
U.S. Cl. 430—58 **20 Claims**

1. A flexible electrophotographic imaging member comprising in sequence a flexible substrate having an electrically conductive surface, a hole blocking layer comprising an aminosilane reaction product, an adhesive layer having a thickness between about 200 angstroms and about 900 angstroms consisting essentially of at least one copolyester resin reaction product of at least one diacid and at least one diol, a charge generation layer comprising a film forming polymeric component, and a hole transport layer, said hole transport layer being substantially non-absorbing in the special region at which said charge generation layer generates and injects photogenerated holes but being capable of supporting the injection of photogenerated holes from said charge generation layer and transporting the holes through said charge transport layer, said copolyester resin having the following formula:



wherein said diacid is selected from the group consisting of terephthalic acid, isophthalic acid, and mixtures thereof, said diol comprises ethylene glycol, the mole ratio of said diacid to said diol is about 1:1, n is a number between about 175 and about 350 and the T_g of said copolyester resin is between about 50° C. about 80° C.

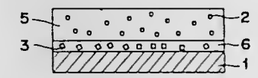
4,786,571

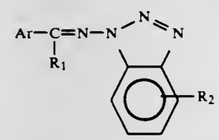
PHOTOSENSITIVE MEMBER WITH HYDRAZONE CHARGE TRANSPORT MATERIAL

Hideaki Ueda, Kawanishi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1987, Ser. No. 51,646
Claims priority, application Japan, May 20, 1986, 61-115915
Int. Cl.⁴ G03G *5/09, 5/14*
U.S. Cl. 430—59 **7 Claims**

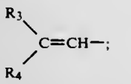
1. A photosensitive member for electrophotography, which contains an specific hydrazone compound represented by the following formula as a charge transporting material;





(I)

wherein Ar is an aryl group, heterocyclic group, condensed polycyclic group, which may have a substituent, or a group represented by the formula



R_1, R_2 and R_3 independently is any of hydrogen atom, an alkyl group, aralkyl group, or aryl group where the alkyl group, aralkyl group and aryl group may have a substituent; R_4 is any of aryl group, heterocyclic group and condensed polycyclic group, which may have a substituent; and Ar and R_1 or R_3 and R_4 may combinedly form cyclic ring and further comprising a photoconductive material.

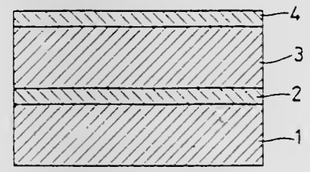
5. The photosensitive member of claim 1, which consists essentially of a charge generating layer, a charge transporting layer and an electroconductive substrate wherein the charge transporting layer contains the hydrazone compound dissolved or dispersed in a binder.

4,786,572

ELECTROPHOTOGRAPHIC MEMBER WITH SILICIDE INTERLAYER

Hisao Haku, Neyagawa; Kazuyuki Goto; Masaru Takeuchi, both of Hirakata; Takeo Fukatsu, Uji, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 896,617, Aug. 14, 1986, Pat. No. 4,681,826, which is a continuation-in-part of Ser. No. 640,314, Aug. 13, 1984, Pat. No. 4,624,905. This application Jul. 20, 1987, Ser. No. 75,129
Claims priority, application Japan, Feb. 14, 1984, 59/26254; Feb. 14, 1984, 59/26255
Int. Cl.⁴ G03G *5/14, 5/082*
U.S. Cl. 430—60 **4 Claims**



1. An electrophotographic photosensitive member comprising:

(a) a substrate made of an electrically conductive material;

(b) a silicide layer formed on the surface of the substrate wherein the silicide is selected from the group consisting of Co silicide, Mo silicide, and W silicide; and

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(c) a photoconductive layer superposed on the silicide layer being composed chiefly of amorphous silicon and containing hydrogen.

4,786,573

LAYERED LIGHT RECEIVING MEMBER FOR ELECTROPHOTOGRAPHY COMPRISING BUFFER LAYER

Hiroshi Amada; Tetsuya Takei, and Naoko Shirai, all of Nagahama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1987, Ser. No. 35,392

Claims priority, application Japan, Apr. 8, 1986, 61-80377; Apr. 8, 1986, 61-80378; Apr. 8, 1986, 61-80379

Int. Cl.[4] G03G *5/082, 5/14*

U.S. Cl. 430—65 **29 Claims**

1. An improved light receiving member including on a substrate constituted principally of aluminum, a buffer layer, a 0.03 to 15 μm thick high resistance intermediate layer and a 1 to 100 μm thick photoconductive layer being disposed in this order from the side of said substrate; said buffer layer comprising a non-single-crystal containing silicon atoms and aluminum atoms to improve contact between said substrate and said high resistance intermediate layer; said high resistance intermediate layer comprising a non-single-crystal material containing silicon atoms, 10 to 5×10^5 atomic ppm of at least one kind of atom selected from the group consisting of oxygen atoms, carbon atoms and nitrogen atoms, and at least one kind of atom selected from hydrogen atoms and halogen atoms; and said photoconductive layer comprising an amorphous material containing silicon atoms as the main constituent and at least one kind of atom selected from the group consisting of hydrogen atoms and halogen atoms in a total amount of 1 to 40 atomic %.

4,786,574

LAYERED AMORPHOUS SILICON CONTAINING PHOTOCONDUCTIVE ELEMENT HAVING SURFACE LAYER WITH SPECIFIED OPTICAL BAND GAP

Shigeru Shirai, Ueno; Keishi Saitoh, Nagahama; Takayoshi Arai, Ueno; Minoru Kato, Ueno, and Yasushi Fujioka, Ueno, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1987, Ser. No. 11,507

Claims priority, application Japan, Feb. 5, 1986, 61-24605; Feb. 6, 1986, 61-24652; Feb. 7, 1986, 61-26464; Feb. 7, 1986, 61-26465; Feb. 12, 1986, 61-28149; Feb. 13, 1986, 61-29792

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—66 **47 Claims**

1. A light-receiving member for electrophotography comprising a substrate and a light-receiving layer provided on the substrate comprising a photoconductive layer exhibiting photoconductivity comprising an amorphous material containing at least one of hydrogen atoms and halogen atoms as the constituent in a matrix of silicon atoms and a surface layer comprising an amorphous material containing silicon atoms, carbon atoms and hydrogen atoms as the constituents, said surface layer being changed in the distribution concentration in the layer thickness direction of the constituent elements such that an optical band gap of said surface layer and an optical band gap of said photoconductive layer are matched at an interface between the surface layer and the photoconductive layer and the maximum distribution concentration of the hydrogen atoms within said surface layer being 41 to 70 atomic percent.

4,786,575

PIGMENT FOR ELECTROPHOTOGRAPHIC RECORDING PROCESSES

Hans-Tobias Macholdt, Darmstadt; Alexander Sieber, Frankfurt am Main, and Helmut Tröster, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main

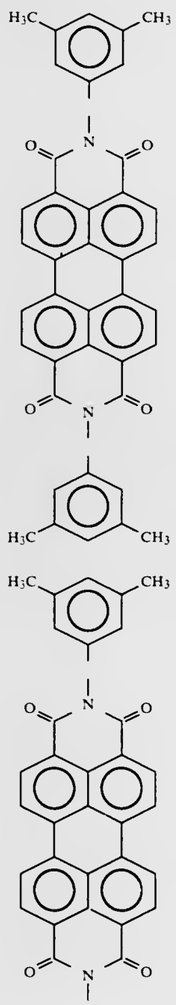
Filed Jan. 22, 1987, Ser. No. 6,509

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602182

Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—109 **2 Claims**

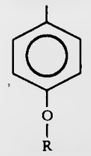
1. An electrophotographic toner containing a binder and mix-crystals of 99-70 parts of a compound of the following formula I and 1-30 parts of a compound of the following formula II



I

II

-continued



where R in formula II denotes an C_1-C_4-alkyl group, as a pigment.

4,786,576

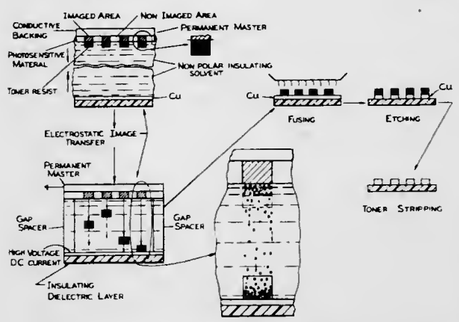
METHOD OF HIGH RESOLUTION OF ELECTROSTATIC TRANSFER OF A HIGH DENSITY IMAGE TO A NONPOROUS AND NONABSORBENT CONDUCTIVE SUBSTRATE

David P. Bujese, Butler, and Gary W. Schmidt, Park Ridge, both of N.J., assignors to Olin Hunt Specialty Products, Inc., Palisades Park, N.J.

Continuation of Ser. No. 883,797, Jul. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 848,669, Apr. 4, 1986, Pat. No. 4,661,431, which is a continuation-in-part of Ser. No. 655,346, Sep. 27, 1984, abandoned. This application Nov. 19, 1987, Ser. No. 158,168

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—126 **38 Claims**



1. A method of fabricating a toned pattern on an electrically isolated nonabsorbent conductive receiving surface, comprising the steps of:

(a) establishing a charged electrostatic latent image area on an electrostatically imageable surface;

(b) developing the electrostatic latent image area by applying to the electrostatically imageable surface charged tones particles of a predetermined height suspended in a liquid comprised at least partially of a nonpolar insulating solvent to form a first liquid layer with a first liquid surface, the charged toner particles being directed to the latent image area of the electrostatically imageable surface to form a developed latent image;

(c) applying to the conductive receiving surface a liquid comprised at least partially of a nonpolar insulating solvent to form a second liquid layer with a second liquid surface;

(d) establishing an electric field between the electrostatically imageable surface and the conductive receiving surface by connecting a D.C. voltage directly to the conductive receiving surface;

(e) placing the conductive receiving surface adjacent to the electrostatically imageable surface so that a gap is maintained therebetween and the first liquid surface contacts the second liquid surface to create a liquid transfer medium across the liquid-filled gap, the liquid-filled gap being of a depth greater than the height of the toner particles;

(f) transferring the developed latent image from the electrostatically imageable surface at a point of transfer through the liquid to the conductive receiving surface to form a transferred toner particle image in an imaged area and define non-imaged area where toner particles are absent;

(g) maintaining the gap during transfer of the developed latent image between the electrostatically imageable surface and the conductive receiving surface at the point of transfer between at least about 1 mil and about 20 mils; and

(h) fusing the transferred toner particles image to the conductive receiving surface.

4,786,577

PHOTO-SOLUBILIZABLE COMPOSITION ADMIXTURE WITH RADIATION SENSITIVE ACID PRODUCING COMPOUND AND SILYL ETHER GROUP CONTAINING COMPOUND WITH EITHER URETHANE, UREIDO, AMIDO, OR ESTER GROUP

Toshiaki Aoai, and Akihiko Kamiya, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

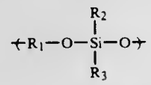
Filed Dec. 12, 1985, Ser. No. 807,937

Claims priority, application Japan, Dec. 14, 1984, 59-264183

Int. Cl.[4] G03C *1/495*

U.S. Cl. 430—192 **16 Claims**

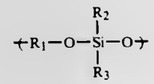
1. A photo-solubilizable composition comprising in admixture (a) a compound capable of producing an acid upon being irradiated with actinic light rays, and (b) a compound represented by the repeating units of formula (II)



(II)

wherein R_1 represents a divalent aliphatic or aromatic hydrocarbon containing at least one of a urethane group, a ureido group, an amido group, and an ester group, and R_2 and R_3, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, or $—OR_4$, wherein R_4 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted aralkyl group, wherein said compound (b) is capable of being decomposed with an acid, wherein the weight ratio of the compound (a) to the compound (b) is from 0.001/1 to 2/1, and wherein said compound (a) and said compound (b) are present in an amount effective to provide excellent storage stability with time.

7. A photo-solubilizable composition comprising in admixture (a) a compound capable of producing an acid upon being irradiated with actinic light rays, and (b) a compound represented by the repeating units of formula (II)



(II)

wherein R_1 represents a divalent aliphatic or aromatic hydrocarbon containing at least one of a urethane group, a ureido group, an amido group, and an ester group, and R_2 and R_3, which may be the same or different, each represents a hydrogen atom, an alkyl group, an alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, or $—OR_4$, wherein R_4 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted aralkyl group and wherein R_1 additionally comprises at least one hydrophilic group, wherein the weight ratio of the compound (a) to the compound (b) is

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from 0.001/1 to 2/1, and wherein said compound (a) and said compound (b) are present in an amount effective to provide excellent storage stability with time.

4,786,578

AGENT AND METHOD FOR THE REMOVAL OF PHOTORESIST AND STRIPPER RESIDUES FROM SEMICONDUCTOR SUBSTRATES

Karl H. Neisius, Darmstadt, and Alois Litters, Lampertheim Hofheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 819,563, Jan. 17, 1986, abandoned. This application Jul. 20, 1987, Ser. No. 77,970

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501675

Int. Cl.[4] G03C *11/12*

U.S. Cl. 430—256 18 Claims

1. A method for removing photoresist and stripper residues from a substrate comprising treating with a post rinsing agent a substrate which has been subjected to photoresist stripping with a photoresist stripping agent and removed from said photoresist stripping agent, said post-rinsing agent comprising effective amounts of a nonionic surfactant and an organic base in aqueous solution, said organic base being water soluble to a degree whereby it will form a water-soluble salt with alkylbenzenesulfonic acids when the agent is contacted therewith.

4,786,579

HEAT-RESISTANT PHOTOSENSITIVE RESIN COMPOSITION

Kenji Tazawa, Samukawa, and Akihiko Saito, Yokohama, both of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1987, Ser. No. 38,124

Claims priority, application Japan, Apr. 28, 1986, 61-96933

Int. Cl.[4] G03C *1/68, 5/16*

U.S. Cl. 430—280 8 Claims

1. A heat-resistant photosensitive resin composition which comprises:

(A) a mixture of resins composed of

(A-1) a diallyl phthalate resin,

(A-2) a first esterified resin which is a reaction product of a cresol novolac epoxy resin with an ethylenically unsaturated carboxylic acid in an amount of 0.2 to 0.8 mole per mole of the epoxy groups in the cresol novolac epoxy resin, and

(A-3) a second esterified resin which is a reaction product of a phenol novolac epoxy resin, a cresol novolac epoxy resin or a combination thereof, with an ethylenically unsaturated carboxylic acid in an amount of 0.9 to 1.1 moles per mole of the epoxy groups in the epoxy resin or resins;

(B) a photopolymerization initiator; and

(C) a curing agent for the epoxy resins.

8. The heat-resistant photosensitive resin composition of claim 1, wherein the curing agent for the epoxy resins as the component (C) is selected from the group consisting of amine compounds, acid anhydride compounds, phenolic resins, melamine resins and cationic epoxy curing agents.

4,786,580

METHOD OF DEVELOPING IMAGED DIAZO MATERIAL WITH PROPANOL CONTAINING DEVELOPER COMPOSITION

Shane Hsieh, Bridgewater, and Wayne A. Mitchell, Bound Brook, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Dec. 27, 1983, Ser. No. 566,125

Int. Cl.[4] G03F *7/08;* G03C *5/18, 5/34*

U.S. Cl. 430—325 10 Claims

1. A method for developing imagewise light exposed negative working diazonium salt sensitized photographic elements by contacting said exposed element with an aqueous developer solution comprising:

(a) a solvent solution composition consisting essentially of, in admixture:

(i) from about 1% to about 28% by weight of the developer of at least one alcohol selected from the group consisting of n-propanol and isopropyl alcohol; and

(ii) from about 5% to about 30% by weight of the developer of at least one component selected from the group consisting of propylene glycol mono methyl ether, propylene glycol mono propyl ether, ethylene glycol monophenyl ether, diethylene glycol mono ethyl ether, and diethylene glycol acetate, and

(b) from about 1% to about 10% by weight of the developer of at least one salt selected from the group consisting of lithium magnesium potassium sodium and ammonium sulfates, phosphates and nitrates; and

(c) from about 0.1% to about 2% by weight of the developer of at least one non-ionic surfactant selected from the group consisting of ethoxylated alkyl phenols.

4,786,581

GUMMING SOLUTION FOR USE IN THE BURNING-IN OF OFFSET-PRINTING PLATES COMPRISING WATER, A HYDROPHILIC POLYMER AND AN ORGANIC ACID DERIVATIVE

Paul Stahlhofen, Wiesbaden, and Loni Schell, Hofheim-Wallau, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 713,806, Mar. 20, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 13,185

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410522

Int. Cl.[4] G03C *5/18*

U.S. Cl. 430—331 5 Claims

1. A solution for use in the burning-in of irradiated and developed offset-printing plates, consisting essentially of an admixture of (a) enough water to solubilize water-soluble components in said solution, (b) at least one water-soluble hydrophilic polymer selected from the group consisting of poly-N-vinyl-pyrrolidone-(2), polyvinyl methylether, a copolymer containing ethylene units and maleic anhydride units, a homopolymer or copolymer containing at least one from the group consisting of vinyl phosphonic acid units and vinyl methyl phosphinic acid units, and a polyalkylene glycol and (c) at least one component derived from an organic acid, wherein (i) said component (c) comprises at least one water-soluble organic acid comprising at east two acid functions and being selected from the group consisting of a benzene carboxylic acid, a benzene sulfonic acid, a benzene phosphonic acid, and an alkane phosphonic acid, or a water-soluble salt thereof; (ii) about 1 to 50% by weight of said solution is comprised of components (b) and (c), which are present in a weight ratio ranging from about 1:1 to 1:20, and (iii) said solution is capable of producing, even after burning-in a totally water-soluble layer.

4,786,582

ORGANIC SOLVENT FREE DEVELOPER FOR PHOTOSENSITIVE COATINGS

Tulay Duyal, Manalapan, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 762,079, Aug. 2, 1985, abandoned. This application Oct. 10, 1986, Ser. No. 917,576

Int. Cl.[4] G03C *5/18*

U.S. Cl. 430—331 15 Claims

1. An organic solvent free developing composition which comprises an aqueous admixture having a pH of from about 6.8 to about 7.2 of

(a) one or more components selected from the group consisting of tri-sodium, -lithium, or -potassium phosphate, or sodium, lithium or potassium carbonate; and

(b) one or more components selected from the group consisting of sodium, lithium, or potassium benzoate or salicylate; and

(c) one or more components selected from the group consisting of sodium lithium, potassium, magnesium or calcium octyl, decyl or dodecyl sulfate; and

(d) one or more components selected from the group consisting of mono-sodium, -lithium, or -potassium phosphates and carbonates, and

(e) sufficient water to formulate an effective developer

wherein said ingredient (a) is present in an amount of from about 0.5% to about 10% by weight of the overall composition, and

wherein said ingredient (b) is present is an amount of from about 0.5% to about 20% by weight of the overall composition, and

wherein said ingredient (c) is present in an amount of from about 1% to about 10% by weight of the overall composition, and

wherein said ingredient (d) is present in an amount of from about 0.2% to about 5.0% by weight of the overall composition, and

wherein said composition is organic solvent free, and wherein at least one of components (a) and (d) is a phosphate.

4,786,583

STABILIZING BATH FOR USE IN PHOTOGRAPHIC PROCESSING

Paul A. Schwartz, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1987, Ser. No. 64,633

Int. Cl.[4] G03C *1/06, 11/00, 7/26, 5/39*

U.S. Cl. 430—372 18 Claims

1. An aqueous photographic stabilizing bath for use in the color processing of photographic elements, said bath containing a dye stabilizing agent and an alkanolamine, said alkanolamine being present in an amount sufficient to inhibit sulfurization of said stabilizing bath resulting from carry-in of a thiosulfate fixing agent.

4,786,584

METHOD OF SUPPLYENG REPLENISHING SOLUTION IN AUTOMATIC DEVELOPING MACHINE

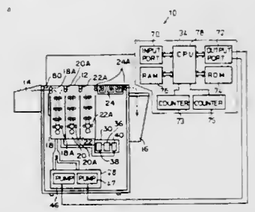
Yoichi Endo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1987, Ser. No. 67,182

Claims priority, application Japan, Jun. 27, 1986, 61-151214; Oct. 6, 1986, 61-237569

Int. Cl.[4] G03C *5/24, 1/06*

U.S. Cl. 430—434 14 Claims



1. A method of supplying a replenishing solution to the processing tank incorporated in an automatic developing machine in which a photosensitive material is subject to developement by means of a developer, said developer having a desired pH, comprising the steps of:

supplying a less active replenishing solution to said processing tank at the commencement of the present processing operation of said automatic developing machine prior to or in the course of the processing of said photosensitive material, said less active replenishing solution compensating for the deterioration of a developer due to air oxidation during the preceding operating period and the subsequent stop period of said automatic developing machine, wherein said less active replenishing solution has a lower pH than said desired pH of said developer; and

supplying a normally active replenishing solution to said processing tank after completion of the supply of said less active replenishing solution, said normally active replenishing solution compensating for the deterioration of said developer due to the processing of said photosensitive material, said normally active replenishing solution having the same pH as said desired pH of said developer, wherein the value of the required quantity of said less active replenishing solution to be presently supplied represents a target MDR value, said target MDR value being obtained from the result of arithmetic operations based on a virtual MDR value of a predetermined quantity of said less active replenishing solution to be supplied under standard operational conditions and a true MDR value of the calculated quantity of said less active replenishing solution to be supplied, said true MDR value being obtained from the operating and stop periods of the preceding replenishment.

4,786,585

IMAGE FORMING AND DATA STORAGE

Victor C. Humberstone, Stapleford, and Robert M. Pettigrew, Foxton, both of England, assignors to Plasmon Data Systems, Incorporated, Curacao, Netherlands Antilles

Continuation of Ser. No. 558,172, Dec. 5, 1983, abandoned. This application May 13, 1986, Ser. No. 862,805

Claims priority, application United Kingdom, Dec. 6, 1982, 8234722

The portion of the term of this pateat subsequent to Oct. 7, 2003, has been disclaimed.

Int. Cl.[4] G01D *9/00;* G11B *7/24;* G03C *1/72*

U.S. Cl. 430—495 21 Claims

3. A radiation-sensitive medium comprising a substrate having a surface structure comprising grooves having a depth in the range 20 to 100 nanometers, and a pitch of 20 to 1000 nanometers, and at said surface structure, a layer of a radiation-sensitive or radiation-absorptive material, said material and the surface structure being such that irradiation of a predetermined polarisation causes radiation to be absorbed at the irradiated parts of the surface so that corresponding areas of the radiation-sensitive or radiation-absorptive layer are affected in a way which makes such areas distinguishable from the remaining areas of the radiation-responsive layer.

4,786,586

RADIATION CURABLE COATING FOR PHOTOGRAPHIC LAMINATE

San A. Lee, Crystal Lake, and Stuart M. Ellerstein, Barrington, both of Ill., assignors to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 763,755, Aug. 6, 1985, abandoned, which is a continuation of Ser. No. 439,521, Nov. 5, 1982, abandoned. This application Feb. 12, 1987, Ser. No. 14,160

Int. Cl.[4] C08F *2/50, 20/36, 20/18;* G03C *7/14*

U.S. Cl. 430—532 5 Claims

1. Unexposed photographic color print material comprising a laminate of a photoemulsion layer having front and back sides and an optically clear coating layer having front and back sides, wherein:

A. said photoemulsion layer is adapted to be exposed to the image of a color print negative projected through said coating layer, developed by an immersion development process, and viewed through said coating layer following said development process;

B. the front side of said coating layer is the front outside surface of said color print material, and is adapted to be in

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contact with immersion development process chemicals during develpment of said print material;

C. the back side of said coating layer faces the front side of said photoemulsion layer;

D. said coating layer has the property of being essentially non-yellowing during and after immersion of said color print material in immersion development process chemicals with said coating layer in direct contact with said chemicals; and

E. said coating layer consists essentially of the cured reaction product of:

(i) from 45 to 80 percent, based upon total weight of the composition, of an oligomer of the formula:

$$X\text{OCNHR}^2\text{NHCOR}^1\text{OCNHR}^2\text{NHCO}Q$$

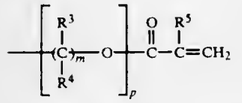
where

R^1 is a linear or branched hydrocarbon polymer of from 1,000 to 4,000 molecular weight selected from the group consisting of fully hydrogenated 1,2-polybutadiene; 1,2-polybutadiene hydrogenated to an iodine number of from 9 to 21; and fully hydrogenated polyisobutylene;

R^2 is a linear, branched or cyclic alkylene of from six to twenty carbon atoms; and

X and Q are independently either

(a) a radical of the formula:



wherein R^3, R^4, and R^5 are independently hydrogen or methyl, m is an integer from 1 to 10, and p is either zero or one, or

(b) a saturated alkyl radical of from nine to twenty carbon atoms,

with the proviso that said oligomer must possess at least one acrylate or methacrylate terminal group;

(ii) from 20 to 50 percent, based on total weight of the composition, of an acrylate or methacrylate terminated reactive diluent of from 11 to 22 carbon atoms; and

(iii) from 0.5 to 5 percent, based upon the total weight of the composition, of a photoinitiator selected from the goup consisting of alpha-hydroxycyclohexylphenyl ketone, diethoxyacetophenone, 1-(4-dodecylphenyl)-2-hydroxy-2-methyl-propan-1-one, 2-hydroxy-2-methyl-1-phenyl-propan-1-one, and mixtures thereof;

wherein R^1 and R^2 are free of aromatic, ether, or ester functional groups.

4,786,587

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING TWO KINDS OF MONODISPERSE EMULSIONS DIFFERING IN MEAN GRAIN SIZE

Ken-ichi Kuwabara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 845,300, Mar. 28, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 115,645

Claims priority, application Japan, Mar. 28, 1985, 60-64199

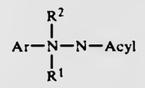
Int. Cl.⁴ G03C *1/06, 1/02*

U.S. Cl. 430—566 **20 Claims**

1. A silver halide photographic material comprising at least one negative type silver halide emulsion layer coated on a support, said emulsion comprising two kinds of monodisperse emulsions each having a mean grain size of not more than 0.5 micron and, differing in mean grain size from each other at least by 0.1 micron, and said photographic material further comprising a hydrazine derivative in at least one photographic layer, wherein one of said monodisperse emulsions has a mean grain size of not more than 0.3 micron and the other has a mean grain size of at least 0.3 micron, wherein the fraction of the finer-grained silver halide ranges from 40 to 90% by weight based on the weight of the total amount of silver halide in the monodisperse emulsions, wherein said hydrazine derivative is a compound selected from the group consisting of compounds represented by formulae (I) and (II):

$$R_1\text{—NHNH—G—}R_2 \qquad \text{(I)}$$

wherein R_1 represents an aliphatic group, an aromatic group or a saturated heterocyclic group; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted alkoxy group, or a substituted or unsubstituted aryloxy group; and G represents a carbonyl group, a sulfonyl group, a sulfoxy group, a phosphoryl group, or a N-substituted or unsubstituted iminomethylene group, and



(II)

wherein;

"Acyl" is an acyl group,

"Ar" is an aryl group,

R^1 represents a hydrogen atom and sulfinic acid radical substituent, and

R^2 is chosen to be a sulfinic acid radical substituent when R^1 is a hydrogen atom and a hydrogen atom when R^1 is a sulfonic acid radical, wherein said hydrazine derivative is present in a contrast-enhancing amount.

4,786,588

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Tadashi Ogawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 22, 1986, Ser. No. 909,540

Claims priority, application Japan, Sep. 20, 1985, 60-209803; May 19, 1986, 61-114273; Jun. 5, 1986, 61-130736

Int. Cl.⁴ G03C *1/08*

U.S. Cl. 430—603 **13 Claims**

1. A silver halide photographic material comprising a support having provided thereon a sulfur-sensitized silver halide emulsion, wherein the silver halide particles in the emulsion as formed by the reaction of a water-soluble silver salt and a water-soluble halide are, after demineralization, subjected to transhalogenation along with sulfur sensitization by the addition of a water-soluble bromide to the emulsion in an amount of 0.1 mol % to 7 mol % of the total amount of the silver halide therein just before or during the sulfur sensitization.

4,786,589

IMMUNOASSAY UTILIZING FORMAZAN-PRELABELED REACTANTS

Donald E. Rounds, Altadena, Calif., assignor to Huntington Medical Research Institute, Pasadena, Calif.

Filed Aug. 18, 1986, Ser. No. 897,601

Int. Cl.⁴ G01N *33/544, 33/542, 33/536*

U.S. Cl. 435—5 **18 Claims**

1. A method for detecting the presence of target proteins in a test fluid comprising:

mixing a sample of the test fluid with a solution free of target proteins and containing a primary protein having a specific affinity for the target protein which has been prelabeled with formazan for a time sufficient to form a colored reaction product between the prelabeled primary proteins and any target proteins in the test fluid;

separating any formed reaction product from unreacted prelabeled primary proteins; and

visually detecting the presence of any formed reaction product.

4,786,590

DIAGNOSTIC AND THERAPEUTIC ASPECTS OF RECEPTOR-MEDIATED LEUKEMOGENESIS

Michael S. McGrath, Menlo Park; Irving L. Weissman, Stanford, and Leroy Hood, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena and The Board of Trustees of the Leland Stanford, Jr. University, Stanford, both of, Calif.

Filed Jan. 15, 1985, Ser. No. 691,997

Int. Cl.⁴ G01N *33/569, 33/574, 33/577;* **A61K** *39/00*

U.S. Cl. 435—5 **12 Claims**

1. A method for detecting the presence of tumor cells in a warm-blooded animal host, said method comprising:

combining a physiological sample suspected of containing a cell surface membrane receptor (CSMR) with a compound capable of binding to said CSMR, where said CSMR is characterized by: (1) being involved in the activation of cells from the resting phase to the cell division cycle; and (2) capable of specifically binding to a binding site of a transforming retrovirus; and

determining the level of complex formation between said compound and said CSMR as compared to a predetermined value, as indicative of the presence of tumor cells.

2. A method according to claim **1**, wherein said cell is a lymphocyte.

12. A method for treating a host suspected of having a tumor caused by a transforming retrovirus, said method comprising:

administering to said host a growth retarding amount of a compound which specifically binds to a cell surface membrane receptor of said tumor cell, wherein said receptor is characterized by: (1) being involved in the activation of a cell from the resting phase to the cell division cycle; and (2) specifically binding to an antigen of said retrovirus;

whereby the proliferation of said cells having said cell surface membrane receptor is retarded.

4,786,591

PROCESS FOR DETERMINING THE BINDING CAPACITY OF THYROXIN-BINDING GLOBULIN

Brigitte Draeger, Tutzing; Winfried Albert, Pähl; Martina Junius, Bernried, and Jürgen Rasch, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 827,349, Feb. 7, 1986, abandoned. This application Dec. 23, 1986, Ser. No. 945,785

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546014

Int. Cl.⁴ G01N *33/53, 33/543, 33/549*

U.S. Cl. 435—7 **13 Claims**

1. A process for determining the binding capacity of thyroxin binding globulin (TBG) comprising incubating a serum sample containing TBG with T_4 or T_3 bound via a spacer to an enzyme label and immobilized antibody which specifically binds to TBG under conditions favoring binding of TBG to labeled T_4 or T_3 and formation of complexes between said immobilized antibody and TBG bound to labeled T_4 or T_3, separating free and immobilized phrases and measuring label in one of the phases as a measurement of the binding capacity of thyroxin binding globulin in said sample.

4,786,592

NEISSERIA GONORRHOEAE LECTIN USEFUL AS A VACCINE AND DIAGNOSTIC MARKER AND MEANS FOR PRODUCING THIS LECTIN

Carolyn D. Deal, San Diego; Magdalene Y. H. So, Cardiff, and H. Steven Seifert, Del Mar, all of Calif., assignors to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 875,477, Jun. 18, 1986, abandoned. This application Sep. 12, 1986, Ser. No. 907,115

Int. Cl.⁴ A61K *39/095;* **C07H** *21/00;* **C12N** *15/00;* **G01N** *33/571*

U.S. Cl. 435—7 **23 Claims**

1. An isolated bacterial lectin, obtainable from gonococci, having a relative molecular weight of about 22,400 daltons, as determined by sodium dodecyl sulfate-polyacrylamide gel electrophoresis, and an isolectric pH value in the range of about 6.1 to about 6.4; said lectin having the ability to bind specifically gangliotetraosylceramide.

6. A method of immunizing a human against a gonococcal infection which comprises administering to the human an effective amount of the lectin defined in claim **1** in a pharmaceutically acceptable carrier.

10. A diagnostic system suitable for assaying for *Neisseria gonorrhoeae* lectin GCL-1, which system comprises, in combination: (a) antibodies to the lectin GCL-1 as defined in claim **1** and (b) indicator means capable of signaling an immunoreaction of said antibodies with said lectin GCL-1.

14. An isolated DNA fragment capable of expressing the bacterial lectin of claim **1** when contained in an expression vector; said DNA fragment having a coding region for said lectin of no more than about 650 base pairs and a flanking region linked on either side thereof, and said flanking regions together with said coding region containing no more than 10 kb pairs.

4,786,593

DIAGNOSTIC METHOD FOR DETECTION OF NEURAL CREST DISEASE

Alonzo Ross, Bensalem; Hilary Koprowski, and Meenhard Herlyn, both of Wynnewood, all of Pa., assignors to Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Filed Apr. 16, 1985, Ser. No. 723,760

Int. Cl.⁴ G01N *33/53, 33/567, 33/543*

U.S. Cl. 435—7 **13 Claims**

1. A method for the identification of human tumors of neural crest origin which comprises:

isolating a tissue section from a human, said tissue section comprising human cells;

contacting said tissue section with an antibody specific for human NGF-receptors having an apparent molecular weight of about 75,000 daltons by SDS-polyacrylamide gel electrophoresis, and determining the concentration of said antibody bound to said cells in the cytoplasm and at the cell surface.

4,786,594

ENZYME IMMUNOASSAY

Pyare Khanna, San Jose; Dennis M. Bleile, Redwood City, and Cynthia D. Stiso, Sunnyvale, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 14, 1986, Ser. No. 863,268

Int. Cl.⁴ G01N *53/00, 21/00, 33/552*

U.S. Cl. 435—7 **23 Claims**

1. A method for determining an analyte in a sample suspected of containing said analyte, which analyte is a member of a specific binding pair (sbp) consisting of ligand and complementary receptor, said method comprising

providing in combination in a first aqueous medium (1) said sample, (2) a first reagent comprising a non-dispersed surface to which is bound an sbp member and (3) a conjugate of an enzyme and an sbp member that becomes bound to said surface in relation to the amount of analyte in said sample, the volume of said aqueous medium being suffi-

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ciently large to allow complete immersion of said first reagent therein;

incubating for a time period sufficient to permit said binding to occur;

adding to said first aqueous medium, without separation of said first reagent therefrom, (1) a second reagent reactive with said conjugate and capable of generating a signal in relation to the amount of analyte in said sample, and (2) a second aqueous medium of sufficient volume to increase the volume of said first aqueous medium by at least three fold, and

examining said first reagent for the presence of said signal.

4,786,595

ANALYTICAL ELEMENT FOR ANALYSIS OF AN ANALYTE

Fuminori Arai; Takushi Miyazako, and Harumi Katsuyama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 553,170, Nov. 18, 1983, abandoned. This application Apr. 29, 1986, Ser. No. 858,545

Claims priority, application Japan, Nov. 19, 1982, 57-202157

Int. Cl.⁴ C12Q *1/26;* **G01N** *21/77, 33/546*

U.S. Cl. 435—25 **8 Claims**

1. An analytical element having at least one reagent layer comprising a color-forming reagent which forms a color in the presence of an analyte and a hydrophilic binder wherein

a portion or all of the binder is a polymer or copolymer containing a repeating unit represented by the formula

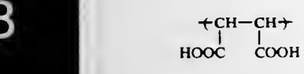


(I)

wherein at least a portion of the carboxyl groups in the repeating unit represented by formula (I), have a nonionic group containing a repeating unit represented by formula (II) attached to the carboxyl group through an ester linkage:

$$-CH_2CH_2O- \quad \text{(II)}.$$

8. A multilayer analytical element for analysis of amylase comprising a diazonium color-forming layer containing a diazonium compound and a binder, and a coupler substrate layer provided on the diazonium color-forming layer, in which at least a portion or all of said binder is a polymer containing a repeating unit represented by formula (I)



(I)

wherein at least a portion of the carboxyl groups in the repeating unit represented by formula (I), have a nonionic group containing a repeating unit represented by formula (II) attached to the carboxyl group through an ester linkage:

$$-CH_2CH_2O- \quad \text{(II)}.$$

4,786,596

METHOD OF PREPARING A TEST STRIP FOR ALCOHOL TESTING

Ernest C. Adams, North Webster, Ind., assignor to Chem-Elec., Inc., North Webster, Ind.

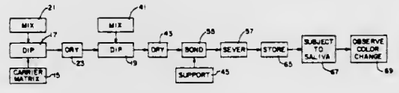
Filed Feb. 20, 1985, Ser. No. 703,335

Int. Cl.⁴ C12Q *1/28*

U.S. Cl. 435—28 **7 Claims**

1. A method of making a test strip for use in determining the level to which an individual is under the influence of alcohol by subjecting the strip to saliva from the individual and then observing a change in the coloration of the strip the intensity of which is proportional to the alcohol concentration in the saliva, the method comprising the steps of:

impregnating a carrier matrix with an alcohol oxidase enzyme which catalyzes a reaction converting ethanol to an oxidizing agent, and a hydrogen donor indicator which changes color when oxidized; by first immersing the carrier matrix in a solution consisting of alcohol oxidase, a



peroxidatively active substance and a buffer; hot air drying the carrier matrix after immersion; immersing the previously hot air dried carrier matrix in a solution consisting of a hydrogen donor and a solvent therefor; and again hot air drying the carrier matrix; and

storing the impregnated matrix in a substantially dry condition until the time of testing.

4,786,597

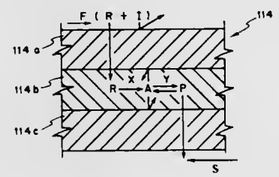
METHOD AND APPARATUS FOR CONDUCTING CATALYTIC REACTIONS WITH SIMULTANEOUS PRODUCT SEPARATION AND RECOVERY

Stephen L. Matson, Schenectady, N.Y., and John A. Quinn, Merion Station, Pa., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 254,350, Apr. 15, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 479,285

Int. Cl.⁴ C12P *1/00;* **B01J** *19/24;* **C02F** *1/44;* **C12M** *1/40*

U.S. Cl. 435—41 **12 Claims**



1. A method for conducting a catalytic chemical or biochemical conversion of a reactant present in a feed mixture to a desired end product so as to simultaneously effect separation of said desired end product from the reaction mixture and recovery of said desired end product in a more concentrated form than the initial reactant concentration in the feed mixture, comprising the steps of:

(a) providing a compartmentalized catalytic reactor having a feed stream flow path and a product stream flow path extending in substantially parallel relation through said reactor on opposite sides of a multilayer composite membrane comprising (1) a feed stream-side permselective membrane layer interfacing with said feed stream flow path and being permeable to said reactant and substantially impermeable to a reaction product and (2) a catalytic membrane layer adjacent to said feed stream-side permselective membrane layer, said catalytic membrane layer being composed of a microporous membrane having internal porous surfaces having immobilized thereon a conversion catalyst capable of irreversibly affecting conversion of said reactant to said desired end product within the presence of said conversion catalyst, and wherein the product stream side of said composite membrane is permeable to said desired end product;

(b) passing said feed mixture through said reactor along said feed stream flow path, whereby said reactant diffuses through said feed stream-side permselective membrane layer into said catalytic membrane layer where it becomes converted to said desired end product, the free energy change of the conversion reaction serving to drive said desired end product, said product subsequently diffusing toward said product stream flow path and

(c) passing an inert sweep fluid through said reactor along said product stream flow path at a flow rate lower than that of said feed mixture, whereby said desired end product separated from the reaction mixture and in a more concentrated form than the initial reactant concentration in the feed mixture is recovered as the product stream withdrawn from said product stream flow path.

4,786,598

PROCESS FOR THE BIOTECHNOLOGICAL PREPARATION OF POLY-D-(−)-3-HYDROXYBUTYRIC ACID

Robert M. Lafferty, and Gerhart Braunegg, both of Graz, Austria, assignors to Petrochemie Danubia Ges.m.b.H., Mannsworth, Austria

Filed Nov. 23, 1984, Ser. No. 675,969

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343551

Int. Cl.⁴ C12P *7/42;* **C12R** *1/05*

U.S. Cl. 435—146 **13 Claims**

1. Process for the preparation of poly-(D)-(−)-3-hydroxybutric acid, hereinafter referred to as PHB, which comprises continuously culturing a strain of the microorganism *Alcaligenes latus* or a PHB-producing mutant derived from this microorganism under aerobic conditions in an aqueous culture medium containing sources of assimilable carbon, nitrogen and phosphorus and the supply of trace nutrients required for the growth of said microorganism with a complete supply of nutrients which is optimum for the growth of the microorganism, under unlimited growth conditions in the temperature range from 36° to 42° in two separate successive fermentation stages comprising a first fermenter and a second fermenter under sterile conditions, the PHB-containing microorganism population cultured in the first fermenter with a dissolved oxygen content of 25 to 50% of the saturation value for air being continuously transferred, together with the culture solution, into the second fermenter in which the culture is continued at a dissolved oxygen content of 8–15% of the saturation value for air, and isolating the PHB by extraction from the biomass thereby obtained.

4,786,599

SERUM-FREE ANIMAL CELL CULTURE MEDIUM AND METHODS FOR THE PRIMARY CULTURE AND PRODUCTION OF CELL LINES USING THIS MEDIUM

Martina L. Chessebeuf, Dijon, and Prudent H. Padieu, Chevigny St Sauveur, both of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

PCT No. PCT/FR84/00080, § 371 Date Nov. 21, 1984, § 102(e) Date Nov. 21, 1984, PCT Pub. No. WO84/03710, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 23, 1984, Ser. No. 684,334

Claims priority, application France, Mar. 24, 1983, 83 04843

Int. Cl.⁴ C12N *5/00;* **C12R** *1/91*

U.S. Cl. 435—240.31 **20 Claims**

1. Serum-free animal cell culture medium, characterized in that is consists essentially of:

(a) a synthetic basal medium designed for animal cell culture;

(b) 0.05 to 30 μeq/l of a mixture of the six fatty acids palmitic acid, cis-palmitoleic acid, stearic acid, cis-oleic acid, cis-linoleic acid and cis-linolenic acid or their esters, in the following proportions, relative to the free fatty acid:

from 0.0155 to 24.0 μmole/l of palmitic acid;

from 0.0058 to 9.0 μmole/l of cis-palmitoleic acid;

from 0.0014 to 2.0 μmole/l of stearic acid;

from 0.0067 to 10.0 μmole/l of cis-oleic acid;

from 0.0178 to 27.0 μmole/l of cis-linolenic acid; and

from 0.0028 to 4.0 μmole/l of cis-linolenic acid, adsorbed on

(c) at least one water-soluble lipophile biopolymer present in an amount capable of ensuring the dissolution of the fatty acids or esters present in the medium.

4,786,600

AUTOCATALYTIC REPLICATION OF RECOMBINANT RNA

Fred R. Kramer, Bronx; Eleanor A. Miele, Brooklyn, both of N.Y., and Donald R. Mills, Englewood, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 25, 1984, Ser. No. 614,350

Int. Cl.⁴ C12P *19/34, 21/00;* **C12N** *15/00;* **C07H** *15/12*

U.S. Cl. 435—235 **9 Claims**

1. A recombinant single-stranded RNA molecule, wherein the sequence required for the initiation of product strand synthesis is a cytidine-rich 3' terminal sequence.

4,786,601

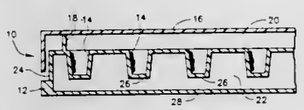
TISSUE CULTURE HOLDER

Barry E. Rothenberg, 149 12th St., Del Mar, Calif. 92014

Continuation-in-part of Ser. No. 712,413, Mar. 15, 1985, Pat. No. 4,673,651. This application Jun. 4, 1987, Ser. No. 58,046

Int. Cl.⁴ F23D *3/34*

U.S. Cl. 435—301 **12 Claims**



1. A tissue culture holder, comprising:

a relatively flat container having at least one culture chamber for containing a reagent under test a relatively flat cover for said container, and a separate insulating chamber below the culture chamber for insulating the culture chamber, the insulating chamber having a transparent bottom wall for allowing viewing of the contents of the culture chamber from beneath the holder, and the depth of the insulating chamber between the bottom wall of the culture chamber and the bottom wall of the insulating chamber being no greater than 5/16 inch.

4,786,602

METHOD FOR COLORIMETRIC ANALYSIS OF WATER CONTENT

Harald Dahms, 472 Madison Ave., Toms River, N.J. 08753

Filed May 15, 1986, Ser. No. 863,602

Int. Cl.⁴ G01N *33/18*

U.S. Cl. 436—42 **21 Claims**

1. A method of colorimetric determination of water content of a sample by a Karl Fischer type reaction, comprising the steps of:

measuring the optical density of a volume of an iodine-containing Karl Fischer reagent and dye mixture at a first wavelength and a second wavelength, said first wavelength being more strongly absorbed by iodine and said second wavelength being more strongly absorbed by said dye,

adding a sample to the volume of iodine-containing Karl Fischer reagent and dye mixture, the sample and the iodine-containing Karl Fischer reagent reacting in accordance with a Karl Fischer type reaction to alter the amount of iodine contained in said volume,

measuring the optical density of the volume of the iodine-containing Karl Fischer reagent, dye, and sample at said

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first wavelength and said second wavelength, the change in optical density at said first wavelength being directly related to the amount of water in the sample, and

determining the amount of water in the sample using the change in optical density at said second wavelength to correct the change in optical density measured at said first wavelength.

4,786,603

METHOD FOR SEPARATING PLASMA FROM BLOOD AND SILANIZED GLASS FIBRES THEREFOR

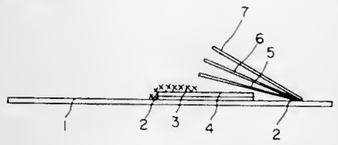
Hans Wielinger, and Helmut Freitag, both of Weinheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 881,835, Jul. 3, 1986, abandoned. This application Mar. 4, 1987, Ser. No. 21,743

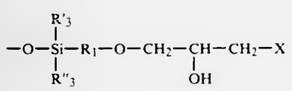
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523969

Int. Cl.[4] G01N *21/78, 30/00, 33/86*

U.S. Cl. 436—69 **14 Claims**



1. An agent for separating plasma from blood for haemostasiological tests which comprises a layer of glass fibres having bonded to their surfaces a layer of silane molecules of the formula



wherein

each molecule is bonded at its end oxygen to a surface of a glass fibre in the layer of glass fibres,

R_1 is C_2-C_6 alkylene,

X is hydroxyl, C_1-C_6 alkoxy, an alkoxy radical having n carbon atoms and up to (n−1) hydroxyl groups in which n is an integer from 1 to 6, or an amino acid or peptide residue; and each of R'_3 and R''_3 is C_1-C_6 alkyl, an oxygen bridge to the silicon atom of another silane molecule, or an oxygen bridge to a glass surface,

said fibres having an average diameter of from 0.2 to 5μ and said glass fiber layer having density of 0.1 to 0.5 g./cm^3.

4,786,604

LEAD DETECTOR KIT

Robert C. Michael, 426 N. Jackson St., Apt. 203, Glendale, Calif. 91206

Filed Jun. 22, 1987, Ser. No. 65,356

Int. Cl.[4] G01N *33/20, 31/22*

U.S. Cl. 436—77 **9 Claims**

6. A method for testing for lead concentrations in water in excess of approximately five parts per million, comprising the steps of:

(a) mixing within a first, substantially transparent vial a yellow dye and a liquid medium to form a non-chromate reference solution having the appearance of a clear sodium chromate solution, that is an optically clear yellow tinted liquid free of precipitate;

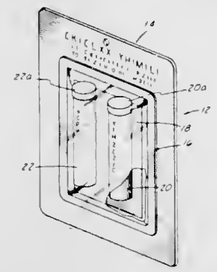
(b) mixing within a second substantially transparent vial a saturated sodium chromate solution;

(c) adding the water to be tested to said second vial containing said saturated sodium chromate solution;

(d) thoroughly mixing the water to be tested with said saturated sodium chromate solution;

(e) placing said second vial in an upright, at rest position for a period of time sufficient to permit any lead contained in the water sample to react with the sodium chromate; and

(f) comparing the mixture thus formed in said second vial with said reference solution to detect an appearance of greater relative cloudiness in said second vial, thereby indicating the presence of lead in said second vial in an amount in excess of approximately five parts per million.



9. A kit for testing for lead concentrations in water in excess of approximately five parts per million comprising:

a packaging means including;

(a) a first vial constructed from a substantially transparent material and containing a non-chromate reference solution being free of precipitate and having the appearance of a clear potassium chromate solution; and

(b) a second vial constructed from a substantially transparent material, said second vial being partially filled with a test solution comprising a saturated potassium chromate solution.

4,786,605

ANALYTICAL METHOD AND ELEMENT FOR PROTEIN ASSAY

John C. Mauck, Rochester, and Harold C. Warren, III, Rush, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 22, 1987, Ser. No. 64,640

Int. Cl.[4] G01N *33/00, 21/00, 1/48*

U.S. Cl. 436—86 **15 Claims**

1. A method for quantitatively determining protein, comprising the steps of:

(a) providing a sample of the protein in an aqueous medium;

(b) providing an aqueous medium having a pH in excess of 12 and comprising

(i) a cupric salt and a pyridyl-azo dye; or

(ii) a preformed cupric-pyridyl-azo dye complex;

(c) combining the aqueous mediums of (a) and (b) thereby forming a color having an intensity which is inversely proportional to the amount of unreacted dye present in the combined mediums; and

(d) determining the quantity of protein present in the sample colorimetrically.

4,786,606

SOLID PHASE SYSTEM FOR LIGAND ASSAY

Joseph L. Giegel, and Mary M. Brotherton, both of Miami, Fla., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 227,664, Jan. 23, 1981, Pat. No. 4,517,288. This application Mar. 7, 1985, Ser. No. 709,008

The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.

Int. Cl.[4] G01N *33/566, 33/543*

U.S. Cl. 436—500 **22 Claims**

1. A competitive method for conducting a solid phase fluorescence immunoassay of a fluid sample with an inert porous medium, having a binding material immobilized within said medium, comprising:

a. providing a binding material which has been immobilized within a finite zone of the interstices of the solid inert porous medium, said binding material being capable of immunological reaction with an analyte from among the constituents of the fluid sample;

b. applying to substantially the center of the zone containing said immobilized binding material, under binding conditions, a fluid sample containing an analyte for which said binding material is specific, said analyte being applied as a solution so as to permit diffusion thereof within a reaction zone of the solid inert porous medium containing the immobilized binding material;

c. applying a fluorophore labeled indicator to substantially the center of said reaction zone, under conditions which allow said labeled indicator to become bound to said immobilized binding material in an amount which can be correlated to the amount of analyte in said reaction zone;

d. applying, to substantially the center of said reaction zone, a stream of eluting solvent in a quantity sufficient to effect radial separation, within said solid inert porous medium, of unbound labeled indicator from bound labeled indicator within said reaction zone; and

e. observing the extent ot which bound labeled indicator is present within a delimited area of said reaction zone by measurement of the level of fluoresence within a delimited area of said zone, said delimited area of said reaction zone being essentially free of unbound indicator.

4,786,607

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE FREE FROM CURRENT LEAKAGE THROUGH A SEMICONDUCTOR LAYER

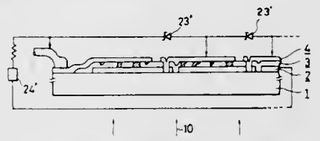
Shumpei Yamazaki, Setagaya; Kunio Suzuki; Mikio Kinka, both of Atsugi; Takeshi Fukada, Ebina; Masayoshi Abe, Tama; Ippei Kobayashi; Katsuhiko Shihata, both of Atsugi; Masato Susukida, Atsugi; Susumu Nagayama, Setagaya, and Kaoru Koyanagi, Saku, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Division of Ser. No. 899,160, Aug. 22, 1986. This application Sep. 4, 1987, Ser. No. 92,943

Claims priority, application Japan, Aug. 24, 1985, 60-186205; Aug. 24, 1985, 60-186206; Nov. 6, 1985, 60-248640

Int. Cl.[4] H01L *31/18*

U.S. Cl. 437—2 **6 Claims**



1. A method of manufacturing a semiconductor device comprising:

forming a first electrode on a substrate;

forming a rectifying semiconductor layer on said electrode;

applying a photocurable resin over said semiconductor layer to fill defects of said semiconductor layer with said resin;

irradiating said photocurable resin to render portions of said resin inside said defect insoluble and the remaining portion soluble to a solvent;

removing said soluble portion of said resin with said solvent;

forming a second electrode on said semiconductor layer; and

burning out any remaining defects forming short-current paths by applying a reverse voltage between said first and second electrodes less than the breakdown voltage of said semiconductor layer.

4. A method of claim **1** wherein said semiconductor device comprises a plurality of solar cells connected to each other in series.

4,786,608

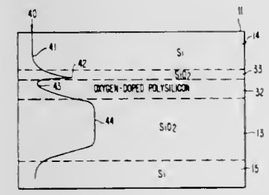
TECHNIQUE FOR FORMING ELECTRIC FIELD SHIELDING LAYER IN OXYGEN-IMPLANTED SILICON SUBSTRATE

Richard W. Griffith, Satellite Beach, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Dec. 30, 1986, Ser. No. 947,749

Int. Cl.[4] H01L *21/265, 21/20*

U.S. Cl. 437—24 **17 Claims**



1. A method of manufacturing a semiconductor device comprisng the steps of:

(a) introducing first impurities into a semiconductor substrate and forming thereby a buried layer of material made of a combination of the material of said substrate and said first impurities;

(b) introducing species into a region of said substrate adjacent to said buried layer and forming thereby an amorphous layer doped with said first impurities; and

(c) heating the substrate resulting from step (b) sufficient to cause the formation of a polycrystalline layer adjacent to said buried layer.

4,786,609

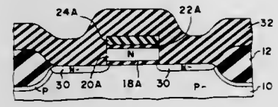
METHOD OF FABRICATING FIELD-EFFECT TRANSISTOR UTILIZING IMPROVED GATE SIDEWALL SPACERS

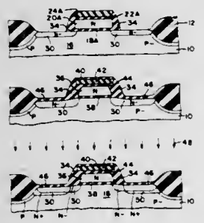
Teh-Yi J. Chen, Santa Clara, Calif., assignor to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Oct. 5, 1987, Ser. No. 104,187

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—30 **15 Claims**





1. A method comprising the steps of:

forming a structure in which a patterned electrically insulating cover layer overlies a similarly patterned conductively

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doped layer of non-monocrystalline semiconductor material lying on a dielectric layer that lies along the upper surface of a major doped region of a semiconductor body;
depositing a further layer of electrically insulating material on the upper surface of the structure;
removing largely all of the further layer except for small spacer portions adjoining the sidewalls of the doped layer; and
performing an oxidizing heat treatment to oxidize parts of the doped layer and parts of the major region along its upper surface, and implanting a main semiconductor dopant into selected parts of the major region using the spacer portions and the material of the patterned layers to substantially block the main dopant from being implanted into the part of the major region below the spacer portions and the material of the patterned layers; characterized in that the cover layer comprises a protective material that substantially prevents the underlying non-monocrystalline material of the doped layer, except for the non-monocrystalline material along its sidewalls, from being oxidized during the heat treatment, portions of the doped layer along its sidewalls being oxidized during the heat treatment to increase the thickness of the spacer portions.

4,786,610

METHOD OF MAKING A MONOLITHIC INTEGRATED CIRCUIT COMPRISING AT LEAST ONE BIPOLAR PLANAR TRANSISTOR

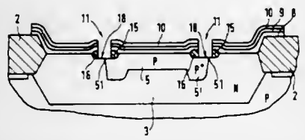
Lothar Blossfeld, Freiburg, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 130,044

Claims priority, application European Pat. Off., Dec. 12, 1986, 86117352.4

Int. Cl.⁴ H01L *21/302, 21/265*

U.S. Cl. 437—31 **8 Claims**



1. An improvement in a method of making a monolithic integrated circuit, said circuit comprising a wafer-shaped semiconductor substrate, a field oxide layer disposed on said substrate, at least one bipolar planar transistor having a base, emitter and collector region, whose collector region, which lies at a main surface of said semiconductor substrate, forms a collector area at said surface within an opening defined in said field-oxide layer, wherein, to form said emitter retention and base region, said emitter region is covered with a portion of an oxidation mask layer of such a thickness that said oxidation mask layer is penetrated by dopants of said base region in a high-energy ion-implantation process and masked against dopants of said base region in a low-energy ion-implantation process, and after the ion-implantation processes, which are performed using an implantation mark defining said base region, the exposed semiconductor surface is thermally oxidized forming an oxide stripe surrounding the emitter region, whereafter said portion of said oxidation mask layer is removed, said improvement comprising the steps of:
providing said main surface of said semiconductor substrate with successive layers consisting of at least an insulating top layer and an underlying silicide layer after removal of said portion of said oxidation mask layer covering said emitter area;
dividing said oxide stripe into an inner portion and an outer portion using an anisotropic etch, thereby forming a moat through said successive layers, which comprise said top layer being a silicide layer, and a polycrystalline silicon layer;
exposing that portion of the PN junction between the outer portion of said base region and said collector region which extends to said semiconductor surface, so that in addition to an emitter electrode, a collector electrode is defined, which overlaps said field-oxide layer;
implanting ions of said conductivity type of said base region with said successive layers acting as a mask;
disposing an insulating layer which covers said surface of said moat and any remaining portion of said lop layer;
performing an anisotropic etch in gas phase, so that the rims of said moat, the rim of said emitter electrode, and the rim of said collector electrode remain covered by remainders of said insulating layer;
activating said implanted ions of said conductivity type of said base region by diffusion to form a base contact region; and
disposing a contact layer for contacting said resulting base contact region from which said base electrode is formed using a photolithographic etching process.

4,786,611

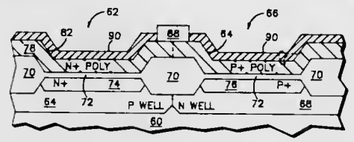
ADJUSTING THRESHOLD VOLTAGES BY DIFFUSION THROUGH REFRACTORY METAL SILICIDES

James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 19, 1987, Ser. No. 109,636

Int. Cl.⁴ H01L *21/225*

U.S. Cl. 437—45 **19 Claims**



1. A process for fabricating field effect transistors (FETs) comprising the steps of: providing a silicon substrat having partially constructed FETs formed therein, each comprising a source, a drain, a channel region separating the source and drain, and a dielectric layer overlying at least the channel region; forming a patterned layer of polycrystalline silicon overlying the dielectric layer, the patterned layer including a first portion doped with an impurity of first conductivity type and a second portion doped with an impurity of second conductivity type, with a junction formed at the location where the first and second portions join; providing a blocking element overlying a selected portion of the patterned layer; forming a refactory metal silicide on the patterned layer including the junction, but not on that portion of the patterned layer having the blocking element thereover; and annealing to cause diffusion of impurities of first conductivity type from a first portion of the patterned layer through the refactory metal silicide to a second portion of the patterned layer doped with impurities of second conductivity type.

4,786,612

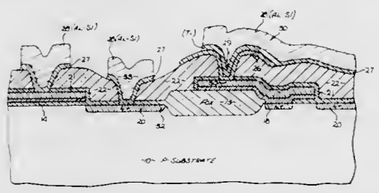
PLASMA ENHANCED CHEMICAL VAPOR DEPOSITED VERTICAL SILICON NITRIDE RESISTOR

Leopoldo D. Yau, Portland, Oreg.; Shih-Ou Chen, Fremont, Calif., and Yih S. Lin, Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 825,314, Feb. 3, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 139,187

Int. Cl.⁴ H01C *7/10;* **H01L** *29/04*

U.S. Cl. 437—47 **11 Claims**



1. A process for fabricating a resistor in a semiconductor device between two conductive regions, comprising the formation of plasma enhanced chemical vapor deposited (PECVD) semi-insulative film, comprised of silicon-enriched silicon nitride formed of silane, nitrogen and ammonia, between said conductive regions, and said film contacting both said conductive regions and providing electrical resistance between said conductive regions, whereby a resistor element is fabricated.

4,786,613

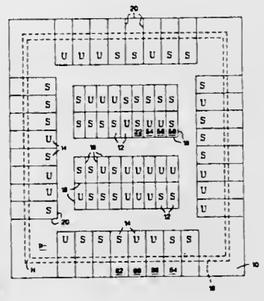
METHOD OF COMBINING GATE ARRAY AND STANDARD CELL CIRCUITS ON A COMMON SEMICONDUCTOR CHIP

Elliot L. Gould, Colchester; Douglas W. Kemerer, Essex Junction; Lance A. McAllister, Williston; Ronald A. Piro, South Burlington; Guy R. Richardson, Milton, and Deborah A. Wellburn, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1987, Ser. No. 18,239

Int. Cl.⁴ H01L *21/38*

U.S. Cl. 437—48 **27 Claims**



1. A method of making a logic chip which includes the steps of
defining a plurality n of cell locations, each having a boundary, within a semiconductor chip,
forming standard cell circuits within n-x of said plurality n of cell locations, where x is a smaller number than n, x cell locations being unoccupied, each of said standard cell circuits being disposed within an active circuit area spaced at least a given distance from the boundary of its associated cell location, and
forming a plurality of gate array cells within said unoccupied cell locations, each of said gate array cells having an active circuit area spaced at least said given distance from the boundary on one side of its associated cell location and extending without the boundary on the side of its associated cell location opposite to that of said one side for a distance at least equal to said given distance for contacting the active circuit area of an adjacent one of said plurality of gate array cells and extending within said opposite boundary so as to be spaced therefrom by at least said given distance when one of said standard cells is disposed adjacent to said opposite boundary.

4,786,614

METHOD OF FABRICATING A HIGH VOLTAGE SEMICONDUCTOR DEVICE HAVING A PAIR OF V-SHAPED ISOLATION GROOVES

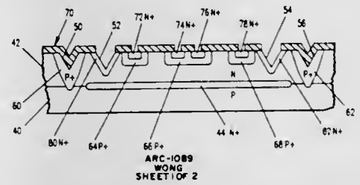
Adrian I. Cogan, San Jose, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Filed Feb. 26, 1987, Ser. No. 19,085

Int. Cl.⁴ H01L *21/38*

U.S. Cl. 437—64 **2 Claims**

1. A method of making a semiconductor device comprising:
providing a first layer of semiconductor material of a first conductivity tape and having a planar surface;
providing a second layer of a semiconductor material of a second conductivity type opposite the first conductivity type, and one which the first layer is disposed;
providing a layer of oxide having a planar surface over said first layer of semiconductor material;
forming first and second generally V-shaped grooves in said first layer through said planar oxide surface;
masking a portion of the first layer including only one of the first and second generally V-shaped grooves;
introducing an impurity into the first layer simultaneously at the unmasked generally V-shaped groove and at least one remaining unmasked portion of the surface of the first



layer, the impurity being of the second conductivity type and extending to the second layer;
removing said masking;
masking a portion of the surface of the first layer including only the other of the generally V-shaped grooves; and
introducing an impurity of said first conductivity type simultaneously into the first layer at the unmasked generally V-shaped groove and at least one remaining unmasked portion of the surface of the first layer, the masking being configured so that the impurities of said first and second conductivity types introduced into said remaining unmasked portions of the surface of the first layer define additional regions so that one additional region of first conductivity type is contained within another additional region of second conductivity type.

4,786,615

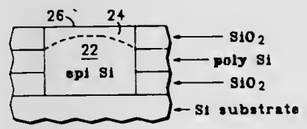
METHOD FOR IMPROVED SURFACE PLANARITY IN SELECTIVE EPITAXIAL SILICON

Hang M. Liaw, Scottsdale, and Ha T.-T. Nguyen, Mesa, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Aug. 31, 1987, Ser. No. 92,267

Int. Cl.⁴ H01L *21/205, 21/76*

U.S. Cl. 437—89 **5 Claims**



1. A method for improved surface planarity in selective epitaxial silicon growth comprising the steps of:
providing a substrate with a mask having at least one aperture;
growing two superimposed layers of selective epitaxial silicon in the aperture at two different temperature separated by a transition point while substantially avoiding indiscriminate growth of silicon on the mask;
one of said layers being grown at a temperature lower than the transition point;
the other one of said two layers being grown at a temperature higher than the transition point; and

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terminating the growth of selective epitaxial silicon when the selective epitaxial silicon is substantially planar with the mask.

4,786,616

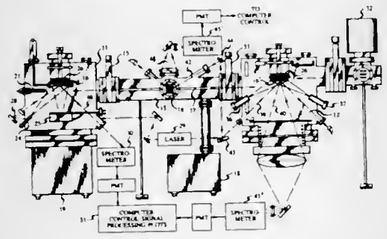
METHOD FOR HETEROEPITAXIAL GROWTH USING MULTIPLE MBE CHAMBERS

Muhammad A. Awal, Trenton, and El Hang Lee, East Brunswick, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Jun. 12, 1987, Ser. No. 61,069

Int. Cl.⁴ H01L *21/306, 21/205*

U.S. Cl. 437—105 **13 Claims**



1. A method for making semiconductor devices comprising the steps of, epitaxially growing, in an ultra-high vacuum and on a crystalline substrate, a first layer of a first material, and then epitaxially growing, in an ultra-high vacuum and over the first layer, a second layer of a second material that is different from the first material,

characterized in that

the first layer is epitaxially grown in a first vacuum chamber that has been separately evacuated to a high vacuum condition;

vapors and particulates of the first layer material are evacuated from the first vacuum chamber;

an intermediate vacuum chamber is separately evacuated to a high vacuum condition;

the first and intermediate vacuum chambers are thereafter brought into mutual communication so that together they constitute a combined single high vacuum chamber and the substrate is transported to the intermediate vacuum chamber;

the first vacuum chamber is next UHV-sealed from the intermediate vacuum chamber;

a second vacuum chamber is separately evacuated to a high vacuum condition;

the intermediate and second vacuum chambers are thereafter brought into mutual communication so that together they constitute a single high vacuum chamber and the substrate is transported to the second vacuum chamber;

the intermediate vacuum chamber is next UHV-sealed from the second vacuum chamber; and

the second layer is next epitaxially grown over the first layer.

4,786,617

GLASS-CERAMIC ARTICLE, PROCESS FOR ITS PRODUCTION AND THERMALLY CRYSTALLIZABLE GLASS

Andre Andrieu, Nemours; Marie J. M. Comte, Paris; Frederic J. M. Ferry, and Jean-Pierre Mazeau, both of Avon, all of France, assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 37,042, Apr. 10, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 163,528

Claims priority, application France, Oct. 13, 1986, 86 14176; Feb. 4, 1988, 88 01288

Int. Cl.⁴ C03C *10/16, 3/112*

U.S. Cl. 501—3 **8 Claims**

1. A glass-ceramic article containing potassium fluorrichterite and/or a related fluormica as the predominant crystal phase(s) which, in the form of bars measuring 9 cm×1 cm×5 mm, will exhibit sagging during the crystallization heat treatment not greater than 0.75 mm over a span of 6.8 cm, and which displays such opacity that the diffuse transmittance of a sample of 2.75 mm thickness is in the 40–180 range, said glass-ceramic article having a composition essentially free of Li_2O and consisting essentially, as expressed in terms of weight percent on the oxide basis, of:

SiO_2	61–70	Na_2O	0.5–3	BaO	0–3.5
Al_2O_3	2.75–7	K_2O	2.5–5.5	P_2O_5	0–2.5
MgO	11–16	$Na_2O + K_2O$	<6.8		
CaO	4.75–9	F	2–3.25		

4,786,618

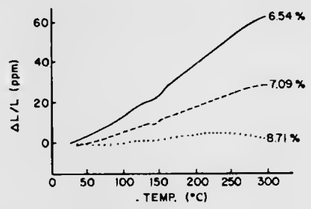
SOL-GEL METHOD FOR MAKING ULTRA-LOW EXPANSION GLASS

Robert D. Shoup, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 29, 1987, Ser. No. 55,632

Int. Cl.⁴ C03C *3/06*

U.S. Cl. 501—12 **13 Claims**



1. A method for making a low expansion TiO_2—SiO_2 glass which comprises the steps of:

(a) preparing an aqueous sol wherein the liquid phase comprises at least one soluble silicate compound selected from the group of alkali silicates and ammonium silicates, and wherein the solid phase comprises colloidal TiO_2, the sol being formed by combining a TiO_2 sol with a silicate solution containing dissolved SiO_2 compounds, said aqueous sol having a pH of at least 9 and being substantially free of precipitated SiO_2 and TiO_2, the proportion of TiO_2 in the sol being such as to provide a TiO_2 concentration of TiO_2 and SiO_2;

(b) gelling the sol to form a semisolid silicate gelled shape wherein the colloidal TiO_2 is homogeneously distributed;

(c) removing alkaline constituents from the semisolid gelled shape to provide a dealkalized gel;

(d) drying the dealkalized gel to remove water and residual volatile solution components and to provide a porous body therefrom; and

(e) firing the porous body to a temperature sufficient to consolidate it to a non-porous TiO_2—SiO_2 glass article.

4,786,619

TELEVISION FACE PLATES RESISTANT TO BROWNING

Alan H. Gerrard, Wigan, and George W. F. Pardoe, Mawdesley, both of England, assignors to Pilkington Brothers P.L.C., St. Helens, England

Filed Jun. 30, 1987, Ser. No. 68,064

Claims priority, application United Kingdom, Jun. 30, 1986, 8615899

Int. Cl.⁴ C03B *5/225*

U.S. Cl. 501—64 **6 Claims**

1. A process for the production of a television face plate resistant to browning, which process comprises melting and refining molten glass which comprises cerium oxide as an anti-browning agent and a refining agent comprising a sulphur containing compound, wherein said refining agent is substantially free from an arsenic or antimony oxide containing compound, the cerium oxide being converted substantially into the cerous state during melting and refining thereby increasing the resistance of the face plate in use to browning, and subsequently forming the molten glass into a face plate.

5. A glass face plate for a television tube which plate is formed by a process as claimed in claims **1** or **2**.

4,786,620

PHYLLOSILICATE TREATMENT

Hermann L. Rittler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 12, 1986, Ser. No. 862,256

Int. Cl.⁴ C04B *33/13, 33/00*

U.S. Cl. 501—147 **8 Claims**

5. A method of chemically altering a phyllosilicate to produce a ceramic material consisting essentially of at least one solid solution, said one solid solution being composed of at least two crystal phases, one being a phyllosilicate crystal phase and a second being a crystal phase selected from the group consisting of a silicate and a spinel which comprises introducing the phyllosilicate into a source of cations exchangeable with the interlayer cations present in the phyllosilicate, said source of exchangeable cations being selected from the group consisting of an aqueous solution and a molten salt bath operating at a temperature of 100°–900° C., to effect an ion exchange between the source of exchangeable cations and the interlayer cations of the phyllosilicate, and either simultaneously or subsequently subjecting the ion-exchanged phyllosilicate to a thermal treatment at a temperature above 200° C. to produce said one solid solution.

4,786,621

PROCESS FOR RECOVERY OF COBALT AND MANGANESE FOR OXIDATION RESIDUE INCINERATOR ASH

Juergen K. Holzhauer, Naperville; Dennis J. Michalak, Warrenville, and Wayne P. Schammel, Naperville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 17, 1987, Ser. No. 62,965

Int. Cl.⁴ B01J *38/62*

U.S. Cl. 502—28 **9 Claims**

1. A process for the recovery of cobalt and manganese from aromatic acid oxidation incinerator ash which process comprises heating said oxidation incinerator ash in the presence of acetic acid and a reducing agent present by addition to said process wherein the weight ratio of acetic acid to said oxidation incinerator ash is from about 1:1 to about 50:1, and the ratio of electrons which said reducing agent can deliver to atoms of said cobalt plus manganese in said oxidation incinerator ash is from about 0.1:1 to about 4:1 at about the boiling point of said acetic acid at atmospheric pressure and recovering said cobalt and manganese in liquid solution as the metal acetic acid salt.

4,786,622

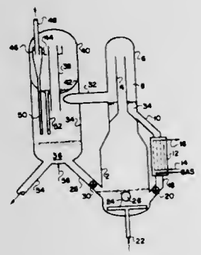
REGENERATION OF FLUID SOLID PARTICLES AND SEPARATION OF SOLID PARTICLES FROM COMBUSTION PRODUCT FLUE GASES

Paul W. Walters, and William M. Rice, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jan. 9, 1984, Ser. No. 568,998

Int. Cl.⁴ B01J *21/20, 29/38;* **C10G** *11/18;* **B07B** *7/04*

U.S. Cl. 502—44 **18 Claims**



1. A method for removing carbonaceous deposits from fluid solid particles and separating entrained solid fines from combustion product flue gases which comprises:

(a) forming a mixture of solid particles comprising carbonaceous deposits with sufficient hot regenerated solid particles to form a mixture thereof at a temperature of at least 649° C. (1200° F.) dispersed in suspension forming combustion supporting oxygen containing gas at a particles concentration within the range of 3 to 35 lbs/cu.ft.;

(b) passing the suspension mixture thus formed in (a) upwardly through a combustion zone as a suspension under conditions selected to restrict combustion temperatures thereof below 871° C. (1600° F.);

(c) discharging the upwardly flowing gas-solids suspension in combustion product flue gases as a confined stream into a zone in open communication with an annular zone about said confined stream, directing the discharged suspension downwardly through said annular zone at a velocity whereby entrained particles solid are separated from combustion flue gas by withdrawing flue gas radially from said annular zone by an open ended confined passageway extending outwardly from above a collected bed of solid particles in a lower bottom portion of said annular zone;

(d) passing hot regenerated solid particles from a bottom portion of said annular zone through a heat exchange zone and thence to a bottom portion of said combustion zone for admixture with spent solid particles as in above;

(e) discharging glue gas with entrained solid particles from said generally horizontal confined passageway tangential into the upper part of a second separate flue gas-entrained solids particle separation zone and recovering centrifugally separated solid particles as a dense fluid mass in a bottom portion of said second separation zone;

(f) passing separated flue gases comprising entrained solid fines from an upper part of said second separation zone upwardly through an open end elongated confined riser transport zone discharging upwardly into a third separation zone under velocity conditions establishing a momentum differential between entrained solid fines and combustion product flue gases;

(g) collecting solids separated by momentum from flue gases in a bottom portion of said third separation zone and transferring solids thus collected to the mass of solids

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collected in a bottom portion of said second separation zone;

(h) passing flue gas separated from solids particles in said third separation zone through an annular passageway in open communication with a plurality of attached cyclone separation zones wherein any entrained solid fines are further separated from the flue gases before effecting recovery of flue gases from said cyclone separation zones;

(i) passing cyclone separated solid fines directly to the collected mass of solid particles in a bottom portion of the second separation zone;

(j) passing particles collected in a bottom portion of said second separation zone to a bottom portion of said combustion zone for admixture with solid particles charged thereto; and

(k) withdrawing collected regenerated solid particles from said second separation zone for use in a hydrocarbon conversion zone.

2. A method for regenerating solid fluid particles comprising carbonaceous deposits by combustion and recovering flue gases of combustion separated from particle fines which comprises:

(a) passing solid fluid particles comprising carbonaceous deposits admixed with regenerated solid particles in combustion supporting fluidizing gas as a suspension upwardly through a combustion zone at a temperature restricted to within the range of 649° C. to 815° C. (1200° F. to 1500° F.), thereby producing hot combustion product flue gases;

(b) passing a suspension of said heat combustion product flue gases comprising entrained solid particles through a sequence of separation zones comprising an annular downflow flue gas-solids suspension separation zone, a centrifugal flue gas-solids suspension separation zone and a flue gas-entrained solids suspension upflow ballistic separation zone;

(c) passing separated solids from each of said annular separation zones and said centrifugal solids separation zone to said combustion zone; and

(d) removing hot regenerated solids from said centrifugal solids separation zone for use in a hydrocarbon conversion zone.

4,786,623

CATALYTIC (CO)DIMERIZATION OF ALKYL ACRYLATES

Pierre Grenouillet, Fontaines sur Saone; Denis Neibecker, Neuves-Maisons, and Igor Tkatchenko, Caluire, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 20, 1987, Ser. No. 28,569

Claims priority, application France, Mar. 27, 1986, 86 04644

Int. Cl.[4] B01J *31/04, 31/02, 31/12*

U.S. Cl. 502—164 **11 Claims**

1. A catalytic compostion of matter, comprising:

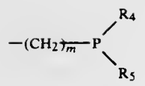
(a) at least one nonhalogenated palladium source;

(b) at least one phosphorus (III) compound having the general formula (I)



(I)

in which R_1, R_2 and R_3 are independently an alkyl, cycloalkyl, aryl, alkoxy, cycloalkoxy or aryloxy radical, with the proviso that one of the radicals R_1, R_2 or R_3 can be a monovalent radical having the general formula (II:



(II)

in which m is an integer ranging from 1 to 4, R_4 and R_5 are independently an alkyl, cycloalkyl, aryl, alkoxy, cycloalkoxy or aryloxy radical;

(c) at least one hydracid HY, wherein Y^- is an anion selected from the group consisting of $C_nF_{2n+1}CO^-_2$, $C_nF_{2n+1}SO^-_3$, $\frac{1}{2}SO^=_4$, ClO^-_4, PF^-_6, SbF^-_6, BF^-_4 and $\frac{1}{2}SiF^=_6$, in which n is an integer of from 1 to 4, the anion Y^- of which does not coordinate with palladium ions.

2. A catalytic composition of matter, comprising (a) at least one nonhalogenated palladium source, (b) at least one hydrogenophosphonium salt having the formula:

$$[HPR_1R_2R_3]^+Y^-$$

and optionally, (c) a hydracid HY, wherein R_1, R_2, R_3 and Y^- are as define in claim 1.

4,786,624

SILVER CATALYST FOR PRODUCTION OF ETHYLENE OXIDE FROM ETHYLENE

Naohiro Nojiri, Tsuchiura, and Yukio Sakai, Ami, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 767,831, Aug. 20, 1985, Pat. No. 4,690,913. This application Feb. 24, 1987, Ser. No. 17,686

Claims priority, application Japan, Aug. 21, 1984, 59-173884; Sep. 14, 1984, 59-191732; Oct. 25, 1984, 59-224877

Int. Cl.[4] B01J *23/04, 23/50, 27/06*

U.S. Cl. 502—226 **6 Claims**

1. A catalyst for the production of ethylene oxide from ethylene, said catalyst comprising a porous carrier composed of a molded article of a refractory material and having thereon (i) silver grains, (ii) as a cationic component, at least one alkali metal element selected from the group consisting of lithium, sodium, potassium, rubidium and cesium, and (iii) as an anionic component, at least one element selected from the group consisting of fluorine, chlorine and bromine, wherein

(A) silver is distributed on the outside surface of the carrier and on the inner surfaces of the pores of the carrier,

(B) silver grains distributed on the inner surfaces of the pores of the carrier have an average diameter of 0.05 to 0.2 micron,

(C) the loading (S) of silver on the outside surface layer of the catalyst and the loading (I) of silver on the innermost layer of the catalyst satisfy the following formula (1):

$$I \geqq 0.7S \quad (1)$$

in which the said outside surface layer of the catalyst denotes a portion having a weight of about 5% by weight on average, in the range of about 4–6%, shaven an uniformly as possible from the outside surface of one catalyst particle toward its inner layer when the weight of one catalyst particle is taken as 100%, and the said innermost layer of the catalyst denotes an inner layer of the catalyst particle which is left after about 60% on the average, in the range of about 50 to 70%, has been shaven off from the outside surface of the catalyst particle toward its inner layer as uniformly as possible, and

(D) the loading (Sc) of the alkali metal element as the cationic component on the outside surface layer of the catalyst and the load (Ic) of the alkali metal element as the cationic component on the innermost layer of the catalyst satisfy the following formula (2-1) or (2-2):

$$Ic \geqq 0.4Sc \quad (2\text{-}1)$$

in the case where the alkali metal is sodium or lithium,

$$Ic \geqq 0.6Sc \quad (2\text{-}2)$$

in the case where the alkali metal is potassium, rubidium or cesium, in which said outside surface layer of the catalyst and said innermost layer of the catalyst are as defined above.

4,786,625

DEHYDROGENATION CATALYST COMPOSITON

Tamotsu Imai, Mt. Prospect; Hayim Abrevaya, Chicago; Jeffery C. Bricker, Buffalo Grove, and Deng-Yang Jan, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 18,541, Feb. 25, 1987, Pat. No. 4,716,143, which is a continuation-in-part of Ser. No. 871,356, Jun. 6, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,882

Int. Cl.[4] B01J *21/04, 23/58, 23/62*

U.S. Cl. 502—326 **12 Claims**

1. A catalytic composite comprising a platinum group metal component, a modifier metal component selected from the group consisting of tin, germanium, rhenium, and mixtures thereof on a refractory oxide support having a nominal diameter of at least about 850 microns wherein the platinum group metal component is surface impregnated such that the average concentration of the surface-impregnated platinum group component on the outside 100 micron layer of the catalyst is at least 2 times the concentration of the platinum group component in the 200 micron diameter center core of the catalyst, and wherein the modifier metal component is uniformly impregnated through the refractory oxide support.

4,786,626

SOLID BASE

Gohfu Suzukamo, Ibaraki; Masami Fukao, Shiga; Masao Minobe, Niihame, and Akemi Sakamoto, Takatsuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 896,951, Aug. 15, 1986, Pat. No. 4,711,873. This application Sep. 10, 1987, Ser. No. 95,619

Claims priority, application Japan, Aug. 16, 1985, 60-180869; Nov. 12, 1985, 60-253568

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] B01J *21/04, 23/04*

U.S. Cl. 502—344 **18 Claims**

1. A solid base obtainable by reacting alumina with an alkali metal hydroxide in a reaction system at a temperature of 200° to 500° C. to form a reaction product; adding an alkali metal to the reaction system; and reacting the reaction product with the added alkali metal at a temperature of 180° to 350° C., or reacting water-containing alumina with an alkali metal in an amount of 1.01 to 2 times the molar equivalent of water contained in the water-containing alumina, wherein a portion of the alkali metal in an amount of not more than a molar equivalent of water contained in a reaction system is reacted at a temperature in a range between a melting point of the alkali metal and 500° C. to form a reaction product and the reaction product is reacted with the rest of the alkali metal at a temperature of 180° to 350° C.

4,786,627

THIADIAZOLE GUANIDINES

Stephen Turner, Letchworth, and Malcolm Myers, Hull, both of United Kingdom, assignors to Reckitt & Colman Products Limited, London, England

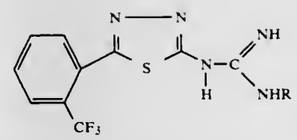
Filed Apr. 8, 1988, Ser. No. 179,298

Claims priority, application United Kingdom, Apr. 24, 1987, 8709734

Int. Cl.[4] C07D *285/12;* **A61K** *31/41*

U.S. Cl. 514—363 **9 Claims**

1. A compound of the formula



wherein R is hydrogen or alkyl C_{1-4} and its non-toxic salts.

4,786,628

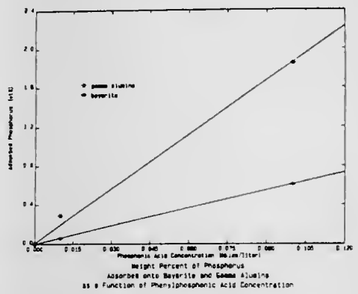
CHROMATOGRAPHIC PACKINGS COMPRISING METAL OXIDE/HYDROXIDE REACTED WITH PHOSPHONIC ACID

Larry F. Wieserman, Apollo; John W. Novak, Jr., New Kensington; Christine M. Conroy, and Karl Wefers, both of Apollo, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 9, 1987, Ser. No. 23,429

Int. Cl.[4] B01J *20/22*

U.S. Cl. 502—401 **23 Claims**



1. A chromatographic packing material comprising a monomolecular layer of one or more phosphonic acids chemically bonded to substantially all of the exposed hydroxyl groups on the surface of a particulate metal oxide/hydroxide support material having a particle size range of from about 0.5 to 300 microns; a pore diameter range of from about 20 to about 10,000 Angstroms; and a pore volume of from about 0.1 to about 2 milliliters/gram.

4,786,629

HEAT-SENSITIVE RECORDING MATERIAL

Hiroshi Kawakami, and Akira Igarashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 18, 1987, Ser. No. 98,331

Claims priority, application Japan, Sep. 18, 1986, 61-220507

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—200 **6 Claims**

1. A heat-sensitive recording material comprising a support provided thereon a heat-sensitive color forming layer comprising an electron donating dye precursor and an electron accepting compound, wherein said support has an oil absorption degree defined according to JIS-P8130 of 10 seconds or less and heat-fusible components contained in said heat-sensitive color forming layer have a fused viscosity at 150° C. of 10 cp or less.

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4,786,630

SOLVENT OF A CHROMOGENIC DYE-PRECURSOR MATERIAL FOR PRESSURE-SENSITIVE RECORDING PAPER, THE PRESSURE-SENSITIVE RECORDING PAPER AND PROCESS FOR PRODUCING THE SOLVENT

Tadashi Nakamura; Takashi Terauchi, and Shoichi Hoshi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Division of Ser. No. 872,091, Jun. 6, 1986, Pat. No. 4,737,189. This application Dec. 22, 1987, Ser. No. 136,722

Claims priority, application Japan, Jun. 13, 1985, 60-128573; Jun. 13, 1985, 60-128574

Int. Cl.[4] B41M *5/16, /5/18*

U.S. Cl. 503—213 **2 Claims**

1. A pressure-sensitive recording paper sheet comprising a paper sheet having a layer of microcapsules containing a chromogenic dye-precursor and a solvent for said dye-precursor, wherein said solvent comprises diarylalkanes which contain not less than 80% by weight of a mixture of 1-tolyl-2-phenylpropane and 1,2-ditolylethane, and are obtained by subjecting ethylbenzene and xylene to "coupling by side-chain dehydrogenation".

4,786,631

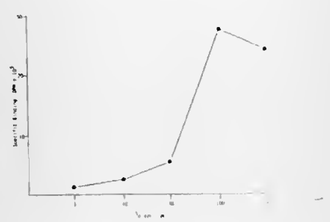
NOVEL ARGININE VASOPRESSIN-BINDING PEPTIDES

Howard M. Johnson, and Barbara A. Torres, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed Mar. 18, 1988, Ser. No. 169,713

Int. Cl.[4] A61K *37/34;* **C07K** *7/06, 7/16*

U.S. Cl. 514—15 **8 Claims**



1. An AVP-binding peptide having the formula

Thr-Met-X-Val-Leu-Thr-Gly-Ser-Pro-B

wherein X is selected from the group consisting of Lys, Arg and Asp; B is OH, NH_2 or NHAlk, wherein Alk is lower alkyl of 1–4 carbons, inclusive; or a pharmaceutically acceptable salt or prodrug thereof.

4,786,632

EMULSIFIABLE CONCENTRATES OF MALATHION WITH INHERENT LOW EYE-IRRITATION PROPERTIES

Joseph J. Dudkowski, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 426,431, Sep. 29, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,671

Int. Cl.[4] H01N *57/00*

U.S. Cl. 514—122 **2 Claims**

1. A low-eye-irritating emulsifiable insecticide concentrate composition comprising: on a weight basis, about 62.5% malathion; about 4.2% of a liquid blend of anionic and nonionic surfactants containing calcium and dodecylbenzene sulfonate, alkylphenoxy polyoxyethylene ethanols and polyalkylene glycol ether, having a specific gravity of 0.98 at 25° C., flash point (T.O.C. °F.) of 125, flash point (closed cup) = 71° F., and a pH of 6.0–6.2, (TOXIMUL ®475); about 2.8% of a liquid blend of anionic and nonionic surfactants containing calcium dodecylbenzene sulfonate, alkylphenoxy polyoxyethylene ethonols and polyalkylene glycol ether, having a specific gravity of 1.001 at 25° C., flash point (T.O.C. °F.) of 125, flash point (closed cup) = 68° F.; and pH of 5.0 (TOXIMUL ® 480); and about 30.5% heavy aromatic naphtha solvent.

4,786,633

CEPHALOSPORIN COMPOUNDS

Mitsuyoshi Wagatsuma, Urawa; Toyonari Oine, Nara, and Totaro Yamaguchi, Urawa, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

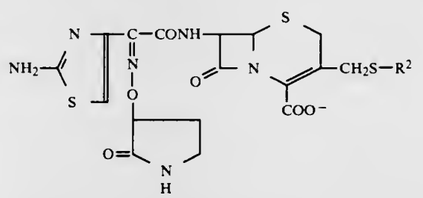
Filed Jun. 3, 1987, Ser. No. 56,958

Claims priority, application Japan, Jun. 4, 1986, 61-130879

Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

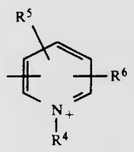
U.S. Cl. 514—206 **9 Claims**

1. A cephalosporin compound of the formula



(I)

wherein: R^2 is a group of the formula



R^4 is a lower alkenyl group, a lower alkyl group or a lower alkyl group substituted with a member selected from the group consisting of cyano, lower alkylthio, 2-(lower alkyl)-1,3,4-thiadiazol-5-yl, carbamoyl, thiocarbamoyl, and N-lower alkyl(thiocarbamoyl), and

R^5 and R^6 are each a hydrogen atom or a lower alkyl group, or a pharmaceutically acceptable salt thereof.

4,786,634

METHOD FOR TREATING ARTERIOSCLEROSIS

Hitoshi Iwasaki, Tokyo; Kazuyuki Kitamura, Urawa, and Akio Ohtani, Warabi, all of Japan, assignors to Tanabe Seikyaku Co., Ltd., Osaka, Japan

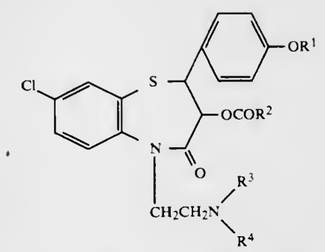
Filed May 12, 1987, Ser. No. 49,169

Claims priority, application Japan, May 23, 1986, 61-119928

Int. Cl.[4] A61K *31/55*

U.S. Cl. 514—211 **8 Claims**

1. A method for the treatment of arteriosclerosis in a warm-blooded animal in need thereof comprising administering to said animal an anti-arteriosclerotic effective amount of an 8-chloro-1,5-benzothiazepine derivative represented by the formula:



wherein R^1, R^2, R^3 and R^4 each represent lower alkyl groups, or a pharmaceutically acceptable salt thereof.

4,786,635

NOVEL BENZOTHIAZINE DERIVATIVES

Jun-ichi Iwao, Takarazuka; Tadashi Iso, Sakai, and Masayuki Oya, Ibaraki, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP86/00379, § 371 Date Mar. 10, 1987, § 102(e) Date Mar. 10, 1987, PCT Pub. No. WO87/00838, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 21, 1986, Ser. No. 34,164

Claims priority, application PCT Int'l Appl., Jul. 29, 1985, PCT/JP85/00426; Japan, Aug. 6, 1985, 60–173531

Int. Cl.[4] A61K *31/54;* **C07D** *279/10*

U.S. Cl. 514—224.2 **17 Claims**

1. A compound or salts, wherein R^1 is hydrogen, lower alkyl, lower alkoxy, halogen or nitro.

4,786,636

THIAZINO-BENZIMIDAZOLES AND THEIR USE AS ANTIULCER AGENTS

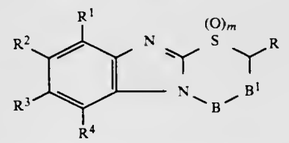
Roger Crossley, Reading, and Peter J. Meade, Maidenhead, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 866,180, May 22, 1986, Pat. No. 4,725,605, which is a continuation-in-part of Ser. No. 619,869, Jun. 12, 1984, abandoned. This application Oct. 13, 1987, Ser. No. 108,384

Int. Cl.[4] A61K *31/38;* **C07D** *513/04*

U.S. Cl. 514—224.5 **3 Claims**

1. A compound of formula



(I)

or a pharmaceutically acceptable salt thereof wherein —B—B-[1]—represents a chain of formula

$$-CR^5=CR^6- \quad \text{(Ib)}$$

$$-CHR^5-CR^6=[-(CHR^5)_n-CR^6=] \quad \text{(Ic)}$$

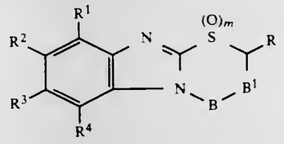
R represents a phenyl, naphthyl, pyridyl, thienyl, furyl, thiazolyl, quinonlyl, isoquinolyl or indolyl group, each optionally substituted by one or more substituents the same or different selected from lower alkylthio, lower alkyl, lower alkoxy, halogen, alkanoyloxy of 2 to 7 carbon atoms, lower alkoxy carbonyl, halolower alkyl, hydroxy, cyano, amino, mono or diloweralkyl amino, lower aklanoylamino, carboxy, carboxyloweralkyl, hydroxylower alkyl, carbamoyl, carbamoyloxy, lower alkyl- carbonyl, benzoyl, naphthoyl, (loweralkoxy) lower alkoxy, 1-piperidinyl, 4-morpholinyl, 4-loweralkylpiperazinyl, 1-pyrrolidnyl OR^8, SR^8, phenyl and phenyl substituted by one or more substituents as hereinbefore defined excepting phenyl;

(where R^8 is C_2–C_6 alkenyl, C_3–C_{10} cycloalkyl, phenyl, naphthyl, phenylalkyl, naphthylalkyl or phenyl or naphthyl or phenylalkyl or naphthylalkyl each carrying from 1 to 3 substituents on the aryl selected from lower alkyl, halogen, nitro, halololoweralkyl, hydroxy and lower alkoxy),

R^1, R^2, R^3 and R^4 independently represent hydrogen, or a substituent as mentioned above in connection with the group R,

R^5 and R^6 independently represent hydrogen or lower alkyl; and m is 0 or 1.

2. A pharmaceutical composition for treating ulcers or hypersecretion comprising an antiulcer/antihypersecretion effective amount of a compound of formula



(I)

or a pharmaceutically acceptable salt thereof wherein —B—B-[1]—represents a chain or formula

$$-CR^5=CR^6- \quad \text{(Ib)}$$

$$-CHR^5-CR^6=[-(CHR^5)_n-CR^6=] \quad \text{(Ic)}$$

R represents a phenyl, naphthyl, pyridyl, thienyl, furyl, thiazolyl, quinolyl, isoquinolyl or indolyl group, each optionally substituted by one or more substituents the same or different selected from lower alkylthio, lower alkyl, lower alkoxy, halogen, alkanoyloxy of 2 to 7 carbon atoms, lower alkoxycarbonyl, halolower alkyl, hydroxy, cyano, amino, mono- or diloweralkyl amino, lower alkanoylamino, carboxy, carboxyloweralkyl, hydroxylower alkyl, carbamoyl, carbamoyloxy, lower alkoxy, 1-piperidinyl, 4-morpholinyl, 4-loweralkylpiperazinyl, 1-pyrrolidinyl OR^8, SR^8, phenyl and phenyl substituted by one or more substituents as hereinbefore defined excepting phenyl; (where R^8 is C_2–C_6 alkenyl, C_3–C_{10} cycloalkyl, phenyl, naphthyl, phenylalkyl, naphthylalkyl or phenyl or naphthyl or phenylalkyl or naphthylalkyl each carrying from 1 to 3 substituents on the aryl selected from lower alkyl, halogen, nitro, halololoweralkyl, hydroxy and lower alkoxy),

R^1, R^2, R^3 and R^4 independently represent hydrogen, or a substituent as mentioned above in connection with the group R,

R^5 and R^6 independently represent hydrogen or lower alkyl; and m is 0 or 1, and a pharmaceutically acceptable carrier.

4,786,637

TREATMENT OF ALLOGRAFT REJECTION WITH MYCOPHENOLIC ACID MORPHOLINOETHYLESTER AND DERIVATIVES THEREOF

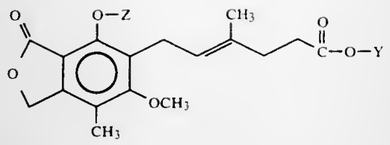
Anthony C. Allison; Elsie M. Eugui, both of Belmont; Peter H. Nelson, Los Altos; Chee-Liang L. Gu, Sunnyvale, and William A. Lee, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation at Ser. No. 008,717, Jan. 30, 1987, Pat. No. 4,753,935. This application Jan. 22, 1988, Ser. No. 146,883 Int. Cl.[4] A61K *31/535*

U.S. Cl. 514—233.5 **4 Claims**

1. A method for treatment of allograft rejection in mammals, which comprises administering to a mammal in need thereof a therapeutically effective amount of a compound represented by the formula:

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wherein:
Y is morpholinoethyl; and
Z is hydrogen or —C(O)R,
where R is lower alkyl or aryl, or a pharmaceutically acceptable salt thereof.

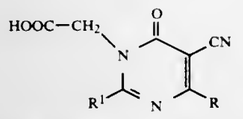
4,786,638

2,4-DISUBSTITUTED-5-CYANO-1,6-DIHYDRO-6-OXO-1-PYRIMIDINEACETIC ACID ALDOSE REDUCTASE INHIBITORS

Jehan F. Bagli; John W. Ellingboe, both of Princeton, and Thomas R. Alessi, Flemington, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 12, 1987, Ser. No. 61,831
Int. Cl.[4] A61K *31/495, 31/505;* **C07D** *403/04, 401/04*
U.S. Cl. 514—252 **9 Claims**

1. The compounds of formula (I)



(I)

wherein R^1 is lower alkyl having 1 to 3 carbon atoms, cyclo(lower)alkyl having 3 to 6 carbon atoms, naphthalenyl, or halogen substituted anphthalenyl; R is $—SR^2$ wherein R^2 is lower alkyl having 1 to 6 carbon atoms, phenylmethyl, halogen substituted phenylmethyl, cyclohexylmethyl; or R is



wherein R^3 is hydrogen, and R^4 is phenylalkyl, pyridinylmethyl, cyclohexylmethyl; or R^3 and R^4 are joined together to form piperidinyl, 4-phenylmethylpiperidinyl, or N-phenylmethylpiperazinyl; or R is R^5 wherein R^5 is lower alkyl hvaing 1 to 3 carbon atoms, phenyl, or naphthalenylmethyl; and the pharmaceutically acceptable salts thereof.

9. A method of prevention or relieving neuropathy, nephropathy, retinopathy, or cataracts in a diabetic mammal, which comprises administering to said mammal an alleviating or prophylactic amount of a compound of claim **1** in conjunction with insulin, or an oral hypoglycemic agent.

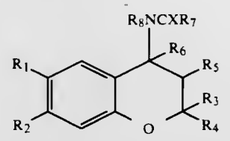
4,786,639

METHOD FOR THE TREATMENT OF REVERSIBLE AIRWAYS OBSTRUCTION AND ASTHMA

John M. Evans, Roydon, England, assignor to Beecham Group p.l.c., England

Continuation of Ser. No. 760,825, Jul. 31, 1985, abandoned. This application Nov. 4, 1986, Ser. No. 926,660
Claims priority, application United Kingdom, Jul. 31, 1984, 8419515
Int. Cl.[4] A61K *31/50, 31/495, 31/53, 31/47, 31/445, 31/44, 31/41, 31/425, 31/42, 31/415, 31/40, 31/35*
U.S. Cl. 514—254 **10 Claims**

1. A method for the treatment of reversible airways obstruction, in mammals, which method comprises administering to a mammal in need of such treatment an effective amount of a compound of formula (I):



(I)

wherein:
either one of R_1 or R_2 is hydrogen and the other is C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl, aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being unsubstituted or substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino, C_{1-6} alkoxysulphinylamino, C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro, cyano, $—C(C_{1-6}$ alkyl) NOH or $—C(C_{1-6}$ alkyl)NNH_2, or either one of R_1 or R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino unsubstituted or substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl; either one of R_3 or R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene; R_5 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy and R_6 is hydrogen, or R_5 and R_6together are a bond; R_7 is hydrogen, C_{1-6} alkyl unsubstituted or substituted by hydroxy, C_{1-6} alkoxy, C_{1-6} alkoxycarbonyl or carboxy, C_{1-6} alkyl substituted by halogen, or C_{2-6} alkenyl, phenyl, naphthyl or heteroaryl each of which is unsubstituted or substituted by C_{1-6} alkoxy, hydroxyl, halogen, trifluoromethyl, nitro, cyano, C_{1-12} carboxylic acyl or amino or aminocarbonyl unsubstituted or substituted by one or two C_{1-6} alkyl groups and wherein the heteroaryl moiety is selected from the list of groups as defined hereinafter;
R_8 is hydrogen or C_{1-6} alkyl; or
R_7 and R_8 are joined together to form C_{3-4} polymethylene or $—CH_2—(CH_2)_n—Z—(CH_2)m—$ where m and n are integers of 0 to 2 such that m+n is 1 or 2 and z is oxygen, sulphur or NR_9 wherein R_9 is hydrogen, C_{1-9} alkyl, C_{2-7} alkanoyl, phenyl C_{1-4} alkyl, naphthylcarbonyl, phenylcarbonyl or benzylcarbonyl unsubstituted or substituted in the phenyl or naphthyl ring by one or two C_{1-6} alkyl, C_{1-6} alkoxy or halogen; heteroaryl carbonyl; and wherein heteroaryl moieties in R_7 and R_9 are selected from the group consisting of furanyl, thiophenyl, pyrryl, oxazolyl, thiazolyl, imidazolyl, thiadiazolyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, triazinyl, benzofuranyl, benzothiophenyl, indolyl, indazolyl, quinolinyl, isoquinolinyl and quinazoninyl;
X is oxygen or sulphur; and the R_8NCXR_7 moiety is trans to the R_5 group when R_5 is hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy; or a pharmaceutically acceptable salt or hydrate thereof.

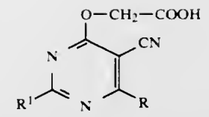
4,786,640

2,6-DISUBSTITUTED-5-CYANO-4-PYRIMIDINYLOXYACETIC ACID ALDOSE REDUCTASE INHIBITORS

Jehan F. Bagli; John W. Ellingboe, both of Princeton, and Thomas R. Alessi, Flemington, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 12, 1987, Ser. No. 62,734
Int. Cl.[4] A61K *31/505;* **C07D** *239/02*
U.S. Cl. 514—269 **7 Claims**

1. A compound of formula (1)



(I)

wherein R^1 is lower alkyl having 1 to 6 carbon atoms, cyclo(lower)alkyl having 3 to 6 carbon atoms, phenyl, halogen substituted phenyl, phenylmethyl, naphthalenyl, halogen substituted naphthalenyl, or thienyl; R is $—S—R^2$ wherein R^2 is lower alkyl having 1 to 6 carbon atoms, lower cycloalkylmethyl having 4 to 7 carbon atoms, phenylmethyl, or halogen substituted phenylmethyl; or R is R^3 wherein R^3 is lower alkyl having 1 to 4 carbon atoms, phenyl, or 1-naphthalenylmethyl; or a pharmaceutically acceptable salt thereof.

6. A pharmaceutical composition for relieving the symptoms of neuropathy, nephropathy, retinopathy, or cataracts in a diabetic mammal, which comprises an effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

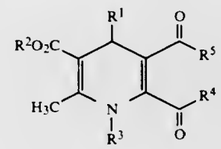
4,786,641

DIHYDROPYRIDINE COMPOUNDS AND THEIR USE IN REDUCING BLOOD SUGAR

Siegfried Goldmann; Hans-Jürgen Ahr; Walter Puls; Hilmar Bischoff, all of Wuppertal; Dieter Petzinna, Duesseldorf; Klaus Schlossmann, and Joachim Bender, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,491
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629545
Int. Cl.[4] A61K *31/44;* **C07D** *211/90, 491/048*
U.S. Cl. 514—302 **9 Claims**

1. A dihydropyridine compound of the formula



in which
R^1 represents phenyl, naphthyl, thienyl, pyridyl, chromenyl or thiochromenyl, it being possible for the radicals mentioned each to carry up to 2 identical or different substituents from the series comprising halogen, alkyl, alkoxy and alkylthio with in each case up to 6 carbon atoms, fluoroalkyl and fluoroalkoxy with in each case up to 3 carbon atoms and 3 fluorine atoms, nitro and cyano,
R^2 represents straight-chain, branched or cyclic alkyl which has up to 8 carbon atoms, can be interrupted in the alkyl chain by an oxygen or a sulphur atom and can be substituted by halogen, phenyl, cyano, hydroxyl, amino, alkylamino or dialkylamino with in each case up to 3 carbon atoms per alkyl group or by N-benzylmethylamino,
R^3 represents straight-chain, branched or cyclic alkyl which has up to 6 carbon atoms, can be interrupted in the alkyl chain by an oxygen atom and can be substituted by halogen, hydroxyl, amino, phenyl, morpholino, carboxy or alkoxycarbonyl with up to 4 carbon atoms and
R^4 and R^5 each represent hydroxyl, or
R^4 and R^5 together represent —O—,
or a physiologically acceptable salt thereof.

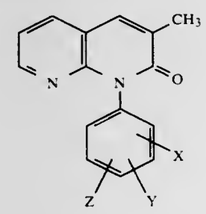
4,786,642

PHENYLNAPHTHYRIDINES CONTAINING A METHYL SUBSTITUENT IN THE 3-POSITION USEFUL IN THE TREATMENT OF ULCERS

Jean-Marie Teulon, La Celle Saint Cloud, France, assignor to Societe Anonyme: Carpibem, Rueil Malmaison, France

Filed Jan. 5, 1987, Ser. No. 315
Claims priority, application France, Jan. 6, 1986, 8600102; Jan. 6, 1986, 8600104
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] A61K *31/435;* **C07D** *471/04*
U.S. Cl. 514—300 **4 Claims**

1. A compound of the formula:



(I)

in which:
X, Y and Z are selected from the following combinations:
(a) Y=Z=H and X is m-CH_3, m-Cl, m-SCH_3, m, p-F, m-CN, m-CH_2-CN,
(b) Z=H, X=2-F and Y=5-F and
(c) Z=H, X=m-CH and Y is p-Cl or p-F.

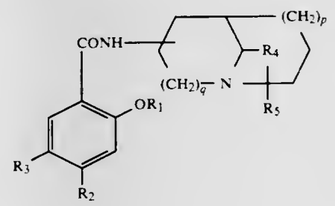
4,786,643

TREATMENT OF MIGRAINE, CLUSTER HEADACHES AND TRIGEMINAL NEURALGIA

Gareth J. Sanger, Sawbridgeworth, and Wesley D. Miner, Harlow, both of England, assignors to Beecham Group p.l.c., Brentford, England

Division of Ser. No. 876,724, Jun. 20, 1986, Pat. No. 4,725,603. This application Nov. 19, 1987, Ser. No. 122,920
Claims priority, application United Kingdom, Jun. 22, 1985, 8515845
Int. Cl.[4] A01K *31/44*
U.S. Cl. 514—305 **6 Claims**

1. A method of treatment of migraine, cluster headaches and trigeminal neuralgia, in mammals, including humans, which method comprises administering to a mammal in need of such treatment an effective amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:
R_1 is C_{1-6} alkyl;
R_2 is amino or C_{1-7} acylamino;
R_3 is halo;
R_4 and R_5 are both hydrogen;
p is 0 or 1; and
q is 1.

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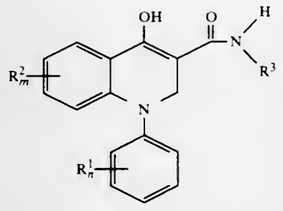
4,786,644

1-ARYL-3-QUINOLINECARBOXAMIDE

Edward J. Glamkowski, Warren, and R. Richard L. Hamer, Westfield, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Nov. 27, 1987, Ser. No. 125,971
Int. Cl.[4] A61K *31/47;* **C07D** *215/00*
U.S. Cl. 514—312 **53 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are monovalent radicals independently selected from the group consisting of halogen, loweralkyl and loweralkoxy; R^3 is a substituted or unsubstituted monovalent radical selected from the group consisting of phenyl, pyridyl, pyrimidyl, pyrazinyl, triazinyl, thiazolyl, thiadiazolyl, isoxazolyl, oxadiazolyl, quinolyl, and benzothiazolyl; and m and n are integers independently having values of zero or 1; the optical antipodes and pharmaceutically acceptable acid addition salts thereof.

47. A method of inhibiting inflammation comprising administering to a mammal in need of inflammation inhibition an inflammation inhibiting effective amount of a compound as defined in claim **1**.

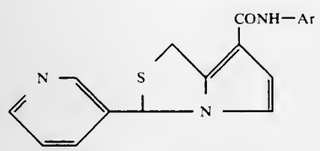
4,786,645

1H, 3H-PYRROLO (1,2-C) THIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Jean-Louis Fabre; Claude James, and Daniel Lavé , all of Paris, France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jul. 2, 1987, Ser. No. 69,211
Claims priority, application France, Jul. 4, 1986, 86 09729
Int. Cl.[4] C07D *513/04, 417/14;* **A61K** *31/44*
U.S. Cl. 514—333 **12 Claims**

1. A compound of the general formula I:



(I)

in which Ar is a pyridyl substituted with one or more halogen or alkyl, alkyloxy, alkylthio, trifluoromethyl, amino, alkylamino, dialkylamino, hydroxy, cyano, alkylsulphinyl, alkylsulphonyl, sulphamido, alkylsulphamido, dialkylsulphamido, alkylcarbonyl, benzoyl, alkyloxycarbonyl, carboxy, phenyoxycarbonyl, alkylcarbonyloxy, benzoyloxy, alkylcarbonylamino, benzamido, phenyl, benzyl, phenoxy or phenylthio group, provided that (i) an alkyl moiety contains 1 to 4 straight- or branched chain carbon atoms; (ii) a phenyl moiety may be unsubstituted or substituted with one or more halogen or alkyl, alkyloxy, alkylthio, trifluoromethly, amino, alkylamino, dialkylamino, hydroxy, cyano, phenyl or benzyl group in separate enantiomeric form or mixtures thereof, or a pharmaceutically acceptable salt thereof.

2. A pharmaceutical composition useful in the treatment of the adverse effects of PAF acether which comprises an effective amount of a compound as defined in claim **1** and a compatible and pharmaceutically acceptable diluent or adjuvant.

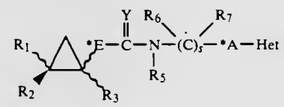
4,786,646

CYCLOPROPYLPROPENAMIDES

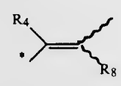
Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 10, 1987, Ser. No. 72,390
Int. Cl.[4] A61K *31/44;* **C07D** *413/00*
U.S. Cl. 514—346 **27 Claims**

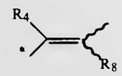
1. A compound of the formula



Y is O or S, *A is paraphenylene or *—$(CH_2)_n$—$(X)_m$—$(CH_2)_r$—, X is O, S or —CH=CH—, n or r, independently, are integers from 0 to 3, s is an integer from 0 to 1, m is an integer from 0 to 1, provided that when m is 1, n+s must be at least 2, R_1 and R_2, independently, are hydrogen, lower alkyl, cycloalkyl, lower alkenyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, *E is



or —$(CH_2)_k$— wherein k is an integer from 0 to 4, R_3, R_4 and R_8 are independently hydrogen or lower alkyl, R_5 and R_6, independently are hydrogen or lower alkyl, R_7 is hydrogen, lower alkyl, cycloalkyl, pyridinyl-lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, Het is pyridinyl unsubstituted or substituted by lower alkyl, halogen or phenyl, and the asterisk denotes the point of attachment, or an enantiomer, diastereomers or racemic mixture thereof, as well as when *E is



a geometric isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

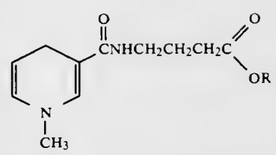
4,786,647

METHOD FOR ELICITING ANXIOLYSIS

James W. Simpkins, and Warren C. Stern, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla., by said James W. Simpkins and Pharmatec, Inc., Alachua, Fla., by said Warren C. Stern

Filed Jun. 30, 1986, Ser. No. 879,944
Int. Cl.[4] A61K *31/44*
U.S. Cl. 514—355 **4 Claims**

1. A method of relieving anxiety without causing significant sedation in a mammal, said method comprising administering to a mammal in need of such treatment an anxiolytically effective, non-sedating amount of a compound of the formula



(I)

wherein R is benzyl or cyclohexyl, or a non-toxic pharmaceutically acceptable salt thereof.

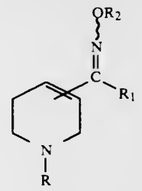
4,786,648

O-SUBSTITUTED TETRAHYDROPYRIDINE OXIME CHOLINERGIC AGENTS

Stephen C. Bergmeier; David A. Downs; Walter H. Moos; David W. Moreland, and Haile Tecle, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

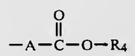
Continuation-in-part of Ser. No. 939,507, Dec. 8, 1986, Pat. No. 4,710,508. This application Sep. 4, 1987, Ser. No. 91,893
Int. Cl.[4] A61K *31/44;* **C07D** *211/70*
U.S. Cl. 514—357 **27 Claims**

1. A compound having the formula

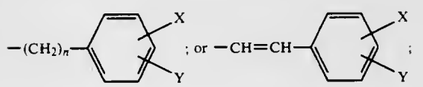


I

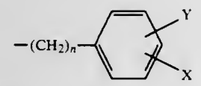
wherein
R is
hydrogen or alkyl from one to six carbon atoms;
R_1 is
hydrogen;
alkyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxyl of from one to four carbon atoms;
alkenyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxyl of from one to four carbon atoms;
alkynyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxyl of from one to four carbon atoms;
cycloalkyl of from three to eight carbon atoms;



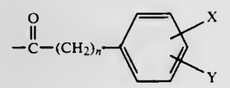
where A is a bond or is a hydrocarbon chain of from one to four carbon atoms and when containing two or more carbon atoms may contain one double bond and where R_4 is alkyl of from one to six carbon atoms;



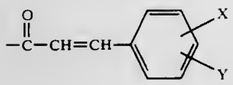
where n is zero to four and X and Y are independently selected from
hydrogen,
fluorine,
chlorine,
bromine,
hydroxy,
alkyl of from one to three carbon atoms, or
alkoxyl of from one to four carbon atoms;
R_2 is
alkyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxyl of from one to four carbon atoms;
alkenyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxyl of from one to four carbon atoms;
alkynyl of from one to six carbon atoms optionally substituted with hydroxy or alkoxyl of from one to four carbon atoms;
cycloalkyl of from three to six carbon atoms; or



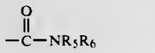
where n is zero to four and X and Y are independently selected from
hydrogen,
fluorine,
chlorine,
bromine,
hydroxy,
alkyl of from one to three carbon atoms, or
alkoxyl of from one to four carbon atoms;
alkylcarbonyl of from two to twelve carbon atoms;
alkenylcarbonyl of from three to twelve carbon atoms;
alkynylcarbonyl of from three to twelve carbon atoms;



or



where n, X and Y are as previously defined; or



where R_5 and R_6 are independently selected from hydrogen, alkyl of from one to four carbon atoms or phenyl;
or a pharmaceutically acceptable acid addition salt thereof; with the provisos that when R is methyl, R_1 is hydrogen; and when R is ethyl, and R_1 is hydrogen, R_2 may not be acetyl.

26. A method of alleviating pain in a mammal comprising administering to a mammal in need of such treatment an analgesically effective amount of a compound in accordance with claim **1** together with a pharmaceutically acceptable carrier.

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4,786,649

ANTIMICROBIAL 1-THIENYL-4-OXOQUINOLINE-3-CARBOXYLIC ACIDS

Hiraki Ueda, and Hisashi Miyamoto, both of Tokushima, Japan, assignors to Otsuka Pharmaceutical Company Limited, Tokyo, Japan

Filed Nov. 13, 1986, Ser. No. 929,847
Claims priority, application Japan, Dec. 20, 1985, 60-289039
Int. Cl.⁴ C07D *409/14;* A61K *31/47*
U.S. Cl. 514—312 **2 Claims**

1. The compound 6-flouro-1-(2-thienyl)-7-(3-aminomethyl-4-chloro-1-pyrrolidinyl)-1,4-dihydro-4-oxoquinoline -3-carboxylic acid or a pharmaceutically acceptable salt thereof.

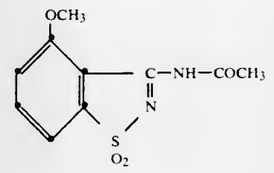
4,786,650

3-ACYLAMINOBENZISOTHIAZOLE-S,S-DIOXIDE AND INSECTICIDAL COMPOSITIONS AND METHODS

Josef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 3, 1986, Ser. No. 825,304
Claims priority, application Switzerland, Feb. 13, 1985, 649/85
Int. Cl.⁴ A01N *43/80;* C07D *275/06*
U.S. Cl. 514—373 **6 Claims**

1. The compound of formula



or the tautomer thereof.

2. A pesticidal composition which contains as active component an insecticidally effective amount of the compound according to claim 1, together with an insecticidally suitable carrier or other adjuvant.

3. A method of controlling insects, which comprises contacting or treating said insects and their various development stages, or the locus thereof, with an insecticidally effective amount of the compound according to claim 1.

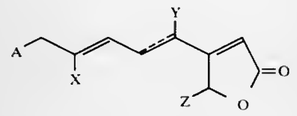
4,786,651

TREATMENT OF CUTANEOUS HYPERPROLIFERATIVE DERMATOSES WITH MANOALIDE

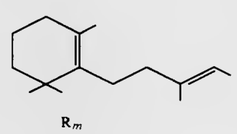
Larry Wheeler, Irvine, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Feb. 3, 1986, Ser. No. 825,309
Int. Cl.⁴ A61K *31/35, 31/34*
U.S. Cl. 514—460 **2 Claims**

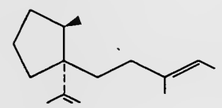
1. A method of treating psoriasis or acne which method comprises administering to a mammal in need of said treatment an amount therapeutically effective for treating psoriasis and acne of a compound of formula I, either alone or in combination with a pharmaceutically acceptable excipient where formula I is



wherein
X is $-CH_3$, $-CH_2OH$, —CHO, OR —COOH;
Y is —H or —OH;
Z is —H or —OH; and
the dotted line represents either a single bond or a double bond which may be in either the E or Z configuration; and
A is R_m or R_n



R_m



R_n

and when Y is —OH and X is —CHO or —COOH, the compound of formula II,includes the hemiacetal or delta-lactose, respectively; and
when X is —COOH, the corresponding alkyl esters, esters derived from alcohols of 1 to 10 carbon atoms; and
when X is $-CH_2OH$ and/or Y is —OH and/or Z is —OH, the corresponding acyl esters of acids from 1 to 10 carbon atoms; and
the pharmaceutically acceptable salts of those compounds where X or X is —COOH.

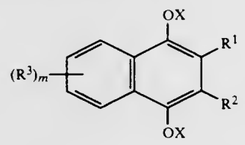
4,786,652

NAPHTHALENE ANTI-PSORIATIC AGENTS

Michael C. Venuti, San Francisco, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 9, 1987, Ser. No. 23,591
Int. Cl.⁴ A61K *31/27, 31/265;* C07C *69/96, 125/075*
U.S. Cl. 514—481 **36 Claims**

1. A compound of the formula

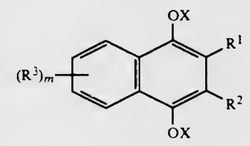


(I)

wherein:
R^1 is lower alkoxy of one to six carbon atoms or phenoxy optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
R^2 is the same as R^1, or R^2 is hydrogen, lower alkyl of one to six carbon atoms, phenyl or phenyl-lower-alkyl, wherein the phenyl ring of the phenyl or phenyl-lower-alkyl group is optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
R^3 is hydrogen, halo, lower alkyl of one to six carbon atoms, lower alkoxy of one to six carbon atoms, phenyl, phenyl-lower-alkyl or phenyl-lower-alkoxy, wherein the phenyl ring of the phenyl, phenyl-lower-alkyl or phenyl-lower-alkoxy group is optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
m is 1 or 2; and
both X groups are the same and X is $-C(O)OR^4$ or $-C(O)NR^5R^6$, wherein
R^4 is alkyl of one or seven carbon atoms, phenyl or benzyl,

wherein the phenyl ring of the phenyl or benzyl group is optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo; and
R^5 and R^6 are independently hydrogen, lower alkyl of one to six carbon atoms, cycloalkyl of five to eight carbon atoms or phenyl optionally substituted with one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo.

36. A method of treating psoriasis in mammals which comprises applying an effective amount of a compound of the formula



(I)

wherein:
R^1 is lower alkoxy of one to six carbon atoms or phenoxy optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
R^2 is the same as R^1, or R^2 is hydrogen, lower alkyl of one to six carbon atoms, phenyl or phenyl-lower-alkyl, wherein the phenyl ring of the phenyl or phenyl-lower-alkyl group is optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
R^3 is hydrogen, halo, lower alkyl of one to six carbon atoms, lower alkoxy of one to six carbon atoms, phenyl, phenyl-lower-alkyl or phenyl-lower-alkoxy, wherein the phenyl ring of the phenyl, phenyl-lower-alkyl or phenyl-lower-alkoxy group is optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
m is 1 or 2; and
both X groups are the same and X is $-C(O)OR^4$ or $-C(O)NR^5R^6$, wherein
R^4 is alkyl of one to seven carbon atoms, phenyl or benzyl, wherein the phenyl ring of the phenyl or benzyl group is optionally substituted by one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo;
R^5 and R^6 are independently hydrogen, lower alkyl of one to six carbon atoms, cycloalkyl of five to eight carbon atoms or phenyl optionally substituted with one or two substituents chosen from lower alkyl of one to four carbon atoms, lower alkoxy of one to four carbon atoms and halo.

4,786,653

TREATMENT OF NEUROTRANSMITTER-LINKED DRUG ABUSE

Daniel H. Golwyn, 701 E. Semoran Blvd., Altamonte Springs, Fla. 32715

Filed Aug. 24, 1987, Ser. No. 88,830
Int. Cl.⁴ A61K *31/135*
U.S. Cl. 514—654 **15 Claims**

1. A method of treating patients abusing drugs likely to enhance neurotransmitter activity in the short term and to depress such activity over a longer term, comprising administering to such a patient substantially daily a phenylalkylhydrazine in an amount effective to preclude such patient from taking such abused drug.

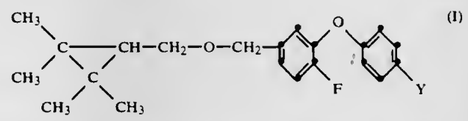
4,786,654

SUBSTITUTED BENZYLCYCLOPROPYLMETHYL ETHERS

Laurenz Gsell, Basel, and Peter Ackermann, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 26, 1987, Ser. No. 53,911
Claims priority, application Switzerland, Jun. 10, 1986, 2338/86
Int. Cl.⁴ A01N *31/16;* C07C *43/29, 149/34, 147/06*
U.S. Cl. 514—712 **11 Claims**

1. A compound of formula I



(I)

wherein Y is hydrogen, halogen, C_1–C_4alkyl or C_1–C_4alkyl which is substituted by 1 to 9 halogen atoms, C_1–C_4alkoxy or C_1–C_4alkoxy which is substituted by 1 to 9 halogen atoms, C_1–C_4alkylthio or C_1–C_4alkylthio which is substituted by 1 to 9 halogen atoms, or is C_2–C_4alkenyl or C_2–C_4alkynyl.

8. A method of controlling insects and representatives of the order Acarina, which comprises treating or contacting said pests, their various development stages and/or the locus thereof, with a pesticidally effective amount of a compound of formula I according to claim 1, or with a composition which contains a pesticidally effective amount of a compound according to claim 1, together with adjuvants and carriers suitable therefor.

4,786,655

PROCESS FOR THE PREPARATION OF POLYURETHANES CONTAINING URETDIONE RINGS FORMED IN THE PRESENCE OF A BISMUTH SALT OF AN ORGANIC CARBOXYLIC ACID

Gerhard Grögler; Heinrich Hess, both of Leverkusen, and Richard Kopp, Köln, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1987, Ser. No. 120,303
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640855
Int. Cl.⁴ C08J *9/00;* C08G *18/00, 18/14, 18/08*
U.S. Cl. 521—93 **6 Claims**

1. A process for the production of a polyurethane in which
(a) an organic polyisocyanate which is at least 50 wt. % diisocyanate containing a uretdione ring
is reacted with
(b) a relatively high molecular weight organic dihydroxyl compound
in the presence of
(c) a bismuth salt of an organic carboxylic acid and
(d) a low molecular weight aromatic diamine in a quantity which is from 5 to 10 times the quantity of bismuth salt (c) used.

4,786,656

POLYHYDROXYALKANE/AROMATIC DIAMINE CHAIN EXTENDERS

J. Kenneth Presswood; James H. Simon, and Christopher J. Nalepa, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 22, 1988, Ser. No. 158,836
Int. Cl.⁴ C08G *18/32*
U.S. Cl. 521—159 **24 Claims**

1. A blend of 90–99 mol % of a polyhydroxyalkane containing 2–6 carbons and 2–3 hydroxyl groups and 1–10 mol % of an aromatic diamine having a pKb value greater than 11.3.

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4,786,657
POLYURETHANES AND POLYURETHANE/POLYUREAS CROSSLINKED USING 2-GLYCERYL ACRYLATE OR 2-GLYCERYL METHACRYLATE
W. James Hammar, and John S. Staral, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jul. 2, 1987, Ser. No. 69,428
Int. Cl.[4] C08F *2/46*
U.S. Cl. 522—90 30 Claims

1. A crosslinkable polyurethane or polyurethane/polyurea comprising the reaction product of a composition comprising a macrodiol having a number average molecular weight of at least 400 or macrodiamine having a number average molecular weight of at least 400, 2-glyceryl acrylate or 2-glyceryl methacrylate, and a diisocyanate.

4,786,658
FLUORINE-CONTAINING RESIN COMPOSITION HAVING LOW REFRACTIVE INDEX
Yutaka Hashimoto; Masayuki Kamei, both of Sakai, and Toshihiko Umaba, Takaishi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Filed Feb. 25, 1987, Ser. No. 18,398
Claims priority, application Japan, Feb. 27, 1986, 61-40383; Apr. 24, 1986, 61-93226
Int. Cl.[4] C08F *259/08, 2/50*
U.S. Cl. 522—121 27 Claims

1. An active energy ray-curable resin composition which gives a cured product having a refractive index of not more than 1.44, said composition comprising (I) a fluorine-containing polymer composed of (A) a fluorine-containing (meth)acrylate, and at least one of (B) an alpha, beta-ethylenically unsaturated dicarboxylic acid ester, and (C) a non-fluorine-containing mono(meth)acrylate, and having a fluorine atom content of at least 30% by weight, (II) a fluorine-containing (meth)acrylate, (III) a non-fluorine-containing mono(meth)acrylate and (IV) a polyfunctional monomer containing at least two (meth)acryloyl groups in the molecule.

4,786,659
LOW WARP FILLED POLYOXYMETHYLENE COMPOSITIONS
Derrick B. McKie, Brooklyn, N.Y., and Andris Olukalns, Cincinnati, Ohio, assignors to Hoechst Celanese Corporation, Chatham, N.J.
Filed Dec. 19, 1986, Ser. No. 940,471
Int. Cl.[4] C08K *7/20, 3/40*
U.S. Cl. 523—220 13 Claims

1. A low warp, filled oxymethylene polymer composition comprising a normally solid oxymethylene polymer in an amount of from about 40 to 99 wt. % of the total composition and glass beads in an amount of from about 1 to 60 wt % of the total composition, said glass beads being present as a bimodal distribution of said glass beads comprising relatively large glass beads having a mean diameter of from about 65 to about 2,800 microns and relatively small glass beads having a mean diameter of from about 5 to about 200 microns, the ratio of mean diameters of said relatively large glass beads to said relatively small glass beads being about 6:1 to bout 550:1, the weight ratio of said relatively large glass beads to said relatively small glass beads comprising 2:1 to about 15:1.

4,786,660
METHOD FOR MAKING CURABLE CASTING RESINS
Guenther Ittmann, Gross-Umstadt, and Manfred Krieg, Darmstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany
Filed Sep. 2, 1986, Ser. No. 902,937
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531914
Int. Cl.[4] C08K *5/24*
U.S. Cl. 524—265 11 Claims

1. A method for making a low-viscosity liquid suspension, adaptable to use as a casting resin and curable in the presence of an agent generating free radicals, said suspension containing a high content of finely divided inorganic filler but being free of any polymeric functional dispersing agent, which method comprises mixing a liquid polymer precursor, an organosilicon compound as an adhesion promotor, and an alkylamine as a catalyst for the organosilicon compound, incorporating finely divided inorganic fillers into the resulting mixture in such an amount that the viscosity of the resulting thixotropic suspension (as determined by means of a rotating cylinder viscosimeter in conformity with DIN 53019, Part 1, at 20° C.) does not exceed 10 Pa.sec, and then converting said thixotropic suspension into a completely deflocculated low-viscosity suspension by letting it stand at room temperature for a sufficient length of time or by heating it for a short time, said liquid polymer precursor consisting essentially of a monomer or monomer mixture or of a mixture of a prepolymer, free of functional groups, dissolved or dispersed in a monomer or monomer mixture.

4,786,661
PROCESS FOR THE RAPID DISSOLUTION OF WATER-SOLUBLE POLYMERS
Wolfgang Hübner, Möhlenring; Helmut Klein, Zu den Tannen; Erhard Goldacker, Am langen Bruchbach, and Otto Schroer, Dohrhofweg, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Fed. Rep. of Germany
Filed Jul. 29, 1983, Ser. No. 518,511
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228843
Int. Cl.[4] C06L *31/00*
U.S. Cl. 523—318 6 Claims

1. A process for the rapid dissolution of water-soluble polymer in water, comprising introducing water alone or mixed solely with a hydrophilic wetting agent in finely divided state under pressure into a water-in-oil emulsion of the polymer or into a suspension of the polymer powder in oil, at least one of the water-in-oil emulsion, the powder-in-oil suspension of the polymer and the water that is introduced containing a hydrophilic wetting agent.

4,786,662
STORAGE-STABILIZED COMPOSITIONS BASED ON VINYLIDENE FLUORIDE POLYMERS COMPRISING A METAL MOLYBDATE
Jean-Marie De Berraly, Waterloo, and Anthony Simoens, Vedrin, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium
Filed Dec. 3, 1987, Ser. No. 128,106
Claims priority, application France, Dec. 15, 1986, 86 17622
Int. Cl.[4] C08K *3/26*
U.S. Cl. 524—406 8 Claims

1. Storage-stabilized compositions based on vinylidene fluoride polymers, containing a metal molybdate, characterized in that they contain molybdate in a proportion of 0.05 to 2 parts by weight, expressed as molybdenum metal, per 100 parts of vinyldine fluoride polymer and they additionally contain, as storage stabilizers alkaline metal or alkaline-earth metal carbonate in a proportion of 1 to 100 parts by weight per 100 of metal molybdate.

4,786,663
FLAME RETARDANT RESIN COMPOSITIONS
Shunitsu Miyashita, and Kenji Mogami, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Jan. 22, 1987, Ser. No. 6,033
Claims priority, application Japan, Jan. 23, 1986, 61-12682
Int. Cl.[4] C08K *3/24*
U.S. Cl. 524—410 7 Claims

1. Flame retardant resin compositions containing thermoplastic polyesters, organic halides and sodium antimonate, characterized in that the sodium antimonate has the ratio of the peak intensity of X-ray diffraction from face distances d of 5.25~5.35 (Å) to that of 2.64~2.66 (Å) of 1.5 or higher and mean particle diameters of 0.5~50 μm, and is 1~15 parts by weight in proportion to 100 parts by weight of the aforementioned thermoplastic polyesters.

4,786,664
COMPATIBLE POLYPHENYLENE ETHER-LINEAR POLYESTER BLENDS HAVING IMPROVED COEFFICIENT OF THERMAL EXPANSION
John B. Yates, III, Glenmont, N.Y., assignor to General Electric Company, Selkirk, N.Y.
Filed Mar. 26, 1987, Ser. No. 31,344
Int. Cl.[4] C08K *7/08*
U.S. Cl. 524—417 12 Claims

1. A thermoplastic composition comprising:
I. 100 parts by weight of the following resinous components and any reaction products thereof, all percentage proportions being by weight of total resinous components:
(A) about 15 to 50% of at least one polyphenylene ether, or a blend thereof with at least one polystyrene;
(B) about 20 to 80% of at least one poly(alkylene dicarboxylate), the weight ratio of component A to B being at most 1.2:1; and
(C) from 3% to about 50% of at least one polymer containing a substantial proportion of aromatic polycarbonate units and having a weight average molecular weight of at least about 40,000 as determined by gel permeation chromatography relative to polystyrene, or a blend thereof with a styrene homopolymer; and
II. about 2 to 50 parts by weight phosphate fiber comprised of a calcium sodium salt of metaphosphoric acid per 100 parts of I.

4,786,665
CHLOROSULFONATED ETHYLENE. α-OLEFIN COPOLYMER COMPOSITION CONTAINING HYDROTALCITE
Tatsushi Nakagawa; Yoshiaki Ishida; Junichiro Kanesaka, and Yosuke Kaneshige, all of Yamaguchi, Japan, assignors to Tosoh Corporation, Yamaguchi, Japan
Filed Mar. 18, 1988, Ser. No. 170,198
Int. Cl.[4] C08K *3/26*
U.S. Cl. 524—424 5 Claims

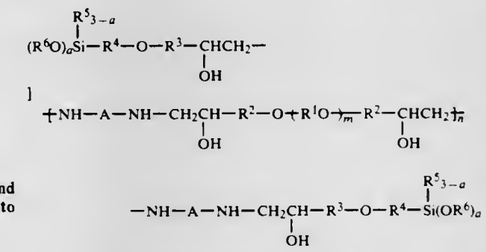
1. A chlorosulfonated ethylene.α-olefin copolymer composition comprising
(a) 100 parts by weight of a chlorosulfonated ethylene.α-olefin copolymer containing from 25 to 32% by weight chlorine and from 0.3 to 2.5% by weight sulfur,
(b) from 10 to 35 parts by weight of a hydrotalcite,
(c) from 0.5 to 5 parts by weight of a thiuram, and
(d) from 0.5 to 5 parts by weight of a maleimide.

4,786,666
EPOXY COMPOSITIONS CONTAINING GLYCIDYL ETHERS OF FATTY ESTERS
Joseph L. Cecil; Walter J. Kurnik, and Donald E. Babcock, all of Louisville, Ky., assignors to Interez, Inc., Jeffersontown, Ky.
Filed Nov. 18, 1987, Ser. No. 122,060
Int. Cl.[4] C08G *59/22, 59/42*
U.S. Cl. 523—427 9 Claims

1. An epoxy ester composition comprising the reaction product of:
(a) a diglycidyl ether of a dihydric phenol;
(b) castor oil polyglycidyl ether;
(c) a dihydric phenol;
(d) a monocarboxylic fatty acid; and
(e) a dimer acid,
wherein the sum of the epoxide equivalents of (a) and (b) and the phenolic equivalents of (c) are in the ratio of about 2:1 to about 4:3; wherein about 70 to about 80 percent of the epoxide equivalents are derived from (a) and the remainder from (b); wherein (d) and (e) are present in the amount of about 26 to about 42 weight percent (e), said weight percents being based on the total weight of (a), (b), (c), (d) and (e).

4,786,667
POLYETHER END-BLOCKED WITH HYDROLYZABLE SILYL GROUPS, METHOD OF MANUFACTURING AND ROOM TEMPERATURE CURABLE COMPOSITION USING THE POLYETHER
Chiyuki Shimizu, and Tamio Yoshida, both of Obta, Japan, assignors to Toshiba Silicone Co., Ltd., Japan
Filed May 22, 1987, Ser. No. 53,247
Claims priority, application Japan, May 30, 1986, 61-124857; May 30, 1986, 61-124858
Int. Cl.[4] C08L *63/00*
U.S. Cl. 523—435 6 Claims

1. A room temperature curable composition comprising:
(I) 100 parts by weight of a polyether having molecular weight from 500 to 50,000, end-blocked with hydrolyzable silyl groups and represented by the general formula:



where R^1, R^2, R^3 and R^4 individually represent a divalent hydrocarbon group, R^5 represents a monovalent hydrocarbon group, R^6 represents an alkyl group with 1 to 6 carbon atoms, A represents a substituted or non-substituted divalent aromatic group, a represents a number of 1 to 3, m represents a number of 10 to 500 and n represents a number of 1 or greater,
(II) 3 to 300 parts by weight of an inorganic filler, and
(III) 0.001 to 20 parts by weight of a curing catalyst.

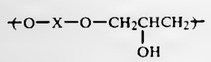
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4,786,668
RESIN MATERIALS

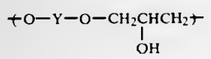
Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 9, 1986, Ser. No. 871,951
Int. Cl.⁴ C08G *59/00, 59/24*
U.S. Cl. 523—445 **59 Claims**

1. The composition comprising linear molecules having the repeating structures:



I.



II.

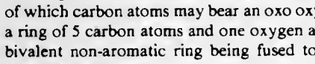
wherein:

(a) the segment X comprises stiff units (SU) and optional flexible units (FU) and has the structure —A—Z—Ar— where Ar is substituted or non-substituted benzene rings, optionally annulated with one or more additional benzene rings, and wherein Z represents a gem-bivalent radical having 1 to 2 aromatic hydrocarbon rings and a gem-bivalent non-aromatic ring selected from the group consisting of a ring of 5 carbon atoms, a ring of 6 carbon atoms, one of which carbon atoms may bear an oxo oxygen atom, and a ring of 5 carbon atoms and one oxygen atom, said gem-bivalent non-aromatic ring being fused to said aromatic hydrocarbon rings;

(b) "Y" represents a segment comprising stiff units (SU') and optional flexible units (FU') which stiff units and flexible units are interconnected;

(c) said stiff units, SU and SU', are independently selected from the group consisting of substituted and non-substituted aromatic rings and non-interfering heterocyclic rings;

(d) said flexible units, FU and FU', are independently selected from the group consisting of

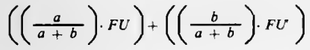


(e) the number of "X" segments in said molecules is "a", the number of "Y" segments in said molecules is "b", and the ratio of a/(a+b) is greater than zero and less than or equal to one;

(f) the number of stiff units and flexible units is selected such that the average number of total stiff units



divided by the average number of total flexible units



is greater than four; and

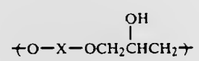
(g) the ratio of the number of stiff units to flexible units in said "X" segment (SU/FU) is equal to or greater than the ratio of the number of stiff units to flexible units in said "Y" segment (SU'/FU').

4,786,669
LIGHTLY CROSS-LINKED RESIN MATERIALS

Kenneth C. Dewhirst, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

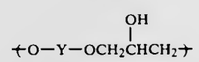
Filed Jun. 9, 1986, Ser. No. 871,952
Int. Cl.⁴ C08G *59/22, 59/26*
U.S. Cl. 523—445 **29 Claims**

1. A polymer composition comprising lightly crosslinked linear molecules having the repeating structures prior to crosslinking of the general formula:



I.

and



II.

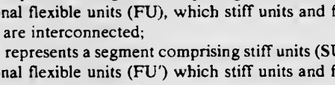
wherein said repeating structures are lightly crosslinked such that between 1 and 50 of said repeating structures per 100 total repeating structures are crosslinked to repeating structures of other molecules, and where:

(a) "X" represents a segment comprising stiff units (SU) and optional flexible units (FU), which stiff units and flexible units are interconnected;

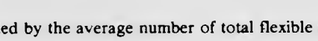
(b) "Y" represents a segment comprising stiff units (SU') and optional flexible units (FU') which stiff units and flexible units are interconnected;

(c) said stiff units, SU and SU', are independently selected from the group consisting of substituted and non-substituted aromatic rings and non-interferring heterocyclic rings;

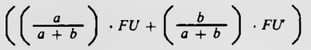
(d) said flexible units, FU and FU', are independenly selected from the group consisting of



(e) the number of X segments in said molecules is "a", the number of y segments in said molecules is "b", the number of stiff units and flexible units is selected such that the average number of total stiff units



divided by the average number of total flexible units



is less than or equal to four; and

(f) the ratio of the number of stiff units to flexible units in said X segment (SU/FU) is equal to or greater than the ratio of the number of stiff units to flexible units in said y segment (SU'/FU').

4,786,670
COMPRESSIBLE NON-ASBESTOS HIGH-TEMPERATURE SHEET MATERIAL USABLE FOR GASKETS

Douglas Tracy, Dayville, and Frank W. Major, Bolton, both of Conn., assignors to Lydall, Inc., Manchester, Conn.

Filed Jan. 9, 1987, Ser. No. 1,704
Int. Cl.⁴ C08L *89/00;* **C08K** *3/10, 3/34*
U.S. Cl. 524—34 **12 Claims**

1. A compressible non-asbestos sheet material usable for high temperature gaskets, said material comprising:

inorganic fibrous material,

inorganic filler material,

organic fibrous material, and

a dual binder system, said dual binder system consisting of an organic binder material and an inorganic binder material.

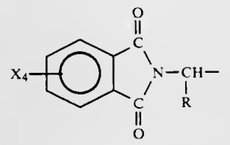
4,786,671
FLAMEPROOFING AGENT COMBINATIONS AND THEIR USE IN THERMOPLASTIC MOULDING COMPOSITIONS OF POLYCARBONATES AND ABS POLYMERS

Hans-Jürgen Kress, Krefeld; Friedemann Müller, Neuss; Horst Peters, Leverkusen; Christian Lindner, Cologne, and Josef Beukers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

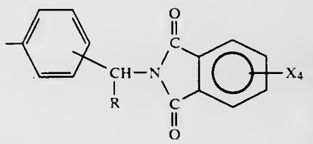
Continuation-in-part of Ser. No. 671,220, Nov. 14, 1984, abandoned. This application Jan. 23, 1986, Ser. No. 821,822
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342414
Int. Cl.⁴ C08K *5/34*
U.S. Cl. 524—94 **35 Claims**

1. Flameproof agent combination consisting of

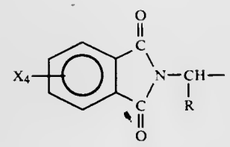
(a) 0.5 to 2.5 parts by weight of a bisphthalimide of the formula (Ia)



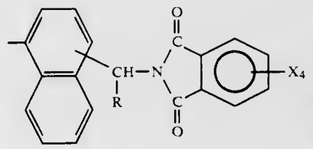
(Ia)



or of the formula (Ib)



(Ib)



wherein

X denotes hydrogen or halogen and

R denotes hydrogen, a C_1–C_4-alkyl, a C_5–C_6-cycloalkyl or an optionally substituted C_6–C_{30}-aryl group, and

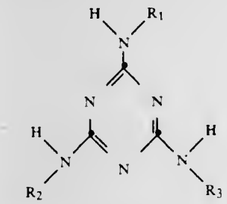
(b) 0.05 to 1 part by weight of a tetrafluoroethylene polymer.

4,786,672
ANILINOTRIAZINES AND THE USE THEREOF

Wolfgang Wehner, Zwingenberg, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

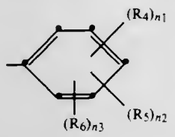
Filed Jul. 21, 1987, Ser. No. 76,246
Claims priority, application Switzerland, Jul. 31, 1986, 3083/86
Int. Cl.⁴ C08K *5/34, 5/09, 5/11;* **C08L** *61/28*
U.S. Cl. 524—100 **12 Claims**

1. A chlorine-containing polymer which is sensitive to degradation induced by light and/or heat and which contains an effective stabilizing amount of at least one compound of the formula I



(I)

in which R_1 is phenyl or a group of the formula II



(II)

in which R_4, R_5 and R_6 independently of one another are chlorine, bromine, cyano, methoxycarbonyl, ethoxycarbonyl, carbamoyl, hydroxyl, methoxy, ethoxy or C_1–C_{18}-alkyl and n_1, n_2 and n_3 are 0, 1, 2 or 3, subject to the proviso that the sum of $n_1+n_2+n_3$ is an integer from 1 to 3, and R_2 and R_3 independently of one another are C_2–C_4-hydroxyalkyl.

4,786,673
FLAME RETARDED POLYAMIDES

Genevieve Morival, Serquigny, and Catherine Hervy, Bernay, both of France, assignors to Atochem, France

Continuation of Ser. No. 833,411, Feb. 19, 1986, abandoned, which is a continuation of Ser. No. 731,552, May 7, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 149,978
Claims priority, application France, May 21, 1984, 84 07879
Int. Cl.⁴ C08K *5/34*
U.S. Cl. 524—101 **14 Claims**

1. Flame retarded polyamides with reduced dripping properties comprising a polyamide and an amount of (1) melamine cyanurate and (2) a polyol having at least four hydroxy groups, dispersed in the polyamide to retard combustion in the polyamide.

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4,786,674
DIFFUSION ISOLATION LAYER FOR MASKLESS CLADDING PROCESS

Lester W. Herron, Hopewell Junction; Ananda H. Kumar, Wappingers Falls, and Robert W. Nufer, Hopewell Junction, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 666,954, Oct. 30, 1984, Pat. No. 4,582,722. This application Jan. 10, 1986, Ser. No. 817,634
Int. Cl.[4] C08K *3/36, 3/22*
U.S. Cl. 524—315 4 Claims

1. A diffusion barrier material having sufficient thermal and mechanical integrity to protect selected metal areas of a plurality of spaced metal areas on the surface of a substrate during maskless cladding consisting essentially of: polymethylmethacrylate, amylacetate, and a ceramic particle base comprising alumina powder and fumed silica, wherein said material has sufficient thermal and mechanical integrity to protect selected metal areas of a plurality of spaced metal areas on the surface of a substrate during maskless cladding.

4,786,675
SEALED SEMICONDUCTOR CONTAINING AN EPOXY RESIN COMPOSITION

Riso Iwata, Tokyo, and Yoichiro Kubo, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 809,716, Dec. 17, 1985, abandoned. This application Apr. 29, 1987, Ser. No. 45,770
Claims priority, application Japan, Dec. 21, 1984, 59-270322; Feb. 15, 1985, 60-27605
Int. Cl.[4] C08K *03/34, 03/26;* C08L *63/02, 63/04*
U.S. Cl. 523—456 5 Claims

1. A sealed semiconductor device comprising a molded epoxy resin composition for sealing semiconductors said epoxy resin composition comprising an epoxy resin, a curing agent for said epoxy resin, a filler and a modifier, wherein the modifier comprises a diene polymer which is a hydrogenated product of a polymer or copolymer prepared from at least one conjugated diene monomer having an iodine number of not more than 120 in an amount of 1 to 50 parts by weight of modifier per 100 parts by weight of the epoxy resin.

4,786,676
CROSSLINKABLE POLYMERIC COMPOSITIONS WHICH HAVE A LONG SHELF LIFE WHEN IN THE FORM OF AN AQUEOUS SOLUTION OR DISPERSION, THEIR PREPARATION AND THEIR USE

Rainer Blum, Ludwigshafen; Rolf Osterloh, Gruenstadt; Gerhard Neubert, Battenberg, and Gerhard Auchter, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 10, 1986, Ser. No. 917,519
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536261
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] C08F *2/16*
U.S. Cl. 524—460 5 Claims

1. A polymeric composition in the form of an aqueous solution or dispersion having a long shelf life which comprises: the reaction product of

(A) a polymeric organic compounds containing carboxyl and carbonyl groups, and

(B) a polyhydrazide, and as a stabilizing agent,

(C) an alkyl, cycloalkyl, arylalkyl monofunctional monoketone, monoaldehyde or a mixture thereof, the reaction of (A) and (B) having been carried out in the presence of (C); the carboxyl groups of the reaction product being partially or completely neutralized.

4,786,677
RUBBER COMPOSITION CONTAINING A CARBON BLACK PARTICLES HAVING TWO MODAL DIAMETERS IN THE AGGREGATE

Kiyonari Nakai, and Masahiko Mito, both of Aichi, Japan, assignors to The Tokai Carbon Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,317
Claims priority, application Japan, Jan. 21, 1987, 62-9956
Int. Cl.[4] C08K *3/04*
U.S. Cl. 524—496 4 Claims

1. A rubber composition comprising 35 to 100 parts by weight of a carbon black per 100 parts by weight of a rubber component, the carbon black having a nitrogen adsorption specific surface area (N_2SA) within a range of 70 to 185 m^2/g and an aggregate characteristic which shows two modal diameters in the aggregate equivalent Stokes diameter distribution and has a difference between the two modal diameters L (nm) to be calculated from the following equation (1) which satisfies the following formula (2):

$$L = Dst_2 - Dst_1 \quad (1)$$

$$20 \leqq L \leqq 110 - 0.3(N_2SA) \quad (2)$$

wherein $\overline{Dst}_1$ and $\overline{Dst}_2$ respectively denote a first modal diameter (nm) and a second modal diameter (nm) in the aggregate equivalent Stokes diameter distribution determined by a centrifugal classification method.

4,786,678
METHOD OF PRODUCING FILMS FROM POLYETHYLENE RESIN, AN ADDITIVE AND A SECOND POLYMERIC RESIN

David V. Dobreski, Fairport; Jack J. Donaldson, Rochester, and Bruce E. Nattinger, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 947,214, Dec. 29, 1986, abandoned. This application May 6, 1988, Ser. No. 191,727
Int. Cl.[4] C08J *3/22;* C08L *23/04, 23/18*
U.S. Cl. 524—528 31 Claims

1. A method of preparing a blown polyethylene film from a major proportion of a polyethylene resin, a minor proportion of a second polymeric resin, which is a thermoplastic polymer of styrene, para-methylstyrene or a polyamide, and at least one additive comprising blending the polyethylene resin with a separately-prepared mixture (masterbatch) of the second polymeric resin and said at least one additive and extruding the resulting blend.

4,786,679
WATER-IN-OIL EMULSIONS OF AMIDASE

Robert L. Wetegrove, Winfield; Ralph W. Kaesler, Barrington, and Bhupati Bhattacharyya, Downers Grove, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Feb. 13, 1987, Ser. No. 14,328
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] C08J *9/04*
U.S. Cl. 524—827 2 Claims

1. A water-in-oil emulsion comprising a mixture of Amidase, and an acrylamide containing polymer.

4,786,680
RUBBER COMPOSITION FOR TIRE TREAD

Yukizi Suzuki, Hiratsuka, and Yasushi Kikuchi, Odawara, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

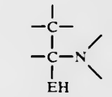
Filed Oct. 8, 1987, Ser. No. 105,744
Claims priority, application Japan, Oct. 14, 1986, 61-242152
Int. Cl.[4] C08L *7/00, 9/00, 9/06;* C08K *9/20*
U.S. Cl. 524—495 5 Claims

1. A rubber composition for a tire tread comprising:

(a) 25 to 55 parts by weight of a rubber selected from the group consisting of natural rubber and polyisoprene rubber;

(b) 5 to 15 parts by weight of a halogenated butyl rubber;

(c) 70 to 30 parts by weight of a styrenebutadiene copolymer rubber including 10 to 30 wt. % of bonded styrene units and 25 to 80% of 1,2-vinyl bonds in the butadiene units and having at a molecular terminal or in a chain thereof an atomic group introduced thereinto and represented by formula (I):



(I)

wherein E is O or S; and

(d) 30 to 80 parts by weight, based on 100 parts by weight of the raw rubber, of carbon black.

4,786,681
POLYMERIZATION PROCESS

Alan S. Baker, Slough; Stephen J. Butterworth, Chesham, and Ravinder K. Jheeta, Slough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Aug. 12, 1986, Ser. No. 895,851
Claims priority, application United Kingdom, Sep. 5, 1985, 8522052
Int. Cl.[4] C08F *2/32;* C08L *33/02;* B01F *17/00;* B01J *13/00*
U.S. Cl. 524—710 10 Claims

7. An inverse emulsion polymerization process for producing a water-in-oil emulsion of a water-soluble polyacrylamide or polyacrylic acid polymer or copolymer comprising the steps of mixing together with agitation an aqueous solution of a monomer or monomers to be polymerized and an oil phase to produce a substantially homogeneous emulsion, and polymerizing the monomer or monomers; wherein the oil phase is a solution containing a water-insoluble, oil-soluble surface active emulsifying agent of the formula (1):

$$X—Y—Z \quad (I)$$

or a functional derivative thereof, wherein:

X represents a saturated or unsaturated hydrocarbon chain containing from 30 to 500 carbons;

Y is carried terminally upon the group X and is the succinic anhydride residue obtained from the reaction of a succinic anhydride group with a compound containing the group Z;

Z represents a hydrophilic group carried by the group Y and is derived from an alcohol, a polyol, an amine, a polyamine, a compound containing both hydroxyl and amino groups or a compound containing carboxylic acid groups in additions to the hydroxyl and/or amino groups.

4,786,682
COATING COMPOSITIONS PREPARED FROM MICHAEL ADDUCTS

Leon A. Perez, Pittsburgh, and H. Hayne Crum, III, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 25, 1987, Ser. No. 66,388
Int. Cl.[4] C08G *18/30*
U.S. Cl. 525—28 15 Claims

1. A coating composition comprising:

(A) an ungelled Michael adduct formed by reacting, under conditions sufficient to form a Michael adduct,

(a) a material containing one or more primary and/or secondary amino groups and at least two hydroxyl groups; with

(b) a material containing at least two alpha,beta-ethylenically unsaturated moieties; with the proviso that the reactants (a) and (b) are selected such that the resultant Michael adduct contains hydroxyl functionality; and

(B) a curing agent adapted to crosslink with the hydroxyl functionality present on the Michael adduct; said adduct being stable under the curing conditions for the coating composition.

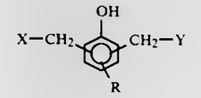
4,786,683
PHENOLIC RESIN AND POLYETHER TREATED GUAYULE RESIN

William W. Schloman, Jr., Stow, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 26, 1987, Ser. No. 54,465
Int. Cl.[4] C08G *8/10;* C08F *8/00*
U.S. Cl. 525—54.42 10 Claims

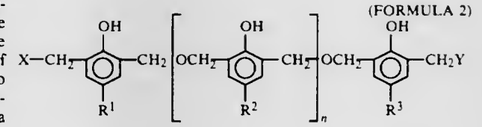
1. A composition of matter, comprising:

a guayule or a guayule like resin chemically treated with an effective amount of a phenolic crosslinking agent and an amine terminated polyether so that the softening point of said resin is at least 75° C. according to ASTM Method E28-67, said phenolic crosslinking agent having the formula



(FORMULA 1)

or



(FORMULA 2)

or combinations thereof, wherein X and Y independently is hydroxyl, bromine, iodine, or chlorine, wherein R is hydroxymethyl, bromomethyl, iodomethyl, chloromethyl, an alkyl having from 1 to 25 carbon atoms, or an alkenyl having from 3 to 25 carbon atoms, and wherein R^1, R^2, and R^3, independently is hydroxymethyl, bromomethyl, iodomethyl, chloromethyl, an alkyl having from 1 to 25 carbon atoms, or an alkenyl having from 3 to 25 carbon atoms, and wherein n is from 0 to 2.

4,786,684
BENZYLTHIOETHER-LINKED SOLID SUPPORT-BOUND THIOL COMPOUNDS AND METHOD FOR PEPTIDE SYNTHESIS

John D. Glass, Shoreham, N.Y., assignor to The Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Filed Aug. 21, 1986, Ser. No. 899,209
Int. Cl.[4] A61K *37/02;* C08F *36/06, 136/06*
U.S. Cl. 525—54.1 19 Claims

1. In a method of synthesizing sulfhydryl-containing peptides, the improvement comprising

(a) forming a benzylthioether-linked solid support-bound thiol compound, said thiol compound having at least one functional group for generating at least one peptide bond;

(b) coupling to said thiol compound at least one protected amino acid or peptide to form a peptide of desired amino acid sequence; and

(c) cleaving the peptide from the support at the benzylthioether linkage.

16. An anitgen comprising a synthesized peptide containing therein an N-terminal β-mercaptopropionic acid wherein the

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N-terminal reactive group of the peptide is a free sulfhydryl group of said β-mercaptopropionic acid, said synthesized peptide being conjugatable through the free sulfhydryl group to a carrier protein.

4,786,685

THERMOPLASTIC RESIN COMPOSITION

Hiroshi Takida; Kenji Hasegawa, both of Takatsuki, and Teruo Iwanami, Ibaraki, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 29, 1987, Ser. No. 79,112

Claims priority, application Japan, Aug. 1, 1986, 61-182456; Jan. 9, 1987, 62-3790

Int. Cl.[4] C08L *29/04*

U.S. Cl. 525—58 8 Claims

1. A thermoplastic resin composition comprising (1) a thermoplastic resin having an ester structure in the main chain and being selected from the group consisting of a polycarbonate, a polyethylene terephthalate, a polybutylene terephthalate, and a polyester-polycarbonate other than said polycarbonate, and (2) a hydrolyzed ethylene-vinyl acetate copolymer having an ethylene content of 20 to 60% by mole and a degree of hydrolysis in the vinyl acetate component of at least 95% by mole, and having an ash content of not more than 20 ppm and an alkali metal content of not more than 5 ppm.

4,786,686

FIRE RETARDANT IMPACT MODIFIED CARBONATE POLYMER COMPOSITION

Michael K. Laughner, Lake Jackson, and Samuel A. Ogoe, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1987, Ser. No. 46,364

Int. Cl.[4] C09L *69/00*

U.S. Cl. 525—67 6 Claims

1. A flame retardant, impact resistant aromatic carbonate polymer composition consisting essentially of a mixture of (a) one or more carbonate polymers, (b) an impact modifying quantity of a rubbery polymer selected from the group consisting of styrene/methylmethacrylate copolymers grafted onto homopolymers or interpolymers of butadiene, and (c) from 0.01 to 10 percent by weight of the total composition of a fluorine containing polymer of the fibril forming type.

4,786,687

MOLDING COMPOSITION

Akira Sano, Kawasaki; Masataka Oka, Fujisawa; Tetsujirou Kuroishi, Chiba, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1986, Ser. No. 854,327

Claims priority, application Japan, May 30, 1985, 60-116979

Int. Cl.[4] C08L *23/04, 23/06*

U.S. Cl. 525—240 2 Claims

1. An injection molding composition comprising an ultra-high molecular weight polyethylene material having an intrinsic viscosity of 10–30 dl/g at 135° C. in decalin, said material resulting from a polymerization process consisting of the following two stages of polymerization reaction:

(a) a first reaction stage wherein an ethylene monomer is polymerized in a reaction vessel in the presence of a composite catalyst comprising a solid component containing at least magnesium, titanium and/or vanadium and an organometallic compound and in the absence of hydrogen or in the presence of hydrogen at a low concentration to produce 75–99 parts by weight of polyethylene having an intrinsic viscosity of 12–32 dl/g at 135° C. in decalin; and

(b) a second reaction stage wherein a fresh feed of ethylene monomer is introduced in the same reaction vessel and polymerized in the presence of hydrogen at a higher concentration while retaining the reaction produce from the first reaction stage in said reaction vessel to produce 25–1 parts by weight of polyethylene having an intrinsic viscosity of 0.1–5 dl/g at 135° C. in decalin.

4,786,688

POLYETHYLENE COMPOSITION FOR EXTRUSION, PARTICULARLY FOR BLOW MOULDING

Jean P. Thiersault; Daniel Durand, both of Martigues, and Alain Seuez, Callas-Cabriès, all of France, assignors to BP Chimie, Lavera, France

Continuation of Ser. No. 780,710, Sep. 26, 1985, abandoned, which is a continuation of Ser. No. 663,829, Oct. 23, 1984, abandoned, which is a continuation of Ser. No. 319,191, Nov. 9, 1981, abandoned. This application Jan. 27, 1988, Ser. No. 149,913

Claims priority, application France, Nov. 13, 1980, 80 24096

Int. Cl.[4] C08L *23/04, 23/06, 23/20*

U.S. Cl. 525—240 6 Claims

1. Polyethylene compositions, characterised in that they contain:

(a) from 80 to 98% by weight of high density polyethylene having a density of at least 0.940, a melt index measured at 190° C. under a load of 5 kg (MI_5) of 1.2 g/10 minutes or less, and a melt flow ratio defined by the ratio of MI_5 to a melt index measured at 190° C. under a load of 2.16 kg, of 6 or higher,

(b) from 2 to 20% by weight of linear low density polyethylene, of a density below 0.930 and a melt index of at least one-fourth the melt index of the high density polyethylene which is formed by copolymerizing 85 to 95% by weight ethylene with 15 to 5% by weight of one or more C_3–C_8 alpha-olefins, in the gaseous phase at a pressure below 4×10^6 Pa in the presence of a catalyst containing compound of a transition metal selected from the sub-groups IVa, Va and VIa of the Periodic Table,

wherein the compositions have a melt index measured at 190° under a load of 2.16 kg of 0.12 g/10 min or higher.

4,786,689

PROCESS FOR METALLATING NONCONJUGATED DIENE-CONTAINING ETHYLENE POLYMERS AND GRAFT POLYMERS PREPARED THEREFROM

Gary K. Lund, Ogden, Utah; Raymond L. Laakso, Jr., St. Francisville, La.; Calvin P. Esneault, and Brian W. Walther, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 899,183, Aug. 18, 1986, Pat. No. 4,761,456, which is a continuation-in-part of Ser. No. 745,763, Jun. 16, 1985, abandoned. This application Oct. 16, 1987, Ser. No. 109,331

Int. Cl.[4] C08F *255/06, 8/00*

U.S. Cl. 525—250 15 Claims

1. A process for preparing a graft polymer having an ethylene polymer backbone and a plurality of side chains, the process comprising:

(a) metallating an ethylene polymer, said polymer having polymerized therein ethylene, a nonconjugated diene and at least one 1-olefin having three or more carbon atoms by a process which comprises:

(1) providing an admixture of the ethylene polymer and a saturated, nonpolar, hydrocarbon solvent,

(2) forming an intermixture of the admixture and activating amounts of a tertiary diamine and a potassium alkoxide, and

(3) contacting the intermixture with an amount of at least one lithium alkyl compound under conditions sufficient to provide more than about twenty percent of the polymer molecules with at least one lithiated site, the amounts of the tertiary diamine, the potassium alkoxide and the lithium alkyl also being sufficient to provide a degree of metallation greater than the degree of metallation attained with (i) the potassium alkoxide and the lithium alkyl compound or (ii) the tertiary diamine and the lithium alkyl compound, or by adding the degrees of metallation attained with (i) and (ii); and

(b) contacting the metallated ethylene polymer with a reagent selected from the group consisting of compounds having sufficient electrophilic character to react with the metallated ethylene polymer which is nucleophilic.

4,786,690

PROCESS FOR POLYMER PRODUCTION

Douglas C. Edwards, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 534,763, Sep. 22, 1983, abandoned. This application Jun. 16, 1987, Ser. No. 62,594

Claims priority, application Canada, Nov. 10, 1982, 415,313

Int. Cl.[4] C08F *114/16, 136/01*

U.S. Cl. 525—330.7 13 Claims

1. A continuous process for producing a polymer of reduced molecular weight which comprises subjecting a halogenated butyl polymer selected from chlorinated butyl rubber and brominated butyl rubber and having a number average molecular weight (M_n) of from about 85,000 to about 150,000 to mastication in an extruder at a temperature of from about 140° to about 200° C. while being exposed to and in contact with an atmosphere containing from about 0.1 to about 4 volume per cent of ozone for a time sufficient to produce a reduced molecular weight polymer wherein the halogenated butyl polymer contains at least about 75 percent of the unsaturation in the EXO methylene configuration, said extruder is selected from twin screw and single screw extruders, said mastication is characterized by a shear rate of at least about 575 to about 1900 sec^{-1}, and said reduced molecular weight polymer has an M_n of from about 10,000 to about 40,000.

4,786,691

COATING COMPOSITION OF A HYDROXY FUNCTIONAL EPOXY ESTER RESIN AND POLYCAPROLACTONE DIOL

Andrew H. Dervan, Grosse Pointe Farms, and Panagiotis I. Kordomenos, Mt. Clemens, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 800,942, Nov. 22, 1985, Pat. No. 4,713,425. This application Aug. 7, 1987, Ser. No. 82,655

Int. Cl.[4] C08G *63/06, 63/20, 63/60;* C08L *63/02*

U.S. Cl. 525—438 21 Claims

1. An organic solvent based thermosetting coating composition comprising

(A) hydroxy functional epoxy ester resin having a number average molecular weight (M_n) between about 1,000 and about 4,000 and being the reaction product of (1) a chain extended product of diepoxide with diphenol and dicarboxylic acid and (2) acid component in chain termination, said acid component comprising primary hydroxy functional acid and a fatty acid and reacted in about 1 to 1 equivalent ratio to chain extended product, wherein said diepoxide is reacted substantially simultaneously with said diphenol and dicarboxylic acid in amounts sufficient to give a weight per epoxide between about 500 and about 2,500;

(B) linear polycaprolactone diol having a molecular weight between about 1500 and about 5000, wherein said (A) and (B) are included in said composition in a weight ratio between about 4:1 and 1:4; and

(C) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, which crosslinking agent de-blocks at the cure temperature of said composition, said crosslinking agent being included in said composition in an amount equal to between about 10 and 50 percent of the combined weight of said (A) and (B) in said composition.

4,786,692

HIGH STRENGTH, REDUCED HEAT DISTORTION TEMPERATURE THERMOPLASTIC COMPOSITION

Deborah L. Allen; Richard B. Allen, both of Dalton, and Robert A. Wiercinski, Cambridge, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 451,186, Dec. 20, 1982, abandoned. This application Mar. 25, 1986, Ser. No. 843,776

Int. Cl.[4] C08L *67/02, 69/00*

U.S. Cl. 525—439 5 Claims

1. A thermoplastic composition comprising:

(a) 2–98% by weight of an aromatic carbonate polymer or copolymer;

(b) 2–98% by weight of a polymer copolymer derived from a

(i) a glycol portion comprising 1,4-cyclohexanedimethanol and ethylene glycol wherein the molar ratio of 1,4-cyclohexane-dimethanol to ehtylene glycol is from about 1:1 to 4:1, and

(ii) an acid portion comprising an aromatic dicarboxylic acid selected from the group consisting essentially of terephthalic acid, isophthalic acid and mixtures of the two acids.

4,786,693

VINYL ESTER RESINS PREPARED FROM URETHANE MODIFIED EPOXY RESIN COMPOSITIONS CONTAINING OXAZOLIDINONE OR THIAZOLIDINONE GROUPS

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 789,899, Oct. 18, 1985, Pat. No. 4,742,146. This application Nov. 16, 1987, Ser. No. 121,030

Int. Cl.[4] C08F *26/02*

U.S. Cl. 525—454 20 Claims

1. A vinyl ester composition comprising

(I) the reaction product of

(A) at least one urethane oligomer modified epoxy resin composition which comprises the reaction product of

(1) at least one epoxy resin with

(2) at least one urethane oligomer containing at least one oxyalkylene group or thioalkylene group and both polymerizable ethylenically unsaturated and isocyanate or isothiocyanate groups in the presence of

(3) a catalyst for oxazolidinone or thiazolidinone formation; and wherein components (I-A-1) and (I-A-2) are present in quantities such that from about 0.001 to about 25, percent of the epoxide groups of component (I-A-1) are converted to oxazolidinone (thiazolidinone) groups and component (I-A-3) is employed in an amount sufficient to cause reaction of component (I-A-1) with component (I-A-2) to form oxazolidinone (thiazolidinone) groups, preferably from about 0.01 to about 3, parts by weight based on the combined weight of components (I-A-1), (I-A-2) and (I-A-3);

(B) at least one member selected from

(1) at least one polymerizable ethylenically unsaturated monocarboxylic acid,

(2) at least one polymerizable ethylenically unsaturated half-ester of a dicarboxylic acid, or

(3) mixtures of (I-B-1) and (I-B-2).

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4,786,694

POLY(ARYL ETHER KETONE) BLOCK COPOLYMERS

Robert A. Clendinning, New Providence; James E. Harris, Piscataway; George T. Kwiatkowski, Green Brook, all of N.J.; Lee P. McMaster, Brookfield, Conn.; Markus Matzner, Edison, and Paul A. Winslow, Millington, both of N.J., assignors to Amoco Corporation, Chicago, Ill.

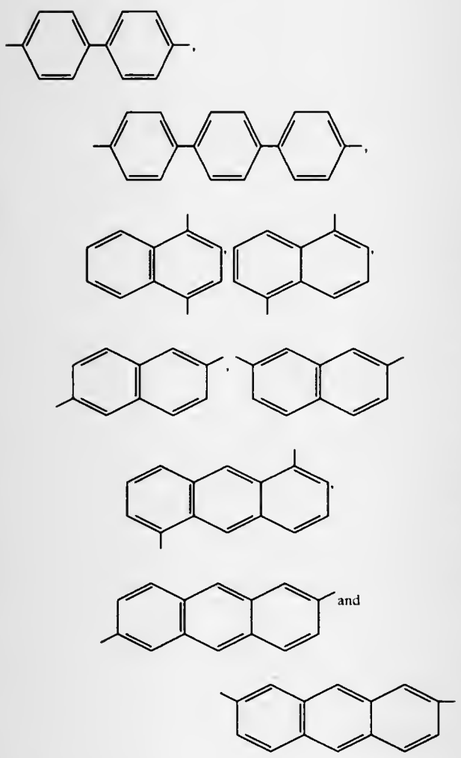
Continuation-in-part of Ser. No. 729,580, May 2, 1985. This application Apr. 16, 1987, Ser. No. 39,310

The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.

Int. Cl.[4] C08L *61/00*; C08G *16/00*

U.S. Cl. 525—471 28 Claims

1. A crystalline, tough poly(aryl ether ketone) solution polymerized block polymer comprising a block of a polymer containing ether groups joined to keto groups through units of at least one formulae selected from the group consisting of



and

which block is bonded to another block through one or more of an ether group, a keto group or a divalent chain extending single or oligomeric unit, with the proviso that when the blocks are identical, then the coupling group is copolymeric.

4,786,695

METHOD AND REACTOR SYSTEM FOR RAPID KILL GAS INJECTION TO GAS PHASE POLYMERIZATION REACTORS

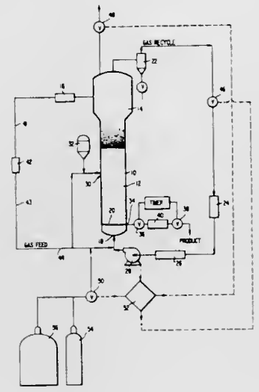
John E. Cook, Westfield; Robert O. Hagerty, Edison, both of N.J., and Frederick W. Jacob, Houston, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 737,565, May 23, 1985, Pat. No. 4,666,999, which is a continuation of Ser. No. 528,502, Sep. 1, 1983, abandoned. This application Jan. 20, 1987, Ser. No. 4,925

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.[4] C08F *2/38*

U.S. Cl. 526—84 14 Claims



1. In a method of terminating, under emergency conditions, an olefin polymerization reaction conducted in the presence of a transition metal-based catalyst system in a substantially vertical gas phase reactor comprising a reactant inlet at the first end thereof and a venting means at the second end thereof to maintain the temperature of the reaction below the sintering temperature of the polymer, said method comprising opening the venting means and injecting an amount of a kill gas into the reaction medium in the reactor sufficient to terminate the reaction, the improvement comprising increasing the rate of penetration of the kill gas through the reaction medium in the reactor by injecting a sufficient penetration rate-increasing amount of a non-catalyst- poisoning carrier gas into the reaction medium along with said kill gas, said kill gas and said carrier gas being injected into the reactor at the first end thereof, thereby enabling the operation of the polymerization reaction at an increased operating temperature while maintaining a sufficient margin below the sintering temperature of the polymer particles to prevent sintering of the polymer particles in the event of the emergency conditions.

4,786,696

PROCESS FOR THE PREPARATION OF TACKY POLYMERIC MICROSPHERES

Bernd Bohnel, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 11,737, Feb. 6, 1987, abandoned. This application Mar. 18, 1988, Ser. No. 171,140

Int. Cl.[4] C08J *2/00*

U.S. Cl. 526—88 18 Claims

1. A process for the preparation of infusible, solvent-insoluble, solvent-dispersible, inherently tacky elastomeric polymeric microspheres without the use of a suspension stabilizer, consisting essentially of the steps of:

(a) concocting a reaction mixture by charging to a reaction vessel
  (i) one or more alkyl acrylate or methacrylate ester monomers or mixtures thereof
  (ii) at least one emulsifier at a concentration above its critical micelle concentration; and
  (iii) an effective amount of at least one substantially water insoluble polymerization initiator;
(b) agitating said reaction mixture sufficient to create a suspension of monomer droplets having an average monomer droplet size in the range of between about 5 microns and about 70 microns prior to the initiation of a reaction therein;
(c) initiating a reaction in said reaction vessel; and
(d) maintaining said agitation for a time sufficient to allow substantially complete conversion of said monomer; whereby elastomeric, solvent-dispersible, polymeric microspheres are formed.

4,786,697

MOLECULAR WEIGHT DISTRIBUTION MODIFICATION IN A TUBULAR REACTOR

Charles Cozewith, Westfield; Shiaw Ju, Edison, and Gary W. Verstrate, Matawan, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 681,951, Dec. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 504,582, Jun. 14, 1983, Pat. No. 4,540,753. This application May 4, 1987, Ser. No. 46,667

Int. Cl.[4] C08F *2/00, 10/00*

U.S. Cl. 526—88 24 Claims

1. A method for preparing a polymodal MWD ethylene copolymer which comprises:
(a) conducting the polymerization in a substantially mix free reactor;
(b) using at least two catalyst species each of which initiates a polymer chain of a different molecular weight than the other catalyst species;
(c) using at least one reaction mixture comprising ethylene and at least one alpha-olefin monomer, said reaction mixture being essentially transfer-agent free;
(d) in such a manner and under such conditions sufficient to initiate propagation of essentially all copolymer chains simultaneously; the resulting polymer comprising at least two modes of differing molecular weights, each mode having at least one of $\overline{M}_w/\overline{M}_n$ of less than 2 and $\overline{M}_z/\overline{M}_w$ of less than 1.8, the resulting polymer being a polymodal MWD ethylene copolymer.

4,786,698

POLYMERIZATION OF CHLOROPRENE

Rüdiger Musch, Bergisch Gladbach; Eberhard Müller, Dormagen; Peter Wendling, Leverkusen; Wolfgang Konter, Neuss, and Gerhard Hohmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 12,243, Feb. 9, 1987, abandoned. This application Dec. 15, 1987, Ser. No. 132,975

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605334.1

Int. Cl.[4] C08F *2/24*

U.S. Cl. 526—220 8 Claims

1. Process for the preparation of chloroprene polymers by aqueous emulsion polymerization of phenothiazine compound-stabilized chloroprene or of a mixture of chloroprene and up to 20% by weight of at least one or more monomers which can be copolymerized with chloroprene, using a polymerization initiator comprising sodium dithionite or a mixture of sodium dithionite with formamidinesulphinic acid or with potassium peroxodisulphate or with formamidinesulphinic acid and potassium peroxodisulphate or with potassium peroxodisulphate and sodium anthraquinone-β-sulphinate or with formamidinesulphinic acid and potassium peroxodisulphate and sodium anthraquinone-β-sulphonate, in the presence of oxygen and a chain transfer agent, 20 to 80% by weight of the total amount of chain transfer agent being present before or at the commencement of polymerization and the remaining amount being added in one or more parts at monomer conversions above 20%, characterized in that 30 to 90% of the initiators are present at the commencement of polymerization and the remainder is added in portions during the polymerization, only further sodium dithionite being added at a conversion > 60% in the case of an initiator combination.

4,786,699

PREPARATION OF POLYVINYLPYRROLIDONE

Adolf Nuber, Boehl-Iggelheim; Siegfried Lang, Ludwigshafen; Axel Sanner, Frankenthal, and Gerd Schroeder, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 901,584, Aug. 29, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 144,744

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532747

Int. Cl.[4] C08F *20/44*

U.S. Cl. 526—229 3 Claims

1. A process for preparing polyvinylpyrrolidone having a Fikentscher K value of from 14 to 95 which comprises: heating an aqueous solution of vinylpyrrolidone at a temperature of 50° to 95° C. in the presence of hydrogen peroxide as a starter and in the presence of free heavy metal ions in a concentration range of from 1 ppb to 2 ppm, based on the vinylpyrrolidone, with said heavy metal being selected from the group consisting of copper, iron, silver and cobalt, and maintaing the pH of the solution at from 7–11 by the addition of NaOH, KOH, their carbonated or bicarbonates.

4,786,700

HOMOGENEOUS THERMOSETTING COPOLYMERS

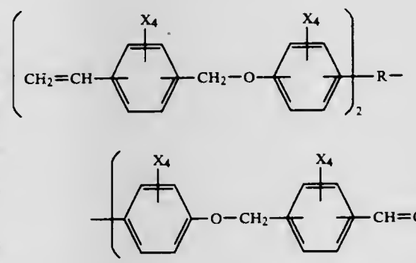
Joseph J. Zupancic, Bensenville; Andrew M. Zweig, Streamwood, and James A. Wrezel, Buffalo Grove, all of Ill., assignors to Allied-Signal, Inc., Morris Township, Morris County, N.J.

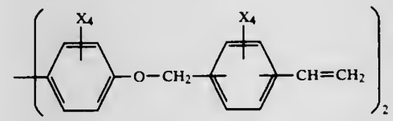
Filed Dec. 30, 1986, Ser. No. 947,590

Int. Cl.[4] C08F *216/12*

U.S. Cl. 526—292.9 20 Claims

1. A homogeneous thermosetting copolymer comprising (a) a poly(vinyl benzyl ether) of a polyphenol having the generic formula:





in which R is selected from the group consisting of alkyl, cycloalkyl, alkaryl and alkaryl radicals and X is independently selected from the group consisting of hydrogen and halogen atoms and (b) a compound containing at least one pendant vinyl group selected from the group consisting of styrene, o-divinylbenzene, m-divinylbenzene, p-divinylbenzene, substituted styrenes, substituted o, m, p divinylbenzenes, dismaleimides, bismaleimide-arylamine reaction products, styrene-terminated bisphenols, methyl acrylate, ethyl acrylate, propyl

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acrylate, methyl methacrylate, ethyl methacrylate, and propyl methacrylate.

4,786,701

CURABLE ORGANOSILOXANE COMPOSITION

Usamu Tanaka, Ichihara, Japan, assignor to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 74,661
Claims priority, application Japan, Jul. 23, 1986, 61-173396
Int. Cl.⁴ C08G *77/06, 77/04*
U.S. Cl. 528—15 **5 Claims**

1. In an improved curable organopolysiloxane composition comprising

(i) an organopolysiloxane containing at least two lower alkenyl radicals per molecule and having the average unit formula

$$R^1_aSiO_{(4-a)/2}$$

where R^1 represents a monovalent hydrocarbon or halogenated hydrocarbon radical and the average value of a is from 0.8 to 2.2, inclusive;

(ii) an organohydrogenpolysiloxane containing at least 2 silicon-bonded hydrogen atoms in each molecule and no alkenyl radicals, where the molar ratio of the total number of silicon-bonded hydrogen atoms in this component to the total number of all alkenyl groups in components (i) and (iv) is from 0.5 to 3.0, inclusive;

(iii) a platinum-containing catalyst in an amount equivalent to from 0.1 to 100 parts by weight of platinum metal for each one million parts of combined weight of components (i), (ii) and (iv); and

(iv) from 0.5 to 20 parts by weight per 100 weight parts of component (i), of an adhesion promoter,

the improvement wherein ingredient (iv) is the hydrolysis reaction product of

(a) 1 part by weight of a tetraalkoxysilane of the general formula $Si(OR^2)_4$, where R^2 represents an alkyl radical,

(b) from 0.1 to 100 parts by weight of an organopolysiloxane containing at least 1 lower alkenyl radical or silicon-bonded hydrogen atom in each molecule and having the unit formula R^3_2SiO, where each R^3 individually represents a hydrogen atom, a monovalent hydrocarbon radical or a monovalent halogenated hydrocarbon radical, and

(c) from 0 to 10 parts by weight of an alkoxysilane of the general formula

$$H_2C{=}CCOR^5Si^x(OR^7)_{3-x}$$
$$\quad\quad R^4 \quad O \quad\quad R^6$$

where R^4 represents a hydrogen atom or an alkyl radical, R^5 represents an alkylene radical, R^6 is selected from the same group as R^1, R^7 is selected from the same group as R^2, the value of x is 0 or 1, and said hydrolysis reaction product is prepared in the presence of water and an acid catalyst.

4,786,702

CURABLE SILICONE COMPOSITION

Huy Sam, and Yasuji Matsumoto, both of Ohta, Japan, assignors to Toshiba Silicone Co., Ltd, Japan

Filed Aug. 20, 1987, Ser. No. 87,581
Claims priority, application Japan, Aug. 27, 1986, 61-198926
Int. Cl.⁴ C08G *77/06*
U.S. Cl. 528—15 **12 Claims**

1. A curable silicone composition comprising:

(A) a polyorganosiloxane containing alkenyl groups attached to silicon atoms in the molecule;

(B) a polyorganosiloxane containing hydrogen atoms attached to silicon atoms in the molecule;

(C) a catalytic amount of curing catalyst to promote addition reaction; and

(D) an amine compound represented by the formula:

$$X(CH_2)_nNR^1R^2$$

wherein X represents a substituted or unsubstituted monovalent aryl group, n represents an integer of 0 to 5, R^1 represents a substituted or unsubstituted alkyl group with 1 to 10 carbon atoms or a hydrogen atom, and R^2 represents a substituted or unsubstituted alkyl group with 1 to 10 carbon atoms or a monovalent group represented by Z_3SiQ^1.

4,786,703

PROCESS FOR THE PREPARATION OF POLYISOCYANATE PREPOLYMERS AND POLYURETHANES HAVING HIGH TEMPERATURE PERFORMANCE AND LOW HYSTERESIS

William E. Starner, Freeland; Jeremiah P. Casey, Emmaus; Barton Milligan, Coplay, and Susan M. Clift, North Wales, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 15, 1987, Ser. No. 38,810
Int. Cl.⁴ C08G *18/30*
U.S. Cl. 528—63 **16 Claims**

1. In a process for producing a reaction product comprising a prepolymer suited for producing polyurethane/urea elastomers, wherein toluenediisocyanate is reacted with a long chain polyol to produce a prepolymer and the prepolymer reacted with an aromatic diamine, to form a polyurethane/urea elastomer the improvement for producing such prepolymer and for enhancing physical properties in the resulting polyurethane/urea elastomer which comprises:

(a) reacting an isomer of 2,4- or 2,6-toluene diisocyanate with a long chain diol at a temperature from about 0° to 90° C. and at a mole ratio of toluenediisocyanate to long chain diol from 4 to 20:1 to form a prepolymer such that at least about 90% of such prepolymer consists of a prepolymer of two moles toluenediisocyanate per mole of long chain diol; and

(b) removing unreacted toluenediisocyanate from the reaction product comprising prepolymer to a level of less than about 0.15%.

4,786,704

POLYUREA DISPERSIONS IN ORGANIC ISOCYANATES

Jeffrey Hughes, Manchester, and John Hynds, Bury, both of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 530,679, Sep. 9, 1983, abandoned. This application Feb. 24, 1986, Ser. No. 832,344
Claims priority, application United Kingdom, Sep. 17, 1982, 8226593
Int. Cl.⁴ C08G *18/32*
U.S. Cl. 528—65 **9 Claims**

1. A process for the manufacture of polyurethane elastomers which comprises reacting a polyol with a dispersion of a polyurea in an aromatic polyisocyanate, said dispersion having been prepared by a process which comprises reacting by simple mixing at a temperature below 90° C. an aromatic polyisocyanate with one or more aliphatic or alicyclic diprimary amines having (a) at least one amine group attached to a carbon atom having not more than one hydrogen atom attached thereto or (b) at least one amine group attached to a carbon atom which is itself attached to a carbon atom having not more than one hydrogen atom attached thereto, provided that both amine groups are not attached directly to separate rings of an alkylene-linked polycyclic aliphatic ring system.

4,786,705

LOW VISCOSITY ADDUCTS OF A POLY(ACTIVE HYDROGEN) ORGANIC COMPOUND AND A POLYEPOXIDE

Joseph V. Koleske, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 546,114, Oct. 27, 1983, Pat. No. 4,707,535. This application Sep. 9, 1987, Ser. No. 94,717
Int. Cl.⁴ C08G *18/30*
U.S. Cl. 528—72 **6 Claims**

1. A curable coating composition comprising: (1) a polyepoxide containing two or more epoxy groups per molecule or a polyisocyanate or an amino-formaldehyde selected from the group consisting of melamine formaldehydes, urea formaldehydes and benzoguanamine formaldehydes; (2) an adduct of a poly(active hydrogen) organic compound and a polyepoxide which is comprised of the reaction product of a poly(active hydrogen) organic compound and polyepoxide containing two or more epoxy groups per molecule, said poly(active hydrogen) being employed in an amount at least sufficient to effect of the epoxy groups of the polyepoxides; and (3) a catalyst or a photoinitiator said adduct composition having a viscosity less than about 25,000 centistokes at 54.5° C.

4,786,706

LIQUID-CRYSTALLINE POLYCONDENSATES WHICH CONTAIN UREA DERIVED LINKING GROUPS

Hans-Jakob Kock, Ludwigshafen; Bernd Hisgen, Limburgerhof, and Michael Portugall, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,069
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542831
Int. Cl.⁴ C08G *63/54, 69/44*
U.S. Cl. 528—125 **7 Claims**

1. A liquid-crystalline carbamyl-containing polycondensate composed of

(a) aromatic hydroxycarboxylic and/or aminocarboxylic acids in which the hydroxyl and amino groups are not vicinal to the carboxyl group,

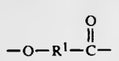
(b) from 0.1 to 20 mol % of urea,

(c) aromatic dihydroxy, diamino and/or hydroxy-amino compounds in which the hydroxyl and amino groups are not vicinal,

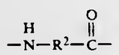
(d) a molar amount equivalent to the total amount of components b and c of an aromatic dicarboxylic acid in which the carboxyl groups are not vicinal.

2. A liquid-crystalline carbamyl-containing polycondensate as defined in claim 1, composed of

(a) not less than 10 mol % of one or more of the repeat units of the formula I and/or II



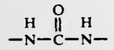
I



II

where R^1 and R^2 can be identical or different and each is 1,4-phenylene, 1,3-phenylene, 2,7-naphthylene or 2,6-naphthylene,

(b) from 0.1 to 20 Mol % of repeat units of the formula III

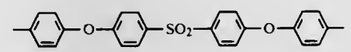


III

(c) one or more of the repeat units of the formula IV

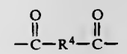
$$-X-R^3-Y- \quad \text{IV}$$

where R^3 is 1,4-phenylene, 1,3-phenylene, 2,6-naphthylene, 2,7-naphthylene, 4,4'-biphenylene, 3,4'-biphenylene, or 2,6-anthraquinoylene, which may all be substituted by halogen, alkyl of 1 to 4 carbon atoms or phenyl, or R^3 is



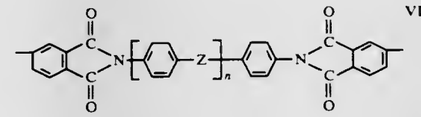
and X and Y can be identical or different and each is oxygen or —NH—,

(d) an amount equivalent to the total amount of components b and c of repeat units of the formula V

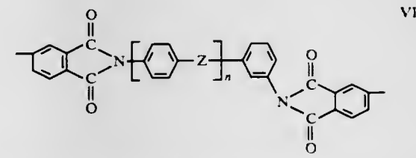


V

where R^4 is 1,4-phenylene, 1,3-phenylene or a radical of the formula VI and/or VII

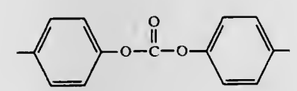


VI

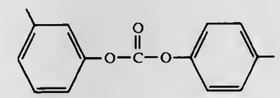


VII

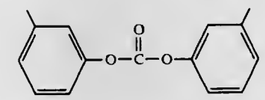
where each Z is identical or different and is —O—, —S—, SO_2—, —CO—, —CH_2— or =$C(CH_3)_2$, and n is 0 or 1, or R^4 is a radical of the formula VIII, IX or X



VIII



IX



X

the mol percentages of components a, b, c and d adding up to 100 mol % in each case.

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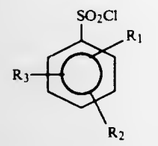
4,786,707

BRANCHED POLYCARBONATE DERIVED FROM SINGLE-RING AROMATIC COMPOUND

Piero Manaresi; Francesco Pilati, both of Bologna; Corrado Berti, Lugo, and Alberto Petri, Milan, all of Italy, assignors to Enichem Tecnoresine S.p.A., Palermo, Italy

Filed Dec. 17, 1986, Ser. No. 943,546
Claims priority, application Italy, Dec. 19, 1985, 23286 A/85
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—175 3 Claims

1. Branched aromatic polycarbonate comprised of units derived from the copolymerization of at least one aromatic dihydroxy compound, a carbonate precursor, and at least one single-ring aromatic compound, having the following formula (I):



(I)

wherein R_1 represents H, —COCl, or $—SO_2Cl$, and R_2 and R_3, represent, independently, —COCl or $—SO_2Cl$.

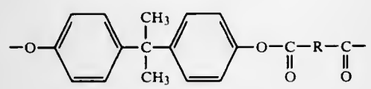
4,786,708

USE OF FILMS OF POLYCONDENSATES

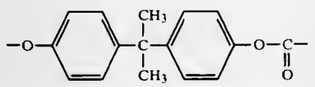
Volker Serini; Bernhard Schulte; Claus Burkhardt; Dieter Freitag, all of Krefeld; Uwe Hucks, Alpen; Werner Waldenrath, Cologne, and Hans-Leo Weber, Rommerskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 29, 1987, Ser. No. 43,973
Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615764
Int. Cl.[4] C08G *63/64*
U.S. Cl. 528—176 6 Claims

1. An electrically insulating film comprising a polycondensate containing 75–100 mol-% of bifunctional structural units of the formula (1) and optionally (2)

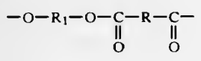


(1)

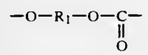


(2)

and 25-0 mol-% of bifunctional structural units of the formula (3) and optionally (4)



(3)



(4)

where the acid radicals —CO—R—CO— in the formulae (1) and (3) denote 75–100 mol-% of tere- and/or isophthalic acid radicals and 25-0 mol-% of radicals of other aromatic dicarboxylic acids and the radicals $—O—R_1—O—$ in the formulae (3) and (4) denote radicals of diphenols other than the 2,2-bis(4-hydroxyphenyl)propane radicals contained in formulae (1) and (2), and the molar ratio of ester groups to carbonate groups in the polycondensates is 100/0 to 10/9.

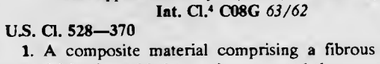
4,786,709

ORGANIC HIGH MOLECULAR LIQUID CRYSTALS

Kazuyoshi Iimura, 2-1, Sayamadai, Sayama-shi, Sataima; Naoyuki Koide, 2-23-13, Kita, Kunitachi-shi, Tokyo, and Mitsutaka Miyabayashi, Mie, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo; Kazuyoshi Iimura, Sayama and Naoyuki Koide, Kunitachi, all of, Japan

Filed Apr. 30, 1987, Ser. No. 44,209
Claims priority, application Japan, Apr. 30, 1986, 61-99794
Int. Cl.[4] C09K *19/52*; C08G *63/02*
U.S. Cl. 528—298 11 Claims

1. An organic high molecular liquid crystal containing a moiety represented by the following structural formula (1) as the recurring unit and having a number average molecular weight of from 1,000 to 100,000:



(1)

wherein m represents an integer of from 2 to 10; n represents an integer of from 1 to 12; and —A— is selected from the group consisting of



, and

(wherein R^1 and R^2 each is selected from the group consisting of a hydrogen atom, a halogen atom, an alkyl group having 1 to 3 carbon atoms, an amino group, a methyl-substituted amino group, an alkoxy group having 1 to 3 carbon atoms, a cyano group, and a nitro group).

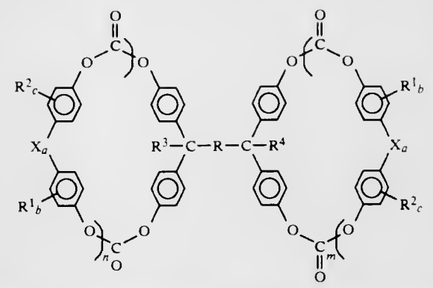
4,786,710

COMPOSITE COMPRISING POLYMERIZED CYCLIC CARBONATE OLIGOMER

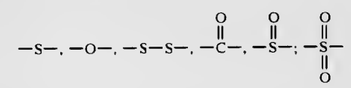
Niles R. Rosenquist, Evansville, and Kenneth F. Miller, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 796,985, Nov. 12, 1985, Pat. No. 4,701,538.
This application May 26, 1987, Ser. No. 54,336
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—370 4 Claims

1. A composite material comprising a fibrous or matted material having added to or impregnated thereon at least one liquid cyclic oligomer of the formula



wherein X is selected from the group consisting of alkylene of two to twelve carbon atoms, inclusive, alkylidene of one to twelve carbon atoms, inclusive, cycloalkylene of four to twelve carbon atoms, inclusive, cylcoalkylidene of four to twelve carbon atoms, inclusive,



a is zero or 1;
n and m are the same or different and are integers of one to about fifteen;
R is alkylene of two to eight carbon atoms, inclusive or alkylidene of one to eight carbon atoms, inclusive, phenylene or R is a single bond;
R^1 and R^2 are the same or different and are alkyl or one to four carbon atoms, inclusive or halo;
b and c are the same or different and are integers of zero to four; and
R_3 and R_4 are the same or different and are alkyl of one to eight carbon atoms, inclusive, phenyl, hydrogen or R_3 and R_4 are taken together to form an alkylene of two to eight carbon atoms inclusive.

4,786,711

P-PHENYLENE SULFIDE POLYMER PREPARATION WITH DEHYDRATED MIXTURE OF ALKALI METAL HYDROXIDE AND EXCESS ALKALI METAL BISULFIDE

Guy Senatore and Afif M. Nesheiwat, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1987, Ser. No. 6,409
Int. Cl.[4] C08G *75/16*
U.S. Cl. 528—388 10 Claims

1. In a method for the preparation of poly(p-phenylene sulfide) wherein at least one p-dihalobenzene is brought together with a dehydrated admixture of at least one alkali metal hydroxide and at least one alkali metal bisulfide in the presence of at least one polar organic solvent under polymerization conditions for a time sufficient to form a reaction mixture comprising said poly(p-phenylene sulfide); the improvement comprises employing a molar ratio of alkali metal hydroxide to alkali metal bisulfide in said dehydrated admixture of about 0.80:1 to 0.98:1.

4,786,712

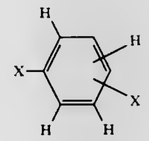
PROCESS FOR THE PREPARATION OF OPTIONALLY BRANCHED POLYARYLENE SULPHIDES HAVING REDUCED CORROSIVENESS WITH KETONE DILUENT AND ORGANIC SOLVENT

Edgar Ostlinning, Duesseldorf; Karsten Idel, and Rolf-Volker Meyer, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

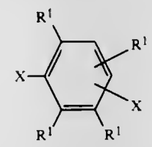
Filed Oct. 17, 1984, Ser. No. 661,936
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1983, 3339233
Int. Cl.[4] C08G *75/14*
U.S. Cl. 528—388 7 Claims

1. Process for the preparation of high molecular weight polyarylene sulphide which comprises forming a reaction mixture by reacting

(a) 50–100 mol % of aromatic dihalogen compound corresponding to the formula:



and 0–50 mol % of aromatic dihalogen compound corresponding to the formula



wherein
X represents halogen atoms in the meta or para position to each other,
R^1 is identical or different and is hydrogen, alkyl, cycloalkyl, aryl, alkylaryl, arylalkyl, or two groups each represented by R^1 in the ortho position to each other are linked together to form an aromatic or heterocyclic ring, and one R^1 is always other than hydrogen, and

(b) 0 to 5 mol %, based on the sum of components (a) and (b) of an aromatic tri- or tetrahalogen compound corresponding to the formula:

$$ArX_n$$

wherein
Ar represents an aromatic or heterocyclic group,
X represents chloro or bromo and
n represents the number 3 or 4, and

(c) alkali metal sulphide or a mixture of alkali metal sulphide with alkali metal hydroxide, the molar ratio of (a+b):c lying in the range of from 0.85:1 to 1.15:1 and

(d) an organic solvent, with the molar ratio of alkali metal sulphide (c) to the organic solvent (d) lying within the range of from 1:2 to 1:5, and

(e) water in the form of water of hydration or free water, the molar ratio of (c):(e) lying within the range of from 1:0 to 1:3 with the process being carried out at a reaction temperature of 160° C. to 270° C.,

wherein after completion of the reaction, the reaction mixture is introduced into an organic diluent comprising a ketone whereby a polyarylene sulphide precipitate is formed and the precipitate is subsequently washed.

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4,786,713

COPOLY(ARYLENE SULFIDEX-DISULFIDE)

Mark Rule; David R. Fagerburg; Joseph J. Watkins, all of Kingsport, and Jerry S. Fauver, Blountville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 6, 1987, Ser. No. 117,722
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—389 7 Claims

1. A copoly(arylene sulfide) having repeating units of the formula

$$[(-A-S-)_{1-x}(-A-S-S-)_x]_n$$

wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.5 to 0.001 and n is at least 200.

4,786,714

CATALYTIC PROCESS FOR POLYMERIZING CARBON MONOXIDE AND OLEFIN(S) WITH NITROGEN BIDENTATE LIGAND

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

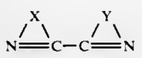
Filed Nov. 26, 1986, Ser. No. 935,431
Claims priority, application Netherlands, Nov. 29, 1985, 8503305
Int. Cl.[4] C08G 67/02
U.S. Cl. 528—392 40 Claims

1. A process for preparing a polymer which comprises contacting carbon monoxide and an olefinically unsaturated hydrocarbon in the presence of a catalyst wherein the catalyst is obtained by reacting

(1) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel,

(2) an anion of a non-hydrohalogenic acid having a pKa less than 6, and

(3) a nitrogen bidentate ligand of the general formula



wherein X and Y represent the same or different organic bridging groups, each having a bridge containing three or four atoms, wherein at least two of the atoms in the bridge are carbon atoms, and under conditions suitable to prepare a polymer.

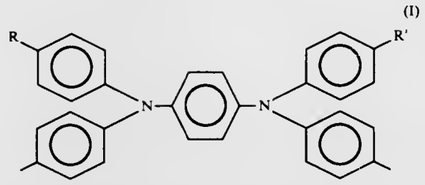
4,786,715

ELECTROCHROMIC POLYMER COMPRISING N,N'-DIPHENYL-N,N'-DIPHENYLENE-PHENYLENE DIAMINE UNITS

Masazumi Ishikawa, Yokosuka; Yasuhiko Ohsawa, Tokyo; Mikio Kawai; Takao Kase, both of Yokohama, and Teruko Yoshimoto, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 27, 1987, Ser. No. 54,872
Claims priority, application Japan, May 28, 1986, 61-122879
Int. Cl.[4] C08G 73/00, 73/02
U.S. Cl. 528—422 11 Claims

1. An electrochromic polymer comprising repeating units represented by the general formula (I):



(I)

wherein R and R' each represent a hydrogen atom , an alkyl group having not more than 4 carbon atoms or an alkoxyl group having not more than 4 carbon atoms.

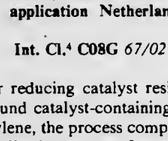
4,786,716

REMOVAL OF CATALYST RESIDUES FROM CARBON MONOXIDE/OLEFIN POLYMER WITH PHOSPHINE

Johannes A. M. Van Broekhoven, and Michael J. Doyle, both of Cm Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 26, 1986, Ser. No. 935,429
Claims priority, application Netherlands, Nov. 26, 1985, 8503258
Int. Cl.[4] C08G 67/02
U.S. Cl. 528—487 21 Claims

1. A process for reducing catalyst residues from a Group VIII metal compound catalyst-containing polymer of carbon monoxide and ethylene, the process comprising contacting the polymers with an effective amount for reducing catalyst residues of a phosphine having the general formula



wherein R^1, R^2, R^3 and R^4 represent hydrocarbon groups or such groups containing polar or non-polar substituents and R represents a bivalent organic bridging group containing at least two carbon atoms in the bridge.

4,786,717

DEACTIVATION OF ALUMINUM ALKYLS

Randall K. Bretches, Houston, Tex.; Andrew J. Sivak, Edgewood Boro, Allegheny County, Pa., and Russell L. Stainfield, Humble, Tex., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1986, Ser. No. 928,766
Int. Cl.[4] C08F 6/02
U.S. Cl. 528—491 16 Claims

1. Method of deactivating alkylaluminum catalyst in a hydrocarbon carrier comprising reacting said alkylaluminum catalyst with a triester of glycerol wherein said ester group has independently up to about 24 carbon atoms, in an amount sufficient to effect deactivation.

4,786,718

METHOD OF PREPARING ANTIBODIES TO CHARACTERIZE ONCOGENES

Robert A. Weinberg, Brookline; Clifford J. Tabin, Cambridge, both of Mass., and Scott M. Bradley, McLean, Va., assignors to Massachusetts Institute of Technology, Boston, Mass.

Division of Ser. No. 432,337, Oct. 1, 1982, Pat. No. 4,535,058.
This application Aug. 8, 1985, Ser. No. 763,663
Int. Cl.[4] C07K 3/00; C12N 15/00
U.S. Cl. 530—387 13 Claims

1. A method of producing antibodies capable of detecting whether a wild-type allele has been mutated to a mutant allele, comprising:

a. isolating a segment of DNA which includes a nucleotide substitution which distinguishes the wild-type allele from the mutant allele;

b. creating an antigen capable of causing, upon immuniation into a host, production of antibodies specific for protein expressed by the wild-type allele or for protein expressed by the mutant allele, but not by both; and

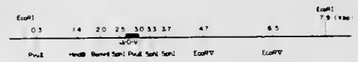
c. immunizing a host under conditions whereby said host produces said antibodies.

4,786,719

DNA SEQUENCE

Akira Kudo; Yushi Nishimura, both of Fukuoka; Yataro Ichikawa, Tokorozawa, and Takeshi Watanabe, Saga, all of Japan, assignors to Teijin, Limited, Osaka, Japan

Filed Oct. 24, 1985, Ser. No. 790,970
Claims priority, application Japan, Oct. 26, 1984, 59-224205
Int. Cl.[4] C07H 19/10, 19/20, 21/02, 21/04
U.S. Cl. 530—388 4 Claims



2. A DNA sequence encoding a polypeptide represented by the following amino acid sequence:

Asp Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val
Gln Pro Gly Gly Ser Arg Lys Leu Ser Cys Ala Ala
Ser Gly Phe Thr Phe Ser Ser Phe Gly Met His Trp
Val Arg Gln Ala Pro Glu Lys Gly Leu Glu Trp Val
Ala Tyr Ile Ser Gly Gly Ser Tyr Thr Ile Tyr Tyr
Ala Asp Thr Val Lys Gly Arg Phe Thr Ile Ser Arg
Asp Asn Pro Lys Asn Thr Leu Phe Leu Gln Met Thr
Ser Leu Arg Ser Glu Asp Thr Ala Met Tyr Tyr Cys
Ala Ser Ser Tyr Gly .Asn Phe Trp Tyr Phe Asp Val
Trp Gly Ala Gly Thr Thr Val Thr Val Ser Ser

wherein the various abbreviations stand for the following amino acids:

Gly: glycine
Ala: alanine
Val: valine
Leu: leucine
Ile: isoleucine
Ser: serine
Asp: aspartic acid
Lys: lysine
Arg: arginine
His: histidine
Phe: phenylalanine
Tyr: tyrosine
Thr: threonine
Cys: cysteine
Met: methionine
Glu: glutamic acid
Trp: tryptophan
Pro: proline
Asn: asparagine
Gln: glutamine.

4,786,720

SULFOMETHYLATED LIGNIN AMINES

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 889,236, Jul. 25, 1986, abandoned. This application May 1, 1987, Ser. No. 45,683
Int. Cl.[4] C07G 1/00
U.S. Cl. 530—501 13 Claims

1. A surface active agent prepared by reacting an amine condensate with a bisulfite formaldehyde in aqueous solution wherein the amine condensate is the product of the reaction between a polyamine having at least three amine groups per molecule and a by-product of papermaking selected from the group consisting of lignin, modified lignin, and mixtures thereof.

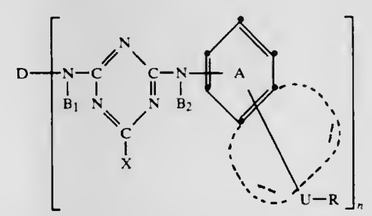
4,786,721

FIBER-REACTIVE DYES CONTAINING A VINYLSULFONYLALKYLAMINO- OR SULFONYL-ARYLAMINOTRIAZINE MOIETY

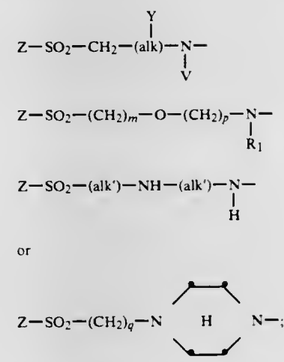
Athanassios Tzikas, Pratteln; Peter Aeschlimann, Allschwil, and Paul Herzig, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, New York, N.Y.

Filed Aug. 13, 1986, Ser. No. 896,290
Claims priority, application Switzerland, Aug. 14, 1985, 3503/85
Int. Cl.[4] C09B 62/04, 62/06, 62/08, 62/085, 62/09, 62/095, 62/10, 62/523
U.S. Cl. 534—617 25 Claims

1. A reactive dye of the formula



in which D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarbimide dye; B_1 and B_2 independently of each other are hydrogen or alkyl having 1 to 4 carbon atoms, which is unsubstituted or substituted by carboxyl, sulfo, cyano or hydroxyl; X is fluorine, chlorine, bromine, sulfo, alkylsulfonyl having 1 to 4 C atoms or phenylsulfonyl; U is —CO— or —SO_2—; R is a radical of the formula



Z is sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acetoxyethyl, β-halogenoethyl or vinyl; alk is a polymethylene radical having 1 to 6 C atoms or its branched isomers; Y is hydrogen, chlorine, bromine, fluorine, hydroxyl, sulfato, C_1-C_4-alkanoyloxy, cyano, carboxyl, alkoxycarbonyl having 1 to 5 C atoms, carbamoyl or a radical —SO_2—Z in which Z is defined as above; V is hydrogen or an alkyl radical having 1 to 4 C atoms which is unsubstituted or substituted by carboxyl, sulfo, C_1-C_2-alkoxy, halogen or hydroxyl; or a radical

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in which Z, alk and Y are as defined above; R_1 is hydrogen or C_{1-6}-alkyl; alk', independently of each other, are polymethylene radicals having 2 to 6 C atoms or their branched isomers; n is 1 or 2, m is 1 to 6, p is 1 to 6 and q is 1 to 6; where, when U is $-SO_2-$, V must not be hydrogen; and the benzene or naphthalene radical A is further unsubstituted or substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, acetylamino, propionylamino, benzoylamino, amino, N-C_1-C_4-alkylamino, phenylamino, N,N-di-β-hydroxyethylamino, N,N-di-β-sulfatoethylamino, sulfobenzylamino, N,N-disulfobenzylamino, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkylsulfonyl, trifluoromethyl, nitro, cyano, halogen, carbamoyl, N-C_1-C_4-alkylcarbamoyl, sulfamoyl, N-C_1-C_4-alkylsulfamoyl, N-(β-hydroxyethyl)-sulfamoyl, N,N-di-(β-hydroxyethyl)sulfamoyl, N-phenylsulfamoyl, ureido, hydroxyl, carboxyl, sulfomethyl or sulfo.

4,786,722

D-TAGATOSE AS A LOW-CALORIE CARBOHYDRATE SWEETENER AND BULKING AGENT

Lee R. Zehner, Brookeville, Md., assignor to Biospherics Incorporated, Rockville, Md.

Filed Aug. 29, 1986, Ser. No. 901,611

Int. Cl.[4] A23L *1/09*

U.S. Cl. 536—1.1 **4 Claims**

1. A process for the preparation of a sweetened edible formulation in which the sweetening agent is less calorific than sucrose which comprises the step of mixing a foodstuff with an amount sufficient to sweeten such foodstuff of D-tagatose.

4,786,723

7-HYDROXYGUANINE COMPOUNDS, PROCESS FOR PREPARING SAID COMPOUNDS, AND ANTI-TUMOR AGENT CONTAINING THE SAME

Mikio Kitahara, Kobe; Kiyoto Ishii, Akashi; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

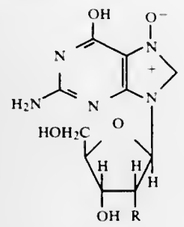
Filed Mar. 27, 1986, Ser. No. 844,687

Claims priority, application Japan, Apr. 8, 1985, 60-74979

Int. Cl.[4] C07H *17/00, 15/12, 19/06*

U.S. Cl. 536—24 **4 Claims**

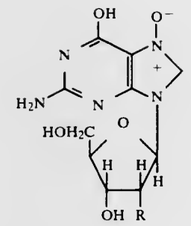
1. A 7-hydroxyguanine compound of the formula:



(I)

wherein R is hydrogen or hydroxy, and a salt thereof.

4. An anti-leukemia composition which comprises as an active ingredient an effective amount of a 7-hydroxyguanine compound of the formula:



(I)

wherein R is hydrogen or hydroxy, or a pharmaceutically acceptable salt thereof in admixture with a pharmaceutically acceptable carrier or diluent.

4,786,724

NUCLEOSIDE TRICHLORODIMETHYLETHYL PHOSPHITE ESTERS

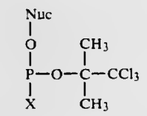
Robert L. Letsinger, Wilmette, Ill., assignor to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 659,645, Oct. 11, 1984, Pat. No. 4,672,110, which is a continuation of Ser. No. 556,619, Nov. 29, 1983, abandoned. This application Jul. 25, 1985, Ser. No. 758,681

Int. Cl.[4] C07H *19/10, 19/20, 19/207*

U.S. Cl. 536—27 **6 Claims**

1. The nucleoside trichlorodimethylethyl phosphite esters represented by the structural formula:



wherein X is selected from Cl and —O—Nuc and Nuc represent nucleosides which are protected at their —OH and $-NH_2$ sites.

4,786,725

SOLUBILIZED PLATINUM (II) COMPLEXES

Alan R. Amundsen, Somerville, and Eric W. Stern, Mountain side, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 660,617, Oct. 12, 1984, abandoned, which is a division of Ser. No. 392,818, Jun. 28, 1982, Pat. No. 4,500,465. This application Mar. 3, 1986, Ser. No. 835,584

Int. Cl.[4] C07H *23/00*

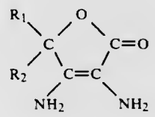
U.S. Cl. 536—121 **1 Claim**

1. A compound having the formula:



wherein

A_2 is a polyhydroxy substituted bidentate amine of the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen, C_{1-6} alkyl, or C_{1-6} mono or polyhydroxyalkyl provided that R_1 and R_2 taken together contain two or more hydroxyl groups, or

A is a polyhydroxy substituted monodentate amine of the formula:



wherein R_1 is a carbohydrate moiety derived from glucose, fructose, galactose, sucrose, or lactose, and

X is an anionic ligand selected from the group consisting of halide and carboxylate, or

X_2 is selected from the group consisting of dicarboxylate anion, sulfate, orthophosphate, pyrophosphate, and a combination of aquo and sulfate, orthophosphate, or pyrophosphate.

4,786,726

FACTOR IX THERAPEUTIC BLOOD PRODUCT, MEANS AND METHODS OF PREPARING SAME

Kenneth J. Smith, Albuquerque, N. Mex., assignor to Blood Systems, Inc., Scottsdale, Ariz.

Continuation of Ser. No. 816,291, Jan. 6, 1986, abandoned. This application May 22, 1987, Ser. No. 53,046

Int. Cl.[4] C07K *3/28;* **A61K** *35/16*

U.S. Cl. 530—381 **11 Claims**

1. The method of producing highly purified factor IX from crude factor IX comprising the steps of:

(a) binding an A-7 monoclonal antibody to an Affigel-10 column;

(b) partially purifying said crude factor IX to produce a partially purified factor IX;

(c) applying said partially purified factor IX to said Affigel-10 column having said A-7 antibody bound thereto with an application buffer;

(d) washing said column with 1M-3M NaCl in 0.05M Tris-HCl, 20 mM $MgCl_2$ and 1 mM Benzamidine HCl;

(e) eluting purified factor IX from said washed column with 20 mM EDTA; and

(f) separating said purified factor IX from said EDTA.

4,786,727

PREPARATION OF HEXAMETHYLENEIMINE

Wolfgang Schroeder, Bad Duerkheim; Wolfgang Franzischka, Ludwigshafen, and Herbert Mueller, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 370,381, Apr. 21, 1982, abandoned, which is a continuation of Ser. No. 59,180, Jul. 20, 1979, abandoned. This application May 9, 1984, Ser. No. 608,447

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837290

Int. Cl.[4] C07D *295/02*

U.S. Cl. 540—484 **1 Claim**

1. A process for the preparation of hexamethyleneimine by hydrogenating ϵ-caprolactam over a copper/aluminum oxide hydrogenation catalyst which is fixed or forms a fluidized bed, said catalyst being formed by precipitating, at pH 8 to 9.5 and a temperature of from 60° to 90° C.

a. an aqueous dilute solution of copper and aluminum salts capable of being precipitated by carbonate, the copper and aluminum being present in said solution in an atomic ratio of m:6, m being a number between 2 and 6, with

b. an aqueous alkali metal carbonate or bicarbonate solution, the atomic concentration of alkali being about twice the concentration of copper and aluminum in said solution,

whereby a composition is obtained of the formula

$$Cu_mAl_6(CO_3)_{0.5m}O_3(OH)_{m+12},$$

having the above definition, and thereafter drying and annealing the precipitate at 350° to 600° C., wherein the reaction is carried out in the gas phase and the caprolactam is vaporized in the stream of hydrogen gas, in an amount such that at a hydrogenation reaction temperature of from 170° to 250° C. and under a working pressure of 10 bar or less the degree of saturation with caprolactam is less than 80%, the residence time being less than one minute.

4,786,728

WATER-SOLUBLE TRIPHENDIOXAZINE COMPOUNDS

Günther Schwaiger, Frankfurt am Main; Hartmut Springer, Königstein/Taunus, and Walter Helmling, Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

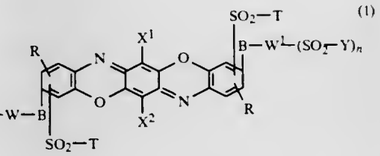
Filed Sep. 18, 1986, Ser. No. 909,010

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1985, 3533411; Jul. 26, 1986, 3625347

Int. Cl.[4] C07D *498/04;* **C09B** *19/00, 19/02*

U.S. Cl. 544—76 **15 Claims**

1. A water-soluble triphendioxazine compound corresponding to the formula (1)



(1)

in which:

T is alkyl of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from the groups of the formulae —O—, —S—, —NH— and —N(R')— in which R' has the meaning given below, and the alkyl group T is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, but with the exclusion of substituents which conform to the group Y defined below, or

T is phenyl or naphthyl, or is phenyl or naphthyl both of which are substituted by substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, carbamoyl unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro and amino unsubstituted or monosubstituted or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms;

B is an oxygen or sulfur atom or an amino group of the formula —NH— or —N(R')— in which

R' is alkyl of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo;

W is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from

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groups of the formulae —O—, —S—, —SO_2—, —CO—, 1,4-piperidino, —NH— and —N(R^o)— in which R^o has one of the meanings of R′ or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

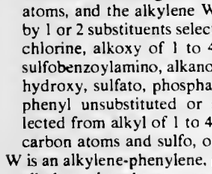
W is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamoyl, carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or phenylalkyl with an alkyl of 1 to 4 carbon atoms, or

W is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, nitro, amino and amiono mono- or di-substituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms, and/or cycloalkyl of 5 to 8 carbon atoms, or

W is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moieties of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms, or

W is a group of the formula



in which

$R^\bullet$ is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, carboxy or sulfo, and

W^x is alkylene of 1 to 6 carbon atoms which may be interrupted by 1 or 2 hetero groups which are selected from groups of the formulae —O—, —S—, —SO_2—, —CO—, 1,4-piperidino, —NH— and —N(R^o)— in which R^o has one of the meanings of R′ or is alkanoyl of 2 to 5 carbon atoms, and the alkylene W^x is unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, or

W^x is an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene group, the alkylene moieties of which are of 1 to 6 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from chlorine, alkoxy of 1 to 4 carbon atoms, benzoylamino, sulfobenzoylamino, alkanoylamino of 2 to 5 carbon atoms, hydroxy, sulfato, phosphato, acetoxy, sulfo, carboxy and phenyl unsubstituted or substituted by substituents selected from alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms and sulfo, and interrupted or non-interrupted by 1 or 2 hetero groups selected from those mentioned above, and the phenylene moieties of which are unsubstituted or substituted by 1 or 2 substituents selected from the group of substituents consisting of sulfo, carboxy, sulfamoyl, carbamoyl, methyl, ethyl, methoxy, ethoxy, nitro, chlorine, amino and amino substituted by alkyl of 1 to 4 carbon atoms, phenyl and/or phenylalkyl with an alkyl of 1 to 4 carbon atoms, or

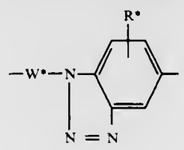
W^x is phenylene or naphthylene, or phenylene or naphthylene both of which are substituted by substituents selected from alkyl or 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, sulfo, carboxy, sulfamoyl, carbamoyl, carbamoyl which is mono- or disubstituted by phenyl, alkyl of 1 to 4 carbon atoms, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, sulfamoyl which is mono- or disubstituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, trifluoromethyl, benzoylamino, sulfobenzoylamino, alkanoylamino fo 2 to 5 carbon atoms, nitro, amino and amino mono- or di-substituted by alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl of 1 to 4 carbon atoms and/or cycloalkyl of 5 to 8 carbon atoms, or

W^x is one of the above-mentioned alkylene and arylene moieties which are connected with one another by one of the above-mentioned hetero groups, or

W^x is a cycloalkylene of 5 to 10 carbon atoms unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, or is an alkylene-cycloalkylene or cycloalkylene-alkylene or alkylene-cycloalkylene-alkylene the alkylene moieties of which are of 1 to 4 carbon atoms and the cycloalkylene moieties of which are of 5 to 8 carbon atoms and may be substituted by alkyl of 1 to 4 carbon atoms;

W^1 has one of the meanings mentioned above for W to be an alkylene unsubstituted or substituted or optionally interrupted by hetero groups or to be an alkylene-phenylene, phenylene-alkylene, phenylene-alkylene-phenylene or alkylene-phenylene-alkylene, each unsubstituted or substituted or optionnally interrupted or bound with one another by hetero groups as defined above for W, or to be a phenylene or naphthylene, optionally substituted as defined above, or

W^1 is a group of the formula



in which $R^\bullet$ has one of the above-mentioned meanings and $W^\bullet$ has one of the meanings given above for W^x;

R is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 5 carbon atoms, halogen, carboxy or sulfo;

X^1 is hydrogen, halogen, cycloalkyl of 5 to 8 carbon atoms, phenylalkoxy with an alkyl moiety of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, phenyloxy, alkyl of 1 to 4 carbon atoms, phenyl, phenylalkyl with an alkyl moiety of 1 to 4 carbon atoms, cyano, carboxy, carbalkoxy of 2 to 5 carbon atoms, phenylamino, carbamoyl, N—(C_1-C_4-alkyl)-carbamoyl, N,N-di-(C_1-C_4-alkyl)-carbamoyl, N-phenyl-carbamoyl, alkanoylamino of 2 to 5 carbon atoms, benzoylamino and benzoylamino substituted by 1 or 2 substituents selected from halogen, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy and sulfo;

X^2 is identical to X^1 or different from X^1 and has one of the meanings given for X^1;

n is 1 or 2;

Y is vinyl or is an ethyl group substituted in the β-position by a substituent which can be eliminated by an alkali;

at least one of the sulfo and sulfato groups which may be present in the molecule as mentioned above, is necessarily present in the molecule.

4,786,729

BENZIMIDAZOLO-QUINAZOLINES

Holger Heidenreich, Cologne, and Gert Jabs, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 34,810

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1986, 3612440

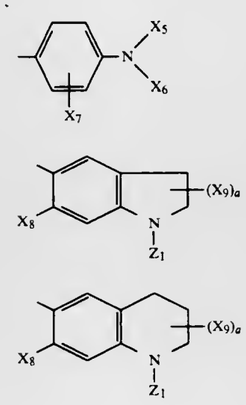
Int. Cl.[4] C09B *57/00;* **C07D** *487/04*

U.S. Cl. 544—125 **4 Claims**

1. A benzimidazolo-quinazoline of the formula

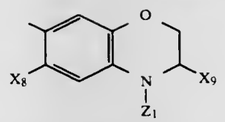
in which

Y_2 denotes a radical of the formula



or

-continued



Y_3 denotes hydrogen or C_1-C_4-alkyl,

X_5 and X_6, independently of one another, denote C_1-C_6-alkyl which may be substituted by halogen, C_1-C_4-alkoxy or cyano, cyclopentyl or cyclohexyl, each of which may be substituted by 1-4 C_1-C_4-alkyl radicals, or denote phenyl, benzyl or phenethyl, each of which may be substituted by 1 or 2 C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen, nitro, cyano or C_1-C_4-alkoxycarbonyl radicals, or X_5 and X_6, together with the nitrogen atom connecting them, denote a pyrrolidine, piperidine or morpholine radical which may be substituted by C_1-C_4-alkyl,

X_7 denotes hydrogen, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy or C_1-C_4-alkoxycarbonyl,

X_8 denotes hydrogen, halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy,

X_9 denotes C_1-C_4-alkyl or phenyl, or 2 radicals X_9, which are both located on the same C atom, together denote trimethylene or tetramethylene,

a denotes 0 or 1-4, and

Z_1 denotes hydrogen, C_1-C_8-alkyl which may be substituted by halogen, cyano or C_1-C_4-alkoxy, benzyl or phenethyl, each of which may be substituted by halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy,

m denotes 0 or 1,

in which a double bond is located between the positions labelled with 1 and 2 when m=0 and a single bond is between these positions when m=1, and in which the rings A_1 and B_1 may be substituted by one or two radicals selected from cyano, halogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, NX_5X_6, phenyl or benzyl.

4,786,730

PYRIMIDINE COMPOUND

Toshihiro Shibata; Masaki Kimura, both of Saitama, and Norio Kurosawa, Tokyo, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan

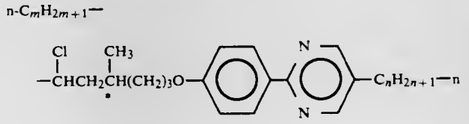
Filed Dec. 22, 1987, Ser. No. 136,648

Claims priority, application Japan, Dec. 26, 1986, 61-314700

Int. Cl.[4] C09K *19/34;* **G02F** *1/13;* **C07D** *239/02*

U.S. Cl. 544—335 **4 Claims**

1. An optically active pyrimidine compound represented by the following general formula:



wherein

m is 1 to 12;

n is 4 to 18; and

•C represents an asymmetric carbon atom.

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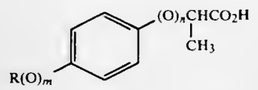
4,786,731

RESOLUTION OF ENANTIOMERS OF 2-(PHENYL OR PHENOXY/PROPIONIC ACIDS USING OPTICALLY ACTIVE ALKANOLAMINES

John W. Russell, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1987, Ser. No. 81,519
Int. Cl.[4] C07D *241/36, 211/72;* C07B *57/00*
U.S. Cl. 544—354 6 Claims

1. A method for the chromatographic resolution and analysis of the enantiomers of 2-(4-(alkyl or aryl)oxyphenoxy)propionic acids of the formula



wherein R is H, C_1-C_4 alkyl or Ar, m and n are independently 0 or 1,

and Ar is an unsubstituted or substituted phenyl pyridinyl or quinoxalinyl ring system

or the C_1-C_4 alkyl esters thereof which comprises converting a racemic or partially resolved mixture of said 2-(4-(alkyl or aryl)oxyphenoxy)propionic acid or C_1-C_4 alkyl ester thereof to a pair of diastereomeric 2-amino-1-alkanol derivatives by reaction with an optically active 2-amino-1-alkanol under conditions that avoid racemization and analyzing the diastereomeric mixture by gas chromatography.

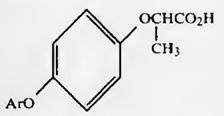
4,786,732

RESOLUTION OF ENANTIOMERS OF 2-(4-ARYLOXYPHENOXY) PROPIONIC ACIDS BY LIQUID CHROMATOGRAPHY WITH A CHIRAL ELUENT

John W. Russell, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1987, Ser. No. 81,515
Int. Cl.[4] C07D *241/36, 211/72;* C07B *57/00*
U.S. Cl. 544—354 7 Claims

1. A method for the effective chromatographic resolution and analysis of the enantiomers of 2-(4-aryloxyphenoxy)propionic acids of the formula



wherein Ar is an unsubstituted or substituted aryl or heterocyclic ring system which comprises dissolving the 2-(4-aryloxyphenoxy)propionic acid in a solvent selected from the group consisting of chlorinated hydrocarbons and admixtures thereof with aliphatic alcohols, injecting the solution into a liquid chromatographic system and eluting the column with an eluent containing R-(−)- or S-(+)-2-pyrrolidinemethanol and an alkanoic acid in said solvent.

4,786,733

DIRECT FLUORINATION OF SUBSTITUTED PYRIDINES

Michael Van Der Puy, Cheektowaga, and Richard E. Eibeck, Orchard Park, both of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Jul. 9, 1987, Ser. No. 71,233
Int. Cl.[4] C07D *213/72, 213/24, 213/04, 213/30*
U.S. Cl. 546—286 18 Claims

1. A process for producing 2-fluoro substituted pyridine compounds comprising contacting a pyridine compound selected from the group consisting of pyridines substituted with C_1 to C_8 alkyl, aralkyl, aryl, Cl, acetyl, carbomethoxy. and cyano with diluted gaseous fluorine at a temperature of +25° to −40° C.

4,786,734

HERBICIDAL PYRIDINE SULFONAMIDES

Mary A. Hanagan, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 936,105, Nov. 28, 1986, which is a continuation-in-part of Ser. No. 837,392, Mar. 7, 1986, abandoned. This application Aug. 24, 1987, Ser. No. 88,259
Int. Cl.[4] C07D *213/46, 213/70*
U.S. Cl. 546—293 1 Claim

1. The compound N,N-dimethyl-2-aminosulfonyl-3-pyridinecarboxamide.

4,786,735

PROCESS FOR PREPARING CIMETIDINE POLYMORPH B

Harold Graboyes, Wynnewood, and David S. Kirkpatrick, Broomall, both of Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Filed Jul. 27, 1987, Ser. No. 77,721
Claims priority, application United Kingdom, Aug. 1, 1986, 8618846
Int. Cl.[4] C07D *233/64*
U.S. Cl. 548—342 12 Claims

1. A process for preparing cimetidine, substantially all of which is in the polymorph B form, which process comprises precipitating cimetidine from a solution of an acid addition salt thereof in water containing 7-20% (v/v) of a C_{1-4}alcohol by addition of a base, the precipitation being conducted at a temperature above 15° C.

4,786,736

PREPARATION OF DIAZIRIDINES AND PRODUCTS THEREFROM

Klaus Bronstert, Carlsberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 5, 1987, Ser. No. 22,236
Int. Cl.[4] C07D *487/04, 229/02*
U.S. Cl. 548—369 3 Claims

1. A process for preparing an N,N'-dialkyldiaziridine or bicyclic diaziridine of the general formula I or II:



(I)

or



(II)

where R^1 and R^2 are each alkyl or aryl, A is a substituted or unsubstituted one-membered carbon bridge and B is a substituted or unsubstituted three-membered methylene bridge, by reacting an aliphatic monoamine or 1,3-diamine with an aliphatic, cycloaliphatic, aromatic or heterocyclic aldehyde or ketone in the presence of an oxidizing agent consisting of an aqueous solution of an alkali or alkaline earth metal salt of hypochlorous acid, which consists essentially of reacting a mixture of 2 moles of the monoamine or 1 mole of a 1,3-diamine with one mole of an aldehyde or ketone at a temperature in the range of from 40°-50° C. while thoroughly mixing with 1 mole of said oxidizing agent, extracting the diaziridine formed from the reaction mixture with an organic solvent and finally separating the diaziridine product from said organic solvent by distillation.

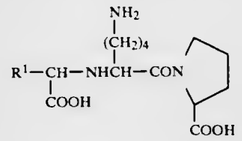
4,786,737

AROMATIC SULFONIC ACID SALTS OF A PROLINE DERIVATIVE

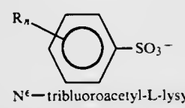
Yasuo Irie; Fusayoshi Kakizaki; Chieko Ishijima; Michito Sumikawa, and Naohiko Yasuda, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 934,563, Nov. 25, 1986, Pat. No. 4,720,554. This application Sep. 4, 1987, Ser. No. 93,240
Claims priority, application Japan, Dec. 6, 1985, 60-274678
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[4] C07D *207/09*
U.S. Cl. 548—533 5 Claims

1. A method of producing a lysylproline derivative represented by the following formula:



which comprises, converting to free form by neutralization with an alkaline solution, an N^{ϵ}-trifluoroacetyl-L-lysyl-L-proline aromatic sulfonic acid salt having the formula:



N^{ϵ}—tribluoroacetyl-L-lysyl-L-proline

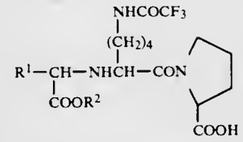
wherein n is 0 to 5, R is Cl, Br, F, C_1-C_4 straight chain or branched alkyl, OH, or CF_3;

reacting the neutralized salt with an α-keto ester having the formula

R^1—CO—$COOR^2$

wherein said reaction is conducted in the presence of hydrogen or a reducing agent,

to produce an N^{ϵ}-trifluoroacetyl-L-lysyl-L-proline derivative having the following formula:



and hydrolyzing the trifluoroacetyl protecting group from said derivative,

wherein R^1 is selected from the group consisting of C_1-C_4 alkyl groups, benzyl, 2-phenylethyl, 3-phenylpropyl, phenyl, and naphthyl, and R^2 is selected from the group consisting of hydrogen and C_1-C_4 alkyl groups.

4,786,738

METHOD FOR PRODUCTION OF MALEIMIDES

Yuichi Kita, Akashi; Kentaro Sakamoto, Hyogo; Masao Baba, and Atsushi Okubo, both of Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 745,414, Jun. 14, 1985, Pat. No. 4,623,734. This application Oct. 27, 1986, Ser. No. 923,266
Claims priority, application Japan, Jun. 18, 1984, 59-123747
Int. Cl.[4] C07D *207/448, 207/452*
U.S. Cl. 548—548 3 Claims

1. A method for the production of maleimides, which comprises subjecting maleinamic acids to ring-closure imidation in an organic solvent capable of forming an azeotrope with water in the presence of an acid catalyst at a temperature in the range of 120° to 250° C. while removing the formed water in the form of an azeotrope with said organic solvent and thereafter purifying the produced maleimides, wherein said purification comprises adding to crude maleimides an organic acid or inorganic acid selected from the group consisting of ortho-phosphoric acid, pyrophosphoric acid, sulfuric acid, sulfuric acid anhydride, fuming sulfuric scid, methane sulfonic acid, chlorosulfonic acid, chloromaleic acid, para-toluenesulfonic acid and trifluoroacetic acid in an amount of from about 5 to about 30% by weight based on the maleinamic acids used as the raw material, heating the resultant mixture at a temperature in the range of 20° to 100° C., removing the resinous impurities formed, separating the organic product containing phase from the aqueous acid phase and washing the resultant organic layer with a sufficient amount of water to remove the water-soluble impurities from the organic layer and removing the solvent portion of the organic phase under reduced pressure to yield essentially pure maleimide.

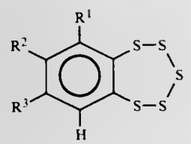
4,786,739

SUBSTITUTED BENZOPENTATHIEPINS, PROCESS THEREFOR AND INTERMEDIATES

Bertrand L. Chenard, Wilmington, Del., assignor to E. I. Du-Pont de Nemours and Company, Wilmington, Del.

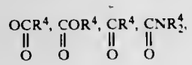
Division of Ser. No. 618,445, Jun. 7, 1984, Pat. No. 4,571,404, which is a continuation-in-part of Ser. No. 502,231, Jun. 8, 1983, abandoned. This application Jan. 6, 1986, Ser. No. 816,258
Int. Cl.[4] C07D *341/00*
U.S. Cl. 549—11 9 Claims

1. A method for making compounds of the formula



wherein

R^1, R^2 and R^3 are the same or different substituents that do not react with sulfur at reaction temperatures and are selected from H, X, CX_3, NO_2, SR^4, OR^4, NR_2^4,



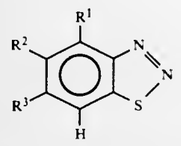
aryl and substituted aryl;

R^4 is selected from aryl, substituted aryl, and substituted and unsubstituted branched or straight chain C_1 to C_6alkyl; the substituents employed in the substituted aryl of R^1 to R^3 and in the substituted aryl and alkyl of R^4 are selected from the group X, CX_3, OR, SR,

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and COOR wherein R is aryl or C_1 to C_4 alkyl; and X is selected from Cl, Br and F; comprising reacting a benzothiadiazole of the formula



with S_8 at a temperature of about 140° to 200° C. in a solvent inert to S_8 at a molar ratio of S_8 to benzothiadiazole of about 1:2 to 2:1.

4,786,740

WORK-UP OF DIALKYL PHOSPHORODITHIOIC ACID ESTERS

Stanley B. Mirviss, Stamford, Conn.; Claudia H. Elkins, White Plains, N.Y., and Sandra L. Urquhart, Wallington, N.J., assignors to Stauffer Chemical Co., Westport, Conn.

Filed Nov. 24, 1986, Ser. No. 934,076
Int. Cl.⁴ C07F *9/165*
U.S. Cl. 549—221 **9 Claims**

1. A process for purifying a reaction mixture comprising a phosphorodithioic acid ester of dichloro-para-dioxane prepared by reacting an 0,0-dialkyl phosphorodithioic acid with a dichloro-para-dioxane in the presence of a catalytic amount of a Lewis acid which comprises washing the reaction mixture with an ammonium hydroxide solution.

4,786,741

PREPARATION OF ALKYLENE CARBONATES

Howard M. Sachs, Riverdale, N.Y., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Filed Nov. 15, 1982, Ser. No. 441,191
Int. Cl.⁴ C07D *317/12*
U.S. Cl. 549—230 **10 Claims**

1. In a process for preparing alkylene carbonate by the reaction of the corresponding alkylene oxide with carbon dioxide in the presence of an effective amount of at least one catalyst selected from the group consisting of organic quaternary ammonium halides, organic quaternary phosphonium halides, organic sulfonium halides, and organic antimony halides and water, the improvement comprising controlling the selectivity of alkylene carbonate and suppressing formation of higher molecular weight glycols to produce high yields of alkylene carbonate by carrying out said reaction at temperatures above about 90° C. with a molar ratio of carbon dioxide to alkylene oxide of at least about 1/1, a water to alkylene oxide molar ratio greater than about 0.01/1, and a carbon dioxide partial pressure sufficient to provide the selectivity to alkylene carbonate desired.

4,786,742

CRYSTALLINE LITHIUM PSEUDOMONETE

Alan D. Curzons, Brighton, England, assignor to Beecham Group p.l.c., England

Division of Ser. No. 684,479, Dec. 21, 1984, Pat. No. 4,639,534, which is a continuation of Ser. No. 332,669, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 207,773, Nov. 17, 1980, abandoned, which is a division of Ser. No. 036,061, May 4, 1979, abandoned. This application Aug. 8, 1986, Ser. No. 894,567
Claims priority, application United Kingdom, May 20, 1978, 7820958
Int. Cl.⁴ C07D *309/10*
U.S. Cl. 549—414 **1 Claim**

1. Crystalline lithium pseudomonate.

4,786,743

SILVER CATALYST AND A PROCESS FOR PREPARING SAME

Jacobus E. Bongaarts, Destelbergen, Belgium; Garmt R. Meima, Amersfoort, and John W. Geus, Bilthoven, both of Netherlands, assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 31, 1986, Ser. No. 925,194
Int. Cl.⁴ C07D *301/10*
U.S. Cl. 549—534 **8 Claims**

1. A process for the catalytic selective oxidation of ethylene to ethylene oxide which process comprises contacting ethylene with oxygen in the presence of a catalytic amount of a catalyst under conditions sufficient to convert the ethylene to ethylene oxide, said catalyst comprising a thermostable, inert carrier consisting essentially of alpha-aluminum oxide to which finely-divided silver partices have been applied, said carrier having a surface wherein at least about 1 percent of the carrier surface is provided with a stepped structure as a result of treatment of the carrier with acid.

4,786,744

METHOD FOR OPENING THE GEM DICYANO EPOXIDES AND THE FORMATION OF COMPOUNDS THEREFROM

Albert L. F. Robert, Rennes; Jean-Luc Guinamant, Neuilly, and Sylvie C. A. Jaguelin, Neuilly sur Seine, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Jun. 17, 1985, Ser. No. 745,579
Claims priority, application France, Jun. 15, 1984, 8409434
Int. Cl.⁴ C07C *102/08, 67/22, 51/08*
U.S. Cl. 558—14 **8 Claims**

1. A process for preparing an ester of arylacetic acid comprising reacting an alcohol with a gem dicyanoepoxide, wherein one ring carbon atom bears an aryl group and a hydrogen atom in the presence of hydroiodic acid.

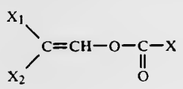
4,786,745

2,2-DIHALOVINYL HALOFORMATES AND PROCESS OF PREPARATION

Mark P. Bowman; Roy A. Olofson, both of State College, Pa.; Thierry Malfroot, Saintry Sur Seine, and Jean-Pierre Senet, Herbeauvilliers-Buthiers, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

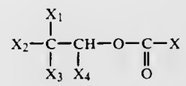
Filed Aug. 13, 1986, Ser. No. 896,605
Claims priority, application France, Aug. 23, 1985, 85 12652
Int. Cl.⁴ C07C *68/02, 69/96*
U.S. Cl. 558—283 **13 Claims**

1. A 2,2-dihalovinyl haloformate of formula:



wherein:
X is chlorine or bromine;
X_1 and X_2 are the same or different and are chlorine or bromine.

4. The process for the preparation of a haloformate according to claim 1, wherein 1,2,2,2-tetrahaloethyl haloformate of formula:



in which:
X_1, X_2 and X are as defined hereinabove;
X_3 is chlorine or bromine and is always bromine when X_1 and/or X_2 are bromine and
X_4 is chlorine or bromine
is reacted with zinc or magnesium in a solvent.

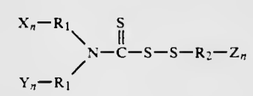
4,786,746

COPPER ELECTROPLATING SOLUTIONS AND METHODS OF MAKING AND USING THEM

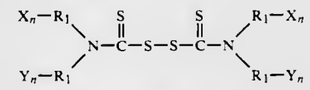
Momcilo Miljkovic, Hummelstown, Pa., assignor to Pennsylvania Research Corporation, University Pk., Pa.

Filed Sep. 18, 1987, Ser. No. 98,254
Int. Cl.⁴ C07C *148/00*
U.S. Cl. 560—302 **7 Claims**

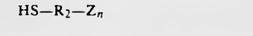
1. A method of preparing a compound of the formula:



wherein:
R_1 and R_2 each is an alkyl containing from 2 to 8 carbon atoms, an aryl, an alkylaryl, an arylalkyl or a heterocyclic group containing at least one nitrogen atom in its ring;
X, Y and Z each is hydrogen or a water-solubilizing group; and
n is an integer of from 1 to 4; provided that:
when R_1 is a heterocyclic group, X, Y and Z are hydrogen and R_2 is an alkyl containing from 2 to 8 carbon atoms, an aryl, an alkylaryl or an arylalkyl;
when R_2 is a heterocyclic group, X, Y and Z are hydrogen and R_1 is an alkyl containing from 2 to 8 carbon atoms, an aryl, an alkylaryl or an arylalkyl;
when X or Y is a water-solubilizing group, R is an alkyl containing from 2 to 8 carbon atoms, an aryl, an alkylaryl or an arylalkyl and Z is hydrogen;
when Z is a water-solubilizing group, R_1 is an alkyl containing from 2 to 8 carbon atoms, an aryl, an alkylaryl or an arylalkyl and X and Y are hydrogen; and
when X and Y are both water-solubilizing groups, they may be the same or different water-solubilizing groups;
the method comprising reacting a compound of the following formula:



with a compound of the formula:



wherein R_1, R_2, X, Y, Z and n are as defined above.

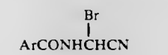
4,786,747

SUBSTITUTED BENZAMIDES

John D. Jones, Bury, and David Schofield, Greater Manchester, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 777,548, Sep. 19, 1985, abandoned, which is a division of Ser. No. 635,595, Jul. 30, 1984, Pat. No. 4,575,557. This application May 11, 1987, Ser. No. 48,505
Claims priority, application United Kingdom, Sep. 22, 1983, 8325408
Int. Cl.⁴ C07C *121/66*
U.S. Cl. 558—392 **1 Claim**

1. A process for the preparation of the compound of formula (III)



(III)

wherein Ar is an optionally substituted phenyl which comprises reacting a compound of the formula (II):



(II)

with a brominating agent in ethyl acetate as the solvent.

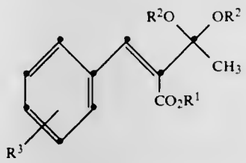
4,786,748

PROCESSES FOR PREPARING AKLYLENE AND DIALKYL KETALS AND ALKYL ALPHA-ENOL ETHERS OF ALPHA-ACETYL CINNAMIC ACIDS OR ESTERS THEREOF

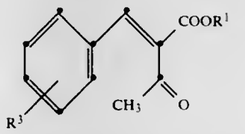
Charles E. Sumner, Jr., and Joseph R. Zoeller, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 13, 1987, Ser. No. 107,744
Int. Cl.⁴ C07C *69/76*
U.S. Cl. 560—60 **18 Claims**

1. A process for preparing an alkylene or dialkyl ketal of the formula



wherein R^1 is H, (C_1-C_{12})alkyl, (C_6-C_{20})aryl or (C_7-C_{21})aralkyl or alkylaryl, each R^2 is (C_1-C_{12})alkyl or two R^2 together are (C_2-C_{12})alkylene, and R^3 is H, halo, carboxy or (C_1-C_{12})alkyl, alkoxy, acyl, acyloxy, carbalkoxy or alkylthio, said process comprising
reacting an alpha-acetyl cinnamic acid or ester thereof of the formula



wherein R^1 and R^3 are as defined above, with a ketalizing agent selected from the group consisting of alkyl glycols, dialkyl ketals, dialkyl acetals, and trialkyl orthoesters, in the presence of a transition metal catalyst and an acid catalyst; said cinnamic acid or ester thereof and said ketalizing agent being present in a proportion and under reaction conditions effective to produce said ketal.

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4,786,749

CARBOXYL-TERMINATED LACTONE ACRYLATES

Joseph V. Koleske, Charleston, W. Va., and George T. Kwiatkowski, Green Brook, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 20, 1986, Ser. No. 831,777
Int. Cl.[4] C08F *20/20, 2/50;* C07C *69/73, 69/80*
U.S. Cl. 560—76 12 Claims

1. A polymerizable monomer having the structure:

$$CH_2=CRCO_2R'-O[COR''-O]_mCOR'' \\ -[COOH]_z$$

wherein R is H, methyl or ethyl, R′ is an alkylene radical having 2 to about 12 carbons, R″ is an alkylene radical having about 1 to about 10 carbons, R‴ is a radical having 2 to about 20 carbons, m is an integer having a value of 1 to about 20, and z is an integer having a value of 1 to about 4.

4,786,750

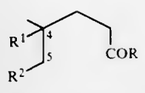
PENTENE DERIVATIVES

Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 894,615, Aug. 8, 1986, Pat. No. 4,709,063, which is a division of Ser. No. 684,194, Dec. 20, 1984, Pat. No. 4,628,096, which is a division of Ser. No. 496,680, May 20, 1983, Pat. No. 4,504,664. This application Aug. 28, 1987, Ser. No. 90,787
Int. Cl.[4] C07C *69/63*
U.S. Cl. 560—226 1 Claim

1. A pentene derivative of the following formula III:

(III)



wherein R is C_{1-6} alkoxy group; and R^1 is hydroxy and R^2 is bromine.

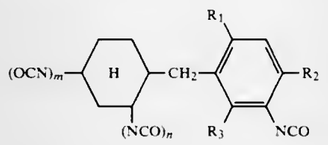
4,786,751

DISSOCYANATES, DIISOCYANATE MIXTURES AND A PROCESS FOR THEIR PRODUCTION

Hartmut Knöfel, Odenthal; Michael Brockelt, Bergisch-Gladbach; Stefan Penninger, and Herbert Stutz, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 556,521, Nov. 30, 1983, abandoned. This application Nov. 12, 1985, Ser. No. 797,072
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245321
Int. Cl.[4] C07C *71/00;* C08G *18/10*
U.S. Cl. 560—358 10 Claims

1. A diisocyanate or isomeric mixture of diisocyanates corresponding to the formula



in which

R_1, R_2 and R_3 each represents hydrogen or an alkyl group having 1 to 12 carbon atoms, provided that two of the radicals R_1, R_2 and R_3 represent hydrogen and

m and n each represent 0 or 1 provided that m+n=1 and when m or n is zero, the free valence is filled with hydrogen.

4,786,752

CATALYST RECOVERY AND RECYCLE OF CATALYSTS IN PSEUDOCUMENT OXIDATION PROCESS

Juergen K. Holzhauer; Wayne P. Schammel, both of Naperville, and Neal R. Nowicki, St. Charles, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 781,935, Sep. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 565,915, Dec. 27, 1983, abandoned. This application Sep. 3, 1987, Ser. No. 92,479
Int. Cl.[4] C07C *51/265*
U.S. Cl. 562—414 6 Claims

1. A process for recovering the metal components of an oxidation catalyst comprising cobalt, manganese and bromine components, or cobalt, manganese, zirconium and bromine components from an oxidation reaction to oxidize pseudocumene to trimellitic acid, which process comprises:

a. separation of a catalyst containing residue stream from said oxidation reaction;

b. addition of water to said catalyst residue stream to form an aqueous solution;

c. addition of an oxalic acid compound to said aqueous solution in an amount required to precipitate from said aqueous solution said metal components of said catalyst as oxalate salts;

d. separation of said oxalate salts from said aqueous solution;

e. application of heat to said oxalate salts after said separation to convert said salts to more catalytically active forms of said salts.

4,786,753

OXIDATION PROCESS FOR THE MANUFACTURE OF AROMATIC ACIDS FROM ALKYLAROMATIC COMPOUNDS

Walter Partenheimer, and Wayne P. Schammel, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 18, 1987, Ser. No. 50,860
Int. Cl.[4] C07C *51/265*
U.S. Cl. 562—416 6 Claims

1. A process of oxidizing di- and trimethylbenzenes with molecular oxygen to benzene di- and tricarboxylic acids under liquid-phase conditions in the presence of an aliphatic acid having less than five carbon atoms or in the presence of water or in the presence of a mixture of the aliphatic acid and water at a temperature of about 100° C. to 260° C. and at a pressure to maintain as liquid phase 70–80% of the reaction medium, which process comprises conducting said oxidation in the presence of a catalyst system comprising a source of bromine with nickel, zirconium and manganese wherein for each gram mole of p-xylene, m-xylene, or pseudocumene in the oxidation there is from about 4 to about 20 milligram atom nickel, about 0.10 to about 0.30 milligram atom zirconium, about 2 to about 10 milligram atom total of manganese and from about 8 to 24 milligram atoms bromine.

4,786,754

CRYSTALLINE UPSILON-FORM BESTATIN AND PROCESSES FOR ITS PREPARATION

Takashi Terada; Tetsushi Saino, both of Yono; Terukatsu Sakurai, Omiya; Hamao Umezawa, and Masaaki Ishizuka, both of Tokyo, Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Hai, Tokyo, Japan

Continuation of Ser. No. 877,066, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 692,582, Jan. 16, 1985, abandoned, which is a continuation of Ser. No. 450,620, Jan. 17, 1982, abandoned. This application Jul. 13, 1987, Ser. No. 72,370
Claims priority, application Japan, Dec. 24, 1981, 56-208144
Int. Cl.[4] C07C *101/30*
U.S. Cl. 562—448 4 Claims

1. γ-form crystalline bestatin.

4,786,755

DIPHENIC ACID MONOAMIDES

John S. Kiely, and Suchin Huang, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 740,799, Jun. 3, 1985, Pat. No. 4,602,023. This application Apr. 2, 1986, Ser. No. 845,704
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] C07C *101/72*
U.S. Cl. 562—455 18 Claims

1. [1,1′-Biphenyl]-2-carboxylic acid, 2′[[[4-[4-phenylbutyloxy]phenyl]amino]carbonyl].

4,786,756

CATALYTIC CONVERSION OF LACTIC ACID AND AMMONIUM LACTATE TO ACRYLIC ACID

Christos Paparizos, Willowick; Serge R. Dolhyj, Parma, and Wilfrid G. Shaw, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 5, 1984, Ser. No. 668,045
Int. Cl.[4] C07C *51/377, 57/065*
U.S. Cl. 562—599 5 Claims

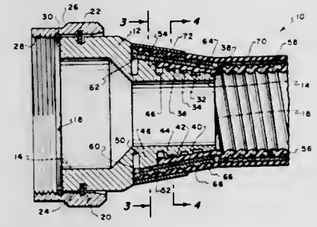
1. A process for the catalytic conversion of lactic acid and/or ammonium lactate to acrylic acid which comprises contacting a mixture of water and lactic acid and/or ammonium lactate in the vapor phase with solid aluminum phosphate which has been treated with an aqueous inorganic base and calcined at a temperature in the range from 300° to 650° C.

4,786,757

FLEXIBLE ELECTROMAGNETIC PULSE SHIELDING CONDUIT

Max T. Owensby, Canoga Park; Richard J. Van Ness, Paso Robles, and Richard J. Delahunty, Templeton, all of Calif., assignors to 501 Fleetwood Electronics, Inc., Canoga Park, Calif.

Filed Nov. 23, 1987, Ser. No. 124,165
Int. Cl.[4] H05K *9/00;* H02G *3/04;* F16L *33/20, 39/00*
U.S. Cl. 174—35 C 7 Claims



5. A flexible electromagnetic pulse shielding conduit for electrical conductors comprising:

a backshell having an internal open-ended chamber, said backshell having an inner end and an outer end, said outer end being adapted to connect with a separate electrical apparatus;

a sheet material tube, said tube being flexible, said tube having an open end, said tube having an interior chamber, said inner end extending through said open end within said interior chamber with said tube being snugly mounted on said inner end;

a first metallic band located about said tube at said inner end, said first metallic band being shrunk about said inner end thereby tightly binding said tube to said backshell forming a secure connection therebetween; and

a rubber sleeve disposed about said tube and said inner end, a second metallic band located about said rubber sleeve, said second metallic band being shrunk about said rubber sleeve thereby tightly binding said rubber sleeve to said backshell forming a secure, moisture-proof seal therebetween, said second metallic band concentrically overlapping said first metallic band;

an electrically conductive tubular member concentrically disposed about said tube, said electrically conductive tubular member being securely fixed in place between said first metallic band and said tube; and

said inner end defining a raised annular ridge, said raised annular ridge having a serrated exterior surface, said electrically conductive tubular member directly abutting against said serrated exterior surface of said raised annular ridge.

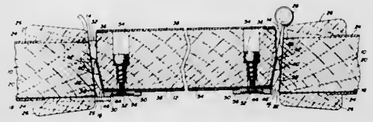
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4,786,758

DOOR SHIELD FOR SHIELDED ENCLOSURE

Stanley J. Zielinski, Addison, Ill., assignor to The Curran Company, Addison, Ill.

Filed Nov. 14, 1986, Ser. No. 930,875
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 GC 11 Claims



1. An electromagnetic interference shielded enclosure comprising relatively movable door and door frame members defining a gap between said relatively movable members and a shield for said gap including:

an elongated base member of electrically conductive material including a mounting flange portion and a support flange portion extending at an angle from said mounting flange portion;

said mounting flange portion being mountable upon a first of said relatively movable members to hold said support flange portion in the gap between the relatively movable members;

a finger contact member permanently attached to said base member and including a plurality of resilient electrically conductive fingers arrayed along the length of said base member to establish electrical contact between the relatively movable members;

each finger having spaced first and second end segments in engagement with said support flange portion and a contact segment between said end segments engageable with the second of said relatively movable members;

the first of said end segments of each finger being fixed to said base member and the second of said end segments being slidable on said support flange portion; and

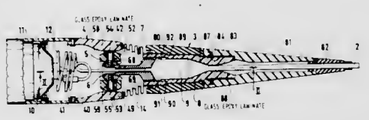
connecting portions joining the second end segments of said fingers to limit the freedom of movement of each finger relative to the other fingers.

4,786,759

ARTICULATED CABLE HEAD FOR SUBMARINE LINKS

Jean-Pierre Gouverneur, Calais, France, assignor to Les Cables de Lyon, Clochy, France

Filed Nov. 12, 1987, Ser. No. 120,260
Claims priority, application France, Nov. 14, 1986, 86 15875
Int. Cl.[4] H02G 15/14, 15/007
U.S. Cl. 174—70 S 10 Claims



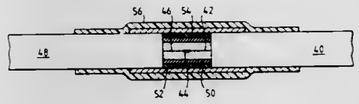
1. An articulated cable head for submarine links, the head having a universal joint including a universal joint head, a universal joint support and a ring, and wherein said support and said ring are made of a fiber and epoxy resin laminate by winding threads.

4,786,760

CABLE CONNECTION

Ritter Friedhelm, Oberhaching, Fed. Rep. of Germany, assignor to Raycbem GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Oct. 20, 1986, Ser. No. 921,172
Claims priority, application United Kingdom, Oct. 25, 1985, 8526377
Int. Cl.[4] H01R 4/24, 43/00
U.S. Cl. 174—84 R 11 Claims



1. A method of forming an electrical connection, comprising:

(i) providing an electric cable having a conductor with a softening temperature surrounded by electrical insulation material, and a conductive piercing member,

(ii) inserting the piercing member into the conductor of the cable so as to leave a portion of the piercing member extending from the cable,

(iii) heating the piercing member to at least the softening temperature of the conductor so as to produce local softening of the conductor, and

(iv) allowing the piercing member and the conductor to cool so as to form a solder joint therebetween.

5. An electrical connection between an electric cable and at least one other cable, the electric cable comprising a conductor having a softening temperature surrounded by electrical insulation material, and having a piercing member with a softening temperature retained within the conductor and extending from the electric cable, wherein the softening temperature of the conductor is below that of the piercing member, and the piercing member is soldered at one end thereof to the said conductor and is connected towards another end thereof to a conductor of the said at least one other cable.

4,786,761

GAS INSULATED ELECTRICAL APPARATUS

Hiroyuki Hama, and Hiroshi Yamamoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 29, 1987, Ser. No. 67,125
Claims priority, application Japan, Jun. 30, 1986, 61-153364
Int. Cl.[4] H02G 5/06
U.S. Cl. 174—22 C 5 Claims

1. A gas insulated electrical apparatus comprising:

a hermetic sheath having a plurality of electrically conductive sheath sections each including flanged ends;

fastening means for fastening said flanged ends of said sheath sections together;

a high voltage conductor disposed within said sheath;

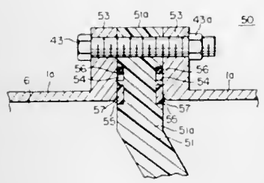
an electrically insulating spacer for electrically insulatably supporting said conductor relative to said sheath, said spacer being hermetically and securely held at the outer periphery thereof between said flanged ends of said sheath sections;

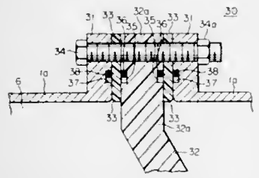
an electrically insulating gas disposed within said sheath; and

an electrically insulating member interposed between and separating at least one of said flanged ends of said sheath sections and a circumferential flange portion of said insulating spacer, a portion of said electrically insulating member being exposed inwardly with respect to said hermetic sheath and to the insulating gas disposed within said sheath, said insulating member being made of a material

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having a lower dielectric constant than said insulating spacer so as to reduce local concentration of the electric





field developed at a junction between said flanged ends, said insulating gas, and said insulating spacer.

4,786,762

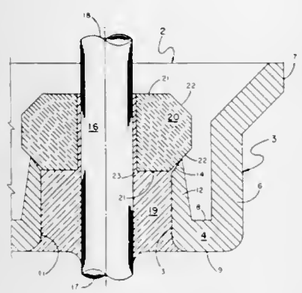
SLEEVE ARRANGEMENT FOR A HERMETIC TERMINAL ASSEMBLY

Benjamin Bowsky, Warren County; Larry G. Burrows, Hamilton County, and Glenn A. Honkomp, Warren County, all of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 3, 1988, Ser. No. 163,541

Int. Cl.[4] H01B *17/30*

U.S. Cl. 174—152 GM **10 Claims**



1. A hermetic terminal assembly adapted to be secured to an opening in a motor unit housing comprising:

a cup-shaped body with a bottom and a rim extending in one direction from said bottom, said bottom having at least one hole in it defined by an annular sealing lip projecting in the same direction as said rim;

a current conducting pin extending through said hole, said pin having an outer end to extend externally of said housing to receive an electrical connection to a current source and an inner end to receive an electrical connection disposed in said housing;

a sealing insulator bonding said pin to the inside surface of said lip; and,

an electrically insulating extension sleeve surrounding said pin with an end portion thereof cooperating with said hole defined by said annular lip to engage with and be bonded to said sealing insulator, said end portion of said extension sleeve and the end portion of said annular lip being so sized and geometrically configured that the outer wall of said extension sleeve abuttingly engages said end portion of said annular lip only along the outer periphery thereof in substantial line contact therewith, thereby localizing any cracking of said sealing insulator which might occur from the abutting contact of said extension sleeve with said lip to a position remote from said conducting pin.

4,786,763

CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF DATA SIGNALS BETWEEN SUBSCRIBER TERMINALS OPERATING WITH DIFFERENT DATA TRANSMISSION PROCEDURES

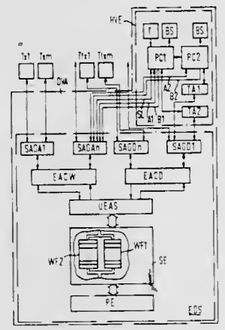
Hinrich Schumacher, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,025

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712130

Int. Cl.[4] H04Q *3/00*

U.S. Cl. 178—2 R **4 Claims**



1. A circuit for transmission of data signals between first subscriber terminals operating with a first data transmission protocol and with second subscriber terminals operating with a data transmission protocol different from the first data transmission protocol, through a data switching system with conversion of the data signals provided by the first subscriber terminals into data signals compatible with the second subscriber terminals, such that the first subscriber terminals and the second subscriber terminals are connected to separate line circuits of a first and second group of line circuits, comprising:

at least one manual switchboard having at least one job memory unit and a control unit connected to at least one line circuit of each of said first and second groups of line circuits, such that jobs sent from the data switching system for manual switching connections and which include the selection data and the data signals from the first subscriber terminals are input to the memory unit together with a continuously assigned job number and output in the sequence in which they were input, under control of control signals provided by the control unit, such that said control unit only maintains, for each job, the selection data required for setting-up of a connection, and the data signals for a conversion and associated forwarding to the second subscriber terminal.

4,786,764

DIGITIZER STYLUS WITH PRESSURE TRANSDUCER

Michael J. Padula, Sandy Hook, and Henry G. Matthews, Haddam, both of Conn., assignors to Summagraphics Corporation, Fairfield, Conn.

Filed Mar. 20, 1987, Ser. No. 28,494

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **20 Claims**



1. A stylus for use with a digitizer tablet having a working surface, comprising:

a conductive tip for pressing against the working surface of said digitizer tablet;

a transducer having electrical resistance, said resistance varying with the amount of compressive force applied to said transducer;

a pair of electrodes conductively contacting said transducer and in electrical circuit with said variable resistance when said compressive force is applied, said tip being electrically insulated from said electrodes;

means for capacitively coupling said tip to one of said electrodes; and

mechanical means for transmitting to said transducer a compressive force substantially equal to the pressure being exerted on the working surface of said tablet by said tip, whereby the resistance of said transducer is a function of said pressure.

4,786,765

COORDINATES INPUT SYSTEM

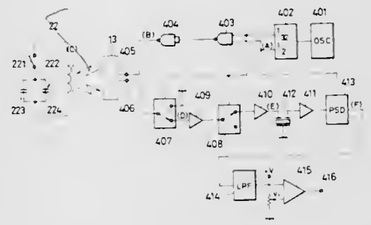
Tsuguya Yamanami; Toshiaki Senda, and Azuma Murakami, all of Okegawa, Japan, assignors to Wacom Co., Ltd., Saitama, Japan

Filed Jul. 23, 1987, Ser. No. 76,962

Claims priority, application Japan, Jul. 23, 1986, 61-171684; Aug. 20, 1986, 61-194492; Aug. 28, 1986, 61-202483

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—19 **8 Claims**



1. A coordinates input system having a tablet constituting a coordinates input portion, a position designating device such as a stylus pen, and a position detection circuit adapted to drive said tablet and detect a position at which coordinates are input by said position designating device, said system comprising:

an antenna coil disposed around a coordinates input range of said tablet; and

a tuning circuit disposed in said position designating device and including a coil and a capacitor,

wherein radio waves are generated by said antenna coil by application of an AC signal of a predetermined frequency thereto, and the status of said tuning circuit is discriminated by a signal of said antenna coil at the time when the transmission of said radio waves is suspended, thereby detecting the status of said position designating device.

4,786,766

KEYBOARD APPARATUS

Akihiko Kobayashi, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

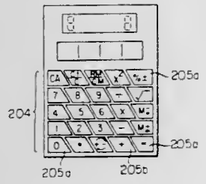
Continuation of Ser. No. 73,882, Jul. 16, 1987, abandoned, which is a continuation of Ser. No. 890,541, Jul. 30, 1986, abandoned.

This application Jan. 15, 1988, Ser. No. 147,016

Claims priority, application Japan, Aug. 26, 1985, 60-185825; Feb. 14, 1986, 61-028863; Feb. 14, 1986, 61-028864

Int. Cl.[4] H01H *13/70*

U.S. Cl. 200—5 A **21 Claims**



8. A keyboard apparatus comprising:

panel means having a plurality of discrete locations, each location having a first opening portion and a plurality of second opening portions;

a plurality of input means adjacent a first side of said panel means, each of said input means comprising a pair of conductive members separated by an elastic force and adapted to contact each other due to a pressing force; and

a group of key buttons of a keyboard including a plurality of key buttons substantially in the shape of a quadrangle which are arranged adjacent a second side of said panel means, each of said plurality of key buttons comprising a first projecting portion which projects from substantially the center of said key button and a plurality of second projecting portions projecting from said key button wherein said first projecting portion is inserted through said first opening portion and thereby guided in a predetermined direction by said first opening portion to said first side of said panel means, the end portion of said first projecting portion contacting an associated one of said input means so as to be biased away from said panel means by the elastic power of said input means, and wherein each of said second projecting portions is inserted through said second openings to said first side of said panel means, each engaging member of said second projecting portions engaging near to said second opening portions so as to provide a force against the elastic power of said input means,

wherein each of the key buttons locating at one end and the other end of said panel means has a trapezoidal shape, and each of the key buttons arranged at positions sandwiched between said trapezoidal key buttons has a parallelogram shape.

4,786,767

TRANSPARENT TOUCH PANEL SWITCH

Bruce Kuhlman, Redwood City, Calif., assignor to Southwall Technologies Inc., Palo Alto, Calif.

Filed Jun. 1, 1987, Ser. No. 57,274

Int. Cl.[4] H01H *13/70*

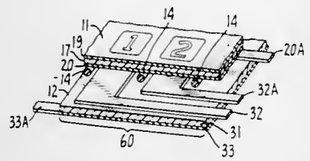
U.S. Cl. 200—5 A **8 Claims**

1. A transparent non-capacitive touch membrane switch for use in front of a cathode ray tube comprising two essentially two-dimensional sheets arrayed substantially parallel to one another in the outer sheet/inner sheet sandwich configuration,

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the outer sheet having a light transmission value of from about 0.20 to about 0.80 and comprising a flexible transparent plastic substrate having on at least a portion of its outer surface a diffuse hardcoat and on its inner surface a first antireflective transparent electrically conductive coating,

and the inner sheet comprising a flexible transparent plastic substrate having on its outer surface a second antireflective transparent electrically conductive coating and on its inner surface a third antireflective transparent electrically



conductive coating, with the inner and outer sheets being mechanically spaced from one another by spacer means to a distance which can be locally traversed by finger tip pressure deformation of the outer sheet so as to make electrical contact between first and second electrically conductive coatings so as to provide an electrical switching event and with the third antireflective transparent electrically conductive coating being electrically grounded so as to provide shielding against the passage of electromagnetic and radio frequency interference through said membrane switch.

4,786,768

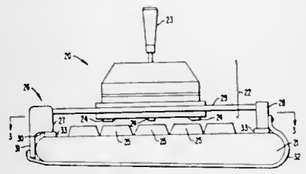
MANUAL CURSOR ACTUATOR FOR ELECTRONIC KEYBOARDS

Cornelis Langewis, Walnut Creek, and Christiaan Langewis, Hayward, both of Calif., assignors to Interlock, Hayward, Calif.

Filed Aug. 20, 1987, Ser. No. 87,715

Int. Cl.[4] A63F 9/00; H01H 25/00

U.S. Cl. 200—6 A **14 Claims**



1. A manual actuator for arrow keys arranged on a data input keyboard in accordance with a standard array comprised of four arrow keys arranged in a cross and four corner keys at the four corners thereof, said manual actuator comprising:

a housing;

eight fingers pivotally mounted in said housing and arranged according to said standard array, each said finger having an inner end and an outer end and mounted such that said outer end is displaced downward below said bottom surface of said housing upon pivoting of said finger, said eight fingers comprising four arrow fingers arranged to align said outer ends thereof with said arrow keys and four corner key fingers arranged to align said outer ends thereof with said corner keys when said housing is positioned over said keyboard;

first biasing means for biasing said outer ends of said arrow fingers upward;

second biasing means for biasing said outer ends of said corner key fingers upward, said second biasing means providing stronger resistance than said first biasing means;

a control shaft mounted in said housing in pivotal manner toward said fingers such that engagement of said control shaft with any said finger causes said finger to move downward below said housing; and

means for stably mounting said housing to a keyboard.

4,786,769

SAFETY COUPLING DEVICE FOR ROBOTIC TOOLING

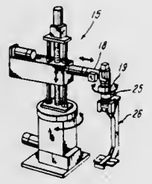
Harold E. Knasel, Springfield, and David A. Grigshy, Medway, both of Ohio, assignors to Process Equipment Company, Tipp City, Ohio

Continuation of Ser. No. 708,561, Mar. 6, 1985, Pat. No. 4,639,184. This application Jan. 27, 1987, Ser. No. 6,923

The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.

Int. Cl.[4] B23J 9/00; H01H 3/16

U.S. Cl. 200—61.41 **16 Claims**



1. A device adapted for connecting a first element to a second element, comprising a first support member, means for rigidly securing said first support member to the first element, a second support member, means for rigidly securing said second support member to the second element, means connecting said first and second support members and providing for relative universal tilting movement between said first and second support members from a normal position where said first support member is in predetermined relation to said second support member, said connecting means including a plurality of pins spaced angularly about an axis and secured to one of said support members, a corresponding plurality of ball members slidably mounted on said pins, the other said support member having a corresponding plurality of slots each receiving one of said ball members for relative movement along a linear path, and means for biasing said first and second support members toward said normal position.

4. A device as defined in claim **1** wherein said first support member includes means forming a planar surface, and said ball members contact said surface in said normal position.

5. A device as defined in claim **4** wherein said means forming said planar surface include a corresponding plurality of electrical conductive members, means forming an electrical circuit with said ball members electrically connected in series with said plate members, and said circuit opens by separation of at least one of said ball members from the corresponding said plate member in response to said tilting movement of said support members.

4,786,770

SWITCHGEAR

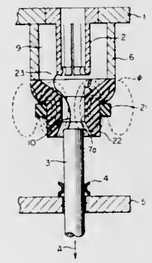
Suenobu Hamano; Hiroyuki Sasao; Yutaka Murai; Yuichi Wada, all of Amagasaki; Hirosi Hasegawa, and Tosimasa Maruyama, both of Marugame, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 8, 1987, Ser. No. 59,041

Claims priority, application Japan, Jun. 6, 1986, 61-130195; Jun. 6, 1986, 61-130197; Jun. 6, 1986, 61-130198; Jun. 6, 1986, 61-130199; Jun. 6, 1986, 61-130200; Jun. 6, 1986, 61-130201; Jun. 6, 1986, 61-130202

Int. Cl.[4] H01H 33/18

U.S. Cl. 200—147 R **14 Claims**



1. A switchgear comprising in a housing containing an arc extinguishing gas,

a stationary contact;

a movable contact capable of contacting with and separating from said stationary contact, said movable contact and said stationary contact defining therebetween an arcing region in which an electric arc is generated when said contacts are separated;

means for defining a gas storage chamber around said stationary contact communicated with said arcing region for storing the arc extinguishing gas increased in pressure by heat from the arc;

an insulating nozzle attached to said gas storage chamber for defining an opening through which said movable contact movably extends and through which said arc extinguishing gas flows; and

magnet means for generating a magnetic field in said opening of said gas storage chamber for rotating and elongating the electric arc generated between said stationary contact and said movable contact upon current interruption;

said insulating nozzle defining a smooth inner transition surface connecting said gas storage chamber to said opening for permitting a smooth flow of the pressurized arc extinguishing gas through said opening, and

said magnet means being made of an electrically insulating material.

4,786,771

CIRCUIT INTERRUPTER WITH TWO STAGE STOPPER PREVENTING BOUNCE BACK

Tsukasa Iio; Yoshinori Mochizuki; Hiroshi Fujii; Yasusi Genba, and Hideaki Moriwaki, all of Midori, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 4, 1987, Ser. No. 95,463

Claims priority, application Japan, Sep. 9, 1986, 61-138776[U]

Int. Cl.[4] H01H 3/46

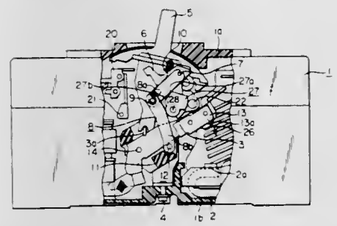
U.S. Cl. 200—153 G **2 Claims**

1. A circuit interrupter comprising:

a toggle link having an upper toggle link and a lower toggle link pivotally connected by a knee pin to each other;

a movable contact arm having a movable contact element secured thereon and connected to said lower toggle link of said toggle link; and

a toggle link stopper contacting said upper toggle link and limiting bouncing back of said movable contact arm during tripping of said movable contact arm;



said toggle link stopper having a first stop surface which is brought into engagement with said upper toggle link when said movable contact arm is being tripped open and a second stop surface which is brought into engagement with said upper toggle link at a position closer to said knee pin than to said first stop surface when said movable contact arm is bouncing back.

4,786,772

INDUCTION HEATING COIL FOR HEAT-TREATING METALLIC TUBES

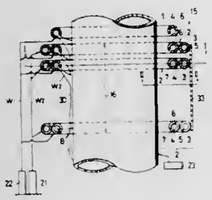
Tadahiro Umemoto; Yasuhiro Tanaka, and Chiyomitsu Fukazawa, all of Yokohama, Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 117,764

Claims priority, application Japan, Nov. 7, 1986, 61-170951[U]

Int. Cl.[4] H05B 6/44

U.S. Cl. 219—8.5 **11 Claims**



1. An induction heating coil for heat-treating a metallic tube by leaving compressive residual stress in the outer surface of the tube, comprising:

a plurality of electrical conductors for inductively heating the metallic tube, said conductors being hollow and connectable with a source of cooling water to allow cooling water to be supplied through said conductors during induction heating of the metallic tube, each of said electrical conductors being constructed in the shape of a ring and dividable into at least two segments along its circumference to allow said segments to be assembled around the metallic tube into said ring, said conductors surrounding the metallic tube and being spaced apart from each other a predetermined distance in the longitudinal direction of the metallic tube when said conductors are assembled around the metallic tube; and

a plurality of cooling water tubes for cooling the outer surface of the metallic tube after having been heat-treated

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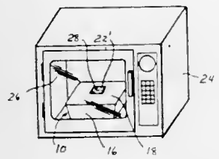
by said electrical conductors, each cooling water tube being shaped in a ring and dividable along its circumference to allow assembly thereof into said ring, each cooling water tube being disposed along a corresponding one of said electrical conductors and having in its outer surface a plurality of nozzles for forming water jets which produce an essentially uniform film of water on the metallic tube so as to uniformly cool said surface, said nozzles being inclined with respect to the outer surface of the metallic tube.

4,786,773

SYSTEMS AND METHODS FOR DETERMINING DONENESS OF MICROWAVE-HEATED BODIES

Richard M. Keefer, Peterborough, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Dec. 18, 1986, Ser. No. 943,680
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **21 Claims**



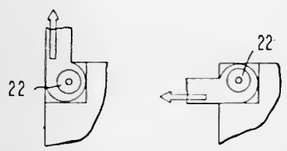
1. A system for indicating doneness of a body of material heated by microwave energy, comprising a thin electrically conductive metal element having first and second opposed extended surfaces; indicator means disposed on the first surface of the element for producing a visually observable change of appearance upon being heated to a predetermined elevated temperature or upon being maintained at such temperature for a predetermined time; and means for supporting the element in substantially fixed relation to and externally of the body, when the body is disposed in a microwave oven for heating by microwave energy, such that the element is also disposed in the oven with the indicator means positioned to be externally visible, and such that the element receives heat from the body by conduction and/or radiation as the body is heated by microwave energy; the dimensions of the element and the disposition of the indicator means thereon being such as substantially to shield the indicator means from temperature-elevating irradiation by microwave energy.

4,786,774

COMBINATION COMPACT MICROWAVE OVEN AND VENTILATOR SYSTEM

Ikuyasu Kaminaka, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 604,581, Apr. 27, 1984, abandoned. This application Jan. 6, 1988, Ser. No. 144,585
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 R **9 Claims**



1. A compact microwave oven incorporating ventilator and cooling systems into a unitized structure, comprising

a housing containing therein a cooking chamber and a compartment having a high voltage transformer disposed therein,

a cooling air intake means for introducing cooling air from outside through an intake opening directly into said compartment, said intake opening being provided to said housing at an elevated frontal position thereof,

a plurality of substantially independent air passages establishing separate airflow routes out of said compartment,

a cooling system fan adapted to cause cooling air to enter said compartment through said air intake means and to leave said compartment through said air passages, said cooling system fan forming a portion of the boundary of said compartment and being disposed proximately in front of said high voltage transformer whereby said transformer is directly exposed to incoming cooling air, and

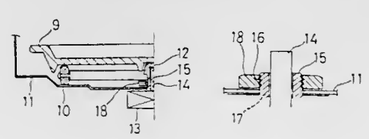
a ventilator assembly with a ventilator motor and centrifugal fans sandwichingly attached to both sides of said ventilator motor, said ventilator assembly being rotatably mounted at an elevated and backward part in said housing such that exhaust gas can be directed in an upward or backward direction by adjustingly rotating said ventilator assembly.

4,786,775

TURNTABLE DRIVING MOTOR FIXING STRUCTURE OF MICROWAVE OVEN

Akira Otani, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 19, 1987, Ser. No. 16,260
Claims priority, application Japan, Feb. 19, 1986, 61-23674[U]
Int. Cl.[4] H05B *6/78*
U.S. Cl. 219—10.55 F **3 Claims**



1. In a microwave oven having a rotatable turntable having supporting means located at an outer edge thereof, a motor-fixing structure mounting a motor to the microwave oven, said motor-fixing structure comprising:

a bottom wall portion of said microwave oven having a through-hole therein, said bottom wall portion presenting a substantially flat surface extending from said through-hole to a raised portion of the oven which serves as a support for said supporting means;

a coupling mounted to a bottom side of said turntable;

a power transmission shaft extending from said motor to said coupling, said power transmission shaft transmitting drive from said motor to said turntable through said coupling to permit rotation of said turntable, said power transmission shaft extending through said through-hole;

a bearing surrounding said power transmission shaft and extending through said through-hole, said bearing having a threaded portion on an upper, outer end thereof, said bearing being attached to said motor, said bearing positioning said motor beneath said bottom wall portion for avoiding a closed space between said motor and said microwave oven; and

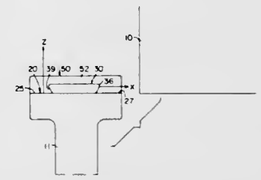
an annular nut having a top face and a bottom face, each of said faces being larger than said through-hole, said nut having an inner opening with threads therein, said threads being engageable with the threaded portion of said bearing to affix said bearing to said nut and to form a seal therebetween, said nut when threaded to said bearing, closing said through-hole to prevent microwave leakage therethrough.

4,786,776

HOLDING AND REFERENCE SYSTEM FOR A WIRE SPARK-EROSION MACHINE

Börje Ramsbro, Djursholm, Sweden, assignor to System 3R International AB, Vallingby, Sweden

Filed May 20, 1986, Ser. No. 865,136
Claims priority, application Sweden, May 21, 1985, 8502488; European Pat. Off., Apr. 10, 1986, 86104898
Int. Cl.[4] B23H *7/02*; B23Q *3/02*
U.S. Cl. 219—69 R **19 Claims**



1. In an apparatus for securing a workpiece within a working zone of a wire spark erosion machine including a mounting table having at least one planar base reference surface outside the working zone, the base reference surface having a width extending in an x-direction and a length extending in a y-direction perpendicular to the x-direction, the improvement comprising:

a first reference piece having a planar bottom surface;

means for attaching said first reference piece on the base reference surface with said bottom surface engaging the base reference surface;

the cross-section of said first reference piece in the x-direction having a generally dovetail-shaped profile;

an oblique planar surface on said first reference piece extending in the y-direction to provide a reference surface in the x-direction; and

a second reference piece having a planar surface extending in the y-direction and removably attachable to said first reference piece so that said planar surface of said second reference piece engages with said oblique planar surface of said first reference piece;

so that a workpiece may be operatively connected to said second reference piece outside the working zone and then transferred to the working zone together with said second reference piece by attaching said second reference piece to said first reference piece attached to the base reference surface.

4,786,777

PROCESS AND APPARATUS FOR WIRE ELECTRODE TRIMMING USING A LASER

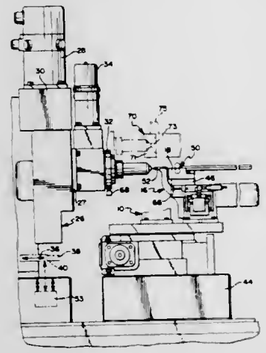
Gary F. Rupert, Ann Arbor, Mich., assignor to Raycon Textron Inc., Ann Arbor, Mich.

Filed Mar. 21, 1988, Ser. No. 170,770
Int. Cl.[4] B23H *7/22, 9/14*
U.S. Cl. 219—69 E **13 Claims**

1. A process for dressing a tip of an electrode with a substantially flat ended tip which is periodically eroded from a flat end configuration to a tapered end shape the improvement comprising:

sequentially forming a plurality of spark eroded holes in a part by directing the flat ended tip of a wire electrode through the part and applying a predetermined current pulse from the electrode to the part to spark erode a hole therein; and

noncontact dressing the wire electrode when a taper is eroded therein at intervals during the sequential hole formation to reshape the wire electrode to form a flat



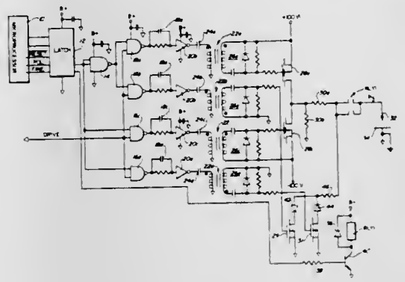
surface tip thereon without the formation of burrs or whiskers at the periphery thereof.

4,786,778

ELECTRICAL DISCHARGE MACHINING FINE FINISH CIRCUIT WITH SYMMETRICAL WAVEFORM IN BOTH POLARITIES

Kuang-Ta Ho, 7202 Quail Meadow La., Charlotte, N.C. 28210, and Randall C. Gilleland, 1029 Dellinger Dr., Statesville, N.C. 28073

Filed Aug. 29, 1986, Ser. No. 901,958
Int. Cl.[4] B23H *1/02*
U.S. Cl. 219—69 P **7 Claims**



1. An electrical discharge machining circuit operable with the machining gap at one polarity for roughing operation and at the other polarity for finishing operation, comprising:

a first swtiching transistor operated to connect machining power power pulses of one polarity to the gap;

a second main switching transistor connected in push-pull to said first switching transistor and operated to connect machining power pulses of the other polarity to the gap;

a separate opposite poled transistor connected to each of the main switching transistors and to the gap and operated along therewith, and

gating means operativley connected to each of the aforesaid transistors for initiating their alternate roughing and finishing operation.

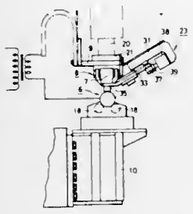
VOL
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4,786,779

SAW BLADE SEGMENT WELDING APPARATUS

Tsunehisa Fushimi; Tomoo Tashiro; Shigeru Suzuki, and Tatsuo Kakizaki, all of Kanagawa, Japan, assignors to Dengensha Manufacturing Company Limited, Kanagawa, Japan

Filed Dec. 24, 1986, Ser. No. 945,980
Claims priority, application Japan, Dec. 27, 1985, 60-294996; Jan. 10, 1986, 61-3882
Int. Cl.⁴ B23D *63/04*; B23K *31/04*
U.S. Cl. 219—77 **11 Claims**



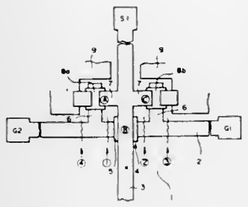
1. A saw blade welding apparatus, comprising:
a first electrode unit including two first electrodes movable toward each other and rotatable about a common axis for positioning and holding between said two first electrodes a blade base of a saw blade, said common axis extending in a direction perpendicular to planes of contact between said two first electrodes and said blade base;
a rotary feed mechanism for rotating said two first electrodes and said blade base to a plurality of predetermined positions while said two first electrodes hold said blade base;
a second electrode unit including a power chuck for holding a segment on an outer periphery of said blade base, said second electrode unit being movable toward said first electrode unit transversely to said common axis; and
a power source connectable between said first and second electrode units for welding said held segment to said held blade base.

4,786,780

METHOD FOR TRIMMING THIN-FILM TRANSISTOR ARRAY

Kazuya Oakabe, Moriya; Chisato Iwasaki, Furukawa; Hitoshi Seki, and Yasuhiko Kasama, both of Izumi, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,533
Claims priority, application Japan, Apr. 21, 1987, 62-98346
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121.72 **2 Claims**



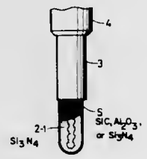
1. A method for trimming a thin-film transistor array wherein a plurality of gate buses and of source buses are intersected with each other at a crossover portion on a substrate, and at least a first thin-film transistor is connected in parallel with a second thin-film transistor which are formed on the substrate adjacent to the crossover portion and connected to said gate buses and source buses so as to drive at least one pixel of a liquid crystal element, said first and second thin-film transistors being separately positioned in a symmetrically positional relationship with sandwiching one of the gate buses and source buses, comprising the steps of:
starting laser trimming for one of said gate buses and source buses located at one side of the crossover portion.

4,786,781

SILICON NITRIDE GLOW PLUG WITH ALUMINA CORROSION AND EROSION PROTECTIVE COATING

Shunkichi Nozaki, and Yukihiro Kimura, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 792,846, Oct. 30, 1985, abandoned. This application Jan. 14, 1988, Ser. No. 144,725
Claims priority, application Japan, Oct. 31, 1984, 59-227999
Int. Cl.⁴ H05B *3/28*; F23Q *7/00*; F02P *19/02*
U.S. Cl. 219—270 **4 Claims**



1. A ceramic glow plug comprising:
a metal tube having an axial bore;
a sintered ceramic heater including a wire embedded in sintered Si_3N_4-based ceramic, said ceramic heater having a tip portion and being attached to the inner surface of said axial bore of said metal tube such that said tip of said ceramic heater extends from an end of said bore of said metal tube and is exposed;
a metal holder having an axial bore, said metal tube being attached at its other end to the inner surface of said axial bore of said metal holder; and
a heat-resistant coating covering the exposed surface of said tip of said ceramic heater, wherein said heat-resistant coating consists essentially of a thin CVD film of alumina having a thickness of about 2 μm and wherein an AlON pre-coating layer is first formed on the exposed surface of said ceramic heater tip, and said alumina coating is formed on the AlON layer.

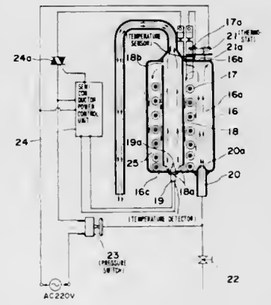
4,786,782

ELECTRIC INSTANTANEOUS WATER HEATER WITH ENHANCED TEMPERATURE CONTROL

Mitsuo Takai, Nara; Takashi Tanahashi, Ikoma; Masahito Uemura, Kashiwara, and Yasukiyo Ueda, Shiki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 22, 1986, Ser. No. 887,924
Claims priority, application Japan, Jul. 22, 1985, 60-161402; Sep. 20, 1985, 60-209129; Sep. 20, 1985, 60-209151
Int. Cl.⁴ H05B *1/02, 3/82*; F24H *1/10*
U.S. Cl. 219—306 **15 Claims**

1. An instantaneous boiler comprising:
a tank for holding water;
an immersion heater disposed within said tank;
a control unit for controlling energization of said immersion heater and operatively connected to said immersion heater;
an input water pipe attached to said tank for flowing water to be heated into said tank;
an output hot water pipe, disposed within said tank, for flowing heated water from said tank;
a thermostat attached to said tank for measuring substantially the temperature of the water which is within said tank yet outside said output hot water pipe, said thermostat being operatively connected to said immersion heater for controlling said heater responsive to the measured temperature of the water;
an output hot water temperature sensor for measuring the temperature of the heated water within said output hot water pipe, said output hot water temperature sensor producing output signals responsive to the temperature of the heated water, and said output hot water temperature sensor being operatively connected to said control unit for supplying the output signals to said control unit, said control unit including a means responsible to the output signals for controlling the operation of said heater;



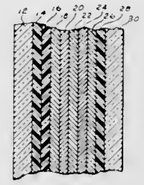
said output hot water pipe extending between the upper and lower portions of said tank, and said output hot water pipe having a discharge end extending through the top portion of said tank;
a first opening portion provided in the lower portion of said output water pipe, opening into the lower portion of the interior of said tank, said first opening portion serving as an inlet for heated water flowing into said output hot water pipe; and
said output hot water temperature sensor having a heat-sensing portion located within said output hot water pipe at the lower portion thereof and substantially directly adjacent said first opening portion.

4,786,783

ELECTRICALLY HEATABLE LAMINATED WINDOW

Floyd E. Woodard, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 11, 1987, Ser. No. 84,600
Int. Cl.⁴ H05B *3/10*
U.S. Cl. 219—547 **8 Claims**



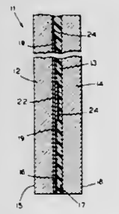
1. A transparent, laminated window having improved defrosting capability and reduced oblique viewing angle color reflectance comprising:
(A) an optical element having a sheet resistivity less than about 6 ohms per square and less than about 11% normal incidence reflection of at any wavelength between 400 and 700 nm, containing:
(i) at least two transparent, electrically conductive layers, each having a thickness of less than 150 angstroms;
(ii) at least one dielectric layer between said conductive layers;
(iii) a transparent substrate; and
(B) a bus bar electrically conductively associated with each conductive layer.

4,786,784

METHOD FOR PRODUCING AN ELECTRICALLY HEATED WINDOW ASSEMBLY AND RESULTING ARTICLE

Robert B. Nikodem, Toledo; Peter J. Tausch, Perrysburg; Ronald D. Goodman, Toledo; Robert M. Felt, Toledo, and Michael J. Grogan, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Continuation-in-part of Ser. No. 14,098, Feb. 17, 1987. This application Feb. 5, 1988, Ser. No. 147,015
Int. Cl.⁴ H05B *3/16*
U.S. Cl. 219—543 **28 Claims**



1. A method of forming an electrically heated window assembly, comprising the steps of:
a. applying to a surface of a first transparent sheet of glass an electrically conducting film stack including a layer of silver metal interposed between layers of zinc oxide, said silver metal layer being of a thickness in the range of 70 to 100 angstroms and said zinc oxide layers being in the range of 350 to 500 angstroms, said filmed sheet having an electrical resistance less than or equal to 10 ohms per square; and
b. laminating said first sheet to a second transparent sheet with the filmed surface of said first sheet facing said second sheet, the composition and thickness of said transparent sheets and said electrically conducting film being effective after lamination to provide a window assembly having an Illuminant A transmittance greater than or equal to 70 percent, an Illuminant C reflectance less than or equal to 9 percent and a total solar transmittance less than or equal to 45 percent, the window being neutral in color transmittance and substantially free of reflected color.

4,786,785

METHOD AND APPARATUS FOR SECURE STORAGE OF VALUABLES

Dennis J. Felt, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

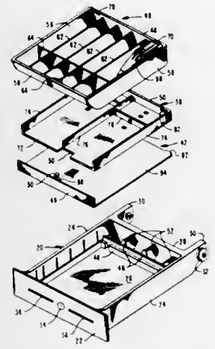
Filed Aug. 10, 1987, Ser. No. 83,403
Int. Cl.⁴ B65D *21/00*
U.S. Cl. 235—7 R **10 Claims**

6. A security container for receiving valuables when located in a business machine cash drawer and for storing said valuables in a secure condition, comprising:
a till having a configuration to enable said till to be placed within said business machine cash drawer, having engaging means at one side of said till, and having locking means at a second of said till;
a slip tray having a configuration to enable said tray to be

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placed below the till in said business machine cash drawer for receiving documents taken in by a user of the business machine in the course of business, having first engaging menas at one side adapted to engage with the engaging means of the till, having second engaging means at said one side, and having an aperture at a second side in position corresponding to the locking means of the till; and

a till lid having a configuration to enable said lid to be placed below the slip tray in said business machine cash drawer, having engaging means at one side adapted to engage with the second engaging means of the slip tray, and having locking means at a second side adapted to engage with the locking means of the till, whereby the till, the till lid and



the slip tray can be removed the business machine cash drawer, and assembled as three interlocking elements with the slip tray between the till and the till lid, with the engaging means of the till lid engaging with the second engaging menas of the slip tray and with the first engaging means of the slip tray engaging with the engaging means of the till to retain all three elements in assembled relation at one side, and with the locking menas of the till lid acting through the aperture of the slip tray to engage the locking means of the till to retain all three elements in assembled relation at the other side, so that the contents of the till and the slip tray are safeguarded for transportation and storage.

4,786,786

METHOD AND BUFFERING DEVICE FOR HIGHLIGHTING DOCUMENTS IN A POCKET

Peter D. Hanna, Waterloo, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 30, 1987, Ser. No. 126,318
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **21 Claims**

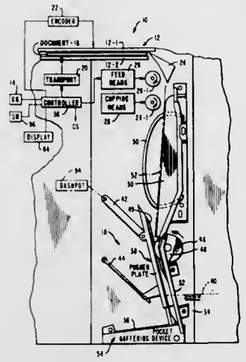
1. A machine comprising:

a pocket for receiving documents processed by said machine;

processing means for processing said documents in accordance with predetermined criteria;

moving means for moving documents processed by said processing means into said pocket; and

highlighting means for highlighting certain of said documents moved into said pocket in accordance with said



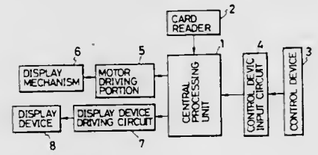
predetermined criteria so as to facilitate the removal of said certain of said documents from said pocket.

4,786,787

PARKING METER AND DISPLAY DEVICE OF THE SAME

Satoru Nawada; Kazuyoshi Matsumae, and Yasuhiro Nanataki, all of Tokyo, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jan. 11, 1988, Ser. No. 141,734
Claims priority, application Japan, Jan. 16, 1987, 62-6099
Int. Cl.[4] G06F *7/08*
U.S. Cl. 235—381 **3 Claims**



1. A parking meter comprising:

a card reader for reading parking data such as residual parking time units and parking time from an IC card;

a central processing unit for reading said parking data and a command signal from a control device and for supplying a command to a motor driving portion and a display device driving circuit;

a display mechanism which is driven by said motor driving portion; and

a display device which is driven by said display device driving circuit.

4,786,788

TRANSACTION PROCESSING APPARATUS HAVING FUNCTION OF MANAGING THE NUMBER OF DAYS DURING WHICH COMMODITIES REMAIN UNSOLD

Hideaki Noji, Kusatsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 4, 1988, Ser. No. 164,340
Claims priority, application Japan, Mar. 9, 1987, 62-53582
Int. Cl.[4] G06K *15/00*
U.S. Cl. 235—383 **6 Claims**

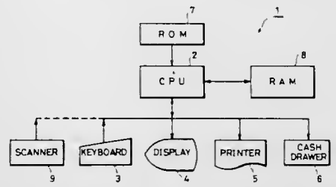
1. A transaction processing apparatus capable of managing

the number of days during which commodities remain unsold, comprising:

storing means capable of storing commodity identification data and data concerning the number of days during which commodities remain unsold corresponding thereto,

updating means for updating the data concerning the number of days during which commodities remain unsold stored in said storing means,

inputting means for inputting the commodity identification data,



clearing means responsive to an input of the commodity identification data for clearing the data concerning the number of days during which commodities remain unsold stored in storing means corresponding thereto, and

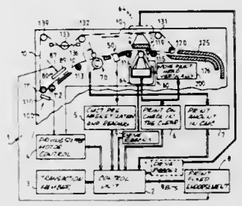
outputting means responsive to the data concerning the number of days during which commodities remain unsold stored in said storing means for outputting information concerning commodities which remain unsold.

4,786,789

APPARATUS FOR PROCESSING VOUCHERS, IN PARTICULAR CHECKS

Michel M. Gaucher, Le Mesnil Saint Denis, France, assignor to Electronique Serge Dassault, Paris, France

Filed Dec. 17, 1985, Ser. No. 810,079
Claims priority, application France, Feb. 6, 1985, 8501661
Int. Cl.[4] G06F *15/12*
U.S. Cl. 235—432 **25 Claims**



1. Apparatus for processing vouchers such as checks, the apparatus comprising:

(a) an inlet (**100**), an internal path (**110-120**), a carrier plate (**1**), a print station (**66**), drive means for driving said voucher from said inlet along said internal path, said drive means including wheels (**111-120, 131-139**) mounted on said carrier plate, a belt (**10**) pressed against wheels to follow a closed loop, a portion of said closed loop belt defining said internal path, said path passing level with said print station; said print station comprising:

(b) a print head (**61,62**) hinge-mounted (**204,210**) to said carrier plate on one side of said internal path, said print head being thereby subjected to a displacement along a circular arc (TTI) located in a plane substantially parallel with said voucher; and

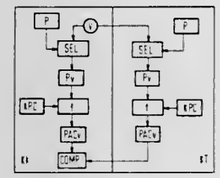
(c) an anvil (**180,181**) on the other side of said internal path for operating in any position of said print head on said circular arc, said anvil having a working station (**181**) having a horizontal extent not less than the geometrical rise (F) of said circular arc.

4,786,790

DATA EXCHANGE SYSTEM WITH AUTHENTICATION CODE COMPARATOR

Dietrich Kruse; Albrecbt Beutelspacher, both of Ottobrunn, and Annette-Gabriele Kersten, Wiesbaden, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,476
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706957
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **7 Claims**



1. A data exchange system comprising at least one data input/data output means serving as a terminal KT and at least one portable data carrier in the form of a chip card, both said data input/data output means and said chip card having means for sending data to the other, both the data input/data output means and said chip card having an independent, programmable data memory with an associated control and address circuit, a stored program (P) for a microprocessor being stored in said data memory, for controlling data flow, a microprocessor for implementing a common athentication algorithm, in accordance with an identical, stored secret cipher, said chip card serving as customer card (KK) and containing a random number generator, means responsive to the output (v) of said random number generator for selecting parts of said program (P) from said data memory in said customer card (KK) and in said customer terminal (KT);

means on said customer card for calculating an authentication code (PACv) from these program parts (Pv) with the assistance of an authentication algorithm (f) and using a secret cipher (KPC); and

a comparison means (COMP) on said customer card (KK), for comparing the authentication code (PACv) calculated in the customer card (KK) and the authentication code (PACv) calculated in the customer terminal (KT) and transmitted into the customer card (KK) for identity.

4,786,791

DATA PROCESSING APPARATUS WITH PORTABLE CARD HAVING MAGNETIC STRIP SIMULATOR

Takuo Hodama, Watsonville, Calif., assignor to Gateway Technology, San Francisco, Calif.

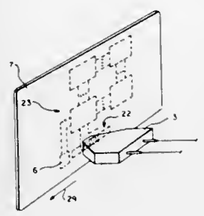
Filed Feb. 10, 1987, Ser. No. 12,944
Int. Cl.[4] G06K *7/08*
U.S. Cl. 235-449 **16 Claims**

1. A transaction card including a magnetic stripe simulator for providing a signal to the read head of a magnetic stripe reader comprising,

coil means for providing a signal to the read head,

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circuit means for providing a drive signal to the coil, said circuit means including means for providing a bit pattern



which simulates the magnetic flux reversals provided from magnetic stripes.

4,786,792

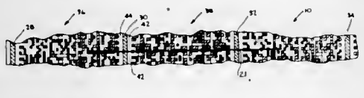
TRANSMISSIVELY READ QUAD DENSITY OPTICAL DATA SYSTEM

Gerald A. Pierce, Redwood City, and James L. Buxton, East Palo Alto, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 794,336, Nov. 4, 1985, Pat. No. 4,634,850, which is a continuation of Ser. No. 541,166, Oct. 12, 1983, abandoned. This application Oct. 31, 1986, Ser. No. 925,197

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—456 **17 Claims**



1. An optical data storage and retrieval system comprising,

an optical data storage medium having optically readable digital data encoded by microscopic spots in specified data cell positions on said medium thereby changing transmissivity of the medium, said data cell positions forming a grid with perpendicular, contiguous yet non-overlapping rows and columns of cell positions, said columns aligned with the length of said medium, and

a linear CCD array aligned perpendicular to said columns of cell positions on a side of said medium opposite a light source, said array having a plurality of fixed position detector cells imaging each specified data cell position in a row of cells, wherein at least two detector cells image a specified data cell position, with groups of detector cells simultaneously imaging a plurality of cell positions.

4,786,793

CARD ACCESSING APPARATUS

Sadao Sugiyama, Shiga; Kazuo Tsuboi, and Takeshi Ishida, both of Takatsuki, Japan, assignors to Omron Teteisi Electronics Co., Kyoto, Japan

Filed Aug. 11, 1987, Ser. No. 84,034

Claims priority, application Japan, Aug. 20, 1986, 61-196348

Int. Cl.[4] G06R *13/08*

U.S. Cl. 235—480 **10 Claims**

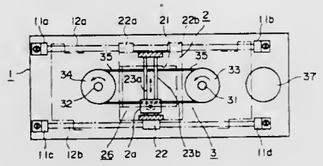
1. A card accessing apparatus, comprising:

card holding means for holding a card;

guiding shaft means for supporting said card holder means such that said card holder means is reciprocable along said shaft means;

slidable means, which is connected to said card holder means at the lower portion thereof, for sliding in the width direction of said card holder means;

means for reciprocating said card holder, which comprises a pair of rotatable members, endless carrying means reeved around said rotatable members, and a motor which is coupled to one of said rotatable member and is rotated only in one direction; and



connecting means for connecting said slidable means to said endless carrying means.

4,786,794

FOCUS SERVO-CIRCUIT WITH ORDERED REFERENCE LEVEL SETTING MEANS

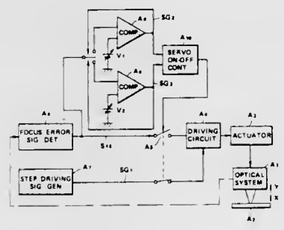
Masanori Doi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 832,810, Feb. 25, 1986. This application Aug. 24, 1987, Ser. No. 88,440

Claims priority, application Japan, Feb. 27, 1985, 60-40010; Mar. 13, 1985, 60-49549

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **15 Claims**



1. A focus servo-means comprising:

an optical recording medium;

a light source which generates light;

a focus servo-loop means including

an optical system for collecting the light generated by the light source and for projecting said light onto said optical recording medium,

a focus actuator applies a driving signal to said optical system to move said opticl system varying distances from said recording medium,

a photodetector detects the light reflected from said recording medium,

an error signal producing circuit connected to said photodetector, said error signal producing circuit for producing focus error signals corresponding to the light detected by said photodetector, and

a driving circuit amplifies said focus error signals from said error signal producing circuit and for outputs the amplified focus error signals as driving signals for said focus actuator;

a switch connected between said driving circuit and said error signal producing circuit, said switch opening and closing said focus servo-loop means;

a moving signal producing means for outputting a move signal to the driving circuit to move said optical system varying distances from said recording medium, said move signal being applied to said driving circuit when said switch is opened;

an ordered reference level setting means for setting a plurality of ordered reference levels from the focus error signal characteristics, at least one of said ordered reference levels being set within a focus pull-in region;

a comparing means for successfully comparing over time said plurality of ordered reference levels with the focus error signal detected from said error signal producing circuit when said move signal is applied to said driving circuit; and

a servo-starting means for closing said switch to set a focus servo-state when the focus error signal, from said error signal producing circuit which has said move signal applied to said driving circuit, is at least equal to said plurality of ordered reference levels as compared by said comparing means, said focus error signal being within said focus pull-in regional when said focus servo-state is set.

4,786,795

SUN TRACKING DEVICE FLOATING UPON LIQUID SURFACE

Shozo Kurashima, Chiba, and Yasuhiko Umezawa, Kanagawa, both of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Mar. 31, 1986, Ser. No. 846,706

Claims priority, application Japan, Mar. 29, 1985, 60-63340; Jun. 25, 1985, 60-97383[U]; Aug. 28, 1985, 60-132363[U]

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—203 R **16 Claims**



1. A sun tracking device, riding on the surface of a body of liquid, comprising:

(a) a rotatable table which is substantially supported by floatation on said surface of said liquid;

(b) means for keeping said rotatable table substantially in a determinate translational position on said surface of said liquid while allowing said rotatable table to rotate;

(c) means for rotationally positioning said rotatable table on said surface of said liquid;

(d) means carried by the table for powering the rotational positioning means and for detecting deviation of the angular position of the sun in relation to said rotatable table, said powering and detecting means comprising a pair of solar cells oriented at different angles relative to said rotatable table; and

(e) means responsive to the powering and detecting means, for controlling said rotational positioning means so as to reduce said deviation of the angular position of the sun in relation to said rotatable table substantially to zero, said means for controlling said rotational positioning means further including means for varying the direction of rotation of said rotatable table imparted by the rotational positioning means in accordance with the one of said pair of solar cells having the greater output.

4,786,796

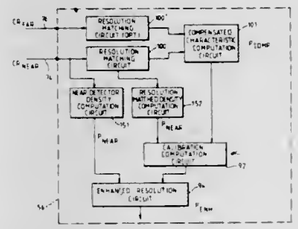
METHOD FOR DETERMINING FORMATION CHARACTERISTICS WITH ENHANCED VERTICAL RESOLUTION

Charles Flaum, Houston; James E. Galford, Sugarland, both of Tex., and Steven V. Ducket, Palo Alto, Calif., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 3, 1986, Ser. No. 915,439

Int. Cl.[4] G01V *5/08*

U.S. Cl. 250—266 **24 Claims**



1. A method for determining the density of a subsurface geological formation traversed by a borehole, comprising the steps of:

(a) passing a logging tool through the borehole, the logging tool having associated therewith a signal source and at least two signal sensors spaced from the signal source by different distances;

(b) transmitting a signal from the signal source into the subsurface geological formation;

(c) generating sensor signals from the at least two signal sensors, in response to the signal from the signal source received by the at least two signal sensors;

(d) matching the vertical resolution of the generated sensor signals from the at least two signal sensors;

(e) determining an environmentally compensated density from the at least two resolution matched sensor signals;

(f) determining the density from the unmatched sensor signal from the signal sensor spaced the least distance from the signal source;

(g) determining the density from the resolution matched sensor signal from the signal sensor spaced the least distance from the signal source;

(h) determining the difference between the density of step (e) and the density of step (g); and

(i) combining the result of step (h) with the density of step (f) to determine the density wherein the vertical resolution of the density is enhanced.

4,786,797

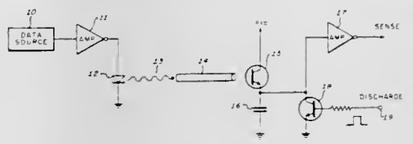
ELECTRO-OPTICAL DATA HANDLING SYSTEM WITH NOISE IMMUNITY

Richard I. Ely, Flemington, N.J., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 28, 1987, Ser. No. 138,254

Int. Cl.[4] G02F *1/00*

U.S. Cl. 250—214 R **9 Claims**



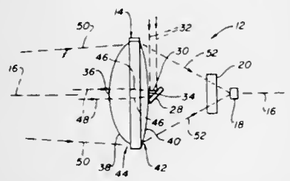
1. Electro-optical apparatus comprising:

a source of input data, modulated light means responsive to

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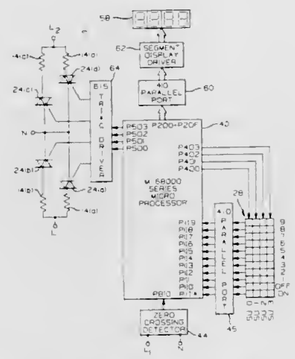
said input data for providing a modulated light output in accordance with said data,
a light responsive transistor coupled to receive said modulated light output,
a capacitor coupled in series circuit with said transistor so that said transistor charges said capacitor in response to said modulated light output impinging thereon,
whereby a voltage is developed across said capacitor,
sensing means responsive to said voltage, and
discharging means coupled across said capacitor for discharging said capacitor,
thereby providing an electrical output signal in accordance with said data.

4,786,798
BEAM FORMING AND COLLECTION LENS ASSEMBLY FOR LASER SCANNER SYSTEM
Randall J. Lonsdale, Eugene, Oreg., assignor to Spectra-Physics Inc., San Jose, Calif.
Filed Jun. 18, 1987, Ser. No. 63,540
Int. Cl.[4] B29D *13/18*
U.S. Cl. 250—216 **29 Claims**



1. A lens assembly for a laser instrument of the kind used to detect light reflected from a target which is spaced from the laser instrument, said lens assembly comprising:
a lens having an optical axis;
light detector means spaced from said lens;
first optical means attached to said lens and aligned with said optical axis thereof for receiving a laser light beam being transmitted to said lens at an angle off said optical axis thereof and for reflecting said received laser beam onto said optical axis for transmission through said lens toward the target;
second optical means formed on said lens at said optical axis and on one side thereof adjacent to said first optical means for receiving said reflected laser beam and expanding the same within said lens as it is transmitted therethrough;
third optical means formed on said lens at said optical axis and on an opposite side thereof from said second optical means for converging and focussing said expanded laser beam at a substantial distance from said lens as it is transmitted therefrom;
fourth optical means formed on said lens about said optical axis and on said opposite side thereof and about said third optical means thereon for collecting within said lens the light reflected from the target and transmitting said collected light therethrough; and
fifth optical means formed on said lens about said optical axis and on said one side thereof opposite from said fourth optical means and about said second optical means thereon for imaging said collected light along said optical axis of said lens to said light detector means.

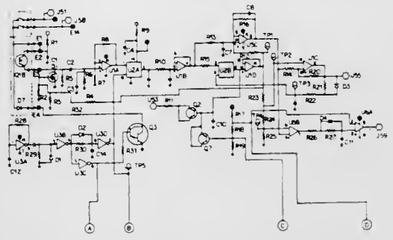
4,786,799
POWER CONTROL FOR COOKING APPLIANCE WITH MULTIPLE HEATING UNITS
Louis A. Welle, Jr., and Thomas R. Payne, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.
Filed Jul. 27, 1987, Ser. No. 78,265
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—486 **8 Claims**



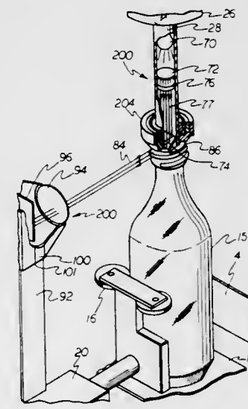
1. An electric cooking appliance comprising:
a plurality of heating units for heating cooking utensils placed in proximity thereto, said heating units being arranged in two groups, a first group adapted for energization by a first AC power signal and a second group adapted for energization by a second AC power signal 180° out of phase relative to said first power signal, at least one of said first and second groups comprising more than one heating unit, the heating units of said first and second groups each being connected to a common neutral power line;
user actuable input selection means for enabling the user to select one of a plurality of power settings for each of said heating units;
power control means responsive to said user actuable input selection means for controlling the output power of each of said heating units in accordance with the user selected power setting for each unit, said power control means being operative to apply current pulses to each heating unit at a pulse repetition rate corresponding to the selected power setting for that heating unit;
said power control means being further operative to control the application of current pulses to each heating unit so as to minimize the concurrent application of current pulses to those heating units energized by the same one of said first and second signals and to maximize the concurrent application of current pulses to those heating units energized by different ones of said first and second power signals thereby minimizing peak current pulses in said common neutral line.

4,786,800
FLUID DROP DETECTION AND DISCRIMINATION SYSTEM
Dean L. Kamen, Bedford, N.H., assignor to Baxter International Inc., Deerfield, Ill.
Continuation-in-part of Ser. No. 680,487, Dec. 11, 1984, Pat. No. 4,680,462. This application Jul. 13, 1987, Ser. No. 72,564
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—222.1 **12 Claims**

1. A drop detection and discrimination system, comprising:
drop signal generation menas for generating an ongoing drop signal of varying levels related to the presence or absence of a drop in a fluid drop path;
reference menas for generating a reference quantity related to the drop signal level in the absence of a drop;
comparison means for comparing the current drop signal level and the reference quantity and generating a deviation quantity related to the difference between the drop signal level and the reference quantity;
comparison means for comparing the deviation quantity both with a first threshold indicative of the presence of a drop and with a relatively higher second threshold determinative of the presence or absence of a true drop.

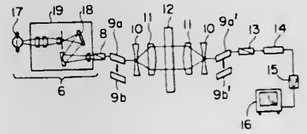


4,786,801
FINISH LEAK DETECTOR HAVING VERTICALLY MOVABLE LIGHT SOURCE
Timothy W. Shay, Horseheads, N.Y., assignor to Emhart Industries Inc., Farmington, Conn.
Filed Jul. 21, 1987, Ser. No. 60,701
Int. Cl.[4] G01N *9/04*
U.S. Cl. 250—223 B **4 Claims**



1. An apparatus for inspecting the sealing surface of a vertically standing bottle having a mouth portion at the top thereof comprising
means for horizontally projecting a collimated and uniformly intense light beam having a selected vertical height including
light source means for producing a vertically downwardly directed substantially collimated and uniformly intense light beam and
mirror means having a selected size and being supported at a predetermined angle for reflecting said light beam as a horizontal substantially collimated and uniformly intense light beam having a selected vertical height,
means for downwardly vertically displacing said mirror means from a location vertically above the bottle to be inspected to a position whereat a portion of said mirror means is located within the bottle whereby a portion of said horizontal light beam will pass through one wall of the bottle amd the remaining portion will pass above the bottle,
means outside of the bottle for receiving said horizontal collimated beam,
means outside of the bottle so that said receiving means will receive said horizontal beam as it passes through horizontally continuous portions of the top of the bottle, and
means for comparing the received light beam with a standard as the bottle is rotated to identify an imperfection in the top surface of the bottle finish.

4,786,802
APPARATUS FOR MEASURING PHOTOELASTICITY
Masaki Yoshii, Yokohama; Shigeo Tohyama, Katsuta, and Aizo Kaneda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 6, 1987, Ser. No. 711
Int. Cl.[4] G02F *1/01*
U.S. Cl. 250—225 **9 Claims**



1. Apparatus for measuring photoelasticity comprising:
a tungsten lamp:
means including a polarizer for linearly polarizing light emitted by said lamp to produce linearly polarized light;
means including a first Fresnel rhomb for transforming said linearly polarized light into a circularly polarized light beam;
a first concave lens means for enlarging the diameter of said circularly polarized light beam;
a first convex lens means for collimating the enlarged circularly polarized light beam to irradiate a specimen with a collimated circularly polarized light beam;
a second convex lens means for focusing the collimated circularly polarized light beam transmitted through said specimen;
a second concave lens means for transmitting the focused circularly polarized light beam to means incuding a second Fresnel rhomb;
said second Fresnel rhomb being effective to transform said circularly polarized light beam received from said second concave lens into linearly polarized light;
an analyzer means for detecting the phase difference of said light beam transmitted through said specimen; and
a camera means for visualizing the light coming from said analyzer.

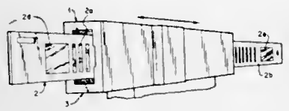
VOL 1096 ISS 4 NO 22 1988 UMI

4,786,803

SINGLE CHANNEL ENCODER WITH SPECIFIC SCALE SUPPORT STRUCTURE

Mark W. Majette; Hatem E. Mostafa, and Chuong C. Ta, all of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 1, 1987, Ser. No. 56,936
Int. Cl.[4] G01B *11/14*
U.S. Cl. 250—237 G **8 Claims**



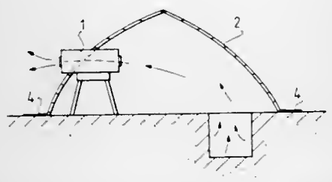
1. An encoder, comprising:
a scale of transparent material having spaced opaque lines, of a length less than the width of said scale, disposed transversely of said scale, defining scale divisions;
an encoder body having a light emitter, a detector, and an opaque aperture plate disposed therebetween;
said aperture plate having an aperture disposed in the light path between light emitter and said light detector;
said scale passing through said light path adjacent said aperture plate;
scale supports on said encoder body in sliding contact with one face of said scale on opposite sides of said aperture along said scale, and on opposite sides of said scale divisions, which together provide four point sliding contact with said one face of said scale; and
scale supports on said encoder body in sliding contact with the opposite face of said scale, in positions on opposite sides of said scale divisions and substantially in line with said aperture, providing two point sliding contact with said opposite face of said scale;
the gap between the points of sliding contact of said scale supports on opposite sides of said scale being preferably no greater than the thickness of said scale and maintaining said scale in a predetermined spaced position with respect to the aperture of said aperture plate in said light path.

4,786,804

MEANS FOR MEASURING RADON GAS IN THE SOIL

Veikko Ilmasti, Helsinki, Finland, assignor to Ilmasti Elektronikka Oy, Vantaa, Finland

Filed Jun. 26, 1987, Ser. No. 66,544
Claims priority, application Finland, Jun. 18, 1987, 872717
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—253 **11 Claims**



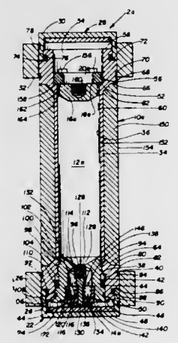
1. A means for measuring radon gas in soil comprising:
wall means sealingly mounted adjacent its periphery upon the soil to define an enclosed gas filled volume;
a continuous acting radon meter means for measuring amounts of radon;
said radon meter means being installed through said wall means;
said radon meter means having a blower means which extracts a flow gas from said soil enclosed gas filled volume and thence through said radon meter means to an area, outside of said wall and said enclosed gas filled volume, and
wherein said continuous-acting radon meter continuously measures the amount of radon in said soil by measuring the radon extracted in the gas therefrom which gas passes through said continuously-acting radon meter.

4,786,805

REUSABLE RADIOACTIVE MATERIAL SHIPPING CONTAINER INCLUDING CARTRIDGE AND INJECTOR

Mark A. Priest, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 16, 1986, Ser. No. 919,750
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—260 **9 Claims**



1. A container for connecting to a flow line extending between a blending tub and a well head, comprising:
receptacle means for holding a radioactive slurry;
means, operatively connected between said receptacle means and the flow line, for connecting said receptacle means directly to the flow line; and
displacement means, mounted in said receptacle means, for displacing at least a portion of a radioactive slurry from said receptacle means into the flow line;
wherein said receptacle means includes:
a support member connectable to said connection means; and
a removable cartridge insert member received within and connected to said support member, said insert member having a cavity defined therein for receiving the radioactive slurry.

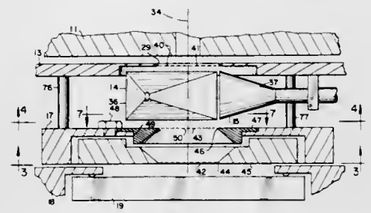
4,786,806

RETARDING FIELD SPECTROMETER

Carl A. Listl, New Hyde Park, N.Y., and Henry Seiwatz, Wayne, N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Jun. 22, 1987, Ser. No. 64,491
Int. Cl.[4] H01J *49/44, 39/00*
U.S. Cl. 250—305 **22 Claims**

1. A retarding field spectrometer in combination with a modulatable and deflectable electron beam generator which generator has a pole piece with an orifice from which said beam emanates, said spectrometer comprising in combination an array of three electron transmissable electrodes joined for mounting in the path of said beam between said pole piece and a target holder, means for individually energizing each of said electrodes with a discrete biasing voltage, means for applying a reference potential to a target in said target holder, and at least one continuous dynode electron multiplier detector of secondary electron emission comprising a cathode entryway



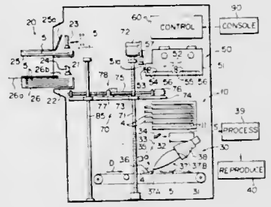
positioned between those two of said electrodes that are situated nearest to said pole piece.

4,786,807

RADIATION IMAGE READ-OUT APPARATUS

Tsutomu Kimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1987, Ser. No. 26,712
Claims priority, application Japan, Mar. 17, 1986, 61-58804
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—327.2 **7 Claims**



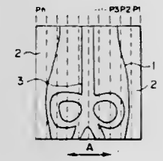
1. A radiation image read-out apparatus comprising:
(i) a sheet receiving section for receiving a stimulable phosphor sheet carrying a radiation image stored thereon,
(ii) a sheet storing section for storing a plurality of the stimulable phosphor sheets,
(iii) an image read-out section provided with a stimulating ray source for emitting stimulating rays for scanning said stimulable phosphor sheet carrying said radiation image stored thereon, and a photoelectric read-out means for detecting light emitted by said stimulable phosphor sheet scanned with said stimulating rays to obtain an electric image signal,
(iv) an erasing section for having said stimulable phosphor sheet release the radiation energy remaining thereon after image read-out is conducted on said stimulable phosphor sheet at said image read-out section, and
(v) a sheet conveyance means provided with a sheet holding mechanism for holding said stimulable phosphor sheet transferably with respect to said sheet receiving section, said sheet storing section, said image read-out section, and said erasing section, said sheet conveyance means moving said sheet holding mechanism in an arbitrary order among said sections.

4,786,808

RESIDUAL IMAGE ERASING APPARATUS FOR STIMULABLE PHOSPHOR SHEET

Tokukazu Saito, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 7, 1986, Ser. No. 837,223
Claims priority, application Japan, Mar. 11, 1985, 60-48074; Mar. 11, 1985, 60-48075
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—327.2 **9 Claims**



1. An apparatus for erasing a residual image on a stimulable phosphor sheet in which a stimulable phosphor sheet capable of being repatedly used for radiation image recording and read-out is exposed to erasing light after radiation image read-out, and the residual image caused by residual radiation energy on the stimulable phosphor sheet is erased, the apparatus comprising:
(i) an energy distribution detecting means for detecting the distribution of residual radiation energy, which is distributed in a predetermined direction, in said predetermined direction,
(ii) a linear light source extending in a sheet width direction normal to said predetermined direction for emitting residual image erasing light over the entire width of said stimulable phosphor sheet,
(iii) a movement means for moving said stimulable phosphor sheet with respect to said linear light source in said predetermined direction so that said stimulable phosphor sheet is exposed to the residual image erasing light over the entire length of said stimulable phosphor sheet, and
(iv) a control mans for receiving an output of said energy distribution detecting means and controlling said linear light source and/or said movement means to adjust the light exposure amount at each portion of said stimulable phosphor sheet in accordance with the level of the distribution of residual radiation energy at each portion of said stimulable phosphor sheet in said predetermined direction.

4,786,809

LOW NOISE PREAMPLIFICATION STAGE

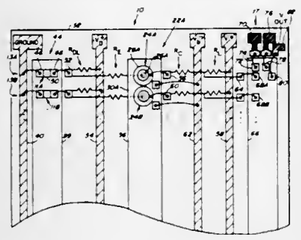
Paul R. Norton, Santa Barbara, Calif., assignor to Santa Barbara Reseach Center, Goleta, Calif.

Filed Jul. 31, 1986, Ser. No. 891,083
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—352 **33 Claims**

1. A circuit for interfacing signals from a sensor with a multiplexer or the like in an environment having a temperature range between 10° K. and 200° K., comprising:
sensor means exposed to said environment for producing a sensor signal indicative of a physical parameter; and

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means, comprising germanium, and exposed to said environment for preamplifying the sensor signal to produce an



output signal having an amplitude greater than the sensor signal.

4,786,810

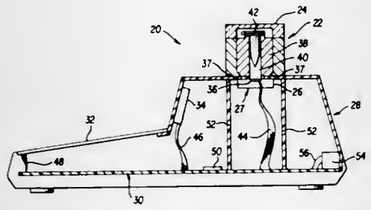
SOLID STATE COUNTING SYSTEM FOR BETA AND GAMMA ISOTOPES OF ALL ENERGIES

Seth D. Shulman, Washington, D.C., and Orren P. Whiddon, Gaithersburg, Md., assignors to Bioscan, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 726,247, Apr. 23, 1985, Pat. No. 4,682,035. This application Aug. 29, 1986, Ser. No. 901,612

Int. Cl.[4] G01T *1/24*

U.S. Cl. 250—370.01 **59 Claims**



1. A portable, bench top radiation detection apparatus for quantitative analysis of radio-active samples comprising:
- a housing having an opening leading to a radiation detecting zone;
- sample holding means removably mounted in said opening in fixed relation to said radiation detecting zone for receiving a sample container containing a radiation-emitting sample and positioning said sample container to present the sample in fixed relation to said radiation detecting zone;
- a radiation detector mounted in said radiation detecting zone for detecting radiation emitted by said radiation emitting sample;
- signal analyzing means responsive to said radiation detector for quantitatively analyzing radiation emitted by said radiation-emitting sample; and
- means responsive to said signal analyzing means or displaying a radiation emission characteristic for said radiation-emitting sample.

4,786,811

IONIZATION TYPE-SMOKE DETECTOR

Toru Sasaki, Tokyo, Japan, assignor to Nohmi Bosai Kogyo Co., Ltd., Tokyo, Japan

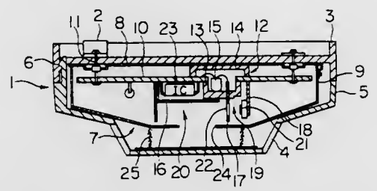
Filed Jan. 16, 1987, Ser. No. 3,717

Claims priority, application Japan, Jan. 17, 1986, 61-4094; Jan. 17, 1986, 61-4095

Int. Cl.[4] G01T *1/18*

U.S. Cl. 250—385.1 **3 Claims**

1. An ionization-type smoke detector having inner and outer ionization chambers, a radioactive source to ionize the air within said inner and outer ionization chambers, electrical circuit elements to detect electrical potential at a connection point between said inner and outer ionization chambers, and a printed board mounted horizontally in said detector to support said electrical circuit elements, said radioactive source producing radiation in a direction parallel to said printed board to ionize the air within said inner and outer ionization chambers, plate-like outer, intermediate and inner electrodes respectively mounted to and extending vertically from said printed board at



fixed intervals to form said inner ionization chamber between said inner and intermediate electrodes, and to form said outer ionization chamber between said outer and intermediate electrodes, said inner electrode supporting said radioactive source, said intermediate electrode being formed with a through-hole such that said radioactive source can irradiate into said outer ionization chamber through said through-hole to ionize the air within said outer ionization chamber and, said outer electrode shielding at least those of said electrical circuit elements which must be electrically shielded.

4,786,812

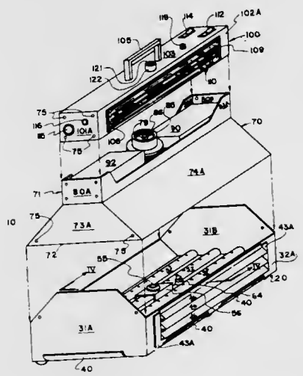
PORTABLE GERMICIDAL ULTRAVIOLET LAMP

Wesley G. Humphreys, Huntingdon Valley, Pa., assignor to Dora DiCamillo 1988 Trust, Newtown, Pa.

Filed Nov. 28, 1986, Ser. No. 935,794

Int. Cl.[4] G01N *23/00*

U.S. Cl. 250—455.1 **10 Claims**



1. A lightweight portable ultraviolet germicidal lamp to kill both airborn and surface carried bacteria, comprising:
- a housing structure having side walls, a top wall and an open lower end;
- a grid spanning, lengthwise and widthwise, the open lower end of said housing;
- support means at the lower end of said sidewalls to support the housing and permit easy movement thereof over a surface with the grid closely adjacent to said surface;
- a reflector closely spaced from and facing said grid, said reflector carried by said housing and spanning between opposite side walls thereof;
- a plurality of ultraviolet germicidal lamps intermediate said reflector and grid extending lengthwise of said housing and parallel to said lengthwise grid;
- means defining air openings in said reflector above said lamps;
- fan means at the top wall of said housing to draw air from adjacent said surface beneath the grid upwardly across said lamps and through the reflector air openings, and discharge the same upwardly through the top wall; and
- control circuitry carried by said housing including switch means to control operation of said fan and lamps.

4,786,813

FLUORESCENCE IMAGING SYSTEM

Sune Svanberg, and Sune Montan, both of Lund, Sweden, assignors to HighTech Network SCI AB, Malmo, Sweden

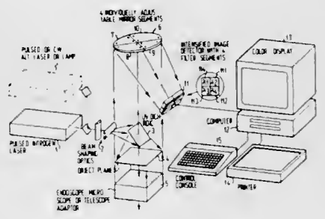
PCT No. PCT/SE85/00408, § 371 Date Jun. 23, 1986, § 102(e) Date Jun. 23, 1986, PCT Pub. No. WO86/02730, PCT Pub. Date May 9, 1986

PCT Filed Oct. 22, 1985, Ser. No. 882,975

Claims priority, application Sweden, Oct. 22, 1984, 8405276

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—461.1 **8 Claims**



1. A fluorescence imaging system comprising:
- a light source for irradiating an object to be viewed;
- a beam-splitting system for forming individual displaced images of said irradiated object;
- a plurality of wavelength filters disposed in the path of said individual images, said filter selected to have different passband frequencies, such that said images are filtered differently;
- a detector for receiving said individual displaced images which pass through said filters, said detector providing a plurality of signals representing the same image point of each of said displaced images; and,
- circuit means connected to receive said signals representing the same image point for each of said displaced images, said circuit means generating a weighted signal value of said individual signals, such that a single image signal is produced for each image point of an image of said object.

4,786,814

METHOD OF REDUCING ELECTROSTATIC CHARGE ON ION-IMPLANTED DEVICES

Frank Kolondra, Delaware Township, Hunterdon County, and Chung P. Wu, Hamilton Township, Mercer County, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

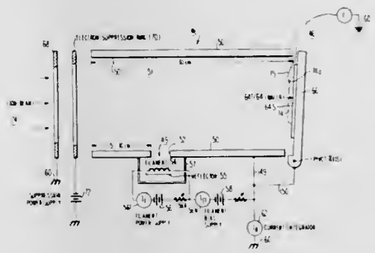
Filed Sep. 16, 1983, Ser. No. 532,898

Int. Cl.[4] H01T *37/00*

U.S. Cl. 250—492.2 **4 Claims**

1. A method of reducing residual electrostatic charge on an ion-implanted wafer comprising the steps of:

(a) implanting said wafer with a predetermined dose of ions in the range of to 10^{10} to 10^{14} ions/cm^2; and



(b) subsequent to implanting said wafer flooding said wafer for one to three seconds with sufficient secondary electrons to neutralize positive charges on said wafer.

4,786,815

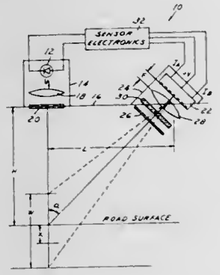
NON-CONTACT SENSOR WITH PARTICULAR UTILITY FOR MEASUREMENT OF ROAD PROFILE

Curtis M. Walker, Armada, and Gordon R. Brown, Livonia, both of Mich., assignors to K. J. Law Engineers, Inc., Farmington Hills, Mich.

Filed Feb. 12, 1987, Ser. No. 13,960

Int. Cl.[4] G01N *21/86*

U.S. Cl. 250—560 **7 Claims**



1. Apparatus for measuring distance to a surface comprising first means for directing a light beam onto said surface; second means including optically sensitive position detection means, and means for receiving light reflected by said surface and directing said reflected light onto said detection means, said detection means providing a pair of signal A and B as a function of orthogonal position coordinates of such reflected light incident on said detection means; means for providing a signal A − B as a function of a difference between said signals A and B; means for providing a signal A + B as a function of a sum of said signals A and B; means for indicating distance to the surface as a function of a ratio P of said difference signal A − B to said sum signal A + B; means mounting said first and second means to establish a frame of reference spaced by a nominal distance H from the surface, said apparatus being constructed to measure departure X of the surface from said nominal distance H within a measurement window W, said first and second means being separated by said mounting means by a distance L; and means for determining said distance X as a function of the equation: $X=(P*K1)/(K2+P*K3)$, where K1 is a constant equal to $(L^2+H^2)^{\frac{1}{2}}$, K2 is a constant equal to F sin(a), K3 is a constant equal to cos(a), a is angle of orientation between said first and second means at said nominal distance H, and F equals image distance.

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4,786,816

WAFER DETECTING DEVICE WHEREIN LIGHT RECEIVER HAS AN EFFECTIVE SURFACE LARGER THAN THE DIMENSIONAL RANGE COVERING ALL THE WAFERS BEING DETECTED

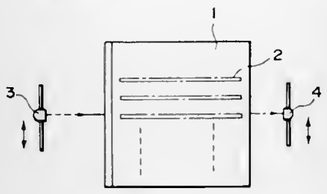
Taro Ohmori, and Hiroaki Kameyama, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 926,470, Nov. 4, 1986. This application Dec. 29, 1987, Ser. No. 140,864

Claims priority, application Japan, Jun. 27, 1986, 61-150981; Nov. 5, 1986, 60-246253; Nov. 5, 1986, 60-246254

Int. Cl.[4] G01N *21/86;* G01V *9/04*

U.S. Cl. 250—561 20 Claims



1. A wafer detecting device usable with a carrier having a plurality of wafer carrying portions disposed in stories, in the direction of an axis, for carrying wafers therein, said device comprising:

light emitting means for emitting light so that it passes through the carrier from a first side thereof to a second side thereof and in a direction substantially parallel to a plane in which a wafer is carried on a wafer carrying portion of the carrier; and

light receiving means disposed at said second side of the carrier, for detecting the presence or absence of the light passed through the carrier,

wherein said light emitting means is arranged to irradiate with light having a dimensional range covering all the wafer carrying portions disposed along said axis, and wherein said light receiving means is fixed relative to the carrier and has a light receiving surface having an effective dimensional range which is greater than the dimensional range covering all the wafer carrying portions disposed along said axis.

4,786,817

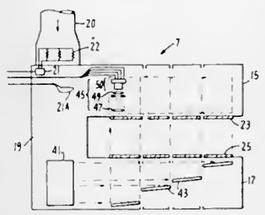
SYSTEM AND METHOD FOR MEASUREMENT OF TRAVELING WEBS

Mathew G. Boissevain, Los Altos Hills; Leonard M. Anderson, San Jose, and Michael K. Norton, Saratoga, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation-in-part of Ser. No. 902,225, Aug. 29, 1986. This application Apr. 3, 1987, Ser. No. 33,749

Int. Cl.[4] G01N *21/31*

U.S. Cl. 250—571 14 Claims



8. A method for optically determining properties such as basis weight, moisture content and dry basis weight of traveling webs of sheet material without scanning comprising the steps of:

(a) directing rays from at least one beam of light such that rays from the beam are generally parallel and perpendicularly incident upon the surface of a traveling web to simultaneously illuminate substantially the full width of the web;

(b) detecting the intensity of the parallel rays emerging generally perpendicularly from the web at least at four selected bands of wavelengths; and

(c) providing electrical output signals proportional to the detected light intensity at each of said different wavelengths.

4,786,818

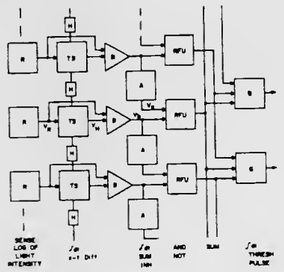
INTEGRATED SENSOR AND PROCESSOR FOR VISUAL IMAGES

Carver A. Mead; Michelle A. Mahowald, and Massimo A. Sivilotti, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 9, 1987, Ser. No. 118,264

Int. Cl.[4] H01J *40/14;* H02H *00/00*

U.S. Cl. 250—578 13 Claims



1. An analog circuit for simultaneously computing the space-time average of a plurality of signals at inputs to an array comprising

a plurality of nodes, each having capacitance connected to a source of fixed potential,

a network of resistive connections between said plurality of nodes in said array,

a separate integrator associated with each of said signal inputs, and

means for injecting a current into each node of said array through said separate integrator associated therewith such that the magnitude of said current is an odd, monotonically increasing function of the potential difference between one of said signal inputs and said node.

4,786,819

METHOD OF FABRICATING A CONTACT TYPE COLOR IMAGE SENSOR

Sadahiro Tei, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 873,181

Claims priority, application Japan, Jun. 18, 1985, 60-132690

Int. Cl.[4] H01L *31/04*

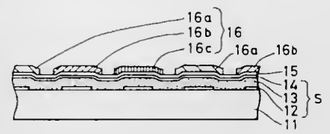
U.S. Cl. 250—578 14 Claims

1. A method of fabricating a contact type color image sensor at low temperature comprising the steps of forming a plurality of photoelectric converting elements having light receiving areas on a substrate; forming a passivation film on selected light receiving areas, forming a light shielding film on said passivation film by depositing a thin film of metal selected from the group consisting of Al, Cr, Au, Pt, Ru, or Mo and forming a color filter on other selected light receiving areas of each photoelectric converting element by forming a dyeable polymer layer and dyeing said dyeable polymer layer,

wherein said step of forming said color filter comprises the steps of:

forming a first relief pattern made of a dyeable polymer layer corresponding to a first group of said photoelectric converting elements,

dyeing said first relief pattern,



forming a first color filter by fixing said first relief pattern thus dyed,

forming a second relief pattern made of a dyeable polymer layer corresponding to a second group of said photoelectric converting elements,

dyeing said second relief pattern,

and forming the second color filter by fixing said second relief pattern thus dyed.

4,786,820

APPARATUS FOR PARALLEL-PROCESSING IMAGE DATA

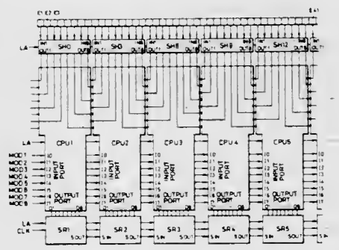
Yoshitaka Ogino, Kawasaki, and Hiroshi Tanioka, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 807,662, Dec. 11, 1985, abandoned. This application Jan. 20, 1988, Ser. No. 147,091

Claims priority, application Japan, Dec. 14, 1984, 59-262888

Int. Cl.[4] H04N *3/14*

U.S. Cl. 250—578 11 Claims



1. An image processing apparatus comprising:

image signal generation means for generating, in parallel digital image signals having a plurality of pixels;

division means for dividing the digital image signals generated in parallel by said image signal generating means into a plurality of blocks; and

a plurality of image processors for parallel-processing by block the divided digital image signal,

each of said plurality of image processors being connected for receiving, an an input for processing both the digital image signal of the pixel to be parallel-processed and the digital image signal of the pixel adjacent the pixel to be parallel processed.

4,786,821

COLOR ORIGINAL READING APPARATUS HAVING A KNIFE EDGED REFLECTING BEAM SPLITTER

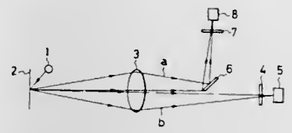
Satoru Uchida, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,787

Claims priority, application Japan, Dec. 28, 1985, 60-293614

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 4 Claims



1. A color original reading apparatus comprising:

means for receiving a light beam reflecting from an original image to be read and outputting said light beam to be convergent in a first direction;

reflecting means disposed in said convergent light beam so as to direct part of said convergent light beam in a second direction which is different from said first direction, said reflecting means being so disposed not to cross an optical axis of said convergent light beam directed in said first direction;

a pair of first and second image sensors disposed to receive a first portion of said convergent light beam which is not reflected by said reflecting means and a second portion of said convergent light beam which is reflected by said reflecting means, respectively; and

a pair of first and second color separating filters disposed to receive said first and second portions of said light beam, respectively, to pass respective predetermined color components thereof.

4,786,822

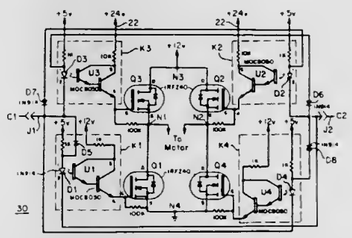
LOAD CONTROL SYSTEM

Lee W. Steely, Reinbolds, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 19, 1987, Ser. No. 64,917

Int. Cl.[4] H01H *47/00;* H02M *3/337*

U.S. Cl. 307—125 17 Claims



1. A circuit for applying a supply voltage to a load in a load control system of the type comprising means for generating a load control signal and means for generating a failsafe signal, said circuit comprising:

means, responsive to the fail safe signal, for generating an enable signal, said enable signal having a voltage higher than that of the supply voltage when the failsafe signal alternates in time periodically and a voltage substantially lower than the supply voltage when the failsafe signal fails to alternate in time periodically;

at least one digital switch adapted to control current to the load, said switch responsive to a gating signal such that

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the digital switch is maintained in a non-conductive state when the gating signal has a voltage substantially less than the supply voltage and the digital switch is maintained in a conductive state when the gating signal has a voltage greater than a threshold voltage which is in turn greater than the supply voltage; and

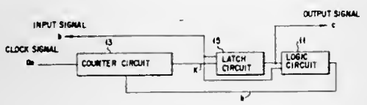
means, responsive to the load control signal, for selectively applying the enable signal to the digital switch as the gating signal such that the digital switch is prevented from entering the conductive state except when the failsafe signal is present.

4,786,823

NOISE PULSE SUPPRESSING CIRCUIT IN DIGITAL SYSTEM

Masato Abe, Sagamihara, and Fumitaka Asami, Kunitachi, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 17, 1987, Ser. No. 39,337
Claims priority, application Japan, Apr. 18, 1986, 61-89599
Int. Cl.⁴ H03K *5/22*
U.S. Cl. 307—234 **9 Claims**



1. A noise pulse suppressing circuit for suppressing a noise pulse superposed on an input signal having binary states, and outputting an output signal responsive to a respective binary state of the input signal without the noise pulse, said noise pulse suppressing circuit comprising:

a latch circuit means for receiving and latching the input signal in response to a triggering signal, and outputting the output signal;

a counter circuit means, connected to an input of said latch circuit means, for counting clock signals and generating the triggering signal when a predetermined count number of pulse edges of the clock signal has been counted; and

a logic circuit means, connected to an output of said latch circuit means and to an input of said counter circuit means, for generating a signal which resets said counter circuit means while said latch circuit means and the input signal have the same logic state, and activates said counter circuit means when the logic states are complementary.

4,786,824

INPUT SIGNAL LEVEL DETECTING CIRCUIT

Eiji Masuda, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1984, Ser. No. 613,634
Int. Cl.⁴ H03K *3/013, 3/295, 3/15, 3/86*
U.S. Cl. 307—290 **3 Claims**

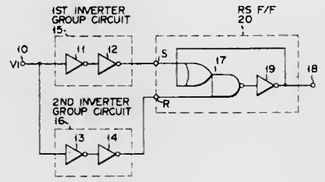
1. An input signal level detecting circuit for receiving an input signal having a rising region including a first threshold level to be detected and a falling region including a second threshold level to be detected, the first threshold level being greater than the second threshold level, the circuit comprising:

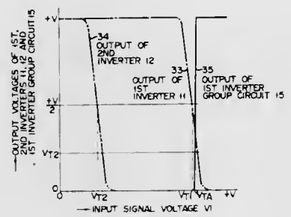
a first inverter group circuit connected between a signal input terminal to which the input signal is applied and a first output terminal, said first inverter group circuit including at least a first inverter having an input connected to said signal input terminal and a second inverter having an input connected to an output of said first inverter;

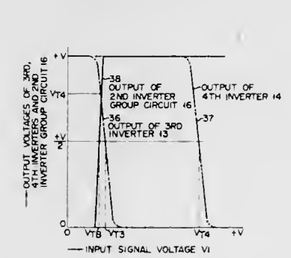
a second inverter group circuit connected between said signal input terminal and a second output terminal, said second inverter group circuit including at least a third inverter having an input connected to said signal input terminal and a fourth inverter having an input connected to an output of said third inverter; and

a set-reset flip-flop circuit including a plurality of CMOS-FET's (complementary oxide semiconductor field effect transistors), said flip-flop circuit having input terminals connected to said first and second output terminals of said first and second inverter group circuits,

each of said first through fourth inverters being formed of CMOS-FET's and being structured to have a predetermined threshold voltage associated therewith, the threshold voltages of each of said first through fourth inverters being determined relative to a reference level defined by the mean level of said first and second levels, wherein the threshold voltage of said first inverter is higher than said reference level, that of said second inverter is lower than said reference level, that of said third inverter is lower than said reference level, and that of said fourth inverter is higher than said reference level.







4,786,825

CMOS SCHMITT TRIGGER CIRCUIT USING RATIOED CURRENTS TO ESTABLISH SWITCHING THRESHOLDS

Timothy O'Shaughnessy, Yorba Linda; Victor G. Pierotti, Anaheim, and Brian A. Wey, Fountain Valley, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Dec. 22, 1986, Ser. No. 945,310
Int. Cl.⁴ H03K *3/29, 3/26, 19/094*
U.S. Cl. 307—290 **12 Claims**

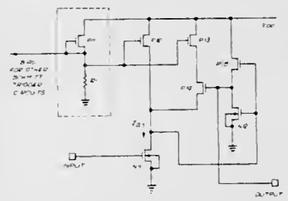
1. A Schmitt trigger circuit comprising:

a first MOS field effect transistor having its source connected to ground, an input signal applied to its gate and having a switching threshold controlled by the drain

current thereof, wherein the first transistor functions as an inverter;

a CMOS inverter being its input connected to the drain of the first transistor, wherein the output of the inverter is the output of the Schmitt trigger circuit;

switchable drain current supply means controlled by the output of the CMOS inverter for providing a drain current of a first or second value to the drain of the first transistor to control the switching threshold thereof, wherein when the output of the CMOS inverter is at a first level the drain current will have the first value and when



the output of the CMOS inverter is at a second level the drain current will have the second value, thereby providing hysteresis to the circuit, said drain current having a first component and second component wherein said first component of drain current establishes said first value of drain current and wherein said first and second components add to establish said second value of drain current; and

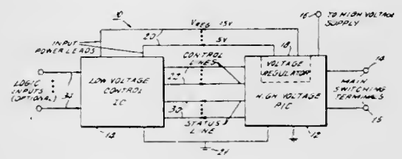
a biasing circuit coupled to said current supply means for biasing said first and second components to have a predetermined relationship to one anther.

4,786,826

POWER INTERFACE CIRCUIT WITH CONTROL CHIP POWERED FROM POWER CHIP

Stefano Clemente, Rolling Hills Estates, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Feb. 19, 1986, Ser. No. 830,740
Int. Cl.⁴ H03K *3/01*
U.S. Cl. 307—296 R **26 Claims**



1. A power interface circuit, comprising:

(a) a low voltage control chip having an input lead on which power to operate the chip is supplied and an output lead;

(b) a high voltage power chip separate from said low voltage control chip and including a power switching device, with a control lead, for supplying power to an electrical load, said high voltage power chip integrally including a conductor on which high voltage is applied and a means for deriving a regulated voltage from said high voltage which is applied to said conductor;

(c) means for applying said regulated voltage to said input lead of said low voltage control chip so that the low voltage control chip is powered from the high voltage power chip; and

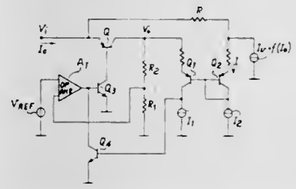
(d) means to couple said output lead to said control lead of said power switching device, whereby the high voltage switching device is controllable by said low voltage control chip.

4,786,827

ANTISATURATION CIRCUIT FOR INTEGRATED PNP TRANSISTOR WITH INTERVENTION CHARACTERISTIC DEFINABLE ACCORDING TO A PRESET FUNCTION

Roberto Gariboldi, Lacchiarella, and Marco Morelli, Livorno, both of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Jun. 26, 1986, Ser. No. 879,160
Claims priority, application Italy, Aug. 9, 1985, 21900 A/85
Int. Cl.⁴ H03K *3/33, 3/01;* **G05F** *1/40*
U.S. Cl. 307—300 **6 Claims**



1. An antisaturation circuit for an integrated PNP transistor having an extremely low DC current gain under conditions of strong imbalance, wherein said circuit comprises a comparator circuit formed by at least two transistors and at least a first generic current generator capable of determining a pre-established maximum threshold current through itself and therefore through the conducting transistor of said comparator circuit;

a regulation resistor connected between an emitter of said PNP transistor and at least a second generator supplying a variable current the intensity of which corresponds to a pre-established function of a current passing through said emitter of said PNP transistor;

said comparator circuit comparing a collector voltage of said PNP transistor and a voltage drop across said regulation resistor determined by the passage throiugh said resistor of an electric current which is the sum of a preset constant current and of said variable current generated by said second current generator and said comparator circuit changing state when

$$V_{CE} \leqq \Delta V$$

where V_{CE} is the collector voltage of said PNP transistor and ΔV is the voltage drop across said regulation resistor;

means, driven by a portion of the conduction current of the one of said two transistors forming said comparator circuit which is made conducting upon said changing of state of the comparator circuit, for increasing the DC current gain of said PNP transistor, thus reducing the degree of saturation thereof.

4,786,828

BIAS SCHEME FOR ACHIEVING VOLTAGE INDEPENDENT CAPACITANCE

Charles R. Hoffman, 1537 Shadowood La., Raleigh, N.C. 27612

Filed May 15, 1987, Ser. No. 49,914
Int. Cl.⁴ H03K *3/26, 3/353;* **H01L** *27/08, 29/78*
U.S. Cl. 307—303 **6 Claims**

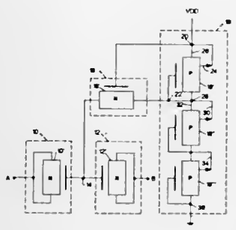
1. A circuit arrangement for producing a constant capacitance, the capacitance value being unaffected by variations in related signal voltages, said circuit arrangement comprising:

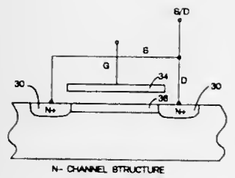
a first FET device having a gate electrode, a source electrode and a drain electrode, with the source electrode and the drain electrode connected together to form an input node;

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a second FET device having a gate electrode connected to the gate electrode of the first FET device, a source electrode and a drain electrode connected together to form an output node; and

a biasing means connected to the gate electrodes of the first





and second FET devices; said biasing means providing a relatively high impedance path to signals flowing between the input node and the output node and providing a selected voltage level on said gate electrode so that an inversion layer is maintained in each FET device beneath the gate electrode for an entire range of signal voltages.

4,786,829

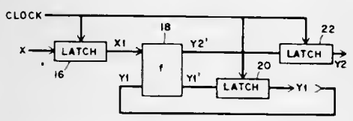
LATCHED FEDBACK MEMORY FINITE-STATE-ENGINE

John H. Letcher, 7421 S. Marion, Tulsa, Okla. 74136

Filed Feb. 24, 1987, Ser. No. 17,751

Int. Cl.⁴ H03K *3/027*

U.S. Cl. 307—465 **9 Claims**



1. A finite-state-engine comprising:

a first latch means having as an input a data set X for producing an output X_1 upon the receipt of a clock signal;

function module means for storing at least one finite-state equation and having as an input X_1 and Y_1, and as an output Y_1' and Y_2';

a second latch means having as an input Y_1' for producing an output Y_1 upon the receipt of the clock signal; and

a third latch means having as an input Y_2' for producing an output Y_2 upon the receipt of a following clock signal.

4,786,830

CMOS INPUT BUFFER CIRCUIT FOR TTL SIGNALS

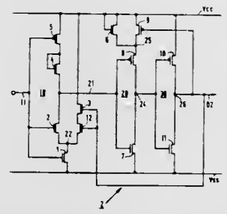
Richard C. Foss, Kanata, Canada, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1987, Ser. No. 65,199

Claims priority, application United Kingdom, Jun. 25, 1986, 8615467

Int. Cl.⁴ H03K *17/30*

U.S. Cl. 307—475 **8 Claims**



1. A CMOS-input circuit, which includes an input CMOS-inverter having a PMOS-switch transistor and an NMOS-load transistor, wherein the conductive channel of the PMOS-switch transistor is connected in series with said NMOS-load transistor between an output node and a first power supply terminal, the NMOS-load transistor substantially defines the load current when the PMOS-switch transistor is conductive, a further NMOS-transistor, an NMOS-transistor of the input inverter being connected to a second power supply terminal via said further NMOS-transistor, the gate of said further transistor being connected to the input of the input inverter, a feedback transistor device, the common node of the NMOS-transistor of the input inverter and of the further NMOS-transistor being connected by said feedback transistor device to the first power supply terminal, and the feedback transistor device being controlled by the output signal of the input inverter.

4,786,831

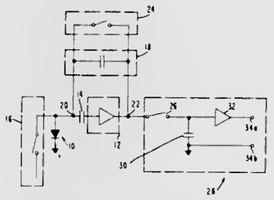
INTEGRATING CAPACITIVELY COUPLED TRANSIMPEDANCE AMPLIFIER

Arthur L. Morse, Hawthorne; Steve D. Gaalema, Encinitas; Ingrid M. Keimel, Fountain Valley, and Mary J. Hewitt, Playa Del Rey, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 17, 1984, Ser. No. 682,112

Int. Cl.⁴ G06G *7/12;* **H03K** *3/42, 5/159;* **G01J** *1/00*

U.S. Cl. 307—490 **8 Claims**



1. An amplifier circuit for an infrared detector of a detector array fabricated on a large scale integrated structure, said amplifier circuit comprising:

biasing means, separate from said detector, for biasing said detector,

switching means, fabricated on said large scale integrated structure, connected between said biasing means and said detector, for selectively coupling said biasing means to said detector during a first time period and for decoupling said biasing means from said detector during a second time period, and

amplifying means, connected to an output terminal of said detector, fabricated on said large scale integrated structure, for amplifying an output signal of said detector during said second time period.

4,786,832

SUPPORTING MECHANISM FOR A MOVABLE MEMBER OF LINEAR PULSE MOTORS

Hiroshi Nakagawa; Toshiki Maruyama, and Minoru Maeda, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

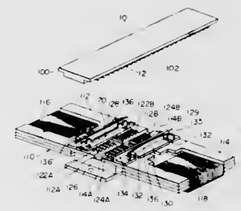
Filed Mar. 13, 1985, Ser. No. 711,153

Claims priority, application Japan, Mar. 13, 1984, 59-47863

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.⁴ H02K *41/00*

U.S. Cl. 310—12 **1 Claim**



1. In a supporting mechanism for a movable member of a linear pulse motor in which a magnetic flux is generated in a gap defined between opposing faces of a stator and a movable member so that the movable member is movable parallel to the opposing face of the stator along a linear passage, the improvement which comprises:

(a) a pair of holding members, disposed above the stator;

(b) a plurality of first rolling members, rotatably held in the holding members to be in rolling contact with the movable member and the stator and to form the gap, for movably supporting the movable member;

(c) a pair of guide members, opposingly disposed on the stator across the linear passage, for defining opposite sides of the linear passage; and

(d) a plurality of second rolling members, rotatably held in the holding members to be in rolling contact with the guide members and opposite lateral edges of the movable member wherein one of the guide members are provided to be movable in a direction to cross the linear passage, and wherein there is provided means for urging the one guide member toward the other.

4,786,833

CASING FOR AIR COOLED ELECTRIC MACHINES

Robert Knobel, Beinwil am See, Switzerland, assignor to Zschokke Wartmann AG, Dottingen, Switzerland

Filed Apr. 16, 1987, Ser. No. 39,102

Claims priority, application Switzerland, Apr. 23, 1986, 1675/86

Int. Cl.⁴ H02K *5/18*

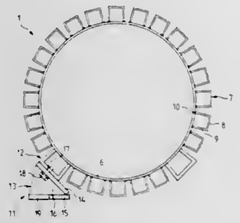
U.S. Cl. 310—89 **9 Claims**

1. A device for an air cooled electrical machine, said device comprising:

an elongated cylindrical metal casing jacket having an axis extending in the direction of elongation, said jacket having oppositely directed outer and inner cylindrical surfaces;

a plurality of spaced apart elongated metal cooling ribs disposed along the outer surface of the jacket, all of said ribs extending in the axial direction, each rib having two spaced apart legs having outer and inner edges, the outer edges of the two legs being connected by a straight web extending therebetween and outwardly displaced from the jacket, the inner edges of the legs being secured to the jacket, each rib in transverse cross section having a generally trapezoidal shape defined by the web and the separation between the legs being a maximum at the web and a minimum at the inner edges, two spaced apart ribs being bases; and

two spaced apart feet, each foot being adjustably connected to a corresponding one of the base ribs.



4,786,834

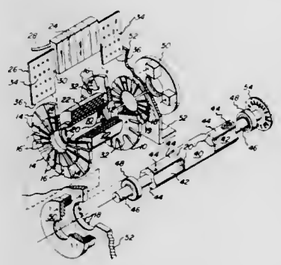
STATOR ASSEMBLY FOR DYNAMOELECTRIC MACHINE

James J. Grant, Schenectady; William H. Miller, Albany, and Edward C. Hartung, Clifton Park, all of N.Y., assignors to REM Technologies, Inc., Albany, N.Y.

Filed Jul. 6, 1987, Ser. No. 69,887

Int. Cl.⁴ H02K *3/04, 19/24*

U.S. Cl. 310—194 **25 Claims**



1. A stator assembly for a dynamoelectric machine, comprising:

a non-magnetic spool-like structure having a hollow, elongated central portion, said central portion comprising wall means extending about and parallel to a centered longitudinal axis and defining a longitudinal passageway through said central portion for accommodating the insertion of a rotor in said passageway, said spool-like structure having axially spaced end portions that extend radially outward relative to said longitudinal axis from respective ends of said central portion, and a plurality of armature core positioning means disposed, respectively, at angularly spaced locations on each of said end portions;

a field winding coiled about the central portion of said spool-like structure and adapted for connection to a source of direct current; and

a circumferentially distributed plurality of generally C-shaped, longitudinally extending armature cores sup-

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ported by the end portions of said spool-like structure, each of said armature cores being secured in position on the end portions of said spool-like structure by said armature positioning means such that each of said armature cores is precisely positioned axially, radially and circumferentially with respect to said longitudinal axis.

4,786,835

COMMUTATOR WINDING END SUPPORTS FOR ELECTRIC MACHINES

Werner Bode, and Peter Franz, both of Hildesheim, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

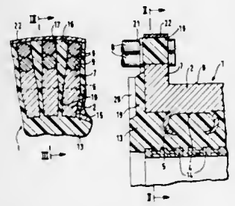
PCT No. PCT/DE86/00280, § 371 Date Apr. 28, 1987, § 102(e) Date Apr. 28, 1987, PCT Pub. No. WO87/01521, PCT Pub. Date Mar. 12, 1987

PCT Filed Jul. 7, 1986, Ser. No. 45,130

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1985, 3530652

Int. Cl.⁴ H02K *13/04*

U.S. Cl. 310—233 **13 Claims**



1. A commutator for an electrical machine equipped with a rotor defining a rotational axis, the rotor being provided with electrical winding means having a plurality of winding ends, the commutator defining a longitudinal axis coincident with said rotational axis and having respective longitudinal commutator ends, the commutator comprising:

a plurality of segments defining a peripheral running surface surrounding said longitudinal axis;

said segments being disposed in spaced relationship one next to the other so as to cause said segments to conjointly define a plurality of slits;

each one of said segments having a seat formed thereon so as to extend over the entire lateral width of said segment, said seat being disposed at one of said commutator ends for receiving selected ones of said winding ends thereon;

an insulating body for accommodating said segments therein and including a first portion filling said slits and a second portion extending radially beyond said running surface at said one commutator end in a non-overlapping relationship to said segments to define a plurality of radially outwardly extending supports one adjacent the other;

each two mutually adjacent ones of said supports projecting outwardly beyond a corresponding one of the seats of said segments to conjointly define a gap above the seat corresponding to said width of said segment for accommodating selected ones of said winding ends therein;

said selected ones of said winding ends being electrically and mechanically connected to the seat of the segment corresponding to said gap; and,

anchoring means on said segments for anchoring the same in said insulating body.

4,786,836

PIEZOELECTRIC MOTOR

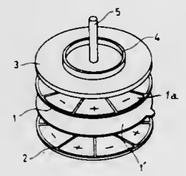
Akira Tokushima, Kyoto, Japan, assignor to Matsushita Electric Industrail Co., Ltd., Kadoma, Japan

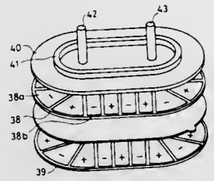
Filed Feb. 27, 1985, Ser. No. 706,387

Claims priority, application Japan, Mar. 1, 1984, 59-39801; Jul. 27, 1984, 59-155147

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **36 Claims**





1. A piezoelectric motor comprising:

a ring-shaped stator having: (a) an acoustic substance member of a circular configuration, and (b) piezoelectric vibrating means coupled to said acoustic substance member for generating a bending vibration wave travelling in a circumferential direction on said member;

a circular vibration transmitting member formed on said stator, the location of which member in a radial direction of said stator is adjacent to a portion at which the displacement of said stator due to said bending travelling wave is maximum in said radial direction;

a slider disposed with a contact surface thereof facing said stator, so as to contact with said vibration transmitting member, thereby receiving a friction driving force in a direction substantially parallel to a face of said stator; and

supporting means for supporting said stator in the vicinity of a node of said vibration thereof.

4,786,837

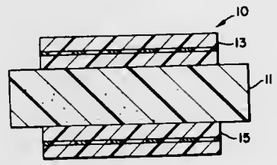
COMPOSITE CONFORMABLE SHEET ELECTRODES

Ilmar L. Kalnin, West Millington, and George J. Breckenridge, Jr., Clark, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed May 5, 1987, Ser. No. 46,076

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—364 **20 Claims**



1. A composite sheet electrode, comprising a conductive polymer sheet or film and a slit-and-expanded screen formed from a sheet of a selected metal, said conductive polymer in said polymer sheet being ethylene/propylene/diene elastomer (EPR) and said metal sheet being embedded into said polymer sheet and having exposed portions to which electrical leads can be soldered.

4,786,838

ELECTROMAGNETIC DEFLECTION UNIT DIRECTLY WOUND ON A SUPPORT

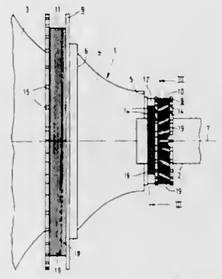
Hans Meershoek, and Antonius H. Van Tiel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1987, Ser. No. 53,984

Claims priority, application Netherlands, Jun. 10, 1986, 8601501

Int. Cl.⁴ H01J *29/70;* H01F *5/05*

U.S. Cl. 313—440 **3 Claims**



1. An electromagnetic deflection unit for a cathode ray tube, comprising:

a longitudinally extending hollow annular support having a constricted end, a wide end, and a longitudinal axis;

a flange at the constricted end and a flange at the wide end of said support, each flange having at least one tangential groove and a multitude of substantially radial grooves merging into a said tangential groove;

a set of line deflection coils for deflection of an electron beam in a line direction at right angles to the longitudinal axis, such set comprising a pair of diametrically opposite coils with respect to said axis which are directly wound on the inside of the support and whose turns each run through a tangential groove and through radial grooves in the flanges;

a set of field deflection coils for deflection of an electron beam in a field direction at right angles to both the longitudinal axis and the line direction, such set comprising a pair of diametrically opposite coils with respect to said axis which are directly wound on the inside of the support and whose turns each run through radial grooves in the flanges;

the two line deflection coils being on opposite sides of a plane of separation therebetween and each having turns adjacent such plane and turns most remote from such plane;

characterized in that the two line deflection coils, viewed in flared-out form, are wound in mutually opposite winding senses, and are each so connected to an energizing source that the highest potential on each line deflection coil is at the turns thereof adjacent said plane of separation and the lowest potential is at the turns thereof most remote from said plane of separation.

4,786,839

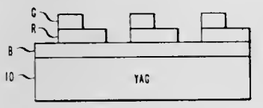
SINGLE CRYSTAL YAG COLOR CRT

Tien-Wen Hou, Berkeley Heights, and Tai-Chan D. Huo, New Providence, both of N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 11, 1985, Ser. No. 786,844

Int. Cl.⁴ H01J *49/10*

U.S. Cl. 313—473 **6 Claims**



1. In a color CRT, a target comprising

a (111) oriented YAG substrate, and

a plurality of epitaxial YAG layers grown on said substrate so as to be capable of generating a plurality of colors in response to an electron beam,

at least one of said layers having the form of a stripe oriented essentially parallel to a <112> direction in the (111) plane to avoid axialmetric profile problems.

4,786,840

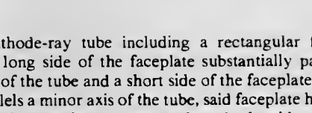
CATHODE-RAY TUBE HAVING A FACEPLATE PANEL WITH A SUBSTANTIALLY PLANAR PERIPHERY

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Feb. 25, 1983, Ser. No. 469,774

Int. Cl.⁴ H01J *29/86*

U.S. Cl. 313—477 R **1 Claim**



1. A cathode-ray tube including a rectangular faceplate wherein a long side of the faceplate substantially parallels a major axis of the tube and a short side of the faceplate substantially parallels a minor axis of the tube, said faceplate having an exterior surface having curvature along both said minor and major axes and wherein said exterior surface includes a substantially rectangular contour near the periphery of said faceplate which substantially lies in a plane that is perpendicular to the central longitudinal axis of said tube and wherein the equation of the line formed by the center-to-corner contour of the cross-section of said exterior surface has at least one sign change of its second derivative.

4,786,841

LOW-PRESSURE ARC DISCHARGE LAMP HAVING INCREASED SURFACE BRIGHTNESS

Timothy Fohl, Carlisle; Robert Y. Pai, Hamilton, and Warren C. Gungle, Danvers, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Jun. 22, 1987, Ser. No. 64,961

Int. Cl.⁴ H01J *61/30, 63/04*

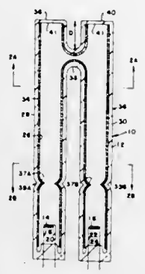
U.S. Cl. 313—493 **16 Claims**

1. An arc discharge lamp having a longitudinal axis comprising:

a sealed envelope having a longitudinal configuration and including a major body portion having at least first and second longitudinally extending leg members, first and second minor transverse end portions respectively associated with said first and second longitudinally extending leg members, and a transversely extending envelope por-

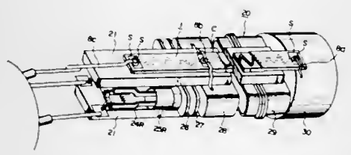
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tion joining said first and second leg members to form a continuous passage therethrough for an arc discharge;
an ionizable medium contained within said envelope;
a pair of electrodes spacedly located within said envelope for generating said arc discharge therebetween during operation of said lamp; and
a phosphor layer disposed on the internal surface of said major body portion of said envelope and not disposed on the internal surface of said first and second minor transverse end portions of said envelope; and
a non-specular light diffusing surface within said envelope associated respectively with each of said longitudinally



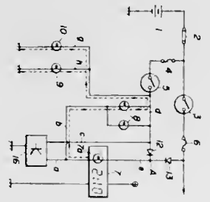
extending leg members, said non-specular light diffusing surface axially located remote from said transversely extending envelope portion and between each minor transverse end portion and a respective electrode, said non-specular light diffusing surface extending in a direction transverse to an imaginary line parallel to said longitudinal axis such that the internal surface brightness of said non-specular light diffusing surface as viewed through said first and second minor transverse end portions of said envelope is of greater intensity than the external brightness of said phosphor layer on said major body portion of said envelope during operation of said lamp.

4,786,842
RESISTOR ASSEMBLY
Taketoshi Shimoma, Isesaki; Eiji Kamohara, Fukaya, and Takahiro Hasegawa, Gyoda, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 736,371, May 21, 1985, abandoned. This application Aug. 25, 1987, Ser. No. 89,940
Claims priority, application Japan, May 24, 1984, 59-103618; Dec. 20, 1984, 59-267346
Int. Cl.[4] H01J *23/16*
U.S. Cl. 315—3 **2 Claims**



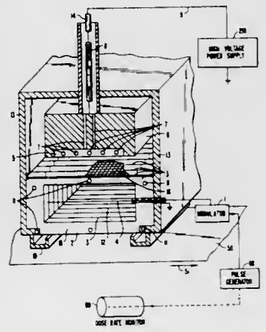
1. A cathode ray tube provided with an electron gun assembly and an anode, said electron gun assembly having electron beam generating means, a plurality of electrodes for focusing said electron beam on said anode, a plurality of insulating supports for supporting said electrodes on one surface of each said insulating support, and a resistor assembly comprising:
an insulating substrate,
a resistor element formed on said insulating substrate and electrically connected to said anode,
a plurality of terminals for applying voltages divided from an anode voltage to said electrodes,
a metal member formed of a structure from the group consisting of metal wire and metal ribbon,
wherein said insulating substrate has at least two through holes and a metal tube which is fixed to said insulating substrate and electrically connected to said resistor element by inserting said metal tube into said through hole and deforming upper and lower end portions thereof by pressure, wherein one end of said metal member is fixed to said upper deformed portion of said metal tube, and said resistor assembly being mounted on at least one other surface of said insulating supports by fixing the other end of said metal member to said electrodes.

4,786,843
VEHICLE ILLUMINATION CONTROL CIRCUIT
Yukio Yamamoto, Atsugi, and Daisuke Kobayashi, Zama, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan
Filed Sep. 29, 1986, Ser. No. 912,491
Claims priority, application Japan, Sep. 30, 1985, 60-214823
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 315—77 **10 Claims**



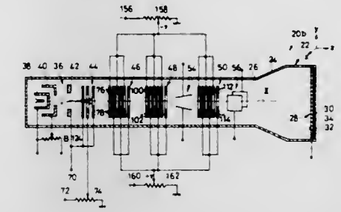
1. In an electrical circuit for a vehicle
a source of EMF;
a first switch;
a second switch;
a first device having a display;
a first illumination device for illuminating the display of said first device;
a first group of illumination devices;
a second group of illumination devices;
an illumination control device;
a circuit arrangement, said circuit arrangement including means defining a first electrical path which includes said first illumination device, a second electrical path which includes said first group of illumination devices and a third electrical path which includes said second group of illumination devices, said circuit arrangement operatively interconnecting said first and second switches and said illumination control device in a manner whereby:
when said first switch is closed and said second switch is open electrical current is supplied to said illumination control device via said first path including said first illumination device and said second path including said first group of illumination devices, and to said second group of illumination devices through said third path; and
when said second switch is closed and said first switch is open electrical current is supplied to said first illumination device through said first path, said second and third paths being arranged with respect to said first path in a manner that an electrical connection is established therebetween the combined resistances of said first and second groups of illumination devices in said electrical connection limiting current flow through said first and second groups of devices to a value that prevents illumination of said first and second groups of illumination devices.

4,786,844
WIRE ION PLASMA GUN
Sherman R. Farrell, Orinda, and Richard R. Smith, Pleasant Hill, both of Calif., assignors to RPC Industries, Hayward, Calif.
Filed Mar. 30, 1987, Ser. No. 31,618
Int. Cl.[4] H01J *7/24*
U.S. Cl. 315—111.21 **9 Claims**



1. In an ion plasma electron gun assembly comprising: an electrically conductive evacuated housing forming first and second chambers adjacent to one another and having an opening therebetween; means for generating positive ions in said first chamber; a cathode positioned in said second chamber in spaced and insulated relationship from said housing, said cathode having a secondary electron emissive surface; means for applying a high negative voltage between said cathode and said housing to cause said cathode to draw the positive ions from said first chamber to said second chamber to impinge on said surface of said cathode and to cause said surface to emit secondary electrons; an electrically conductive electron transmissive foil extending over an opening in said housing at the end of said first chamber facing said cathode, said foil being electrically connected to the housing to constitute an anode for the secondary electrons and causing the secondary electrons to pass through the foil as an electron beam; an electrically conductive extractor grid mounted in said second chamber adjacent to the secondary electron emissive surface of said cathode and connected to said housing to create an electrostatic field at said surface to cause secondary electrons therefrom to pass through the openings in the grid and into said first chamber; and an electrically conductive support grid mounted in said first chamber adjacent to said foil and connected to said foil and to said housing, said support grid serving to support said foil and to act in conjunction with said extractor grid to accelerate the secondary electrons to the foil,
the improvement comprising providing means for creating a pulse of secondary electrons by varying the period of time in which the secondary electrons are transmitted through the foil, by varying the power supply for said means for generating positive ions between on and off conditions to pulse the output of said secondary electrons.

4,786,845
CATHODE RAY TUBE HAVING AN ELECTRON GUN CONSTRUCTED FOR READY REFOCUSING OF THE ELECTRON BEAM
Takefumi Kato, Hinodemachi; Toshihiro Harada, and Osamu Akizuki, both of Hachioji, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Mar. 16, 1988, Ser. No. 169,239
Claims priority, application Japan, Mar. 25, 1987, 62-71250
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 **21 Claims**



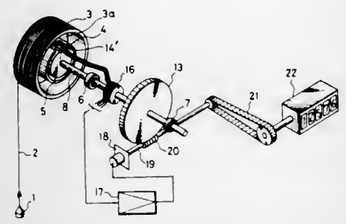
1. Apparatus including a cathode ray tube, comprising:
(a) a hermetically sealed envelope having a pair of opposite ends and a central axis extending therebetween;
(b) a target at one end of the envelope;
(c) a cathode at the other end of the envelope for emitting a beam of electrons;
(d) a control electrode disposed between the cathode and the target for directing the beam of electrons from the cathode toward the target along the central axis, the control electrode causing the electron beam to focus at a crossover point on the central axis which point is subject to change along the central axis with a variation in a potential on the control electrode;
(e) an accelerating electrode disposed between the control electrode and the target for accelerating the electron beam;
(f) deflection means disposed between the accelerating electrode and the target for deflecting the electron beam in two orthogonal directions;
(g) a series of quadrupolar lenses disposed between the accelerating electrode and the target;
(h) means for applying potentials to the quadrupolar lenses for focusing the electron beam at the target;
(i) a refocusing lens disposed between the crossover point of the electron beam and the series of quadrupolar lenses for providing a converging lens action of radial symmetry about the central axis; and
(j) means including a variable potential source for applying a variable potential difference to the refocusing lens for adjustably varying the lens action thereof;
(k) whereby the electron beam, on being defocused at the target by a change in the potential on the control electrode, can be refocused through adjustment of a single potential on the refocusing lens by the variable potential source rather than through adjustment of the potentials on the quadrupolar lenses.

4,786,846
LEVEL GUAGE APPARATUS
Mitsuru Uchida, Tokyo, Japan, assignor to Sakura Instrument Co., Ltd., Tokyo, Japan
Filed Jun. 22, 1987, Ser. No. 65,321
Claims priority, application Japan, Jul. 9, 1986, 61-161464
Int. Cl.[4] G01F *23/46*
U.S. Cl. 318—482 **11 Claims**

1. A liquid level gauge apparatus comprising:
(a) a detection shaft;

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(b) a drum rotatably journalled about said shaft having a wire wound about its outer surface;
(c) a displacer suspended at the end of said wire to float on the liquid surface to be sensed and to cause rotation of said drum relative to said shaft in response to the displacement of said displacer;
(d) a magnetic coupling between said shaft and drum comprising an outer magnet ring fixed to said drum and an inner magnet ring fixed to said shaft, said inner and outer magnet rings being aligned to generate a magnetic flux field therebetween;



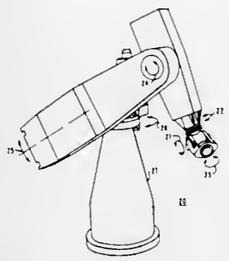
(e) an electromagnetic transducer fixed to said inner magnet ring for sensing the change in the magnetic flux field generated between said outer and inner magnetic rings as a result of the rotation from alignment of said drum in response to said displacer and converting said change into an electrical signal; and
(f) means for rotating said shaft in response to said electrical signal so as to move said shaft in the direction of movement of said drum to realign the outer and inner magnet rings to obtain an indication of the value of level of the liquid sensed.

4,786,847

DIGITAL CONTROL FOR MULTIAXIS ROBOTS

Kenneth E. Daggett, Murrysville, Pa.; Eimei M. Onaga, Brookfield Center, Conn.; Richard J. Casler, Jr., Newtown, Conn.; Barrett L. Booth, Brookfield, Conn.; Rajan C. Penkar, Woodbury, Conn.; Leonard C. Vercellotti, Oakmont, and Richard A. Johnson, Murrysville, both of Pa., assignors to Unimation Inc., Danbury, Conn.

Filed Nov. 20, 1986, Ser. No. 932,989
Int. Cl.⁴ G05B *19/42*
U.S. Cl. 318—568 **8 Claims**



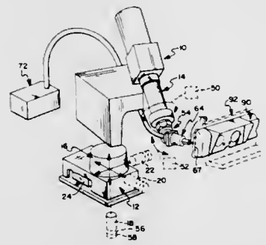
1. A completely digital control for a robot operating at a predetermined sampling rate and having an arm with each of a plurality of joints driven by an electric DC motor, each of said DC motors in turn supplied with drive current by a power amplifier bridge circuit having power switches connected therein to supply motor winding current in the positive direction or the negative direction, said robot control comprising:
digital means for generating position commands at the sampling rate for each of the robot axes in accordance with a stored robot program;
means for sensing the position of each of said motors;
means for generating digital position feedback signals synchronously with the sampling rate in response to said position sensing means;
means for generating digital velocity feedback signals synchronously with the sampling rate for each of said motors;
means for sensing the polarity and magnitude of motor current for each of said joint motors;
means for generating digital current feedback signals synchronously with the sampling rate in response to said current sensing means;
digital means for generating torque commands for each of the robot axes at the sampling rate in response to said position commands and said position and velocity feedback signals;
digital means for generating motor voltage commands for each of the robot axes at the sampling rate in response to said torque commands and said digital current feedback signals;
pulse width modulation means for generating digital motor control signals for each of the robot axes at the sampling rate in response to said voltage commands; and
means for coupling said digital control signals for each axis to control terminals of the corresponding power switches to control on/off switch time and satisfy said motor voltage commands and thereby satisfy said position commands.

4,786,848

WATER JET TRIM HEAD SIMULATOR

Ellery Nickerson, New Durham, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Jul. 27, 1987, Ser. No. 78,406
Int. Cl.⁴ G05B *19/42*
U.S. Cl. 318—577 **8 Claims**



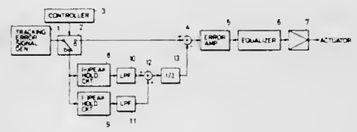
1. In water jet apparatus having a water jet trim head with a nozzle supplied from a high pressure pump means and wherein the nozzle is mounted on a driven member the improvement comprising:
a head simulator for replacing said water jet trim head during a teach mode of operation including mounting means for connection to the driven member and having a shape and size corresponding to the shape and size of the replaced water jet trim head including the nozzle portion thereof;
drive means for moving the driven member through a desired trim path;
tracking means on said head simulator for visually observing the trim path of said head simulator as it is moved along the desired trim path; and
programmable means responsive to movement of the driven member for preprogramming the water jet apparatus for operating said drive means to position the driven member along multi-axes for directing a water jet from the nozzle head along the desired trim path on a production workpiece being trimmed by the water jet apparatus.

4,786,849

OFFSET COMPENSATING CIRCUIT IN FINE CONTROL SERVO DEVICE

Kiyoshi Tateishi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 99,261
Claims priority, application Japan, Sep. 19, 1986, 61-221679
Int. Cl.⁴ G05D *13/275*
U.S. Cl. 318—632 **3 Claims**



1. An offset compensating circuit in a servo device, comprising:
a servo loop including a source of an error signal and means for processing said error signal;
means for opening said servo loop;
peak detecting means for detecting positive and negative peak values p_p and p_n of said error signal with said servo loop kept open;
means for calculating an offset value by inserting said peak values p_p and p_n in the following expression:

$(p_p+p_n)/2$; and

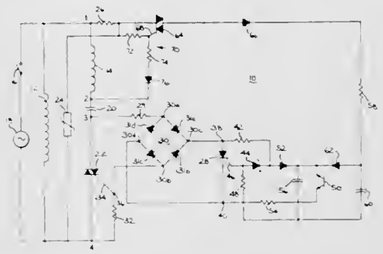
means for subtracting said offset value from a signal level of said error signal only when said servo loop is closed.

4,786,850

MOTOR STARTING CIRCUIT WITH TIME DELAY CUT-OUT AND RESTART

Steven F. Chmiel, Milwaukee, Wis., assignor to PT Components, Inc., Milwaukee, Wis.

Filed Aug. 13, 1987, Ser. No. 85,645
Int. Cl.⁴ H02P *1/44*
U.S. Cl. 318—786 **6 Claims**



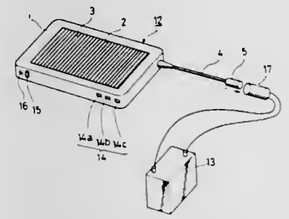
1. In a single phase AC induction motor having a main winding and a start winding both connectable to an AC power source, and having start switch means in series with said start winding for disconnecting said start winding from said AC source, an improved time delay disconnect control comprising:
turn-on switch means connected across said start switch means and not across said start winding, and turning on said start switch means to connect said start winding to said AC source at energization of said motor;
cut-out switch means turning off said start switch means to disconnect said start winding from said AC source after a given time delay following said energization;
timing means connected across said AC source and coupled to said cut-out switch means to provide said time delay following said energization,
wherein said timing means comprises an RC timing circuit including a resistor and a timing capacitor, said RC timing circuit being connected across said AC source in parallel with said main winding and in parallel with the series connectd start winding and start switch means, and comprising restart switch means connected in series with said RC timing circuit and sensing start winding voltage and turning ON to permit charging of said timing capacitor when said start winding voltage is above a given value.

4,786,851

BATTERY CHARGER

Sadao Fuji, Kobe; Takeharu Yamawaki, Otsu; Osamu Takamatsu, Ibaragi; Shinji Kuwamura, Takasago; Kazuhiro Suenobu, Otsu, and Hiroshi Nakano, Ashiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 28, 1987, Ser. No. 90,367
Claims priority, application Japan, Mar. 4, 1987, 62-31726[U]
Int. Cl.⁴ H02J *7/00*; H01L *31/04*; H01M *10/44*
U.S. Cl. 320—2 **11 Claims**



1. A battery charger for automobiles comprising
a case made of thin plate having a surface and an opening on a portion of the surface top thereof and said case also having a hollow portion therein,
a solar cell consisting of a tansparent electrode, an amorphous silicon semiconductor layer, a metal diffusion blocking layer and a reverse electrode, said solar cell being accommodated by said case in such a manner that a surface of the cell is located in said opening,
a wiring material provided with a plug at one end thereof to couple said wiring material with a cigarette lighter socket and to take out an electromotive force of said solar cell,
a circuit provided in said case for measuring an electric potential of a secondary battery being charged by said solar cell, and
a display device displaying said electric potential of said secondary battery charged by said circuit.

4,786,852

INVERTER OPERATED TURBINE ENGINE STARTING SYSTEM

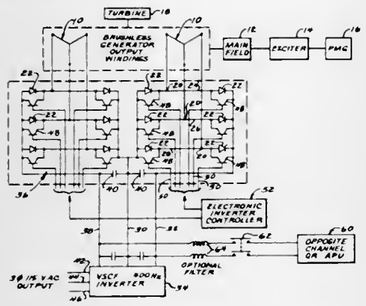
Alexander Cook, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 886,874, Jul. 18, 1986, abandoned. This application Mar. 10, 1988, Ser. No. 169,141
Int. Cl.⁴ F02N *11/00*
U.S. Cl. 322—10 **3 Claims**

1. In a generating system for an aircraft turbine or the like including a brushless generator coupled to the turbine and having at least one plural phase output winding in which electrical power may be induced by a magnetic field produced in a

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main field powered by an exciter; a full wave rectifier comprising two diodes for each phase interconnected in a bridge which is connected to said winding, and a variable speed constant frequency inverter for providing an A.C. signal and connected to said bridge oppositely of said winding the improvement wherein said generator may be utilized as an A.C. synchronous starting motor for said turbine and comprising:



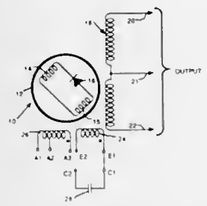
a plurality of transistors, one for each diode, each having its emitter-collector conduction path connected in shunt relation to the corresponding diode within said bridge;
an inverter controller connected to the bases of said transistors to selectively drive said transistors so that said transistors and diodes may operate as an inverter;
and means for selectively applying a D.C. signal to said bridge oppositely of said winding.

4,786,853

BRUSHLESS CAPACITOR EXCITED GENERATOR

Richard D. VanMaaren, Sheboygen, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Mar. 23, 1987, Ser. No. 28,799
Int. Cl.[4] H02P *9/10*
U.S. Cl. 322—75 **7 Claims**



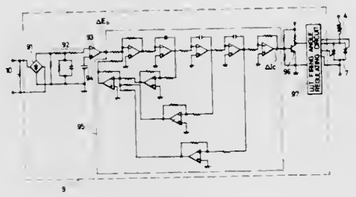
1. A brushless electrical generator comprising:
a rotor assembly having a rotor coil and a diode connected in series with the rotor coil;
a stator coil for producing the output current of the generator, said stator coil having a voltage induced thereacross;
an excitation coil means for inducing a current in said rotor coil, said excitation coil means having more than two terminals;
an excitation capacitor; and
means for selectively connecting said excitation capacitor across two of the more than two terminals of said excitation coil means to adjust the voltage induced across said stator coil.

4,786,854

ALTERNATING CURRENT VOLTAGE REGULATOR USING A FEEDBACK LOOP WITH STEP FILTERING

Kosuke Harada; Takazi Nakamizo, and Cheng-Jen Chen, all of Fukuoka, Japan, assignors to Nishimu Electronics Industries, Co., Ltd., Fukuoka, Japan

Filed Sep. 24, 1987, Ser. No. 100,487
Claims priority, application Japan, Oct. 17, 1986, 61-245346; May 21, 1987, 62-124423
Int. Cl.[4] G05F *1/12*
U.S. Cl. 323—232 **12 Claims**



1. An alternating current (AC) voltage regulator comprising:
a first linear reactor and a capacitor adapted for being connected in series to an alternating current power source of a selected frequency and which together are in a state of substantial resonance relative to the selected frequency,
a series circuit formed of a second linear reactor and a bi-direction switching element, and connected to said capacitor in parallel therewith,
means for sensing a deviation of the output voltage generated across the capacitor from a selected value,
means for regulating said bi-direction switching element in accordance with said deviation in such a manner as to advance the firing angle of said switching element in proportion to said deviation increases when said deviation has a positive value, and
filter means having a filter characteristic for steeply attenuating abnormal oscillation frequency components contained in said deviation differing in frequency from the selected frequency such that this steep attenuation is the result of the filter characteristic being of at least second order.

4,786,855

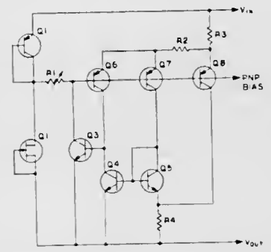
REGULATOR FOR CURRENT SOURCE TRANSISTOR BIAS VOLTAGE

Dennis P. O'Neill, Mountain View, and Carl T. Nelson, San Jose, both of Calif., assignors to Linear Technology Inc., Milpitas, Calif.

Filed Feb. 4, 1988, Ser. No. 152,169
Int. Cl.[4] G05F *3/30*
U.S. Cl. 323—314 **7 Claims**

1. A bias voltage regulator comprising
a first bipolar transistor having a collector, a base, and an emitter,
first means connecting the emitter of said first bipolar transistor to a first voltage line,
a second bipolar transistor having a collector, a base, and an emitter,
a third bipolar transistor having a collector, a base, and an emitter,
first resistive means connecting the emitter of said first transistor to the emitters of said second transistor and said third transistor,
a fourth bipolar transistor having a collector, a base, and an emitter,
means connecting the collector of said fourth transistor to the bases of said first transistor, said second transistor and said third transistor,

means connecting the emitter of said fourth transistor to a second voltage line,
a fifth bipolar transistor having a collector, a base, and an emitter,
means connecting the collector of said fifth transistor to the collector of said second transistor and to the base of said fourth transistor,
means connecting the emitter of said fifth transistor to said second voltage line,
a diode means having two terminals,



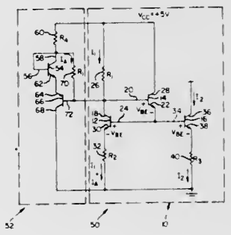
means connecting one terminal of said diode means to the base of said fifth transistor and to the collector of said third transistor,
means connecting the other terminal of said diode means to the collector of said first transistor, and
a second resistive means connecting the other terminal of said diode means and the collector of said first transistor to said second voltage line, whereby current through said first transistor is established by said first means and said second resistive means, and currents through said second transistor and said third transistor are established by said first resistive means.

4,786,856

TEMPERATURE COMPENSATED CURRENT SOURCE

Michael H. Metcalf, and Stewart S. Taylor, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 3,526, Mar. 12, 1987, abandoned. This application May 10, 1988, Ser. No. 195,385
Int. Cl.[4] G05F *3/26*
U.S. Cl. 323—315 **12 Claims**



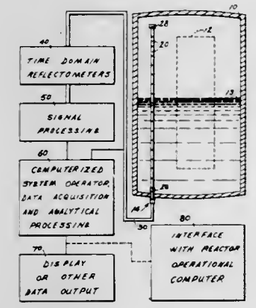
1. A temperature compensated current source, comprising:
a current mirror circuit including first, second, and third transistors each having a base, a collector, and an emitter, the bases of the first and second transistors being coupled together and to the emitter of the third transistor, the emitters of the first and second transistors being coupled together and to a first source of reference voltage, the collector of the first transistor and the base of the third transistor being coupled together to form a current input, and the collector of the second transistor forming a current output;
a reference impedance coupled between a second source of reference voltage and the current input for establishing an input current; and
compensating current means for injecting a compensating current into the collector of the first transistor such that the output current flowing in the collector of the second transistor is substantially temperature invariant.

4,786,857

METHODS AND APPARATUS FOR TIME DOMAIN REFLECTOMETRY DETERMINATION OF RELATIVE PROPORTION, FLUID INVENTORY AND TURBULENCE

Charles L. Mohr, 1440 Agnes, Richland, Wash. 99352, and Frederick R. Reich, Richland, Wash., assignors to Charles L. Mohr, Richland, Wash.

Filed Apr. 24, 1986, Ser. No. 855,805
Int. Cl.[4] G01N *27/00*
U.S. Cl. 324—58.5 B **26 Claims**

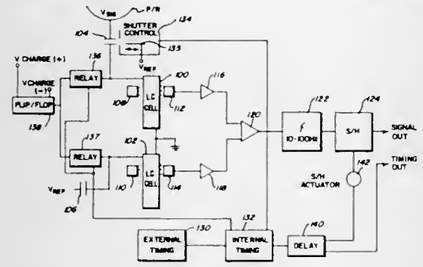


6. An electrical proportion measuring apparatus for quantitatively determining relative proportions of dynamically varying intermixed constituents having different electrical permittivities contained in a multiphase fluid system, comprising:
means for generating time varying stimulating electrical signals;
at least one electrically conductive probe means having first and second ends; which are spaced along the probe means; said probe means being less than approximately 12 inches (30 centimeters) between said first and second ends to define a limited sample zone thereabout within the fluid system; said first end being adapted to be electrically connected to said means for generating time varying stimulating electrical signals; said probe means having a first conductor and a second conductor spaced from said first conductor; said probe means being adapted for mounting substantially within said multiphase fluid system;
means for detecting and measuring reflected electrical signals generated from said stimulating electrical signals at impedance changes along said probe means;
means for analyzing reflected electrical signals to deduce approximate probe transit time periods associated with time differences between receipt of first reflected electrical signals generated as stimulating electrical signals pass through the first end, and receipt of second reflected electrical signals generated as stimulating electrical signals pass through the second end;
means for measuring temperature at said probe means to provide probe temperature data;
means for comparing data derived from probe transit time periods and probe temperature data against predetermined data associating probe transit time periods with relative proportions of variable, intermixed constituents as a func-

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tion of varying probe temperatures to derive a measure of relative proportions;
output means for providing an indication of the measure of relative proportions of the variable, intermixed constituents of the multiphase fluid system.

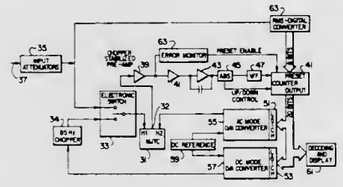
4,786,858
LIQUID CRYSTAL ELECTROSTATIC VOLTMETER
Werner E. Haas, Webster, and John R. Andrews, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 18, 1986, Ser. No. 943,236
Int. Cl.[4] G01R *23/16*; G02F *1/03*
U.S. Cl. 324—96 **14 Claims**



7. A voltage sensor for sensing voltage on a charged surface, comprising:
first and second liquid crystal cells, said liquid crystal cells comprising a high impedance electro-optic material;
said first liquid crystal cell electrically connected to a charged surface having a voltage to be measured;
said second liquid crystal cell electrically connected to a reference voltage;
said first and second liquid crystal cells each provided with a light source for directing light through said liquid crystal cell, and a light detector for detecting light passed through said liquid crystal cell and providing a detector output signal indicative of detected light intensity;
comparison means for comparing said detector output signals from each said light detector, and providing a comparison signal representative thereof as a corrected output signal; and
charging means for controllably directing a series of voltage pulses to said liquid crystal cells to periodically charge said liquid crystal cells to a selected bias condition.

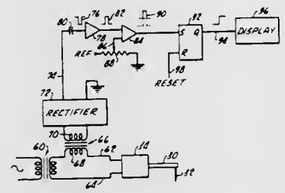
4,786,859
RMS MEASURING APPARATUS FOR AC/DC VOLTAGES
Rejean Arseneau, Orleans, and John J. Zelle, Gloucester, both of Canada, assignors to Canadian Patents and Development Ltd., Ottawa, Canada
Filed May 29, 1987, Ser. No. 55,553
Claims priority, application Canada, Jun. 2, 1986, 510602
Int. Cl.[4] G01R *17/06, 19/03*
U.S. Cl. 324—98 **7 Claims**

1. An apparatus for automatically measuring the true RMS value of an input signal, comprising:
a thermal converter means having a first heater, a second heater and a converter output terminal,
an attenuator means for receiving the input signal and producing an attenuated input signal,
an electronic switch means connected between the attenuator means and the first heater,
an integrating means connected to the output terminal for amplifying and integrating a converter output signal from the converter output terminal,
a counter means connected to the integrating means for producing a counter output in response to the converter output signal,
a first latch means connected between the counter means and the second heater for applying a first latch output to the second heater in response to the counter output,
a second latch means connected to the counter means for producing, in response to the counter output, a second latch output,
a chopper means connected between the second latch means and the electronic switch means for applying a chopper output to the electronic switch means in response to the second latch output, and
a display means connected to the counter means, in that:



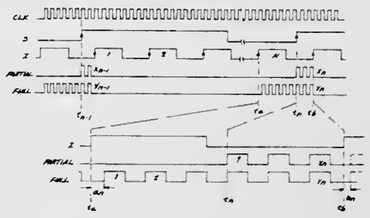
the said electronic switch means alternately applies the attenuated input signal and the chopper output to the first heater;
the first latch means latches the first latch output when the converter output signal indicates that the attenuated input signal and the first latch output are balanced;
the second latch means latches the second latch output when the converter output signal indicates that the chopper output and the first latch output are balanced; and
the display means displays the counter output which is indicative of the true RMS value of the input signal when the second latch means is latched.

4,786,860
MISSING WIRE DETECTOR
Robert Zimmerman, Naperville, Ill., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Apr. 8, 1987, Ser. No. 35,849
Int. Cl.[4] G01N *3/30*
U.S. Cl. 324—65 R **16 Claims**



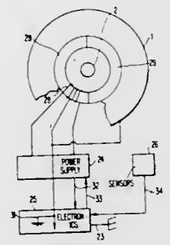
1. For use in a wire bonder wherein a bonding tool is moved relative to the wire and away from a prior bond to feed fresh wire to the tool, and wherein the wire is then pulled to break it at said prior bond, a method of detecting lost wire comprising the steps of:
moving the wire relative to the prior bond in a breaking step, thereby tending to exert a breaking force on the wire to break the wire, and
detecting the loss of the wire by monitoring the force exerted on the wire during said breaking step.

4,786,861
FREQUENCY COUNTING APPARATUS AND METHOD
Rand H. Hulsing, II, Redmond, and Charles K. Lee, Seattle, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.
Filed Sep. 1, 1987, Ser. No. 91,977
Int. Cl.[4] G01R *23/02*
U.S. Cl. 324—78 R **30 Claims**



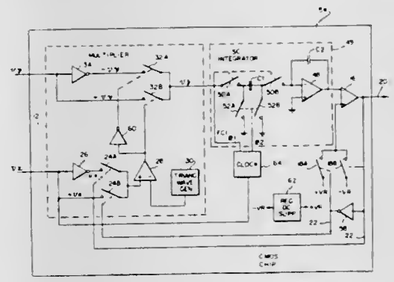
1. A device for determining the phase of a periodic reference signal at a predetermined time, the device comprising:
charge storage means;
current source means;
first switch means connected between the current source means and a reference potential;
second switch means connected between the current source means and the charge storage means; and
control means connected to receive the reference signal and a signal representing the predetermined time, the control means including means for sensing a periodic characteristic of the reference signal, means for causing the current source means to be disconnected from the reference potential at the predetermined time, means for causing the current source means to be disconnected from the charge storage means upon the occurrence of said characteristic after the predetermined time, and means for measuring the voltage on the charge storage means after the occurrence of said characteristic and for producing therefrom a phase signal a_n representing the phase of the reference signal at the predetermined time.

4,786,862
WATCHDOG CIRCUIT FOR TRANSMISSION LINE SENSOR MODULE
Richard L. Sieron, Fairfield, Conn., assignor to Niagara Mohawk Power Corporation, Syracuse, N.Y.
Filed Jun. 9, 1986, Ser. No. 872,011
Int. Cl.[4] G01R *15/04*; G06F *11/00*
U.S. Cl. 324—126 **9 Claims**



1. A device for monitoring at least one parameter of a power transmission line for transmitting alternating current comprising:
means for sensing values of said parameters;
means coupled to said sensing means for processing said values;
memory means coupled to said processing means for storing said processed values;
means for deriving energy from said transmission line for powering said device;
means coupled to said means for deriving energy from said transmission line for converting alternating current into direct current;
means coupled to said means for converting for supplying power to said processing means and said memory means;
means for controlling said means for supplying power to said processing means and said memory means;
said means for controlling including means for receiving a periodic signal indicating normal device operation and being responsive to said periodic signal for continuously enabling said means for supplying power to supply power to said processing means and said memory means; and
said means for controlling further including means responsive to sustained absence of said periodic signal indicating abnormal device operation for disabling said means for supplying power to said processing means and said memory means for a fixed time period and for subsequently enabling said means for supplying power to said processing means and said memory means; whereby
said processing means and said memory means are powered down and subsequently powered up following an indication of abnormal device operation.

4,786,863
SOLID STATE WATTHOUR METER WITH SWITCHED-CAPACITOR INTEGRATION
Miran Milkovic, Schenectady, N.Y., assignor to General Electric Co.
Continuation of Ser. No. 812,369, Dec. 23, 1985. This application May 15, 1987, Ser. No. 50,628
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] G01R *19/06, 19/00*
U.S. Cl. 324—142 **3 Claims**



1. A solid state watthour meter comprising:
means for producting a product signal responsive to an analog voltage related to one of a load voltage and a current, said product signal being pulse-width modulated in relation to the other of said load voltage and current;
a first capacitor;
means for charging said first capacitor to said analog voltage whereby said first capacitor contains a charge related to an instantaneous value of said analog voltage;
means for disconnecting said first capacitor from said analog voltage whereby said charge remains in said first capacitor;
a second capacitor
means for adding said charge to said second capacitor;
means for cycling through said means for charging, means

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for disconnecting and means for adding at a predetermined fixed frequency which is high with respect to a frequency of said pulse-width modulated product signal, whereby a rate of increase of charge in said second capacitor is proportional to a ratio of capacitances of said second and first capacitors and said predetermined fixed frequency;

a hysteresis comparator responsive to a charge in said second capacitor and effective for changing its output between first and second different voltages upon said charge in said second capacitor attaining first and second different values, respectively; and

said means for producing a product signal including means responsive to said first voltage for producing a product signal producing integration in a first direction and responsive to said second voltage for producing integration in a second direction.

4,786,864

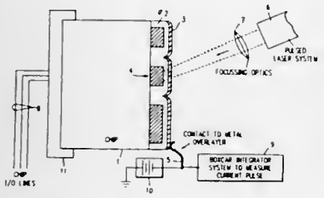
PHOTON ASSISTED TUNNELING TESTING OF PASSIVATED INTEGRATED CIRCUITS

Johannes G. Beha, Wadenswil, Switzerland; Russell W. Dreyfus, Mt. Kisco, N.Y.; Allan M. Hartstein, Chappaqua, N.Y., and Gary W. Rubloff, Katonah, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 717,409, Mar. 29, 1985, Pat. No. 4,644,264. This application Nov. 18, 1986, Ser. No. 932,128

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—158 R **5 Claims**



1. An integrated circuit process intermediate chip-to-test having enhanced susceptibility to non-contact dynamic photon assisted tunneling testing, having a multiplicity of operational circuits of which a testable plurality of such circuits are arrayed on a surface under a passivation layer comprising:

a plurality of conductive test sites associated with such circuits, at identifiable locations accessible by photons, and

a transparent conductive overlayer disposed on said passivation layer, said overlayer comprising test output connecting means, whereby when such chip-to-test is mounted for exercise in a test operational mode to generate operational parameters at the test sites, the test sites are photon accessed during exerices, and photon assisted tunneling values related to the operational parameters are measured from said transparent conductive overlayer.

4,786,865

METHOD AND APPARATUS FOR TESTING INTEGRATED CIRCUIT SUSCEPTIBILITY TO COSMIC RAYS

Itsu Arimura, Mercer Island, and Arthur C. Day, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 3, 1986, Ser. No. 835,347

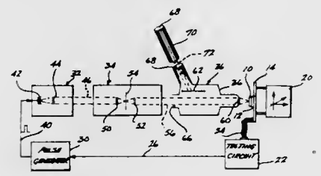
Int. Cl.⁴ G01R *31/26;* **G01N** *23/225*

U.S. Cl. 324—158 R **15 Claims**

1. An apparatus for testing the susceptibility of an integrated circuit to single event upsets caused by high energy heavy ions, comprising:

positioning means for mounting the integrated circuit at a selected position;

source means for generating a pulse of light having sufficient power to simulate the effect on the integrated circuit that would be caused by impact of high energy heavy ions;



optical means for focusing the pulse of light produced by the source means at a target position on the integrated circuit mounted by the positioning means; and,

electronic testing means for operating the integrated circuit and monitoring the integrated circuit to determine whether a single event upset has been caused by the pulse of light.

4,786,866

METHOD AND APPARATUS FOR POWER STEERING

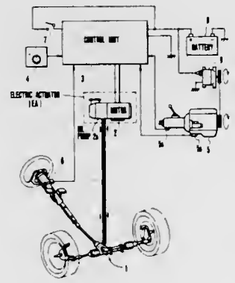
Hideo Yabe, Hiki, and Ichiro Koike, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,640

Claims priority, application Japan, Jul. 11, 1983, 58-125926

Int. Cl.⁴ B62D *5/04*

U.S. Cl. 324—158 MG **14 Claims**



1. A method of confirming an operating condition of a power steering device for use in an engine powered motor car having a starter motor, said power steering device being of the type including a steering mechanism driven by an electric actuator, the method comprising the steps of:

supplying a test current to said electric actuator after the engine has started and the starter motor is disengaged;

confirming whether the power steering device operates normally or not in accordance with a state variation of said power steering device caused by said test current, said state variation being a variation in electric current flowing through said electric actuator; and

stopping generation of said test current when said state variation is normal and when normal operation of said power steering device is commenced.

4,786,867

WAFER PROBER

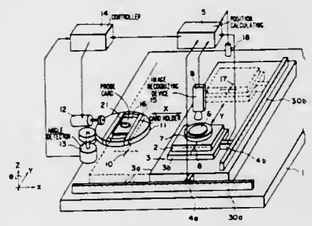
Yasuyoshi Yamatsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1987, Ser. No. 91,907

Claims priority, application Japan, Sep. 2, 1986, 61-205146

Int. Cl.⁴ C01R *1/06;* **H04N** *7/00;* **H01L** *21/66*

U.S. Cl. 324—158 F **8 Claims**



1. A wafer prober usable with a probe card having probing needles and a wafer having chips formed thereon, comprising:

pressing means for pressing the probing needles relative to a non-chip portion of the wafer in which portion no chip is formed, so that traces of tips of the probing needles are formed on the non-chip portion of the wafer;

detecting means for detecting the positional relation between electrode pads of a chip on the wafer and the traces of the needle tips formed on the nonchip portion of the wafer; and

control means for controlling the positional relation between the electrode pads and the probing needles on the basis of the detection by said detecting means.

4,786,868

SPEED CONTROL UNIT

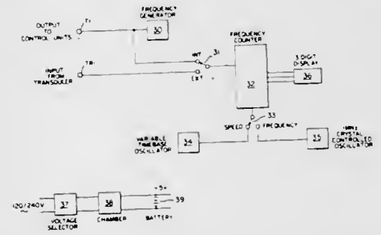
Eric L. Nield, Stalybridge, England, assignor to Romatic Limited, Saltford, England

Filed Sep. 5, 1986, Ser. No. 904,120

Claims priority, application United Kingdom, Sep. 7, 1985, 8522274

Int. Cl.⁴ G01P *3/56*

U.S. Cl. 324—161 **11 Claims**



2. In combination with a vehicle speed measuring sensor (**16**) and a speed control circuit to which the sensor is connected for establishing a selected vehicle speed, means connected to the speed control circuit for calibration thereof during travel of the vehicle at a predetermined speed lower than said selected vehicle speed, including: a pair of signal generators (**34, 35**) respectively generating signals at a fixed frequency and a variable frequency, a frequency counter (**32**) having a calibration input, means (**33**) for selectively connecting either one of the signal generators to the calibration input of the frequency counter, means (**31**) selectively connecting said sensor to the frequency counter for measurement of signal frequency at said predetermined speed simultaneously with said fixed frequency of the signal generated by one of the signal generators (**35**) being selectively connected to said calibration input, display means (**36**) coupled to the frequency counter for displaying said signal frequency of the sensor at said predetermined speed relative to said fixed frequency, means for adjusting the variable frequency of the other of the signal generators (**34**) while connected to the frequency counter independently of the sensor to produce a calibration frequency as a function of the displayed signal frequency corresponding to a desired readout related to the selected vehicle speed and frequency adjustable means (**30**) being connected to the speed control circuit for transmitting thereto a test signal at said calibration frequency corresponding to the desired readout.

4,786,869

TONER LEVEL SENSOR

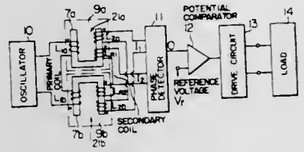
Kenichi Kanai, and Osamu Shimoe, both of Kumagaya, Japan, assignors to Hitachi Metals Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 589,116, Mar. 2, 1984, abandoned. This application Nov. 5, 1986, Ser. No. 927,137

Claims priority, application Japan, Jul. 12, 1982, 57-120781; PCT Int'l Appl., Jul. 12, 1983, JP83/00222

Int. Cl.⁴ G01B *7/06*

U.S. Cl. 324—207 **4 Claims**



1. A toner level sensor for detecting magnetic toner level in a developing unit, comprising:

at least first and second magnetic circuits each having magnetic gaps, the coupling coefficient of one of said first and second magnetic circuits being set at a predetermined value equivalent to the coupling coefficient exhibited when the toner level lies within a predetermined range, the coupling coefficient of the other of said first and second magnetic circuits varying in proportion to the toner level;

coil members wound about each of said first and second magnetic circuits for providing a differential output from said first and second magnetic circuits;

means coupled to said first and second magnetic circuits for providing a reference A.C. signal; and

phase detector means for comparing the phases of the differential output and the reference A.C. signal, and for providing an output indicative of the phase comparison as an indication of toner level.

4,786,870

MAGNETIC SENSOR FOR MAGNETICALLY DETECTING THE POSITION OF A MOVABLE BODY

Syooichi Kawamata; Tadashi Takahashi, and Kunio Miyashita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 8, 1986, Ser. No. 916,699

Claims priority, application Japan, Oct. 9, 1985, 60-223567

Int. Cl.⁴ G01B *7/28*

U.S. Cl. 324—208 **14 Claims**

1. An apparatus for magnetically detecting the position of a movable body, comprising:

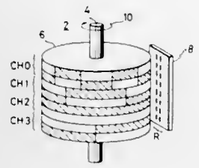
a magnetic recording medium provided on one of a moving part coupled to the movable body for movement therewith and a fixed part facing the moving part, the magnetic recording medium having a recording portion divided

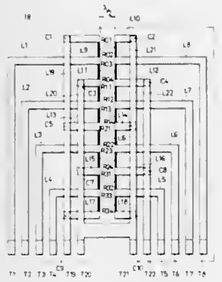
VOL 1096 ISS 4 NO 22 1988 UMI

into a plurality of channels extending in the direction of movement of the moving part, each of the channels including a pair of tracks having magnetic signals recorded thereon at predetermined intervals so that the magnetic signals on one of the pair of tracks are shifted by a distance equal to the predetermined interval from the magnetic signals recorded on the other of the pair of tracks;

a magnetic sensor provided on the other of the moving part and the fixed part and having magneto resistive elements arranged to face the channels of the magnetic recording medium with a predetermined air gap therebetween so as to detect the magnetic signals recorded on the corresponding channels, the magnetic sensor providing an output signal indicative of the position of the movable body;

the magnetic sensor further including a base plate of insulating material having magnetoresistive elements arranged thereon so that the magnetoresistive elements facing each channel include a first set of two magnetoresistive elements and a second set of two magnetoresistive elements, a first element of the first set of two magnetoresistive





elements being disposed for facing one of the pair of tracks of a respective channel and the second element of the first set of two magnetoresistive elements being disposed for facing the other of the pair of tracks of the respective channel, a first element of the second set of two magneto resistive elements being disposed for facing the one track of the pair of tracks of the respective channel at a position spaced by a predetermined distance from the first element of the first set of the magnetoresistive elements, the second element of the second set of two magnetoresistive elements being disposed for facing the other of the pair of tracks of the respective channel at a position spaced by the predetermined distance from the second element of the first set of the magnetoresistive elements;

the first and second elements of the first and second sets of two magnetoresistive elements being connected as a bridge circuit for producing an output signal in accordance with the magnetic signals recorded on the respective channel; and

the first and second elements of the first and second sets of the magnetoresistive elements being formed as one body on the base plate so that the first and second elements of the first and second sets of the magnetoresistive elements are coupled with each other at adjacent ends thereof, the coupled adjacent ends of the first and second sets of the magnetoresistive elements being connected to one of a first group of terminals provided on an edge of the base plate of the magnetic sensor for connecting the magnetoresistive elements with an external circuit for supplying the magnetoresistive elements with source voltage and a second group of terminals for deriving output voltages from the bridge circuit connected magnetoresistive elements, and nonadjacent ends of the first and second elements of the first and second sets of magnetoresistive elements which are opposite to the coupled ends of the magnetoresistive elements being connected to the other of the first and second group of terminals.

4,786,871

NMR IMAGING METHOD AND APPARATUS

Kazuya Hoshino, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00545, § 371 Date Jun. 23, 1987, § 102(e) Date Jun. 23, 1987, PCT Pub. No. WO87/02568, PCT Pub. Date May 7, 1987

PCT Filed Oct. 29, 1986, Ser. No. 65,358

Claims priority, application Japan, Oct. 30, 1985, 60-243598

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **2 Claims**



1. In an NMR imaging method wherein à static magnetic field, gradient magnetic fields in x-, y- and z- directions and a radio-frequency electromagnetic wave are applied to an object of inspection to measure an NMR signal from the object, and a cross-sectional image of the object is reconstructed on the basis of the NM signal; the improvement comprising the steps of

measuring a projection with respect to a desired cross-section of the object in each of a plurality of directions along said desired cross-section;

obtaining a direction in which the width of the measured projection is the smallest;

obtaining a warp step from said smallest width of the measured projection; and

measuring the NMR signal from the object on the basis of the Fourier transformation method so that a direction which is perpendicular to the obtained direction is defined as the direction of the coordinate axis of the spin warp.

4,786,872

NMR IMAGING METHOD AND APPARATUS

Kazuya Hoshino, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

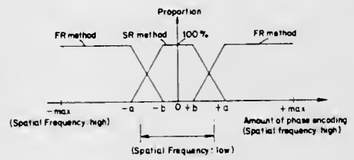
PCT No. PCT/JP86/00546, § 371 Date Jun. 23, 1987, § 102(e) Date Jun. 23, 1987, PCT Pub. No. WO87/02569, PCT Pub. Date May 7, 1987

PCT Filed Oct. 29, 1986, Ser. No. 65,359

Claims priority, application Japan, Oct. 31, 1985, 60-244820

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **8 Claims**



1. In an NMR imaging method wherein a static magnetic field, gradient magnetic fields in x-, y- and z- directions and a radio-frequency electromagnetic wave are applied to an object of inspection, an NMR signal from the object is measured by the Fourier transformation method with the amount of warp of spins varied for each view, and a cross-sectional image of the object is reconstructed on the basis of the NMR signal,

the improvement which comprises

measuring the NMR signal with the SR or IR method for low spatial frequency;

measuring the NMR signal with the FR method so as to be shorter in time than the SR or IR method for high spatial frequency; and

reconstructing a cross-sectional view of the object on the basis of the data synthesized from the data obtained by these measurements.

4,786,873

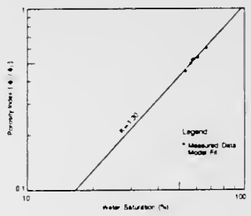
METHOD FOR EVALUATING WATER SATURATION IN PETROLEUM RESERVOIRS FROM DIELECTRIC PERMITTIVITY

Michael M. Sherman, Broken Arrow, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Jun. 6, 1986, Ser. No. 871,730

Int. Cl.[4] G01V *3/38, 3/18*

U.S. Cl. 324—323 **7 Claims**



1. A method for determining the water saturation of a porous hydrocarbon and water-bearing earth formation, said process comprising the steps of:

obtaining a first formation parameter, ϕ_c, which is based upon dielectric permittivity data and represents a measure of water-filled porosity of said formation and which takes into account the geometrical distribution of rock and water in said earth formation;

obtaining a second formation parameter, ϕ_t, which is based upon the total porosity of the rock containing both water and hydrocarbon in said formation; and

determining a value for water saturation, S_w, of said earth formation having improved accuracy and reliability by functionally relating said first formation parameter to said second formation parameter by a functional third formation parameter, k, according to the equation $S_w=[\phi_c/\phi_t]1/k$.

4,786,874

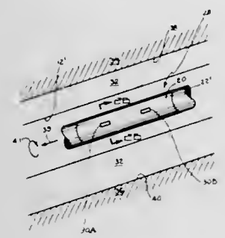
RESISTIVITY SENSOR FOR GENERATING ASYMMETRICAL CURRENT FIELD AND METHOD OF USING THE SAME

Donald S. Grosso, West Hartford, and Allen Duckworth, Middlefield, both of Conn., assignors to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Aug. 20, 1986, Ser. No. 898,409

Int. Cl.[4] G01V *3/20;* **E21B** *47/02*

U.S. Cl. 324—369 **18 Claims**



1. A method of determining the existence and location of substantially horizontal strata boundary in a geological strata while drilling boreholes therein with a drill string segment having a longitudinal axis, said drill string segment including a focussed formation resistivity sensor, comprising the steps of:

generating a current field which is asymmetric with respect to the longitudinal axis of the drill string segment, the asymmetric current field being generated by the focussed formation resistivity sensor;

sensing the presence of a substantially horizontal strata boundary by analyzing measurements of formation resistance determined by said asymmetric current field generated by said focussed formation resistivity sensor;

sensing the location of said substantially horizontal strata boundary relative to said drill string by means of analyzing said measurements taken from said focussed formation resistivity sensor; and

maintaining said drill string within said substantially horizontal strata during the drilling of a borehole in response to the sensed presence and location of the substantially horizontal strata boundary.

4,786,875

CONDUCTIVITY MEASURING CIRCUIT

Kenneth B. Carll, Bridgeton, N.J., assignor to General Signal Corporation, Stamford, Conn.

Filed Jul. 22, 1986, Ser. No. 889,033

Int. Cl.[4] G01N *27/42, 27/02*

U.S. Cl. 324—444 **16 Claims**

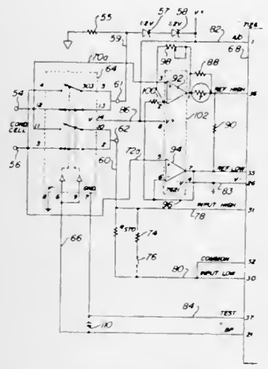
15. A circuit for measuring the conductivity of a solution, comprising:

electrode terminal means for receiving a pair of electrodes immersed in said solution;

means connecting a source of known ac current across said electrode terminal means;

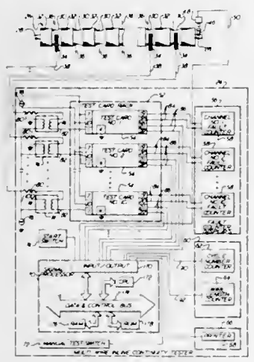
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a dual slope analog-to-digital converter of the integrated circuit type having a conversion cycle including a signal input integration phase and a reference integration phase, said converter including signal input terminals for receiving the signal to be converted, a clock for controlling said



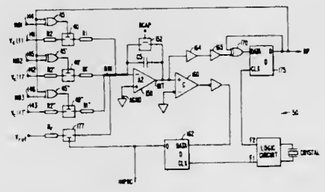
phases of converter operation, and a capacitor for sampling the signal input in synchronism with said clock;
means for connecting said signal input terminals to receive as the input for conversion the voltage drop across said electrode terminal means due to said ac current; and
means for synchronizing said ac current to said clock.

4,786,876
CONTINUITY TEST METHOD AND TEST CARD CIRCUIT
Randall C. Graham, Nashville, Tenn., assignor to Essex Group, Inc., Fort Wayne, Ind.
Filed May 30, 1986, Ser. No. 868,968
The portion of tbe term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] G01R *31/12*
U.S. Cl. 324—551 **7 Claims**



1. A method for testing the insulation of a wire, comprising the steps of:
grounding the wire;
pulling the wire, under tension, over a rotating metal roller;
energizing the roller with a high voltage signal so as to cause a current to flow through the insulation and the wire;
providing said current to a modular circuit board having a sensing circuit responsive thereto for generating a sensing voltage having a magnitude proportional to the magnitude of said current;
providing a low voltage AC input signal to said board;
providing, on said board, a regulated DC voltage signal in response to said low voltage AC input signal;
providing, on said board, a reference voltage signal at a magnitude proportional to the magnitude of said regulated DC voltage;
comparing, on said board, the magnitude of said sensing voltage to said reference voltage signal; and
providing, on said board, a fault signal in the presence of a comparison of the magnitudes of said sensing and reference signals indicative of a fault condition.

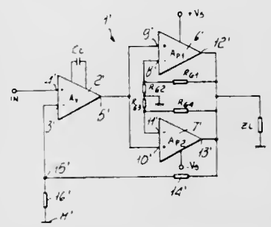
4,786,877
AMPLIFIER FOR VOLTAGE OR CURRENT TO FREQUENCY CONVERTER
Robert A. Leydier, Mountain View, Calif., assignor to Sangamo-Weston Incorporated, Norcross, Ga.
Filed Jun. 25, 1987, Ser. No. 66,793
Int. Cl.[4] H03F *1/02, 3/16*
U.S. Cl. 330—9 **14 Claims**



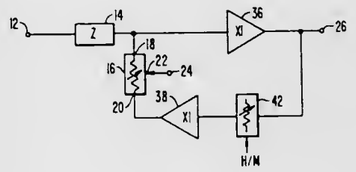
3. An amplifier comprising:
a master amplifier having a first terminal connected to an input node, a second terminal connected to first charge storage means, and a first output terminal;
a load connected to the first output terminal;
a master differential pair of transistors connected to the load, the input node, and to the first output terminal;
control means for controlling the load in response to a potential across the first charge storage means, the control means being connected to the load and to the first charge storage means; and
a slave amplifier having a first terminal connected to the input node, a second terminal connected to second charge storage means, and a second output terminal switchably connectable to one of the first and second charge storage means.

4,786,878
LOW-FREQUENCY POWER AMPLIFIER, IN PARTICULAR OF THE INTEGRATED TYPE
Edoardo Botti, Mortara, Italy, assignor to SGS Microelettronica S.p.A., Catania, Italy
Filed Feb. 17, 1987, Ser. No. 15,655
Claims priority, application Italy, Feb. 19, 1986, 19453 A/86
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—84 **4 Claims**

1. A low-frequency power amplifier, in particular of the integrated type, comprising:
an input amplifying stage having an input stage input and an input stage output, said input stage input receiving an input signal,
a first and a second power amplifying stages, each said power amplifying stage including a power amplifier means and a feedback block, each said power amplifier means having power amplifier inputs and a power amplifier output, said power amplifier first inputs being connected together and to said input stage output, said power amplifier outputs being connected together, each said feedback block having first and second terminals, said first terminal of each feedback block being connected to a respective one of said power amplifier outputs and said second terminal of each feedback block being connected to a respective one of said power amplifier second inputs, with each said power amplifying means having a power amplifier transfer function, each said feedback block having a feedback transfer function and each said power amplifying stage having a loop gain, a closed loop gain and a phase shift, with said loop gain of each said power amplifying stage being defined as the product of said power amplifier transfer function and said feedback transfer function, with said closed loop gain of each said power amplifying stage being greater than 0 dB, wherein, at the frequencies at which said phase shift is greater than 180°, said loop gain is less than 0 dB.

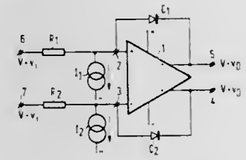


4,786,879
ATTENUATOR CIRCUIT EMPLOYING BOOTSTRAPPING
Ray M. Dolby, 3340 Jackson St., San Francisco, Calif. 94118
Continuation-in-part of Ser. No. 835,245, Mar. 3, 1986, abandoned. This application Feb. 25, 1987, Ser. No. 14,620
Int. Cl.[4] H03F *1/26;* H03G *7/00*
U.S. Cl. 330—145 **25 Claims**



1. A circuit for attenuating signals comprising:
a circuit element having a variable impedance for attenuating an input signal to obtain an attenuated output signal, said element having a first and second terminal and a control terminal, said input signal applied to the first terminal, wherein the impedance between the first and second terminals varies as a predetermined function of a first control signal applied to the control terminal when the voltage difference across the first and second terminals is less than a predetermined value;
means for deriving a bootstrapping second control signal from the signal at a point in the circuit, said bootstrapping control signal for indicating a signal condition which causes the voltage across the first and second terminals to exceed said predetermined value, causing distortion in the output signal; and
bootstrapping means responsive to the bootstrapping control signal for applying to the second terminal a fraction of the voltage at the first terminal when the bootstrapping control signal indicates said signal condition to reduce the voltage difference between the first and second terminals, where said fraction is of such magnitude that the voltage difference across the first and second terminals does not exceed the predetermined value.

4,786,880
FILTER ARRANGEMENT
Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 31, 1987, Ser. No. 33,140
Claims priority, application Netherlands, Nov. 14, 1986, 8602893
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—294 **9 Claims**



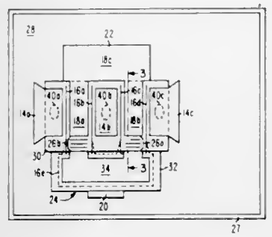
1. A filter arrangement comprising a balanced amplifier having an inverting input, a non-inverting input, an inverting output and a non-inverting output, at least a first input circuit arranged between a first input terminal and the inverting input, at least a second input circuit arranged between a second input terminal and the non-inverting input, a first feedback circuit arranged between the non-inverting output and the inverting input, and a second feedback circuit arranged between the inverting output and the non-inverting input, said first and second input circuits each comprising a substantially identical first circuit element and said first and second feedback circuits each comprising a substantially identical second circuit element, one of said two circuit elements being a capacitor and the other circuit element being a resistor, the magnitude of at least one of said two circuit elements being adjustable, characterized in that one circuit element comprises a junction capacitor and further comprising a bias-current source connected to the inverting input and to the non-inverting input for adjusting the capacitance of the junction capacitor connected to the relevant input.

4,786,881
AMPLIFIER WITH INTEGRATED FEEDBACK NETWORK
Murat Eron, South Brunswick Township, Middlesex County, N.J., and Henrik F. Ebbesen, Valkenburg, Netherlands, assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 27, 1987, Ser. No. 89,806
Int. Cl.[4] H03F *1/34*
U.S. Cl. 330—307 **9 Claims**

1. An amplifier comprising:
a semi-insulating substrate;
a conducting mesa overlying said substrate;
a transistor disposed on said substrate and having a control electrode including a pad, a grounded common electrode and at least one output electrode;
a capacitor comprising said control electrode pad as a first plate, a dielectric overlying said control electrode pad, and a second plate overlying said dielectric; and

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at least one floating gate resistor connecting said output electrode and said second plate and comprising at least



one conducting strip disposed on said mesa and forming a Schottky barrier therewith.

4,786,882

QUADRIPHASE PHASE MODULATION SYSTEM

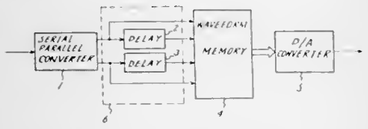
Shin'Ichi Koike, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,470

Claims priority, application Japan, Oct. 26, 1985, 60-238605

Int. Cl.[4] H03C *3/00*

U.S. Cl. 332—16 R **4 Claims**



1. A quadriphase phase modulation system, comprising:

serial to parallel converter means for converting first symbols, each comprised of two-bit serial data, into second symbols comprised of two-bit parallel data;

means for generating waveform information in response to said second symbols;

memory means for storing basic waveforms and connecting waveforms, said connecting waveforms being designed to smooth connections between and eliminate phase discontinuity at junctions of adjoining symbols, and for reading out said basic waveforms and said connecting waveforms in response to said waveform information, each said basic waveform being selected on the basis of the most recently generated waveform information, and said connecting waveform being selected on the basis of said most recently generated waveform information and the immediately preceding waveform information; and

a digital to analog converter means for converting the basic and connecting waveforms output by said memory means into analog signals.

4,786,883

TRANSFORMATION DEVICE FOR CONNECTING WAVEGUIDES

Georg Spinner, Am Eichberg 12, 8152 Fledkirchen-Westerham, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 96,078

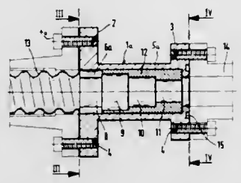
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631981

Int. Cl.[4] H01P *1/16, 5/08*

U.S. Cl. 333—21 R **14 Claims**

1. A transformation device for connecting waveguides of different cross section, comprising:

a waveguide element defining an axis and having an axial length corresponding to at least two transforming sections, said waveguide element including two recesses extending symmetrical to each other in axial direction over the entire axial length of said transforming sections of said waveguide element, and insulating means including insulating rings of varying inner diameter, said insulating



rings being successively inserted in said recesses in such a manner that one of said transforming sections adjoining the connection plane with one of the waveguides is defined by said recesses while subsequent transforming sections are defined by said insulating rings.

4,786,884

ADAPTIVE TRANSVERSAL FILTER

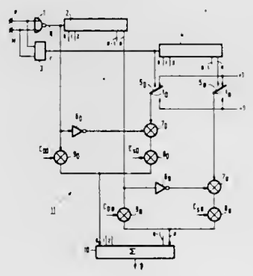
Kornelis J. Wouda, and Simon J. M. Tol, both of Eindhoven, Netherlands, assignors to AT&T Philips Telecommunications B.V., Hilversum, Netherlands

Filed Mar. 20, 1987, Ser. No. 28,631

Claims priority, application Netherlands, Mar. 28, 1986, 8600816

Int. Cl.[4] H03H *15/00*

U.S. Cl. 333—166 **5 Claims**



1. An adaptive transversal filter having an input for receiving a time-discrete input signal which is representative of three signal levels constituting a central signal level and two extreme signal levels, first and second delay means responsive to said signal levels applied to said input for producing delayed versions of each time-discrete input signal, first and second coefficient registers each containing respective coefficients for the non-delayed and each delayed version of the input signal, individual coefficients in said first and second registers being respectively associated with signals in said first and second delay means; means responsive to said registers and to said first and second delay means for multiplying one of the coefficients by the associated version of the input signal, and means for adding together all the multiplying results obtained to provide a cancellation signal, characterized in that the first delay means contains M delayed versions of each time-discrete signal and the first coefficient register contains $M+1$ coefficients, that the second delay means contains N delayed versions of each time-discrete signal and the second coefficient register contains $N+1$ coefficients, wherein $M \leqq N$ and that when information representing the central signal level is applied to the first delay means, that information representing one or the other extreme signal level is correspondingly applied to the second delay means, in addition means being provided for only applying multiplication results obtained with the air of the first delay means to said adding means when the information present which signals the presence of the central signal level is applied to the first delay means.

4,786,885

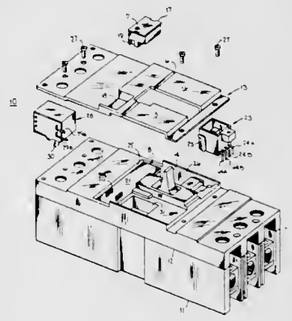
MOLDED CASE CIRCUIT BREAKER SHUNT TRIP UNIT

Robert A. Morris, Burlington; Paul T. Rajotte, Plainville, and Alan J. Messerli, Bristol, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,867

Int. Cl.[4] H01H *9/02, 13/04*

U.S. Cl. 335—202 **15 Claims**



1. A molded case circuit breaker and shunt trip unit comprising:

a circuit breaker case and cover;

an operating mechanism within said case and arranged for separating a pair of contacts connecting between line and load terminals arranged on said case;

an accessory cover mounted on said circuit breaker cover;

a shunt trip coil within a recess in said circuit breaker cover and arranged for interacting with said operating mechanism to separate said contacts upon receipt of an electric signal;

an electric switch and circuit within an enclosure contained in a separate recess within said circuit breaker cover and accessible through said accessory cover;

an operating lever within said enclosure and extending within said circuit breaker case, said operating lever being arranged against a plunger on said switch when said contacts are closed and being away from said switch when said contacts are open, said electric signal being transmitted to said coil when said operating lever is against said plunger and said electric signal being interrupted to said coil when said lever is away from plunger.

4,786,886

FORCED-COOLED SUPERCONDUCTOR

Eisuke Tada; Hiroshi Tsuji; Takashi Kato; Tadao Hiyama, and Susumu Shimamoto, all of Ibaraki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 6, 1987, Ser. No. 23,106

Int. Cl.[4] H01F *7/22*

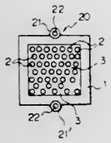
U.S. Cl. 335—216 **5 Claims**

1. A forced-cooled superconductor comprising:

a conduit;

a pack including a plurality of superconducting strands disposed in spaced relationship within said conduit, said superconducting strands defining spaces therebetween for passing coolant through the spaces for cooling said superconducting strands and said conduit; and

an additional separate cooling channel in heat exchange relationship with at least one of said conduit and said pack



of said plurality of superconducting strands for cooling said conduit and said pack of said plurality of superconducting strands in addition to the cooling spaces defined by said plurality of superconducting strands.

4,786,887

THIN-FILM STRAIN GAUGE SYSTEM AND METHOD OF MANUFACTURING SAME

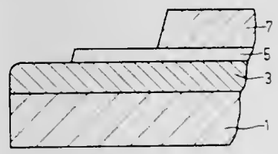
Udo Bringmann, Halstenbek; Olaf H. Dössel, Ellerau; Klaus W. Gerstenberg, Halstenbek; Gerbard Kürsten, Hamburg; Reiner U. Orlowski, Quickborn, and Detlef G. Schön, Halstenbek, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 694,723, Jan. 25, 1985, abandoned. This application Jul. 30, 1987, Ser. No. 80,183

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1984, 3403042

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—2 **16 Claims**



1. A thin-film strain gauge system comprising an elastically deformable flexible substrate, an insulating layer present on a surface of said substrate, a resistance layer on the surface of said insulating layer away from said substrate and a patterned electrically conductive layer on the surface of said resistance layer characterized in that the insulating layer consists of a plasma polymerized material.

4,786,888

THERMISTOR AND METHOD OF PRODUCING THE SAME

Yasunobu Yoneda; Michihiro Murata; Harufumi Mandai; Yukio Sakabe, and Yukio Banba, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Sep. 25, 1987, Ser. No. 100,861

Claims priority, application Japan, Sep. 20, 1986, 61-222958; May 13, 1987, 62-116594; Jun. 23, 1987, 62-157119

Int. Cl.[4] H01C *7/10*

U.S. Cl. 338—22 R **17 Claims**

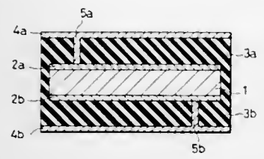
1. A negative temperature coefficient thermistor comprising:

at least one thermistor element layer formed with a pair of internal electrodes;

an insulating ceramic envelope for enclosing said thermistor element layer to be integrated therewith;

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a part of external electrodes provided on the exterior surface of said insulating ceramic envelope as being electrically



connected to corresponding ones of said internal electrodes.

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BATTERY CASING FOR A PAGING RECEIVER

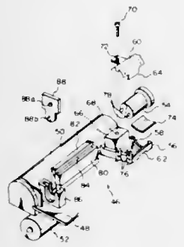
Sigeki Hayasaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 939,976

Claims priority, application Japan, Dec. 10, 1985, 60-189798[U]

Int. Cl.⁴ H04Q *1/30*; G08B *5/22*

U.S. Cl. 340—311.1 **5 Claims**



1. A battery housing structure for a paging receiver which has a function of alerting a person to reception by causing a motor to vibrate a housing of said receiver, comprising:

a battery container for accommodating a battery;

a generally box-like motor receiving portion provided on an outer side periphery of said battery container and having a recess which is complementary in shape to said motor; and

a cover fastened to said motor receiving portion while covering said motor which is placed in said motor receiving portion, thereby fixing said motor to said receiving portion,

said battery container comprising a side wall provided with a projection which extends perpendicular to a printed circuit board which is built in said receiver, said side wall adjoining a ROM and a label which is bonded to a side wall of said ROM and engraved with a function of said receiver and others, such that said label is visible from the outside of said battery container.

4,786,890

METHOD AND APPARATUS FOR IMPLEMENTING A PRML CODE

Brian H. Marcus, Sunnyvale; Arvind M. Patel, and Paul H. Siegel, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 28, 1987, Ser. No. 78,731

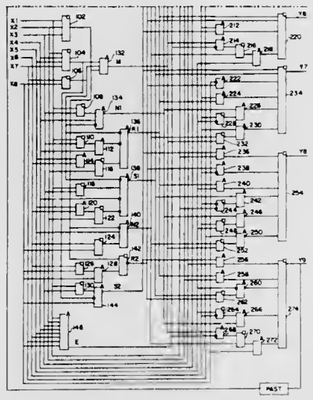
Int. Cl.⁴ H03M *7/00*

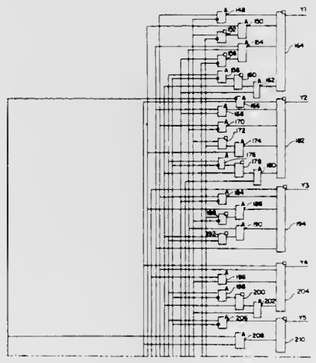
U.S. Cl. 341—81 **7 Claims**

1. Apparatus for encoding a preselectable number of bits of binary data into codewords having a preselectable number of bits, said apparatus comprising:

receiver means for receiving the preselectable number of bits of binary data; and

encoder means, coupled to the receiver means, for producing sequences of codewords each having at least two interleaved odd and even subsequences in response to said bits of binary data;





said sequences of interleaved subsequences having no more than three consecutive zeroes therein; and

said odd and even subsequences each having no more than five consecutive zeroes therein;

said number of bits in the encoded binary data having a ratio of 8/9 to the number of bits in codewords.

4,786,891

ABSOLUTE ENCODER FOR LINEAR OR ANGULAR POSITION MEASUREMENTS

Toshitsugu Ueda; Fusao Kohsaka; Toshio Iino, and Hiroshi Nakayama, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,574

Int. Cl.⁴ H03M *1/22*

U.S. Cl. 341—13 **10 Claims**

1. A encoder of the absolute position type, comprising

a code plate having a first grid pattern wherein items of information, represented by 1 and 0, are disposed periodically, and a second grid pattern wherein items of information, represented by 1 and 0, are disposed periodically at a pitch slightly different from that of the disposition of said first grid pattern;

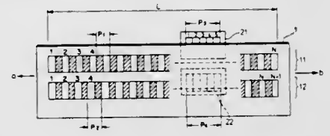
a first and a second sensor array, each comprising a plurality of detecting elements, for respectively detecting said first and second grid patterns and moved in relation to said code plate;

driving means for driving said first and second sensory arrays, said driving means comprising

first and second switching circuits, each comprising a plurality of switches connected to said plurality of detecting elements of said first and second sensory arrays,

a timing circuit for generating clock pulses and an alternating reference signal, and

drive circuit means responsive to said clock pulses for turning ON and OFF said plurality of switches of said first and second switching circuits in a sequence according to a predetermined cycle thereby to transmit signals from said detecting elements;



signal processing means for obtaining alternating output signals from said first and second sensory arrays as switched by said first and second switching circuits in response to operation of said driving means;

phase measuring means responsive to said alternating output signals and said alternating reference signal for measuring difference between phase angles of said alternating output signals and difference between phase angles of said alternating output signals and said reference alternating signal, said phase measuring means comprising a first interval counter for counting said clock pulses in response to a signal from said second switch circuit and for stopping the counting in response to a signal from said first switch circuit, and a second interval counter for counting said clock pulses in response to a signal from said first switch circuit and for stopping the counting in response to a signal from said second switching circuit thereby to enable measurement of the differences of phase angles; and

computation means responsive to said difference of phase angles between said alternating output signals and said difference of phase angles between said alternating output signals and said reference signal for calculating the position using said differences of phase angles.

4,786,892

X-Y DIRECTION INPUT DEVICE HAVING CHANGEABLE ORIENTATION OF INPUT AXES AND SWITCH ACTIVATION

Yoshizo Kubo, Furukawa; Masanori Harada, Kawasaki, and Daisuke Gotoh, Minamikata, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jan. 6, 1987, Ser. No. 728

Claims priority, application Japan, Feb. 22, 1986, 61-23865[U]; Feb. 22, 1986, 61-23866[U]; Feb. 22, 1986, 61-23867[U]; Feb. 22, 1986, 61-23868[U]

Int. Cl.⁴ G09G *1/00*; G05G *9/00*

U.S. Cl. 340—365 R **4 Claims**

1. An X-Y direction input device comprising:

a rotatably mounted ball;

a first follower roller contacting and rotated by said ball on a first rotational axis;

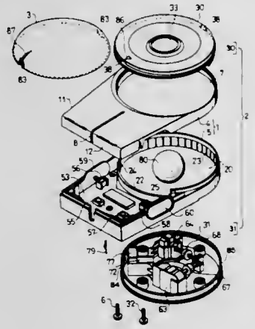
a second follower roiler contacting and rotated by said ball on a second rotational axis perpendicular to the first rotational axis of said first follower roller, wherein the rotation of said first and second follower rollers by said ball on said first and second rotational axes defines an input X-Y plane;

a first rotation detecting means detecting the rotation of said first follower roller;

a second rotation detecting means detecting the rotation of said second follower roller;

a switch board carrying a push switch assembly for processing signals from said first and second rotation detecting means;

a switch activating means for activating said push switch assembly; and



an inner shell means enveloping at least said ball, first and second follower rollers and first and second rotation detecting means, and an outer shell means enveloping at least said switch board and having an external orientation axis in said X-Y plane, said switch activating means being exposed on outer surfaces of said outer shell means, and said inner shell means being rotatably engaged with said outer shell means for rotation relative thereto about an axis perpendicular to said X-Y plane, whereby said first and second axes of said first and second follower rollers can be rotatively changed when desired relative to said external orientation axis of said outer shell means.

4,786,893

METHOD AND APPARATUS FOR GENERATING RGB COLOR SIGNALS FROM COMPOSITE DIGITAL VIDEO SIGNAL

Robin B. Moore, Fremont, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Oct. 7, 1985, Ser. No. 785,220

Int. Cl.⁴ G09G *1/28*

U.S. Cl. 340—703 **21 Claims**

1. A method for converting a bit stream representing color codes of a video signal to separate color control signals comprising the steps of:

determining from changing patterns of bits in said bit stream when a color change is occurring;

examining fields in said bit streams to detect one of a set of predetermined colors;

using the one of said set of predetermined colors for generating said color control signals detected prior to said deter-

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mination of said color change until said color change is complete;



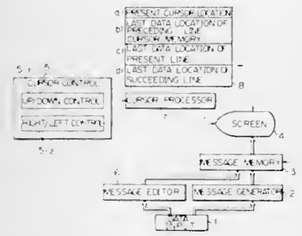
whereby better transition from one color to another color results.

4,786,894

CURSOR CONTROL IN A MESSAGE EDITOR

Mitsuji Furusawa; Osamu Ueno, and Kenji Yamada, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 680,543, Dec. 11, 1984, abandoned. This application Oct. 1, 1987, Ser. No. 105,490
Claims priority, application Japan, Dec. 13, 1983, 58-233631
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—709 **6 Claims**



1. A message editor comprising a keyboard having cursor control key functions, a video display screen, a message memory for storing a message comprised of non-null characters, a cursor memory separate from said message memory and processor means for generating and editing a message, said message editor having cursor control means responsive to actuation of said cursor control key functions for controlling a cursor displayed on said screen, said separate cursor memory having four storage registers comprising:
- a first register for storing the present cursor (i) horizontal and (ii) vertical location,
- a second register for storing the horizontal address of the rightmost non-null character of the present cursor horizontal line,
- a third register for storing the horizontal address of the rightmost non-null character of the adjacent cursor horizontal line above the present horizontal cursor location, and
- a fourth register for storing the horizontal address of the rightmost non-null character of the adjacent cursor horizontal line below the present horizontal cursor location,

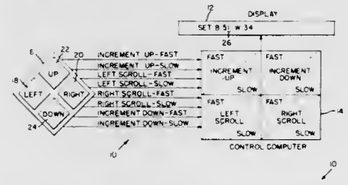
said cursor control means including:
- a comparator for comparing (1) the contents of said first register horizontal location to the contents of said third register upon actuation of a cursor control key function indicating upward cursor movement; and (2) the contents of said first register horizontal location to the contents of said fourth register upon actuation of a cursor control key function indicating downward cursor movement;
- a selector for assigning the contents of said third or said fourth register to said first register horizontal location if the value stored in said first register is less than or equal to that stored in said third or said fourth register;
- an adder for incrementing the value stored in said first register vertical location, and
- means for moving said cursor directly to a screen location according to the values stored in said first register.

4,786,895

CONTROL PANEL

Fernando Castaneda, Contago, Costa Rica, assignor to Xeltron, S. A., San Jose, Costa Rica

Filed Aug. 2, 1985, Ser. No. 762,543
Int. Cl.[4] G09G *3/02, 1/06*
U.S. Cl. 340—709 **10 Claims**



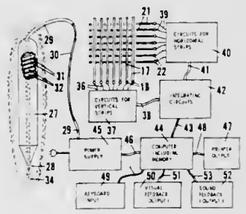
1. A control panel, comprising:
- a digital display for displaying selected statements from a plurality of stored statements each said stored statement containing one or more separate segments of user-alterable input parameters and each said stored statement containing one or more separate segments of non-alterable parameter identifiers wherein said non-alterable parameter identifiers are provided for identifying the significance of said user-alterable input parameters;
- four selectively operable switches, including an increment-up switch and an increment-down switch, with said increment-up switch positioned above said increment-down switch, and a left scroll switch and a right scroll switch, with said left scroll switch positioned to the left or said right scroll switch, when viewed by a user of the control panel, said increment up and down switches and said left and right scroll switches being arranged about a common central point to provide a diamond-shaped switch layout; and
- computer means for storing said plurality of stored statements and controlling said display, said computer means controlling a cursor on said display movable left and right between one or more pre-programmed positions in each displayed statement in response to operation of said left and right scroll switches, respectively, each of said pre-programmed positions corresponding to one of said segments of alterable parameters, said computer means scrolling left or right for sequentially displaying the next stored statement in response to operation of said left and right scroll switches indicating user-instructed movement of said cursor to the left or right beyond the leftmost or rightmost pre-programmed position of the displayed statement, said computer means incrementing up and down the value of said segment of alterable parameter corresponding to the pre-programmed position to which said cursor has been moved in response to operation of said increment up and down switches, respectively.

4,786,896

INPUT MECHANISM FOR WORD PROCESSOR

J. Richard Harte, 10 W. Concord, Kansas City, Mo. 64112

Filed Aug. 9, 1985, Ser. No. 763,980
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—712 **27 Claims**



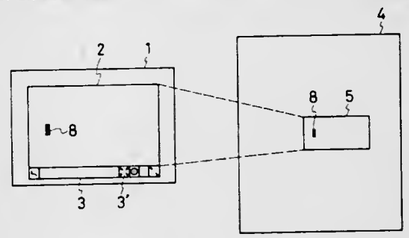
1. An input apparatus for a word processor comprising:
- a plurality of printed overlay sheets each having user response areas thereon and multiple symbol sequence indicia adjacent each of said response areas,
- holding frame means for receiving a selected overlay sheet and positioning the same in overlying relationship to at least a portion of a number of spaced electrical switching sites presented by a corresponding pattern of electrical sensors, said portion underlying respective user response areas on all of said overlay sheets,
- a programmable computer having a memory in which said multiple symbol sequences are stored,
- means under user control for selecting individual response areas and causing activation of the underlying sensors,
- circuit means interconnecting said pattern of sensors and said computer for identifying the site of each sensor that is activated by the user and assigning a code to each site of sensor activation.
- said memory being programmed to identify the codes assigned to the respective sites of sensor activation underlying user-selected response areas, and further programmed to reproduce the user-selected multiple symbol sequences in response to the identified codes, and
- computer-linked hardware means for displaying the user-selected multiple symbol sequences.

4,786,897

DISPLAY SCREEN CONTROL METHOD

Katsuya Takanashi, and Kimitoshi Yamada, both of Hatano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1986, Ser. No. 888,979
Claims priority, application Japan, Aug. 6, 1985, 60-172984
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—721 **1 Claim**



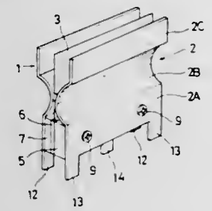
1. A display screen control method for facilitating the selection of display data in a display device capable of supporting a logical screen larger in size than a physical screen on which information of the logical screen is to be displayed, said method comprising the steps of:
- displaying on the physical screen a first window area which is within the logical screen;
- changing the display on the physical screen to a first rectangle related to the size of said logical screen in response to a command inputted by an operator, and displaying in the first rectangle displayed on the physical screen a second rectangle similar to said first window area which is within the logical screen and which was previously displayed on the physical screen just before displaying the first rectangle, the second rectangle being displayed in the first rectangle at a position corresponding to a position of the first window area in the logical screen;
- moving the second rectangle to a desired position within said first rectangle so as to determine a second window area which is within the logical screen and which is desired to be picked up from the logical screen and to be displayed on the physical screen; and
- changing the display on the physical screen to the second window area determined by the second rectangle moved to the desired position in the first rectangle in response to another command inputted by the operator.

4,786,898

ELECTROSTATIC DISPLAY APPARATUS

Kazuo Hata, and Hidehiko Togo, both of Kakogawa, Japan, assignors to Daiwa Shinku Corporation, Hyogo, Japan

Continuation of Ser. No. 701,859, Feb. 14, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 104,537
Claims priority, application Japan, Feb. 15, 1984, 59-27723; Feb. 15, 1984, 59-27724
Int. Cl.[4] G09G *3/34*
U.S. Cl. 340—783 **4 Claims**



1. An electrostatic display apparatus capable of displaying an animated pattern by making a static pattern vary successively, said apparatus comprising:
- a display panel constituted of a plurality of electrostatic display units arranged in the form of a matrix consisting of a plurality of rows and a plurality of columns, each of said electrostatic display units having a pair of fixed electrodes kept oppositely to each other with their confronting surfaces coated with an electrically insulating layer, a movable electrode positioned between said pair of fixed electrodes, and lead wires for said fixed electrodes and said movable electrode, said fixed electrodes being voltage-supplied therebetween with said movable electrode enabled to have its potential switched selectively to the potential of either of said fixed electrodes;
- a display units driving circuit consisting of switching elements having one-to-one correspondence to said electrostatic display units;
- a display register having bits corresponding to said electrostatic display units through said switching elements constituting said display units driving circuit, said bits being shifted by shift pulses in groups in correspondence to the electrostatic display units belonging to said columns in said matrix;

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a memory for storing both display pattern data and display mode instruction codes, said display mode instruction codes including a high-speed display mode instruction code and a display stop mode instruction code, said high-speed display mode instruction code arranging said columns, said display stop mode instruction code following on said high-speed mode instruction code without arrangement of display pattern data;

a data transmitting means for transmitting said display pattern data from said memory to said display register in accordance with said shift pulses;

a frequency selection means for selecting the frequency of said clock pulses, in accordance with said high-speed display mode instruction code, to a first frequency which is too high to be responded to by said movable electrodes of said electrostatic display units or, in accordance with said display stop mode instruction code, to a second frequency which is markedly lower than said first frequency; and

a means for preventing said shift pulses from being supplied to said register in accordance with said display stop instruction code while said second frequency is employed for said clock pulses.

4,786,899

CIRCUIT ARRANGEMENT FOR PCM TELECOMMUNICATION FACILITIES

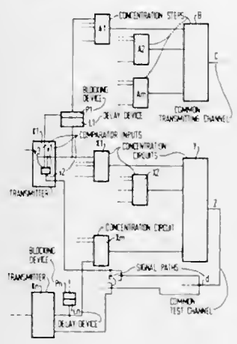
Wolfgang Berner; Rolf Grabenhorst; Peter Kueffer, all of Munich; Josef Birlmeier, Deisenhofen, and Gerhard Prey, Eichenau, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 18, 1987, Ser. No. 16,159

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3605886; Oct. 28, 1986, 3636698

Int. Cl.[4] H04Q *9/00;* **H04J** *3/14*

U.S. Cl. 340—825.500 **5 Claims**



1. A switching circuit for PCM long distance exchange facilities, in which a plurality of synchronous pulse clock controlled transmitters transmitting binary coded information have simultaneous access to a common transmitting channel and in which provision is made for the interruption of two or more simultaneous transmissions after simultaneous transmission by two or more transmitters, each of said transmitters including:

(a) means for initially at the beginning of a transmission always transmitting its own binary coded transmitter specific address;

(b) means for providing that the information transmitted by the transmitter flows together bit-wise when transmitted by two or more transmitters simultaneously;

(c) means for providing that when inequality of binary characters transmitted by two or more transmitters in coequal time-slots and flowing together the character of one type of two possible types of binary characters asserts itself against the character of the other type;

(d) such that the information flowing together is transferred back to the transmitters;

(e) including means for each transmitter to compare bit-by-bit the information instantaneously transmitted with the information received back at the corresponding point in time;

(f) means for providing that each transmitter in the event that the character received back at said corresponding point in time is a character of one type, and the character transmitted with coequal time-slots is one of the other type the transmission is interrupted, comprising;

pulse clock controlled converters between the transmitters and the transmission channel for renewing the binary characters at the transmitting channel; and

a test channel over which the transmitters transmit their binary characters; whereby the binary characters on their way to the test channel flow together, are transmitted between two clock pulses and are combined at the test channel and coupled back to the transmitter such that a potentially required interruption of transmission with certainty occurs within the time interval between two clock pulses.

4,786,900

ELECTRONIC KEY APPARATUS

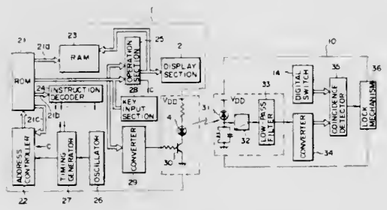
Katsuaki Karasawa; Hideyuki Shoji; Tomoo Kasuo; Kazunori Kita; Syunichi Matsumoto; Keisuke Tonomura, and Narutoshi Minami, all of Tokyo, Japan, assignors to Casio Computer Co. LTD., Tokyo, Japan

Filed Sep. 23, 1986, Ser. No. 910,649

Claims priority, application Japan, Sep. 30, 1985, 60-217344; Oct. 16, 1985, 60-232057; Oct. 16, 1985, 60-232058; Oct. 22, 1985, 60-235624; Oct. 31, 1985, 60-246012

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.31 **50 Claims**



1. An electronic key apparatus comprising:

encrypted code storage means for storing an encrypted code for unlocking an electronic lock;

pass data storage means for storing pass data;

data input switch means for inputting the same pass data as that stored in said pass data storage means;

data coinidence detection means for detecting a coincidence between the data input by said data input switch means and the pass data stored in said pass data storage means;

manual switch means; and

encrypted code transmission means for transmitting the encrypted code stored in said encrypted code storage means to said electronic lock when said coincidence is detected by said data coincidence detection means and said manual switch means is operated.

4,786,901

PAGING RECEIVER

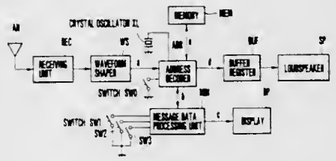
Masahiro Matai; Takashi Ohyagi, and Toshihiro Mori, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 711,089, Mar. 12, 1985, abandoned. This application Jul. 28, 1987, Ser. No. 89,227

Claims priority, application Japan, Mar. 13, 1984, 59-46582

Int. Cl.[4] G08B *5/22;* **H04Q** *7/00*

U.S. Cl. 340—825.47 **4 Claims**



1. A paging receiver having an individual paging number and at least one common paging number, said receiver comprising:

first memory means including an individual memory area for storing at least one message signal following said individual paging signal, and a specific memory area for selectively storing one of a message signal following said common paging number and a message signal following said individual paging number;

second memory means for storing information which indicates whether or not said receiver is set to receive a message signal following said common paging number; and

control means responsive to the content of said second memory for making said specific memory area store a message signal following said individual paging number when said receiver is not set to receive a message signal following said common paging number and for making said specific memory area store a message signal following said common paging number when said receiver is set to receive the message signal following said common paging number.

4,786,902

CONTROL INTERFACE FOR COMBINED WATCH AND PAGER FUNCTIONS

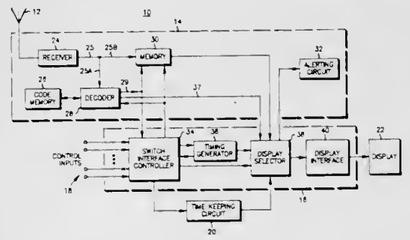
Walter L. Davis, Coral Springs, and Philip P. Macnak, West Palm Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

PCT No. PCT/US87/00003, § 371 Date Feb. 20, 1987, § 102(e) Date Feb. 20, 1987, PCT Pub. No. WO88/05184, PCT Pub. Date Jul. 14, 1988

PCT Filed Jan. 2, 1987, Ser. No. 16,895

Int. Cl.[4] H04B *7/00;* **H04Q** *7/00;* **G04G** *9/00;* **G08B** *3/10*

U.S. Cl. 340—825.440 **45 Claims**



1. A switch control interface arrangement for a device normally generating and displaying time information, the device having a plurality of switches for controlling the time display, the switches including permanent indicia positionally adjacent the switches for indicating the switch functions, the device being further capable of receiving transmitted coded message signals, said arrangement comprising:

receiver means for receiving and decoding the transmittted coded message signals to derive control signals;

means for internally generating time information and means for displaying the same;

a plurality of control inputs; and

switch controller means including input steering means coupled to said plurality of control inputs and further coupled to said time information generating means and to said receiver means for enabling control of said time information generating means and said receiver means by said control inputs, said switch controller means enabling control of said receiver means in response to the control signals, and information selecting means electronically selecting indicia displayed on said display means positionally adjacent the plurality of switches indicating the new switch functions enabled in response to the control signals.

4,786,903

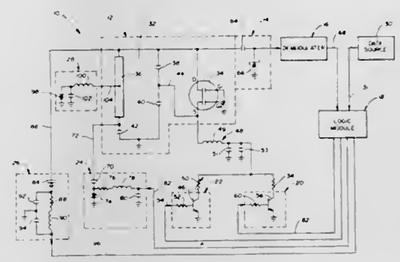
REMOTELY INTERROGATED TRANSPONDER

Mervin L. Grindahl, Waseca; George Rosar, Owatonna, and Mark Kodet, Waseca, all of Minn., assignors to E. F. Johnson Company, Waseca, Minn.

Continuation of Ser. No. 852,154, Apr. 15, 1986, abandoned. This application Jun. 1, 1987, Ser. No. 58,636

Int. Cl.[4] H04Q *7/00;* **H03B** *5/12*

U.S. Cl. 340—825.540 **16 Claims**



1. A radio frequency transponder for receiving an externally generated signal at first carrier frequency, said externally generated signal being amplitude modulated in accordance with an interrogation signal, and for transmitting a data signal at a second carrier frequency in response to receipt of said interrogation signal, comprising:

an oscillator circuit including means for producing radio frequency oscillations at said first carrier frequency, said oscillator circuit including means for receiving said externally generated signal;

quenching circuit means operably coupled to said oscillator circuit for periodically quenching the amplitude of said oscillations in said oscillator circuit;

sampling means operably coupled to said oscillator circuit for sampling said oscillations in said oscillator circuit and providing a sampling means output in response to the receipt of said externally generated signal by said oscillator circuit;

tuning circuit means operably coupled to said oscillator circuit for selectively changing the resonant frequency of said oscillator circuit between said first frequency and said second frequency; and

switching means operably coupled to said sampling means and said tuning ciruit means for selectively activating said tuning circuit in response to receipt of said sampling

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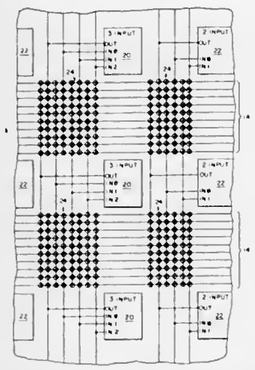
means output whereby said oscillator circuit resonant frequency is shifted from said first frequency to said second frequency in response to receipt of said externally generated signal by said transponder.

4,786,904

ELECTRONICALLY PROGRAMMABLE GATE ARRAY HAVING PROGRAMMABLE INTERCONNECT LINES

Hatch Graham, III, Santa Clara, and Daniel Seltz, Mountain View, both of Calif., assignors to Zoran Corporation, Santa Clara, Calif.

Filed Dec. 15, 1986, Ser. No. 941,765
Int. Cl.[4] H04Q 9/00; H03K 17/693
U.S. Cl. 340—825.830 **2 Claims**



1. An electronically programmable gate array comprising
a plurality of rows of logic cells, each row of logic cells includes alternating three-input cells of programmable gates and two-input cells of programmable gates, each cell having a plurality of inputs, at least one output, and a plurality of electronically programmable voltage levels for configuring the cell, wherein each electronically programmable voltage level comprises two voltage alterable resistors serially connected between first and second voltage potentials, and
a plurality of sets of interconnect lines, one set of interconnect lines provided between adjacent rows of logic cells with electronically programmable means connecting inputs and an output of each cell in a row of cells with either of two adjacent sets of interconnect lines, each electronically programmable means comprises a voltage alterable resistor.

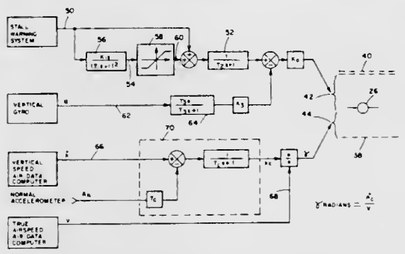
4,786,905

WIND SHEAR DETECTOR HEAD-UP DISPLAY SYSTEM

Hans R. Muller, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Mar. 26, 1986, Ser. No. 844,046
Int. Cl.[4] G01C 23/00
U.S. Cl. 340—975 **7 Claims**

4. An aircraft instrument for indicating the performance margin of the aircraft during take-off or a go-around phase of flight and for assisting the pilot of the aircraft in responding to a windshear encounter, comprising:
(a) flight path angle means for displaying the flight path angle of the aircraft relative to a scale calibrated in degrees; and
(b) maximum angle of attack means for displaying relative to said scale and said display of said flight path angle the margin to the maximum permissible angle of attack, said maximum angle of attack means being driven by a Stall



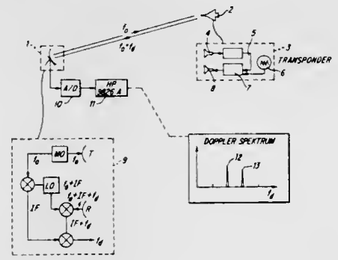
Warning System which operates in response to aircraft flight parameters.

4,786,906

METHOD OF MOTION COMPENSATION IN SYNTHETIC APERTURE RADAR TARGET IMAGING AND A SYSTEM FOR PERFORMING THE METHOD

Ernst Krogager, St. Merlose, Denmark, assignor to Forsvarets Forskningstjeneste, Denmark

PCT No. PCT/DK86/00068, § 371 Date Feb. 12, 1987, § 102(e) Date Feb. 12, 1987, PCT Pub. No. WO86/07635, PCT Pub. Date Dec. 31, 1986
PCT Filed Jun. 16, 1986, Ser. No. 32,727
Claims priority, application Denmark, Jun. 17, 1985, 2722/85
Int. Cl.[4] G01S 13/90, 13/80
U.S. Cl. 342—25 **3 Claims**



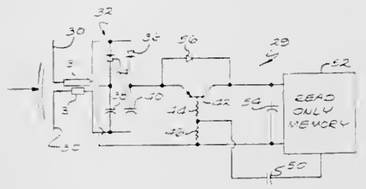
3. A synthetic aperture radar system comprising a synthetic aperture radar, said radar transmitting a signal toward a target, and comprising a transponder mounted on the target, said transponder transmitting a modulated, coherent copy of the signal transmitted toward the target, and comprising a receiver to receive a reflected radar signal and the transponder signal, characterized in that the system further comprises:
(a) transponder means for frequency shifting of the signal transmitted toward the target so that in terms of
frequency it is completely outside the region where doppler information may be expected in the radar signal reflected from the target,
(b) separating means separating the reflected radar signal and the transponder signal immediately upon reception, and
(c) combination means for combining the reflected radar signal and the transponder signal so as to compensate for the translatory motion of the target and fluctuations in the propagation paths of the signals whereby to remove translatory doppler components of said combined signal.

4,786,907

TRANSPONDER USEFUL IN A SYSTEM FOR IDENTIFYING OBJECTS

Alfred R. Koelle, Los Alamos, N. Mex., assignor to Amtech Corporation, Santa Fe, N. Mex.

Filed Jul. 14, 1986, Ser. No. 885,250
Int. Cl.[4] G01S 9/56
U.S. Cl. 342—51 **13 Claims**



1. In combination for use in a transponder for sending signals to a reader to identify an object associated with the transponder,
antenna means for receiving interrogating signals from the reader, the antenna having a particular impedance,
means responsive to such received signals for storing energy,
switching means having first and second states of operation and having a low impedance in the first state of operation and a high impedance in the second state of operation, the switching means including a semi-conductor having first, second and third electrodes,
a data source for providing a sequence of binary indications individual identifying the object,
the first and third electrodes of the semi-conductor being connected between the energy storing means and the data source,
means including the data source and the switching means for defining a load, with the switching means having an impedance in the first state of operation corresponding to the impedance of the antenna means and having an impedance in the second state of operation considerably higher than the impedance of the antenna means, and
means responsive to the sequence of binary indications in the data source for introducing the sequence of binary indications to the second electrode of the semi-conductor to obtain the operation of the switching means in the first and second states of operation in accordance with the sequence of binary indications individually identifying the object.

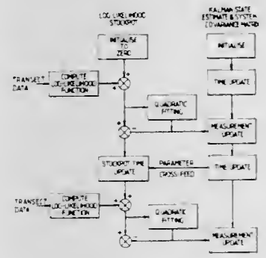
4,786,908

APPARATUS INCORPORATING RECURSIVE ESTIMATORS

Andrew R. Runnalls, Faversham, England, assignor to GEC Avionics Limited, England

Filed May 15, 1986, Ser. No. 874,332
Claims priority, application United Kingdom, May 15, 1985, 8512340
Int. Cl.[4] G01S 13/00
U.S. Cl. 342—63 **14 Claims**

1. An apparatus for measuring the state of a dynamic system comprising:
(a) sensing means for producing a sequence of measurements or sets of measurements which are dependent upon the current state of the said system in the presence of noise and other sources of error being sources which are representable by a statistical model;
(b) first computing means for determining a log-likelihood function associated with each of the said measurements or sets of measurements in accordance with the said statistical model;
(c) second computing means for obtaining the sum of said log-likelihood function and a residual function which is initially set to be identically zero;
(d) third computing means using a recursive estimator to model the dynamic behaviour of the system;
(e) fourth computing means for determining a quadratic approximation to the said sum of the log-likelihood function and the residual function, the fit being weighted in dependence upon the present uncertainty in the state of the dynamic system as evidenced by the output of the third computing means;
(f) fifth computing means for deriving from the said quadratic approximation parameters to serve as the basis for a measurement update within the third computing means;
(g) sixth computing means for subtracting the said quadratic approximation from the said sum of the log-likelihood function and the residual function which it approximates so as to form a new residual function;



(h) seventh computing means for transforming the said residual function to take into account dynamic change in the state of the system during the interval between successive measurements or sets of measurements in the said measurement sequence; and
(i) eighth computing means for determining whether the said quadratic approximation produced by said fourth computing means is suitable to serve as an input to said third computing means and being operative, if it is determined that the quadratic approximation is suitable for the aforesaid purpose, to activate the fifth and sixth computing means and otherwise to use as an input to the seventh computing means the sum of the log-likelihood function and the residual function, which sum is used as input to the fourth computing means and is taken as the new said residual function.

4,786,909

RECEIVING CIRCUIT

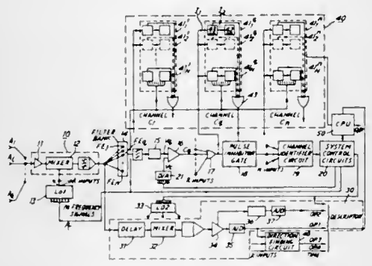
Alan N. Payne, Wedmore, England, assignor to EMI Limited, Haynes, England

Filed Jan. 24, 1986, Ser. No. 822,214
Claims priority, application United Kingdom, Feb. 1, 1985, 8502547
Int. Cl.[4] G01S 13/00
U.S. Cl. 342—94 **11 Claims**

1. A receiving circuit comprising,
an antenna arrangement for receiving pulses of microwave radiation from one or a number of sources,
a first processing circuit for generating a succession of electrical data pulses representing successively received pulses of microwave radiation at a selectable carrier frequency,
a second processing circuit capable of deriving a coded data message from said succession of electrical data pulses, the coded data message being representative of at least the relative timings of the received pulses of microwave radiation at said selectable carrier frequency,

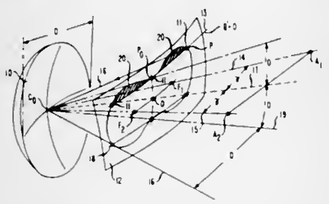
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a comparison circuit including a plurality of pulse generating means each capable of producing a respective train of electrical pulses and means for comparing said succession of electrical data pulses with a reference pulses train com-



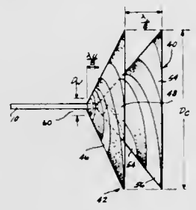
prising pulses generated jointly by selected ones of said pulse generating means,
and means for inhibiting said second processing circuit whenever the compared pulses have a predetermined temporal relationship.

4,786,910
SINGLE REFLECTOR MULTIBEAM ANTENNA ARRANGEMENT WITH A WIDE FIELD OF VIEW
Corrado Dragone, Little Silver, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Nov. 5, 1987, Ser. No. 117,109
Int. Cl.[4] H01Q *19/14*
U.S. Cl. 343—753 **4 Claims**



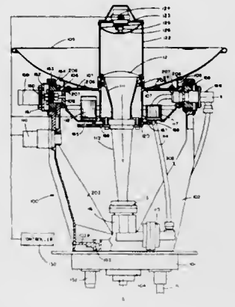
1. An antenna for producing a maximum desired field of view in a first one of two orthogonal principal planes, the antenna comprising:
a device including both (A) a major surface which is curved in each of the two orthogonal principal planes to produce a first and a second focal point on a focal surface of the device line the first of the two principal planes, and (B) a focal length diameter (f/D) ratio which is of a magnitude such that the only significant aberration is astigmatism, the first and second focal points being spaced apart on either side of the axis normal to the center of the curved major surface by a predetermined amount such that (1) a coefficient of astigmatism is essentially at a maximum tolerable amount at both a central point and at opposite edges of the field of view of the device in the first principal plane; and (2) a peanut-shaped area is produced (a) wherein the coefficient of astigmatism is equal to or less than the maximum tolerable coefficient of astigmatism, and (b) which is widest along the first principal plane; and
a plurality of feeds disposed both on the focal surface of the device and in the peanut-shaped area, each feed including a longitudinal axis which is directed at the device for propagating, in any one of two directions along the longitudinal axis, beams which include (1) a spherical wavefront when propagating between a feed and the device, and (2) a substantially planar wavefront when propagating between the device and a remote location.

4,786,911
APPARATUS FOR CIRCULARLY POLARIZED RADIATION FROM SURFACE WAVE TRANSMISSION LINE
Kosal Svy, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Nov. 10, 1987, Ser. No. 119,026
Int. Cl.[4] H01Q *9/28, 1/30*
U.S. Cl. 343—785 **11 Claims**



1. A radio frequency transmission and radiation system comprising: a surface wave transmission line adapted for transmission of an RF surface wave along said surface wave transmission line in a direction toward one terminus of said surface wave transmission line with the electromagnetic field of said RF surface wave being substantially confined to a substantially cylindrical energy bundle that concentrically surrounds said surface wave transmission line;
a first radiator attached to said terminus of said surface wave transmission line, said first radiator being of increasing cross-sectional geometry relative to the direction in which said RF surface wave travels along said surface wave transmission line, said first radiator defining an outer surface that includes a first electrically conductive pattern, said first electrically conductive pattern including an electrically conductive region that is centrally located on said surface of said first radiator with said surface wave transmission line being attached to said electrically conductive central region and said electrically conductive central region exhibiting an area greater than the cross-sectional area of said surface wave transmission line, said first electrically conductive pattern further including a plurality of electrically conductive arms that are spaced apart from one another and are electrically interconnected to said centrally located electrically conductive region, each of said arms spiraling outwardly along said outer surface of said first radiator; and
a second radiator that is attached to said surface wave transmission line, said second radiator being of increasing cross-sectional area relative to the direction in which said RF surface wave travels along said surface wave transmission line, said second radiator defining an outer surface that includes a second electrically conductive pattern that includes an annular conductive region that concentrically surrounds said surface wave transmission line and further includes a plurality of electrically conductive arms that are spaced apart from one another and are electrically connected to said annular conductive region, each of said arms spiraling outwardly along said surface of said second radiator; said attachment of said second radiator to said surface wave transmission line establishing a predetermined distance relationship between said surface of said first radiator and said surface of said second radiator, said second radiator being further oriented relative to said first radiator to establish a predetermined spatial relationship between said arms of said first and second radiators, said spatial relationship between said arms of said first and second radiators and said predetermined distance relationship between said surfaces of said first and second radiators resulting in combined far field radiation by said first and second radiators that exhibits circular polarization.

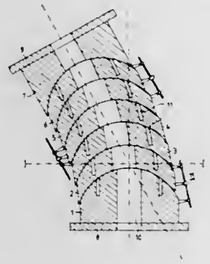
4,786,912
ANTENNA STABILIZATION AND ENHANCEMENT BY ROTATION OF ANTENNA FEED
Ralph A. Brown, Bountiful, and Lowell N. Shestag, Cottonwood, both of Utah, assignors to Unisys Corporation, Blue Bell, Pa.
Filed Jul. 7, 1986, Ser. No. 882,839
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 343—761 **8 Claims**



1. An antenna system comprising,
support means (**101, 102**) comprising an open-ended yoke means mounted on a base wherein the support means is rotatable about an axis thereof extending vertically from said base and through said yoke means,
first drive means (**151**) for selectively rotating said support means about said axis of said support means,
reflector means (**105**) comprising a reflector dish for reflecting signals from a feed assembly pivotally mounted on said support means,
second drive means (**110**) for selectively rotating said reflector means about an axis of said reflector means,
feed assembly means (**111, 112, 113**) mounted in said support means adjacent to said reflector means,
said feed assembly means including means for generating an RF signal and a horn for transmitting said RF signal,
third drive means (**117**) for selectively rotating said feed assembly means about an axis of said feed assembly means,
sub-reflector means mounted adjacent to and spaced from said reflector dish in a skewed fashion relative to said reflector dish, and
stepper motor means arranged to drive said sub-reflector means in a rotary fashion about an axis of said sub-reflector means.

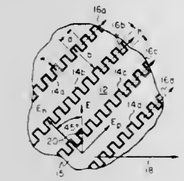
4,786,913
UNIVERSAL WAVEGUIDE JOINT, FLEXIBLE COUPLER, AND ARRANGEMENT FOR A SURVEILLANCE RADAR ANTENNA
Albertus J. Barendregt, Diepenheim, and Marcellis J. A. Van Der Kemp, Hengelo, both of Netherlands, assignors to 501 Hollandse signaalapparaten B.V., Henglo, Netherlands
Filed Apr. 18, 1986, Ser. No. 853,790
Claims priority, application Netherlands, May 1, 1985, 8501233
Int. Cl.[4] H01Q *3/00*
U.S. Cl. 343—765 **16 Claims**

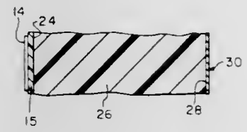
1. A universal waveguide joint comprising at least three consecutive waveguide segments slidable over each other at abutting concave-spherical and convex-spherical end surfaces,



the curvatures in said at least three segments being oriented in the same direction.

4,786,914
MEANDERLINE POLARIZATION TWISTER
Te-Kao Wu, Rancho Palos Verdes, Calif., and Darrell L. Helms, Seminole, Fla., assignors to E-Systems, Inc., Dallas, Tex.
Filed Jan. 25, 1985, Ser. No. 694,930
Int. Cl.[4] H01Q *15/24*
U.S. Cl. 343—909 **13 Claims**





1. A wide angle polarization twister fo twisting the polarization of an incident electromagnetic wave of wavelength λ, comprising:
a dielectric substrate having a longitudinal axis and a dimension in thickness equal to 0.017λ;
a spacer having first and second sides and a dimension "x" given by the expression x=0.275 λ, said dielectric substrate bonded to the first side of the spacer;
a single layer of a plurality of meanderline conductive strips etched on said dielectric substrate, each meanderline conductive strip having a width "d"=0.31 λ and an axis extending at a 45° angle with respect to the longitudial axis of said dielectric substrate;
a reflector bonded to the second side of the spacer for reflecting the wide angle incident electromagnetic wave with its polarization twisted 90°; and
wherein each of the meanderline conductive strips has a longitudinal period "a", a distance "b", a transverse length "h", and a width "w" determined by the wavelength λ to

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provide the 90° twist of the electromagnetic wave by the single layer of meanderline conductive strips.

4,786,915

ATTENUATION OF MICROWAVE SIGNALS

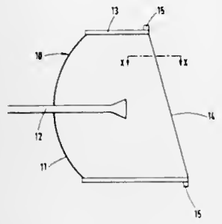
Norman E. Cartwright, Debenham, and Miles E. Butcher, Woodbridge, both of England, assignors to British Telecommunications public limited company, England

Continuation of Ser. No. 854,544, Apr. 22, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 170,650

Claims priority, application United Kingdom, Apr. 26, 1985, 8510724

Int. Cl.[4] H01Q *17/00*

U.S. Cl. 343—909 **10 Claims**



1. An antenna assembly having an r.f. aperture and which includes removable signal attenuation means which can be situated to cover substantially the entirety of said aperture, said signal attenuation means being adapted to partially absorb electromagnetic radiation so as to partially attenuate the signal by at least 1 dB when it is situated so as to obscure said aperture while permitting the remainder of such signal to pass onward toward a receiving site.

4,786,916

THERMAL HEAD

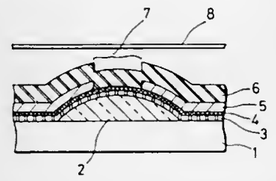
Masakazu Kato, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 2, 1986, Ser. No. 936,795

Claims priority, application Japan, Dec. 25, 1985, 60-297083

Int. Cl.[4] G01D *15/10;* **H01C** *1/012;* **B05D** *5/12;* **B32B** *15/06*

U.S. Cl. 346—76 PH **2 Claims**



1. A thermal head in which a glaze layer, an undercoat layer, a heat generating resistor layer, an electric power supply conductor layer and a protection layer are successively laminated in series on the surface of an insulating substrate, wherein said undercoat layer is made of an aluminum nitride (AlN) film having high bonding strength to the glaze layer and the heat generating resistor layer and a good thermal conductivity characteristic so as to evenly distribute heat generated by said heat generating resistor layer and reduce thermal stress, and wherein said protection layer is made of a silicon dioxide (SiO_2) film.

4,786,917

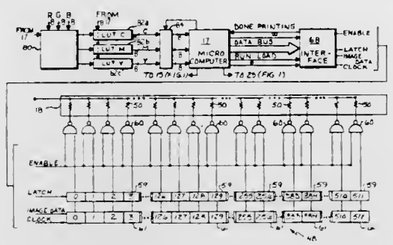
SIGNAL PROCESSING FOR A THERMAL PRINTER

Edward A. Hauschild, Pittsford, and David J. Howard, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 3, 1987, Ser. No. 56,925

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH **3 Claims**



1. In a continuous tone color thermal apparatus including a printhead having a plurality of heating elements for printing a line at a time of image pixels, each heating element being selectively energized in response to a digital dye density word to apply heat to a carrier having dye to cause such dye to transfer to a receiver to form a dye image pixel of a line, each dye image pixel having a density which is a function of the value of its corresponding digital dye density word, the improvement comprising:

a. contrast and color correcting means responsive to each digital dye density word and transfer functions for producing corrected dye density words which are adjusted for contrast and color such correcting means including means for changing such transfer functions;

b. edge enhancing means for comparing each corrected dye density word in a line with its corresponding correcting dye density word in an adjacent line for adjusting the value of each corrected dye denstiy word to provide an edge enhanced dye density word, said edge enhancing means includes computer means programmed with an edge enhancement algorithm which computes the difference Δ between the value of a corrected dye density word to be printed and the previous coresponding corrected dye density word and in response to such difference Δ adjust the value of the corrected dye density word to be printed by an enhancement term δ to produce an enhanced dye density word where δ will have a negative value if Δ is less than a and a positive value if Δ is greater than b, where a and b are negative and positive values; and

c. control means coupled to the printhead and responsive to each enhanced dye density word for selectively energizing the heating elements of the printhead to form a line of continuous tone dye image pixels.

4,786,918

INCOHERENT, OPTICALLY UNCOUPLED LASER ARRAYS FOR ELECTRO-OPTIC LINE MODULATORS AND LINE PRINTERS

Robert L. Thornton, East Palo Alto; Henry W. Sang, Jr., Santa Clara; Thomas L. Paoli, Los Altos, and Robert D. Burnham, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

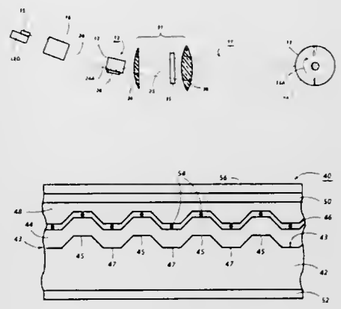
Continuation of Ser. No. 808,197, Dec. 19, 1985, abandoned. This application Oct. 1, 1987, Ser. No. 106,014

Int. Cl.[4] G01D *9/42;* **H01S** *3/19*

U.S. Cl. 346—108 **5 Claims**

1. An incoherent, optically uncoupled laser array for an electro-optic line modulator or a line printer or the like, said array comprising a plurality of spatial laser emitters and characterized by having high power density and a uniform far field emission pattern,

the improvement comprising index waveguide means formed between said spatial laser emitters to reduce the strength of evanescent field of said laser emitters from extending into adjacent emitters below a level required for accomplishing stable phase locking among said laser emitters to produce a broad output intensity envelope in the far field of substantially Gaussian profile with corresponding aligned Gaussian profiles with increasing applied input to said array without incurring emitter phase locking, said index waveguide means comprises a plurality of spatially disposed isolation regions extending across said laser array and extending into said laser array a distance sufficient to optically isolate said laser emitters from one another and to permit close physical spacing of said laser emitters at 6 μm center-to-center spacing or less.



4,786,919

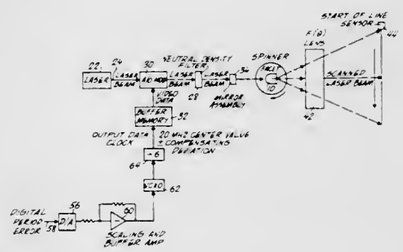
METHOD AND APPARATUS FOR PLACING INFORMATION ON A MEDIUM WHILE COMPENSATING FOR DEVIATIONS FROM A CHARACTERISTIC TIME PERIOD

Harvey Bidner, Plainview, and James J. Zuber, Mastic, both of N.Y., assignors to Bidco Inc., Hicksville, N.Y.

Filed Jul. 29, 1986, Ser. No. 891,535

Int. Cl.[4] G01A *9/42*

U.S. Cl. 346—108 **10 Claims**



1. Apparatus comprising a source of a laser beam, a medium adapted for being processed by said laser beam, scanner means adapted for directing said laser beam and causing said laser beam to scan said medium in sequential scan lines, drive means to drive said scanner means to produce said sequential scan lines, said drive means having a rotational speed subject to deviations, compensating means to respond to said deviations to correct subsequent sequential scan lines, modulating means to modulate said laser beam in accordance with pixel information to be placed upon said medium, said compensating means controlling said modulating means to control the rate with which the pixel information is placed upon said medium to compensate for the deviations of the drive means so that the rate at which the pixels are generated for each scan line is corrected relative to the rate at which the pixels were generated in the previous scan line, memory means for storing said information, said compensating means controlling the release of said information from the memory means to the modulating means, counting means to generate an error count during each of said sequential scan lines, the resulting error counts being proportional to said deviations, and a start-of-line sensor means to generate a start-of-line signal for each of said sequential scan lines and to apply the resulting start-of-line signals to the counting means to commence and terminate the count for each of said scan lines.

4,786,920

RECORDING APPARATUS

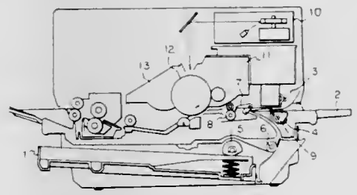
Masaru Igarashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 677,515, Dec. 3, 1984, abandoned. This application Jul. 13, 1987, Ser. No. 73,307

Claims priority, application Japan, Dec. 6, 1983, 58-229147; Dec. 6, 1983, 58-229148

Int. Cl.[4] G01D *15/24;* **B65H** *3/44;* **G03G** *15/00;* **B41J** *3/42*

U.S. Cl. 346—134 **11 Claims**



1. A recording apparatus comprising:

a recording information generation section for providing recording information and control data;

recording means for recording on a recording medium recording information provided by said recording information generation section;

first sheet feed means for feeding the recording medium to said recording means in a first mode;

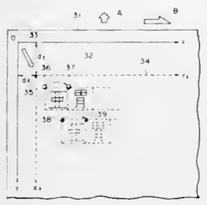
second sheet feed means for feeding the recording medium to said recording means in a second mode;

input means for producing a select signal to manually select either one of the first mode or the second mode; and

control means for selecting one of said first and second modes in accordance with at least one of control data from said recording information generation section or the select signal from said input means, said control means being operable to inhibit mode switching, during a period of time when a recording operation is being carried out on the recording medium fed in said first mode or said second mode, even though an instruction of switching to another mode occurs based on at least one of the control data or the select signal.

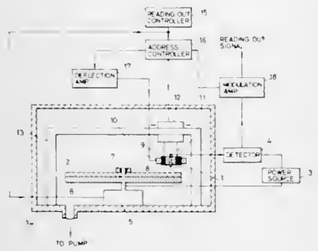
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4,786,921
RECORDING APPARATUS
Yasuhito Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 69,208, Jul. 1, 1987, abandoned. This application Dec. 28, 1987, Ser. No. 139,117
Claims priority, application Japan, Jul. 14, 1986, 61-163821
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—150 **10 Claims**



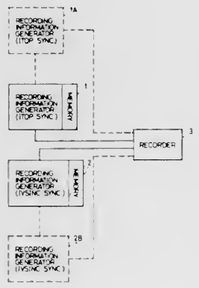
1. A recording apparatus comprising:
record means for recording an image on a recording medium;
detecting means for detecting a binding hole of the recording medium; and
record control means responsive to a detection of the binding hole by said detection means for causing said record means to record the image on the recording medium such that the image is not cut by the binding hole.

4,786,922
ELECTRON BEAM RECORDING AND REPRODUCING APPARATUS
Shigeyuki Hosoki, Hachioji; Keiji Takata, Koganei; Toshiyuki Aida, Chofu, and Sumio Hosaka, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 12, 1987, Ser. No. 13,798
Claims priority, application Japan, Feb. 17, 1986, 61-30819
Int. Cl.[4] G01J *15/00*
U.S. Cl. 346—158 **8 Claims**



1. An electron beam recording and reproducing apparatus comprising:
a needle cathode;
a disc disposed in such a manner as to face said needle cathode with a fine gap therebetween;
means for moving said needle cathode with respect to a surface of said disc;
means for rotating said disc; and
means for applying a magnetic field in the axial direction of said needle cathode in order to converge an electron beam emitted from said needle cathode onto said disc;
wherein the electron emitted from said needle cathode to said disc is used as means for recording and reproduction.

4,786,923
IMAGE RECORDING SYSTEM FOR IMAGE RECORDING IN RESPONSE TO SIGNALS ENTERED FROM A RECORDING INFORMATION GENERATING UNIT
Haruo Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 528,211, Aug. 31, 1983, abandoned. This application May 20, 1986, Ser. No. 867,901
Claims priority, application Japan, Sep. 7, 1982, 57-154485; Sep. 7, 1982, 57-154486; Sep. 7, 1982, 57-154487; Sep. 22, 1982, 57-164128
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 **18 Claims**

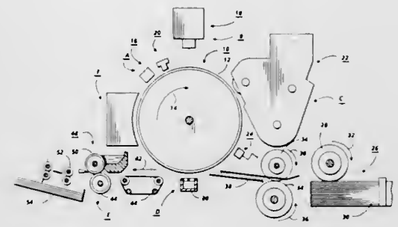


1. An image recording apparatus comprising:
a first recording information generating unit for transmitting recording information, representing an image, in one transmission mode;
a second recording information generating unit for transmitting recording information, representing an image, in a transmission mode difference from the one transmission mode; and
a recording unit for recording said recording information transmitted from said first recording information generating unit or said second recording information generating unit,
wherein said recording unit records information on a recording sheet and controls the conveyance of the recording sheet in association with a start of transmission of said recording information when the recording information from said first recording information generating unit is to be recorded, and
said recording unit controlling the start of transmission of said recording information in association with recording operation by said recording unit when the recording information from said second recording information generating unit is reproduced.

4,786,924
HYBRID CONTROL SYSTEM FOR A COPIER
Jeffrey J. Folkins, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 20, 1987, Ser. No. 28,518
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **13 Claims**

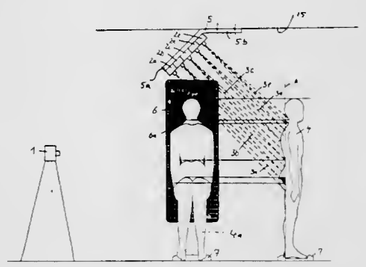
1. An apparatus for controlling the discharge of marking particles into a development system of a printing machine adapted to have a test area recorded, at selected intervals, on a member, including:
means for transporting marking particles closely adjacent the member to deposit marking particles on the test area recorded thereon;
means for electrically biasing said transporting means to a selected magnitude and polarity;

means for sensing current electrically biasing said transporting means and transmitting a signal proportional thereto;
means for detecting, at selected intervals, the mass to area ratio of the marking particles deposited on the test area and transmitting a signal proportional thereto; and



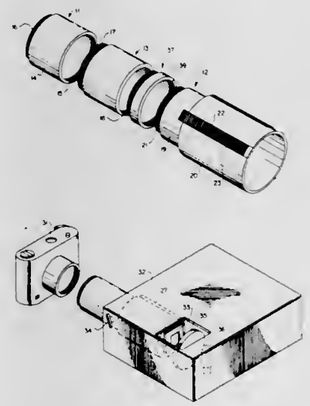
means, responsive to the signal from said sensing means and from said detecting means, for generating a marking particle discharge signal.

4,786,925
PHOTOGRAPHIC CONTOUR MEASUREMENT
Ulrich M. Landwehr, Bahnhofstrasse 8, D-3000 Hannover 1, Fed. Rep. of Germany
Filed Jun. 29, 1987, Ser. No. 67,930
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621927
Int. Cl.[4] G03B *15/00, 29/00, 21/26;* **G01B** *11/28*
U.S. Cl. 354—77 **8 Claims**



1. In an imaging method for ascertaining the dimensions of an object by means of photography using a camera and including the step of projecting during imaging and in an oblique direction a particular pattern of horizontal lines upon the object to be imaged, the improvement comprising:
using a plurality of narrow bundled projection beams arranged one above each other each with an optical axis of about 45 degrees to the vertical and each projecting a relatively small plurality of horizontal lines upon said object.

4,786,926
CAMERA ATTACHMENT FOR ENABLING PHOTOGRAPHING OF TRANSPARENCIES IN A SLIDE PROJECTOR
James S. Hurvitz, 2351 Physicians Dr., Suite 3-I, Baton Rouge, La. 70808
Continuation of Ser. No. 725,589, Apr. 22, 1985, abandoned. This application Sep. 18, 1986, Ser. No. 909,123
Int. Cl.[4] G03B *29/00*
U.S. Cl. 354—77 **3 Claims**



1. An attachment for connecting a single lens reflex camera to a slide projector to permit photocopying of a transparency at the slide station within the projector, said attachment including
lens tube means adapted to be connected to the camera for producing a 1:1 image size ratio,
a tubular member which is formed of two hollow tubes interconnected to permit relative rotational movement therebetween, said tubular member further being adapted to be received within the lens assembly receptacle of the projector,
a macro lens connectable in series with the lens tube means and tubular member,
a light diffusing screen adapted to be placed in the projector between the transparency and the light source of the projector
a light filter connected in series with the lens tube means, tubular member and macro lens, and
means associated with the tubular member which cooperates with the lens focusing mechanism of said projector for focusing the image of the transparency onto the film plane of the camera.

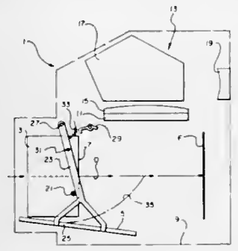
4,786,927
MIRROR SYSTEM FOR A SINGLE LENS RELFEX CAMERA
Joel S. Lawther, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 4, 1987, Ser. No. 128,837
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—153 **2 Claims**

1. An improved single lens reflex camera of the type wherein a unitary mirror can be positioned at an upwardly inclined angle between a taking lens and the film to intercept the optical

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axis of said lens, to reflect the rays of light that come through the lens generally upward on to a focusing screen of a viewfinder, and can be positioned out of the way to expose the film, and wherein the improvement comprises:

means for supporting said entire mirror to swing in an arc about a single axis, without inverting the mirror, from its



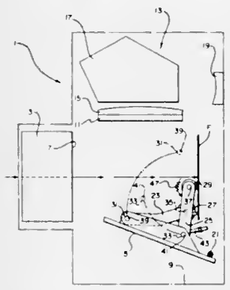
light-reflecting position at said upwardly inclined angle between the taking lens and the film to a non-reflecting position at least partially underneath said lens, whereby the back focus of the lens required to clear the mirror for movement from its light-reflecting position to out of the way to expose the film can be reduced.

4,786,928

MIRROR SYSTEM FOR A SINGLE LENS REFLEX CAMERA

Joel S. Lawther; Richard F. Manley, both of Rochester, and William L. Burnham, Leroy, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,844
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—153 **7 Claims**



1. An improved single lens reflex camera of the type wherein a unitary mirror can be positioned at an upwardly inclined angle between the rear of a taking lens and the film to intercept the optical axis of said lens, to reflect the rays of light that come through the lens generally upward on to a focusing screen of a viewfinder, and can be positioned out of the way to expose the film, and wherein the improvement comprises:

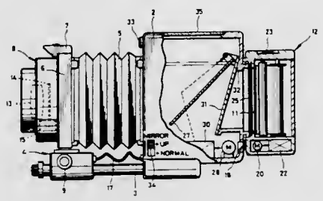
means for supporting said entire mirror to swing forward toward the rear of said lens and downward to at least partially below the film, simultaneously, from its light-reflecting position to a non-reflecting inverted position substantially facing the bottom of said camera, whereby the back focus of the lens required to clear the mirror for movement from its light-reflecting position to out of the way to expose the film can be reduced.

4,786,929

SINGLE LENS REFLEX CAMERA

Hisashi Hamada, Tokyo, and Michihiro Shiina, Saitama, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 111,155
Claims priority, application Japan, Oct. 17, 1986, 61-246976; Oct. 20, 1986, 61-249200
Int. Cl.[4] G03B *19/12*
U.S. Cl. 354—154 **4 Claims**



1. In a single lens reflex camera comprising a camera body having a reflex mirror and a light-blocking plate which are pivotally mounted in said camera body for vertical swinging movement between a viewing position wherein said reflex mirror and light-blocking plate are disposed in a photographic optical path of the camera and a photographing position wherein said reflex mirror and light-blocking plate are out of said photographic optical path, and a lens unit having a shutter which is detachably mounted on said camera body; the improvement comprising:

a driving mechanism including an electric motor for vertically swinging said reflex mirror and light-blocking plate between said viewing and photographing positions;

manually operable mirror swing-up means for forcing said driving mechanism to swing up said mirror and plate and thereby placing said mirror and plate in said photographing position; and

switch means operated by detaching said lens unit from said camera body for forcing said driving mechanism to swing down said reflex mirror and light-blocking plate into said viewing position independently of said manually operable mirror swing-up means when said reflex mirror and light-blocking plate have been placed in said photographing position.

4,786,930

LENS SHUTTER USING AN ELECTROSTRICTIVE STRAIN ELEMENT AS DRIVING SOURCE MEANS

Akira Suzuki; Haruki Ōe, and Kiyoshi Touma, all of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,555
Claims priority, application Japan, Dec. 25, 1986, 61-202872
Int. Cl.[4] G03B *7/00, 9/14*
U.S. Cl. 354—234.1 **4 Claims**

1. A lens shutter using an electrostrictive strain element as driving source means, comprising:

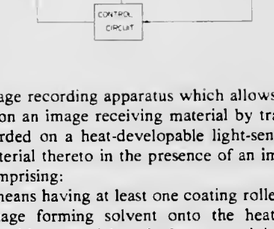
a base plate having an exposure aperture;

shutter blades supported rockably on said base plate to open and close said aperture;

said electrostrictive strain element which has properties that said element is biased by application of voltage and is returned to an original form by discharge of stored electric charge and which is constructed to be fixedly held at one end by a retaining member provided on said base plate and to be free at the other end; and

an opening and closing lever supported rotatably on said base plate so that two arms are different in length from each other and engaged with said shutter blades at an end portion of a long arm and with the free end of said electrostrictive strain element at an end portion of a short arm to open and close said shutter blades through the bias and restoration of said electrostrictive strain element,

said electrostrictive strain element and said opening and



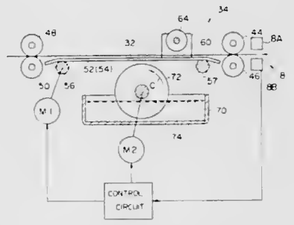
closing lever being arranged so that an inertia force acting on said opening and closing lever through engagement with said electrostrictive strain element are counterbalanced by that acting on said electrostrictive strain element through engagement with said opening and closing lever.

4,786,931

IMAGE RECORDING APPARATUS

Minoru Saito; Yoshiyuki Monma, and Shin-ichi Ichikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1987, Ser. No. 25,698
Claims priority, application Japan, Mar. 14, 1986, 61-056702
Int. Cl.[4] G03D *5/06*
U.S. Cl. 354—303 **21 Claims**



1. An image recording apparatus which allows an image to be formed on an image receiving material by transferring an image recorded on a heat-developable light-sensitive photographic material thereto in the presence of an image forming solvent, comprising:

coating means having at least one coating roller for coating the image forming solvent onto the heat-developable light-sensitive material or the image receiving material;

conveying means for conveying said light-sensitive material or said image receiving material above said coating roller;

first driving means for rotating said coating roller so as to perform said coating; and

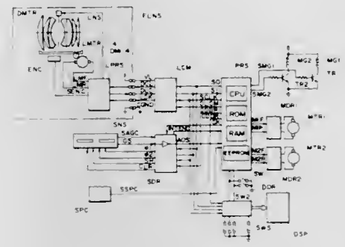
control means for reducing the speed at which said coating roller is rotated, whereby said coating roller continuously applies said solvent to said light sensitive image receiving material without applying said solvent in excess.

4,786,932

CAMERA HAVING A FOCUS STATE DETECTION DEVICE

Akira Akashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 138,969
Claims priority, application Japan, Jan. 12, 1987, 62-4576
Int. Cl.[4] G03B *3/10*
U.S. Cl. 354—402 **9 Claims**



1. A camera having a focus state detection device for detecting a focus state and driving a focusing optical system toward an in-focus position in accordance with a result of focus state detection and, in a circumstance where the focus state is not detectable, carrying out a search operation to drive the focusing optical system in a predetermined range independently from the result of the focus state detection, comprising:

(a) a focus state detector for detecting the focus state;

(b) a driver for driving the focusing optical system in accordance with the result of the focus state detection by said focus state detector;

(c) a discriminator for determining whether the focus state is detectable or not;

(d) search control means for supplying a search signal to said driver to start the search operation when said discriminator determines that the focus state is not detectable;

(e) inhibit means for inhibiting further search operation after the control of the search operation by said search control means; and

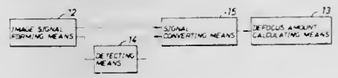
(f) release means for releasing the inhibit of the search operation by said inhibit means when the result of the focus state detection by said focus state detector indicates an in-focus or near in-focus state.

4,786,933

FOCUS DETECTION APPARATUS FOR CAMERA

Masamori Makino, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 160,488
Claims priority, application Japan, Feb. 24, 1987, 62-39091
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—408 **15 Claims**



1. In a focus detection apparatus for detecting an in-focus position of a photographing lens on the basis of a phase difference between image signals produced from at least two focusing portions of an image sensor for focusing an object image, said image sensor being scanned at least two times to produce first image signals corresponding to said object image from a first scanning cycle and second image signals corresponding to said object image from a second scanning cycle of said image sensor,

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the improvement comprising:

detecting means for detecting maximum and minimum values of said first image signals produced from said at least two focusing portions obtained in a first scanning cycle of said image sensor;

signal converting means for converting signal components of said second image signals falling within a range of the maximum and minimum values detected by said detecting means into digital signals, said second image signals and said signal components being obtained in a second scanning cycle of said image sensor;

calculating means responsive to the digital signal output from said signal converting means for calculating the in-focus position of the photographing lens based on a phase difference between the image signals produced from said two focusing portions of said image sensor in said second scanning cycle; and

means responsive to said calculating means for focusing said photographing lens to said in-focus position to thereby focus said object image.

4,786,934

PHOTOGRAPHIC CAMERA HAVING AN INTERCHANGEABLE LENS

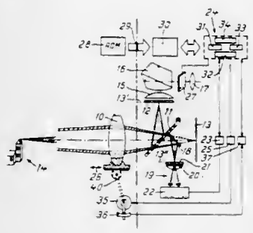
Heinz Kunze, Huettenberg-Rechtenbach, and Dirk Tautenhahn, Solms-Albshausen, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 114,758

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637742

Int. Cl.[4] G03B *3/08, 3/10, 7/097*

U.S. Cl. 354—409 **10 Claims**



1. A camera having an aperture, comprising,

a viewfinder having means to display depth-of-field data;

a lens having means for storing lens data;

an automatic focusing device for providing data on the depth-of-field range including data on the front and rear depth-of-field planes of an imaged object, the automatic focusing device being operatively connected to the lens so as to receive lens data and to the viewfinder so as to provide depth-of-field data to the viewfinder;

an automatic program exposure control device operatively connected to the automatic focusing device; and

means for successively automatically positioning the lens to the front and rear depth-of-field planes comprising a drive motor for displacing the lens, the means for successively automatically positioning the lens being operatively connected to the automatic focusing device so as to successively displace the lens to the front and rear depth-of-field planes provided by the automatic focusing device, whereby the means for displaying data on the depth-of-field in the viewfinder displays data on each respective depth-of-field plane at each successive position of the lens.

4,786,935

LIGHT MEASURING DEVICE

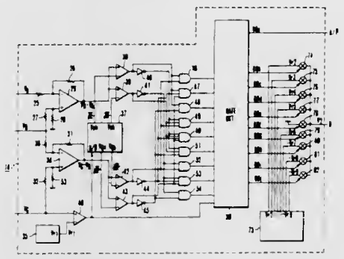
Shingo Hayakawa; Shuichi Kiyohara, and Masanori Ishikawa, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 9,995

Claims priority, application Japan, Feb. 8, 1986, 61-026275; Feb. 21, 1986, 61-037757; Mar. 18, 1986, 61-060171

Int. Cl.[4] G03B *7/08*

U.S. Cl. 354—432 **17 Claims**



15. A light measuring device comprising:

(a) light receiving means arranged to divide a photographic field into a plurality of areas inclusive of at least three areas including a middle area located in the middle of said field, a first outer area located on the outer side of said middle area and a second outer area located on the outer side of said first outer area and to obtain luminance information values on each of said plurality of areas;

(b) luminance difference detecting means for obtaining a plurality of luminance information difference values between adjacent areas among said plurality of areas from a plurality of said luminance information values obtained by said light receiving means; and

(c) a circuit for determining a photometric value on the basis of at least the luminance information in said first outer area, said circuit being operative to substantially correct the luminance information value of said middle area and the luminance information value of said first outer area in accordance with said plurality of luminance information difference values.

4,786,936

ELECTROSTATIC LATENT IMAGE DEVELOPING DEVICE

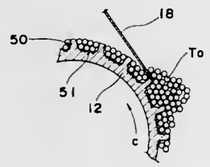
Akihito Ikegawa, Sakai; Hiroshi Mizuno, Ikoma; Hiroshi Murasaki, Ibaraki, and Kouichi Etou, Takatsuki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1987, Ser. No. 108,118

Claims priority, application Japan, Oct. 17, 1986, 61-248115

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—300 **9 Claims**



1. A developing device comprising:

a developing sleeve which is so provided as to confront a

support member for supporting an electrostatic latent image;

a toner reservoir for accommodating toner, which is formed, at its one portion, with an opening; and

a rotatable toner supply roller which is provided in said opening so as to confront said developing sleeve;

said toner supply roller being formed, on its outer peripheral surface, with a plurality of first minute recesses;

said toner supply roller being formed, in said first minute recesses, with a plurality of second minute recesses finer than said first minute recesses.

4,786,937

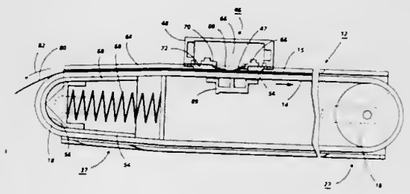
PROCESSING CARTRIDGE WITH ONE TIME FUNCTION SHEET

Carl I. Bouwens, LeRoy, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1987, Ser. No. 44,923

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 BE **13 Claims**



1. A processing cartridge removably mountable into the main body of an image forming apparatus comprising a housing containing therein processing means useful in forming an image including an imaging member upon which a developed toner image may be formed and a cleaning blade for removing residual toner from said imaging member preparatory to the next imaging cycle, said housing having an opening therein and within the opening and extending therefrom a sheet-like member which is positioned between said imaging member and said cleaning blade and which upon withdrawal of said sheet-like member initiates the functional relationship between the cleaning blade and the imaging member.

4,786,938

PROCESS UNIT FOR AN IMAGING APPARATUS

Robert A. Carter, Stevenage, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 10, 1987, Ser. No. 131,162

Claims priority, application United Kingdom, Dec. 15, 1986, 8629941

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **20 Claims**

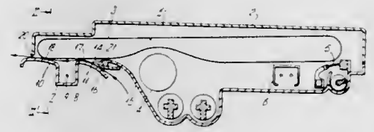
1. A process unit adapted to be removably mounted in a main assembly of an electrostatographic copying machine, the process unit comprising:

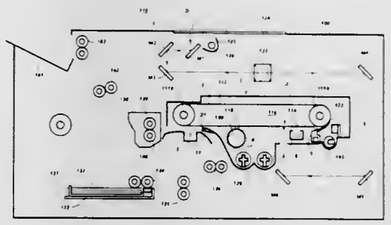
a housing,

an imaging member inside the housing,

the housing having an aperture through which a copy sheet may enter the process unit for transferring an image from the imaging member to the copy sheet when the process unit is installed in the main assembly,

and means providiing an opaque cover which is arranged normally to adopt a closed position covering the aperture, the cover means being adapted to be displaced from the closed position by the action of an entering copy sheet bearing against it thereby enabling the copy sheet to enter the process unit.





4,786,939

IMAGE FORMING APPARATUS

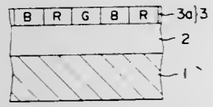
Satoshi Haneda, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1986, Ser. No. 897,651

Claims priority, application Japan, Aug. 23, 1985, 60-186433; Aug. 23, 1985, 60-186434

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **6 Claims**



1. An image forming apparatus comprising: a photosensitive member having a surface insulating layer and a color separating function on a surface thereof and an image exposure means and a whole surface exposure means arranged to face said photosensitive member, wherein at least one of said image exposure means and said whole surface exposure means is operative to expose said photosensitive member to light which does substantially contain a visible light.

4,786,940

DATA HANDLING AND ARCHIVING SYSTEM

Joseph J. Daniele, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 931,485, Nov. 17, 1986, Pat. No. 4,728,984. This application Oct. 16, 1987, Ser. No. 108,890

Int. Cl.[4] G03G *15/04*

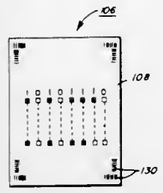
U.S. Cl. 355—6 **2 Claims**

1. Apparatus for inexpensively archiving information comprising:

(a) a permanent data archiving member comprising a copy substrate material; and

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(b) a visible machine only readable image on said copy substrate material, said image consisting of a dot pattern



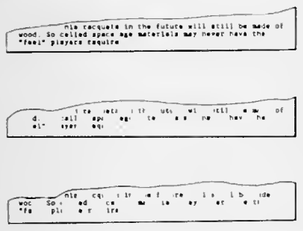
forming a digitized image, said image being a digital representaiton of the data being archived.

4,786,941

METHOD OF PROTECTION OF CONFIDENTIAL DOCUMENTS

Michael T. Regan, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1987, Ser. No. 60,804
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—7 **3 Claims**



1. A method of rendering a document unintelligible to the casual observer for purposes of transportation, storage or the like, comprising the steps of:

imagewise exposing a charged photoconductor to produce at least two electrostatic images of said document

in a step separate from said exposing step exposing the respective image portions of said photoconductor to complementary patterns of erasing radiation to erase complementary portions of said images in a pattern making each image separately unintelligible, and

producing a visible image corresponding to each of said unintelligible electrostatic images.

4,786,942

IMAGE FORMING APPARATUS

Keiji Kusumoto, Toyokawa; Kaoru Hashimoto, Toyohashi, and Kenzo Nagata, Okazaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 7, 1987, Ser. No. 83,039
Claims priority, application Japan, Aug. 9, 1986, 61-187607; Aug. 9, 1986, 61-187608; Aug. 9, 1986, 61-187609; Aug. 11, 1986, 61-188279; Aug. 11, 1986, 61-188280
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—14 D **15 Claims**

1. An image forming apparatus comprising:

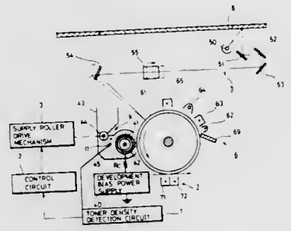
image forming means for performing image forming operation,

developing means for developing, by using developer containing toner, an image formed by said image forming means,

toner supply means for supply toner to said developing means,

first control means for controlling said toner supply means, to supply a prescribed amount of toner with prescribed timing during said image forming operation,

toner density detection means for detecting a toner density of the developer in said developing means;



second control means for controlling said toner supply means, to continue supply of toner till it is determined that the toner density in said developing means attains a prescribed density, in response to an output of said toner density detection means;

first input means for instructing a start of operation of said image forming means, and

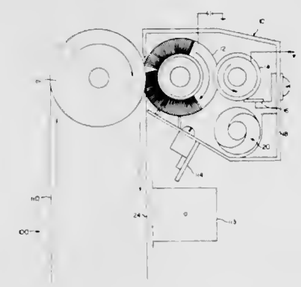
second input means for instructing a start of operation of said second control means.

4,786,943

DEVICE FOR REMOVING RESIDUAL DEVELOPER PARTICLES FROM A PHOTOCONDUCTIVE MEMBER

Kensuke Fukae, Monsey, N.Y., and Toshio Muramatsu, Nagano, Japan, assignors to Kentek Information Systems, Inc., Allendale, N.J.

Filed Apr. 1, 1987, Ser. No. 33,457
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 **16 Claims**



1. A cleaning device for removing residual particles from a photoconductive member in an electrographic printing apparatus, comprising

brush means for being held in contact with a charged rotatable photoconductive member, said brush means being maintained at a first biasing voltage for attracting residual particles from said photoconductive member,

transferring means in juxtaposition with said brush means, said transferring means being maintained at a second biasing voltage for attracting said residual particles from said brush means, said second biasing voltage being of the same polarity and greater in magnitude than said first biasing voltage,

removal means for removing said residual particles from said transferring means, and

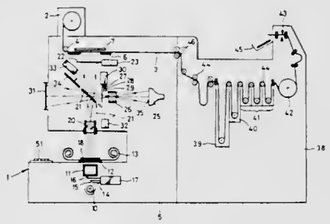
discharge means for discharging said photoconductive member, said discharge means being located downstream of said brush means relative to said photoconductive member.

4,786,944

COMPOSITE IMAGE PRINTING METHOD AND APPARATUS

Kiichiro Sakamoto; Liyoshi Yamaguchi, both of Kanagawa, and Yuji Oshikoshi, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1987, Ser. No. 13,278
Claims priority, application Japan, Feb. 10, 1986, 61-25929; Mar. 25, 1986, 61-64892; Mar. 25, 1986, 61-64893; Mar. 27, 1986, 61-67247
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—20 **16 Claims**



1. An apparatus for printing a composite image on a photographic paper in an exposure station which comprises:

means for exposing said photographic paper to an image on a photographic original;

means including a CRT display device for exposing said photographic paper to a CRT image displayed on the screen of said CRT display device;

means for sequentially actuating said photographic image exposure means and said CRT image exposure means while said photographic paper remains in said exposure station so as successively to print said photographic and CRT images as a composite image on said photographic paper; and

means for projecting simultaneously said photographic original image and said CRT image in the form of said composite image onto a monitor screen disposed in a different position from said exposure station.

4,786,945

MICROFILM READER-PRINTER

Takeshi Sambayashi, Tokyo; Hideshi Oushiden, Kawasaki, and Akihiko Kida, Ebina, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 29, 1986, Ser. No. 947,384
Claims priority, application Japan, Mar. 20, 1985, 61-63076; Dec. 27, 1985, 60-293204; Mar. 28, 1986, 61-70397
Int. Cl.[4] G03G *15/00;* **G03B** *13/24, 13/26*
U.S. Cl. 355—14 R **9 Claims**

1. A microfilm reader/printer, comprising:

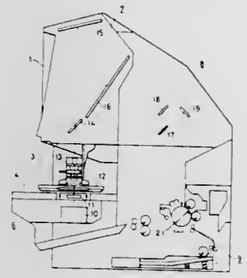
a light source device for irradiating with light a microfilm to obtain projection light of the microfilm;

image projection means for displaying an enlarged image of an image information recorded in the microfilm in accordance with the projection light;

means for forming the image information recorded in the microfilm on a recording medium;

a page searcher detachably provided to the microfilm reader/printer for moving the microfilm irradiated with the light; and

means for directing said light source device, image protection means, image forming means, and page searcher so



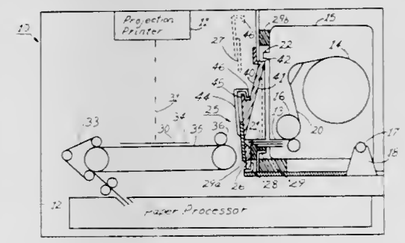
that when said page searcher is first attached to said microfilm reader/printer, the microfilm is automatically moved before said image forming means can form an image on the recording medium.

4,786,946

PAPER DELIVERY SYSTEM FOR PHOTOGRAPHIC PRINTER

Thomas C. Jessop, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 21, 1988, Ser. No. 146,657
Int. Cl.[4] G03B *29/00, 27/32*
U.S. Cl. 355—28 **25 Claims**



1. A photographic paper delivery system for a printer having a cassette containing a supply roll of said photographic paper and means for advancing said paper into said printer along a path extending between a fixed and a movable blade of a cut-off knife, said paper delivery system comprising:

a. a hood of said printer disposed opposite said fixed knife blade, and light locks formed between said hood and said cassette, and between said fixed knife blade and said cassette, when said cassette is in a delivery position;

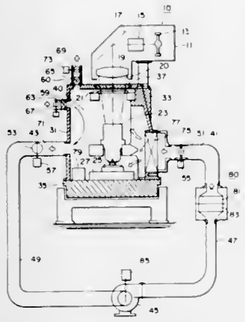
b. a fixed portion of a labyrinth light seal being formed around said path, and a movable portion of said labyrinth light seal being arranged on said movable knife blade for closing said labyrinth light seal when said movable knife blade is closed over said fixed knife blade;

c. a platen for advancing a cut-off sheet of said paper from said cut-off knife to an optical axis of said printer where said cut-off sheet is imaged; and

d. a shutter blocking light from said optical axis except when said cut-off knife and said labyrinth seal are closed.

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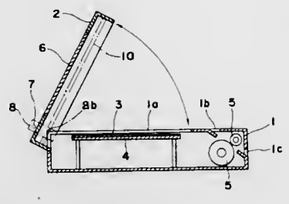
4,786,947
PROJECTION EXPOSURE APPARATUS
Masao Kosugi, Yokohama; Toshikazu Matsushita, Tokyo; Shuichi Yabu, Kawasaki, and Masakatsu Obta, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 915,867, Oct. 7, 1986, abandoned, which is a continuation of Ser. No. 814,967, Dec. 31, 1985, abandoned. This application May 4, 1987, Ser. No. 45,203
Claims priority, application Japan, Jan. 10, 1985, 001479
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—30 **8 Claims**



1. An apparatus for transferring a pattern of a first member onto a second member, said apparatus comprising:
projection optical means for optically projecting the pattern of the first member onto the second member;
means for illuminating the first member so as to transfer, with said projection optical means, the pattern of the first member onto the second member;
chamber means for housing at least said projection optical means in a substanitally closed space, said chamber means having an inlet port and an outlet port;
means for detecting pressure in said substantially closed space; and
means for controlling the pressure in said space on the basis of detection by said detecting means so as to retain a predetermined optical performance of said projection optical means, said controlling means comprising (i) a gas passageway in communication with said space via said inlet port and said outlet port, respectively, (ii) gas flowing means for flowing a gas in said passageway into said space through said inlet port and for extracting a gas in said space to said passageway through said outlet port and (iii) means for controlling the degree of opening of at least one of said inlet port and outlet port in accordance with the detected pressure.

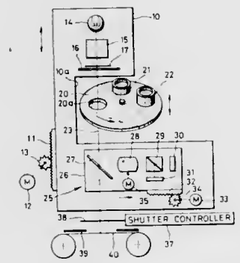
4,786,948
PRINTER
Hirotoshi Matsui, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jan. 13, 1988, Ser. No. 143,192
Claims priority, application Japan, Jan. 13, 1987, 62-3682[U]
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—40 **3 Claims**

1. A printer which comprises a lower cabinet, and an upper cabinet pivotally connected at its one end to said lower cabinet for selective opening or closing thereof with respect to the lower cabinet, said lower cabinet being provided with a holder plate to place thereon a photo-sensitive and heat-sensitive paper having a heat-sensitive layer to be sensitized by light and visualized by heat, and a set of heat fixing rollers for visualizing images by imparting heat to the photo-sensitive and heat-sensitive paper, said upper cabinet being provided with a transparent liquid crystal display panel of a light transmitting type disposed at a position to confront the photo-sensitive and heat-sensitive paper placed on said holder plate, upon closure of said upper cabinet with respect to said lower cabinet so as to



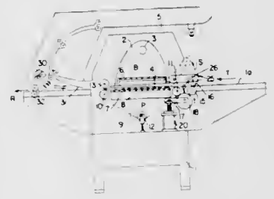
display images corresponding to input as applied by an external operation or external signal, and a light source for projecting light onto said transparent liquid crystal panel from an upper portion thereof.

4,786,949
PHOTOGRAPHIC PRINTER
Takashi Yamamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 15, 1987, Ser. No. 108,676
Claims priority, application Japan, Oct. 15, 1986, 61-157945
Int. Cl.[4] G03B *27/74, 27/80*
U.S. Cl. 355—68 **4 Claims**



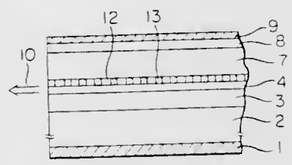
1. A photographic printer of the type having a printing lens disposed between a negative carrier and a photographic paper which is displaceable along a printing optical path to vary a printing magnification of said photographic printer, said photographic printer comprising;
image projecting means including an illumination lamp and said negative carrier for projecting an image of a negative held by said negative carrier;
image sensing means displaceably located in said printing optical path for sensing said projected image, said image sensing means comprising an image sensing element, a reflection mirror removably disposed in said printing optical path for reflecting and deflecting printing light toward said image sensing element, and a zoom lens for focusing said reflected and deflected printing light onto said image sensor; and
means for moving said image projection means and said image sensing means along said printing optical path as one body.

4,786,950
DEVICE FOR INSERTING COPY . . . MATERIAL
Hans Haus, Hahlgartenweg 7, D-6250 Limburg, Fed. Rep. of Germany
PCT No. PCT/DE86/00433, § 371 Date Jun. 22, 1987, § 102(e) Date Jun. 22, 1987, PCT Pub. No. WO87/02788, PCT Pub. Date May 7, 1987
PCT Filed Oct. 27, 1986, Ser. No. 72,260
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1985, 3538192
Int. Cl.[4] G03B *27/08*
U.S. Cl. 355—99 **7 Claims**



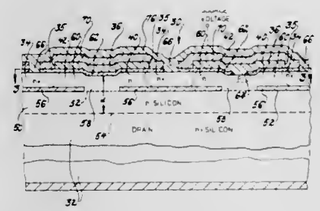
1. A device for inserting copier web material and exposure web material into an apparatus for continuously exposing this material; here the web materials are moved by means of a belt conveyor through an entry slit formed by a pair of drive rolls, through an exposure chamber with a transparent plate, to another pair of drive rolls disposed behind the exposure chamber, and from there are conducted to a separation device which separates the webs from one another; the web materials have positioning holes that can be aligned with one another; register pins can be inserted into or withdrawn from these positioning holes by means of a lifting device; it is characterized as follows: the register pins (**26**), together with their lifting devices (MZ) are disposed fixed between the pair of drive rolls (**15, 16**) which forms the entry slit or the exposure chamber (B); here, one of the drive rolls (**16**) of the pair of drive rolls (**15, 16**) is designed so that it can be lifted away from the web material, while the other drive roll (**15**) is mounted permanently.

4,786,951
SEMICONDUCTOR OPTICAL ELEMENT AND A PROCESS FOR PRODUCING THE SAME
Yasunori Tokuda, and Kenzo Fujiwara, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Feb. 11, 1986, Ser. No. 828,375
Claims priority, application Japan, Feb. 12, 1985, 60-25415; Oct. 2, 1985, 60-219344
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 **15 Claims**



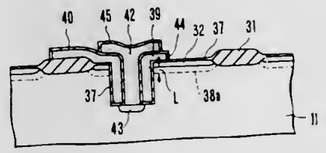
1. A semiconductor optical element comprising:
a first cladding layer;
a second cladding layer; and
a semiconductor layer having a diffraction grating function located intermediate said first and second cladding layers and comprising alternating first and second zones differing in indices of refraction, said first zone comprising a semiconductor superlattice and said second zone comprising a damaged superlattice.

4,786,952
HIGH VOLTAGE DEPLETION MODE MOS POWER FIELD EFFECT TRANSISTOR
Bernard A. MacIver, Lathrup Village, and Kailash C. Jain, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 24, 1986, Ser. No. 888,697
Int. Cl.[4] H01L *29/78, 27/10*
U.S. Cl. 357—23.4 **9 Claims**



1. A vertical FET device having a high drain-to-source breakdown voltage, comprising:
a substrate of a semiconductor material of a first each of the source electrode apertures being doped with an impurity of the first conductivity type to form a more highly doped source region therein, and a second disjoint subset of said set of apertures not overlying said source regions, the portion of the third drain layer adjacent each aperture in said second subset of apertures being doped with an impurity of a conductivity type opposite to the first conductivity type;
one or more gate electrodes over the portion of the gate insulating layer adjacent said one or more source apertures;
an insulating layer over each of the gate electrodes, each said insulating layer being placed so as to leave one or more source regions in the third drain layer exposed through the source apertures; and
a source electrode layer for making electrical contact with each of the plurality of source regions in the epitaxial layer.

4,786,953
VERTICAL MOSFET AND METHOD OF MANUFACTURING THE SAME
Takashi Morie; Toshifumi Somatani, both of Zama; Shigeru Nakajima, Chigasaki; Kazushige Minegishi, Atsugi, and Kenji Miura, Isehara, all of Japan, assignors to Nippon Telegraph & Telephone, Tokyo, Japan
Division of Ser. No. 756,135, Jul. 16, 1985, Pat. No. 4,683,643. This application May 12, 1987, Ser. No. 48,702
Int. Cl.[4] H01L *29/78, 29/06, 27/02, 29/04*
U.S. Cl. 357—23.4 **6 Claims**



1. A vertical metal oxide semiconductor field effect transistor, comprising:

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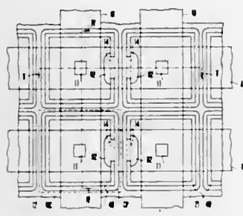
a trench formed in a major surface of a semiconductor substrate, said trench having a botom and side walls substantially normal to said major surface;
a first insulating film overlying at least one of said side walls and a portion of said major surface;
a first conductive layer formed on a portion of said first insulating film and overlying said at least one of said side walls and at least part of said portion of said major surface, said first conductive layer serving as a gate electrode;
a second insulating film formed on said first conductive layer;
lower and upper diffusion layers formed in said bottom of said trench and in a surface layer of said semiconductor substrate, said diffusion layers serving as source/drain regions, respectively; and
a second conductive layer formed in contact with said lower diffusion layer in said bottom of said trench, said second conductive layer being insulated from said first conductive layer by said second insulating film and serving as the electrode for said lower diffusion layer.

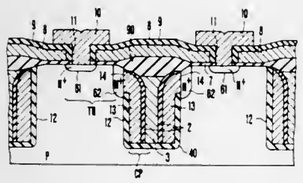
4,786,954

DYNAMIC RAM CELL WITH TRENCH SURROUNDED SWITCHING ELEMENT

Takashi Morie; Kazushige Minegishi, and Shigeru Nakajima, all of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 716,370, Mar. 26, 1985, abandoned.
This application Oct. 19, 1987, Ser. No. 110,616
Claims priority, application Japan, Apr. 19, 1984, 59-79683; Oct. 8, 1984, 59-209789
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.6 **12 Claims**





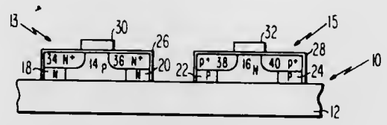
1. A semiconductor memory device comprising a semiconductor substrate of a first conductivity in which a plurality of memory cells are formed, each of said plurality of memory cells including at least one capacitor, a switching element and a trench being disposed on a major surface of said substrate, and switching element being disposed on a flat surface of said substrate which is surrounded by said trench, wherein a first insulating film is formed at least on most areas of side wall surfaces of said trench, said capacitor and first insulating film being disposed within a region defined by said trench, said first insulating film having a window near the opening of said trench so that a portion of said substrate is exposed, a diffusion region is formed in a portion of said substrate corresponding to said window, a first conductive film serving as one electrode of said capacitor is formed on said first insulating film and an exposed portion, said exposed portion being disposed in corresponding relationship to said window, said first conductive film and said diffusion region extending into said window and being in contact with one another thereat, wherein among adjacent memory cells, the first conductive film of each adjacent memory cell are disposed upon side wall of said trench and are isolated from one therewithin, and wherein a second insulating film is formed on said first conductive film, a second conductive film serving as the other common electrode of said capacitor of each adjacent memory cell is formed between said first insulating and said second insulating film, at the bottom of said trench so that the first conductive film of each adjacent memory cell is electrically separated from each other by the second insulating films, and wherein one terminal of said switching element contacts to said first conductive film through said window.

4,786,955

SEMICONDUCTOR DEVICE WITH SOURCE AND DRAIN DEPTH EXTENDERS AND A METHOD OF MAKING THE SAME

Dora Plus, South Bound Brook, and Ronald K. Smeltzer, Princeton Township, Mercer County, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 24, 1987, Ser. No. 18,314
Int. Cl.[4] H01L *29/78, 27/12, 27/02*
U.S. Cl. 357—23.7 **8 Claims**



1. A semiconductor device, comprising:
an insulating substrate;
a layer of semiconductor material disposed on said insulating substrate;
source and drain depth extenders of a first conductivity type disposed within said layer of semiconductor material so that at least a portion of each of said extenders has a common boundary with said insulating substrate; and
source and drain regions of a first conductivity type disposed within said layer of semiconductor material so that each of said source and drain depth extenders subtend and contact the respective source and drain regions, said source and drain regions each having an impurity concentration which is greater than the impurity concentration of the respective source and drain depth extenders and a depth which is less than the thickness of said layer of semiconductor material.

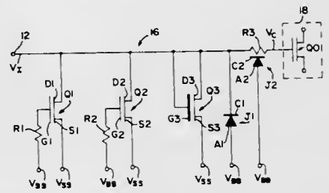
4,786,956

INPUT PROTECTION DEVICE FOR INTEGRATED CIRCUITS

Deepraj S. Puar, Sunnyvale, Calif., assignor to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Continuation of Ser. No. 435,586, Oct. 20, 1982, abandoned.
This application Oct. 11, 1985, Ser. No. 786,899
Int. Cl.[4] H01L *29/78, 27/04*
U.S. Cl. 357—23.13 **16 Claims**

1. An integrated circuit protection device for preventing an input signal applied to a terminal of an integrated circuit from damaging a section of the circuit coupled to the terminal, the circuit comprising a semiconductor body having an upper surface along which a recessed field-oxide region laterally separates active semiconductor portions of a primary monocrystalline semiconductive region of the body, the device comprising:
an N-channel enhancement-mode first insulated-gate field-effect transistor (FET) having a source that receives a first voltage, an insulated-gate electrode, and a drain coupled to the terminal, the source and drain lying in one of the active portions along the upper surface;



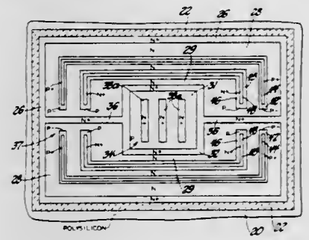
a resistor of which one end is coupled to the insulated-gate electrode of the first FET and the other end receives a second voltage; and
an N-channel thick-oxide second insulated-gate FET having a source that lies in one of the active portions along the upper surface and receives the first voltage, an insulated-gate electrode coupled to the terminal, and a drain that lies in another of the active portions along the upper surface and is coupled to the terminal.

4,786,958

LATERAL DUAL GATE THYRISTOR AND METHOD OF FABRICATING SAME

Jayant K. Bhagat, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1986, Ser. No. 931,345
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **6 Claims**





1. A lateral dual gate thyristor comprising:
a substrate having an included region of semiconductor material electrically isolated from said substrate by a buried layer of electrically insulated material;
a layer of highly conductive buried semiconductor material overlying said buried layer of electrically insulative material and disposed in said electrically isolated region;
an island of semiconductor material centrally disposed in the surface of said electrically isolated region and having a conductivity type opposite that of said electrically isolated region;
a ring of semiconductor material disposed in the surface of said electrically isolated region and encircling said island, said ring having one surface contiguous with said island and another surface contiguous with said electrically isolated region, and said ring being formed of semiconductor material having the same conductivity type as said electrically isolated region but more heavily doped than said isolated region;
at least one strip of semiconductor material disposed in the surface of said electrically isolated semiconductor region one end of said one strip being in electrical contact with said ring, the other end of said one strip being in contact with said highly conductive buried layer;
a centrally disposed cathode formed in the surface of said island and having the same conductivity type as said ring;
an anode formed in the surface of said electrically isolated semiconductor region spaced apart from said ring and having a conductivity type opposite that of said electrically isolated semiconductor region;
a channel region formed in the surface of said electrically isolated semiconductor region having a conductivity type opposite that of said electrically isolated semiconductor region and spaced apart from said ring and said anode;
a drain region of semi-conductor material formed wholly within the surface of said channel region and having a conductivity type opposite that of said channel region;
a layer of dielectric disposed on the surface of said electrically isolated region;
a first gate electrode disposed on said dielectric layer and registering with those portions of said channel and said electrically isolated semiconductor region interposed

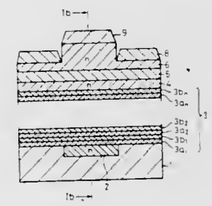
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4,786,957

NEGATIVE DIFFERENTIAL RESISTANCE ELEMENT

Shunichi Muto, Isebara, Japan, assignor to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 29, 1987, Ser. No. 8,240
Claims priority, application Japan, Jan. 30, 1986, 61-16700
Int. Cl.[4] H01L *29/06, 29/205, 29/70*
U.S. Cl. 357—34 **7 Claims**



1. A negative differential resistance element, comprising
a GaAs emitter layer of one conductivity type;
a first barrier layer of non-doped AlGaAs in contact with the emitter layer;
a GaAs base layer of the one conductivity type in contact with the first barrier layer on the opposite side of the emitter layer;
a second barrier layer of a superlattice composed of a plurality of coupled non-doped AlAs and GaAs thin layers in contact with the base layer on the opposite side of the first barrier layer;
a GaA's collector layer of the one conductivity type in contact with the second barrier layer on the opposite side of the base layer;
an emitter electrode connected to the emitter layer;
a base electrode connected to the base layer;
a collector electrode connected to the collector layer; and,
means for biasing the element so that a carrier of said one conductivity type flows from the emitter layer to the collector layer via the base layer.

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between said ring and said drain for capacitively connecting ring with said drain in order to turn-off said thyristor.

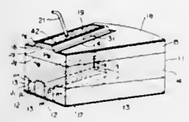
a second gate electrode disposed on said dielectric layer and register with that portion of said island interposed between said cathode and said ring for capacitively providing an electrical link between said ring and said cathode in order to turn-on said thyristor.

4,786,959

GATE TURN-OFF THYRISTOR

Yoshiteru Shimizu, Katsuta; Takahiro Nagano, Hitachi; Shuroku Sakurada, Hitachi, and Takehiro Ohta, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 164,944, Jul. 1, 1980. This application Oct. 5, 1981, Ser. No. 308,614
Claims priority, application Japan, Jul. 6, 1979, 54-84964
Int. Cl.⁴ H01L *29/74*
U.S. Cl. 357—38 **12 Claims**





1. A gate turn-off thyristor which comprises:

(a) a semiconductor substrate having a pair of opposing major surfaces which comprises:

(i) a plurality of first emitter regions of one conductivity type exposed to one of said major surfaces exposed area, said first emitter regions having strip-shapes on said one major surface, and being separated from one another in said substrate;

(ii) a plurality of second emitter regions of opposite conductivity type to said first emitter regions exposed to the other of said major surfaces, and having portions of strip-shapes which overlap respectively projections of said first emitter regions onto said other major surface;

(iii) a first base region of said opposite conductivity type adjacent to said first emitter regions and exposed to said one major surface so as to surround the exposed surface of said first emitter regions; and

(iv) a second base region of said one conductivity type adjacent to said first base region and said second emitter regions, and exposed to said other major surface so as to surround exposed surfaces of said second emitter regions and so as to have a portion where an area of the exposed surface of said second base region is increased in a substantially continuous manner along a longitudinal direction of at least one of said strip-shaped portions of said second emitter regions from one portion close to one side of a terminal edge of said at least one strip-shaped portion of said second emitter regions to another portion close to another side of said terminal edge of said at least one strip-shaped portion of said second emitter regions,

(b) a plurality of first main electrodes disposed on said one major surface of said semiconductor substrate in ohmic contact with the exposed surfaces of said first emitter regions;

(c) a second main electrode disposed on said other major surface of said semiconductor substrate in ohmic contact with the exposed surfaces of said second emitter regions and said second base region; and

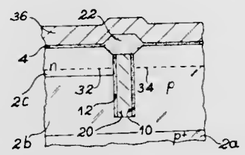
(d) only a single gate electrode disposed on said one major surface in ohmic contact with the exposed surface of said first base region, to which gate electrode an external gate wire is to be electrically connected at at least one corresponding portion of said gate electrode close to said one side of terminal edges of said second emitter regions.

4,786,960

CMOS INTEGRATED CIRCUIT AND PROCESS FOR PRODUCING AN ELECTRIC ISOLATION ZONES IN SAID INTEGRATED CIRCUIT

Pierre Jeuch, Seyssins, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 759,755, Jul. 29, 1985, abandoned. This application Jul. 23, 1987, Ser. No. 77,092
Claims priority, application France, Aug. 7, 1984, 84 12463
Int. Cl.⁴ H01L *27/02*
U.S. Cl. 357—42 **5 Claims**



1. A CMOS integrated circuit having at least one n-channel MOS transistor and at least one p-channel MOS transistor formed on a same silicon substrate having a determined conductivity type and corresponding to the circuit ground, an isolation trench having a layer of insulating material on the side walls of said trench only for electrically isolating said n-channel transistor from said p-channel transistor, a gate common to said n-channel transistor and to said p-channel transistor crossing said isolation trench in a first direction, corresponding to the channel width direction said isolation trench being in direct contact with the channels of said transistors in said first direction at the location where the gate crosses the trench, without there being a field oxide between said transistors and said trench, said trench being filled with a filling conductive material constituting a conductive electrode, which is electrically connected to said substrate and grounded by means of a doping formed in the bottom of said trench and which has the same conductivity type of said substrate.

4,786,961

BIPOLAR TRANSISTOR WITH TRANSIENT SUPPRESSOR

Leslie R. Avery, Flemington Borough, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 28, 1986, Ser. No. 834,385
Int. Cl.⁴ H01L *27/02, 29/06, 29/72*
U.S. Cl. 357—43 **9 Claims**

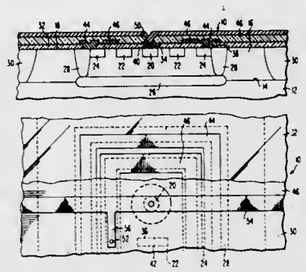
1. In an integrated circuit which includes a lateral bipolar transistor formed by first and second spaced regions of one conductivity type formed in and at a surface of a region of the opposite conductivity type in a body of semiconductor material, the improvement comprising,

a first layer of insulating material over the said surface of the body and over the first and second spaced regions, said first layer having openings therethrough,

separate conductive contacts extending through said openings in said first insulating layer to said first and second regions,

a second layer of insulating material over said first insulating layer and said contacts,

a conductive strip extending over said second insulating layer and over a portion of the region of opposite conductivity type between said first and second spaced regions, and through an opening in said second insulating layer to the contact on the first region, and



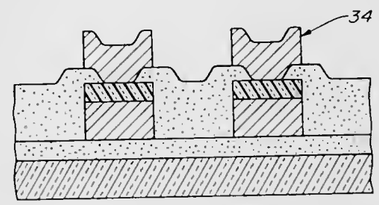
a MOS transistor formed in said region of opposite conductivity type having source and drain regions, said source region being connected to the second region, said drain region being connected to the region of opposite conductivity type, and a gate connected to the first region.

4,786,962

PROCESS FOR FABRICATING MULTILEVEL METAL INTEGRATED CIRCUITS AND STRUCTURES PRODUCED THEREBY

Tim R. Koch, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 6, 1986, Ser. No. 871,660
Int. Cl.⁴ H01H *23/48*
U.S. Cl. 357—71 **3 Claims**



1. A process for fabricating multilevel metal integrated circuits including the steps of:

a. providing a semiconductor substrate with a surface insulator thereon,

b. providing a first level of metallization comprising one or more strips of aluminum covered by corresponding surface strips of tungsten,

c. providing an inter-metal insulating layer surrounding said first level of metallization and having openings therein exposing preselected areas of said tungsten, and

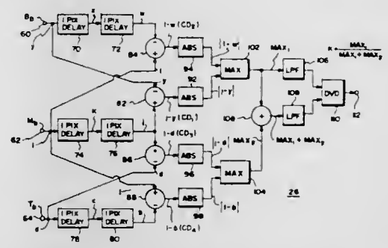
d. providing a second level of metallization atop said inter-metal insulating layer and comprising one or more strips of conductors positioned in vias or openings in said inter-metal insulating layer and making electrical contact with said tungsten, whereby said tungsten serves to prevent hillocks from occuring in the aluminum of said first level of metallization and further serves as an etch stop material during the etching of both said inter-metal insulating layer and the second level of metallization thereon.

4,786,963

ADAPTIVE Y/C SEPARATION APPARATUS FOR TV SIGNALS

David L. McNeely, and Donald H. Willis, both of Indianapolis, Ind., assignors to RCA Licensing Corporation, Princeton, N.J.

Filed Jun. 26, 1987, Ser. No. 66,671
Int. Cl.⁴ H04N *9/78*
U.S. Cl. 358—31 **9 Claims**



5. Video signal processing apparatus comprising:

an input terminal for applying said video signal;

means coupled to said input terminal for producing a plurality of video signals respectively delayed by integral numbers of a horizontal line interval;

means, coupled to said means for producing said plurality of video signals, for forming pairs of cross differences from pairs of said plurality of video signals;

means for providing, in accordance with a predetermined relative magnitude function of the cross differences of each pair of cross differences, the magnitude of one cross difference from each pair; and

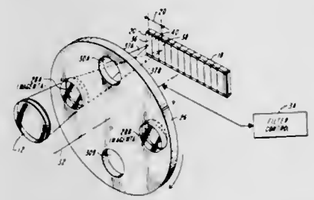
means for combining ones of said plurality of video signals in proportions determined by the quotient of one of said provided magnitudes over the sum of said provided magnitudes.

4,786,964

ELECTRONIC COLOR IMAGING APPARATUS WITH PRISMATIC COLOR FILTER PERIODICALLY INTERPOSED IN FRONT OF AN ARRAY OF PRIMARY COLOR FILTERS

William T. Plummer, Concord, and Hugh R. MacKenzie, Belmont, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 2, 1987, Ser. No. 9,934
Int. Cl.⁴ H04N *9/077, 5/335, 9/04;* **G03F** *3/08*
U.S. Cl. 358—44 **6 Claims**



1. Electronic imaging apparatus for producing an enhanced image of a scene comprising:

an array of photosensitive elements, with each of said elements producing an electrical signal indicative of the intensity of light incident thereon;

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an array of primary color filters, with each of said filters having a respective one of at least three given primary colors, said filter array being fixedly positioned in an overlying relationship to said photosensitive element array such that each of said filters is operably associated with a respective one of said photosensitive elements, and said filter array in its entirety being structured to normally pass light which is weighted in favor of one of said given primary colors;

means for focusing image-carrying light rays from a scene onto said photosensitive element array through said filter array;

means for causing light rays from each of a plurality of areas of said scene to pass through a first respective one of said filters onto the associated photosensitive element to produce a first electrical signal representative of the corresponding scene area, and for subsequently causing said light rays from each of said plurality of scene areas to pass through a filter element interposed in front of said filter array, said filter element being structured to filter out said one of said given primary colors, and then causing said filtered light rays from each of said plurality of scene areas to be redirected to pass through a second respective one of said filters onto the associated photosensitive element to produce a second electrical signal representative of the corresponding scene area, said second respective filter being structured to filter out any primary color other than said one of said given primary colors which is passed by said first respective filter; and

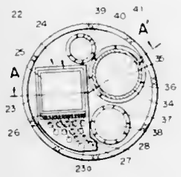
means for at least temporarily storing said first and second electrical signals representative of each of said plurality of scene areas, whereby the stored signals may be later manipulated to produce an enhanced image of said scene.

4,786,965

ELETRONIC ENDOSCOPE WITH AN IMAGING DEVICE HAVING SIDE BONDING PADS

Hisao Yabe, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,401
Claims priority, application Japan, Sep. 4, 1986, 61-209155
Int. Cl.[4] H04N *7/18, 3/14*
U.S. Cl. 358—98 **18 Claims**



1. An electronic endoscope comprising:

an operating part;

a flexible insertable part formed to have a diameter which is smaller than a diameter of the operating part;

contents of said flexible insertable part including at least a light guide arranged over an entire length within said insertable part;

a solid state imaging device provided within a tip of said insertable part, provided substantially at right angles with an axial direction of the insertable part and provided in a space enclosed with an inside diameter of the insertable part and said contents;

a solid state imaging chip forming said solid state imaging device and having an image area and chip side bonding pads provided along one side of said image area;

a base securing said solid state imaging chip;

base side bonding pads provided in groups on said base; and

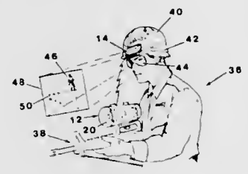
bonding wires connecting said chip side bonding pads and base side bonding pads respectively with each other.

4,786,965

HEAD MOUNTED VIDEO DISPLAY AND REMOTE CAMERA SYSTEM

Charles M. Hanson, Richardson; Vaughn J. Koester, Dallas, and Robert D. Fallstrom, Richardson, all of Tex., assignors to Varo, Inc., Garland, Tex.

Filed Jul. 10, 1986, Ser. No. 883,994
Int. Cl.[4] H04N *7/18, 5/33*
U.S. Cl. 358—108 **20 Claims**



1. A video system, comprising:

an imaging system for generating video signals representative of an object;

a video receiver and display remotely located from said imaging system;

an optical link operating between a short UV and a far IR wavelength for transmitting said video signals between said imaging system and said video receiver; and

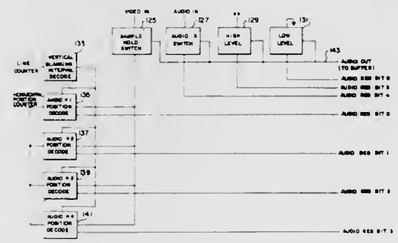
means removably attachable to a person's head, including means for mounting thereto said video receiver and said video display, said video display being mounted in a position such that the person can view the display without the use of the person's hands and wherein the person can move about in an unimpeded manner.

4,786,967

INTERACTIVE VIDEO APPARATUS WITH AUDIO AND VIDEO BRANCHING

Jay Smith, III, Los Angeles; Kenneth J. Curran, Redondo Beach, both of Calif., and Ralph H. Baer, Manchester, N.H., assignors to Smith Engineering, Culver City, Calif.

Filed Aug. 20, 1986, Ser. No. 898,320
Int. Cl.[4] H04N *7/04*
U.S. Cl. 358—143 **45 Claims**



1. Video apparatus comprising:

applying means for applying a raster scan format television signal wherein a plurality of digital commands and audio segments are encoded as amplitude modulated pulses between successive horizontal sync intervals;

a raster scanned video display employing a raster scan spot;

means for generating a selection signal;

means responsive to first control signals for modifying said television signal and supplying a modified television signal to said video display;

cursor generation means for optically sensing a portion of said video display remotely, detecting the raster scan spot and generating second control signals for producing a cursor at a selected position of said display means in response to detection of the raster scan spot;

means receiving said video information for separating said digital commands from said video information and supplying them as an output;

means receiving said video information and responsive to third control signals for separating a selected one of said plurality of audio segments from said video information; and

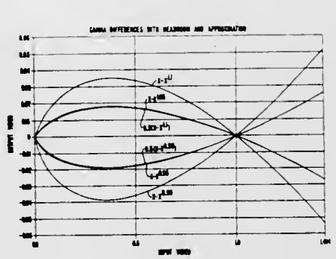
digital processor means responsive to said selected position of said cursor at the time of generation of said selection signal and to the digital commands outputted by said means for separating said digital commands to generate one or more of (1) first control signals for causing said modifying means to blank a selected portion of said video display and (2) third control signals for causing said means for separating said audio segments to separate a particular said audio segment.

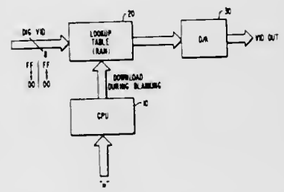
4,786,968

GAMMA CORRECTION OF DIGITAL VIDEO DATA BY CALCULATING LINEARLY INTERPOLATED GAMMA CORRECTION VALUES

Michael A. Kutner, Palo Alto, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,272
Int. Cl.[4] H04N *5/202*
U.S. Cl. 358—164 **4 Claims**





1. Apparatus for gamma correcting an input digital video signal comprising:

means for calculating linearly interpolated gamma correction values (d) according to one of the formulae:

$$d = 10 \cdot a \cdot (x - x^{1.10})$$

or

$$d = 10 \cdot a \cdot (x - x^{0.90}),$$

where a is an operator selected variable; and

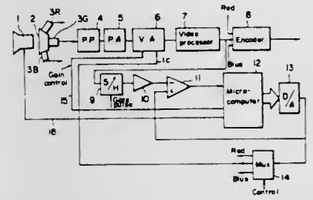
lookup table means, loaded with said linearly interpolated gamma correction values, for receiving input digital video signals and outputting a corresponding digital video signal as corrected by adding to the input signal corresponding linearly interpolated gamma correction values.

4,786,969

BLACK LEVEL CORRECTION CIRCUIT FOR VIDEO CAMERA

Hiroyuki Shouji, Tokyo, and Eiji Tamura, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 29,985
Claims priority, application Japan, Apr. 8, 1986, 61-80887
Int. Cl.[4] H04N *5/16*
U.S. Cl. 358—171 **8 Claims**



1. A black level correcting circuit for a video camera having image pick-up means for generating a video signal corresponding to an image, video signal amplifying means for amplifying the video signal from said image pick-up means, the gain of said video signal amplifier means being variable and being switchable between at least two fixed values and video signal processing means that clips a black level signal below a predetermined level and that is supplied with the output of said video signal amplifying means for processing the same, said black level correcting circuit comprising:

control means for controlling said image pick-up means such that no light enters said image pick-up means in a black level correcting mode;

detecting means for detecting the level of the output of said video signal processing means when no light enters said image pickup means at predetermined time points in the video signal;

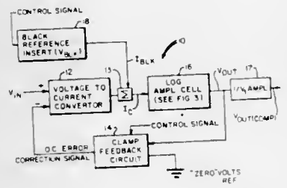
means for judging whether a difference between the outputs of said detecting means detected at two time points with a predetermined interval of time therebetween is below a threshold value and determining therefrom that the black level is stabilized;

correcting means for generating a correcting signal upon a chance in stabilized black levels from said means for judging before and after switching the gain of said video signal amplifying means between said at least two fixed levels and for supplying said correcting signal to said video signal amplifying means to vary the gain thereof for decreasing said change; and

said correcting means further detects that the black level is below the predetermined level by comparing said correcting signal and a predetermined reference level and said correcting means outputs a fixed value instead of the correcting signal and said means for judging is operated again.

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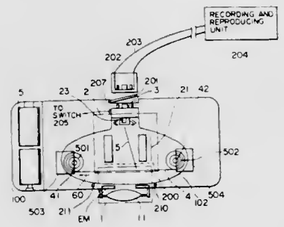
4,786,970
LOGARITHMIC AMPLIFIER
Leslie G. Moore, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 89,707, Aug. 26, 1987. This application Mar. 23, 1988, Ser. No. 171,977
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—184 **1 Claim**



1. A D.C. stabilized logarithmic amplifier which in response to an input video signal V_{in} having blanking and picture intervals provides a temperature compensated logarithmic signal $V_{out(comp)}$, compensated for a thermal voltage V_t and a saturation leakage current I_S, comprising:
   a. a logarithmic amplifier cell having first and second matched bipolar transistors connected to compensate for I_S and a third transistor for providing a constant collector current I_{REF}, through the second transistor, an output voltage V_{out} being produced at the junction of the second and third transistors and;
   b. feedback means including:
      i. a voltage to current convertor responsive to V_{in} and an error signal to provide the collector current I_c for the first transistor during picture information intervals;
      ii. means for producing a black reference current I_{BLK} and for summing such I_{BLK} current with the output of said voltage to current converter during the blanking interval to provide a collector current I_c during blanking for the first transistor; and
   c. a clamp feedback circuit producing the error signal and during the blanking interval being responsive to V_{out} to adjust the error signal so that I_c equals I_{REF} thereby providing temperature compensated D.C. stabilization for V_{out}; and
   d. a 1/Vt amplifier responsive to V_{out} for correcting the thermal voltage Vt to provide a compensated voltage $V_{out(comp)}$ during the picture interval.

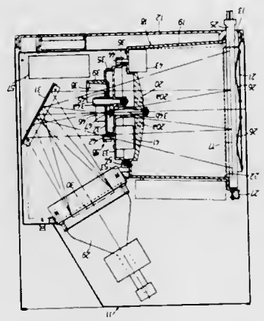
4,786,971
IMAGE RECORDING AND/OR REPRODUCING APPARATUS
Shuzo Kaneko, Tokyo; Tatsuo Takeuchi, Kawasaki; Tsutomu Toyono, Yokohama; Tohru Takahashi, Tokyo; Nagao Hosono, Hachioji; Fumitaka Kan, Tokyo; Akihiko Tojo, Yokohama; Takayoshi Tsutsumi, Tokyo; Ryo Fujimoto, Kawasaki, and Yoshiro Udagawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 14, 1987, Ser. No. 38,337
Claims priority, application Japan, Apr. 14, 1986, 61-85501; Apr. 14, 1986, 61-85502; Apr. 14, 1986, 61-85503; Apr. 14, 1986, 61-85504; Apr. 14, 1986, 61-85505; May 10, 1986, 61-107354; May 10, 1986, 61-107355; Jun. 11, 1986, 61-136770; Jun. 11, 1986, 61-136771; Jun. 17, 1986, 61-141018; Jun. 17, 1986, 61-141019; Jun. 19, 1986, 61-143879; Jun. 19, 1986, 61-143880; Jun. 19, 1986, 61-143881
Int. Cl.[4] H04N *1/29, 5/335, 5/80*
U.S. Cl. 358—209 **54 Claims**

1. An image recording and/or reproducing apparatus comprising:
   a photoelectric conversion member for converting an optical image into electrical image data, said photoelectric conversion member being in the form of a thin film on a base member;
   means for applying light from predetermined optical images to different areas on said photoelectric conversion member, thus accumulating a plurality of images on said photoelectric conversion member;



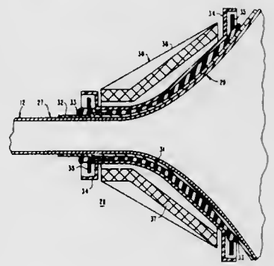
   scanning means for scanning said photoelectric conversion member with an electron beam; and
   means for sealing at least said photoelectric conversion means and said scanning means from the exterior of said apparatus.

4,786,972
CRT PHOTOGRAPHY APPARATUS UTILIZING ROTATABLE LENS
Atsumi Kashiwagi, Osaka, Japan, assignor to Fujimoto Photo Industrial Co., Ltd., Osaka, Japan
Filed Apr. 24, 1987, Ser. No. 41,943
Claims priority, application Japan, Dec. 9, 1986, 61-293170
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—244 **8 Claims**



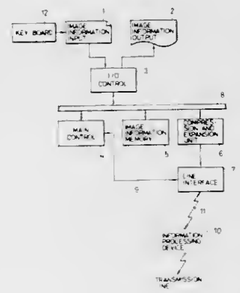
1. An apparatus for photographing images on a CRT wherein a photographic lens is interposed between the CRT and a film for focusing images on the CRT on the film to photograph the CRT images on a plurality of frames of the film, the apparatus being characterized in that the apparatus comprises a lens mount for supporting the single lens thereon with its optical axis positioned perpendicular to the film, and a drive mechanism for rotating the lens mount about a support shaft substantially parallel with the optical axis of the lens so that the lens is moved to and stopped at a plurality of positions for focusing the CRT images on the film frames individually.

4,786,973
MOUNTING SLEEVE FOR VIDEO APPARATUS DEFLECTION YOKE
Brian E. Lock, Princeton, N.J.; Mark Galambus, Indianapolis, and Richard M. Leonard, Greenwood, both of Ind., assignors to RCA Licensing Corporation, Princeton, N.J.
Filed Aug. 19, 1987, Ser. No. 68,643
Int. Cl.[4] H04H *5/645*
U.S. Cl. 358—248 **9 Claims**



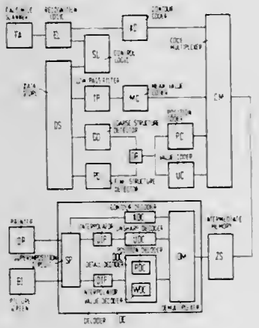
1. A display system for a video apparatus comprising:
   a cathode ray tube incorporating a neck and funnel region;
   a flexible sleeve disposed on and substantially conforming to said cathode ray tube in the vicinity of said neck and funnel regions;
   means for removably afixing said sleeve to said cathode ray tube;
   a deflection yoke disposed on said cathode ray tube in the vicinity of said neck and funnel regions; and
   a quantity of adhesive disposed between said deflection yoke and said sleeve for fixing the position of said deflection yoke with respect to said cathode ray tube.

4,786,974
IMAGE INFORMATION PROCESSING SYSTEM
Kenzoh Ina, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 20, 1985, Ser. No. 713,820
Claims priority, application Japan, Mar. 26, 1984, 59-56218; Mar. 26, 1984, 59-56219
Int. Cl.[4] H04N *1/32*
U.S. Cl. 358—257 **19 Claims**



1. An image information processing system comprising:
   read means connected to a bus line for reading an original image by photoelectric conversion and supplying image information representing the original image to said bus line;
   memory means connected to said bus line for storing the image information received from said read means through said bus line;
   compression means connected to said bus line for compressing the image information received from said read means through said bus line;
   communication means for transmitting the image information compressed by said compression means to an external apparatus and for receiving start command data from said external apparatus; and
   control means for controlling the operation of said read means, said memory means, said compression means, and said communication means, wherein said control means causes said read means to read the original image in response to start command data from said external apparatus and causes the communication means to transmit the compressed image information to said external apparatus.

4,786,975
METHOD FOR CODING FACSIMILES
Wolfgang Postl, Berg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 36,188, Apr. 9, 1987, abandoned. This application Jan. 25, 1988, Ser. No. 147,665
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415763
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—283 **55 Claims**



1. A method for coding a facsimile acquired when scanning an original and which contains halftone areas H_i where i is a running number of a respective halftone area within the facsimile to be coded, comprising the steps of:
   in order to substantially reduce moire and to achieve data compression, executing a coding of the halftone areas corresponding to an unsharp imaging in comparison to the original such that a so-called halftone raster is suppressed;
   defining a detail area Di within a respective halftone area H_i and coding it with a detail code in a detail coding step; and
   at least a remaining area of the halftone area H_i being coded with an unsharp code in an unsharp coding step.

4,786,976
IMAGE PROCESSING APPARATUS
Mitsuji Takao, Tokyo, and Hiroyuki Mikada, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 16, 1984, Ser. No. 580,821
Claims priority, application Japan, Feb. 25, 1983, 58-31177
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—283 **29 Claims**

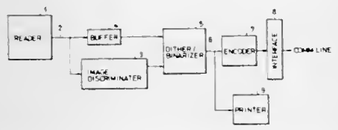
1. An image processing apparatus comprising:
   input means for inputting pixel data;
   discrimination means for discriminating whether the pixel

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data inputted by said input means represents a half-tone image or non-half-tone image for each of a plurality of blocks, each said block having a plurality of pixel data arranged in two dimensions;

buffer means for delaying the pixel data inputted by said input means; and

process means for processing the pixel data outputted from said buffer means for each said block, in accordance with the result of the discrimination performed by said discrimination means,



wherein said discrimination means performs the discrimination operation thereof in synchronism with input of the pixel data into said buffer means, and

wherein said discrimination means sequentially receives the pixel data, for each line, and determines whether said block represents half-tone or non-half-tone in synchronism with input of the pixel data corresponding to the last line of the block.

4,786,977

LIGHTWEIGHT RECORDING APPARATUS USING OPERATIVE PORTIONS FOR STRUCTURAL SUPPORT

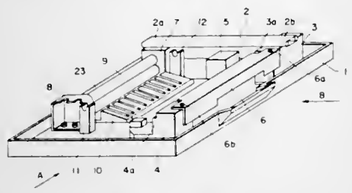
Tadayuki Tsuda, Kawasaki; Shigeyoshi Onoda, Yokohama; Morikazu Mizutani, Tokyo; Isao Ikemoto, Kawasaki; Shinji Kanemitsu, Tokyo, and Hajime Kitajima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,200

Claims priority, application Japan, Apr. 17, 1986, 61-088608

Int. Cl.⁴ H04N *1/21*

U.S. Cl. 358—296 **21 Claims**



1. A recording apparatus, comprising:

a bottom plate constituting a bottom portion of said recording apparatus;

a first unit fixed to said bottom plate and contributable to a recording operation of said recording appartus;

a second unit fixed to said bottom plate and contributable to the recording operation; and

a third unit which is elongated and is contributable to the recording operation and which is fixed adjacent its one longitudinal end to said first unit and is fixed adjacent its other end to said second unit and wherein said first and second units are fixed to said third unit adjacent corners of said bottom plate.

4,786,978

REPRODUCTION APPARATUS

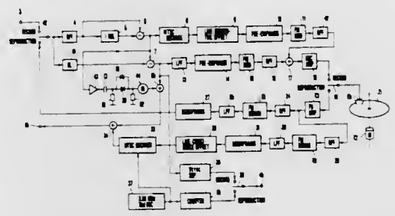
Somei Kawasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1986, Ser. No. 892,585

Claims priority, application Japan, Aug. 2, 1985, 60-170818

Int. Cl.⁴ H04N *9/87, 5/93*

U.S. Cl. 358—329 **21 Claims**



1. A reproducing apparatus for reproducing a luminance signal recorded on a recording medium with with improved signal-to-noise ratio, including:

(a) reproducing means for reproducing the luminance signal recorded on said recording medium;

(b) separating means for separating such reproduced luminance signal into a first signal including a prescribed rate of noise component and into a second signal including a smaller rate of noise component than that of said first signal;

(c) removing means for removing said noise component of said first signal to thereby produce a third signal; and

(d) adder means for adding said third signal to said second signal to produce an apparatus output signal.

4,786,979

METHOD AND SYSTEM FOR PICTURE-CORRECT TRANSFER OF MOTION PICTURE FILM SCENES TO MAGNETIC TAPE

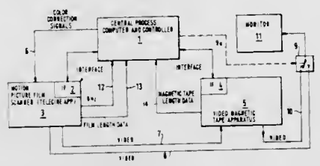
Holger Claus, and Winfried Herbst, both of Weiterstadt, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,583

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520333

Int. Cl.⁴ H04N *5/782*

U.S. Cl. 358—335 **8 Claims**



1. Method for recording motion picture film frames representing scenes on television recording tape, utilizing a telecine forming a motion picture video scanner (**3**), a video tape recording apparatus (**5**) to record video scenes in accordance with television transmission standards operating at 60 fields per second, and a central process computer (**1**);

comprising

generating a sequence of pulses (FIG. 1: graph c) in the telecine which have a frequency which is characteristic for the scanning repetition frequency at all occurring motion picture film speeds and which corresponds to the lowest common denominator of the frame repetition frequency of the motion picture film speed and the field repetition frequency of the video standard, respectively,

transferring said pulses to the central process computer (**1**); and

jointly controlling by said process computer (**1**), the telecine (**3**) with respect to the video tape recording apparatus (**5**) to operate the video scanner (**3**) to scan a selected frame of the film at a time when the selected frame of the film is before the scanner and, simultaneously and based on the generated sequence of pulses, controlling recording on the recording tape by the video tape recording apparatus (**5**).

4,786,980

IMAGE INFORMATION RECORDING SYSTEM

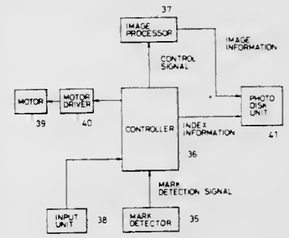
Hiraku Sonobe, Yokohama, and Norio Hashimoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 875,962

Claims priority, application Japan, Jun. 24, 1985, 60-137403; Jun. 24, 1985, 60-137404; Jun. 24, 1985, 60-137405

Int. Cl.⁴ H04N *5/85;* **G11B** *7/00, 27/10*

U.S. Cl. 358—335 **28 Claims**



18. An image storing apparatus comprising:

input means for inputting an image provided from external memory;

memory means for storing a plurality of images input by said input means; and

converting means for automatically converting first retrieving information usable by and output from said external memory means into second retrieving information for use in retrieving the images stored in said memory means.

4,786,981

EDIT MODE CONTROLLER

Satoshi Sekimoto, Kanagawa, and Seiji Saitou, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 12, 1986, Ser. No. 941,046

Claims priority, application Japan, Dec. 18, 1985, 60-284559

Int. Cl.⁴ H04N *5/78;* **G11B** *27/02*

U.S. Cl. 360—10.3 **8 Claims**

1. Apparatus for use in reproducing and recording video signals in tracks on a magnetic recording medium by a magnetic head that scans the magnetic recording medium, the apparatus comprising:

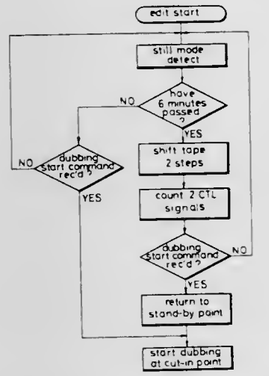
means for transporting said magnetic recording medium;

position detecting means for detecting a position of said magnetic recording medium relative to said magnetic head;

mode selecting means for selecting a functional mode of said recording and reproducing apparatus from a plurality of modes including a still playback mode and a normal playback mode;

detector means connected to said mode selecting means and to said position detecting means for determining whether said magnetic head scans one location on said magnetic recording medium for a predetermined period of time during a time that said recording and reproducing apparatus is in said still playback mode; and

means connected to said means for transporting and said detector means for generating a command signal to move said magnetic recording medium relative to said head to a different track position on said magnetic recording medium when said detector means determines that said magnetic head has scanned side one position on said magnetic recording medium for said predetermined period of time.



4,786,982

MULTI-FUNCTION ROTARY DIAL SYSTEM INCLUDING TIMER SETTING FEATURE

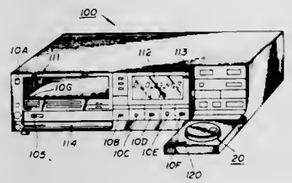
Tatsuya Wakahara, Tokyo; Shinya Fukushima, Saitama; Hisayuki Akiguchi, Tokyo; Toshizumi Ando, Kanagawa; Masanori Arimitsu, and Kiyoshi Takagaki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1985, Ser. No. 812,807

Claims priority, application Japan, Dec. 28, 1984, 59-275617; Dec. 28, 1984, 59-275623

Int. Cl.⁴ H04N *5/783*

U.S. Cl. 360—10.3 **54 Claims**



48. A video tape recorder having a timer activated recording function comprising:

a dial manually rotatable in opposing directions;

sensing means for sensing the rotation of said dial;

selecting means for selecting set modes of said time-activated recording function, said set modes comprising at least a record-starting set mode and a record-ending set mode;

a controller responsive to said selecting means for changing the contents of each of said set modes according to an output from said sensing means.

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4,786,983

SYSTEM FOR RECORDING ONE'S OWN VOICE ON TAPES ALREADY RECORDED WITH MUSICAL ACCOMPANIMENTS

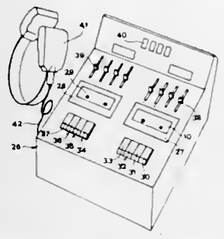
Berardo Massari, Via Gramsci 76, Rozzano (Milano), Italy

Filed May 17, 1982, Ser. No. 379,577

Claims priority, application Italy, Jul. 13, 1981, 22892 A/81; Apr. 21, 1982, 21637/82[U]

Int. Cl.⁴ G11B *5/86*

U.S. Cl. 360—13 **1 Claim**



1. System enabling a user to record on commercial cassette tapes his voice accompanied by music, particularly music accompanying the voice of a well-known professional singer, already recorded by the manufacturer, comprising:

recording means which enables the manufacturer to produce cassettes with dual-track tapes, so that the first track is recorded by the manufacturer with musical accompaniments of songs, and the second track is left blank thereby allowing the user to repeatedly record his own voice singing along with the musical accompaniment recorded on the first track; and reproducing/recording equipment for the dual-track cassette tapes which enable the user to play back the musical accompaniment of the first track and simultaneously record his voice on only the second track; and

wherein said reproducing/recording equipment includes an arrangement receiving two cassettes, said arrangement including one recess for holding an ordinary commercial complete one track cassette recorded with the musical accompaniment and the professional singer's voice, and another recess for holding the dual-track cassette tape on which only the accompaniment is recorded, said arrangement thereby making it possible to hear simultaneously the original rendering the the user's voice on the second track so that an immediate comparison can be made between the two renderings.

4,786,984

METHOD AND APPARATUS FOR LOCATING THE EDGE OF A MAGNETIC TAPE

Steven R. Seeman, Moundsview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 5, 1986, Ser. No. 938,641

Int. Cl.⁴ G11B *27/36, 5/02*

U.S. Cl. 360—31 **22 Claims**

1. A method for recognizing a given edge of a magnetic recording tape comprising:

(a) providing a record and playback unit including record means and playback means each having gaps parallel to each other, wherein the record gap width is less than one-tenth said tape width and the playback gap width is no greater than the gap width of the record means,

(b) positioning said unit at a first transverse location away from said tape edge and recording a first test signal along a track having a transverse width at least equal to the gap width of said playback means,

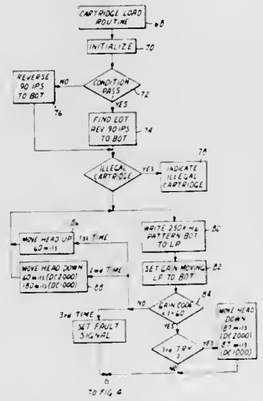
(c) playing back a corresponding playback test signal,

(d) fixing the gain of a playback signal amplifier to provide an output at a predetermined level in the presence of a said playback signal,

(e) storing as a reference value, a value which is a given fraction of said predetermined level and which corresponds to a minimum threshold detection level at which recorded signals are reliably detected,

(f) recording a second test signal along a track bounded by said edge,

(g) incrementally positioning said unit at a plurality of transverse locations, each of which is successively closer to said edge, and differs from a previous position by a small fraction of said record gap width and playing back a corresponding test signal at each successive transverse position,



(h) comparing the level of each corresponding output from said signal amplifier with said stored reference value, and

(i) storing information indicative of the transverse position of the unit when a given output signal is substantially equal to said reference value as an edge of tape reference position, thereby enabling subsequent transverse locations of the unit to be indexed relative to the edge of tape reference position to enable recording and playing back signals on any one of a plurality of parallel tracks along the tape.

4,786,985

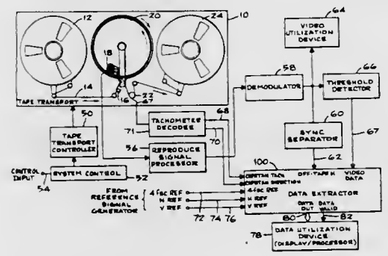
METHOD AND APPARATUS FOR EXTRACTING BINARY SIGNALS INCLUDED IN VERTICAL BLANKING INTERVALS OF VIDEO SIGNALS

Marshall Williams, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Aug. 21, 1986, Ser. No. 899,278

Int. Cl.⁴ A04N *5/91;* **G11B** *20/10*

U.S. Cl. 360—33.1 **20 Claims**



1. Apparatus for extracting binary signals included in the vertical blanking intervals of a video signal reproduced from a tape transported over a range of velocities past a transducer retated at a fixed velocity relative to the tape, said video signal reproduced at a rate which varies as a function of the tape velocity to the transducer velocity, each binary signal having a selected number of bits at regular intervals with each bit represented by one of two signal amplitude levels, certain of the bits of each binary signal at the same level to form a known bit pattern in each binary signal, and each binary signal having a bit rate which varies as the rate of reproduction of the video signal, comprising:

means for generating a control signal having a rate proportional to the velocity at which the tape is transported past the transducer;

means for supplying a direction signal indicative of the direction of tape movement;

a clock generator responsive to the control signal and the direction signal for generating a clock signal having a rate corresponding to the bit rate at which the binary signal is reproduced from the tape by the transducer as said tape is transported in a selected direction at a selected velocity within said range of velocities;

means responsive to the video signal reproduced by the transducer for generating a stream of binary data therefrom having a first level corresponding to one of said two signal amplitude levels when said video signal has an amplitude above a selected reference level, and a second level corresponding to the other of said two signal amplitude levels when said video signal has an amplitude below the selected reference level; and

a binary signal detector coupled to receive the stream of binary data and the clock signal, said detector responsive to said clock signal and the occurrence of the known bit pattern of the binary signal for detecting the occurrence of the binary signal in the received stream of binary data.

4,786,986

MAGNETIC RECORDING AND REPRODUCING APPARATUS

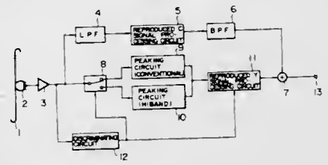
Fumihiko Yamanushi; Atsushi Yoshioka; Katsuyuki Watanabe; Michio Masuda, all of Katsuta, and Kuniaki Miura, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,603

Claims priority, application Japan, Oct. 31, 1986, 61-258251; Apr. 10, 1987, 62-86824

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—33.1 **10 Claims**



1. A magnetic recording and reproducing apparatus including a recording system operable with a first and a second recording mode converting a luminance signal of a video signal into an FM luminance signal having a first and a second carrier frequency respectively and recording the FM luminance signal on a magnetic recording medium, and a reproducing system reproducing the FM luminance signal recorded on the magnetic recording medium, said apparatus comprising:

discriminating means disposed in said reproducing system for receiving said FM luminance signal reproduced from said magnetic recording medium and discriminating as to whether said reproduced FM luminance signal was recorded according to said first recording mode or said second recording mode;

first signal processing means disposed in said reproducing system for processing said reproduced FM luminance signal recorded according to said first recording mode;

second signal processing means disposed in said reproducing system for processing said FM luminance signal recorded according to said second recording mode; and

control means responsive to an output of said discriminating means to control application of said reproduced FM luminance signal to one of said first and second signal processing means.

4,786,987

ELECTRONIC CAMERA WITH AUTOFOCUS WARNING DEVICE

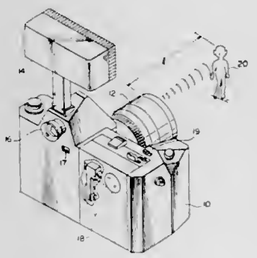
Ikuo Fujimura, and Mikio Utsugi, both of Minato, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 15, 1986, Ser. No. 918,909

Claims priority, application Japan, Oct. 19, 1985, 60-160031[U]; Oct 19, 1985, 60-160032[U]; Oct 19, 1985, 60-160033[U]; Oct. 19, 1985, 60-160034[U]

Int. Cl.⁴ H04N *5/781*

U.S. Cl. 360—35.1 **11 Claims**



1. A camera comprising:

an optical finder section for ascertaining a scope for photographing a subject;

means for measuring an object distance to said subject to be photographed; and

an optical system including a mechanism for automatically focusing a taking lens in response to an output signal from said means for measuring a distance;

wherein said taking lens is comprised of zoom lenses, and said camera further comprises means for outputting a zoom lens driving signal when the object distance to the subject, which is measured by, said distance measuring means, is beyond a predetermined value at which it becomes difficult to identify a face of the subject taken by said camera, and control means for driving a zoom lens mechanism in response to input of said zoom lens driving signal.

4,786,988

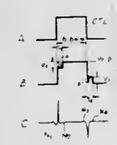
METHOD AND DEVICE FOR RECORDING CONTROL SIGNALS FOR HIGH-SPEED CONTACT PRINTING

Toshiharu Kobayashi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 29, 1986, Ser. No. 867,913

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—40 **13 Claims**



1. A sub-master tape for high-speed contact printing for duplicating video information onto a slave tape, characterized by video information copied from a master tape and including a control signal which is made up of rectangular pulses of alternating upper and lower peak levels, each pulse having respective leading and trailing edges, said control signal having

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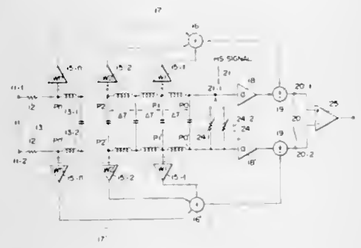
a first level immediately following the leading edge of each pulse of the control signal, a second level immediately following said first level and corresponding to said upper peak level of said control signal pulses, said second level being higher than said first level, a third level immediately following the trailing edge of each pulse of the control signal, and a fourth level immediately following said third level and corresponding to said lower peak level of said control signal pulses, said fourth level being lower than said third level.

4,786,989

WAVEFORM EQUALIZER FOR SIGNAL REPRODUCED FROM A MAGNETIC RECORDING MEDIUM

Hiroshi Okamura, and Hiroshi Suzuki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1987, Ser. No. 30,922
Claims priority, application Japan, Mar. 31, 1986, 61-72894
Int. Cl.[4] G11B *5/45, 5/09*
U.S. Cl. 360—65 **14 Claims**



1. A waveform equalizer for equalizing a waveform of a parallel signal reproduced from a magnetic record medium, comprising:

delaying means including first and second delay lines each having a receiving end and a terminating end, for receiving the parallel-reproduced signal at said receiving ends, each of said first and second delay lines having at least one tap;

reflecting means connected between said terminating ends, for reflecting a part of the parallel-reproduced signal supplied to said receiving ends and for transmitting a remaining part of the parallel-reproduced signal;

first weighting means for weighting a first tap signal from said first delay line;

second weighting means for weighting a second tap signal from said second delay line;

first combining means for adding a first transmitted signal from the terminating end of said first delay line and the weighted first tap signal in accordance with a relation predetermined by the impedance of said reflecting means to produce a first Hilbert-transform signal;

second combining means for adding a second transmitted signal from the terminating end of said second delay line and the weighted second tap signal in accordance with the predetermined relation to produce a second Hilbert-transform signal; and

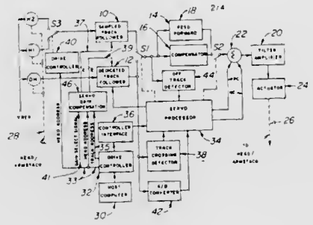
operation amplifier means for calculating the difference between the first and second Hilbert-transform signals.

4,786,990

SERVO GAIN COMPENSATION IN A DISC DRIVE

Wallace H. Overton; Vernon L. Knowles, and Bruce J. Jackson, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 30, 1986, Ser. No. 869,268
Int. Cl.[4] G11B *15/14*
U.S. Cl. 360—65 **6 Claims**



1. The method of compensating for servo gain variations when the servo is connected to different magnetic heads supported to simultaneously scan respective memory discs in a disc drive, comprising:

a. determining at corresponding tracks on the different memory discs, individual servo gain corrections for each magnetic head at several different selected tracks on the associated memory discs;

b. Storing the individual servo gain corrections in a read only memory;

c. addressing said read only memory for a stored individual servo gain correction for a selected magnetic head at a selected track, for coupling to said servo to equalize servo gain when positioning any selected magnetic head at a selected one of its tracts;

d. utilizing one magnetic head as a dedicated head and the associated memory disc as a dedicated servo code memory disc;

e. utilizing a second magnetic head as a sampled servo magnetic head and the associated memory disc as a sampled servo code memory disc, the addressed stored individual servo gain corrections for said dedicated servo magnetic head and said sampled servo magnetic head being for corresponding tracks on said dedicated servo code memory disc and said sampled servo code memory disc; and

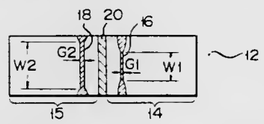
f. switching access between said addressed, stored individual servo gain corrections for providing servo gain corrections to control positioning of the dedicated servo magnetic head and the sampled servo magnetic head.

4,786,991

MAGNETIC RECORDING/REPRODUCTION APPARATUS

Kazuyoshi Yamamori, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 757,286, Jul. 22, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 27,124
Claims priority, application Japan, Jul. 31, 1984, 59-160515
Int. Cl.[4] G11B *5/03*
U.S. Cl. 360—66 **4 Claims**



1. A magnetic recording/reproducing apparatus comprising:

a disk-like perpendicular magnetic recording medium having a magnetic layer for recording digital data by remanent magnetization perpendicular to said magnetic layer;

recording head means including a recording gap which at least records data in said recording medium by changing the direction of magnetic field applied to the recording medium, in response to signals containing digital data to be recorded;

erase head means formed integrally with said recording head means, including an erase gap greater than 1.5 μm arranged in an advanced position relative to said recording gap of said recording medium prior to the recording of new data by said recording head means, the track width determined by said erase gap being greater than that determined by said recording gap, to thereby sufficiently remove all remanent magnetization with a range wider than the recording track, and said erase gap having a gap length greater than that of said recording gap, to thereby deeply remove all remanent magnetization of the old data when driven by a current having an overwrite modulation below −26 dB; and

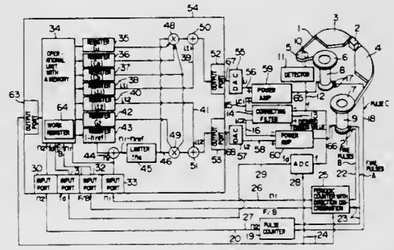
driving means for driving at least one of said head means and said recording medium, to cause relative movement between said head means and said recording medium.

4,786,992

APPARATUS AND METHOD FOR CONTROLLING TAPE TENSION USING ACCELERATION AND AVERAGE TENSION DEVIATION INFORMATION TO ADJUST MOTOR DRIVE CURRENTS

Fujio Tajima; Atsushi Ichikawa, both of Ibaraki; Hiroshi Maejima, Kanagawa, and Munetake Kanna, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 917,980
Claims priority, application Japan, Oct. 11, 1985, 60-226384; Apr. 25, 1986, 61-94525
Int. Cl.[4] G11B *15/43;* **B65H** *59/38*
U.S. Cl. 360—73 **49 Claims**



1. An apparatus for transporting a tape between two reels comprising:

a reel driving system including two motors for driving said reels, respectively and means for energizing said motors thereby effecting transportation of the tape between said reels,

means for measuring an actual value of a tension applied to the tape during a transient period when the tape is mounted to the reels for transportation between them and its transportation speed is changed, and obtaining a tension deviation of the actual tension value from a desired tension value,

means for calculating correction values of factors relating to determination of driving currents of said reel driving motors, respectively, as energized by said reel driving system, based on said tension deviation,

means for storing said correction values of the factors to be used in a succeeding transportation of the tape, and

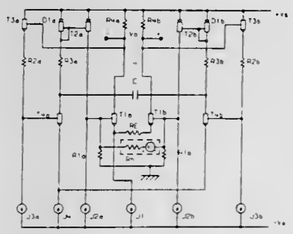
means for correcting said factors based on said stored correction values, thereby correcting the driving currents of the respective reel motors in the succeeding transportation of the tape.

4,786,993

VOLTAGE AMPLIFIER FOR CONSTANT VOLTAGE BIASING AND AMPLIFYING SIGNALS FROM A MR SENSOR

Stephen A. Jove, Watsonville; Klaas B. Klaassen, San Jose; Calvin S. Nomura, San Jose, and Jacobus C. L. Van Peppen, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,419
Int. Cl.[4] G11B *5/02, 5/127*
U.S. Cl. 360—67 **20 Claims**



1. A circuit for simultaneously biasing and amplifying signals produced by a magnetoresistive sensor, said circuit comprising:

a magnetoresistive sensor having a steady-state resistance value;

a bias means to provide across said sensor a bias voltage having constant time average value;

an input stage, having at least two transistors coupled in differential pair configuration and having the magnetoresistive sensor coupled between the bases of said pair of transistors, for amplifying voltage deviations from said constant time average value of the voltage across the magnetoresistive sensor; and

an output stage, coupled to the input stage, for amplifying and transmitting signals received therefrom.

4,786,994

METHOD OF AND APPARATUS FOR CONTROLLING THE DISPLACEMENT OF A MOVABLE SYSTEM DRIVEN BY AN ELECTRIC MOTOR

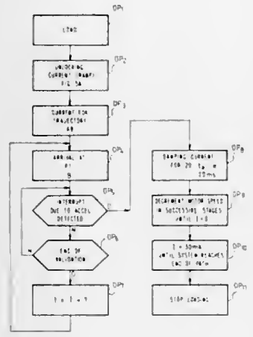
Daniel Carteau, Limours; Jean-Jacques Couette, Montigny le Bretoneux; Christian Maury, Velizy, and Pham Dan Tam, Bagneux, all of France, assignors to Cii Honeywell Bull, Paris, France

Filed Nov. 29, 1985, Ser. No. 803,508
Claims priority, application France, Nov. 29, 1984, 84 18156
Int. Cl.[4] G11B *5/54*
U.S. Cl. 360—75 **18 Claims**

1. A method of displacing an output element with a shaft of an electric motor, the method comprising the steps of: activating the motor to drive the element along a given trajectory from a point of departure to a given destination point of the trajectory by applying a control current to the motor in such a way as to cause the initial speed of the element to be in a predetermined range between maximum and minimum predetermined values, the element being subjected to a sudden acceleration less than a maximum value causing the speed of the element to be unstable and undetermined, applying a damping current to the motor to cause the motor shaft to have an angular velocity reduced to a reference angular velocity such that the element has a reference speed, the element being subjected to a driving force having an intensity which decreases as a

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function of the distance of the element from the departure point and to constant resistive forces for the duration of the particular cycle of travel of the element over the trajectory, the resistive forces being subject to variation from one trajectory cycle to another, and then controlling the speed of the element by supplying the motor with a current having an



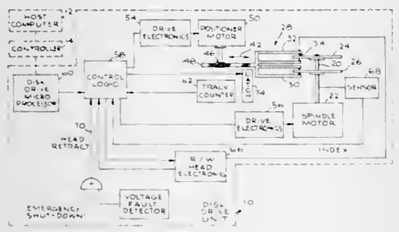
amplitude that decreases from the value of the damping current, the decreasing current varying such that the velocity of the driven element is in a predetermined range when the element arrives at the destination point so the object arrives at the destination point with a velocity falling within a predetermined range.

4,786,995

AUTOMATIC HEAD RETRACT SYSTEM FOR DISK DRIVE

Donald G. Stupeck, Canoga Park; Gaston A. Palombo, Agoura; Ara W. Nazarian, Glendale, and Hugh K. Gagnier, Sherman Oaks, all of Calif., assignors to Peripheral Technology, Inc, Simi Valley, Calif.

Filed Nov. 6, 1986, Ser. No. 927,916
Int. Cl.[4] G11B *5/54, 21/12*
U.S. Cl. 360—75 **15 Claims**



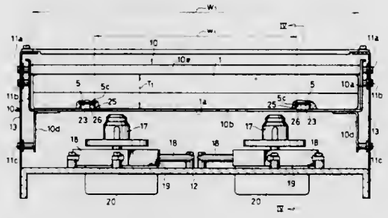
1. A disk drive unit including:
a spindle mounted for rotation;
one or more disks supported on said spindle, each disk including at least one data surface having a data zone and a landing zone;
a head supported adjacent to each data surface;
positioner means for selectively positioning said head on said data surface;
a spindle motor coupled to said spindle, said spindle motor including at least first and second drive windings;
a positioner motor coupled to said positioner means, said positioner motor including at least first and second drive windings;
a source of DC voltage;
spindle motor switch means connecting said voltage source to said spindle motor drive windings;
spindle motor commutation means connected to said spindle motor switch means for energizing said spindle motor drive windings in a predetermined sequence to rotate said spindle;
positioner motor switch means connecting said voltage source to said positioner motor drive windings;
positioner motor commutation means connected to said positioner motor switch means for energizing said positioner motor drive windings in accordance with a first predetermined sequence to move said head inwardly toward said spindle or a second predetermined sequence to move said head outwardly away from said spindle;
capacitor means connected to said voltage source substantially in parallel with said positioner motor switch means for being charged by said voltage source during normal operation of said disk drive unit;
means for detecting a voltage fault condition;
means responsive to said voltage fault condition for disabling said spindle motor switch means to allow said spindle motor windings to produce a back EMF for charging at least a portion of said capacitor means; and
means responsive to said voltage fault condition for causing said positioner motor commutation means to energize said positioner motor drive windings to move said head to said landing zone.

4,786,996

CASSETTE TAPE WITH GUIDERAILS ON CASSETTE HOLDER APPARATUS

Yuzo Ohtani, and Sachio Ueda, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,550
Int. Cl.[4] G11B *5/008, 15/00, 17/00*
U.S. Cl. 360—94 **5 Claims**



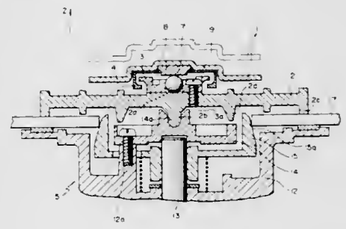
1. A tape cassette recording and/or reproducing apparatus capable of selective operation with at least a large-sized cassette or a small-sized cassette having differenet respective widths each measured in a transverse direction, said large-sized cassette having a bottom surface with a plurality of grooves therein spaced apart in the respective transverse direction and each extending at right angles to said transverse direction, said appratus comprising:
a cassette holder movable between a cassette receiving and discharging position and a cassette loading position;
two parallel guide rails on said cassette holder, said guide rails being spaced apart laterally for slidable reception in the grooves of said large-sized cassette so as to position the latter in respect to said holder in said loading position of the latter, and so as to guide said large-sized cassette in and out of said holder in said receiving and discharging position; and
confronting surfaces on said two guide rails which are spaced apart by the width of said small-sized cassette so that said confronting surfaces are slidably engageable with opposed side surfaces of said small-sized cassette for positioning the latter in respect to said holder in said loading position and for guiding said small-sized cassette in and out of said holder in said receiving and discharging position.

4,786,997

DISK CLAMPING MECHANISM FOR A DISK PLAYER

Tadashi Funabashi, and Kenji Tanaka, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 25, 1985, Ser. No. 780,110
Claims priority, application Japan, Sep. 25, 1984, 59-144704[U]; Sep. 25, 1984, 59-144705[U]; Sep. 25, 1984, 59-144706[U]; Sep. 25, 1984, 59-144707[U]
Int. Cl.[4] G11B *5/012*
U.S. Cl. 360—97 **8 Claims**



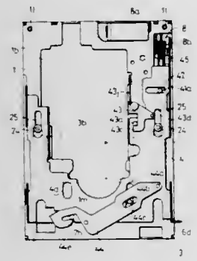
1. In a disk-driving mechanism including a turntable for rotating a disk to be played, a clamping mechanism comprising:
a pressing member, for clamping said disk in cooperation with said turntable, and having a projection extending from a lower surface thereof at its rotational center, said turntable having a recess formed in an upper surface thereof, at its respective rotational center, said projection fitting into said recess, said pressing member further having an outer annular pressing protrusion, extending from the side of said pressing member facing said disk, for pressing a main surface of said disk, and an inner annular pressing protrusion, extending in the same direction as said outer annular pressing protrusion;
a spherical bearing member which contacts the rotational center of said pressing member on an upper surface thereof;
an annular holding member fitted around said spherical bearing member, an upper end portion of said spherical bearing member projecting out of said holding member so as to fix said spherical bearing member onto said pressing member;
supporting means for rotatably supporting said pressing member, said supporting means having a surface which faces the upper surface of said pressing member and which contacts said upper end portion of said spherical bearing member, said pressing member having a tapered portion formed at a contact point between said spherical bearing member and said pressing member, said tapered portion conforming to the surface of said spherical bearing member;
a spindle passing through the rotational center of said turntable; and
a centering hub having a rotational center through which said spindle also passes, said centering hub accommodating at least one of a first disk having a center hole of a first diameter and a second disk having a center hold of a second diameter smaller than said first diameter, wherein said outer annular pressing protrusion clamps said first disk and said inner annular pressing protrusion clamps said second disk.

4,786,998

DISK DRIVING DEVICE

Tadami Sugawara; Hiroshi Yoshida, and Masao Okita, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1986, Ser. No. 929,335
Claims priority, application Japan, Nov. 8, 1985, 60-248936
Int. Cl.[4] G11B *17/04*
U.S. Cl. 360—97 **3 Claims**



1. A disk driving device which has a frame extending horizontally with a front side for receiving a cartridge having a magnetic disk therein which is inserted longitudinally in the frame toward a rear side thereof, a horizontal turntable for driving the magnetic disk of a cartridge loaded thereon, and loading means for receiving a cartridge inserted in the frame and loading it on the turntable, said loading means comprising:
holding means extending horizontally in the frame for receiving a cartridge inserted in the front side of the frame up to an abutting, innermost position in said holding means, said holding means thereupon being horizontally slidable toward the rear side of the frame by a further insertion movement of the cartridge toward a rearmost position in the frame and being movable downward onto the turntable at said rearmost position, said holding means having a guide member projecting laterally on one lateral side thereof and a projection member projecting downwardly on a bottom side thereof;
first biasing means for biasing said holding means for movement downward toward the turntable;
fixing means operative in conjunction with insertion of the cartridge in said holding means for fixing the cartridge in place in said holding means when it is inserted to said innermost position therein;
sliding means including a sliding plate oriented horizontally and extending longitudinally in the frame in parallel on said one lateral side of said holding means, said sliding plate having an upper cam surface extending along a longitudinal length thereof on which said guide member of said holding means is guided, during commencement of said further insertion movement of the cartridge and the horizontal sliding movement of said holding means, to hold said holding means in an upper position above the turntable, and an downwardly inclined cam surface at an inner position of the sliding plate on which said guide member is guided to allow said holding means to be moved downward by said first biasing means to load the cartridge to a loaded position on the turntable, said sliding means being horizontally slidable toward the front side of the frame and also having an engagement member at a rearward side thereof;
second biasing means for biasing said sliding means for movement from a rear position to a front position toward the front side of the frame;
locking means which has one part engaged with said engagement member of said sliding means for holding said sliding

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means in said rear position while the cartridge is inserted up to said innermost position in said holding means, and a second part which is abutted during said further insertion movement of the cartridge from said innermost position to said rearmost position in the frame to cause said one part to release said engagement member of said sliding means, whereupon said sliding means is released to be moved by said second biasing means to its front position and said guide member of said holding means is guided from said upper cam surface to said downwardly inclined cam surface of said sliding means to load the cartridge on the turntable; and

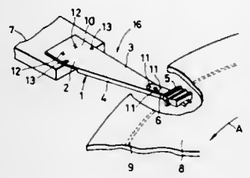
a lever member mounted for pivotal movement in a horizontal plane below said holding means having one end pivotally attached to said sliding means, an intermediate portion including a guide slot in which a pivot shaft fixed to said frame is slidable engaged, and an opposite end engageable with said projection member of said holding means, wherein said opposite end of said lever member holds said holding means stably from movement during insertion of the cartridge to said innermost position therein when said sliding plate has not been released to the front position, and upon further insertion movement of the cartridge, said one end of said lever member is moved frontwardly upon release of said sliding plate toward the front position and said lever member is thereby pivoted on said pivot shaft so that said opposite end is pivoted horizontally in conjunction with movement of said projection member of said holding means toward the rear side of said frame.

4,786,999

TRANSDUCER SUSPENSION MOUNT APPARATUS

Kihachiro Tanaka, Ushiku; Taichi Sato; Shuji Onodera, both of Ibaraki; Yokuo Saitoh, Kanagawa; Hiroshi Daito, Odawara; Yoko Murata, Ibaraki; Shigeo Hara, Minamiashigara, and Shoichi Setone, Ebina, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,075
Claims priority, application Japan, Jan. 20, 1986, 61-7924
Int. Cl.[4] G11B *5/49*
U.S. Cl. 360—104 **18 Claims**



1. A transducer suspension mount apparatus comprising:

a magnetic head/arm assembly which supports a transducer; and

a rigid arm which supports said magnetic head/arm assembly in a cantilevered manner;

said magnetic head/arm assembly having a mounting portion fixed to said rigid arm and including connecting points at which said magnetic head/arm assembly and said rigid arm are connected to each other, and an elastic spring portion disposed on a side of said magnetic head/arm assembly closer to said rigid arm than to said transducer, said mounting portion of said magnetic head/arm assembly overlapping part of said rigid arm;

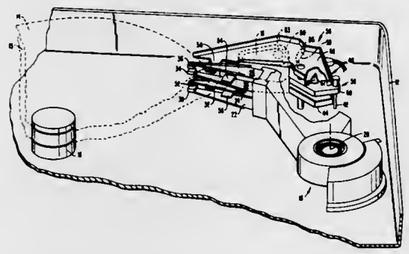
at least each of predetermined ones of said connecting points proximate to said elastic spring portion having a point at an outer periphery thereof disposed with respect to a first borderline at which said magnetic head/arm assembly extends beyond said rigid arm and to a second intersecting borderline at which said mounting portion of said magnetic head/arm assembly proximate to said elastic spring portion overlaps said rigid arm so as to delimit closest distances extending in different directions between said outer periphery point and said first and second borderlines indicated by the symbols lx and ly, respectively, each of said predetermined ones of said connecting points being provided within a region in which the closest distances lx and ly are not greater than predetermined dimensional values, respectively, and within which region the rigidity of each of said predetermined ones of said connecting points varies at a constant rate with respect to the associated first and second borderlines and the distances lx and ly therebetween.

4,787,000

HEAD LIFTER FOR DISK DRIVE

Dieter M. Schulze, 18956 Sara Park Cir., Saratoga, Calif. 95070

Filed Jul. 8, 1987, Ser. No. 71,001
Int. Cl.[4] G11B *5/54, 21/22, 21/16*
U.S. Cl. 360—105 **10 Claims**



1. An apparatus for lifting first and second heads away from the top and bottom surfaces of a disk, respectively, in a disk drive, said heads being mounted on first and second head arms, respectively, comprising:

a first lifter arm having first and second ends, said first end extending between said first head and said top surface of said disk;

a second lifter arm having first and second ends, said first end of said second lifter arm extending between said second head and said bottom surface of said disk;

at least one fulcrum contacting said first and second lifter arms proximate said second ends;

means for biasing said first ends of said first and second lifter arms away from each other about said fulcrum so that said first lifter arm forces said first head arm away from said disk and said second lifter arm forces said second head arm away from said disk; and

an electromagnet mounted between said lifter arms and between said fulcrum and said first ends of said lifter arms for moving said first and second lifter arms toward each other.

4,787,001

MAGNETIC DISC APPARATUS

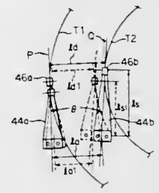
Naohiro Okutsu, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 15, 1987, Ser. No. 61,972
Claims priority, application Japan, Jun. 20, 1986, 61-144039
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—106 **3 Claims**

1. A magnetic disc apparatus including a magnetic recording disc having at least two tracks formed thereon and a magnetic head assembly comprising a rotary shaft, an actuator arm connected to said rotary shaft, said actuator arm having a longitudinal axis intersecting the center of said rotary shaft,

elongated suspension arms mounted on said actuator arm and magnetic heads, each of which is mounted on one end of said suspension arms, respectively, for magnetic recording and reproducing on said disc,

one of said suspension arms comprising a reference suspension arm being mounted on one end of said actuator arm and extending parallel to the axis of said actuator arm, and one of said suspension arms being mounted on the one end of said actuator arm at a mounting distance from and



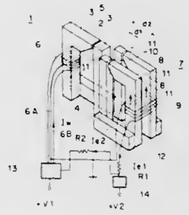
extending at an acute mounting angle relative to said reference suspension arm, said suspension arms having equal length and being made of the same material, and at least one of said actuator arm, and said magnetic disc being made of different material, whereby the distance between said heads and that between said tracks varies at substantially the same rate as a function of changes in temperature so that no positional separation of said magnetic heads with respect to said tracks occurs.

4,787,002

MAGNETIC HEAD HAVING A READ/WRITE COIL WITH A D.C. CURRENT THROUGH IT FOR CANCELLATION OF LEAKAGE MAGNETIC FLUX FROM ERASE COIL

Shin Isozaki, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 721,816, Apr. 10, 1985, abandoned.
This application Sep. 15, 1987, Ser. No. 97,419
Claims priority, application Japan, Apr. 12, 1984, 59-73174; Apr. 12, 1984, 59-73175
Int. Cl.[4] G11B *5/127, 5/03, 5/147, 5/17*
U.S. Cl. 360—118 **2 Claims**



1. A magnetic head for use in a magnetic disc drive apparatus for performing read/write operations, said magnetic head comprising:

a read/write head having a read/write coil with a center tap to divide said read/write coil into a first section and a second section;

an amplifying circuit means for supplying a write current through said read/write coil in accordance with data to be written during a write mode, said write current including a first write current flowing through said first section and a second write current flowing through said second section, said first write current flowing alternately with said second write current and in an opposite direction;

an erase head having an erase coil through which an erase current flows during said write mode for erasing on both sides of a data track written by said read/write head, said erase head causing a magnetic leakage flux in an opposite direction to a magnetic flux set up by said first write current;

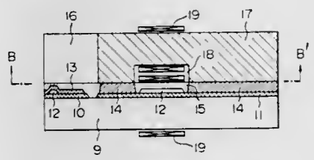
an erase switch circuit means provided in series with a DC voltage source and said erase coil, said erase switch circuit means being closed during said write mode for supplying said erase current and for causing a DC current therefrom to flow through said first section in the same direction as said first write current, such that said DC current generates a magnetic flux in an opposite direction to said magnetic leakage flux caused by said erase head in said read/write head, thereby cancelling out said magnetic leakage flux.

4,787,003

STEP-UP TYPE MAGNETIC HEAD

Kazuo Nakamura, Toyonaka, and Ken Takahashi, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 14, 1986, Ser. No. 851,518
Claims priority, application Japan, Apr. 18, 1985, 60-83165
Int. Cl.[4] G11B *5/17, 5/31, 5/127;* **H01F** *17/06*
U.S. Cl. 360—123 **5 Claims**



1. A step-up type magnetic head, comprising:

a first plate having a planar first side surface and a second side surface which are substantially narrower than planar principal surfaces of the first plate and which define an edge at a portion thereof at which they intercept one another;

a thin film magnetic head core formed on said first side surface of said first plate and having a substantially closed magnetic circuit including a gap, a pole tip surface of said head core extending to said edge defined by said first side surface and said second side surface;

a plurality of thin film magnetic layers formed on said first side surface of said first plate at a position adjacent to said magnetic head core but remote from said edge defined by said first side surface and said second side surface;

a closed-loop thin film coil formed over said thin film magnetic layers and extending through said magnetic circuit of said head core;

a second plate having a substantially planar third side surface and a fourth side surface which are substantially narrower than planar principal surfaces of said second plate, said third side surface being provided with a groove which extends from one principal surface of said second plate to another principal surface of said second plate, said second plate having a magnetic part and a non-magnetic part, said magnetic part occupying a portion of said second plate including an entire inner wall of said groove and a part of said third side surface adjacent said groove, said non-magnetic part occupying a portion of said second plate including said fourth side surface, said magnetic part of said second plate contacting said thin film magnetic layers to form a substantially closed transformer magnetic circuit which encompasses said groove;

a transformer secondary bulk winding, said secondary winding being divided into a first portion wound around said first plate through said groove and a second portion

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wound around said second plate through said groove, said first portion and said second portion of the secondary winding being connected in a balanced winding manner, said secondary winding being electromagnetically coupled with said thin film coil through said transformer magnetic circuit;

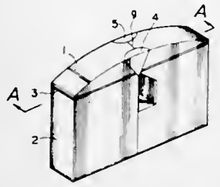
wherein said second side surface of said first plate and said fourth side surface of said second plate form a substantially continuous operative surface of the head, said operative surface being a surface which in operation of the head for recording and/or reproduction faces a magnetic recording medium.

4,787,004

MAGNETIC HEAD INCLUDING SINGLE CRYSTAL AND POLYCRYSTALLINE FERRITES WITH INTERFACIAL OXIDE LAYER

Hiraku Akiho; Hideaki Karamon; Sadayuki Nishiuchi, and Toru Sugai, Miayagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 6, 1987, Ser. No. 70,021
Claims priority, application Japan, Jul. 7, 1986, 61-158987
Int. Cl.[4] G11B *5/193, 5/187*
U.S. Cl. 360—127 **8 Claims**



1. A composite type magnetic head including a single crystal ferrite having a magnetic gap at the portion which contacts the magnetic recording medium and a polycrystalline ferrite magnetically coupled to said single crystal ferrite and having a portion constituting a back magnetic circuit, and

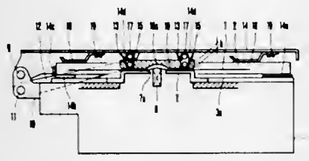
an oxide magnetic thin film at the junction interface between said single crystal ferrite portion and the polycrystalline ferrite portion, said thin film resulting from crystal grains of very fine and uniform size which exhibit non-uniform grain growth when heated.

4,787,005

RECORDING AND/OR REPRODUCING APPARATUS HAVING IMPROVED HEAD STABILIZING MEANS

Nobuo Tezuka, Kanagawa, and Tsukasa Uehara, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 523,727, Aug. 16, 1983, abandoned. This application Feb. 5, 1987, Ser. No. 11,381
Claims priority, application Japan, Aug. 18, 1982, 57-142944
Int. Cl.[4] G11B *15/60, 23/03*
U.S. Cl. 360—130.2 **13 Claims**



1. A recording and/or reproducing apparatus using a disc shaped flexible recording medium, comprising:

(A) head means for recording signals on said recording medium and/or reproducing recorded signals from the recording medium;

(B) a lid for covering said head means and having a holding member for holding therein said recording medium, said lid being movable supported in said apparatus and thereby closable for causing the recording medium to gain access to said head means and openable for receiving said recording medium;

(C) stabilizing means for stabilizing a portion of said medium, said stabilizing means being supported at a portion of said lid in such a manner as to be movable between an active position at which it can gain access to the recording medium held at said holding member and a non-active position being separated from said recording medium; and

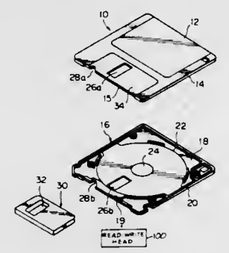
(D) control means for controlling the movement of said stabilizing menas between said active and non-active positions thereof in correspondence with the opening and closing of said lid, said control means being connected to said said stabilizing means and said main body and operating so as to move the stabilizing means in a first direction with respect to the lid for bringing said stabilizing means into said active position when the lid is closed and operating so as to move the stabilizing means in a second direction with respect to the lid when the lid is opened.

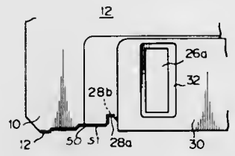
4,787,006

SHUTTER PIN GROOVE FOR A MAGNETIC DISC CARTRIDGE

Michio Iizuka, Saku, and Haruo Shiba, Komoro, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 784,796, Oct. 4, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 153,497
Claims priority, application Japan, Oct. 26, 1984, 59-162426[U]
Int. Cl.[4] G11B *23/033*
U.S. Cl. 360—133 **5 Claims**





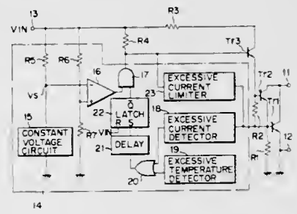
1. A magnetic disc cartridge comprising, a substantially flat case having a center axis and a front peripheral edge, a magnetic disc rotatably housed in said case and having a center rotational axis which defines the center axis of said case, means for defining an aperture in said case between said center axis and said peripheral edge for access of a read-write head to said magnetic disc, a shutter movably mounted on said case and engageable with a shutter actuation pin to move between a first position in which said shutter closes said aperture and a second position in which said shutter opens said aperture, and a means for defining a groove on said peripheral edge of said case to receive the shutter actuation pin when said shutter is in said second position, wherein said case comprises a pair of upper and lower case members superposed one upon the other and in registry with each other said upper case member includes an upper front peripheral edge and said lower case member includes a lower front peripheral edge in registry with said upper front peripheral edge, said upper front peripheral edge includes an upper recessed straight edge portion and said lower front peripheral edge includes a lower recessed straight edge portion, and said means for defining a groove is formed by a first groove portion defined on a portion of the upper front peripheral edge of said upper case member and contiguous with the upper recessed straight edge portion, and a second groove portion defined on a portion of the lower front peripheral edge of said lower case member and contiguous with the lower recessed straight edge portion, said second groove having a greater depth from said upper front peripheral edge than that of said first groove from said lower front peripheral edge when said upper and lower front peripheral edges are in registry with each other, whereby the shutter acuation pin moves along said upper and lower recessed straight edge portions and then falls into said groove and is thereby able to attain a correct positioning in the groove and will not exert pressure on the lower case member thereat, which would otherwise cause bending of the cartridge.

4,787,007

OUTPUT DRIVER CIRCUIT

Ken Matsumura, Odawara, and Hideharu Tezuka, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1987, Ser. No. 24,672
Claims priority, application Japan, Mar. 31, 1986, 61-72903
Int. Cl.[4] H02H *3/093, 5/04*
U.S. Cl. 361—98 **3 Claims**



1. An output driver semiconductor circuit comprising:

first, second, and third terminals;

an output NPN transistor whose collector and emitter are connected to said first and second terminals, respectively;

a control NPN transistor whose emitter is connected to the base of said output NPN transistor, and whose base and collector are operatively connected to said third terminal;

a protection circuit, connected between the base of said output NPN transistor and the base of said control NPN transistor, for detecting a collector current of said output NPN transistor based on a base-emitter voltage thereof and for controlling a base current of said control NPN transistor to turn the control transistor on or off, the protection circuit comprising a first detection circuit for detecting an excessive collector current of said output NPN transistor, a second detection circuit for detecting an excessive temperature of said output NPN transistor, a logic circuit for providing a logical sum of output signals of said protection circuits and delaying the output of the logical sum for a predetermined time period, a latch circuit for latching an output signal of said logic circuit which is used to control the base current of said control NPN transistor, and a limit circuit for controlling the base current of said control NPN transistor, so that a base current of said output NPN transistor is reduced to a predetermined value;

a constant-voltage circuit for generating a constant voltage;

a comparator for comparing a constant voltage of said constant-voltage circuit and a voltage corresponding to an input voltage of said third terminal; and

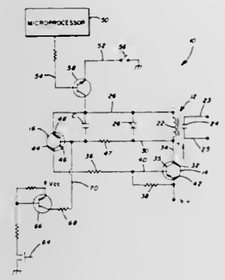
a logic gate for providing a logical product of an output signal of said comparator and an output signal of said latch circuit, the logic product beig used to control the base current of said control NPN transistor.

4,787,008

ELECTRONIC LATCH CIRCUITRY

Timothy Graff, Palatine, and Gregory A. Peterson, Barryington, both of Ill., assignors to Digital Appliance Controls, Inc., Hoffman Estates, Ill.

Filed Mar. 9, 1987, Ser. No. 23,210
Int. Cl.[4] H05B *6/68*
U.S. Cl. 361—190 **19 Claims**



1. Electronic circuitry for maintaining current flow to or voltage potential across an electrical load comprising,

a load sensing element connected to the electrical load to detect transmission of a signal from an energy source where the circuitry is normally maintained in an off state,

said load sensing element being normally nonconductive switched to a conductive state upon receipt of an input signal from a current-voltage source to permit current flow to the electrical load and initiate a latch signal,

a switching element connected to said load sensing element and the electrical load,

said switching element being normally nonconductive switched to a conductive state upon receipt of the latch signal from said load sensing element,

said load sensing element maintaining the latch signal to said switching element for the duration of time said load sensing element detects current flow or voltage potential across the load, and

said switching element in a conductive state maintaining current flow through the electrical load to convert the circuitry from an off state to a latched state.

4,787,009

OPTICAL DISK

Kenji Takahashi, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

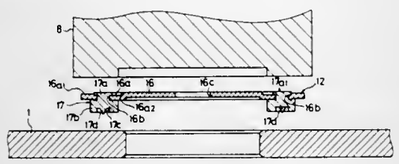
Filed May 22, 1987, Ser. No. 53,402
Claims priority, application Japan, Jun. 26, 1986, 61-98000[U]
Int. Cl.[4] G11B *23/00, 5/82, 7/00*
U.S. Cl. 369—282 **5 Claims**

1. An optical disk of the type having an optical recording medium disk substrate on or from which information signals

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are recorded or reproduced optically and a chucking hub, which is welded by means of an ultrasonic welding horn to the disk substrate, and wherein the chucking hub comprises:

(a) a disk-shaped metal plate having an upper surface and a lower surface and being made of a magnetic material which, at its periphery, is bent to have a low stepped portion in its upper surface through which a plurality of openings extend, the low stepped portion having an inner diameter which is less than the inner diameter of the ultrasonic welding horn used to weld the hub to the disk substrate, and



(b) a synthetic resin ring attached through the plurality of openings to the periphery of the metal plate, the resin ring having

(i) an upper surface on which is formed a contacting portion, for contact with the ultrasonic welding horn, the contacting portion being formed so as to be spaced apart from the bend which forms the low stepped portion of the metal plate and being substantially flush with the upper surface of the metal plate, and

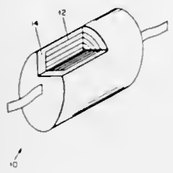
(ii) a lower surface, which protrudes from the bottom surface of the low stepped portion, on which is formed a welding portion which is ultrasonically welded to a central portion of the surface of the disk substrate.

4,787,010

IMPREGNATION AND ENCAPSULATING MATERIAL

Jeffrey A. Bentley, Riverside, R.I., assignor to Aerovox Incorporated, New Bedford, Mass.

Filed Jun. 4, 1986, Ser. No. 870,717
Int. Cl.[4] H01G *4/22, 3/17, 9/00*
U.S. Cl. 361—315 **21 Claims**



9. A capacitor comprising

a capacitive element including a dielectric sheet, and

a dielectric impregnating composition impregnating said element and comprising a blend of polybutene and polyethylene.

4,787,011

CONTROL CENTER UNIT SHELF ASSEMBLY

Harold W. Stanfield, Mequon, Wis., and Richard A. VonRotz, Peru, Ind., assignors to Square D Company, Palatine, Ill.

Filed Aug. 20, 1986, Ser. No. 898,178
Int. Cl.[4] H05K *7/14*
U.S. Cl. 361—391 **5 Claims**

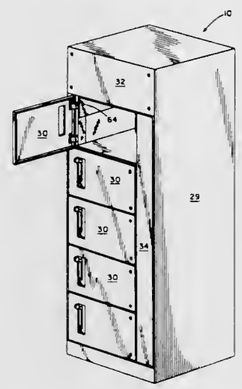
1. A control center comprising:

a frame;

a control unit;

a shelf vertically positioning said control unit within said frame at predetermined heights, said shelf being mounted on said frame, said shelf having a surface juxtaposed said frame;

a door providing access to the control unit, said door being



mounted on said frame, said door having a surface positioned juxtaposed said frame; and

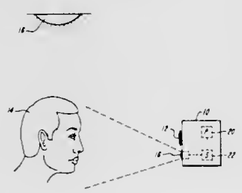
a connector passing through said frame, said shelf and said door.

4,787,012

METHOD AND APPARATUS FOR ILLUMINATING CAMERA SUBJECT

Joel C. Guskin, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Jun. 25, 1987, Ser. No. 66,775
Int. Cl.[4] G03B *15/06*
U.S. Cl. 362—3 **10 Claims**



1. In an image transmitting camera of a type which is responsive to both visible light and infrared light, a method for reducing shadowing of the subject in the transmitted image comprising the steps of:

generating infrared light;

illuminating the subject with the infrared light, such illumination being in addition to any ambient lighting of the subject; and

receiving the image at the camera in both the visual light and infrared frequency ranges;

whereby any dificiencies in the illumination of the subject by ambient light may be compensated for and overcome by the infrared illumination.

4,787,013

INTERMEDIATE RANGE INTENSITY MODIFICATION OF GAUSSIAN BEAM USING OPTICAL INTEGRATION MEANS

Paul S. Sugino, Santa Maria, and Leland V. Gardner, Buellton, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 30, 1987, Ser. No. 126,434
Int. Cl.[4] F21V *8/00*
U.S. Cl. 362—32 **11 Claims**



1. Optical projection apparatus comprising:

a multi-element source projecting a beam having a generally Gaussian intensity distribution along an optical axis towards an output plane;

a rod of optically transmitting material disposed coaxially with the optical axis, the rod having an entrance face and an exit face;

an objective lens disposed between the rod exit face and the output plane, said objective lens having a given focal length; and

optical means for moving the image of the rod entrance face that would otherwise be created between the lens and the output plane to a position between the rod exit face and the lens;

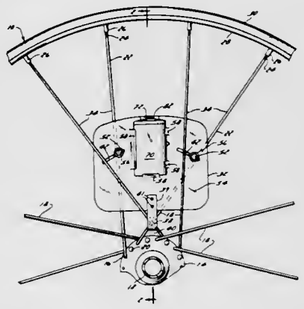
whereby the intensity of the beam projected along the optical axis from the exit face to the output plane has a generally uniform intensity throughout the length of the projected beam.

4,787,014

SPOKE MOUNTED BICYCLE LIGHT

Terry G. Wodder, 1236 Larrabee La., Northbrook, Ill. 60062, and Lawrence J. Crain, 845 Deerfield Rd., Highland Park, Ill. 60035

Filed Jul. 28, 1987, Ser. No. 78,710
Int. Cl.[4] B62J *5/00*
U.S. Cl. 362—78 **16 Claims**



1. A lighting device designed to be mounted on a bicycle of the type having a frame and a pair of wheels, each said wheel including a rim, a hub and a plurality of spokes connecting said rim to said hub, said spokes arranged on said wheels so as to be in a specified crossed over relationship with each other, said lighting device comprising:

a housing having a lens;

a self-contained light located within said housing and designed to emit a directed beam of light through said lens;

means for releasably mounting said housing to said spokes on at least one of said wheels, said mounting means including a plate having a center portion adapted so that said housing may be secured thereto and two side edge portions, each of said edge portions adapted to be wedgingly inserted between a respective pair of crossed over spokes of said wheel; and

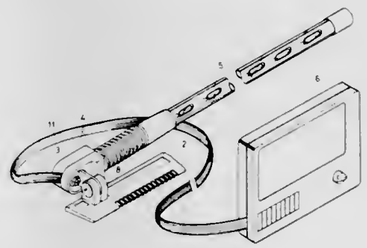
means for deflecting at least a portion of said light beam emitted through said lens so that as said wheel rotates, said beam of light is substantially deflected away from said wheel rim.

4,787,015

BASE FOR SIGNAL LIGHT

Lan Ching-Hwei, No. 65, Shuang-shih Rd., Sec. 2, Panchiao City, Taipei Hsien, Taiwan

Filed Jun. 1, 1987, Ser. No. 57,019
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—80 **2 Claims**



1. A base structure for a signal light;

said signal light being in a tube form and further comprising means for illuminating at least a portion of said tube; said signal light tube having a joint base toward an end of said tube;

said base structure comprising a base board; said base board having a direction of extension; said base board carrying a pivot lug projecting therefrom and normal to the direction of extension;

a first pivot shaft pivotally connecting said pivot lug and said joint base for enabling pivoting of said light tube about said first pivot shaft and about said joint base with said light tube swingable through a plane to selected angular positions with respect to said base board;

a second pivot shaft oriented perpendicular to such first pivot shaft pivotally connecting said pivot lug and said joint base wherein said joint base along with said tube is movable through an arc raising the tube and the joint base to a selected height over the support base and an L-shaped plate, having a first leg of said plate connecting said plate to said pivot lug at said first pivot shaft and having a second leg of said plate connecting said plate to said joint base; the length of said first leg determining the height of said joint base and of said light tube above said base board.

4,787,016

LIGHT ATTACHABLE TO A KEY

Chang J. Song, 125 15th Ave., Seattle, Wash. 98122

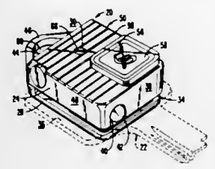
Filed Feb. 12, 1987, Ser. No. 13,756
Int. Cl.[4] F21V *33/00*
U.S. Cl. 362—116 **15 Claims**

1. A key light including a lamp, battery, and switch, for affixing to a variety of standard key heads for engaging a lock mechanism defining a region for receiving the head of the key, the region being of a size substantially equal to the widest radius defined by the key head, comprising:

a housing, open on a first surface for accepting a light assem-

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bly, having a bore through a second surface opposite said first surface for accepting a switch actuator, at least one groove located at one end of said housing for accepting a securing means notch, and a first bore through a second end of said housing opposite of said first end for accepting a light bulb, the width of the housing being less than or equal to the width of the standard key head;



securing means, for securing the standard key head to said housing, having a planar region, at least one notch projecting from said planar region for engaging said groove;

a light assembly having a frame with recesses for accepting a battery, light bulb, contacts, and switch means which connect the battery and bulb; and

switch means having a plurality of contacts and a switch actuator carried by said housing for actuating the key light.

4,787,017

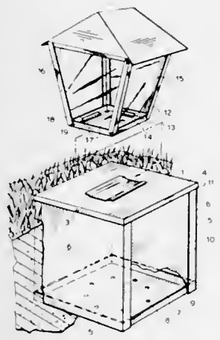
MEMORIAL LIGHT

Steve Vrettos, Toronto, Canada, assignor to Panta Fos Enterprises Inc., Toronto, Canada

Filed Mar. 14, 1988, Ser. No. 167,577

Int. Cl.[4] F21L *19/00*

U.S. Cl. 362—161 **7 Claims**



1. A memorial light system for housing a candle; said system comprising a base box with a lid to provide access therein, a lantern body for housing a candle, said lantern body having a door to permit placement of a candle within said lantern body, said lantern body having a base plate, cooperating means provided on said base plate and on said lid for releasably connecting said lantern body to said lid of said base box.

4,787,018

OUTDOOR ELECTRIC LIGHTING FIXTURE

David D. Poyer, 858 Roseway St., Naples, Fla. 33942

Filed May 23, 1988, Ser. No. 197,340

Int. Cl.[4] F21S *5/00, 1/10*

U.S. Cl. 362—216 **2 Claims**



1. A lighting fixture designed for outdoor use comprising:

a U-shaped fluorescent lamp;

a socket for the fluorescent lamp;

a 120 volt transformer;

a flanged circular base plate supporting the socket and the transformer;

a cylindrical housing made of polyvinyl chloride having at its center an interior annular ring supporting the base plate;

a cylindrical post whose outer diameter is slightly less than the inner diameter of the housing for supporting the housing and whose upper edge rests against the annular ring of the housing;

a cylindrical frosted lens surrounding the flourescent lamp and resting upon the flange of the base plate; and

a domed end cap fitted over the upper end of the cylindrical lens.

4,787,019

LAMP FITTING WITH DIVISIBLE ATTACHMENT RING

Aleidus G. van den Broeke, Klokkendijk 12, 7467 PD Nijverdal, Netherlands

Filed Mar. 10, 1987, Ser. No. 24,132

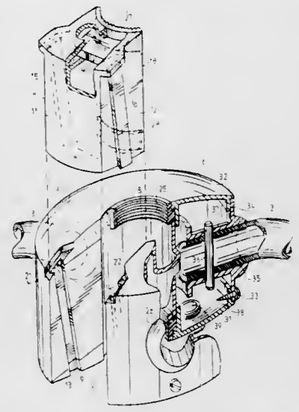
Claims priority, application Netherlands, Apr. 1, 1986, 8600828

Int. Cl.[4] F21S *1/10*

U.S. Cl. 362—250 **6 Claims**

1. A lamp fitting assembly comprising the combination of collar means having an axial opening therethrough for receiving a support pole in surrounding relation thereto, a plurality of tubes extending radially from the collar means, a lamp fixed to each tube in radially outwardly spaced relation to the collar means, the collar means including separate parts which are movable relative to each other between a first position defining a radial gap permitting the collar means to be moved radially to accept the pole at any position along its length and a second position enclosing the entire circumference of the pole in circumferentially embracing relation thereto, coupling means for holding the parts in the second position enclosing and circumferentially embracing the pole, one of the parts being C-shaped to define, by itself, the gap which accepts the pole, and a second part being of truncated pie-shape to fit snugly within the gap, the C-shaped one part comprising upper and

lower C-shaped end walls and concentric inner and outer part-tubular upright walls, the lower end wall being removable



to gain access to the interior of the one part, and electrical wire lead-in means in the lower end wall.

4,787,020

FULL-WAVE OUTPUT TYPE FORWARD CONVERTER

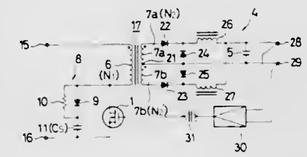
Rihei Hiramatsu, Tokyo; Tokunari Inoue, Machida, and Kazushi Watanabe, Nagaoka, all of Japan, assignors to Nemic-Lambda K.D. and Densetsu Corporation, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,208

Claims priority, application Japan, Feb. 16, 1987, 62-33117

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—20 **1 Claim**



1. A full-wave output type forward converter comprising a power input unit obtained by connecting a switching element in series with a primary winding of a main transformer and an output unit obtained by connecting a rectifier circuit and a filter circuit to secondary windings of said main transformer, said converter being adapted to detect and amplify an output voltage from said output unit to control an ON time ratio of said switching element, wherein said main transformer comprises an iron core having a gap and said secondary windings arranged such that two windings divided by a center tap are alternately connected at the turn start and end portions so as to alternately arrange said two windings, anodes of two diodes are respectively connected to one end of a corresponding one of said secondary windings and said center tap, cathodes of said diodes are connected to one end of a corresponding one of choke coils, the other end of one choke coil is connected to the other end of the other choke coil to constitute one output terminal, said center tap serves as the other output terminal, and a capacitor is connected between said output terminals.

4,787,021

CURRENT-TYPE CONVERTER APPARATUS

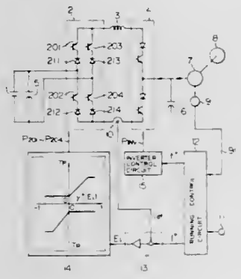
Sadao Hokari; Kiyoshi Nakamura, both of Katsuta; Katsu Komuro, Mito; Takeki Ando, Ibaraki; Hiromi Inaba, Katsuta, and Shigeta Ueda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1988, Ser. No. 143,121

Claims priority, application Japan, Jan. 14, 1987, 62-4844; Mar. 24, 1987, 62-67914

Int. Cl.[4] H02M *5/458*

U.S. Cl. 363—37 **17 Claims**



1. A current-type converter apparatus comprising:

a DC power source for supplying predetermined DC power;

a current-type converter connected to output terminals of said DC power source, said current-type converter receiving DC power from said DC power source, performing power conversion control, and outputting the converted power;

a load connected to output terminals of said current-type converter and supplied with output power of said current type converter; and

a converter control unit for outputting a predetermined power conversion control signal to said current-type converter, said converter control unit controlling said current-type converter so as to cause at least two states among a powering conduction state for supplying power from said DC power source to said load within predetermined control periods of both a powering control mode and a regenerative control mode, a regenerative conduction state for regenerating power supplied from said load toward said DC power source, and a reflux state for short-circuiting the output of said current-type converter and returning the circuit current of the load, and said converter control unit varying the period length of respective states.

4,787,022

HIGH VOLTAGE POWER SOURCE FOR A DISCHARGE TUBE

Yukio Maeba, Kyoto, and Masashi Nakasaka, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 24, 1987, Ser. No. 29,668

Claims priority, application Japan, Mar. 26, 1986, 61-68189

Int. Cl.[4] H02H *7/125*

U.S. Cl. 363—52 **4 Claims**

1. A high voltage power source for supplying a high DC voltage to a discharge tube, said power source comprising:

a means for generating an AC signal;

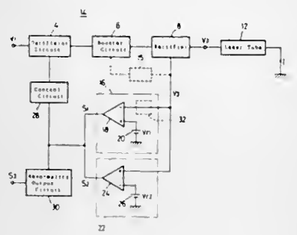
a first rectifier means for rectifying said AC signal into said high DC voltage fed to said discharge tube;

a second rectifier means for rectifying said AC signal into another DC voltage which is proportional to said high DC voltage;

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a control circuit means connected to said means for generating an AC signal for controlling said means in response to control signals input thereto;

an excessive voltage comparator means for receiving said another DC voltage and a voltage output from a first reference voltage source and for supplying a control signal to said control circuit means instructing said control circuit means to disable said means for generating an AC signal when said another DC voltage is greater than said output from said first reference voltage source, whereby the generation of said high DC voltage is stopped;



an undervoltage comparator means for receiving said another DC voltage and a voltage output from a second reference voltage source and for supplying a control signal to said control circuit means instructing said control circuit means to disable said means for generating an AC signal when said another DC voltage is less than said voltage output from said second reference voltage, whereby the generation of said high DC voltage is stopped.

4,787,023

POWER SUPPLY APPARATUS

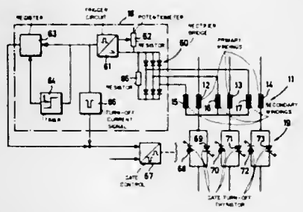
Friedrich-Werner Thomas, Gelnhausen, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 8, 1987, Ser. No. 59,589

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3619801

Int. Cl.[4] H02H *7/125*

U.S. Cl. 363—54 **10 Claims**



1. Power supply apparatus comprising:

controlled rectifier elements connected in antiparallel relation and all being gate-turn-off thyristors;

a three-phase transformer having primary windings connected in delta and having secondary windings; means for connecting the three phases of a three-phase main each through said controlled rectifier elements connected in antiparallel relation to said primary windings of said three-phase transformer;

rectifiers;

load terminals fed by said secondary windings through said rectifiers on a direct current side; and

measuring sensors on the primary-side alternating-current side of said transformer, which, in the presence of an overload on the primary-side alternating current side, block said controlled rectifier elements.

4,787,024

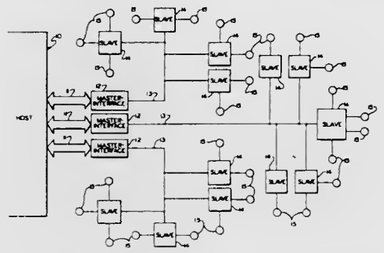
INTERFACE SYSTEM FOR SIMULATED DISPLAY INSTRUMENTS IN A VEHICLE SIMULATOR

Derek P. Allsop, Woking, and Lawrence C. Marini, Worthing, both of Great Britain, assignors to The Singer Company, Binghamton, N.Y.

Filed Jul. 28, 1986, Ser. No. 890,207

Int. Cl.[4] G06F *15/20;* **G09B** *9/08*

U.S. Cl. 364—132 **2 Claims**



1. An interface system for a simulated instrument display in a vehicle simulator such as a flight simulator that includes a host simulator computer, said interface system comprising:

at least one serial bus master controller coupled to said host computer;

a serial bus means connected to said serial bus master controller;

at least two simulated vehicle instrument display devices, each of said simulated instrument display devices being electromechanical in operation; and

at least one slave circuit coupled to said serial bus and said simulated instrument display devices, said slave circuit including a means to process data transmitted by said master controller in order to supply drive signals to each of said simulated instrument display devices, said slave circuit including a microcontroller with a program incorporating mathematical modelling of said predetermined physical instrument performance characteristics, said slave circuit including one or more feedback devices arranged to provide feedback signals indicative of the display, and said slave circuit including means to transmit serial data representative of the feedback signals to the master controller.

4,787,025

REMOTE FAN OUT FACILITY FOR DATA TERMINALS

Harry Cheselka, Saugerties; Gerald J. Hladik; Chris Karabatsos, both of Kingston; Lawrence G. Mosher, Rhinebeck, and Richard M. Morrison, Lake Katrine, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 586,659, Mar. 6, 1984, abandoned. This application Feb. 5, 1988, Ser. No. 154,527

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 **4 Claims**

1. A remote fan out box facility, having transmitting means for transmitting digital messages and a plurality of data terminal means for receiving digital messages, comprising:

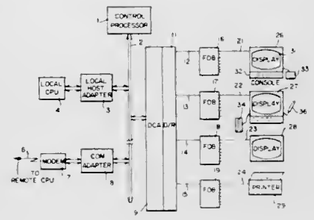
means, within said transmitting means, for creating a terminal address for each outbound data message and for inserting said address into a respective outbound data message to create a complete message having an address section and data section;

a first serial transmission means, having a first terminus connected to said transmitting means, for carrying said complete messages; and

a remote fan out box, connected to a second terminus of said first serial transmission means, for receiving said complete messages, said remote fan out box including means for reading said address section of each said complete message into a shift register;

said shift register having a particular number of positions wherein the rightmost position of said shift register detects the final bit of the address section being read into said shift register and activates a logic gate;

said logic gate directing the data section of said complete message into a first FIFO buffer;



said remote fan out box also including a decoder connected to particular positions of said shift register for reading said address section and said decoder also connected to multiple second serial data lines with each of said second serial data lines connected to a separate data terminal;

said decoder also logically connected to the output line of said first FIFO buffer;

said decoder logically connecting the output line of said first FIFO buffer to one of said second serial data lines dependent on the address section in said shift register for directing the data section of said complete message received by said fan out box to a particular data terminal.

4,787,026

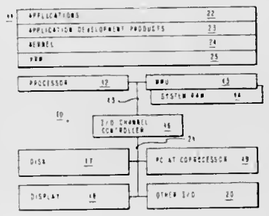
METHOD TO MANAGE COPROCESSOR IN A VIRTUAL MEMORY VIRTUAL MACHINE DATA PROCESSING SYSTEM

Johnny G. Barnes; Joe W. Blackard; Rajan Krishnamurty, and Terry L. Mothersole, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1986, Ser. No. 820,456

Int. Cl.[4] G06F *13/00, 12/08*

U.S. Cl. 364—200 **7 Claims**



1. A method for use in a virtual machine type data processing system which comprises a main processor, a coprocessor, a first device independent operating system which executes directly only on said main processor and a second device dependent operating system which executes directly only on said coprocessor, and a Virtual Resource Manager consisting of a plurality of interrelated programming components which are executable on said main processor for selectively establishing at least two different type virtual machines which operate to process first and second application programs, each of which runs under a different one of said operating systems, said method comprising the following steps:

(A) establishing with said Virtual Resource Manager, a first virtual machine that employs said main processor and one of said operating systems to process said first application program,

(B) establishing in said VRM, a coprocessor programming subsystem component comprising a plurality of programming subcomponents which function to define a virtual machine interface to said coprocessor, and

(C) establishing with said coprocessor programming subsystem a second type virtual machine that employs said coprocessor and said device dependent operating system to process said second application program.

4,787,027

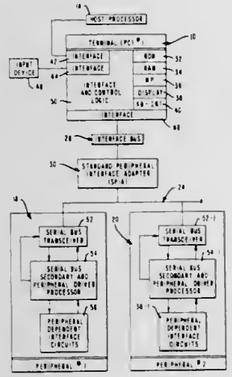
SYSTEM USING AN ADAPTER BOARD TO COUPLE A PERSONAL COMPUTER TO A PLURALITY OF PERIPHERALS IN A FINANCIAL ENVIRONMENT

William L. Prugh, Centerville; Tom R. Deaton, Carlisle, and Henry G. Cooney, Kettering, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 20, 1985, Ser. No. 778,578

Int. Cl.[4] G06F *13/10*

U.S. Cl. 364—200 **5 Claims**



1. A system comprising:

a plurality of peripherals;

a personal computer having an application to be run, an interface bus for receiving adapter boards, and an adapter board operatively coupled to said interface bus; and

a serial communication link for coupling said plurality of peripherals with said adapter board;

said adapter board comprising:

processing means for coupling said serial communication link with said personal computer to transfer data between said personal computer and said plurality of peripherals;

said processing means including:

a microcomputer on a chip having a UART thereon;

a serial bus transceiver which is coupled to said serial communication link and said UART; and

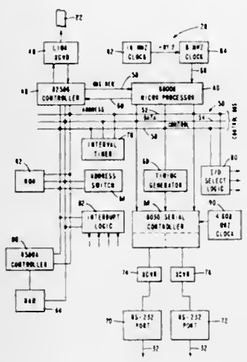
latch means for receiving data to be transferred in accordance with said application between said personal computer and said microcomputer;

each of said peripherals having a serial bus transceiver to

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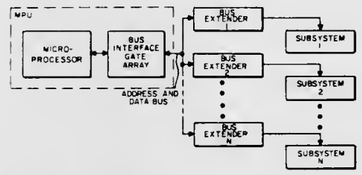
couple the associated peripheral with said serial communication link;
said data which is transferred being in a format of command messages coming from said application and responses coming from said plurality of peripherals;
said personal computer including a driver for interfacing said application and said adapter board via said interface bus;
said driver having means for assigning sequence numbers to said command messages to provide a correlation between said command messages and their associated said responses from said plurality of peripherals;
said processing means including an encryption means located on said adapter board for encrypting and decrypting said data in response to said application;
each said command message including a device address to address said plurality of peripherals and said encryption means so as to enable said encryption means located on said adapter board to be addressed as a peripheral; and
said processing means also including disabling means for disabling said communication link from said adapter board whenever a device address for said encryption means is received by said processing means to keep said encrypting data on said adapter board and to prevent said encrypting data from appearing on said serial communication link.

4,787,028
MULTICOMMUNICATION PROTOCOL CONTROLLER
Don C. Finfrock, and Donald J. Girard, both of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Sep. 3, 1985, Ser. No. 772,225
Int. Cl.[4] G06F *3/00, 15/20*
U.S. Cl. 364—200 **8 Claims**



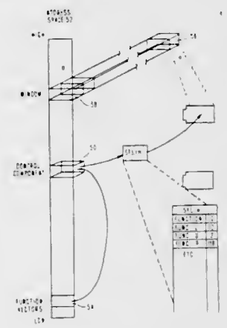
7. A data processing system for transmitting data between a host processing device and one of a plurality of remote terminal devices comprising:
a communication channel coupled between said host processing device and each of said remote terminal devices;
a look-up table coupled to said host processing device for storing a plurality of sets of program instructions, each set controlling the transmission of data between one of said remote terminal devices and said host processing device in accordance with a different communication protocol;
a controller mounted in each of said terminal devices and coupled to said communication channel for controlling the transmission of data between said one of said remote terminal devices and said host processing device over said communication channel, said controller including a processing member; and
a manually operated hexadecimal rotary switch member mounted in said controller and coupled to said processing member, said switch member settable to one of a plurality of positions in which each position will output a plurality of different binary signals to said processing means for identifying the controller whereby said processing member transmits over the communication channel the identifying binary signals to said host processing device enabling the host processing device, using the identifying binary signals as an address, to retrieve from said look-up table a set of program instructions controlling the transmission of data between the host processing device and the remote processing terminal controlled by said controller, said host processing device transmitting the set of program instructions to said controller enabling the controller to control the transmission of data between the host processor and said one of said remote terminal devices.

4,787,029
LEVEL CONVERTING BUS EXTENDER WITH SUBSYSTEM SELECTION SIGNAL DECODING ENABLING CONNECTION TO MICROPROCESSOR
Salim M. Khan, St. Joseph, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Sep. 29, 1986, Ser. No. 912,304
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **17 Claims**



1. In a microprocessor system, a bus extender arrangement is connected between a microprocesor controller and a plurality of subsystems, said bus extender arrangement comprising:
said microprocessor controller including microprocessor means;
first gate array means connected to said microprocessor means for converting a plurality of signals of said microprocessor means from a first logic level to a second logic level;
bus extender means including a plurality of bus extender circuit means, each bus extender circuit means including first level converting means connected between said first gate array means and said corresponding subsystem for converting said plurality of signals from said first to said second logic level, and second level converting means connected between said corresponding subsystem and said first gate array means for converting said plurality of signals from said second logic level to said first logic level;
said plurality of subsystems each including second gate array means, and each subsystem connected via said corresponding bus extender circuit means to said microprocesor means, one at a time, for transferring data between said microprocessor means and one of said subsystems;
selection signal means connected between said first gate array means and said bus extender means for addressing one of said plurality of subsystems; and
each of said bus extender circuit means further including decoding means connected to said first gate array means, said corresponding subsystem and to said second level converting means, said decoding means operated in response to said operation of said selection signal means to enable said corresponding subsystem to connect to said microprocessor means.

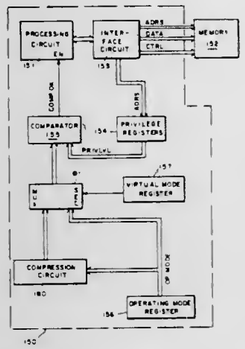
4,787,030
DATA PROCESSING APPARATUS WITH FIXED ADDRESS SPACE
Ronald S. Harter, Saugerties; Jeffrey S. Lucash, Hurley, and Robert J. Major, Red Hook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 665,225, Oct. 26, 1984, abandoned. This application Sep. 16, 1987, Ser. No. 98,107
Int. Cl.[4] G06F *13/14*
U.S. Cl. 364—200 **7 Claims**



1. In a system comprising a processor, memory addressing means defining a finite memory address space, and an indefinite plurality of memory containing modules connectable into said address space, the improvement comprising:
each of said modules having an identification indicium which is different from that of any of the other of said plurality of modules,
each of said modules having memory address decoding means responsive to addresses in one common segment of said address space,
each of said modules having an identifier register writable by said processor, and
each of said modules having comparison means sensitive to the contents of its said identifier register and operative upon a predetermined relationship of the contents of said register to the indicium of the module to enable said memory on that module to respond to said addresses in said one common segment so long as that module is enabled and to the exclusion of the others of said modules,
whereby said modules effectively occupy said segment of said address space selectively and one at a time.

4,787,031
COMPUTER WITH VIRTUAL MACHINE MODE AND MULTIPLE PROTECTION RINGS
Paul A. Karger, Acton; Timothy E. Leonard, Groton, both of Mass., and Andrew H. Mason, Nashua, N.H., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Jan. 4, 1985, Ser. No. 688,702
Int. Cl.[4] G06F *12/14, 9/44*
U.S. Cl. 364—200 **19 Claims**

8. A processor for use in a computer system, (a) the processor including processing means for processing instructions in at least three protection ring operating modes each associated with one of a hierarchy of privilege levels (b) said computer system including a memory means which includes a plurality of addressable storage locations for storing instructions requiring access to the memory locations, said memory means being comprised of plural groups of memory locations, wherein the number of memory locations in each memory group may vary, each memory group having an associated privilege means for identifying the protection ring operating modes in which the processor can access any memory location in the group, (c) said processor further comprising:
A. means connected to said processing means and for connection to said memory means for iteratively retrieving instructions from the memory means requiring access to a location in memory;
B. operating mode indicating means for identifying the privilege level of the current protection ring operating mode of said processor;
C. virtual mode indicating means for indicating whether or not said processor is operating in a virtual mode;
D. compression means connected to said operating mode indicating means for identifying a virtual mode operating mode in response to the current protection ring operating mode identified by said operating mode indicating means, said compression means operating in accordance with a compression function "F" which maps a set A=(0, 1, . . . , N) into a second set B=(0, 1, . . . , M), "M" greater than "N", with each element of the set A identifying one of the privilege levels when the processor is operating in the virtual mode and each element of the set B identifying one of the privilege levels when the processor is not operating in the virtual mode, the successive elements of each set corresponding to protection rings of progressively lower privilege, such that in each set "0" identifies the most privileged level and "N" and "M" identify the least privileged level, said compression function F satisfying the following conditions:
i. F (0) is greater than "0";
ii. if "i" is greater than or equal to "j", then F (i) is greater than or equal to F (j);
iii. for at least one "i" and "j", "i" not equal to "j", F (i) is equal to F (j); and
iv. if "i" and "j" are elements of set "A" such that "i" is greater than or equal to "j", then F (i) is greater than or equal to F (j).



E. selection means connected to said operating mode indicating means, said virtual mode indicating means and said compression means for selectively transmitting as an output the privilege level identified by said compression means in response to said virtual mode indicating means indicating that said processor is operating in a virtual mode, and otherwise transmitting the privilege level identified by said operating mode indicating means;
F. comparison means for comparing the output of said selection means to the privilege means of the location in memory to which the processor requires access to determine whether the processor can access the required memory location; and
G. means responsive to a successful comparison by said comparison means for enabling the processing means to access the required memory location and execute the instruction.

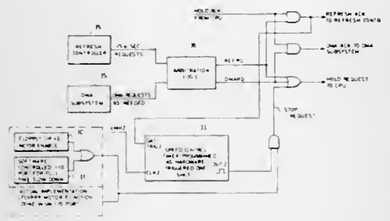
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4,787,032

PRIORITY ARBITRATION CIRCUIT FOR PROCESSOR ACCESS

Paul R. Culley, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Sep. 8, 1986, Ser. No. 905,075
Int. Cl.[4] G06F 9/46
U.S. Cl. 364—200 **6 Claims**



1. A personal computer with a high speed microprocessor compatible with applications software written for slower speed microprocessors comprising:

(a) a high speed microprocessor with a real and protected mode electrically coupled to a high speed data bus;

(b) non-volatile memory electrically coupled to a slow speed data bus;

(c) bus controller electrically coupling the high speed data bus to the slow speed data bus;

(d) dynamic memory electrically coupled to the high speed data bus;

(e) at least one input/output device coupled to said slow speed data bus;

(f) first microprocessor instruction halting means responsive to dynamic memory refresh cycle, said cycle repeatably occurring at timed intervals to generate a first microprocessor hold request;

(g) second microprocessor instruction halting means responsive to a direct memory access (DMA) request to generate a second microprocessor hold request;

(h) first arbitration means to arbitrate said first microprocessor hold request and said second microprocessor hold request to generate an arbitrated microprocessor hold request;

(i) switching means for switching the microprocessor from the real to protected mode and from protected to real mode, said switching means generates a microprocessor reset cycle when the microprocesor returns from the protected mode to the real mode; and

(j) detection means to detect the occurrence of an arbitrated microprocessor hold request during a microprocessor reset cycle to retain, for execution at a later time, the arbitrated microprocessor hold request generated during the execution of a microprocessor reset cycle.

4,787,033

ARBITRATION MECHANISM FOR ASSIGNING CONTROL OF A COMMUNICATIONS PATH IN A DIGITAL COMPUTER SYSTEM

Frank C. Bomba, Andover; William D. Strecker, Harvard, and Steven R. Jenkins, Acton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

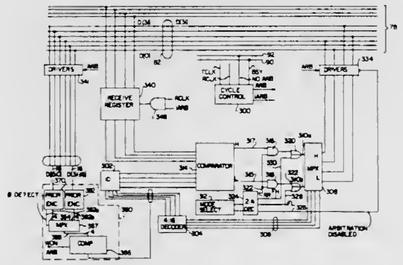
Filed Sep. 22, 1983, Ser. No. 534,829
Int. Cl.[4] G06F 13/00, 13/40
U.S. Cl. 364—200 **21 Claims**

1. An interconnecting circuit in a device for providing a communications interface for that device to a non-pended bus, wherein the device has a unique ID number and initiates a transaction at times when a request signal is asserted by asserting a busy line to obtain access to the bus, the bus including a plurality of information lines, a plurality of data lines, a no arbitration line, and the busy line, and wherein each of the transactions has a command/address cycle followed by an imbedded arbitration cycle which is then followed by at least one data cycle, the circuit comprising:

controller means coupled to the no arbitration and busy lines and responsive to a de-assertion of the no arbitration line for indicating when the imbedded arbitration cycle is occurring;

driver means coupled to the controller means for asserting one of two data lines corresponding to the device during the imbedded arbitration cycle;

priority resolution means coupled to the data lines for asserting a won arbitration signal to indicate that the device had the highest priority during the imbedded arbitration cycle, wherein assertion of the won arbitration signal enables the device to assert the busy line during a subsequent cycle after said busy line is de-asserted by a previous device having access to the bus during the current transaction;



receive register means coupled to the information lines for comparing the ID number of the device with an ID number of the previous device which is present of the information lines during the imbedded arbitration cycle, and for setting an indicator in either a first or second state according to whether the ID number of the device seeking to initiate a transaction is greater than that of the previous device; and

switching means, responsive to the receive register means and coupled to the driver means, for asserting a low priority data line corresponding to the device during the imbedded arbitration cycle of the next transaction when the indicator is in the first state, and for asserting a high priority data line corresponding to the device during the imbedded arbitration cycle of the next transaction when the indicator is in the second state, wherein the device has a variable priority and is allocated access to the bus fairly according to a dual-count, dual round robin algorithm.

4,787,034

PROGRAM ACCESS SYSTEM

Pal Szoke, 20819 Anza Ave., Torrance, Calif. 90503

Continuation of Ser. No. 671,461, Nov. 14, 1984, abandoned.
This application Aug. 28, 1987, Ser. No. 91,361
Int. Cl.[4] G06F 9/30
U.S. Cl. 364—300 **5 Claims**

1. A method for operating a digital computer such that calling programs included in a first load module can CALL a callable program included in a second load module, the method comprising:

(a) linking the first load module;

(b) while linking the first load module, initializing a dummy entry point address for the callable program in the first load module;

(c) commencing execution of the first load module;

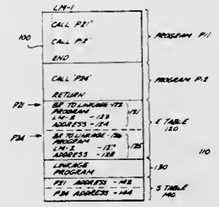
(d) upon the occurrence of a CALL from a calling program to the callable program when the callable program has not yet been loaded,

(i) determining the name of the second load module in which the callable program is included;

(ii) loading the second load module;

(iii) determining the actual address of the callable program;

(iv) replacing said dummy entry point address with said actual address; and



(v) transferring control to the callable program at said actual address; and

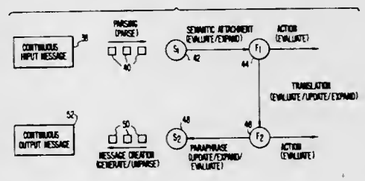
(e) upon the occurence of a CALL from a calling program to the callable program after the callable program has been loaded, transferring control to the callable program at said actual address.

4,787,035

META-INTERPRETER

David A. Bourne, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 17, 1985, Ser. No. 788,650
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—300 **19 Claims**
MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 245 Pages)



1. An interpreter process, comprising steps performed by a computer of:

(a) converting a message into a parse table using a grammar table;

(b) comparing the parse table to data needed in a condition designating a function table name; and

(c) evaluating the named function table designated in the condition when the comparison indicates all data for the condition exists in the parse table.

4,787,036

STUDENT ENROLLMENT STABILIZATION SYSTEM

Patrick J. Fleming, 1321 McLaughlin Rd., Pittsburgh, Pa. 15241

Filed May 29, 1986, Ser. No. 868,643
Int. Cl.[4] G06F 15/21
U.S. Cl. 364—401 **11 Claims**

1. A student enrollment stabilization system for an educational institution comprising:

means for determining a ratio of an educational institution's historical full tuition student enrollment to the educational institution's market area's historical demographics; means for calculating future demographics of the educational institution's market area for a target year;

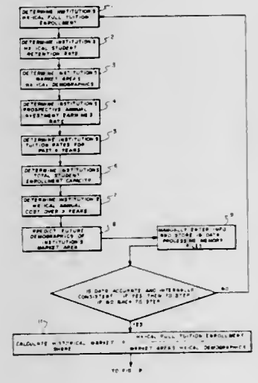
means for calculating said target year's future full tuition student enrollment by multiplying said ratio by said calculated future demographics for the target year;

means for calculatiing a tuition amount per student for said target year;

means for calculating annual future revenue for said target year by multiplying said full tuition amount per student for the target year;

means for calculating a total student enrollment capacity for an educational institution;

means for subtracting a present year from a target year; means for calculating a student scholarship population size for a target year by subtracting the predicted full tuition student enrollment for the target year from said total student enrollment capacity;



means for calculating annual future costs for said target year based upon said total student enrollment capacity for said target year;

means for calculating an annual break even point of said educational institution for a target year from said annual future costs and said annual future revenues for said target year; and

means for calculating a per student future scholarship fee for a target year using said calculation means;

means for advertising, promoting and distributing positions in said target year's student scholarship population size, each said position being distributed at a fee approximating said per student future scholarship fee, said distribution not exceeding numerically said target year's student scholarship size.

4,787,037

ECR WITH DATA MEMORY STRUCTURE FOR TRANSMITTING SALES DATA AND RE-STOCK DATA TO AN EXTERNAL UNIT

Tetsuo Ootsuka, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1982, Ser. No. 433,864
Claims priority, application Japan, Oct. 19, 1981, 56-167417
Int. Cl.[4] G07G 1/12; G06F 15/21
U.S. Cl. 364—404 **5 Claims**

1. An electronic cash register for transmitting sales data and commodity re-stock data to an external unit, comprising:

a keyborad (**1**) having a plurality of keys including numeral keys (**1***a*), a data write key (**1***b*) and a transmission key (**1***e*);

a central processing unit (**3**) coupled to said keyboard and including input data storage means (X) for storing input data, which is input by operation of numeral keys on said

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keyboard, and format data memory means (P) for storing the number of digits of each of a plurality of data items required for transmission of said commodity data;

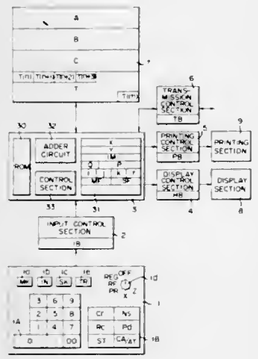
sales data memory means (A, B, C) coupled to said central processing unit for storing various accumulated totals of sales data input from said keyboard;

additional data memory means (T), coupled to said central processing unit for storing, in format ready for transmission, commodity data items in numerical or numerically coded form obtained from said input data storage means; and

transmission control means (6) coupled to said central processing unit and to said sales data and additional data memory means and including means for transmitting data from said central processing unit to said external unit;

said central processing unit including:

means for reading out the digit number data of each item of said commodity data from said format data memory means (P);



means for checking each commodity data item in said input data storage means with said digit number data for format requirements and for checking said additional data memory means to assure the presence of available memory areas therein having a size corresponding to said digit number data;

means for writing into said available memory areas a commodity data item stored in said input data storage means after said commodity data item is successfully checked by said data and memory checking means;

means responsive to operation of said data key on said keyboard after a commodity data item has been stored in said input data storage means for activating, in turn, said digit number data read-out means, said data and memory checking means and said data writing means, and

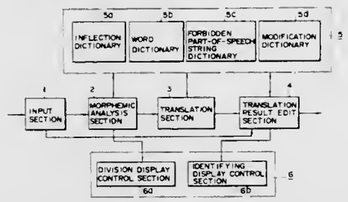
means responsive to operation of said transmission key on said keyboard for causing said transmission control means to transmit to said external unit the commodity data composed of items in accordance with said format data memory means and written into said memory areas of said additional data memory means.

4,787,038

MACHINE TRANSLATION SYSTEM

Miwako Doi, Kawasaki, and Tsutomu Kawada, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 24, 1986, Ser. No. 843,395
Claims priority, application Japan, Mar. 25, 1985, 60-59881
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 **7 Claims**



1. A machine translation system comprising:

translation processing means for processing an input original sentence so as to obtain translated-word possibilities and translation data associated therewith corresponding to translation processing units of the original sentence, thereby producing a translated-sentence possibility, formed of selected translation processing units, corresponding to the original sentence, said translation processing means including syntax determining means for determining improper combinations of translated words and producing said translated sentence possibility only in accordance with predetermined grammatical rules;

display means for displaying the translated-sentence possibility produced by said translation processing means;

division display control means, operated in response to the processing of said translation processing means, for controlling said display means so that the displayed translated-sentence possibility is divided into the translation processing units in said translation processing means and is displayed on said display means;

identifying display control means, operated in respose to the processing of said translation processing means, for controlling said display means in such a manner that, if portions of the original sentence have other translation processing units in addition to the displayed translation processing units, the translated-sentence possibility is displayed so that positions of said portions of the original sentence having the other translation processing units and classes of the other translation-processing units are identified; and

selection means to enable an operator to select an appropriate translation processing unit while displaying the other translation processing units on said display means.

4,787,039

DISPLAY DEVICE FOR MOTOR VEHICLE AND INFORMATION DISPLAY METHOD IN THE DEVICE

Hajime Murata, Shimada, Japan, assignor to Yazaki Corporation, Japan

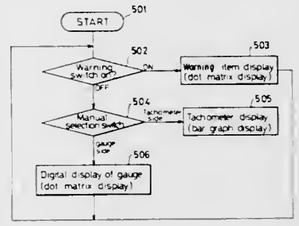
Filed May 30, 1986, Ser. No. 869,050
Claims priority, application Japan, May 31, 1985, 60-080814[U]
Int. Cl.[4] B60Q *1/00;* **G06F** *15/20*
U.S. Cl. 364—424.01 **3 Claims**

1. An information display method in display device for motor vehicles with dot matrix display unit, comprising the steps of:

(i) judging whether or not there is input emergency display information;

(ii) interrupting the ordinary information display if there is input emergency display information;

(iii) judging whether the emergency information is to be symbol displayed or graph displayed; and



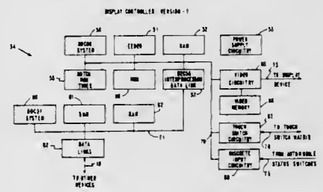
(iv) processing the emergency display information for symbol display or for graph display, based on the result of the judgement of whether the emergency information is to be symbol displayed or graph displayed, and outputting the result of the processing to the dot matrix display unit.

4,787,040

DISPLAY SYSTEM FOR AUTOMOTIVE VEHICLE

Richard N. Ames; Layton Balliet, both of Boca Raton; Richard V. Ballou, Lake Worth; Stanley M. Belyeu, Boca Raton; Joseph A. Boscove, Highland Beach; Akram Bou-Ghannam, Boca Raton; Peter Langer, Coral Springs; Andrew B. McNeill, Dearfield Beach; Gerald U. Merckel, Delray Beach; Robert V. Miller; Thomas K. Pate, both of Boca Raton, all of Fla.; Nicholas J. Schwartz, San Francisco, Calif.; Frederick T. Slater, Boca Raton, Fla.; Stanford A. Strickland, Boca Raton, Fla., and William C. Troop, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1986, Ser. No. 945,053
Int. Cl.[4] G09G *1/00;* **G06F** *15/20*
U.S. Cl. 364—424.01 **12 Claims**



1. A display system for an automotive vehicle, said display system operating by selective partitioning of functions comprising:

(1) display means for displaying graphics and text to an operator of the vehicle;

(2) video graphics means for controlling operation of said display means, said video graphics means being reconfigurable to generate different styles of graphics and text;

(3) touch switch entry means for entry of desired function information by the operator and generation of touch input signals;

(4) discrete switch means for entry of additional function information by the operator and generation of discrete signals;

(5) a Display controller for controlling system operations;

(6) an input/output (I/O) channel incorporated in said Display controller;

(7) an interprocessor data link for transferring data and commands in said system;

(8) a master micropro;cessor incorporated in said Display controller for issuing control signals and responding to control signals representative of major system functions, said master microprocessor having associated storage means for storing master data and commands and a master control program to control major functions in said system, said major functions including control of graphics and text for display on said display means and responsive to signals from said touch switch means and said discrete switch means; and

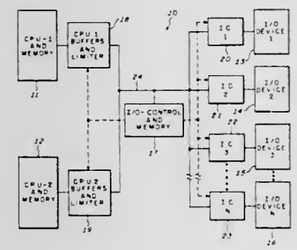
(9) a slave microprocessor incorporated in said Display controller for issuing and responding to control and data signals involving communication with said master microprocessor in said Display controller via said input/output channel and said interprocessor data link, and said slave microprocessor having associated storage means for storing slave data and commands and a slave control program to control slave functions in said system, said slave functions including control and monitoring of communications internally within said Display controller and externally by said Display controller.

4,787,041

DATA CONTROL SYSTEM FOR DIGITAL AUTOMATIC FLIGHT CONTROL SYSTEM CHANNEL WITH PLURAL DISSIMILAR DATA PROCESSING

Larry J. Yount, Scottsdale, Ariz., assignor to Honeywell, Minneapolis, Minn.

Filed Aug. 1, 1985, Ser. No. 761,455
Int. Cl.[4] G06F *15/16, 15/50*
U.S. Cl. 364—424.03 **18 Claims**



1. A channel for an automatic flight control system comprising:

a set of input devices,

a set of output devices,

a first digital processor,

a second digital processor,

a data control system intercoupling said set of input devices, said set of output devices, said first digital processor and said second digital processor for transferring data signals, address signals and control signals therebetween, said first digital processor having access of said data control system for a first predetermined time interval and said second digital processor having access to said data control system for a second predetermined time interval,

first limiter means associated with said first digital processor for disabling access of said first digital processor to said data control system whenever said first digital processor maintains access thereto for a time interval greater than said first predetermined time interval,

second limiter means associated with said second digital processor for disabling access of said second digital processor to said data control system whenever said second

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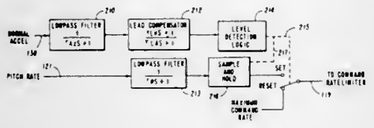
digital process maintains access thereto for a time interval greater than said second predetermined time interval.

4,787,042

LIMITING AIRCRAFT VERTICAL ACCELERATION RESPONSE

Roger D. Burns, and Larry A. Anspach, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 18, 1985, Ser. No. 799,222
Int. Cl.[4] G05D *1/06*
U.S. Cl. 364—433 **3 Claims**



1. An autopilot pitch command apparatus having a specified maximum pitch rate control output comprising:

a. first means for receiving a sensed vertical acceleration signal;

b. second means for receiving a sensed pitch rate signal;

c. third means, coupled to said first means, for lead compensating said sensed vertical acceleration signal; and

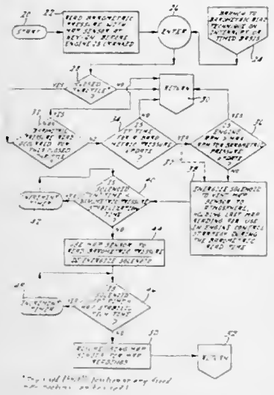
d. fourth means, coupled to said second means, and to said third means, for detecting when said lead compensated acceleration signal exceeds the absolute value of a first predetermined factor, and for requiring said autopilot pitch command apparatus to limit as a function of said detection, said pitch control output to said presently-sensed pitch rate as a maximum.

4,787,043

METHOD OF MEASURING BAROMETRIC PRESSURE AND MANIFOLD ABSOLUTE PRESSURE USING A SINGLE SENSOR

Eugene S. Zimmerman, Brownstown, and Larry R. Hartwick, Auburn Heights, both of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Continuation of Ser. No. 647,084, Sep. 4, 1984, abandoned. This application Oct. 28, 1986, Ser. No. 922,779
Int. Cl.[4] F02D *35/00, 41/26;* **G01L** *23/24*
U.S. Cl. 364—431.05 **1 Claim**



1. In an electronic control system for an engine, the system having sensors to monitor various engine and vehicle parameters, including manifold absolute pressure (MAP), vehicle speed and ambient temperature, the system also having memory means for storing data values representing the various engine and vehicle parameters, as well as for storing a predetermined control strategy, the system further having a solenoid to vent the MAP sensor to atmosphere, the system further having computer means for utilizing the data values along with the control strategy to control the engine, a barometric pressure read technique for utilizing the MAP sensor to measure barometric pressure dynamically while the engine is operating and for controlling the engine while the MAP sensor is dedicated to measuring the barometric pressure, comprising:

branching to the barometric pressure read technique from the control strategy;

determining whether the throttle is in a predetermined position;

returning to the engine control strategy if the throttle is at a position other than the predetermined position;

determining whether the system is due for a barometric pressure update, returning to the engine control strategy if it is not;

determining whether the actual engine RPM is greater than the maximum allowable RPM set for a barometric pressure update, returning to the engine control strategy if it is;

energizing a solenoid to vent the MAP sensor to atmosphere, holding the last MAP sensor reading for use in the engine control strategy during the following barometric read time period;

determining if the solenoid "on" time is less than the predetermined barometric pressure stabilization time, delaying until the solenoid "on" time is equal to or greater than the barometric pressure stabilization time;

utilizing the MAP sensor to read barometric pressure;

de-energizing the solenoid;

determining whether the solenoid "off" time is less than the MAP sensor's stabilization time, delaying, if needed, until the solenoid "off" time is equal to or greater than the MAP sensor stabilization time;

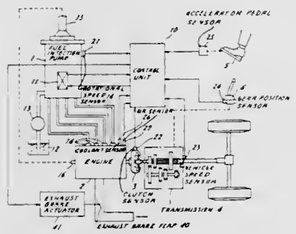
resuming the engine control strategy using the MAP sensor for MAP readings and the new barometric pressure reading.

4,787,044

APPARATUS AND METHOD FOR CONTROLLING ROTATIONAL SPEED OF INTERNAL COMBUSTION ENGINE FOR VEHICLES

Tosirou Nagata, Kariya; Fumiaki Murayama; Mikio Kumano, both of Anjo; Michitaka Terasawa, Tokyo; Hideo Nagakura, Tokyo, and Masaru Idoguchi, Tokyo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Hino Motors, Ltd., Tokyo, both of, Japan

Filed Jul. 16, 1985, Ser. No. 755,435
Claims priority, application Japan, Jul. 17, 1984, 59-149097
Int. Cl.[4] F02D *31/00, 9/06*
U.S. Cl. 364—431.07 **8 Claims**



1. An apparatus for controlling a rotational speed of an internal combustion engine coupled via a clutch to a transmission, comprising:

(a) first means for detecting a rotational speed of said engine;

(b) second means for detecting a connecting and disconnecting state of said clutch;

(c) third means for detecting parameters indicative of a rotational speed of an input shaft of said transmission, including:

(i) fourth means for detecting a vehicle speed from a rotational speed of an output shaft of said transmission, and

(ii) fifth means for detecting a gear position of said transmission;

(d) exhaust brake means for selectively reducing the rotational speed of said engine when actuated;

(e) fuel amount controlling means for controlling an amount of fuel supplied to said engine to control the rotational speed of said engine; and

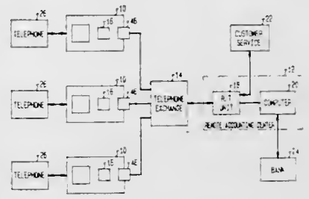
(f) computing means for: (1) detecting a gear changing state of said transmission on the basis of said clutch state detection by said second means, (2) calculating said rotational speed of said input shaft of said transmission from said parameters from said fourth and fifth means, and (3) controlling said exhaust brake means and said fuel amount controlling means in accordance with said parameters from said fourth means and fifth means so that the rotational speed of said engine detected by said first means approaches the rotational speed of said input shaft of said transmission during said gear changing state.

4,787,045

POSTAGE METER RECHARGING SYSTEM

Anthony Storace, Norwalk, Conn.; Donatas V. Gasiunas, Carmel, N.Y., and Albert V. Yannella, Milford, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 10, 1986, Ser. No. 850,476
Int. Cl.[4] H04L *9/00*
U.S. Cl. 364—464.02 **18 Claims**



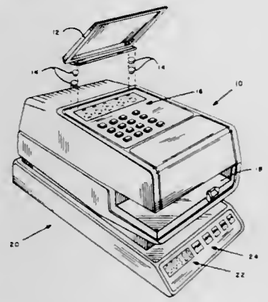
1. In an electronic postage meter having an external communication port means, an accounting circuit including a descending register, communication control means coupled to said accounting circuit for applying dialing signals and coded identification signals to said communication port means, said dialing signals corresponding to a data center, said control means comprising means responsive to determined coded signals from said port for modifying the contents of said register to correspond to a determined higher postage printing value authorization; the improvement wherein said control means comprises means for interrupting communication via sid communication port means following the application of said dialing and identification signals thereto, and means responsive to the receipt of dialing signals after the interruption for said modifying of the contents of said register.

4,787,046

MAILING SYSTEM HAVING A CAPABILITY FOR ONE-STEP POSTAGE METERING

Seymour Feinland, Stamford; Gerald C. Freeman, Darien, and Timothy R. Erwin, West Redding, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 12, 1985, Ser. No. 797,326
Int. Cl.[4] G01G *23/22;* **G06F** *15/20*
U.S. Cl. 364—464.03 **18 Claims**



1. A mailing system comprising:

(a) a postal scale for computing postage values as a function of the weight of an item to be mailed, and for generating signals representative of said computed value;

(b) a postage meter connected to said scale for receiving said signals and imprinting indicia representative of said computed postage value in accordance with said signals; and

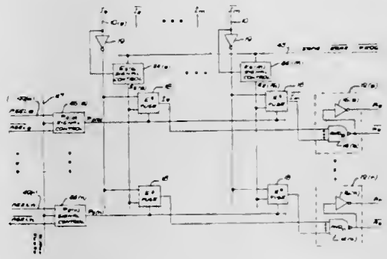
(c) said meter is supported by said scale so that the weight of said meter is part of the tare weight of said scale.

4,787,047

ELECTRICALLY ERASABLE FUSED PROGRAMMABLE LOGIC ARRAY

James Y. Wei, Santa Clara, Calif., assignor to Intersil, Santa Clara, Calif.

Filed Mar. 22, 1985, Ser. No. 714,866
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—716 **29 Claims**



1. A programmable logic array comprising:

a plurality of logic input means for receiving a plurality of input logic signals;

a plurality of logic gates, each gate having a plurality of inputs;

a plurality of electrically alterable programmable fuse means, each having an input and an output electrically isolated from the output of any other electrically alterable programmable fuse means and each being programmable into a first state in which said electrically alterable pro-

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grammable fuse means operates and functions as a logic inverter or into a second state in which said electrically alterable programmable fuse means provides at its output a preselected logic signal;

means for coupling each input of said plurality of inputs of each logic gate to a selected output of said electricaly alterable programmable fuse means, each input of each logic gate being connected to a different programmable fuse means output than any other logic gate input for connecting the output of each fuse means to only one input of a logic gate and each logic gate input to only one fuse means output, whereby said input means are selectively logically coupled to selected ones of said logic gates; and

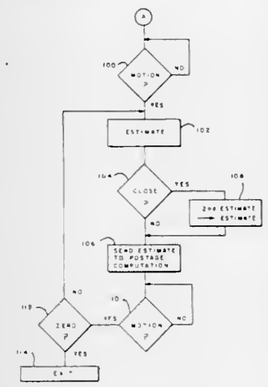
programming means for selectively programming said fuse means.

4,787,048

POSTAL WEIGHING APPARATUS AND METHOD

Gerald C. Freeman, Darien, and Seymour Feinland, Stamford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 19, 1986, Ser. No. 909,151
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—466 **28 Claims**



1. A postal scale for determining the appropriate postage amount for a mailpiece as a function of the weight of said mailpieces, said postage amount function having a constant value over at least one range between two predetermined weight breakpoints, comprising:

(a) means for supporting said mailpiece;

(b) transducer means for generating a sequence of digital output signals representative of the instantaneous response of said support means; and

(c) processing means for, in response to said digital output signals:

(c1) detecting the presence of said mailpiece on said support means;

(c2) then making a first estimate of the weight of said mailpiece;

(c3) then testing said first estimate to determine if it is within one of said ranges and if the distance from the closest of said breakpoints exceeds a predetermined amount; and

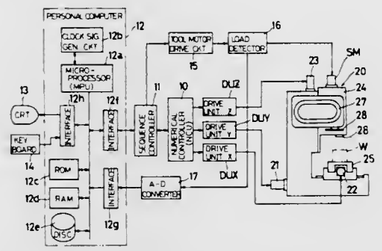
(c4) then, if said first estimate satisfies said test, using said first estimate to determine said postage amount for said mailpiece; or, if said first estimate fails to satisfy said test, making a second more accurate estimate of the weight of said mailpiece, and using said second estimate to determine said postage amount.

4,787,049

ADAPTIVE CONTROL APPARATUS FOR A MACHINE TOOL

Minoru Hirata, Kariya; Norimitsu Makihara, Gamagouri; Kazuo Kawai, Nagoya, and Mamoru Nagasawa, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 20, 1987, Ser. No. 51,593
Claims priority, application Japan, May 21, 1986, 61-116472
Int. Cl.[4] G06F *15/46; G05B 13/02*
U.S. Cl. 364—474.15 **4 Claims**



1. An adaptive control apparatus for a machine tool having feed means for effecting relative movement between a tool carrier and a work table, said adaptive control apparatus comprising:

a load detector for detecting a machining load acting on at least one of said tool carrier and said work table;

data input means for inputting information which identifies the kinds of a tool to be used and a machining operation to be performed in a model machining operation;

load value storage control means including plural storage files for respectively storing plural groups of load values sampled in plural model machining operations using a single tool, in connection with the kinds of said tool and machining operation input by said data input means;

selection means for identifying the kinds of a tool to be used and a machining operation to be performed in accordance with a numerical control program during an adaptive control machining operation, so as to select from said plural storage files one storage file which corresponds to the identified tool and the identified kind of said machining operation;

objective load read-out means for successively reading out from said one storage file selected by said selection means sampled load values in synchronous relation with the progress of said adaptive control machining operation; and

feed rate control means for controlling the feed rate in the relative movement of said tool carrier and said work table so as to make the machining load detected by said load detector follow the sampled load values successively read out by said objective load read-out means.

4,787,050

APPARATUS FOR MANAGING SOFTWARE BENDING MACHINES

Takamitsu Suzuki, Nagoya, Japan, assignor to Brother Industries, Ltd., Japan

Filed Nov. 12, 1986, Ser. No. 930,332
Claims priority, application Japan, Nov. 12, 1985, 60-253352
Int. Cl.[4] G06F *15/21*
U.S. Cl. 364—479 **4 Claims**

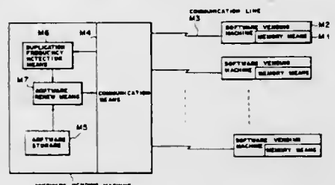
1. An apparatus for managing at least one local software vending machine connected to said apparatus through a communication line and arranged so that a software program selected by a customer out of a plurality of software programs

stored in memory means disposed in said machine is duplicated onto an external storing medium, said apparatus comprising:

communication means for carrying out information communication with a local software vending machine through said communication line;

storage means for storing at least one software program;

duplicating frequency detecting means for detecting frequency of duplicating for every software program in said software vending machine through said communication



means and for correcting the frequency of duplicating for every software program in inverse proportion to a length of the time elapsed from registration of the software program; and

software renewing means for replacing one of said plurality of software programs stored in said memory means in said software vending machine selected on the basis of said frequency of duplicating for a predetermined period of time with said software program stored in said storage means through said communication line.

4,787,051

INERTIAL MOUSE SYSTEM

Lynn T. Olson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 16, 1986, Ser. No. 864,053
Int. Cl.[4] G09G *1/00*
U.S. Cl. 364—518 **11 Claims**

1. An apparatus for providing data to a computer from which the computer can determine an operator selected spatial position with respect to a reference point corresponding to a location on a display, the apparatus comprising:

a chassis adapted to be held in an operator's hand;

an accelerometer mounted on the chassis for producing an output signal of magnitude proportional to the acceleration of the chassis as the operator moves the chassis from a reference point;

means for integrating the accelerometer output signal to produce velocity data of magnitude proportional to the velocity of said chassis; and

means for providing said velocity data to a computer so that the computer can integrate the velocity data to determine the magnitude of the displacement of the chassis from the reference point, the displacement of the chassis being indicative of its spatial position with respect to the reference point.

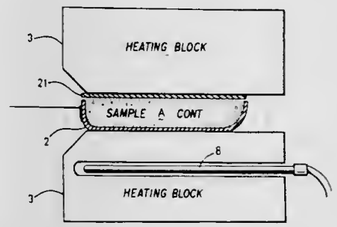
4,787,052

MOISTURE MEASURING METER OF A HYDROUS SUBSTANCE

Tetsuo Yamaguchi, Chiba, Japan, assignor to Kabushiki Kaisha Toyoko Elmes, Yokohama and Fukken Chosa Sekkei Kabushiki Kaisha, Hiroshima, both of, Japan

Filed May 2, 1986, Ser. No. 858,629
Claims priority, application Japan, May 2, 1985, 60-93912
Int. Cl.[4] G01N *5/02, 25/56*
U.S. Cl. 364—550 **3 Claims**

1. A method for measuring the moisture content of a hydrous material comprising: determining the tare weight of a shallow rectangular sample container having a top; adding a sample of material to the sample container; weighing the sample and sample container; applying heat and pressure to said sample container by means of a heating medium comprising a pair of blocks formed from a material selected from the group



consisting of aluminum and graphite; weighing the sample after heating; and calculating the percentage moisture content M according to formula I

$$M = \frac{W - Wo}{W} \times 100 \qquad (1)$$

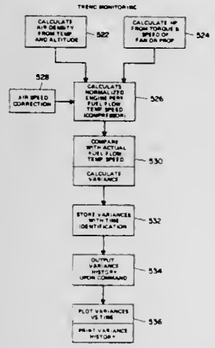
wherein W is the weight of the sample in the hydrous state and Wo is the weight of the sample in the dehydrated state.

4,787,053

COMPREHENSIVE ENGINE MONITOR AND RECORDER

M. Samuel Moore, Northridge, Calif., assignor to Semco Instruments, Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 335,841, Dec. 30, 1981, Pat. No. 4,575,803. This application Oct. 4, 1985, Ser. No. 784,724
Int. Cl.[4] G11B *5/02; G01M 15/00*
U.S. Cl. 364—551.01 **29 Claims**



1. A comprehensive aircraft turbine engine monitoring and recording system whereby said turbine engine has predetermined maximum normal operating parameters, said system comprising:

means for sensing the speed of rotation of said turbine engine; means for sensing temperature of said turbine engine; means for sensing altitude; means for determining exceedances indicating operation of said turbine engine over the normal operating temperature and/or speed of said engine; means for determining the air speed of said aircraft;

non-volatile storage means for permanently storing data giving the duration and magnitude of each said exceedance, and the total duration of the exceedances;

means for recording and processing data required for turbine

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engine trend monitoring, including means for calculating horsepower and the air density index factor, and the resultant optimum fuel flow rate, engine speed and engine temperature under these horsepower and air density conditions;

means for determining the actual fuel flow rate, engine speed and engine temperature;

means for determining the variances from the optimum for the fuel flow rate, the engine speed and the engine temperature;

means for numerically displaying selected data from said system;

means for mounting said numerical display means in the cockpit of the aircraft; and

switching means in the cockpit for actuation by the pilot for selecting any of at least ten desired sensed or calculated information or data, to be displayed, including altitude and airspeed;

whereby said display provides a backup source of instrumentation for the pilot of the aircraft, and whereby an evaluation of the engine degradation trend may be made for purposes of power assurance, engine overhaul scheduling, or the like.

4,787,054

INTERDIAL COMPENSATION TECHNIQUE FOR ANGULAR POSITION DETECTORS

Thomas D. Wason, Raleigh, N.C., assignor to Cain Encoder Co., Greenville, N.C.

Division of Ser. No. 516,714, Jul. 25, 1983, Pat. No. 4,606,008. This application Aug. 8, 1986, Ser. No. 894,782

Int. Cl.[4] G01R *11/17, 11/25;* **G06F** *15/20*

U.S. Cl. 364—571.04 **8 Claims**

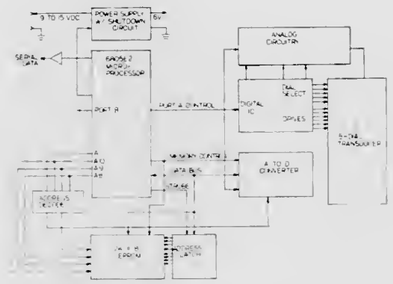
1. In a device for remotely reading the position of a plurality (n) of continuously movable position indicators representing less significant and more significant digits in any number system, movement of any more significant of two adjacent indicators being in a ratio of 1/N to the less significant of the two adjacent indicators where N is the base of the number system employed, a method of interdial compensation for minimizing the effect of errors in the apparent positions of the indicators comprising:

(a) sensing the readings of the least significant of said indicators to the nearest digit of the N-based numbering system;

(b) in ascending sequence starting with the least significant indicator and storing the compensated reading from each less significant indicator, if any, in a storage means;

(c) for each reading after the first, with adding means, adding a variable compensation value to the apparent value of the indicator being read based on a cumulative compensation value from the previous adjusted values of all lesser significant indicator, which tend to make the reading from each indicator one which falls exactly halfway between two adjacent integers on the more significant indicator being read responsive to the compensated value from all the previous less significant indicators;





(d) outputting the compensated value from each indicator as data.

4,787,055

CIRCUIT FOR CALCULATING THE DISCRETE FOURIER TRANSFORM

Gérard Bergeon, Maison Alfort; Claude Legendre, Paris; Marc Muller, Meudon; Philippe Cros, Paris, and Jean-Louis Lemaire, Montrouge, all of France, assignors to Thomson-CSF, Paris, France

Filed Jul. 15, 1985, Ser. No. 755,278

Claims priority, application France, Jul. 20, 1984, 84 11541

Int. Cl.[4] G06F *7/34*

U.S. Cl. 364—726 **17 Claims**

1. A circuit for calculating the discrete Fourier transform, comprising

means (**190**) for providing time discrimination including

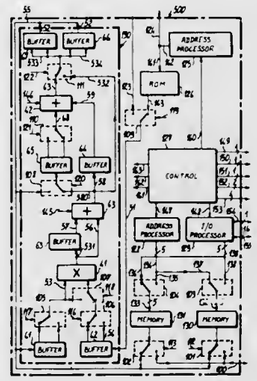
a multiplier (**41**), having a pair of inputs (**53, 107**) and an output, and

a first adder (**42**) having a pair of inputs, a first one (**59**) of which is connected to said multiplier output, and a second one (**68**) of which is connected to a data stream (**55**) not passing through said multiplier (**41**), and

a second adder (**43**) having a pair of inputs, a first one (**56**) of which is connected directly to said multiplier output, and a second one (**57**) of which is connected to a buffer memory (**63**), said buffer memory (**63**) being coupled to said multiplier output, said connections of said first and second

adders thereby defining a butterfly data stream configuration,

means (**500, 124–131**) for breaking up calculation of the transform over N points into a succession of independent



Fourier transform calculations over groups of N_i terms, where N is greater than N_i, and including address processor means (**125,128**) for supplying continuous streams of data (**51, 100**) to said time discrimination means (**190**).

4,787,056

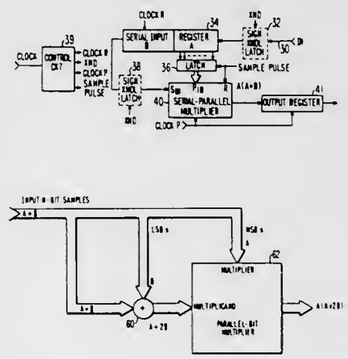
APPARATUS FOR ESTIMATING THE SQUARE OF DIGITAL SAMPLES

Charles B. Dieterich, South Brunswick Township, Middlesex County, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Mar. 26, 1986, Ser. No. 844,203

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—753 **11 Claims**



1. Apparatus for producing an estimate of the square of a number. represented by a multi-bit digital serial-bit sample wherein said multi-bit digital sample comprises N-bits including L least significant bits (LSB's) and (N—L) most significant bits (MSB's) where N and L are intergers, said apparatus comprising:

an input terminal for receiving said multi-bit digital sample;

a multiplier circuit having a parallel bit multiplier input terminal and a serial multiplicand input terminal, and having an output terminal for providing said estimate;

a serial shift register having an input coupled to said input terminal for receiving said multi-bit digital sample, having a serial output terminal, and having (N—L) parallel output terminals for providing said (N—L)-MSB's;

means for coupling said serial output terminal to said serial multiplicand input terminal;

means for coupling said (N—L) parallel output terminals to said parallel bit multiplier input terminal.

2. Apparatus for producing an estimate of the square of a number represented by a multi-bit digital sample wherein said multi-bit digital sample comprises N-bits representing values (A+B) including L least significant bits (LSB's) representing value B and (N—L) most significant bits (MSB's) representing value A where N and L are integers, said apparatus comprising:

an input terminal for receiving said multi-bit digital sample;

a multiplier circuit having multiplier and multiplicand input terminals, and having an output terminal for providing said estimate;

means coupled to said input terminal for applying said (N—L)-MSB's to said multiplier input terminal;

means coupled to said input terminal for providing said L-LSB's of said multi-bit digital sample;

an adder having a first input terminal coupled to said means for providing said L-LSB's, having a second input terminal, and having an output terminal coupled to said multiplicand input terminal;

means, coupled to said input terminal, for applying said N-bit multi-bit digital sample to the second input terminal of said adder; and

wherein the estimate of the square of the value (A+B) corresponds to A^2+2AB.

4,787,057

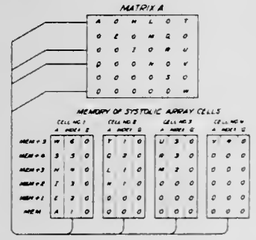
FINITE ELEMENT ANALYSIS METHOD USING MULTIPROCESSOR FOR MATRIX MANIPULATIONS WITH SPECIAL HANDLING OF DIAGONAL ELEMENTS

Steven W. Hammond, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 4, 1986, Ser. No. 870,566

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—754 **32 Claims**



1. Apparatus for loading and storing a matrix defined by a series of one dimensional arrays arranged along orthogonal axes, comprising:

a plurality of processing cells, said cells being intercoupled to pass data therebetween;

a memory for each said processing cell;

means for scanning each element of said matrix along one orthogonal axis thereof;

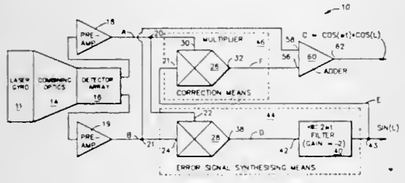
means for loading non-zero elements of said matrix along said one orthogonal axis into the respective memories of a plurality of said cells, said means for loading including means for loading all of the non-zero diagonal elements of said matrix into the memory of a designated one of said cells; and

means for generating an index, said index being stored in

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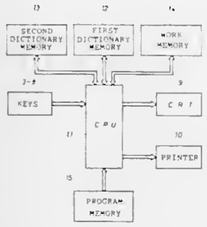
association with each such stored non-zero element for identifying the array along said other axis from which said non-zero element originated.

4,787,058
SYNTHETIC QUADRATURE GENERATING APPARATUS
William T. Schmars, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Sep. 13, 1985, Ser. No. 776,181
Int. Cl.[4] G06F *15/51*
U.S. Cl. 364—807 **9 Claims**



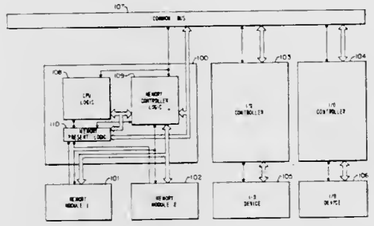
1. A synthetic quadrature generating apparatus responsive to an input reference signal of the form SIN(wt) from an input reference signal source and to an error shifted quadrature signal of the form COS(wt+L) from a shifted quadrature signal source, wherein angle "L" represents a quadrature phase error angle between angle (wt) and angle (wt+L) for forming a synthetic quadrature output signal of the form COS(wt)•COSL substantially free of error shift angle L comprising:
an error signal synthesizing filter means responsive to said input reference signal and to said error shifted quadrature signal for forming a filtered signal of the form SIN(L);
correction means responsive to said input reference signal and to said filtered signal for forming their product as a filtered product signal of the form SIN(wt)•SIN(L);
adder means responsive to said filtered product signal and said error shifted quadrature signal for forming their sum as a synthetic quadrature output signal of the form COS(wt)•COSL.

4,787,059
SYSTEM FOR EFFECTIVE SPELL CHECK IN WORD PROCESSING WITH RELOCATED STARTING LOCATION
Motokazu Yoshimura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan
Filed Mar. 18, 1986, Ser. No. 840,657
Claims priority, application Japan, Mar. 23, 1985, 60-58777
Int. Cl.[4] G06F *15/02, 15/40*
U.S. Cl. 364—900 **8 Claims**



1. An apparatus for checking a spelling of an input English word comprising:
an input device for receiving a word;
an electronic dictionary memory including a first dictionary in which pre-installed English words are stored and a second dictionary, said first and second dictionaries having a plurality of locations identified by addresses and second dictionary storing English words which are not stored in the first dictionary;
an address memory in which an address of the second dictionary is stored, the address being arranged such that start and end locations of the second dictionary are adjacent and consecutive with one another;
a search means for searching an input word through the first and the second dictionary, the search means searching in the second dictionary circularly from said start location whose address is stored in the address memory to said adjacent end location; and
a store means for storing a new input word that has been found in neither the first nor the second dictionary into the second dictionary, including (a) a writing means for writing the new input word at a location just before the start location in the second dictionary whose address is stored in the address memory, and (b) a change means for changing the start address in the address memory to a start address of the location in the second dictionary at which the new input word is stored, whereby a new word is added before the previous start address of the search means such that the search means begins searching at the location of the new input word.

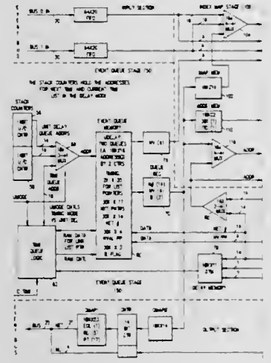
4,787,060
TECHNIQUE FOR DETERMINING MAXIMUM PHYSICAL MEMORY PRESENT IN A SYSTEM AND FOR DETECTING ATTEMPTS TO ACCESS NONEXISTENT MEMORY
Daniel A. Boudreau, and Edward R. Salas, both of Billerica, Mass., assignors to Honeywell Bull, Inc., Minneapolis, Minn.
Continuation of Ser. No. 481,107, Mar. 31, 1983, abandoned.
This application Nov. 24, 1986, Ser. No. 931,956
Int. Cl.[4] G06F *12/14*
U.S. Cl. 364—200 **22 Claims**

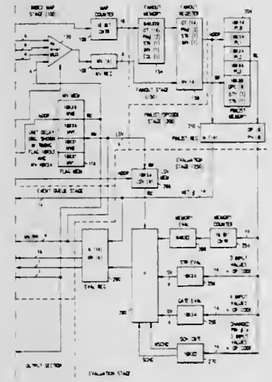


1. A method of determining the amount of memory physically present within a system capable of containing one or more memory modules, wherein each memory module contained in the system can be one of several different types with every type of memory module having a predetermined number of memory locations, said method comprising the steps of:
A. constructing said system to have a plurality of positions to which each of said memory modules can be physically connected;
B. receiving from each of said plurality of positions a first signal which when in a first state indicates that a one of said memory modules is physically present and when in a second state indicates that said one of said memory modules is not physically present;
C. receiving from each of said plurality of positions a number of signals which are in different states for each one of said several different types of memory modules, said number of signals including, a second signal in a first state specifying a first memory chip capacity and in a second state specifying a second memory chip capacity, a third signal in a first state specifying a first memory module capacity and in a second state specifying a second memory module capacity and a fourth signal specifying that a second memory module is present;
D. computing the amount of memory physically present by using logic circuits responsive to each state of said number of signals corresponding to a predetermined amount of memory and that said logic circuits are responsive to said first signal in said first state to indicate the said predetermined amount of memory is physically present;
E. writing a predetermined value into at least one location of each possible increment of memory;
F. reading back said predetermined value from said at least one location of each possible increment of memory;
G. comparing said predetermined value written into said at least one location with said predetermined value read from said at least one location;
H. verifying that a successful access is made to each possible increment of memory that is indicated to be physically present; and
I. verifying that no successful access is made to any possible increment of memory that is computed not to be physically present.

4,787,061
DUAL DELAY MODE PIPELINED LOGIC SIMULATOR
Chu C. Nei, San Jose; Dan R. Hafeman, Sunnyvale, and William Fazakerly, Saratoga, all of Calif., assignors to Ikos Systems, Inc., Sunnyvale, Calif.
Filed Jun. 25, 1986, Ser. No. 878,459
Int. Cl.[4] G06F *9/38, 9/44*
U.S. Cl. 364—900 **4 Claims**

1. In a logic simulator for simulating a plurality of logic devices, each of said devices having some propagation delay or delays between changes in the input state of said device and a resultant change in the output state of said device, said simulator comprising:
first storage means for storing a first propagation delay for each logic device to be simulated, said first delay being either zero or one simulated time unit;
first simulating means coupled to said first storage for simulating a first zero and unit delay mode of operation utilizing said first stored delay;
second storage means for storing a group of propagation delays for each of said simulated logic devices, said group of stored propagation delays being either zero, one unit, or multiple simulated time units;
second simulating means coupled to said second storage means for simulating a zero, unit and multiple unit time wheel mode of operation utilizing said group of stored delays;
control means for selecting from said first simulating means or said second simulating means either said first zero and unit delay mode of operation or said zero, unit and multiple unit time wheel mode of operation for said simulator; and
means responsive to selection by said control means for performing said simulation in either said first zero and unit delay mode of operation or said zero, unit and multiple time wheel mode of operation using a common architecture and a common net list,
whereby the average number of memory access cycles required in the simulation of any one of said logic devices is





reduced when said first zero and unit delay mode of operation is selected by said control means.

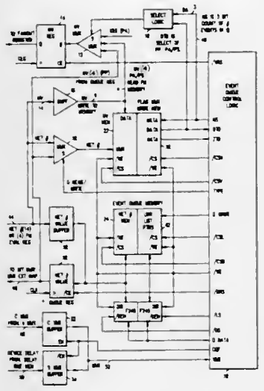
4,787,062
GLITCH DETECTION BY FORCING THE OUTPUT OF A SIMULATED LOGIC DEVICE TO AN UNDEFINED STATE
Chu C. Nei, San Jose; Dan R. Hafeman, Sunnyvale, and William Fazakerly, Saratoga, all of Calif., assignors to Ikos Systems, Inc., Sunnyvale, Calif.
Filed Jun. 26, 1986, Ser. No. 878,552
Int. Cl.[4] G06F *11/28*
U.S. Cl. 364—900 **4 Claims**

1. In a logic simulator for evaluating a plurality of simulated logic devices, a logic evaluator for detecting the input state and producing the future output state of said simulated logic devices where said input and output states may represent a logic "zero", a logic "one", and at least one state representing an "undefined" or "unknown" logic level, said logic evaluator comprising:
means for determining the future output state of said simulated logic device based upon the present state of inputs to said device,
means of detecting whether any future output state transi-

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tions have been scheduled to occur on said simulated logic device output;

means for forcing said simulated logic device output to said "undefined" or "unknown" state in response to detection of future output state transitions which have been scheduled to occur on said simulated logic device output;



wherein said forcing means forces said output state to said "undefined" or "unknown" state at any time between the scheduling of said future output state transition and the time when the last of said future output state transitions would have normally occurred, said forcing of said output state being conditioned upon the detection that future output state transitions have been scheduled to occur.

4,787,063

ACQUISITION AND TRANSMISSION SYSTEM FOR A RECORDER AND A COMPUTER CENTER

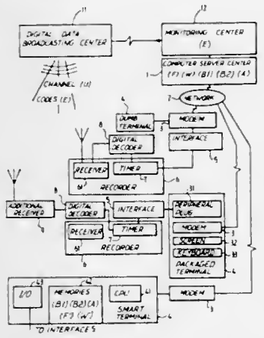
Francis Muguet, 71, rue du Commerce, 75015 Paris, France

Filed Oct. 16, 1985, Ser. No. 787,975

Claims priority, application France, Oct. 19, 1984, 84 16077; Mar. 19, 1985, 85 04012

Int. Cl.⁴ G06F *1/00*

U.S. Cl. 364—900 **20 Claims**



1. An acquisition and transmission system between a video/audio recorder and a server computer center of special data related to a scheduling of a recorder, comprising:

a computer center (1) including memories, codes A being stored in said memories for establishing a link between an interface (5) and said computer center;

an interactive data network (2) to which is connected said computer center (1);

said computer center (1) including memories in which are stored input language codes (B1) and output language codes (B2) of said interface (5);

said computer center including additional memories in which are stored a data base (W) which contains characteristics of TV or radio programs of next weeks, such as a channel reference, a forecast hour and, optionally, an identification code (F) of a real time start/stop broadcast code (E);

said computer center including further memories in which are stored a set of instructions describing different methods of implementing the system;

each user including:

a modem (3) connected to said data network (2),

a terminal (4) including means for data acquisition, means for data display, and means for connection to said modem (3),

means (6) for receiving and recording independently video or audio programs broadcast by television or radio companies, respectively, and including a timer (7), and

said interface (5) interfacing said timer (7) with either said modem (3) or said terminal (4).

4,787,064

CIRCUIT MODULE WITH INTERFACE CIRCUITS FOR CONNECTING TO PLURALITY OF BUSSES OPERATING IN DIFFERENT OPERATING MODES

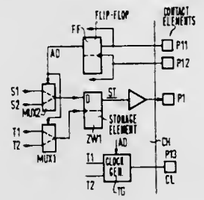
Wolfgang Wagner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 839,813, Mar. 12, 1986, abandoned, which is a continuation of Ser. No. 562,864, Dec. 19, 1983, abandoned. This application Nov. 10, 1986, Ser. No. 928,704

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247834

Int. Cl.⁴ G06F *15/00*

U.S. Cl. 364—900 **4 Claims**



1. Integrated circuit module for connection to at least two busses comprising: a plurality of contact elements for transmitting data, address and control signals to a plurality of busses operating in different operating modes; an operating mode selection signal being connected to said circuit module via one of said contact elements; a clock generator for generating a plurality of internal clock signals respective of said operating modes, an external system clock drivingly connected to said clock generator through another one of said contact elements; a plurality of interface circuits, each connected to a respective contact element; at least one of said interface circuits having a first intermediate memory; at least one of said interface circuits having a first multiplexer controlled by said operating mode selection signal for connecting a respective one of said internal clock signals to said first intermediate memory; said first intermediate memory being connected in the signal path of the bus signals between the respective contact element and the circuit module for intermediate storage of said data, address and control signals therein; and a second multiplexer having at least two signal inputs, of which at least one is connected to an input of the first intermediate memory, being responsive to the mode

selection signal for controlling data access of the respective one of said signal inputs to said intermediate memory.

4,787,065

DATA PROCESSING APPARATUS PROVIDING CYCLIC ADDRESSING OF A DATA STORE IN SELECTIVELY OPPOSITE DIRECTIONS

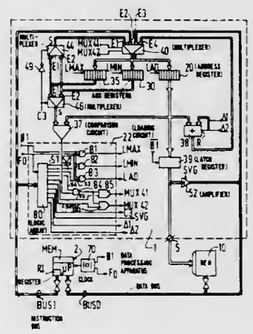
Bahman Barazesh, Paris, and Luc Mary, Bures Sur Yvette, both of France, assignors to Telecommunications Radioelectriquetes et Telephomiques T.R.T., Paris, France

Continuation of Ser. No. 711,544, Mar. 13, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 153,526

Claims priority, application France, Mar. 13, 1984, 84 03813

Int. Cl.⁴ G11C *7/00, 21/00*

U.S. Cl. 364—900 **3 Claims**



1. A data processing apparatus comprising:

a random access memory for storing data in a plurality of addresses therein;

an address register for storing and accessing any address in said memory;

an incrementation circuit connected to said address register for selectively incrementing or decrementing the address stored therein;

a first auxiliary register for storing a minimum address value;

a second auxiliary register for storing a maximum address value;

address comparison means having a first input connected to said address register, a second input selectively connectable to either of said first and second auxiliary registers, and an output at which an equality signal is produced when an address signal at the first input matches an address signal at the second input; and

address cycling means for controlling the cyclic accessing of successive addresses in said memory in opposite directions between said minimum and maximum address values, such address cycling means having first and second operating states such that:

(i) in said first operating state said address cycling means actuates said incrementation circuit to increment the address in said address register; connects the second auxiliary register to said second input of said address comparison means; and, in response to an equality signal produced at the output of said address comparison means, connects the first auxiliary register to said address register to load said minimum address value therein; and

(ii) in said second operating state said address cycling means actuates said incrementation circuit to decrement the address in said address register; connects the first auxiliary register to said second input of said address comparison means; and, in response to an equality signal produced at the output of said address comparison means, connects the second auxiliary register to said address register to load said maximum address value therein;

whereby the data in said random access memory at addresses therein between said minimum and maximum address values may be cyclically accessed in selectively opposite directions.

4,787,066

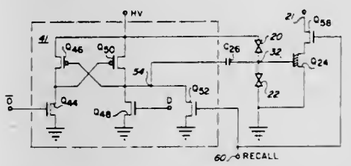
NON-VOLATILE SHADOW STORAGE CELL WITH IMPROVED LEVEL SHIFTING CIRCUIT AND REDUCED TUNNEL DEVICE COUNT FOR IMPROVED RELIABILITY

Horst Leuschner, Scottsdale, Ariz., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Aug. 3, 1987, Ser. No. 81,037

Int. Cl.⁴ G11C *11/24, 7/00*

U.S. Cl. 365—149 **4 Claims**



1. In a non-volatile shadow memory cell comprising a non-volatile storage element and at least one isolation element for charging and discharging the at least one non-volatile storage element, the improvement comprising in combination:

level shifting means for charging and discharging the non-volatile storage element, said level shifting means for charging and discharging the non-volatile storage element further comprising:

a latching circuit, said latching circuit having a first and a second input drive terminal, one of said first and second input terminals also being an output terminal;

a coupling capacitor, said coupling capacitor being connected from said output terminal of said latching circuit to a control electrode of the nonvolatile storage element;

a first drive transistor, said first drive transistor having a gate electrode connected to a first logic signal source;

a second drive transistor, said second drive transistor having a gate electrode connected to a second logic signal source, said first and said second logic signal sources being complementary each to the other;

said first drive transistor having a first electrode connected to said first input terminal of said latching circuit, and said first drive transistor having a second electrode connected to ground; and

said second drive transistor having a first electrode connected to said second input terminal of said latching circuit, and said second drive transistor having a second electrode connected to ground.

4,787,067

SEMICONDUCTOR DYNAMIC MEMORY DEVICE HAVING IMPROVED REFRESHING

Yoshihiro Takemae, Tokyo; Masao Nakano, Kawasaki; Kimiaki Sato, Tokyo, and Nobumi Kodama, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 9, 1986, Ser. No. 883,804

Claims priority, application Japan, Jul. 10, 1985, 60-150094

Int. Cl.⁴ G11C *8/00, 7/00*

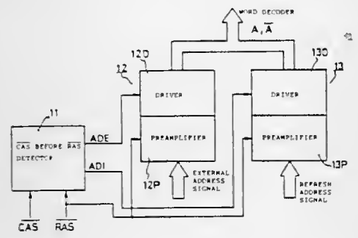
U.S. Cl. 365—222 **7 Claims**

1. A semiconductor dynamic memory device having read/-write and refreshing operations controlled by $\overline{RAS}$ and $\overline{CAS}$ signals applied from external circuits, comprising:

a memory cell array for storing data;

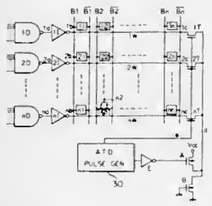
VOL 1096 ISS 4 NO 22 1988 UMI

a word decoder for decoding an address signal applied thereto and selecting word lines of said memory array;
a refresh address counter for generating a refresh address signal;
a $\overline{CAS}$ before $\overline{RAS}$ detector means, for detecting the levels of the $\overline{CAS}$ signal and $\overline{RAS}$ signal applied to said memory device, and for providing an external address driving signal ADE when it discriminates that the $\overline{CAS}$ signal is high level when the $\overline{RAS}$ signal becomes low level, and for providing a refresh address driving signal ADI when it discriminates that the $\overline{CAS}$ signal is low level when the $\overline{RAS}$ signal becomes low level;
an external address buffer means, coupled to said detector means, for latching an external address sent to the dynamic memory device from the external circuit, and sending the latched address to said word decoder when said address buffer means receives the ADE signal; and



a refresh address buffer means, coupled to said detector means in parallel with said external address buffer means, for latching the refresh address generated by said refresh address counter and sending the latched address to said word decoder when said refresh address buffer means receives the ADI signal,
wherein said external address and said refresh addresses are simultaneously processed in parallel in said external address buffer means and said refresh address buffer means respectively, such that one of said external address or said refresh address can be immediately applied to said word decoder in response to one of said ADE or ADI signals respectively.

4,787,068
MOS-TYPE MEMORY CIRCUIT
Yuji Kihara, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Apr. 1, 1987, Ser. No. 32,551
Claims priority, application Japan, Apr. 2, 1986, 61-77412
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **11 Claims**



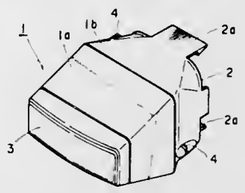
1. A MOS-type memory circuit comprising:
a plurality of memory cells arranged in a matrix,
word lines, each of which is connected to a row of said memory cells, said word lines having base ends receiving signals to access memory cells at different addresses, and said word lines having terminal end, and
a terminal end potential feeder circuit which applies a predetermined voltage having a potential level between a supply voltage and a ground potential to said terminal ends of said word lines during an address transition to speed up access by reducing voltage swing at said terminal ends of said word lines to reach steady state values determined by the signals applied to said base ends of said word lines.

4,787,069
DEVICE USABLE FOR OFFSHORE SEISMIC PROSPECTION FOR RECEIVING SEISMIC SIGNALS AND TRANSMITTING THEM TO A CENTRAL CONTROL AND RECORDING SYSTEM
Claude Beauducel, Henonville, and Pierre Fouquet, Argenteuil, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France
Filed Nov. 25, 1986, Ser. No. 934,917
Claims priority, application France, Nov. 25, 1985, 85 17498
Int. Cl.[4] G01J *1/22*
U.S. Cl. 367—21 **11 Claims**



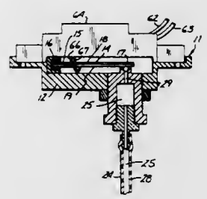
1. In a reception device of great length for offshore seismic prospection including a series of sections interconnected with each other by means of boxes, each of the sections including a plurality of seismic signal receivers distributed over the whole of the section length, seismic signal acquisition apparatuses disposed in at least a portion of the boxes for digitizing and storing seismic signals coming from a group of seismic receivers to which a respective acquisition apparatus is connected; a central control and recording device, digital transmission means for transferring interrrogation control signals from the central control device to the acquisition apparatuses and for transferring in sequence signals from the acquisition apparatuses; and assembly of electronic modules, each of which is disposed in the vicinity of a seismic receiver and being capable of amplifying and filtering the seismic receiver signals; means connecting each group of seismic receivers to an associated acquisition apparatus including a single transmission line; means including a switch associated with each electronic module for sequentially connecting the outputs of the different electronic modules to the transmission line; and synchronization means including a clock-element disposed in each acquisition apparatus, means including a common connection line connecting each clock element to control elements disposed in the different electronic modules, said control elements being interconnected with each other so as to generate in sequence control signals whose duration is equal to the repetition period of the clock, and the control element of each electronic module is a bistable flip flop, a first input of which is connected to the connection line to the clock element, a second input of which is connected to a first output of a bistable flip flop in another electronic module and a second output of which is connected to the corresponding switch, each of the successive pulses transmitted over the connection line resulting in opening the switch of one electronic module and in closing the switch of another electronic module, the time intervals for connecting the different electronic modules to each connection line being equal and offset with respect to each other.

4,787,070
COUPLER FOR ULTRASONIC TRANSDUCER PROBE
Akifumi Suzuki, and Hiroshi Sasaki, both of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Jun. 29, 1987, Ser. No. 67,124
Claims priority, application Japan, Jul. 29, 1986, 61-179187
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—140 **4 Claims**



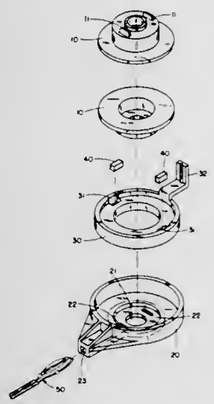
1. A coupler for use between an ultrasonic transducer probe and a sample to be examined thereby to keep the untrasonic transducer probe and the sample spaced a prescribed distance from each other, said coupler comprising:
a hollow main body having distal and proximal ends, a trapezoidal cross section, and a contact surface disposed on the distal end adapted for contact with the sample to be examined;
a mounting member, disposed on the proximal end, for attachment to an ultrasonic transducer probe;
said main body having, between said mounting member and said contact surface, a larger width in a scanning direction in which a beam from the ultrasonic transducer probe is scanned and a smaller width in a focusing direction normal to said scanning direction; and
an acoustic lens disposed on the coupler.

4,787,071
PIEZOELECTRIC/FLUID PRESSURE TRANSDUCER APPARATUS
Paul E. Kreuter, and Larry G. Odegaard, both of Thief River Falls, Minn., assignors to Kreuter Manufacturing Co., Inc., New Paris, Ind.
Filed Mar. 12, 1987, Ser. No. 24,968
Int. Cl.[4] H04R *23/00*
U.S. Cl. 367—140 **8 Claims**



1. Transducer apparatus for actuating a fluid pressure actuated work device by developing a fluid pressure which constantly varies as a function of the magnitude of a varing electronic signal impressed on it, said apparatus including:
A. a base;
B. a plate of piezoelectric material having a first portion fixedly mounted to said base and a second portion spaced from the first portion;
C. means for applying a variable electronic signal across opposed portions of piezoelectric material of the plate so as to induce a variable piezoelectric effect as a function of such signal;
D. a constant source of fluid under constant pressure;
E. a fluid flow conduit having a first flow input portion open to said source of fluid under pressure, a second working portion open to a pressure actuated work device, and a third pressure relief and flow output portion, said conduit providing a fluid flow chamber which is partially defined by the first, second and third conduit portions;
F. a flow restrictor of fixed predetermined size between said source of fluid under pressure and said fluid flow chamber;
G. the third flow output portion of said fluid flow conduit being provided with a pressure relief and flow orifice open to said fluid flow chamber between its first input portion and its second working portion, said orifice being fixedly mounted with respect to the base and positioned in adjacent functionally operable relation to said second portion of said plate; and
H. means including the second portion of the plate for constantly varying the magnitude of outward flow through the fluid flow conduit chamber orifice in accordance with the variations of the magnitude of the electrical signal applied to the piezoelectric material.

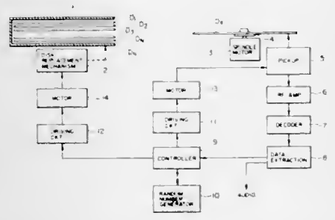
4,787,072
STRUCTURE OF ELECTRONIC WATCH
Ming-Fu Jou, 27 Alley 2, Lane 437, Peltwen Rd., Taichung City, Taiwan
Filed Apr. 20, 1987, Ser. No. 40,336
Int. Cl.[4] G04B *19/00, 47/00*
U.S. Cl. 368—76 **1 Claim**



1. In an electronic watch, a sensor of the closed type which consists of an upper circular cover (**10**), a shell (**20**), a rotary turning disk (**30**), clamped between said upper cover and said shell, said shell having a socket (**23**) on one side, a reed switch (**50**) enclosed in said socket, said turning disk forming a concave trough (**31**), a pair of magnets (**40**) located laterally in said concave trough, an axial shaft, said shell having a first central orifice (**21**), said axial shaft being held in said orifice, a plier (**32**) extending from the side of said turning disk, said upper cover having a pair of lugs, said shell having a pair of second orifices on each side of said central first orifice (**21**), said lugs penetrating said second orifices, an external axial wheel, said plier (**32**) engaging said axial wheel.

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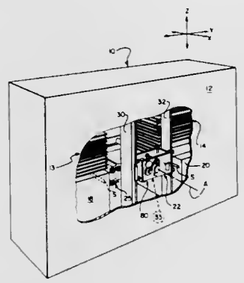
4,787,073
DATA PLAYBACK SYSTEM FOR RANDOM SELECTIONS
Naoki Masaki, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Aug. 22, 1986, Ser. No. 899,355
Claims priority, application Japan, Aug. 22, 1985, 60-185492; Aug. 22, 1985, 60-185493
Int. Cl.[4] G11B *17/22, 27/28*
U.S. Cl. 369—32 7 Claims



1. A data playback process in which data blocks recorded on a plurality of recording media are randomly selected and reproduced, comprising;
(a) providing a data playback apparatus having a plurality of storage locations, each for accommodating one of said recording media,
(b) selecting a recording medium by generating a first random number associated with one of said recording media, the presence of said selected medium in said plurality of storage locations being initially unknown,
(c) determining if said selected recording medium is present in one of said locations,
(d) in response to a determination that said selected recording medium is present, determining the number of data blocks recorded on said selected medium and their respective locations thereon,
(e) selecting a data block by generating a second random number associated with one of said number of data blocks recorded on said selected medium, and
(f) playing said selected data block recorded on said selected medium.

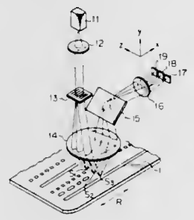
4,787,074
AUTOMATED LIBRARY FOR DATA STORAGE DISKS
Howard C. Deck, Henrietta; Warner P. Carlson, and Lawrence W. Wirth, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 27, 1987, Ser. No. 19,903
Int. Cl.[4] G11B *5/48, 17/00*
U.S. Cl. 369—36 9 Claims

1. An automated library for data storage disks, said library comprising:
(a) a housing;
(b) storage means supported by said housing for storing a plurality of data storage disks side-by-side in closely spaced parallel planes, each of such disks being supported in a generally rectangular disk carrier having a pair of spaced, parallel edges along which racks of teeth are disposed;
(c) a disk utilization device supported by said housing;
(d) a disk picker assembly operable in a first mode to engage a selected disk carrier in said storage means and to extract such disk carrier from said storage means by moving such disk carrier along a linear path, said disk picker assembly comprising a first bi-directional disk carrier conveyor mechanism including a pair of movably mounted toothed conveyor members adapted to cooperate with the racks of teeth of a selected carrier for moving such carrier along said linear path, means for selectively moving said conveyor members into engagement with said racks of teeth, and means for advancing said conveyor members along endless paths to advance a disk carrier along said linear path;
(e) support means for rotatably supporting said picker assembly for movement about an axis extending perpendicular to said linear path and in a plane parallel to said spaced parallel planes;



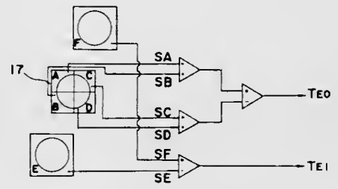
(f) drive means for selectively rotating said picker assembly 180° about said axis; and
(g) means for movably mounting said support means on said frame for movement in a direction perpendicular to said linear path and to said axis of rotation to present an extracted disk carrier to said disk utilization device.

4,787,075
OPTICAL INFORMATION RECORDING MEDIUM AND APPARATUS FOR RECORDING/REPRODUCING INFORMATION USING THE SAME
Hiroshi Matsuoka, Kawasaki; Akio Aoki, Tokyo; Hideki Hosoya, Yokohama; Kazuhiko Matsuoka, Yokohama; Masayuki Usui, Yokohama; Kazuo Minoura, Yokohama; Fumiaki Kawaguchi, Tokyo; Masahiko Enari; Kenichi Suzuki, both of Yokohama, and Satoshi Shikichi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 19, 1985, Ser. No. 810,747
Claims priority, application Japan, Dec. 26, 1984, 59-276942; Dec. 27, 1984, 59-275760; Dec. 28, 1984, 59-276991
Int. Cl.[4] G11B *7/09*
U.S. Cl. 369—44 19 Claims



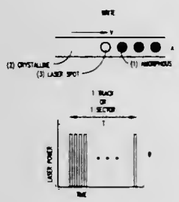
3. An apparatus for recording or reproducing information on or from a card-shaped optical information recording medium comprising tracking tracks each of which is formed as an unbroken line and clock tracks, at least a portion of each of said clock tracks being formed as a line intermittently broken at constant periods, each arranged alternately and record zones in which information is to be recorded and each of which is provided between each of the tracking tracks and each of the clock tracks so that only one of each of the tracking tracks and each of the clock tracks is alternately positioned between two adjacent record zones, said apparatus comprising:
means for forming at least first, second, and third beam spots on said recording medium;
means for projecting said first spot on the record zone to record or reproduce informaiton;
tracking signal detection means for projecting one of said second and third beam spots on the tracking track to detect a tracking signal;
means for changing over said tracking signal detection means in accordance with the positional relation between said projected record zone and the tracking track so as to obtain the tracking signal from the other one of said second and third spots; and
clock signal detection means for projecting the remaining spot of the second and third spots, which is not projected on said tracking track, on the clock tract to detect a clock signal.

4,787,076
OPTICAL DISC TRACKING SYSTEM WITH SWITCHING OF TRACKING ERROR SIGNALS AT BOUNDARY BETWEEN TRACK GUIDE AND TRACK ADDRESS
Toshihisa Deguchi; Tetsuya Inui; Kenji Ohta, all of Nara, and Shohichi Katoh, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Sep. 25, 1986, Ser. No. 911,410
Claims priority, application Japan, Sep. 27, 1985, 60-215695; Oct. 30, 1985, 60-245095
Int. Cl.[4] G11B *7/095, 21/10*
U.S. Cl. 369—46 2 Claims



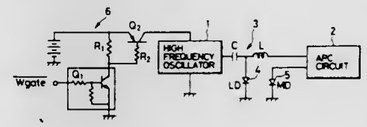
1. A tracking system for an optical memory disc having a plurality of recording tracks thereon including track address regions and track information regions comprising:
an optical head assembly including light beam producing means for producing a main light beam and two auxiliary light beams, said main and auxiliary beams being scanned over said plurality of tracks;
detector means for detecting light beams reflected from said tracks as a result of said scanning and producing a first tracking error signal in response to the light reflected from said main beam and a second tracking error signal in response to the light reflected from said two auxiliary beams; and
tracking control means for performing tracking control of said main beam on one of said tracks in response to said first tracking error signal at a boundary between a track address region and a track information region, and said second tracking error signal at track regions other than said boundary.

4,787,077
PROCESS FOR OPTICALLY STORING INFORMATION USING MATERIALS HAVING A SINGLE PHASE IN BOTH THE CRYSTALLINE STATE AND THE AMORPHOUS STATE
Roger W. Barton, Menlo Park; Martin Y. Chen, San Jose; Charles R. Davis, San Jose; Grace L. Gorman, San Jose; Vincent Marrello, Morgan Hill, and Kurt A. Rubin, Santa Clara, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 766,160, Aug. 15, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 90,636
Int. Cl.[4] G11C *13/02;* G11B *7/24*
U.S. Cl. 369—100 4 Claims



1. A process for optically storing information comprising the steps of:
(1) depositing a film of a material which is selected from the group consisting of GeTe, and GeTe with small amounts of an additional element, and
(2) heating spots in said film using a controlled laser beam with controlled duration and intensity to melt the material in said spots, and
(3) quenching the spots at one rate to produce the amorphous state, and in a second revolution of the disk at a different rate to produce the crystalline state.

4,787,078
OPTICAL DATA RECORDING AND REPRODUCING SYSTEM WITH CONTROL OF HIGH FREQUENCY SUPERPOSED SIGNAL APPLIED TO SEMICONDUCTOR LASER
Fumihiko Yokogawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Mar. 17, 1987, Ser. No. 26,704
Claims priority, application Japan, Mar. 17, 1986, 61-38764[U]
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—122 4 Claims

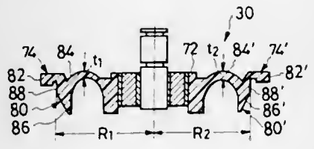


1. An optical data recording and reproducing system, comprising:
a semiconductor laser for irradiating an optical recording disk;
means for applying a DC or low frequency current to said laser at a low amplitude during a data reproducing operation and a high amplitude during a data recording operation of said recording disk;
means for superposing a high frequency current on said laser; and
level varying means, connected to said superposing means,

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for varying a level of said high frequency current so as to provide a first level of said high frequency current during said data recording operation and a second, higher level of said high frequency current during said data reproducing operation.

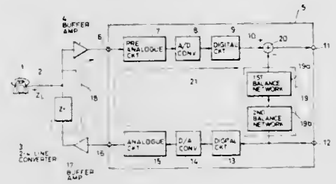
4,787,079
RECORDING DISK CENTERING AND CLAMPING APPARATUS
Kazumi Ueno, Tokorozawa, Japan, assignor to Teac Corporation, Tokyo, Japan
Filed Feb. 9, 1988, Ser. No. 154,089
Claims priority, application Japan, Feb. 19, 1987, 62-23664[U]
Int. Cl.[4] G11B *17/03*
U.S. Cl. 369—270 **7 Claims**



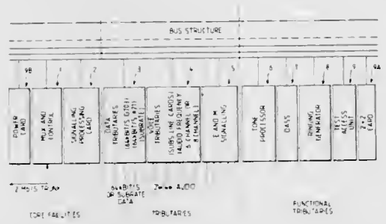
4. An apparatus for centering and clamping a recording disk in a disk drive, comprising:
(a) a drive hub having a socket defined therein and also having an annular disk bearing surface around the socket for supporting the recording disk;
(b) a rotary clamp movable into and out of clamping engagement with the drive hub via the recording disk, the rotary clamp comprising a body portion, and a first and a second set of clamp segments of substantially identical shape arranged radially and alternately on the body portion, each clamp segment comprising a deflectable bridge portion which extends radially outwardly from the body portion and which terminates in a centering portion to be engaged in the socket in the drive hub through a central hole in the recording disk for centering the same on the drive hub, and in a clamping portion for clamping the recording disk against the disk bearing surface of the drive hub, the centering portions of the first set of clamp segments being greater in radius than the centering portions of the second set of clamp segments, the bridge portions of the first set of clamp segments being more deflectable than the bridge portions of the second set of clamp segments, whereby the first set of clamp segments serve principally for centering the recording disk on the drive hub whereas the second set of clamp segments serve principally for clamping the recording disk to the drive hub; and
(c) means for moving the rotary clamp into and out of engagement with the drive hub for clamping and unclamping the recording disk.

4,787,080
PCM CODER AND DECODER CIRCUIT HAVING DIGITAL BALANCING NETWORK
Kazuo Yamakido, Nishitama; Takahiko Kozaki, Koganei; Shigeo Nishita, Kokubunji, and Kenichi Ohwada, Yokohama, all of Japan, assignors to Hitachi Ltd. and Hitachi Micro Computer Eng. Ltd., both of Tokyo, Japan
Filed Aug. 8, 1986, Ser. No. 894,861
Claims priority, application Japan, Aug. 14, 1985, 60-177564
Int. Cl.[4] H04B *3/23*
U.S. Cl. 370—32.1 **3 Claims**

1. In a PCM coder and decoder circuit having a D/A converter adapted to convert an input PCM signal into an analogue signal, and A/D converter adapted to convert an input analogue signal into a PCM signal, and a digital balancing network provided between the input terminal of said D/A converter and the output terminal of said A/D converter,
the improvement which comprises:
said digital balancing network being formed by cascade-connecting first and second balancing circuits, said first balancing circuit having predetermined non-variable characteristics approximated to transfer characteristics viewed from said digital balancing network toward said D/A converter and said A/D converter when the output terminal of said D/A converter and the input terminal of said A/D converter are shorted, and said second balancing circuit having characteristics approximated to the characteristics of a signal which is produced when a circuit having an impedance component is connected between the output terminal of said D/A converter and the input terminal of said A/D converter by a portion of the output of said D/A converter which undesirably enters said A/D converter through said circuit having an impedance component.

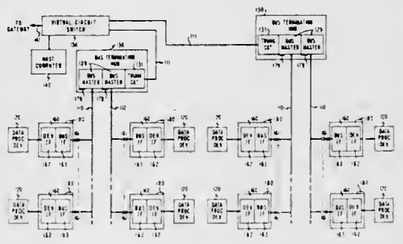


4,787,081
TIME DIVISION MULTIPLEX EQUIPMENT FOR USE IN DATA TRANSMISSION EQUIPMENT
Derek B. Waters, Chelmsford, and Michael J. Sexton, Basildon, both of England, assignors to STC PLC, London, England
Filed Jan. 22, 1987, Ser. No. 6,699
Claims priority, application United Kingdom, Jan. 22, 1986, 8601545
Int. Cl.[4] H04J *3/22, 3/12*
U.S. Cl. 370—85 **15 Claims**



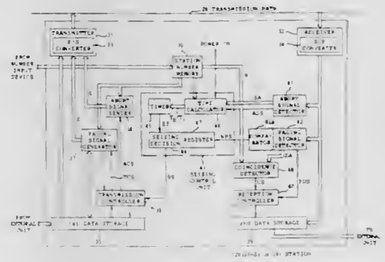
1. Data transmission equipment, which includes a control unit which exercises overall control of the operations of the equipment and one or more tributary units, said units being interconnected by respective bus conductors of a common bus structure to which all of said units are connected, all transmissions over the bus structure being digital, wherein:
(a) a high bit-rate incoming and outgoing digital trunk is coupled to the control unit when the equipment is in use;
(b) said tributary units each provide interfaces for one of more digital highways of lower or equal bit rate than that of said high bit rate trunk, or for one or more analogue channels, which said highways include one or more highways to subscriber stations;
(c) the control unit controls the establishment, maintenance and breakdown of connections between the high bit rate trunk and said digital highways and analogue channels, such that the control unit is involved in the establishment of all connections set up through the equipment;
(d) the respective bus conductors which interconnect the control unit and the tributary units are allocated time slots for connections between the said high bit-rate trunk and respective ones of said highways or channels, wherein such a connection can be allocated one or more of said time slots dependant on the bandwidth required, which allocation is effected under the control of the control unit;
(e) connections between the control unit and such of the tributary units as are present being effected by messages sent over the bus structure, each of which messages is addressed with the address of the unit for which that message is destined, and is sent at a time slot allocated to the bus structure for the connection to which it relates;
(f) the address of a said tributary unit is responded to by address responsive means in that tributary and relates to that unit as such and not to its location in the equipment, whereby a said tributary unit can be located anywhere in the equipment without alteration of its address;
(g) said tributary units can handle different customer services, which may require different bandwidths; and
(h) the control unit includes memory means in which details of the current allotments of time slots and bus conductors to the customer services of all of the tributary units are stored.

4,787,082
DATA FLOW CONTROL ARRANGEMENT FOR LOCAL AREA NETWORK
Robert H. Delaney, Blairstown; Alexander G. Fraser, Bernardsville; Charles R. Kalmanek, Jr., Hoboken, and Robert C. Restrick, III, Hopatcong, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 24, 1986, Ser. No. 890,262
Int. Cl.[4] H04J *3/02*
U.S. Cl. 370—85 **27 Claims**



1. A local area data distribution system for packet formatted data flow comprising:
a bidirectional data transmission bus,
first and second stations connected to the bidirectional data transmission bus, each station including; means for transmitting and receiving data, data storage means for accommodating differing input and output data rates, a unique address and connecting means for accepting a data processing device and means for resolving a conflict in the first and second stations simultaneous attempting to access the bidirectional data transmission bus to apply data thereto;
a bus termination hub, including; a bus master control connected to the data transmission bus, a data trunk for facilitating a data transmission connection to external data handling entities, local virtual circuit switching means, and bus monitoring means for monitoring an operational status of the bidirectional data transmission bus and the first and second station connected thereto;
the bus master control including data drive and receive means and data buffering means for accommodating differing input and output data rates
the local virtual circuit switching means being operative for controlling data flow between the first and second station and between one or first and second stations and an external data hanling entity.

4,787,083
BUS-METHOD COMMUNICATION NETWORK SYSTEM CAPABLE OF SEIZING TRANSMISSION RIGHT BY USING TIMER MEANS AT EACH STATION
Naotami Tanaka, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan
Filed Sep. 30, 1987, Ser. No. 103,189
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—85 **22 Claims**



1. In a bus-method communication network system comprising a bus-method transmission path and a plurality of stations commonly connected to said transmission path for mutual communication, said stations being assigned with station numbers different from one another, a specific one of said stations having an exclusive transmission right to access to said transmission path at a specific time without the other stations being permitted access to said path, said specific station having means for transmitting an abort signal representative of abandonment of said exclusive transmission right to said transmission path so that one of the other stations can then seize the exclusive transmission right by detecting said abort signal, the improvement wherein:
said specific station has, as a specific station number, an assigned station number and said abort signal comprises synchronization information and the specific station number, each one of said stations comprising:
station number memorizing means for storing, as a preassigned station number, a corresponding one of said assigned station numbers;
receiver means coupled with said transmission path for receiving a transmission signal on said transmission path;
abort signal detecting means for detecting said abort signal in said transmission signal when received by said receiver means and for extracting said specific station number in said abort signal as detected, said abort signal detecting means producing an abort detection signal and an address signal representative of said specific station number as extracted;
time calculating means coupled with said station number memorizing means and said abort signal detecting means for calculating a first time period depending on said extracted specific station number and said preassigned station number to produce a first time data signal representative of said first time period;
first time measuring means responsive to said first time data

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signal for measuring time to produce an output, as a first enabling signal, when said first time period elapses; and

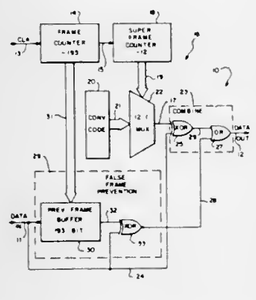
seizing decision means responsive to said first enabling signal for deciding permission of seizure of the exclusive transmission right to produce a seizing signal when the permission is decided, wherein one of the stations other than said specific station can newly seize the exclusive transmission right.

4,787,084

FRAME CODE CONVERTER

John R. Piercy, Mississauga, Canada, assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Feb. 26, 1987, Ser. No. 19,046
Int. Cl.[4] H04L *7/00*
U.S. Cl. 370—105 **16 Claims**



1. In a system receiving a time multiplexed data stream organized in frames and a clock signal synchronized with the data stream, each frame including a plurality of multibit channels and a frame code, a plurality of frames making up a superframe and the frame codes from the plurality of frames in a superframe making up a framing pattern with a preselected format, an apparatus for converting a frame code from the received data stream having a framing pattern in a first preselected format to a frame code in an output data stream having a framing pattern according to a second preselected format, comprising:

a data path connected to receive the data stream

framing means, connected to receive the clock signal, for identifying framing windows in the data stream;

modifying means, in communication with the framing means, for generating a frame code modifier for identified framing windows; and

combining means, connected to the data path and the modifying means, for combining the frame code modifier with the data stream in the framing window to supply the output data stream.

4,787,085

DIGITAL SIGNAL TRANSMITTING SYSTEM

Kohichi Sato; Hisayoshi Sugiyama, both of Kanagawa; Akira Sakamoto, Tokyo; Takeshi Fukami, Kanagawa; Toshiro Terauchi, Tokyo, and Masakatsu Toyoshima, Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Corporation and Sony Corporation, both of Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,513
Claims priority, application Japan, May 30, 1986, 61-125116
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—110.1 **9 Claims**

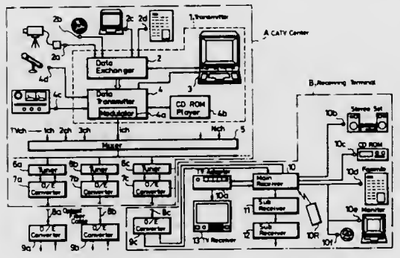
1. A digital signal transmitting system comprising:

a plurality of digital signal reproducers, each outputting a digital signal to be time-division multiplexed;

a digital data signal multiplexer connected to receive a frame synchronizing signal, a service bit signal and the output signals of said plurality of digital signal reproducers, for producing a block data signal including said frame synchronizing signal, siad service bit signal and a plurality of slot data bits arranged with said digital data signals each one bit within a multiple-frame, in which said service bit signal is indicative of the transmission mode and the slot data being transmitted with each of said plurality of digital data signals; and

means for modulating the output of said digital data signal multiplexer so as to transmit the same through a transmission line with plural channel signals;

a plurality of tuners, each being supplied with said channel signals, means for demodulating a selected one channel; and



means for transmitting the demodulated multiplexed digital signal through an optical fiber cable to a corresponding receiver terminal, said receiver terminal including:

(a) a frame synchronizing signal detector for detecting the frame synchronizing signal from said block data signal;

(b) a service bit detector for detecting the service bit signals from said block data signal;

(c) a controller supplied with the slot data from the output of said service bit detector and for producing a data extracting pattern in response to said slot data; and

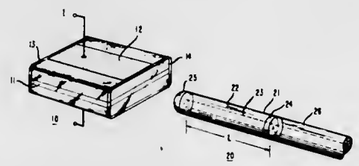
(d) a data extractor supplied with the data extracting pattern so as to produce a predetermined digital data signal.

4,787,086

HIGH-POWER, FUNDAMENTAL TRANSVERSE MODE LASER

Andrew G. Deatai, Atlantic Highlands; Gadi Eisenstein, Middletown; Enrique A. J. Marcatili, Rumson, and Rodney S. Tucker, Howell, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 864,770, May 19, 1986. This application Jan. 11, 1988, Ser. No. 142,266
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—19 **6 Claims**



1. An optical source comprising

first and second reflectors separated from and opposite to each other for forming a single resonant optical cavity,

a semiconductor gain medium having a major surface including a stripe contact extending longitudinally and transversely along said major surface for defining a large optical cavity in a volume of said gain medium thereunder, said semiconductor gain medium for generating a high-power optical signal by spontaneous emission,

a single-mode optical fiber coupled to said semiconductor gain medium responsive to said high-power optical signal for causing a fundamental transverse mode optical signal to be amplified by said gain medium,

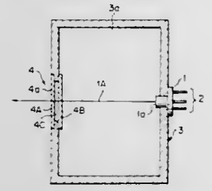
said semiconductor gain medium and said single-mode optical fiber being disposed within said single resonant optical cavity formed by said reflectors, said optical source for producing stimulated coherent radiation in a fundamental transverse mode.

4,787,088

SEMICONDUCTOR LASER BEAM SOURCE APPARATUS

Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1986, Ser. No. 842,095
Claims priority, application Japan, Mar. 20, 1985, 60-56942; Mar. 20, 1985, 60-56943; Mar. 20, 1985, 60-56944
Int. Cl.[4] H01S *3/04. 3/00*
U.S. Cl. 372—34 **6 Claims**



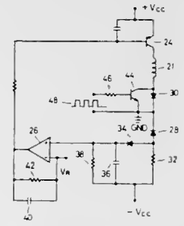
1. A semiconductor laser beam source apparatus provided with a semiconductor laser for emitting a laser beam, wherein said semiconductor laser is positioned inside of a case for shielding at least a laser beam outlet face from the ambient atmosphere, and said case is provided with a double-layer window positioned at least on the optical path of said laser beam, said double-layer window comprising two laser beam-permeable plates facing each other with a space, which is shielded from the ambient atmosphere, intervening therebetween.

4,787,087

CIRCUIT FOR DRIVING A LASER DIODE

Nobuyuki Hashimoto, and Kazuya Ohike, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,333
Claims priority, application Japan, Mar. 4, 1986, 61-45199; Mar. 7, 1986, 61-50022
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—29 **4 Claims**



1. A circuit for driving a laser diode comprising:

an exciting circuit for energizing said laser diode, including a first transistor connected to said laser diode in parallel and supplied with clock pulses so as to be intermittently turned on and off;

a photodiode for detecting the power of a beam emitted from said laser diode upon energization;

a first resistor serially connected to said photodiode;

a charging circuit for storing a voltage appearing across said first resistor that is representative of the power detected by said photodiode, said charging circuit being a one-way charging circuit including a diode and a capacitor connected in parallel to said first resistor; and

a constant current circuit, responsive to the voltage stored in said capacitor, for supplying a constant energization current to said laser diode, said constant current circuit including

an operational amplifier having a non-inverting terminal coupled to the voltage stored in said capacitor, and

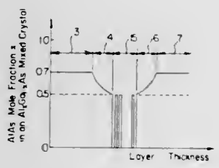
a second transistor serially connected to said laser diode, a base terminal of which is connected to an output terminal of said operational amplifier so as to control the amount of energization current flowing in said laser diode.

4,787,089

QUANTUM WELL SEMICONDUCTOR LASER DEVICE

Toshiro Hayakawa, Nara; Kohsei Takahashi, Tenri; Takahiro Suyama, Tenri; Masafumi Koodo, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 9, 1987, Ser. No. 12,702
Claims priority, application Japan, Feb. 13, 1986, 61-31647
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **2 Claims**



1. In a semiconductor laser device comprising a single or a plurality of quantum well regions formed by a superlatticed structure, said superlatticed structure is composed of alternate layers consisting of thin GaAs layers and thin $Al_xGa_{1-x}As$ $(0<x<1)$ layers, each of said layers having a thickness of five molecular layers or less and each of said quantum well regions having a thickness in the range of 100 Å to 150 Å.

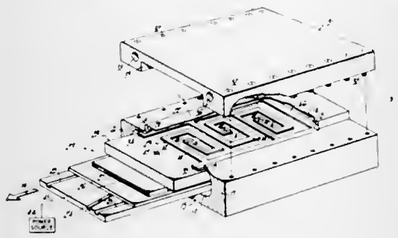
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4,787,090

COMPACT DISTRIBUTED INDUCTANCE RF-EXCITED WAVEGUIDE GAS LASER ARRANGEMENT

Leon A. Newman, South Windsor; John T. Kennedy, Meriden, and Richard A. Hart, Wethersfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 28, 1988, Ser. No. 173,790
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—82 **16 Claims**



1. A waveguide laser arrangement comprising:
a housing bounding an internal space;
a first electrode having a major surface situated in and facing into said internal space;
a dielectric waveguide body juxtaposed with said major surface of said first electrode and bounding at least one elongated laser cavity;
a second electrode juxtaposed with said waveguide body across said laser cavity from, and forming a capacitor of a predetermined capacitance with, said first electrode;
a dielectric spacer body juxtaposed with said second electrode across from said waveguide body and having one major surface facing toward, and another major surface facing away from, said second electrode;
distributed inductance means including a plurality of flat inductor coils distributed longitudinally of said laser cavity along and in juxtaposition with said other major surface of said spacer body and each having spaced first and second ends and a predetermined electric inductance between said ends; means for supplying first electric potential to
said first electrode and a second electric potential to said second electrode, at least one of said electric potentials alternating at a predetermined frequency relative to the other; and
first and second connecting means for electrically connecting said first and second ends of each of said inductor coils with said first and second electrode, respectively, with attendant inclusion of said inductances of said inductor coils electrically in parallel with said capacitance.

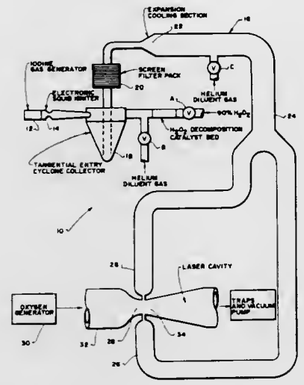
4,787,091

CHEMICAL LASER SYSTEM EMPLOYING IODINE ATOMS AS A LASING GAS

Ross I. Wagner, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 13, 1987, Ser. No. 72,830
Int. Cl.[4] H01S *3/095*
U.S. Cl. 372—89 **12 Claims**

1. A chemical oxygen/iodine transfer laser system including an apparatus for chemical generation of gaseous iodine comprising:
(a) means for conveying gaseous iodine from an iodine generating apparatus to a mixing venturi said generating apparatus comprising: (1) a reactive iodine producing container; (2) a reactive iodine generating composition including a combustible fuel and an oxidizer retained within the container; and (3) an electronic squib igniter means for effecting a chemical reaction, of the reactive iodine generating composition within the container
(b) means for producing and conveying an excited energizing gas to a mixing venturi to be mixed and reacted with gaseous iodine;



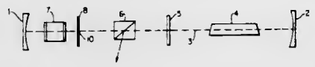
(c) a laser cavity; and
(d) means for conveying mixed and reacted iodine atoms and excited energized gas to the laser cavity.

4,787,092

LASER UTILIZING A NEGATIVE BRANCH INSTABLE CAVITY RESONATOR

Pier G. Gobbi, and Giancarlo Reali, both of Pavia, Italy, assignors to Quanta System S.R.L., Italy

Continuation of Ser. No. 801,045, Nov. 22, 1985. This application Feb. 23, 1988, Ser. No. 161,412
Claims priority, application Italy, Nov. 30, 1984, 40110 A/84
Int. Cl.[4] H01S *3/08*
U.S. Cl. 372—95 **15 Claims**



1. A laser, utilizing a negative branch type unstable cavity resonator comprising at least two aligned and opposed reflecting mirrors, at least one active laser medium located along the optic axis of the resonator and interposed between said mirrors and means for intercepting and coupling a beam emitted from said active laser medium out of the resonator, wherein the effective focal point of at least one of the mirrors, the focusing mirror, as determined by the influence of all the optical components located in the resonator, including the other reflective mirror, said laser medium and said beam coupling means, falls within the cavity resonator itself; and wherein a baffle, aligned with the optic axis in close proximity to said effective focal point, is provided with a pin hole aperture dimensioned so as to stop down the light spot of the laser beam emitted by the active laser medium and reflected by the focusing mirror to thereby provide a first minimum level of its luminous intensity as measured transversely with respect to the optic axis and departing from it and wherein said dimensioning of the pinhole aperture, which effectively limits the intensity level of the laser beam at the effective focal point and produces a smooth intensity and phase beam profile, is calculated applying the formula:

$$D=2\sqrt{m\cdot f\cdot\lambda}$$

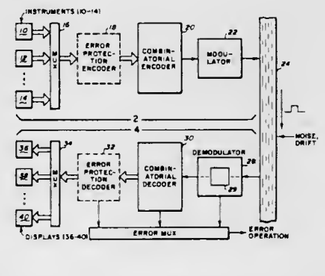
for circular symmetry, side for rectangular symmetry), m equals 0.61 for circular symmetry and 0.5 for rectangular symmetry, f which is the distance of the pinhole aperture from the focusing mirror is also the equivalent focal length of said focusing mirror as determined by the influence of all the optical components located in the resonator, and λ is the wavelength of the laser beam emitted by the laser medium.

4,787,093

COMBINATORIAL CODED TELEMETRY

Louis H. Rorden, Los Altos, Calif., assignor to Develco, Inc., San Jose, Calif.

Continuation of Ser. No. 477,003, Mar. 21, 1983, abandoned. This application Sep. 15, 1986, Ser. No. 907,727
Int. Cl.[4] H03K *7/00*
U.S. Cl. 375—23 **5 Claims**



1. The method of communicating a datum, W, across a communication channel from a data source to a data receiver, by a sequence of time displaced, nonadjacent, constant width pulses within a fixed time interval T_w said time interval having beginning and final ends and being independent of said datum W, comprising the steps,
(a) ordering a combinatorial set of said sequence of pulses,
(b) determining from said datum, a particular one of said sequence of time displaced pulses of said combinatorial set,
(c) generating and transmitting said determined sequence of time displaced pulses across said communication channel,
(d) recovering said transmitted sequence of time displaced pulses from said communication channel, and
(e) performing the inverse of the determination of step (b) on the recovered sequence of pulses to obtain a representation of said datum W.

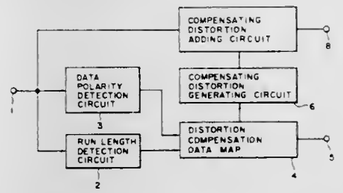
4,787,094

APPARATUS FOR TRANSMITTING DIGITAL SIGNAL

Takeo Eguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,252
Claims priority, application Japan, Apr. 12, 1986, 61-084609
Int. Cl.[4] H04B *1/62*
U.S. Cl. 375—60 **3 Claims**

1. An apparatus for transmitting digital signals comprising:
a. means for receiving an input digital signal having level transitions between first and second states in a predetermined phase;
b. run length detecting means for detecting each run length of at least a predetermined length between the transitions of the input digital signal and for producing a first detection signal corresponding to each such run length; and



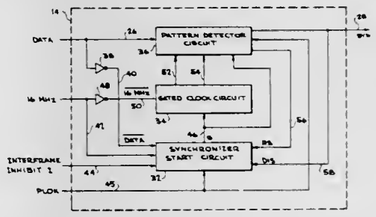
c. means for controlling the positions of the transitions of the input digital signal with respect to the predetermined phase according to the detection signal.

4,787,095

PREAMBLE SEARCH AND SYNCHRONIZER CIRCUIT

Leslie Forth, and Raymond S. Duley, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 3, 1987, Ser. No. 21,287
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—114 **20 Claims**



1. A preamble search and synchronizer circuit for detecting a preamble pattern within data input signals and for synchronizing it with a clock signal associated with a starLAN coded data transceiver, said preamble search and synchronizer circuit comprising:
input means for receiving data input signals and a clock signal and for generating the complement of the data input signals and the complement of the clock signal;
synchronizer start means responsive to the complement of the data input signals and the uncomplemented clock signal for generating a start signal which is synchronized with the uncomplemented clock signal;
counter means responsive to the start signal and the complement of the clock signal for generating a gated clock signal; and
pattern detector means responsive to the start signal, the data input signals and the gated clock signal for sampling the data input signals and for generating a synchronized output signal upon detection of the preamble pattern.

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SECOND-ORDER CARRIER/SYMBOL SYCHRONIZER

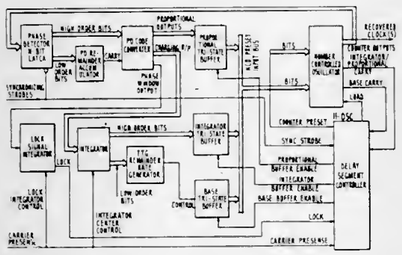
Hee Wong, San Jose, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Mar. 4, 1987, Ser. No. 21,413
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—120 **10 Claims**

1. An apparatus for recovering a clock signal from a modulated phase shift keying (PSK) input signal, the apparatus comprising

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(a) means for generating synchronizing strobing intervals corresponding to zero crossings of the PSK input signal;
(b) a number controlled oscillator having an output comprising the clock signal; and



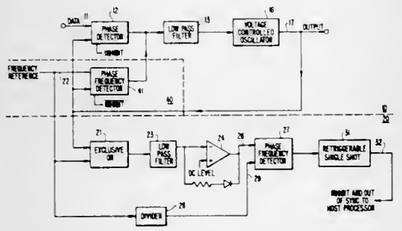
(c) a phase detector which samples the output of the number controlled oscillator at the synchronizing strobing intervals to generate binary weighted outputs which correspond to the phase error between the output of the number controlled oscillator and the synchronizing strobes.

4,787,097

NRZ PHASE-LOCKED LOOP CIRCUIT WITH ASSOCIATED MONITOR AND RECOVERY CIRCUITRY

Raymond P. Rizzo, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,598
Int. Cl.[4] H04L *7/02*
U.S. Cl. 375—120 **17 Claims**



1. A monitor/recovery circuit for monitoring a phase locked loop circuit and for recovering the operation of said phase locked loop circuit inside a predetermined frequency window, said phase locked loop circuit including an input, a phase detector having a narrow acquisition range, a first low pass filter, a voltage controlled oscillator and an output, said monitor/recovery circuit comprising:

monitor means, connected to said output of said phase locked loop and to said phase detector, for monitoring said phase locked loop and for outputting a first control signal when said phase locked loop circuit is operating outside said predetermined frequency window and for outputting a second control signal when said phase locked loop circuit is operating inside said predetermined frequency window, said phase detector being enabled responsive to said second control signal, said monitor means comprising:

a first frequency reference signal,

comparing means connected to said phase locked loop circuit output and said first frequency reference signal for comparing the output frequency of said phase lock loop circuit with said first reference signal frequency; and

detecting means, connected to said comparing means, for detecting when the difference between said output frequency and said first reference frequency exceeds said predetermined frequency window, thereby generating said first control signal,

said detecting means generating said second control signal when the difference between said output frequency and said first reference frequency does not exceed said predetermined frequency window; and

recovery means, connected to said monitor means and to an input of said low pass filter and enabled responsive to said first control signal, for recovering the operation of said phase locked loop circuit when said phse locked loop circuit is inside said predetermined frequency window, said recovery means comprising:

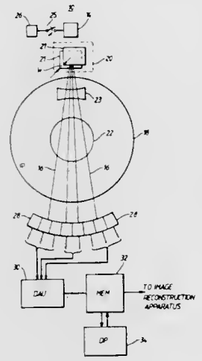
a first phase frequency detector having a wide acquisition range and having a first and second input and an output, said first input connected to said first frequency reference signal and said second input connected to said output of said phase locked loop circuit.

4,787,098

METHOD FOR OBTAINING CALIBRATED TOMOGRAPHIC IMAGE DATA TO CORRECT FOR COLLIMATOR WIDTH DIFFERENCES

Michael D. Silver, Northbrook, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 10, 1987, Ser. No. 37,149
Int. Cl.[4] G01N *23/08;* **H05G** *1/60*
U.S. Cl. 378—18 **5 Claims**



1. A method for obtaining calibrated image data of a target object with a tomographic apparatus having a radiation source for generating radiation beams, a collimator having a plurality of collimator width settings for collimating the radiation beams, a chamber through which the radiation beams are directed, the chamber having a portion adapted for receipt of an object, a plurality of detectors for detecting radiation emerging from the chamber and for generating response signals responsive to the detected radiation, a data acquisition unit for generating data representative of the response signals, a data processor and a memory, wherein the calibrated image data are used to reconstruct a tomographic image of the target object, said method comprising the steps of:

scanning a reference object having physical characteristics similar to the target object, wherein the step of scanning the reference object includes the substeps of: placing the reference object in the portion of the chamber; setting the width of the collimator to a predetermined reference object collimator width; directing radiation beams through the chamber; detecting radiation emerging from the chamber; generating reference object response signals

thereto; and generating and storing reference object data for each of the detectors representative of the reference object response signals;

scanning the target object, wherein the step of scanning the target object includes the substeps of: placing the target object in the portion of the chamber; setting the width of the collimator to a predetermined target object collimator width; turning on the radiation source to direct radiation beams through the chamber; detecting radiation beams emerging from the chamber and generating target object response signals thereto; and generating and storing target object data for each of the detectors representative of the target object response signals;

obtaining processed width correction data for each of the detectors representative of a variation between response signals generated by each of the detectors for radiation directed through the chamber, with the chamber having a selected medium through which said radiation is directed and the collimator being set at the predetermined reference object collimator width, and response signals generated by the detectors for radiation directed through the chamber with the chamber having said selected medium, and the collimator being set at the predetermined target object collimator width;

storing the processed width correction data for each of the detectors;

differencing the processed width correction data for each of the detectors from the reference object calibration data for each of the detectors to obtain width-corrected calibration data for each of the detectors; and

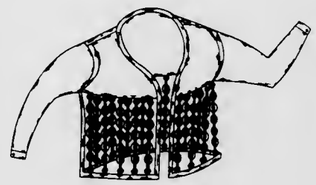
differencing the target object data for each of the detectors from the width-corrected data for each of the detectors to obtain calibrated image data for use in reconstructing a tomographic image of the target object.

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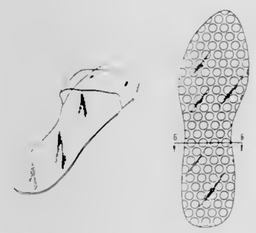
DESIGNS

NOVEMBER 22, 1988

298,580
JACKET
Gilberto B. Diaz, P.O. Box 3287, Taos, N. Mex. 87571
Filed May 24, 1985, Ser. No. 737,722
Term of patent 14 years
U.S. Cl. D2—183



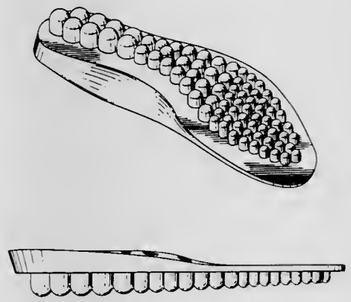
298,582
SLIPPER
Hernan N. Caire, Urquiza 150, 8324 Cipolletti, Argentina
Filed Jul. 11, 1985, Ser. No. 753,775
Term of patent 14 years
U.S. Cl. D2—282



298,581
VEST
Gilberto B. Diaz, P.O. Box 3287, Taos, N. Mex. 87571
Filed May 10, 1985, Ser. No. 732,554
Term of patent 14 years
U.S. Cl. D2—190

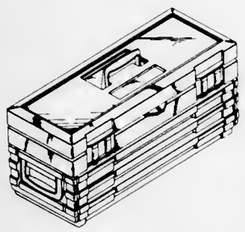


298,583
MIDSOLE
Lin Yung-Mao, Taichung, China, assignor to Autry Industries, Inc., Dallas, Tex.
Filed May 18, 1987, Ser. No. 51,995
Term of patent 14 years
U.S. Cl. D2—318

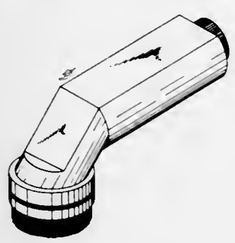


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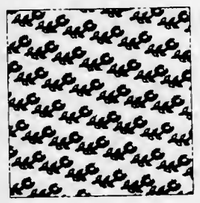
298,584
TOOL CHEST
John P. Newby, Sr., Wake County, N.C., assignor to Southern Case, Inc., Raleigh, N.C.
Filed Mar. 18, 1986, Ser. No. 844,779
Term of patent 14 years
U.S. Cl. D3—72



298,585
CHEMICAL DISPENSING BRUSH FOR USE IN FLEA EXTERMINATING
William R. Dolan, and Michael J. Dolan, both of 3951 NW. 45th Ave., Lauderdale Lakes, Fla. 33319
Filed Nov. 27, 1985, Ser. No. 806,831
Term of patent 14 years
U.S. Cl. D4—114



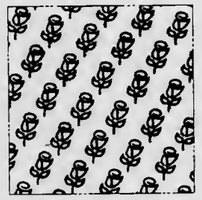
298,586
EMBOSSED TISSUE OR SIMILAR ARTICLE
Robert A. Drew, Appleton, and Raju B. Peddada, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 19, 1986, Ser. No. 833,445
Term of patent 14 years
U.S. Cl. D5—53



298,587
EMBOSSED TISSUE OR SIMILAR ARTICLE
Raju B. Peddada, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 12, 1986, Ser. No. 833,446
Term of patent 14 years
U.S. Cl. D5—53



298,588
EMBOSSED TISSUE OR SIMILAR ARTICLE
Raju B. Peddada, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 12, 1986, Ser. No. 833,447
Term of patent 14 years
U.S. Cl. D5—53



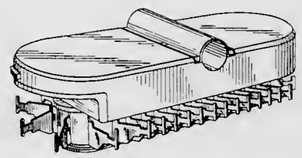
298,589
EMBOSSED TISSUE OR SIMILAR ARTICLE
Robert A. Drew, Appleton, and Raju B. Peddada, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 12, 1986, Ser. No. 833,448
Term of patent 14 years
U.S. Cl. D5—53



298,590
EMBOSSED TISSUE OR SIMILAR ARTICLE
Robert A. Drew, Appleton, and Raju B. Peddada, Menasha, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 12, 1986, Ser. No. 833,449
Term of patent 14 years
U.S. Cl. D5—53



298,591
CLOSET ORGANIZER ACCESSORY
Barbara Arner, 1901 Polaris Dr., Glendale, Calif. 91208, and Kenneth Tarlow, Playa del Rey, Calif., assignors to Barbara Arner, Glendale, Calif.
Filed Feb. 28, 1986, Ser. No. 857,805
Term of patent 14 years
U.S. Cl. D6—315



298,592
JAR
Petrus M. C. Stoop, Leerdam, Netherlands, assignor to N.V. Vereenigde Glasfabrieken (United Glassworks), Netherlands
Filed Jul. 15, 1985, Ser. No. 755,183
Claims priority, application Hague, Jan. 31, 1985, DM/004700
Term of patent 14 years
U.S. Cl. D6—349



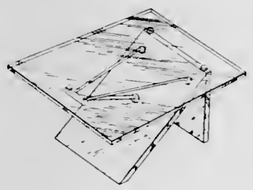
298,593
CHAIR
Burkhard Vogtherr, Holzen-Kandern, Fed. Rep. of Germany, assignor to Klober GmbH & Co., Uberlingen, Fed. Rep. of Germany
Filed Dec. 19, 1985, Ser. No. 810,700
Term of patent 14 years
U.S. Cl. D6—366



298,594
PLANTER STAND
Kee T. Hahn, 5311 Manton Ave., Woodland Hills, Calif. 91367
Filed Sep. 23, 1985, Ser. No. 778,930
Term of patent 14 years
U.S. Cl. D6—403



298,595
COFFEE TABLE
Luciano Cionini, Casciana Terme, Italy, assignor to Lavorazione Artigiana Onice di Cioni Luciano & C.S.n.c., Italy
Filed Dec. 27, 1985, Ser. No. 814,203
Claims priority, application Italy, Jun. 28, 1985, 11715/85[U]
Term of patent 14 years
U.S. Cl. D6—480



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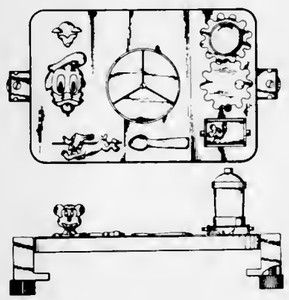
298,596
CUP DISPENSER COLLAR
J. Marshall Suttles, Elberton, Ga., assignor to Royston Corporation, Royston, Ga.
Filed Jun. 9, 1986, Ser. No. 872,448
Term of patent 14 years
U.S. Cl. D6—516



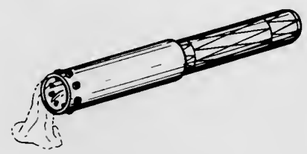
298,597
PAPER TOWEL DISPENSER
Randall Bell, Oak Park, Ill., assignor to Wilton Enterprises, Inc., Woodridge, Ill.
Filed Oct. 29, 1986, Ser. No. 924,503
Term of patent 14 years
U.S. Cl. D6—521



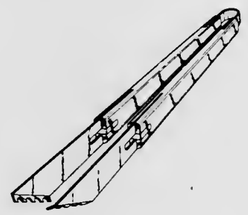
298,598
COMBINED PLAY AND FEEDING TRAY
Steven Ellman; Fred Ellman; Julius Ellman, all of 1672 E. 7th St., Brooklyn, N.N.Y. 11230, and George Lerner, 14820 Naran-Ja Lakes Blvd., Naran-Ja, Fla. 33032
Filed Dec. 30, 1985, Ser. No. 814,781
Term of patent 14 years
U.S. Cl. D7—38



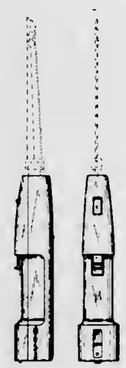
298,599
BUTTER DISPENSING DEVICE
Bruce A. Rzeszut, 5909 Johnson Rd., Coloma, Mich. 49038
Filed May 8, 1985, Ser. No. 731,965
Term of patent 14 years
U.S. Cl. D7—84



298,600
TONGS
Michel Dallaire, 2151 A, rue de la Montagne, Montreal, Quebec, Canada H3G 1Z8
Filed Apr. 14, 1986, Ser. No. 852,504
Claims priority, application Canada, Nov. 13, 1985, 13-11-85-5
Term of patent 14 years
U.S. Cl. D7—105



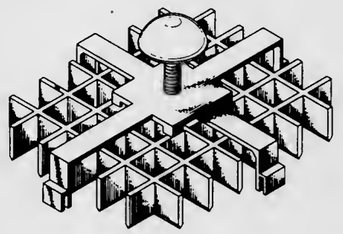
298,601
HANDLE FOR AN ELECTRIC KNIFE OR THE LIKE
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Feb. 21, 1986, Ser. No. 834,852
Term of patent 14 years
U.S. Cl. D7—139



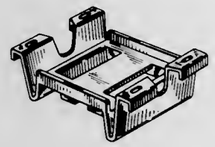
298,602
COMBINED BEVERAGE COOLER AND DISPENSER
Sterling A. Price, 6191 Rancho Mission Rd., #313, San Diego, Calif. 92108
Filed Feb. 14, 1986, Ser. No. 834,031
Term of patent 14 years
U.S. Cl. D7—313

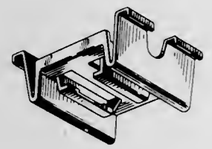


298,603
CUTTING TOOL FOR BAKED GOODS
Benjamin H. White, Rte. 1, Box 206, Doyle, Tenn. 38559
Filed Oct. 15, 1985, Ser. No. 787,476
Term of patent 14 years
U.S. Cl. D8—98

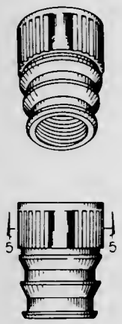


298,604
BRACKET OR SIMILAR ARTICLE FOR ATTACHMENT BENEATH A SHELF
Brian L. Newton, Woonstocket, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Apr. 1, 1986, Ser. No. 847,609
Term of patent 14 years
U.S. Cl. D8—380



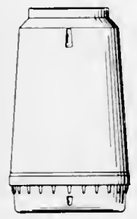


298,605
INSERT FOR SECURING FASTENING DEVICES
William L. Colgan, Wyckoff, and Robert W. Post, Jersey City, both of N.J., assignors to Rexnord Inc., Torrance, Calif.
Filed Apr. 5, 1985, Ser. No. 720,469
Term of patent 14 years
U.S. Cl. D8—382

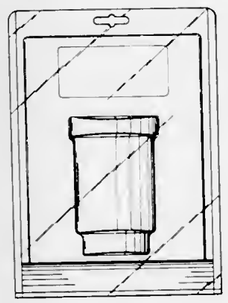


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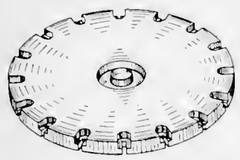
298,606
PACKAGING CONTAINER
Donald N. MacLaughlin, Midland, Mich., assignor to Packaging Resources Incorporated, New Vienna, Ohio
Filed Dec. 5, 1985, Ser. No. 804,712
Term of patent 14 years
U.S. Cl. D9—398



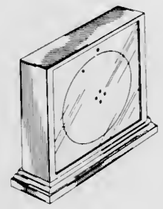
298,607
DISPLAY PACKAGE FOR INTERCHANGEABLE LENS
Norman Didia, Brooklyn, N.Y., assignor to Rokina Optical Co., Inc., Irvington, N.J.
Filed Dec. 10, 1985, Ser. No. 807,186
Term of patent 14 years
U.S. Cl. D9—415



298,608
LID FOR A STORAGE CONTAINER
Kenneth M. Dewing, Porterville, Calif., assignor to Walter L. Hood and Darold W. Hood, part interest to each
Filed Oct. 10, 1985, Ser. No. 786,326
Term of patent 14 years
U.S. Cl. D9—452



298,609
ELECTRONIC CLOCK
Melvyn H. Dawson, Jr., 1130 Rollingwood Trail, Maitland, Fla. 32751
Filed Jan. 21, 1986, Ser. No. 820,726
Term of patent 14 years
U.S. Cl. D10—15



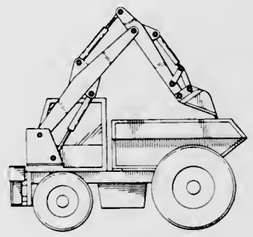
298,610
WRISTWATCH
Yin D. Young, Happy Valley, Hong Kong, assignor to Hong Kong Potak Watch & Parts Factory Limited, Hong Kong
Filed Mar. 14, 1986, Ser. No. 844,992
Claims priority, application United Kingdom, Sep. 20, 1985, 1029359
Term of patent 14 years
U.S. Cl. D10—32



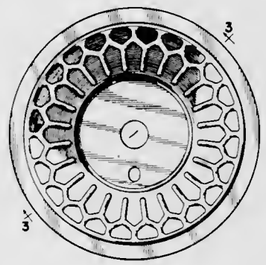
298,611
EARRING
Pepe Saraga, 13910 Old Harbor La., Marina del Rey, Calif. 90292
Filed Aug. 22, 1985, Ser. No. 768,823
Term of patent 14 years
U.S. Cl. D11—42



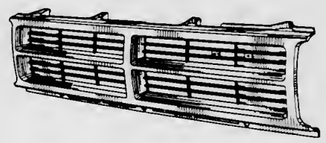
298,612
DUMPER TRUCK WITH JIB ATTACHMENT
Patrick J. Douglas, 2 School La., Santon, Isle of Man, United Kingdom
Filed Feb. 7, 1986, Ser. No. 827,051
Claims priority, application United Kingdom, Aug. 9, 1985, 1028513
Term of patent 14 years
U.S. Cl. D12—15



298,613
BICYCLE CHAIN GUARD
David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Co., Inc., Maysville, Ky.
Filed Feb. 24, 1986, Ser. No. 836,467
Term of patent 14 years
U.S. Cl. D12—127



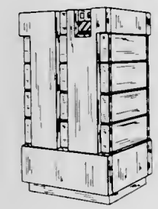
298,614
RADIATOR GRILLE FOR AN AUTOMOBILE
Hideto Kikuchi, Hachioji, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jul. 28, 1986, Ser. No. 889,853
Term of patent 14 years
U.S. Cl. D12—163



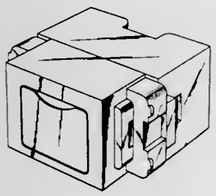
298,615
AUTOMOBILE WINDSHIELD COVER
Chukwuemeka N. Chionuma, 7819 E. 117th St., Kansas City, Mo. 64134
Filed Feb. 12, 1986, Ser. No. 833,494
Term of patent 14 years
U.S. Cl. D12—182



298,616
MODULAR POWER SUPPLY
Daniel Aschbacher, San Jose; Tadao B. Warashina, Cupertino; Anthony F. Matouk, Los Altos, and David C. Hoffman, Los Angeles, all of Calif., assignors to Modular Power Corporation, San Jose, Calif.
Filed Apr. 29, 1986, Ser. No. 858,272
Term of patent 14 years
U.S. Cl. D13—12

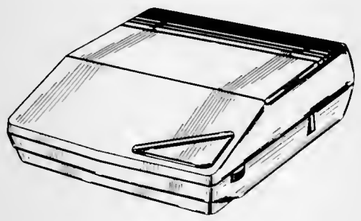


298,617
TELEPHONE OUTLET
Toshiaki Nakajo, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Japan
Filed Aug. 20, 1985, Ser. No. 767,615
Term of patent 14 years
U.S. Cl. D13—31

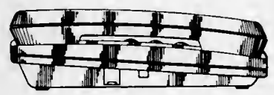


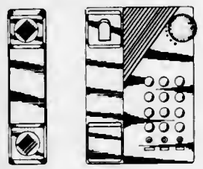
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298,618
TELEPHONE ANSWERING SET
Arthur T. Martinez, Long Beach, Calif., assignor to Fortel Corporation, Compton, Calif.
Filed Sep. 23, 1985, Ser. No. 779,237
Term of patent 14 years
U.S. Cl. D14—4

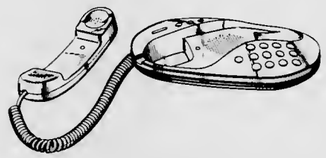


298,619
COMBINATION TELEPHONE HANDSET AND BASE THEREFOR WITH DIALING MEANS AND SPEAKER-PHONE
Peggy Kuo, 3-3 Alley 6, Lane 10, Hsiu Lang Rd., Sec. 3, Chung-Ho, Taiwan
Filed Jan. 8, 1987, Ser. No. 1,981
Term of patent 14 years
U.S. Cl. D14—53



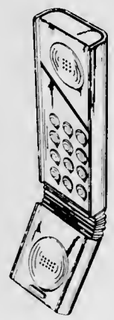


298,620
TELEPHONE SET
Fumiharu Ohta, and Masao Tamura, both of Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 2, 1987, Ser. No. 103,975
Claims priority, application Japan, Jun. 23, 1987, 62-25541
Term of patent 14 years
U.S. Cl. D14—53

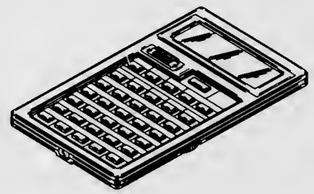




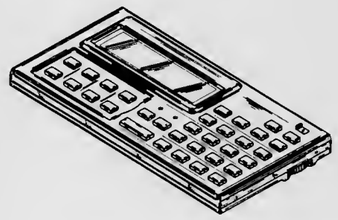
298,621
HANDSET TELEPHONE INSTRUMENT
Gordon Willis, St Albans, Great Britain, assignor to STC PLC, London, England
Filed Aug. 19, 1987, Ser. No. 87,234
Claims priority, application United Kingdom, Aug. 19, 1987, 1040232
Term of patent 14 years
U.S. Cl. D14—64



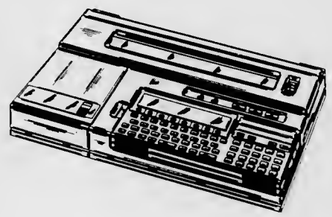
298,622
INPUT/OUTPUT DEVICE FOR ELECTRONIC MEMO
Takahisa Yubisui; Hiroshi Sakaguchi, and Tadahiko Saimen, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 14, 1986, Ser. No. 844,755
Claims priority, application Japan, Sep. 25, 1985, 60-40397
Term of patent 14 years
U.S. Cl. D14—100



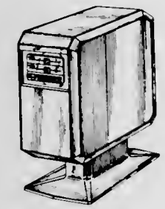
298,623
POCKET COMPUTER
Takahisa Yubisui; Hiroshi Sakaguchi, and Kazumi Osaka, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 14, 1986, Ser. No. 844,758
Claims priority, application Japan, Sep. 18, 1985, 60-39552
Term of patent 14 years
U.S. Cl. D14—100



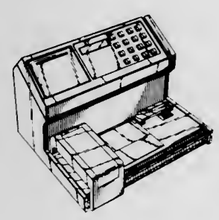
298,624
COMPUTER
Hajime Shiozawa; Kazumi Osaka, and Ken Kimata, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 1, 1986, Ser. No. 847,626
Claims priority, application Japan, Oct. 18, 1985, 60-44171
Term of patent 14 years
U.S. Cl. D14—100



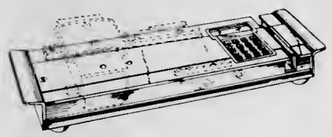
298,625
ELECTRONICS CONSOLE
Fred M. Gore, Carrolltoo, Tex., assignor to Seicom Business Systems, Inc., Carrollton, Tex.
Filed May 7, 1986, Ser. No. 860,774
Term of patent 14 years
U.S. Cl. D14—102



298,626
COMBINED CREDIT CARD AUTHORIZATION TERMINAL AND RAISED CREDIT CARD IMPRINTER
David A. Stark, Apple Valley, Minn., and Laurance F. Plaskan, West Bend, Wis., assignors to DataCard Corporation, Minnetonka, Minn.
Filed Feb. 26, 1986, Ser. No. 832,161
Term of patent 14 years
U.S. Cl. D14—105

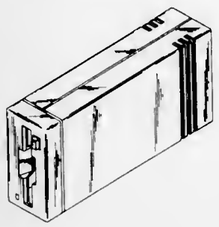


298,627
CREDIT/DEBIT AUTHORIZATION AND FINANCIAL TRANSACTION TERMINAL OR SIMILAR ARTICLE
Harry R. Soza; Dennis E. Wilkison; Craig C. Williams, all of San Jose; Bruce M. Lang, Livermore, and Thomas J. Clark, Santa Clara, all of Calif., assignors to Norand Corporation, Cedar Rapids, Iowa
Filed May 30, 1986, Ser. No. 869,121
Term of patent 14 years
U.S. Cl. D14—105

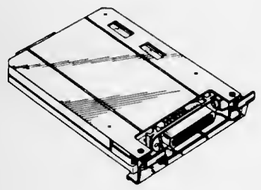


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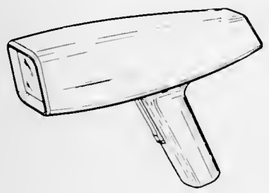
298,628
DISKETTE DRIVE
Tristan A. Merino, Cedar Park, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 17, 1986, Ser. No. 820,458
Term of patent 14 years
U.S. Cl. D14—109



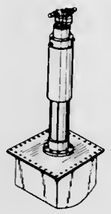
298,629
INTERFACE CASSETTE FOR PRINTER
Nobutoshi Mochizuki, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1985, Ser. No. 805,551
Claims priority, application Japan, Jul. 22, 1985, 60-31006
Term of patent 14 years
U.S. Cl. D14—114

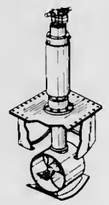


298,630
HAND-HELD BAR CODE SCANNER
James F. Sellars, Jr., Plano, and Jesse Sanchez, Jr., Desoto, both of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.
Filed Jul. 7, 1986, Ser. No. 882,697
Term of patent 14 years
U.S. Cl. D14—116

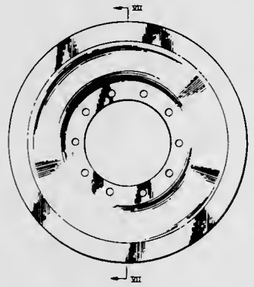


298,631
RETRACTABLE MARINE THRUST MOTOR
Derrick C. Richfield, Poole, England, assignor to Richfield Marine Thrusters Limited, Poole, England
Filed Oct. 23, 1985, Ser. No. 790,336
Claims priority, application United Kingdom, Apr. 23, 1985, 1026368
Term of patent 14 years
U.S. Cl. D15—4

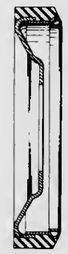




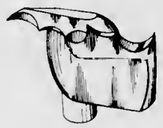
298,632
IDLER WHEEL FOR A TRACK VEHICLE
Charles E. Grawey; Robert J. Grob, and Cullen P. Hart, all of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.
Filed May 9, 1985, Ser. No. 732,475
Term of patent 14 years
U.S. Cl. D15—28



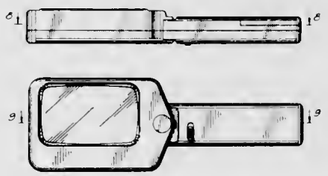




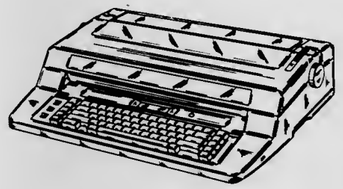
298,633
CUTTING TOOL
Marvin E. Kenemore, 2609 Berkley Dr., Chattanooga, Tenn. 37415
Filed Aug. 21, 1985, Ser. No. 767,979
Term of patent 14 years
U.S. Cl. D15—139



298,634
COMBINED ULTRAVIOLET LAMP AND MAGNIFYING LENS FOR AUTHENTICATING BANK NOTES
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jul. 31, 1986, Ser. No. 891,383
Claims priority, application United Kingdom, Feb. 4, 1986, 1032032
Term of patent 14 years
U.S. Cl. D16—135



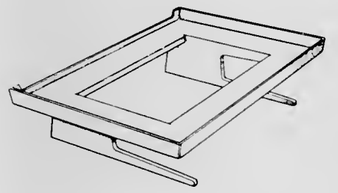
298,635
TYPEWRITER
Akira Tsukada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 3, 1986, Ser. No. 815,872
Claims priority, application Japan, Jul. 22, 1985, 60-31667
Term of patent 14 years
U.S. Cl. D18—1



298,636
TYPEWRITER
Masakazu Sugiyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 21, 1986, Ser. No. 835,314
Claims priority, application Japan, Aug. 22, 1985, 60-35702
Term of patent 14 years
U.S. Cl. D18—1

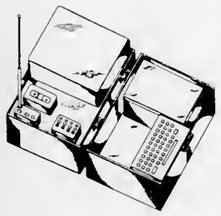


298,637
COMBINED PRINTER SUPPORT AND PAPER HANDLING PLATFORM
Eugene K. Sokolowski, Chicago, Ill., assignor to American Telephone and Telegraph Company, AT&T Teletype Corp., Skokie, Ill.
Filed Nov. 1, 1985, Ser. No. 793,871
Term of patent 14 years
U.S. Cl. D18—23

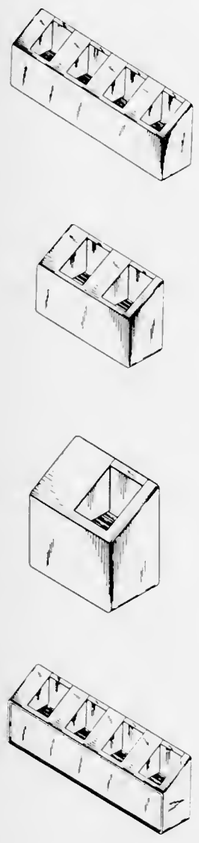


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298,638
LECTERN
William F. Smith, Sr., 1681 Wesleyan Rd., Dayton, Ohio 45406
Filed Apr. 15, 1985, Ser. No. 723,560
Term of patent 14 years
U.S. Cl. D19—62



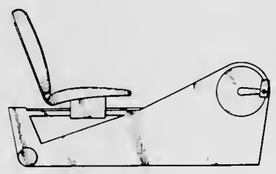
298,639
HOLDER FOR PENS, PENCILS AND THE LIKE
Stephen H. Wolff, 222 E. 35th St., New York, N.Y. 10016
Filed Oct. 7, 1985, Ser. No. 785,273
Term of patent 14 years
U.S. Cl. D19—85



298,640
STUFFED RABBIT
Judith F. Albert, Oyster Bay, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 28, 1986, Ser. No. 840,712
Term of patent 14 years
U.S. Cl. D21—187



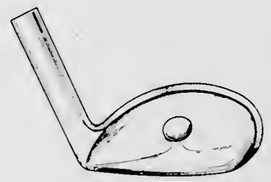
298,641
EXERCISE BICYCLE
Ron Sheltra, Alhambra, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.
Filed Apr. 10, 1986, Ser. No. 851,400
Term of patent 14 years
U.S. Cl. D21—194



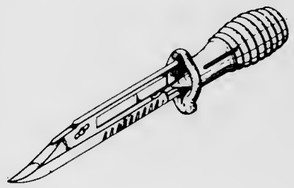
298,642
NOVELTY TENNIS RACQUET
Henry C. Dolive, 43 Faren Dr., Highland Heights, Ky. 41076
Filed Dec. 16, 1985, Ser. No. 809,417
Term of patent 14 years
U.S. Cl. D21—212



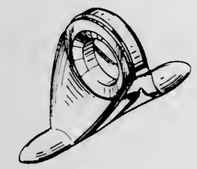
298,643
GOLF IRON CLUB HEAD
Akira Mitsui, 73-51, Soboshiri, Oyama-cho, Sunto-gun, Shizuoka-ken, Japan
Filed Mar. 19, 1986, Ser. No. 845,064
Term of patent 14 years
U.S. Cl. D21—220

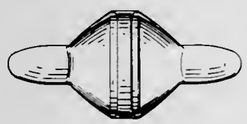


298,644
BAYONET FOR AN AUTOMATIC FIREARM
Alexander R. Newman, and Derek G. Skinner, both of London, England, assignors to Royal Ordnance Plc, London, England
Filed Dec. 2, 1985, Ser. No. 803,482
Term of patent 14 years
U.S. Cl. D22—118

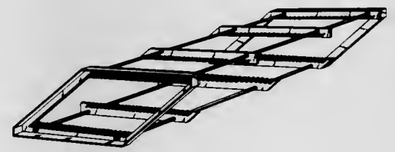


298,645
LINE GUIDE FOR FISHING RODS
Tamao Miyata, and Junichi Suzuki, both of Musashino, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Apr. 29, 1986, Ser. No. 858,262
Claims priority, application Japan, Oct. 30, 1985, 60-45674
Term of patent 14 years
U.S. Cl. D22—143



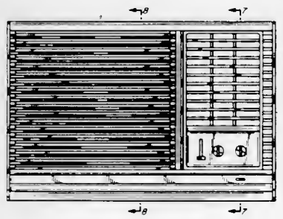


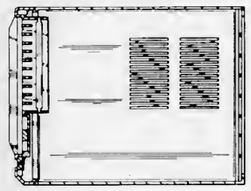
298,646
OIL SEPARATION PLATE SUPPORT FRAME FOR WATER TREATMENT TANKS
John L. Meyers, Lugarno, Australia, assignor to Sepa Waste Water Treatment Pty. Ltd., Caringbah, Australia
Filed Feb. 21, 1985, Ser. No. 703,695
Term of patent 14 years
U.S. Cl. D23—210



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298,647
AIR CONDITIONER
Kenichi Matsuda, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jun. 19, 1986, Ser. No. 876,347
Claims priority, application Japan, Dec. 27, 1985, 60-54212; Dec. 27, 1985, 60-54224
Term of patent 14 years
U.S. Cl. D23—353

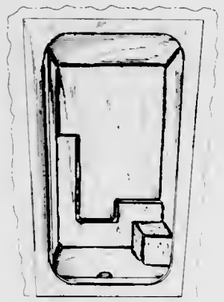




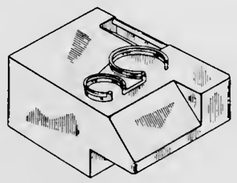
298,648
FAN
Martin F. Gill, 2 Oakhurst Close, Hampton Rd., Teddington, Middlesex TW11 oJP, England
Filed Aug. 12, 1986, Ser. No. 895,873
Term of patent 14 years
U.S. Cl. D23—379



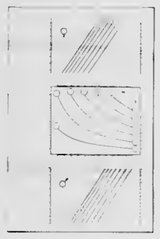
298,649
SHOWER ENCLOSURE
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 12, 1987, Ser. No. 2,256
Term of patent 14 years
U.S. Cl. D23—281



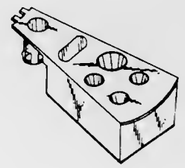
298,650
SURGICAL ASPIRATOR PUMP
Robert Lash, Foster City, Calif., assignor to MD Engineering, Foster City, Calif.
Filed Apr. 3, 1986, Ser. No. 847,843
Term of patent 14 years
U.S. Cl. D24—8



298,651
NOMOGRAM FOR CALCULATING THE MAXIMUM TOLERABLE BLOOD LOSS OF A PATIENT
Henrik Zetterström, Frösön, Sweden, assignor to Pharmacia AB, Uppsala, Sweden
Filed Oct. 24, 1985, Ser. No. 790,934
Claims priority, application Sweden, May 10, 1985, 85-1262
Term of patent 14 years
U.S. Cl. D24—21



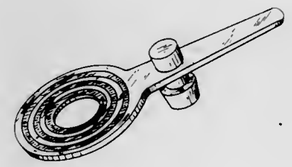
298,652
SAMPLE CUP OR THE LIKE
Robert C. Hollar, Wildwood, and Tung M. Huang, Elk Grove Village, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Jun. 8, 1984, Ser. No. 618,647
Term of patent 14 years
U.S. Cl. D24—56



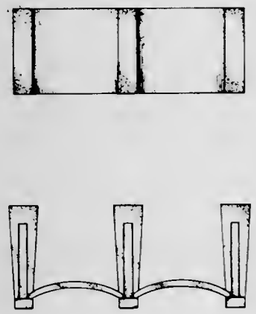
298,653
VAGINAL FOAM APPLICATOR
Michael G. Maietta, Cogan Station, Pa., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.
Filed Dec. 20, 1985, Ser. No. 824,985
Term of patent 14 years
U.S. Cl. D24—63



298,654
COMBINATION TONOMETER AND PLACIDO DISK
Loren G. Hendricks, San Diego, Calif., assignor to Lee T. Nordan, La Jolla, Calif.
Filed Apr. 10, 1986, Ser. No. 850,012
Term of patent 14 years
U.S. Cl. D24—17

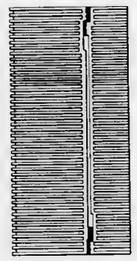


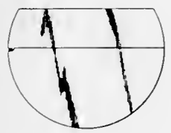
298,655
RETAINING WALL WITH TIE-BACK ELEMENTS
H. Joe Meheen, 1860 Lincoln St., Ste. 1026, Denver, Colo. 80295
Filed May 28, 1985, Ser. No. 738,642
Term of patent 14 years
U.S. Cl. D25—58



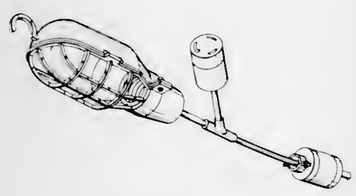
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298,656
FLOODLIGHT HOUSING
Wayne W. Compton, Chino Hills, Calif., assignor to Kidde Consumer Durables Corporation, City of Industry, Calif.
Filed Aug. 7, 1986, Ser. No. 894,331
Term of patent 14 years
U.S. Cl. D26—24

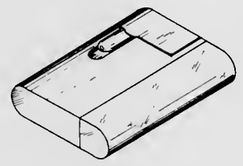




298,657
COMBINED DROP LIGHT AND EXTENSION CORD ATTACHMENT THEREFOR
Edward F. Flores, 939 E. Renton St., Carson, Calif. 90745
Filed Oct. 21, 1985, Ser. No. 789,387
Term of patent 14 years
U.S. Cl. D26—37



298,658
PURSE ILLUMINATOR
Stephen A. Roberts, 17791 Sky Park Cir., Ste. E, Irvine, Calif. 92714, and William H. Howard, Newport Beach, Calif., assignors to Stephen A. Roberts, Irvine, Calif.
Filed Mar. 3, 1986, Ser. No. 841,350
Term of patent 14 years
U.S. Cl. D26—37



298,659
FLASHLIGHT
Bruce Burns, Portland, Oreg., assignor to Burns Bros., Inc., Portland, Oreg.
Filed Jun. 4, 1986, Ser. No. 870,684
Term of patent 14 years
U.S. Cl. D26—46

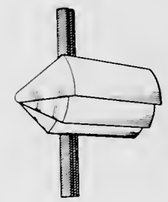




298,660
HANGING LAMP
Luis E. Diaz-Paez, 3629 SW. 8 St., Miami, Fla. 33135
Filed Jan. 10, 1986, Ser. No. 817,553
Term of patent 14 years
U.S. Cl. D26—73



298,661
WALL LAMP
Ernesto Gismondi, Milan, Italy, assignor to Artemide S.p.A., Pregnana Milanese, Italy
Filed Dec. 23, 1985, Ser. No. 812,215
Claims priority, application Italy, Jul. 3, 1985, 22384/85[U]
Term of patent 14 years
U.S. Cl. D26—86



298,662
AUTOMOTIVE CIGAR LIGHTER
Kazumi Honjo, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1985, Ser. No. 748,955
Claims priority, application Japan, Dec. 27, 1984, 59-54040
Term of patent 14 years
U.S. Cl. D27—141



298,663
AUTOMOTIVE CIGAR LIGHTER
Kazumi Honjo, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1985, Ser. No. 748,956
Claims priority, application Japan, Dec. 27, 1984, 59-54042
Term of patent 14 years
U.S. Cl. D27—141



298,664
BAR OF SOAP OR SIMILAR ARTICLE
Charles A. Huff, P.O. Box 1297, Mtn. View, Calif. 94042
Filed May 31, 1985, Ser. No. 716,242
Term of patent 14 years
U.S. Cl. D28—8.1



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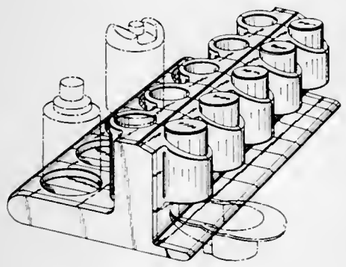
298,665
SOAP BAR
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J.
Filed Jan. 27, 1986, Ser. No. 822,662
Term of patent 14 years
U.S. Cl. D28—8.2



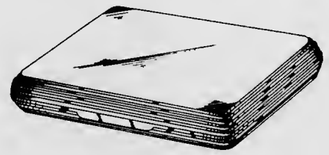
298,666
SOAP BAR
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J.
Filed Jan. 27, 1986, Ser. No. 822,667
Term of patent 14 years
U.S. Cl. D28—8.2



298,667
COMBINED DISPENSER AND CONTAINER FOR COSMETICS AND HAIR CARE PRODUCTS
Michael Tinius, Thalfingen, Fed. Rep. of Germany, assignor to Kadabell GmbH & Co. KG, Lenzkirch, Fed. Rep. of Germany
Filed Sep. 27, 1985, Ser. No. 781,404
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, MR BD.IINR.21N
Term of patent 14 years
U.S. Cl. D28—77



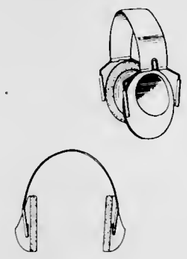
298,668
COSMETIC CASE
Roberto Trabattoni, 70, Route du Pont-Butin, 1213 Petit-Lancy, Switzerland
Filed Dec. 11, 1985, Ser. No. 807,851
Term of patent 14 years
U.S. Cl. D28—83



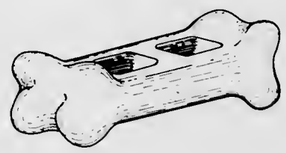
298,669
KNEE PROTECTOR FOR MOTORCYCLIST'S COVERALLS
Hisashi Kushitani, Tokyo, Japan, assignor to Kushitani Company, Ltd., Tokyo, Japan
Filed Sep. 12, 1986, Ser. No. 907,539
Term of patent 14 years
U.S. Cl. D29—10



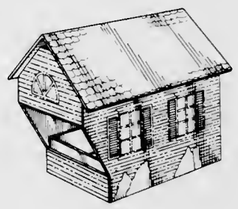
298,670
HEARING PROTECTOR
Tore Palmaer, Kvarnliden, Sweden, assignor to Leif Palmaer, Varnamo, Sweden
Filed Jun. 9, 1986, Ser. No. 872,379
Claims priority, application Sweden, Jan. 10, 1986, 860040
Term of patent 14 years
U.S. Cl. D29—19



298,671
PET BOWL
Keith C. Simerson, 8470 Sonoma Ave., Sebastopol, Calif. 95472
Filed Feb. 12, 1987, Ser. No. 14,913
Term of patent 14 years
U.S. Cl. D30—130

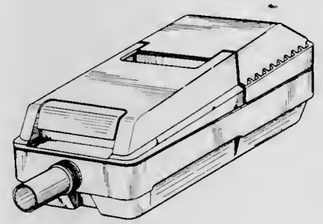


298,672
CAT LITTER BOX
Walter B. Herbst, 345 N. Canal St., Chicago, Ill. 60606
Filed Dec. 7, 1987, Ser. No. 129,074
Term of patent 14 years
U.S. Cl. D30—161

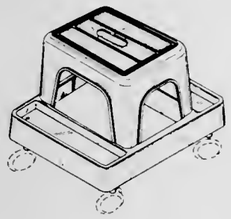


298,673
HAND VACUUM CLEANER
Hans E. Slany, and Reinhard Renner, both of Esslingen, Fed. Rep. of Germany, assignors to Progress-Elektrogeraete Mauz & Pfeiffer GmbH, Nürtingen, Fed. Rep. of Germany
Filed Nov. 26, 1985, Ser. No. 806,562
Claims priority, application Fed. Rep. of Germany, May 28, 1985, 12774/85(MR811
Term of patent 14 years
U.S. Cl. D32—18





298,674
MECHANICS ROLLER SEAT
Alois J. Koller, Sr., 201 Riviera Dr., Fenton, Mo. 63026
Filed Dec. 16, 1985, Ser. No. 808,947
Term of patent 14 years
U.S. Cl. D34—23



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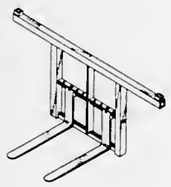
298,675
FLIGHT FOR APRON FEEDER
James E. Jestice, Middletown, Ohio, assignor to The Manufacturers Equipment Company, Middletown, Ohio
Continuation-in-part of Ser. No. 708,752, Mar. 6, 1985, abandoned. This application Nov. 28, 1986, Ser. No. 936,070
Term of patent 14 years
U.S. Cl. D34—29



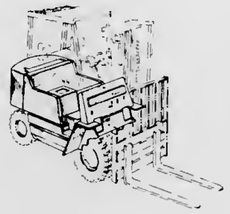
298,676
TRAILER JACK
James W. Chambers, Rockford, Ill., assignor to Atwood Industries, Inc., Rockford, Ill.
Filed Dec. 30, 1986, Ser. No. 947,971
Term of patent 14 years
U.S. Cl. D34—31



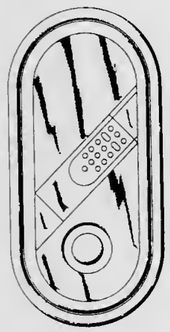
298,677
LIFT TRUCK CONVERTER
Stephen A. Carlson, 1268 Rockinghorse La., Lake Oswego, Oreg. 97034, and James P. Creagan, 5708 NE. 118th, Vancouver, Wash. 98665
Filed Aug. 5, 1985, Ser. No. 762,313
Term of patent 14 years
U.S. Cl. D34—35



298,678
LIFT TRUCK BODY
Warner K. Brown; Robert L. Kirby, both of Battle Creek, Mich.; Dennis M. Lanci, Renton, Wash., and Jay J. Reinhart, Battle Creek, Mich., assignors to Clark Equipment Company, South Bend, Ind.
Filed Jun. 17, 1985, Ser. No. 745,553
Term of patent 14 years
U.S. Cl. D34—37



298,679
WALL SAFE
Silvano Casini; Guido Moretti, both of Bologna, and Paolo Andina, Casalecchio di Reno, all of Italy, assignors to Viro Innocenti S.p.A., Zola Predosa, Italy
Filed Nov. 19, 1985, Ser. No. 799,449
Claims priority, application Italy, May 24, 1985, 15189/85[U]
Term of patent 14 years
U.S. Cl. D99—28





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TO WHOM

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Ziecker, Roger A.; Boger, Bentley J.; and Lewis, Dwayne N., to Nordson Corporation. Adhesive spray gun and nozzle attachment. 4,785,996, Cl. 239-298.000.
Zielinski, Stanley J., to Curran Company, The. Door shield for shielded enclosure. 4,786,758, Cl. 174-35.0GC.
Zifferer, Morton F.; and Tarlton, Richard J., to Zifferer, Morton F. Baffle support fixture for machines for assembling tubes in a heat exchanger. 4,785,518, Cl. 29-281.100.
Zils, James A.: *See*—
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Zimmerman, Donna F.: *See*—
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Zimmerman, Eugene S.; and Hartwick, Larry R., to Chrysler Motors Corporation. Method of measuring barometric pressure and manifold absolute pressure using a single sensor. 4,787,043, Cl. 364-431.050.
Zimmerman, Robert, to Hughes Aircraft Company. Missing wire detector. 4,786,860, Cl. 324-65.00R.
Zinger, Kurt E. Basketball return. 4,786,052, Cl. 273-1.50A.
Ziph, Benjamin: *See*—
Meijer, Roelf J.; and Ziph, Benjamin, 4,785,633, Cl. 60-641.150.
Meijer, Roelf L.; Verhey, Robert P.; and Ziph, Benjamin, 4,785,875, Cl. 165-104.250.
Ziu, Christopher G., to Asahi/America, Inc. Double-containment thermoplastic pipe assembly. 4,786,088, Cl. 285-138.000.
Zobel, Gregory B.: *See*—
Schoon, JoAnna; Weyant, Robert R.; and Zobel, Gregory B., 4,785,799, Cl. 128-53.000.
Zoeller, Joseph R.: *See*—
Sumner, Charles E., Jr.; and Zoeller, Joseph R., 4,786,748, Cl. 560-60.000.
Zomick, David A., to Allied-Signal Inc. Fiber-optic angular rates sensor having enhanced reliability. 4,786,172, Cl. 356-350.000.
Zondler, Rolf; and Pottharst, Jurgen, to Standard Elektrik Lorenz AG. Liquid-crystal display manufacturing method. 4,786,268, Cl. 445-25.000.
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Graham, Hatch, III; and Seltz, Daniel, 4,786,904, Cl. 340-825.830.
Zschokke Wartmann AG: *See*—
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Zuber, James J.: *See*—
Bidner, Harvey; and Zuber, James J., 4,786,919, Cl. 346-108.000.
Zucher Beuteltuchfabrik AG: *See*—
Muller, Hans-Rudolf, 4,785,764, Cl. 119-15.000.
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., to Allied-Signal, Inc. Homogeneous thermosetting copolymers. 4,786,700, Cl. 526-292.900.
ZVS - Adamovsky strojirny koncernovy podnik Adamov: *See*—
Jiruse, Jaroslav; Konecny, Milan; and Drlik, Vladimir, 4,786,043, Cl. 271-103.000.
Zweig, Andrew M.: *See*—
Zupancic, Joseph J.; Zweig, Andrew M.; and Wrezel, James A., 4,786,700, Cl. 526-292.900.
501 Fleetwood Electronics, Inc.: *See*—
Owensby, Max T.; Van Ness, Richard J.; and Delahunty, Richard J., 4,786,757, Cl. 174-35.00C.
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Barendregt, Albertus J.; and Van Der Kemp, Marcellis J. A., 4,786,913, Cl. 343-765.000.

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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF NOVEMBER, 1988

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See*—
Fu, Yun-Lung; and Wang, Samuel S., Re. 32,786, Cl. 209-166.000.
Amphenol Corporation: *See*—
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., Re. 32,787, Cl. 439-271.000.
Disanza, William G., Jr. Separation-chamber means. Re. 32,788, Cl. 55-429.000.
Frear, David L.: *See*—
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., Re. 32,787, Cl. 439-271.000.
Fu, Yun-Lung; and Wang, Samuel S., to American Cyanamid Company. Neutral hydrocarboxycarbonyl thiourea sulfide collectors. Re. 32,786, Cl. 209-166.000.
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., to Amphenol Corporation. Sealing ring for an electrical connector. Re. 32,787, Cl. 439-271.000.
Lynk, Charles N., Jr.; and Mikulski, James J., to Motorola, Inc. Transmission trunk multichannel dispatch system with priority queuing. Re. 32,789, Cl. 379-58.000.
MacAvoy, David W.: *See*—
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., Re. 32,787, Cl. 439-271.000.
Mikulski, James J.: *See*—
Lynk, Charles N., Jr.; and Mikulski, James J., Re. 32,789, Cl. 379-58.000.
Motorola, Inc.: *See*—
Lynk, Charles N., Jr.; and Mikulski, James J., Re. 32,789, Cl. 379-58.000.
Punako, Stephen: *See*—
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., Re. 32,787, Cl. 439-271.000.
Wang, Samuel S.: *See*—
Fu, Yun-Lung; and Wang, Samuel S., Re. 32,786, Cl. 209-166.000.

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CERTIFICATES WERE ISSUED

Du Pont de Nemours, E. I., and Company: *See*—
Hauser, William P., B1 4,528,261, Cl. 430-322.000.
Franklin, Leonard N., Jr., to General Motors Corporation. Universal joint. B1 4,385,899, 11-22-88, Cl. 464-146.000.
General Motors Corporation: *See*—
Franklin, Leonard N., Jr., B1 4,385,899, Cl. 464-146.000.
Hauser, William P., to Du Pont de Nemours, E. I., and Company. Prelamination, imagewise exposure of photohardenable layer in process for sensitizing, registering and exposing circuit boards. B1 4,528,261, 11-22-88, Cl. 430-322.000.
Howes, Randolph M., to Kinchen, Janice, a part interest. Venous catheter device. B1 1,031,873, 11-22-88, Cl. 128-675.000.
Kinchen, Janice: *See*—
Howes, Randolph M., B1 1,031,873, Cl. 128-675.000.
Modar, Inc.: *See*—
Modell, Michael, B1 4,338,199, Cl. 210-721.000.
Modell, Michael, to Modar, Inc. Processing methods for the oxidation of organics in supercritical water. B1 4,338,199, 11-22-88, Cl. 210-721.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Hollar, Robert C.; and Huang, Tung M., 298,652, Cl. D24-56.000.
Albert, Judith F., to Quaker Oats Company, The. Stuffed rabbit. 298,640, 11-22-88, Cl. D21-187.000.
American Telephone and Telegraph Company, AT&T Teletype Corp.: *See*—
Sekolowski, Eugene K., 298,637, Cl. D18-23.000.
Andina, Paolo: *See*—
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Arner, Barbara; and Tarlow, Kenneth, to Arner, Barbara. Closet organizer accessory. 298,591, 11-22-88, Cl. D6-315.000.
Artemide S.p.A.: *See*—
Gismondi, Ernesto, 298,661, Cl. D26-86.000.
Aschbacher, Daniel; Warashina, Tadao B.; Matouk, Anthony F.; and Hoffman, David C., to Modular Power Corporation. Modular power supply. 298,616, 11-22-88, Cl. D13-12.000.
Atwood Industries, Inc.: *See*—
Chambers, James W., 298,676, Cl. D34-31.000.
Autry Industries, Inc.: *See*—
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Bell, Randall, to Wilton Enterprises, Inc. Paper towel dispenser. 298,597, 11-22-88, Cl. D6-521.000.
Brown, Warner K.; Kirby, Robert L.; Lanci, Dennis M.; and Reinhart, Jay J., to Clark Equipment Company. Lift truck body. 298,678, 11-22-88, Cl. D34-37.000.
Burns Bros., Inc.: *See*—
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Bussell, Vanda J. Soap bar. 298,665, 11-22-88, Cl. D28-8.200.
Bussell, Vanda J. Soap bar. 298,666, 11-22-88, Cl. D28-8.200.
Caire, Hernan N. Slipper. 298,582, 11-22-88, Cl. D2-282.000.
Carlson, Stephen A.; and Creagan, James P. Lift truck converter. 298,677, 11-22-88, Cl. D34-35.000.
Casini, Silvano; Moretti, Guido; and Andina, Paolo, to Viro Innocenti S.p.A. Wall safe. 298,679, 11-22-88, Cl. D99-28.000.
Caterpillar Inc.: *See*—
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Chambers, James W., to Atwood Industries, Inc. Trailer jack. 298,676, 11-22-88, Cl. D34-31.000.
Chionuma, Chukwuemeka N. Automobile windshield cover. 298,615, 11-22-88, Cl. D12-182.000.
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Clark Equipment Company: *See*—
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Clark, Thomas J.: *See*—
Soza, Harry R.; Wilkison, Dennis E.; Williams, Craig C.; Lang, Bruce M.; and Clark, Thomas J., 298,627, Cl. D14-105.000.
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ISSUED NOVEMBER 22, 1988

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596.17 4,785,848
625.64 4,785,849
894 4,785,850
907 4,785,851

CLASS 138

109 4,785,852
4,785,853

CLASS 139

452 4,785,855
453 4,785,856

CLASS 141

9 4,785,857
27 4,785,858
313 4,785,859

CLASS 144

174 4,785,860

CLASS 148

6.2 4,786,339
6.27 4,786,336
11.5 A 4,786,337
12.4 4,786,338
439 4,786,340

CLASS 152

209 A 4,785,863
209 R 4,785,861
4,785,862

CLASS 156

71 4,786,341
89 4,786,342
93 4,786,343
109 4,786,344
156 4,786,345
160 4,786,346
172 4,786,347
181 4,786,348
187 4,785,854
234 4,786,349
244.24 4,786,350
245 4,786,351
345 4,786,352
359 4,786,353
538 4,786,354
556 4,786,355
580.1 4,786,356
633 4,786,357
643 4,786,358
4,786,359
4,786,360
4,786,361
645 4,786,362

CLASS 157

1.17 4,785,865
20 4,785,864

CLASS 159

13.1 4,786,363

CLASS 160

345 4,785,866
4,785,867

CLASS 162

5 4,786,364
65 4,786,365
102 4,786,366
158 4,786,367

CLASS 163

5 4,785,868

CLASS 164

4.1 4,785,869
34 4,785,870
56.1 4,785,872
122 4,785,871
481 4,785,873

CLASS 165

1 4,785,874
104.25 4,785,875
111 4,785,876
134.1 4,785,877
163 4,785,878
164 4,785,879

CLASS 166

53 4,785,880
88 4,785,881
252 4,785,882
270 4,785,883
280 4,785,884
285 4,785,885
370 4,785,886

CLASS 169

37 4,785,887
39 4,785,888

CLASS 172

22 4,785,889
29 4,785,890
579 4,785,891

CLASS 173

28 4,785,892
119 4,785,893

CLASS 174

22 C 4,786,761
35 C 4,786,757
35 GC 4,786,758
70 S 4,786,759
84 R 4,786,760
152 GM 4,786,762

CLASS 175

19 4,785,898
39 4,785,894
4,785,895

CLASS 177

211 4,785,896
232 4,785,897

CLASS 178

2 R 4,786,763
18 4,786,764
19 4,786,765

CLASS 180

7.1 4,785,899
89.14 4,785,900
142 4,785,901
164 4,785,902
197 4,785,903
4,785,904
219 4,785,905
270 4,785,906
274 4,785,907

CLASS 181

156 4,785,908
252 4,785,909

CLASS 182

92 4,785,910
129 4,785,911
160 4,785,912

CLASS 184

6.26 4,785,913

CLASS 187

105 4,785,914
110 4,785,915
121 4,785,916

CLASS 188

72.4 4,785,918
181 A 4,785,919
299 4,785,920
300 4,785,921
316 4,785,922

CLASS 192

0.08 4,785,917
3.29 4,785,924
3.3 4,785,923
17 R 4,785,925
18 A 4,785,926

CLASS 194

200 4,785,927

CLASS 198

450 4,785,928
750 4,785,929

CLASS 200

5 A 4,786,766
4,786,767
6 A 4,786,768
61.41 4,786,769
147 R 4,786,770
153 G 4,786,771

CLASS 202

99 4,786,368

CLASS 203

15 4,786,370

CLASS 204

1 T 4,786,372
4,786,373
4,786,374
3 4,786,375
4,786,376
37.1 4,786,377
43.1 4,786,378
67 4,786,379
95 4,786,380
129.75 4,786,381
132 4,786,382
148 4,786,383
149 4,786,384
180.1 4,786,385
182.3 4,786,386
183.1 4,786,387
197 4,786,388
206 4,786,389
242 4,786,390
247 4,786,391
298 4,786,392
301 4,786,393
401 4,786,394
409 4,786,395
420 4,786,396
427 4,786,397
4,786,398
4,786,399

CLASS 206

3 4,785,930
222 4,785,931
232 4,785,932
260 4,785,933
315.11 4,785,934
372 4,785,935
454 4,785,936
484 4,785,937
511 4,785,939
554 4,785,938
632 4,785,940

CLASS 208

80 4,786,400
85 4,786,401
217 4,786,403
4,786,404
230 4,786,405
443 4,786,402

CLASS 209

139.1 4,786,406
166 Re.32,786
601 4,785,941
657 4,785,942

CLASS 210

178 4,786,407
193 4,786,408
238 4,786,409
321.4 4,786,411
321.72 4,786,410
512.1 4,786,412
616 4,786,413
634 4,786,414
635 4,786,415
4,786,416
639 4,786,417
673 4,786,418
721 III 4,338,199
747 4,786,419
791 4,786,420

CLASS 211

59 2 4,785,943
4,785,944
4,785,945
187 4,785,946
695 4,785,947

CLASS 215

1 C 4,785,948
4,785,949
4,785,950
32 4,785,951
329 4,785,952
365 4,785,953

CLASS 219

8.5 4,786,772
10.55 E 4,786,773
10.55 F 4,786,775
10.55 R 4,786,774
69 E 4,786,777
69 P 4,786,778
69 R 4,786,776
77 4,786,779
121.72 4,786,780
147 4,785,954
270 4,786,781
306 4,786,782
486 4,786,799
543 4,786,784
547 4,786,783

CLASS 220

3 4,785,955
4,785,956
4,785,957
5 A 4,785,958
23.83 4,785,959
4,785,960
4,785,961
4,785,962
4,785,964
4,785,963
4,785,965
4,785,966
4,785,967
4,785,968

CLASS 221

2 4,785,969
47 4,785,970
312 R 4,785,971

CLASS 222

1 4,785,972
82 4,785,973
105 4,785,974
321 4,785,975
370 4,785,976
399 4,785,977
482 4,785,978
591 4,785,979

CLASS 224

42.03 A 4,785,980
165 4,785,981
177 4,785,982
206 4,785,983
259 4,785,984

CLASS 226

97 4,785,985
4,785,986

CLASS 227

67 4,785,987

CLASS 228

122 4,785,988
4,785,989
170 4,785,990

CLASS 229

5.6 4,785,992
52 B 4,785,991
137 4,785,993

CLASS 235

7 R 4,786,785
379 4,786,786
380 4,786,790
381 4,786,787
383 4,786,788
432 4,786,789
456 4,786,792
480 4,786,793
482 4,786,791

CLASS 238

171 4,785,994

CLASS 239

3 4,785,995
298 4,785,996
332 4,785,997
440 4,785,998

CLASS 241

26 4,785,999
36 4,786,000
101 B 4,786,001
4,786,002
101.7 4,786,003

CLASS 242

55.53 4,786,005
67.3 R 4,786,006
74 4,786,007
84.8 4,786,010
195 4,786,011
198 4,786,012
705 B 4,786,004

CLASS 244

53 R 4,786,008
75 R 4,786,009
4,786,013
115 4,786,014
117 A 4,786,015
130 4,786,016
158 R 4,786,017
164 4,786,018
169 4,786,019
204 4,786,020

CLASS 248

188 4,786,021
287 4,786,022
309.1 4,786,023
422 4,786,024
558 4,786,025

CLASS 249

9 4,786,026
56 4,786,027

CLASS 250

201 4,786,794
203 R 4,786,795
214 R 4,786,797
216 4,786,798
222.1 4,786,800
223 B 4,786,801
225 4,786,802
237 G 4,786,803
253 4,786,804
260 4,786,805
266 4,786,796
305 4,786,806
327.2 4,786,807
4,786,808
352 4,786,809
370.01 4,786,810
385.1 4,786,811
455.1 4,786,812
461.1 4,786,813
492.2 4,786,814
560 4,786,815
561 4,786,816
571 4,786,817
578 4,786,818
4,786,819
4,786,820
4,786,821

CLASS 251

7 4,786,028
129.15 4,786,030
149.6 4,786,029
368 4,786,031

CLASS 252

8.8 4,786,421
4,786,422
32.7 E 4,786,423
41 4,786,424
47 4,786,425
49.6 4,786,426
56 R 4,786,427
62.2 4,786,428
4,786,429
62.58 4,786,430
99 4,786,431
120 4,786,369
4,786,432
174.24 4,786,433
181 4,786,434
182.27 4,786,435
352 4,786,436
506 4,786,437
510 4,786,438
544 4,786,439
546 4,786,440

CLASS 254

93 HP 4,786,032

CLASS 260

513 F 4,786,441
544 F 4,786,442
549 4,786,443

CLASS 264

1.4 4,786,444
4,786,445
2.6 4,786,446
46.6 4,786,447
65 4,786,448
73 4,786,449
82 4,786,450
87 4,786,451
129 4,786,452
136 4,786,453
157 4,786,454
237 4,786,455
285 4,786,456
310 4,786,457
515 4,786,458

CLASS 267

47 4,786,033
64.15 4,786,034
122 4,786,035
140.1 4,786,036
226 4,786,037

CLASS 269

60 4,786,038

CLASS 271

3.1 4,786,039
4,786,040
4,786,041
9 4,786,042
103 4,786,043
171 4,786,044
251 4,786,045
276 4,786,046
281 4,786,047

CLASS 272

27 N 4,786,048
73 4,786,049
4,786,050
134 4,786,051

CLASS 273

1.5 A 4,786,052
4,786,371
1.5 R 4,786,053
33 4,786,054
73 D 4,786,055
144 A 4,786,056
186 R 4,786,057
371 4,786,058
410 4,786,059

CLASS 277

1 4,786,060
81 R 4,786,061

CLASS 279

83 4,786,062
106 4,786,063

CLASS 280

30 4,786,064
91 4,786,065
4,786,066
221 4,786,067
4,786,068
4,786,069
281 LP 4,786,070
289 G 4,786,071
289 WC 4,786,072
656 4,786,073
690 4,786,074
696 4,786,075
777 4,786,076
801 4,786,077
808 4,786,078
4,786,079
4,786,080
4,786,081
812 4,786,082

CLASS 281

15 R 4,786,083

CLASS 283

91 4,786,084

CLASS 285

24 4,786,085
49 4,786,086
97 4,786,087
138 4,786,088
281 4,786,089
332.3 4,786,090

CLASS 292

36 4,786,091
4,786,092

CLASS 293

120 4,786,093
128 4,786,094
132 4,786,459

CLASS 294

51 4,786,095
137 4,786,096
147 4,786,097

CLASS 296

37.12 4,786,098
98 4,786,099
146 4,786,100
216 4,786,101
4,786,102

CLASS 297

218 4,786,103
224 4,786,104
258 4,786,105
265 4,786,106
330 4,786,107
353 4,786,108
355 4,786,109
362 4,786,110

CLASS 299

10 4,786,111
76 4,786,112

CLASS 301

41 R 4,786,113
124 R 4,786,114
4,786,115

CLASS 303

22.6 4,786,117
40 4,786,116
110 4,786,118

CLASS 307

125 4,786,822
234 4,786,823
290 4,786,824
4,786,825
296 R 4,786,826
300 4,786,827
303 4,786,828
465 4,786,829
475 4,786,830
490 4,786,831

CLASS 310

12 4,786,832
89 4,786,833
194 4,786,834
233 4,786,835

323 4,786,836
364 4,786,837

CLASS 312

195 4,786,119
208 4,786,120
214 4,786,121
257 SK 4,786,122
341 R 4,786,123

CLASS 313

440 4,786,838
473 4,786,839
477 R 4,786,840
493 4,786,841

CLASS 315

3 4,786,842
77 4,786,843
111.21 4,786,844
382 4,786,845

CLASS 318

482 4,786,846
568 4,786,847
577 4,786,848
632 4,786,849
786 4,786,850

CLASS 320

2 4,786,851

CLASS 322

10 4,786,852
75 4,786,853

CLASS 323

232 4,786,854
314 4,786,855
315 4,786,856

CLASS 324

58.5 B 4,786,857
65 R 4,786,860
78 R 4,786,861
96 4,786,858
98 4,786,859
126 4,786,862
142 4,786,863
158 F 4,786,867
158 MG 4,786,866
158 R 4,786,864
4,786,865
161 4,786,868
207 4,786,869
208 4,786,870
309 4,786,871
4,786,872
323 4,786,873
369 4,786,874
444 4,786,875
551 4,786,876

CLASS 330

9 4,786,877
84 4,786,878
145 4,786,879
294 4,786,880
307 4,786,881

CLASS 332

16 R 4,786,882

CLASS 333

21 R 4,786,883
166 4,786,884

CLASS 335

202 4,786,885
216 4,786,886

CLASS 338

2 4,786,887
22 R 4,786,888

CLASS 340

311.1 4,786,889
365 R 4,786,892
703 4,786,893
709 4,786,894
4,786,895
712 4,786,896
721 4,786,897
783 4,786,898
825.31 4,786,900
825.440 4,786,902
825.47 4,786,901
825.500 4,786,899
825.540 4,786,903
825.830 4,786,904
975 4,786,905

CLASS 341

13 4,786,891
81 4,786,890

CLASS 342

25 4,786,906
51 4,786,907
63 4,786,908
94 4,786,909

CLASS 343

753 4,786,910
761 4,786,912
765 4,786,913
785 4,786,911
909 4,786,914
4,786,915

CLASS 346

76 PH 4,786,916
4,786,917
108 4,786,918
4,786,919
134 4,786,920
150 4,786,921
158 4,786,922
160 4,786,923

CLASS 350

3.65 4,786,125
3.7 4,786,124
3.71 4,786,126
96.10 4,786,127
96.14 4,786,128
96.15 4,786,129
4,786,130
96.16 4,786,131
96.19 4,786,132
4,786,133
96.20 4,786,134
96.21 4,786,135
4,786,136
96.23 4,786,137
4,786,138
96.27 4,786,139
96.29 4,786,140
99 4,786,141
169 4,786,160
319 4,786,142
321 4,786,143
4,786,144
331 R 4,786,145
4,786,146
337 4,786,147
339 F 4,786,148
356 4,786,149
427 4,786,150
434 4,786,151
454 4,786,152
463 4,786,153
508 4,786,154
516 4,786,155
637 4,786,156
4,786,157

CLASS 351

122 4,786,158
132 4,786,159
205 4,786,161
206 4,786,162
212 4,786,163

CLASS 354

77 4,786,925
4,786,926
153 4,786,927
4,786,928
154 4,786,929
234.1 4,786,930
303 4,786,931
402 4,786,932
408 4,786,933
409 4,786,934
432 4,786,935

CLASS 355

3 BE 4,786,937
3 DD 4,786,924
3 R 4,786,938
4 4,786,939
6 4,786,940
7 4,786,941
14 D 4,786,942
14 R 4,786,945
15 4,786,943
20 4,786,944
28 4,786,946
30 4,786,947
40 4,786,948
68 4,786,949
99 4,786,950
300 4,786,936

CLASS 356

4 4,786,164
23 4,786,165
28.5 4,786,168
123 4,786,166
141 4,786,167
244 4,786,169
318 4,786,170
326 4,786,171
328 4,786,174
350 4,786,172
4,786,173
353 4,786,175
373 4,786,176
400 4,786,178
429 4,786,177

CLASS 357

17 4,786,951
23.13 4,786,956
23.4 4,786,952
4,786,953
23.6 4,786,954
23.7 4,786,955
34 4,786,957
38 4,786,958
4,786,959
42 4,786,960
43 4,786,961
71 4,786,962

CLASS 358

31 4,786,963
44 4,786,964
98 4,786,965
108 4,786,966
143 4,786,967
164 4,786,968
171 4,786,969
184 4,786,970
209 4,786,971
244 4,786,972
248 4,786,973
257 4,786,974
283 4,786,975
4,786,976
296 4,786,977
329 4,786,978
335 4,786,979
4,786,980

CLASS 360

10.3 4,786,981
4,786,982
13 4,786,983
31 4,786,984
33.1 4,786,985
4,786,986
35.1 4,786,987
40 4,786,988
65 4,786,989
4,786,990
66 4,786,991
67 4,786,993
73 4,786,992
75 4,786,994
4,786,995
94 4,786,996
97 4,786,997
4,786,998
104 4,786,999
105 4,787,000
106 4,787,001
118 4,787,002
123 4,787,003
127 4,787,004
130.2 4,787,005
133 4,787,006

CLASS 361

98 4,787,007
190 4,787,008
315 4,787,010
391 4,787,011

CLASS 362

3 4,787,012
32 4,787,013
78 4,787,014
80 4,787,015
116 4,787,016
161 4,787,017
216 4,787,018
250 4,787,019

CLASS 363

20 4,787,020
37 4,787,021
52 4,787,022
54 4,787,023

CLASS 364

132 4,787,024
200 4,787,025
4,787,026
4,787,027
4,787,028
4,787,029
4,787,030
4,787,031
4,787,032
4,787,033
4,787,060
300 4,787,034
4,787,035
401 4,787,036
404 4,787,037
419 4,787,038
424.01 4,787,039
4,787,040
424.03 4,787,041
431.05 4,787,043
431.07 4,787,044
433 4,787,042
464.02 4,787,045
464.03 4,787,046
466 4,787,048
474.15 4,787,049
479 4,787,050
518 4,787,051
550 4,787,052
551.01 4,787,053
571.04 4,787,054
716 4,787,047
726 4,787,055
753 4,787,056
754 4,787,057
807 4,787,058
900 4,787,059
4,787,061
4,787,062
4,787,063
4,787,064
4,787,065

CLASS 365

149 4,787,066
222 4,787,067
230 4,787,068

CLASS 366

2 4,786,179
83 4,786,180
89 4,786,181
140 4,786,182
265 4,786,183
4,786,187
288 4,786,184
340 4,786,185
348 4,786,186

CLASS 367

21 4,787,069
140 4,787,070
4,787,071

CLASS 368

76 4,787,072

CLASS 369

32 4,787,073
36 4,787,074
44 4,787,075
46 4,787,076
100 4,787,077
122 4,787,078
270 4,787,079
282 4,787,009

CLASS 370

32.1 4,787,080
85 4,787,081
4,787,082
4,787,083
105 4,787,084
110.1 4,787,085

CLASS 372

19 4,787,086
29 4,787,087
34 4,787,088
45 4,787,089
82 4,787,090
89 4,787,091
95 4,787,092

CLASS 374

125 4,786,188

CLASS 375

23 4,787,093
60 4,787,094
114 4,787,095
120 4,787,096
4,787,097

CLASS 376

270 4,786,460
285 4,786,461
293 4,786,462
299 4,786,463
352 4,786,464
400 4,786,465

CLASS 378

18 4,787,098

CLASS 379

58 Re.32,789

CLASS 383

61 4,786,190
75 4,786,189
4,786,191
119 4,786,192

CLASS 400

279 4,786,194
636.3 4,786,193
696 4,786,195

CLASS 401

82 4,786,196
116 4,786,197
142 4,786,198
288 4,786,199

CLASS 402

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	4,786,328		4,786,078		4,786,881		4,785,548	42 :	4,785,518		4,786,611
	4,786,722		4,786,105		4,786,910		4,785,750		4,785,532		4,786,668
25 :	4,785,496		4,786,106		4,786,955		4,786,120		4,785,600		4,786,669
	4,785,502		4,786,111		4,786,961		4,786,400		4,785,603		4,786,686
	4,785,531		4,786,188		4,786,973		4,786,472		4,785,672		4,786,693
	4,785,534		4,786,433		4,787,056		4,786,485		4,785,879		4,786,711
	4,785,644		4,786,444		4,787,082		4,786,778		4,785,927		4,786,717
	4,785,669		4,786,446		4,787,086		4,786,828		4,786,117		4,786,796
	4,785,704		4,786,657		4,528,261		4,787,054		4,786,121		4,786,966
	4,785,709		4,786,696	35 :	4,786,726	38 :	4,785,865		4,786,179		4,787,012
	4,785,792		4,786,903	36 :	4,786,907	39 :	4,785,522		4,786,221		4,787,026
	4,785,795		4,786,984		Re.32,787		4,785,529		4,786,239		4,787,032
	4,785,908		4,787,071		4,785,488		4,785,574		4,786,258		4,787,095
	4,785,953	28 :	4,786,388		4,785,499		4,785,576		4,786,336	49 :	4,785,807
	4,785,984		1,031,873		4,785,513		4,785,590		4,786,348		4,785,822
	4,786,010	29 :	4,785,567		4,785,536		4,785,604		4,786,350		4,785,934
	4,786,016		4,785,726		4,785,544		4,785,606		4,786,364		4,786,019
	4,786,072		4,785,810		4,785,553		4,785,624		4,786,367		4,786,038
	4,786,088		4,785,891		4,785,581		4,785,735		4,786,374		4,786,531
	4,786,131		4,786,197		4,785,599		4,785,797		4,786,389		4,786,689
	4,786,140		4,786,783		4,785,621		4,785,805		4,786,420		4,786,912
	4,786,154		4,786,896		4,785,622		4,785,813		4,786,451	50 :	4,786,360
	4,786,155	30 :	4,786,370		4,785,634		4,785,864		4,786,461		4,786,613
	4,786,193	31 :	4,785,694		4,785,676		4,785,893		4,786,479	51 :	4,785,608
	4,786,198		4,785,889		4,785,817		4,785,900		4,786,482		4,785,731
	4,786,254		4,785,958		4,785,932		4,785,922		4,786,563		4,785,887
	4,786,271		4,785,965		4,785,938		4,785,956		4,786,593		4,785,935
	4,786,277		4,785,966		4,785,944		4,785,987		4,786,628		4,786,009
	4,786,387		4,786,050		4,785,960		4,786,020		4,786,682		4,786,168
	4,786,437		4,786,141		4,785,981		4,786,026		4,786,703		4,786,465
	4,786,462	32 :	4,785,659		4,785,983		4,786,027		4,786,735		4,786,549
	4,786,692	33 :	4,785,945		4,786,006		4,786,057		4,786,745	53 :	4,785,509
	4,786,718		4,785,949		4,786,008		4,786,080		4,786,745		4,785,528
	4,786,841		4,785,950		4,786,023		4,786,087		4,786,812		4,785,560
	4,786,964		4,786,372		4,786,025		4,786,178		4,786,822		4,785,664
	4,787,031		4,786,455		4,786,041		4,786,222		4,786,840		4,785,812
	4,787,033		4,786,800		4,786,042		4,786,230		4,786,847		4,785,842
	4,787,060		4,786,848		4,786,124		4,786,234		4,787,035		4,786,067
	4,338,199	34 :	Re.32,788		4,786,125		4,786,240		4,787,036		4,786,068
26 :	4,785,500		4,785,494		4,786,126		4,786,326	44 :	4,785,802		4,786,069
	4,785,515		4,785,511		4,786,128		4,786,344		4,785,808		4,786,202
	4,785,571		4,785,547		4,786,144		4,786,349		4,787,010		4,786,396
	4,785,585		4,785,724		4,786,189		4,786,355	45 :	4,785,552		4,786,438
	4,785,615		4,785,765		4,786,191		4,786,369		4,785,613		4,786,468
	4,785,633		4,785,872		4,786,247		4,786,390		4,785,826		4,786,857
	4,785,643		4,785,883		4,786,305		4,786,397		4,786,275		4,786,861
	4,785,686		4,785,888		4,786,357		4,786,398		4,786,720		4,786,865
	4,785,695		4,785,914		4,786,363		4,786,399	46 :	4,785,647		4,786,905
	4,785,699		4,785,915		4,786,418		4,786,409	47 :	4,785,665		4,786,911
	4,785,711		4,786,005		4,786,436		4,786,432		4,785,957		4,787,016
	4,785,721		4,786,039		4,786,478		4,786,435		4,785,994	54 :	4,786,291
	4,785,804		4,786,044		4,786,493		4,786,484		4,786,272		4,786,705
	4,785,875		4,786,132		4,786,517		4,786,502		4,786,320		4,786,749
	4,785,913		4,786,172		4,786,566		4,786,556		4,786,353	55 :	4,785,614
	4,785,931		4,786,181		4,786,570		4,786,683		4,786,524		4,785,641
	4,785,980		4,786,269		4,786,583		4,786,756		4,786,713		4,785,645
	4,785,993		4,786,295		4,786,597		4,786,762		4,786,748		4,785,683
	4,786,029		4,786,332		4,786,600		4,786,769		4,786,876		4,785,687
	4,786,052		4,786,371		4,786,605		4,786,784	48 :	Re.32,789		4,785,722
	4,786,056		4,786,378		4,786,618		4,786,785		4,785,478		4,785,866
	4,786,058		4,786,401		4,786,620		4,787,027		4,785,542		4,785,867
	4,786,094		4,786,422		4,786,659		4,787,028		4,785,569		4,785,926
	4,786,101		4,786,425		4,786,664		4,786,031		4,785,588		4,785,986
	4,786,103		4,786,426		4,786,674	40	4,786,051		4,785,656		4,786,000
	4,786,119		4,786,483		4,786,678		4,786,097		4,785,661		4,786,113
	4,786,203		4,786,487		4,786,684		4,786,185		4,785,758		4,786,169
	4,786,223		4,786,499		4,786,733		4,786,290		4,785,801		4,786,282
	4,786,394		4,786,508		4,786,741		4,786,424		4,785,870		4,786,333
	4,786,459		4,786,511		4,786,801		4,786,805		4,785,880		4,786,346
	4,786,648		4,786,521		4,786,806		4,786,829		4,785,882		4,786,383
	4,786,691		4,786,534		4,786,834		4,786,873		4,785,894		4,786,392
	4,786,731		4,786,576		4,786,858		4,785,557		4,785,895		4,786,550
	4,786,732		4,786,580		4,786,863	41	4,785,570		4,785,971		4,786,850
	4,786,755		4,786,582		4,786,917		4,785,692		4,786,053		4,786,853
	4,786,777		4,786,602		4,786,919		4,785,700		4,786,090		4,787,011
	4,786,815		4,786,616		4,786,924						

DESIGN PATENTS

06 :	298,591		298,656	17 :	298,597	29 :	298,615		298,640		298,633
	298,594		298,657		298,632		298,674	37 :	298,584	48	298,625
	298,602		298,658		298,637	34 :	298,605	39 :	298,638		298,628
	298,608		298,664		298,652		298,665		298,675		298,630
	298,611		298,671		298,672		298,666	41 :	298,659	55	298,586
	298,616	08 :	298,655		298,676	35 :	298,580		298,677		298,587
	298,618	09 :	298,601	21 :	298,613		298,581	42 :	298,599		298,588
	298,627	12 :	298,585		298,642	36 :	298,598		298,653		298,589
	298,641		298,609	26 :	298,606		298,607	44 :	298,604		298,590
	298,650		298,660		298,678		298,639	47 :	298,603		298,649
	298,654	13 :	298,596	27 :	298,626						

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06 :	6,407		6,410	13 :	6,411	6,418	53 :	6,406	6,413
	6,408								
	6,409	12 :	6,420	39 :	6,417	42 : 6,416		6,412	6,414

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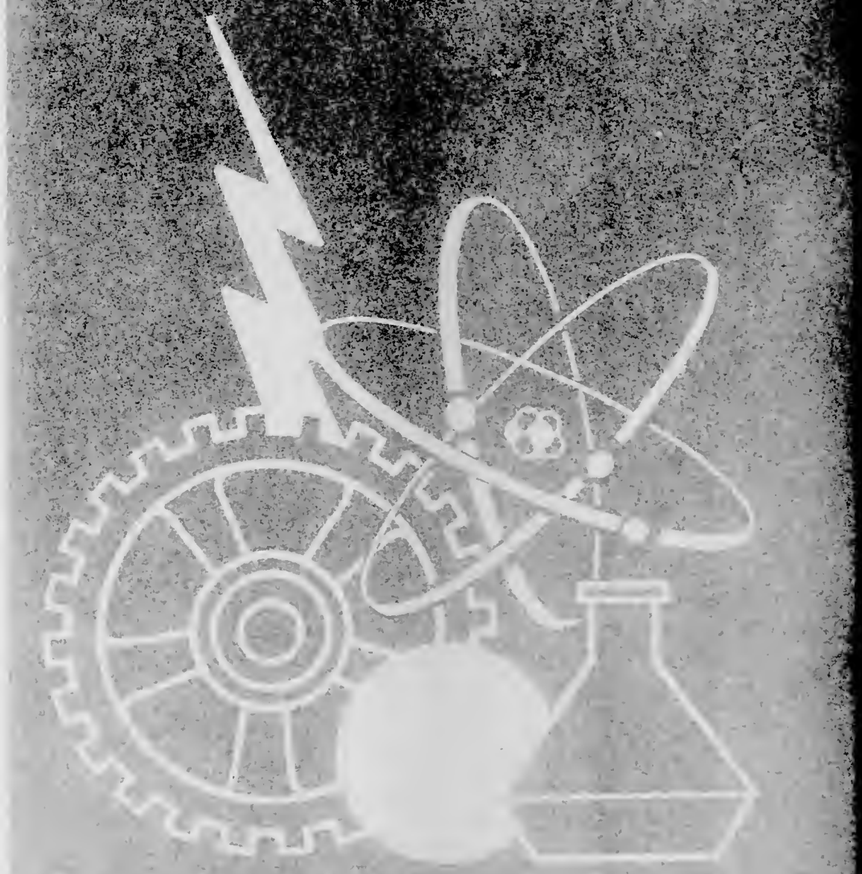
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 29, 1988



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
November 29, 1988 Volume 1096 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Oct. 26, 1988.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel for A Decision Without A Hearing as of Oct. 31, 1988

Chemical Discipline	–	December 10, 1987
Mechanical Discipline	–	March 2, 1987
Electrical Discipline	–	February 13, 1987

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of Oct. 31, 1988

Chemical	–	July 1, 1986
Electrical	–	July 1, 1986
Mechanical	–	July 1, 1986

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of Oct. 1988

Affirmed	181
Affirmed-in-Part	36
Reversed	142
Total Decided	359

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 26, 1985, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,554,681 through 4,555,810
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 11, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,470,156	06/545,442	9/11/84
4,470,174	06/448,773	9/11/84
4,470,176	06/429,383	9/11/84
4,470,187	06/454,999	9/11/84
4,470,197	06/425,868	9/11/84
4,470,198	06/415,962	9/11/84
4,470,201	06/467,021	9/11/84
4,470,212	06/357,747	9/11/84
4,470,222	06/337,382	9/11/84
4,470,231	06/290,728	9/11/84
4,470,245	06/384,641	9/11/84
4,470,246	06/525,970	9/11/84
4,470,275	06/230,479	9/11/84
4,470,295	06/381,438	9/11/84
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4,471,479	06/374,266	9/11/84

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,402,190	06/377,022	9/6/83	5/11/82	9/30/88
4,426,098	06/346,293	1/17/84	2/5/82	9/28/88

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,108,029, Re. S.N. 256,907, Filed Oct. 12, 1988, Cl. 83/54, CUT-OFF DIE SET, Alexander Borzym, Owner of Record: *Alpha Industries, Inc., Detroit, Mich.,* Attorney or Agent: Thomas N. Young, Ex. Gp.: 324

4,589,767, Re. S.N. 195,854, Filed May 19, 1988, Cl. 355/45, READER-PRINTER, Masaaki Vanagi, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Ronald A. Clayton, Ex. Gp.: 215

4,591,626, Re. S.N. 199,775, Filed May 27, 1988, Cl. 526/282, POLYMERS OF TRICYCLO [5.2.1.$0^{2,6}$] DECA-8-YL (METH) ACRYLATE, Hiromasa Kawai, et al., Owner of Record: *Hitichi Chemical Co. Ltd., Tokyo, Japan,* Attorney or Agent: David T. Terry, Ex. Gp.: 155

4,615,688, Re. S.N. 254,395, Filed Oct. 6, 1988, Cl. 464/93, COUPLING DEVICE, Rudolf Schneider, Owner of Record: *Erowa AG, Reinach, Switzerland,* Attorney or Agent: John B. Pegram, Ex. Gp.: 342

4,751,154, Re. S.N. 260,428, Filed Oct. 19, 1988, Cl. 429/53, BATTERY EXPLOSION ATTANUATION MATERIAL AND METHOD, Richard R. Binder, et al., Owner of Record: *Globe-Union Inc., Milwaukee, Wis.,* Attorney or Agent: Edward L. Levine, Ex. Gp.: 114

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,025,159, Reexam. No. 90/001,625, Requested: Oct. 24, 1988, Cl. 350/105, CELLULAR RETROREFLECTIVE SHEETING, Joseph M. McGrath, Owner of Record: *Minnesota Mining & Mfg. Co., St. Paul, Minn.,* Attorney or Agent: Roger R. Tamte, Ex. Gp.: 250, Requester: Spensley, Horn, et al., Los Angeles, Calif.

4,590,265, Reexam. No. 90/001,623, Requested: Oct. 18, 1988, Cl. 536/63, CARBOXYLATED CELLULOSE ESTER AND MANUFACTURE THEREOF, Richard T. Bogan, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Thomas Savitsky, Ex. Gp.: 150, Requester: Owner

4,605,721, Reexam. No. 90/001,624, Requested: Oct. 18, 1988, Cl. 536/63, NOVEL GRAFT COPOLYMERS AND PROCESS FOR THE PREPARATION THEREOF, Waylon L. Jenkins, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Thomas R. Satvitsky, Ex. Gp.: 150, Requester: Owner

4,659,369, Reexam. No. 90/001,626, Requested: Oct. 27, 1988, Cl. 71/92, HERBICIDAL ACETALS AND KETALS, George Levitt, Owner of Record: *E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.,* Attorney or Agent: Barbara C. Siegell, Ex. Gp.: 120, Requester: Owner

4,753,672, Reexam. No. 90/001,627, Requested: Oct. 27, 1988, Cl. 71/92, HERBICIDAL ACETALS AND KETALS, George Levitt, Owner of Record: *E. I. Du Pont de Nemours & Co., Inc., Wilmington, Del.,* Attorney or Agent: Barbara C. Siegell, Ex. Gp.: 120, Requester: Owner

Department of the Treasury
United States Customs Service

Recordation of Trade Name: "J & J AMERICA, INC."

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Recordation
Summary: On July 19, 1988, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "J & J AMERICA, INC." was published in the Federal Register (53 FR 27258). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views or arguments submitted in writing by any person in opposition to the recordation and received not later than Sept. 19, 1988. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "J & J AMERICA, INC." is recorded as the trade name used by J & J America, Inc., a corporation organized under the laws of the State of Florida, located at 11401 SW. 40th St., Miami, Fla. 33165.

The trade name is used in connection with the following merchandise manufactured in Korea: textiles; textile products; fabrics; ladies handbags; luggage; audio/visual equipment; televisions; video camera recorders; electronic accessories and costume jewelry.

For Further Information Contact: Bettie Coombs, Value Special Programs and Admissibility Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202) 566-5765.

MARVIN M. AMERNICK,
Oct. 31, 1988 *Chief, Value, Special Programs and Admissibility Branch.*

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Status of PTO Services

The following is an update of the status of PTO services for October 1988:

Service Item	FY 1988 Goal (Calendar Days[1])	Monthly Average (Calendar Days[1])
Filing Receipts:		
Patents	22	25*
Trademarks	30	17
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	18 Hours
Window Coupons	5	2
Mail Coupons	12	6
Letter Orders	16	9
Certified Copies:		
Trademark Registrations	21	30
Applications-As-Filed	17	11**
File-Wrapper/Contents	N/A	13
Walk-up Certification	1	1
Trademark Search Library:		
Filing Pending Marks	21	11
Filing Reg. Certificates	Issue Date	Issue Date
Filing Temp. Drawings	6	5
Assignments:		
Recording Patent Assignments	20	129***
Receipt Date of Patent Documents Returned		June 17, 1988
Recording Trademark Assignments	20	98***
Receipt Date of Trademark Documents Returned		June 30, 1988
Avg. Days from Issue Fee Payment to Issue Date	90–100	92
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule
Patent Copies Available	95% on Issue Date	99% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

1] Unless otherwise noted.
* Backlog created due to unusually high number of applications being received. Special efforts are being applied and days have been reduced by 6 since last month.
** The 5% of orders for which fiche are not on site are not included in calculations.
*** See Narrative.

SERVICE STATISTICS

* *Assignment Processing* — The Assignment and Certification Branches have been combined under one Division and an attorney/manager has been appointed to provide legal advice and closer control of operations. We have ascertained that substantial backlogs exist in a number of different processing steps for both patent and trademark assignments. Our goal is to reduce the backlogs by Jan. 31, 1989. We have instituted a number of changes to expedite processing such as using data worksheets to speed typing of trademark cards and instituting a quality review step early in processing to more quickly catch errors. We are also addressing problems in reporting, especially documenting and tracking incoming work and production.

The definitions of items reported under Service Statistics are:

Recording Trademark Assignments—The number of days from receipt in the PTO (recording date) to the filing of cards in the Assignment Search Room.

Receipt Date of Trademark Documents Returned—The date of receipt in the PTO of assignments most recently processed and mailed back.

Because patent assignments are received in the Assignment Branch from both the Mail Room and from Application Division (when they are filed with new applications), a variety of Mail Room receipt dates are in process at any given time. During the next month we will explore means to capture and report on the processing times for various types of patent assignments received. For this month, the processing time reported reflects that of the bulk of the work now being processed.

Resolving the assignments reporting issues, as well as getting back on target, are high priorities.

IMPROVEMENT TO SERVICE

* *Fee Postings* — As a result of a suggestion from a member of the public, bulletin boards, containing a listing of all PTO fees, have been installed at the Attorney's Window in the Mail Room and at the Cashier's Window in the Finance Office.

* *Information Contacts* — Attached is an alphabetical index of information contacts.

THERESA A. BRELSFORD.
Assistant Commissioner for Administration.

Nov 4, 1988

* * * * *

Information Contacts
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Patents . . . .
Trademarks . . . .

For additional information contact:
Public Service Center . . . . (703) 557-INFO

For service problems not successfully resolved using normal channels contact:
Public Service Center . . . . (703) 557-HELP

All numbers are area code 703 unless otherwise noted

Address Boxes, PTO Special

These boxes should be used *only* for the specified purposes. *Only* material for which the special boxes have been established should be enclosed.

Address to:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for the U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box 171	Vacancy Announcement Applications.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the Official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
Patent Application	New patent application and associated papers and fees.
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Note: Please Mail *Deposit Account Remittances only* to:

Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

Drop Boxes

Department of Commerce
Main Entrance
14th and E St., NW.
Washington, D.C.

Patent and Trademark Office
Crystal Plaza 3 — Lobby
Arlington, Va.

Note: (Hours 8:30 a.m. - 12:00 midnight Monday - Friday)

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Note: All questions should be addressed to:

Box 2600
Arlington, Va. 22202

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Note: Rule 312 Amendments should be mailed to:

U.S. Patent and Trademark Office
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Crystal Plaza 2 Room-6C30
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Note: Address inquiries to:

Mr. C. A. LaBarre
Superintendent of Documents
United States Government Printing Office
Washington, D.C. 20402
(202) 783-3238

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PATENT NOTICES

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PP 6,230	4,706,788	4,739,923	4,755,556
Re. 32,606	4,708,421	4,740,035	4,755,622
D. 296,239	4,708,930	4,740,229	4,755,644
D. 297,125	4,710,449	4,740,330	4,755,743
D. 297,126	4,711,110	4,741,330	4,756,049
4,427,871	4,711,903	4,741,765	4,756,052
4,467,444	4,712,355	4,741,974	4,756,093
4,511,194	4,714,399	4,742,356	4,756,187
4,520,283	4,715,534	4,742,651	4,756,370
4,552,477	4,716,111	4,742,712	4,756,562
4,567,157	4,716,547	4,742,756	4,756,572
4,578,490	4,720,014	4,744,018	4,756,618
4,583,583	4,720,078	4,744,258	4,756,899
4,622,215	4,720,875	4,744,318	4,757,023
4,645,980	4,721,523	4,744,928	4,757,262
4,647,790	4,721,743	4,745,075	4,757,264
4,662,431	4,722,046	4,745,256	4,757,328
4,663,504	4,723,304	4,746,256	4,757,474
4,664,812	4,723,565	4,746,616	4,757,621
4,665,310	4,724,921	4,747,097	4,757,636
4,665,427	4,725,019	4,747,575	4,757,794
4,667,850	4,725,140	4,747,826	4,757,927
4,669,134	4,725,526	4,748,148	4,757,963
4,669,198	4,726,239	4,748,258	4,757,983
4,671,029	4,726,256	4,749,108	4,758,247
4,672,357	4,727,392	4,749,394	4,759,196
4,672,449	4,727,500	4,750,540	4,759,294
4,673,750	4,727,608	4,752,058	4,759,339
4,674,417	4,728,229	4,752,281	4,759,368
4,675,277	4,728,242	4,752,295	4,759,548
4,678,625	4,728,574	4,752,487	4,759,564
4,679,650	4,730,048	4,752,811	4,759,680
4,680,640	4,730,273	4,753,155	4,760,116
4,682,382	4,732,102	4,753,255	4,760,120
4,682,710	4,732,241	4,753,412	4,760,124
4,686,012	4,732,257	4,753,603	4,760,478
4,688,439	4,732,816	4,753,762	4,760,483
4,688,819	4,734,183	4,753,888	4,760,676
4,690,867	4,734,872	4,754,027	4,760,831
4,691,039	4,735,749	4,754,080	4,761,002
4,691,381	4,735,889	4,754,105	4,761,152
4,691,833	4,736,273	4,754,108	4,761,188
4,694,199	4,736,285	4,754,269	4,761,374
4,696,465	4,736,512	4,754,386	4,761,566
4,699,838	4,736,598	4,754,640	4,761,569
4,700,264	4,736,660	4,754,784	4,761,637
4,700,399	4,736,678	4,754,806	4,762,129
4,701,903	4,737,815	4,755,374	4,762,375
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Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box Issue Fee	Issue Fee Transmittals (PTOL Form 85) and associated fees and corrected drawings.
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Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System); which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska—Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
		(214) 670-1468
	Dallas Public Library	(713) 527-8101 Ext. 2587
	Houston: The Fondren Library, Rice University	(801) 581-8394
Utah	Salt Lake City: Marriott Library, University of Utah	(804) 367-1104
Virginia	Richmond: Virginia Commonwealth University Library	(206) 543-0740
Washington	Seattle: Engineering Library, University of Washington	(608) 262-6845
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner

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PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	2-10-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	9-3-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-5-87
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MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—VACANT, Director	1-6-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-16-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-6-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1988, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,609,763 to 3,616,462, inclusive
Plant Patents ..... 3,063 to 3,081 inclusive

REEXAMINATIONS

NOVEMBER 29, 1988

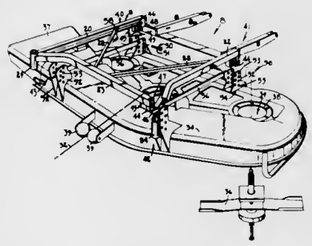
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 30,759 (951st)
Patent Not Issued For This Number

B1 4,325,211 (952nd)
FLOATING DECK FOR RIDER MOWER

Robert H. Witt, Bloomington, and Walter J. Petersen, Eden Prairie, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Reexamination Request No. 90/001,515, May 23, 1988.
Reexamination Certificate for Patent No. 4,325,211, issued Apr. 20, 1982, Ser. No. 183,293, Sep. 2, 1980.
Int. Cl.[4] A01D *34/66, 34/74*
U.S. Cl. 56—15.8



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **3–5** are cancelled.

Claim **2** is determined to be patentable as amended.

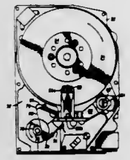
Claims **6–8** dependent on an amended claim, are determined to be patentable.

2. A self-propelled riding mower, which comprises:
(a) a traction unit suited for movement over the ground;
(b) a cutting unit having means for cutting vegetation; and
(c) means for mounting the cutting unit on the traction unit, wherein the mounting means comprises:
(i) frame means extending outwardly from the traction unit; and
(ii) means for suspending the cutting unit from the frame means on at least three suspension points defining a plane with the cutting unit free to move upwardly at each of the suspension points independently of the frame means and independently of whether the frame means also moves upwardly at the other suspension points to allow the cutting unit to free float and tilt side-to-side relative to the frame means, and wherein the suspending means comprises a suspension unit at each of the suspension points, wherein each suspension unit comprises an upwardly opening saddle member carried on the frame means having a pre-determined open vertical height; *and* a pin carried on the cutting unit wherein the pin is received in the saddle member and is free to move upwardly throughout the height of the saddle member, and wherein the open vertical height of the saddle member is at least twice the diameter of the pin to allow substantial vertical movement therein, *further including means for longitudinally fixing at least some of the pins to the saddle members in which they are received to longitudinally secure the cutting unit relative to the frame means so that the cutting unit is propelled by the traction unit, and further including means for vertically adjusting the pins on the cutting unit for changing the height of cut of the cutting unit relative to the frame means when the pins are received in the saddle members, wherein the saddle members to which the pins are longitudinally fixed include a vertical slot in which the pins are received, wherein the slots are sufficiently vertically elongated to allow vertical movement of the pins therein and are sufficiently narrow to longitudinally constrain the pins therebetween for longitudinally securing the cutting unit to the frame means.*

B1 4,568,988 (953rd)
MICRO HARD-DISK DRIVE SYSTEM

James G. McGinlay, Kirkcaldy, and Roderick M. Urquhart, Glenrothes, both of Scotland, assignors to Rodime plc, Glenrothes, Scotland

Reexamination Request No. 90/001,337, Sep. 28, 1987.
Reexamination Certificate for Patent No. 4,568,988, issued Feb. 4, 1986, Ser. No. 582,554, Feb. 22, 1984.
Int. Cl.[4] G11B *5/012, 5/55, 5/56*
U.S. Cl. 360—77



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

1. A computer disk drive system [for operating a micro hard-disk, said disk drive system] comprising:
at least one micro hard-disk *having a diameter of between 85 and 100 millimeters and having a plurality of concentrically adjacent tracks on each side thereof;*
means for rotatably supporting said micro hard-disk;
means for rotating said *micro* hard-disk;
transducer means for writing digital information on and reading digital information from said *micro* hard-disk in a format so that said *micro* hard-disk has digital information stored at a density of approximately 600 concentric tracks per inch; [and,]
open-loop positioning means [for moving said transducer means between the tracks on said hard-disk] *including means pivotally arranged for moving said transducer means along an arcuate path extending in an approximately radial direction with respect to said micro nard-disk so that said transducer means can move between the innermost and outermost concentric tracks on said micro hard-disk,* said positioning means including a stepper motor and means for operating said stepper motor in full step increments with each step increment being 0.9°, which increment causes said transducer means to move from one track to the next adjacent track on said *micro* hard-disk.

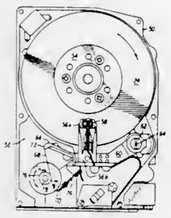
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B1 4,638,383 (954th)

MICRO HARD-DISK DRIVE SYSTEM

James G. McGinlay, 103 Ralston Drive, Kirkcaldy, and Roderick M. Urguhart, 10 Balgeddie Way, Glenrothes, both of Scotland

Reexamination Request No. 98/001,339, Sep. 28, 1987.
Reexamination Certificate for Patent No. 4,638,383, issued Jan. 20, 1987, Ser. No. 790,621, Nov. 19, 1985.
Continuation of Ser. No. 582,554, Feb. 22, 1984, Pat. No. 4,568,988.
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.[4] G11B *5/012, 5/55, 5/56*
U.S. Cl. 360—77



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2, 10, 12, 15** and **16** are cancelled.

Claims **3–9, 11, 13** and **14** are determined to be patentable as amended.

New claims **17–27** are added and determined to be patentable.

3. A computer disk drive system [for operating a micro hard-disk, said disk drive system] comprising:

a sealed housing;

at least one micro hard-disk having a diameter of between 92 and 96 millimeters *and having a plurality of concentrically adjacent tracks on both planar sides thereof, said micro hard-disk* fixedly mounted in [a] *the* sealed housing;

means for rotatably supporting said *micro* hard-disk;

means for rotating said *micro* hard-disk;

transducer means having two read/write heads for writing digital information on and reading digital information from said *micro* hard-disk on both planar sides of said *micro* hard-disk in a format so that said *micro* hard-disk has digital information stored on [concentric] *said concentrically adjacent* tracks at a density providing at least 5 Megabytes of storage per *micro* hard-disk; [and,]

positioning means for moving said transducer means between the *concentrically adjacent* tracks on said *micro* hard-disk, said positioning means including:

two support arms each supporting one of said read/write heads with each read/write head being mounted at one end of its respective support arm;

a pivot shaft having an axis located on one side of said support arms and spaced away from said support arms;

a positioning arm to which the other ends of said support arms are attached, said positioning arm having one end thereof coupled to said pivot shaft;

a bearing assembly supporting said pivot shaft for rotational movement thereby enabling said positioning arm to be pivoted about the axis of said pivot shaft;

a stepper motor [and] *having an output drive shaft;*

means for operating said stepper motor in step increments[,]; *and*

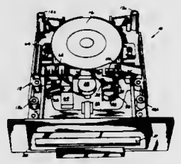
a tensioned steel band coupling said drive shaft of said stepper motor to the other end of said positioning arm, said band being arranged in a pulley arrangement whereby rotational movement of said stepper motor causes pivoting of said positioning arm about said pivot shaft for moving said support arms and the read/write heads in incremental steps with each increment causing said [transducer means] *read/write heads* to move from one track to the next adjacent track on said *micro* hard-disk.

B1 4,647,994 (955th)

MINIATURIZED CARTRIDGE-TYPE TAPE DRIVE FOR DATA PROCESSORS

Samuel N. Irwin; Francis Lum; Michael L. Bolt, all of Ann Arbor; Steven E. Henke, Westland; Edmund L. Sokolik, Warren, and John M. Chambors, Canton, all of Mich., assignors to Irwin Magnetic Systems, Inc., Ann Arbor, Mich.

Reexamination Request No. 90/001,369, Nov. 2, 1987.
Reexamination Certificate for Patent No. 4,647,994, issued Mar. 3, 1987, Ser. No. 589,146, Mar. 13, 1984.
Int. Cl.[4] G11B *5/027, 5/54, 21/22, 21/08*
U.S. Cl. 360—85



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–25** is confirmed.

18. A transducer-moving arm apparatus for use in a data memory having a movable transducer for accessing different recording tracks on a recording media and a cam means for moving said transducer through interconnection therewith by said arm apparatus, said arm apparatus comprising: pivot axle means defining a pivot axis; a first arm portion extending in a first direction away from said pivot axis, and a second arm portion extending in a second direction away from said pivot axis; cam-follower means coupled to said first arm portion at a distance spaced from said pivot axis; means for coupling said second arm portion to said transducer to move the same in response to movement of the first and second arm portions; at least one of said first and second arm portions including a section of thin sheet-like stock having integral angularly-offset extremities for reinforcing such portion and substantially eliminating flexure in the direction of transducer movement otherwise resulting from the forces generated by the operation of said cam means in moving said transducer.

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REISSUES

NOVEMBER 29, 1988

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,790

INERTIALLY LOCKED HINGE FOR MOTOR VEHICLE SEAT

Willibald Strowick, and Paul Werner, both of Remscheid-Lennep, Fed. Rep. of Germany, assignors to Keiper Recaro Incorporated, Battle Creek, Mich.

Reissued No. Re. 31,741, dated Nov. 20, 1984, Ser. No. 173,803, Jul. 30, 1980.
Original No. 4,165,128, dated Aug. 21, 1979, Ser. No. 833,336, Sep. 14, 1977. Application for reissue Jan. 10, 1986, Ser. No. 817,717
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641587
Int. Cl.[4] A47C *1/025*
U.S. Cl. 297—367 **20 Claims**



1. In a motor-vehicle seat having a seat part and a reclining back part adjustable in any of a plurality of angular positions relative to said seat part, a hinge comprising:

a lower hinge element fixed to said seat part;

an upper hinge element fixed to said back part;

means for pivotably connecting said upper hinge element to said lower hinge element;

a positioning element pivotal on said lower hinge element and formed with an outwardly open recess having one end forming a stop formation and another end forming an abutment engaging said upper hinge element in a rest position thereof;

an inertial pawl in the form of a two-arm lever pivotal on said upper hinge between a blocking position and a freeing position, one arm of said lever being directed toward said stop formation on said positioning element and having a stop face engageable with said formation when said pawl is in said blocking position, the other arm of said lever being directed substantially horizontally and weighted so as normally to pivot by gravity in one rotational sense into said freeing position;

said another end on said positioning element having a support surface adapted for engaging said other arm against the force of gravity to urge said pawl into said blocking position and for releasing said other arm into said freeing position only **[[**upon a slow forward pivoting of said back part**]] when the resultant of gravity and any inertial force, together with pivot reaction provide an effective unblocking couple on the inertial pawl during initial forward seat back movement**; and

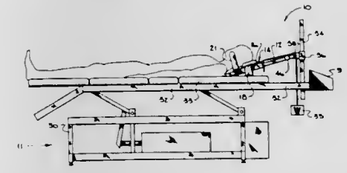
means for locking and positioning means in any of a plurality of angularly offset positions for adjusting said rest position.

Re. 32,791

CERVICAL TRACTION DEVICE

Harold D. Saunders, 9840 Purgatory Rd., Eden Prairie, Minn. 55344

Original No. 4,508,109, dated Apr. 2, 1985, Ser. No. 338,479, Jan. 11, 1982. Application for reissue Mar. 9, 1987, Ser. No. 23,220
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—75 **17 Claims**



11. An apparatus for applying a therapeutic traction force to the body of a patient along a line in general alignment with the spine, and comprising

track means adapted to be positioned on a traction table or the like and so as to extend in a longitudinal direction,

carriage means mounted for slideable movement in the longitudinal direction along said track means,

attachment means mounted to said carriage means for attachment thereto of a force applying means so that a force may be applied to said carriage means which tends to move the same in the longitudinal direction along said track means,

upstanding body engaging means configured for engaging the occipital area of the patient's head which is restingly received thereon, and

means mounting said body engaging means to said carriage means for selective pivotal movement about an upright pivotal axis which is substantially perpendicular to the longitudinal direction, and whereby the lateral angle of the traction force relative to the midline of the patient's body may be laterally adjusted.

Re. 32,792

PROCESS FOR PRODUCING MESOPHASE PITCH

Takayuki Izumi; Tsutomu Naito, both of Saitama, and Seiko Igarashi, Sakado, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 4,533,461, dated Aug. 6, 1985, Ser. No. 281,407, Jul. 8, 1981. Application for reissue Nov. 3, 1986, Ser. No. 926,153
Claims priority, application Japan, Jul. 21, 1980, 55-99646
Int. Cl.[4] C10C *3/00*
U.S. Cl. 208—44 **9 Claims**

1. A process for producing a mesophase pitch having a mesophase content of above 90% and a softening point of below 320° C. comprising the steps of:

(1) heat-treating a pitch forming material at elevated temperatures above about 380° C. for a time sufficient to provide a mixture of mesophase and non-mesophase pitch containing about 20% to about 80% **[**by weight**]** of mesophase and a softening point of no greater than 250° C.;

(2) aging and settling said mesophase portion of said mixture of mesophase and non-mesophase pitch obtained in step (1) by maintaining the mixture in a substantially quiescent condition and at a temperature below the temperature in the heat-treating step, *at which temperature the mixture is sufficiently liquid so that the separation of the mesophase and*

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nan-mesophase portions of the mixture can be substantially accomplished, [and above about 350° C.] for a time sufficient for the mesophase portion of the mixture to coalesce and accumulate into a substantially lower homogeneous mesophase pitch layer containing at least 90% mesophase and an upper layer comprising the non-mesophase portion of said mixture; and

(3) separating said lower mesophase layer from said upper non-mesophase layer whereby a mesophase pitch which has a mesophase content of above 90% and a softening point below 320° C. is obtained. heat-treated at a temperature in the range of about 380° C. to about 460° C. whereby thermal cracking and polycondensation reactions occur.

Re. 32,793

LATCHING SOLENOID MECHANISM

Keith F. Baker, Naperville; Richard M. Kowalski, Morton Grove, and Ralph E. Mishler, Deerfield, all of Ill., assignors to Synchro-Start Products, Inc., Skokie, Ill.

Original No. 4,623,860, dated Nov. 18, 1986, Ser. No. 747,923, Jun. 24, 1985. Application for reissue Jul. 20, 1987, Ser. No. 75,356

Int. Cl.[4] H01H *9/20*

U.S. Cl. 335—170 **15 Claims**

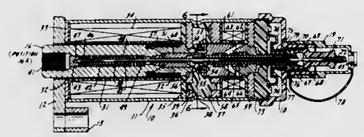
9. In a latching solenoid of the kind comprising a main plunger axially movable between an unactuated position and an actuated position, a main return spring for driving the main plunger to its unactuated position, a latching mechanism for holding the main plunger in its actuated position, a latch release plunger axially movable through a given displacement from a normal position to a latch release position to release the latch means and allow the main plunger to return to its unactuated position, a latch spring urging the latch release plunger to its normal position, and a release coil energizable to drive the latch release plunger to its latch release position, an improved latch mechanism comprising:

a ball race mounted on the main plunger and having a plurality of circumferentially distributed ball-receiving apertures;

a plurality of balls disposed in the ball race apertures;

first and second axially displaced fixed retainer means of different diameters, interconnected by a shoulder defining limits of displacement of the balls in one radial direction for the unactuated and actuated positions, respectively, of the main plunger;

and third and fourth axially displaced retain means of different diameters defining limits of displacement of the balls in the



opposite radial direction when the balls engage the first and second retainer means, respectively;

one of the retainer means comprising a movable retainer connected to the latch release plunger;

the balls displacing the movable retainer means, as the main plunger nears its actuated position, through an axial clearance distance sufficient to allow the balls to ride along the shoulder away from the first retainer means and into contact with the second retainer means and permitting the latch release plunger to return to its original position, the balls engaging the shoulder to latch the main plunger in its actuated position until the latch release plunger is driven to its latch release position.

PLANT PATENTS

GRANTED NOVEMBER 29, 1988

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,421

GRAPEVINE, ROUGE

George L. Caratan, Delano, Calif., assignor to Anton George Caratan, Delano, Calif.

Filed Jan. 29, 1987, Ser. No. 8,643

Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine to be denominated varietally as "Rouge", substantially as illustrated and described, and which is characterized principally as to novelty by its production of a red berry which is mature for harvesting approximately September 10 to October 15 in Delano, Calif., said grapes maturing in approximately the same season as the fruit produced by the Emperor grapevine (unpatented) which it most closely resembles but from which it is distinguished by producing berries which are mature for commercial harvesting approximately two to three weeks before the Emperor grapevine and which further has leaves having a distinctive U-shaped petiolar sinus and which further has cluster size and color which are distinctively different from the Emperor variety of grapevine.

6,422

LILY NAMED BUTTER PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Jan. 22, 1987, Ser. No. 6,026

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Asiatic hybrid lily, substantially as herein shown and described, characterized by its short height and its medium-large sized, vivid yellow flowers; the excellence of its flower form and its versatility both as a garden plant and as a pot plant variety well suited to forcing into flower out of season.

6,423

ANNETTE HEGG DIVA STARLIGHT

Peter Jacobsen, Skibby, Denmark, assignor to Paul Ecke, Jr., Encinitas, Calif.

Filed Jan. 23, 1987, Ser. No. 6,424

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinctive Poinsettia cultivar, substantially as herein shown and described, distinguished by the brighter red color than other red varieties of the Annette Hegg family.

6,424

LILY NAMED CORAL PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Feb. 25, 1987, Ser. No. 18,917

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive variety of Asiatic hybrid lily and parts thereof, substantially as herein shown and described, characterized by its gold accented, 'old rose' colored flowers with their dainty ring of tiny spots, the excellence of its flower form, and its versatility both as a garden plant and as a pot plant variety well suited to forcing into flower out-of-season.

6,425

LILY NAMED BUFF PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Feb. 25, 1987, Ser. No. 18,918

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily plant and parts thereof, substantially as herein shown and described, characterized by its virtually unspotted, clear buff-orange flowers; and by its short stemmed, longer, and abundantly leaved, upright flowering silhouette particularly suited for pot plant culture and for forcing into flower out-of-season from properly precooled bulbs.

6,426

LILY NAMED PEACH PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Gresham, Oreg.

Filed Feb. 25, 1987, Ser. No. 18,919

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive variety of Asiatic hybrid lily, substantially as herein shown and described, characterized by its virtually unspotted, gold accented, deep peach-pink flowers and by its short stemmed, longer, and more abundant leaves and an upright flowering silhouette; this plant has a high resistance to disease and a high tolerance to virus; its vigorous growth habit and rapid natural propagation together with its versatility both as a garden plant and as a pot plant variety make it well suited to forcing into flower out of season from properly precooled bulbs.

6,427

BEGONIA PLANT NAMED ENCHANTMENT

Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1987, Ser. No. 20,762

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct Begonia plant named Enchantment, as illustrated and described, and particularly characterized by its salmon orange flower color, semi-double flower form, cyme type inflorescence; compact, upright growth habit with good branching, early flowering, ease of propagation by stem and leaf cuttings, and excellent flower retention during shipping.

6,428

AFRICAN VIOLET PLANT NAMED MEMPHIS

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Mar. 4, 1987, Ser. No. 21,733

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Memphis, as described and illustrated, and particularly characterized by its single light pink, wavy flowers, girl-type leaves, strong, upright flower stems that curve toward the center to form a bouquet above the leaves, profuse flowering, vigorous growth habit, flowering 9–10 weeks after potting, and its long-lasting and non-dropping flowers.

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6,429
AFRICAN VIOLET PLANT NAMED SUSI
Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselberg, Fed. Rep. of Germany
Filed Mar. 4, 1987, Ser. No. 21,734
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Susi, as described and illustrated, and particularly characterized by its single, frilled, mainly white flowers with red-purple centers; strong, upright flower stems that curve toward the center to form a bouquet above the leaves; profuse flowering; vigorous growth habit, flowering 8–9 weeks after potting, and its long-lasting and non-dropping flowers.

6,430
AFRICAN VIOLET PLANT NAMED JULIANA
Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany
Filed Mar. 4, 1987, Ser. No. 21,737
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Juliana, as described and illustrated, and particularly characterized by its single, bicolored, bright violet-blue and dark violet flowers; strong, upright flower stems that curve toward the center to form a bouquet above the leaves, profuse flowering, vigorous growth habit, flowering 9–10 weeks after potting, and its long-lasting and non-dropping flowers.

6,431
AFRICAN VIOLET PLANT NAMED AQUARIUS
Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany
Filed Mar. 4, 1987, Ser. No. 21,740
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Aquarius, as described and illustrated, and particularly characterized by its single violet blue flower; heavily serrated, girl-type leaves; strong, upright flower stems that curve toward the center to form a bouquet above the leaves, profuse flowering, vigorous growth habit, flowering 9–10 weeks after potting, and its long-lasting and non-dropping flowers.

6,432
AFRICAN VIOLET PLANT NAMED MARILYN
Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany
Filed Mar. 4, 1987, Ser. No. 21,787
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Marilyn, characterized by its large, single, mainly white flowers with purple centers and occasional purple tinging on the edges; pink in the centers; strong, upright flower stems that curve toward the center to form a bouquet above the leaves; profuse flowering, vigorous growth habit, flowering 9–10 weeks after potting, and its long-lasting and non-dropping flowers.

6,433
CHRYSANTHEMUM PLANT NAMED SALMON BIJOUX
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Research and Breeding B.V., De Lier, Netherlands
Filed Oct. 3, 1986, Ser. No. 915,107
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Salmon Bijoux, as described and illustrated, and particularly characterized by its lavender pink tubular ray floret color; green (immature) to yellow (mature) disc floret color; nine week response; spider/anemone capitulum form, and excellent flower production.

6,434
BEGONIA PLANT NAMED CHANTILLY
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Mar. 2, 1987, Ser. No. 20,761
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Begonia plant named Chantilly, as illustrated and described, and particularly characterized by its rose pink flower color, ruffled, double flowers with petals slightly cut at margins; strong stems and very upright growth habit with good branching; early and profuse flowering, and excellent flower retention during shipping.

6,435
BEGONIA PLANT NAMED GUINEVERE
Lyndon W. Drewlow, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio
Filed Mar. 2, 1987, Ser. No. 20,763
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Begonia plant named Guinevere, as described and illustrated, and particularly characterized by its pink flower color, double flower form, cyme inflorescence, upright growth with strong stems and good branching, early flowering, and ease of propagation both from stem and leaf cuttings.

6,436
AFRICAN VIOLET PLANT NAMED ROCKY MOUNTAIN
Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany
Filed Mar. 4, 1987, Ser. No. 21,735
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 1 Claim

1. A new and distinct cultivar of African violet named Rocky Mountain, as described and illustrated, and particularly characterized by its semi-double, mainly white flowers with purple red edges and centers; strong, upright flower stems that curve toward the center to form a bouquet above the leaves; profuse and long flowering, vigorous growth habit, flowering 9-10 weeks after potting, and its long-lasting and non-dropping flowers.

PATENTS

GRANTED NOV. 29, 1988

ERRATA

For CLASS	See PATENT NO.
449-001	4,787,108
524-410	4,787,188
600-018	4,787,368
356-244	4,787,715
251-368	4,787,736
418-104	4,787,831
261-153	4,788,020
514-661	4,788,130
514-438	4,788,301
536-021	4,788,307
564-457	4,788,339
562-465	4,788,360
341-155	4,788,528
358-256	4,788,578
370-691	4,788,675

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PATENTS

GRANTED NOVEMBER 29, 1988

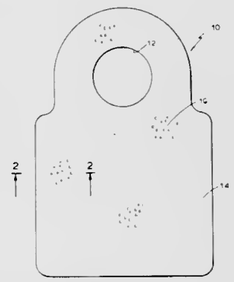
GENERAL AND MECHANICAL

4,787,099

DISPOSABLE LIMITED REUSABLE BIB

Robert J. Mack, Aberdeen, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 113,107
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R 5 Claims



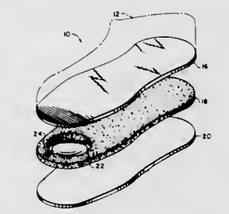
1. A disposable limited reusable bib comprising a sheet of hydrophobic non-woven material, means for securing said bib about the torso of a person, said having a weight of between 20 to 100 grams per square yard, said non-woven material being configurated to simulate terrycloth and having a plurality of outwardly projecting nubbins for the simulation of terrycloth for facilitating retention of food dropped thereon and for enhancing wiping qualities of said bib.

4,787,100

CHILDREN'S ITEM OF APPAREL WITH FOOTWEAR ACTUATED NOISEMAKER

Michael Jonat, 6 Adrienne Pl., White Plains, N.Y. 10605

Filed Jul. 30, 1987, Ser. No. 79,529
Int. Cl.[4] A41D *11/00*; A43B *3/30*
U.S. Cl. 2—80 18 Claims



1. An item of children's clothing apparel including a foot portion adapted to receive the foot of a child, said foot portion including an upper and a sole which defines a toe portion formed of a resilient material, said toe portion having an enclosed cavity; and noisemaker means within said cavity for generating a predetermined noise when pressure is thereto when the child involuntarily applies pressure to said toe portion during walking to thereby depress said toe portion and compress said cavity and said noisemaker means to generate the desired noise effect.

4,787,101

GARMENT FOR CONVALESCENTS

Alixandra Feinberg, 1430 William St., River Forest, Ill. 60305

Continuation-in-part of Ser. No. 641,168, Aug. 15, 1984, Pat. No. 4,683,594. This application Apr. 30, 1987, Ser. No. 44,803
Int. Cl.[4] A41D *1/22*
U.S. Cl. 2—105 16 Claims



1. A dress-like garment suitable for dignified wear in public for use by a convalescent wearer confined at least part of the time to a wheelchair and secured therein for safety reasons by a restraining device distinct from the dress-like garment said restraining device having strap portions which are intended to be fastened to such wheelchair, said dress-like garment comprising a body portion, said body portion including a front portion having a front hemline and a back portion having a rear hemline which is longer than said front hemline, a sleeve portion, and opening means within the body of said garment through which such strap portions of such restraining device can extend from within to outside of said garment for fastening such restraining device to such wheelchair, said garment substantially concealing the restraining device while covering the wearer so as to be suitable for dignified wear in public.

4,787,102

DETACHABLE PATIENT AID FOR COMMODE

Pamela Rosenberg, 33 N. Mercer La., Pearl River, La. 70452

Filed Feb. 27, 1987, Ser. No. 19,765
Int. Cl.[4] E03D *11/00*
U.S. Cl. 4—254 7 Claims



1. A urinal apparatus for assisting a male child with a handicapping condition in use of a commode having a rim and an open bowl, comprising:

a. a base portion connectable to the commode, and including a pair of spaced apart horizontal members that are positioned on the rim of the commode, a pair of upright members extending above the commode, and a transverse member defining a handle for a user;

b. connection means positioned rearwardly of the commode bowl for attaching the base portion to the commode at rear end portions of the horizontal members; and

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c. a receptacle removably mounted on the base portion forwardly of the bowl for providing a flow passage for waste from the user into the commode and for allowing easy cleaning.

4,787,103

TRAPLESS WATER FLUSH TOILET BOWL FIXTURE

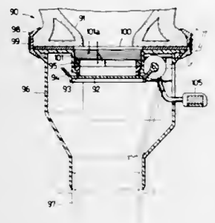
Makoto Endo, Handa, Japan, assignor to INAX Corporation, Tokoname, Japan

Filed Sep. 25, 1986, Ser. No. 911,610

Claims priority, application Japan, Oct. 11, 1985, 60-156067[U]; Nov. 25, 1985, 60-182111[U]; Nov. 29, 1985, 60-184954[U]; Apr. 1, 1986, 61-49233[U]; Jun. 3, 1986, 61-84366[U]

Int. Cl.⁴ E03D *11/10*

U.S. Cl. 4—441 **15 Claims**



1. A trapless water flush toilet bowl fixture comprising,

a bowl having a waste water discharge port at a bottom portion thereof,

cylindrical means attached to the discharge port of the bowl to allow materials in the bowl to pass therethrough, said cylindrical means having one of concave groove and rib at a lower portion thereof,

a seal packing attached to the lower portion of the cylindrical member, said seal packing having one of rib and concave groove to engage said one of concave groove and rib respectively so that the seal packing can be attached to and detached from the cylindrical means through the inside of the cylindrical means,

closing means tor blocking the waste water discharge port, said closing means including a disk-like member situated adjacent to the bowl to pivot thereto, said disk-like member abutting against the seal packing from underside thereof, and a sinker connected to one end of the dish-like member so that the sinker urges the disk-like member to abut against the seal packing, said disk-like member, when a predetermined amount of weight is applied to the dish-like member, being able to pivot relative to the bowl to open the waste water discharge port, and

operation means for opening the waste water discharge port, said operation means being connected to the dish-like member so that when the operation means is actuated, the dish-like member pivots to allow materials on the dish-like member to drop.

4,787,104

CONVERTIBLE HOSPITAL BED

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90049

Filed Oct. 18, 1984, Ser. No. 662,355

Int. Cl.⁴ A61G *7/06*

U.S. Cl. 5—66 **23 Claims**

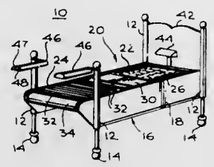
1. A convertible bed comprising:

a main frame supported on legs and extending generally between the head and foot of the bed;

a movable frame supported on the main frame and movable longitudinally relative thereto between a first position defining a bed configuration and a second position defining a chair configuration;

an upper body portion of the movable frame which is pivotably mounted to the movable frame approximately midway between opposite ends thereof;

selectively operable drive means for controlling the position of the upper body portion between a generally horizontal attitude in the bed configuration and a nearly vertical attitude in the chair configuration, whereby the upper body portion serves as a chairback in the chair configuration; and



selectively operable means for driving the movable frame longitudinally between said first and said second positions, said last-mentioned means including means for drawing the foot end of the movable frame back under the bed in the chair configuration.

18. The convertible bed of clam 1 further including a pair of arm rests respectively positionable adjacent the legs at the foot of the bed for use by a patient when the bed is in the chair configuration.

4,787,105

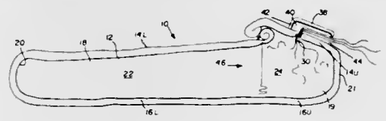
SLEEPING BAG WITH SNORKEL HOOD AND DRAFT CURTAIN

James G. Phillips, Pleasant Grove, and Gordon K. Scott, Orem, both of Utah, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 10, 1987, Ser. No. 12,954

Int. Cl.⁴ A47G *9/08*

U.S. Cl. 5—413 **5 Claims**



1. A sleeping bag comprising:

an elongated body having upper and lower portions and formed of a material having low air porosity, said body having means defining an opening in said upper portion for allowing a person to breathe therethrough but not of a size providing for access into said body by such person;

means separate from said breathing opening and providing an access opening in said upper portion enabling access into said body by such person;

a snorkel hood carried by said body and disposed over said breathing opening, said snorkel hood having top and side walls closing said hood for preventing entry of precipitation into said opening, said snorkel hood also having at least one open side for allowing outside air to enter said breathing opening, said snorkel hood being formed of a material having sufficient pliability so that the snorkel hood may be collapsed but also having sufficient rigidity so that said snorkel hood may be self-supporting over said breathing opening.

4,787,106

BODY SUPPORT DEVICE SUCH AS CUSHIONS OR PILLOWS

John B. Paxon, 123, Abbey Foregate, Shrewsbury SY2 6A2, United Kingdom

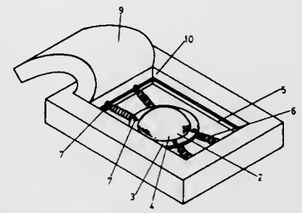
PCT No. PCT/GB85/00380, § 371 Date Jun. 13, 1986, § 102(e) Date Jun. 13, 1986, PCT Pub. No. WO86/01385, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 23, 1985, Ser. No. 925,635

Claims priority, application United Kingdom, Aug. 23, 1984, 8421408

Int. Cl.⁴ A47C *7/42, 7/46, 27/20*

U.S. Cl. 5—432 **7 Claims**



1. A portable cushion comprising a support structure mounted within a case, said support structure comprising, in combination, a rigid frame with a convex support pad fixed to the frame by resilient connection means, the support structure located in the interior portion of the cushion, and being surrounded by a solid, soft, filling or padding material.

4,787,107

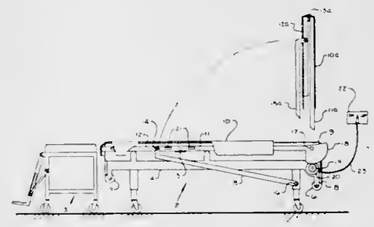
BLANKET REMOVER ARRANGEMENT

Paul DiMatteo, Dix Hills, and Charles F. Chubb, Brookville, both of N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 731,533, May 7, 1985. This application Apr. 27, 1987, Ser. No. 43,182

Int. Cl.⁴ A47C *21/02*

U.S. Cl. 5—488 **9 Claims**



1. A person transfer system including a platform positioned at a side of a bed and having a horizontal surface; a bed with a frame and a mattress thereon; a transport sheet on which a person may lie; said transport sheet extending across said mattress; roller means for moving said transport sheet and transporting said person across the mattress and onto said horizontal surface; a cover sheet extending across the mattress over and on said transport sheet; a lift member and attachment means, said cover sheet being removably fastened by said attachment means to said lift member in vicinity of a side of said bed; motor means for moving said lift member to remove said cover sheet from said transport sheet; control means for actuating said motor means to remove or replace said cover sheet; said lift member comprising a first bar and a second bar on each side of said bed; a hinge for pivotally connecting said first and second bars; said first bar being pivotally connected to said frame; said motor means being coupled to said first bar; a link pivotally connected to said second bar, said link being pivotally connected to said frame; said first and second bars and said link and said frame comprising a four bar linkage on each side of said bed so that actuating said motor raises said first and second bars to substantially vertical position above said bed; said bars and said cover sheet attached thereto being folded above said bed; said motor replacing said cover sheet on said mattress when said motor is actuated therefor.

4,787,108

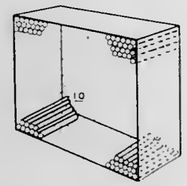
NEST FOR AND METHOD OF MANAGING MEGACHILE ROTUNDATA

Frederick A. Norman, 21 Greensview Road, Banksia Park, Australia

Filed Apr. 10, 1987, Ser. No. 36,946

Int. Cl.⁴ A01K *47/00*

U.S. Cl. 449—1 **11 Claims**



6. A nest for Megachile Rotundata, the nest comprising:

a plurality of tubes for containing progeny of Megachile Rotundata, the tubes having seams joined by a soluble adhesive which can be dissolved in a suitable liquid not toxic to the progeny, wherein when the tubes are immersed in the liquid, the tubes open up releasing the progeny for harvesting and subsequent deployment for pollination of crops, and means for releasably retaining the plurality of tubes in a nest configuration while the Megachile Rotundata are nesting, said retaining means being capable of releasing the tubes from the nest configuration so that individual tubes separate in the liquid.

4,787,109

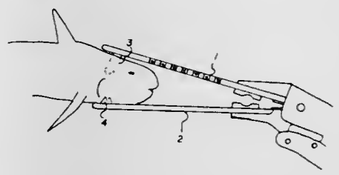
SPORTSMAN MULTIPLE USE TOOL

Clarence L. Bennett, P.O. Box 73, and Tommy L. Bennett, Rte. 1, Box 14, both of Garfield, Ark. 72732

Filed Aug. 14, 1987, Ser. No. 85,478

Int. Cl.⁴ A01K *69/00*

U.S. Cl. 7—106 **5 Claims**



1. A sportsman's multiple use locking plier type gripping tool comprising in combination;

(a) a first flexible elongated tool bill having gripping teeth, with strength and the flexibility to deflect from its normal position, on the elongated side edge, serrations, and on the front free end of the bill an elongated V groove;

(b) a second flexible elongated tool bill also having gripping

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teeth with strength and the flexibility to deflect from its normal position;

(c) a means interconnecting said first and second elongated tool bills so that said first and second bills are swingable with respect to one another between a spaced apart condition and an apposed condition, in which the bill's gripping teeth are in a contracted relationship with one another, with the free ends of said bills defining one end of said gripping tool;

(d) a single rigidly secured elongated vertical gripping tooth on the first of the said bills, the tooth being located in the center front inside of the free end of said bill;

(e) a pair of rigidly secured elongated vertical teeth on the second of the said bills, the teeth being located in the front inside of the free end of said bill;

(f) a spacer having been rigidly secured to each of the said bills, being located on the inside of said bills next to the connected pivoting base of said bills.

4,787,110

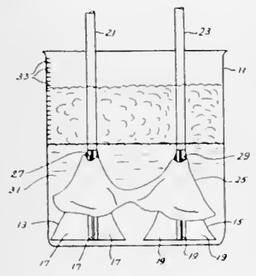
FOAMING TESTING APPARATUS WHICH YIELDS RESULTS CORRELATABLE TO HAND WASHING OF LAUNDRY

Patrizia Barone, Piscataway, and Pallassana Ramachandran, Robbinsville, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 836,907, Mar. 6, 1986, abandoned. This application Jul. 13, 1987, Ser. No. 72,469

Int. Cl.[4] D06B *23/00*

U.S. Cl. 8—158 **6 Claims**



1. A method for determining comparative foaming characteristics of a detergent laundry bar, relatable to actual use of such a bar when it is employed for hand washing of laundry, which comprises dissolving/dispersing in wash water a washing concentration of a detergent laundry bar or the components thereof, subjecting the resulting wash water containing detergent laundry bar components to agitating action of at least a pair of oscillating agitators and corresponding twisting and untwisting action of textile material that is maintained in contact with the agitators, halting the movements of the agitators and the textile material, and measuring the height of foam above the wash water.

4,787,111

SELECTIVELY-RETRACTABLE ELEVATED WALKWAY EXTENSION

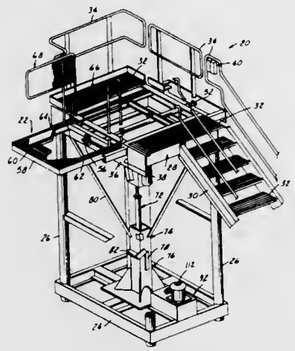
Mathew J. Pacek, St. Charles, and Thomas E. Pomerville, Pinconning, both of Mich., assignors to Magnum Construction Company, Inc., Midland, Mich.

Filed Jan. 11, 1988, Ser. No. 141,978

Int. Cl.[4] E01D *1/00*

U.S. Cl. 14—71.1 **14 Claims**

1. In an elevated walkway assembly, a planar walkway and means for selectively extending said walkway comprising a planar ramp, means mounting said ramp for movement between a retracted position beneath said walkway and an extended position a pair of handrail gates pivotally mounted on said ramp-mounting means at spaced positions adjacent to opposite side edges of said ramp, guide means on said ramp coupled to said handrail gates for pivoting said handrail gates to an open position as said ramp extends from said ramp-mounting means and to a closed position as said ramp is retracted into said ramp-mounting means, and means for selectively extending said ramp from said mounting means and retracting said ramp into said mounting means;



characterized in the said handrail gates overlap each other in said closed position, and in that said guide means on said ramp comprises assymetric guide means for pivoting one said handrail gate to said closed position prior to the other of said handrail gates to prevent interference of said handrail gates with each other.

4,787,112

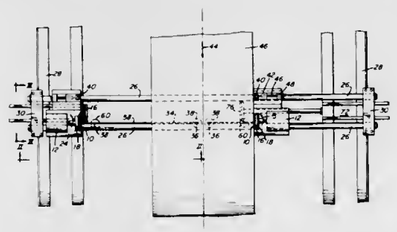
EDGE BRUSH FOR ELECTROPLATED STRIP

Edwin J. Gebhardt, Center Township, Porter County; George H. Keaton; Michael M. Sinar, both of Porter Township, Porter County, all of Ind., and James N. Wendt, Oakland County, Mich., assignors to USX Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1987, Ser. No. 90,482

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—77 **8 Claims**



1. Apparatus for removing excess plated metal from the narrow face of the edges of electroplated metal strip as the strip travels through a strip processing line, said apparatus comprising:

a brush;

a carriage for supporting said brush, said carriage being slidably movable in a transverse direction with respect to the strip,

means mounted on said carriage for rotatably driving said brush,

means for slidably moving said carriage inwardly and permitting movement outwardly in said transverse direction to maintain said brush in contact with the narrow face of said strip edge and so that said brush exerts substantially constant pressure thereagainst,

said brush comprising a cup having an outer cylindrical surface and filaments extending longitudinally along an inner face of said outer cylindrical surface so as to extend beyond an exposed edge thereof, said brush being rotatably driven about a central longitudinal axis of said cup so as to rotate in a direction downwardly across a top surface of the strip and against the direction of strip travel.

4,787,113

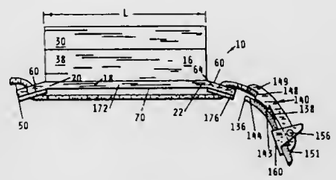
HAND-MOUNTED SQUEEGEE

David R. Kamenske, Rt. 1, Box 250, Bellwood, Nebr. 68624

Filed Mar. 25, 1988, Ser. No. 148,277

Int. Cl.[4] A47L *25/00*

U.S. Cl. 15—245 **6 Claims**



1. A squeegee for mounting on the back of an operator's hand comprising a base elongated from left to right and having left and right ends and front and rear sides, said base having an undersurface having a forward side and a rearward side, the lowermost portions of the outer edges of which lie substantially in a first plane, an upwardly projecting protrusion attached to said base and also elongated from left to right, a hand-encircling means for extending around an operator's hand, attaching means attaching said hand-encircling means to said base, said protrusion having a forward side and a rearward side together defining a pair of elongated sides extending along the elongation of said protrusion, said protrusion having an upper end having a wiping edge on at least one side of its said pair of sides, said wiping edge having at least one elongated portion extending from left to right, said pair of sides extending along the elongation of said protrusion and transversely to said first plane, there being for reference a second plane parallel to said first plane and extending through said wiping edge, said forward and rearward sides of said protrusion being spaced to provide a specific flexibility such that when pressure is placed on said protrusion so that it bends to that one of its pair of sides which is opposite from said one side on which said wiping edge is disposed then the attack angle which said one side of said protrusion makes with respect to a second plane parallel to said first plane will be substantially 20 degrees to 40 degrees when said bending is caused by a pressing force from an operator's wrist which is at substantially the maximum which will not dislodge from an operator's face a pair of over-the-ear bow type of spectacles on which is the lens being wiped, such spectacles having a capability of gripping the operator's head with an average gripping resistance to the dislodging of the spectacles by such a wiping force when such force is applied during a horizontal motion of the squeegee.

4,787,114

WIPER DRIVING SYSTEM FOR VEHICLE

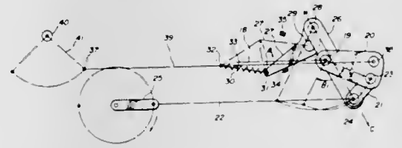
Soichiro Okudaira, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 8, 1987, Ser. No. 105,659

Claims priority, application Japan, Oct. 27, 1986, 61-255499

Int. Cl.[4] F16H *21/24;* **B60S** *1/28*

U.S. Cl. 15—250,13 **4 Claims**



1. A wiper driving system for a vehicle having one or more wiper arms, comprising:

a first driving shaft located at a fixed point on an automotive body;

a wiper arm fixed to said shaft;

a wiper link having one end thereof pivotally connected to the crank of a motor for driving a wiper, said wiper link being reciprocated by said crank;

a first lever fixed at one end to said first driving shaft;

an intermediate link having one end pivotally connected to the other end of said wiper link and the other end thereof to the other end of said first lever, said intermediate link transmitting the reciprocation of said wiper link to said first lever so that the latte oscillates said driving shaft to oscillate said wiper arm between upper and lower positions;

a second lever having one end thereof pivotally connected to the pivotal connection between said intermediate link and said wiper link;

a switching lever pivotally mounted at a fixed point on the automotive body and pivotally connected to the other end of said second lever;

stops fixed to the automotive body to limit movement of said switching lever to a predetermined angle between two positons; and

turn-over spring means connected to said switching lever and to the automotive body for yieldingly retaining said switching lever in either of said two positions,

whereby siad switching lever in one of said two positions limits angular movement of said wiping arm between an upper position and first lower position and in the other of said two positions limits and angular movement of said wiper arm between said upper position and a second lower position.

4,787,115

WINDSCREEN WIPERS

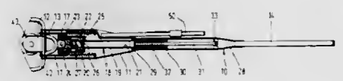
Andrew K. Clokie, Coventry, England, assignor to Jaguar Cars Limited, England

Filed Jun. 17, 1987, Ser. No. 63,120

Claims priority, application United Kingdom, Jun. 24, 1986, 8615385

Int. Cl.[4] B60S *1/12, 1/22*

U.S. Cl. 15—250.21 **5 Claims**



1. A windscreen wiper mechanism comprising a wiper arm including first and second members mounted with respect to

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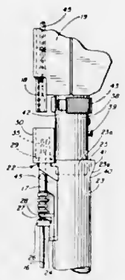
one another so as to permit axial movement of one member relative to the other to vary the length of the arm, mounting means being provided on said first member by means of which the arm may be secured to one end of a pivot by which it may be driven in reciprocating manner, and means being provided on said second member by means of which a wiper blade may be attached, a cam being mounted in fixed relationship to said pivot adjacent said end of the pivot and a fluid operated means being mounted upon the arm for movement therewith, said fluid operated means being controlled by a cam follower which when the arm is mounted on said pivot engages and follows the cam as the arm is moved on the pivot, said fluid means controlling axial movement of the second member relative to the first.

4,787,116
Patent Not Issued For This Number

4,787,117
VACUUM CLEANER ELECTRICAL CONNECTOR MOUNT

George A. Westergren, Linwood Township, Anoka County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 22, 1987, Ser. No. 5,829
Int. Cl.[4] A47L *9/24*
U.S. Cl. 15—339 **15 Claims**



1. In a vacuum cleaner having metallic duct means defining a suction flow passage for conducting dirt laden air in the operation of the vacuum cleaner, and electrical circuit means for controlling operation of the vacuum cleaner including first and second electrical connectors having confronting surfaces and electrical terminals exposed at said surfaces, the improvement comprising:

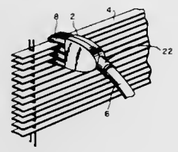
first mounting means removably mounting said first connector to said duct means; and

second mounting means mounting said second connector to said duct means with said electrical terminals being spaced outwardly of said duct means and being electrically connected at a joint between said confronting surfaces capable of passing static electricity outwardly from said duct means to said terminals, said second mounting means including a static shield unitarily integral therewith interposed between said connector confronting surfaces joint and said duct means to comprise means for preventing static electricity from passing outwardly from said duct to said terminals through said joint.

4,787,118
VACUUM BRUSH DEVICE FOR CLEANING VENETIAN BLINDS

Herbert C. Weiland, 54 Avenida Corona, Rancho Palos Verdes, Calif. 90274, and Bryan K. Honkawa, Jr., 561 Ida St., Pacific Palisades, Calif. 90272

Filed Mar. 30, 1987, Ser. No. 32,757
Int. Cl.[4] A47L *9/06*
U.S. Cl. 15—394 **5 Claims**



1. A vacuum brush device for cleaning slatted structures such as venetian blinds comprising:

a hollow body member havng a curved side joined by a pair of flat side members with a plurality of rectangular openings aligned at one end opposite the curved side and adapted to be connected to a source of suction such as a vacuum cleaner hose;

a spring member;

means for connecting the body member to a source of suction including a tubular hollow member, the hollow body member has first and second housing portions, each housing portion has a bearing surface, and the tubular hollow member has a pair of circular rims of complementary dimensions to the bearing surfaces and a pair of indents for contacting the spring member to provide set positions for adjustment; and

a plurality of elongated finger members having a hollow interior attached to and extending from the hollow body member, each finger member having an exterior napped surface on an upper and lower surface so that the napped surfaces extend between each of the finger members, the finger members being spaced at a distance slightly greater than the dimension of the thickness of the slatted structure to be cleaned whereby the napped surfaces will engage and clean the slatted structure, each of the elongated fingers having a rectangular connector and an elongated opening extending through the napped surface and communicating through the hollow exterior with the hollow body member to provide a source of suction between the fingers, the individual elongated finger members are mounted on the hollow body member through connection of the rectangular connectors in the rectangular openings of the hollow body member, the tubular hollow member is connected at one end of the hollow body member opposite the elongated finger members, and the tubular hollow member is movably mounted to permit relative adjustment of the hollow body member with the source of suction.

4,787,119
SUPPORT STRUCTURE FOR ENGAGING OPENING AND CLOSING UNITS TO TRACK

Makoto Furuya, 5, Kandasakumacho 4-chome, Chiyoda-ku, Tokyo, Japan 101

Filed Aug. 27, 1987, Ser. No. 89,876
Claims priority, application Japan, Aug. 29, 1986, 61-202831
Int. Cl.[4] E06B *3/46*; E05D *15/10*
U.S. Cl. 16—102 **3 Claims**

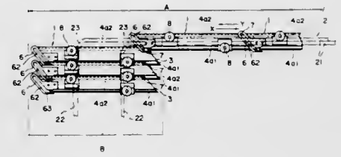
1. A support structure for engaging opening and closing units to a track, wherein the support structure (1) comprises:

a support main body (1') which is secured to the upper side or to both of the upper and the lower sides of each of a plurality of opening and closing units that move along a track laid in an opening and closing section (A) of a predetermined length and a storing section (B) contiguous with said section (A), and which has oblique slidable contact sides (3, 3) each formed in parallel with each other at respective ends of a horizontal plane thereof,

parallel side engagement members (4, 4) each disposed along a longitudinal side of said support main body respectively for slidably engaging a plurality of adjacent support main bodies to each other when a plurality of main bodies are arranged in parallel with each other,

a pulling engagement member (6) integrally secured along one of said oblique slidable contact sides (3, 3) of said support main body (1') and formed with an engaging groove (62) having an introduction port (63) adjacent to a blunt apex (3*b*) and a terminating end (61) adjacent to an acute apex (3*a*) of one of said oblique slidable contact sides (3, 3) and

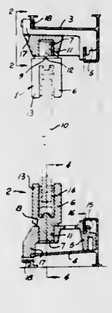
another pulling engagement member (7) integrally secured to the other of said oblique slidable contact sides (3, 3) of said support main body (1') at a position inside the blunt apex (3*b*), such that said another pulling engagement member (7) is engageable in the engaging groove (62) of said one pulling engagement member (6) of an adjacent support main body, when a plurality of support main bodies are arranged in series with each other.



4,787,120
DOOR HINGE ASSEMBLY

Peter Haigh, Palm Beach, Australia, assignor to Ryde Glass Company Pty. Limited, Australia

Filed Jun. 23, 1987, Ser. No. 65,601
Claims priority, application Australia, Jun. 30, 1986, 59392/86
Int. Cl.[4] E05F *1/04, 1/06*
U.S. Cl. 16—317 **4 Claims**

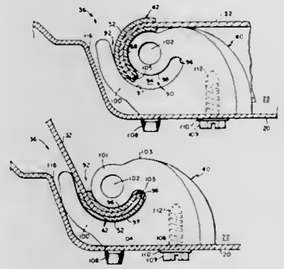


1. A door pivot assembly comprising a base portion adapted for attachment to a support beam; said base portion including a load supporting surface adapted to abut a surface of said support beam, an upwardly directed tongue adapted to be received by an engagement formation of said support beam at one end thereof, and a downwardly directed flange adapted to be fastened at the other end of said support beam; said base portion including a vertically directed cylindrical pivot bearing; a horizontally extending bearing surface; and a V-shaped groove extending across said bearing surface, defining the closure plane of said door; said assembly further comprising a pivot portion, adapted for attachment to a door, having a pin projecting therefrom engageable with said bearing, a V-shaped rib extending normally of said pin for complementary engagement with said V-shaped groove formed in said support member, said V-shaped rib extending at an angle to said closure plane such that the door is biased towards a closed position on engagement of said rib with said V-shaped groove; said pivot portion including a U-shaped portion adapted to receive a pane of glass or other suitable door panelling.

4,787,121
HINGE WITH STOP

Karlis V. Racenis, Wauwatosa, and Donald A. Coates, Green Lake, both of Wis., assignors to Speed Queen Company, Ripon, Wis.

Filed Oct. 16, 1987, Ser. No. 109,149
Int. Cl.[4] E05D *1/04*
U.S. Cl. 16—356 **11 Claims**



4. A hinge for pivotally connecting a first and second member about a pivot axis, comprising:

a first hinge portion comprising a cylindrical segment having a concave surface on one side and a concentric convex surface of the opposite side, said concave and convex surfaces terminating at an edge, said first hinge portion being connected to said first member;

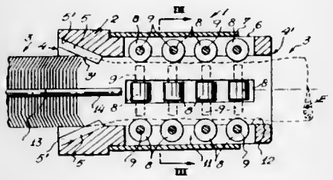
a second hinge portion having a guide channel for receiving said cylindrical segment of said first hinge portion, said channel having a mouth portion, a throat portion comprising a first arcuate surface substantially conforming to said concave surface and a second spaced arcuate surface substantially conforming to said convex surface, said throat receiving said cylindrical segment in sliding engagement, and an end portion, said second hinge portion being connected to said second member;

said cylindrical segment being rotatable in sliding engagement in said throat portion in a first direction until said edge of said first hinge portion contacts said end portion of said guide channel thereby providing a stop; and

said mouth portion having an outwardly extending lip that engages said first member at approximately the rotational position said edge engages said end portion.

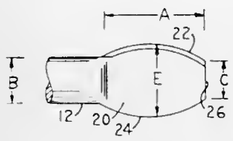
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4,787,122
ROTATABLE SAUSAGE FORMING SLEEVE MEMBER FOR THE INLET OF A SAUSAGES PRODUCING APPARATUS
Isaac Vinokur, Buenos Aires, Argentina, assignor to Envaril, S.A., Buenos Aires, Argentina
Filed Jan. 22, 1987, Ser. No. 64,885
Claims priority, application Argentina, Sep. 17, 1986, 305.292
Int. Cl.⁴ A22C *11/02*
U.S. Cl. 17—35 **4 Claims**



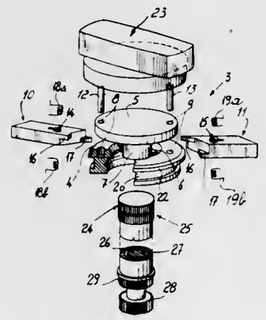
1. In a sausage producing apparatus using a tubular casing, a rotatable sleeve member having an inlet and an outlet, a source of flowable meat mass, a tubular injector connected to said source and having a nozzle housed within said inlet, for injecting said flowable meat mass into said tubular casing which is to be rotated by the sleeve injector defining a longitudinal axis, and a pulling and constricting assembly for pulling the meat filled casing through the sleeve member and constricting at short intervals the meat mass filled casing to form a string of sausages, the improvement wherein said inlet is a converging inlet portion including a plurality of longitudinal radially extending projections forming longitudinal grooves therebetween, a through passage in said sleeve extending between said inlet portion and said outlet and including a plurality of freely rotatable rolling means providing peripheral surfaces for moving the tubular casing there along, with a minimum frictional engagement and in the direction of said longitudinal axis, to enable the tubular casing to freely slide out of said outlet of said sleeve member.

4,787,123
OYSTER SHUCKING DEVICE
John E. Geddings, 221 W. Ridge Ct., Chapin, S.C. 29036
Filed Apr. 8, 1988, Ser. No. 179,571
Int. Cl.⁴ A22C *29/04*; A47G *21/06*
U.S. Cl. 17—75 **6 Claims**



1. A device for separating the shells of an oyster and removing the meat therein, comprising an elongated rod having a handle at one of its ends and a flat-surfaced blade extending from its other end on the rod axis; said blade having a length greater than the cross-sectional dimension of the rod; said flat blade having two side edges and an end edge; said end edge being a blunt square edge extending normal to the rod axis, said blunt edge having a length that is approximately the same as the rod cross sectional dimension, whereby the device can be moved in the direction of the rod axis to insert the blunt edge of the blade into a hinged muscle connection between the shells of an oyster, after which the device can be turned on the rod axis to enable the blade flat surfaces to break the hinged connection; at least one of the side edges of the flat blade having a convex oviform shape conforming generally to the concave interior surface of an oyster shell containing edible meat, whereby the blade can be drawn along the shell interior surface to permit said one side edge of the blade to sever the meat from the oyster shell; said convex oviform edge being sharpened along its length to enhance the blade cutting action.

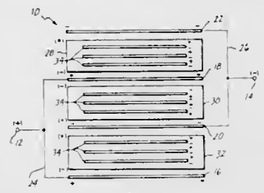
4,787,124
MULTIPLE-FUNCTION ACTUATION DEVICE PARTICULARLY USABLE IN SKI BOOTS
Alessandro Pozzobon, Paderno di Ponzano Veneto, and Roberto Gorza, Feltre, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy
Filed Sep. 14, 1987, Ser. No. 96,193
Claims priority, application Italy, Sep. 23, 1986, 82577 A/86; Sep. 23, 1986, 82578 A/86; Nov. 25, 1986, 59488/86[U]
Int. Cl.⁴ A43B *5/04*
U.S. Cl. 24—68 SK **17 Claims**



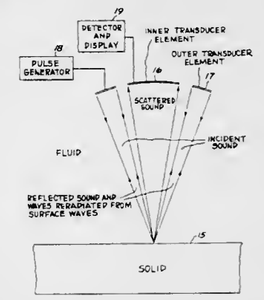
1. Multiple-function actuation device particularly for ski boots, comprising a containment body associable with a ski boot and supporting an actuation assembly for the actuation of at least two traction elements each connected to at least one movable element of said boot, characterized in that said actuation assembly actuates at least one drive shaft kinematically connected at least to a first winder and to a second winder for a traction element, kinematic switching means being provided to kinematically connect said actuation assembly alternately to said first winder and to said second winder, means being furthermore provided for the releasable locking of the rotation in the direction of unwinding of said first winder and of said second winder, wherein said acutation assembly actuates an inner shaft and an outer shaft coaxial to said inner shaft, said inner shaft being connected to a first toothed wheel connected by means of a bevel gear pair to said first winder, said outer shaaft being connected by means of gearwheels to said second winder, said first winder and said second winder being provided with mutually perpendicular axes of rotation.

4,787,125
BATTERY ELEMENT AND BATTERY INCORPORATING DOPED TIN OXIDE COATED SUBSTRATE
Naum Pinsky, Thousand Oaks, and Saulius A. Alkaitis, Venice, both of Calif., assignors to Ensci, Inc., Woodland Hills, Calif.
Division of Ser. No. 843,047, Mar. 24, 1986, Pat. No. 4,708,918.
This application Aug. 6, 1987, Ser. No. 82,277
Int. Cl.⁴ H01M *4/60*; B23P *13/00*
U.S. Cl. 29—2 **5 Claims**

1. A process for at least partially coating fibers with an electrically conductive, fluorine doped, tin-containing coating comprising (1) contacting a vaporous composition comprising at least one component of tin and at least one fluorine-containing component with said fibers; and (2) contacting said contacted fibers with an oxygen-containing vaporous medium at conditions effective to form said electrically conductive, fluorine doped, tin-containing coating on said fibers, provides that said fibers are maintained in substantially constant three dimensional motion during steps (1) and (2).



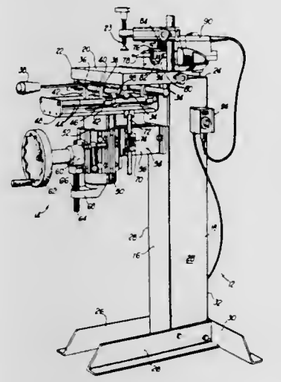
4,787,126
METHOD OF FABRICATING DARK FIELD COAXIAL ULTRASONIC TRANSDUCER
David W. Oliver, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 934,520, Nov. 24, 1986, Pat. No. 4,760,304.
This application Nov. 30, 1987, Ser. No. 126,325
Int. Cl.⁴ H01L *41/22*
U.S. Cl. 29—25.35 **2 Claims**



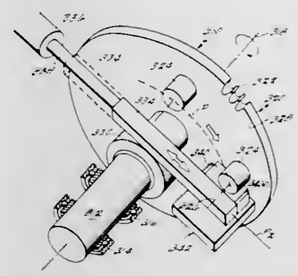
1. The method of fabricating a dark field ultrasonic transducer having a spherical inner element and a coaxial, annular, conical outer element, comprising:
providing a mold having a cylindrical bore leading to a cone;
placing a metal ball at the bottom of said cone;
filling said bore and a connecting portion of said cone with a filler material;
curing said filler material and removing the resulting tool, which has said ball embedded in a conical surface, form said mold;
selectively removing metal from a thin piezoelectric polymer from coated with a layer of metal to delineate said inner and outer elements, and shaping and curving said thin film with the end of said tool.

4,787,127
COMBINATION SLOT MORTISING, HORIZONTAL BORING, ROUTER TABLE AND OVERARM ROUTER MACHINE
Jerrold R. Beall, 541 Swans Rd., N.E., Newark, Ohio 43055
Filed Mar. 20, 1987, Ser. No. 28,244
Int. Cl.⁴ B23C *7/00*
U.S. Cl. 29—26 A **10 Claims**

1. A horizontal boring machine comprising a table mounted on a base having means to move the table along orthogonal x, y and z axes, two dowels mounted on the base to receive an electric router, and an electric router mounted on the dowels, by receiving the dowels in two sleeves in the router motor housing, for holding a bit in a bit holding means in a position above the x-y-z table and rotating the bit about a horizontal axis, a means for controlling the operating speed of the router, and at least one adjustable stop for limiting lateral motion of the x-y-z table relative to the bit.



4,787,128
MODULARLY EXPANDABLE INTEGRATED PROCESS MACHINE SYSTEM AND ROTARY INDEXING MECHANISM THEREFOR
John L. Wickham, Glenarm, Md., assignor to J. L. Wickham Co., Baltimore, Md.
Continuation of Ser. No. 881,236, Jul. 2, 1986, abandoned. This application May 18, 1987, Ser. No. 50,394
Int. Cl.⁴ B23P *23/04*; B23Q *16/06*
U.S. Cl. 29—33 P **9 Claims**



1. An integrated process machine system comprising:
means defining a platform having a plurality of tool module accepting positions, each of said tool module accepting positions having a common dimension mounting interface for accepting any one of a plurality of tool modules; and
a work piece transport system for moving a work piece from one tool module accepting position to another, said transport system including a carrier band entrained about said first and second sprockets, at least one work piece carrying pallet, means for connecting said at least one pallet to said carrier band, a rotary indexing mechanism for incrementing said carrier band in a step-wise manner to carry said pallet from one tool module accepting position to another with each incrementing of said carrier band, said rotary indexing mechanism including:

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a rotatably mounted shaft carrying a first member that moves along a first path in response to rotation of said shaft;

a one-way clutch coupled to said shaft, said clutch drivable in a first direction to couple rotation to said shaft and in an opposite direction in which said shaft is uncoupled;

means for driving said clutch in the first the opposite directions to cause incremental rotation of said shaft when driven in the first direction; and

a second member connected to said driving means and reciprocal along a second path in response to driving of said clutch in the first and opposite directions, said first and second paths intersecting;

the first and second members engaging one another to stop rotation of said shaft at a predetermined rotary position.

5. An integrated process machine system comprising:

means defining a platform having a plurality of tool module accepting positions, each of said tool module accepting positions having a common dimension mounting interface for accepting any one of a plurality of tool modules; and

a work piece transport system for moving a work piece from one tool module accepting position to another, said transport system including a carrier band entrained about first and second sprockets, at least one work piece carrying pallet, means for connecting said at least one pallet to said carrier band, a rotary indexing mechanism for incrementing said carrier band in a step-wise manner to carry said pallet from one tool module accepting position to another with each incrementing of said carrier band, said rotary indexing mechanism including:

a first member mounted for rotation about an axis and carrying at least one first stop member for a movement along an orbital path about the axis as said first member rotates; and

means for periodically rotating said first member in a first direction about said axis and for moving a second stop member along a linear path that intersects said orbital path to periodically cause said first and second stop members to engage and halt further rotation of said first member,

wherein said first member is a disc mounted on a shaft for incremented rotation therewith and said shaft has a one-way clutch mechanism associated therewith, said one way clutch having inner and outer elements, said inner element being mounted on said shaft for rotation therewith.

4,787,129

METAL OF MANUFACTURING A COMPOSITE JOURNAL BUSHING

Robert L. Williamson, Fort Worth, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 6, 1984, Ser. No. 628,178

Int. Cl.[4] B21D *53/10*

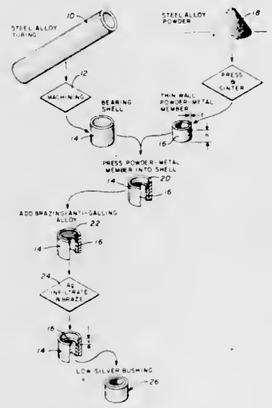
U.S. Cl. 29—149.5 C **6 Claims**

1. A method of manufacturing a composite journal bearing defining a first member of an axial height having a bearing surface and an opposite surface at a desired wall thickness therebetween and a second member, generally co-extensive with said opposite surface and attached to said opposite surface to provide a backing for said first member comprising the steps of:

forming, through pressing and sintering of powdered steel alloy, said first member having communicating pores generally throughout and having, as formed, a height to wall thickness ratio greater than 4;

providing a metal backing member in intimate engagement with said opposite surface of said first member;

infiltrating an anti-galling molten metal alloy into said pores to substantially fill said pores and concomitantly brazing said members into an integral unit from a surface on said first member other than said bearing surface; and,



finishing said integral unit prior to assembly as a bearing by appropriate machining and heat treating.

4,787,130

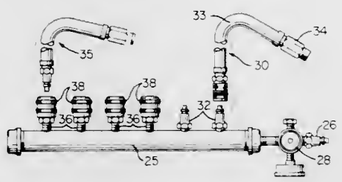
AIR PRESSURE MANIFOLD FOR VALVE REPAIR

Rodney D. Hale, 106 Stewart La., Germantown, Ohio 45327, and Donald R. Heindl, 311 Orphans Rd., Eaton, Ohio 45320

Filed Jun. 6, 1984, Ser. No. 618,007

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—213.1 **2 Claims**



1. Apparatus for use in the repair of different types of multi-cylinder internal combustion engines by admitting air under pressure into selected cylinders of the engine to seat all the corresponding valves, comprising

a manifold member including an inlet fitting for connection to a source of compressed air,

at least two primary outlet fittings on said manifold,

at least two primary spark plug hole fittings,

primary hoses connecting each of said primary outlet fittings to a corresponding one of said hole fittings to provide at least two primary air circuits,

at least one secondary outlet fitting on said manifold including a normally closed check valve,

at least one secondary spark plug hole fitting and a secondary hose connected thereto at one of the hose ends and a nipple fitting on the other hose end adapted to interlock with and open the associated check valve,

whereby the apparatus can be used in the repair of a variety of engines by simultaneously pressurizing the selected cylinders as repairs are made.

4,787,131

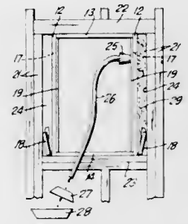
METHOD OF INSTALLING REPLACEMENT WINDOWS

Stephen R. Pacca, 150 Overlook Ave., Apt. 15F, Hackensack, N.J. 07601

Filed Sep. 28, 1987, Ser. No. 102,003

Int. Cl.[4] B21K *21/16;* **B23P** *17/04, 23/00*

U.S. Cl. 29—401.1 **4 Claims**



1. A method of replacing a double-hung window having a casing with side boards inwardly delimiting sash pockets, the method comprising the steps of sequentially:

stripping the casing of the sashes;

filling the sash pockets with fluent particulate insulation; and

fitting a replacement window into the casing.

4,787,132

METHOD OF MAKING DYNAMIC ROTATIONAL COUNTERBALANCE STRUCTURE

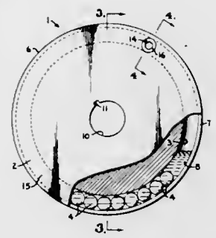
Ronald B. Kilgore, 7415 Jefferson, Kansas City, Mo. 64114

Division of Ser. No. 729,368, May 1, 1985, Pat. No. 4,674,356.

This application Mar. 17, 1987, Ser. No. 26,455

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—434 **7 Claims**



1. A method of manufacturing a dynamic rotational counterbalance structure comprising the steps of:

(a) forming a discoid counterbalance body, said body having an outer circumferential surface and an axis of rotation;

(b) forming a radially outwardly opening outer circumferential groove in said outer surface of said body;

(c) positioning a plurality of movable weight means in said groove, said weight means being sized and shaped to move freely about said groove; and

(d) positioning an outer circumferential band in surrounding and sealing relation to said body to thereby enclose said groove.

4,787,133

METHOD OF ASSEMBLING A REFRIGERATOR DOOR

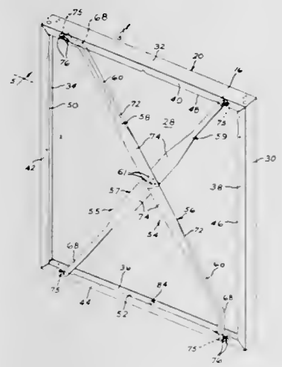
Stephen C. Lesmeister, and Thomas E. Jenkins, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

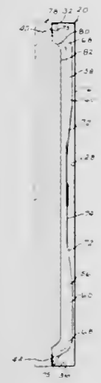
Division of Ser. No. 60,684, Jun. 11, 1987, Pat. No. 4,747,245.

This application Feb. 8, 1988, Ser. No. 153,051

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—460 **6 Claims**





1. The method of assembling a refrigerator door comprising:

forming an outer metal rectangular shaped shell having a base panel, four upwardly turned side panels on each side and perpendicular to the base panel and two sets of two opposite facing inturned flanges, each flange being perpendicular to each of the side panels and having free terminal edges;

constructing a cross brace by,

forming two legs, each leg having at one end a U-shaped channel section having an offset portion terminating with a flat tab, an intermediate section and a flat section at the end opposite the channel section;

securing the flat section of one leg to the flat section of the other leg such that the length of the brace will accommodate the desired length to diagonally span the door;

positioning two such braces to form an X;

holding the base panel in a flat plane; and

securing the flat tabs at the opposite ends of each brace to

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one set of opposite flanges while the base panel is held in a flat plane.

4,787,134

AUTOMATIC TOOL EXCHANGE APPARATUS

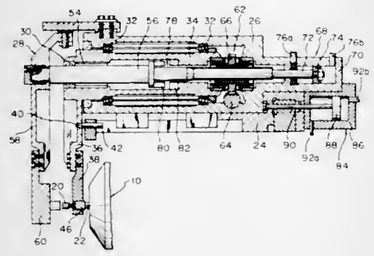
Tanji Yamamoto, Hiroshima, and Yohinori Abe, Higashihiroshima, both of Japan, assignors to Mazda/Motor Corporation, Hiroshima, Japan

Filed Sep. 16, 1987, Ser. No. 97,609

Claims priority, application Japan, Sep. 19, 1986, 61-219649; Sep. 19, 1986, 61-219650; Sep. 19, 1986, 61-222929

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **16 Claims**



1. An automatic tool exchange apparatus comprising:

a magazine for holding a plurality of tools in a freely detachable manner;

a spindle of a machine tool a distal end whereof has a collet chuck in which a tool is loaded and which is tightened by a screw ring;

a quill arm movable swingably and in an axial direction for engaging said screw ring, whereby rotation of said screw ring is inhibited;

spindle rotating means for rotating said spindle in a state where rotation of said screw ring is inhibited by said quill arm, whereby said spindle and screw ring are caused to rotate relative to each other to loosen said collet chuck;

an exchange arm movable swingably between said spindle and magazine and in an axial direction for extracting one tool held by said magazine and mounting the one tool on the distal end of said spindle;

swinging means for swinging said quill arm and said exchange arm; and

moving means for moving said quill arm and said exchange arm in the axial direction.

4,787,135

METHOD OF ATTACHING LEADS TO PTC DEVICES

Atsushi Nagahori, Ibaraki, Japan, assignor to Nippon Mektron, Ltd., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,158

Claims priority, application Japan, Mar. 31, 1986, 61-73728

Int. Cl.[4] H01C *7/02*

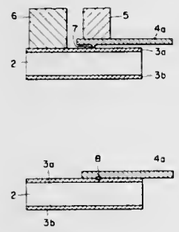
U.S. Cl. 29—612 **5 Claims**

1. A process for producing a PTC device, comprising:

forming a laminate comprising a PTC composition and at least two electrode plates, said PTC composition being sandwiched between said electrode plates, each of said electrode plates having an exposed outer surface;

placing a lead plate in opposition with the outer surface of one of said electrode plates so that the lead plate contacts the outer surface of said one electrode plate over only a small contact area; and

passing a current between said one electrode plate and said lead plate via the small contact area to weld them together, said current being sufficient to provide physical and electrical connection between the lead plate and the



outer surface of said one electrode plate while also preventing heat damage to the PTC device.

4,787,136

CONTROL AND MONITORING ARRANGEMENT FOR TOOLS

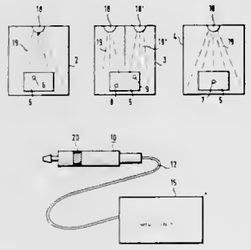
Milivoj Majic, Urbach, Fed. Rep. of Germany, assignor to Stabil Elektronik GmbH, Esslingen, Fed. Rep. of Germany

Filed Mar. 31, 1987, Ser. No. 32,218

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637236

Int. Cl.[4] B23Q *15/00*

U.S. Cl. 29—709 **7 Claims**



1. A control and monitoring arrangement for tools which are adapted to be randomly used at different assembly locations, at each of which at least one specific assembly operation is to be performed with the aid of at least one of said tools, at different assembly locations the assembly operations which are to be performed by means of one and the same tool being different from each other with respect to a predeterminable reference value for at least one assembly parameter and/or with respect to predeterminable tolerance limits within which an actually obtained value of said at least one assembly parameter must coincide with said predeterminable reference value, said tools being adapted to measure for each carried out assembly operation the actually obtained value of said at least one assembly parameter and to transmit this measured value to a respective control unit which receives said measured value and checks whether said measured value coincides with a reference value predetermined with respect to said assembly operation within tolerance limits also predetermined with respect to said assembly operation, wherein said control and monitoring arrangement comprises a recognition means comprising

for each of said assembly locations at least one transmitter which is fixedly mounted at the respective assembly location so that it emits into a limited spatial area at said assembly location a specific recognition signal which is different from the recognition signals emitted by other transmitters

of the arrangement, thereby identifying the pertinent spatial area and

for each of said tools a receiver which is attached to the pertinent tool and which is adapted to receive the respective recognition signal when the pertinent tool is moved into one of said spatial areas, said receiver transmitting the received recognition signal to said control unit where it is used for identifying the spatial area in which the respective tool is to be used, so that the control unit can select the pertinent reference value for the at least one assembly parameter and the pertinent tolerance limits of the assembly operation to be done in said spatial area.

4,787,137

AUTOMATIC COMPONENT PLACER AND PLACER HEAD

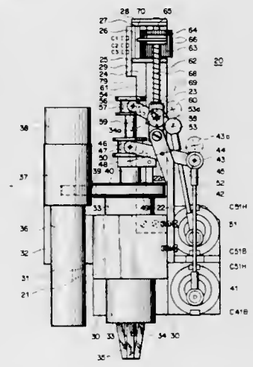
Maurice Jeanmairet, Boudry, and Raymond Stauffer, La Chaux-de-Fonds, both of Switzerland, assignors to Ismeca, SA, La Chaux-de-Fonds, Switzerland

Filed Nov. 6, 1986, Ser. No. 928,238

Claims priority, application Switzerland, Nov. 8, 1985, 4811/85

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—740 **22 Claims**



1. An automatic machine for placing components of various shapes on substrates, comprising:

at least one component feed location,

substrate-supporting means,

at least one placer head for translatory movements within a space extending above said component feed locations and said substrate-supporting means, and

head translation control and driving means for successively positioning said head above and facing each of said feed locations and supporting means,

said head comprising:

a lowerable transfer tube having a free lower end substantially directed toward said feed locations and supporting means,

a controlled component-pickup tip arranged at said free lower end, and

dipping control means for driving and operating said transfer tube and said pickup tip for dipping movements, to withdraw a said component from a said feed location and to put this said component on a substrate disposed on said supporting means,

wherein said dipping control means comprise:

dipping driving means provided with an element selectively driven for effecting reciprocations and

transmission means arranged for a partly compulsory and partly elastically retainable transmission of said reciprocation of said element to said transfer tube,

said transmission means comprising:

a transmission mode selecting device responsive to said reciprocation for determining (and deciding) a compulsory transmission mode and an elastically retainable transmission mode of said transmission means, and thereby defining said dipping in a first phase, of compulsory lowering of said transfer tube, and in a second phase, of elastically conditioned lowering of said transfer tube, said second phase taking place at the lower end-of-course of said dipping movements of said transfer tube and pickup tip, and

releasing force determining means for establishing and calibrating an elastic release force for said second phase of dipping.

4,787,138

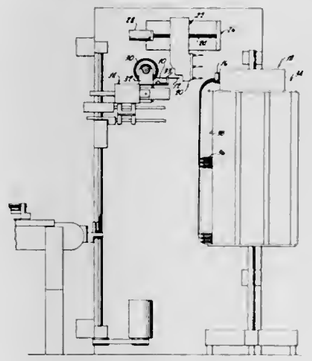
METHOD AND APPARATUS FOR CONTACT INSERTION

Homer L. Eaton, Leucadia, and Goro Kambara, Valley Center, both of Calif., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 646,949, Sep. 4, 1984, Pat. No. 4,658,503. This application Mar. 19, 1987, Ser. No. 27,939

Int. Cl.[4] G23P *19/04*

U.S. Cl. 29—748 **24 Claims**



1. Apparatus for inserting the end of a wire into a connector comprising

a support,

mounting means on said support for mounting a connector having at least one connector aperture for receiving a wire end,

an insertion head mounted to the support for motion relative to said mounting means,

a roller frame support mounted to the insertion head for motion between an insertion position and a retracted position,

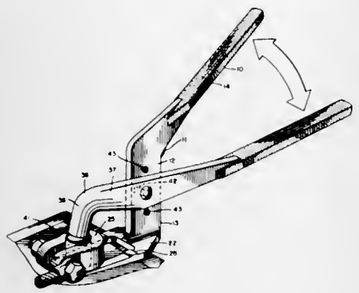
first and second wire drive roller frames having first and second wire drive rollers rotatably mounted therein respectively, said wire drive roller frames being mounted to said roller frame support for relative motion between a first position in which the rollers of said frames are mutually displaced and a second position in which said rollers are mutually juxtaposed for grasping and driving a wire positioned therebetween, and

means on said roller frame support for guiding a wire end to said rollers, said means for guiding comprising first and second funnel parts defining mating portions of a guide funnel positioned to guide a wire to and between said rollers, said funnel parts being movably mounted to said roller frame support for motion between a first position in which the funnel parts are mutually displaced and a sec-

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ond position in which the funnel parts are mutually juxtaposed to provide a guide funnel adjacent said rollers.

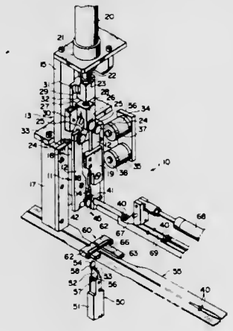
4,787,139
BATTERY CABLE PULLER PLIERS
Paul A. Sweet, Rte. 1, Box 150, New Madrid, Mo. 63869
Filed Jan. 8, 1987, Ser. No. 1,366
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—758 **6 Claims**



1. An improved battery cable puller pliers comprising, in combination:
a first generally elongate and straight handle;
a first generally straight pivot section integral with and extending from the handle at an angle in the range of about 100° to 150°;
a first jaw integral with and extending from the pivot section, said first jaw extending generally perpendicular to the pivot section whereby the handle, pivot section and jaw define, in profile, a continuous member having a spaced jaw and handle connected by the pivot section;
a second generally elongate and straight handle;
a second generally straight pivot section integral with and extending from the second handle in a generally straight line, and pivotally connected to the first pivot section; and
a second jaw integral with and extending from the second pivot section, said second jaw including an integral run transverse to the second pivot section and transverse to the first jaw, said first jaw comprising first and second spaced, parallel legs joined together at their inner end to define a yoke which connects to the first pivot section, said legs being wedge shaped and terminating with a knife edge, said legs being of equal length and being equally spaced from a center line extending from the yoke so as to be capable of extending on opposite sides of a battery post, said legs parallel to each other, said first handle extending along a line centrally located between the parallel legs said integral run of said second jaw also projecting along a line that extends midway between the legs of the first jaw, said integral run of said second jaw terminating with a surface for contact with the top of a battery post.

4,787,140
APPARATUS FOR ATTACHING TOP END STOPS TO A CONTINUOUS SLIDE FASTENER CHAIN
Kozo Watanabe, Kurobe; Yasuhiko Matsuda, Toyama, and Shunji Akashi, Kurobe, all of Japan, assignors to Yoshida Kogyo, K. K., Tokyo, Japan
Filed Aug. 19, 1986, Ser. No. 897,815
Claims priority, application Japan, Aug. 28, 1985, 60-131041[U]; Aug. 28, 1985, 60-131042[U]; Aug. 31, 1985, 60-133821[U]
Int. Cl.[4] A41H *37/06*
U.S. Cl. 29—767 **7 Claims**

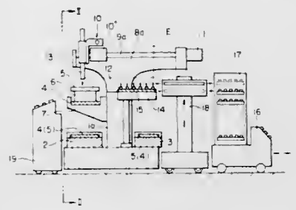
3. An apparatus for attaching a pair of top end stops of a substantially U-shape to a continuous slide fastener chain composed of a pair of stringer tapes supporting a pair of intermeshing rows of coupling elements on and along respective beaded longitudinal marginal edges of the stringer tapes, the slide fastener chain having longitudinally spaced element-free spaces, said apparatus comprising:
(a) a punch/die holder;
(b) a clamping mechanism mounted on said punch/die holder and including a pair of punch arms angularly movably supported on said punch/die holder and a die fixed to said punch/die holder and disposed between said punch arms for supporting the top end stops between the die and first ends of said punch arms, said punch arms having a



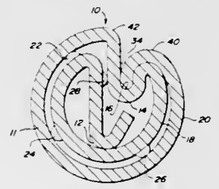
pair of first recesses defined respectively in opposite inner side surfaces thereof, said die having a pair of second recesses defined respectively in opposite outer side surfaces thereof, said first and second recesses jointly defining cavities for holding said top end stops, respectively, therein, with legs of the top end stops being snugly fitted in said first and second recesses and
(c) means operatively coupled between said punch/die holder and second opposite ends of said punch arms for angularly moving said punch arms to cause said first ends thereof to clinch the top end stops respectively about the beaded marginal edges of the stringer tapes at one of the element-free spaces adjacent to ends of the rows of coupling elements.

4,787,141
AUTOMATIC ASSEMBLING APPARATUS
Hiroshi Miyazaki; Takao Miyatani, and Akira Ishizaki, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Jun. 19, 1987, Ser. No. 63,919
Claims priority, application Japan, Jul. 18, 1986, 61-110395[U]
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—795 **7 Claims**

1. An automatic assembly apparatus for fastening parts to a workpiece which is movable along a path, comprising:
a base;
a pair of spaced vertically extending columns mounted on said base, said columns being spaced from each other in the direction of the path of the workpiece;
a pair of T-shaped legs disposed on adjacent upper ends of said columns, each of said legs having a horizontal portion extending substantially transverse to the direction of the workpiece path;
a pair of guides, each mounted on one of said T-shaped legs extending at right angles to and intersecting the path of the workpiece; and
a horizontal orthogonal coordinate type assembling robot having an elongated supporting member fastened at opposite ends to said pair of guides for bridging the pair of columns, one of said pair of guides being disposed on the corresponding T-shaped leg to block removal of the member in the vertical direction, said elongated member being capable of reciprocating along said pair of guides, said robot being capable of reciprocating along said elongated member.



4,787,142
EXOTHERMIC CUTTING ELECTRODE
Harold R. Henderson, and David Mosinski, both of Lancaster, Ohio, assignors to Arcair Company, Lancaster, Ohio
Division of Ser. No. 815,433, Dec. 31, 1985, Pat. No. 4,697,791. This application Jun. 8, 1987, Ser. No. 58,977
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—825 **3 Claims**

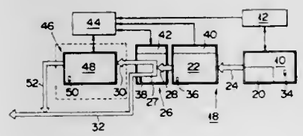


1. A process for continuously forming exothermic electrodes comprising the steps of:
a. providing an elongated sheet of metal having generally parallel elongated edges;
b. forming a lock seam portion in the elongated sheet of metal between the longitudinal edges of the elongated sheet of metal;
c. forming a hook-shaped section on one of the longitudinal edges of the elongated sheet of metal; and
d. wrapping the sheet metal around the hook-shaped section in a manner to form a generally cylindrical shape with the edge of the sheet opposite that of the hook-shaped section held by the prex-formed lock seam portion; and
e. dividing the continuously formed cylindrical shape into electrodes of fixed length.

4,787,143
METHOD FOR DETECTING AND CORRECTING FAILURE IN MOUNTING OF ELECTRONIC PARTS ON SUBSTRATE AND APPARATUS THEREFOR
Hiroshi Yagi; Masanori Ohta; Hirokazu Shutou, and Masami Tsuji, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan
Filed May 19, 1986, Ser. No. 865,067
Claims priority, application Japan, Dec. 4, 1985, 60-273796; Dec. 16, 1985, 60-282366
Int. Cl.[4] H05K *3/30;* **B23P** *19/00*
U.S. Cl. 29—833 **10 Claims**

1. A method of detecting a failure in the mounting of electronic parts on substrates, comprising the steps of:
applying a different code mark, to a surface of each substrate on which electronic parts are to be mounted;
detecting a failure in the mounting of said electronic parts on each of said substrates after the mounting by checking for at least one of proper electrical functioning of said parts and proper physical positioning of said parts relative to each of said substrates;
reading the code mark of each substrate for which a failure is detected thereby identifying failed substrates;
classifying said failed substrates from acceptable substrates and transferring said failed substrates to a station for correction of the failures.

7. An apparatus for detecting a failure in the mounting of electronic parts on substrates, comprising:
a characteristic checker for detecting substrates on which electronic parts having characteristics other than predetermined ones are mounted, to identify failed substrates;
a misregistration checker for detecting a default in the parts mounting, the positional deflection of the mounted electronic parts with respect to each of said substrates, and an error in the mounting direction;
a separating conveyor for carrying out a classification between the failed substrates and acceptable substrates;
a failure indicator for indicating details of a failure of each of said failed substrates to facilitate correction of each failed substrate;
a code reader incorporated in each of said characteristic checker, misregistration checker, separating conveyor and failure indicator to read a code mark attached to each of said substrates;
control boxes connected to said characteristic checker, misregistration checker and separating conveyor, respectively;
a mounting failure data edit controller connected through said control boxes to said characteristic checker, misregistration checker and separating conveyor, respectively, and further connected to said failure indicator;
said mounting failure data edit controller including means for editing and storing mounting failure data of the failed substrates as supplied from said respective checkers through the corresponding control boxes together with code mark data of the corresponding failed substrates as read by the corresponding code reader of each of said characteristic checker and misregistration checker;
said mounting failure data edit controller also including means for carrying out collating between said code mark data stored therein and code mark data read by said code reader of said separating conveyor to identify said failed substrates, so that said separating conveyor is enabled to carry out its classification operation;
said failure indicator selectively calling said mounting failure data stored in said mounting failure data edit controller therefrom depending upon the code mark of each of said failed substrates as read by said code reader of said failure indicator to indicate details of the called mounting failure data.



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4,787,144

CUTTING TOOL FOR STRIPPING CABLES

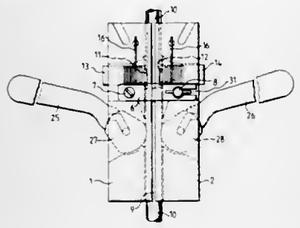
Josef Krampe, An der Vogelrute 32, 4715 Asheberg-Herbern, Fed. Rep. of Germany

Filed Nov. 18, 1987, Ser. No. 122,940

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 3640097

Int. Cl.⁴ H02G *1/12*

U.S. Cl. 30—90.7 **7 Claims**



1. A cutting tool for stripping an insulation sheath from cables, particularly glass fiber cables, comprising blades for slitting a sheath from a cable; a lever drive for driving the cable; and a housing accommodating said blades and having a chute for guiding said cable, said drive including a hand-actuated lever pair with levers arranged opposite said chute and positionable in said housing interchangeably in different operative positions, said blades being arranged between places of supporting said lever pair in said chute.

4,787,145

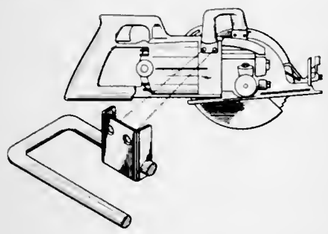
TWO POSITION PORTABLE POWER TOOL HANGER STABILIZED BY SPRING AND DETENT

Garry L. Klicker, and John B. Hackett, both of 6821 Cunningham Way, Sacramento, Calif. 95828

Filed Mar. 9, 1987, Ser. No. 23,140

Int. Cl.⁴ B23D *45/16*

U.S. Cl. 30—296 A **3 Claims**



1. A two position hanger consisting of in combination with a portable power saw a rod bent into a square-ended horseshoe shape, 2 pins inserted through one section of said rod, and a u-shaped bracket which is drilled through the two parallel sections of said u-shaped bracket to receive said rod, the bracket stamped with the detents to seat one pin, a spring the other pin compressing said spring between said bracket and said other pin said, bracket in combination with said spring pins, and detents providing an indexing mechanism for said bracket being fixed to said power saw, and said horseshoe shaped rod acting as a hanger for saw power saw.

4,787,146

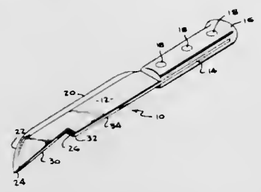
KNIFE WITH CHISEL EDGE

Thomas Gaskins, Cypress Knee Museum, Palmdale, Fla. 33944

Filed Jan. 27, 1983, Ser. No. 461,450

Int. Cl.⁴ B26B *3/00*

U.S. Cl. 30—299 **11 Claims**



1. A knife including a handle and a blade, said blade comprising a metal blade having a handle enclosed portion, a first sharp edge having a substantially linear edge portion and a curved end portion, a second sharp or chisel edge having first and second ends and extending in a linear manner substantially perpendicular to said linear edge, and a flat linear guide edge surface extending between one end of said curved end portion and said first end of said second sharp edge.

4,787,147

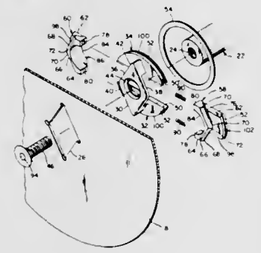
QUICK CHANGE MECHANISM FOR DIAMOND ARBOR CIRCULAR SAW BLADES AND OTHER SPINNING DISC DEVICES USING RADIALLY SLIDING LOCKS

Edward R. Wiley, 9020 SE. 51st Pl., Mercer Island, Wash. 98040

Filed Aug. 28, 1986, Ser. No. 901,887

Int. Cl.⁴ F16B *7/00*

U.S. Cl. 30—388 **7 Claims**



1. A quick change mechanism, operable in seconds, to change rotatable work contacting members, such as circular saw blades, which have diamond arbor central holes, with respect to drive shafts of power tools, which have internally threaded holes to receive installation bolts, comprising the preassembly of:

(a) a main body for rotating radially about the axis of a drive shaft of a power tool having:

(i) an axially protruding receiving means establishing a major diameter to guide the axial movement of a work contacting member, such as a circular saw blade, which has a diamond arbor central hole;

(ii) a partial radial receiving means formed in the axially protruding receiving means to partially receive a blade locking means; and

(iii) a partial surrounding partial blade receiving means, in turn having a partial radial receiving means, radially in line with the partial radial receiving means formed in the axial protruding receiving means, and these two partial radial receiving means form an overall radial receiving means; and

(b) a locking means slidably received in the overall radial receiving means having radially slidable locks for radial movement together to clear a circular saw blade, and for radial movement apart to lock a circular saw blade adjacent to the partial surrounding partial blade receiving means, and having a spring means to keep the radially slidable locks apart in their circular saw blade holding and locking positions;

(c) an axially protruding receiving means on each radially slidable lock, establishing a minor diameter, to guide the axial movement of a circular saw blade which has a diamond arbor central hole, when the axially protruding receiving means on the main body is also guiding the circular saw blade, and during such guidance, the radially slidable locks are first moved radially toward one another, when in contact with the circular saw blade, against the force of the spring means, and then, after the axial clearance of the circular saw blade, the radially slidable locks are moved apart by the force of the spring means to hold and to lock the circular saw blade in place;

(d) a surrounding holding means to keep the main body and the radially slidable locks together in a preassembly, while providing clearance for the radial movements of the radially slidable locks of the locking means;

(e) a receiving means in the main body to accommodate an end of a drive shaft of a power saw;

(f) a center receiving means on the main body to accommodate an installation bolt used in securing this quick change mechanism to the end of a drive shaft, which has an internally threaded hole to receive this installation bolt;

(g) receiving means in each radially slidable lock to accommodate one half diameter of an end of a drive shaft of a power saw;

(h) a radial opening of the overall radial receiving means, having parallel vee grooves arranged on each side of this radial opening; and

(i) parallel vee projections arranged on each side of each radially slidable lock to slidably fit the parallel vee grooves of the overall radial receiving means.

4,787,148

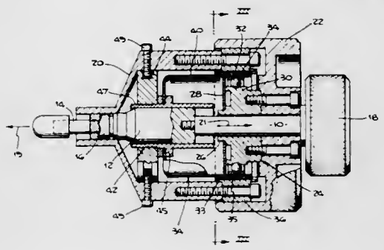
NANOMETRIC DRIVE APPARATUS

Jon Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 13, 1987, Ser. No. 37,495

Int. Cl.⁴ G01B *3/18*

U.S. Cl. 33—164 B **13 Claims**



1. A nanometric drive apparatus, providing superimposed coarse and fine adjustments of linear displacements, comprising:

an elongated displacement shaft having an axis, and a plunger on the forward end, and integrally connected to a coarse adjustment means at the rearward end;

means for nanometric adjustment;

a harmonic wave generator means coupled to said nanometric adjustment means; and

frictional shaft engagement means, coupled to said harmonic wave generator means, for rotating said elongated displacement shaft and advancing said plunger forward along the axis of said shaft,

whereby, said nanometric adjustment means may be used to provide nanometric linear displacement to said shaft along said axis to supplement coarse adjustments which may be made independently by said coarse adjustment means.

4,787,149

GAUGE FOR CHECKING LINEAR DIMENSIONS OF MECHANICAL PIECES

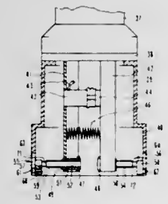
Mario Possati, Bologna; Narciso Selleri, Monteveglio, and Guido Golinelli, Bologna, all of Italy, assignors to Marposs Societa' per Azioni, S. Marino di Bentivoglio, Italy

Filed Dec. 27, 1982, Ser. No. 453,108

Claims priority, application Italy, Jan. 15, 1982, 3307 A/82

Int. Cl.⁴ G01B *7/00*

U.S. Cl. 33—542 **6 Claims**



1. A gauge for checking linear dimensions of mechanical pieces, comprising a support, at least an arm that is movable with respect to the support along a measurement direction, a feeler element associated with the movable arm in order to touch a piece to be checked, a position transducer with two reciprocally movable elements, one of the two transducer elements being coupled to the movable arm, the transducer being adapted to provide a signal responsive to the dimension of the checked piece, and a screw and nut-screw mechanical zero-setting device for zero-setting the gauge by adjusting the position of the feeler element with respect to the movable arm, said zero-setting device including a thread insert, located between the screw and nut-screw, the thread insert having at least a friction coil to provide a stable zero-setting, and the feeler element including a first portion coupled to the movable arm by means of said screw, nut-screw and thread insert and a second portion made of a considerably harder material than that of the first portion, the second portion being fixed to the first portion and including an end feeler adapted for touching the piece to be checked and a part adapted for allowing the adjustment of the feeler element by means of a tool, and wherein said first portion is made of steel and said second portion is made of a sintered material and is fixed to the first portion by brazing.

4,787,150

FIXTURE FOR CHECKING THE ALIGNMENT OF A LOADWHEEL WITH THE SPINDLE OF A TIRE UNIFORMITY MACHINE

Neill W. Klinginsmith, III, Clinton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 5, 1987, Ser. No. 104,605

Int. Cl.⁴ G01B *5/255*

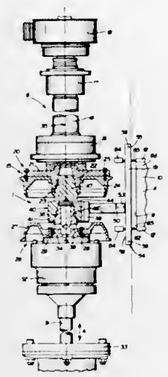
U.S. Cl. 33—552 **28 Claims**

1. In a tire uniformity machine of the type having a spindle with spaced first and second chucks for rotatably mounting a tire therebetween, said tire to be tested by engagement with a

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loadwheel rotatably mounted independent of and spaced from the spindle, and in which the first chuck has a nose cone sleeve formed with a conical-shaped recess and the second chuck has a conical-shaped nose cone; wherein the improvement comprises a fixture for checking the alignment of the loadwheel with respect to the centerline of the spindle including:

(a) an adaptor block having a conical-shaped projection on one end of the block and a conical-shaped recess formed in an opposite end of said block, said projection being complementary to and adapted to be inserted into the conical-



shaped recess of the first chuck with said conical-shaped recess being complementary to and adapted to receive the nose cone of the second chuck when said chucks are moved towards each other to align a centerline of the adaptor block with the centerline of the spindle;

(b) a support bar mounted on the adaptor block and extending parallel with the centerline of the adaptor block; and

(c) sensor means mounted on the bar for engaging the loadwheel to measure the alignment of said loadwheel with respect to the centerline of the spindle.

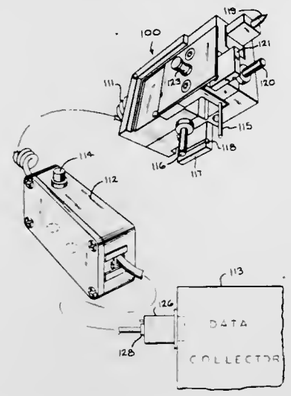
4,787,151
CONTOUR AND OUTLINE TRANSDUCER GAGE ASSEMBLY
James E. Struble, 81 W. Newman Rd., Williamston, Mich. 48895
Division of Ser. No. 919,135, Oct. 15, 1986, Pat. No. 4,731,935. This application Mar. 21, 1988, Ser. No. 171,421
Int. Cl.[4] G01B *7/02, 7/28*
U.S. Cl. 33—613 **1 Claim**

1. In a gage provided with biased fixture rail-engaging means for selectively mounting a gage in operative use snap engagement with a fixture rail comprising:

a gage housing;

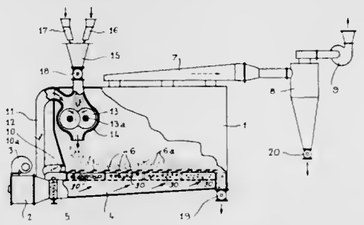
at least one fixed rigid locator peg provided on said housing so as to extend outwardly therefrom, said fixed rigid locator peg adapted to matingly engage a corresponding rigid locator peg receiving hole provided in a fixture rail;

at least one spring biased locator peg provided on said housing so as to extend outwardly therefrom in a substantially parallel spaced-apart relationship to said fixed rigid locator peg, said spring biased locator peg adapted to matingly engage a corresponding spring biased locator peg receiving hole provided in a fixture rail, said spring biased locator peg and said fixed rigid locator peg cooperating to make a spring biased snap lock engagement with the corresponding locator peg receiving holes in the fixture



rail so as to maintain the gage in its operative use position on a fixture rail.

4,787,152
FLUID-BEDS
Andre Mark, 15 Rue Vendome, Lyon, France 69006
Filed Apr. 14, 1987, Ser. No. 38,067
Int. Cl.[4] F26B *3/00, 17/00*
U.S. Cl. 34—10 **17 Claims**



1. In a fluid-bed dryer or cooler apparatus for treating a product including a housing having a bedplate disposed therein which bedplate includes upper and lower surface members through which fluid currents are directed from a fan and wherein a product to be fluidized is introduced into the housing adjacent a feed end of the bedplate and discharged adjacent the opposite end of the bedplate, the improvement comprising said upper surface member of said bedplate being formed of a plurality of spaced plate means, each of said plate means having horizontally offset uppermost and lowermost portions, a generally continuous fluid permeable slot between each of said plate means, said plate means being mounted within the housing so that said lowermost portion of one of said plate means is in underlying relationship with respect to said uppermost portion of an adjacent plate means so that product passing along said uppermost portion is obstructed from passing through said slots and vertically below said plate means, said uppermost portions of said plate means being substantially coplanar and horizontally oriented within the housing, a plurality of varying sizes of ball elements disposed between the upper and lower surface members of the bedplate, said ball elements being of progressively less dimension along the length of the bedplate extending from the feed end and toward the opposite end thereof, a first fluid conveying duct extending between and communicating the fan with the lower surface member of the bedplate so that fluid distributed through said first duct to said lower surface member of said bedplate will pass through said slots between said uppermost and lowermost portions of adjacent plate means of the bedplate and will direct the product from the feed end toward the opposite end of the bedplate when the fan is operating to supply a fluid current and wherein the product will be supported so as to not pass through the upper surface member when the fan is inoperable.

4,787,153
SHOE DRIER
Yi Chen, No. 209, Sec. 3, Min Tsu Road, Tainan City, Taiwan
Filed Dec. 30, 1987, Ser. No. 139,441
Int. Cl.[4] F26B *19/00*
U.S. Cl. 34—87 **4 Claims**



1. A shoe drier comprising:

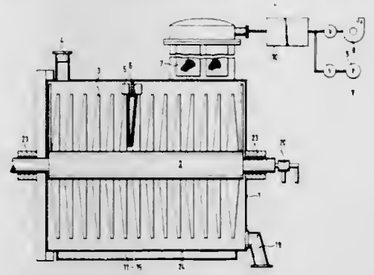
(a) a base (**1**) with a semicircular channel (**19**) mounted on central part of an exterior side of said base (**1**), wherein a plurality of slots (**10**) are provided at a bottom end of said base (**1**) to admit gas flowing therethrough; a timer (**11**) with a control bar (**112**) is mounted thereon for counting a period of time; a motor (**12**) is mounted on said base (**1**) for driving an impeller (**13**) to rotate; a heating chamber (**14**) encases a heater (**15**) which emits thermal gas for drying a pair of wet shoes; said impeller (**13**) transmits thermal gas to said semicircular channel (**19**);

(b) a cap (**2**) having a circular concavity (**21**) with a hole for said control rod (**112**) to insert through; a dial (**22**) being received by said circular concavity (**21**) for setting a drying period; a semicircular channel (**23**) being provided on said cap (**2**) which channel (**23**) is complemented by matching said channel (**19**) to form a passage;

(c) a U-shaped hanging element (**3**) having an upper housing (**31**), a first and a second lower housing (**35, 36**); a plurality of evenly spaced slots (**32**) being provided on upper parts of two wings of said upper housing (**31**) for guiding thermal gas to flow laterally out of said upper housing (**31**); an opening (**33**) being provided respectively on each top center of each wing of said upper housing (**31**) for thermal gas to flow out.

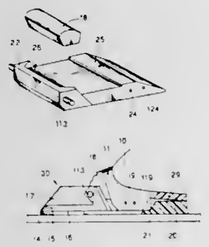
4,787,154
SUCTION FILTER-DRIER
Hans-Joachim Titus, 11, Av. Princesse Grace, MC 98 Monaco, Monaco
Filed Jun. 12, 1987, Ser. No. 60,924
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1986, 3619810; Oct. 8, 1986, 3634197; Oct. 15, 1986, 3635079
Int. Cl.[4] F26B *13/30*
U.S. Cl. 34—92 **41 Claims**

1. A suction-filter-drier, in particular for isolating and drying products from suspension characterized by a closed container (**1**) having a horizontal axis, of which the casing comprises generally in its lower half a liquid-permeable, concave, for instance cylindrically or elliptically curved inner filter surface (**24**) and an outer wall (**42**) spaced from this surface, this casing being divided into a plurality of filter chambers (**11** through **15**), and by a hollow rotor (**54**) generally extending axially through the container and supporting heatable rotor disks means (**58**) and driven in swinging or in reversible rotating manner to homogenize the product cake during filtration or to wash and to dry the product following isolation and said filter



surface (**24**) operable through a manifold system communicating with the filter chambers (**11** through **18**) and through selectively connected vacuum or compressed-gas sources both with excess pressure in the container (**1**) and external vacuum on one hand and on the other with external excess pressure and vacuum or normal pressure in the container.

4,787,155
TOE FOR LONG-DISTANCE SKIING BOOTS
Mario Callegari, Biadene Di Montebelluna, Italy, assignor to Icaro Olivieri & C. SpA, Italy
Filed Jun. 19, 1987, Ser. No. 63,973
Claims priority, application Italy, Jun. 20, 1986, 83374 A/86
Int. Cl.[4] A43B *5/04;* **A63C** *9/00*
U.S. Cl. 36—117 **6 Claims**



1. A long distance ski boot, comprising:

a toe member;

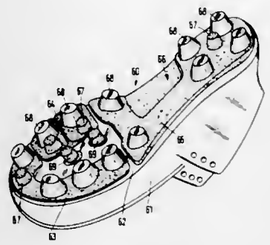
an elongate element having a front portion located anteriorly of said toe member and an extension portion extending beneath at least a portion of said toe member;

a seating surface formed in a posterior region of said front portion; and

a removable and replaceable resilient element fitted within said seating surface and thus positioned between said toe member and said elongate element.

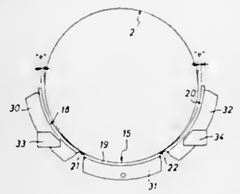
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4,787,156
SPORTS SHOE AND METHODS FOR MAKING THE SAME
Dieter Bade, Achim, Fed. Rep. of Germany, assignor to Kloeckner Ferromatik Desma GmbH, Achim, Fed. Rep. of Germany
Continuation of Ser. No. 32,988, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 795,405, Nov. 6, 1985, abandoned. This application Nov. 2, 1987, Ser. No. 117,401
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440567; Oct. 8, 1985, 3535830
Int. Cl.[4] A43B *5/02*; A43D *65/00*; B29C *45/16*
U.S. Cl. 36—128 5 Claims



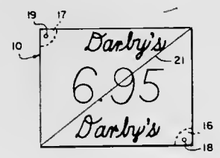
1. A shoe comprising shoe uppers having an inner sole, an exterior sole which is molded to the shoe uppers and made out of material that can be injection molded, the exterior sole including an intermediate sole and an outer sole, the outer sole comprising individual sole sections which are separated from one another and which are molded to the intermediate sole, the shoe further including one set of cleats injection molded together with the intermediate sole and molded to the inner sole of the shoe and a second set of cleats injection molded with the outer sole, at least some of the outer sole cleats being molded to the inner sole of the uppers through open spaces in the intermediate sole.

4,787,157
DRYER AND IRONER WITH DEFORMABLE TROUGH
Francois Ferrage, La Riviere-de-Corps, and Michel Adler, Bouilly, both of France, assignors to Etablissements DUBIX (S.A.), Saint-Julien-Les-Villas, France
Filed Apr. 21, 1986, Ser. No. 854,140
Claims priority, application France, Apr. 23, 1985, 85 06199
Int. Cl.[4] D06F *65/06*, *67/08*
U.S. Cl. 38—56 10 Claims



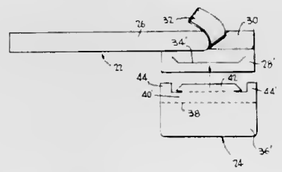
1. In a drying and ironing machine having a rotating cylinder the whole cylindrical surface of which being perforated by a large number of openings and completely wrapped by a sleeve-like elastic and permeable outer lining, at least:
a trough, heated to ironing temperature and against the inner concave and polished surface of which a piece of fabric, drawn by the rotating cylinder and its lining, is applied and simultaneously dried and ironed by friction, said inner concave and polished surface being that of a rectangular metal plate, such as of boiler-type steel sheet metal, which is bent to a radius approximately equal to that of the cylinder with its outer lining when cold, and which is carved on its outside convex surface, by such means as power drilling, with grooves running parallel to the bending axis of this plate and dividing the trough into several equal rigid curved sectors the number of which is equal to that of the grooves plus one, each of these grooves providing, by reduction of the thickness of the said plate, an axis of less resistance to the bending of the trough, and
adjustable supports of the trough which ensure the tight fit of each of the said sectors of the trough against the outer lining of the rotating cylinder by the slight bending of the trough occurring along each of the said grooves, regardless of the temperature and the expansion of the trough.

4,787,158
EASY REMOVAL TAMPER-INDICATING LABEL
Matt J. Vitol, 146 E. Court St., Woodstock, Va. 22664
Continuation-in-part of Ser. No. 768,477, Aug. 22, 1985, Pat. No. 4,671,003. This application Mar. 12, 1987, Ser. No. 24,966
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[4] A44C *3/00*
U.S. Cl. 40—638 10 Claims



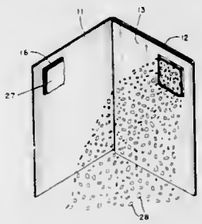
1. A tamper indicating label for removable application to a substrate including a first sheet having a first, information-conveying surface and a second adhesive-receiving surface opposite said first surface, a layer of pressure-sensitive adhesive adjacent to and completely covering said second surface, finger grip means on said second surface for grasping the edge of the label immediately interior of and adjacent to the perimeter of the label comprising a zone where the adhesive has been neutralized to render the zone nonadhesive, marking means on said first surface for marking the location of said finger grip means, tamper indicating means for indicating the unauthorized removal and reapplication of the label to the substrate, and a second backing sheet including a low adhesion portion in mating contact with the adhesive layer of the first sheet.

4,787,159
LABEL HOLDER FOR DISPLAYING PRODUCT INFORMATION
Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317
Filed Jan. 21, 1987, Ser. No. 5,908
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—642 7 Claims



1. A label holder comprising an elongate strip of sheet material such as plastic, having contact adhesive on one surface whereby the strip may be looped around an elongate hook prong or the like and secured to the prong by self adhesion between opposite end sections of the strip, each of said end sections being provided with the contact adhesive the strip including a widened flange extending laterally from one of said end sections, said flange being substantially free of the adhesive and providing a support element for a fold-down label holding panel wherein the flange includes first attachment means for a separate label-holding attachment, the holder further including the separate holding attachment formed of sheet material which includes the fold down panel and second attachment means engageable with the first attachment means for releasably securing the attachment to the flange, wherein the first attachment means comprises a slit in the flange and the second attachment means comprises a headed formation on the label holding attachment engageable in the slit, and wherein the headed formation on the attachment is bounded by tab means for engaging an upper surface of the flange and preventing upward tilting of the attachment.

4,787,160
GREETING CARD CONFETTI DELIVERY SYSTEM
Lawrence J. Balsamo, 539 Yosemite Court, Roselle, Ill. 60172
Filed May 15, 1987, Ser. No. 50,606
Int. Cl.[4] G09F *1/00*
U.S. Cl. 40—124.1 9 Claims



1. A greeting card comprising:
(a) a flat sheet of material folded into first, second and third adjacent sections, the first section forming a first leaf of the card and the second and third sections being laminated together to form a second leaf of the card where the third section is interposed between the first and second sections when said card is folded closed, the third section including an opening therethrough:
(b) a packet of confetti interposed between the lamination of said second and third sections, said packet including a front face containing perforations defining a rupture section, said packet being positioned such that
(i) the rupture section of said front face is exposed to the inside of said first leaf through said opening in said third section and
(ii) said opening provides a space for the confetti to occupy to promote flat folding of the card;
(c) a rupturing adhesive positioned on said first section opposite said rupture section; and
(d) a protective covering interposed between said adhesive and said front packet surface, said covering being removable to expose said adhesive to said front packet surface;
(e) whereby when said protective covering is removed and the card is closed the rupture adhesive contacts the rupture section and adheres with sufficient force to cause said rupture section to rupture and release the confetti in the packet upon the opening of the leaves.

4,787,161
ADVERTISING WRITING INSTRUMENT
Ou-Yang Feng, P.O. Box 10160, Taipei, Taiwan
Filed Jul. 13, 1987, Ser. No. 73,229
Int. Cl.[4] G09F *19/06*
U.S. Cl. 40—334 1 Claim



1. An advertising pen means comprising a pen having: a pen barrel having a hollow cylindrical hole formed in an upper portion of the barrel and a longitudinal slit formed in the barrel as downwardly notched from a top opening of said barrel, an axle tube fixed inside said barrel, a central stick selected from a pencil lead of a pencil or an inner ink reservoir of a ball pen replaceably mounted in said axle tube, a reel pole rotatably mounted on said axle tube and slidably reciprocated along the tube inside the barrel, a display sheet selected from a flag cloth, an advertising paper and a display cloth operatively wound on the reel pole through said longitudinal slit in said barrel, a clip formed on an upper portion of said barrel and a lower cap covering a nib of said pen;
said longitudinal slit having a length larger than a height of said display sheet;
said reel pole having a top knob formed on a top end of said pole rotatably engaged with a top opening of said barrel and having a lower plug formed on a lower end of said pole engageable with a bottom of said cylindrical hole of said barrel;
the improvement which comprises: said lower plug having an annular hook portion formed between said reel pole and said axle tube, and said axle tube having an extension formed on a top end of said tube, whereby upon an upward extending of said pole to protrude said display sheet beyond said barrel, said lower plug of said pole is limited by said extension of said tube; and said longitudinal slit having a trumpet port diverging upwardly and outwardly from a top opening of said slit, adapted for a retraction of said display sheet into said barrel through said port and said slit.

4,787,162
DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS
Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland
PCT No. PCT/EP85/00614, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/03028, PCT Pub. Date May 22, 1986
PCT Filed Nov. 12, 1985, Ser. No. 890,023
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441482
Int. Cl.[4] G09F *11/30*
U.S. Cl. 40—513 45 Claims

1. An apparatus for cyclic rearrangement of a pile of substantially planar rectangular sheets of nominally identical thickness, said pile having a first end and an opposite second end, said apparatus comprising a first frame part and a second frame part, said frame parts being reciprocable relative to one another along a reciprocation axis which is parallel to the plane of any said sheets, each of said sheets having a first edge trans-

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verse to said reciprocation axis and an opposite second edge parallel to said first edge, and said reciprocation extending between a closed end portion in which said frame parts are closest together and an opposite open end position, the apparatus further comprising means responsive to each reciprocation of said frame parts for removing an individual sheet from said first end of said pile leaving a remainder of said pile and for returning said individual sheet to said second end of said pile, said means for removing and returning including:

(a) separating means disposed in said frame parts for separating said individual sheet from said first end of said pile,

(b) feeding means disposed in said first frame part for feeding at least said individual sheet to said separating means,

(c) first retaining means disposed in said frame parts for holding said individual sheet in said first frame part, and

(d) second retaining means disposed in said second frame part for holding the remainder of said pile in said second



frame part, said second retaining means engaging said first edges of said sheets in said pile at the start of reciprocation, said feeding means including:

contact means for engaging said second edge of at least said individual sheet, and

bias spring means for urging said contact means and said second edge of at least said individual sheet into engagement,

said contact means being shaped to retain sheets engaged by said contact means against a predetermined force transmitted to each of said engaged sheets by said second retaining means upon said reciprocation, and

said bias spring means yielding to disengage said contact means from each of said engaged sheets to which a force exceeding said predetermined force is applied so as to permit passage past said contact means of those sheets which are subjected to said exceeding force.

4,787,163

VEHICLE MOUNTED SIGN

Marlin C. Berg, 5851 Farmington Rd., West Bloomfield, Mich. 48033

Continuation-in-part of Ser. No. 874,877, Jun. 16, 1986, Pat. No. 4,671,004, which is a continuation-in-part of Ser. No. 723,917, Apr. 16, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 27,392

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] G09F *21/04*

U.S. Cl. 40—592 **6 Claims**

1. A portable sign for removable mounting on the roof of a vehicle, said sign comprising:

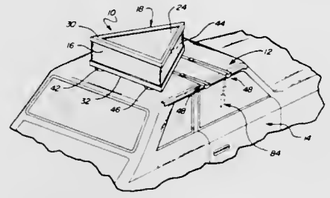
(A) an upper substantially planar frame structure having a triangular configuration;

(B) a lower substantially planar frame structure having a triangular configuration matching that of said upper frame structure;

(C) a side panel assembly of hollow triangular configuration matching the triangular configuration of said upper and lower frame structures,

(1) said side panel assembly defining first, second and third plastic panel sides with at least two of said sides formed integrally from a continuous rigid plastic panel bent to form a rigid apex of the assembly triangle and provide a rigid triangular panel structure,

(2) said panel assembly extending vertically between said upper and lower frame structures and forming a struc-



tural member supporting said upper frame structure with respect to said lower frame structure;

(D) means securing the upper and lower triangular edge portions of said side panel assembly respectively to the laterally outer triangular perimeters of said upper and lower frame structures with the outer display face of each panel side lying substantially in the plane of the associated laterally outer side edges of the frame structures to form a continuous uninterrupted closed loop viewing display surface extending 360 degrees with respect to the central vertical axis of the sign, extending for substantially the full height of said panel sides, and presenting at the outer lateral triangular extents of said sign; and

(E) attachment means for removably securing said sign to the roof of the vehicle.

4,787,164

Patent Not Issued For This Number

4,787,165

ARTIFICIAL BAIT FEEDING APPARATUS

Harold T. Cook, Jr., Bainbridge Island, Wash., assignor to Marco Seattle, Inc., Seattle, Wash.

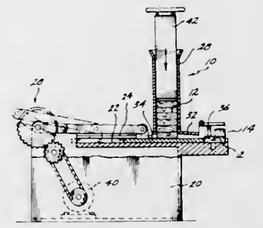
Filed Jul. 8, 1987, Ser. No. 71,119

Int. Cl.[4] A01K *79/00*

U.S. Cl. 43—4 **7 Claims**

1. An apparatus for feeding artificial bait to a baiting station comprising:

means for holding a stack of bait pieces adjacent a baiting station having means for guiding a fish hook through said baiting station, said having a first end and an opening adjacent said first end for allowing a piece of bait to be moved transversely from the end of the stack adjacent the first end;



means for moving said piece of bait transversely from the stack and transferring it to a baiting station; and,

means for biasing said stack of bait toward said first end so that when the piece of bait adjacent said first end is removed, the stack will index toward said first end to replace the just-removed piece of bait.

4,787,166

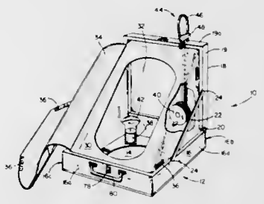
COLLAPSIBLE ENCLOSED FISHERMAN'S SIGNALING DEVICE

Wayne J. Vogt, 702 S. 15th St., and Ernest J. Clouse, 604 S. 11th St., both of Olivia, Minn. 56277

Filed Jan. 25, 1988, Ser. No. 147,538

Int. Cl.[4] A01K *97/12*

U.S. Cl. 43—17 **22 Claims**



1. A collapsible ice fishing apparatus, comprising:

(a) a collapsible container having a base with an opening therein;

(b) a light source contained within said container;

(c) a fishing reel mounted for rotation within said container and carrying fishing line with a hook attached;

(d) a triggering means constructed and arranged to be actuated by said reel upon a bite or catch of a fish upon said hook; and

(e) said container being constructed and arranged to emit light outside said container from said light source within said container upon actuation of said triggering means.

4,787,167

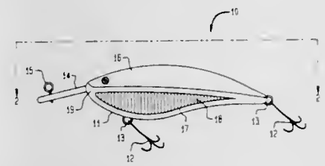
APPARATUS FOR ARTIFICIAL FISHING LURES HAVING VARIABLE CHARACTERISTICS

Michel T. Wroclawski, 12 Carter Rd., East Brunswick, N.J. 08816

Filed Dec. 23, 1986, Ser. No. 945,496

Int. Cl.[4] A01K *75/02*

U.S. Cl. 43—17.6 **4 Claims**



1. An artificial fishing lure comprising:

a body portion;

at least one fishing hook attached to said body portion; and

a liquid crystal material disposed on a surface of said body portion, wherein said liquid crystal material changes color in response to a variation in temperature of said liquid crystal material or a variation in electrical current flowing through said liquid crystal material.

4,787,168

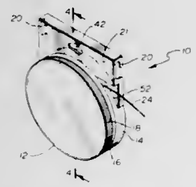
FISHING LINE DISPENSER AND DISPLAY PACKAGE

Brad J. Benit, and Gary B. Ader, both of Spirit Lake, Iowa, assignors to Berkley, Inc., Spirit Lake, Iowa

Filed May 7, 1987, Ser. No. 47,734

Int. Cl.[4] A01K *97/00*

U.S. Cl. 43—25.2 **13 Claims**



1. A fishing line dispenser mountable on a fishing rod for dispensing fishing line onto a reel mounted on the fishing rod, the dispenser comprising:

(a) a spool of fishing line having a free end for dispensing line onto said reel;

(b) a housing rotatably supporting said spool with the free end of the line operatively connected to the reel;

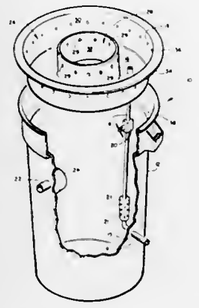
(c) means for releasably securing said housing to a shaft of said fishing rod while the line is transferred from the spool to the reel;

(d) a resilient pad engaging a side wall of said spool and an inside surface of the housing for providing drag to said spool for maintaining tension in fishing line being wound from the spool to the reel; and

(e) means for varying the drag on the spool by varying the spacing between the side wall of the spool and the inside surface of the housing engaged by the resilient pad to vary the friction between the pad and the surface of the housing.

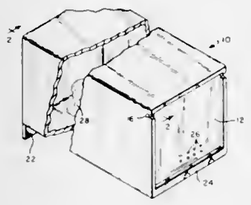
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,169
LIVE BAIT CONTAINER
Kathryn V. Maxfield, and Roger L. Nelson, both of 9232 Massot Ave., Santee, Calif. 92071
Filed Jan. 25, 1988, Ser. No. 148,280
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—57 **7 Claims**



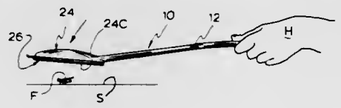
1. A live bait container comprising:
a first principle container for containing a large quantity of live bait therein;
a second removable subordinate container for containing a small quantity of said live bait taken periodically from said first container, said second container having an open circular trough as its upper surface with an aperture therethrough, said second container being positioned as a cover for said first container with said aperture therethrough providing an opening into said first container;
conduit means extending from a source of water under pressure for supplying water to said first container and selectively to said second container; and
means for independently maintaining preselected levels of water in said containers.

4,787,170
LOW OXYGEN SCENTED MOUSE TRAP
William E. Kingsbury, and Kenneth R. Bernard, both of Haverhill, Mass., assignors to Pied Piper International, Inc., Plaistow, N.H.
Filed Aug. 14, 1986, Ser. No. 860,140
Int. Cl.[4] A01M *23/02*
U.S. Cl. 43—61 **2 Claims**



1. An animal trap comprising:
an enclosure having an opening for permitting entry by an animal;
a one-way door hinged to the top of said opening, said door being adapted to close said opening and to swing freely upward into the enclosure; and means to allow the escape of scent from bait placed in the enclosure, which means to allow the escape of scent does not permit sufficient airflow into the enclosure to satisfy the oxygen requirements of an animal caught in the trap.

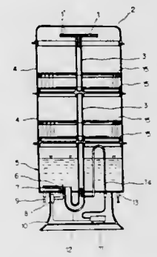
4,787,171
INSECT SWATTER
Pierre Dagenais, 6024 Waverly Street, Montreal, Canada H2T 2Y3
Filed Jun. 1, 1987, Ser. No. 56,248
Int. Cl.[4] A01M *3/02*
U.S. Cl. 43—137 **10 Claims**



1. An insect swatter comprising a frame-like body, a handle secured to said body, said body having a surface-striking peripheral edge, and a membrane closing the inside of said body and recessed from said surface-striking edge, a glue layer lining the face of said membrane facing said surface-striking edge, wherein said membrane is forcibly movable transversely of the thickness of said frame between a first position, which is its normal rest position, in which said membrane is outwardly convex, and a second insect-catching limit position in which said membrane is outwardly concave and extends short of a plane passing through said surface-striking edge, whereby an insect trapped within said body will contact and adhere to said glue layer without being crushed.

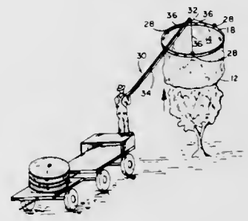
4,787,172
CULTIVATING DEVICE FOR BEAN SPROUTS
Soo H. Lee, Seoul, Rep. of Korea, assignor to Chan Beom Kim, Seoul, Rep. of Korea
Filed Apr. 29, 1987, Ser. No. 43,750
Claims priority, application Rep. of Korea, May 2, 1986, UM 86-6111[U]
Int. Cl.[4] A01C *1/00*
U.S. Cl. 47—16 **10 Claims**

1. A cultivating device for growing vegetables which comprises:
a water reservoir tank,
at least one cultivating container compositely stacked on said water reservoir tank,
two spaced-apart sieve plates disposed in said cultivating container, said vegetables being disposed between said sieve plates,
ascending tube means positioned within said water reservoir tank and said cultivating container for protecting said tube means from inadvertent dmage, one end of said ascending tube means communicating with the water disposed in the water reservoir tank with a U-shaped configuration and the other end thereof extending above the cultivating container,
a T-shaped injection pipe rotatably provided at said other end of said ascending tube means, said T-shaped injection pipe containing arm members which contain spray nozzles positioned at the end portions thereof, said spray nozzles on the end of said arm members being disposed to face in opposite directions so that through the introduction of the water to the T-shaped injection pipe, the T-shaped injection pipe being caused to rotate for sprinkling the water uniformly on the growing vegetables in said cultivating container,
pump means communicating with said ascending tube means



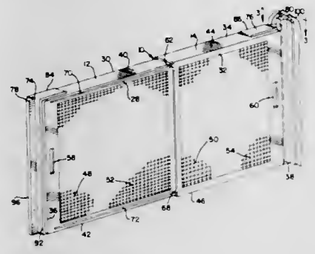
for generating air bubbles and pumping water from the water reservoir tank to the spray nozzles,
heating means disposed in said water reservoir tank for controlling the temperature of the water disposed in the water reservoir tank,
temperature sensing means disposed in said water reservoir tank for sensing the temperature of the water disposed in the water reservoir tank, and
control means operatively connected with said pump means, said heating means and said temperature sensing means for controlling the environment of the device for sprinkling the water periodically on the growing vegetables in the cultivating container in accordance with predetermined time schedule.

4,787,173
TREE COVERING AND METHOD OF USING THE SAME
Gene R. Lewis, Rte. 1, Box 284, Orland, Ind. 46776
Filed Sep. 29, 1986, Ser. No. 912,089
Int. Cl.[4] A01G *13/02*
U.S. Cl. 47—21 **5 Claims**



4. A method of removing a covering from a tree and the like, said covering including a flexible envelope having an open bottom and a closed top; ring means affixed to said envelope around the open bottom thereof for holding said bottom open; the method comprising the steps of removing said covering by exerting upward forces on the ring means at the open bottom of said envelope until said covering is turned substantially completely inside out, thereby reverse peeling it from the tree.

4,787,174
CHILD SAFETY GATE
Tyrone Brown, 15338 Hastings Dr., Dolton, Ill. 60419
Filed Jun. 5, 1987, Ser. No. 58,551
Int. Cl.[4] E06B *7/00*
U.S. Cl. 49—55 **9 Claims**



1. A child safety gate for restraining and protecting children and pets, comprising:
a first elongated, open-ended, slidable panel having
a substantially imperforate rectangular solid first front wall with an attached end, an unattached cantilevered end, a middle portion, a top edge, and a bottom edge;
a substantially imperforate rectangular solid second back wall with an attached end, an unattached cantilevered end, a middle portion, a top edge, and a bottom edge;
said first front and first back walls being aligned and in substantial parallel relationship to each other and cooperating with each other to provide a first substantially child-impermeable upright barrier for safely restraining and blocking passage of babies and toddlers;
a substantially vertical first end wall extending substantially perpendicular between and connecting said attached ends of said first front and first back walls, said end wall having a top edge and a bottom edge;
a first resilient upright door frame-engaging portion connected to and extending outwardly from said first end wall for matingly engaging and abutting against a door jamb;
a first intermediate reinforcing strut extending between, reinforcing, and connecting said middle portions of said first front and back walls, said first strut being substantially parallel to said first end wall;
a first top wall extending laterally between and connecting the top edges of said first front, back and end walls;
a first bottom wall extending laterally between and connecting the bottom edges of said first front, back and end walls, said first bottom wall being substantially parallel to said first top wall and substantially perpendicular to said first end wall; and
said unattached cantilevered ends and middle portions of said first front and first back walls cooperating with said first strut and said first top and bottom walls to form a panel-receiving pocket and a first spring-containing chamber;
a second elongated, open-ended, slidable panel being slightly smaller than said first panel for telescopic sliding engagement with said first panel, said second elongated, open-ended, slidable panel having
a substantially imperforate rectangular solid second front wall with an attached end, an unattached cantilevered end, a middle portion, a top edge, and a bottom edge;
a substantially imperforate rectangular solid second back wall with an attached end, an unattached cantilevered end, a middle portion, a top edge, and a bottom edge;

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said second front and second back walls being aligned and in substantial parallel relationship to each other and cooperating with each other to provide a second substantially child-impermeable upright barrier for safely restraining and blocking passage of babies and toddlers;

a substantially vertical second end wall extending substantially perpendicular between and connecting said attached ends of said second front and second back walls, said second end wall having a top edge and a bottom edge;

a second resilient upright door frame-engaging portion connected t and extending outwardly from said second end wall for matingly engaging and abutting against a portion of a door frame opposite said door jamb;

a second intermediate reinforcing strut extending between, reinforcing, and connecting said middle portions of said second front and back walls, said second strut being substantially parallel to said second end wall;

a second top wall extending laterally between and connecting the top edges of said second front, back and end walls;

a second bottom wall extending laterally between and connecting the bottom edges of said second front, back and end walls, said second bottom wall being substantially parallel to said second top wall and substantially perpendicular to said second end wall; and

said unattached cantilevered ends and middle portions of said second front and first back walls cooperating with said second strut and said second top and bottom walls to form a second spring-containing chamber and an open-ended plug for slidably, telescopically, and matingly engaging said panel-receiving pocket of said first panel; and

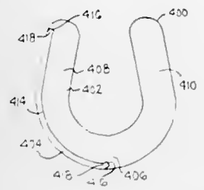
a plurality of compression springs positioned in said spring chambers and extending longitudinally between and connected to said first and second struts for urging said first and second panels to move telescopically outwardly to an expanded engagement position to securely engage said safety gate against said door frame upon installation and use, and said springs being compressible when said panels are squeezed longitudinally towards each other with a preselected minimum force for moving said panels telescopically inwardly to a contracted compressed position to release and remove said safety gate from said door frame.

4,787,175

NON-METALLIC DOOR EDGE GUARD

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Continuation-in-part of Ser. No. 004,658, Jan. 20, 1987, Pat. No. 4,730,415. This application Dec. 7, 1987, Ser. No. 129,544
Int. Cl.⁴ E05F *7/00*
U.S. Cl. 49—462 **6 Claims**



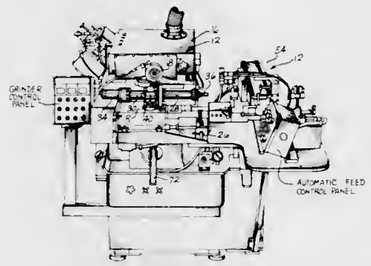
1. In combination with the trailing edge of a swinging closure, the improvement in a decorative and protective edge guard fitted onto the trailing edge of the swinging closure, comprising a non-metallic body having a curved base fitting over the edge and legs extending from the base to fit against sides of the swinging closure adjacent the edge, said body containing notch structure forced in its surface and having a certain thickness, a layer of non-metallic material having a thickness corresponding essentially to the thickness of said notch structure, and cooperatively joined to said body and fitted to said notch structure, said layer overlying at least a portion of the exterior surface of said base and an adjoining portion of one of the legs and in which side edges of said layer of non-metallic material that extend lengthwise of the edge guard are embedded into the material of said body.

4,787,176

DRILL BIT SHARPENING APPARATUS

Robert L. Fuller, Jr., Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 24, 1986, Ser. No. 822,198
Int. Cl.⁴ B24B *19/00*
U.S. Cl. 51—5 R **28 Claims**



1. Mechanism for feeding drill bits one at a time into a drill bit holder of a drill bit sharpener which includes a grinding wheel, comprising:

a drill bit carrier movable between a drill bit receiving position and a drill bit inserting position, said carrier including a collet for receiving the shank end of a drill bit when the carrier is in its drill bit receiving position, and means for rotating the collet in position about the drill bit axis;

means for inserting a drill bit into the collet when the drill bit carrier is in its drill bit receiving position and closing the collet to grip said drill bit;

locator means for sensing the position of the drill bit in the collet and rotating the collet an amount sufficient to position the point of the drill bit for proper contact with the grinding wheel;

means for then moving the carrier from its drill bit receiving position into its drill bit inserting position, said drill bit being aligned with the drill bit holder when the carrier is in its drill bit inserting position;

means for then moving the collet endwise an amount sufficient to insert the drill bit into the drill bit holder and opening the collet to release the drill bit from the collet; and

means for moving the carrier back into its drill bit receiving position, for receiving another drill bit.

4,787,177

TOOLHOLDER FOR GRINDING FLAT TIP OF SCREWDRIVER INTO HOLLOW GROUND SHAPE

Carmine J. Scalia, 43 Ridge St., Cos Cob, Conn. 06807

Filed Nov. 26, 1986, Ser. No. 935,044
Int. Cl.⁴ B24B *19/00*
U.S. Cl. 51—217 R **6 Claims**

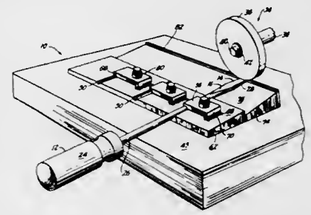
1. A toolholder for use in grinding the flat angled planes of the driving tip of a screwdriver having a shank into a hollow ground shape by use of a grinding machine having a grinding wheel with a grinding circumferential surface and a toolholder bed for holding said toolholder while simultaneously moving said screwdriver, held by said toolholder, into grinding contact with said circumferential surface of said grinding wheel, comprising:

(a) a first section of said toolholder having a first top surface and a shaped recess cut therein for positioning said shank of said screwdriver;

(b) a shank holding means which cooperates with said recess for maintaining said shank of said screwdriver in fixed relative position on said toolholder;

(c) a second section of said toolholder adjacent to said first section and having a second top surface;

(d) said first section and said second section having coplanar bottom surfaces;



(e) a first angle of incline being defined between said first top surface of said first section and said coplanar bottom surfaces, first angle of incline being slightly greater than one quarter of the angle defined by the flat planes of said tip of said screwdriver; and

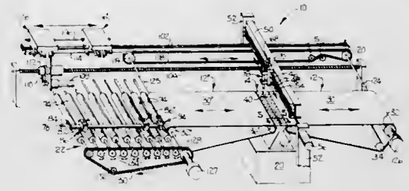
(f) a flat screwdriver tip abutment ledge located at the front end of said second section and extending perpendicularly to said bottom of said second section, providing an abutment surface perpendicular to the axial line of said shank holding means preventing relative forward move- ment of said tip of said screwdriver secured in said toolholder, the height of said ledge being not more than the thickness of the front end of said tip of said screwdriver.

4,787,178

FLUID-JET CUTTING APPARATUS

G. Michael Morgan, Fairfield; W. Douglas Hipp, Jefferson County, both of Iowa; Henry R. Sterner, San Diego, Calif., and L. Bruce Moore, Rock Island, Ill., assignors to Creative Glassworks International, Inc., Fairfield, Iowa

Filed Apr. 13, 1987, Ser. No. 37,380
Int. Cl.⁴ B24C *3/32*
U.S. Cl. 51—418 **33 Claims**



1. Apparatus for cutting a sheet of substantially rigid material by means of a high velocity fluid jet, comprising:

supporting means for supporting said sheet during cutting thereof;

nozzle means for discharging said fluid jet against said supported sheet;

mounting means mounting said nozzle means for movement relative to said sheet along a first one of two orthogonal axes;

said supporting means including sheet-supporting belt means movable parallel to the second one of said axes;

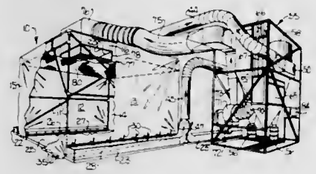
sheet moving means separate from said supporting means for moving said sheet parallel to said second one of said axes, and for imparting generally synchronous movement to said belt means.

4,787,179

ABRASIVE BLASTING CONTAINMENT SYSTEM

Richard E. Lewis, 7728 Bedfordshire Dr., Charlotte, N.C. 28226

Filed Aug. 10, 1987, Ser. No. 83,449
Int. Cl.⁴ B21C *9/00*
U.S. Cl. 51—426 **8 Claims**



1. An abrasive blasting containment system particularly adapted for cleaning large turbines and the like and for preventing the escape of abrasive blasting particles, said system comprising

a portable blasting room enclosure including a substantially square open frame member, flexible opposite side and end walls, and a roof supported on said frame and including a central air entry opening therein,

air circulating means including a blower, a pair of elongate and spaced parallel air return ducts extending along the lower edges of said opposite side walls of said blast room enclosure and defining opposite side boundaries of a first solid floor area beneath said blasting room enclosure, said spaced parallel air return ducts also extending outwardly beyond said blast room enclosure and defining opposite side boundaries of a second solid floor area extending between said air return ducts and adjacent the first floor area beneath said blasting room enclosure, said air return ducts being positioned above the level of said solid floor, abrasive particle separator means, and pipe means communicatively interconnecting said air return ducts, said abrasive separator means, said blower, and said central opening in said roof of said blast room enclosure to provide a closed loop conveying air stream through said blasting room enclosure,

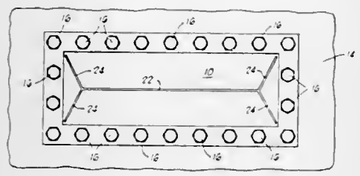
inlet air diffuser means extending parallel to and spaced below said roof and covering the air entry opening therein for uniformly distributing the air introduced into said blast room in a downward direction and into said parallel air return ducts without creating turbulence in said blast room,

track members extending parallel with and along the length of said air return ducts, and

roller means supporting the lower portion of said portable blasting room enclosure, said roller means being mounted on said track means to permit rolling movement of said portable blasting room enclosure between positions covering said first and second floor areas.

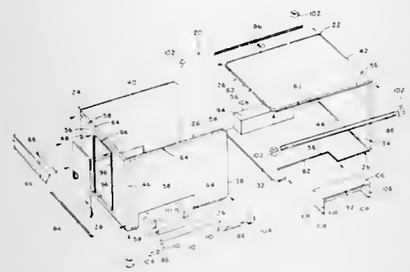
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,180
VIBRATION RESISTANT RUPTURABLE PRESSURE RELIEF MEMBER
M. Steven Robinson, and Arnold L. Mundt, both of Tulsa, Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.
Filed Jan. 29, 1988, Ser. No. 150,284
Int. Cl.⁴ E04H *9/00;* **F16K** *17/40;* **B65D** *25/00*
U.S. Cl. 52—1 **13 Claims**



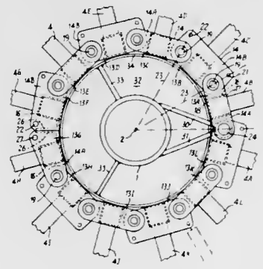
1. A vibration resistant rupturable member for sealingly covering a pressure relief vent of a structure subject to vibration and rupturing at a predetermined pressure level to thereby protect said structure from overpressure comprising a rupture panel adapted to be sealingly connected over said vent having an elongated concave-convex bulged portion formed therein and including a score pattern on a surface of said bulged portion forming lines of weakness therein along which rupture of said panel occurs, said score pattern being comprised of an elongated score extending longitudinally across said bulged portion the ends of which connect with the intersecting ends of pairs of divergent additional scores on said bulged portion which form V-shapes, the length of said elongated score being in the range of from about 2.0 to about 10.0 times the length of the longest of the additional scores forming said V-shapes.

4,787,181
SHELTER AND SHELTER CONSTRUCTION METHOD
Donald W. Witten, Collinsville, and Donald R. Downey, Tulsa, both of Okla., assignors to Nordam, Tulsa, Okla.
Filed Sep. 15, 1986, Ser. No. 907,460
Int. Cl.⁴ E04H *1/00*
U.S. Cl. 52—79.1 **22 Claims**



1. A shelter, comprising:
a unitary first shell means for forming a unitary top wall, bottom wall, and first end wall;
a unitary second shell means for forming a unitary second end wall, first side wall, and second side wall, the first and second shell means being complementarily positioned to create the shelter;
entryway means, located in at least one of the walls, for sealably allowing entry into and exit from the shelter;
a first metallic member, in transverse cross-section the first metallic member having a bottom end bonded along the peripheral edge of the first shell means and having a top end;
a second metallic member, in transverse cross-section the second metallic member having a bottom end bonded along the peripheral edge of the second shell means and having a top end; and
wherein the top end of the first metallic member weld receivingly adjoins the top end of the second metallic member when the first and second shell means are complementarily positioned to form the shelter.

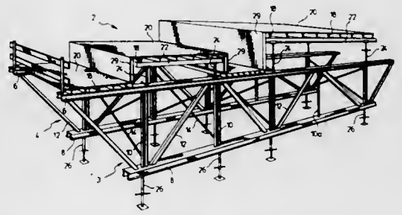
4,787,182
DISPLACEABLE OPENABLE AND CLOSABLE COVERING STRUCTURE
Gillard Serge, Bois Le Roi, France, assignor to G. Gillard et Cie, France
Filed May 26, 1987, Ser. No. 53,691
Claims priority, application France, Jun. 6, 1986, 86 08189
Int. Cl.⁴ E04B *7/00*
U.S. Cl. 52—82 **11 Claims**



1. A displaceable openable and closable cover structure comprising:
a main pivotal shaft (**24**) which is vertical in position in use of the structure,
two first links (**13**) which are horizontal in use and which are each pivotally connected by way of a first end portion about the main pivotal shaft (**24**) respectively on two opposite sides of the shaft (**24**),
a succession of supplementary links (**13**) which follow each other from each of the two first links (**13**), the number thereof being determined by the size of the structure, said links being pivotally connected together in twos by way of their end portions, each link (**13**) having between its end portions a central truss fixing zone (**16**), the succession of links (**13**) on each side of the main pivotal shaft (**24**) respectively terminating with a terminal link (**13F, 13G**) having a free end provided with a support and fixing means (**26, 27**) for fixing them to each other when the links (**13**) have been disposed in a closed contour,
trusses (**4**) respectively fixed by one end to a corresponding link (**13**), to the central zone (**16**) thereof, and each extending substantially perpendicularly to said link,
at least one frame (**7**) extending in use in a vertical plane between two successive trusses (**4**), each frame (**7**) being pivotally connected by its opposite ends to the trusses (**4**) that it connects and itself being pivoted at its centre about a vertical axis (**35**) to be folding while the frame (**7G**) which in use connects the trusses (**4G, 4H**) of the terminal links (**13F, 13G**) can be dismantled into two portions (**7'G, 7''G**),
a jack (**8**) pivotally connected by way of one end to a link (**13**) between the two links of each pair of successive pivotally interconnected links, said jack (**8**) being pivotally connected by way of its opposite end to the corresponding folding frame (**7**) or to at least one connecting bar (**10, 11**) pivotally connected to said folding frame (**7**) and
removable legs (**5A, 5B**) which are preferably foldable and which are mounted at the free end portion of certain trusses (**4**) which are in opposite relationship in use of the structure

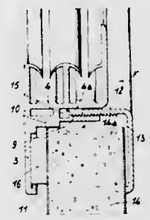
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4,787,183
TRUSS ARRANGEMENT
Ronald J. Johnston, Georgetown, Canada, assignor to Aluma Systems Ltd., Downsview, Canada
Filed Dec. 24, 1985, Ser. No. 813,242
Int. Cl.⁴ E04G *11/36*
U.S. Cl. 52—126.4 **21 Claims**



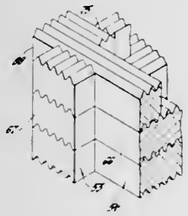
1. A truss for use in concrete forming comprising a top chord and a bottom chord interconnected by upright members and diagonal bracing members, at least some of said upright members being of a shape for receiving adjustable extension legs each of a length substantially greater than half the distance spacing said top chord and said bottom chord, said upright members receiving adjustable extension legs to extend beyond said bottom chord for supporting said truss and beyond said top chord for supporting a load collecting beam, each leg being independently telescopically movable within said truss.

4,787,184
DOOR AND WINDOW FRAME
Guy A. D. Boidron, Le Pave Neuf, 37500 Chinon, France
Filed Mar. 27, 1987, Ser. No. 30,573
Claims priority, application France, Apr. 4, 1986, 86 04848
Int. Cl.⁴ E06B *1/04*
U.S. Cl. 52—217 **3 Claims**



1. A frame for doors and windows comprising:
(a) a first L-shaped member comprising:
(i) a first arm;
(ii) approximately parallel inner and outer second arms, both approximately perpendicular to said first arm, and said outer second arm intersecting with said first arm; and
(iii) a shoulder interposed between said inner second arm and said first arm, said shoulder being adapted to space said inner second arm from an edge of said doors and windows;
(b) a second L-shaped member comprising intersecting and approximately perpendicular first and second arms; and
(c) a compressible strip; wherein one of said second arms of said first L-shaped member, and said second arm of said second L-shaped member, comprise means for cooperating to connect said first and second L-shaped members, and wherein at least one of said first arms comprises an internal groove for supporting said compressible strip, said compressible strip being adapted to be supported in said internal groove, and being of a thickness greater than the depth of said internal groove.

4,787,185
LOG STRUCTURES AND METHOD OF CONSTRUCTING SAME
Dwayne Gascho, 1051 Schmid Rd., Fairview, Mich. 48621
Filed Feb. 11, 1982, Ser. No. 347,706
Int. Cl.⁴ E04B *1/10*
U.S. Cl. 52—233 **8 Claims**



1. A log structure comprising, in combination, first and second logs which are each defined by a predetermined width and a longitudinal axis and which each have top and bottom ripple surfaces which are each substantially defined along planes parallel to said longitudinal axis and side walls on opposite sides of said axis connecting said ripple surfaces, said ripple surfaces each including a series of peaks and valleys of substantially the same size, spacing and configuration, said first log being positioned on top of said second log so their axes are at a right angle to each other, a notch in said first log, said first log notch intersecting said first log bottom ripple surface and being of a length to extend between said first log side walls, a depth substantially to said first log longitudinal axis; a notch in said second log, said second log notch intersecting said second log top ripple surface and being of a length to extend between said second log side walls, a depth substantially to said second log longitudinal axis whereby when said notches are placed together said notches interlock and said axes substantially intersect at substantially said right angle, each of said logs having an interior side wall, said first log containing a hole substantially defined by an axis that is substantially perpendicular to said first log top ripple surface plane and is substantially aligned with said second log interior side wall, said second log containing a hole substantially defined by an axis that is substantially perpendicular to said second log top ripple surface plane and is substantially aligned with said first log interior side wall, said first log having a second notch substantially aligned with said second log hole, said second log having a second notch substantially aligned with said first log hole, and a sealant in each of said holes and second notches so as to provide a seal that prevents air flow past said interior surfaces through said interlocked notches.

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4,787,186

COMBINATION FOR SECURING AN ANCHOR MEMBER

Hans-Jürgen Irmscher, Emmering; Ludwig Gebauer; Gusztav Lang, both of Munich, and Peter Mauthe, Kleinberghofen, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

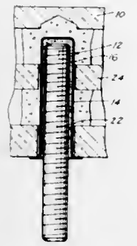
Filed Dec. 20, 1983, Ser. No. 563,662

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247227

The portion of the term of this patent subsequent to May 29, 2005, has been disclaimed.

Int. Cl.⁴ E04C *1/00, 5/00;* **E21D** *20/02;* **E04B** *1/38*

U.S. Cl. 52—309.3 **25 Claims**



1. A combination for securing an anchor member, such as an anchor rod, in a hard receiving material, comprising a hardenable reaction resin mortar containing filler material, and an axially elongated sleeve-shaped screen-like wall forming an axially extending dowel member having openings along the axial length thereof and extending through said wall transversely of the axial direction of said dowel member and said dowel member serving to receive said mortar so that said mortar flows outwardly through the openings and said dowel member containing said mortar arranged to receive and secure the anchor member, wherein the improvement comprises that said filler material in said mortar has a mean particle diameter in the range of 0.01 to 0.5 mm, and the ratio of the diameter of said openings through said dowel member to the mean particle diameter of said filler material is in the range of approximately 1.5 to 12.0 so that said filler material passes through said openings.

4,787,187

WINDOW TRIM STRIP

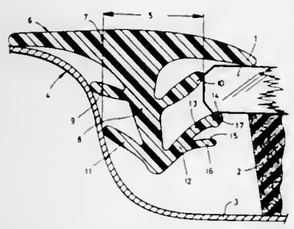
Franz Feldmann, Grolsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1987, Ser. No. 89,729

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 8623135[U]

Int. Cl.⁴ E04B *1/62*

U.S. Cl. 52—397 **2 Claims**



1. A trim strip for covering a gap between a window glass and a window frame, consisting of a decorative strip covering the gap with a web projecting obliquely from the decorative strip for insertion into the gap, and a plurality of barb-like ribs pointing outwards from the web to engage the window glass and the window frame, characterized by the lowest most of the ribs facing the window glass being split to provide an upper arm and a lower arm at different heights and each arm having a having catch surface to engage with the glass and the upper arm being longer than the lower arm and having an enlargement at the end.

4,787,188

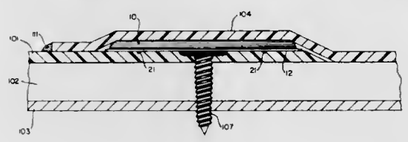
STRESS PLATE AND METHOD OF USING SAME FOR SECURING A ROOF MEMBRANE TO A ROOF DECK

Colin R. Murphy, Augusta, N.J., assignor to Engineered Construction Components

Continuation of Ser. No. 815,551, Jan. 2, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 106,991

Int. Cl.⁴ E04B *5/00, 1/38*

U.S. Cl. 52—410 **23 Claims**



1. In a roof including a roof membrane, the improvement comprising:

a stress plate having a top surface and a bottom surface, said plate including an opening for receiving a fastening means for securing the stress plate to a roof, said bottom surface being in contact with a roof membrane portion which is in contact with the roof, said stress plate having at least three spaced prongs extending outwardly from the bottom surface of said plate, said at least three spaced prongs being unitary with said plate; and fastening means received in said opening and secured to the roof, said prongs gripping the top surface of said membrane portion which is in contact with the roof, said stress plate clamping the membrane between the bottom surface of the stress plate and the roof.

4,787,189

BUILDING BLOCKS

Erik M. Haug, Gosnells, and Erling G. Haug, Inglewood, both of Australia, assignors to Baldina Pty. Ltd., Booragoon, Australia

PCT No. PCT/AU84/00230, § 371 Date Aug. 19, 1985, § 102(e) Date Aug. 19, 1985, PCT Pub. No. WO85/02216, PCT Pub. Date May 23, 1985

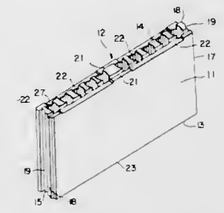
PCT Filed Nov. 8, 1984, Ser. No. 767,281

Claims priority, application Australia, Nov. 8, 1983, PG2252

Int. Cl.⁴ E04B *2/00*

U.S. Cl. 52—415 **19 Claims**

1. A building construction comprised of blocks of substantially rectangular prismatic configuration wherein the first pair of opposite edges of each block are each formed with a first tongue and a first groove of complementary configuration extending in parallel relationship along each edge wherein the first tongue of one edge is opposite the first groove of the other edge, each of said first pair of edges being formed with a land portion extending between sides of said edge and the adjacent first tongue or groove, the height of said first tongue above said land portion being greater than the depth of the first groove below said land portion such that on a pair of blocks abutting whereby the first tongue of one edge is snugly received within the first groove of the other edge of another block,, the opposing land portions of the blocks are spaced from each other and a gap is formed between said land portions outwardly of said first tongue and said groove, the second pair of edges being formed whereby one edge has a second tongue extending along its edge and the portion of the one edge to each side of the second tongue being formed with raised land



portions, and the other edge of said second pair of edges is formed with a second groove of complementary configuration to said second tongue wherein the height of the second tongue above the land portions is equal to the depth of the second groove, and a bonding adhesive filling solely the gap between said land portions for affixing said blocks to each other.

4,787,190

ROOF TILES AND FASTENING DEVICES

Kurt R. Papsdorf, Furstenfeldbruck, Fed. Rep. of Germany, assignor to Evertile Building Systems Canada Ltd., Delta, Canada

Continuation-in-part of Ser. No. 884,396, Jul. 11, 1986, abandoned. This application May 8, 1987, Ser. No. 48,008

Int. Cl.⁴ E04D *1/20*

U.S. Cl. 52—553 **11 Claims**



1. A roof tile comprising an upper side and an under side, first and second lateral edges, first and second transverse edges, a downward-oriented flange running longitudinally along one lateral edge of said tile and a complementary upward-facing channel running longitudinally along the other lateral edge of said tile whereby a flange of one said tile will rest loosely in said channel of a second neighbouring said tile, a transverse groove running laterally along the upper side of said tile adjacent one transverse edge thereof and a complementary downward-facing ridge running transversely along the under side of said tile adjacent the other transverse edge thereof whereby said ridge of one tile will rest loosely in said groove of a second neighbouring tile, said tile being thereby adapted for interlocking engagement with laterally neighbouring tiles and overlapping engagement with longitudinally neighbouring tiles, said tile further comprising means for fastening said tile to a roof whereby said tile is provided with an aperture for receiving a resilient plug, said plug having a surface for bearing against said tile and being adapted to receive fastening means for fastening said plug to said roof and thereby resiliently fastening said tile to said roof.

4,787,191

ELEMENTS FOR CONSTRUCTING A THREE-DIMENSIONAL STRUCTURE

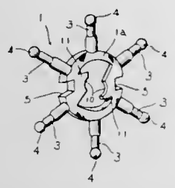
Hiroshi Shima, 2-20, Kuko 1-chome, Ikeda-shi, Osaka Prefecture, Japan

Filed Jul. 6, 1987, Ser. No. 69,762

Claims priority, application Japan, Jul. 8, 1986, 61-105142[U]; Feb. 12, 1987, 62-19271[U]

Int. Cl.⁴ E04H *12/00*

U.S. Cl. 52—648 **19 Claims**



1. Elements for constructing a three-dimensional structure, which comprises beams that make edges, polygonal plates that make faces and joints with arms that connect said beams and/or said polygonal plates with each other so that a desired structure is formed, and said polygonal plates include hooks at each side for holding said beams by said sides.

4,787,192

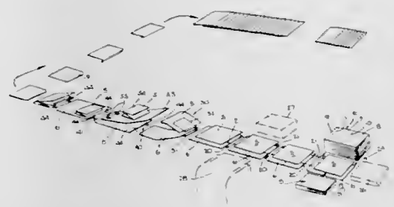
MECHANISM FOR FOLDING AN ENVELOPE AROUND AN INSERT

William H. Gunther, Jr., Mystic, Conn., assignor to Gunther International, Ltd., Mystic, Conn.

Continuation of Ser. No. 899,645, Aug. 25, 1986, Pat. No. 4,694,632, which is a continuation-in-part of Ser. No. 747,704, Jun. 24, 1985, abandoned, which is a continuation of Ser. No. 423,665, Sep. 27, 1982, abandoned. This application Jul. 20, 1987, Ser. No. 75,125

Int. Cl.⁴ B65B *57/14*

U.S. Cl. 53—56 **2 Claims**



1. A mechanism for forming an article having at least one sheet having code data thereon comprising means for holding a stack of pre-cut single individual sheets, means for feeding each of said sheets individually from said stack of sheets, means for sequentially presenting a series of comparison data to said mechanism, reading means adjacent said stack for sensing said code data on each sheet before each sheet is fed from said stack, means for comparing the code data on each sheet sensed by the reading means with the then first, at the time of comparison, sequential series of comparison data to determine whether the code data on each sheet matches with said comparison data, means for interrupting feeding of sheets from said stack responsive to said comparing means for stopping the feed of a sheet from said stack if the code data on the sheet does not match with said comparison data.

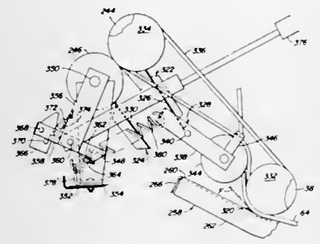
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4,787,193

SYSTEM FOR AUTOMATICALLY ENVELOPING A LARGE ROUND BALE WITH A WRAPPING

Michael J. Verhulst, and Henry D. Anstey, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Division of Ser. No. 883,791, Jul. 8, 1986, Pat. No. 4,677,807. This application Feb. 18, 1987, Ser. No. 16,021
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—118 **6 Claims**



1. A wrapping mechanism for enveloping a large round bale with a wrap material having a width commensurate with that of the bale, comprising: first and second rotatably mounted wrap material drive rolls for delivering wrap material generally along a flight path extending tangent to the drive rolls; a drive assembly including a driven pulley axially coupled to the first drive roll, a drive pulley, a drive belt trained about the driven and drive pulleys, and a pivotally mounted idler arm carrying an idler pulley engaged with the drive belt and being swingable between first and second positions for selectively establishing engaged and disengaged drive conditions; a knife support arm carrying a knife and being pivotally mounted for movement between a cocked position disposed away from the flight path and a cut-off position extending across the flight path; a spring coupled between the knife support arm and the idler arm for biasing the idler arm to its first position when the knife support arm is in its cocked position and for simultaneously moving the idler arm to its second position and moving the knife support arm from its cocked to its cut-off position when the knife support arm is released from its cocked position; and a latch assembly means for selectively moving the knife support arm from its cut-off position to its cocked position, for selectively releasing the knife support arm from its cocked position and for selectively reengaging the knife support arm when the latter is in its cut-off position.

4,787,194

RF-SEALABLE PACKAGING CONTAINERS

Gerald M. Lancaster, Surfside, and David C. Kelley, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 738,008, May 28, 1985, Pat. No. 4,660,354, and a continuation-in-part of Ser. No. 645,990, Aug. 31, 1984, Pat. No. 4,601,948, which is a continuation-in-part of Ser. No. 531,110, Sep. 12, 1983, Pat. No. 4,600,614. This application Apr. 27, 1987, Ser. No. 42,997
Int. Cl.[4] B65B *7/02*
U.S. Cl. 53—469 **18 Claims**

1. A method for filling and sealing a container of multiwall construction, said container being closed except for a pinch-valve, comprising

introducing product into the container through the pinch-valve via a filling spout,

removing the filling spout from the pinch-valve, allowing the valve to close, and

sealing the valve closed by subjecting the valve to the RF energy of a stray current or stray field electrode,

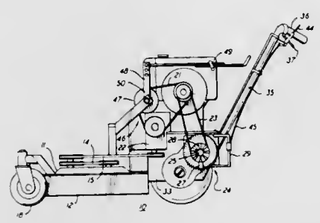
wherein the material from which the valve is made contains at least one RF-sealable polymer of the group consisting of carbon monoxide-containing ethylene polymers.

4,787,195

POWER LAWNMOWER WITH HYDROSTATIC DRIVE

Philip H. Wenzel, Vernon Center, N.Y., assignor to Ferris Industries, Inc., Oneida, N.Y.

Filed Jun. 17, 1987, Ser. No. 63,007
Int. Cl.[4] A01D *69/06*
U.S. Cl. 56—11.1 **12 Claims**



1. A self-propelled mower that includes a front mowing deck housing a blade assembly containing one or more movable blades,

a rear power deck containing an engine, a pair of drive wheels and a power train coupling the engine to the drive wheels, wherein the engine has a horizontally disposed output shaft positioned over the power deck, and power take off means for connecting the blade assembly to said output shaft,

handle bar means attached to the back of the power deck for steering the drive wheels,

said power train further includes a hydrostatic transmission having an output shaft means connected to the engine and a drive shaft means connected to the drive wheels and a speed regulator to set the speed ratio of the drive shaft means to the input shaft means within a continuous range from reverse through neutral, wherein the drive shaft means is idle, to maximum forward,

a control member positioned on the handle bar means that is connected to the regulator by a speed control linkage for setting the regulator at any desired positioned within the continuous range so that the operator can select a desired drive wheel speed without releasing the handle bar means or uncoupling the transmission from the engine, and

wherein the power take off means further includes a gear box mounted upon the mower deck with a horizontal input shaft that is coupled to the horizontally disposed output shaft of the engine, and with an output shaft, means connecting said gear box output shaft to the blade assembly, and clutch means for releasably coupling the engine output shaft to the gearbox input shaft.

4,787,196

SELF-CLEANING ROTOR ASSEMBLY

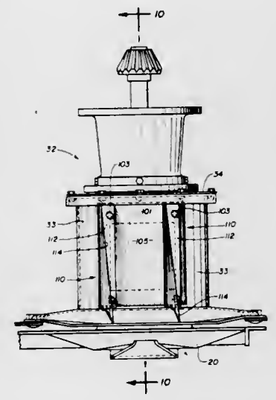
Franja F. Voler; John K. Hale, both of New Holland, and Earl E. Koch, Mohnton, all of Pa., assignors to New Holland Inc., New Holland, Pa.

Continuation-in-part of Ser. No. 846,652, Mar. 31, 1986, Pat. No. 4,653,253. This application May 22, 1987, Ser. No. 28,945
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—13.6 **12 Claims**

1. In a disc cutterbar for severing standing crop from the ground and having a transmission casing housing power transmission means for transferring rotational power to a plurality of disc cutter assemblies from a source of rotational power, each said disc cutter assembly having at least one knife

mounted thereon for engaging and severing standing crop material upon rotation thereof, said disc cutter assemblies including a pair of end discs, each of which having a generally hollow hat-shaped divider mounted thereon for rotation therewith to facilitate the flow of crop material across the disc cutterbar, each said divider having an outer wall defining an interior chamber therewithin, an improved divider comprising:

air inlet means for introducing a flow of air into said interior chamber;



exhaust means affixed to said divider to discharge air from said interior chamber upon rotation of said divider to create a flow of air from said air inlet means through said interior chamber; and

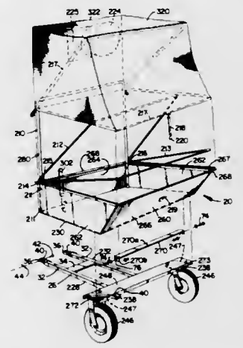
a removable access door detachably connected to said outer wall to cover an opening formed therein to permit selective access to said interior chamber.

4,787,197

MULTI-PURPOSE CART AND GRASS COLLECTOR

James R. Schweigert, 5739 Juneau La., Plymouth, Minn. 55446

Filed Dec. 31, 1986, Ser. No. 748,112
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—202 **23 Claims**



1. A multi-purpose cart and grass collector for attachment to a garden tractor, lawn tractor, or riding mower, the multi-purpose cart and grass collector being adaptable for receipt of grass clippings from a grass chute of the tractor or mower, the multi-purpose cart and grass collector comprising:

(a) a first support framework having a front end facing the garden tractor and a back end facing away from the garden trasctor, the first support framework including rigid hitch means proximate the front end for providing attachment to the garden trator, the rigid hitch means providing for pivotal movement about a horizontal axis and prohibiting movement about a vertical axis;

(b) at least one wheel supporting the first support framework above the surface of the ground, the wheel being pivotally interconnected to the first support framework for pivotal motion, the wheel being located closer to the back end of the first support framework than to the front end of the first support framework;

(c) a trailer box including a floor and a plurality of walls, the trailer box being pivotally interconnected to the first support framework for pivotal motion about a substantially horizontal axis disposed proximate the back end of the first support framework, such that the floor of the trailer box pivots;

(d) latching means for releasably latching the trailer box to the first support framework proximate the front end of the first support framework; and

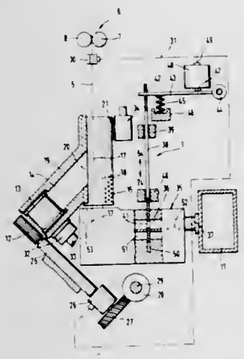
(e) a collapsible cover assembly removably mounted on the trailer box, the collapsible cover assembly including a second support framework rising above the trailer box and a flexible, perforated cover operatively connected to the second support framework, the second support framework including individual framework members interconnected for pivotal movement relative to each other away and toward the front end of the multi-purpose cart, the cover assembly foldable toward a front end of the trailer box into a more compact, collapsed configuration so as to uncover the trailer box, the collapsible cover assembly including means for receiving grass clippings from the grass chute of the garden tractor into an enclosed area formed by the cover assembly and the trailer box.

4,787,198

OPEN-END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,522
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437573
Int. Cl.[4] D01H *15/02*
U.S. Cl. 57—401 **32 Claims**



1. An open-end friction spinning apparatus having a plurality of spinning units, each said spinning unit having drivable friction surface means defining a yarn formation zone, and suction device means for holding a forming yarn in said yarn formation

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zone, each said suction device means being connected to a joint vacuum supply system by connecting line means, comprising:

blocking means for blocking the connecting line means,

throughput control means for maintaining a substantially constant air throughput in said joint vacuum supply system when said blocking means are engaged, said throughput control means comprising auxiliary suction device means at the spinning units which are selectively connectable with the vacuum supply system instead of said suction device means when the connecting line means are blocked for a respective spinning unit, said auxiliary suction device means including means for applying a load on the joint vacuum supply system which is substantially equivalent to the load applied by the suction device at the respective spinning unit, and

yarn breakage monitoring means for monitoring yarn breakages and controlling said blocking means and said throughput control means in response to yarn breakage conditions at respective spinning units.

4,787,199

YARN MONITORING DEVICE FOR A DOUBLING MACHINE

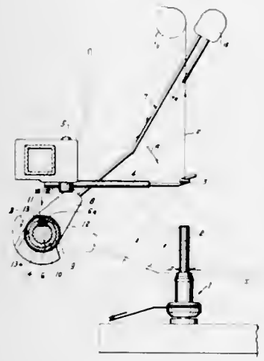
Hubert Schaub, Kempten, Fed. Rep. of Germany, assignor to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

Filed Oct. 9, 1987, Ser. No. 107,374

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 8629229

Int. Cl.⁴ D01H *13/16;* **D02H** *13/04;* **D03D** *51/18;* **D04B** *35/10*

U.S. Cl. 57—80 **5 Claims**



1. In a yarn monitoring device for a doubling machine having a rocker shaft extending over the whole machine length, plural doubling spindles spaced along the length of said machine, means defining a yarn guide eye and a feed roller for each of said plural doubling spindles, each doubling spindle having associated therewith a sensing arm monitoring the upwardly directed yarn run between said yarn guide eye and said feed roller, which arm is mounted on said rocker arm by means of a mounting bush to facilitate a swinging of said arm within limits provided on said rocker shaft, a stop pin fixedly mounted on said rocker shaft and extending radially thereto, wherein said mounting bush comprises a circumferentially extending slot, in which is received said stop pin, the improvement wherein a lining member is arranged in said slot, said lining member being substantially U-shaped and made of spring steel, said lining member having a semi-circular connecting part joining two U-arms adjacent an end surface of said slot remote from said spindle, said U-arms extending parallel to the sidewalls of said slot and engaging said sidewalls, said U-arms additionally being bent inwardly at their free ends so that a spacing between said free ends is somewhat smaller than the diameter of said stop pin, and wherein said two free ends grip on to said stop pin in one position of said sensing arm.

4,787,200

RUBBER-REINFORCING AROMATIC POLYAMIDE FIBER CORDS

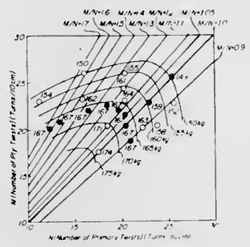
Norio Inada, Kodaira, and Isamu Imai, Tokorozawa, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 62,982

Claims priority, application Japan, Jul. 24, 1986, 61-112658[U]

Int. Cl.⁴ D02G *3/28, 3/40, 3/48*

U.S. Cl. 57—242 **3 Claims**



1. A rubber-reinforcing polyamide fiber cord which is obtained by primarily twisting an aromatic polyamide filament yarn, doubling a plurality of thus primarily twisted yarns and finally twisting doubled yarns in a twisting direction opposite to that of the primary twist yarn to obtain a plied yarn, and applying a rubber adhesive to the thus obtained plied yarn, wherein N and M satisfy the following equation; $1.05 \leqq M/N \leqq 1.6$ in which N and M are the number of primary twists and the number of the ply twists in the cord respectively, where M is the number of twists per 10 cm of cord before ply twist yarns being untwisted under an initial load in grams of Denier/20 and N is the number of twists per 10 cm under a load in grams of Denier/20×1/number of primary twists.

4,787,201

METHOD AND APPARATUS FOR CONTROLLING MULTIPLE ENGINE AIRCRAFT

Barton H. Snow, Wyoming, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 25, 1985, Ser. No. 715,569

Int. Cl.⁴ F01K *11/00*

U.S. Cl. 60—204 **19 Claims**

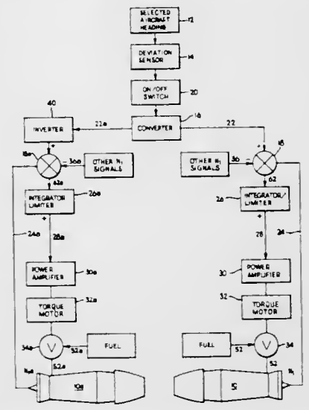
4. In an aircraft including two engines positioned on opposite sides of the longitudinal axis of said aircraft, a sensing control mechanism, and a thrust control mechanism, a method for steering said aircraft comprising the steps of:

a. selecting an aircraft heading;

b. sensing a deviation from said heading using said sensing control mechanism;

c. producing a signal indicating a desired thrust in response to the deviation sensing step;

d. monitoring a signal indicating engine thrust; and



e. controlling the fuel flow to at least one of the engines in response to the desired thrust signal and the signal indicating engine thrust.

4,787,202

COMBUSTION CHAMBER FOR ROCKET MOTOR AND ITS ASSEMBLING METHOD

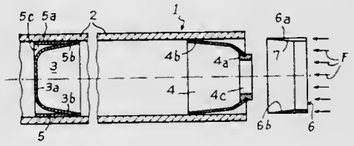
Dino Crapiz, Le Haillan, France, assignor to Societe Europeenne de Propulsion, Suresnes, France

Filed Jan. 21, 1987, Ser. No. 5,647

Claims priority, application France, Jan. 22, 1986, 86 00877

Int. Cl.⁴ F02K *9/08*

U.S. Cl. 60—253 **5 Claims**



1. Combustion chamber for rocket motor of the type comprising two domes, interconnected by a cylindrical shell, each of said domes and the intermediate shell being produced from a filamentary composite material, wherein each dome comprises a conical skirt section of which the external face is joined over at least part of its length to the inner face of the shell, via a split cylindro-conical connection ring, each of said rings having a substantially cylindrical outer surface and an inner surface of which at the portion of the length opposite said conical skirt section is substantially conical in shape, thus forming at the extremities of said rings a thinner end and a thicker end respectively, said cylindrical outer surface and said inner surface of said rings having a common central axis, the conicity of the conical portion of the inner surface of said rings being equal to the conicity of the conical skirt section, said rings being situated in the assembled combustion chamber between the inner face of said cylindrical shell and the conical skirt section of said domes the dome, shell and ring being secured together by adhesive bonding.

4,787,203

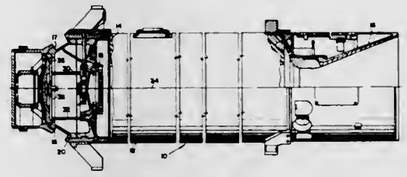
SHOCK ABSORPTION AND RETENTION MECHANISM

Richard G. Alfiero, Hazel Green, and Charles T. Bryant, Huntsville, both of Ala., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Feb. 2, 1987, Ser. No. 10,064

Int. Cl.⁴ F02K *9/00*

U.S. Cl. 60—256 **12 Claims**



1. A shock absorption and retention mechanism for stopping and retaining a moving part against a bulkhead comprising,

a bulkhead,

an object movable toward said bulkhead, said object having a side facing said bulkhead,

at least one pin protruding from said bulkhead toward said movable object,

a plurality of external self-locking rings,

at least one metallic slug, and

at least one recess in said side of said movable object facing said bulkhead, said recess having an inner centrally located region and including said plurality of self-locking rings captured in stacked arrangement therein with said metallic slug held in said centrally located region thereof, the configuration and internal diameter of said self-locking rings being such as to allow relatively unrestrained entry therein of said restraining pin but arranged to strongly resist withdrawal therefrom,

whereby, upon movement of said movable object toward said bulkhead and entry of said retaining pin into said recess, said metallic slug is crushed by engagement therewith of said retaining pin thereby effecting absorption of kinetic energy of said movable object and said movable object is retained against said bulkhead by said self-locking rings grabbing said retaining pin with no rebound.

4,787,204

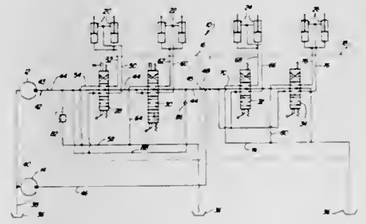
COMMON RELIEF VALVE

Roger D. Mickelson, West Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 28, 1987, Ser. No. 101,512

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—428 **1 Claim**



1. A common relief valve circuit comprising:

a first fixed displacement pump connected between a reservoir and a first valve body having a plurality of first movable valve spools therein which direct fluid to a plurality of piston cylinders, said first valve body including an inlet port, an open center cavity, and an outlet port, and the

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discharge flow from said first pump being directed through said inlet port and open center cavity to said outlet port when said first valve spools are not actuated;

a second fixed displacement pump connected between said reservoir and a second valve body having a plurality of second movable valve spools therein which direct fluid to a plurality of piston cylinders, said second pump being in fluid communication with the outlet port of said first valve body, and the discharge flow from said second pump being combined with the discharge flow of said first pump when said first valve spools are not actuated;

a main relief valve connected between the inlet port of said first valve body and said reservoir, and said relief valve being in fluid communication with said outlet port of said first valve body when the first valve spools are not actuated;

a parallel cavity line in said first valve body in fluid communication between said relief valve and said outlet port, and a check valve connected in said parallel cavity line; and

said check valve remaining closed when only one of said first or second valve spools are actuated, and fluid pressure from a location downstream of said first valve body outlet port being communicated to said relief valve through said parallel cavity line when both one of said first valve spools and one of said second valve spools are actuated

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4,787,205

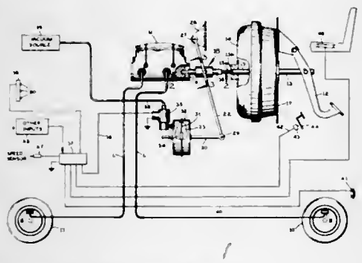
VEHICLE BRAKE SYSTEM

William G. Fontaine, 451 S. E. 3rd Ave., Pompano Beach, Fla. 33060

Continuation-in-part of Ser. No. 701,787, Feb. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 346,551, Feb. 8, 1982, abandoned. This application Sep. 15, 1986, Ser. No. 907,325

Int. Cl.[4] B60T *13/00*

U.S. Cl. 60—547.1 **10 Claims**



1. In a vehicle brake system having:

a movable brake pedal;

a master cylinder having a movable pressure-applying member therein for applying and releasing the vehicle brakes;

a power booster acting between said brake pedal and said pressure-applying member in the master cylinder, said power booster having a pressure responsive member therein movable toward and away from said pressure-applying member in the master cylinder to produce corresponding movement of said pressure-applying member in the actuator to apply and release the brake;

and reciprocable shaft means acting between said pressure responsive member in the power booster and said pressure-applying member in the master cylinder;

the improvement which comprises:

an actuator offset from said shaft means and having a member movable parallel to said shaft means:

pivoted rigid lever means pivotally coupled separately to said shaft means and to said movable member in the actuator to displace said shaft means in response to movement of said movable member in the actuator:

and means for causing movement of said movable member in the actuator in response to a pre-determined condition of the vehicle.

4,787,206

HYDRAULIC PRESSURE TRANSDUCER

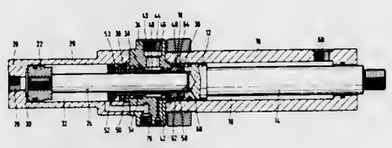
Hans D. Fabrowsky, Neuhausen, Fed. Rep. of Germany, assignor to Herbert Haenchen KG, Ostfildern, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,354

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 3625805

Int. Cl.[4] F15B *7/00;* **B60T** *13/58*

U.S. Cl. 60—560 **13 Claims**



1. A hydraulic pressure transducer having an operating cylinder with an operating piston means adapted for rapid traverse, and a pressure transducer piston means guided within an axially connected power cylinder, the piston rod of which having a cross-section smaller than that of the operating piston and adapted to intrude into the operating cylinder volume and extending through a seal separating the operating cylinder volume from the driven-sided power cylinder volume, and further having a rapid traverse flow fluid inlet adapted for communication with the driving-sided operating cylinder volume, and a power stroke fluid inlet adapted for communication with the driving-sided power cylinder volume, the improvement being characterized in that a control sleeve (**36**) is sealingly guided on the piston rod (**24**) of the power cylinder (**20**), has a collar (**38**) near its front end adjacent the operating cylinder (**10**), and with its surface (**40**) averted from said operating cylinder is biased towards a stationary plane sealing surface (**42**) and in that the rapid traverse flow inlet (**44**) opens into an annular space (**46**) encircling said control sleeve (**36**), and during the rapid traverse operating mode, when the control sleeve is removed from the stationary sealing surface, is extended as unobstructed admission opening for traverse stroke pressure fluid past said plane sealing surface (**42**) to the driving-sided operating cylinder volume (**16**).

4,787,207

MULTI-ENGINE PLANT INCLUDING TURBOCHARGED COMBUSTION ENGINES

Hans C. Kristensen, Holeby, and Hans C. Lauritsen, Nysted, both of Denmark, assignors to M.A.N.-B & W Diesel A/S, Hvidovre, Denmark

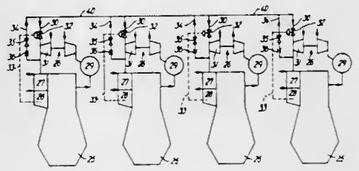
Filed Oct. 23, 1986, Ser. No. 922,339

Claims priority, application Denmark, Oct. 28, 1985, 4938/85

Int. Cl.[4] F02D *25/00*

U.S. Cl. 60—710 **6 Claims**

1. A multi-engine plant comprising a plurality of turbocharged internal combustion engines (**9**, **10**), of which at least one (**10**) is intended to operate in stand-by mode during a substantial part of the plant's operating time while simultaneously another engine (**9**) operates on load, each of said engines (**9**, **10**) having an individual turbocharger (**11**,**18**), the compressor part of which is connected with the associated engine via a charging air system wherein a conduit (**22**) is provided which connects the charging air system of the stand-by engine (**10**) with the charging air system of the on-load engine (**9**) at a location downstream of the compressor outlet of



said latter system, and means for opening and closing said conduit (**22**).

4,787,208

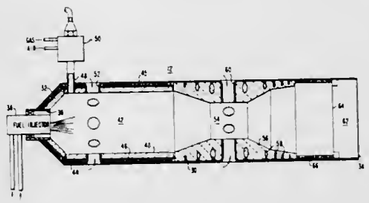
LOW-NOX, RICH-LEAN COMBUSTOR

Serafino M. DeCorso, Upper Providence Township, Delaware County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 356,068, Mar. 8, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 621,129

Int. Cl.[4] F02E *1/00*

U.S. Cl. 60—723 **7 Claims**



1. A low-NO_x combustor for heating compressor discharge gases to drive a turbine, comprising:

a basket having a wall for containing combustion therein and further having an upstream zone for fuel rich, diffusion flame combustion and a downstream zone for fuel-lean combustion with a necked-down quench zone connecting said cumbustion zones;

means for injecting fuel into the upstream end of said basket;

means for enabling fuel-rich combustion of the fuel injected by said injecting means in said fuel-rich combustion zone;

means for introducing a quench air flow into said combustor quench zone to assure downstream fuel-lean combustion of gaseous products produced in said fuel-rich combustion zone without need for dilution air admission;

said basket wall having disposed about its inner side and along said rich zone a first ceramic enclosure means to support combustion without wall cooling air;

means for admitting oxidant to said rich zone including openings through said basket wall and said first ceramic enclosure means to ensure that the fuel equivalence ratio within said rich zone is greater than 1.0;

means for igniting the injected fuel;

a first section at the upstream end of said quench zone gradually decreasing in diameter in the downstream direction;

a second section at the downstream end of said quench zone gradually increasing in diameter in the downstream direction;

a third section between said first and second sections having a substantially constant inner diameter and a plurality of annularly disposed cooling ports extending radially therethrough for supplying cooling air to said quench zone; and

a second ceramic enclosure substantially continuous with said first ceramic enclosure being disposed along the inner side of the first, second and third wall sections of said quench zone.

4,787,209

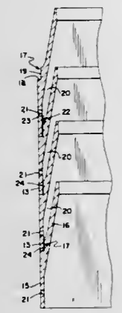
STACKED RING COMBUSTOR ASSEMBLY

Charles R. Taylor, and George Opdyke, Jr., both of Stratford, Conn., assignors to Avco Corporation, Providence, R.I.

Continuation of Ser. No. 45,701, Apr. 29, 1987, abandoned, which is a continuation of Ser. No. 802,669, Nov. 29, 1985, abandoned. This application Apr. 20, 1988, Ser. No. 185,309

Int. Cl.[4] F02C *7/00*

U.S. Cl. 60—757 **4 Claims**



1. A combustor assembly for gas turbine engines comprising:

a plurality of generally annular members having a common center line, each such member having at one end a first cylindrical portion having a cylindrical inner surface concentric about said center line, a second axially inwardly tapered portion at the other end, and a third step-shaped portion intermediate said first and second portions, each said step-shaped portion having a cylindrical first surface concentric about said center line and a second surface normal to said center line defining said step, said annular members being disposed in nested substantially coaxial relationship spaced axially along said center line with at lest a portion of said first cylindrical portions nested in said third step portions, said inner surfaces of said first portions facing said first surfaces, said first and second portions being disposed in overlapping relationship, said first cylindrical portions having holes therein which in combination with said overlapping first and second portions define airflow passages, said first and third portions defining a substantially smooth outer wall, each said first surface having a machined diameter just slightly less than the inside diameter of each said first cylindrical portion, one of said facing first portion inner surfaces and said first surfaces being upset to define at a plurality of different locations portions of said upset surface in contact with said inner surface; and

brazing material disposed between and bonding said first portion inner surfaces and said first surfaces.

4,787,210

BUS AIR CONDITIONING UNIT

Ronald W. Brown, New Hope, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 5, 1988, Ser. No. 152,787

Int. Cl.[4] B60H *1/32*

U.S. Cl. 62—89 **9 Claims**

6. In an air conditioning unit for a bus, wherein the bus has front, side, rear and roof portions, a longitudinal axis which extends between the front and rear portions, a passenger compartment having a ceiling, and first and second air delivery ducts in the passenger compartment, comprising:

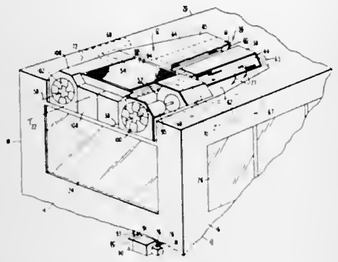
an evaporator disposed above the passenger ceiling,

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said evaporator having first and second evaporator sections spaced transversely relative to the longitudinal axis of the bus,

a return air grille disposed below and between said first and second spaced evaporator sections, substantially in the plane of the ceiling of the passenger compartment,

first and second evaporator blowers each having an inlet, and outlet and a rotational axis,



first and second air outlet ducts,

said first and second evaporator blowers being respectively disposed between the first and second evaporator sections and the rear of the bus, with their rotational axes substantially parallel with the longitudinal axis of the bus, and with their outlets connected to said first and second air outlet ducts, respectively,

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4,787,211

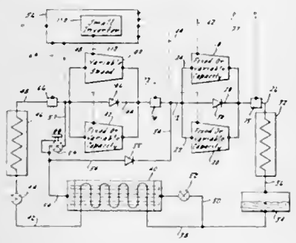
REFRIGERATION SYSTEM

David N. Shaw, Unionville, Conn., assignor to Copeland Corporation, Sidney, Ohio

Continuation-in-part of Ser. No. 636,068, Jul. 30, 1984, Pat. No. 4,594,858, which is a continuation of Ser. No. 569,886, Jan. 11, 1984, abandoned. This application May 15, 1986, Ser. No. 863,593

Int. Cl.⁴ F25B *7/00*

U.S. Cl. 62—117 **42 Claims**



1. A system comprising:

a variable capacity first stage compressor;

at least two second stage compressors;

conduit means bearing a compressible refrigerant connecting said first stage compressor to said second stage compressors, said second stage compressors being connected in parallel with each other;

motors for driving said compressors; and

control means for controlling said first stage compressor and said second stage compressors, said control means being operable to vary the capacity of said first stage compressor while said second stage compressors are operating, to shut down one of said second stage compressors when the capacity of said first stage compressor reaches a predetermined minimum and thereafter to increase the capacity of said first stage compressor while continuing to operate the remaining second stage compressors.

4,787,212

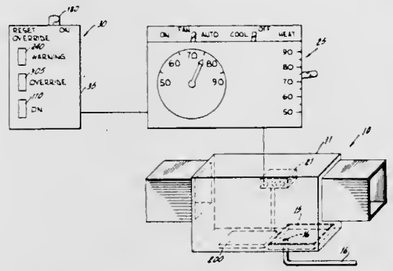
AIR CONDITIONER WITH AUTOMATIC SHUTDOWN

John C. Hessey, 8570 N.W. 177th St., Miami, Fla. 33015

Filed Oct. 19, 1987, Ser. No. 109,711

Int. Cl.⁴ F25D *21/02*

U.S. Cl. 62—188 **6 Claims**



1. An air conditioning system subject to undesirable water leakage due to drain line stoppage, and/or drain pan corrosion and cracking, and/or melting of ice formed because of icing of evaporating coils, and/or water wicking by cabinet insulation, and/or sweating of a cabinet housing, said air conditioning system comprising, in combination,

an air conditioner, an electric circuit, said circuit including a source of laternating current, a thermostat control means for selectively operating said air conditioner;

a relay including a normally closed relay switch in the circuit to said thermostat control means, a normally open relay switch constructed and arranged to be open when said normally closed relay switch is closed and to be closed when said normally closed relay switch is open, and energizable coil means coupled to said normally closed relay switch and to said normally open relay switch to open said normally closed relay switch and simultaneously close said normally open relay switch when energized, said energizable coil means cooperating with said normally open relay switch when the latter is closed to retain said normally closed relay switch open and said normally open relay switch closed as long as said energizable coil means remains energized from said energization;

at least one water sensing means constructed and arranged for placement in a location likely to contain water due to said undesirable water leakage, said water sensing means permitting flow of alternating current when wet and inhibiting flow of alternating current when dry;

means between said source of alternating current and said energizable coil means for selectively permitting and inhibiting flow of alternating current to said energizable coil means, said means for selectively permitting and inhibiting flow of alternating current to said energizable coil means being responsive to said electric current from said water sensing means, whereby flow of said electric current to said means for inhibiting flow of alternating current to said energizable coil means permits flow of current from said source of alternating current to said energizable coil means to energize said coil means for opening said normally closed relay switch and closing said normally open relay switch to automatically shut down said air conditioner and to retain said normally closed relay switch open and said normally open relay switch closed as long as said coil means remains energized, and

a manually operated override switch for de-energizing said energizable coil means to cause said normally open relay switch to resume its normally open position and said normally closed relay switch to resume its normally closed position to enable current to resume to said air conditioner via said thermostat control means when said override switch is manually operated.

4,787,213

REGULATING MECHANISM FOR THE REFRIGERANT FLOW TO THE EVAPORATOR OR REFRIGERATING SYSTEMS OR HEAT PUMPS AND EXPANSION VALVES ARRANGED IN THE REFRIGERANT FLOW

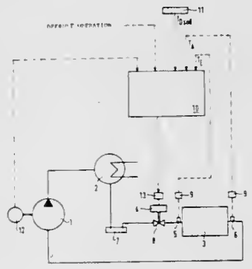
Horst Gras, Neuffen, and Herbert Blaich, Fellbach, both of Fed. Rep. of Germany, assignors to Otto Egelhof GmbH & Co., Fellbach, Fed. Rep. of Germany

Filed Dec. 9, 1986, Ser. No. 940,027

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601817

Int. Cl.⁴ F25B *41/00*

U.S. Cl. 62—212 **21 Claims**



1. Regulating mechanism for the refrigerant flow to the evaporator of refrigerating systems or heat pumps with a compressor, which is arranged in the refrigerant circulation system and is connected or connectable, respectively, with the input of a condenser on the pressure side and with the output of an evaporator on the suction side and which is connectable with the output of said condenser or of a collector on the input side thereof via and expansion valve, an actuation motor for controlling the opening coefficient of said expansion valve, said output of the condenser being directly connected to said expansion valve or arranged as the output of said condenser, comprising a computer (10) for controlling said actuating motor (4) of the expansion valve (8) as a function of set values and as a function of the signals from sensors (5,6), which are sensitive to temperature and are arranged on a refrigerant line at the input and output sides of said evaporator (3) to indicate an input temperature (T_E) and an output temperature (T_A), said computer controlling the actuating motor such that in the event the input temperature (T_E) at said evaporator lies below a threshold value, said expansion valve increasingly opens when the difference between the input and output temperature (T_E,T_A) at said evaporator exceeds a set value or such that said expansion valve increasingly closes when the difference falls below said set value, and closes completely when said input temperature signal (T_E) lies above a threshold value.

4,787,214

TRANSPORT REFRIGERATION SYSTEM

Jack K. Stillwell, Nokomis, Fla., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Nov. 23, 1987, Ser. No. 124,323

Int. Cl.⁴ F25D *17/00*

U.S. Cl. 62—228.4 **5 Claims**

1. A transport refrigeration system comprising:

a compressor,

a prime mover for said compressor having selectable speeds via a predetermined mechanical movement,

an evaporator,

a condenser,

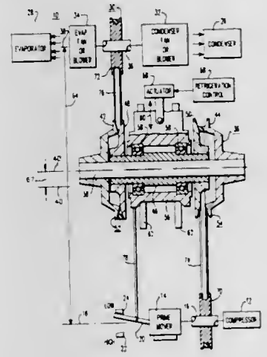
air mover means for said evaporator and condenser,

speed changer means,

pulleys on the prime mover, speed changer means, and air mover means,

first and second belts linking pulleys of the prime mover and speed changer means, and pulleys of the speed changer means and the air mover means, respectively,

and a mechanical link between the speed changer means and prime mover,



said speed changer means having a changeable pulley ratio, with said prime mover driving said air mover means via said speed changer means,

said speed changer means mechanically interlocking said prime mover and said air mover means such that physical movement of the speed changer means relative to the prime mover simultaneously initiates the predetermined mechanical movement which selects a prime mover speed via the mechanical link, and tensions the first and second belts to effect a change in the pulley ratio of the speed changer means,

whereby the speed of the prime mover cannot be changed without automatically changing the pulley ratio of the speed changer means, and the pulley ratio cannot be changed without automatically changing the speed of the prime mover.

4,787,215

TRANSPORT REFRIGERATION APPARATUS

Gregory D. Bleck, Chaska, and Michael R. Weiss, Richfield, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 2, 1988, Ser. No. 163,353

Int. Cl.⁴ B60H *1/32*

U.S. Cl. 62—239 **10 Claims**

1. Transport refrigeration apparatus, comprising:

a metallic frame,

said metallic frame including first and second upstanding end portions which define first and second spaced, parallel end planes, an upstanding back portion which defines a vertical back plane which extends between the first and second side planes, and a horizontally oriented portion which defines a horizontal support plane which extends between the side and back planes,

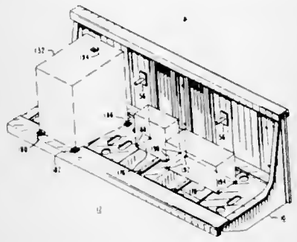
said metallic frame having first and second spaced end members,

each of said first and second spaced end members having first and second integral, orthogonally related portions, with the first integral portion defining a rectangular con-

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figuration which is part of the upstanding back portion of said metallic frame, and with the second integral portion defining a generally triangular configuration which is part of an end portion of said metallic frame,

said triangular configuration including a horizontally oriented lower side, a vertically oriented side which joins the



first integral portion, and a flanged side which extends between the horizontally and vertically oriented sides,

said flanged side including a horizontally oriented lower portion which flares upwardly via a smoothly radiused intermediate portion to join an upper portion which slopes towards the vertically oriented side of the triangular configuration.

4,787,216

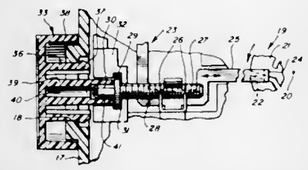
ADJUSTABLE ICE MAKER CONTROL

Paul B. Chesnut, Armstrong Township, Vanderburgh County, and Robert H. Kraemer, Evansville, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 15, 1987, Ser. No. 108,755

Int. Cl.[4] F25C *1/04*

U.S. Cl. 62—347 **15 Claims**



1. In an automatic ice maker having a water valve and rotary switch means for controlling operation of the water valve, a manually adjustable contact structure associated with said rotary switch means for varying the time of operation of said water valve, said contact structure comprising:

an electrical contact;

support means supporting said contact for reciprocal rectilinear positioning relative to said switch means, said support means having a thread engagement portion;

a screw having a threaded shank threadedly engaging said thread engagement portion of the support means, and an end portion having a noncircular cross section;

means for mounting said screw for axially fixed rotation about the axis of said shank;

a housing for said structure having a wall provided with an opening aligned with said screw end portion; and

a control knob having a manually operable portion, a connecting portion projecting from said manually operable portion and having a socket complementary to said screw end portion, and knob mounting means rotatably mounting said knob to said housing wall in said opening with said screw end axially movably and rotatively fixedly received in said socket for rotation of said screw as an incident of rotation of said manually operable portion, whereby rotation of said control knob effects linear movement of said contact in engagement with said rotary switch means, said contact and rotary switch means comprising cooperating means for varying the time of operation of the water valve as a function of the position of said contact relative to said rotary switch means.

4,787,217

CAM CARRIAGE FOR FLAT-BED KNITTING MACHINE

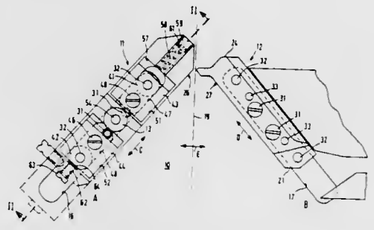
Ernst Goller, Reutlingen; Jürgen Ploppa, Pfullingen; Franz Schmid, Bodelshausen, and Hans-Günther Haltenhof, Pfullingen all of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Sep. 3, 1987, Ser. No. 92,522

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630050

Int. Cl.[4] D04B *7/10*

U.S. Cl. 66—71 **15 Claims**



1. A cam carriage for flat-bed knitting machines having at least one leading and trailing draw-down element with atop plate rigidly connected with a drive element at least in a direction of several draw-down positions, a bottom plate including a draw-down track, and a cam plate including a guide slot for guiding the draw-down element in a reciprocal manner between an alignment position, wherein the top plate and the bottom plate are movable relative to each other in their longitudinal direction, and are biased to assume a basic position such that a relative movement of the top plate and the bottom plate can occur only during a shifting movement of the top plate in the direction of one of the draw-down positions.

4,787,218

HOSIERY DYE BAGS

R. Rodger Mayes, Burlington, N.C., assignor to Fuller Specialty Co., Burlington, N.C.

Filed Nov. 7, 1986, Ser. No. 927,952

Int. Cl.[4] D04B *7/16*

U.S. Cl. 66—170 **5 Claims**

1. A dye bag for nylon or polyester hosiery and similar apparel, said dye bag being made from a tricot fabric composed primarily of 100% polypropylene yarn, said fabric having the characteristics of lacking an affinity for dye stuffs and preventing a build up of static electricity in or damage to the nylon or polyester apparel.

4,787,219

SPATIAL WARP KNITTED STRUCTURE AND A METHOD OF MANUFACTURING THE SAME

Seizo Sato, and Kazuo Furuya, both of Otsu, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 898,635, Aug. 21, 1986. This application Jul. 15, 1987, Ser. No. 73,844

Claims priority, application Japan, Aug. 22, 1985, 60-182989; Sep. 17, 1985, 60-203415

Int. Cl.[4] D04B *7/12*

U.S. Cl. 66—190 **18 Claims**



1. A spatial warp knitted structure comprising two warp knitted fabrics each consisting of at least two wales of loops, said two warp knitted fabrics facing each other and united together by uniting parts each having at least one uniting thread; and at least four rows of insert warp threads inserted between and in parallel to the warp knitted fabrics across the uniting threads, and at lease one row of insert weft threads between the adjacent rows of insert warp threads.

4,787,220

AGITATOR FOR A FULL AUTOMATIC WASHER

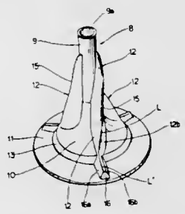
Yang H. Noh, Pusan, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 29, 1987, Ser. No. 55,262

Claims priority, application Rep. of Korea, May 31, 1986, 7838/1986

Int. Cl.[4] D06F *17/10*

U.S. Cl. 68—134 **8 Claims**



1. An agitator for a full automatic washer, which comprises:

a central hollow shaft having at a lower end thereof a fixture part for fixing to a washing axis of the washer,

a bell-shaped expansion part connected at an upper end thereof in one piece to a peripheral surface of a lower mid-portion of the central shaft,

a circular base connected in one piece to a lower end of said expansion part, and

a plurality of vanes formed integrally with said central shaft on a peripheral surface of the expansion part and inclined relative to a vertical plane through said central shaft,

a step of a predetermined width being formed between said bell-shaped expansion part and the circular base so that the bell-shaped expansion part and the circular base have a step-shaped step difference, each vane being formed such that a width and a thickness thereof increase gradually from a top thereof to a lower end thereof, each vane having a substantially hollow interior portion with an open lower end.

4,787,221

APPARATUS FOR PELT PROCESSING

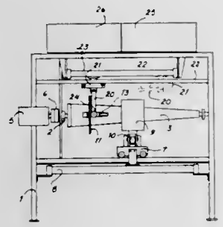
Ingvar Johansson, Hans Arons väg 3, 311 04 Falkenberg, Sweden

Filed May 11, 1987, Ser. No. 48,423

Claims priority, application Sweden, May 16, 1986, 8602228

Int. Cl.[4] C14B *1/10, 7/08*

U.S. Cl. 69—40 **11 Claims**



1. An apparatus for fleshing pelts comprising:

a pole;

means for rotating the pole;

a tensioning ring disposed in concentric relation with the pole;

pelt clamp means carried by the ring for clamping a pelt to the ring;

means for displacing along the pole to tension a pelt on the pole, the displacing means including a rail, a carriage reciprocally movable on the rail, means on the carriage for engaging the ring, and carriage driving means for reciprocally driving the carriage to move the engaging means reciprocally in opposite directions; and

scraper means proximate the pole for scraping flesh from a flesh side of a pelt.

4,787,222

COMBINATION LOCK FOR BLOOD IDENTIFICATION SYSTEM

Carlos A. Irazoqui, and John G. Gorman, both of New York, N.Y., assignors to Novatek Medical Inc., New York, N.Y.

Filed Nov. 24, 1986, Ser. No. 933,994

Int. Cl.[4] E05B *65/00, 37/00*

U.S. Cl. 70—57 **19 Claims**



1. A combination lock assembly comprising:

(a) a base member;

(b) locating means frangibly attached to the base member;

(c) a plurality of locking rings mounted on the base member,

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each locking ring defining notch means, and engagement means to engage the locating means so as to non-rotatably mount the locking rings on the base member such that the notch means are aligned;

(d) an indicia ring associated with each locking ring;

(e) a clasp member adapted to be attached to the base member so as to retain the base member, the locking rings and the indicia rings in assembled relationship; and

(f) attachment means to attach the clasp member to the base member in first and second positions such that, in the first position the indicia rings may be rotated with respect to their associated locking ring so as to align a desired indicia with the notch means to thereby set the combination and, in the second position, the locating means are detached from the base member thereby permitting the locking rings to rotate with respect to the base member.

4,787,223

DOOR LOCK DEVICE FOR AUTOMOBILE

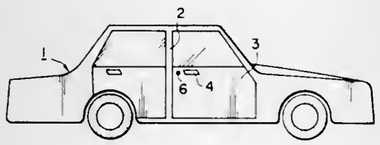
Motohiro Gotanda, Abiko, Japan, assignor to Doei Kikau Center Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,344

Claims priority, application Japan, Dec. 18, 1985, 60-283059

Int. Cl.⁴ E05B *65/20*

U.S. Cl. 70—264 **4 Claims**



1. A lock device for an automobile door, said automobile having an engine starting circuit, a door frame and a door pivotally supported on the door frame, said device comprising:

an operating plate supported on the door and movable between upper and lower positions;

engaging means engageable with said operating plate and moveable between first and second positions such that when said engaging means is displaced from the first to the second position the operating plate is moved from the lower to the upper position, but when the operating plate is moved from the lower to the upper position the engaging means in the first position is disengaged therefrom and is not moved;

actuating means for moving said engaging means from the first to the second position;

a hook member provided in the door frame;

latch means provided in the door and capable of engaging with said hook member when the door is closed and disengaged from said hook member when the door is opened;

an engaging portion provided in said operating plate and engageable with said latch means to prevent said latch means from disengaging from said hook member when said operating plate is in the lower position and disengageable from said latch means to permit said latch means to disengage from said hook member when said operating plate is in the upper position; and

means capable of detecting the position of said engaging means and electrically coupled to said engine starting circuit to make said engine starting circuit operable only upon detection of the movement of said engaging means from said first to said second position.

4,787,224

MECHANISM FOR KEYLESS LOCK SYSTEMS

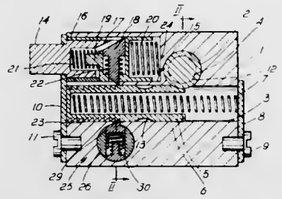
Rafael F. Mesa, Torrente Flores 92 - 2a, Barcelona, Spain

Filed Apr. 27, 1987, Ser. No. 43,158

Claims priority, application Spain, Apr. 29, 1986, 555377

Int. Cl.⁴ E05B *37/00*

U.S. Cl. 70—313 **12 Claims**



1. A mechanism for a keyless lock, comprising:

a generally prismatic body having a longitudinal hole and, orthogonal thereto, a plurality of transverse holes through the body, the longitudinal and transverse holes having geometric axes at respective distances from each other less than the respective sums of the radii thereof;

a longitudinal cylinder for carrying a locking element axially movable in the longitudinal hole for lock-operating movement of the locking element, the longitudinal cylinder having concavely-rounded annular cuts thereabout;

retaining cylinders respectively having concavely-rounded annular cuts at positions therealong and being movable axially in the transverse holes for respective receipt in the annular cuts of the longitudinal cylinder, whereby to restrain the lock-operating axial movement of the longitudinal cylinder and, upon axial movement of the retaining cylinders in one direction, for aligning the concavely-rounded annular cuts of all the retaining cylinders with the longitudinal cylinder, whereby to allow the lock-operating axial movement of the latter, each retaining cylinder having a plurality of other, teeth annular cuts which define a saw-toothed structure about one end thereof in the block; and

independent advance means respectively for axially moving the retaining cylinders, each independent advance means comprising a pulsator movably emerging from the body and lug means in the body responsive to pushing the pulsator into the body for engaging the saw-toothed structure of a corresponding retaining cylinder and incrementally moving the latter in the one direction in the transverse hole it is in.

4,787,225

KEY FOR A LOCK CYLINDER

Herbert P. Häuser, Elsdorf-Heppendorf, and Alexander Stefanescu, Cologne, both of Fed. Rep. of Germany, assignors to DOM-Sicherheitstechnik GmbH & Co KG, Bruhl, Fed. Rep. of Germany

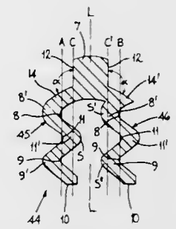
Filed Nov. 18, 1986, Ser. No. 932,468

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1985, 3541928; Apr. 26, 1986, 3614222

Int. Cl.⁴ E05B *19/02*

U.S. Cl. 70—401 **22 Claims**

1. Key for a cylinder lock comprising a guide region extending along a back edge portion of the key for guiding the key along a keyway of the cylinder, and at least one blade portion having a narrow edge opposite the guide region, in which edge V-cuts are formed for operating tumbler pins of the cylinder, said blade portion also having formed in one side surface thereof at least one longitudinal rib portion flanked at each side by a longitudinal groove, wherein each blade portion is connected to the guide region by a bridging portion and the longitudinal central plane of each blade portion is offset from that of



the guide region such that the side surface of the guide region facing said plane forms an obtuse angle with the bridging portion, and further wherein an extension of the plane of the side surface of the guide region passes through the peak region of the rib portion formed in the side surface of the blade portion.

4,787,226

ROLL ADJUSTMENT METHOD

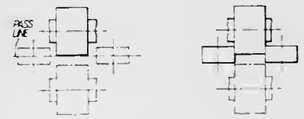
Ralph G. Haynes, Yorkshire, England, assignor to Davy McKee (Sheffield) Limited, Sheffield, England

Filed Jun. 3, 1987, Ser. No. 57,085

Claims priority, application United Kingdom, Jun. 3, 1986, 8613353

Int. Cl.⁴ B21B *1/10, 13/12, 37/08*

U.S. Cl. 72—20 **11 Claims**



1. A method of aligning horizontal and vertical rolls of a beam mill stand comprising the steps of:

(a) bringing a first horizontal roll to a datum position, said first horizontal roll having opposite flanks;

(b) bringing the vertical rolls into a first contact with the opposite flanks of the first horizontal roll, to establish datum positions for the vertical rolls;

(c) withdrawing the vertical rolls from their datum positions;

(d) bringing a second horizontal roll into contact with the first horizontal roll to establish a datum position for the second horizontal roll, said second horizontal roll having opposite flanks; and

(e) bringing the vertical rolls into a second contact with the flanks of the first and second horizontal rolls.

4,787,227

FEED-THROUGH ELEMENT FOR A VACUUM APPARATUS

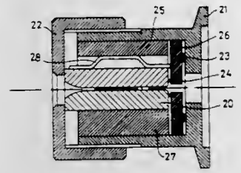
Hugo Lievens, Gent, and Wilfried Coppens, Kortrijk-Marke, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Oct. 9, 1987, Ser. No. 106,365

Claims priority, application Netherlands, Oct. 23, 1986, 8602660

Int. Cl.⁴ B21D *37/16;* **C21D** *1/74;* **C23C** *14/56*

U.S. Cl. 72—38 **5 Claims**



1. In a vacuum apparatus having at least one vacuum chamber defined by end walls, said chamber being adapted to receive wire-shaped material fed therethrough so that the material may be treated under vacuum conditions wherein the material may have portions of relatively larger cross section; the improvement comprising: a feed-through element disposed in at least one wall of said chamber, said feed-through element comprising a split drawing die having a surface configured and arranged to closely contact the outer surface of the material fed therethrough so as to provide good sealing engagement therewith, means for holding said split drawing die, resilient means disposed between said die and said holding means for urging said die into said sealing contact with the outer surface of the material fed therethrough including those portions of the material having relatively larger cross sections, and at least one detachable sealing means disposed between said die and said wall so as to enable replacement of said die.

4,787,228

MAKING MOLDS WITH RECTANGULAR OR SQUARE-SHAPED CROSS SECTION

Eike Weisner, Windeck, and Horst Gravemann, Osnabrück, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Hanover, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,515

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218100

Int. Cl.⁴ B21D *31/00;* **B21C** *1/24*

U.S. Cl. 72—47 **6 Claims**

1. A method for making a tubular mold having rectangular or square shaped cross section to be used for continuous casting of high melting metals such as steel comprising the steps of:

providing a round tube made of copper or a copper alloy by means of press working and/or rolling and/or drawing;

electrolytically depositing a wear resisting coating on the inside surface of the round tube as made to produce a compound tube having a wear resisting uniform coating on the inside; and

subsequently forming the round tube into a tube with rectangular or square-shaped cross section.

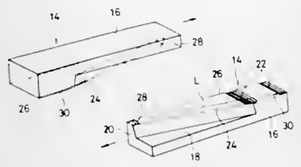
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,229

METHOD OF ROLLING A PIPE BY FLAT CUTTERS

Hideo Hikuma, and Masaji Yamada, both of Hamamatsu, Japan, assignors to Fuji Tekko Co., Ltd., Shizuoka, Japan

Filed Mar. 26, 1987, Ser. No. 30,427
Claims priority, application Japan, Jul. 14, 1986, 61-165785
Int. Cl.[4] B21D 7/00; B21H 5/00
U.S. Cl. 72—88 6 Claims



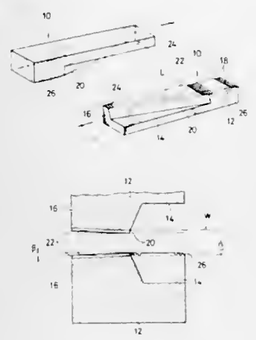
1. A method of rolling a pipe with flat cutters, which comprises rotatably supporting a pipe at both ends by a pair of centers, engaging an outer periphery of said pipe with a pair of flat cutters having a plurality of corrugated working blades on a substantially triangular blade base which is narrowest at one longitudinal end thereof and widest at the other longitudinal end thereof with the finishing blades of both cutters facing each other and extending in a direction parallel to a central axis of said pipe, and moving said flat cutters rectilinearly in opposite directions while pressing said pipe starting with an initial working portion of the respective finishing blades and ending with a terminal working portion of the respective finishing blades, said initial working portion of the respective finishing blades being located at the narrowest portion of the triangular blade base and the terminal working portion of the respective finishing blades being located at the widest portion of the triangular blade base.

4,787,230

ROLLING FLAT CUTTER AND METHOD OF ROLLING THEREBY

Hideo Hikuma, and Masaji Yamada, both of Hamamatsu, Japan, assignors to Fuji Tekko Co., Ltd., Shizuoka, Japan

Filed Mar. 10, 1987, Ser. No. 24,157
Claims priority, application Japan, Jun. 15, 1986, 61-138684; Jun. 15, 1986, 61-138685; Jun. 15, 1986, 61-90725[U]; Aug. 2, 1986, 61-119121[U]
Int. Cl.[4] B21D 7/00; B21H 5/00
U.S. Cl. 72—88 8 Claims



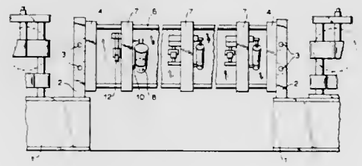
1. A rolling flat cutter comprising a cutter body extending in a longitudinal direction and having an upper surface divided into a raised generally triangular blade base and a lower recessed portion, said blade base being narrowest at one longitudinal end of said cutter body and widest at the other longitudinal end of said cutter body, and a plurality of corrugated finishing blades formed on said blade base, said finishing blades extending in a direction perpendicular to said longitudinal direction, said one longitudinal end at which the narrowest part of said blade base is located comprising a leading end of said cutter body.

4,787,231

ROLLER MACHINE FOR PROFILE COLD BENDING

Tancho P. Chochev, Stroevo, and Todor D. Andonov, Plovdiv, both of Bulgaria, assignors to Znorc "Metalni Konstruckcit", Trud, Bulgaria

Filed Feb. 6, 1987, Ser. No. 12,104
Int. Cl.[4] B21D 5/14
U.S. Cl. 72—176 4 Claims



2. A roller machine for profile cold bending comprising
a bearing framework with mounted supports;
a plurality of end carriers, said end carriers being mounted on said mounted supports;
said machine having a longitudinal axis;
a plurality of bar blocks, each of said bar blocks comprising a plurality of bars parallel to the longitudinal axis of the machine, and each bar block being supported by one of said end carriers;
a plurality of vertical bearers, said vertical bearers being carried by said bar blocks and said bar blocks being connected by said vertical bearers;
each of said vertical bearers comprising a horizontal roller, a cylindrical roller, and a shape forming roller, secured at a fixed angle and an axially movable free rotating cylindrical roller;
an axially movable top shape forming block and an axially movable bottom shape forming block, said shape forming blocks being mounted on said bearing framework and lying crosswise to said longitudinal axis of said machine.

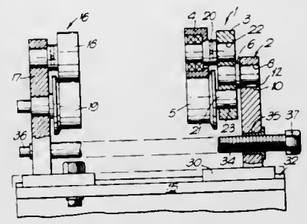
4,787,232

ROLL FORMING MEMBER AND/OR A ROLL FORMER

Thomas C. Hayes, Rotorua, New Zealand, assignor to Hayes Engineering Limited, Rotorua, New Zealand

Filed Apr. 9, 1987, Ser. No. 36,396
Claims priority, application Netherlands, Apr. 9, 1986, 215754
Int. Cl.[4] B21D 5/08
U.S. Cl. 72—176 15 Claims

1. A roll forming member for shaping thin sheet material fed in a feeding direction relative to the roll forming member comprising:
a stand;
a support member;
pivot means for mounting said support member on said stand so that said support member is rotatable relative to said stand about a selected axis extending at substantially right angles to the feeding direction;
a pair of shaping elements mounted on substantially parallel axes on said support member and positioned with respect to each other so that in use each shaping element bears on one of the opposite surfaces of the sheet material, said shaping elements being shaped to modify the shape of the sheet material when passed therebetween said parallel axes of said shaping elements being parallel to said selected axis; and locating means for retaining said support member in a selected one of a plurality of positions relative to said stand and said selected axis so that the support member can be pivoted to permit each shaping element to bear against either side of the sheet material.

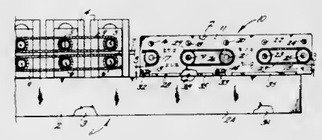


4,787,233

ROLL FORMING MACHINE WITH AUXILIARY ROLL SET ASSEMBLY

Glen E. Beymer, Creswell, Oreg., assignor to Eastside Machine Company, Creswell, Oreg.

Filed Aug. 20, 1987, Ser. No. 87,298
Int. Cl.[4] B21D 5/08
U.S. Cl. 72—181 1 Claim



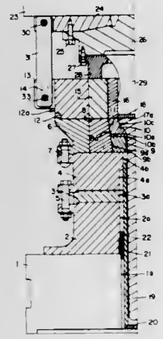
1. An auxiliary roll set assembly for attachment in a detachable manner to the side frame members of a roll forming machine, said assembly comprising, parallel side frame member extensions spaced from one another and extending longitudinally from said side frame members, cross members superimposed on said frame members and spanning the spacing between said parallel side frame member extensions, a pair of parallel side plates spaced from one another and having lower edges for rested engagement one each with said side frame member extension, said side plates having right angularly shaped cut-out openings at intervals along said lower edges to receive said cross members in a precise manner to assure said side plates being parallel to the frame member extensions of the roll forming machine, spacer bars interconnecting said side plates at said intervals at a location above said cut-out openings, said spacer bars overlying said cross members with the cross members being received in said cut-out openings,
a fastener attaching one each of said spacer bars to one each of said cross members to facilitate removal of the auxiliary roll set assembly from said side frame members and the installation of a second auxiliary roll set assembly in place, and
roll sets carried by said side plates for progressively shaping continuous siding material passing through the roll sets.

4,787,234

METHOD AND APPARATUS FOR EXTRUDING SUPERALLOY MATERIAL

Stéphane C. G. Garyga, Bessancourt, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.", France

Filed Dec. 16, 1987, Ser. No. 133,894
Claims priority, application France, Dec. 17, 1986, 86 17635
Int. Cl.[4] B21C 23/04, 33/00, 35/00
U.S. Cl. 72—263 10 Claims



1. A forward extrusion, method for extruding metal parts from superalloy material in a forward extrusion press having a lower press table assembly defining means to accommodate the extruded part, an extrusion pot assembly including an extrusion pot and an extrusion die located on the lower press table, and an upper plunger reciprocally movable along a reciprocating axis with respect to the lower press table having an extrusion punch mounted thereon, the method comprising the steps of:
(a) laterally displacing the lower press table assembly and extrusion pot assembly from the reciprocating axis of the upper plunger;
(b) placing an extrusion billet of superalloy material in the extrusion pot;
(c) placing a spacer on an upper surface of the extrusion billet;
(d) moving the lower press table assembly into alingment with upper plunger such that the extrusion die is substantially coaxial with the reciprocating axis;
(e) extending the upper plunger along its reciprocating axis such that the extrusion punch enters the extrusion pot so as to extrude the superalloy material through the extrusion die;
(f) fixedly attaching the extrusion pot assembly to the upper plunger;

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(g) retracting the upper plunger so as to remove the extrusion pot assembly from the lower press table assembly;
(h) laterally displacing the lower press table assembly from alignment with the reciprocating axis; and,
(i) removing the extrusion die and the extruded part from the lower press table assembly.

4,787,235
METHOD FOR MANUFACTURING A STACK OF SUPPORTING PLATES
Cornelis E. Van Berkel, Staringlaan 27, 1422 BG Uithoorn, Netherlands
Filed Jul. 29, 1987, Ser. No. 79,119
Claims priority, application Netherlands, Aug. 6, 1986, 8602014
Int. Cl.⁴ B21D *28/26, 31/00, 53/20*
U.S. Cl. 72—379 **9 Claims**

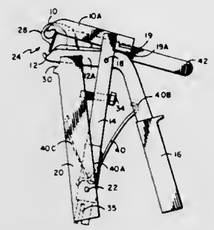




1. Method for manufacturing a stack of supporting plates, wherein all of said plates are identical and have at least one flat side edge, and said plates in the stack are placed with the flat side edges in a common plane, said plates being made by pressing them out of a large plate; punching a central hole in each plate such that the central hole of each plate has a sloping edge formed therein which in the stack extends downwardly a distance beyond the lower surface of each plate and centers the plates in the stack; forming by punch means at least three indentations in each plate extending out of the plane of the plate, said indentations spaced-apart from each other and from the central hole; and rotating the punch means a fixed angular distance after each indentation forming to form angularly staggered sets of said at least three indentations in successively formed plates step, and stacking the formed plates whereby, after stacking, the indentations on a superjacent plate in the stack engage flat surface areas of a subjacent plate of the stack to thereby provide a non-nested stack of said formed plates.

4,787,236
CLIP PLIERS
Robert J. West, R.F.D. 1, Box 682, Pownal, Me. 04069
Continuation-in-part of Ser. No. 863,856, May 16, 1986, abandoned. This application Jul. 31, 1987, Ser. No. 80,427
Int. Cl.⁴ B21D *7/06;* **B21F** *45/16*
U.S. Cl. 72—410 **3 Claims**

1. A hog ring type clip-applying device comprising:
an upper horizontally extending jaw having a front end and a rear end;
a lower horizontally extending jaw having a front end and a rear end;
a clip receipt area defined between the front ends of said upper jaw and said lower jaw;
a vertically disposed rear handle having a top and a bottom said rear handle attached at its top to the rear end of said lower jaw;
a lever member having a top and a bottom, the top of said lever member being attached at its top to the rear end of said upper jaw;
a vertically disposed front handle having a top and a bottom said front handle having defined in its top a slot having a right side and a left side through which slot said upper and lower jaws are adapted to pass;
a first pivot member pivotally attaching said lever member at a point on said lever member lower than lever member's attachment to said rear end of said upper jaw, to said lower jaw;
a second pivot member pivotally attaching the bottom of said lever member to the bottom of said front handle;
means to urge said front handle away from said rear handle for said jaws to be in a clip receipt mode;

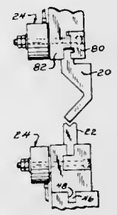


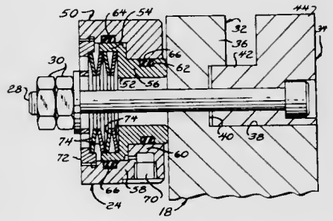
a clip slide attachment member affixed to the upper right side of said front handle;
a clip slide for retaining a plurality of clips thereon affixed to said clip slide attachment, said clip slide having a first end disposed at said clip receipt area when said device is in its clip receipt mode and a second end on which clips can be slid to pass into said clip receipt area, said device, when said front and rear handles are grasped by the user and manually moved together, being adapted to grasp a clip and move said jaws through said slot to a position beyond said slot where said clip can be positioned around the objects desired to be clipped together and by further manual pressure on said handles, the jaws clench said clip around the objects to be clipped together.

4,787,237
FAILSAFE TOOL CLAMPING SYSTEM FOR PRESS BRAKE
David L. Houston, Hanover Park; John W. Hughes, and Terrence M. Pelech, both of Oak Lawn, all of Ill., assignors to Accurate Manufacturing Company, Alsip, Ill.
Filed Aug. 28, 1986, Ser. No. 901,438
Int. Cl.⁴ B21D *37/04*
U.S. Cl. 72—462 **5 Claims**

1. A failsafe pressure/spring actuated clamping system for press brakes of the type including a stationary bed for receiving a first tool member thereon and a vertically movable ram, above the bed, for receiving a second tool member therebelow, the press brake adapted to bend or otherwise form material positioned between the tool members; the clamping system including a bed clamp assembly and a ram clamp assembly, said assemblies being secured to the bed and ram, respectively; one of said clamp assemblies comprising a first substantially stationary clamp member and a second sliding clamp member supported adjacent said first clamp member for substantially linear movement with respect thereto; said clamp members each including respective linear movement guide means coacting with each other for guiding the second clamp member in said substantially linear movement, one of said linear movement guide means comprising a pair of generally horizontal vertically spaced guide wall portions defining a recess therebetween, and the other of the linear movement guide means comprising an extension portion extending within said recess and being engageable with said wall portions to guide the

second clamp member in sliding linear movement during clamping of the tool member; and acutator means for moving the second clamp member in relation to the first clamp member whereby the associated tool member may be selectively retained and released; said actuator means comprising a plurality of spring means spaced along the clamp assembly for biasing the sliding and stationary clamp members into clamping en-

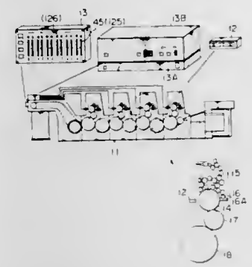




gagement with the associated tool member; said actuator means including pressure operated means for overcoming the spring means biasing force thereby releasing the tool member from the clamp assembly whereby a positive pressure must be applied to the pressure operated means to release the tool member secured within the clamp assembly and whereby the tool member is fixedly secured within the clamp assembly upon removal of pressure from the pressure operated means.

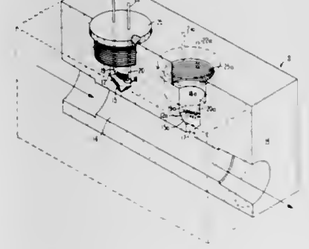
4,787,238
METHOD AND DEVICE FOR MEASURING THE QUANTITY OF WATER DAMPENING THE FACE OF AN OFFSET PRINTING PLATE
Toshiyuki Seki, Soka, and Daiji Suzuki, Urawa, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 783,569, Oct. 3, 1985. This application Jan. 20, 1987, Ser. No. 5,295
Claims priority, application Japan, Oct. 8, 1984, 59-211096; Jun. 11, 1985, 60-126934
Int. Cl.⁴ G01C *25/00;* **G01N** *21/49, 21/55*
U.S. Cl. 73—1 R **5 Claims**

5. A method for measuring the quantity of water dampening the face of an offset printing plate wherein the quantity of dampening water supplied to a non-image area of the offset printing plate of an offset press is measured by utilizing a light beam reflected from the face of the offset printing plate, said method comprising:
detecting the light beam directly reflected from the offset printing plate at an angle equal to the angle of incidence between the light beam and the offset printing plate;
independently detecting the diffused portions of the light beam reflected in a direction normal to the face of the offset printing plate;
detecting the non-image area of the offset printing plate in response to the diffused portions of the light beam thus detected; and



calibrating the variations in level of said directly reflected light beam in response to the diffused portions of the light beam thus detected.

4,787,239
SENSOR FOR HAND HELD GAS CHROMATOGRAPH
Richard DiMatteo, San Jose, Calif., assignor to Mark Products, Inc., Sunnyvale, Calif.
Filed Jan. 11, 1988, Ser. No. 142,120
Int. Cl.⁴ G01N *30/66*
U.S. Cl. 73—23.1 **8 Claims**



1. In combination with a portable helium detector having a probe for gathering a gas sample, a chromatographic column for classifying helium in a passing gas stream from said gathered sample, a detector cell having communication to said passing gas stream and including a reference electrode and a measurement electrode, and a circuit having input to said electrodes and an output for amplification of the differential output of said reference electrode with respect to said measurement electrode: and means for digitizing the output of said circuit, the improvement in said detector cell comprising:
a detector cell body defining first and second identical cavities for confining said electrodes;
first and second identical electrode assemblies, each electrode assembly including identical first and second legs, identical coils mounted between said legs, said legs mounted to identical bases configured to seal the cavities in said detector cell body:
said first electrode assembly constructed to dimensionally and electrically match said second electrode assembly:
said first and second electrode assemblies placed in said detector cell at said bases to seal said electrodes within said first and second cavities:
said first and second electrode assemblies having identical alignment in said cells as sealed with said first and second

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legs and said coils being disposed in parallel alignment whereby motion induced changes in electrical resistivity of said coil is substantially identical for both cells:

one of said cavities defining a single passageway for occluded sampling of a passing classified gas stream from said columns: and

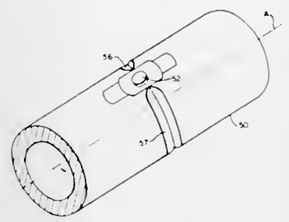
the other of said cavities isolated for the prevention of sampling of said classified gas stream from said column.

4,787,240

LIQUID MEASUREMENT ARRANGEMENT

James L. McShane, Churchill Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1987, Ser. No. 91,226
Int. Cl.[4] G01F *23/28*
U.S. Cl. 73—290 V **10 Claims**



1. Apparatus for use in a liquid measuring system, comprising:

(A) a structure having an outside wall and an interior in which a liquid is relatively movable;

(B) at least one acoustic transducer coupled to said structure and operable to transmit acoustic energy through said wall to said interior;

(C) said wall including at least one groove on either side of said transducer, each said groove extending laterally of said transducer;

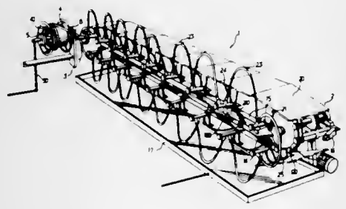
(D) each said groove being constructed and arranged that acoustic energy which would normally be transmitted laterally through said wall will reflect off of said groove and be redirected to an off lateral direction.

4,787,241

FLOW TEST STAND AND FLUID SUPPLY SYSTEM

Guang-Yue Sheen, No. 1-2, 23 Lane, Yung-Chang Third Street, Taichung, Taiwan

Filed Feb. 4, 1987, Ser. No. 10,816
Int. Cl.[4] G01M *3/00*
U.S. Cl. 73—45.1 **3 Claims**



1. A flow test stand system comprising:

(a) a plurality of like test tube units arranged in a head-to-tail manner to form an endless test-unit-chain;

(b) means for driving said endless test unit chain;

(c) control means including a microswitch for controlling said driving means to drive said endless test-unit-chain to alternately travel a distance corresponding to a test table unit and thereafter stop said driving means for a predetermined interval upon actuation of the microswitch;

(d) fluid supplying means for introducing a fluid from a source and distributing said fluid to each test table unit; and

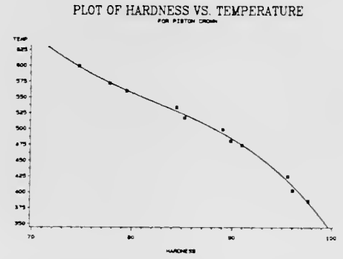
(e) each test table unit including a fitting to provide communication between said fluid supplying means and a flow apparatus to be tested, each fitting being connected with the fittings of two adjacent test table units.

4,787,242

MEASURING PISTON STEADY-STATE TEMPERATURES

John K. Shine, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 21, 1987, Ser. No. 75,930
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 R **6 Claims**



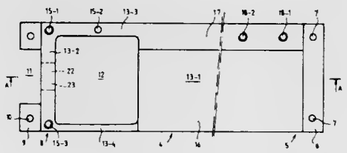
1. An apparatus for the calculation of the steady-state temperature experienced by a piston comprising an Aluminum-Copper alloy device incorporated into said piston, wherein said Aluminum-Copper alloy device is a setscrew made from an Aluminum-Copper alloy.

4,787,243

DEVICE FOR DETECTING A DIMENSION, IN PARTICULAR A TREAD WIDTH ON A PATH

Michel M. Gaucher, Le Mesnil Saint Denis, France, assignor to Electronique Serge Dassault, Saint Cloud, France

Filed Jan. 12, 1988, Ser. No. 143,000
Claims priority, application France, Jan. 13, 1987, 87 00285
Int. Cl.[4] B60C *11/00*; G01M *17/02*
U.S. Cl. 73—146 **10 Claims**



1. A device for detecting a dimension, in particular a tread width on a path, the device comprising:

an elongate support part suitable for being embedded in the path and having a low upstanding wall running along one edge thereof;

a plate cantilevered out from the low wall with its cantilevered portion being subdivided into tongues by slots which extend perpendicularly to the longitudinal direction of the support part;

pressure transducers received in the support part beneath said tongues;

resilient means between the tongues and the transducers; and

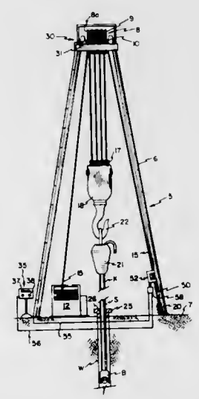
electrical connection means making connections with the pressure transducers.

4,787,244

WELL PIPE OR OBJECT DEPTH INDICATOR

Raymond F. Mikolajczyk, Rte. 1, Box 57-A, Broussard, La. 70518

Continuation of Ser. No. 556,106, Nov. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 523,102, Aug. 15, 1983, abandoned. This application Feb. 10, 1988, Ser. No. 154,271
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 **8 Claims**



5. In a method of continuously displaying the total depth of an object in a well bore while accommodating raising and lowering the object supported on a cable line reeved around at least one rotatable sheave means, the steps of:

a. positioning circumferentially spaced detectable means on one of the rotatable sheave means;

b. positioning sensor means to sense the amount of movement of the sheave means by producing a signal each time one of the detectable means passes the sensor means;

c. communicating totalizer means including a computer counter circuit capable of being preset and having memory with the sensor means to instrumentally display the continuous total depth of the well string;

d. moving the cable line longitudinally a predetermined amount; and

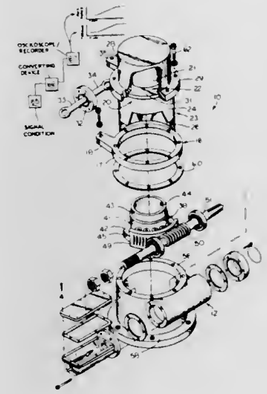
e. receiving in the totalizer means the number of signals generated by the sensor means during such predetermined longitudinal movement of the drill line as an indication of the number of detectable means passing the sensor means whereby the totalizer means may be preset with the amount of longitudinal movement of the cable line for each detectable means that passes said sensor means.

4,787,245

TORQUE MEASURING APPARATUS FOR VALVE OPERATING SYSTEM

Paul G. Anderson, and John A. McMennamy, both of Cobb County, Ga., assignors to Movats Incorporated, Marietta, Ga.

Filed May 13, 1987, Ser. No. 50,239
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—168 **7 Claims**



1. In combination:

a stem driving gear mounted for rotation within a valve actuator housing about an axis of rotation, said stem driving gear including an inner surface in driving communication with a valve stem and an outer surface, said outer surface defining, at least, a gear engaging portion;

a worm driven by a worm shaft and in driving communication with said gear engaging portion of said outer surface of said stem driving gear,

a stationary member mounted to said actuator housing;

a load measuring means mounted to said stationary member at a determinable distance from said axis of rotation of said stem driving gear for measuring a force generated thereat;

a moving member mounted for rotation about said axis of rotation of said stem driving gear, said moving member including, at least, a gear interfacing means for effecting rotation of said moving member with said stem driving gear, and said moving member further comprising load cell engaging means for engagement with said load measuring means at some point along the path of rotation of said moving member and at a determinable distance from said axis of rotation of said stem driving gear, and for generating, in cooperation with said stationary member and in response to said engagement, counter-rotation force at said load measuring means, which counter-rotation force resists rotation of said moving member about said axis of rotation,

whereby the driven worm gear effects rotation of the stem driving gear about its axis of rotation, which effects rotation of the moving arm assembly about the axis of rotation and engagement of the moving arm assembly with the load measuring means and generation of force measured at the load measuring means.

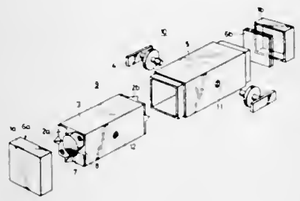
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,246

BIDIRECTIONAL SHOCK SENSOR

Tomoaki Komatsu, and Hiroshi Yamaguchi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 27, 1987, Ser. No. 19,813
Claims priority, application Japan, Feb. 27, 1986, 61-026515[U]
Int. Cl.[4] G01P *15/04*
U.S. Cl. 73—492 5 Claims



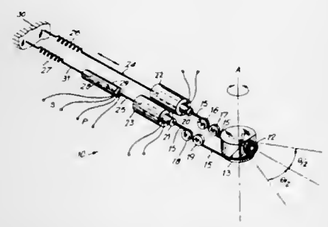
1. A bidirectional shock sensor, comprising:
a container;
an impact block slidably fitted within and along first walls of said container;
elastic members fixed on ends of said impact block facing opposed second walls of said container; and
pressure-sensitive color-changing sheets attached to said second walls and selectively contactable with said elastic members.

4,787,247

SCANNING APPARATUS AND METHOD

David G. Wuchinich, New York; William Henriksen, Happauge; Robert Brendolan, Mamaroneck, and Louis Katz, Flushing, all of N.Y., assignors to Sonomed Technology, Inc., Lake Success, N.Y.

Continuation-in-part of Ser. No. 888,660, Jul. 23, 1986, abandoned. This application Jan. 14, 1987, Ser. No. 3,157
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—620 54 Claims



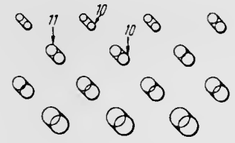
8. A scanning apparatus comprising:
(A) means for obtaining information from an object;
(B) means for oscillating said information means comprising:
(i) frame means for providing support;
(ii) means for connecting said information obtaining means to said frame means comprising:
(a) transfer means at least partially comprising a cable for transmitting oscillating force to said information obtaining means;
(b) means attached to said frame for providing bidirectional biasing forces comprising at least one spring to oscillate said transfer means;
(c) means for measuring the displacement of a portion of said transfer means in response to the biasing force providing means;
(d) means for comparing the measured displacement of said transfer means portion with a predetermined desired displacement of said transfer means portion; and
(e) means for providing driving forces to said transfer means comprising at least one solenoid to compensate for the difference between said measured displacement and said predetermined desired displacement so that the information obtaining means scans a predetermined portion of said object.

4,787,248

METHOD FOR MEASURING AMPLITUDE OF MECHANICAL VIBRATIONS

Arkady V. Polyakov, and Genrikh A. Speransky, both of Moscow, U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie Stroitelnogo I Dorozhnogo Mashinostroenta "Vniistroidormash" , Moscow, U.S.S.R.

Filed Dec. 9, 1986, Ser. No. 939,807
Int. Cl.[4] G01H *9/00, 17/00*
U.S. Cl. 73—649 5 Claims



1. A method of measuring the amplitude of mechanical vibrations in vibration machines comprising applying a multitude of measuring signs to the surface of the vibrating object, each of said signs being in the form of a measuring circle with a radius selected out of a range of amplitudes to be measured, subjecting said multitude of measuring circles to mechanical vibrations such that each circle forms a discreet visual image, selecting a particular circle from said multitude of circles in which visibly perceived parts of said measuring circle are in contact in the center of said image and taking the value of the measured amplitude as equal to the radius of said particular measuring circle.

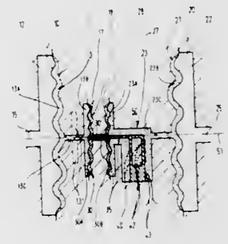
4,787,249

DIFFERENTIAL PRESSURE TRANSDUCER

Hans Duppul, Stuttgart; Leo Nawrocki, Waiblingen; Rolf Specht, Leonberg, and Werner Winter, Stuttgart, all of Fed. Rep. of Germany, assignors to Eckardt AG, Stuttgart, Fed. Rep. of Germany

Filed May 26, 1987, Ser. No. 53,694
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621795
Int. Cl.[4] G01L *19/00, 9/04*
U.S. Cl. 73—708 5 Claims

1. A differential pressure transducer for measuring a differential between two pressures, said transducer comprising:
a closed measuring chamber formed by at least two deformable measuring membranes arranged to be acted upon by said two pressures, respectively, said measuring chamber containing a fluid medium, said measuring membranes being of identical size and shape and arranged as symmetrical mirror images of one another,
a first deformable transmission membrane exposable to one of said pressures,
a first pressure transmission chamber defined by said first transmission membrane and one of said measuring membranes, said first transmission chamber containing a fluid medium,
a second deformable transmission membrane exposed to the other of said pressures,
a second pressure transmission chamber defined by said second transmission membrane and the other of said measuring membranes, said first and second pressure transmission chambers having the same volume and arranged as symmetrical mirror images of one another,
first and second fixed surfaces located opposite said first and second measuring membranes, respectively, for limiting the extent to which said measuring membranes can be deformed,



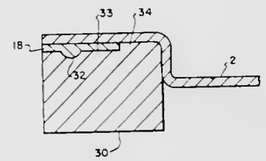
third and fourth fixed surfaces located opposite said first and second transmission membranes, respectively, for limiting the extent to which said transmission membranes can be deformed,
the volume of said measuring chamber being less than the volume of either of said pressure transmission chambers,
measuring means disposed in said second pressure transmission chamber and operably connected to both of said measuring membranes to be activated thereby in response to a pressure differential, and
means responsive to the activation of said measuring means for determining said pressure differential.

4,787,250

METHOD OF PRODUCING A UNIFORM FLUID-TIGHT SEAL BETWEEN A THIN, FLEXIBLE MEMBER AND A SUPPORT AND AN APPARATUS UTILIZING THE SAME

Francis R. Varrese, Ambler, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 23, 1987, Ser. No. 41,952
Int. Cl.[4] G01L *7/08*
U.S. Cl. 73—715 5 Claims



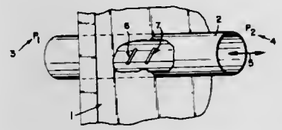
1. A pressure transmitter comprising
a thin, flexible diaphragm,
an annular support surface for said diaphragm,
an annular recess on said support surface for receiving excess braze material,
an upwardly extending annular ridge on said support surface spaced by an annular portion of said surface from said recess and in contact with said diaphragm,
brazing material means between said diaphragm and said surface e and extending across said recess and said surface adjacent to said recess up to said ridge for attaching said diaphragm to said surface,
pressure inlet means for applying an input pressure to the transmitter to one side of said diaphragm and
pressure outlet means for transmitting an outlet pressure from the other side of said diaphragm.

4,787,251

DIRECTIONAL LOW DIFFERENTIAL PRESSURE TRANSDUCER

Kenneth J. Kolodjaki, Minneapolis, Minn., assignor to TSI Incorporated, St. Paul, Minn.

Filed Jul. 15, 1987, Ser. No. 73,731
Int. Cl.[4] G01L *21/12*
U.S. Cl. 73—755 7 Claims



1. An apparatus for measuring differential pressure
(a) a flow passageway between a first chamber and a second chamber, wherein at least one chamber contains a fluid, each chamber being in fluid communication with the other chamber via the flow passageway;
(b) a first thermal sensor element and a second thermal sensor element, each sensor being mounted inside the flow passageway, the sensors being aligned in tandem such that each sensor is directly on a streamline occupied by the other sensor, each sensor being a temperature sensitive element, the temperature sensitive element having an electrical resistance that is a function of temperature, wherein a thermal wake created by passage of the fluid over the first sensor affects the temperature of the second sensor;
(c) means for connecting each thermal sensor element in series, the series connected sensor elements residing in a bridge circuit wherein the two series connected sensor elements form a first arm of the bridge;
(d) means for causing a current to flow through the two series connected sensor elements, thereby casuing each sensor element to be heated above the temperature of a surrounding flowing fluid;
(e) means to regulate the current so as to cause resistance of the two series connected sensors to be held constant given a constant ambient fluid temperature;
(f) means to connect a conductor to a junction between the two sensors;
(g) means to measure a voltage at the junction; and
(h) means to calculate which of the two sensors has a higher difference of potential relative to a predetermined reference difference of potential, thereby indicating which sensor is downstream from the other and thus indicating a flow direction and indicating that the upstream sensor is the flow sensor to be used for measuring flow velocity.

4,787,252

DIFFERENTIAL CORRELATION ANALYZER

Saul A. Jacobson, Bellingham; Lawrence C. Lynnworth, Waltham, and James M. Korba, Woburn, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Filed Sep. 30, 1987, Ser. No. 103,066
Int. Cl.[4] G01F *1/66*
U.S. Cl. 73—861.28 18 Claims

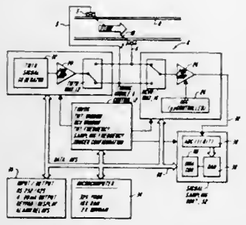
1. Apparatus for measuring a selected transmission characteristic of a medium, such apparatus comprising
signal transmission means for providing a coded ultrasonic

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transmission signal for injection into a medium at a determined time,

timing means for determining at least one sample selection time window synchronized to said determined time,

signal reception means for receiving signal energy from the medium and for providing during a said sample selection time window a plurality of digitized signals representative of received signal energy,



processing means for processing said plurality of digitized signals to produce a correlation function having discrete values,

means operative on said correlation function for determining a signal offset having a defined functional relation to the selected characteristic thereby enabling its calculation, and

output calculation means for determining a value of the selected transmission characteristic as said function of the signal offset.

4,787,253

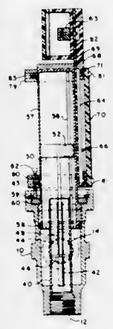
ELECTRONIC DISPLAY FLOW METER

Craig R. deFasselle, 7361 Briar Hill Rd., Kirtland, Ohio 44094; Robert J. deFasselle, Timberidge Trail, Gates Mills, Ohio 44040, and David E. Kent, Palm Harbor, Fla., assignors to Craig R. deFasselle, Kirtland and Robert J. deFasselle, Gates Mills, both of, Ohio

Filed Jun. 29, 1987, Ser. No. 67,927

Int. Cl.[4] G01F *1/24*

U.S. Cl. 73—861.54 **29 Claims**



5. A fluid flow meter comprising:

a body portion having an inlet port, an outlet port and a chamber connecting the inlet port to the outlet port;

a movable stem within said chamber, said stem adapted to change position in response to changes in flow through said chamber such that the position of said stem is indicative of flow rate;

a magnet fixed to said stem; and

a transducer outside of said chamber comprising a resistor bar having first and second ends, a contact bar and indicator means, said resistor bar being connected to a source of reference voltage at said first end and a source of reference ground at said second end, said contact bar being connected to a position signal line, and said indicator means adapted to be attracted to said magnet and making electrical contact between said resistor bar and said contact bar at a point adjacent said magnet thereby creating a position signal on said position signal line.

4,787,254

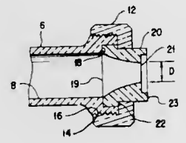
MASS FLOW METER

R. Alan Duckworth, Farnham, England, assignor to Briggs Technology, Inc., Pittsburgh, Pa.

Filed Feb. 20, 1987, Ser. No. 16,876

Int. Cl.[4] G01F *1/42*

U.S. Cl. 73—861.62 **2 Claims**



1. A device for measuring the mass flow rate of a compressible fluid delivered from a source comprising:

a hollow bored conduit means having an inlet end adapted to be placed into communication with said source and a discharge end including a converging nozzle means fitted therein, said nozzle having a throat section defining a cross-sectional area of a known numeric value;

fluid pressure sensing means including a pressure gauge communicating with the hollow bore of said conduit means in an upstream location from said nozzle means;

locking collar means at the discharge end thereof adapted to detachably receive the nozzle means, whereby nozzle means of differing cross-section areas may be sequentially fitted to the device to obtain a mass flow rate indication for each of said nozzle means; and

the gauge having pressure indicia thereon and a plurality of concentric mass flow rate indicia rings each corresponding to a nozzle of different cross-sectional area, whereby a single device enables direct reading of both pressure and mass flow rate for each of the different nozzles.

4,787,255

TORQUEMETER

Normand Gany, Boucherville, Canada, assignor to Centre de Recherche Industrielle du Québec and Consulab Inc., Ste-Foy and Beauport, Canada

Filed Apr. 2, 1987, Ser. No. 33,195

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.34 **9 Claims**

7. A device for measuring torque, comprising:

a torque detector including;

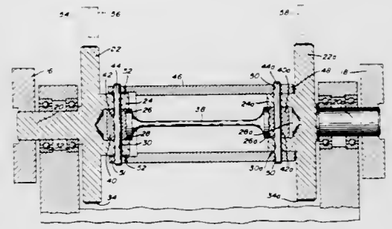
a supporting structure;

a torsion shaft rotatably mounted to said supporting structure, said torsion shaft being adapted to transmit torque that is to be measured, the torque producing a twist in said torsion shaft;

first and second recording mediums mounted at axially spaced locations on said torsion shaft, a periodic signal being recorded on said first and second recording mediums;

first and second signal detecting means mounted to said supporting structure and associated respectively with said first and second recording mediums for detecting the periodic signals and generating in turn output signals, the twist producing a phase shift between the output signals of the first and second signal detecting means, the phase shift being representative of the torque;

high pass filter means operatively connected to said first and second signal detecting means for filtering the output



signals generated by said first and second signal detecting means; and

computer means operatively connected to said high pass filter means for receiving and processing the filtered output signals to calculate said phase shift for, and in turn determining said torque.

4,787,256

RESISTANCE-GAUGE FORCE TRANSDUCER

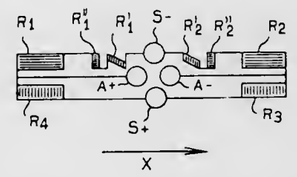
Jean Cherbuy, Nice, France, assignor to Sfernice Societe Francaise de l'Electro-Resistance, Paris, France

Filed Apr. 28, 1987, Ser. No. 42,653

Claims priority, application France, Apr. 30, 1986, 86 06298

Int. Cl.[4] G01L *1/22*

U.S. Cl. 73—862.67 **3 Claims**



1. Resistance-gauge force transducer, comprising a resilient bar (1) having one end adapted to be fixed to a stationary support (2) and the other end subjected to the force (P) to be measured, wherein the bar carries two pairs of resistance gauges symmetrically disposed on opposite sides of the center of gravity (G) of the bar, the direction of the lines of current of a gauge of one pair being parallel to the bar axis and perpendicular to that of the other gauge of the same pair, the gauges being electrically connected together so as to form a Wheatstone bridge delivering a signal which is a function of the force (P) applied on the said end of the bar, the two gauges of one pair being adjacent and connected to each other in the Wheatstone bridge.

4,787,257

GEARSHIFT DEVICE

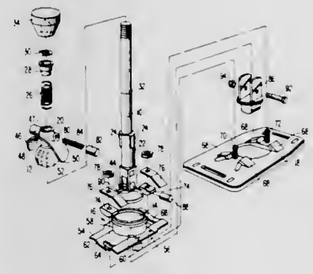
Dieter Ott, Ingolstadt; Klaus Bieber, Gaimersheim; Christian Dronia, Ingolstadt, and Josef Maier, Hepberg, all of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 37,274

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613854

Int. Cl.[4] G05G *9/12, 5/04*

U.S. Cl. 74—473 P **6 Claims**



1. A gearshift device in a motor vehicle for shifting the speeds of a transmission comprising:

(a) a gearshift lever pivotable in two planes and mounted on a ball joint sphere;

(b) said gearshift lever having two movable stops;

(c) a bearing bracket cup for receiving at least a portion of said ball joint sphere;

(d) two pair of fixed stops each pair fixed with respect to said cup and cooperating with said movable stops to limit the pivot angle of said lever in one of said planes;

(e) said movable stops provided with an element for rolling on the fixed stops; and

(f) said movable stops being colinear with a line passing through the center of said sphere and each of said pair of fixed stops being colinear with said line when engaged with said movable stops.

4,787,258

CONTROL SYSTEMS FOR AUTOMATIC TRANSMISSIONS

Koichi Yamamoto, Hiroshima, and Fumiaki Babe, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Japan

Filed Mar. 31, 1987, Ser. No. 32,611

Claims priority, application Japan, Apr. 3, 1986, 61-77090

Int. Cl.[4] B60K *41/18, 41/16*

U.S. Cl. 74—866 **7 Claims**

1. A control system for an automatic transmission employed in a vehicle comprising;

a torque converter coupled with an output shaft of an engine,

a power transmitting gear arrangement disposed at an output end of the torque converter,

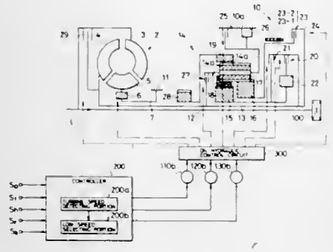
speed change means for changing over power transmitting paths to one from another in said power transmitting gear arrangement to give rise to speed change,

a valve arrangement for controlling an operation fluid to be supplied to and drained from said speed change means,

revolving speed sensing means for detecting the revolving speed of one of input and output portions of said power transmitting gear arrangement when the shifting-down to a low speed with which an engine brake effect is to be obtained from a high speed in said power transmitting gear arrangement is carried out; and

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control means for selecting directly a first low speed with which the engine brake effect can be obtained as the low speed of a target of the shifting-down when the revolving speed detected by said revolving speed sensing means is not lower than a predetermined revolving speed and for selecting a second low speed which is provided with the same speed reduction ratio as said first low speed and with



which the engine brake effect can not be obtained as the low speed of a target of the shifting-down for a predetermined period of time and then making a shift from said second low speed to said first low speed following said predetermined period of time when the revolving speed detected by said revolving speed sensing means is lower than said predetermined revolving speed.

4,787,259

ROTARY DRIVE APPARATUS HAVING MULTIPLE DRIVE SHAFTS

Donald G. Carson, 12108 Towner Ave., NE., Albuquerque, N. Mex. 87112

Filed Feb. 6, 1987, Ser. No. 11,683
Int. Cl.⁴ F16H *27/02, 29/02*
U.S. Cl. 74—89.2 **5 Claims**



1. Multiple shaft rotary drive apparatus, comprising, in combination:

a relatively large diameter driven element having an outer periphery;

a plurality of relatively small diameter driving elements spaced apart from each other adjacent to the outer periphery of the driven element;

a plurality of motors connected to the plurality of driving elements for rotating the driving elements; and

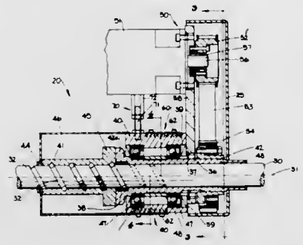
cable means helically disposed about the outer periphery of the driven element and extending helically about the plurality of driving elements for coupling together and rotating the driven element in response to the rotation of the driving elements.

4,787,260

SELF-ALIGNMENT DEVICE FOR BALLSCREW ARRANGEMENT

Edward J. Bailey, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 20, 1987, Ser. No. 40,222
Int. Cl.⁴ F16H *25/20*
U.S. Cl. 74—89.15 **22 Claims**



1. A self-aligning ballscrew assembly for a ballscrew arrangement of a manipulator device for reciprocating an extension element along a linear extension axis, said assembly comprising;

(a) a ballscrew having a longitudinal axis;

(b) a ballscrew bearing block having a ballscrew nut mounted on said ballscrew for translating the extension element of said manipulator device along a linear extension axis in response to relative rotation between said ballscrew and said ballscrew nut;

(c) drive means for selectively providing relative rotation between said ballscrew and said ballscrew nut; and

(d) flexible mounting means for connecting said bearing block to said manipulator device, said flexible mounting means further comprising a pair of reed spring arrangements for permitting limited linear movement of said bearing block and said ballscrew nut with said ballscrew in a direction normal to said longitudinal axis, and limited rotational movement about an axis mutually perpendicular to said longitudinal axis and said normal direction, while maintaining proper alignment of said ballscrew nut relative said ballscrew.

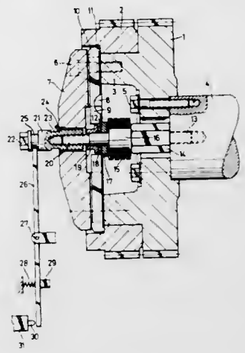
4,787,261

DEVICE FOR SETTING A RELATIVE ROTATIONAL POSITION OF A GEARWHEEL AND A RING GEAR WHICH ARE COAXIALLY MOUNTED

Willi Becker, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 35,067
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611325
Int. Cl.⁴ B41F *13/24;* **F16H** *55/00*
U.S. Cl. 74—439 **14 Claims**

1. Device for setting a relative rotational position of a gearwheel and a ring gear disposed coaxially mounted and turnable on an annular extension of the gearwheel, comprising a plurality of radially extending pressure levers actuatable in common by an axially adjustable, centrically disposed adjusting element for releasing a spring-biased positive connection of mutually engaging faces of the gearwheel and the ring gear by reducing the spring bias acting upon said faces, said pressure levers being loosely disposed between the annular extension of the gearwheel and a clamping disc adjacent thereto, said pressure levers being received in radial grooves formed in said clamping disc and being pivotally braced at a first contact region located between the ends thereof against one of the annular extension and said clamping disc, the adjusting element being displaceable over a distance, during a first portion of which the spring bias increases from a relatively low value to a value necessary for maintaining the relative rotational position of the gearwheel and the ring gear and, during a second portion of the



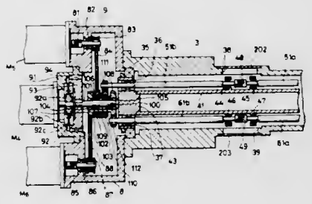
distance displaceable by the adjusting element, the spring bias necessary for maintaining the relative rotational position of the gearwheel and the ring gear is at least maintained, and an electric switch connected in a supply-current circuit of a machine drive is actuatable by said element.

4,787,262

WRIST DEVICE OF ROBOT

Fusaaki Kozawa, Ibaraki; Shigemi Igarashi, Ushiku; Kob Tsuji, Ebina, and Tatenori Jinriki, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 60,349
Claims priority, application Japan, Jun. 13, 1986, 61-135968
Int. Cl.⁴ B25J *17/02;* **G05G** *11/00*
U.S. Cl. 74—479 **5 Claims**



1. In a wrist device of a robot which is attached to a front end of an arm as a base portion and which includes a wrist portion having three degrees of rotating freedom orthogonal to one another;

a wrist device of a robot characterized by comprising driving motors which are mounted on a rear end of said arm through a motor holding frame, a coaxial driving mechanism which is disposed in said motor holding frame and which transmits power of said driving motors between parallel shafts, and arm power transmission means constructed of a first transmission shaft being a main shaft and a second and third transmission shafts which are divided and journaled in bearings between a plurality of flanges circumferentially provided at an outer periphery of said first transmission shaft and which are connected and formed by shaft couplings, for transmitting power from said coaxial driving mechanism to said wrist portion,

said wrist portion being provided with wrist power transmission means and speed reducers for realizing two frontward ones of said three degrees of rotating freedom.

4,787,263

AUTOMATIC SELF-ADJUSTING CABLE SYSTEM

Miroslav Jaksic, Ann Arbor, Mich., assignor to Acco Babcock Inc., Fairfield, Conn.

Filed Mar. 23, 1987, Ser. No. 28,761
Int. Cl.⁴ F16C *1/10*
U.S. Cl. 74—501.5 R **2 Claims**



1. An automatic self-adjusting cable system comprising

first, second and third cables, each including a conduit and a strand extending through the conduit, wherein the first strand is the actuator strand and the second strand and third strand are connected to devices to be actuated,

a housing,

a member movable axially relative to the housing, and

a clutch between the housing and the member comprising a plurality of collet members which are movable radially and longitudinally and surround the member,

a spring extending between the collet housing and the first conduit,

said housing being attached to the strand of the second cable,

said inner member being attached to the third strand,

such that when a load is applied to the strand of the first cable, the strand tends to move toward the collet housing, the resisting force created by the second and third cables causing the collets to be forced into locking position to sustain the load, and when there is slack in the system, the spring exerts force on the housing moving the collets out of engagement with the member until the slack is removed and a balance of force occurs and the collets re-engage the inner member,

said compression spring surrounding a portion of said first conduit and said first strand,

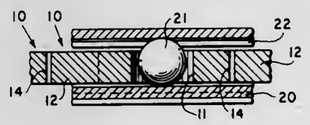
a pair of flexible strands connecting said housing and the second strand.

4,787,264

REMOTE CONTROL WITH BALL BEARINGS IN LINKED BALL-CAGE ELEMENTS

Charles S. Tamarin, New Rochelle, N.Y., and Gerard Magliaro, Brookfield Center, Conn., assignors to Incom International Inc., Pittsburgh, Pa.

Filed Nov. 21, 1986, Ser. No. 933,529
Int. Cl.⁴ F16C *1/10*
U.S. Cl. 74—502.3 **12 Claims**

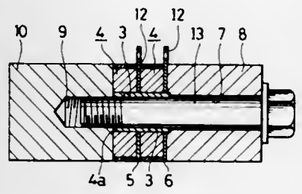


1. In tubular remote controls wherein at least one flexible push-pull blade slides on rows of spaced balls positioned on the opposite faces of said blade the improvement of a ball-cage strip comprising a linked series of linkable ball-cage elements for spacing said balls in each of said rows, each said element

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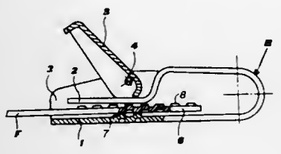
having a flat, elongate body with a head and neck formed at one end and a cavity and entrance formed at the opposite end of said body, said head and said neck being shaped to fit loosely in said cavity and said entrance of another said element, said element having a thickness greater than the radius but less than the diameter of said balls and being provided with at least one perforation to retain one of said balls.

4,787,265
TORSION VIBRATOR
Shoji Mishiro, Kanagawa, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan
Filed Sep. 9, 1986, Ser. No. 905,136
Int. Cl.⁴ F16F *15/10*
U.S. Cl. 74—574 **2 Claims**



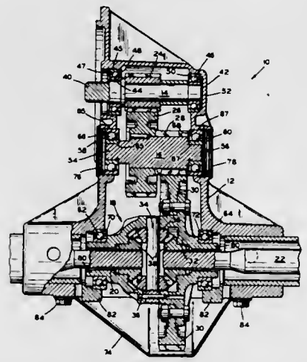
1. A torsional vibrator comprising:
at least two frames of insulating material, said frames each having partitions connected by an outer peripheral wall;
a plurality of block shaped electrostrictive elements forming annular arrangements in each of said frames, said electrostrictive elements in each of said frames being separated by said partitions and having residual polarization in the same circumferential direction so as to form an electrostrictive member having a residual polarization in said circumferential direction in each of said frames;
an electrode plate abutting at least one wall of each of said electrostrictive members transverse to said circumferential direction, said electrostrictive members and electrode plates forming an alternating array in a direction transverse to said circumferential direction;
metal members abutting opposite ends of said alternating array; and
means for rigidly securing said metal members and said alternating array.

4,787,266
ADJUSTABLE TOE CLIP FOR BICYCLE PEDALS
Antonio Romano, Padua, Italy, assignor to Campagnolo S.P.A., Vicenza, Italy
Filed Aug. 12, 1987, Ser. No. 84,904
Claims priority, application Italy, Sep. 5, 1986, 22928/86[U]
Int. Cl.⁴ G05G *1/14;* **A44B** *11/12;* **B68B** *5/00*
U.S. Cl. 74—594.6 **2 Claims**



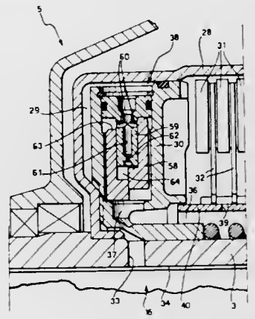
1. In a toe clip for bicycle pedals, comprising a plate of flexible material adapted to be fixed to one side of a bicycle pedal body and extending forward and then being bent rearward to enclose the toe of a shoe, and a strap surrounded by an eyelet secured to the rearwardly bent portion of the plate; the improvement in which said eyelet is in the form of a loop having two free superposed ends, and lever means for pressing together said two ends with the end of said rearwardly bent portion between them thereby to permit selective positioning and locking of the flexible plate and the eyelet in any of a plurality of selected adjusted positions relative to each other.

4,787,267
DIFFERENTIAL AXLE REDUCTION GEAR HOUSING
Thomas M. Kessler, Fort Wayne, and Kraig J. Schlosser, Auburn, both of Ind., assignors to Dana Corporation, Toledo, Ohio
Filed Oct. 7, 1986, Ser. No. 916,352
Int. Cl.⁴ F16H *57/02, 37/08*
U.S. Cl. 74—606 R **6 Claims**



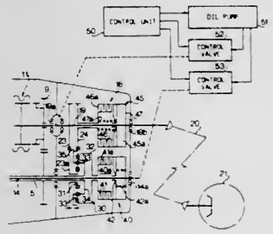
1. In a differential gear reduction apparatus including a pair of coaxially arranged driving axle shafts, a vehicular differential assembly positioned coaxially between said axle shafts, said differential assembly including a differential drive gear positioned circumferentially about one of said axle shafts, and also positioned coaxially therewith, an input shaft disposed for rotary coupling to a prime mover, said input shaft parallel to said axle shafts and containing a first gear coaxially fixed thereon, an intermediate shaft positioned between said axle shafts and said input shaft, said intermediate shaft parallel to said axle shafts and said input shaft, said intermediate shaft including a second gear in mesh with said first gear, and said intermediate shaft including a third gear in mesh with said drive gear; an improvement comprising: a unitary structural housing containing said input and intermediate shafts, said differential assembly, and said axle shafts, said housing disposed for maintaining each of said input and intermediate shafts and said axle shafts parallel with respect to one another wherein said input shaft contains a stepped diameter wherein said input shaft defines an outboard and an inboard end of differently sized diameters, wherein the diameter of said outboard end thereof is larger than said inboard end diameter, wherein each of said differently sized ends is positioned in a correspondingly sized input shaft bearing bore in said unitary structural housing, said first gear being smaller than the outboard bearing bore of said housing.

4,787,268
STEP CHANGE-SPEED TRANSMISSION WITH CENTRIFUGAL CLUTCH
Gianluigi Falzoni, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy
Filed Apr. 9, 1987, Ser. No. 36,511
Claims priority, application Italy, Apr. 23, 1986, 67339 A/86
Int. Cl.⁴ F16H *37/00*
U.S. Cl. 74—689 **6 Claims**



1. A stepless change-speed transmission between the engine and the drive shafts of the driven wheels of a motor vehicle, comprising a main shaft, an expansible driving pulley carried by the main shaft, a driven shaft, an expansible driven pulley carried by the driven shaft, a drive belt which passes around the driving and driven pulleys and hydraulic control means for varying the transmission ratio between the driving and driven pulleys, an epicyclic differential rotatable by the driven shaft to drive the drive shafts, a geared reversing unit for reversing the sense of rotation of the differential to effect forward or reverse drive respectively, hydraulic actuator means for controlling the reversing means, and a hydraulically-operated friction clutch for engaging and disengaging the transmission, the friction clutch being arranged on the drive shaft and including a driving member actuated by the driven pulley and a driven member for actuating the reversing unit, and the reversing unit comprising:
a driving gear for forward drive rotatably mounted on the drive shaft, transmission means and a driven gear for forward drive engaged with the driving gear for forward drive through said transmission means;
a toothed clutch sleeve coaxial with the driven shaft and coupled for rotation with the driven member of the friction clutch, the toothed sleeve normally being meshed with the driving gear for forward drive, and being displaceable axially by the hydraulic actuator means to a position of disengagement from the driving gear for the forward drive;
a driven gear for reverse able to mesh directly with the toothed clutch sleeve when the latter is in its disengaged position, and
transmission means between said driven gear for forward and reverse drive and the differential;
wherein the friction clutch comprises an actuating cylinder fixed to the driving member of the clutch and defining a thrust chamber connected to a hydraulic supply circuit and a hydraulic exhaust duct housing a normally-open modulating valve, rotatable with the actuator and with centrifugal closing actuation;
wherein the modulating valve comprises a centrifugal mass slidable radially in the exhaust duct and carrying an obturator which cooperates with a valve seat formed in the exhaust duct; and
wherein the centrifugal mass is constituted by a substantially cup-shaped slide with a tapering edge acting as an annular obturator and the interior of which defines a pressure chamber communicating with the hydraulic supply circuit with the function of balancing the centrifugal force acting on the centrifugal mass.

4,787,269
POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE
Rempei Matsumoto, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 14, 1987, Ser. No. 50,599
Claims priority, application Japan, May 23, 1986, 61-119490; May 23, 1986, 61-119491; May 26, 1986, 61-120403; Jul. 11, 1986, 61-163030
Int. Cl.⁴ F16H *37/06*
U.S. Cl. 74—665 GA **20 Claims**



1. A power transmitting system for a four-wheel drive motor vehicle having an engine and a transmission connected to the engine comprising:
a front drive shaft for transmitting torque of the transmission to front wheels of the vehicle;
a rear drive shaft for transmitting torque of the transmission to rear wheels of the vehicle;
a planetary gear device connected to the transmission for transmitting power of the transmission;
first and second torque distribution devices connected to the front drive shaft and rear drive shaft, respectively, each of the torque distribution devices including clutch means for transmitting an output of the planetary gear device to a corresponding of the drive shafts;
control means continuously responsive to driving conditions of the vehicle for rendering the clutch means operative for automatically distributing via said first and second torque distribution devices different and changing ratios of torque to the front and rear drive shaft according to the driving conditions of the vehicle.

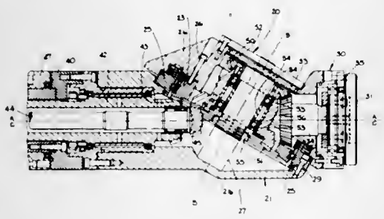
4,787,270
ROBOTIC MANIPULATOR
David E. Suica, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Feb. 11, 1987, Ser. No. 13,378
Int. Cl.⁴ F16H *37/06*
U.S. Cl. 74—665 M **19 Claims**

1. An improved robotic manipulator of the type having a plurality of serially connected drive shafts and a mounting surface affixed to one end thereof, said manipulator including a first shaft rotatable about a first axis coincident with one ordinant of a mutually perpendicular triordinant system and a first housing rotatable about said first axis, a second shaft rotatably mounted to said first shaft for rotation about a second axis obliquely oriented with respect to said first axis and a second housing rotatable on said first housing about said second axis, means for imparting rotational movement to said second shaft about the second axis in accordance to rotational movement of a shaft rotatable about said first axis, the mounting surface having a centerline angularly oriented with respect

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to said second shaft, and a third shaft upon which said mounting surface is attached, said third shaft being rotatable about a third axis angularly oriented with respect to said second axis, wherein the improvement comprises:

an axis bearing cylinder substantially immovably mounted parallel to said second axis, said axis bearing cylinder



having a first end mounted on said second housing and a second end extending partially inwardly into said first housing and said bearing cylinder being cantilever mounted to provide sole support, independent of said first housing means, for a gear cluster arrangement for transferring rotational input to said third shaft.

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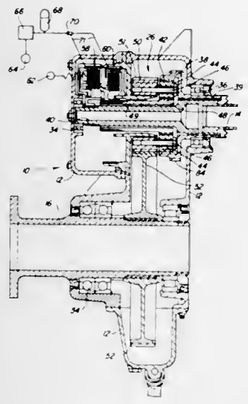
GEAR BOX

J. William Brogdon, Daphne, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Mar. 23, 1987, Ser. No. 29,197

Int. Cl.[4] F16H *3/44, 37/06, 57/04;* **F01M** *9/10*

U.S. Cl. 74—781 R **15 Claims**



1. A gear box comprising:

a housing;

a drive shaft rotatably supported in said housing;

an output shaft rotatably supported in said housing;

planetary gear means including an annular gear mounted for rotation with said drive shaft and having a radially inwardly facing gear ring, a plurality of planet gears engaged with said gear ring, a sun gear supported coaxially with said drive shaft and engaged with said planet gears, and an annular planetary gear carrier having an inner circumferential surface and an outer circumferential surface, said surfaces being concentric, axially overlapping and in radial alignment relative to an axis of said drive shaft, said inner circumferential surface being adapted to freely rotate about said sun gear, said outer circumferential surface having a plurality of gear teeth, said gear carrier having a plurality of spindles for rotatably supporting said plurality of planet gears;

a second gear mounted for rotation with said output shaft, said second gear being in engagement with said plurality of teeth of said gear carrier whereby said output shaft is driven when said gear carrier rotates; and

means for selecting one of at least two output rotational speeds including brake means for selectively preventing rotation of said sun gear, clutch means for selectively locking said sun gear to said drive shaft for rotation therewith, and means for selectively actuating said brake means and said clutch means.

4,787,272

HYDRAULIC PRESSURE CONTROL APPARATUS FOR USE IN AUTOMATIC TRANSMISSION

Yutaka Taga, Aichi, and Kunio Morisawa, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

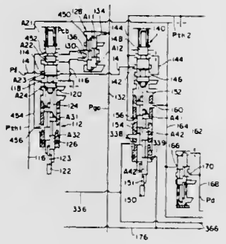
Division of Ser. No. 715,821, Mar. 25, 1985, Pat. No. 4,660,693. This application Feb. 4, 1987, Ser. No. 10,731

Claims priority, application Japan, Apr. 4, 1984, 60-65820; Jul. 13, 1984, 60-144381

The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.

Int. Cl.[4] B60K *41/04*

U.S. Cl. 74—867 **1 Claim**



1. A hydraulic pressure control apparatus for use in an automatic transmission, comprising:

a first throttle valve for producing a first throttle pressure which increases in response to a first control force applied thereto in relation with intake throttle position, said first throttle pressure being for boosting a line pressure according to the intake throttle position;

a second throttle valve for producing a second throttle pressure which increases in response to a second control force applied thereto in relation with the intake throttle position, said second throttle pressure being for shifting transmission speed stages;

a first hydraulic system for supplying said first throttle pressure to said first throttle valve so as to lower said first throttle pressure to be produced thereby;

a second hydraulic system for supplying said first throttle pressure to said first throttle valve for producing a first auxiliary force in said first throttle valve, said first auxiliary force being added to said first control force so as to operate in the same direction therewith;

a third hydraulic system for supplying said second throttle pressure to said second throttle valve so as to lower said second throttle pressure to be produced thereby;

a fourth hydraulic system for supplying said second throttle pressure to said second throttle valve for producing a second auxiliary force in said second throttle valve, said second auxiliary force being added to said second control force so as to operate in the same direction therewith; and

a cut-back valve for controlling said supply of said first throttle pressure to said first throttle valve through said first and said second hydraulic system so as to allow said first throttle pressure to be supplied only when vehicle speed is above a predetermined low value.

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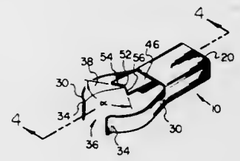
WRENCH RETAINING DEVICE

Donald J. Griffith, 6025 Twin Rock Ct., Colorado Springs, Colo. 80907

Filed Sep. 29, 1982, Ser. No. 426,673

Int. Cl.[4] B25B *13/00*

U.S. Cl. 81—13 **17 Claims**



1. An attachment clip adapted to mount on wrenches having a shank and a working head and operative to retain the working head on a nut and threaded bolt, the clip comprising:

a yoke extending at least partially around said shank and slideable therealong;

a first prong member connected to said yoke and having a free end adapted to engage the threads of said bolt when said free end is placed in abutting relation to said bolt, said free end moveable between an engaged position and a disengaged position as said yoke is slid in opposite directions on said shank; and

releasable retaining means associated with said first prong for releasably and resiliently retaining said first prong member in said engaged position whereby said free end engages said threads, said releasable retaining means including a pair of resilient arms extending outwardly from said yoke and adapted to embrace said working head when said free end is in said engaged position and to bias said free end into said engaged position.

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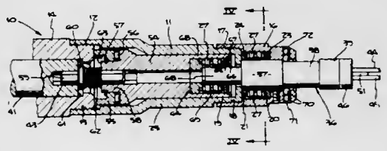
INSTALLING TOOL FOR WEDGING-TYPE FASTENERS

Victor Belanger, Huntington Beach, Calif., assignor to Monogram Industries, Inc., Culver City, Calif.

Continuation of Ser. No. 717,947, Mar. 29, 1985, abandoned. This application Jan. 9, 1987, Ser. No. 5,386

Int. Cl.[4] B25B *13/00*

U.S. Cl. 81—59.1 **9 Claims**



1. A power tool for rotationally driving a workpiece of the type having a first cylindrical outer member and a second cylindrical inner member which is concentrically mounted with respect to the outer member for relative rotation thereto and which projects axially therefrom, the tool being adapted to engage and disengage the workpiece by axial motion onto and off it, respectively, and being adapted, when engaged with the workpiece, to hold the outer member stationary relative to the tool while selectively applying torque to the inner member in either direction of rotation, the tool comprising:

a tool body;

a drive shaft rotatably mounted in said tool body for rotation about a central axis, said drive shaft including

a generally tubular open end positioned to receive the inner member of the workpiece and extend in spaced relation therearound;

motor means mounted in said tool body for applying torque to said drive shaft to selectively rotate it in opposite directions;

a nosepiece attached to said tool body in concentric relation to said central axis, said nosepiece including

a generally tubular open end positioned to receive the outer member of the workpiece at the same time that the inner member of the workpiece is received within the open end of said drive shaft, said open end of said nosepiece extending in spaced relation around the outer member of the workpiece; and

inner and outer cylinder gripping means mounted in the open ends of said drive shaft and said nosepiece releasably gripping said inner and outer members of the workpiece, said inner and outer cylinder gripping means being engaged with and disengaged from the inner and outer members of the workpiece by axial motion of the tool onto and off the workpiece, respectively, rotation of said drive shaft in one rotational direction causing said inner cylinder gripping means to grip the inner member rotating it in the one direction and causing said outer cylinder gripping means to grip the outer member and hold it against rotation, while rotation of said drive shaft in the other rotational direction without disengaging the workpiece causing said inner cylinder gripping means to grip the inner member rotating it in the other direction and causing said outer cylinder gripping means to grip the outer member and hold it against rotation.

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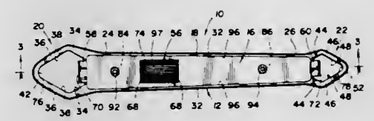
ADJUSTABLE DOUBLE-ENDED BOX WRENCH

David S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48018

Filed Mar. 20, 1987, Ser. No. 28,489

Int. Cl.[4] B25B *13/10*

U.S. Cl. 81—77 **9 Claims**



1. An adjustable double-ended box wrench comprising:

(A) a wrench body of an elongated shape including:

(a) a hollow intermediate portion of an elongated shape having opposite ends, said intermediate portion including a base wall having an adjusting opening and also including a pair of spaced side walls connected by the base wall and projecting therefrom, and said intermediate portion having a pair of adjusting seats located between the side walls on opposite extremities of the adjusting opening toward the opposite ends of the intermediate portion;

(b) a large box wrench connected to one end of the intermediate portion of the wrench body and including support portions extending therefrom in a diverging relationship to each other, said large box wrench also including engagement portions extending from its support portions in a converging relationship to each other and having engagement surfaces that define an included angle of about 60°, and said large box wrench also including a connecting portion; and

(c) a small box wrench connected to the other end of the

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intermediate portion of the wrench body and including support portions extending therefrom in a diverging relationship to each other, said small box wrench also including engagement portions extending from its support portions in a converging relationship to each other and having engagement surfaces that define an included angle of about 60°, and said small box wrench also including a connecting portion that connects its engagement portions;

(B) an adjustable jaw assembly supported by the wrench body and including:

(a) an elongated adjusting member supported within the hollow intermediate portion of the wrench body for movement along the length thereof in opposite directions toward and away from the large and small box wrenches, said adjusting member having an intermediate portion including an externally threaded portion adjacent the adjusting opening in the base wall of the intermediate portion of the wrench body, and said adjusting member having end portions that extend in opposite directions from the threaded intermediate portion toward the large and small box wrenches;

(b) an adjusting nut that threadingly receives the externally threaded portion of the intermediate portion of the adjusting member, said adjusting nut being located within the adjusting opening of the base wall of the wrench body, and the adjusting nut having oppositely facing surfaces that engage the adjusting seats of the intermediate portion of the wrench body to move the adjusting member in opposite directions with respect to the large and small box wrenches upon rotation of the adjusting nut in opposite directions; and

(c) a pair of jaw ends on the opposite ends of the end portions of the adjusting member, said pair of jaw ends being respectively received between the support and engagement portions of the large and small box wrenches, and each jaw end including a generally flat jaw surface that defines an angle of about 60° with respect to each of the pair of engagement surfaces of the associated box wrench to permit gripping of a hexagonal nut or bolt head thereby upon appropriate rotational adjustment of the adjusting nut; and

(C) a cover plate that extends between the side walls of the wrench body and is secured thereto to retain the adjustable jaw assembly within the hollow intermediate portion of the wrench body, said cover plate having an adjusting opening through which the adjusting nut projects to permit the rotational adjustment from either side of the wrench, the externally threaded intermediate portion of the adjusting member having a greater size than the spacing between the cover plate and the base wall of the wrench body so as to be received within the openings thereof, and the openings of the cover plate and base wall of the wrench body having end surfaces that engage the threaded intermediate portion of the adjusting member in order to limit movement of the adjusting member in opposite directions.

4,787,276

TOOL HANDLE WITH INTERCHANGEABLE BLADES AND ALTERNATE ORIENTATION

Harry F. Condon, 147 S. Howell, Hillsdale, Mich. 49242

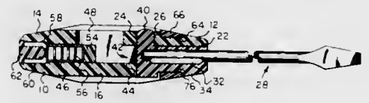
Filed May 11, 1987, Ser. No. 48,372

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ B25G *1/06*

U.S. Cl. 81—177.1 **7 Claims**

1. A hand tool having a tool implement alternately positionable upon a handle comprising, in combination, an elongated handle having an outer surface, a longitudinal axis, a front end, a rear end and a central region bisected by a central plane perpendicular to said axis, an elongated axially extending radial slot defined in said handle laterally intersecting said handle outer surface and said handle front end and said slot having a configuration including opposed flat surfaces radially spaced from said handle axial axis, an elongated implement having an axis, an outer end and an inner end, torque drive means defined on said implement outer end, a head integrally fixed upon said implement inner end, a portion of said head having a configuration complementary to a portion of said slot in a first position and in a second position, said slot flat surfaces comprising spaced opposed flat parallel sides defined upon opposite sides of said handle axis and radially spaced relative thereto, said head including a pair of parallel sides spaced apart a distance substantially equal to the spacing of said opposed flat parallel



sides thereby permitting said head to be closely received within said slot in said first position with said implement axis substantially coincident with said handle axis and alternately in said second position wherein said implement axis is transverse to said handle axis, and a radial recess defined in said handle central region of a configuration to closely receive said implement head in a third position, said recess including a pair of parallel sides spaced apart a distance substantially equal to the spacing of said opposed flat parallel sides whereby said implement axis will be radially disposed to said handle axis and located within said central plane.

4,787,277

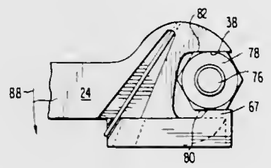
SLIDING RATCHET WRENCH

Robert E. Myers, 18507 Prince William La., Houston, Tex. 77058

Filed May 29, 1987, Ser. No. 55,093

Int. Cl.⁴ B25B *1/12*

U.S. Cl. 81—179 **3 Claims**



1. A sliding ratchet wrench comprising:

a wrench body terminating at one end in a head,

said head including a first stationary jaw defining a first gripping surface, a slide mount projecting from said body opposite from said stationary jaw, being spaced therefrom and defining a flat bearing surface facing said stationary jaw, a slidable jaw mounted on said slide mount and slidable towards and away from said wrench body and having a byte portion forming a second gripping surface which extends generally parallel to said stationary jaw first gripping surface facing that first gripping surface and being spaced therefrom to grip opposite flats of a nut or bolt head therebetween, said slidable jaw byte portion including an inner surface slidably mating with said slide mount bearing surface and an adjacent slide surface contacting said wrench body to resist torque acting on said sliding jaw at said byte portion in response to wrench operation, said wrench further including spring means biasing said slidable jaw in a retracted position toward said wrench body to align said first and second gripping surfaces with each other and said slidable jaw further including a cam surface rearward of the byte portion second gripping surface and disposed at an angle thereto to cause said slidable jaw to move in opposite to said bias to effect ratcheting of said wrench about a nut or bolt head captured between said first and second gripping surfaces when rotating said wrench body in a first direction relative to the axis of said nut or bolt head, and wherein, during the rotation of said wrench body in a second direction, said first and second gripping surfaces grip opposite, parallel flats on said nut or bolt head to force said nut or bolt head to rotate with said wrench body and wherein a side face of the wrench body perpendicular to said first gripping surface of said stationary jaw includes an elongated groove extending from the side of said ratchet wrench remote from said slide mount to the side of said wrench body proximate to said slide mount, said groove diverging in the direction of said slide mount, said biasing means comprises a straight wire spring having one end fixed to the apex end of said diverging groove, said slidable jaw including a diagonal groove within a face thereof aligned with said wrench body diverging groove, said straight wire spring including a free end positioned within said slidable jaw groove, and wherein the position of said wire spring is such that said wire spring exerts a biasing force tending to contact the side wall of said diverging groove remote from said stationary jaw to bias said slidable jaw in a retracted position, and wherein said diverging groove limits the flexing of said spring in a fore and aft position relative to the stationary jaw.

4,787,278

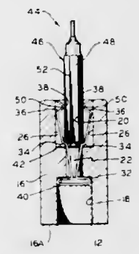
TOOL BIT DRIVER WITH SPRING RETAINER

Fred A. Bononi, Simsbury, Conn., assignor to Western Pacific Industries Inc., New York, N.Y.

Filed Mar. 30, 1988, Ser. No. 175,206

Int. Cl.⁴ B25B *23/00*

U.S. Cl. 81—438 **11 Claims**



1. A tool bit driver comprising a body having a non-circular drive opening, a non-circular bit socket and an intermediate through-opening of reduced cross-section connecting the drive opening and socket; the drive opening, socket and connecting through-opening being in coaxially aligned relation within the body; the bit socket having internal walls defining bit drive faces with a pair of spring finger retention grooves formed therein; and a spring formed of resilient material and having a pair of bit retaining fingers and a base connecting those fingers; the base of the spring having a minimum dimension greater than the maximum cross-sectional dimension of the intermediate through-opening of the body; the spring being insertable into the drive opening into an operating position within the body wherein the base of the spring is positively secured against unintended displacement within the drive opening of the body and the fingers of the spring extend through the intermediate through-opening and are biased by the spring material into seating engagement within the grooves of the socket.

4,787,279

TOOL OF THE PLIERS-TYPE

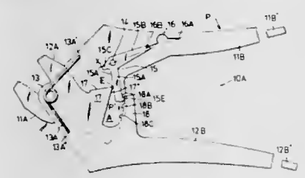
Hans Undin, Akersberga, Sweden, assignor to C. A. Weidmuller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,794

Claims priority, application Sweden, Feb. 2, 1987, 8700382

Int. Cl.⁴ B25B *7/02*

U.S. Cl. 81—313 **20 Claims**



1. A tool of the pliers-type, having two elongated handles; two jaws operably connected to the handles for performing a closing movement and an opening movement, and a mechanism preventing premature interruption of the said closing movement, said mechanism comprising an engagement member connected to at least one of said handles, and a pawl member pivotally mounted on a pivot pin which is connected with the first one of said handles, said pawl member being constantly affected, in a first fixing point, by a spring means so as to operate as a bistable rocker swingable between two opposite lateral positions, said pawl member comprising an engagement part with a means of engagement with said engagement member, and an actuating part on which said first fixing point is located, said spring means being further anchored in a second fixing point, connected to the said first handle, wherein

said engagement part is defined by an elongated engagement arm extending, in a direction transverse to a line connecting said pivot pin and said first fixing point, between a first end attached to the actuating part, and free second end;

said means of engagement is defined by a rearwardly pointing cog, having an engagement edge, and located at said free end;

a forwardly pointing second cog is provided at said first end;

said engagement member is defined by a forward projection and a rearward projection which are rigidly connected to the second handle, point with their top portions toward the first handle, and are spaced one from another so as to define between them an operating area for the said engagement arm;

said rearward projection is at its top portion provided with a first tooth pointing toward the forward projection and having an engagement edge facing the said engagement edge of said first cog and being shaped for engagement therewith;

said top portion of said forward projection is defined by a point alternately engageable with said engagement arm and said second cog to swing the pawl member from one side position to the other one and vice versa.

4,787,280

APPARATUS FOR MACHINING WORKPIECES AND METHOD THEREFOR

Bruce D. Voelkerding, Lakewood, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Jul. 24, 1986, Ser. No. 889,987

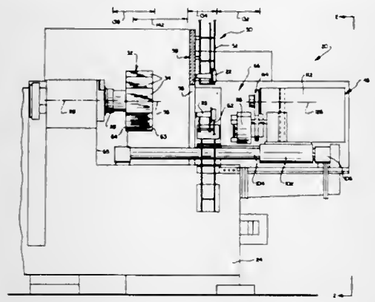
Int. Cl.⁴ B23B *13/00*

U.S. Cl. 82—2.5 **24 Claims**

1. An apparatus for sequentially machining a plurality of workpieces (22), said apparatus comprising a base (24) which at least partially defines a work area (66), spindle means (26) connected with said base and disposed at one end of said work area for sequentially gripping workpieces (22) and rotating a gripped workpiece about a spindle axis (28) which extends

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outwardly from one end of said spindle means through the work area, a plurality of stations (132, 134, 138,142) located in the work area in a linear array which extends outwardly from the one end of said spindle means along the spindle axis, said plurality of stations including a work station (138) located adjacent to the one end of said spindle means and a conveyor station (134) disposed along the spindle axis outwardly of said work station, conveyor means (50) for conveying unfinished workpieces to said conveyor station (134) in a direction toward the spindle axis (28) and for conveying finished workpieces from said conveyor station in a direction away from the spindle axis, said conveyor means (50) including an infeed section (52) which extends into said conveyor station (134) along a path which is transverse to the spindle axis to a pickup location and an outfeed section (62) which extends from a drop off location at said conveyor station along a path extending transverse to the spindle axis, said apparatus being characterized by shield means (58) located outwardly from said one end of said spindle



means along the spindle axis between said infeed and outfeed sections (52,62) of said conveyor means (50) and said work station (138) for blocking materials moving away from a workpiece while the workpiece is being rotated by said spindle means, said shield means (58) including means for at least partially defining an opening (56), and workpiece loading and unloading means (46) for engaging an unfinished workpiece which is disposed on said infeed section (52) of said conveyor means (50) at the pickup location (68), for moving the unfinished workpiece along the spindle axis through the opening (56) in said shield means (58) in a direction toward said one end of said spindle means (26), for engaging a finished workpiece gripped by said spindle means, for moving the finished workpiece along the spindle axis through the opening in said shield means in a direction away from said one end of said spindle means (26) to the outfeed section (62) of said conveyor means and for releasing the finished workpiece at the drop off location (98) which is spaced from the pickup location (68).

4,787,281

METHOD OF DIVIDING LOGS OF HEATED METAL INTO BILLETS AND APPARATUS FOR USE IN THE METHOD

John A. Gardner, Tettenhall, Great Britain, assignor to Mechatherm Engineering Limited, West Midlands, United Kingdom

Filed Mar. 4, 1987, Ser. No. 21,760

Claims priority, application United Kingdom, Mar. 8, 1986, 8605773

Int. Cl.⁴ B23D *33/02*

U.S. Cl. 83—15 **8 Claims**

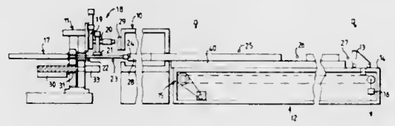
1. A method of dividing first and second logs of heated metal into billets comprising the steps of:

dividing said first log into a plurality of billets with a remainder of said first log being left over after said dividing is completed;

dividing said remainder into a plurality of parts;

dividing said second log into a plurality of parts; and

combining each of said parts from said remainder with one



of said parts from said second log to form a plurality of billet pairs, each part from said remainder being used as a first billet in each of said billet pairs.

4,787,282

METHOD AND APPARATUS FOR FORMING BY PUNCHING

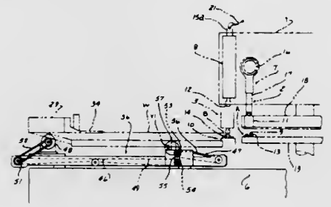
Kenji Okachi, and Sadaharu Ishihara, both of Inuyama, Japan, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Aug. 3, 1987, Ser. No. 80,935

Claims priority, application Japan, Aug. 9, 1986, 61-187540

Int. Cl.⁴ B26V *3/00*

U.S. Cl. 83—25 **9 Claims**



1. A method of forming a shaped, planar part (Wa) from a sheet of material (W), by moving the sheet (W) past a first punching station (A) along a path defining the shape of said part (WA), repeatedly punching through said sheet (WA) as each portion thereof is presented at said punching station (A) to progressively punch out said part (WA) from said sheet (W), and characterized by the steps of discontinuing said sheet, characterized by the steps of discontinuing said punching and sheet moving process to leave one or more localized bridging connections (Wc) between said sheet (W) and said part (WA), shifting said sheet (W) with said connected part (W) to a second punching station (B) at a different location from said first punching station (A), and punching out said one or more connections (WC) thereat to separate said part (WA) from the remainder of said sheet (W), and removing said part (WA) from said remainder of said sheet (W) at said second punching station (B) by supporting said sheet on the surface of a table (33), providing a hinged trap door within the surface of the table, supporting said part (WA) on said hinged trap door (37) during said punching out of said connections, and lowering one end of said trap door (37) after said one or more connections (WC) are punched out to allow said part (WA) to drop away from said sheet (W) and slide away on said trap door 37.

4,787,283

METAL STUD AND CHANNEL CORNERING DIE

Larry L. Foster, P.O. Box 1283, Modesto, Calif. 95353

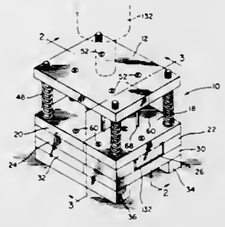
Filed Mar. 26, 1987, Ser. No. 30,237

Int. Cl.⁴ B23D *23/00*

U.S. Cl. 83—453 **11 Claims**

1. A metal stud and channel cornering die, said die including first die plate means having opposite end margins, opposite side margins extending between said end margins and a central

zone disposed between said side margins and extending between said end margins, a pair of die bars overlying and supported from said side margins and defining a metal stud receiving channel therebetween over said first die plate means, die guide plate means mounted over said die bars and closing said channel from above, a force plate mounted over said die guide plate means for guided movement toward and away from said guide plate means, cutting die means mounted from said force plate and depending downwardly therefrom, said die guide plate means and said first die plate means defining registered



openings therein with said openings each including generally right angled arm portions including a first arm portion extending along one side of said channel and a second arm portion extending laterally of said channel from said first arm portion and terminating slightly inward of the other side of said channel, said first arm portion including inner and outer portions thereof disposed inward and outward, respectively, of said one side of said channel, said cutting die means, in plan, including generally right angled arm portions snugly downwardly receivable through said registered openings.

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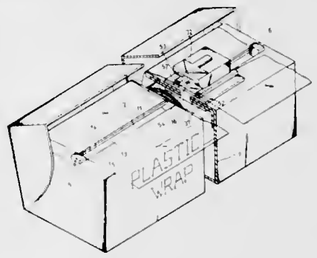
CUTTING APPARATUS FOR WRAP FILM

Shing-Huei Chen, 3 Fl., No. 6, Lane 10, Sec. 2 Chung-Cheog Rd., Shih-Lin, Taipei, Taiwan

Filed May 14, 1987, Ser. No. 50,247

Int. Cl.⁴ B26D *5/10*

U.S. Cl. 83—614 **1 Claim**



1. An apparatus for cutting plastic wrap film comprising:

a cardboard dispenser box having a top portion and one side wall portion made of two layers of cardboard, said top portion having a horizontal guiding track slot formed thereon, said slot having two side edges,

a sliding saddle having an upper portion being generally T-shaped in cross section and a lower portion being generally I-shaped in cross-section, a top surface of said sliding saddle having a direction indicator thereon, said upper portion having a horizontal portion and a vertical portion, said lower portion having an upper horizontal portion, a lower horizontal portion, and a vertical portion connecting said upper horizontal portion and said lower horizontal portion of said lower portion of said sliding saddle thereby defining two guide channels between said upper horizontal portion and said lower horizontal portion of said lower portion of said sliding saddle, said two guide channels respectively engaged with the two side edges of said guiding track slot, said vertical portion of said upper portion of said sliding saddle being fixed to said upper horizontal portion of said lower portion of said sliding saddle, a safety razor blade mounted beside said vertical portion of said upper portion for cutting the wrap film, said upper horizontal portion of said lower portion having two flanges formed thereon, each said flange having a curved surface formed on a front end of each said flange, said upper portion of said sliding saddle having two front curved surfaces formed on two front ends of said horizontal portion of said upper portion with each said front curved surface on said horizontal portion of said upper portion corresponding to each said curved surface of said flange on said upper horizontal portion of said lower portion defining an opening to receive the wrap film, and

two protection terminals each having a channel mounted on either end of two opposite ends of said guiding track slot on said cardboard dispenser box, whereby upon a depression and sliding movement of said sliding saddle along said guiding track slot the wrap film received in said opening is cut by said safety razor blade.

4,787,285

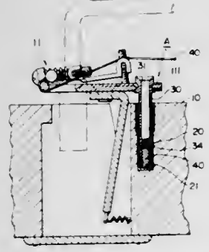
ANCHOR BOLT DEVICE FOR TREMOLD DEVICE

Takao Goto, Isezakishi, Japan, assignor to Gotoh Gut Yugen Kaisha, Gunmaken, Japan

Filed Oct. 7, 1987, Ser. No. 105,343

Int. Cl.⁴ G10D *3/04*

U.S. Cl. 84—313 **7 Claims**



1. An anchor bolt device for a tremolo device comprising

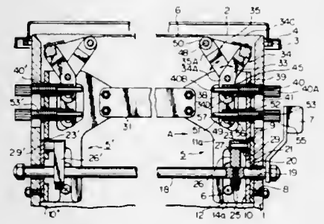
a bottomed tube which is buried to be open upwardly in a body of a stringed instrument and provided with an internal thread on its inner wall,

a bolt which is provided on its outer surface with an external thread which meshes with the internal thread of said tube to allow to be thread-fitted into the tube from the opening of the tube so that the bolt can be moved in the tube, at the circumference of its top part with a groove for securing a front edge of a tremolo device, and at the center of the bolt in its axial direction with a through hole in which an internal thread is provided on an internal wall of at least the lower part of the bolt, and a pushing member which is threaded at least partly to be thread-fitted to the internal thread inside the through hole of said bolt and adapted so that the lower end of said pushing member can be moved as desired from the lower end of the through hole toward the bottom of the tube by an external operation,

wherein said bolt is fixed to the internal thread of the tube by depressing said pushing member onto the bottom of said tube.

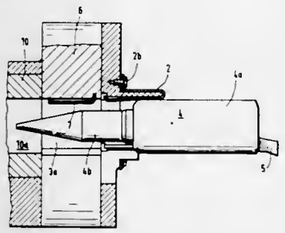
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,286
SNARE MECHANISM FOR A DRUM
Yukimasa Okumura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Aug. 12, 1987, Ser. No. 84,618
Claims priority, application Japan, Aug. 13, 1986, 61-123369[U]; Aug. 13, 1986, 61-123370[U]
Int. Cl.[4] G10D *13/02*
U.S. Cl. 84—417 **8 Claims**



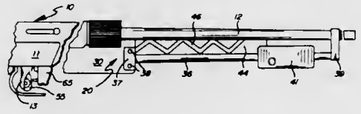
1. An improved snare mechanism for a drum, comprising:
(A) a snappy base for arrangement within the stem of said drum;
(B) a snappy mounted to said snappy base facing the inner surface of the fore side drum head with a clearance;
(C) means for driving said snappy selectively into and out of contact with said inner surface of said fore side drum head; and
(D) clearance adjusting means for adjusting said clearance, said clearance adjusting means including:
(1) a snappy supporter arm swingably mounted to a support shaft within said stem and supporting said snappy at a first end thereof;
(2) a height adjuster bolt having an inner end operably coupled to a second end of said snappy supporter arm and an outer end exposed outside said stem for manual operation; and
(3) means for converting rotational movement of said height adjuster bolt to swinging movement of said snappy supporter arm.

4,787,287
AUTOMATIC CANNON HAVING AN AMMUNITION-RECEIVING DEVICE
Gerhard Skowasch, Gelsenkirchen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed May 28, 1987, Ser. No. 54,961
Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618267
Int. Cl.[4] F41F *11/02*
U.S. Cl. 89—24 **7 Claims**



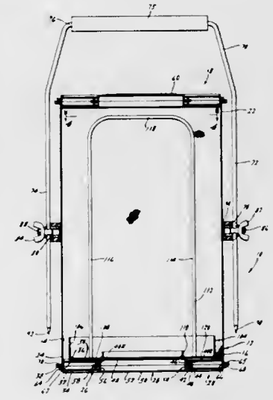
6. An automatic cannon for use with a linearly advanced and retracted feed finger that transports caseless ammunition to the cannon, said cannon comprising:
a weapon housing having a feed opening with a periphery; a wedge-type breech block disposed adjacent the weapon housing, the wedge-type breech block having a feed opening;
a gun barrel disposed adjacent the wedge-type breech block, the gun barrel having a cartridge chamber for receiving ammunition transported through the feed opening of the weapon housing and the feed opening of the wedge-type breech block by the feed finger;
receiving means for damping the forward movement of the ammunition into the cartridge chamber, the receiving means including a plurality of leaf springs which are distributed around the periphery of the feed opening of the weapon housing, the leaf springs having free ends which resiliently project inwardly so as to constrict the feed opening of the weapon housing, the receiving means further including at least one additional leaf spring disposed in the feed opening of the wedge-type breech block and having a free end which projects inwardly, the spring characteristics of the leaf springs being different from the spring characteristics of the at least one additional leaf spring and the inward extension of the free ends of the leaf springs being shaped differently from the inward extension of the free end of each at least one additional leaf spring.

4,787,288
RAPID FIRE TRIGGER ACTIVATOR
Clifford E. Miller, 3605 Elizabeth, Melvindale, Mich. 48123
Filed Jul. 24, 1987, Ser. No. 77,653
Int. Cl.[4] F41F *13/04*
U.S. Cl. 89—27.3 **20 Claims**



1. A rapid fire trigger activator apparatus attached to a weapon's receiver used to convert any semi-automatic firearm, fired from the shoulder, into nearly the firing capability of an automatic weapon, comprising:
a main side plate being suitably attached to the receiver of the semi-automatic weapon, said main side plate having a fore end, rear, and top portions with a pivot pin located near its rear portion;
a fore end slide tube, said slide tube being suitably mounted at one end to the fore end portion of said main side plate and to the semi-automatic weapon's gun barrel at the opposite end;
a trigger activator having a trigger pin being disposed over the pivot pin of said main slide plate;
a transfer bar having an aperture at one end and a cam follower slot pin at the opposite end, said transfer bar being disposed unto the pivot pin of said main side plate through the aperture over said trigger activator;
a slotted cam plate having a cam recess into which the cam follower slot pin of said transfer bar is disposed, said slotted cam plate having a fore end portion;
a bearing block, said bearing block being suitably attached to the fore end portion of said main side plate so as to form a bearing surface for said slotted cam plate and said transfer bar;
a fore end hand grip, said fore end hand grip being suitably connected to the fore end portion of said slotted cam plate and mounted over said slide tube so as to allow it to move in a longitudinal back and forth direction, with reference to the semi-automatic weapon's gun barrel, along side slide tube; and
a swing out safety block being suitably attached to said transfer bar near its aperture,
whereby the longitudinal movement of the fore end hand grip in a pumping back and forth action will cause the semi-automatic weapon to fire at nearly the firing capability of an automatic weapon.

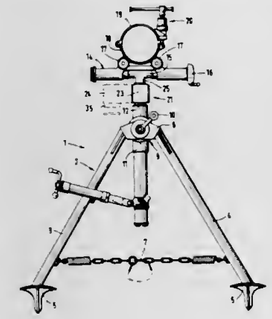
4,787,289
BULLET TRAP
Morris J. Duer, 8501 Peachwood Dr., Centerville, Ohio 45458-6642
Filed Jan. 15, 1988, Ser. No. 144,093
Int. Cl.[4] F41J *1/12*
U.S. Cl. 89—36.02 **10 Claims**



1. A bullet trap comprising, in combination, a tubular housing defining a chamber open at each end of said housing, a pair of cover assemblies, one of said cover assemblies being releasably secured to one end portion of said housing and the other of said cover assemblies being secured to the opposite end portion of said housing, each of said cover assemblies including a membrane formed of a material easily penetrated by a bullet fired from a firearm, and a relatively low density filler material in the form of particles loosely filling the chamber defined by said housing and being retained therein by said cover assemblies.

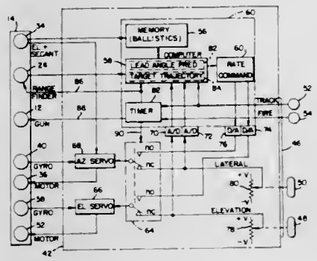
4,787,290
SUPPORT APPARATUS FOR A GRENADE THROWER TUBE
Gideon Argon, Tel-Aviv, Israel, assignor to Salgad International Ltd., Cayman Insel, Cayman Islands
Filed Aug. 18, 1987, Ser. No. 86,545
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630729
Int. Cl.[4] F41F *23/24*
U.S. Cl. 89—37.05 **17 Claims**

1. In a support apparatus for a grenade thrower tube wherein a height adjustment assembly raises and lowers the tube along a first vertical axis and a sideways adjustment assembly moves the tube back-and-forth in a direction transverse to the first vertical axis, the combination comprising:
(a) transverse extension arm means pivotally mounted between the height adjustment assembly and the sideways adjustment assembly to rotate about said first vertical axis, and
(b) coupling means pivotally connecting the sideways adjustment assembly to rotate about a second vertical axis on the transverse extension arm means at a location laterally spaced form said first vertical axis to rotatably carry the



sideways adjustment assembly about said second vertical axis when the transverse extension arm means rotates about said first vertical axis.

4,787,291
GUN FIRE CONTROL SYSTEM
Millard M. Frohock, Jr., Encino, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Oct. 2, 1986, Ser. No. 914,213
Int. Cl.[4] F41G *3/06, 3/08*
U.S. Cl. 89—41.22 **9 Claims**



1. A gun fire control system for directing a launcher of a projectile at a target, comprising:
means for commanding a firing of said projectile;
means for directing said launcher towards said target, said launcher being pivotally supported about a first axis and a second axis;
gyro means locked to said launcher for providing rate signals designating rates of rotation of said launcher about said first axis and said second axis;
motor means for positioning said launcher;
optical sighting and ranging means having an orientation locked to an orientation of said launcher for outputting target coordinate signals; and wherein
said directing means includes predicting means responsive to the target coordinate signals of said sighting and ranging means for predicting a future track of said target, and offsetting means responsive to a firing command of said commanding means for offsetting said launcher relative to a sight line to said target for interception of said target by a projectile fired from said launcher;
said offsetting means develops further rate signals combined

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with said rate signals of said gyro means for driving said motor means during an offsetting of said launcher; and

said directing means includes means responsive to the firing command of said commanding means for disconnecting said sighting means and ranging means from said predicting means during an offsetting of said launcher, said offsetting being based on target track obtained prior to the firing command.

4,787,292

BRAKE BOOSTER

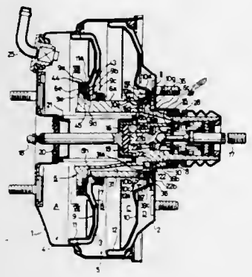
Yasuo Tsuyuki; Haruo Suzuki; Hidefumi Inoue, and Junichi Ohki, all of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

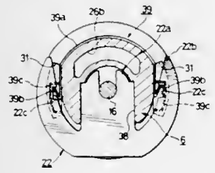
Filed Sep. 16, 1987, Ser. No. 97,803

Claims priority, application Japan, Sep. 29, 1986, 61-149113[U]; Sep. 29, 1986, 61-149114[U]; Oct. 20, 1986, 61-160231[U]

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—369.3 **7 Claims**





1. A brake booster including a valve plunger slidably fitted in a valve body and forming part of a valve mechanism, a locking portion of a key member which is inserted into a bore formed within the valve body from a radially outer location for engagement with the valve plunger to prevent the withdrawal of the valve plunger from the valve body, an arcuate portion of the key member extending integrally from the locking portion and surrounding substantially one-half the perimeter of the valve body, and a retainer surrounding substantially one-half the perimeter of the valve body at a location opposite to the arcuate portion and having opposite ends which are connected to the arcuate portion to prevent the withdrawal of the key member from the bore;

characterized in that engaging recesses are formed at the opposite ends of the arcuate portion of the key member on the inner side while engaging pawls are formed at the opposite ends of the retainer on the outer side for engaging with the engaging recesses under the resilience of the retainer to prevent the key member and the retainer from being separated from each other in the radially outward direction of the valve body, the axially opposite ends of the retainer being held between a pair of stepped end faces formed on the valve body or between a stepped end face formed on the valve body and the key member, thereby preventing the disengagement between the engaging recesses and the engaging pawls as a result of an axial displacement, the retainer having an arcuate body, the opposite ends of which arcuate body are formed with abutments axially offset from the engaging pawls and which are received in recessed formed in the valve body.

4,787,293

HYDRAULIC SYSTEM FOR WORKING VEHICLES

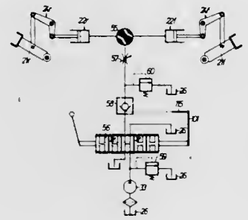
Yuji Kishizawa, and Sadanori Nishimura, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,060

Claims priority, application Japan, Jun. 17, 1986, 61-141031

Int. Cl.⁴ F15B *11/08*

U.S. Cl. 91—443 **14 Claims**



1. A hydraulic system for a working vehicle comprising:

a hydraulic cylinder on the working vehicle and operable to raise and lower a working machine;

a hydraulic pump;

an oil tank;

a manual valve constructed to be shiftable to a stationary position in which a working oil discharged from said hydraulic pump is released into said oil tank, a raised position in which the working oil is supplied into said hydraulic cylinder, and a lowered position in which the working oil supplied into the hydraulic cylinder is passed back into the oil tank; and

a check valve interposed in an oil passage between said manual valve and said hydraulic cylinder for permitting a flow of the working oil in a normal direction from said manual valve toward said hydraulic cylinder and blocking a flow of the working oil in a reverse direction, wherein said check valve comprises a main valve seat interposed within the oil passage between said manual valve and said hydraulic cylinder to permit the flowing of the working oil therethrough, a main valve cooperating with said main valve seat to permit flowing of the working oil in said normal direction and to block flowing of the working oil in said reverse direction; a sub-valve seat formed in said main valve to permit flowing of the working oil therethrough; a sub-valve having a pressure-receiving area smaller than that of said main valve seat and cooperating with said sub-valve seat to permit flowing of the working oil in said normal direction and to block flowing of the working oil in said reverse direction; and a valve-opening rod mounted in an opposed relation to said main and sub valves and operable to open said sub-valve prior to said main valve, said valve opening rod being operatively connected to said manual valve such that the rod operates in the course of shifting of said manual valve from the stationary position to the lowered position;

said manual valve including a spool slidable in a valve bore in a casing to which bore are opened a discharge port of said hydraulic pump, an exit port connected to said oil tank and a feed port connected to said hydraulic cylinder,

said manual valve being operable to permit said feed port to selectively communicate with said discharge port and said exit port; and wherein an oil passage is provided in said manual valve for interconnecting said discharge port and said oil tank and a relief valve is interposed in said oil passage in the manual valve to open when a pressure discharged from said hydraulic pump reaches not less than a specified value.

4,787,294

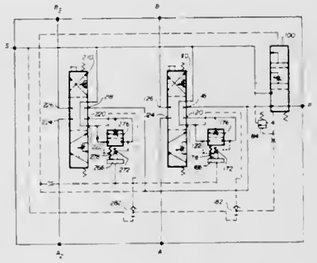
SECTIONAL FLOW CONTROL AND LOAD CHECK ASSEMBLY

Charles J. Bowden, Battle Creek, Mich., assignor to Hydreco, Incorporated, Kalamazoo, Mich.

Filed Jul. 29, 1987, Ser. No. 79,011

Int. Cl.⁴ F15B *11/08*

U.S. Cl. 91—447 **11 Claims**



1. In a control valve including a body, an inlet port, an outlet port, a first and second motor ports, an inlet core connected to said inlet port, a first and a second power core, a load check means in a bore connecting said first and second power cores, first and second motor cores connected to a respective first and second motor port, an outlet core connected to said outlet port and a spool means for determining the interconnections of said inlet core to said first power core of said second power core to said motor cores and of said motor cores, to said outlet core, the improvement comprising:

a flow control means in said bore between said first and second power cores and being connected to said inlet port for controlling the fluid flow from said first to said second power core as a function of the differential of the inlet port pressure and said first power core pressure.

4,787,295

PISTON FOR INTERNAL COMBUSTION ENGINES

Karl-Heinz Obermeier-Wagner; Edgar Martin, both of Nürnberg, and Gerhard Böhm, Rosstal, all of Fed. Rep. of Germany, assignors to Alcan Deutschland GmbH, Fed. Rep. of Germany

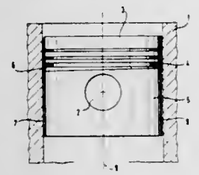
Filed Feb. 24, 1988, Ser. No. 159,660

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1987, 3706940

Int. Cl.⁴ F16J *1/00*

U.S. Cl. 92—158 **7 Claims**

1. Piston for internal combustion engines comprising an oil scraper ring disposed in an annular groove on the circumference of its head portion, the outer edge of the annular groove adjacent to the piston skirt which adjoins the head portion being bevelled to form a chamfer, wherein the width of the chamfer, which extends over the whole circumference of the



piston, is larger on the counter-thrust side of the piston than on the thrust side of the piston.

4,787,296

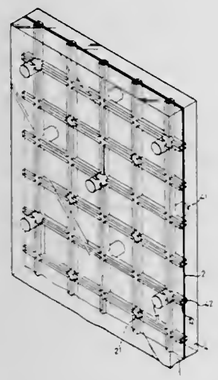
VENTILATED SOUNDPROOF GLASS

Tao Hsuan Huang, 3F., No. 10, alley 18, Lane 10, Lin Sen Rd.,Yeong Ho., Taipei Hsien, Taiwan

Filed Dec. 3, 1987, Ser. No. 128,208

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 98—96 **2 Claims**



1. Ventilated soundproof glass comprising: at least a first and a second sheet of glass with one sheet of plastic film there between, wherein said sheets of glass and said sheet of plastic film have a plurality of holes therein respectively; said holes of said first and second sheet of glass, and said sheet of plastic film being in different horizontal and vertical positions, one side of said first sheet of glass and one side of said second sheet of glass adjacent to said sheet of plastic film having a plurality of grooves arranged thereon between said holes of said first sheet of glass and said second sheet of glass respectively.

4,787,297

STACKED ROBOTIC WORK CELL PROCESS STATION

Jenny R. Johnson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 27, 1987, Ser. No. 89,896

Int. Cl.⁴ B08B *15/02*

U.S. Cl. 98—115.3 **12 Claims**

1. A stacked robotic work cell process station for processing a workpiece and being disposed in a ventilated environment with a downward directed air stream, comprising:

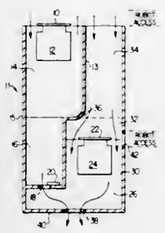
a first process module having a first planar work surface;

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a first module chamber for containing said first process module and having an upper and open surface, a lower surface, a rear side and a front side, said first module chamber for containing said first process module with said first planar work surface being parallel to the upper surface of said first module chamber and perpendicular to the air flow with said first planar work surface being accessible from the front;

a second process module having a second planar work surface;

a second module chamber for containing said second process module and having an upper and open surface, a lower surface, a rear side and a front side, the upper surface of said second module chamber being parallel to said second



work surface and disposed a predetermined distance below the upper surface of said first module chamber, the front side of said second module chamber being parallel to the front side of said first module chamber with said second planar work surface being accessible from the front;

communication means for communicating between the lower portions of said first and second module chambers and the air stream to provide an even flow through said first and second module chambers from the upper open surfaces thereof through to the lower surfaces thereof; and

the planar work surfaces of said first and second process modules accessible from the front side of said first and second module chambers, respectively, by an external robotic system.

4,787,298

METHOD AND APPARATUS TO CONSOLIDATE ROOM AND POINT EXHAUST WITH A SINGLE FAN

Clarence C. Hon, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 22, 1987, Ser. No. 99,852

Int. Cl.[4] F23J *11/00*

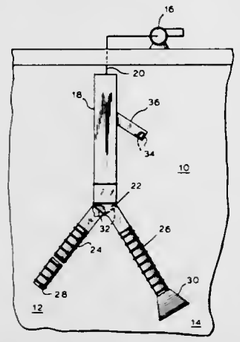
U.S. Cl. 98—115.4 **5 Claims**

4. Method for exhausting through a single multi-speed exhaust fan located outside the room space normal room space ambient air and any gases which may be liberated at localized work sites within said room space through a single multi-speed exhaust fan located outside the room space, said method comprising

disposing an exhaust main having an ambient air inlet within the room space and communicating an end of said exhaust main with the exhaust fan,

providing a pair of flexible exhaust ducts and connecting them with the other end of said exhaust main such that the suction end of each can be positioned at localized work sites in the room space, and

blocking the ambient air inlet and the communication of one of said flexible exhaust ducts with the exhaust main whenever it is desired to exhaust gases present at a work site where the suction end of the other flexible exhaust duct has been positioned so that the only exhaust flow in the



exhaust main is that drawn into the main through said other flexible exhaust duct.

4,787,299

DETECTION AND DISPLAY DEVICE FOR AUTOMATIC SERVICE EXPRESSO COFFEE MACHINE

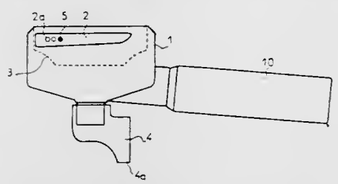
Mario Levi, "Les Lavandes" 90 AV. de la Lanterne, and Jean-Pierre Levi, Résid. Isola Celesta - Bat C - Rez de Jardin "L'Ithaque" 4 Corniche Fleurie, both of F-06200 Nice, France

Filed Feb. 9, 1988, Ser. No. 153,924

Claims priority, application France, Feb. 11, 1987, 87 01801

Int. Cl.[4] A47J *31/42, 31/00*

U.S. Cl. 99—285 **9 Claims**



1. Detection and display device for automatic service expresso coffee machine which automatically outputs and displays the number of ground coffee or water doses required for the desired infusion quantity, depending on the capacity of the filter-holder bowl engaged on the bowl-holder of the coffee grinder or coffee machine; automatic detection and display of the number of ground coffee or water doses according to the capacity of the filter-holder bowl are obtained by means of an actuator mounted on the filter-holder bowl and a detector mounted on the bowl-holder of the coffee grinder or coffee machine, characterized in that the actuator and detector form a system generating electric signals the number of which corresponds to the capacity in cups of the filter-holder bowl engaged on the bowl-holder, in that display of the number of cups corresponding to the capacity of the filter-holder bowl engaged on the bowl-holder is obtained by means of an electronic readout (**14**) and in that the number of water doses corresponding to the capacity of the filter-holder bowl engaged and the desired coffee strength is obtained by means of an electronic circuit controlled by strength selection keys (**11** and **12**) connecting the detector mounted on the bowl-holder to the water metering device (**17**).

4,787,300

APPARATUS FOR CONTINUOUSLY COOKING AND/OR DEHYDRATING FOODSTUFFS

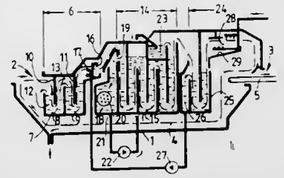
Manfred Mette, Hamburg, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH + Co KG, Lubeck, Fed. Rep. of Germany

Filed Feb. 10, 1987, Ser. No. 12,845

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604808

Int. Cl.[4] A23L *1/01, 3/02*

U.S. Cl. 99—330 **20 Claims**



1. Apparatus for continuously processing foodstuffs for the purpose of at least one of boiling and dewatering them under atmospheric pressure by contact with a heat carrier in the form of water, said apparatus comprising

an installation having a preheating zone, a boiling zone and a recooling zone, each of which zones is arranged separately and has an inlet region and an outlet region, and in which zones troughs are installed, each being provided with chambers and traversed by means for conveying said foodstuffs,

heat exchange means for transferring the thermal energy to be supplied to said heat carrier,

means for supplying and removing said heat carrier and

means for conveying said heat carrier within said installation,

wherein

said means for supplying said heat carrier are provided in said outlet region of said recooling zone and said means for removing said heat carrier are provided in said inlet region of said preheating zone,

said inlet region of said recooling zone is connected with said outlet region of said preheating zone by pipe conduct means, in which is intermediately arranged a feed pump as means for supplying said heat carrier and controlled in accordance with the supply quantity of said heat carrier into said recooling zone, and

said heat exchange means are installed in said boiling zone.

4,787,301

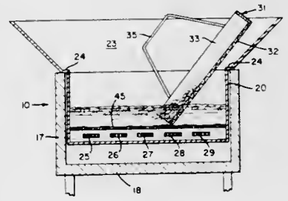
DEEP FAT COOKING APPARATUS AND METHOD

William J. Hoatson, Springfield, and John I. Decker, Jefferson City, both of Mo., assignors to Little Chipper, Inc., Jefferson City, Mo.

Filed Nov. 10, 1987, Ser. No. 119,332

Int. Cl.[4] A47J *37/12*

U.S. Cl. 99—403 **8 Claims**



1. Deep fat frying apparatus for immersion cooking of a product in pieces comprising, a kettle having walls with upper edges and a bottom, means for heating the contents of the kettle, a cradle screen having a tray portion including a screen bottom fitting proximately within the walls of said kettle and having walls extending upwardly from the screen bottom along a portion of its periphery, another portion thereof being open to permit the product to be scooped out of the kettle into the screen, and handle means extending upwardly from the tray portion, a cover screen having a screen bottom fitting proximately within the walls of said kettle, and handle means extending upwardly from said screen bottom, whereby, with a relatively high level of fat within the kettle, the cradle screen may be lower thereinto, the product introduced into the kettle above the screen bottom of the cradle screen, and the cover screen lowered into a position above the product in order to keep it submerged above the cradle screen, said cover screen being liftable by its handle means and an edge of its screen bottom being insertable at an angle into the contents of the kettle above the screen bottom of said cradle screen for stirring the product during cooking, and whereby when cooking is completed the product may be lifted out of the kettle in said cradle screen.

4,787,302

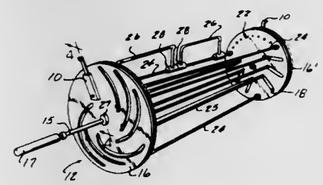
POSITIONING LEVER FOR A ROTISSERIE GRILL

John H. Waltman; Wesley J. Stewart, both of Pontiac, and Gerald E. Leroux, Clarkston, all of Mich., assignors to JWG Enterprises, Pontiac, Mich.

Filed Oct. 19, 1987, Ser. No. 109,600

Int. Cl.[4] A47J *37/04*

U.S. Cl. 99—427 **5 Claims**



1. In a rotisserie grill of the type comprising a cradle for supporting food to be cooked, said cradle having:

first and second opposite end plates connected together and shaft means mounted to said plates, with a free end extending longitudinally outwardly therefrom, said end plates each having a plurality of radially disposed slots and means forming an aperture adjacent the periphery thereof;

first and second control plates rotatably mounted on the shaft means associated with, respectively, said first and second end plates between said first and second end plates and said free ends of the shafts, said first and second control plates each having a plurality of spiral shaped slots;

a plurality of longitudinally disposed clamping rods, each rod extending through one radial slot in each plate and one spiral slot in each control plate and movable within said slots as said plates are rotated with respect to each other such that the radial and angular position of said clamping rods with respect to the axis of rotation of each of said shafts may be selectively and independently varied across the length of the cradle; and

means forming a plurality of spaced apertures adjacent the periphery of the first and second end plates and alignable with the apertures in the first and second control plates;

wherein the improvement comprises a positioning lever disposed on an outer surface of each control plate, the positioning lever including:

a housing including a top, opposed side walls, a first open end, and a second closed end to define a slot therein, the

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first end being disposed over the aperture in the control plate and the second end extending radially inwardly toward the shaft means;

a biasing means disposed in the slot having first and second ends, the first end being attached to the housing;

a pin formed on the second end of the biasing means and capable of moving from a first position, wherein it extends through the aperture in the control plate and a first one of the plurality of apertures in the end plate which has been aligned therewith, to a second position wherein the pin extends through the aperture in the control plate, said pin being biased into the first position; and

a lever having first and second ends, the first end being slidably disposed in the slot between the biasing means and the control plate, and the second end extending from the housing, said lever having an extension formed on the first end extending toward the biasing means,

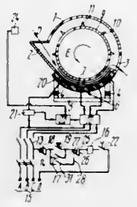
wherein the radial and angular position of the clamping rods may be adjusted by first applying radial force in an outward direction to the second end of the lever, thereby causing the lever to be slidably disposed at least part way out of the slt and to bias the biasing means so as to urge the pin to move into the second position, and then applying rotational force to the second end of the lever to rotate the control plate with respect to the end plate and align the aperture in the control plate with a second one of the apertures in the end plate, thereby causing the plurality of longitudinally disposed clamping rods to be set at a preselected position, the preselected position being fixed by slidably displacing the lever back into the housing and allowing the pin to move back into the first position, whereby it extends through the aperture in the control plate and the second one of the plurality of apertures in the end plate.

4,787,303

APPARATUS FOR PROCESSING VEGETABLE RAW MATERIAL

Andrei Y. Papchenko; Mircha K. Bologa, and Semen E. Berzoi, all of Kishinev, U.S.S.R., assignors to Institut Prikladnoi Fiziki, Kishinev, U.S.S.R.

Filed Sep. 30, 1987, Ser. No. 102,908
Int. Cl.[4] A23L 3/00
U.S. Cl. 99—451 **2 Claims**



1. An apparatus for processing vegetable raw material, comprising:

(1) shock absorbers for providing a preset density to the vegetable raw materials;

(2) a casing, mounted on the shock absorbers having a longitudinal axis and a lower part;

(3) the casing having an inlet pipe, an outlet port, and a central electrode and power electrodes disposed inside the casing and extending along the longitudinal axis of the casing in the lower part thereof, the power electrodes being in communication with a three phase power supply;

(4) a drum having pins for conveying the vegetable raw materials from the inlet pipe to the outlet port of the casing, the drum having a cylindrical shape, accommodated in the casing and mounted for rotary movement relative to the electrodes, the electrodes being arranged under the drum; the control electrode for mounting the presence of the vegetable raw material supplied to the inlet pipe of the casing, being located upstream of the power electrodes in the direction of flow of the vegetable raw materials;

(5) a relay for disconnecting a power supply when the flow of the vegetable raw material is interrupted, the relay having a first and a second input and an output, the first input to the central electrode and the second input connected to one phase of the three-phase power supply;

(6) a power regulator for regulating power in accordance with the density and flow rate of the vegetable raw material, the power regulator having an input connected to the output of the relay and to the output of a flow pickup and an output;

(7) a voltage regulator for regulating the voltage at the power electrodes, having a first, a second, a third and a fourth input and three power outputs, the first, second and third inputs being connected to the respective phases of the three-phase power supply, the fourth input being connected to the output of the power regulator, each power output being connected to a respective power electrode;

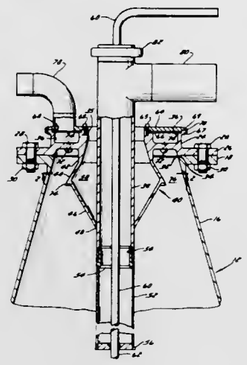
(8) a means for rotating the drum in the casing.

4,787,304

APPARATUS FOR STERILIZATION OF LIQUIDS

Hervé X. Bronnert, 21495 Partridge Ct., Brookfield, Wis. 53005

Filed Sep. 11, 1987, Ser. No. 96,358
Int. Cl.[4] A23C 3/02
U.S. Cl. 99—453 **14 Claims**



1. An infusion heating apparatus comprising a generally vertically disposed hollow pressure vessel having a top, a bottom and sides walls, said side walls being sealed to the top and bottom of said vessel and having a central axis,

spray means in said top for introducing a liquid form material into the top of said vessel in a form of a continuous shower of droplets of liquid form material onto said entire interior side wall surfaces of said vessel,

steam dispensing means for dispensing saturated steam into said vessel for heating said liquid form material,

said dispensing means being located along the central axis of said side walls and being spaced intermediate said top and bottom of said vessel in a spaced relation to said side walls and

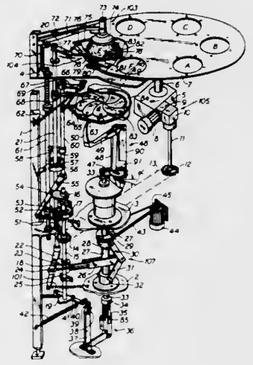
means for removing the heated liquid form material from the bottom of said vessel.

4,787,305

MACHINE FOR HOLLOWING VEGETABLES AND FRUITS

Yngve Akesson, Helsingborg, Sweden, assignor to Progressive Food Engineering AB, Helsingborg, Sweden

Filed Apr. 29, 1987, Ser. No. 44,050
Claims priority, application Sweden, Apr. 30, 1986, 8602013
Int. Cl.[4] A47J 23/00
U.S. Cl. 99—538 **10 Claims**



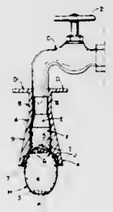
1. A machine for hollowing vegetables, fruits or parts thereof, having at their base a central portion, to be separated along a hemispherical or ogival surface from the surrounding portion, which comprises a step-by-step pivoting table; at least one recess in the table; a holding device in the table for holding the fruit or vegetable; a partition device that is controlled in such a way that it leaves an opening for the cut out part to fall away from the other part of the vegetable or fruit; a vertically moveable and rotatable knife head; a knife connected to the knife head; a first control device for controlling the movements of the knife; and a second control device for controlling the vertical position of the knife head.

4,787,306

EGG SHELLING DEVICE

Gladys E. Johnson, P.O. Box 1343, Hughson, Calif. 95326

Continuation of Ser. No. 012,435, Feb. 9, 1987, abandoned. This application Jan. 11, 1988, Ser. No. 143,291
Int. Cl.[4] A47J 43/14
U.S. Cl. 99—568 **3 Claims**



1. An egg shelling device, comprising:

(a) a tubular member having an upper end adapted to be removably attached to a water faucet and having a passage for receiving the flow of water from the faucet when the faucet valve is opened and also having a lower end of larger diameter than said upper end;

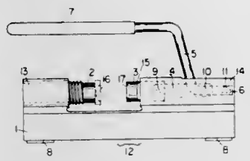
(b) said tubular member near its lower end having a first surface comprising a portion of said passage communicating with a second outwardly angling surface to define an edge seat to receive the small end of an egg to establish an annular edge line contact between said edge seat and said egg, said second outwardly angling surface extending outwardly at an angle so as to be spaced from an egg held against said edge seat and such that it joins with the inner surface of a skirt formed integrally with said tubular member and extending downwardly to define an interior third surface also spaced from an egg held against said seat edge.

4,787,307

NUTCRACKER

Ernest J. Rollband, 3415 Slaterville Rd., Brooktondale, N.Y. 14817

Filed Jan. 5, 1988, Ser. No. 141,002
Int. Cl.[4] A23N 5/00
U.S. Cl. 99—572 **6 Claims**



1. A nutcracker, comprising:

a. base means for holding the moving parts of said nutcracker;

b. anvil cover means, located at one end of said base means, and having internal threads;

c. anvil screw means having a face at one extremity and screw threads at the other extremity for rotatable adjustment within said anvil cover means, said screw threads move said anvil screw means in the direction of one dimension of said base means;

d. piston cover means, located at the opposite end of said base means from said anvil cover means, and aligned with said anvil cover means and said anvil means;

e. movable piston means having a face at one extremity opposing said anvil face, slidably inserted into said piston cover means for moving toward and away from said opposing anvil means;

f. handle force amplifying means for translating the pivotal motion of a handle into the slidable motion of the piston, located at the opposite end of said piston means from said piston face, for moving said piston toward and away from said anvil means;

g. said force amplifying means translates the pivotal motion of said handle into the slidable motion of said piston and maximum cracking force is delivered via said piston as said piston reaches the end of its travel toward said opposing anvil;

h. measuring means cooperating with said piston means for determining an optimum cracking distance for said piston to move away from and toward said rotatable anvil overcracking of the nut to be cracked;

i. said nutcracker functioning by having the user set the optimum cracking distance with the measuring means and adjusting said rotatable anvil toward said piston to firmly hold a nut to be cracked therebetween, then moving said piston the optimum cracking distance by activating said force amplifying means.

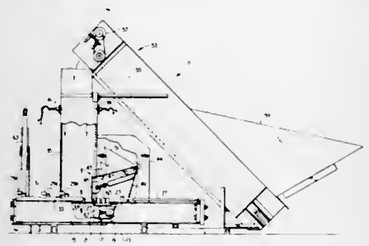
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,308

COMPACTING APPARATUS WITH PRECOMPACTION TAMPER

Horace R. Newsom, Midland; Michael W. Lockman, Lorena, and Kenneth B. Boren, Dallas, all of Tex., assignors to Mosley Machinery Company, Inc., Waco, Tex.

Filed Nov. 9, 1987, Ser. No. 118,723
Int. Cl.[4] B30B *15/18, 7/04*
U.S. Cl. 100—50 26 Claims



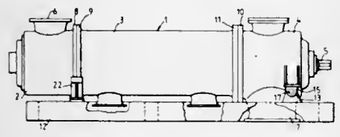
1. Apparatus for compacting articles, which comprises:
a compaction chamber adapted to receive articles to be compacted;
an article chute positioned to feed articles into said compaction chamber;
a tamper positioned in said article chute, said tamper being movable between an open position and a closed position to precompact articles in said compaction chamber;
a compacting platen movably mounted in said compaction chamber to compact articles precompacted by said tamper;
means for determining if said tamper has moved to said closed position;
and means for moving said compacting platen to compact said precompacted articles when said tamper is unable to move fully to said closed position.

4,787,309

MOVABLY SUPPORTED SCREW PRESS

Oscar Brovoll, Oslo, Norway, assignor to Kvaerner-Eureka A/S, Tranby, Norway

Filed Sep. 3, 1987, Ser. No. 92,580
Claims priority, application Norway, Sep. 26, 1986, 863846
Int. Cl.[4] B30B *9/02*
U.S. Cl. 100—145 6 Claims



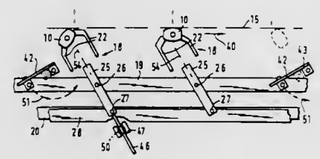
1. A screw press comprising an elongated casing having a press screw therein, means at one end of the casing for rotating said press screw, a stationary base, means fixedly secured to said stationary base and interconnected with said casing adjacent said one end of the casing for pivotally interconnecting said casing and said fixed base for vertical swinging movement of said casing about a fixed horizontal axis extending perpendicular to the length of said casing, and a cradle on said base a substantial distance from said axis and supporting the other end of said casing for horizontal sliding movement of said casing relative to said cradle.

4,787,310

APPARATUS FOR DECORATING ARTICLES

Gerhard Tiemann, Löhne, Fed. Rep. of Germany, assignor to Werner Kammann Maschinenfabrik GmbH, Bunde, Fed. Rep. of Germany

Filed Oct. 29, 1987, Ser. No. 115,121
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637638
Int. Cl.[4] B41F *17/22;* B65G *25/00*
U.S. Cl. 101—40 20 Claims



1. Apparatus for decorating articles comprising at least one first station for an operation to be performed on respective articles passing through the apparatus, at least one second station disposed at a spacing from the first station in the direction of transportation of the articles through the apparatus, for carrying out a further operation on the articles, at least one said station being provided with at least one means for applying decoration to the articles, a holding arrangement for carrying the articles in the stations and comprising holding members co-operable in pairs to form at least two holding devices for holding the articles in the respective stations, the holding members being reciprocable parallel to the longitudinal axis of the articles for selectively engaging and releasing same, and a transportation means for transporting the articles stepwise from one said station to another and comprising: at least one main support member, means mounting said main support member pivotably in a plane substantially perpendicular to the longitudinal axis of the articles carried by said holding members, at least one carrier means pivotably mounted on said main support member and projecting therefrom towards said holding arrangement and pivotable with the pivotal movement of the main support member and means for producing pivotal movement of said carrier means, whereby the stroke movement of the main support member in the said direction of transportation and the stroke movement of the carrier means in said direction of transportation supplement each other to make up a distance by which a said article is advanced from the first station in which it is carried by said holding members thereof to the second station in which it is carried by the further said holding members thereof.

4,787,311

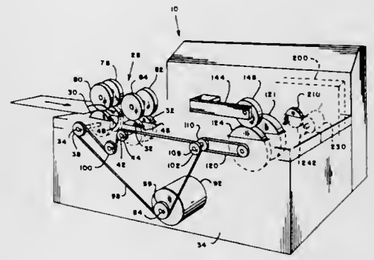
MAILING MACHINE ENVELOPE TRANSPORT SYSTEM

Hans C. Mol, Wilton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 19, 1987, Ser. No. 87,268
Int. Cl.[4] B41F *5/04*
U.S. Cl. 101—232 13 Claims

1. In a mailing machine having a feed deck and a postage meter mounted to said mailing machine at a location along said feed deck such that a portion of said postage meter is in spaced relation to said feed deck to define a printing station, feed means for delivering a plurality of mailpieces to said feed deck in a seriatim manner and within a given linear velocity range said postage meter having a print means for the printing of an indicia on each of said mailpieces as it traverses said print station, said mailing machine including a transport system comprising:
a. first means for capturing each of said mailpieces as it is received from said feed means and controllably transporting said mailpiece along said feed deck and maintaining

control during indicia printing by said postage meter and thereafter ejecting said mailpiece from said mailing machine, said first means to including,
movable means for receiving said mailpiece and establishing positive position control of said mailpiece substantially throughout the traversal path of said mailpiece along said mailing machine feed deck,
drive means for driving said movable means,



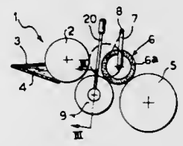
control means for controlling said drive means such that said drive means drives said movable means at an initial velocity generally equal to or greater than said velocity of said fed mailpiece, and subsequent to said movable means establishing control of said mailpiece and prior to indicia printing causing said drive means to adjust said velocity of said movable means to a predetermined velocity if said initial first velocity is greater than said predetermined velocity.

4,787,312

VARIABLE UNIT FOR SUPPLYING INK IN AN OFFSET PRINTING MACHINE

Enzo Bosetto, Turin, Italy, assignor to Nebiolo Macchine S.p.A., Turin, Italy

Filed Jul. 3, 1986, Ser. No. 881,861
Claims priority, application Italy, Jul. 4, 1985, 67617 A/85
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—350 2 Claims



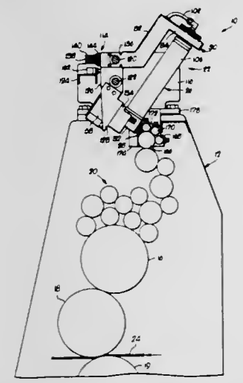
1. Unit for supplying ink in an offset printing machine, comprising
an ink fountain roller (2) which draws a film of ink from a reservoir (3),
a distributing roller (5) located at a distance from the ink fountain roller (2) and rotating at a higher speed than the speed of rotation of the ink fountain roller (2),
a transfer roller (6) freely rotatably supported by a support structure (7) which can oscillate reciprocatingly between a first position in which the transfer roller (6) is in contact with the ink fountain roller (2) so as to take the film of ink therefrom, and a second position in which the transfer roller (6) is in contact with the distributing roller (5) so as to transfer the film of ink of the latter,
characterized in that the unit further includes a freely rotatable auxiliary roller (9) which is moveable between a first working position spaced from the ink fountain roller (2) and the distributing roller (5) and corresponding to a first operating mode of the unit, and a second working position in operative ink transfer relation with the ink fountain roller (2) and corresponding to a second operating mode of the unit, so that, when the auxiliary roller (9) is in its first working position, it interferes with the movement of the transfer roller towards the ink fountain roller (2) so as to slow its rotation before its contact with the ink fountain roller (2), while, when the auxiliary roller (9) is in its second working position, the transfer roller (6) is maintained in a fixed position in contact with both the auxiliary roller (9) and the distributing roller (5) to transfer the film of ink from the auxiliary roller to the distributing roller.

4,787,313

PRINTING PRESS USING SHIFTABLE INKING MEANS

Wayne L. Osborn, and Paul D. Naab, both of Emporia, Kans., assignors to Didde Graphic Systems Corporation, Emporia, Kans.

Continuation of Ser. No. 857,150, Apr. 29, 1986, abandoned.
This application Jun. 19, 1987, Ser. No. 61,645
Int. Cl.[4] B41F *31/08*
U.S. Cl. 101—366 8 Claims



1. A lithographic printing press comprising:
an imprinting cylinder train having a plurality of elongated, axially rotatable cylinders including a pair of adjacent nip-defining cylinders for receiving therebetween a material to be imprinted;
an inking roller train having a plurality of elongated, axially rotatable inking rollers including an ink-receiving roller and at least one ink-transfer roller in operative contact with a cylinder of said imprinting train, for conveying ink from the ink-receiving roller to said imprinting train;
means for operatively supporting said imprinting and inking trains;
an inking assembly adapted for connection to a supply of viscous lithographic ink, said assembly including
an inking element including an ink outlet for depositing ink onto said ink-receiving roller;
means for operatively coupling said element and said supply of ink for passage of ink from the supply to the element, including structure defining an ink-flow path leading from the supply to the element;
selectively actuatable ink-flow control means operatively interposed in said ink-flow path, said ink-flow control means including means for pressurizing ink received from said supply and supplying pressurized ink to said inking element, and for permitting selective, alternate delivery of ink from said outlet and termination of said ink delivery therefrom;

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means for mounting said element adjacent said ink-receiving roller with the element outlet in an ink-depositing orientation, and for translatory movement of the element axially along the length of the ink-receiving roller; and

operational means operatively connected with said ink flow control means for operation of the latter during said translatory movement of said element in order to deposit preselected variable quantities of ink onto said ink-receiving roller at different positions, said operational means comprising

means for determining the position of said element along the length of said ink-receiving roller during said translatory movement of said element, and for producing a position signal indicative of a position of the element at at least certain locations along the path of travel of the element;

memory means for electronically storing data representative of said preselected variable quantities of ink to be deposited onto said ink-receiving roller at said different positions along the length thereof; and

control means operatively coupled with said position-determining means, said memory means and said ink flow control means for receiving said position signals from said determining means, for selecting certain of said stored data in response to respective position signals, and for selectively actuating said ink flow control means in accordance with said selected data to deposit variable quantities of ink onto said ink-receiving roller at said different positions along the length thereof.

4,787,314

DEVICE FOR REMOVING WATER FROM MESHED ROLL

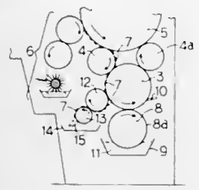
Noritake Harada, Yokohama; Yukitoshi Takahashi, and Masayoshi Sato, both of Kawasaki,, Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Oct. 28, 1986, Ser. No. 924,048

Claims priority, application Japan, Jun. 9, 1986, 61-132958

Int. Cl.⁴ B41F *35/00, 31/00*

U.S. Cl. 101—425 **1 Claim**



1. A device for removing water from a meshed roll, comprising:

a smoothed roll, being made of rubber or soft resin, for pressing against the returning portion of the meshed roll from which ink has been transferred;

a second smoothed metal roll being in contact with said smoothed roll;

a water removing blade pressed against the periphery of the second smoothed roll; and

a container disposed below the blade to recover water.

4,787,315

APPARATUS FOR SEVERING TUBULAR MEMBERS

John J. Kenny, 500 Wall Blvd., Apt. 239, Gretna, La. 70056

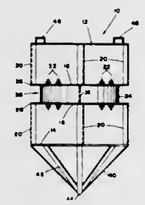
Filed Aug. 31, 1987, Ser. No. 91,102

Int. Cl.⁴ F42B *3/00*

U.S. Cl. 102—313 **19 Claims**

1. An apparatus for severing tubular members, comprising:

a frame adapted for positioning inside the tubular member, said frame carrying a circular-shaped explosive charge means with a plurality of circumferentially spaced detonation signal receiving locations, so as to facilitate explosion of the explosive charge means substantially simultaneously about circumference of the explosive charge



means, said frame comprising a pair of parallel spaced-apart deflection plate means for creating a focused charge of the explosive charge means

positioned between the deflection plate means.

4,787,316

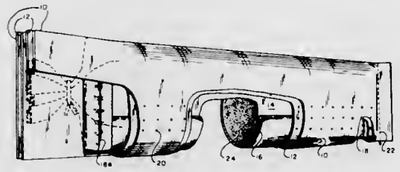
EXPANDABLE, SELF-TAMPING EXPLOSIVE BAG

Fred C. Drury; Donald J. Westmaas, both of Wheaton, and Philip H. Porter, Pittsfield, all of Ill., assignors to Econex, Inc., Wheaton, Ill.

Filed Sep. 10, 1984, Ser. No. 649,115

Int. Cl.⁴ F42B *3/00*

U.S. Cl. 102—323 **2 Claims**



1. An expandable self-tamping bag for blasting agents containing ANFO comprising

an outer bag of a first diameter formed of a plurality of layers of a rupturable paper material and provided with a plurality of longitudinal perforation lines;

an inner waterproof bag of a second diameter larger than the diameter of said outer bag, formed of a heat-sealable material having a longitudinal fold therein, disposed within said outer bag with said longitudinal fold in substantial alignment with said perforation lines in said outer bag, adapted to receive a quantity of blasting agent and when filled with blasting agent, is heat sealed at each end thereof;

whereby when said filled bag is dropped into a blast hole, upon impact said outer bag ruptures longitudinally along said perforation lines and said inner bag expands outwardly at said longitudinal fold to substantially fill the cross-section of said blast hole.

4,787,317

RAIL VEHICLE HAVING MAGNETIC MEANS FOR COMPENSATING FOR LOAD WEIGHT

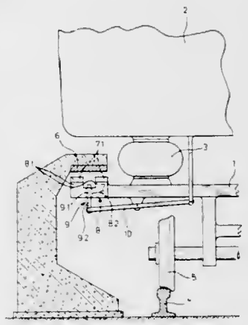
Gerhard Bohn, Munich, and Christian Gunther, Haar, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 8, 1987, Ser. No. 106,157

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637844

Int. Cl.⁴ B60L *13/04;* **B61B** *13/08*

U.S. Cl. 104—281 **2 Claims**



1. A rail vehicle having a car body, an underframe, suspension means for the car body mounted on the underframe and flanged wheels for guiding and supporting the vehicle on a track, further comprising permanent magnet means attached to the underframe for exerting an attractive force, counter to the wheel load, on armature bar means extending along the track, the magnetic force exerted by the magnetic means being controllable as a function of the load of the car body by increase or reduction of the magnetic resistance of a ferromagnetic magnet core by mechanical means as the load decreases or increases, each permanent magnet means further comprising a U-shaped ferromagnetic magnet core with two core legs provided with pole faces, permanent-magnetic pole plates being attached at the ends thereof, the magnet core having a core hole traversed by an armature movable lengthwise in the direction of action of the spring support means, said armature comprising a non-magnetic length section and a ferromagnetic length section, each at least having a length corresponding to the length of the associated core hole.

4,787,318

TRACTION BOGIE FOR A RAIL VEHICLE

Hans H. Vogel, Tuttwil, Switzerland, assignor to Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland

Filed Feb. 13, 1987, Ser. No. 14,795

Claims priority, application Switzerland, Feb. 27, 1986, 803/86

Int. Cl.⁴ B61B *3/06*

U.S. Cl. 105—136 **17 Claims**

1. A traction bogie for a rail vehicle comprising

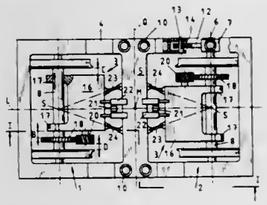
at least two wheel sets, each wheel set having an axle connecting at least two wheels;

a plurality of axle boxes, each box being disposed on a respective end of a respective axle;

a bogie frame resiliently mounted on said axle boxes for movement at least lengthwise of the bogie;

a pair of casings, each casing being mounted on said axle of a respective wheel set and having means therein for transmitting a driving force to said axle; and

a pair of articulated linkages connecting said casings to said bogie frame to transmit a driving force from said wheel sets to said bogie frame; each linkage including at least a pair of links disposed on opposite sides of a longitudinal axis of said bogie frame and in converging relation to each other towards a respective wheel set, each said pair of links having the imaginary extensions of the longitudinal axis of each link thereof intersecting each other at a point



of intersection disposed in the vicinity of said respective wheel set and said casing thereon, each said link being articulated at one end to said bogie frame and at an opposite end to a respective casing for pivoting about a vertical axis.

4,787,319

MODULAR FURNITURE FRAMEWORK

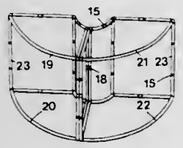
André Dupraz, 14, quai des Forces-Motrices, 1204 Geneva, Switzerland

Filed Jul. 8, 1986, Ser. No. 905,293

Claims priority, application Switzerland, Sep. 9, 1985, 03775/85

Int. Cl.⁴ A47B *57/00*

U.S. Cl. 108—64 **8 Claims**



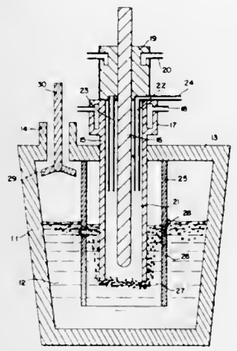
1. A framework for furniture adapted to be combined with at least one element for supporting at least an article or a person, said framework being made of at least two basic modular units, each of said basic modular units comprising at least a pair of arcuate elongate members each shaped as an arc of a circle, said members being disposed parallel and concentric to each other in a single plane and interconnected by first straight elongate members extending radially in said plane, second elongate members extending perpendicular to said plane on a single side of said plane and solid with the ends of said first straight elongate members, so as to form a rigid modular unit, and said second elongate members extending perpendicular to said plane having both ends open so as to removably receive connectors for other elongate members from other modular units to form a rigid framework.

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4,787,320
METHOD AND APPARATUS FOR THERMAL TREATMENT

Ola S. Raaness, Sandsvei 13; Steinar Prytz, Overlege Kindtsgt. 27, both of 7000 Trondheim, and Aud N. Waernes, Rostengrenda 35, 7075 Tiller, all of Norway

PCT No. PVT/NO86/00066, § 371 Date May 26, 1987, § 102(e) Date May 26, 1987, PCT Pub. No. WO87/01792, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 19, 1986, Ser. No. 53,851
Claims priority, application Norway, Sep. 23, 1985, 853714
Int. Cl.[4] F23G *5/00, 5/10, 5/12*
U.S. Cl. 110—250 9 Claims

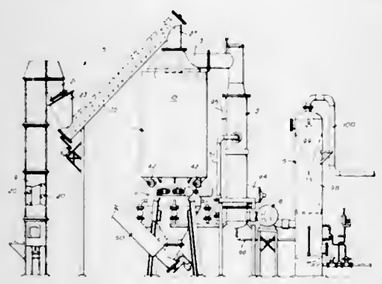


1. A method for thermal treatment of pumpable or blowable materials comprising establishing an electric arc in a gap between a pair of concentric electrodes, pumping or blowing said materials into said gap and through said electric arc to effect said thermal treatment, and passing the product of said thermal treatment through a high temperature smelt.

4,787,321
SOLID WASTE CONVERSION PLANT

John J. Schnellbacher, and Ray M. Mason, both of Houston, Tex., assignors to Howbeit, Inc., Houston, Tex.

Filed Mar. 26, 1987, Ser. No. 31,082
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—258 15 Claims

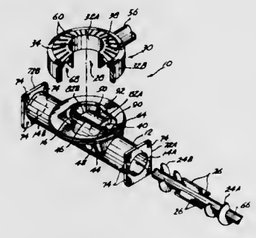


1. A conversion plant for solid waste comprising:
a reactor having an upper section and a lower section, a heat exchange means and a stripper connected in series,
means for introducing said solid waste to said reactor,
grate structure means in said lower section of said reactor, said grate structure means includes a fixed grate and a plurality of rotating fingers extending through said grate for preventing compaction of the solid waste in said reactor,
pyrolysis heating gas distributor means below said grate means; and
blower means positioned between said heat exchange means and said stripper for drawing said heating gas into said reactor and removing the gases formed and passing the gases through said heat exchange means and into said stripper.

4,787,322
PELLET FEED SYSTEM

Oliver J. Whitfield, 4206 242nd St., S.W., Mountlake Terrace, Wash. 98043

Filed Feb. 26, 1988, Ser. No. 161,003
Int. Cl.[4] F23K *3/10*
U.S. Cl. 110—266 10 Claims



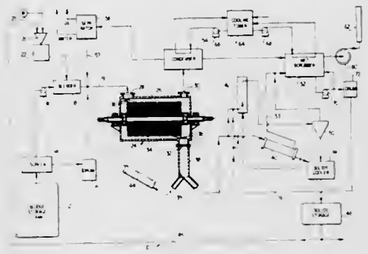
1. A stoker assembly for a soild particulate fuel burning stove comprising:
(a) a fuel conveyor means having a casing; first and second fuel inlets adjacent each end of the casing; a fuel outlet zone intermediate the inlets, a rotatably driven auger means disposed within the casing to move fuel from the first and second fuel inlets to the fuel outlet zone, the auger means including a first helical flight and a second helical flight of opposite hand, the first helical flight intermediate the first fuel inlet and the fuel outlet zone and the second helical flight intermediate the second fuel inlet and the fuel outlet zone;
(b) fuel directing means proximate the ends of the first helical flight and the second helcial flight opposite the first and second fuel inlets;
(c) an air housing having an inner wall defining a vertical fuel channel for passage of fuel from a lower fuel channel inlet zone through the fuel channel to a combustion plate at the top of the air housing, the fuel channel inlet zone communicates between the fuel outlet zone of the casing and the fuel channel; and
(d) fuel guiding means including a member for directing a portion of the fuel in the fuel outlet zone of the casing into the fuel channel inlet zone, the fuel guiding means includes a flange disposed on the interior surface of the casing at the interface between the fuel outlet zone of the casing and the fuel channel inlet zone, the fuel guiding means extends from the casing in a direction opposite the fuel flow created by the fuel directing means.

4,787,323
TREATING SLUDGES AND SOIL MATERIALS CONTAMINATED WITH HYDROCARBONS

Gary L. Beer, and Ying H. Li, both of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 12, 1987, Ser. No. 84,641
Int. Cl.[4] F23G *7/04*
U.S. Cl. 110—346 21 Claims

1. A system for treating oily sludges containing small amounts of solids, wherein said oily sludges are primarily a flowable liquid mixture, said system comprising:
dryer means including an inlet, a vapor outlet and a solids discharge outlet;
oxidation means in communication with said solids discharge outlet for receiving dried solids and for combusting hydrocarbons remaining on said dried solids to provide substantially hydrocarbon free solids;
a source of solids material having a particle size which averages about one inch or less and having a relatively high liquid absorptive capacity;
means for mixing said oily sludge with said solids and for conveying a mixture of said oily sludge and said solids in

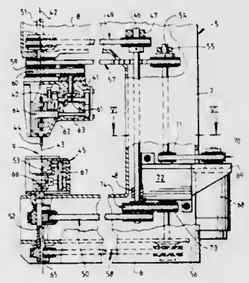


the form of a substantially thickened sludge to said inlet of said dryer means;
and condenser means connected to said vapor outlet of said dryer means for receiving vapors of said oily sludge from said dryer means;
said system being operable to convey a thickened sludge comprising said oily sludge and a quantity of said solids to said dryer means for evaporation of liquid hydrocarbons and other liquids in said dryer means at a temperature of less than about 700° F., to convey vapors generated in said dryer means to said condenser means, to discharge substantially dried solids to said oxidation means and to discharge substantially hydrocarbon free solids from said oxidation means to means for receiving said solids.

4,787,324
AUTOMATIC SEWING DEVICE WITH A SEWING HEAD INCLUDING A ROTARY HOUSING

Jochen Fischer, Detmold, and Hans Scholl, Oerlinghausen-Lipperreihe, both of Fed. Rep. of Germany, assignors to Kochs Adler Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 70,916
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625881
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 5 Claims

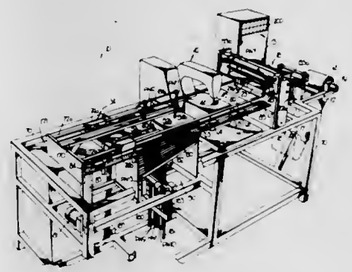


1. An automatic sewing device with a sewing head (5) and a device for generating a two-axis-relative movement between the sewing head (5) and a workpiece (36) to be sewn, said sewing head (5) including:
a rotary housing (41) supported at said sewing head (5) and drivable in a swivelling manner about an axis of rotation by an adjusting shaft (46), said rotary housing (41) having:
a needle bar (44) with a needle (43) supported in said rotary housing (41) and reciprocatingly drivable via a crank drive (62) driven by a common drive, which common drive is drivable by a main drive shaft (54) of said sewing head (5), the needle having a needle axis (42) being identical with said axis of rotation,
a needle jogging gear (63, 64) connected to said crank drive (62) for generating a needle feed movement, and
a thread take-up level drive (40) coupled to said crank drive (62),
a hook bearing (45) drivable in a swivelling manner by said adjusting shaft (46) about said needle axis (42) equiangularly to said rotary housing (41),
a hook (53) arranged in said hook bearing (45) and drivable by said main drive shaft (54),
a drive motor (68) for driving said main drive shaft (54),
an adjusting drive (84) for driving said adjusting shaft (46), and said main drive shaft (54) and said adjusting shaft (46) being coupled via a differential gear (72) in such a manner that at rotations of said adjusting shaft (46) a swivelling movement is imparted to the main drive shaft (54) which compensates changes of position of said needle bar (44), said needle jogging gear (63, 64), said thread take-up lever drive (40) and said hook (53).

4,787,325
CLOTH PLY FOLDING AND SEWING APPARATUS AND METHOD

Marshall Black, Vidalia, Ga.; E. V. Humphreys, Jr., Blue Springs, Miss., and William O. Mitchell, Vidalia, Ga., assignors to Oxford Industries, Inc., Vidalia, Ga.

Filed Sep. 9, 1985, Ser. No. 773,820
Int. Cl.[4] D05B *33/00*
U.S. Cl. 112—121.29 21 Claims



9. An apparatus for forming a coin pocket in a ply of material, comprising:
(a) a folding station for forming a generally Z-shaped ply of material, comprising:
means for holding one end of a length of material provided from a supply roll,
a substantially flat first folding plate movable between a flat position and a second position adjacent the top surface of the material,
a substantially flat second folding plate adjacent the bottom surface of the material movable between a first position and a second position along a path substantially parallel to but spaced apart from said first folding plate,

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means for moving said first folding plate between said first and said second positions,

means for moving said second folding plate between said first and said second positions to force the material of the ply to be displaced, thereby forming a folded region in the material, and

means for cutting the folded material to form a separate folded ply;

(b) a gripping and transfer means, comprising:

gripping means for grasping a folded ply at said folding station and movable from a first position operatively associated with said folding station to a second position operatively associated with a sewing station and to a third position operatively associated with a stacking station,

means for sensing a folded ply when said gripping means are positioned at said folding station, and

means responsive to said folded ply sensing means for moving said gripping means from said folding station to said sewing station at a first rate, for moving a folded ply through said sewing station at a sewing rate, and for moving a sewn folded ply from said sewing station to said stacking means at a third rate;

(c) a sewing station for sewing a folded ply moved therethrough by said gripping means at said sewing rate to form a sewn pocket; and

(d) a stacking station, comprising:

a stacking surface for holding a stack of folded plies,

stack height sensing means for sensing the relative heights of the ends of the stack of folded plies on said stacking surface, and

tilting means responsive to said stack height sensing means for tilting said stacking surface so that the top of the stack of folded plies presents a relatively flat stacking surface for a folded ply presented for stacking by said gripping means.

4,787,326

METHOD FOR OPERATING AN AUTOMATIC SEWING DEVICE WITH A SEWING HEAD INCLUDING A ROTARY HOUSING

Hans Scholl, Wellbachstrasse 13, D-4811 Oerlinghausen-Lipperreihe, and Hans-Jürgen Wessel-Schlickmann, Preussweg 3, D-5100 Aachen, both of Fed. Rep. of Germany

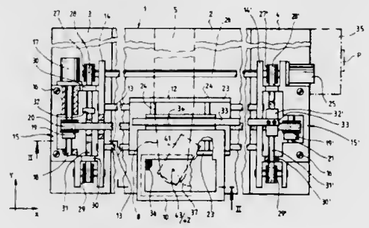
Filed Sep. 3, 1987, Ser. No. 92,685

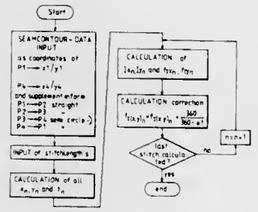
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1986, 3632046

Int. Cl.⁴ D05B *21/00*

U.S. Cl. 112—262.3 **3 Claims**

1. Method for operating an automatic sewing device with a sewing head and a device for generating a two-axis-relative movement between the sewing head and the workpiece to be sewn wherein the sewing head is provided with a rotary housing supported at the sewing head and swivelling drivable by an adjusting shaft, said rotary housing having a needle bar with a needle supported in the rotary housing and reciprocatingly drivable via a crank drive driven by a common drive, which in turn is driven by a main drive shaft of the sewing head, a workpiece holder that retains the workpiece, whereby said workpiece holder and said sewing head are driven in two directions relative to each other by an x-drive motor and a y-drive motor a needle jogging gear connected to the crank drive for generating a needle feed movement, and a thread take-up lever drive coupled to the crank drive for the needle bar, wherein a hook bearing is provided, which is swivelling drivable by the adjusting shaft about a common axis of the needle and the hook bearing respectively equiangularly to the rotary housing, wherein a hook is arranged in the hook bearing and drivable by the main drive shaft, wherein a drive motor is provided for driving the main drive shaft and an adjustable drive is provided for driving the adjusting shaft, and wherein a control unit is provided for the programmable control of the drive motor and the adjusting motor, respectively, which control unit comprises a computer and a receptacle for a program storing the coordinates of contour points for the computation of the x- and y-coordinates of the stitch points of a seam to be sewn depending on the stitch length chosen, comprising detecting for each stitch point in addition to the x-y-coordinates also the direction of the seam referred to a defined reference line and thus the angle of rotation (t) of the rotary housing, computing the resulting change of the angle of rotation (t) from one stitch point to the next, generating a stitch length correction signal from said computed angle of rotation relative to the rotary movement of the main drive shaft of the sewing head, and feeding said correction signal to the control unit to influence the drive movement of at least one of the x and y drive motors.





4,787,327

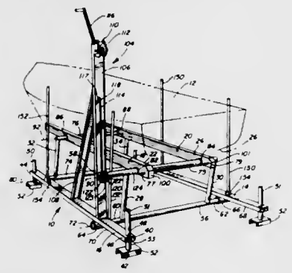
LIFT FOR MARINE CRAFT

Glenn A. Porter, c/o BTM Industries, Inc., 604 Washington, Woodstock, Ill. 60098

Filed Feb. 26, 1987, Ser. No. 19,437

Int. Cl.⁴ B63C *7/16*

U.S. Cl. 114—44 **22 Claims**



1. A lift for elevating a boat relative to a support surface, said lift comprising:

an elongate base beam;

means for supporting the base beam on the support surface;

a first lifting arm;

means mounting one portion of the first lifting arm for pivoting movement relative to the base beam about a first axis that is transverse to the length of the base beam;

a second lifting arm;

means mounting one portion of the second lifting arm for pivoting movement relative to the base beam about a second axis that is parallel to said first axis and spaced lengthwise of the base beam from the first axis;

a lifting rail having a boat engaging surface;

means mounting a second portion of the first lifting arm to the lifting rail for pivoting movement relative to the lifting rail about a third axis that is parallel to and spaced from said first axis; and

means mounting a second portion of the second lifting arm to the lifting rail for pivoting movement relative to the lifting rail about a fourth axis that is parallel to and spaced from said second axis,

said first and third axes residing in a first plane, said third and fourth axes residing in a second plane, said second and fourth axes residing in a third plane and the first and second axes reside in a fourth plane,

said first, second, third and fourth planes cooperatively enclosing a trapezium,

whereby with the fourth plane within which the first and second axes reside horizontally oriented, the second plane within which the third and fourth axes reside is non-horizontal and tilts downwardly from the third axis toward the fourth axis.

4,787,328

DRAWING AWAY DEVICE OF BILGE WATER FOR WATER JET PROPULSION

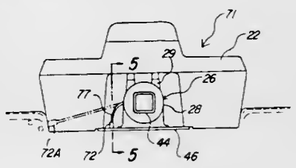
Seiji Inoue, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 1, 1987, Ser. No. 33,402

Claims priority, application Japan, Apr. 1, 1986, 61-72472

Int. Cl.⁴ B63B *13/00*

U.S. Cl. 114—183 R **11 Claims**



1. An arrangment for removing bilge water from a watercraft having a hull, an engine carried by said hull, a water jet propulsion unit driven by said engine for driving said watercraft, said water jet propulsion unit being operable through a speed range wherein water is moved through said propulsion unit at a slow speed for idling of said watercraft and a high speed for moving said watercraft in the water, means for diverting a portion of the water pressurized by said jet propulsion unit back to the body of water in which said watercraft is operating through a conduit having a venturi section for creating an area of reduced static pressure, and means for conveying bilge water to said venturi section for draining bilge water from within said hull and for discharging it into the body of water in which said watercraft is operating the opening of said conduit communicating with the water being positioned below the water line at least when said watercraft is idling so that an operator will see bubbles emanating from said opening during idle operation and when said bilge has been cleared of water.

4,787,329

DEVICE FOR DETECTION OF IMMINENT GAS DEPLETION OF A LIQUIFIED GAS TANK AND GAS LIGHTER EQUIPPED WITH THIS DEVICE

Claude R. Grossiord, Annecy, France, assignor to S. T. Dupont Company, Paris, France

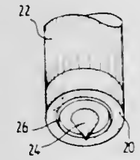
PCT No. PCT/FR86/00300, § 371 Date May 6, 1987, § 102(e) Date May 6, 1987, PCT Pub. No. WO87/01801, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 10, 1986, Ser. No. 57,054

Claims priority, application France, Sep. 11, 1985, 85 13496

Int. Cl.⁴ G01F *23/02*

U.S. Cl. 116—227 **8 Claims**



1. A device for detecting the imminent depletion of gas in a gas tank for liquified gas, said device comprising:

a tank adapted to hold liquified gas;

a fiber optic bundle, said bundle having two ends, one end of which forms an observation surface and is viewable from the exterior of said tank and the other end of which has a flat surface and is disposed inside of said tank;

a transparent element having at least two surfaces, one of which is flat, the flat end of said transparent element being disposed against the flat end of said fiber optic bundle and in optical contact therewith; and

at least one dioptric element disposed on the other surface of said transparent element, said dioptric element having lateral walls which form an angle, preferable obtuse, with said other surface of said transparent element, the dimensions of said dioptric element being such that it is capable of being covered nearly completely by a meniscus formed of a liquid gas condensate, so long as there is gas remaining in said tank, said meniscus thus preventing any total reflection of the rays directed thereto by the fiber optic bundle.

4,787,330

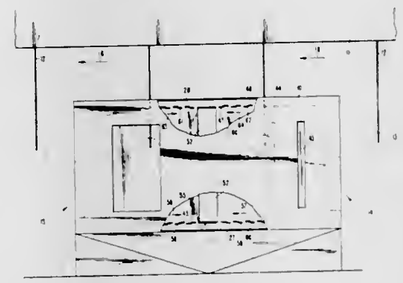
SELF-CLEANING POWDER COATING BOOTH

Carl R. Bolf, 1707 Mulberry Cir., Noblesville, Ind. 46060

Filed Dec. 22, 1987, Ser. No. 136,355

Int. Cl.⁴ B05B *15/12*

U.S. Cl. 118—308 **17 Claims**



1. A self-cleaning powder coating booth comprising:

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a plurality of interconnected outer walls forming a powder coating booth and including a top outer longitudinally slotted wall extending the length of said booth;

a plurality of interconnected side inner walls, a top inner wall and bottom inner wall forming a powder coating chamber within said booth and being mounted interiorly to said outer walls but being spaced therefrom forming an gas chamber therebetween. said top inner wall being longitudinally slotted and aligned with said top outer longitudinally slotted wall extending the length of said booth;

an exit conduit in communication with said powder coating chamber;

conveying means with a plurality of depending holders extendable through said top outer slotted wall and said top inner wall and being movable through said powder coating chamber along a center path of travel to hold items to be coated;

powder dispensing means extendable into said powder coating chamber and operable to direct coating powder against said items to be coated; and,

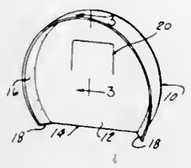
gas pressurized means connected to said gas chamber and operable to direct pressurized gas into said powder coating chamber. said side inner walls having a plurality of first louvers formed thereon oriented to direct pressurized gas from said gas chamber parallel to said side inner walls and downwardly to said bottom inner wall, said top inner wall and said bottom inner wall also including a plurality of additional louvers formed thereon oriented to direct pressurized gas flowing through said additional louvers from said gas chamber parallel to said top inner wall and said bottom inner wall and to said exit conduit.

4,787,331

SHIELD FOR PROTECTING AUTOMOBILE WHEELS

Randall R. Jarvis, Madison Heights, Mich., assignor to William Ellis, Warren, Mich., a part interest

Filed Feb. 8, 1988, Ser. No. 153,191
Int. Cl.[4] B05C *21/00*
U.S. Cl. 118—504 **5 Claims**



1. A protective shield to cover an automobile wheel and tire for use during spray painting of automobile panels, the improvement comprising:

a circular disk larger than said tire;

a segment removed from said disk along the bottom thereof;

a flange extending axially inward along the perimeter of said disk ending at said segment; and whereby said shield is free standing when resting on the ends of said flange.

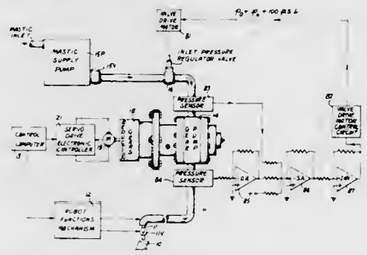
4,787,332

ADHESIVE DISPENSING PUMP CONTROL SYSTEM

Donald J. Geisel, Clifton Park; C. Alan Crotty, Niskayna, and Richard J. Pilarski, Saratoga Springs, all of N.Y., assignors to Robotics, Inc., Ballston Spa, N.Y.

Continuation-in-part of Ser. No. 828,870, Feb. 12, 1986, Pat. No. 4,699,575. This application Feb. 3, 1987, Ser. No. 5,403
Int. Cl.[4] B05C *5/02*
U.S. Cl. 118—692 **21 Claims**

1. An adhesive dispensing pump system for automatically changing the flow rate of adhesive being dispensed to a workpiece in conformance with changes in movement of an automatically controlled adhesive dispensing nozzle used to apply predetermined pattern of adhesive around the surface of the workpiece; said improved adhesive dispensing pump system comprising an adhesive dispensing positive displacement rotary pump specially designed for pumping medium to high viscosity adhesive material and supplying the same under pressure to a dispensing nozzle mounted on and moved by an automatically controlled dispensing machine over a preprogrammed path of movement for dispensing adhesive in a preprogrammed pattern onto a workpiece, said adhesive dispensing pump being driven by a variable speed electric servo drive



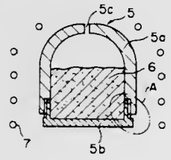
motor, and a servo drive electronic motor controller coupled to and controlling the speed of the servo drive motor, said automatically controlled dispensing machine having a programmable control computer for controlling movement of the adhesive dispensing nozzle in tracing out the predesigned pattern of adhesive being dispensed, and said servo drive electronic motor controller also being controlled by the control computer of the automatically controlled dispensing machine in conjunction with the movement of the adhesive dispensing nozzle whereby the speed of the adhesive dispensing pump and hence the flow rate of adhesive being dispensed is synchronized with the movement of the adhesive dispensing nozzle.

4,787,333

METAL VAPOR GENERATOR

Yukishige Kamino, Tsuchiura, and Nobuyuki Hiraishi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1987, Ser. No. 20,883
Claims priority, application Japan, May 2, 1986, 61-100947
Int. Cl.[4] C23C *14/24*
U.S. Cl. 118—726 **7 Claims**



1. A metal vapor generator including a vapor generating vessel having an opening, the vapor generating vessel being formed of a body and of a bottom plate, the bottom plate covering the bottom of the body, said opening being formed in the body, the vapor generating vessel being disposed within a vacuum chamber and being adapted to contain a depositing metal material, and heating means for heating the side wall of the vapor generating vessel so as to make metal vapor spout out through the opening of said vapor generating vessel by a difference in pressure between the vacuum chamber and the vapor generating vessel, characterized in that said opening is provided around the top of the body, the body being in the form of an inverted cup, and an airtight joint between the bottom plate and the body in the form of an inverted cup is located in the vicinity of a lower portion of the body in the form of an inverted cup, the bottom plate being detachable from the body in the form of an inverted cup, whereby the vapor generating vessel can be refilled and repeatedly employed.

4,787,334

HOUSE PET LITTER DISPOSAL DEVICE

Judith M. Bassine, 4000 Marina Cir., North Fort Myers, Fla. 33903

Filed Mar. 26, 1987, Ser. No. 30,126
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **1 Claim**



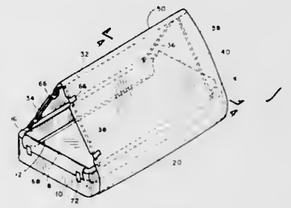
1. A householder's litter disposal device for house pets so that the pets do not have to be let outside at such frequent intervals comprising an uncovered channel shaped base that is approximately two feet wide and three feet long having spaced apart upstanding side walls, an absorbent litter dispensing cabinet at one end of the base, and a used litter receiving cabinet at the other end of the base, a reel of plastic sheathing at the litter dispensing end of the base to dispense plastic sheathing through the litter dispensing cabinet to the base, a rotatable reel in the used litter receiving cabinet to withdraw plastic sheathing through the base from the litter dispensing cabinet, means operable on movement of the plastic sheathing out of the litter dispensing cabinet to deposit a layer of absorbent litter on the plastic sheathing, means to vary the thickness of the layer of absorbent litter, a crank in the used litter receiving cabinet to propel the rotatable reel in the used litter receiving cabinet to withdraw the plastic sheathing and the litter positioned thereon from the litter dispensing cabinet and to wind it on the reel in the used litter receiving cabinet, means to deflect the lateral sides of the plastic sheath to overlie the outer edges of the used litter positioned on the plastic sheath as the plastic sheath approaches the used litter receiving cabinet to substantially seal the used litter in the plastic sheath to reduce odors eminating from the used litter.

4,787,335

LITTER BOXES

John E. Carlyon, Rte. 1, Box 72-1, Fort Gibson, Okla. 74434

Filed Jul. 16, 1987, Ser. No. 74,149
Int. Cl.[4] A01K *67/00*
U.S. Cl. 119—1 **9 Claims**



1. A pet litter apparatus comprising:

a frame which includes:

a container having a substantially rectangular bottom panel and a peripheral array of substantially upright side panels,

a rod member positioned generally centrally of and parallel to said container bottom at a spaced position therefrom, said rod member extending from above one end of said bottom panel to above the other end thereof, and

a plurality of elongate struts extending from said side panels to said rod member for substantially rigidly supporting said rod member;

a disposable bag having a planar end and a plurality of sides, said bag being of a size sufficient to receive said frame therein with said bag end being abutted against one end of said container; and

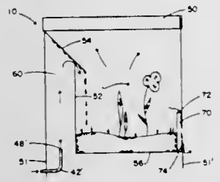
a sheet having one end fixedly secured to the interior side of said bag end for substantially covering said bottom panel when said frame is so received in said bag said bag receiving waste material from said container when one end of said frame is tipped over on its side and said frame is removed therefrom.

4,787,336

CONTROLLED ENVIRONMENT HABITAT FOR AQUARIUMS

W. Scott Lineberry, 109 Nut Bush Rd. W., Greensboro, N.C. 27410

Filed Nov. 13, 1987, Ser. No. 120,109
Int. Cl.[4] A01K *63/00*
U.S. Cl. 119—5 **5 Claims**



1. A controlled environment habitat for use submerged in an aquarium; said habitat including:

(a) a transparent housing having top, bottom and side walls and being adapted to be received within and submerged below water in an aquarium;

(b) said housing walls being impervious to air and water;

(c) means for introducing air into said housing to support growth and life processes of the plants or animals contained in said habitat;

(d) means associated with one of said walls for passage of air from the interior to the exterior of said housing and selective passage of water into the habitat;

(e) means for retaining said housing in a submerged position in the aquarium;

whereby plants or small animals may be nurtured and maintained in a controlled environment within said aquarium.

4,787,337

PET WATER CONTAINER

Gerald J. Mayer, 1556 Charmaine, Toledo, Ohio 43614

Filed Jun. 1, 1987, Ser. No. 56,373
Int. Cl.[4] A01K *7/00*
U.S. Cl. 119—18 **3 Claims**

1. A protective enclosure for a water container, the water container including a downwardly extending drinking tube, the enclosure comprising:

a rear panel having a width and height approximately equal to a diameter and height respectively of the water container;

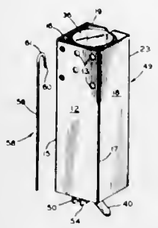
a pair of side panels attached to opposite edges of said rear panel each having a width and height approximately equal

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to the diameter and height respectively of the water container;

at least one front panel attached to an edge of one of said side panels;

a pair of bottom panels each attached to a lower edge of one of said side panels, said bottom panels, said rear panels, said side panels and said at least one front panel forming an



enclosure open at an upper end for receiving and supporting the water container and having a slot formed between said bottom panels for receiving the drinking tube extending from the water container; and

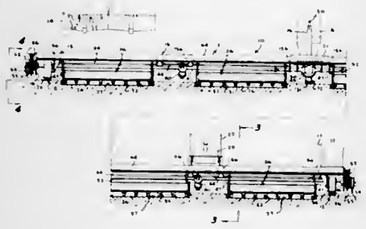
a pair of flanges each flange attached to an edge of an associated one of said bottom panels and extending downwardly from said slot formed between said bottom panels.

4,787,338

POULTRY HOUSE CLEANER APPARATUS

Walter R. Stanley, Sr., Rt. 1, Box 865, Kountze, Tex. 77625, and Walter R. Stanley, Jr., P.O. Box 1179, Sour Lake, Tex. 77659

Filed Aug. 4, 1987, Ser. No. 87,880
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—22 **20 Claims**



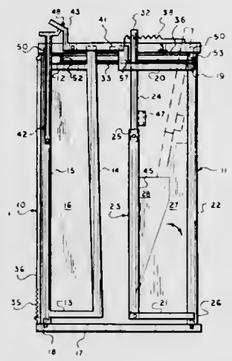
1. Mobile poultry house cleaner apparatus for scraping poultry manure and droppings from elongated parallel floor level receiving pits extending along parallel transversely spaced paths over the length of an elongated poultry house and disposed below rows of overhead poultry cages, the elongated receiving floor pits being of substantially rectangular cross-sectional configuration corresponding to the width of the cages of the associated row with intervening and flanking floor surface lanes coextensive longitudinally with and located between an outboard of the the pits, the apparatus comprising a transversely elongated main frame transversely spanning substantially the width of the poultry house having opposite ends to overlie the flanking floor lanes and a central portion overlying an intervening floor lane, a respective pair of wheels rotatably supported in depending relation from said main frame adjacent said opposite ends and said central portion forming plural pairs of outboard wheels to track on a plurality of said lanes, a driver's station and an engine and control therefor adjacent said station each surmounted on said main frame, output gear box means driven by drive means powered by the engine and having output shafts extending therefrom driving a chain sprocket at each of the opposite ends of the main frame, a pair of traction chains respectively located adjacent said opposite ends extending the length of the poultry house at floor level and anchored at opposite ends thereof to the building floor adjacent side walls of the poultry house, the chains being trained about said chain sprockets whereby rotation of the chain sprockets driven by said output shafts causes the sprocket to track along the chains and concurrently drive the opposite ends of the main frame to translate the main frame the length of the poultry house while maintaining predetermined transverse alignment relative to the receiving pits, and a plurality of scraper blade assemblies spaced widthwise along the main frame respectively aligned with and extending into the receiving pits, means to draw the scraper assemblies along their respective receiving pits upon movement of the main frame along the length of the poultry house, and remote controlled lift means for raising the scraper blade assemblies out of contact with the bottom and sides of the associated pits and lowering the same into contact therewith.

4,787,339

AUTOMATIC HEADGATE FOR LIVESTOCK

Marshall B. Heizer, Jr., Rte. 1, Box 21, Rawlings, Va. 23876

Filed Sep. 2, 1987, Ser. No. 92,300
Int. Cl.[4] A61D *3/00*
U.S. Cl. 119—98 **5 Claims**



1. A livestock headgate for rapid and positive automatic operation in securing animals of varying sizes, said headgate comprising:

(a) vertically elongated left and right gate frameworks, each having upper and lower horizontally disposed boundary members, upright interior and outer boundary members, forward and rearward faces, and rigid opaque panels disposed between said boundary members, said frameworks being pivotable upon said outer boundary members to permit horizontal swinging motion of said frameworks between a substantially coplanar disposition representing the closed state of the headgate, and an opposed forwardly directed parallel disposition representing the open state of the headgate, the upright interior boundary member of said right framework being pivotably joined to the lower horizontally disposed boundary member of the same framework so as to permit movement of said interior boundary member in the plane of the framework, and having an upper portion adjustably positionable within the plane of said right framework, the terminal upper extremity of said upper portion being slidably retained by the corresponding upper horizontally disposed boundary member,

(b) a stationary upper horizontal bar extending between the upper extremities of the upright outer boundary members of said gates in pivotal engagement therewith and adapted to prevent rearward movement of said frameworks past their coplanar disposition,

(c) a horizontally disposed floor beam extending between the lower extremities of the upright outer boundary members and in pivotal engagement therewith,

(d) a connecting rod extending in pivotal interengagement between the upper horizontally disposed boundary members of the two frameworks in a manner such that said frameworks are mechanically coupled in their movements between said open and closed states,

(e) latch means disposed upon said upper horizontal bar adjacent the right extremity thereof and adapted to engage said terminal extremity when the framework is in its closed state, and effect disengagement of said terminal extremity when the upright interior boundary member of the right framework is slightly displaced in a forward direction,

(f) spring means under tension associated with said terminal extremity in a manner to draw the upright interior boundary member of the right framework toward the upright interior boundary member of the left framework when said terminal extremity is disengaged from the latch means,

(g) ratchet means interactive between said upper horizontal bar and terminal extremity to lock the position of the upright interior boundary member of the right framework after it has been drawn toward the upright interior boundary member of the left framework,

(h) securing means associated with said horizontal bar for releasibly holding said frameworks in their closed state,

(i) lever means associated with the upright outer boundary member of the left framework and adapted to permit manual pivotal movement of said frameworks between their open and closed states,

(j) coupling means interactive with said lever means for releasing said securing means prior to manual movement of said frameworks to the open state, and restoring the holding position of said securing means with movement to the closed state, and

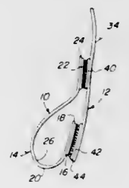
(k) means for automatically restoring said terminal extremity to its latched position during the aforesaid movement of said frameworks.

4,787,340

ANIMAL COLLAR AND LEASH SET

Douglas A. Kirtley, 6515 SW. 21st St., Miramar, Fla. 33023

Filed Feb. 24, 1987, Ser. No. 18,170
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—106 **1 Claim**



1. An animal collar and leash set which comprises:

(a) a collar with means for attaching said collar to any leash;

(b) a leash with means for attaching said leash to any collar;

(c) singular means having a first configuration providing a permanent attachment of said collar to said leash and having a second configuration providing a quick release attachment of said collar to said leash, wherein said leash further comprises:

(d) a first conventional handle end to be held in the hand of a person;

(e) a second attachment end for attaching to any collar, said attachment end having mating hook pile and loop pile fastener material which can be secured together in a loop through any collar thereby forming said first configuration for attachment of said collar to said leash, and wherein said collar further comprises;

(i) a first end having loop pile fastener material;

(ii) a second end having hook pile fastener which mates with the first end, wherein;

(iii) said first end of said collar can be secured to said mating hook pile of said leash; and

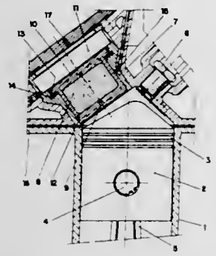
(iv) said second end of said collar can be secured to said mating loop pile of said leash, thereby forming said second configuration for providing a quick release attachment of said collar to said leash.

4,787,341

PRESSURE ASSIST PISTON FOR INTERNAL COMBUSTION ENGINE

Eleuterio E. Chivato, Residencia las Alamedas No. 3-5 II, Laredo (Cantabria), Spain

Filed Apr. 18, 1986, Ser. No. 853641
Claims priority, application Spain, May 21, 1985, 543.340
Int. Cl.[4] F02B *75/04*
U.S. Cl. 123—48 D **8 Claims**

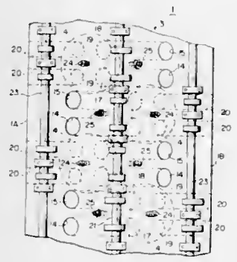


1. A controlled pressure combustion chamber for a reciprocating engine, the engine comprising a main cylinder including means permitting admission of a fuel mixture and escape of exhaust material therefrom, means for initiating combustion of the fuel mixture in the main cylinder, a piston supported for reciprocating movement through the main cylinder, the main cylinder having a head, toward and away from which head the piston reciprocates in the cylinder;

a second cylinder in the piston head, the second cylinder opening toward the main cylinder; a free piston disposed for displacement along the second cylinder and communicating with the main cylinder for prolonging the compression and combustion stages and absorbing energy upon displacement of the first mentioned piston by the compression and combustion; the second cylinder being closed on the side of the free piston away from the main cylinder, for defining a pneumatic cushion in the second cylinder which generates a force resisting movement of the second piston away from the main cylinder, when said pneumatic cushion is compressed by movement of the second piston away from the main cylinder, said pneumatic cushion being substantially the only source of such a resisting force, whereby when the pressure in the pneumatic cushion and the pressure in the first cylinder have become equalized due to displacement of the first and second pistons, the free piston commences to return energy to the first piston in the main cylinder on the stroke thereof while the gases of combustion expand.

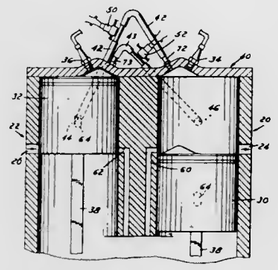
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,342
V-6 ENGINE
Yoshiro Matsumori, and Takashige Tokushima, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan
Filed Apr. 17, 1987, Ser. No. 39,235
Claims priority, application Japan, Apr. 18, 1986, 61-90218
Int. Cl.[4] F02B *75/22*
U.S. Cl. 123—55 VS 10 Claims



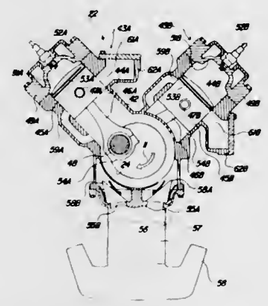
1. A V-6 engine having left and right cylinder banks which have three cylinders each and are set to each other at an angle α not larger than about 30°, the piston for each cylinder being connected to a single crankshaft by way of crankpins, characterized in that the positions of the crankpins are so arranged that the crankpins for the three cylinders in each cylinder bank are positioned to differ from each other in phase by 120°, and the phase differences between the crankpins for a number 1 cylinder and a number 6 cylinder, between the crankpins for a number 2 cylinder and a number 5 cylinder and between the crankpins for a number 3 cylinder and a number 4 cylinder are equal to the angle α so that the pistons in the cylinders of each pair reach the respective top dead centers simultaneously with each other, the cylinders in the left cylinder bank and the cylinders in the right cylinder bank are alternately fired, only one intake camshaft driving intake valves for all of the cylinders, the intake and exhaust valves for each cylinder are arranged to form a V-shape, the exhaust port for each cylinder is disposed on the outer side of the corresponding cylinder bank, and the intake port for each cylinder of each cylinder bank is connected to a surge tank disposed on the other cylinder bank side;
the number 1, number 3 and number 5 cylinders are disposed in the left bank in this order and the number 2, number 4 and number 6 cylinders are disposed in the right bank in this order from an end of the engine toward the other end along the crankshaft direction, with the cylinders of the left and right banks being alternately arranged;
the one intake camshaft being disposed in the middle portion between the cylinder banks and having cams for driving the intake valves for the cylinders in the both cylinder banks, and a pair of exhaust camshafts disposed on the outer sides of the respective cylinder banks and provided with cams for driving the exhaust valves for the cylinders in the corresponding cylinder banks; and
each of the cylinders has a pent roof type combustion chamber.

4,787,343
COMBUSTION ENHANCER FOR INTERNAL COMBUSTION ENGINES
Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.
Filed Nov. 7, 1986, Ser. No. 928,185
Int. Cl.[4] F02B *75/20*
U.S. Cl. 123—59 EC 4 Claims



1. In a fuel system for a two-cycle internal combustion engine having two or more cylinders with reciprocating pistons having a top stroke position and a bottom stroke position, a fuel inlet at the top of each cylinder, an exhaust outlet in each cylinder positioned to be uncovered by each piston as it reaches the lowest point of its stroke, air transfer ports in each cylinder also uncovered by each piston as it reaches the lowest point of its stroke, a wall port in each cylinder positioned between the top and bottom stroke positions of each piston, a transfer conduit connecting each said wall port of one cylinder with the fuel inlet of a second cylinder, and a fuel injector in each said conduit,
whereby in the operation of the engine hot exhaust gases are transferred from one cylinder in which a piston is descending in a power stroke to a second cylinder in which a piston is ascending in a compression stroke, said transferring gases also preheating and atomizing fuel from said fuel injectors.

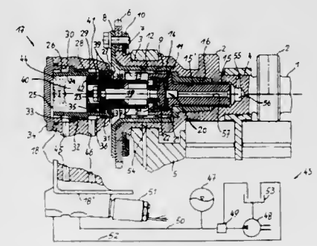
4,787,344
TWO-STROKE MULTI-CYLINDER ENGINE
Shigeo Okumura, and Kyoji Hakamata, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Jul. 14, 1987, Ser. No. 72,872
Claims priority, application Japan, Jul. 28, 1986, 61-175674
Int. Cl.[4] F02B *75/22*
U.S. Cl. 123—65 PE 2 Claims



1. In an internal combustion engine having a pair of cylinder

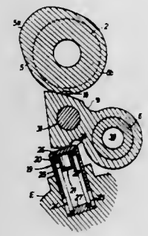
bores disposed at an angle to each other, pistons reciprocating in said cylinder bores, a crankshaft supported for rotation about an axis relative to said cylinder bores, connecting rods for transferring reciprocation of said pistons into rotation of said crankshaft, the connection between said pistons and said connecting rods being such that a side thrust is exerted on said pistons for causing said pistons to tilt in said cylinder bores during the power strokes of the pistons, and exhaust ports opening into said cylinder bores at one side of a plane passing through the respective cylinder bore axis and parallel to the crankshaft rotational axis, the improvement comprising each of said exhaust ports opening through the same side of the respective plane with respect to the direction of rotation of said crankshaft.

4,787,345
ARRANGEMENT FOR THE RELATIVE ANGULAR POSITION CHANGE OF TWO SHAFTS DRIVINGLY CONNECTED WITH EACH OTHER, ESPECIALLY BETWEEN A CRANKSHAFT SUPPORTED IN AN ENGINE HOUSING OF AN INTERNAL COMBUSTION ENGINE AND A CAM SHAFT
Josef Thoma, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Fed. Rep. of Germany
Filed May 12, 1987, Ser. No. 48,817
Claims priority, application Fed. Rep. of Germany, May 14, 1986, 3616234
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.17 35 Claims



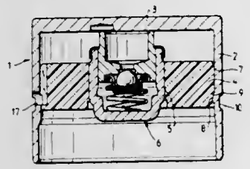
1. An arrangement for the relative angular position change of two shafts drivingly connected with each other, comprising adjusting means and actuating means, the adjusting means including a movably arranged coupling member effecting a non-rotatable connection by way of form-locking guide means of one of said shafts and a coordinated driving gear, said coupling member being in operative form-locking engagement for an angular position change by axial displacement of said guide means, the coupling member being operatively connected on its shaft side with one of said guide means arranged in a guided end area of the shaft within an aperture means, the aperture means of said shaft including additionally a bearing bore for a hub of the driving gear, the hub being of tubular-like shape and being provided along the inside with said one of said guide means, which are operatively connected with another guide means arranged adjacent in said one shaft by way of the coupling member, said coupling member being operable to be coupled with the actuating means which is structurally separate from the adjusting means and includes a coupling rod operatively connected with the coupling member by way of a joint means having three degrees of freedom,
wherein said driving gear surrounds the hub and is disposed at a position spaced axially from the joint means towards the end of said cam shaft.

4,787,346
VALVE OPERATING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE
Yoshio Ajiki, and Atsushi Ishida, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 13, 1987, Ser. No. 107,345
Claims priority, application Japan, Oct. 13, 1986, 61-242679
Int. Cl.[4] F01L *1/18, 1/34, 1/26*
U.S. Cl. 123—90.44 8 Claims



1. Operating apparatus for an valve for an internal combustion engine including a camshaft rotatably driven by said engine, a cam on said camshaft and a cam follower operably interconnecting said cam and said valve and means for biasing said cam follower against said cam, said means comprising:
a stationary base subjacent said cam follower;
an abutment member movable in a direction between said base and said cam follower,
spring means extending between said base and said abutment member for biasing said abutment member against said cam follower including a first spring of relatively small spring constant and a second spring of relatively large spring constant series-coanected to said first spring.

4,787,347
SELF-ADJUSTING HYDRAULIC VALVE TAPPET
Georg Schaeffler, Herzogenaurach, Fed. Rep. of Germany, assignor to INA Walzlager Schaeffler KG, Fed. Rep. of Germany
Filed Sep. 28, 1987, Ser. No. 101,634
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639911
Int. Cl.[4] F01L *1/24*
U.S. Cl. 123—90.55 8 Claims



1. A self-adjusting hydraulic valve tappet arranged in a guide bore of a cylinder head of an internal combustion engine and comprising a cup-shaped housing (1) formed by a hollow cylindrical wall (2) closed at one end by an end member (3) against the outside of which a cam abuts, a radial flange (4) provided in the bore of the hollow cylindrical wall (2) at a distance from the end member and guides for longitudinal movement of the hydraulic play compensating element (6) in a bore (5) concentric to the hollow cylindrical wall (2) and formed as a separate unit inserted in liquid-tight manner in the bore of the hollow cylindrical wall (2) and fixed therein, char-

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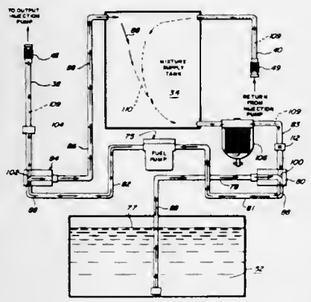
acterized in that the radial flange (4) is made of a material which has a higher thermal expansion coefficient than steel and the wall thickness of the hollow cylindrical wall (2) is thin walled at least in the longitudinal area in which the outer surface of the radial flange (4) is arranged so that during heat expansion, the radial flange (4) is capable of elastically widening the wall (2) outwardly.

4,787,348

CARBON-CLEANING APPARATUS FOR DIESEL ENGINES

Timothy A. Taylor, Santa Ana, Calif., assignor to Parker Automotive Corporation, Santa Ana, Calif.

Filed Jan. 25, 1988, Ser. No. 148,339
Int. Cl.[4] B08B *3/08*
U.S. Cl. 123—198 R **19 Claims**



1. A carbon-cleaning apparatus for diesel engines, wherein said apparatus defines an independent fuel system attachable to the diesel engine by way of the fuel-injection pump of the engine so as to temporarily replace the engine's closed fuel system, said apparatus comprising:
- a fuel/chemical mixture tank having at least two fuel lines including an outlet line and a return line, said outlet and return lines being connected to the respective inlet and outlet ports of the engine's fuel-injection pump;
- a fuel pump interposed in said outlet line whereby said fuel/-chemical mixture is pumped to the engine's fuel-injection pump;
- a filter means interposed in said outlet fuel line between said mixture tank and said fuel pump; and
- a circuit means for controlling the proper operation of said apparatus and the diesel engine being cleaned, said circuit being connected in series with the engine's fuel shut-off circuit.

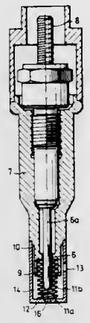
4,787,349

IGNITION DEVICE FOR AIR-COMPRESSING INTERNAL COMBUSTION ENGINE

Ulrich Hilger, Aachen, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 14, 1987, Ser. No. 96,896
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1986, 3631473
Int. Cl.[4] H05B *3/00*
U.S. Cl. 123—297 **20 Claims**

1. An ignition device for an air-compressing internal combustion engine of the type having an injection nozzle arranged in a cylinder head, said ignition device including an elongated heating element, a hollow casing having a cylindrical wall spaced from and surrounding a substantial part of the length of said element, thereby providing open space therebetween, said element being spaced radially inward from said cylindrical wall, a heat reservoir in the form of at least one incandescent body operatively disposed between said cylindrical wall of said casing and said heating element and occupying a minor part of said open space and an inlet opening in said cylindrical wall of



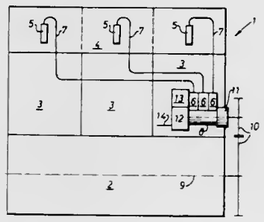
said casing through which fuel enters into the hollow interior of said casing where it ignites and burns upon contact with said incandescent body.

4,787,350

DUAL-INJECTION METHOD AND DEVICE FOR SELF-IGNITING INTERNAL COMBUSTION ENGINES

Ing. Ono Syassen, Hemsbach, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 92,889
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630439
Int. Cl.[4] F02M *45/06*
U.S. Cl. 123—300 **13 Claims**



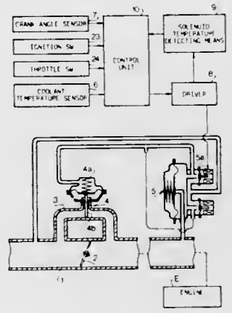
1. A device for injecting fuel into a combustion chamber of a self-igniting internal combustion engine (1), wherein the injection process is subdivided by a high pressure fuel pump (6) into a preliminary injection and a primary injection, and fuel is delivered to the high pressure pump (6) by a preliminary pressure fuel pump (12), characterized by: at least one high pressure storage vessel operatively interposed between the preliminary pressure fuel pump (12) and the high pressure fuel pump (6) and so constructed and arranged as to permit its pressurization to a predetermined high pressure independently of said preliminary pressure fuel pump (12).

4,787,351

SYSTEM FOR CONTROLLING IDLE SPEED OF AN ENGINE

Masanori Sakamoto, Tokyo, and Takuro Morozumi, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 128,230
Claims priority, application Japan, Dec. 3, 1986, 61-289542
Int. Cl.[4] F02D *41/16, 41/08*
U.S. Cl. 123—339 **2 Claims**



1. A system for controlling idle speed of an engine having a bypass around a throttle valve and a solenoid operated idle speed control valve provided in the bypass, comprising:
- first means for generating driving pulses for driving the idle speed control valve in dependence on a coolant temperature and an old learning correction value;
- second means for converting temperature of a solenoid of the control valve to voltage;
- a map storing normal temperature duty ratios;
- third means for deriving a normal temperature duty ratio from the map in dependence on duty ratio of the driving pulses and the voltage;
- a first calculator for producing a difference between the duty ratio of the driving pulses and the derived normal temperature duty ratio;
- a memory storing the difference as a correction value;
- detecting means for detecting turning off of an ignition switch and for producing an off signal;
- a second calculator responsive to the off signal for adding the correction value to the old learning correction value to produce a new learning correction value and for storing the new learning correction value for a subsequent engine operation instead of the old learning correction value.

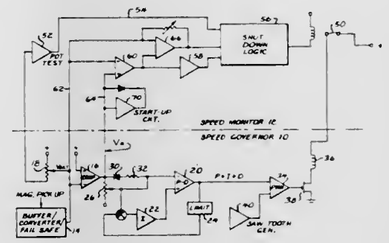
4,787,352

ENGINE CONTROL CIRCUIT INCLUDING SPEED MONITOR AND GOVERNOR

George Anderson, Rockford, Ill., assignor to Barber-Coleman Company, Rockford, Ill.

Filed Aug. 6, 1987, Ser. No. 82,525
Int. Cl.[4] F02D *17/04, 31/00*
U.S. Cl. 123—352 **6 Claims**

1. A control circuit for an internal combustion engine comprising:
- (a) buffer means receiving a signal related to engine RPM (the RPM signal) and producing a buffered signal proportional thereto;
- (b) a PID governor circuit for receiving and comparing the buffered signal against a reference signal to control the speed of said engine as a result of said comparison, said PID governor circuit including:
  - (i) operational amplifiers receiving said buffered signal for producing an error signal and a proportional (P), integral (I), and a derivative (D) of said error signal, the P, I, D signals being combined to produce a signal for controlling engine speed; and
  - (ii) means for providing high gain for the operational



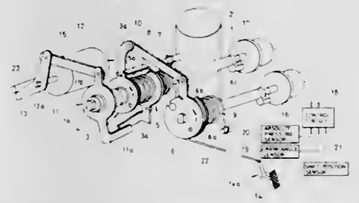
amplifiers producing the P and D signals during engine start up to permit the engine to quickly reach normal operating speed and avoid saturation of the operational amplifier producing the I signal.

4,787,353

THROTTLE VALVE CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE MOUNTED ON A VEHICLE

Yoshikazu Ishikawa, and Kouji Yamaguchi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,065
Claims priority, application Japan, Sep. 24, 1986, 61-226536; Sep. 24, 1986, 61-226538
Int. Cl.[4] F02D *11/10*
U.S. Cl. 123—399 **4 Claims**



1. A throttle valve control apparatus for controlling the opening of a throttle valve disposed in an intake system of an internal combustion engine having an accelerator pedal and mounted on a vehicle, comprising:
- accelerator pedal position detection means for detecting an operation position of said accelerator pedal;
- target throttle valve opening setting means for setting a target opening of said throttle valve;
- throttle valve opening detection means detecting the actual opening of said throttle valve;
- throttle valve drive means for driving said throttle valve to equalize said actual opening of said throttle valve to said target throttle valve opening;
- means for detecting an operating condition of said internal combustion engine, wherein one of a first opening value proportional to said operation position of said accelerator pedal and a second opening value which is smaller than said first opening value is selected by said target throttle valve opening setting means as said target throttle valve opening in accordance with said operating condition of said internal combustion engine; and
- means for limiting the driving speed of said throttle valve by

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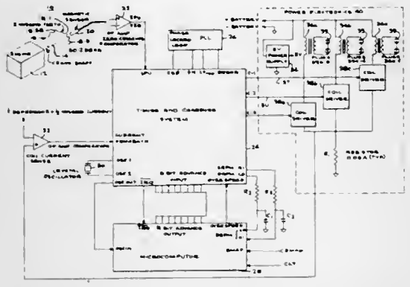
said throttle valve drive means to be lower than a slow limit speed when said target throttle valve opening is switched from said second opening value to said first opening value.

4,787,354

IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES WITH SIMPLIFIED CRANKSHAFT SENSING AND IMPROVED COIL CHARGING

David I. Wilens, Rockville, Md., and Alexander Long, Oakton, Va., assignors to Electromotive, Inc., Chantilly, Va.

Filed Feb. 5, 1986, Ser. No. 826,331
Int. Cl.[4] F02P *5/145*
U.S. Cl. 123—414 **55 Claims**



1. An electronic ignition system for controlling as a function of at least one selected engine parameter the ignition instant of an internal combustion engine having at least one cylinder, said cylinder having a piston and a rotatable crankshaft coupled to said piston to be rotatably driven as combustions occur within said cylinder at said ignition instants, said crankshaft having at least one reference position defining a positional relationship of said crankshaft to said cylinder, said electronic ignition system comprising:

(a) a rotor affixed to rotate with said crankshaft and having a plurality of reference indicia thereon positionally related with respect to said reference position, said reference indicia being disposed at points equally spaced by a predetermined arc of crankshaft rotation from each other about said rotor, at least one of said points having a missing indicium and disposed in a predetermined relation to said reference position of said crankshaft;

(b) a single sensor disposed at a point fixed in relation to the rotation of said crankshaft for providing a train of signals, each signal occurring in time when each of said plurality of reference indicia rotates past said fixed point

(c) missing indicium means responsive to each sensor signal of said train for measuring an arc of crankshaft rotation from the corresponding, current indicium, and if said measured arc of crankshaft rotation exceeds said predetermined arc of crankshaft rotation, for providing a missing indicium signal; and

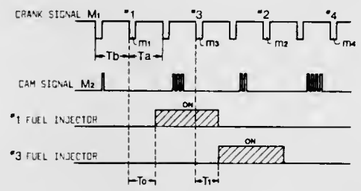
(d) closed loop circuit means comprising comparison means coupled to received said first mentioned train of sensor signals for providing an error signal, oscillator means responsive to said error signal for providing a corrected, second train of signals of a frequency proportional to said error signal, and feedback means for coupling said second train of signals to said comparison means, whereby said comparison means provides said error signal as a function of the phase difference between said signals of said first mentioned and said second trains.

4,787,355

CRANK ANGLE DETECTING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Satoshi Maeda, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1988, Ser. No. 152,615
Claims priority, application Japan, Feb. 13, 1987, 62-032140
Int. Cl.[4] F02P *5/14*
U.S. Cl. 123—414 **4 Claims**



1. A crank angle detecting system for an internal combustion engine having a plurality of cylinders, comprising:

a pulse generator disk secured to a crankshaft of said engine and having notches each corresponding to a compression top dead center of the cylinders,

a first magnetic pickup for producing a first output signal in accordance with said notch;

a rotary member secured to a camshaft of said engine and having projections provided at positions corresponding to respective cylinders, said projections at each position being set to represent a corresponding cylinder,

a second magnetic pickup for producing a second output signal in accordance with said projections;

first means responsive to said first output signal for producing a crank angle signal;

second means for detecting production of an erroneous first output signal and for producing a trouble signal;

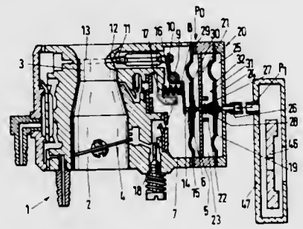
third means responsive to said trouble signal for producing a crank angle signal in accordance with said second output signal.

4,787,356

CARBURETOR ARRANGEMENT FOR CHANGING THE RATIO OF THE AIR/FUEL MIXTURE IN HANDHELD MOTOR-DRIVEN APPARATUS

Stephan Rösgen, Cologne, and Michael Langer, Fellbach, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,591
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621497
Int. Cl.[4] F02M *7/12*
U.S. Cl. 123—438 **6 Claims**



1. A carburetor arrangement for an internal combustion engine of a handheld portable tool such as a chain saw, hedge trimmer and the like, the carburetor arrangement comprising:

a carburetor housing having an interior space;

a movable regulating membrane mounted in said space so as to partition the same into a first chamber on one side of said membrane and into a second chamber on the other side of said membrane;

a fuel channel communicating with said first chamber and defining a valve seat;

a valve needle mounted in said first chamber to define a valve with said valve seat;

resilient means for resiliently biasing said valve needle into engagement with said valve seat;

said valve needle being operatively connected to said regulating membrane so as to be displaceable against the force of said resilient means and away from said valve seat in response to a movement of said membrane thereby admitting fuel into said first chamber;

actuating means operatively connected to said valve needle for additionally displacing the latter in the opening direction to open the valve a further incremental amount in response to a predetermined rotational speed of the engine thereby enriching the air/fuel mixture by an additional amount; and,

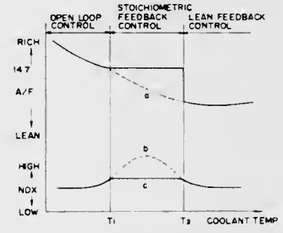
abutment means for limiting the additional displacement of said valve needle for the enrichment of said air/fuel mixture.

4,787,357

INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Toshio Nishikawa; Makoto Hotate, both of Hiroshima; Tadataka Nakazumi, Kure, and Tadashi Kaneko, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 28, 1986, Ser. No. 923,865
Claims priority, application Japan, Oct. 30, 1985, 60-243108
Int. Cl.[4] F02D *41/06, 41/14*
U.S. Cl. 123—489 **6 Claims**



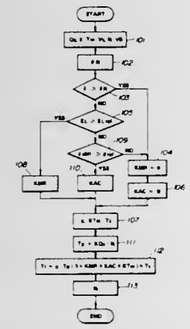
1. An intake system for an internal combustion engine including operating condition detecting means for detecting an engine operating condition, air-fuel setting means for setting a desirable air-fuel ratio at a value leaner than a stoichiometric air-fuel ratio in at least a predetermined engine operating region after a warming-up condition, coolant temperature detecting means for detecting coolant temperature of the engine, warming-up compensating means for compensating said desirable air-fuel ratio in accordance with the outputs of the coolant temperature detecting means in such a manner that the desirable air-fuel ratio becomes leaner as the coolant temperature is increased, and feedback control means for controlling the air-fuel ratio to correspond with the stoichiometric air-fuel ratio between a first coolant temperature at which the desirable air-fuel ratio, compensated for the warming-up condition, is equivalent to the stoichiometric air-fuel ratio and a second coolant temperature at which the emission of NO_x at the air-fuel ratio compensated for the warming-up condition is substantially the same value as at the stoichiometric air-fuel ratio, an open loop control being carried out in the region of the coolant temperature lower than the first coolant temperature in which the air-fuel ratio is controlled so that it approaches the stoichiometric air-fuel ratio as the coolant temperature approaches said first coolant temperature, and an air-fuel feedback control being carried out so as to control the air-fuel ratio to a desirable air-fuel ratio compensated in the lean mixture side of the stoichiometric value in accordance with the coolant temperature in the region of the coolant temperature more than the second coolant temperature, the warming-up compensating means being adapted to provide the desirable air-fuel ratio with the stoichiometric value between said first coolant temperature and said second coolant temperature where the amount of NO_x emitted from the engine is increased and to compensate the desirable air-fuel ratio in accordance with the coolant temperature in regions other than between said first coolant temperature and said second coolant temperature.

4,787,358

FUEL SUPPLY CONTROL SYSTEM FOR AN ENGINE

Mitsuru Kasanami, and Hideyuki Tamura, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Nov. 12, 1986, Ser. No. 929,375
Claims priority, application Japan, Dec. 23, 1985, 60-291353
Int. Cl.[4] F02B *3/00*
U.S. Cl. 123—492 **7 Claims**



1. A fuel supply control system including means for supplying a controlled amount of fuel to an internal combustion engine having a throttle valve movable for controlling air flow to the engine, comprising:

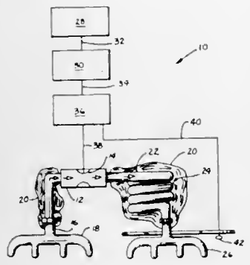
sensor means for detecting engine operating conditions including engine load and engine speed;

a throttle sensor for detecting the degree of opening of the throttle valve; and

a control unit for controlling the amount of fuel to the engine in accordance with the detected engine operating conditions, the control unit including first enrichment means responsive to a demand for engine acceleration for increasing the amount of fuel to the engine, and means for preventing the first enrichment means from increasing the amount of fuel to the engine when the detected throttle valve opening position is at a degree greater than a reference value, the control unit including second enrichment means for increasing the amount of fuel to the engine when the detected engine load is greater than a predetermined value and means for preventing the second enrichment means from increasing the amount of fuel to the engine when the detected throttle valve opening position is at a degree greater than the reference value.

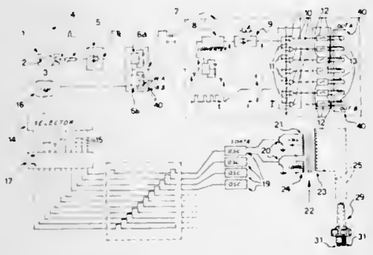
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4,787,359
EXHAUST/FUEL MIXER/VAPORIZER
Samuel J. Blake, 30 Westville Rd., Plaistow, N.H. 03865
Filed Nov. 17, 1986, Ser. No. 930,886
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—568 **2 Claims**



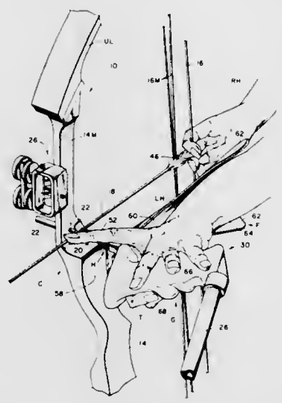
1. An apparatus for improving fuel vaporization prior to combustion in an internal combustion engine, said apparatus comprising:
a. fuel supply means comprising a fuel tank, a fuel pump, and a metering means;
b. mixing chamber means;
c. exhaust gas delivery means in fluid communication with said mixing chamber means, said exhaust gas delivery means comprising a first conduit extending between an exhaust manifold and said mixing chamber means;
d. fuel delivery means in fluid communication with said mixing chamber means, said fuel delivery means comprising a second conduit interconnected between said fuel supply means and said mixing chamber means;
e. venturi nozzle means positioned in said mixing chamber means, said exhaust gas and said fuel being intermixed in said Venturi nozzle means; and,
f. additional fuel vaporization means comprising a coiled conduit through which said intermixed exhaust gas and fuel passes.

4,787,360
ELECTRONICALLY-CONTROLLED PLASMA IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES
Claudio Filippone, Trento, Italy, assignor to EL.EN.A. S.p.A., Rovereto, Italy
Filed Apr. 23, 1987, Ser. No. 41,506
Claims priority, application Italy, Apr. 24, 1986, 85541 A/86
Int. Cl.[4] F02P *3/01, 5/145*
U.S. Cl. 123—606 **14 Claims**



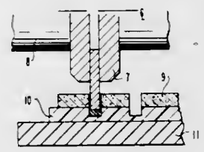
1. An electronically-controlled plasma ignition system for an internal combustion engine, including
at least one spark-plug for each cylinder of the engine,
sensor means for monitoring the rotation of the drive shaft of the engine,
a plurality of coils having each a primary winding and a secondary winding; the secondary winding of each coil being coupled to a respective spark-plug;
a plurality of high frequency electrical-current generators each connected to the primary winding of a respective coil; and
electronic control means coupled to said sensor means, for activating each of the high frequency electrical-current generators in correspondence with the combustion phase in the corresponding cylinder to generate an electronic plasma between the electrodes of the associated spark-plug;
each of the said coils including a respective auxiliary winding magnetically coupled to the secondary winding for providing a signal which is indicative of the impedance between the electrodes of the associated spark-plug;
each of said high frequency electrical current generators including an oscillator coupled to the primary winding and the auxiliary winding of the associated coil; each of said oscillators being adapted to apply to the primary winding of the corresponding coil a signal having an intensity which is variable as a function of the signal provided by the associated auxiliary winding, so as to maintain in each combustion phase a substantially constant plasma-flow between the electrodes of the associated spark-plug.

4,787,361
ARCHERY BOW WITH SELF-ALIGNING COMBINATION HANDGRIP AND FOREARM PROTECTOR
Emil Vyprachticky, 7713 Webster Way, Arvada, Colo. 80004
Filed Jan. 27, 1987, Ser. No. 6,962
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—88 **11 Claims**



1. An archery bow comprising: upper and lower limbs defining a longitudinal axis and having adjacent ends thereof spaced apart to leave a gap therebetween; a bow string interconnecting the remote ends of said upper and lower limbs; connecting means including upper and lower axially-aligned portions connecting said upper and lower limbs together so as to bridge the gap therebetween and a laterally-offset portion intermediate said axially-aligned portions defining an axially-aligned opening for the passage of an arrow; and, means comprising a combination handgrip means and forearm protecting means pivotally attached to said lower axially-aligned portion of said connecting means for limited relative pivotal movement about a fixed axis paralleling and closely adjacent said longitudinal axis, said forearm protecting means including rigid brace-forming means extending rearwardly from said axis of pivotal movement in the direction of said bowstring and on the opposite side thereof from said laterally-offset portion of said connecting means, said brace-forming means being shaped and dimensioned to define a protective surface for positioning between the forearm of the archer's arm holding the bow by means of the handgrip means and the bowstring, said handgrip means extending laterally in laterally-offset relation to said axis of pivotal movement and in rearwardly-inclined acute-angular relation to said forearm protecting means while cooperating therewith when grasped with the archer's bow-holding hand palm-down to prevent rotation of said archer's forearm as the bowstring is drawn and the arrow released, and said forearm protecting means and handgrip means further cooperating to cause the archer's hand and forearm in engagement therewith to automatically thrust the bow in a direction closely paralleling the flight of the arrow an the bow, arrow, bowstring and hand drawing the latter are permitted to pivot freely relative to said bow-holding hand and associated handgrip means and forearm protecting means as the arrow is aligned with its target.

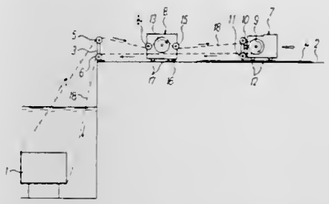
4,787,362
ABRASIVE BLADE HAVING A POLYCRYSTALLINE CERAMIC CORE
John N. Boucher, Longwood, and David E. Bajune, Sanford, both of Fla., assignors to Thermocarbon, Inc., Casselberry, Fla.
Continuation of Ser. No. 920,533, Oct. 20, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 178,787
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 **20 Claims**



1. An abrasive dicing blade comprising:
an annular disc less than 0.025 in. in thickness, said disc having an inner and an outer diameter, and being formed from a fine grain, low porosity, polycrystalline, non-conductive, structural ceramic, and
an abrasive material, which is a polymerized resin matrix in which abrasive particles are embedded, adhered to an outer peripheral surface of said annular disc, said abrasive material having a thickness greater than the thickness of said annular disc.

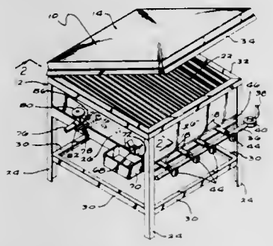
4,787,363
WIRE SAWING METHOD FOR REINFORCED CONCRETE STRUCTURES
Setsuo Kubo, Kyoto, Japan, assignor to Kabushiki Kaisha Dymosha, Japan
Filed Jul. 29, 1987, Ser. No. 78,883
Claims priority, application Japan, Jan. 31, 1987, 62-21241
Int. Cl.[4] B28D *1/08*
U.S. Cl. 125—21 **4 Claims**

1. A wire sawing method for cutting reinforced concrete structures comprising:
reeving an endless cutting cable around the concrete structure to be cut and through the pulleys of a cable driving system, said cable driving system including a movable cable driving machine and a fixed cable driving machine arranged in series to circularly drive said endless cable;
pulling said cable with said movable cable driving machine;



driving the tension side of said cable with said fixed cable driving machine, said movable cable driving machine and said fixed cable driving machine cooperating so as to adjust the speed and tension of said endless cable.

4,787,364
FRYING OVEN
Ernesto F. Zepeda, Col. Jaurez C.P., Mexico, assignor to Errol Rex McNeil, El Cajon, Calif.
Filed Sep. 21, 1987, Ser. No. 98,624
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—41 R **19 Claims**



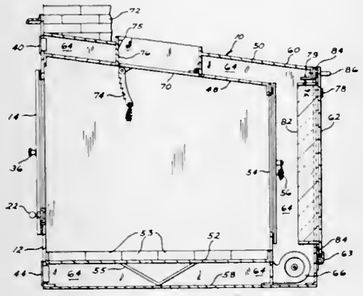
1. A frying oven, comprising:
a substantially enclosed cooking chamber;
burner means situated below a lower wall defining a portion of the cooking chamber;
a grill rack supported within the cooking chamber and above the burner means, which grill rack provides a support surface for food cooked within the frying oven;
means for collecting grease produced by food on the grill rack as it is cooked, the collecting means preventing contact between the grease and the burner means; and
a drip injection steam generator located in the cooking chamber above the burner means for producing a humid environment within the cooking chamber during the cooking process, the drip injection steam generator including means for providing drops of water into a perforated tube.

4,787,365
DOUBLE WALLED FIREPLACE INSERT AND METHOD FOR LOADING FROM THE OUTSIDE
Dwight E. Coleman, HC83 Box 20, Virgie, Ky. 41572
Filed Nov. 12, 1987, Ser. No. 119,630
Int. Cl.[4] F24B *7/00*
U.S. Cl. 126—521 **5 Claims**

1. A method of loading firewood into an interior firebox of a double walled fireplace insert comprising an inner firebox

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containing a rear wall, side walls, a top wall and a bottom wall and an outer shell containing a rear wall, side walls, a top wall, a bottom wall, and a front wall wherein the insert is provided with convection air channels between the adjacent walls of the inner firebox and the outer shell, wherein the rear wall of the inner firebox has a swinging rear door, and the rear wall of the outer shell has a hinged rear door to allow the inner rear door to swing open, and a vertical masonry chimney is built on the outside of a building in which the fireplace insert is installed, wherein the chimney has a door opening in its lower portion



for allowing access to the two rear doors so they may swing open to load firewood into the firebox, as well as for cleaning out ashes and cinders that may be formed, wherein a lock mechanism is provided for the rear door of the outer shell to prevent unauthorized entry by unknown persons wherein the rear door of the outer shell is also provided with thermal insulation to reduce heat loss from the inner firebox and a thermal door gasket to prevent cool outside air from mixing with the convection air that flows around the convection air channels.

4,787,366

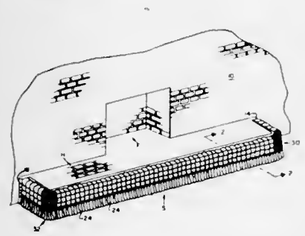
SAFETY DEVICE FOR A HEARTH

Bobbi B. Bell, P.O. Box 993, Burgaw, N.C. 28425

Filed Jun. 9, 1987, Ser. No. 60,004

Int. Cl.[4] F24B *13/02*

U.S. Cl. 126—500 **21 Claims**



1. Safety device for use with an elevated hearth or the like having horizontal and vertical surfaces, comprising:
(a) padding means for substantially spanning the length of a hearth to which the safety device is to be attached and having a first portion for substantially covering the vertical surfaces thereof and a second portion for overlying at least a portion of a horizontal hearth surface;
(b) cover means secured to and exterior of said padding means;
(c) resilient biasing means carried by said second portion and substantially spanning said cover means for drawing said cover means about the hearth; and,
(d) means for removably securing said cover means to the hearth.

11. Improved fireplace assembly, comprising:
(a) an elevated hearth extending from a fireplace and including at least one vertical and one contiguous horizontal surface;
(b) padding means substantially spanning said vertical surface and covering an adjacent portion of said horizontal surface;
(c) cover means secured to and disposed exterior of said padding means;
(d) bias means operably connected to said cover means for drawing said cover means about said vertical surface; and,
(e) means for removably securing said padding means to one of said surfaces.

4,787,367

SOLAR COLLECTOR DEVICE

Bernardus A. Crul, Rijswijk, Netherlands, assignor to Tebodin, Advies- en Constructiebureau B.V., The Hague, Netherlands

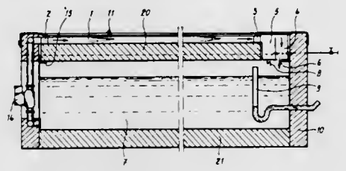
PCT No. PCT/NL86/00009, § 371 Date Nov. 24, 1986, § 102(e) Date Nov. 24, 1986, PCT Pub. No. WO86/05862, PCT Pub. Date Oct. 9, 1986

PCT Filed Mar. 26, 1986, Ser. No. 945,094

Claims priority, application Netherlands, Mar. 26, 1985, 8500886

Int. Cl.[4] F24J *2/04*

U.S. Cl. 126—437 **5 Claims**



1. A solar collector for warming up of water comprising:
a flat cylinder-shaped absorber, through which water flows, having an integrated film including:
an inner film being substantially impermeable for water and water vapor; and
a temperature resistant, black polymeric outer film being laminated on said inner film so that said outer film has an embedded spectral-selective absorption pigment;
a cover, disposed on a sunside of said absorber, including at least one transparent polymeric film; and
an insulation panel, disposed on a shadowside of said absorber;
wherein said absorber further comprises:
first and second opposed ends;
a water inlet at said first end;
a water outlet at said second end; and
said solar collector further comprises:
a water inlet header and a water outlet header, on which said inlet and said outlet of said absorber are fixed respectively, said outlet header having a weir device; and
a water collecting tank, located below said outlet header, whereby said weir device is at such a height with respect to said absorber, and said inlet and outlet openings are of such dimension, that said absorber operates with a water layer height of a few centimeters casu quo with a water velocity of a few centimeters per second.

4,787,368

MEDICAL DEVICE DRIVING SYSTEM

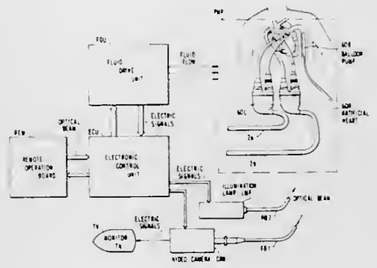
Toshinobu Kageyama, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 7, 1986, Ser. No. 882,745

Claims priority, application Japan, Jul. 8, 1985, 60-149605

Int. Cl.[4] A61B *19/00*

U.S. Cl. 600—18 **2 Claims**



1. A system for driving a medical device, comprising:
a positive pressure source;
a first electromagnetic valve connected with said positive pressure source;
a negative pressure source;
a second electromagnetic valve connected with said negative pressure source; and
electronic control means for controlling said first and second electromagnetic valves,
said electronic control means comprising setting means for setting a switching timing of said first and second electromagnetic valves; switching means for switching said first and second electromagnetic valves according to said switching timing; memory means for storing a plurality of assistance ratios; and selecting switch means, said electronic control means selecting one of said assistance ratios according to a condition of said selecting switch means and inhibiting an operation of said switching means according to said selected assistance ratio.

4,787,369

FORCE RELIEVING, FORCE LIMITING SELF-ADJUSTING STEERING FOR BORESCOPE OR ENDOSCOPE

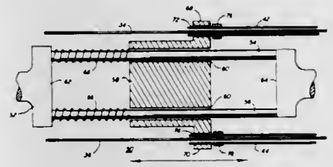
Jimmie B. Allred, III, Skaneateles, and Allan I. Krauter, Syracuse, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,347

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **7 Claims**

1. Self-adjusting steering mechanism for endoscopes of the type having a flexible insertion tube, a distal steering section, at least one pair of steering cables that are enclosed in respective cable sheaths for controlling bending of said steering section, a control housing at a proximal end of the insertion tube, and means in said control housing for displacing said control cables relative to said sheaths; the mechanism comprising a frame fixed in said control housing;
a movable member supported on said frame and disposed for motion generally proximally-distally, the movable member including passages for receiving the proximal ends of said cable sheaths, said cable sheaths each having stop means for limiting proximal motion of said cable sheaths relative to said movable member; and



force-control spring means biasing said movable member distally on said track.

4,787,370

ATTACHMENT FOR ENDOSCOPES

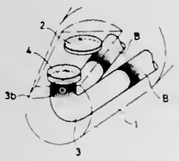
Iwao Kanamori, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 13, 1987, Ser. No. 49,322

Claims priority, application Japan, May 14, 1986, 61-72224[U]

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **11 Claims**



1. An attachment for endoscopes removably mountable to the forward end of an endoscope provided with, within the forward end thereof, an illumination optical system having a plurality of light-emitting ends arranged separately each other, in which said attachment comprises a light guide member having light-incidence end means capable of receiving lights coming from each of said plurality of light-emitting ends when the attachment is mounted to the forward end of the endoscope and having a single light-emitting end surface capable of emitting said lights having been received by said light-incidence end means toward an object under observation.

4,787,371

APPARATUS FOR THE DISINTEGRATION OF CALCULI

Franz Grasser, Eggolsheim, and Manfred Rattner, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 6, 1987, Ser. No. 70,035

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624374

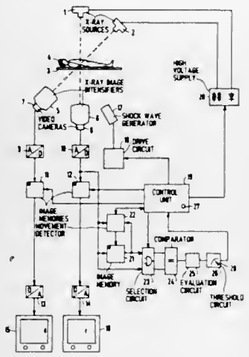
Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **9 Claims**

8. An apparatus for disintegrating calculi subject to movement in the body of an examination subject comprising:
means for generating a plurality of successive images of a region of said examination subject in which said calculi are disposed;
triggerable means for directing shock waves at said calculi for disintegration thereof;
means for detecting one of said images in which said calculi exhibit a phase of minimal movement;
means for storing said one of said images;

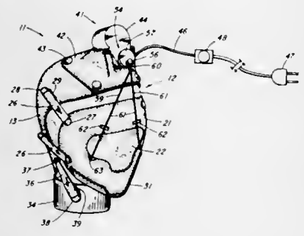
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means for comparing a remainder of said successive images to said one of said images; and



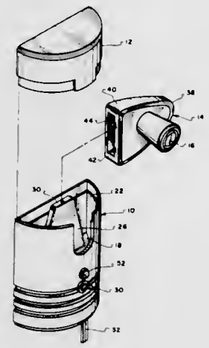
means for triggering said means for directing shock waves based on a result of the comparison in said means for comparing.

4,787,372
MASSAGING HEAD AND FACE MASK
Keith Y. Ramseyer, P.O. Box 409, Magalia, Calif. 95954
Filed Oct. 23, 1987, Ser. No. 111,747
Int. Cl.[4] A61H *1/00*
U.S. Cl. 128—24 R **8 Claims**



1. A massaging head and face mask comprising:
a. a posterior carapace having a rearward portion shaped to cover the back of a human head and a forward portion shaped to cover the top of a human head;
b. an anterior carapace shaped to cover the forehead, jaw and chin but leaving the eyes, nose and upper lip uncovered;
c. a tether anchored at opposite ends to opposite sides of said anterior carapace, said tether including a bight extending upwardly toward said forward portion of said posterior carapace;
d. an electric motor mounted on said forward portion of said posterior carapace;
e. means interconnecting said motor and said bight for reciprocating said tether, said posterior carapace and said anterior carapace during operation of said motor; and,
f. elastic means for positioning said carapaces on the head, the reciprocation of said tether and said carapaces being yieldably resisted by said elastic means.

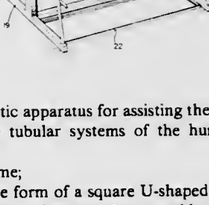
4,787,373
FACIAL IRONER
Peter Vogel, 125 Auburn Ct., Ste. 200, Westlake Village, Calif. 91361
Filed Jun. 15, 1987, Ser. No. 62,017
Int. Cl.[4] A61H *21/00*
U.S. Cl. 128—24.1 **7 Claims**



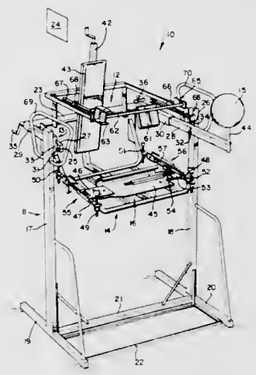
1. Facial Ironer apparatus comprising:
a housing;
a heating element having a base and a head and positioned in said housing;
electrical cord means connecting the apparatus to a source of electricity;
thermostatic switch means attached to said housing and interconnecting said cord means and said base of said heating element for keeping said heating element at a predetermined temperature;
a facial ironer separate from and demountably attached to said head of said heating element;
said facial ironer further comprising:
a soleplate having a top, a bottom and a slotted butt end;
said soleplate being sufficiently hollow for closely fitting over said head of said heating element through said slotted end;
said soleplate being heated by said heating element when said heating element is heated by the flow of electricity from said electrical cord means;
thermally insulated handle means for attachment to said top of said soleplate for manipulating said bottom of said ironer over the skin of the subject.

4,787,374
LIQUID APPLICATOR DEVICE HAVING CAVITIES TO RETAIN DROP OF LIQUID
James B. DeYarman, 990 Highland Rd., #310, Solana Beach, Calif. 92075
Continuation of Ser. No. 867,757, May 29, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 175,599
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—65 **7 Claims**

1. An applicator for applying, spreading and penetrating a liquid composition into the skin comprising a flexible base member for being held in a user's hand having a planar top surface, and a plurality of first and second protuberances of substantially equal length integral with and extending from said top surface, said first protuberances having a non-suction forming cavity of circular cross-section having a depth of between about 1 and 2 mm and a diameter of between about 10 and 15 mm whereby said cavity is capable of holding and retaining a drop of said liquid composition when said applicator is held with said cup upside down, said combined depth and diameter dimensions of said cavity providing means for allowing skin of a user to project into said cavity to remove substantially all of said liquid composition therefrom, said second protuberances having a convex surface of circular cross-section, said first and second protuberances being alternately arranged on said top surface whereby at least one second protuberance is immediately adjacent each of said first protuberances.

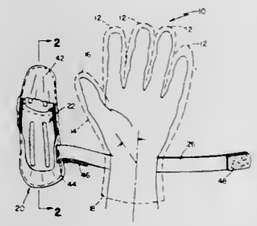


4,787,375
THERAPEUTIC APPARATUS
Nicolaas J. P. R. Krause, P.O. Box 3386, Kenmare, Krugersdorp, 1745, South Africa
Filed Jul. 2, 1986, Ser. No. 881,248
Claims priority, application South Africa, Jul. 2, 1985, 85/4992
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—70 **3 Claims**



1. A therapeutic apparatus for assisting the movement of the contents of the tubular systems of the human body which includes:
a support frame;
a cradle in the form of a square U-shaped bracket mounted on the support frame to be rotatable in a substantially vertical plane on the support frame so that the plane of rotation of the cradle coincides with the sagittal plane of a user of the apparatus;
a seat mounted on the cradle to be movably adjustable relative to the cradle;
a counterbalance adjustably secured to the cradle for adjusting the centre of gravity of the seat and cradle of the apparatus before use; and
securing means mounted on the seat to secure a user in position on the seat at or near the user's groin region, wherein the cradle is movably adjustable relative to the rotatable mounting by means of telescoping arms provided on the limbs of the bracket.

4,787,376
RETAINER FOR GLOVE
Joel H. Eisenberg, 410 Morehouse Rd., Easton, Conn. 06612, assignor to Joel H. Eisenberg, Easton, Conn.
Filed Mar. 3, 1987, Ser. No. 21,172
Int. Cl.[4] A61F *5/10*
U.S. Cl. 128—77 **3 Claims**



1. In combination, a glove having a thumb pocket and a removable retainer for selective use with the thumb pocket of said glove to prevent injury to the ulnar collateral ligament of the thumb of the glove's user, said retainer comprising:
a trough, said trough comprising a first part and a second part, said parts being connected together by a hinge which allows said first part to move only in an ulnar direction with respect to said second section when said retainer is in place
said trough extending from the tip of the thumb portion of the glove to the wrist area and being generally inflexible in the radial direction when said retainer is in place on the thumb portion of the glove,
said trough having a hollow section extending substantially its entire length, is hollow section adapted to fit partially around the radial side of the thumb pocket of the glove when said retainer is in place,
a covering,
said covering being disposed around said trough opposite said hollow section,
a pocket,
said pocket being connected to said covering at an end of said trough and extending over the adjacent portion of said hollow section leaving a space therebetween, said pocket being adapted to receive the tip of the thumb pocket of the glove when said retainer is in place, and
a means for securing and unsecuring said retainer to the glove, said means for securing consisting of means designed and intended to be repeatedly removed and replaced at will and with minimal effort whereby when said means for securing is released, said retainer can be separated from the glove.

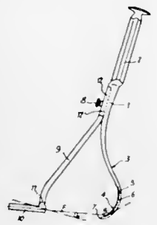
4,787,377
SURGICAL INSTRUMENT FOR POSITIONING AND INSERTION OF POSTERIOR CRUCIATE LIGAMENT OF THE KNEE IN PLASTY (OR PROSTHETIC REPLACEMENT)
Jacques-Philippe Laboureau, 24, rue de la Fontaine Billenois, 21000 Dijon, France
Filed May 6, 1987, Ser. No. 47,858
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 VD **7 Claims**

1. Surgical instrument for positioning and insertion for plasty (or prosthetic replacement) of the posterior cruciate ligament of the knee enabling this surgery to be carried out by a medial anterior approach, whilst obtaining an anatomical point of penetration of the aforementioned PCL at the parapatellar aspect of the tibia and avoiding any damage to the posterior elements, notably vascular, the surgical instrument comprising:

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a chisel composed of a handle and a blade in the shape of an italic 'S' and having an internal terminal part that is concave, so that the aforesaid blade can be introduced across the femoral notch up to the posterior face of the tibia; and

a guide support rigidly anchored on the chisel and which includes at its extremity a double branch guide, adapted



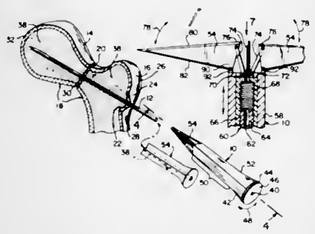
for guiding the placement of drills into the tibial section, the angle between the axis of the guide and the tangent at the internal face of the concave part of the blade being greater than 90 degrees, thus permitting the simultaneous insertion of the two postero-internal and postero-external parts of the posterior cruciate ligament.

4,787,378

SELF-RETAINING NAIL FOR FRACTURE OF NECK OF FEMUR

Jitendra S. Sodhi, Manhattan Ville Station, Box 3227, New York, N.Y. 10027

Filed Sep. 8, 1986, Ser. No. 906,340
Int. Cl.[4] A61M *37/00*
U.S. Cl. 128—92 YW **8 Claims**



1. A self-retaining nail intended for repairing a fractured neck of a femur comprising:

(a) a housing;

(b) a plurality of blades each sharpened on two opposite edges and rotatively mounted on said housing; and

(c) means contained within said housing for adjusting the rotative position of said blades with respect to said housing after said self retaining nail has been inserted into said femur to be repaired, whereby said blades may cut through spongy bone tissue contained within said femur and draw the fracture neck of said femur together; wherein said nail has an axial passageway through its entire length which co-operates with a skewer so that said skewer may act as a pilot device for positioning said nail into a correct position in said femur, and wherein said nail has a regular polygon cross sectional shape so as to prevent said nail from rotating in a properly prepared opening in said femur.

7. A method for repairing a fractured neck of a broken femur comprising:

(a) piercing the surface near the greater trochanter of said femur with an appropriate guide skewer passing therethrough;

(b) driving said skewer through said fractured neck and into the head portion of said broken femur;

(c) aligning a cooperative punch over said skewer;

(d) guiding said cooperative punch through the surface of said femur and punching out a triangular shaped opening;

(e) withdrawing said cooperative punch;

(f) aligning a cooperative self-retaining nail over said skewer;

(g) guiding said cooperative self-retaining nail through the opening punched, out by said punch through said fractured neck, and into the head portion of said broken femur;

(h) withdrawing said appropriate guide skewer;

(i) causing blades attached to said self-retaining nail to spread apart, whereby said fractured in said neck of said broken femur is drawn together; and

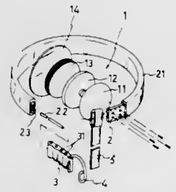
(j) allowing sufficient time for the fracture to unite.

4,787,379

HERNIA HEALING TRUSS

Bo-Wung Yeh, No. 14, Lane 200, Guaang Dung Road, Ping Dung City, Taiwan

Filed Apr. 24, 1987, Ser. No. 42,443
Int. Cl.[4] A61F *5/24*
U.S. Cl. 128—95.1 **4 Claims**



1. A hernia healing truss for use by a patient, comprising:

belt means for coupling and positionally locating said truss on said patient, said belt means including a flexible metal spring extending longitudinally through a substantial portion thereof; said flexible metal spring being overlaid by (1) a first covering layer formed of a soft leather composition, and (2) a second covering layer formed of a cotton textile composition, said belt means further including an elastic band member of predetermined length coupled to said flexible metal spring and having a plurality of compartments disposed along said length for receiving a coupling hook member;

a coupling hook member engaging one of said compartments

first buckle means coupled to said flexible metal spring for (1) applying pressure to a first hernia site, and (2) receiving said coupling hook member for forming a releasable coupling therewith, said first buckle means including a pad member which comprises a sponge member covered by a soft cloth member, said pad member being fixedly coupled to a fixing plate member, said fixing plate member being covered by a hood member and fixedly coupled to said flexible metal spring; and,

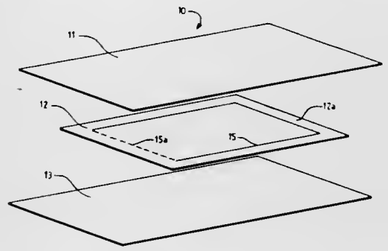
a wrapping belt member formed of a soft cloth material composition and being positionally located adjacent said first buckle means for binding to said patients legs and waist.

4,787,380

DELIVERY SYSTEM AND PACKAGE FOR A SELF ADHERING POLYMER MEDICAL DRESSING

David F. Scott, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 28, 1987, Ser. No. 90,497
Int. Cl.[4] A61L *15/00*
U.S. Cl. 128—156 **8 Claims**



1. A delivery system and package for a self adhering polymer medical dressing for application over parts of biological subjects comprising:

a film backing sheet having a subject facing surface and an opposite outward surface defined by an edge and including a dressing demarcated by being substantially cut out of said film backing sheet and said dressing designed for application to a selected part of the biological subject;

a film carrier shaped substantially the same as said film backing sheet and attached directly to at least one part of said film backing sheet along said opposite outward surface near the edge, said film carrier being a protective support for said film backing sheet aiding handling of said film backing sheet during application of said dressing to the selected part of the biological subject, said film carrier secured to said film backing sheet and removable therefrom after said dressing is applied to the biological subject;

an adhesive coating covering said subject facing surface of said film backing sheet for adhering to said subject facing surface so that said film backing sheet is sandwiched between said film sheet carrier and said adhesive coating whereby said adhesive coating on said dressing holds said dressing to the selected part of the biological subject as said dressing and film backing sheet are separated, said dressing being adhesively held to the selected part of the biological subject by said adhesive coating with greater adhesive strength than the connection of said demarcation between said dressing and the attachment near the edge of said film backing sheet; and

a release sheet for cooperating with said film carrier as a package member and being removably adhered to said adhesive coating prior to application to the biological subject.

4,787,381

ABDOMINAL BINDER

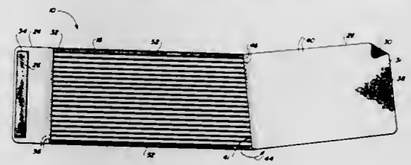
Vance M. Hubbard, Bedford, and Welton K. Brunson, both of Bedford, Tex., assignors to Tecnol, Inc., Fort Worth, Tex.

Filed Jan. 21, 1986, Ser. No. 820,000
Int. Cl.[4] A61P *5/04*
U.S. Cl. 128—157 **8 Claims**

1. A body wrap securable around the body of a person, comprising:

a rectangular shaped stretchable panel section wrappable at least partially around the person for securement thereof, said panel including a plurality of parallel spaced apart nonstretchable filaments extending parallel to the shorter length of said rectangle;

a plurality of elongate spaced apart unidirectionally stretchable sections woven about said filaments and extending transverse to said filaments, said sections alternating with a plurality of parallel elongate spaces, each said nonstretchable filament crossing said spaces, each said space divided into a plurality of rectangular apertures by said filaments, each rectangular aperture unidirectionally stretchable in a direction parallel to the longer length of said rectangle, each rectangular aperture increasing in area when stretched in a direction parallel to the longer



length of said rectangle, to allow the observation of parts of said body therebeneath;

a first section integral with one side edge of said panel and including a plurality of loops distributed over one entire surface thereof;

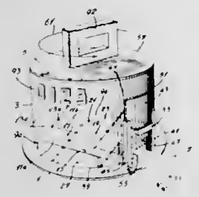
a second section integral with an opposing side edge of said panel and including a plurality of elements engageable with said loops of said first section to thereby fasten said wrap secured in a stretched condition around the person.

4,787,382

APPARATUS FOR ANAESTHETIZING AN ANIMAL

Drasko D. Pekovic, Dollard-des-Ormeaux, Canada, assignor to Soficorp Scientifique Inc., Dollard-des-Ormeaux, France

Filed Jul. 24, 1987, Ser. No. 77,460
Int. Cl.[4] A62B *18/06*
U.S. Cl. 128—203.25 **18 Claims**



1. An apparatus for anaesthetizing an animal and enabling the latter to undergo surgery or the like, comprising

a base on which said animal is placed before being anaesthetized,

a hollow bell type enclosure to be disposed over said base with said animal bound therewith,

means defining a supply for an anaesthetic substance to be introduced into said enclosure for anaesthetizing said animal,

control means enabling to introduce said anaesthetic substance into said enclosure when said animal is to be anaesthetized and to stop said introduction when said anaesthetic substance is no longer required,

opening means provided in said enclosure enabling to place said animal with its head inside said enclosure to keep it under anaesthetic conditions while its body lies outside said enclosure where a surgical operation or the like can take place.

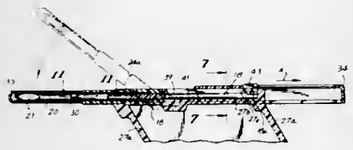
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,383
PROSTHETIC KNEE IMPLANTATION
Robert V. Kenna, Hackensack, N.J., assignor to Howmedica, Inc., N.Y.
Divisioo of Ser. No. 811,020, Dec. 19, 1985, Pat. No. 4,646,729, which is a cootinuation of Ser. No. 350,013, Feb. 18, 1982, abandoned. This application Jan. 16, 1987, Ser. No. 4,128
Int. Cl.[4] A61B *17/00;* A61F *5/04*
U.S. Cl. 128—303 R 2 Claims



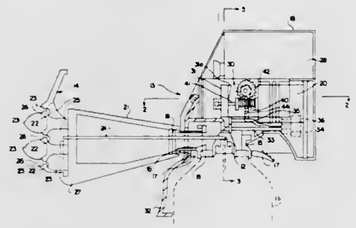
1. A tibial positioning/fixation jig comprising a plate having a substantial area of its lower surface being planar, a pair of spaced parallel tabs extending downwardly below said planar surface, an osteotome cut-out extending through said plate, an inclined drill hole extending through said plate on each side of said cut-out, a block connected to said plate, a pair of inclined vertical alignment pin holes extending through said block, and a pair of horizontally disposed adjustably movable rods extending through said block.

4,787,384
ANIMAL MARKER IMPLANTING SYSTEM
Neil E. Campbell, Hasbrouck Heights, and Chinsoo Park, Rutherford, both of N.J., assignors to Bio Medic Data System, Inc., Maywood, N.J.
Filed Oct. 6, 1986, Ser. No. 919,152
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—330 16 Claims



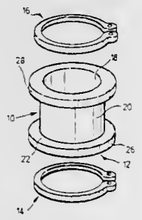
1. An apparatus for implanting a marker in an animal comprising; a hollow tubular means having an entrance opening and an exit opening, a sharp edge formed at the exit opening, support means configured to permit said tubular means to be releasably mounted in said support means, said support means includes a housing and a chamber in said housing, said chamber being adapted to receive said tubular means, and a cover slideably mounted to said housing and adapted to be disposed between a first position in which said tubular means can be inserted into said chamber and a second position wherein said tubular means is maintained securely within said chamber and projects from said housing; and a plunger means, slidably disposed between a first position and a second position, said plunger means cooperatively supported by said housing and adapted to enter said tubular means when said tubular means is maintained securely in said housing and is displaced from a first position to a second position and to engage said marker of said tubular means for ejecting said marker through said exit opening in response to said plunger means being coordinately displaced from said first position to said second position.

4,787,385
METHOD AND APPARATUS FOR FREEZE BRANDING AND DEHORNING
Joseph Pfistershammer, 22, 11-19 Stirling Road, Claremont, Australia
Filed Jan. 13, 1987, Ser. No. 15,777 Continuation of PCT AU 86/00127 filed May 7, 1986 published as WO 86/06583 on Nov. 20, 1986.
Claims priority, application Australia, May 14, 1985, PH00551
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 14 Claims



1. A freeze branding and/or dehorning apparatus for use with a dispenser having a nozzle for dispensing a cooling medium, said apparatus comprising a contact element comprising a delivery zone formed with an open face which is to be applied to an animal's hide or horn bud, the perimeter of the open face of the delivery zone is defined by a sharp raised serrated lip, a support for said contact element, said support being receivable on the dispenser such that the contact element is opposed to said nozzle and said nozzle is adapted to deliver the cooling medium to the delivery zone of the contact element wherein the contact element is supported by said support by a pivotable means enabling movement of the nozzle transversely to an axis extending between the nozzle and the contact element.

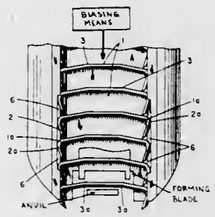
4,787,386
ANASTOMOSIS DEVICES, AND KITS
David J. Walsh, Mississauga; William M. Lougheed, Toronto; Fred Gentili, Toronto, and Mahmood Fazl, Toronto, all of Canada, assignors to Idea Research Investment Fund, Inc., Toronto, Canada
Continuation of Ser. No. 598,900, Apr. 10, 1984, Pat. No. 4,657,019. This application Oct. 27, 1986, Ser. No. 923,490
Int. Cl.[4] A61B *17/04*
U.S. Cl. 128—334 R 7 Claims



1. An anastomosis device for non-suture, non-adhesive end-to-end connection of tubular tissue members to be anastomosed with overlapping intima to intima contact comprising:
a tubular connection member of sterilizable, biocompatible material having an inner cylindrical surface and an outer cylindrical surface,

first and second, spaced apart clip-retaining means on said outer surface,
first and second clip members, each clip member having a ring shaped body part and opposed ends separable under spring tension for temporary enlargement of the ring-shaped body part, each body part defining a substantially circular opening, the body parts of said first and second clip members being adapted to circumferentially surround said outer cylindrical surface, and apply a radially inward spring force thereon,
said opposed ends having opposed handling elements to facilitate handling of said clip members and separation of said opposed ends for temporary enlargement of the ring-shaped body parts and application of said clip members about tubular tissue applied over said outer surface of said tubular connection member with essentially radially inward application of spring force on said tissue on release of force separating said opposed ends.

4,787,387
SURGICAL CLOSURE ELEMENT
John E. Burbank, III, Ridgefield, and John R. Montgomery, Fairfield, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.
Continuation of Ser. No. 669,497, Nov. 8, 1984, abandoned. This application Mar. 13, 1987, Ser. No. 24,929
Int. Cl.[4] A61B *17/04;* F16B *35/04*
U.S. Cl. 128—334 R 4 Claims



1. An improved surgical stapler of the type having a cartridge and a handle, the cartridge, having means for forming a staple including an anvil and a forming blade, and a staple feed track movably containing a plurality of surgical staples and means for biasing the staples toward the anvil, each staple having a crown, and two opposite side legs; and the handle having means for activating said forming means, the activating means in said handle being cooperatively attached to said forming means in said cartridge, the improvement comprising in combination the distal end of each leg of a surgical staple contacting the crown of the adjacent preceding staple, each staple having at least one bend in the crown such that the distal ends of said legs of each staple in an essentially symmetrical converging relationship, and said biasing means acts only on the proximal staple, whereby the plurality of staples are self-aligning on the staple feed track.

4,787,388
METHOD FOR OPENING CONSTRICTED REGIONS IN THE CARDIOVASCULAR SYSTEM
Eugen Hofmann, Zurich, Switzerland, assignor to Schneider - Shiley AG, Zurich, Switzerland
Continuation-in-part of Ser. No. 842,562, Mar. 21, 1986, abandoned. This application Nov. 26, 1986, Ser. No. 935,467
Claims priority, application Switzerland, Nov. 29, 1985, 5108/85
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 6 Claims



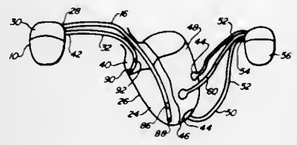
1. A method for opening a constricted region in the cardiovascular system of a patient comprising the steps of:
(a) providing a catheter comprising an elongated support tube having distal and proximal ends, a radially expandable dilatation means carried by and integrally connected to said support tube adjacent the distal end thereof, and means for expanding and contracting said dilation means, with said dilatation means comprising a plurality of dilatation elements arranged circumferentially around the support tube and each presenting a smoothly-rounded exterior surface free of sharp edges;
(b) inserting the distal end of said catheter into the cardiovascular system of the patient with said dilatation means in an unexpanded condition;
(c) advancing said catheter within said cardiovascular system until said dilatation means is situated within said constricted region;
(d) expanding the dilatation means to open the constricted region while permitting the patient's blood to flow through the expanded dilatation means, between the dilatation elements and outside the support tube;
(e) contracting the dilatation means; and
(f) withdrawing said catheter from the body of the patient.

4,787,389
USING AN IMPLANTABLE ANTITACHYCARDIA DEFIBRILLATOR CIRCUIT
Peter P. Tarjan, Miami, Fla., assignor to TNC Medical Devices Pte. Ltd., Miami, Fla.
Filed Jul. 16, 1987, Ser. No. 74,092
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 PG 15 Claims

1. Cardiac stimulation apparatus, which comprises:
an implantable cardiac pacer having an antitachycardia circuit for GM lowering a patient's electrical heart rate;
an implantable defibrillator circuit;
energy source means for said pacer and said defibrillator circuit;

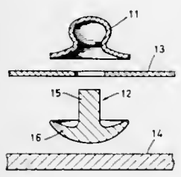
VOL 1096 ISS 5 NO 29 1988 UMI

means for coupling said energy source means to said pacer and defibrillator circuit;
first means for connecting said pacer to a patient's heart;
second means for connecting said defibrillator circuit to the patient's heart;



means coupled to the patient's heart and at least one of said circuits for sensing the patient's electrical heart rate;
switching means coupled to said first connecting means and said second connecting means, said switching means being operative for isolating the cardiac pacer from the defibrillator circuit during operation of the defibrillator circuit.

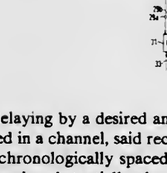
4,787,390
ELECTRODE SENSOR
Akihiko Takata, Tokyo, Japan, assignor to Scovill Japan Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 23, 1987, Ser. No. 41,437
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—641 **2 Claims**



1. An electrode sensor for use with an electrode button having an expanded hollow head forming a cavity, said sensor comprising a plastic base including a shank adapted to be clinched to fill up said cavity of said expanded hollow head of said electrode button, said base further including a base flange formed integrally with said shank, and an electrically conductive firm formed over said plastic base, said base flange having a generally smoothly recessed upper side and a bowl-shaped lower side, said lower side having a gradual upward inclination from the center thereof toward the periphery thereof, and the thickness of said base flange decreasing gradually from said center toward said periphery, said base flange having a plurality of projections formed on at least one of said upper and lower sides thereof.

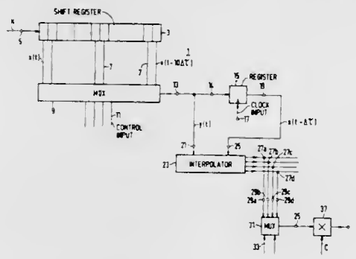
4,787,391
ANASTOMOTIC MARKING DEVICE AND RELATED METHOD
John A. Elefteriades, 503 Emerson Dr., Branford, Conn. 06405
Continuation of Ser. No. 745,667, Jnn. 17, 1985, abandoned.
This application Aug. 11, 1987, Ser. No. 85,249
Int. Cl.[4] A61B *6/00, 17/11*
U.S. Cl. 128—654 **7 Claims**

1. A sutureless, anastomotic marking device for the fluoroscopic localization of coronary grafts, said device comprising:
a sheet of flexible, hemostatic microfibrillar collagen, said hemostatic microfibrillar collagen being of the general type that dissolves after being in contact with body fluids for a period of time, said sheet having a first and second surface;
said sheet having an inner edge and defining a centrally located opening through the sheet for accommodating a coronary artery bypass graft passing therethrough, said opening having a diameter substantially equal to the diameter of said coronary artery bypass graft, said sheet further having an outer edge concentric.with said central opening and defining an annular surface on said sheet first and second surface between said opening and said outer edge,
said sheet having a plurality of means defining a slit extending radially outward for some distance from said opening



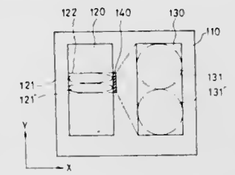
in said sheet, said sheet having a number of said radial slits to facilitate the encirclement of said sheet around said bypass graft, and wherein one of said slits extends fully from said opening in said sheet to the outer edge of said sheet so that said sheet may be separated at said fully extended slit to allow the sheet to be placed about the bypass graft,
a number of radiopaque indicators circumferentially arranged on one of said first and second surfaces, each of said indicators having a surface area substantially less than the annular surface area of said sheet, and
means for attaching said radiopaque indicators to said one surface of said hemostatic sheet.

4,787,392
METHOD AND APPARATUS FOR DIGITAL DELAY OF ULTRASOUND SIGNALS UPON RECEPTION THEREOF
Ulrich Saugeon, Nuremburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 6, 1987, Ser. No. 46,512
Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616498
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—661.01 **16 Claims**



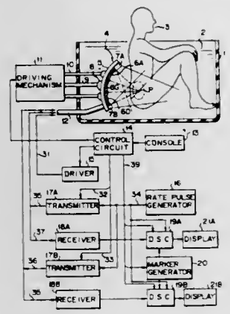
1. A method for delaying by a desired amount digital ultrasound signals received in a channel, said received digital ultrasound signals being chronologically spaced in a series, which chronological spacing is substantially the same as a sample period according to a clock signal, said method comprising the steps of:
digitally delaying a first received ultrasound signal by a selected delay which is an integer multiple of said sample period;
digitally forming a plurality of interpolated signals from said delayed first received ultrasound signal and from a next successively delayed received ultrasound signal in said series; and
selecting for further processing one among said delayed ultrasound signals and said plurality of interpolated signals which has a delay closest to said desired amount.

4,787,393
ULTRASONIC TOMOGRAPHIC WITH ALTERNATE IMAGE SCALING
Hiroshi Fukukita, Tokyo; Shinichiro Ueno, Machida, and Tsutomu Yano, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 20, 1986, Ser. No. 932,828
Claims priority, application Japan, Nov. 20, 1985, 60-260027; Apr. 1, 1986, 61-74769; Apr. 2, 1986, 61-75705
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.04 **5 Claims**



1. An ultrasonic tomograph comprising:
(1) display means, having two display areas for respectively simultaneous displaying a first and a second tomographic image;
(2) display marker producing means for producing a display marker which can be moved on said display area of said first tomographic image for designating an area of said first tomographic image to be displayed as said second tomographic image;
(3) ultrasonic transducer means, for emitting ultrasonic waves to an object to be examined in a sector scanning mode, and for receiving reflected ultrasonic waves which have been reflected from said object;
(4) driving means for driving said ultrasonic transducer means at first and second scanning angles, respectively corresponding to angles to produce said first and second tomographic images;
(5) angle detection means for detecting an angle of said ultrasonic transducer means and for producing an angle information signal indicative thereof;
(6) imaging means for converting said reflected ultrasonic waves from said object of said ultrasonic transducer into image signals;
(7) address conversion means for compressing said angle information data corresponding to said first tomographic image at a first ratio; and
(8) memory means, for storing data to display means, said memory means storing: (a) said image data corresponding to said first tomographic image by using said compressed angle information data corresponding to said first tomographic image in a first part thereof, and (b) said image data corresponding to said second tomographic image by using said angle information data not compressed by said address conversion means in a second part thereof.

4,787,394
ULTRASOUND THERAPY APPARATUS
Ichiro Ogura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 23, 1987, Ser. No. 41,423
Claims priority, application Japan, Apr. 24, 1986, 61-95416
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.03 **6 Claims**



1. An ultrasound therapy apparatus for a treating of an object within a patient, said apparatus comprising:
at least one ultrasonic beam emitter means for emitting an ultrasonic beam onto the object;
at least two ultrasonic transducer means for applying ultrasonic beams to the patient, and detecting ultrasonic echoes coming from the patient;
support means supporting said ultrasonic beam emitter and said ultrasonic transducers in a specific positional relationship;
means for mechanically driving said support means such that the beam emitted from said ultrasonic beam emitter means is focused at a given position within the patient;
means for supplying drive signals to said ultrasonic beam emitter means;
signal-receiving means for receiving echo signals corresponding to the ultrasonic echoes detected by said ultrasonic transducer means;
means for forming first and second tomograms in accordance with the echo signals supplied from said signal-receiving means, each tomogram being of a selected plane of the patient, one plane intersecting with the other on a line which passes through a region in which the beam emitted by said ultrasonic beam emitter means is focused; and
display means for displaying the first and second tomograms, for displaying first markers indicating a region in which the ultrasonic beam emitted by said ultrasonic beam emitter means is focused and being superposed on the first and second tomograms, and for displaying second markers representing the intersecting line of the two planes and being superposed on the first and second tomograms.

4,787,395
BLOOD FLOW MEASURING APPARATUS
Tadahiko Yanashima, Fujisawa; Shinichi Amemiya; Ikuo Watanabe, both of Yokohama, and Hirohide Miwa, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Filed Feb. 6, 1986, Ser. No. 826,704
Claims priority, application Japan, Feb. 8, 1985, 60-022909
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—661.09 **5 Claims**

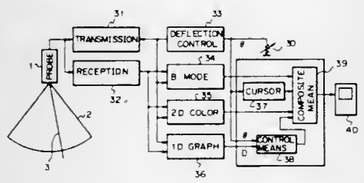
1. An improved ultrasound blood flow measuring apparatus which includes a first means for measuring in real time a two-dimensional blood sream flow velocity distribution in a region in a living body by transmission and reception of ultrasonic

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waves along a plurality of scanning lines and providing data representative thereof, and a second means for measuring a one-dimensional blood stream flow velocity distribution of a linear region along a predetermined line from among said scanning lines in said living body region by transmission and reception of ultrasonic waves ad providing data representative thereof; the improvement comprising:

means for simultaneously displaying on a single display screen said one-dimensional and said two-dimensional blood stream data,

cursor means for displaying said predetermined line superposed on said living body region data,



wherein said second means includes a processor means and a memory means, said processor means for writing blood stream flow velocity information derived from the reception of ultrasonic waves into a picture memory as said one-dimensional flow representative data, and

said second means being adapted to measure said one-dimensional blood stream flow velocity distribution along said predetermined line for a first number of times per scan, said first means being adapted to measure said two-dimensional blood stream velocity distribution for a second number of times per scan line of said distribution, per scan, said first number being larger than said second number.

4,787,396

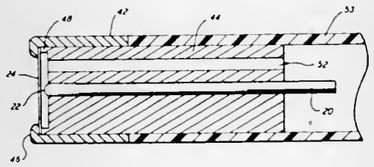
FIBEROPTIC PRESSURE TRANSDUCER

John Pidorenko, Ypsilanti, Mich., assignor to Fiberoptic Sensor Technologies, Inc., Ann Arbor, Mich.

Filed Jun. 18, 1987, Ser. No. 63,411

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—667 **12 Claims**



1. A fiber optic pressure transducer comprising:

(a) light generating means;

(b) an elongated, optical fiber having a first terminal end positioned to receive light from said generating means and a second terminal end to which said light is carried through said fiber;

(c) a deformable member having a first, light reflecting surface positioned in opposed, spaced relation to said second terminal end and movable with respect thereto in accordance with the pressure exerted on the side of said deformable member opposite said first surface;

(d) a spherical lens formed integrally as a radius on said second terminal end and having a focal point positioned in predetermined relationship to said light reflecting surface, whereby light carried from said first to said second end of said fiber passes through said lens and impinges on said light reflecting surface and at least a portion of said light reflected by said surface passes back through said lens and fiber and out of said first end thereof; and

(e) means for generating an electrical signal commensurate with the intensity of light passing out of said first end, said intensity being a function of the distance between said lens and said light reflecting surface and thereby of said pressure exerted on said opposite side of said deformable member.

4,787,397

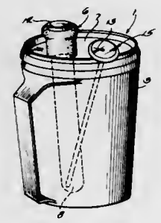
HOT AND COLD SENSOR DISCRIMINATION UNIT

Peer Lindemann, West Bend, and Robert R. Ungemach, Brown Deer, both of Wis., assignors to Smith & Nephew Rolyan, Inc., Menomonee Falls, Wis.

Filed Jun. 11, 1987, Ser. No. 60,463

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—742 **11 Claims**



1. A diagnostic tool in the form of a kit for perception of temperatures on a sensory surface of the body, comprising:

an insulated container having a top and containing a liquid of predetermined temperature;

a cover fastened to the top of said container and forming perforations therethrough;

at least one probe extending through a perforation in said cover and into the liquid in said container;

a thermometer extending through another of the perforations of said cover and extending into the liquid of said container for sensing the liquid temperature,

said probe including a metallic tube having an open top and a closed sensory end,

means defining an opening extending from the top of the tube to the closed sensory end,

a thermometer received in said tube opening and extending to the sensory end for sensing temperature of the tube, and a cap on the top of said probe providing a handle for holding said probe.

4,787,398

GLUCOSE MEDICAL MONITORING SYSTEM

Fernando S. Garcia; Hartmut G. Merkert; Paul J. Anderson; David E. Linde, and Bertram J. Hudson, all of Eden Prairie, Minn., assignors to Garid, Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 744,539, Jun. 14, 1985, Pat. No. 4,637,403, which is a continuation-in-part of Ser. No. 720,906, Apr. 8, 1985, Pat. No. 4,627,445. This application Jul. 25, 1986, Ser. No. 889,185

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] A61B *5/14*

U.S. Cl. 128—770 **26 Claims**

1. A disposable diagnostic lancet reagent unit for operative engagement with a glucose medical monitoring diagnostic system, said system including a hammer means, said disposable unit comprising:

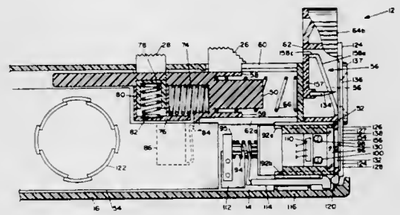
a. a housing;

b. means for operatively connecting said unit to said system;

c. puncturing means supported within said housing and aligned to be actuated by the hammer means and driven from within said housing through a first opening therethrough to puncture a surface adjacent said housing and cause a flow of liquid from said punctured surface;

c. blood reagent chemistry means supported within said housing;

d. fluid transporting means including said first opening in



said housing for transporting a liquid substance flowing from said punctured surface to said reagent means;

e. at least one opening in said housing for providing a liquid substance to said reagent means; and,

f. aperture means through said housing adjacent said system positioned to pass light from at least a portion of said reagent means in said diagnostic unit to a sensing means in said system for a determination of color change of said reagent means by the system whereby said color change indicates a diagnostic condition.

4,787,399

REMOTE CONTROLLED CATHETER GUIDE

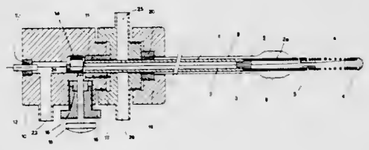
Philippe Bonello, Geneva, and Maurice Jeanmonod, Meyrin, both of Switzerland, assignors to Sarcem S.A., Meyrin, Switzerland

Filed Jul. 1, 1987, Ser. No. 69,532

Claims priority, application Switzerland, Jul. 29, 1986, 3146/86

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—772 **6 Claims**



1. In a remote controlled catheter-guide comprising a thin and flexible tube, one end of which is fixed to a head and the other end of which is removably fixed to a control unit, said head comprising a coil spring secured at one end to said flexible tube and closed at its other end, said spring having spaced coils at least in its central zone, and an operating member sliding in the control unit and connected to an eccentric point of said closed end of said head by a flexible traction member; the improvement in which the end of the tube that carries the head is comprised by a coil spring having abutting coils covered by a fluid-tight casing, an inflatable microballoon surrounding said casing, and a duct connecting said microballoon to a channel in the control unit for the introduction of a fluid into the microballoon to inflate the microballoon.

4,787,400

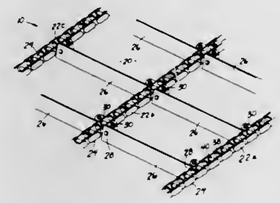
COMBINE CONVEYOR

Dale R. Tanis, Naperville, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Sep. 28, 1987, Ser. No. 101,499

Int. Cl.[4] A01F *7/00*

U.S. Cl. 130—27 T **20 Claims**



1. In a combine conveyor of the type having a conveyor surface, at least two chains having parallel reaches along the surface, elongated carriers extending across the surface and means securing opposite ends thereof with respect to the chains, the improvement comprising:

resiliently deformable slats as the carriers; and

the securing means including means allowing adjustment of position and orientation of the ends,

whereby the carriers can respond to loads, forces and obstacles without damage to the conveyor.

4,787,401

SCULPTURED CIGARETTE

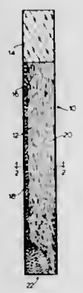
Warren A. Brackmann, Mississauga, Canada, assignor to Rothmans of Pall Mall Limited, North York, Canada

Filed Nov. 26, 1986, Ser. No. 935,215

Claims priority, application United Kingdom, Dec. 4, 1985, 8529851

Int. Cl.[4] A24D *1/00*; **A24F** *1/00*; **A24C** *5/14, 5/39*

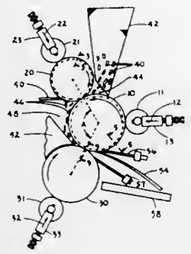
U.S. Cl. 131—360 **7 Claims**



1. A novel cigarette having a tobacco filler rod in a paper tube, comprising a first blend of shredded tobacco lamina material having a first flavour/tar ratio in a strip within the cross-section of the rod, a second bland of shreded tobacco lamina material having a higher flavour/tar ratio than said first blend provided in a strip to one side of the cross-section of said rod, and a lighting end having a higher proportion of said higher flavour/tar ratio tobacco in the cross-section of said rod than in the cross-section of said rod other than at said lighting end.

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4,787,402
PROCESS AND APPARATUS FOR PROVIDING ROLL RECONSTITUTED TOBACCO MATERIAL
Gerard E. Leonard, Kernersville, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Feb. 3, 1986, Ser. No. 825,177
Int. Cl.[4] A24B 3/14
U.S. Cl. 131—370 42 Claims

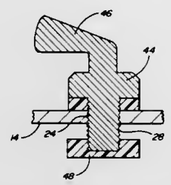


1. A process for providing reclaimed tobacco material in sheet-like form, said process comprising the steps in combination (a) providing tobacco material including tobacco leaf stem material, the tobacco material having a moisture content less than about 30 weight percent, and then (b) passing the tobacco material through the nip of a first pressurized roller system having two rollers exhibiting a nip zone pressure sufficient to provide compression of said tobacco material thereby providing compressed, admixed tobacco material, wherein at least one of the roller faces comprises a series of grooves, which series extends longitudinally along the roller and each groove extends about the periphery of the roller, wherein each groove has a maximum width near the surface of the roller and a minimum width near the bottom of the groove, wherein each of the grooves has a maximum width and depth which is smaller than the length and/or diameter of tobacco leaf stem material, and wherein the tobacco leaf stem material is employed in a structural strength providing amount, and then (c) forming under pressure reclaimed tobacco material in sheet-like form by passing the compressed, admixed tobacco material through the nip of a second pressurized roller system having two rollers exhibiting a nip zone pressure sufficient to provide the reclaimed tobacco material, wherein the roller faces of the rollers are positioned in a spaced apart relationship in the region along the rollers where the reclaimed tobacco material is formed, and wherein the spaced apart relationship between the faces of the rollers provides a sufficient distance therebetween to provide formed sheet-like reclaimed tobacco material.

4,787,403
DENTAL FLOSS HOLDER
Koo-Chun Chen, 1775 Hammond Ct., Bloomfield Hills, Mich. 48013
Continuation-in-part of Ser. No. 10,402, Feb. 3, 1987. This application Jul. 2, 1987, Ser. No. 52,992
Int. Cl.[4] A61C 15/00
U.S. Cl. 132—327 8 Claims

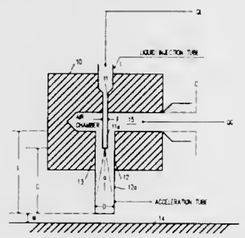
1. In a device for supporting a strand of dental floss under tension and allowing manipulation of the floss for use in cleaning teeth, of the type comprising an elongated handle member having a pair of relatively short tines extending from a common base rigidly connected to one end of the handle and diverging outwardly from the handle at an acute angle relative to one another to form free ends, and notches formed on outer sides of the tines adjacent to their free ends for supporting the strand of dental floss tautly between the tines, the improvement comprising:

threaded fastener means engaged with said base including a serrated thumbscrew and being rotatably supported with respect to said base for movement between an unlocked position wherein said thumbscrew is spaced from a surface of the base, and a locked position wherein said thumbscrew is in registry with the surface of the base to lock the strand of dental floss between said thumbscrew and said base, said fastener means including means forming a



threaded hole extending through the base in a direction transverse to a longitudinal axis of the handle and a threaded post having two ends, said thumbscrew being disposed at a first of said ends and a head being disposed at a second of said ends, said post being rotatingly engageable with said hole, such that one of the head and the thumbscrew is in registry with the base and the other of the head and the thumbscrew is spaced from the base.

4,787,404
LOW FLOW RATE-LOW PRESSURE ATOMIZER DEVICE
Donald H. Klosterman, Morgan Hill; Sofia M. Laskowski, Mountain View, both of Calif.; Scott V. Knee, Minneapolis, Minn., and Shei-Kung Shi, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 12, 1987, Ser. No. 61,840
Int. Cl.[4] B08B 3/02, 5/02
U.S. Cl. 134—198 5 Claims



1. A low flow rate atomizer device for cleaning a surface, comprising:

a first tube through which a cleaning liquid is injectable at a pressure of between 20 and 50 psi;

a second tube coaxially aligned with and surrounding a portion of said first tube with radial clearance and cooperating therewith to define a venturi throat; the length of said second tube being at least five times its inner diameter, and the diameter of the chamber adjacent the inlet end of said throat being at least 2.5 times the inner diameter of said second tube and the distance from the exit end of said second tube to the surface being less than four times the inner diameter of said second tube; and

housing means supporting said first and second tubes and providing a chamber adjacent the inlet end of said throat for receiving a pressurized dry gas at a pressure between 15 and 100 psi;

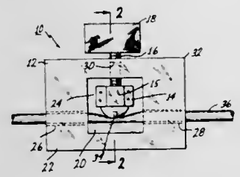
thereby to reduce the volumetric flow rate of the liquid to less than 1/1000 that of the gas and accelerate said gas to substantially sonic velocity and cause it to break up said liquid into small droplets and accelerate said droplets to at least half the velocity of said gas upon exiting said second tube to create shear stress at the surface for removing matter therefrom.

4,787,405
CONVERTIBLE CRUTCH
Daniel E. Karwoski, 4149 Georgian Dr., Ferndale, Wash. 98248
Filed Jul. 21, 1986, Ser. No. 887,526
Int. Cl.[4] A45B 3/00
U.S. Cl. 135—66 7 Claims



1. A crutch comprising an upper support section, a central support section, and a lower support section having a longitudinal axis, first means cooperating between the upper and central support sections for connecting the upper support section to the central support section and second means cooperating between the central and lower support sections for connecting the central support section to the lower support section, said central support section having a hand gripping portion intermediate the first and second connecting means, said hand gripping portion having a midpoint offset with respect to the longitudinal axis of the lower support section in a forwardly direction whereby a forward thrusting moment is created by a force applied downwardly at the midpoint of the hand gripping portion, said upper support section comprising an arm support portion spaced above said hand gripping portion, said arm support portion having a midpoint offset with respect to the longitudinal axis of the lower support section in a rearwardly direction whereby a rearward thrusting moment is created by a force applied downwardly at the midpoint of the arm support section, said upper support section being generally L-shaped, said first connecting means comprising a telescopic joint between said upper and central support sections and detent means engageable in a selected one of a plurality of apertures in one of said upper and central support sections for adjusting the distance between the arm support portion and the hand gripping portion, said first connecting means further comprising a locking collar means for frictionally locking the telescopic joint between said upper support section and said central support section, said second connecting means comprising a sleeve threadably connecting the central support section with the lower support section, whereby said upper support section is connectable to said lower support section whereby said crutch is adapted to be converted into a cane by removal of said central support section.

4,787,406
FLUID FLOW CONTROL CLAMP AND METHOD FOR USING SAME
Fred Edwards, Orange, and Eric Barr, Santa Ana, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.
Filed Sep. 21, 1987, Ser. No. 98,844
Int. Cl.[4] F16L 55/14; F16K 7/06
U.S. Cl. 137—1 21 Claims

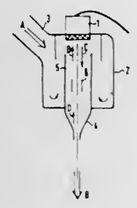


1. A clamp apparatus for precisely controlling and metering the flow of fluid through a flexible conduit, comprising:

(a) a resilient pad adapted to aid in partially occluding or completely occluding said conduit; and

(b) a rigid force means structured to be moved to partially occlude a plurality of positions to maintain said flexible conduit in a plurality of different states of partial occlusion or in a state of complete occlusion, such that when said force means is activated or adjusted to various positions, said force means directly contacts said flexible conduit which in turn directly contacts and is supported by said resilient pad, and said resilient pad moves in response to said activation or adjustment of said force means, said resilient pad having sufficient rigidity to permit complete occlusion and sufficient resiliency to compress to varying degrees in response to movement of said force means towards said resilient pad, thereby permitting a continuous and wide range of small incremental adjustments in the degree of partial occlusion which in turn achieves a wide range of fluid flow rates.

4,787,407
METHOD AND APPARATUS FOR THE DETECTION OF THE FLUID LEVEL IN A TANK BEING FILLED
Johannes A. Vogel, Delft, Netherlands, assignor to Sbell Internationale Research Maatschappij B.V., The Hague, Netherlands
Filed Aug. 7, 1987, Ser. No. 82,453
Claims priority, application Netherlands, Aug. 28, 1986, 8602189
Int. Cl.[4] G01F 23/28; F16K 31/00
U.S. Cl. 137—2 27 Claims

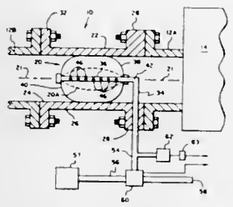


1. A method for detecting fluid level in a tank or storage container being filled, the fluid level being detected at a distance in front of the opening of a filling means, wherein an acoustic signal is passed from a transmitter through the fluid flow in the filling means and from the filling means to the fluid in the tank or storage container being filled, wherein an echo signal resulting from the reflection of the transmitted acoustic

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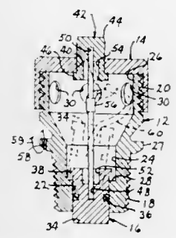
signal at the fluid surface in the tank or storage container is passed back through the fluid flow from the filling means and into the filling means to a receiver, thereby enabling the fluid level in the tank or storage container to be detected.

4,787,408
FAIL SAFE VALVE FOR AN AIR INLEAKAGE MONITORING SYSTEM IN A STEAM TURBINE
Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed May 14, 1987, Ser. No. 49,493
Int. Cl.[4] F16K *31/126*
U.S. Cl. 137—14 **6 Claims**



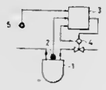
4. Method for sealing off a normally low pressure gas flow through a segment of pipe with an inflatable bladder, the bladder being selectably connected in fluid communication with either a gas source or a vent by means of a two position valve, the method comprising the steps of:
(a) securing the bladder along the interior of a tube;
(b) positioning a first end of the tube for receiving gas flow;
(c) connecting a second end of the tube to the pipe segment;
(d) positioning the valve to place the bladder in fluid communication with the gas source;
(e) inflating the bladder to a predetermined pressure which blocks relatively low pressure gas flow through the tube to the pipe segment and which permits relatively high pressure gas flow through the pipe segment; and
(f) collapsing the bladder when gas flow pressure in the tube exceeds a preselected value.

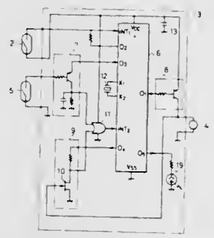
4,787,409
RUPTURE PIN VALVE SYSTEM
Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73128
Continuation-in-part of Ser. No. 931,305, Nov. 17, 1986, Pat. No. 4,724,857. This application Dec. 11, 1987, Ser. No. 131,592
Int. Cl.[4] F16K *17/40*
U.S. Cl. 137—67 **9 Claims**



1. A pressure relief valve, comprising;
a valve body having an axial bore forming an inlet port at one end and a counterbored opposite end portion and having at least one transversely apertured chord surface subtending
an arc of its periphery at its counterbored end portion; valve means slidable in the axial bore and normally closing the inlet port;
valve cap means secured to the body and axially closing the counterbore;
pin stop means axially projecting through the cap means in a direction opposite the inlet port; and,
collapsible means including an elongated rigid member axially interposed between said pin stop means and said valve means for normally maintaining said inlet port closed.

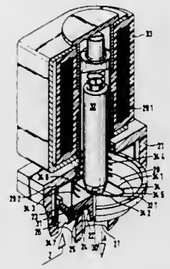
4,787,410
GAS SHUT-OFF SYSTEM
Hiroshi Fujieda, Kashihara; Tatsuo Saka, and Takashi Uno, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
PCT No. PCT/JP84/00477, § 371 Date Jun. 9, 1986, § 102(e) Date Jun. 9, 1986, PCT Pub. No. WO86/02431, PCT Pub. Date Apr. 24, 1986
PCT Filed Oct. 11, 1984, Ser. No. 878,990
Int. Cl.[4] F16K *17/36*
U.S. Cl. 137—78.4 **5 Claims**





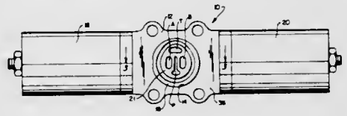
1. A gas shut-off system powered by a battery, comprising:
flow rate measuring means provided in a gas passage for measuring a gas flow rate therein to generate a signal indicative of the measured gas flow rate;
shut-off means provided in said gas passage to allow shutting off the flow of gas, said shut-off means generating a return signal when being set to the opening condition; and
a control unit coupled to said flow rate measuring means and said shut-off means and arranged to assume an operating mode and a standby mode, said control unit having mode switching means whereby said control unit is allowed to be switched from said standby mode to said operating mode and storing data representative of a proper use condition of gas, said control unit determining a use state of gas on the basis of the flow rate signal from said flow rate measuring means and further determining an abnormality when the use state departs from the proper use condition and outputting a shut-off signal to said shut-off means in response to the determination of abnormality, said control unit switching by itself to said standby mode after the output of said shut-off signal and being then switched from said standby mode to said operating mode in response to an input of said return signal to said mode switching means.

4,787,411
VALVE CONTROLLED BY THE SAME MEDIUM IT HANDLES AND ACTIVATED BY A PREFERABLY ELECTROMAGNETIC CONTROL VALVE
Hermann Moldenhauer, Dusseldorf, Fed. Rep. of Germany, assignor to Firma A. U. K. Muller GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany
Filed Dec. 10, 1987, Ser. No. 131,150
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642669
Int. Cl.[4] F15B *13/043*; F16K *31/383*
U.S. Cl. 137—244 **4 Claims**



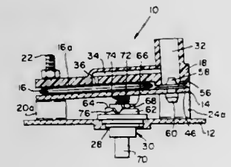
1. In a valve controllable by the medium it handles and having a valve housing, a differential piston mounted for axial movement in the valve housing a valve plate mounted on one face of the piston, a valve seat for the valve plate, means forming a pressure chamber that communicates with a valve intake between the valve seat and the valve plate, means forming a control space at the other face of the piston and that communicates with the valve outlet through a relief bore that is positioned at the axis of the differential piston, an electromagnetic control valve having a control valve plate for closing off and opening the relief bore, means forming a control bore positioned eccentrically in the differential piston and connecting the control space with the pressure member, the improvement comprising: a spring shaped from wire and inserted into the control space with an initial straight section resting against said other face of the differential piston, another straight section that extends out of the first section and rests against the inner surface of a wall of the control space that faces the differential piston, and a third straight section that extends out of the second section, through the control bore, and into the pressure chamber.

4,787,412
CARTRIDGE VALVE
Richard Wigmore, Brighton, and Michael S. Abraham, Burgess Hill, both of England, assignors to Hagglunds Denison, Columbus, Ohio
Filed Dec. 24, 1986, Ser. No. 945,807
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—454.2 **14 Claims**



1. A cartridge valve which comprises:
a valve housing having a first opening for a valve cartridge:
a valve cartridge inserted into said first opening in said valve housing having a pressure port, a tank port, a first exhaust port and a second exhaust port;
a valve element mounted in said valve cartridge movable between a first operative position, a second operative position and a third operative position;
operating means mounted in said valve housing for operating said moveable valve element from said first operative position to one of said second or said third operative positions;
spring means mounted in said valve cartridge for biasing said valve element towards said first said operative position;
said operating means including a solenoid and a unitary armature element;
said armature element including a second opening for receiving a portion of said valve cartridge; and
a portion of said valve cartridge mounted in said second opening.

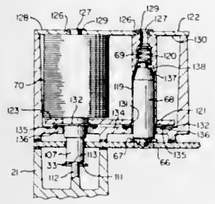
4,787,413
PRESSURE CONTROL VALVE
Michael J. Saggers, 9 Pennycroft, Harpenden, Hertfordshire, England
Filed Dec. 11, 1986, Ser. No. 940,381
Claims priority, application United Kingdom, Dec. 11, 1985, 8530515
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—494 **4 Claims**



1. A pressure control valve for adjusting the pressure of fluid flowing in a conduit comprising:
(a) first and second plates mounted together in superposed relationship on a common base;
(b) an inflatable sac interposed between said plates;
(c) a pivotal support connecting said plates together and providing pivotal movement for said first plate relative to said second plate in response to inflation and deflation of said sac;
(d) a fluid passageway incorporated in said second plate remote from said pivotal support and having an axis perpendicular to a plane containing said second plate and providing a fluid inlet for coupling to a conduit having a pressurized flowing fluid and a fluid outlet;
(e) means provided by said first plate to control fluid flow from said outlet by opening and closing said outlet in said second plate in response to pivotal movement of said first plate with respect to said second plate;
(f) a branch duct formed integrally with second plate and interconnecting said fluid passageway and said inflatable sac so that pressurized fluid from the pressurized flowing fluid can be transferred therebetween; and
(g) pressure setting control means acting on said first plate for adjusting the pivotal movement of the first plate and thereby adjusting the opening and closing of said fluid outlet to control the pressure of the pressurized flowing fluid, said pressure setting control means comprising a follower slidable with respect to a spiral cam surface, said spiral cam surface being located on a face of said common base facing said first plate, and said follower being connected to a rotatable shaft extending from the opposite face of said base wherein adjustment of the position of said follower on said spiral cam adjusts the amount said first plate is pivotable relative to said second plate.

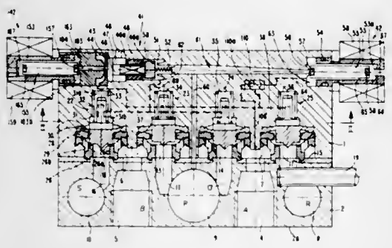
VOL 1096 ISS 5 NO 29 1988 UMI

4,787,414
FUEL CONTROL VALVE CONSTRUCTION, PARTS THEREFOR AND METHODS OF MAKING THE SAME
Kelly, Samuel T., Torrance, and Jay R. Katchka, Cypress, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 938,621, Dec. 5, 1986, Pat. No. 4,729,396. This application Aug. 20, 1987, Ser. No. 87,419
Int. Cl.[4] F16K *31/06*
U.S. Cl. 137—595 **8 Claims**



1. In the combination comprising a supporting means, electrically operated coil means carried by said supporting means, two movable plunger means carried by said supporting means in generally a side-by-side spaced apart parallel relation and being operatively associated with said coil means to be moved to certain positions thereof when said coil means is energized, and two separate valve means carried by said supporting means and respectively being operatively associated with said plunger means to be controlled thereby, the improvement wherein said coil means comprises a single coil having a portion of one of said plunger means disposed therein, the other of said plunger means being entirely external to said coil while being adapted to be operated by said coil substantially in unison with said one plunger means.

4,787,415
VALVE
Rainer Teltscher, Waagkirchen, Fed. Rep. of Germany, assignor to Concordia Fluidtechnik GmbH, Stuttgart, Fed. Rep. of Germany
Filed Sep. 23, 1987, Ser. No. 100,027
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—596.15 **6 Claims**



1. In a valve having at least one connection P for a pressure medium source and a connection A for the supply of pressure medium to a consuming device, at least one control valve element actuated by a pressure medium to provide a P/A connect/disconnect function and having a movable valve body which cooperates with a valve seat and is connected to a pressure chamber, a first servo valve element, an inverter valve element actuated by said pressure medium via said servo valve element, and an actuating piston which in a first switch position allows the pressure medium to pass from the pressure medium connection P to said pressure chamber, thus breaking the connection between the connections P and A, and in a second switch position draws off the pressure medium from the pressure chamber of said valve element, thus producing a connection between the connections P and A in which a pressure chamber of said first servo valve element is connected to the pressure chamber of said inverter valve element via a connecting channel, the improvement comprising a connecting channel between said connection A and said connecting channel leading from the pressure chamber of said first servo valve element to the pressure chamber of said inverter valve element, a second servo valve element means for drawing off the pressure medium from the pressure chamber of said inverter valve element, and means for actuating said second servo element in response to an impulse for switching said inverter valve element over to said first switch position.

4,787,416
REGULATOR MEANS FOR AUTOMATICALLY SHUTTING PIPELINE PASSAGE OFF DURING PRESSURE REDUCING FAILURE
Rong-Chao Chuang, 113 Nan-Yang Road, Nan-Tsu, Kaohsiung, Taiwan
Continuation-in-part of Ser. No. 828,740, Feb. 17, 1986, abandoned. This application Jan. 22, 1987, Ser. No. 5,933
Int. Cl.[4] F16K *31/48*
U.S. Cl. 137—624.12 **5 Claims**



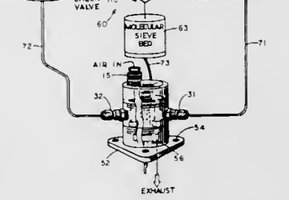
5. In a device for the regulation of the flow of a gaseous stream having a pressure condition, said device being of the type having a housing including an inlet port and an outlet port, means positioned at the inlet port being responsive to the pressure condition of the gaseous stream for preventing the flow of a gaseous stream through said inlet port, a pressure reducing valve positioned between the inlet port and the outlet port for reducing the pressure condition of and regulating the flow of the gaseous stream through the regulator, and means for selectively preventing the flow of the gaseous stream through the outlet in response to the pressure condition of the gaseous stream, the improvement thereon comprising:

the housing having an upper timing chamber and a lower pressure reducing chamber, wherein the inlet port and the outlet port are each formed in the pressure reducing chamber;

the pressure reducing valve includes an adjustable, deformable diaphragm positioned in the reducing chamber for deforming movement away from the inlet port in response to an increase in the pressure condition of the gaseous stream, means for adjusting the diaphragm to selectively increase and decrease its deformation to the pressure condition of the gaseous stream, a first shut off valve pivotably mounted in the pressure reducing chamber, said shut off valve including a rearward portion secured to the diaphragm and further including a head portion, wherein deforming movement of the diaphragm in response to an increase in the pressure condition of the gaseous stream pivots the head portion into a first position, so that said head portion contacts the inlet port, preventing the gaseous stream from entering the reducing chamber, and further wherein when the diaphragm is not deformed in response to the pressure condition of the gaseous stream, the head portion of the shut off valve is pivoted into a position spaced from the inlet port permitting the free flow of the gaseous stream through the inlet port and into the pressure reducing chamber; and a second shut off valve slidably disposed in the outlet port, said second shut off valve having a first position, wherein the second valve contacts the outlet port preventing the free flow of the gaseous stream therethrough and a second position, wherein the second valve is spaced from the outlet port, permitting the free flow of the gaseous stream from the pressure reducing chamber through the outlet port; and

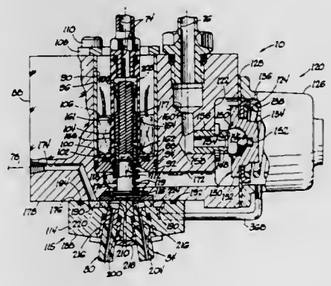
a timer having a deformable portion being operatively coupled to the second shut off valve, such that the second valve moves between its first and second positions in response thereto; and wherein the second shut off valve may move into its first position in response to the pressure condition of the gaseous stream, thereby deforming the deformable portion of the timer.

4,787,417
ROTARY PRESSURE/PURGE VALVE
John F. Windsor, Jr., 4501 Raymar Dr., Orlando, Fla. 32809
Filed Nov. 24, 1987, Ser. No. 124,568
Int. Cl.[4] F16K *11/14*
U.S. Cl. 137—624.13 **28 Claims**



1. In a rotary pressure/purge valve for supplying pulsation-free oxygen without the use of an oxygen tank, said valve comprising an air chamber section and a center section, utilized in conjunction with a source of purging air, said air chamber section having an inlet port for compressed air, said center section having a plurality of passages therein, disposed at equal intervals from each other and with respect to a centerline common to both sections, said center section and therefore said passages having first and second ends, first valve means operatively associated with said first passage ends, and serving to control the entry of charging air into two adjacent passages at the same time, and second valve means operatively associated with said second ends of said passages and serving to control the exit of purging air from said passages, said center section having a separate output port connecting to each of said passages, a shaft rotatably journaled on the centerline of said center section, with said shaft being connected to rotation producing means, said first valve means and said second valve means each having a portion that is operated by said shaft, with said first and second valve means being set out of phase such that when a first end of a given passage is closed to the entry of charging air, the other end of that passage is open to a flow of purging air, and vice versa, whereby at a given moment compressed air can flow in one direction through at least one of said first valve means and an associated passage, contemporaneously with purging air flowing in a different direction through a different one of said passages.

4,787,418
VALVE ASSEMBLY AND FUEL METERING APPARATUS
Richard Chute, Harsen's Island, Mich., assignor to Colt Industries Inc., New York, N.Y.
Filed Sep. 15, 1987, Ser. No. 96,524
Int. Cl.[4] F16K *11/04, 31/06*
U.S. Cl. 137—625.48 **4 Claims**



1. An improvement in a liquid flow valving assembly comprising valve body means, valve seating surface means carried by said body means, a plurality of passages formed through said body means, each of said plurality of passages comprising an upstream inlet end generally surrounded by said seating surface means and a downstream outlet end, a valve member, said valve member comprising a valving surface means for at times sealingly engaging said seating surface means, said valve member being movable in a first direction for causing said valving surface means to sealingly engage said seating surface means to thereby terminate flow of liquid through each of said plurality of passages, said valve member being movable in a second direction opposite to said first direction to thereby open each of said plurality of passages to the flow of said liquid therethrough, wherein said first and second directions of movement comprise a single axis of movement, stationary stem-like guide means for guiding said valve member along said single axis of movement during the time that said valve member is moving in said first direction as well as during the time that said valve member is moving in said second direction, wherein said plurality of passages are each located in said body means as to be radially outwardly of said stem-like guide means and radially outwardly of said single axis of movement, means for causing the movement of said valve member along said stem-like guide means in said first and second directions, wherein said means for causing the movement of said valve member comprises electrically energizable coil means effective to cyclically produce a flux field for the corresponding cyclic movement of said valve member along said stem-like guide means and in said second direction, and wherein said valve member extends into the region of said coil means and said flux field as to be acted upon thereby, said improvement comprising a plurality of discrete valve seating surfaces forming said valve seating surface means, wherein each of said plurality of discrete valving seating surfaces circumscribes at least respective ones of said plurality of passages, wherein said valve body means comprises a plurality of boss-like portions all projecting in the same general direction toward said valve member valv-

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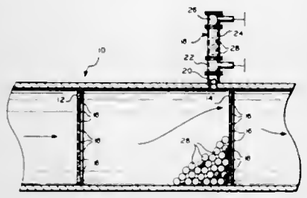
ing surface means, wherein said plurality of boss-like portions are space from each other as to provide a space between next adjacent ones of said plurality of boss-like portions with said space being effective to receive therein said liquid to be subsequently supplied to and through said plurality of passages when said valve member is moved in said second direction, wherein respective ones of said plurality of discrete seating surfaces are carried by respective projecting ends of respective ones of said plurality of boss-like projections, and wherein each of said inlet ends of each of said plurality of passages is of a cross-sectional configuration which increases in liquid flow area as each said inlet end approaches the related circumscribing discrete seating surface.

4,787,419

APPARATUS FOR CONTROLLING THE PRESSURE OF GASES FLOWING THROUGH A CONDUIT

Bryan A. Megee, and James D. Whiteside, II, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 828,482, Feb. 12, 1986, Pat. No. 4,679,579.
This application May 22, 1987, Ser. No. 52,947
Int. Cl.[4] F15D *1/02*
U.S. Cl. 138—46 **8 Claims**





1. Apparatus suitable for use in controlling the flow of hot gases through a conduit, comprising:
- at least two generally spherically shaped objects substantially constructed of refractory material located within said conduit;
- means interconnecting at least two of said at least two generally spherically shaped objects wherein said interconnecting means is flexible; and
- means for introducing said at least two generally spherically shaped objects into said conduit.

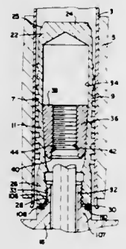
4,787,420

PLUGGING APPARATUS AND METHOD USING A HYDRAULICALLY ASSISTED PLUG EXPANDER

John J. Wilhelm, New Kensington, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 1, 1986, Ser. No. 936,558
Int. Cl.[4] F16L *55/12*
U.S. Cl. 138—89 **26 Claims**

1. A plugging apparatus for plugging a conduit, comprising:
(a) a plug shell having a closed end and an open end;
(b) an expander element contained within the shell and sealingly engaged therein that is movable between the closed end and the open end and that wedgingly engages the shell and radially expands it when so moved, and
(c) an expansion means including both a source of pressurized hydraulic fluid for facilitating said movement of the expander element by conducting said fluid to the shell interior between the closed end of the shell and the expander element, thereby expanding the shell while urging the expander element toward the open end of the shell, and a



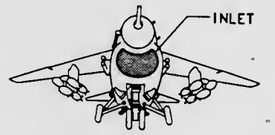
rod means for pulling the expander element toward the open end of the shell, whereby said expansion means moves the expander element by the application of both the hydraulic force from the pressurized fluid, and the pulling force from said rod means.

4,787,421

FLOW PATH DEFINING MEANS AND METHOD OF MAKING

Mason K. Yu, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 851,973, Apr. 14, 1986, abandoned.
This application Jun. 22, 1987, Ser. No. 63,796
Int. Cl.[4] F16L *9/00*
U.S. Cl. 138—178 **12 Claims**



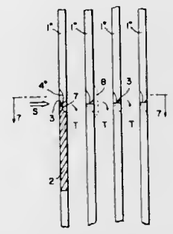
1. A body including two spaced locations and a flow path for conducting fluids between said spaced locations with a high degree of flow efficiency, said flow path being defined by
- an axis connecting said locations of the body and
- a boundary surface of said body intermediate said locations and defined by coordinates from said axis, said boundary surface defining
- a first cross-sectional area normal to the axis at a first one of said locations,
- a second cross-sectional area normal to the axis at a second one of said locations and
- intermediate cross-sectional areas normal to the axis between said locations,
- wherein the coordinates of the boundaries of at least some of said cross-sectional areas follow the relation that the absolute value of the quantity x/a raised to the power p plus the absolute value of the quantity y/b raised to the power q equals unity, where x and y are the coordinates of the boundaries of the cross sections, a is half the width of each cross section, b is half the height of each cross section and the exponents p and q are shape factors which are of unequal value for at least half of said cross-sections and variations in which are without abrupt changes between said locations.

4,787,422

WEAVING REED WITH PROFILED TEETH

Erich Peter, Lindau, and Rudolf Riezler, Nonnenhorn, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 9, 1987, Ser. No. 94,817
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633139; Dec. 13, 1986, 3642712
Int. Cl.[4] D03D *47/28*
U.S. Cl. 139—435 **9 Claims**



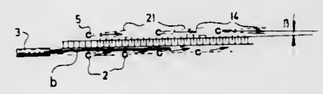
1. A weaving reed for weaving looms with pneumatic weft thread insertion, comprising profiled reed teeth each with a nose projection for forming a weft thread guide channel, each nose projection having a recessed portion (4') for guiding a weft thread through said guide channel, said recessed portion having a first deformation including a first bevelled edge (4'') the bevel of which is slanting in the direction (S) of weft thread insertion for an improved guiding of an air flow carrying a weft thread through said guide channel and for preventing or at least reducing an air loss through gaps between neighboring reed teeth, each of said reed teeth having a further deformation (7) located on its profiled reed tooth substantially in a weft thread contact zone, said further deformation (7) slanting in a direction opposite to the weft thread insertion direction, said further deformations causing a partial, downwardly directed air stream (T) for guiding said weft thread along said nose projections.

4,787,423

METHOD OF AND DEVICE FOR INSERTING WEFT YARN IN JET LOOMS

Miroslav Hrus, and Ladislav Sevcik, both of Liberec, Czechoslovakia, assignors to ELITEX Koncern Textilniho Strojirenstvi, Liberec, Czechoslovakia

Filed Jul. 7, 1986, Ser. No. 882,610
Claims priority, application Czechoslovakia, Jul. 5, 1985, PV 5060-85
Int. Cl.[4] D03D *47/28*
U.S. Cl. 139—435 **8 Claims**



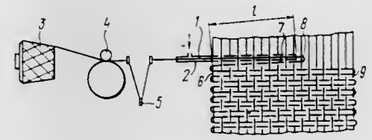
1. Method of inserting weft yarn in jet looms, in which the weft yarn is inserted by the action of inserting fluid jet and entraining fluid jets, wherein the weft yarn is projected by the inserting fluid jet into a carrying field of at least two systems of entraining fluid jets and is supported discontinuously in the carrying field upon the simultaneous stabilization of the carrying field by exhaustion of a part of the fluid from a boundary layer of the carrying field, wherein the exhaustion of a part of the fluid from the boundary layer of the carrying field is supported by activation of further fluid jets.

4,787,424

METHOD OF INSERTING LOOPS OF CONTINUOUS WEFT THREAD IN A NEEDLE LOOM

Mikhail A. Gendelman; Anatoly F. Borodulin; Alexandr V. Voroblev, and Sergei V. Bychkov, all of Klimovsk Moskovskoi oblasti, U.S.S.R., assignors to Klimovskoje Spetsialnoje Konstruktorskoje Bjuro Po Projektirovaniju Tkatskogo Oborudovanija, Klimovsk, U.S.S.R.

Filed Oct. 15, 1986, Ser. No. 918,928
Int. Cl.[4] D03D *47/02*
U.S. Cl. 139—441 **1 Claim**



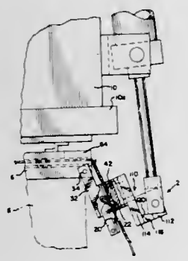
1. A method of inserting loops of continuous weft thread in a needle loom with the aid of a tubular needle, said method comprising:
- feeding a weft thread from a supply bobbin through a tubular needle;
- inserting said weft thread into a shed of a loom in a continuous loop by reciprocating the tubular needle and securing a head portion of the inserted loop in a respective selvage of the cloth being woven;
- effecting said feeding of said weft thread through the tubular needle in a stream of air; and
- matching said feeding of said weft thread through the stream of air and the strokes of the tubular needle so that the head portion of the loop being formed by carrying said weft thread through the shed is positioned in front of the tubular needle in the direction of the working stroke thereof spaced from a front end of the tubular needle so that at any moment a length of said weft thread which is projecting from said tubular needle and measured from an extrance selvage is in excess of a spacing between said front end of said tubular needle and said entrance selvage of the cloth being woven.

4,787,425

PREFEED AND BENDER ASSEMBLY FOR BALE WIRES

Millard P. Saylor, Arlington Heights, Ill., assignor to Frank L. Wells Company, Kenosha, Wis.

Filed Nov. 23, 1987, Ser. No. 124,026
Int. Cl.[4] B21F *15/04*
U.S. Cl. 140—73 **19 Claims**



1. A pre-feed and bender assembly for applying bale wires having preformed ends to bales of material comprising

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fixture means being arranged to receive one preformed end of a bale wire being fed in a generally horizontal direction,

said fixture means having retention means for retaining the preformed end of the bale wire being fed,

mounting means being pivotally adjacent the bale and carrying said fixture means in a first position for receiving the preformed end of the bale wire being horizontally fed, and

means for moving said mounting means and cause pivotal movement of said fixture means from said first position to a second position for bending the bale wire having a preformed end retained by said fixture means downward for joining with the preformed end of the opposite end of the bale wire.

4,787,426

HIGH-SPEED ELECTRICAL COMPONENT LEAD FORMING APPARATUS AND METHOD

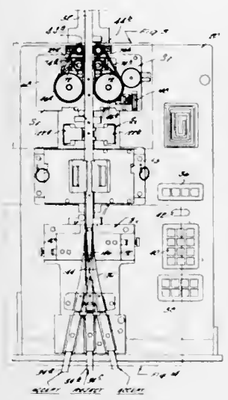
Frank V. Linker, and Frank V. Linker, Jr., both of Broomall, Pa., assignors to American Tech Manufacturing, Inc., Glenolden, Pa.

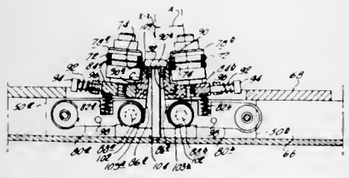
Continuation of Ser. No. 710,032, Mar. 11, 1985, Pat. No. 4,665,954. This application Nov. 18, 1986, Ser. No. 933,931

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.⁴ B21F *1/02*

U.S. Cl. 140—147 **1 Claim**





1. A forming station in a DIP handling apparatus operable to align leads in predetermined orientation and at a predetermined angle relative to the body portion, the leads having a shoulder adjacent the body portion, said handling apparatus including a trackway for operatively supporting and moving DIPs therealong from a loading station to a discharge station, said forming station positioned along said trackway subsequent to said loading station comprising laterally spaced rotatable forming rollers on opposite sides of said trackway, anvil means confronting the inner faces of said leads, said rollers and anvil means having cooperating confronting surfaces adapted to engage the DIP leads adjacent the shoulder to the outer terminal ends, said forming rollers cooperatively associated with said anvil means and spaced therefrom to define a nip gap, selectively variable pressure-applying means mounting the forming rollers and anvil means relative to one another which normally urges the cooperating surfaces toward one another and permits a continuously variable nip gap adjustable as determined by the leads passing through the nip gap and means for moving DIPs through said nip gap.

4,787,427

APPARATUS FOR FILLING CONTAINERS USING COUNTERPRESSURE

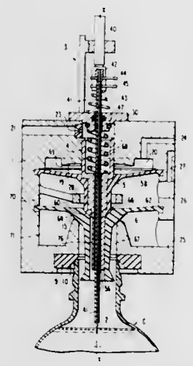
Marcel Bacroix, Givry, and Claude Toubhans, Bry sur Marne, both of France, assignors to Societe Dite: SEVA, Chalon sur Saone, France

Filed Jan. 13, 1987, Ser. No. 3,333

Claims priority, application France, Jan. 15, 1986, 86 00591

Int. Cl.⁴ B67C *3/06*

U.S. Cl. 141—39 **8 Claims**



1. A counterpressure filling apparatus for use on bottling or filling machines to fill a container, comprising:

a supply tank (B) for storing liquid under gaseous pressure;

filling means (A) for injecting said liquid into said container (C) when said container is disposed in an operative position with respect to said filling means, said filling means including a barrel (**1**) having a first chamber (**11**) defined therein, and a sensor (**2**) for issuing a first output when an amount of said liquid injected into said container reaches a predetermined amount;

de-actuation means, responsive to said first output of said sensor, for de-actuating said filling means; and

first and second flexible membranes (**5**, **6** or **72**) disposed in said barrel and having first and second walls (**58**, **62** or **621**), respectively, for dividing said first chamber into second, third and fourth successive chambers (**69**, **70**, **71**) prior to injection of said liquid into said container,

wherein the filling apparatus further comprises a detector (P) for issuing a second output when said container is in said operative position, and said de-actuation means is responsive to said second output of said detector for actuating said filling means.

4,787,428

CONTAINER FILLING APPARATUS WITH SELECTIVELY COMMUNICATED CHAMBERS

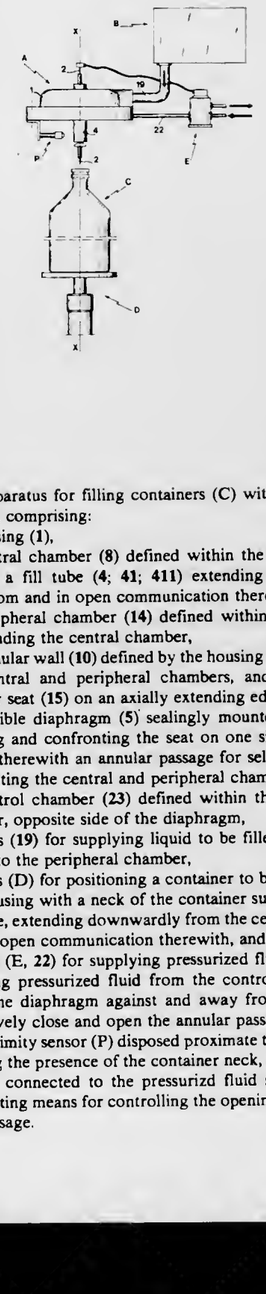
Marcel Bacroix, Givry, and Claude Toubhans, Bry Sur Marne, both of France, assignors to Seva, Chalon sur Saone, France

Filed Jul. 21, 1987, Ser. No. 76,083

Claims priority, application France, Jul. 21, 1986, 86 10655

Int. Cl.⁴ B67C *3/06*

U.S. Cl. 141—39 **4 Claims**



1. An apparatus for filling containers (C) with noncarbonated liquids, comprising:

(a) a housing (**1**),

(b) a central chamber (**8**) defined within the housing, and having a fill tube (**4**; **41**; **411**) extending downwardly therefrom and in open communication therewith,

(c) a peripheral chamber (**14**) defined within the housing, surrounding the central chamber,

(d) an annular wall (**10**) defined by the housing for separating the central and peripheral chambers, and defining an annular seat (**15**) on an axially extending edge thereof,

(e) a flexible diaphragm (**5**) sealingly mounted within the housing and confronting the seat on one side thereof to define therewith an annular passage for selectively communicating the central and peripheral chambers,

(f) a control chamber (**23**) defined within the housing on another, opposite side of the diaphragm,

(g) means (**19**) for supplying liquid to be filled into a container to the peripheral chamber,

(h) means (D) for positioning a container to be filled below the housing with a neck of the container surrounding the fill tube, extending downwardly from the central chamber and in open communication therewith, and

(i) means (E, **22**) for supplying pressurized fluid to and exhausting pressurized fluid from the control chamber to urge the diaphragm against and away from the seat to selectively close and open the annular passage, and

(j) a proximity sensor (P) disposed proximate the fill tube for sensing the presence of the container neck, and having an output connected to the pressurizd fluid supplying and exhausting means for controlling the opening of the annular passage.

4,787,429

DEVICE FOR COUPLING A SMALL TUBE TO AN APPARATUS ADAPTED FOR FITTING A SYRINGE TO A DRUG HOLDING BOTTLE

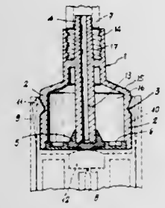
Luigi Valentini, Milan, and Mario Coccia, Cesano Boscone, both of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jul. 20, 1987, Ser. No. 75,776

Claims priority, application Italy, Jul. 25, 1986, 22647/86[U]

Int. Cl.⁴ B65B *3/04*; **A61M** *5/00*

U.S. Cl. 141—383 **5 Claims**



1. A device for coupling a tube to an apparatus for coupling a syringe to a drug holding bottle, said device comprising:

(a) a body having a first end, a second end, a longitudinal axis, and an axial passageway extending from said first end of said body to said second end of said body, said first end of said body being adapted to be connected to a hollow tube such that said axial passageway is in fluid communication with the interior of said hollow tube, said body comprising a first at least substantially cylindrical wall at said second end of said body that is concentric to said longitudinal axis and that has an external annular recess therein spaced from said second end of said body, and

(b) a resilient plug mounted on said second end of said body so as to close said axial passageway;

(c) said second end of said body comprising:

(i) said first at least substantially cylindrical wall;

(ii) a first blind recess that is within said first cylindrical wall, that is concentric to said longitudinal axis, and that is open to said second end of said body; and

(iii) a lug the radially outer surface of which defines one side of said blind first recess, which is concentric to said longitudinal axis, and which contains said axial passageway, the radially outer surface of said lug which defines one side of said first blind recess being at least substantially cylindrical.

4,787,430

DUPLICATING ROUTER

Kouichi Miyamoto, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed Jun. 8, 1987, Ser. No. 59,654

Claims priority, application Japan, Feb. 23, 1987, 62-25992[U]; Feb. 23, 1987, 62-41181

Int. Cl.⁴ B27C *5/00*

U.S. Cl. 144—144 R **9 Claims**

1. A duplicating router, comprising:

a base;

vertical guide plates fixed on both sides of said base;

a vertical guide frame guided by said vertical guide plates and disposed movably up and down on said vertical guide plates;

a horizontal guide connected to said vertical guide frame;

a cutter unit movably disposed left and right on said horizontal guide, said cutter unit comprising a motor and a cutter mounting chuck on a shaft connected to said motor;

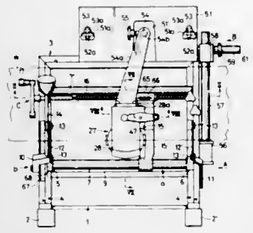
a bracket mounting said motor;

a template fixed on an upper portion of said vertical guide plates, including a curved portion formed in said template;

VOL 1096 ISS 5 NO 29 1988 UMI

vertical feeding means for vertically moving said vertical guide frame;

screw feeding means for feeding said cutter unit horizontally in a feed direction and including a feed screw rod feeding said cutter unit; and



a cushion material disposed in said screw feeding means at a point mechanically between said screw feeding means and one of said cutter unit and said vertical guide frame, a pressure being applied against said feed direction of said feed screw rod to said cushion material.

4,787,431

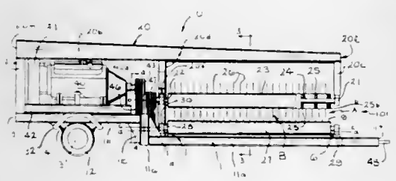
FLAIL APPARATUS

Ronald D. Demlow, 6600 S. Shore Dr., Weidman, Mich. 48893

Filed Jun. 27, 1988, Ser. No. 212,296

Int. Cl.[4] B27L *3/00*

U.S. Cl. 144—341 **19 Claims**



13. An improved method for debarking or limb removal from trees which comprises:

(a) providing an apparatus which comprises: a horizontally oriented frame means having an upper surface, lower surface, two opposed ends and two opposed sides between the ends;

a first drum means having a longitudinal axis and horizontally mounted on the axis for rotation and between the opposed sides and between the ends of the frame means;

a first set of flail means mounted on and along the axis of the first drum means;

a beam means mounted on and above the upper surface of the frame means and cantilevered over the frame means and first drum means and between the ends and opposed sides of the frame means;

a second drum means mounted on the beam means and having a longitudinal axis which is horizontal and in essentially parallel and spaced relationship to the axis of the first drum means such that there is an opening leading into a space between the first drum means and the second drum means;

a second set of flail means mounted on and along the axis of the second drum means in a spacing which with the flail means of the first drum means provides the debarking or the limb removal from trees; and

power means mounted on the frame means and connected to the first and second drum means for providing rotation of the first and second drum means and first and second set of flail means together for the debarking or limb removal, wherein at least one tree with limbs and bark can be moved into the opening and the space between the first and second drum means for debarking or limb removal; and

(b) moving at least one tree into the opening and into the space between the first and second drum means in contact with the first and second set of flail means, whereby the limbs or bark are removed from the tree.

4,787,432

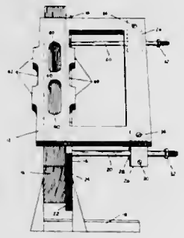
APPARATUS AND METHOD FOR PRODUCING MORTISE AND TENON JOINTS

James D. Williams, 28544 N. Highway 67, Woodland Park, Colo. 80863

Filed Jun. 15, 1988, Ser. No. 207,511

Int. Cl.[4] B27M *3/00, 1/08*

U.S. Cl. 144—367 **18 Claims**



17. A method for forming a set of mortises in a workpiece, by means of a tool comprising a rigid plate, and a template adjustably connected to the rigid plate, with upper and lower faces, a mortise guide, a first tenon guide, and a second tenon guide, adjustably positioned with the lower face of the template adjacent to the rigid plate, comprising the steps of:

(a) securing the workpiece to the rigid plate so that the workpiece is adjacent to the lower face of the template,

(b) moving the template to a position with respect to the rigid plate such that the mortise guide is adjacent to the workpiece, and securing the template in said position,

(c) positioning a rotating cutting blade of a router within the mortise guide so that the rotating cutting blade is inserted into the workpiece, and the router may be guided along the edges of the mortise guide, and

(d) cutting a portion of the workpiece adjacent to the mortise guide by guiding the router along the edges of the mortise guide.

4,787,433

BEAD BREAKING DEVICE FOR TRACTOR TIRES

Charles M. Thomas, 215 N. A St., Morris, Okla. 74445

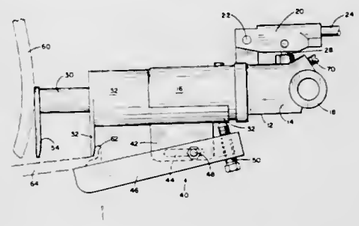
Filed Oct. 31, 1986, Ser. No. 925,291

Int. Cl.[4] B60C *25/06*

U.S. Cl. 157—1.17 **3 Claims**

1. A device comprising a manually operated hydraulic pump having been modified to break the circumferential bead of a pneumatic tire from a wheel rim, said hydraulic pump including a pump unit having a horizontally disposed cylinder extending therefrom, said cylinder being provided with an internal piston rod, said pump unit being provided with a pivotal actuating member whereby pivoting said actuating member upwardly and downwardly urges said piston rod outwardly from said cylinder, and a means for releasing hydraulic pressure from said pump unit; said cylinder being provided with threads on the end opposite said pump unit, a barrel for threadedly receiving the threaded end of said cylinder, a ram portion being affixed to the end of said piston rod, said barrel including a stationary horseshoe-shaped plate surrounding said ram, said stationary plate and said ram constituting a wedge capable of

being inserted between the interior of said wheel rim and a side wall of said pneumatic tire, and means for locking said device onto said wheel rim; whereby urging said piston rod outwardly from said cylinder presses said ram portion of said wedge into said side wall of said tire thereby breaking its bead; wherein said means for locking said device comprises a vertically disposed bar extending downwardly from said barrel and being



provided with a horizontally disposed adjustment slot, a locking arm being pivotally mounted on said bar by means of a bolt passing through said slot, and a tightening screw mounted on said locking arm and having one end engagable with said barrel; whereby said arm is pivoted to engage said wheel rim and said screw is tightened against said barrel to secure said device on said wheel rim.

4,787,434

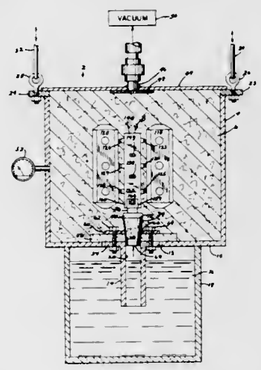
VACUUM LIFT FOAM FILLED CASTING SYSTEM

Terrance M. Cleary, Allenton; Raymond J. Donahue, Fond du Lac; William G. Hesterberg, Rosendale, and Lawrence I. Toriello, Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 29, 1986, Ser. No. 946,812

Int. Cl.[4] B22C *9/04;* **B22D** *18/06*

U.S. Cl. 164—34 **3 Claims**



1. A lost foam casting method comprising:

providing a flask for holding particulate media;

providing a source of molten metal external of said flask;

providing gas-nonopermeable fill means having a fill passage communicating between said source of molten metal and the interior of said flask;

providing gas-permeable throat means communicating between said fill passage and the interior of said flask;

providing a gas-nonpermeable pattern assembly of evaporative foam material and placing said pattern assembly in said flask in communication with said fill passage;

introducing particulate media into said flask to surround said pattern assembly and said throat means such that said fill passage communicates said pattern assembly with said source of molten metal, and said throat means communicates between said particulate media and said fill passage;

applying vacuum to said flask and said particulate media, such that vacuum is applied from said particulate media through said throat means to said fill passage such that molten metal is drawn solely by vacuum through said fill passage from said source of molten metal, and such that said foam material vaporizes and is replaced by said metal in the shape of said pattern assembly, said vaporized foam material escaping into the interstices in said particulate media.

4,787,435

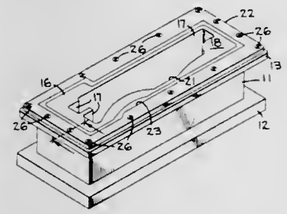
CORE BOX ASSEMBLY WITH WEAR STRIP

John J. Uppgren, St. Paul, Minn., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 340,403, Jan. 18, 1982, abandoned. This application Mar. 20, 1984, Ser. No. 591,251

Int. Cl.[4] B22C *13/12*

U.S. Cl. 164—228 **9 Claims**



1. A core box assembly, comprising

a core box of a relatively soft material,

a strike-off surface on said core box,

said core box having a core depression therein adapted to receive a mold sand and forming a mold opening in said strike-off surface.

said strike-off surface having a recess therein surrounding and displaced laterally from the edges of said mold opening,

a continuous strike-off member of a relatively hard material formed to fit within said recess, thereby surrounding said mold opening and lying substantially flush with said strike-off surface, whereby mold sand may be leveled at said mold opening with a strike-off bar which is guided by the upper surface of said strike-off member and erosion of said strike-off surface is substantially eliminated.

4,787,436

GAS VENTING DEVICE FOR MOLDING OPERATIONS

Mamoru Ozeki, Zama, and Akihico Tsuda, Atsugi, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1987, Ser. No. 58,777

Int. Cl.[4] B22D *17/20*

U.S. Cl. 164—305 **18 Claims**

1. A gas venting arrangement for use with molding apparatus including a mold having a cavity to be filled with a melt, means for injecting melt into the mold cavity and a gas vent passage communicating with the mold cavity for evacuating gas from the mold cavity ahead of advancing melt as it fills the mold cavity, said gas venting arrangement comprising:

a housing having a valve chamber with an inlet adapted to be placed in fluid communication with the gas vent passage, and an exhaust port for evacuating gas from said valve chamber;

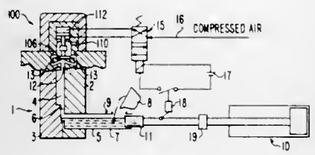
an annular valve seat adjacent said inlet;

a valve body coaxial with said valve chamber and said valve

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seat and having a valve stem extending rearwardly through said valve chamber away from the mold, said valve body being axially movable forwardly, toward the mold, to open said inlet, and movable rearwardly, away from the mold, to close said inlet in cooperation with said valve seat; and

valve actuation means associated with said housing and including a positively driven, reciprocable drive member



and coupling means interconnecting said drive member and said valve stem for transmitting rearward movement of said drive member to said valve stem to positively close said inlet when the mold is full of melt, and permitting said valve body to be driven rearwardly more rapidly by the melt itself to close said inlet if melt advancing through the gas vent passage overtakes the positively driven valve body.

4,787,437

METHOD FOR STARTING A CONTINUOUS CASTING PLANT

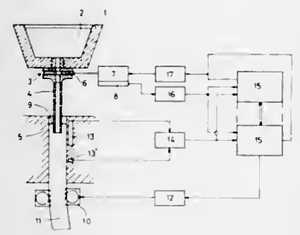
Armin Kursfeld, Cham, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed Mar. 11, 1987, Ser. No. 24,789

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608503

Int. Cl.⁴ B22D *11/18*

U.S. Cl. 164—453 **24 Claims**



1. A method for the automatic casting start-up for a strand in continuous casting installations, wherein a molten metal flows through a controllable sliding gate valve of a tundish into an empty mold above a starting rod, comprising the steps of: controlling the rising of the actual metal level in the mold along a predetermined start-of-casting curve having predetermined characteristics times between metal-level distances and controlling the level so as to reach a desired metal level with measuring and controlling devices during the pouring operation and causing the strand withdrawal to be commenced; wherein, during the start of casting, beginning with the gate valve being throttled to a start-of-casting position, each partial real time of the rising actual metal level measured within a filling distance is compared with stored time ranges for each of the partial characteristic times, each of the partial characteristic times being assigned a flow position of the gate valve which advances the rising actual metal level in accordance with the predetermined start-of-casting curve, and wherein said gate valve is moved, after the comparison to a corresponding flow position for each time range into which the measured partial real time falls.

4,787,438

METHOD AND APPARATUS FOR CONTINUOUSLY CASTING METAL

Günter Flemming; Hans Streubel, and Manfred Kolakowski, all of Erkrath, Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag, A.G., Düsseldorf, Fed. Rep. of Germany

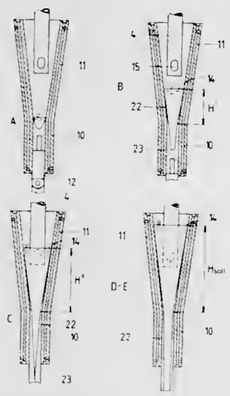
Filed Feb. 13, 1987, Ser. No. 14,654

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606290

The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.

Int. Cl.⁴ B22D *11/18, 11/20*

U.S. Cl. 164—453 **13 Claims**



1. A method for the start-up of continuously cast strip metal comprising the steps of:

positioning a dummy strip having a connection head in a narrow slotted mold having a flared inlet pouring zone necking down to a distal zone in which the walls of the mold are parallel and spaced apart by substantially the desired cross-sectional shape and dimensions of the strip being cast,

pouring liquid metal through a pouring tube having an orifice, into the flared zone of said mold to form a metal bath and controlling the rate of pouring,

continuously detecting and monitoring the surface level of said bath,

withdrawing said dummy strip after the level of said bath rises above the neck between said flared and distal zones, and controlling the rate of withdrawal, maintaining the relative pouring and withdrawal rates so that the surface level of said bath continues to rise,

continuously monitoring said cast strip on the downstream side of said mold with a fluid presence sensor to indicate the presence of liquid in the core of said cast strip, and

increasing the withdrawal rate of the cast strip from the mold until said fluid sensor indicates the presence of liquid metal in the core of said cast strip at a point downstream of the distal end of said mold.

8. Apparatus for continuously casting metal strip comprising:

a narrow slotted mold having inlet and exit ends, a flared pouring zone adjacent to the inlet end necking down to a distal zone having parallel sided stripforming walls adjacent to the exit end,

a dummy strip having a connecting head, for starting casting strip,

means for positioning said dummy strip in the distal end of said mold,

means for withdrawing said dummy strip from said mold through a series of support idlers,

means extending into said pouring zone near to but clear above the neck between the distal and pouring zones, said means having an orifice for pouring liquid metal into said mold to form a metal bath and for filling said mold around said connection head up into the distal and pouring zones so as to immerse said orifice,

means for detecting and monitoring the instantaneous surface level of said bath and for generating signals responsive thereto so as to indicate the instantaneous surface level of said bath from within said distal zone to the top of said pouring zone,

a first means responsive to said detecting means for actuating said withdrawing means to start the withdrawal of said dummy strip after the start of pouring but only after the surface level of said bath rises higher than the neck between said distal and pouring zones,

a second means for regulating the respective withdrawing and pouring rates so that the surface level of the bath continues to rise above said orifice to a predetermined operating level after the commencement of said withdrawal,

a third means responsive to said detecting means for thereafter further controlling the respective withdrawing and pouring rates to reach a predetermined casting speed while maintaining the bath surface substantially at said operating level,

means downstream of the exit end of said mold for sensing the presence of liquid metal in the core of said cast strip, and

a fourth means responsive to said sensing means for further increasing the withdrawal rate of said cast strip to a speed at which the tip end of the liquid core of said cast strip is at least downstream of said sensor.

4,787,439

CASTING OF REACTIVE METALS INTO CERAMIC MOLDS

Roy C. Feagin, Boca Raton, Fla., assignor to Remet Corporation, Chadwicks, N.Y.

Continuation of Ser. No. 741,661, Jun. 6, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 935,084

Int. Cl.⁴ B22C *1/02*

U.S. Cl. 164—518 **41 Claims**



1. A composition for making a coating consisting essentially of a refractory material selected from the group consisting of yttrium oxide, zirconium oxide, fused yttrium oxide, fused zirconium oxide, fused stabilized zirconium oxide, and fused mixtures of zirconium oxide and yttrium oxide; and a sufficient amount of an yttria sol binder.

4,787,440

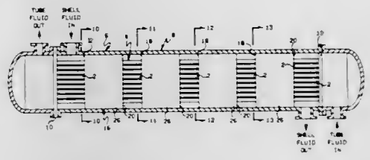
SPIRAL FLOW IN A SHELL AND TUBE HEAT EXCHANGER

Richard K. Young, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 326,777, Dec. 2, 1981, Pat. No. 4,697,637. This application Aug. 24, 1987, Ser. No. 88,747

Int. Cl.⁴ F28D *7/00;* **F28F** *9/00, 9/22*

U.S. Cl. 165—1 **7 Claims**



1. In a method for producing longitudinal and spiral flow of shell side fluid through a shell and tube heat exchanger of the type wherein tube side fluid is passed through a plurality of generally parallel, transversely spaced apart tubes arranged along longitudinal axes in an ordered pitch configuration, and wherein a shell side fluid is introduced into one end region of a shell positioned about said tubes, passed through said shell generally longitudinally and in heat exchange relationship to said tubes, and removed from an opposite end region of said shell, the improvement which comprises the step of:

moving such shell side fluid concurrently during such passing against a series of progressively located, relative to the direction of longitudinal shell side fluid flow, rod groups, all individual rods of each such rod group

extending diagonally relative to the longitudinal axes through the spacings defined between such tubes, and being in generally parallel relationship to one another transversely across said tubes when such a rod group is viewed in a cross section taken through such rod group and said tubes,

the respective rod members of each succeeding such rod group proceeding longitudinally along said tubes being disposed at an angle which is circumferentially angularly displaced relative to the respective rod members of the preceding such rod group,

whereby said shell side fluid in so passing sweeps across said tubes in a generally spiral manner.

4,787,441

HEAT TRANSFER ELEMENT

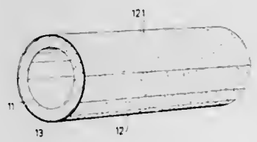
Eric Granryd, Slatthallsvagen 2, S-183 65 Taby, and Bjorn Palm, Tomtbergavagen 10, S-141 43 Huddinge, both of Sweden

Filed Jul. 8, 1987, Ser. No. 71,126

Claims priority, application Sweden, Jul. 24, 1986, 8603206

Int. Cl.⁴ F28F *13/00*

U.S. Cl. 165—133 **9 Claims**



1. A heat transfer wall for a heat exchanger, at least one surface of which being in contact with a heat exchange medium, of the type changing its phase state during heat exchanging, characterized in that said wall comprises a mechanically

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stable, smooth part (**11**), one surface of which being provided with a thin metal, flexible foil which is directly applied to the mechanically stable part without any intermediate means so as to create between the mechanically stable part and the thin metal foil a minute gap or spacing, and in that said thin metal foil (**12**) has a large number of through-passing holes (**121**) formed therein.

4,787,442

DELTA WING AND RAMP WING ENHANCED PLATE FIN

Jack L. Esformes, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 4, 1987, Ser. No. 128,962
Int. Cl.[4] B22C *19/04*
U.S. Cl. 165—151 **4 Claims**



1. An enhanced plate fin of a plate fin heat exchanger for transferring heat between the fin and a fluid flowing over the fin comprising:

a convoluted heat transfer means for enhancing the exchange of heat between the fluid and the fin, said convoluted heat transfer means having a sine-like wave pattern of predetermined height along the fin in a direction parallel the flow of the fluid over the fin, said sine-like wave pattern having curved peaks at a maximum and minimum of said wave heights of the pattern along the fin, said peaks extend along said convoluted heat transfer means generally transverse to the direction of flow of the fluid flowing over the fin; and

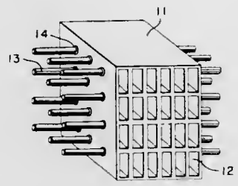
an enhanced heat transfer section disposed generally parallel to said peaks, said enhanced heat transfer section having a number of rows of a plurality of raised delta wing means and ramp means, said rows of raised delta wing means and ramp means arranged in a direction generally perpendicular to the direction of flow of the fluid, a side length of each of said plurality of raised delta wing means and ramp means connected to the fin in a direction generally perpendicular to the direction of flow of the fluid, said side length of said ramp means positioned upstream in the flow direction of the fluid wherein said raised ramp means form counter rotating vortices in the fluid and said side length of said delta wing means positioned downstream in the flow direction of the fluid, said raised delta wing means and ramp means are triangular shaped, with a raised apex downstream in the fluid direction from said side length connected to the fin for said raised ramp means, and with a apex upstream in the fluid direction from said side length connected to the fin for said raised delta wing means.

4,787,443

CERAMIC HEAT EXCHANGER ELEMENT

Yukio Fukatsu, Tokyo; Yasuhiko Endo, and Tetsuo Takehara, both of Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 780,600, Sep. 26, 1985, abandoned. This application May 5, 1987, Ser. No. 47,546
Claims priority, application Japan, Sep. 28, 1984, 59-203089
Int. Cl.[4] F28D *7/02*
U.S. Cl. 165—165 **13 Claims**



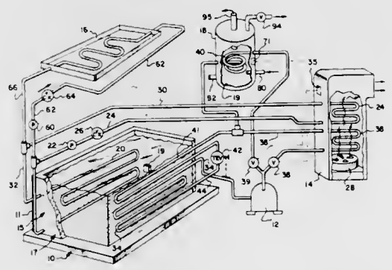
1. A ceramic heat exchanger element which comprises a ceramic honeycomb body, fluid passages formed in said honeycomb body and at least one ceramic tube extending through and fixed by a binder to said honeycomb body so as to intersect said fluid passages, wherein said honeycomb body and said at least one tube are made of ceramics having a thermal conductivity of 50 Kcal/m/hr/°C. or higher and said binder comprises silicon or a mixture of silicon and silicon carbide as a main component.

4,787,444

HEATING AND COOLING SYSTEM

James H. Countryman, 720 Peach Orchard Dr., West Carrollton, Ohio 45449

Filed Dec. 19, 1983, Ser. No. 562,918
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—48.2 **7 Claims**



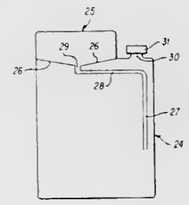
1. A heating and cooling system for an environmental space comprising in combination, an enclosed chamber having an upper portion and a lower portion containing a heat exchange material, means for distributing air to said environmental space, and means for transferring heat energy form said heat exchange material in said chamber to said air distributing means, said heat energy transferring means further maintaining at least a portion of said heat exchange material as a solid phase in the lower portion of said chamber and at leasts a portion of said heat exchange material as a liquid phase in the upper portion of said chamber and including, first conduit means containing a first heat exchange fluid extending between and into said chamber and said air distributing means, said system further including a pump for circulating said first heat exchange fluid, said first heat exchange fluid being circulated to said air distributing means to cause air flowing through said air distributing means to be cooled when said system is operated in a cooling mode, said heat energy transferring means further including second conduit means containing a second heat exchange fluid extending between and into said chamber and said air distributing means, said first conduit means being positioned such that said first heat exchange fluid contained therein enters said chamber at a point adjacent said upper portion of said chamber and exits said chamber at a point adjacent said lower portion of said chamber, said second conduit means being positioned such that said second heat exchange fluid enters said chamber at a point adjacent said lower portion of said chamber and exits said chamber at a point adjacent said upper portion of said chamber, respective portions of said first and second conduit means following substantially parallel, spaced courses through said chamber, and means for compressing said second heat exchange fluid in said second conduit means to raise its temperature to a temperature higher than the temperature of the air entering said air distributing means to cause said air to be heated when said system is operated in a heating mode.

4,787,445

HERMETICALLY SEALED, RELATIVELY LOW PRESSURE COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES AND METHOD THEREFOR

David E. Howcroft, Yucaipa, Calif., assignor to Susan E. Lund, Baldwin, N. Dak.

Division of Ser. No. 001,463, Jan. 8, 1987, Pat. No. 4,739,824. This application Feb. 23, 1988, Ser. No. 159,236
Int. Cl.[4] F01P *11/02*
U.S. Cl. 165—104.32 **13 Claims**



4. A hermetically sealed, relatively low pressure cooling system for internal combustion engines including a thermostat which opens at a predetermined engine operating temperature, comprising:

a hermetically sealed radiator having a filling neck located in the top portion of the radiator, a nonpressurized cap in sealed relationship with said filling neck;

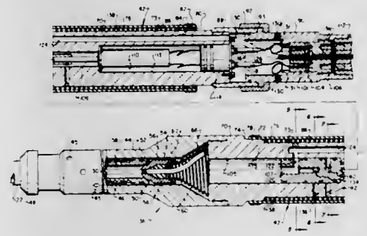
a small expansion reservoir for liquid coolant integral with and connected in hermetically sealed relationship with the top portion of the radiator forming a composite structure thereby, said reservoir having coolant inlet means which projects downwardly into the radiator so that coolant will reside in the lower portion of the expansion chamber when said radiator is filled with coolant and having a closed dead air space in the upper portion of the expansion reservoir wherein liquid coolant due to engine heating during operation expands and flows freely from the radiator upwardly and into said expansion reservoir causing a relatively low pressure to be built up in the dead air space behind the coolant and subsequently returning from the reservoir into the radiator under the influence of the relatively low pressure in the closed dead air space to maintain the cooling system full at a full level at all times, whereby pressure in the hermetically sealed cooling system is maintained at a relatively low value compared to conventional high pressure systems which operate at or near 15 psi, said low pressure causing the boiling point of the coolant to remain at a relatively low value, permitting said thermostat of the engine to thereby control engine temperature over substantially the full range of engine operation and thus causing said engine to operate at a temperature at or in relatively close proximity to said predetermined temperature of the thermostat.

4,787,446

INFLATABLE PACKER AND FLUID FLOW CONTROL APPARATUS FOR WELLBORE OPERATIONS

Eddie P. Howell, McKinney; Lonnie J. Smith, Allen, and Dennis R. Wood, Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 1, 1987, Ser. No. 45,093
Int. Cl.[4] E21B *33/127*
U.S. Cl. 166—66.4 **15 Claims**



1. Apparatus for insertion into a wellbore and connected to an elongated tubing string extending from the earth's surface into said wellbore, said apparatus being connected to electrical cable means extending through said tubing string, said apparatus being adapted to be disposed between said tubing string and a downhole tool operably controlled by said cable means and for controlling the flow of pressure fluid between said tubing string and said wellbore, said apparatus including:

a body including means for connecting said apparatus to said tubing string and to said downhole tool, said body including passage means therein for extending said cable means through said apparatus to said downhole tool;

resilient seal means disposed on said body and operable to be actuated by pressure fluid to engage a wall of said wellbore to form a fluid seal in said wellbore between said tubing string and said downhole tool;

passage means in said body for conducting pressure fluid between said tubing string and said seal means;

passage means in said body for conducting pressure fluid between said tubing string and said wellbore; and

motor operated valve means disposed on said apparatus for selectively controlling the flow of pressure fluid from said tubing string to operate said seal means and to inject pressure fluid into said wellbore.

4,787,447

WELL FLUID MODULAR SAMPLING APPARATUS

Jon B. Christensen, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 19, 1987, Ser. No. 64,902
Int. Cl.[4] E21B *49/08*
U.S. Cl. 166—169 **20 Claims**

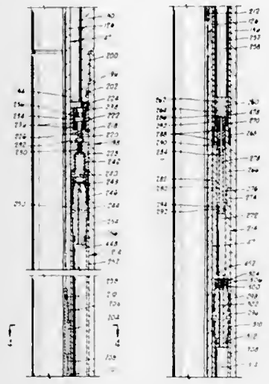
1. A downhole well fluid sampling apparatus for use in a well in testing operations therein, said downhole well fluid sampling apparatus comprising:

enlongated body means defining a sampling chamber therein, said elongated body means comprising a portion of said downhole well fluid sampling apparatus, and sampler port means in communication with said sampling chamber;

sampler valve means disposed in said sampling chamber for

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opening and closing said sampler port means to selectively allow communication of fluid in said well with said sampling chamber via said sampler port means and to selectively allow fluid from said well to be retained within said sampling chamber when said well fluid sampling apparatus is removed from said well; and



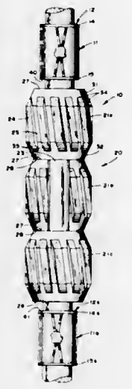
modular sampling means disposed in said sampling chamber and adapted for separately entrapping an isolated volume of fluid as said sampling chamber fills with fluid from said well when said sampler port means is opened by said sampler valve means.

4,787,448

ROD GUIDE

Donald E. Sable, 14175 Proton Rd., Dallas, Tex. 75244

Filed Aug. 18, 1987, Ser. No. 86,555
Int. Cl.[4] E21B *37/02*
U.S. Cl. 166—176 **6 Claims**



1. A rod guide assembly for a sucker rod longitudinally reciprocably movable in a well flow conductor comprising: a pair of longitudinally spaced upper and lower stops rigidly secured to a sucker rod; and a guide body movably mounted on said rod between said stops, said stops being spaced from each other a distance slightly greater than the length of said guide body, said upper stop engaging said guide body to move said guide body downwardly with said rod after an initial short downward movement of said rod after initiation of each downward movement of the rod and said lower stop engaging said guide body to move said second guide body upwardly with said rod after initial short upward movement of said rod after initiation of each upward movement of the rod during the longitudinal reciprocatory movement of said rod in a well flow conductor.

4,787,449

OIL RECOVERY PROCESS IN SUBTERRANEAN FORMATIONS

Lloyd G. Jones, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 44,166, Apr. 30, 1987. This application Feb. 19, 1988, Ser. No. 157,677
Int. Cl.[4] E21B *43/20, 43/247*
U.S. Cl. 166—259 **12 Claims**

1. A process for recovering oil from a subterranean, oil-containing formation having at least one injection well and a spaced-apart production well in substantial fluid communication with said formation and further having relatively high permeability and/or fractured zones and relatively lower permeability zones, comprising:

(a) injecting a predetermined amount of a plugging agent into the formation via the injection well which preferentially enters the highly permeable and/or fractional zones and plugs the face of said zones;

(b) continuing to inject said plugging agent into the formation at a flow rate and pressure sufficient to initiate and propagate new fractures and/or extensions of existing fractures in the formation; and

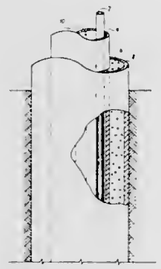
(c) thereafter injecting a displacing fluid into the formation at a pressure sufficient to maintain the new fractures and/or extensions of existing fractures open and displace oil from zones communicating with said new fractures and/or extensions of existing fractures toward the production well where it is recovered.

4,787,450

GAS LIFT PROCESS FOR RESTORING FLOW IN DEPLETED GEOTHERMAL RESERVOIRS

Gregory R. Andersen, Whittier; Stephen D. Pye, Brea, and Alice A. Probst, Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 7, 1987, Ser. No. 47,851
Int. Cl.[4] E21B *41/02, 43/00, 43/40*
U.S. Cl. 166—267 **31 Claims**



1. A method for increasing the production flow from a well penetrating a geothermal reservoir from a wellhead, said method comprising:

(a) continuously injecting a sufficient amount of an inert, non-condensible lift gas into the well during the production of geothermal fluids therefrom to cause a substantial fraction, or to substantially increase a preexisting fraction, of steam in the produced fluids without having to significantly reduce the pressure of the produced fluid at the wellhead; and

(b) recovering increased produced fluids and the lift gas from the well.

4,787,451

MELAMINE/FORMALDEHYDE CROSS-LINKING OF POLYMERS FOR PROFILE CONTROL

Thomas O. Mitchell, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 11, 1986, Ser. No. 940,682
Int. Cl.[4] E21B *33/138, 43/16, 43/20*
U.S. Cl. 166—270 **16 Claims**

1. A process for closing pores in a more permeable zone of a hydrocarbonaceous fluid bearing formation to obtain improved sweep efficiency prior to a waterflood oil recovery operation wherein the process comprises injecting into the formation a gelable composition comprising:

(a) water;

(b) 0.2 to 5.0 wt. percent of a cross-linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group; and

(c) 0.1 to 5.0 wt. percent of a methylol containing aminoplast resin which cross links with said polymer, thereby forming a gel of a size and strength sufficient to close pores in one or more permeable zones of said formation, said resin having amine and aldehyde in a critical mole ratio of from about 1:6 to about 1:30 respectively, which ratios are sufficient to form substantially improved stable gels for utilization in a subterranean formation during the recovery of hydrocarbonaceous fluids.

9. A process for closing pores in a more permeable zone of a hydrocarbonaceous fluid bearing formation to obtain improved sweep efficiency prior to a cabon dioxide oil recovery operation wherein the process comprises injecting into the formation a gelable composition comprising:

(a) water;

(b) 0.2 to 5.0 wt. percent of a cross-linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group; and

(c) 0.1 to 5.0 wt. percent of a methylol containing aminoplast resin which cross-links with said polymer thereby forming a gel of a size and strength sufficient to close pores in one or more permeable zones of said formation, said resin having amine and aldehyde in a critical mole ratio of from about 1:6 to about 1:30 respectively, which ratios are sufficient to form substantially improved stable gels for utilization in a subterranean formation during the recovery of hydrocarbonaceous fluids.

4,787,452

DISPOSAL OF PRODUCED FORMATION FINES DURING OIL RECOVERY

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 8, 1987, Ser. No. 59,357
Int. Cl.[4] E02D *3/12;* **E21B** *33/138, 43/24, 43/40*
U.S. Cl. 166—272 **12 Claims**

1. A method for disposing of fines recovered during the production of hydrocarbonaceous fluids from a formation comprising:

(a) making an aqueous saline slurry from said recovered fines;

(b) injecting incrementally said slurry into a formation via at least one wellbore at a rate and velocity sufficient to close pores in said formation without fracturing said formation where a slug containing a higher concentration of fines in the slurry follows a slug of lower fines concentration; and

(c) decreasing the injection rate and velocity of said slurry thereby causing said fines to settle and close at least one more permeable zone in said formation.

4,787,453

PERMEABILITY STABILIZATION IN SUBTERRANEAN FORMATIONS CONTAINING PARTICULATE MATTER

Gregory S. Hewgill, Chino; David R. Watkins, Irvine, and Leonard J. Kalfayan, Claremont, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 30, 1986, Ser. No. 924,938
Int. Cl.[4] C09K *17/00;* **E21B** *43/24, 43/22*
U.S. Cl. 166—272 **29 Claims**

1. A method for treating a water-sensitive subterranean formation which contains fine siliceous particulates, comprising injecting into the formation a non-acidic, aqueous composition which contains at least one water-soluble organosilicon compound having only one silicon atom per molecule.

14. A method for treating a subterranean formation which contains fine siliceous particles, comprising injecting into the formation an aqueous composition which contains steam and at least one water-soluble organosilicon compound, the organosilicon compound being capable of binding to said siliceous particles to form a polymer film thereover.

4,787,454

RECOVERING HYDROCARBONS WITH SURFACTANTS FROM LIGNIN

Douglas G. Naae, Houston; Lawrence E. Whittington, Katy; Will A. Ledoux, Sugar Lane, and Francis E. Debons, Richmond, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 946,270, Dec. 24, 1986, Pat. No. 4,739,040. This application Oct. 23, 1987, Ser. No. 112,316
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **4 Claims**

1. A method of recovering hydrocarbons from an underground hydrocarbon formation penetrated by at least one injection well and at least one production well, which comprises:

injecting into the formation through an injection well a surfactant slug comprising about 0.1% to about 10% by weight of surfactants produced from lignin,

said surfactants produced by placing lignin in contact with water, converting the lignin into low molecular weight lignin phenols by reducing the lignin in the presence of a reducing agent of carbon monoxide or hydrogen creating a reduction reaction mixture comprising oil soluble lignin phenols, said reduction occurring at a temperature greater than about 200° C. and a pressure greater than about 100 psi, recovering the oil soluble lignin phenols from the reduction mixture, and converting the lignin phenols into lignin surfactants by a reaction selected from the group consisting of alkoxylation, sulfonation, sulfation, alkylation, sulfomethylation, and alkoxysulfation;

injecting into the formation through the injection well a drive fluid to push the surfactant slug towards a production well; and

recovering hydrocarbons at the production well.

4,787,455

METHOD FOR SCALE AND CORROSION INHIBITION IN A WELL PENETRATING A SUBTERRANEAN FORMATION

Earl S. Snavely, Jr., Arlington, Tex., and John Hen, Skillman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,170
Int. Cl.[4] E21B *41/02, 43/12*
U.S. Cl. 166—279 **7 Claims**

1. A method for inhibiting scale and corrosion in a well penetrating a subterranean formation for the production of fluids from the formation comprising:

(a) injecting a predetermined amount of microparticles of a basic anion exchange resin providing a source of polyca-

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tions into the formation about the well that are trapped and retained by the interstices of the formation without rendering said interstices or the formation impermeable to the flow of fluids; and

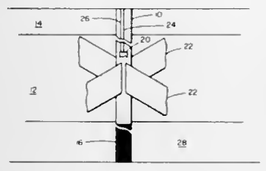
(b) injecting a predetermined amount of an aqueous solution of scale and corrosion inhibitor into the formation about the well that contacts the basic anion exchange resin providing a source of polycations and becomes fixed in a slightly soluble state either by complexation with the polycations or is precipitated by the polycations contained in said resin.

4,787,456

METHOD TO IMPROVE MATRIX ACIDIZING IN CARBONATES

Alfred R. Jennings, Jr., Plano, and Lloyd G. Jones, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 10, 1987, Ser. No. 36,742
Int. Cl.[4] F21B *33/134, 43/263, 43/27*
U.S. Cl. 166—281 **16 Claims**



1. A method for increasing the permeability of a formation which formation bas at least one zone of lesser permeability and one zone of greater permeability where high energy impulse fracturing is used in combination with an inhibited acid comprising:

(a) directing into a wellbore within said formation a pumpable solidifiable gel into the zone of the formation having the zone of greater permeability under conditions to selectively close pores in said greater permeability zone;

(b) allowing said pumpable gel to solidify and form a gel plug within said wellbore which plug is sufficient to support a desired volume of acid;

(c) placing an inhibited acid into said wellbore above said gel plug adjacent to said zone of lesser permeability;

(d) suspending a canister containing a propellant into the wellbore substantially near said zone of lesser permeability; and

(e) igniting said propellant which releases energy sufficient to form more than two simultaneous radial fractures in said zone of lesser permeability which also causes said acid to enter said fractures and thereafter react within said fractures, thereby increasing the permeability of said zone of lesser permeability.

14. A method for increasing the permeability of a formation, where high energy impulse fracturing is used in combination with an inhibited acid comprising:

(a) placing an inhibited acid into a wellbore adjacent to the interval of the formation desired to be treated which acid is of strength sufficient to react with said formation;

(b) suspending a canister containing a propellant into the wellbore substantially near said interval; and

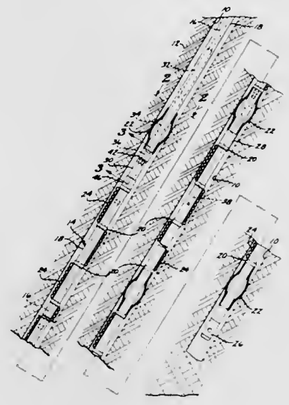
(c) igniting said propellant which releases energy sufficient to form more than two simultaneous radial fractures which also causes said acid to enter said fractures and thereafter react within said fractures, thereby increasing the permeability of said interval.

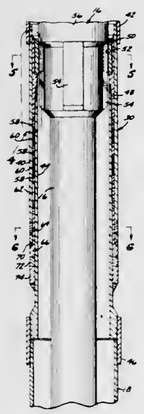
4,787,457

METHOD AND APPARATUS FOR ROTATING CASING STRING SEGMENT

Mark B. Webster, 1996 Balearic Dr., Costa Mesa, Calif. 92626; Tom D. Bateman, 263 Ocean View Ave., Newport Beach, Calif. 92663, and Trent A. Bateman, 1584 Riverside Pl., Costa Mesa, Calif. 92627, assignors to Mark B. Webster, Costa Mesa; Tom D. Bateman, Newport Beach and Trent A. Bateman, Costa Mesa, all of, Calif., a part interest

Filed Jun. 22, 1987, Ser. No. 65,021
Int. Cl.[4] E21B *33/14*
U.S. Cl. 166—286 **16 Claims**





1. A method of rotating a segment of a casing string extending from the surface into a well bore having a relatively highly deflected well bore portion, the method comprising the steps of:

providing a rotation enabling portion in the well bore beyond the deflected well bore portion;

making up a casing string having a swivel between a segment of the string and an adjacent portion of the string to render the casing segment rotatable relative to the adjacent portion of the string, and wherein the segment and the adjacent portion of the string have substantially the same external diameter;

running the casing string into the well bore and locating the casing segment in the rotation enabling portion of the well bore;

running a drill string through the casing string and into driving engagement with the swivel; and

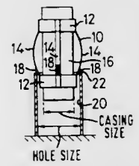
rotating the drill string to rotate the casing segment relative to the adjacent portion of the casing string.

4,787,458

SPRING BOW, CENTRALIZER, AND RELATED METHODS

Friederich H. Langer, Houston, Tex., assignor to Weatherford U. S., Inc., Houston, Tex.

Filed May 29, 1987, Ser. No. 56,488
Int. Cl.[4] E21B *17/10*
U.S. Cl. 166—380 **15 Claims**



1. A centralizer for well casing to function in an annular space between the casing and a wellbore, the centralizer having a longitudinal central axis, the wellbore having an upper edge at an upper wellbore opening, the centralizer comprising

a pair of spaced-apart and aligned collar means adapted to encircle the casing,

a plurality of spring bows extending between and secured to the collar means, each bow having two ends and a bow mid-portion curved outwardly from the longitudinal central axis of the centralizer, the bows disposed so that a bow part of the bow mid-portion is at a bow angle with respect to the upper edge of the wellbore upon insertion of the centralizer into the wellbore,

at least one of said bows having at least one contact angle reduction member, the contact angle reduction member comprising a member protruding from the bow part, the contact angle reduction member protruding outwardly with respect to the longitudinal central axis of the centralizer, the contact reduction member contacting the upper edge of the wellbore at a contact angle which is smaller than the bow angle.

13. A method for employing casing in a wellbore, the method including the steps of

disposing a centralizer on the casing, the centralizer comprising

a pair of spaced-apart and aligned collar means adapted to encircle the casing,

a plurality of spring bows extending between and secured to the collar means, each bow having two ends and a bow mid-portion curved outwardly from the longitudinal central axis of the centralizer, the bows disposed so that a bow part of the bow mid-portion is at a bow angle with respect to the upper edge of the wellbore upon insertion of the centralizer into the wellbore,

at least one of said bows having at least one contact angle reduction member, the contact angle reduction member comprising a member protruding from the bow part, the contact angle reduction member protruding outwardly with respect to the longitudinal central axis of the centralizer, the contact angle of reduction member contacting the upper edge of the wellbore at a contact angle less than the bow angle,

inserting the casing into the top of the wellbore, and

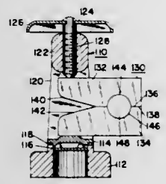
moving the casing so that it is contained within the wellbore.

4,787,459

RELEASE TECHNIQUE AND DEVICE

John Thomas M. Lee, Phoenixville, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 354,223, Mar. 3, 1982, Pat. No. 4,466,489. This application Aug. 23, 1982, Ser. No. 410,337
Int. Cl.[4] A62C *37/30*
U.S. Cl. 169—42 **6 Claims**



1. A quick release valve comprising:

(a) a pair of members opposed surfaces in proximity with each other;

(b) means comprising a thin layer of bonding material between said opposed surfaces for releasably joining said members together, said bonding material being weaker than the material forming said members so that the device when actuated separates along said opposed surfaces;

(c) a port in one of said members extending from an external surface of said member to the surface of said member which is in proximity with the other member, said bonding material forming a hermetic seal which prevents discharge of fluid through said port;

(d) said opposed surfaces having aligned indentations which together form an opening for a radially expandable actuator which, when expanded, forces said members apart and thereby causes said members to separate; and

(e) A radially expandable actuator adapted to be inserted into said opening in close fitting engagement with the walls thereof, said actuator having a casing at least a portion of which is radially expandable, and means for generating within said casing on command an internal pressure sufficient to expand said casing radially and thereby force said members apart.

4,787,460

MOUNTING PLATE FOR A FIRE EXTINGUISHER HAVING A SELF-LOCATION FEATURE

Joseph G. Clarkson, 662 Riordan Ter., Towson, Md. 21204

Filed Apr. 17, 1987, Ser. No. 39,292
Int. Cl.[4] A62C *11/00*
U.S. Cl. 169—51 **7 Claims**

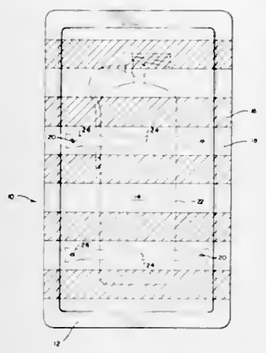
1. A wall-mounting for a hand-operated fire extinguisher, comprising

a plate having a substantially flat surface and having markings thereon defined by a contrasting and alternating color pattern,

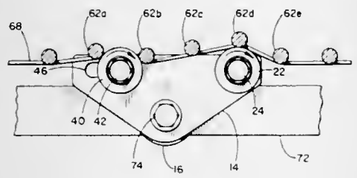
said fire extinguisher occupying a portion of said plate, and

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a substantial further portion of said plate extending in its planar dimension beyond the periphery of said fire extinguisher, whereby said markings adjacent said fire extinguisher are clearly visible.

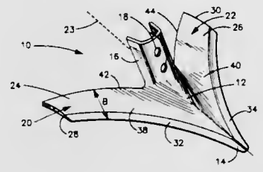


4,787,461
SHAKER ASSEMBLY
Thomas E. Rogus, Rte. 2, Box 99, Strandquist, Minn. 56758
Filed Jun. 5, 1987, Ser. No. 58,928
Int. Cl.[4] A01D *33/00*
U.S. Cl. 171—27 **5 Claims**



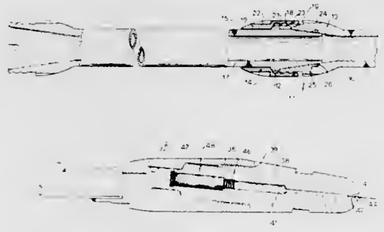
1. A shaker assembly for use on driven endless rod chain conveyors of the type having a plurality of substantially parallel, spaced rod members on which root crops may be conveyed, said shaker assembly comprising:
(a) a body securable to a frame of a chain conveyor, said body including a first opening and a second opening spaced from said first opening;
(b) means for securing said body to a frame of a chain conveyor;
(c) a first roller assembly mounted to said body through said first opening; and
(d) a second roller assembly mounted to said body through said second opening; said second roller assembly being spaced from the first roller assembly by the spacing between said first and second openings, at least one of said openings being elongated in a direction toward the other opening such that the distance between said roller assemblies may be adjusted by moving a roller assembly along the elongated opening.

4,787,462
CULTIVATOR SWEEP
John W. Nichols, Sterling, Colo., assignor to Nichols Tillage Tools, Inc., Sterling, Colo.
Filed Jan. 21, 1987, Ser. No. 5,609
Int. Cl.[4] A01B *23/02, 35/26*
U.S. Cl. 172—730 **14 Claims**



1. A sweep for use with an earth-cultivating implement, said sweep comprising:
an elongated body terminating in a front nose portion;
stem means for attaching said body to said implement;
a pair of laterally extending wing members diverging rearwardly from said body, each terminating at one end with said body to form said front nose portion while terminating at its opposite distal end in a tip portion; and
each said wing member defining a continuous front cutting surface along its forwrad edge between said nose and tip portions, said cutting surface being shaped in a concave curve between said nose and tip portions, and each said wing member further defining a substantially uniformly curving, concave bottom surface extending between said front cutting surface and the rear edge of said wing member.

4,787,463
METHOD AND APPARATUS FOR INSTALLMENT OF UNDERGROUND UTILITIES
Edward Geller, Mercer Island; Mike Kirby, Vashon; John Mercer, Kent; Tom O'Hanlon, Tacoma; Jim Reichman, Issaquah; Ken Theimer, Auburn, and Robert Svendsen, Seattle, all of Wash., assignors to FlowMole Corporation, Kent, Wash.
Continuation of Ser. No. 20,545, Mar. 3, 1987, abandoned, which is a continuation of Ser. No. 709,046, Mar. 7, 1985, Pat. No. 4,674,579. This application Apr. 18, 1988, Ser. No. 183,414
Int. Cl.[4] E21B *7/08, 7/18, 10/60, 47/024*
U.S. Cl. 175—45 **17 Claims**



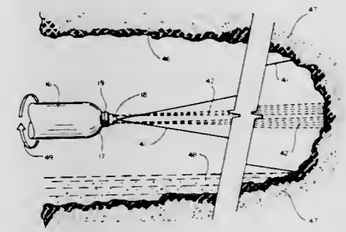
1. A method of installing a utility line comprising the steps of:
drilling a hole in the vicinity where the line is desired by means of a fluid jet which is advanced without rotation to drill a curved section and which is advanced with rotation to drill a straight section;
monitoring the progess of said drilling step;
applying correction to eliminate any deviation from the desired path;

reaming said hole drilled in said drilling step with a reamer provided with fluid jets; and,
pulling said reamer back through the drilled reamed hole; and,
towing the utility line through the drilled reamed hole with said reamer by connecting the utility line to the reamer.
9. An apparatus for drilling an underground passageway comprising:
(a) a bendable, hollow drill string which has a front end and a back end which when maintained straight defines a straight, longitudinal axis;
(b) a fluid jet producing nozzle assembly having a nozzle body connected to the front end of said drill string by means of a key and slot arrangement whereby to prevent the nozzle body from rotating relative to the drill string;
(c) means for supplying high pressure fluid through said drill string and to said nozzle assembly whereby to cause at least one fluid jet to flow from said nozzle assembly;
(d) means for intermittently rotating said drill string and said nozzle assembly about the longitudinal axis of said drill string; and
(e) means for pushing said drill string and nozzle assembly in a forward direction.

4,787,464
VARIABLE RAKE MINE TOOL INSERT AND METHOD OF USE
Randall W. Ojanen, Bristol, Tenn., assignor to GTE Products Corporation, Stamford, Conn.
Filed Nov. 13, 1987, Ser. No. 120,294
Int. Cl.[4] E21B *10/58*
U.S. Cl. 175—57 **7 Claims**

1. A mine tool roof bit insert comprising a flat elongated body rotatable about a central axis and having two halves symmetrical about the axis, each symmetrical half comprising:
a planar leading face inclined at a constant angle of 0°–3° with respect to the axis;
a frontal face inclined with respect to a radial line intersecting and normal to the axis and inclined with respect to a second line normal to both the radial line and the axis; and
a cutting edge defined by the intersection of the leading face and the frontal face; and wherein
the angle of inclination of the frontal face with respect to the second line decreases with radial distance from the axis, decreasing from 25°–55° at the axis to 15°–25° at its radially distal edge, the rate of angle decrease being at least 10°/in.
7. A method of drilling a hole in a mine roof comprising the steps of:
positioning a mine tool including a mine tool roof bit insert comprising a flat elongated body rotatable about a central axis and having two halves symmetrical about the axis, each symmetrical half comprising:
a planar leading face inclined at a constant angle of 0°–3° with respect to the axis;
a frontal face inclined with respect to a radial line intersecting and normal to the axis and inclined with respect to a second line normal to both the radial line and the axis; and
a cutting edge defined by the intersection of the leading face and the frontal face; and wherein
the angle of inclination of the frontal face with respect to the second line decreases with radial distance from the axis, decreasing from 25°–55° at the axis to 15°–25° at its radially distal edge, the rate of angle decrease being at least 10°/in; and
rotating the mine tool roof bit, insert, or the like at about 250–600 rpm and about 1000–8000 lb thrust for a time sufficient to drill the hole in the mine roof.

4,787,465
HYDRAULIC DRILLING APPARATUS AND METHOD
Ben W. O. Dickinson, III, San Francisco; Robert W. Dickinson, San Rafael; Richard R. Jensen, Hacienda Heights; Sherman C. May, San Francisco; Charles S. Mackey, Bakersfield; Robert D. Wilkes, Jr., and Paul S. Turin, both of Berkeley, all of Calif., assignors to Ben Wade Oakes Dickinson III et al., San Francisco, Calif.
Continuation-in-part of Ser. No. 853,548, Apr. 18, 1986, abandoned. This application Nov. 19, 1986, Ser. No. 932,712
Int. Cl.[4] E21B *7/18*
U.S. Cl. 175—67 **43 Claims**



1. In apparatus for drilling a borehole in the earth: a drill head having means for discharging a cutting jet of drilling fluid in a generally axial direction to form the borehole, means for supplying pressurized drilling fluid to the drill head, and means responsive to orientation of the drill head for discharging a portion of the drilling fluid to control the direction in which the hole is cut.
15. In a method of drilling a borehole in the earth with a hydraulic drill head at the distal end of a tubular drill string to which a pressurized drilling fluid is applied, the steps of: discharging a high speed jet of drilling fluid from the drill head to cut into the earth in front of the drill head, discharging a side jet of pressurized fluid in a radial direction from the distal end portion of the drill string to steer the drill head within the earth, and controlling the discharge of the side jet in accordance with the orientation of the end portion of the drill string.

4,787,466
CUTTING COMPONENT
Peter N. Tomlinson, 315 Endford Road, Mondeor, Johannesburg, Transvaal, South Africa, and Klaus Tank, 9 Warbleton Avenue, Essexwold, Johannesburg, Transvaal, South Africa
Filed Oct. 5, 1987, Ser. No. 105,094
Claims priority, application South Africa, Oct. 6, 1986, 86/7606
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **2 Claims**

1. A cutting component comprising:
(a) a composite abrasive compact comprising an abrasive compact bonded to a cemented carbide support;
(b) an elongate, cylindrical pin having end surfaces and a side surface;
(c) a recess for receiving the composite abrasive compact sloping from one end surface of the pin to the side surface;
(d) the composite abrasive compact being located in the recess and bonded to the pin such that the abrasive com-

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pact presents a cutting edge for the cutting component and the abrasive compact lies wholly within the side surface of the pin and an imaginary extension thereof; and



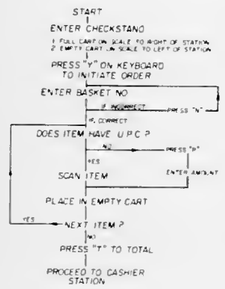
(e) a groove in the recess which spaces the abrasive compact from the pin.

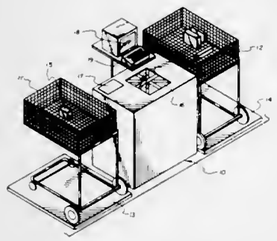
4,787,467

AUTOMATED SELF-SERVICE CHECKOUT SYSTEM

Neldon P. Johnson, 1050 E. State Rd., American Fork, Utah 84003

Filed Jul. 31, 1987, Ser. No. 79,951
Int. Cl.[4] G01G *19/52*; G06K *15/00*; G06F *15/24*
U.S. Cl. 177—50 **5 Claims**





1. An apparatus for a self-service check out system, comprising in combination:

a check out stand;

a bar code scanner disposed in said check out stand for scanning a bar code on a scanned product, said code containing product information including price and weight;

weighing scales for weighing a product receiving basket placed on said scales and for weighing all scanned products placed into said basket;

computer controlled means for receiving product information from said bar code scanner, determining the weight of a scanned product and comparing it with the weight of the scanned product when placed in the receiving basket to determine if the same product is placed in the basket as was scanned;

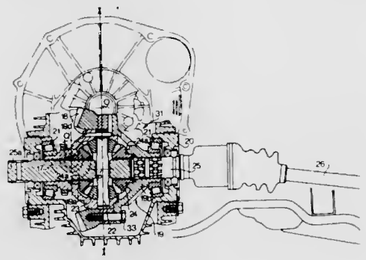
error control means connected to said computer controlled means to stop scanning function of bar scanner if product weight in receiving basket does not match product weight from bar product scanner; and p1 print-out means connected to said computer means for producing a print-out of scanned products with individual prices for each product and a total price for all purchased products.

4,787,468

SYSTEM FOR TRANSMITTING POWER OF AN ENGINE TO DRIVING WHEELS OF A MOTOR VEHICLE

Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1987, Ser. No. 75,101
Claims priority, application Japan, Jul. 26, 1986, 61-176483
Int. Cl.[4] F16H *37/10*
U.S. Cl. 180—70.1 **10 Claims**



1. A system for transmitting power of an engine to driving wheels of a motor vehicle having an automatic transmission of a trans-axle type and differential provided between axles of the driving wheels, and the automatic transmission having an input shaft operatively connected to a crankshaft of the engine, a drive pinion shaft as an output shaft of the transmission, and a drive pinion formed on the drive pinion shaft and engaged with a ring gear of the differential, the system comprising:

a center of the input shaft of the transmission and a center of the differential with respect to the horizontal direction being positioned on a vertical plane; and

a center of the drive pinion shaft being deviated from the vertical plane in a lateral direction, and the center of the differential is positioned at a central position with respect to width of the vehicle.

4,787,469

POWER STEERING SYSTEM

Hiroshi Yoshida, Toyokawa; Hajime Kozuka, and Masao Murai, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo and Koyo Seiko Kabushiki Kaisha, Osaka, both of, Japan

Filed Jul. 23, 1986, Ser. No. 888,436
Claims priority, application Japan, Jul. 31, 1985, 60-167648; Jul. 31, 1985, 60-116440[U]; Jul. 31, 1985, 60-116441[U]; Jul. 31, 1985, 60-116442[U]; Jul. 31, 1985, 60-116443[U]; Jul. 31, 1985, 60-116444[U]; Jul. 31, 1985, 60-116445[U]; Jul. 31, 1985, 60-116446[U]; Jul. 31, 1985, 60-116447[U]
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—142 **10 Claims**

1. A power steering system comprising

an input shaft coupled to a steering wheel,

a torsion bar for transmitting rotation of said input shaft to an output shaft,

a power cylinder coupled to said output shaft,

an oil path switching valve for switching oil paths to said power cylinder in accordance with the difference of turning angle between said input shaft and said output shaft,

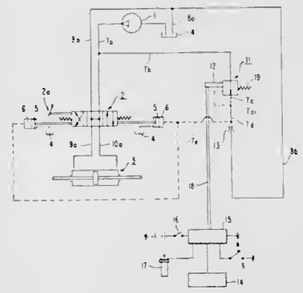
a high pressure oil path for supplying working oil delivered from an oil pump to said power cylinder via said oil path switching valve,

a low pressure oil path for returning the working oil from said power cylinder to an oil tank via said oil path switching valve,

a reaction piston for exerting a restraining force between said intput shaft and said output shaft to limit the difference of turning angle therebetween,

a control oil path extending from the midway of said high pressure oil path to said reaction piston,

a pressure control valve for controlling oil pressure in said



control oil path extending to said reaction piston to a level not higher than a predetermined highest pressure,

a spring for energizing said pressure control valve in the direction of increasing the control oil pressure,

a return side orifice for communicating said control oil path between said pressure control valve and said reaction piston with said low pressure oil path,

a solenoid of which the plunger energizes said pressure control valve in the direction of decreasing the control oil pressure, while the axial force of said plunger varies in accordance with the supplied electric current and does not vary in accordance with the displacement of said plunger, and

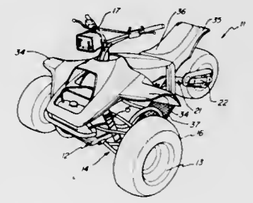
a control apparatus for supplying the electric current to said solenoid, the electric current decreasing with an increase in car speed.

4,787,470

THREE WHEEL VEHICLE

William J. Badsey, San Juan Capistrano, Calif., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 30, 1986, Ser. No. 880,554
Int. Cl.[4] B62D *61/06*
U.S. Cl. 180—210 **7 Claims**



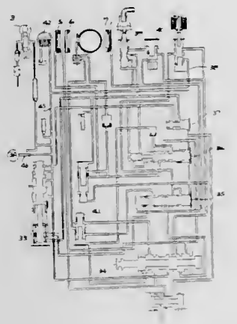
1. A single rider three wheel vehicle having a frame a pair of front wheels dirigibly supported by said frame at the forward end thereof, a single rear wheel supported at the rear end of said frame, suspension means for suspending each of said wheels for independent movement to said frame about respective pivot area fixed relative to said frame, power means carried by said frame for driving said rear wheel, and a single saddle type seat carried by said frame midway between said front and rear wheels on a longitudinal centerplane passing through said frame, said front and rear wheels carrying tires, the effective area of contact of the rear wheel mounted tire with the ground being equal to the sum of the contact areas of the front wheel carried tires with the ground, the wheel base between said front and rear wheels equally the tread between said front wheels.

4,787,471

POWER TRANSMITTING SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1987, Ser. No. 52,669
Claims priority, application Japan, May 23, 1986, 61-119485
Int. Cl.[4] B60K *17/35*
U.S. Cl. 180—249 **13 Claims**



1. A power transmitting system for a four-wheel drive vehicle driven by an engine controlled by a throttle and having an automatic transmission, comprising:

a central differential operatively connected to an output member of the automatic transmission, the central differential having a first side gear and a second side gear;

a first drive train for transmitting rotation of the first side gear of the central differential to a front drive shaft, the latter being operatively connected to front driving wheels of the vehicle;

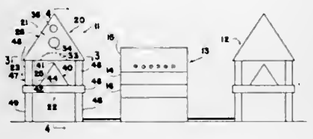
a second drive train for transmitting rotation of the second side gear to a rear drive shaft, the latter being operatively connected to rear driving wheels of the vehicle;

a fluid operated friction clutch provided between the first and second side gears so as to operatively connect both the side gears for locking the central differential; and

a hydraulic control circuit for applying line pressure of oil in the automatic transmission to the friction clutch so a to engage the clutch at clutch capacity varying according with said line pressure, said line pressure increasing with increase of throttle opening degree, so that distribution of power of the engine to the driving wheels of the vehicle varies with driving conditions of the vehicle.

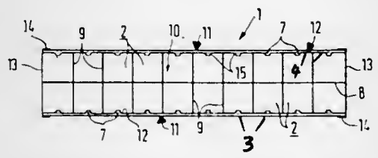
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4,787,472
AUDIO SPEAKER APPARATUS
Donald L. Minnerath, and Robert J. Minnerath, both of Saco, Mont., assignors to Mark Cassel, Saco, Mont.
Filed Apr. 6, 1987, Ser. No. 34,653
Int. Cl.[4] H05K 5/00
U.S. Cl. 181—145 19 Claims



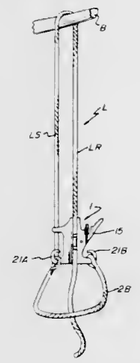
1. Audio speaker apparatus including a chamber portion, a sound generating portion, a sound distributing portion and a positioning portion; said chamber portion including a generally transverse face section, a housing section extending from adjacent a periphery of said face section along a centerline of said chamber portion, said housing section including wall elements converging from said face section and interconnected to form an apex, said face section and said housing section forming a speaker chamber with an enclosed upwardly extending apex; said sound generating portion including a low frequency range speaker mounted adjacent said face section and facing outwardly therefrom and extending into an area of the converging wall elements of said housing section, middle frequency range and high frequency range speakers mounted adjacent said housing section along the length thereof, said mid-range and high range speakers facing in a direction different from said low range speaker; said sound distributing portion including a deflecting member disposed directly outside said low range speaker and closely adjacent thereto, said deflecting member including an apex close to said low range speaker and a wall section with elements diverging from said apex; said positioning portion including connecting means maintaining said deflecting member substantially centered with respect to said low range speaker.

4,787,473
SOUND ATTENUATING BOX
Helmut V. Fuchs, Weil; Ulrich Ackermann, Stuttgart, and Norbert Rambausek, Weil der Stadt/Merklingen, all of Fed. Rep. of Germany, assignors to Fraunhofer Gesellschaft, Munich, Fed. Rep. of Germany
PCT No. PCT/EP86/00039, § 371 Date Nov. 13, 1996, § 102(e) Date Nov. 13, 1986, PCT Pub. No. WO86/04668, PCT Pub. Date Aug. 14, 1986
PCT Filed Jan. 30, 1986, Ser. No. 925,023
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1985, 3504208
Int. Cl.[4] E04F 17/04; F01N 1/02
U.S. Cl. 181—224 26 Claims



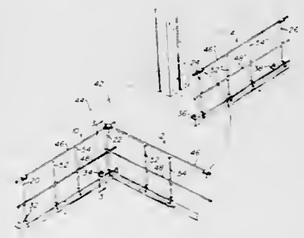
1. A sound attenuator box, particularly for attenuating sound waves in an audible range propagating in flow channels, such as venting channels, and including:
(a) at least one enclosed chamber forming, a hollow cavity and being bounded to one side by means of an outer plate excitable to undergo vibrations in the audible range; and
(b) at least one inner plate which is arranged essentially parallel to the outer plate inside the hollow cavity of the chamber, and partitioning the hollow chamber into two partial first and second follow chambers, which are interconnected exclusively through a passage opening in the inner plate, said passage opening together with the first partial cavity facing away from said outer plate establishing a Helmholtz resonator tuned to osciallations in the audible frequency range; the improvement comprising:
said inner plate, said first and second partial chambers, and said outer plate constituting a vibrating entity, oscillating in the audible range;
said outer plate being of an unperforated, impermeable configuration;
there being such a small distance (S) between said inner plate (4) and said outer plate (3), so that the vibrations of the outer plate (3) and of the Helmholtz resonator are positively coupled by means of oscillation induced air or gas currents in said second partial chamber between the outer plate (3) and the inner plate (4) as well as said passage opening (7).

4,787,474
ROPE CONTROLLER
Daniel F. Brennan, 512 Main St., Shauemakersville, Pa. 19555
Filed Nov. 23, 1987, Ser. No. 123,817
Int. Cl.[4] A62B 1/16, 35/00
U.S. Cl. 182—7 5 Claims



1. Control apparatus to aid in hauling in, paying out or securing a line, comprising:
a body portion having a cylindrical passageway adapted to receive a line and permit the line to move axially through the passageway;
a side opening extending the axial length of the passageway adapted to accept the lateral insertion or removal of the bight of a line;
jaws having line engaging surfaces oppositely disposed within the passageway, including:
a first jaw fixedly positioned and defining a portion of the inside surface of the passageway;
a second jaw mounted for rotation about a pivot point located outboard of the passageway and adapted to be rotated sequentially, by cooperative interaction with the first jaw, from a first line engaging position, to an intermediate line disengaging position, to a second line engaging position;
spring bias means to urge the second jaw into the first line engaging position; and
lever means fixed to the second jaw and mounted for rotation about the pivot point which, when rotated toward the control apparatus, will rotate the second jaw against the spring bias first into the line disengaging position and next into the second line engaging position.

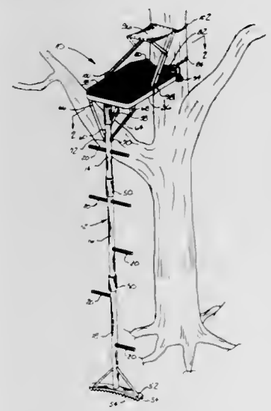
4,787,475
SAFETY FENCE ASSEMBLY FOR USE IN A BUILDING UNDER CONSTRUCTION
Jean Arteau, and Raymond Bertrand, both of Montreal, Canada, assignors to Instit de Recherche en Sante et en Securite du Travail du Quebec, Quebec, Canada
Filed Dec. 31, 1987, Ser. No. 140,028
Int. Cl.[4] E04G 21/32, 1/26
U.S. Cl. 182—82 24 Claims



1. A safety fence assembly for mounting to a floor of a building under construction comprising:
post means adapted to be vertically mounted to said floor, said post means having upper and lower ends;
at least one guard rail structure including at least an upper rail and upright means secured to said upper rail to define therewith a frame;
first hinge means mounted to said upper rail at one end thereof, said first hinge means including:
(i) a vertically extending pivot member adapted to be pivotally mounted to the upper end of said post means, or to hinge means of an adjacently disposed guard rail structure, and
(ii) a horizontally extending support member having an opening therethrough to receive a pivot member of an adjacently disposed guard rail structure; and
movable second hinge means slidably mounted to said upper rail at an opposite end thereof, said movable second hinge means including:
(i) a sliding member slidably mounted to said upper rail;
(ii) a pivot member vertically extending from said sliding member and adapted to be pivotally mounted to hinge means of an adjacently disposed guard rail structure, or to the upper end of said post means; and
(iii) a support member horizontally extending from said sliding member and having an opening therethrough for receiving a vertically extending pivot member of a hinge means of an adjacently disposed guard rail frame structure.

4,787,476
TREE STAND
Richard D. Lee, 2110 Morningside Dr., Safety Harbor, Fla. 33572
Filed Jan. 29, 1988, Ser. No. 149,788
Int. Cl.[4] A45F 3/26
U.S. Cl. 182—116 5 Claims

1. A portable tree stand apparatus for positioning a person at an elevated position in a tree comprising:
an elongated ladder having a cylindrical top, bottom and intermediate section, each section collapsible at connecting joints, each joint having a socket from each adjacent ladder section rotatably connected together;
a braced supporting member attached to a distal end of the bottom section, the supporting member having a top and bottom surface, with the top surface attached to the bottom ladder section and the bottom surface of the supporting member having serrated edges for firm engagement with a top surface of soil surrounding the tree;
multiple cantileveredly mounted hand and foot grips extending from each section;
a platform pivotably attached at a front end to a distal end of the top section;



each connection joint having a frictionally fit sleeve engaged over the connected sockets to prevent movement of the ladder in an erected position;
the platform attached at a back edge to the trunk of a tree and held securely in place by a chain around the tree;
the chain being tightened down around the tree by a locking wheel screw mounted on a side surface of the platform.

4,787,477
STAND FOR ALL TERRAIN VEHICLE
Rex H. Dolan, Hwy. 80 and 4th Ave., Forest, Miss. 39074
Filed Jan. 15, 1988, Ser. No. 144,277
Int. Cl.[4] A01M 31/02
U.S. Cl. 182—116 10 Claims



1. An extensible stand for use in connection with an all terrain vehicle, comprising
(a) a collapsible frame including
(1) front and rear pairs of legs, each leg comprising upper and lower sections;
(2) hinge means for connecting said upper and lower leg sections together, said sections of each leg being pivoted between a folded position wherein said sections are arranged at an acute angle and an extended position wherein said sections are arranged vertically end to end;
(3) locking means for locking each of said hinge means when said leg sections are in the extended position; and
(4) brace means releasably connected between front and

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rear legs for stabilizing the legs when in the extended position; and

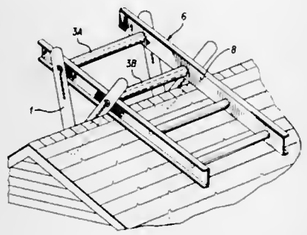
(b) a platform connected with the upper ends of said legs to define a support surface, whereby when said leg sections are in the folded position, said platform is arranged generally vertically behind the seat of the vehicle and when said leg sections are in the extended position, said platform is arranged horizontally and is spaced above the vehicle.

4,787,478

ROOF LADDER ATTACHMENT

John W. Stakes, Jr., 1640 Chanticleer Ave., Santa Cruz, Calif. 95062

Filed Feb. 25, 1987, Ser. No. 18,031
Int. Cl.[4] E06C *7/48*
U.S. Cl. 182—206 **1 Claim**



1. A ladder attachment for a ladder having side rails and hollow tubular rungs, said attachment comprising:

a pair of separate brackets, each bracket comprising a foot member, a pair of elongated bars, each bar pivotally connected at one end to each other and to said foot member, said bars each having a plurality of holes spaced apart along their longitudinal axis, a pair of bolts longer than the width of said ladder whereby when in operative position each bracket is located adjacent said side rails with some of the holes in each bar in alignment with a pair of said hollow-rungs and interconnected by means of said bolts passing through said hollow rungs and said holes in said bars, and means attached at each end of said bolts for fastening the brackets firmly to the ladder.

4,787,479

CONTROL SYSTEM FOR A CENTRAL LUBRICATION SYSTEM FOR VEHICLE

Günter Ostermeyer, Walldorf; Karl Rodemer, Heidelberg, and Peter Steiger, Schriesheim, all of Fed. Rep. of Germany, assignors to Lincoln GmbH, Walldorf, Fed. Rep. of Germany

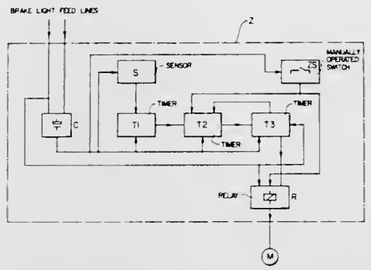
Filed Sep. 3, 1987, Ser. No. 92,879
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1986, 3630327
Int. Cl.[4] F16N *7/38*
U.S. Cl. 184—7.2 **12 Claims**

1. A control system for a central lubrication system for a powerless vehicle having an electrically operated lubrication pump and having electrical power externally supplied thereto via brake light feed lines, said control system comprising:

a sensor means for detecting movement of the vehicle and for generating an output signal in response thereto;

a first timer means for receiving said output signal from said sensor means and for adding the durations of said output signal from said sensor means and for comparing the resultant sum with a predefined pause time and for providing an output signal when said sum is greater than said predefined pause time;

a second timer means connected to a relay means which is in turn connected to the electrically operated lubrication pump and the brake light feed lines for receiving said output signal from said first timer means and for connecting the electrically operated lubrication pump to the brake light feed lines in response thereto and for adding the durations of said output signal from said first timer means and for comparing the resultant sum with a predefined operating time and for generating an output signal when said sum is equal to said operating time, said output signal



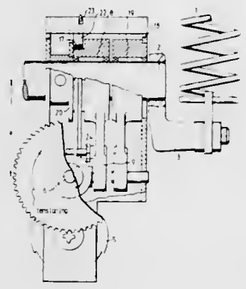
of said second timer means being sent to said first timer means so as to reset said first timer means and thereby also reset said second timer means so as to disconnect the electrically operated lubrication pump from the brake light feed lines.

4,787,480

TENSIONING DEVICE FOR THE ENERGY STORE OF AN ELECTRICAL SWITCH

Erwin Reichl, Tegernheim, Fed. Rep. of Germany, assignor to Sachesenwerk, Aktiengesellschaft, Regensburg, Fed. Rep. of Germany

Filed Aug. 13, 1987, Ser. No. 85,025
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627508
Int. Cl.[4] F03G *1/08;* **H01H** *3/30*
U.S. Cl. 185—40 R **8 Claims**



1. A tensioning device comprising:

a rotatable drive shaft having a crank articulated to the drive spring, said drive shaft being rotatable into an end position at which the spring is tensioned;

a rotatable tensioning shaft and displacement-producing means carried by said tensioning shaft;

directional coupling means disposed on said drive shaft and coupled to said displacement-producing means for rotating said drive shaft in steps in a selected direction in response to rotation of said tensioning shaft;

spring means disposed for maintaining said coupling in operative engagement with said displacement-producing means;

a setting member associated with said drive shaft for uncoupling said directional coupling means from said displacement-producing means when said drive shaft is in its end position; and

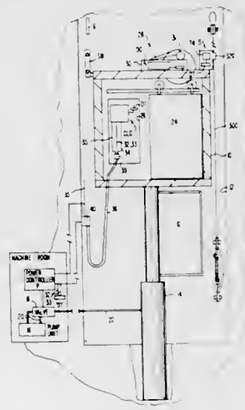
an additional energy source which is charged before said drive shaft reaches its end position and which is connected to hold said setting member in a position to maintain said directional coupling means uncoupled from said displacement producing means.

4,787,481

HYDRAULIC ELEVATOR HAVING MICROPROCESSOR-BASED, DISTRIBUTED CONTROL SYSTEM

Dennis J. Farrar, and William M. Dugan, both of Memphis, Tenn., assignors to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Jan. 20, 1987, Ser. No. 5,552
Int. Cl.[4] B66B *1/00*
U.S. Cl. 187—110 **20 Claims**



1. A hydraulic elevator having a distributed intelligence control system, said elevator comprising:

a car having a door;

a jack coupled to the car for raising and lowering the car between landings;

a pump means for supplying hydraulic fluid to the jack;

a valve means for controlling the flow of hydraulic fluid to and from the jack;

means for registering floor calls for each of the landings;

a power controller for selectively actuating said pump means and said valve means for up travel, and said valve means for down travel;

door operator means mounted to said car including door drive means coupled to said door for opening and closing the door and including first microprocessor means for actuating said door drive means, said first microprocessor means including (a) means for executing an open door cycle, for opening the door in a predetermined, controlled speed pattern, responsive to an external open door command; and (b) means for executing a close door cycle, for closing the door in a predetermined, controlled speed pattern, responsive to an external door close command;

a selector means for producing selector signals representative of car position and car travel and including second microprocessor means mounted to said car (a) for setting, responsive to an external run signal, target floor and target distance, (b) for storing a pre-selected slowdown distance for said target floor; (c) for calculating, responsive to selector signals, instantaneous target distance, and (d) for producing slowdown interrupt signals SDI representative of the car reaching the slowdown distance; and (e) for producing output signals representative of levelling position;

a car logic controller ("CLC") mounted to said car comprising a third microprocessor means for controlling said power controller and for overseeing said door operator means and said selector means, said third microprocessor means including means for (a) issuing run commands to said power controller for selective actuation thereof; (b) issuing door open and door closed commands to said first microprocessor means; (c) issuing run signals to said second microprocessor means; (d) actuating, responsive to the receipt of slowdown interrupt signals SDI and floor call signals, said power controller to slow said car into a selected landing; and (e) actuating said power controller for levelling of said car, wherein said power controller includes means for levelling said car responsive to selector signals; and

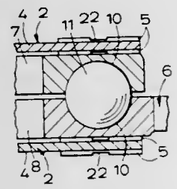
communication means among said first, second, and third microprocessor means for sending and receiving communications, wherein each microprocessor means has stand alone intelligence for performing certain of predefined control tasks independent of the other microprocessors.

4,787,482

SELF ENERGIZING DISC BRAKES

Roy Campbell, Worcestershire, and Graham J. Gornall, West Midlands, both of England, assignors to Lucas Industries Public Limited Co., Birmingham, England

Filed Jun. 7, 1984, Ser. No. 618,419
Claims priority, application United Kingdom, Jun. 11, 1983, 8316026
Int. Cl.[4] F16D *55/04*
U.S. Cl. 188—71.4 **11 Claims**

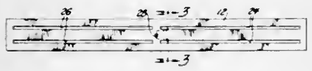


1. A self-energising disc brake comprising a housing, axially spaced first and second surfaces in said housing, radial pilot lugs in said housing, axially spaced first and second pressure plates centred on said pilot lugs, adjacent faces of said pressure plates, being provided with cooperating oppositely inclined angularly spaced recesses defined between end faces, balls located in complementary pairs of said recesses, said recesses having an angularly spaced relationship relative to each other to form a pitch circle of constant diameter, a first unitary rotatable friction member disposed between said first pressure plate and said first surface, a second unitary rotatable friction member disposed between said second pressure plate and said second surface, each of said friction members comprising a disc, and first and second linigs of friction material for engagement with the adjacent pressure plate and the adjacent surface, respectively, carried by opposite faces of said disc, and means for moving said pressure plates angularly relative to said housing to initiate application of said brake with said pressure plates also moving axially to urge the friction members into engagement with said first and second surfaces, respectively, due to a tendency for said balls to ride up said end faces, said pressure plates thereafter being carried round with said friction member to provide a servo action, wherein a braking face of at least said first lining of friction material of each of said friction members is separated into only two annular rings by only a single annular groove, and said groove is substantially coinci-

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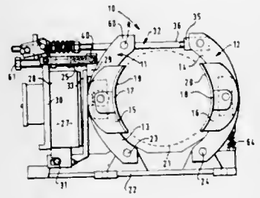
dent with said pitch circle of constant diameter to increase the degree of cooling in said recesses.

4,787,483
SLOTTED BRAKE BAND FOR TRANSMISSION ASSEMBLY
Oscar E. Stefanutti, West Bloomfield, Mich., assignor to Advanced Friction Materials Co., Sterling Heights, Mich.
Filed Mar. 4, 1982, Ser. No. 354,590
Int. Cl.⁴ F16D *65/06*
U.S. Cl. 188—77 W **5 Claims**



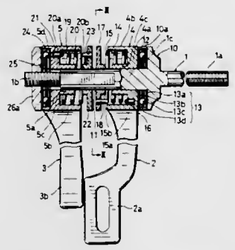
1. A band assembly (10) adapted for wrapping about a portion of the peripheral surface of a drum, said band assembly comprising; a band member (12) extending in a circular configuration between ends thereof, connector members (14 and 16) disposed at said ends of said band (12) on the exterior thereof, a friction lining (22) disposed on the interior of said band (12), characterized by a first pair of spaced slots (24) extending from one of said ends for a portion of the length of said band member (12) and said lining (22), and a second pair of slots (26) having ends spaced from said first pair of slots (24) and extending therefrom over the remaining portion of the length of said band member (12) and said lining (22) to the other end thereof, said slots extending through said lining (22) as well as said band member (12).

4,787,484
ELECTROMAGNETICALLY OPERATED FRICTION BRAKE HAVING AUTOMATIC ADJUSTMENT MECHANISM
David J. Webb, Bridgwater, England, assignor to Torvale Transmissions Limited, Bridgwater, United Kingdom
Filed Jan. 23, 1987, Ser. No. 6,414
Claims priority, application United Kingdom, Jan. 29, 1986, 8602120
Int. Cl.⁴ B60T *13/04*
U.S. Cl. 188—171 **14 Claims**



11. A brake comprising a base, a pair of brake shoes, means mounting the brake shoes on the base, a drum to be braked, means resiliently to bias the brake shoes into engagement with the drum to apply the brake, electromagnetic means to move the brake shoes against the resilient biasing means to release the brake, the electromagnetic means comprising an electromagnet having a coil and an armature movable relative to the coil when the coil is energised, the resilient biasing means biasing the armature of the electromagnet into engagement with one of the shoes whilst a housing of the coil of the electromagnet is resiliently biased in an opposite direction by the resilient biasing means, a connecting element connecting the housing and the other of the brake shoes so that the shoes are both oppositely biased into engagement with the drum, and means automatically to maintain the movement of the armature relative to the coil within a predetermined range of movement irrespective of the amount of wear of the brake shoes, the maintaining means comprising lost motion means having a one way clutch mounted adjacent to the electromagnet and operated by a linkage means that is mounted to be pivotable on the housing of the coil and on the armature and automatically varying the effective length of the connecting element by an amount corresponding to the amount of wear of the brake shoes, the linkage means of the lost motion means comprising a first link member pivotally connected at one end to the armature and at the other end to a second link member which itself is pivotally secured to the housing at the coil of the electromagnet, the second link member being rigid with a lever which when rotated at least in one sense of the rotation causes the effective length of the connecting element to be reduced.

4,787,485
BICYCLE CALIPER BRAKE ASSEMBLY
Mikio Hosokawa, Fukui, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan
Filed Jun. 10, 1987, Ser. No. 60,320
Int. Cl.⁴ B62L *1/12*
U.S. Cl. 188—24.12 **7 Claims**



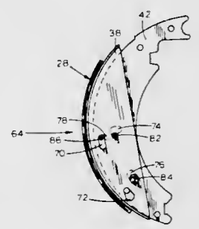
1. A bicycle caliper brake assembly comprising:
a support shaft having an intermediate flange;
a pair of calipers respectively having bosses rotatably fitted on said shaft axially one behind the other, so said calipers are pivotally movable toward and away from each other;
said bosses respectively defining annular accommodating spaces;
said bosses being axially movable relative to each other on said shaft to assume their respective preassembled and assembled positions;
locking means adjustably mounted on said shaft so that said bosses are interposed between said locking means and said flange;
one of said calipers being formed with a projecting portion which engages the other caliper to prevent it from pivoting away from said one caliper more than a predetermined amount when said bosses assume said assembled position but which disengages from said other caliper to allow it to pivot away from said one caliper more than said predetermined amount when said bosses assume said preassembled position;
a pair of coil springs each housed completely within the accomodating space of a corresponding boss and having one end engaging said corresponding boss at a fixed position relative thereto; and
a pair of engaging disks non-rotatably but axially slidably fitted on said shaft between said bosses and each engaging the other end of a corresponding coil spring, so that each engaging disk is movable toward and away from the other engaging disks while maintianing engagement with said other end of said corresponding coil spring.

4,787,486
LANDING GEAR MECHANISM INCLUDING CONTROLLED INSTROKE AND REBOUND DAMPING AND STROKE OVERLOAD PROTECTION
Louis C. Hrusch, Chesterland, and Richard J. Winn, Parma, both of Ohio, assignors to Pneumo Abex Corporation, Boston, Mass.
Filed Jun. 19, 1986, Ser. No. 876,101
Int. Cl.⁴ F16F *9/48*
U.S. Cl. 188—289 **17 Claims**



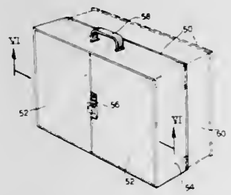
1. A landing gear mechanism comprising a main cylinder, a main strut piston axially movable within said main cylinder, restrictor means contained within said cylinder and defining with said cylinder and piston upper and lower chambers, said restrictor means including orifice means providing for the passage of fluid between said upper and lower chambers during relative movement between said piston and cylinder, said orifice means comprising an opening through said restrictor means, and a metering pin attached to said piston for movement therewith, said metering pin extending through said opening in said restrictor means, and relief valve means contained within said metering pin for movement therewith, said relief valve means including means providing for the bypass flow of fluid from said lower chamber to said upper chamber via said relief valve means in response to a pre-set pressure drop from said lower chamber to said upper chamber only during an intermediate portion of the instroke of said landing gear mechanism, and means for blocking bypass flow of fluid from said upper chamber to said lower chamber via said relief valve means during the entire outstroke of said landing gear mechanism.

4,787,487
ARTICULATED LINKAGE ASSEMBLY FOR A SURGE BRAKE
Eugene P. Conradi, Des Moines, Iowa, assignor to Dico Company, Inc., Des Moines, Iowa
Filed May 28, 1987, Ser. No. 55,235
Int. Cl.⁴ F16D *51/00;* **B60T** *7/20*
U.S. Cl. 188—328 **4 Claims**



1. In a surge brake system for a tractor-trailer combination, wherein the brake system includes a brake drum and an articulated brake shoe carried on a lever plate for movement into braking engagement with the brake drum in response to the action of forward inertia of the trailer relative to the tractor and out of braking engagement in response to at least one of neutral or rearward inertia of the trailer relative to the tractor, an articulated linkage assembly, comprising:
(a) plate means movably supporting the brake shoe;
(b) linkage means interconnecting said plate means to said lever plate for limited movement of the brake shoe between a non-braking contact position with the brake drum under a condition of at least one of neutral or rearward inertia of the trailer and a position of braking engagement under a condition of forward inertia of the trailer; and
(c) yieldable means between said plate means and the lever plate for urging the brake shoe into a rest position therefor, wherein said linkage means, on movement of the trailer from a condition of forward inertia to a condition of rearward inertia, limits the movement of said brake shoe to a non-braking contact position whereby said yieldable means acts to urge the brake shoe to said rest position.

4,787,488
EXPANDABLE PIECE OF LUGGAGE
Giorgio Campanini, Via Servais 50, Torino, Italy
Filed May 11, 1987, Ser. No. 47,486
Claims priority, application Italy, May 15, 1986, 53411/86[U]
Int. Cl.⁴ A45C *5/06, 7/00, 13/10, 13/26*
U.S. Cl. 190—104 **30 Claims**



1. A parallelepiped luggage case, comprising:
a rigid quadrangular frame having an upper side with means for carrying said case, end sides and a base side;
first and second lateral walls lying in opposed parallel planes, at least one of said first and second lateral walls having a single walled frame perpendicular thereto along its perimetral edge, said single walled frame being telescopically slidable with respect to said quadrangular frame to allow the displacement of said lateral wall in a direction perpendicular to its plane between a retracted position in which it is located adjacent the quadrangular frame and a projecting position in which it is located spaced away from the quadrangular frame, for increasing the internal volume of said case;
a spring means being compressed between the lateral wall and the quadrangular frame for engaging said lateral wall and urging it towards the projected position with respect to the frame;
means formed in the quadrangular frame for guiding said single walled frame between extreme positions; and
means coupled to the single walled frame for retaining the lateral wall in the retracted position against the compression of the spring means including a cursor having at least one latch, said cursor being slidable between first and second positions in a plane parallel with the base side and a coil spring engaging the cursor for urging it to the first position.

20. A parallelepiped luggage case, comprising:
a rigid quadrangular frame having an upper side with means for carrying said case attached to the upper side, end sides and a base side;
first and second lateral walls lying in opposed parallel planes, at least one of said first and second lateral walls having a single walled frame attached thereto along its perimetral edge, said first lateral wall being divided into two panels hingedly connected to the corresponding edges of the two end sides of said quadrangular frame,

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means for opening said panels in the same way as the doors of a cupboard;

said single walled frame being telescopically slidable with respect to said quadrangular frame to allow the displacement of said lateral wall attached thereto in a direction perpendicular to its plane, between a retracted position in which it is located adjacent the quadrangular frame and a projecting position spaced from the quadrangular frame, as a result of which the internal volume is increased; and

a partition formed by first and second bars, said first bar has a height corresponding to the spacing between said first and second lateral walls when said second lateral wall is retracted, said partition being hinged to said second lateral wall and provided with guide means extending vertically, said second bar being slidable in the guide means between a lowered position in the space of the hinged bar and a raised position in which it occupies the space between the hinged bar and the first lateral wall, when the second lateral wall is located in the projected position.

4,787,489

SYSTEM FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH FOR A VEHICLE

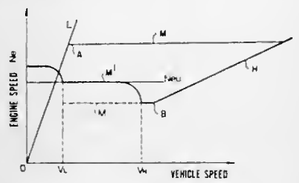
Motohisa Miyawaki, Chofu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 27,830

Claims priority, application Japan, Mar. 31, 1986, 61-73687

Int. Cl.[4] B60K *41/22*; F16D *27/16*

U.S. Cl. 192—0.052 **3 Claims**



1. In a system for a motor vehicle having an engine, an accelerator pedal for controlling air-fuel ratio of fuel mixture supplied to the engine, a choke valve for controlling the air-fuel ratio of the fuel mixture at a cold engine condition, a continuously variable transmission, an electromagnetic clutch having a coil for operating the clutch for transmitting the power of the engine to the transmission, the transmission having a drive range, reverse range and neutral range, and a selector lever for selecting the ranges, the improvement in the system comprising:

vehicle speed detecting means for producing a first vehicle speed signal at a first predetermined low speed and respectively a second vehicle speed signal when vehicle speed is between said first predetermined low speed and a second predetermined speed higher than said first low speed;

drive range detecting means for detecting the position of said selector lever and for producing a drive signal when said selector lever is at a drive range position;

switch means for producing a release signal during release of the accelerator pedal;

means for producing a choke signal when the choke valve of the engine is closed;

first control means responsive to said first vehicle speed signal and to said drive signal for producing a lock-up current signal;

second control means responsive to said second vehicle speed signal, said release signal and said choke signal for producing a current reducing signal;

clutch current control means responsive to said lock-up current signal for controlling current passing through the coil in said electromagnetic clutch to lock-up said electromagnetic clutch, and respectively responsive to the current reducing signal for reducing the current through the coil to slightly slip said clutch, so as to prevent elevation of temperature of the clutch at cold engine.

4,787,490

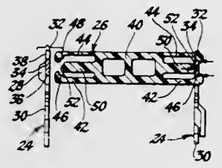
METAL AND PLASTIC COMBINATION ROLLER CLUTCH CAGE

Frederick E. Lederman, Sandusky, and Albert D. Johnston, Huron, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 15, 1987, Ser. No. 61,488

Int. Cl.[4] F16D *41/06, 15/00*

U.S. Cl. 192—45 **3 Claims**



1. An overrunning clutch cage of the type that retains a plurality of wedging elements in an annular space defined between a pair of coaxial races, comprising,

a pair of generally annular and substantially flat metal side rails having a predetermined width as measured between inner and outer edges thereof and a substantially uniform thickness, and,

a plurality of axially extending, circumferentially spaced plastic cross bars interconnecting said side rails with each end of each of said cross bars including,

a pair of radially aligned and flexible cantilevered arms that are, in an unflexed state, spaced apart by substantially the width of said side rails, said arms each further including an axially inwardly facing gripping surface, and,

a support column terminating in an axially outwardly facing fulcrum surface located intermediate to and substantially radially aligned with said arm gripping surfaces and axially spaced from said gripping surfaces by slightly less than the thickness of said side rails,

whereby said arms may be flexed apart and moved over the inner and outer edges of said annular side rails, thereby tightly holding said side rails with an axially inward force of said gripping surfaces and an axially outward force of said intermediate fulcrum surface, thereby providing rigidity to said cage while limiting the moment arm of said forces on said side rails to the width of said side rails.

4,787,491

SELECTING DEVICE OF A POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

Sboji Kato, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 35,639

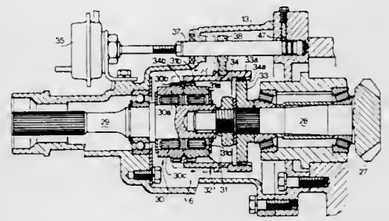
Claims priority, application Japan, Apr. 7, 1986, 61-080685

Int. Cl.[4] F16D *41/07, 47/04*; B60K *17/34*

U.S. Cl. 192—48.6 **3 Claims**

1. In a power transmission system for a four-wheel drive vehicle, having a transmission, a transmitting system for transmitting output of the transmission to front and rear wheels of the vehicle, the transmitting system including a double overrunning clutch comprising a forward overrunning clutch including a forward outer race provided with forward outer teeth on a periphery thereof, and forward spragges operatively disposed between said forward outer race and a shaft of said transmitting system, said shaft being rotatably connected to the front wheels, said forward overrunning clutch permitting faster rotation of said front wheels than said rear wheels in a first rotatable direction of said shaft corresponding to forward driving direction of the vehicle to prevent a tight corner braking phenomenon in said forward driving direction, and a reverse overrunning clutch including a reverse outer race provided with reverse outer teeth on a periphery thereof, and reverse spragges operatively disposed between said reverse outer race and said shaft of said transmitting system, said reverse overrunning clutch permitting faster rotation of said front wheels than said rear wheels in a second rotatable direction of said shaft corresponding to reverse driving of the vehicle to prevent said tight corner braking phenomenon in said reverse driving direction, the improvement in the system which comprises

selecting means comprising an axially slidable sleeve rotatably connected to said transmitting system and provided with inner teeth selectively engagable separately or simultaneously together with said forward and/or reverse outer teeth, respectively, of the forward and reverse overrunning clutches for selectively engaging said forward and/or reverse overrunning clutches in said transmitting system in order to transmit said output to said front wheels, said inner teeth when engaging simultaneously together with said forward and reverse outer teeth locks said double overrunning clutch establishing a directly connected four-wheel driving mode,



each of said forward outer teeth forming a first chamfer facing with a predetermined angle toward the first rotatable direction,

each of said reverse outer teeth forming a second chamfer facing with said predetermined angle toward the second rotatable direction, and

each of said inner teeth at both ends forming third and fourth chamfers respectively with said predetermined angle complementary to said first and second chamfers, respectively, so as to smoothly establish the directly connected non-overrunable four-wheel driving mode.

4,787,492

DOUBLE FRICTION CLUTCH WITH INDIVIDUAL CONTROL

Robert J. Ball, Bishops Itchington, and John D. Banks, Whitnash, both of United Kingdom, assignors to Automotive Products plc, Leamington Spa, England

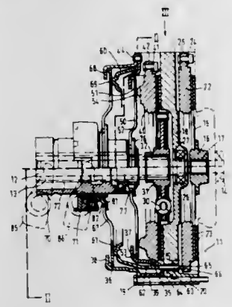
Filed May 19, 1987, Ser. No. 51,394

Claims priority, application United Kingdom, May 20, 1986, 8612213

Int. Cl.[4] F16D *21/06, 13/50*

U.S. Cl. 192—48.8 **7 Claims**

1. A friction clutch assembly for independently controlling transmission of drive to a pair of concentric output shafts comprising a first driven plate adapted to be mounted on the inner output shaft so as to be capable of transmitting torsional loads thereto while being free to move axially; a first pressure plate mounted co-axially with the first driven plate for engagement of a frictional surface thereof; a reaction plate mounted co-axially of the first driven plate and first pressure plate and spaced axially thereof; a second driven plate mounted co-axially of the reaction plate and adapted to be mounted on the outer output shaft so as to be capable of transmitting torsional loads thereto while being free to move axially thereof; a second pressure plate mounted co-axially of the second driven plate for engagement of a frictional surface thereof; first and second cover members mounted co-axially of one another; first spring means acting between the first cover member and the second pressure plate to urge the second pressure plate and second driven plate against the reaction plate, thereby applying a clamping load to the second driven plate; second spring means acting between the second cover member and an annular pressing having a series of circumferentially separated axially extending arcuate fingers which extend through corresponding arcuate apertures in the first cover member and reaction plate and engage in a groove in the first pressure plate to urge the first pressure plate towards the first driven plate and apply a clamping load to the first driven plate; and individual means associated with each of the first and second spring means for relieving the load applied thereby to remove the clamping load applied to the associated driven plate; means being provided to drivingly interconnect said first and second cover members and fix them axially with respect to said reaction plate, said first and second pressure plates being drivingly interconnected with said reaction plate, first cover member and second cover member by means which will permit limited axial movement of each pressure plate relative thereto.



4,787,493

AUTOMATIC CLUTCH ADJUSTER MECHANISM

Kobei Ohsono, Saitama, and Yoshihiro Yoshida, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1987, Ser. No. 11,777

Claims priority, application Japan, Feb. 7, 1986, 61-025359

Int. Cl.[4] F10D *13/75*

U.S. Cl. 192—70.25 **8 Claims**

1. A release mechanism for a clutch, comprising:

a support shaft having an axis,

a clutch release sleeve operatively connected to said clutch and concentrically disposed about said support shaft for axial movement therealong between a clutch-engaged position and a clutch-disengaged position,

selectively movable actuator means for moving said sleeve along said shaft, and

means for adjustably connecting said actuator means to said sleeve for concurrent movement along said shaft, including:

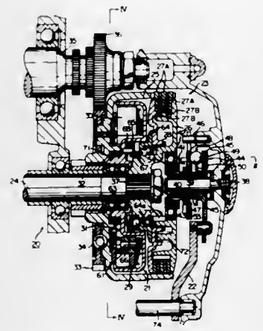
a rigid annular lock plate normally biased into a position loosely encircling said sleeve,

means on said actuator means for inclining said lock plate with respect to said support shaft axis into binding engagement with said sleeve as said actuator means moves through a first range of movement along said shaft from said clutch-engaged position and for concurrently moving said lock plate and said sleeve to release

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said clutch during a second range of movement along said shaft toward said clutch-disengaged position,

means for moving said actuator means along said support shaft, and



means for resiliently biasing said lock plate into said loosely-encircling condition each time said sleeve moves toward said clutch-engaged position.

4,787,494

HYDRAULIC OPERATING UNIT OF FRICTION ENGAGING APPARATUS FOR TRANSMISSIONS

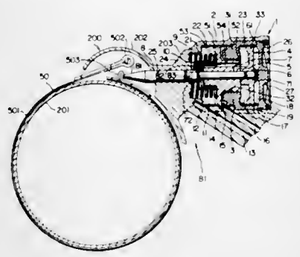
Tsunehiko Ogasawara, and Koji Sumiya, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Aisin Warner Kabushiki Kaisha, Aichi, both of, Japan

Continuation of Ser. No. 585,128, Mar. 1, 1984, abandoned. This application May 4, 1987, Ser. No. 45,425

Claims priority, application Japan, Mar. 31, 1983, 58-57496

Int. Cl.[4] F16D *65/32. 25/06*

U.S. Cl. 192—86 **13 Claims**



1. A hydraulic operating unit of a friction engaging apparatus for engaging some of the elements of a gear mechanism or for locking some of the elements to a stationary member in order to achieve a prescribed driving ratio between an input shaft and an output shaft of a transmission, comprising:

a hollow cylinder body including an inner diameter surface;

a piston guide positioned in said cylinder body, said piston guide including a first inner diameter portion and a second inner diameter portion larger than said first portion;

a first piston having first slidable engagement means for engaging said inner diameter surface and second slidable engagement means for engaging said first inner diameter portion;

means engageable with said first piston and slidable therewith for governing operation of the friction engaging apparatus;

a second piston slidably and removably received in said second inner diameter portion;

a first hydraulic chamber formed by said first slidable engagement means and a portion of said inner diameter surface adjacent said governing means and actable on said first piston in a direction causing said governing means to release said friction engaging apparatus, said first chamber having a first pressure acting area;

a second hydraulic chamber formed between said first and second slidable engagement means and actable on said first piston in a direction causing said governing means to engage said friction engaging apparatus, said second chamber having a second pressure acting area;

a third hydraulic chamber formed by said second inner diameter portion and said second piston and actable on said second piston in said direction causing said governing means to release said friction engaging apparatus, said third hydraulic chamber having a third pressure acting area;

a flow passage communicating said first and third hydraulic chambers; and said piston guide being removably mounted in said cylinder body whereby the third pressure acting area may be adjusted by substitution of said piston guide and said second piston with a substitute piston guide and a substitute second piston, both said substitute piston guide and a substitute second piston, both said substitute guide and said substitute piston having dimensions different from said piston guide and said second piston.

4,787,495

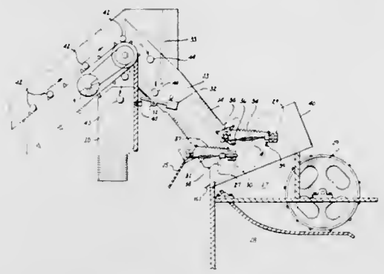
METHOD AND APPARATUS FOR SELECTIVE SCRAP METAL COLLECTION

William J. Tuten, and Kennith D. Crosby, both of Scottsdale, Ariz., assignors to Creative Technology, Inc., Scottsdale Ind. Air Park, Ariz.

Filed Nov. 30, 1984, Ser. No. 676,785

Int. Cl.[4] G07F *7/06;* B07C *9/00*

U.S. Cl. 194—209 **14 Claims**



6. A scrap metal collection system comprising:

first means for separating non-ferrous material from ferrous materials, said first means includes a conveyer belt and magnetic pulley;

second means for separating non-ferrous materials having a pre-determined weight from a remainder of said non-ferrous materials, said second means comprising a plate of flexible material, said non-ferrous material dropping from said conveyer belt onto said plate, said plate preventing jamming of said conveyer belt;

third means for separating non-metallic material having the same weight from said remainder of non-ferrous material;

fourth means for determining a quantity of non-ferrous metallic material after separation by said first, said second and said third means; and

fifth means for providing compensation dependant on said quantity of non-ferrous metallic material.

4,787,496

APPARATUS FOR THE ASSEMBLY AND/OR MACHINING OF CIRCULATING AND IMMOBILIZABLE PARTS CARRIED BY PALLETS

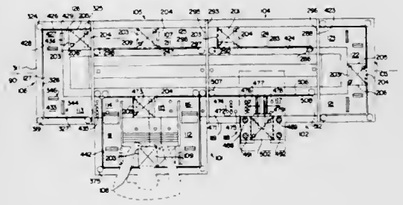
Maurice Prodel, 153, rue de Verdun-Carlepont, and Jacques Prodel, Rue de Cuts - Carlepont, both of 60170 Ribecourt, France

Continuation of Ser. No. 673,009, Nov. 19, 1984, abandoned, which is a continuation of Ser. No. 311,117, Oct. 14, 1981, Pat. No. 4,519,491. This application Aug. 4, 1987, Ser. No. 81,535

Claims priority, application France, Oct. 14, 1980, 80 21976; Apr. 8, 1981, 81 07088; Sep. 11, 1981, 81 17272; Oct. 9, 1981, 81 19109

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—346.1 **5 Claims**



1. Plural interchangeable-module apparatus for moving individual pallets, each adapted for supporting a workpiece, over a defined path enabling a workpiece to pass one or more work stations, said apparatus comprising:

(a) a plurality of substantially identical base units adapted to be secured to each other in juxtaposed end-to-end fashion, substantially all said base units having the same predetermined length in the direction of said end-to-end juxtaposition;

(b) a plurality of pallet transport means each detachably connectable to any said base unit, the upper surface of each said pallet transport means having a guide means extending throughout its length and defining a generally rectilinear segment of said defined path, said guide means having a length substantially equal to said predetermined length of any said base unit, the combined height of any said base unit with a pallet transport means supported thereon being such as to cause the path segment of such pallet transport means to be situated substantially at waist level to optionally permit a person to conveniently perform a manual operation on a workpiece supported on a said pallet;

(c) means for removably connecting each pallet transport means, in a direction of movement transverse to that of the rectilinear segment defined by the associated pallet transport means, to any said base unit, said connecting means including cooperating fastening elements on respectively each base unit and the associated pallet transport means for enabling alignment of said end-to-end juxtaposed plurality of pallet transport means to facilitate the smooth movement of any pallet over said defined path;

(d) at least one said pallet transport means including auxiliary transport means for enabling transport of a pallet over a secondary transport path segment extending laterally from the rectilinear segment defined by such pallet transport means;

(e) at least one pallet being connected to said plurality of pallet transport means for movement over said defined path; and

(f) a work station associated with said at least one pallet transport means and adapted to cooperate with a pallet located on said secondary transport path;

whereby any said pallet transport means may conveniently and quickly, by means of unskilled labor, be detached from a base unit on which it is supported and connected to any other base unit to thereby facilitate the rearrangement of pallet transport means of different kinds in said apparatus to accommodate said modular apparatus to the specific requirements of a particular operation without rearranging said base units, while still optionally also permitting the addition, deletion, and rearrangement of base units when expansion, contraction, or reconfiguration of the apparatus is desired.

4,787,497

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

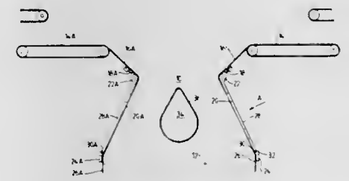
Paul G. King, and Anthony R. Brown, both of Bucks, Great Britain, assignors to Molins PLC, London, England

Filed Jul. 28, 1986, Ser. No. 889,613

Claims priority, application United Kingdom, Jul. 29, 1985, 8519696

Int. Cl.[4] B65G *1/00*

U.S. Cl. 198—347 **13 Claims**



10. A conveyor system for rod-like articles, comprising wall means forming a boundary for a region containing rod-like articles in stack formation, said wall means comprising a flexible membrane maintained under tension to restrain and control articles in the region while maintaining the capacity of the region relatively constant, and support means allowing differing degrees of movement across the membrane, wherein the wall means is resilient, including means for maintaining different parts of said wall means under different tensions.

4,787,498

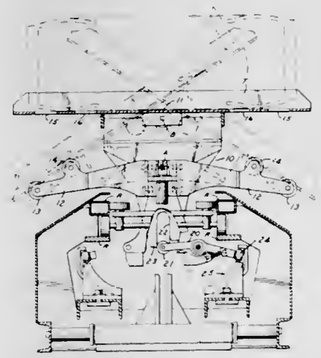
TIRE HANDLING TRAY SORTATION SYSTEM

Maurice C. Males, Alpharetta, and Suren Varjabedian, Dunwoody, both of Ga., assignors to Babcock Industries Inc., Fairfield, Conn.

Filed Feb. 10, 1988, Ser. No. 154,389

Int. Cl.[4] B65G *47/46*

U.S. Cl. 198—365 **6 Claims**



1. A tray sortation system particularly suited to the handling

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of tires which are at elevated temperature and tend to adhere to the tray which comprises

a plurality of carriage assemblies movable along a track and defining an axis of travel,

each carriage assembly including a tray which is tiltable about an axis generally parallel to the axis of travel by a tilting means,

each said tray having a first set of openings,

each carriage assembly further including a first pair of rollers attached thereto along one side of the carriage assembly and adapted to extend through said first set of openings in the tray when the tray is tilted by said tilting means toward said first pair of rollers thereby breaking any contact formed between the tire and the tray and insuring a free gravitational discharge of the tire from the tray at a predetermined discharge location along said track.

4,787,499

DEVICE FOR OVERTURNING PACKS, PARTICULARLY CIGARETTE PACKS AND THE LIKE

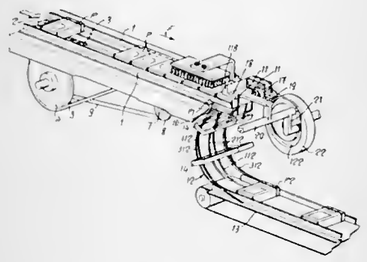
Oliviero Lodi; Gianni Armaroli, and Marco Cugolli, all of Bologna, Italy, assignors to Sasib S.p.A., Bologna, Italy

Filed Dec. 10, 1986, Ser. No. 940,253

Claims priority, application Italy, Dec. 18, 1985, 12626 A/85

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—407 **8 Claims**



1. A device for overturning packs, particularly cigarette packs, or the like, which are advanced in a substantially horizontal row toward an abutment stop member, and must be each capsized around an axis which is transverse to the direction of progress of the pack row, so as to turn upward their originally downwardly turned face, characterized by a pack-guiding arcuate channel extending in a substantially vertical plane at about 180°, from a substantially horizontal top opening provided before the abutment stop member and having a width that is at least slightly greater than the extension of pack in direction of progress of the pack row, as far as an underlying conveyor for the overturned packs, which pack-guiding arcuate channel has its extrados convex side turned toward the direction of arrival of the pack row, while in correspondence of its opening, means are provided which are adapted for each time supporting in a substantially horizontal position the leading pack in the row of packs and for letting it through upon control, so as to cause it to drop into the opening of the pack-guiding channel, and the pack runs along the pack-guiding arcuate channel by gravity, with its side that in the overlying row of packs was turned backward, being turned forward; the width of the opening of the pack-guiding arcuate channel, in the direction of progress of the row of packs, is sensibly greater than the extension of a pack in the direction, so that even when the leading pack in the row of packs lies at a certain distance from the abutment stop member, this pack can be led into the pack-guiding arcuate channel; the top opening of the pack-guiding arcuate channel flares upwardly; the opening of the pack-guiding arcuate channel is delimited on the extrados and/or intrados side by a substantially rectilinear upper section of the respective walls of said pack-guiding arcuate channel; the abutment stop member is formed by a relative upper extension of the intrados wall of the pack-guiding arcuate channel; the pack-guiding arcuate channel has a cage-like construction; the leading pack in the row of packs is supported over the opening of the pack-guiding arcuate channel only at the edges of at least two opposite sides thereof, by elastic supporting means that can be elastically opened for letting through a pack under the action of a thrust exerted from above on the pack by a pusher, the path of movement of the pusher as a result of movement of a cam follower by a cam causes the pusher to move downwardly and rearwardly toward the extrados side and in such a manner that already at the time of its passage between the elastic supporting means, this pack is caused to assume a certain inclination being concordant with that of the initial section of the pack-guiding arcuate channel, or with that of the upper section of the intrados wall of said channel.

4,787,500

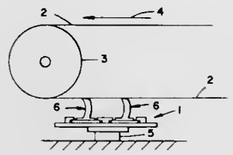
CONVEYOR BELT SCRAPER

William G. Holz, 105 S. Washington St., Lodi, Calif. 95240

Filed Sep. 22, 1986, Ser. No. 910,387

Int. Cl.⁴ B65G *45/00*

U.S. Cl. 198—497 **5 Claims**



1. In a conveyor belt scraper for a belt having a direction of travel toward said scraper, the belt scraper having scraping elements urged into contact with the underside of the belt to remove material from the belt, the improvement comprising:

a mounting plate having a top surface, two spaced, parallel attachment strips fixed to the surface, each attachment strip having a holding portion spaced from the surface with the holding portions facing each other;

a plurality of scraper elements mounted on said mounting plate, each said scraper element having a metal base plate, the base plate dimensioned to slide between the holding portions and the mounting plate; and

an elastomeric portion connected to and extending generally perpendicularly from the base plate, said elastomeric portion having a convex face facing the direction of travel of said belt, a concave face in the direction of travel of said belt, and a top face extending between the convex and concave faces, the top face and the concave face meeting at an edge engaging said belt, said elastomeric portion additionally including an integral base widening out from said convex and concave faces and secured to said base plate, said base being disposed between said attachment strip holding portions and said base plate extending beyond said base and between the holding portions and mounting plate, said scraper elements being disposed end to end with elastomeric portions and base plates of adjacent scraper elements in abutting relationship.

4,787,501

CONNECTIONS FOR SCRAPER-CHAIN CONVEYORS

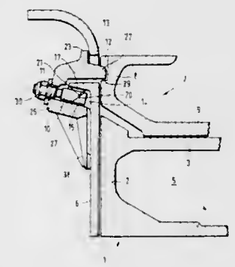
Christoph Rassmann; Peter Lindenau; Bernd Steinkuhl, all of Lünen, and Horst Schlüsener, Werne, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia GmbH, Lünen, Fed. Rep. of Germany

Filed Sep. 4, 1987, Ser. No. 93,261

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630450

Int. Cl.⁴ B65G *19/28*

U.S. Cl. 198—735 **12 Claims**



1. In a channel section for a scraperchain conveyor which is composed of upper and lower components (1, 7) each having a pair of interconnected side walls (2, 8); an improved means for detachably connecting the components together, said connecting means comprising: a side plate (6) fixed to one of the side walls of the lower component and projecting alongside an associated side wall of the upper component, recesses (12) defined in said associated side wall of the upper component, said recesses having base surfaces (29), locking members (10) having upper regions provided with projecting noses (22) received within the recesses to engage with the base surfaces, means (14) on the side plate defining sockets, fixing elements (11) with screw-threaded shanks (19) and heads (15), the heads of the fixing elements being located by the sockets with complementary surfaces (20, 21) of the heads of the elements and within the socket engaging one another, apertures (24, 26) in the locking members receiving and locating the fixing elements and presenting their shanks to receive nuts (30) which can be tightened to clamp the upper component firmly down onto the lower component, wherein each locking member has a depending flange (38) which supports itself against the side plate.

4,787,502

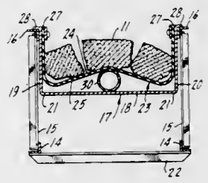
APPARATUS AND METHOD FOR CONVEYING MATERIAL

James F. Sullivan, Dallas, and Jimmy D. White, Duncanville, both of Tex., assignors to Triple/S Dynamics Inc., Dallas, Tex.

Filed Aug. 4, 1986, Ser. No. 892,429

Int. Cl.⁴ B65G *27/00, 27/22*

U.S. Cl. 198—771 **18 Claims**



1. A conveyor for moving particulate agglutinating material comprising: a trough having a bottom portion and upstanding side portions, a flexible sheet having an upper surface and a lower surface lining said trough with its lower surface in contact with said bottom portion, said sheet being attached to said trough adjacent the upper edges of said upstanding side portions; means for moving said conveyor so as to cause said particulate material to flow through said trough over said upper surface of said sheet; and means for breaking up accumulations of said particulate material in said conveyor comprising a flexible hose lying on said bottom portion in contact with said lower surface of said sheet, said hose normally being collapsed by the weight of particulate material on said upper surface of said sheet; and means for inflating said hose with a fluid so that said hose assumes a substantially round cross section and raises said sheet off said bottom portion and away from at least a portion of said upstanding side portions of said trough to break up packed accumulations of said particulate material.

15. The method of preventing the packing of an agglutinating particulate material which is being moved along a vibrating conveyor that has a bottom portion and opposed upstanding side portions, comprising the steps of:

(A) lining said conveyor with a sheet of flexible material with the under surface of said sheet being in contact with said bottom portion;

(B) attaching said sheet adjacent to the upper edges of said upstanding portions;

(C) placing a hose between said bottom portion and said under surface of said sheet;

(D) collapsing said hose by placing said particulate material on the upper surface of said sheet;

(E) causing said conveyor to vibrate and thereby to move said particulate material; and

(F) moving said sheet away from said bottom portion and at least a part of said side portions so as to break up packed accumulations of said particulate material on said upper surface by periodically inflating said hose.

4,787,503

DEVICE FOR THE CONVEYANCE OF BULK MATERIAL

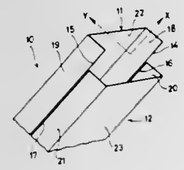
Cornelis F. Poelma, Nuenen, Netherlands, assignor to Intertransshipment B.V., Netherlands

Filed Mar. 20, 1987, Ser. No. 28,603

Claims priority, application Netherlands, Mar. 26, 1986, 8600781

Int. Cl.⁴ B65G *25/02*

U.S. Cl. 198—776 **17 Claims**

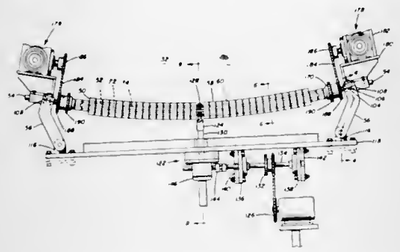


1. A device for the conveyance of material, in particular bulk material, comprising at least one trough-type conveyor element with a cyclical drive for transmitting a propelling force periodically to the material present in the trough-type conveyor element at least in the envisaged direction of conveyance, wherein provision is made for at least two parallel, mating trough-type conveyor elements which can move lengthwise relative to each other, and which each have an essentially U-shaped cross section and with their open sides face each other, with the free edges of the side walls essentially resting against each other, so that a closed conveyance space is produced in the form of an oblong conveyor box, and the two trough-type conveyor elements are provided with a cyclical drive which acts both transversely to and in the lengthwise direction of the trough-type conveyor elements, the drive of the two elements when transverse to the lengthwise direction

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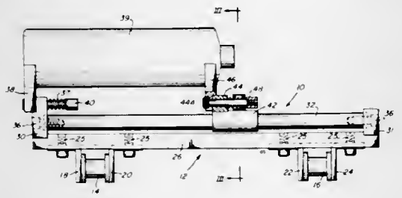
being in phase, and in the lengthwise direction exhibiting a relative phase shift of about 180 degrees.

4,787,504
ADJUSTABLE RADIUS CONVEYOR ROLL
Stephen J. Schultz, Indiana Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Oct. 6, 1986, Ser. No. 916,071
Int. Cl.[4] B65G *13/02*
U.S. Cl. 198—782 19 Claims



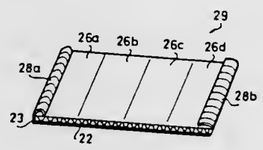
1. An adjustable radius conveyor roll for conveying an article comprising:
a flexible shaft;
means for pivotally supporting opposing end portions of said shaft;
a plurality of article contacting members mounted around said shaft in generally adjacent and abutting relationship along said shaft for rotation thereabout; and
means for displacing a portion of said shaft relative to said end portions of said shaft wherein said portion is intermediate of said end portions of said shaft and said displacing means acts on said intermediate portion.

4,787,505
WORKPIECE CARRIER ASSEMBLY
Mark Tweedy, Mars, Pa., assignor to Carl Strutz & Company, Mars, Pa.
Filed Nov. 18, 1986, Ser. No. 932,032
Int. Cl.[4] B65G *49/00*
U.S. Cl. 198—803.01 10 Claims



1. A workpiece carrier assembly for carrying a workpiece on a conveyor from an entry location to a work station and thence to a discharge station with said workpiece being positioned at a desired orientation relative to the work station, said assembly including:
upstanding V-blocks having V-shaped workpiece support surfaces for supporting the workpiece thereupon;
support means extending transversely of the conveyor for receiving said V-blocks for support by conveyor;
resiliently operable connecting means for removably connecting said upstanding V-blocks to said support means, said resiliently operable connecting means comprising a screw or bolt supporting each V-block on said support means and a spring biasing one of said V-block and screw or bolt to resiliently clamp said V-block on said support means.

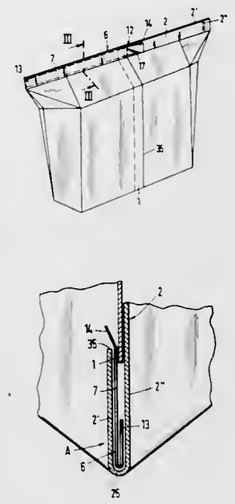
4,787,506
MAGAZINE FOR PHOTOSENSITIVE MATERIALS
Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 9, 1987, Ser. No. 36,438
Claims priority, application Japan, Apr. 12, 1986, 61-84815
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—395 10 Claims



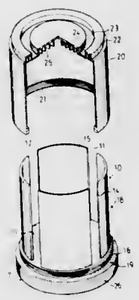
1. In a magazine for a roll of a photosensitive strip material which includes a core rotatably supporting said roll of photosensitive strip material and a light-shielding container body admitting said core and having an opening for drawing out said photosensitive strip material and having light-shielding teremp cloth provided at said opening, the improvement comprising a plurality of wall sections defining said container body, each of said plurality of wall sections being formed by paper board and a multilayer film laminated thereon and having a metal foil layer or a metallized flexible sheet layer visible from exteriorly of the roll and the ground fabric structure of said teremp cloth being a knit structure.

4,787,507
LIQUID PACK, METHOD OF MANUFACTURE THEREOF AND PLASTICS WEB FOR AN OPENING STRIP FOR THE PACK
Hans Rausing, Wadhurst, Great Britain, assignor to AB Tetra Pak, Lund, Sweden
Filed Apr. 27, 1987, Ser. No. 43,033
Claims priority, application United Kingdom, Apr. 28, 1986, 8610324
Int. Cl.[4] B65D *5/70*
U.S. Cl. 206—617 13 Claims

1. A pack for liquid comprising:
a plastics-coated cardboard carrier material; said cardboard carrier having a longitudinal weld seam and at least one transverse weld seam, said transverse weld seam being disposed in a doubled cardboard strip on a top section of the pack;
an opening means located in said top section, said opening means being in the form of an opening strip which is liquid-tight on one side and is oriented such that outward sides of the opening strip are joined to inward sides of the doubled cardboard strip, said opening strip being made of a laminated plastics material, one layer of which is oriented in one direction, said opening strip having limb portions with free ends to substantially form a U-shape in cross-section, said opening strip being oriented such that the free ends of the limb portions of the U-shape are directed inwardly into the pack, the limb portions being welded together at least at a beginning and an end section of the opening strip to form an initial sealing region and an end sealing region, respectively, the initial sealing region providing a gripping tongue portion projecting out of the doubled cardboard strip and being sealed in a region in the doubled cardboard strip where the longitudinal and transverse weld seams interact, and the end sealing region in the doubled cardboard strip is sealed in a pouring-out region of the opening means.

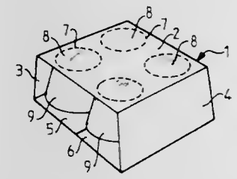


4,787,508
INTEGRATED CIRCUIT WAFER CONTAINER
Chin J. Wu, Hsin Chu Hsien; Genie Chen, Taipei; Pai Y. Cheng; I Ping Hu, both of Hsin Chu; Tsu J. Lu, Tao Yuan, and Jenn J. Wang, Hsin Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Ltd., Hsin, Taiwan
Filed Oct. 6, 1987, Ser. No. 105,092
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—445 3 Claims



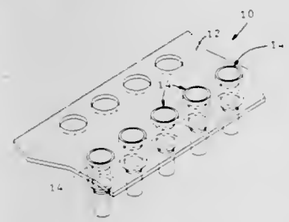
1. An integreated circuit wafer container for containing integrated circuit wafers therein, comprising:
an enclosure member and a body member, said enclosure member and said body member having respective longitudinally directed portions, said enclosure member being slidably insertable over said body member in said longitudinal direction in overlapping relation, said body member and said enclosure member being threadedly coupled each to the other by matingly engaging screw threads formed at a bottom portion of said enclosure member and said body member, respectively, a two-layer shield being formed to provide increased protection for said integrated circuit wafers therein, said body member having at least one longitudinal opening formed therethrough, thereby facilitating handling of said integrated circuit wafers.

4,787,509
MULTI-ITEM PACKAGING FOR RETAINING A PLURALITY OF OBJECTS
Michel Pasternicki, Saint-Arnoult-En-Yvelines, France, assignor to Paker S.A., Luce, France
Filed Oct. 26, 1987, Ser. No. 113,624
Claims priority, application France, Oct. 27, 1986, 86 14904
Int. Cl.[4] B65D *67/00*
U.S. Cl. 206—427 13 Claims



1. Multi-item packaging for retaining a plurality of objects, the packaging comprising a card panel having two flaps adapted to be connectable together for wrapping around said objects and for retaining them after said two flaps of said panel have been connected together, the packaging including at least one pre-cut which runs along a line disposed within an outer edge of the panel, said pre-cut defining a detachable portion capable of being fixed to at least one of said objects by gluing, said detachable portion being removable from the panel when the packaging is opened and remaining fixed to said at least one of said objects.

4,787,510
CARRIER STRIP FOR ELECTRICAL COMPONENTS
Francis R. Powell, Cheshire, Conn., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 2, 1988, Ser. No. 162,928
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—329 4 Claims



1. A carrier strip for carrying electrical components which are inserted into holes in circuit boards, said carrier strip comprising:
an elongated web of a suitable plastics material; and
a plurality of serially arranged, open ended cups integral with and extending outwardly from said web for removably receiving the electrical components, said cups having a free end with a thickness such that upon inserting the electrical components into the holes in the circuit board, at least a portion of said free end engages the circuit board to prevent the cups form entering the hole and to thereby

VOL 1096 ISS 5 NO 29 1988 UMI

result in the separation of the electrical components from said cups.

4,787,511

MIXING BAG WITH PLURAL COMPARTMENTS

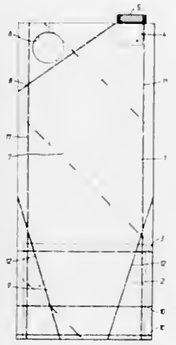
Lesley E. McIver, Deeside, United Kingdom, assignor to Inotec Laboratories Limited, Clwyd, England

Filed Dec. 21, 1987, Ser. No. 135,707

Claims priority, application United Kingdom, Dec. 19, 1986, 8630345

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—219 **9 Claims**



1. A pack adapted to store separately and allow mixing of a plurality of components and subsequent dispensing of the mixture, the pack comprising an outer container, a preferentially rupturable inner container having its outer surface sealed to the inner surfaces of said outer container walls at a median point of the outer container and adjacent an end of said inner container, the wall of said inner container between said seals defining a first compartment within said inner container to one side of said seal and a second compartment within said outer container to the other side of said seal, and a recloseable inlet and outlet means communicating with said second compartment.

4,787,512

MOUNTING HARDWARE FOR SAFE REAR SEAT EVELATION AND SEAT BELT EXTENSION IN FORD SUPER CAB TRUCKS

Charles M. Dosser, III, San Antonio, Tex., assignor to Dosser Industries, Inc., Universal City, Tex.

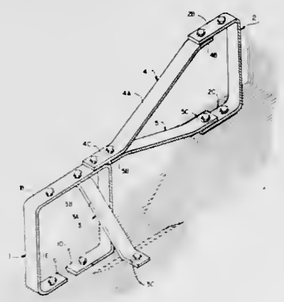
Continuation-in-part of Ser. No. 653,763, Sep. 24, 1984, abandoned. This application Jan. 15, 1987, Ser. No. 3,463

Int. Cl.[4] B65D *69/00;* **B60N** *1/00;* **B60R** *22/22*

U.S. Cl. 206—223 **8 Claims**

1. A kit for elevating one end of a rear seat in a Ford truck in which the rear seat includes a seat bottom and a seat back, and in which the cab of the truck includes a cab floor, said kit comprising a bottom seat bracket shaped to have four sides with bends therebetween, one of said sides having a gap to form free members, a first attachment means for attaching free members to the cab floor, another of said sides being opposite and based from said one side; a side brace bracket having a central member and two end members with bends between central member and each of said two end members, said end members facing in opposite directions, second attaching means for attaching one of said end members to the cab floor, third attaching means for attaching the other of said end members to said another side of said bottom seat bracket; a C-shaped back seat bracket having an intermediate member and two connecting end members with bends therebetween, said connecting end members generally facing in same direction, one of said connecting end members having attachment means for attaching said one connecting end member to the cab floor, the other connecting end member for being spaced from said cab floor, said intermediate member for extending in a upright orientation; a back seat brace sized for extending between said another side of said bottom seat bracket and said other connecting end member of said back seat bracket, said back seat brace having first and second free end members, means for connecting said first end members to said another side of said bottom seat bracket, means for connecting said second free end member to said other connecting end member of said C-shaped back seat bracket; a back seat stabilizer sized to extend between said one connecting end member of said C-shaped back seat bracket and said first free end member of said back seat brace, said back seat stabilizer having first and second attaching end members, means for attaching said first attaching end member to said one connecting end member of said C-shaped back seat bracket, means for attaching said second attaching end member to said first free end member of said back seat brace, whereby said bottom seat bracket constitutes means for elevating the seat bottom of said cab seat and whereby said back seat bracket constitutes means for elevating the seat back of the cab seat.

7. A method for installing a kit for elevating one end of a rear seat in a Super Cab truck in which said rear seat includes a seat bottom and a seat back and in which the cab of the truck attaches to the cab floor, including the steps of providing a bottom seat bracket shaped to have four sides with bends



therebetween wherein one of said sides has a gap forming free members and wherein there is another side opposite and spaced from said one side, providing a side brace bracket having a central member and two end members with bends between said central member and each of said two end members wherein the two end members extend in opposite directions, attaching one of said end members to the cab floor, attaching the other of said end members to said another side of said bottom seat bracket, providing a C-shaped back seat bracket having as intermediate member and two connecting end members with bends therebetween wherein said connecting end members generally face in the same direction, attaching one of said connecting end members to the cab floor wherein the other connecting end member is spaced from the floor and wherein the intermediate member extends in an upright orientation, providing a back seat brace extending between said another side of said bottom seat bracket and said other connecting end member of said C-shaped back seat bracket, said back seat brace having first and second free end members, connecting the first free end member to said another side, connecting said second free end member to said other of said connecting end members, providing a back seat stabilizer extending between said one connecting end member of said C-Shaped back seat bracket and said first free end member of said back seat brace, said back seat stabilizer having first and second attaching end members, attaching said first attaching end member to said one connecting end member, attaching said second attaching end member to said first free end member.

4,787,513

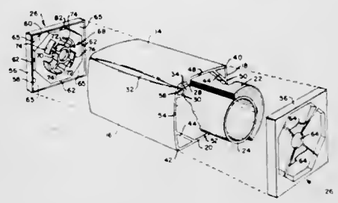
LIGHT-TIGHT CASSETTE

Ronald E. Auble, Spencerport, N.Y., and Ralph E. Grady, Loveland, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 10, 1988, Ser. No. 166,299

Int. Cl.[4] B65D *85/67;* **B65H** *19/02;* **G03B** *17/26*

U.S. Cl. 206—407 **7 Claims**



1. A light-tight cassette for housing and dispensing a roll of web material comprising:

a plurality of side walls comprising first and second side walls of convexly outwardly curved cross sections formed from a single sheet of material for partially enclosing a roll of web material, the side walls further having side edges;

first and second faceted tubes formed at opposite ends of the sheet material corresponding to free edges of the first and second curved side walls, respectively, the first and second tubes having first and second opposed facets, respectively, defining a narrow web exit passageway; and

a pair of end caps for supporting ends of the roll and for closing the side edges of the side walls, each end cap having a plurality of straight channels for receiving complementary side edges of the side walls, whereby when the curved side edges of the first and second side walls are inserted into the complementary straight channels, forces are developed within the first and second curved side walls causing the first and second facets to define the exit passageway with a substantially constant width from one of the side edges of the first and second side walls to the opposite side edges of the first and second side walls.

4,787,514

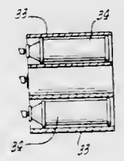
PROCESS AND APPARATUS FOR HANDLING PRESSURIZED SPRAY PAINT CONTAINERS

Willard W. Shepherd, P.O. Box 22122, Los Angeles, Calif. 90022

Filed Jun. 26, 1987, Ser. No. 66,454

Int. Cl.[4] B65D *65/00*

U.S. Cl. 206—427 **7 Claims**



1. In an apparatus for handling pressurized spray paint containers, the combination of:

a rack having a plurality of support units; and

a plurality of pressurized spray paint containers having a generally cylindrical configuration about a container axis with a top and a bottom, a spray control nozzle at said top end of said container, and a transport tube positioned within said container and having inlet and outlet ends, with said outlet end connected to said control nozzle, and with said container charged with a mixture of paint solvent, paint solids, and propellant, which paint solids settle in said paint solvent toward the lowestmost portion of said container under the influence of gravity;

with individual containers supported in individual support units with said container axis at an angle to the vertical whereby said paint solids in said container settle away from said inlet end of said tube.

4,787,515

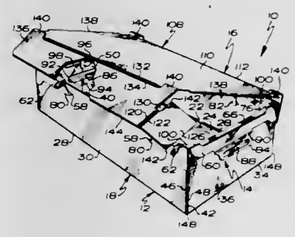
TOTE CONTAINER WITH REMOVABLE HINGED LID AND COMBINED HANDGRIP/STACKING FRAME

Mark S. Stoll, Deephaven, Minn., assignor to Liberty Diversified Industries, New Hope, Minn.

Filed Sep. 26, 1986, Ser. No. 911,993

Int. Cl.[4] B65D *5/46, 21/02, 61/00, 5/64*

U.S. Cl. 206—509 **23 Claims**



1. A storage and tote container stackable in a vertical column with other like containers, said container comprising:

a substantially rectangular container body including a generally rectangular base panel having two opposing side edges and two opposing end edges, two substantially rectangular and generally vertical side wall panels connected to and extending upwardly from said base panel adjacent said opposing side edges, two substantially rectangular and generally vertical end wall panels connected to and extending upwardly from said base panel adjacent said opposing end edges, each said end wall panel defining a handgrip opening extending through the surface thereof, and a pair of end fold-over panels extending from each said side wall panel and hingedly connected thereto along scored fold lines, said end fold-over panels being folded generally perpendicular to said side wall panel and generally parallel to said end wall panel adjacent said side wall panel, each said end fold-over panel defining a handgrip cutout communicating with the overlapping a region of said handgrip opening in said end wall panel, with said base panel and said side wall panels and end wall panels defining a generally rectangular open top receptacle;

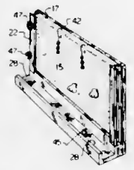
at least one combined frame grip member including means for mounting said frame grip member to said container body, said mounting means including means for connecting said frame grip member to at least one of said side walls and, one or more handgrip reinforcing members removably insertable through said handgrip openings, said mounting means extending between said one of said side walls and said end wall, said mounting means preventing said frame grip member from being moved upward relative to said open top of said container body unless said mounting means is disengaged from said one of said side wall panels and said handgrip openings, and retaining means for retaining the like container on top ofthe container when the containers are stacked in the vertical column; and

a lid unit removably mountable on said body, said lid unit being hingedly movable between a closed position disposed o ver said open top receptacle and an open position,

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said lid unit including a plurality of securing tabs extending outwardly from said lid unit and being connected thereto along scored fold lines, said securing tabs being slidably engagable under at least a portion of said frame grip member extending between said one of said side walls and said end wall when said lid unit is moved to said closed position.

4,787,516
SELF-SEALING PIERCED EARRING AND OTHER ARTICLE SUPPORT PANEL
Willard L. Morrison, 1896 Meadowbrook Dr., Winston-Salem, N.C. 27104
Filed Jan. 11, 1988, Ser. No. 142,562
Int. Cl.[4] A47F *7/02, 7/03, 5/08*
U.S. Cl. 206—566 **7 Claims**



1. A storage and display device for use in the storing and display of articles of the type which include a piercing component that provides a means for supporting the article on a selected surface; said device including:

(a) a panel member for receiving and supporting articles to be stored or displayed thereon; said panel comprising a sheet of elastomeric, self-sealing material having a characteristic resilience which provides for the insertion of a piercing component into said panel and for the closure of the puncture when the piercing component is removed from the panel; said panel having a prescribed shape and size;

(b) a means for supporting said panel in a selected position; whereby selected articles are stored or displayed by inserting the piercing component into the surface of said panel and, when removed, said elastomeric sealant material seals the punctured area.

4,787,517
EASILY OPENED AND RECLOSABLE BAG WITH TEAR-GUIDING RIDGES
Andrew McG. Martin, Boston, Mass.
Continuation of Ser. No. 732,046, May 6, 1985, abandoned, and a continuation of Ser. No. 451,170, Nov. 29, 1982, Pat. No. 4,549,657, which is a continuation-in-part of Ser. No. 251,185, Apr. 6, 1981, abandoned, which is a continuation-in-part of Ser. No. 11,080, Feb. 12, 1979, abandoned, and a continuation-in-part of Ser. No. 29,886, Apr. 13, 1979, abandoned. This application Nov. 4, 1986, Ser. No. 926,389
The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.
Int. Cl.[4] B65D *27/36*
U.S. Cl. 206—610 **4 Claims**

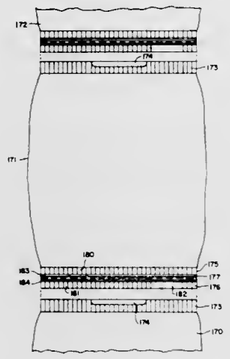
1. In a bag formed to enclose contents in a sealed pouch between walls of the bag and constructed with at least two seals formed by the material of the bag, the seals enclosing the bag and sealing the contents within the bag, the improvement wherein

A. the bag is formed as a flattened tube having a longitudinal seal and two end seals;

B. opening are provided at a selected end seal to facilitate breaking said selected end seal to gain access to the interior of the bag, said opening means comprising an unsealed portion formed in said selected seal for exposing separated bag wall portions adjacent to the seal thereby to facilitate gripping of the separated portions for breaking that seal;

C. reclosure means are formed integral with the bag at an end seal thereof for reclosing the open end of the bag after said selected end seal has been broken, said reclosure means comprising a pair of opposite walls which are integral extensions of said bag walls;

D. a perforated tear line is present at the boundary of said reclosure means and the adjacent end seal;

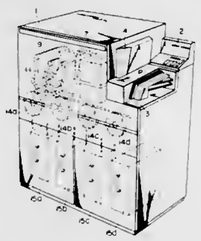


E. a transversly directed seal ridge is spaced generally parallel to said perforated tear line in said reclosure means, said ridge

1. being substantially continuous and coextensive with said perforated tear line, and

2. comprising conforming, fused-together portions of the opposite walls of said reclosure means.

4,787,518
PAPER SHEET SORTING APPARATUS
Akio Yuge, and Hiroshi Watanabe, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 649,483, Sep. 11, 1984, abandoned. This application Sep. 15, 1986, Ser. No. 907,159
Claims priority, application Japan, Sep. 14, 1983, 58-168232
Int. Cl.[4] B07C *5/344*
U.S. Cl. 209—534 **14 Claims**



1. A paper sheet sorting apparatus comprising:

a paper sheet supply port at which a plurality of paper sheets of various kinds are set;

a pick-up unit for picking up the paper sheets one by one from said paper sheet supply port;

a discrimination unit for discriminating between kinds of the paper sheets picked up by said pick-up unit;

a plurality of stacking units in which the paper sheets picked up by said pick-up unit are to be stacked;

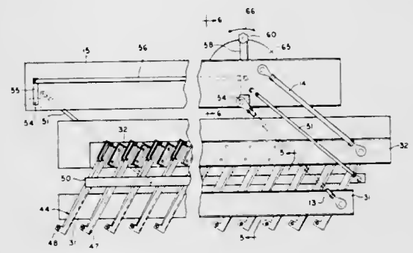
specification means for specifying the kinds of the paper sheet to be stacked in each of said stacking units; and

stacking control means for stacking the paper sheets picked up by said pick-up unit in each said stacking unit as specified by said specification means in accordance with a discrimination result of said discrimination unit,

wherein said specification means can be set such that the paper sheets of identical kind are stacked in more than two said stacking units, and when one stacking unit in which the specified sheets are currently stacked is full, said stacking control means automatically changes a stacking designation to another of said specified stacking units which is not full, and

wherein said specification means comprises a full flag for representing whether or not said stacking unit which is currently used is full when the paper sheets of the identical kind are stacked in more than two stacking units, a stacking transition table comprising stacking unit codes for representing in which said stacking unit the paper sheets currently stacked are to be stacked next when said stacking unit in which the paper sheets are currently stacked is full, and a stacking transition address table for referring to said stacking transition table in accordance with a discrimination result of said discrimination unit.

4,787,519
ADJUSTABLE SLIVER REMOVER
Ronel W. Anderson, Reno, Nev., and Elmer W. Stratton, Beckwourth, Calif., assignors to Magnuson Corporation, Reno, Nev.
Continuation of Ser. No. 762,685, Aug. 5, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 124,057
Int. Cl.[4] B07C *5/06*
U.S. Cl. 209—674 **3 Claims**



1. A shuffle feed sorting apparatus comprising:

a frame,

a first set of transversely disposed inclined shuffle members carried by said frame,

a second set of transversely disposed inclined shuffle members interposed between the shuffle members of said first set in alternating relation therewith,

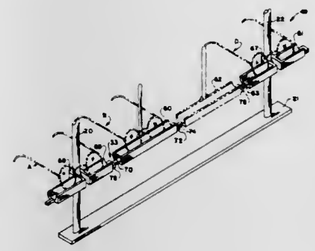
means mounting said sets of shuffle members for relative reciprocation in substantially parallel relation to each other to provide a valley-to-valley progression of a mainstream of articles supported on said shuffle members,

means spacing at least a portion of said adjacent shuffle members apart to provide openings through which articles smaller than said openings can pass and be separated from the article mainstream for sorting said articles,

at least a portion of one of said sets of said shuffle members being comprised of two relatively movable interfitting parts to allow a change of thickness of each shuffle member of said set portion, and

means interconnecting each of one of said two movable interfitting pats to allow a change in thickness of each said shuffle member of said set portion in unison thereby to allow adjustment of the size of said openings.

4,787,520
ARTICLE DISPLAY
Robert C. Pearson, 7000 Bryan Dairy Rd., Bldg. B, Ste. 1, Largo, Fla. 33543
Continuation-in-part of Ser. No. 791,356, Oct. 25, 1985. This application Nov. 7, 1986, Ser. No. 928,469
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—13 **16 Claims**



1. An article display for displaying a plurality of articles comprising:

a base;

a plurality of supporting posts attached to said base with each supporting post extending vertically relative said base and being spaced apart relative each other;

a plurality of horizontal members with each horizontal member of said plurality of horizontal members including a first portion, a second portion and an intermediate portion;

each of said first and second portions of each said horizontal member defining a first and a second trough, respectively, to enable the positioning of the article to be displayed thereon;

each said intermediate portion of each said horizontal member defining a grasping means for releasingly gripping one of said plurality of vertical supporting posts to enable each said horizontal member to be positioned along said vertical length of one of said plurality of supporting posts;

each said first and second portions of each said horizontal member being axially spaced apart to provide an opening to permit each said grasping means of each said horizontal member to grippingly receive one of said plurality of supporting posts;

a bridging member for interconnecting one of said horizontal members positioned at one of said supporting posts of said plurality of supporting posts with another said horizontal member of said plurality of horizontal members positioned at an adjacent supporting post of said plurality of supporting posts;
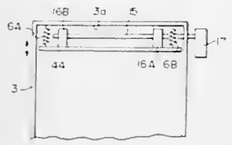
said bridging member having a first section, a second section and a midsection;

a first fastening means for enabling a releasable attachment of said first section of said bridging member with one horizontal member of said plurality of horizontal members positioned along said length of one of said supporting posts; and

a second fastening means for enabling a releasable attachment of said second section of said bridging member with another horizontal member of said plurlity of horizontal members positioned along said length of said adjacent supporting post of said plurality of supporting posts thereby providing a continuous display for the plurality of articles to be displayed spanning from one of said plurality supporting posts to said adjacent supporting post and enabling the removal of one of said horizontal members and bridging members as determined by the removal of displayed articles from article display thereby maintaining an article display filled with displayed articles.

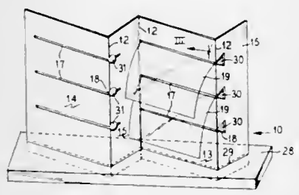
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4,787,521
STIMULABLE PHOSPHOR SHEET STACKING TRAY
Isao Utsumi; Yasuhiro Kawai; Kaoru Tamura, all of Kanagawa; Yasunori Maehara, Tochigi; Sigeme Fujiwara, Tochigi, and Katsuhide Koyama, Tochigi, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Kabushiki Kaisha Toshiba, both of, Japan
Division of Ser. No. 808,174, Dec. 12, 1985. This application Jan. 21, 1987, Ser. No. 5,665
Claims priority, application Japan, Dec. 13, 1984, 59-263500; Dec. 13, 1984, 59-263501; Dec. 13, 1984, 59-263502
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—51 **2 Claims**



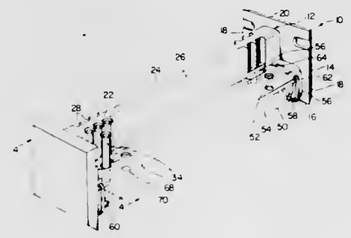
1. A stacking tray for stacking therein stimulable phosphor sheets one by one by sheet feeding with a feed mechanism and sheet falling by sheet weight, comprising:
a tray member having an upper end face, said upper end face having an inner wall;
a sheet holding member positioned for contact with upper edges of the stacked stimulable phosphor sheets, said sheet holding member being disposed between said inner wall of said upper end face of said tray member and the upper edges of the stacked stimulable phosphor sheets, and a means for moving, by operation from the exterior, said sheet holding member between a position at which said sheet holding member contacts the upper edges of said stacked stimulable phosphor sheets and a position spaced from said stacked stimulable phosphor sheets;
said means for moving said sheet holding member including a rotation shaft having one end projected outwardly of said tray member, eccentric cams being formed integrally with said rotation shaft, and a lever secured to said projected end of said rotation shaft.

4,787,522
BAG STORAGE DEVICE
Robert S. Nocek, Stamford, Conn., and George C. Perry, Jr., Summit, N.J., assignors to Minigrip, Inc., Orangeburg, N.Y.
Filed Oct. 16, 1987, Ser. No. 109,062
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—71 **17 Claims**



1. A combination of a storage device and bag of selected width and length and each having a top end portion with a rib extending thereacross, and said rib being of greater thickness than the thickness of the top end portion, said combination comprising:
a member having at least one slot substantially as long as the bag width;
said slot being narrower than the rib thickness but of a width which will freely receive said bag top portion thickness; and
an entrance into said slot through which said top end portion of the bag can be insert by movement longitudinally along the slot for storage of the bag on said device with the rib located at one side of the slot and the remainder of the bag located at the opposite side of the slot.

4,787,523
TEST TUBE RACK
Leo D. Kalous, 12 Tyler St., Newport, R.I. 02840
Filed Jul. 6, 1987, Ser. No. 70,335
Int. Cl.[4] A47B *73/00*
U.S. Cl. 211—74 **20 Claims**

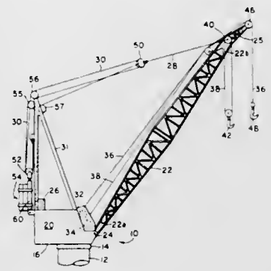


1. An improved construction test tube rack usable in alternate horizontal and vertical use positions for respectively initially loading and stamping reaction tubes and thereafter conducting tests from patient specimen tubes in such reaction tubes, comprising a rack body including a pair of end plates each having a lower edge surface forming a first supporting surface for supporting the rack in its vertical position and at least one adjacent side edge surface forming a second supporting surface for supporting said rack in its alternate horizontal position, said body further including a substantially planar tube grid with upper and lower surfaces and longitudinally extending between said end plates and supported thereby, said grid having at least one said surface provided with a plurality of upstanding aligned and longitudinally spaced members for supporting and longitudinally spacing a plurality of reagent test tubes thereon, at least one control bar longitudinally extending along said one grid surface and operable between open and closed alternate positions, said control bar having a substantially transparent inner surface member in opposition to said one grid surface and adapted to contact said reagent test tubes supported thereon in its closed position and positioned away from said one grid surface in its open position, said closed control bar position adapted for use in said vertical rack position to lock said reagent tubes in an upright position.

4,787,524
OVERLOAD PROTECTION SYSTEM FOR A CRANE
Jasper E. Cobb, III, and William A. Bezner, both of Gainesville, Tex., assignors to National-Oilwell, Houston, Tex.
Filed Sep. 25, 1985, Ser. No. 780,007
Int. Cl.[4] B66C *13/18*
U.S. Cl. 212—150 **15 Claims**

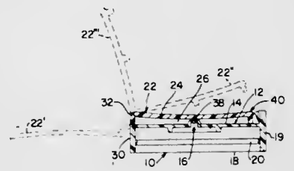
1. A multi-stage system for protecting a crane against overload, comprising:
(a) a structural frame;
(b) an elongated boom, said boom having an inboard end pivotally secured with respect to the structural frame about a substantially horizontal axis and an outboard end adapted for guiding a load hoist line reeved thereabout,

said boom being pivotally movable throughout a range of movement;
(c) a boom hoist line interconnected to the outboard end of said boom for pivoting said boom about said horizontal axis to raise and lower the outboard end of the boom;
(d) a load hoist line, said load hoist line reeved about the outboard end of the boom for supporting a load connected to the load hoist line;
(e) means for selectively retracting and extending the load hoist line to raise and lower a load supported by the load hoist line;



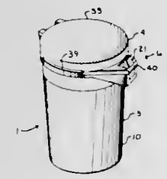
(f) means responsive to a load on said boom hoist line for generating a plurality of different control signals, which control signals are adaptively dependent upon the magnitude of the load on the boom hoist line throughout the range of boom movement; and
(g) control means responsive to said signal generating means for adaptively providing multiple levels of corrective action to control both the boom hoist line and the load hoist line, said control means being operative to prevent lowering of the boom in response to a first control signal and operative to vary the magnitude of the load supported on the load hoist line in response to a second control signal.

4,787,525
CHILD-RESISTANT CLOSURES
Michael Joyce, 287 Smoke Rise Rd., Kinnelon, N.J. 07405
Filed Dec. 23, 1987, Ser. No. 137,504
Int. Cl.[4] B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—201 **22 Claims**



1. A closure comprising:
(a) a base having a top surface facing generally in an upward direction and an opening in said top surface;
(b) a lid;
(c) means for mounting said lid to said closure for movement between a closed position wherein said lid overlies said top surface and occludes said opening and an open position wherein said lid does not occlude said opening, so that said lid moves upwardly away from said top surface in movement from said closed position toward said open position;
(d) an elongated, curvilinear rib protruding upwardly from said base and extending at least partially around said opening, said rib having an inward face facing toward said opening and an outward face facing away from said opening, said rib being disposed alongside said lid with said inward face facing toward said lid so that said rib impedes access to said lid when said lid is in said closed position, said rib including a resilient portion and two substantially rigid portions continuous with said resilient portion and extending from opposite ends thereof; and
(e) means for permitting manual engagement of said resilient portion of said rib to thereby permit outward flexure of said resilient portion away from said lid so as to expose said lid for manual engagement.

4,787,526
CONTAINER CLOSURE HAVING CHILD PROTECTIVE FASTENING MEANS
Harold T. Pehr, 3920 W. 96th St., Shawnee, Mission, Kans. 66207
Filed Feb. 26, 1988, Ser. No. 160,571
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—216 **1 Claim**



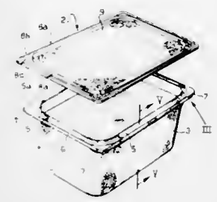
1. In a latch mechanism for securing a closure member to a container body including a multipositional latch hinged to a first of the closure member or the container body and allowing a user to select between a hard to open configuration and an easy to open configuration, the improvement comprising wherein:
(a) said latch is an elongate tongue hinged at one end thereof to the first of the closure member or the container body and having a rear surface and further having a tooth extending outwardly opposite said rear surface from near a distal end thereof;
(b) the first of the closure member or the container body also having positioned thereon a mating surface that abuts against said backing surface when said latch is in the hard to open configuration thereof; said mating surface having an upper edge whereabout said tongue is bent during opening of said latch mechanism; and
(c) the second of the closure member or the container body having extending therefrom a bar; said bar being positioned such that, when said latch is in the hard to open configuration thereof, said tooth is resiliently biased over said bar and said mating surface is aligned to abut against said back surface in close proximity to said bar, such that a user, to open the latch, must manually bias the distal end of said latch to bend the latch at the upper edge of the mating surface such that said tooth clears said bar while simultaneously lifting said closure member.

4,787,527
PLASTICS CONTAINER
Giovanni Monetti, Racconigi, Italy, assignor to Monetti S.p.A., Racconigi, Italy
Filed Oct. 29, 1987, Ser. No. 113,979
Claims priority, application Italy, Oct. 31, 1986, 54030/86[U]
Int. Cl.[4] B65D *8/00*
U.S. Cl. 220—74 **5 Claims**

1. A plastics container comprising a body in the form of a

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substantially parallelepipedal bowl having substantially vertical walls with rounded corners and provided with a peripheral flange of rectangular outline around its edge, and a cover having a shallow tray-shaped part having substantially vertical walls with rounded corners complementary to the walls of said bowl which engage the walls of the bowl and a peripheral flange which rests on the flange of the body and has a rectangular outline corresponding to that of the flange of the body, wherein the flange of the body has a part which is inclined



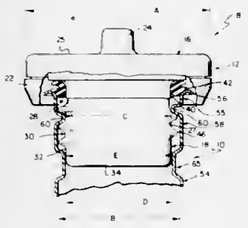
downwardly at a sharp angle relative to the walls of said bowl wherein the flange of the cover has a first section which is inclined downwardly at a sharp angle relative to the walls of said tray shaped part and engages the inclined part of the flange of the body about the entire periphery, wherein the rectangular flange of the body and the rectangular flange of the cover have a flat zone at each of their corners, and in that the flat zones are spaced from each other when the cover is fitted onto the body, so as to enable partial lifting of the cover due to a pressure exerted on one of the flat zones of the cover.

4,787,528

TIP-PROOF CAR AND FILLER NECK

Robert S. Harris, and Billy G. Crute, both of Connersville, Ind., assignors to Stant Inc., Connersville, Ind.

Filed Apr. 8, 1985, Ser. No. 720,979
Int. Cl.[4] B65D *41/04*
U.S. Cl. 220—86 R **9 Claims**



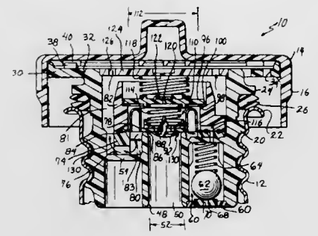
1. A vehicle fuel tank filler neck for receiving a rigid threaded vehicle fuel tank filler cap including a closure member having an axially outer portion, a threaded axially middle portion, and an axially inner portion, the filler neck comprising a generally cylindrical tube having an axially outer portion, a threaded axially middle portion for receiving the threaded axially middle portion of the closure member, the threaded middle portion being sized to receive the closure member relatively loosely so as to permit a skewed engagement with the closure member, and a reduced diameter axially inner portion sized and positioned to receive the rigid axially inner portion of the closure member in a closely spaced relation as the filler cap is engaged with the filler neck to prevent a skewed orientation of the closure member, thereby ensuring a total circumferential sealing relation at the inner filler neck and closure member portions.

4,787,529

VAPOR-LIQUID CONTROL FUEL CAP

Robert S. Harris, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Jun. 16, 1987, Ser. No. 62,852
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—203 **25 Claims**



1. A fuel cap for use in a vehicle fuel system filler neck, the cap comprising

closure means for closing the filler neck,

pressure relief means for venting pressurized fuel vapor in the filler neck through the closure means, and

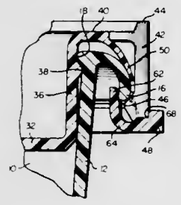
roll-over control means for controllably disabling the pressure relief means during vehicle rollover or the like to block discharge of liquid fuel in the filler neck to the atmosphere through the pressure relief means, the closure means being formed to include conducting means for conducting liquid fuel and fuel vapor from the filler neck to the atmosphere, the pressure relief means being situated in an upstream position in the conducting means, and the roll-over control means being situated to intersect the conducting means in a position in downstream relation to the pressure relief means.

4,787,530

TAMPER-EVIDENT LID

Bryant Edwards, 274 Stonegate Rd., Clarendon Hills, Ill. 60514

Filed Oct. 16, 1987, Ser. No. 109,716
Int. Cl.[4] B65D *41/02*
U.S. Cl. 220—266 **11 Claims**



1. A tamper-evident lid adapted to be used with a container, said lid comprising:

a continuous surface adapted to cover the mouth of said container, said lid having downwardly projecting portions adapted to surround the outside of the mouth of said container;

a bead integrally formed on said continuous surface and adapted to engage the side wall of said container and form a seal therewith;

a continuous ring affixed to said downwardly projecting portions, said ring adapted to encircle the mouth of said container;

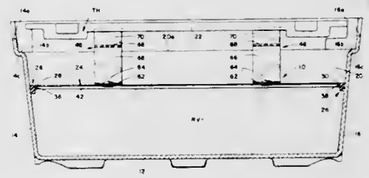
a tamper evident assembly frangibly affixed to said ring, said tamper evident assembly comprising hook members adapted to engage said container, said downwardly projecting portions having openings in the area of each tamper evident assembly in order to provide visual observation of said tamper evident assembly.

4,787,531

COVER AND SEAL FOR POWER DRIVEN THREADING MACHINE OIL RESERVOIR

Paul W. Gress, Bay Village, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 22, 1988, Ser. No. 158,939
Int. Cl.[4] B65D *45/16*
U.S. Cl. 220—324 **21 Claims**



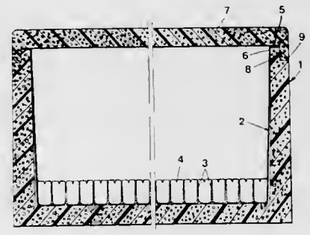
1. An attachment for a portable power driven threading machine which includes housing means including means providing an upwardly open oil reservoir having a bottom wall and opposed pairs of walls extending upwardly from said bottom wall and having corresponding upper ends, said walls having inner surfaces providing said reservoir with a peripheral sealing surface area below said upper ends, said attachment beign removably mountable on said housing means to close and seal said reservoir and comprising, cover plate means having outer edge means, compressible sealing gasket means on said outer edge means, and cover plate retaining means for releaseably interengaging said cover plate means with said housing means to position said cover plate means and gasket means relative to said sealing surface area such that said gasket means is sealingly compressed between said sealing surface area and said edge means.

4,787,532

TRANSPORT-AND STORAGE CONTAINER FOR COOLED GOODS

Ove Börjesson, Varberg, Sweden, assignor to Bilspedition AB, Sweden

Filed Sep. 29, 1987, Ser. No. 102,571
Int. Cl.[4] A23G *9/00*
U.S. Cl. 220—410 **1 Claim**



1. A transport- and storage unit for cooled goods, especially fresh fish, using ice as cooling medium, which is packed together with the cooled goods and when melted is admitted to flow down about said goods, and which comprises

an outer container of an impact resisting and heat insulating material,

a self-supporting inner container of a water-proof material shaped so that it can be received as an insert in the outer container covering the bottom and inner side walls thereof,

at which the insert is liftable out of the outer continer and usable separately e.g. when storing the goods in cold stores, at sales exposure etc.,

a lattice work arranged in the bottom of the water-proof inner container for distancing the cooled goods from the melted ice, said lattice work comprising a plurality of closed, upwards open cells communicating with each other through overflows,

a cover provided with downwardly projecting edge intended to engage into a recess in the upper edge of the outer container,

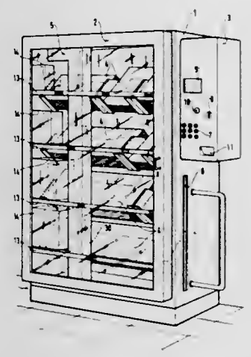
at which the inner container at the top is provided with an outwardly projecting, circumferential flange arranged to rest on the upper edge of the outer container and sealingly connect on to the same by means of the cover.

4,787,533

DISPENSER FOR FLAT PRODUCTS

Jean-Claude Haroutel, Orsay, and Philippe Michel, Asnieres, both of France, assignors to SML Alcatel, Paris, France

Filed Dec. 15, 1987, Ser. No. 133,459
Claims priority, application France, Dec. 17, 1986, 86 17687
Int. Cl.[4] G07F *11/04*
U.S. Cl. 221—12 **21 Claims**



1. Dispenser for flat products, comprising a cabinet and in said cabinet magazines for storing a plurality of products stacked according to predefined categories, an outlet for a product selected from one of said magazines, and a mechanism for extracting and dispensing said products disposed in front of said magazines and adapted to extract the top product from a selected stack and transfer it to said outlet, wherein said mechanism comprises a product holding device, individually controlled and motorized vertical and horizontal carriages carrying said device and a support for said device articulated to one of said carriages and adapted to assume a holding position in which said device is placed against said top product in a selected stack and a position retracted against said carriages, said dispenser further comprising a control circuit responsive to a signal selecting one of said products, and wherein said magazines are inclined to the horizontal so that said stacks are offered up slantwise to said mechanism and said outlet is in a side of said cabinet, between said magazines and said mechanism.

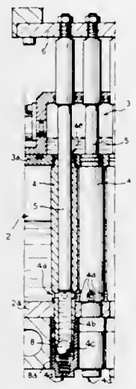
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4,787,534

DROPPER MACHINE

Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy

Filed Feb. 8, 1983, Ser. No. 464,968
Int. Cl.[4] B67D *5/08*
U.S. Cl. 222—130 7 Claims



1. Dropper machine for delivering metered quantities of a fluid or semi-fluid substance, comprising

a support framework;

a first reservoir carried by the framework, said first reservoir receiving a filling of the substance to be delivered and having a base wall lying in a horizontal plane;

a second reservoir carried by the framework and superimposed over the first reservoir, said second reservoir receiving a filling of a lubricant and having a base wall lying in a horizontal plane;

a plurality of tubular elements with vertical axes which traverse the base walls of the first and second reservoirs, each tubular element having apertures in an intermediate part for putting its interior into communication with the first reservoir adjacent the base wall of the first reservoir, each tubular element having a dropper nozzle at its lower end and communicating at its upper end with the second reservoir adjacent the base wall of the second reservoir, wherein the upper end of each tubular element has a flared mouth which facilitates the penetration of the lubricant into said passage;

a plurality of pistons each of which is slidable in a respective tubular element with a tolerance such as to achieve substantial sealing without the need for washers, each piston being movable between an upper position, in which the piston uncovers the apertures in the tubular element and allows the passage of the substance to be delivered into the tubular element, and a lower position in which the lower end of the piston is close to the dropper nozzle, the movement of the piston from the upper position to the lower position causing the expulsion of a metered quantity of the substance to be delivered through the dropper nozzle and the penetration of the lubricant from the second reservoir into the passage defined by the piston and the inner wall of the tubular element; and

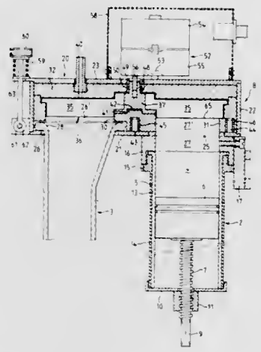
actuator means carried by the framework for effecting the axial movements of the pistons within the tubular elements.

4,787,535

APPARATUS FOR THE DOSED DELIVERY OF A GRANULAR SOLID MATERIAL

Henri Angly, Hegenheim, France, assignor to Contraves AG, Zürich and Sandoz AG, Basel, both of, Switzerland

Filed Apr. 28, 1986, Ser. No. 856,652
Claims priority, application Switzerland, May 20, 1985, 2141/85
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—148 15 Claims



1. An apparatus for the dosed delivery of a granular solid material to a reaction container possessing a delivery inlet, comprising:

a delivery funnel adapted to be connected to the delivery inlet of the reaction container;

said delivery funnel having an inlet opening;

a dosing device having a supply of granular solid material and an outlet opening;

a transfer chamber connecting said inlet opening of said delivery funnel with said outlet opening of said dosing device;

said dosing device conveying the granular solid material upwardly against the force of gravity through said outlet opening into said transfer chamber;

said transfer chamber having a base means;

said outlet opening of said dosing device and said inlet opening of said delivery funnel being located in said base means of said transfer chamber; and

conveying means within said transfer chamber and including a predetermined number of vanes for conveying said granular solid material from said outlet opening of said dosing device to said inlet opening of said delivery funnel.

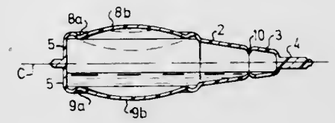
4,787,536

DOSAGE PACKAGE

Carin A. M. Widerström, Höllviksnäs, Sweden, assignor to Aktiebolaget Draco, Lund, Sweden

Filed Feb. 27, 1986, Ser. No. 834,229
Claims priority, application Sweden, Mar. 29, 1985, 8501582
Int. Cl.[4] B65D *37/00*
U.S. Cl. 222—212 9 Claims

1. A dosage package for storing and discharging a liquid, semi-liquid or pasty product, comprising a squeezing thermoplastic container portion and a discharge portion, said container portion and discharge portion being parts of a unitary member, said container portion having a closed all around extending circular cylindrical shaped substantially rigid edge wall portion to which said discharge portion is joined, two opposite side wall portions, at least one of which includes an outwardly durved portion which is compressible to an inwardly similarly curved position so as to measure and discharge a specific dosage when the outwardly curved portion is compressed to the inwardly curved position, and an annular bulged portion forming a juncture between the edge wall portion and the outwardly curved portion so as to form and to limit the outwardly curved portion and also limit the inwardly curved position of the outwardly curved portion, said edge wall portion and said side wall portions having a substantially



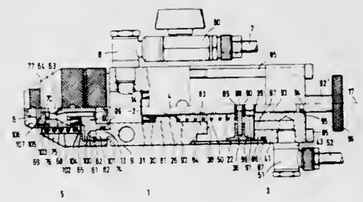
equal thickness, said thickness being sufficient so that substantially no fluid is diffusable through said wall portions, and so that the side wall portions are imcompressible without said annular bulged portion and said discharge portion being configured so as to prevent discharge of the product stored in the container in the absence of compression of said outwardly curved portion to the inwardly curved position.

4,787,537

HIGH-PRESSURE METERING APPARATUS

Egbert Hau, Offenbach, Fed. Rep. of Germany, assignor to Hau-Simex Giesserei-und Oberfalchentechnik Vetriebsgesellschaft m.b.H., Offenbach am Main, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,212
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621947
Int. Cl.[4] B67D *5/00*
U.S. Cl. 222—334 7 Claims



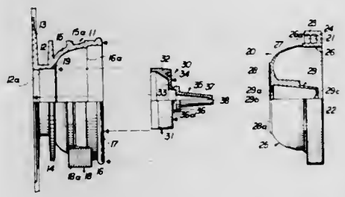
7. A high-pressure metering apparatus for ejecting a fluid such as a polishing paste, comprising a housing having a storage chamber, a spring-loaded, stroke-adjustable compressed air piston-cylinder device with a plunger displaceable into the storage chamber, an injection nozzle, an adjustable valve device closing the storage chamber off from said injection nozzle and controlled in use by the pressure in the storage chamber, said valve device including a valve plate, the storage chamber having an outlet side bounded by a piston element carrying a valve ball engaging said valve plate fixed to said housing, on which a cylinder element is displaceably mounted, which cylinder element is closed by said valve plate of the valve device, said injection nozzle being located downstream of said valve plate and being fixed to said cylinder element, the apparatus further comprising a compression spring against which said cylinder element bears and a clamping cap against which said compression spring thrusts, said clamping cap having a front opening and being screwed externally onto the housing, the arrangement being such that said valve plate is fixed in said cylinder element independently of said injection nozzle, which is removable by a screwed connection without adversely affecting the setting of said valve device, which screwed connection passes through said front opening of the clamping cap, and the securing in use of the piston element to the housing takes place as the clamping cap surrounding the valve device is screwed onto the housing.

4,787,538

TAP ASSEMBLY

Lazzaro A. Fattori, West Palm Beach, Fla., assignor to The REL Corporation, Montclair, N.J.

Filed Mar. 17, 1987, Ser. No. 26,860
Int. Cl.[4] B22D *37/00*
U.S. Cl. 222—511 16 Claims



1. A tap assembly for a container of liquid comprising a delivery spout molded of a gas impermeable plastic mounted on said container and having a neck located on the inner end thereof for receiving liquid from the container for dispensing therethrough, said neck opening outwardly into a generally hemispherical bowl formed with a circular rim and an opening inwardly of said rim providing a gravity flow dispensing port for the assembly, a dispenser closure molded of an elastomeric material having means in snap-on mounting engagement with the rim of said spout and having a bowl-shaped portion adapted to seat in said spout bowl and normally extend as a seal across the opening from said neck and across said port, said closure having an integrally formed toggle means projecting axially outwardly from the bottom of said bowl-shaped portion, said bowl-shaped portion having a predetermined resiliency enabling distortion thereof on finger manipulation of said toggle means from said seated, sealing position to an open position permitting flow of liquid through the neck and port, and a gas impermeable barrier means coacting with said delivery spout in the region of said neck.

4,787,539

ICE DISPENSER

Naoya Uchida, and Hiroshi Kai, both of Toyoake, Japan, assignors to Hosbizaki Electric Co., Ltd., Toyoake, Japan

Filed Jun. 19, 1987, Ser. No. 64,122
Claims priority, application Japan, Jun. 19, 1986, 92486[U]; Jun. 19, 1986, 92487[U]; Jun. 19, 1986, 92488[U]
Int. Cl.[4] F25C *1/00*; G01F *11/28*
U.S. Cl. 222—639 10 Claims

1. An ice dispenser apparatus comprising:

an ice making mechanism for producing ice;

ice storage means operatively connected to said ice making mechanism for storing ice produced by said ice making mechanism, said ice storage means having a discharge port through which the ice stored in the ice storage means is discharged;

a discharge port shutter mounted over said discharge port and actuatable to an open position at which said discharge port is open thereby enabling the ice to be discharged therethrough and to a closed position at which said discharge port is closed;

a discharge port shutter actuating means operatively connected to said discharge port shutter for normally actuating said discharge port shutter to said closed position;

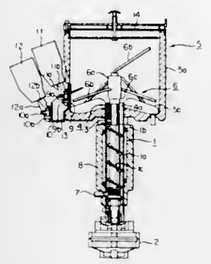
transient storage chamber means in communication with said discharge port for transiently storing a predetermined amount of the ice discharged through said discharge port,

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said transient storage chamber means having a bottom, a front, respective side portions, and an aperture through which ice transiently stored therein is dispensed, said aperture including respective portions defined, respectively, at the bottom and the front of said transient storage chamber means;

a transient storage chamber shutter movably mounted over said aperture for selectively opening and closing over said aperture,

said transient storage chamber shutter comprising a pivotable L-shaped plate member having a bottom leg portion and an upstanding leg portion extending perpendicularly to said bottom leg portion,



said bottom leg portion and said upstanding leg portion closing over said aperture portions, respectively, when said transient storage chamber shutter is closed over said aperture;

a transient storage chamber actuating means operatively connected to said transient storage chamber shutter for selectively opening and closing said discharge port shutter over said aperture; and

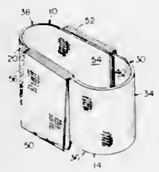
control means operatively connected to said discharge port shutter actuating means and said transient storage chamber shutter actuating means for controlling the same to actuate said shutters in a manner in which said predetermined amount of ice is temporarily stored once within said transient storage chamber before being disposed through said aperture.

4,787,540

HAND GUN HOLSTER SELECTABLY CONFIGURED AND TO BE PLACED ON A BELT

John C. Barry, 21521 73rd Pl. W., Unit 3, Edmonds, Wash. 98020

Filed Dec. 29, 1986, Ser. No. 946,971
Int. Cl.⁴ F41C *33/02*
U.S. Cl. 224—192 **6 Claims.**



1. A hand gun holster selectably configured and to be placed on a belt, either in an alignment configuration to hold an automatic pistol or in a perpendicular configuration to hold a thirty eight revolver, comprising:

(a) a curved front assembly, in turn comprising:

(i) a front curved portion of webbing, having a continuous U shaped front portion, having in turn terminating integral end portions extending rearwardly, having inside facing vertical surfaces;

(ii) hook fastening materials secured to the inside facing vertical surfaces of the rearwardly terminating integral end portions of this front curved portion of webbing, and

(iii) two belt loops comprised of folded webbing are secured to the front curved portion of webbing on the terminating integral end portions on the side opposite to the side on which the hook fastening materials are secured;

(b) a curved rear assembly positioned in alignment with the curved front assembly, in turn comprising:

(i) a back curved portion of webbing, having an outside rear facing vertical surface; and

(ii) loop fastening material secured to the outside rear facing vertical surface of this back curved portion of webbing,

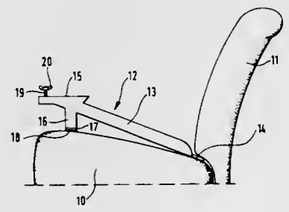
the curved front assembly being aligned with the curved rear assembly, selectively overlapped and then secured together, using the hook and materials, whereby a hand gun holster is completed to receive and to hold an automatic pistol.

4,787,541

SUPPORT DEVICES

Ernest Pollard, Bingley, England, assignor to Automate (U.K.) Limited, Bradford, England

Filed Oct. 20, 1986, Ser. No. 920,677
Int. Cl.⁴ B60R *7/08*
U.S. Cl. 224—275 **9 Claims**



8. A support device for use in a motor vehicle having at least one seat comprising: a generally planar support table having an upper face, a lower face, a front edge and a rear edge; a pair of support arms; means for mounting the support arms under the lower face of the support table leaving the upper face of the support table exposed for use; each support arm having a location portion shaped such that it can be forced into a gap normally found between a seat cushion and an upright portion of a motor vehicle seat to be gripped thereby, and a foot portion which is shaped to rest on a seat cushion; at least the location portions of the support arms being adjustable towards and away from one another, and each support arm being adjustable in a direction extending between the front and rear edges of the support table.

4,787,542

FOIL DISPENSER FOR AND METHODS OF DISPENSING FOIL

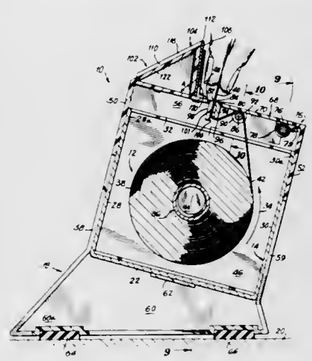
Stanley L. Ruff, New Rochelle, N.Y., and Albert Stubbmann, Franklin Lakes, N.J., assignors to Clik-Cut, Inc., New Rochelle, N.Y.

Filed Sep. 15, 1986, Ser. No. 906,911
Int. Cl.⁴ B65D *85/672*
U.S. Cl. 225—1 **30 Claims**

1. A dispenser, comprising:

(a) a support having a base and a top above the base, said top having a generally planar top wall having transverse edges bounding an opening extending through the planar top wall;

(b) a roll mounted on the support for turning movement about an axis, said roll having a coiled, continuous, imperforate supply of a broad, sheet material web wound about the axis, and unwindable during use ® for successively paying out a desired length of the web when successive leading end regions of the web are respectively manually grasped by a user in a ready-to-use position and the desired length of the web is withdrawn from the roll along a path through the opening to a position spaced from and at least partially overlying the support, said transverse edges of the top wall generally being in an adjacent confronting relationship in the plane of the top wall in the ready-to-use position;



(c) means for exerting a drag on each successively withdrawn length of the web to tauten the same during withdrawal;

(d) means on the support for severing each successively withdrawn, taut length of the web when the same is moved from the aforesaid spaced position onto the severing means in a direction generally toward the base; and

(e) bearing means on the support for positioning each successive leading end region of the web in the ready-to use position to extend in an unsupported manner from the adjacent confronting transverse edges of the top wall in a generally normal direction relative to the top wall and to stand freely in a generally erect condition spaced from the severing means, thereby enabling the user to gain ready and safe access to each upstanding leading end region of the web along the transverse width thereof for paying out a fresh length of web.

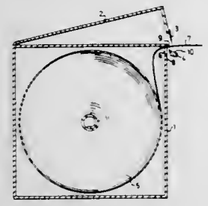
4,787,543

DISPENSER WITH CUTTING DEVICE

Tomas Fabo, Mölnlycke, and Rolf Abrahamsson, Mölndal, both of Sweden, assignors to Molnlycke AB, Goteborg, Sweden

PCT No. PCT/SE86/00427, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/02020, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 24, 1986, Ser. No. 53,830
Claims priority, application Sweden, Oct. 3, 1985, 8504585
Int. Cl.⁴ B65D *85/671*
U.S. Cl. 225—19 **5 Claims**

1. A dispenser for tough, hardly tearable, weblike rolled-up material, comprising a roll holder (1) and a part (2) movably connected thereto, which has a knife (3) and a knife guard (4) situated outside the knife, the guard limiting a dispensing gap for the web material situated between the guard and the knife, the movable part being movable between an end position in which withdrawal of the web material (5) over a guiding edge (8) on the roll holder (1) and through the dispensing gap is permitted, and a cutting-off end position in which the web material is cuttable after folding around the knife (3), the guard (4) having a guide surface (10) extending at least from a position directly opposite the knife and a distance from the roll holder (1), this surface forming an acute angle to the knife (3), whereby a piece of web with a length corresponding to the distance between the guiding edge (8) and the knife (3) in its



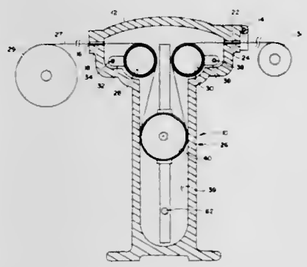
cutting end position is led out by the guiding surface through the dispensing gap on the return of the movable part from the cutting end position to the withdrawal end position so that a gripping flap (7) is provided such as to be accessible for a subsequent withdrawal of the web material inside the dispenser.

4,787,544

DANCER ROLLER

Charles R. Jones, Rte. 2, Box 99, Tippah County, Miss. 38683

Filed May 5, 1986, Ser. No. 859,398
Int. Cl.⁴ B65H *20/24*
U.S. Cl. 226—118 **9 Claims**



1. A dancer roller apparatus for controlling tension in a sheet material as the sheet material is wound between a pair of rollers comprising:

a housing having a cavity and an entrance and an exit opening communicating into said cavity for passage of said sheet material into and out of said cavity, said cavity having therein a pair of end arcuate surfaces and a guide channel disposed adjacent said end arcuate surfaces;

an elongated movable roller positioned in said cavity atop said sheet material for applying a tension to said sheet material between said entrance and exit openings, said roller having end arcuate surfaces for closely fitting in said end arcuate surfaces of said housing;

an annular gear segment secured to each of said arcuate ends of said roller, the pitch of each said annular gear segment having a common radius measured from the axial center point of said roller; and

a gear rack movably carried in each of said guide channels for meshed relation with a said annular gear segment.

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4,787,545

PAPER FEEDING MECHANISM

Yoshiyuki Yasumi, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 14, 1987, Ser. No. 85,533

Claims priority, application Japan, Oct. 20, 1986, 61-160578[U]

Int. Cl.⁴ B65H *20/20;* **B41J** *11/30*

U.S. Cl. 226—74 **4 Claims**



1. A paper feeding mechanism for a printer comprising:

a driven shaft and a support shaft in parallel therewith;

a pair of tractors spaced apart from each other on opposite sides of a paper feeding path and supported in common on said driven shaft and said support shaft, said tractors having respective belts which are driven by said driven shaft for conveying a sheet of paper placed in engagement with said belts, said tractors being swingable on said driven shaft about said support shaft between an open position at which a paper to be conveyed is loaded in engagement with said belts of said tractors, and a closed position at which said tractors are driven to convey the paper by rotation of said driven shaft;

a drive gear for rotating said driven shaft mounted on said driven shaft and swingable therewith between said open and closed positions, by which said drive gear is moved out of and into engagement with a driving transmission gear, respectively;

a stopper member having teeth which are engageable with said drive gear to stop it from rotation at said open position; and

a drive member for shifting said stopper member to engage its teeth with said drive gear only when said tractors are swung to said open position.

4,787,546

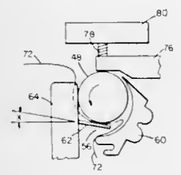
APPARATUS FOR AUTOMATIC THREADING OF A WEB

Philip F. Bradbury, Topsfield, Mass., assignor to General Scanning, Inc., Watertown, Mass.

Filed Mar. 7, 1986, Ser. No. 837,544

Int. Cl.⁴ G03B *1/56;* **G01D** *15/28*

U.S. Cl. 226—91 **9 Claims**



1. A recorder or printer apparatus having means for threading a continuous web of printable material from a supply through a main drive nip, said device comprising:

a main drive nip formed by a drive surface of a rotatable roll and a main presser which urges the web against the roll,

a loop-introducing guide surface arranged relative to the drive surface of said roll, to form a convergent channel leading to said drive nip, and

an initial presser for urging the web against the roll at an initial drive nip spaced from said main drive nip,

said initial presser having a second position separate from said drive roll for enabling placement of a leader portion of said web between said initial presser and said roll with the leader extending past said initial nip,

the initial presser in its nip position and said loop introducing guide surface being cooperatively constructed and arranged with respect to said roll in the manner that rotation of said roll causes retrograde motion of said leader to form a loop that is progressively guided toward said main nip until said main nip becomes effective to drive the web, further rotation of said roll being effective to move the free end of said leader portion out from under said initial nip and through the main nip, thereafter, the main nip being effective to feed the web through said machine as a single layer.

4,787,547

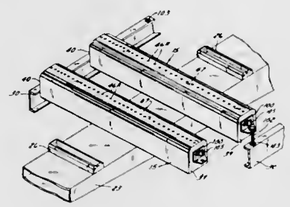
MOUNTING MEANS FOR AIR BARS

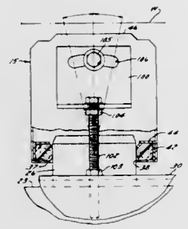
Terry A. Hella, and Paul H. Stibbe, both of DePere, Wis., assignors to Advance Systems, Inc., Oneida, Wis.

Filed Jun. 11, 1987, Ser. No. 61,327

Int. Cl.⁴ B65H *20/14;* **F26B** *13/20*

U.S. Cl. 226—97 **9 Claims**





1. Paper web dryer apparatus of the type having an elongated housing through which a web is floatingly suspended as it moves through the housing, a series of elongated air bars located transversely across said web and in spaced apart relation along both the upper and lower sides of the web for directing air against the web for drying and supporting said web, said air bars having air nozzle slots at their side adjacent said web and through which air is directed, and said bars also have an air supply opening at their side opposite said slots, an air supply duct means for said upper air bars and also an air supply duct means for said lower bars, and said duct means have an air feed neck extending therefrom and which are adapted to be inserted in said bar supply openings for directing pressurized air thereto, said duct air feed necks having side walls, and O-ring type seal means mounted on said bars and located between said bar openings and said side walls of said duct feed necks, said seal means sealingly embracing said side walls to permit relative sliding and continuous sealing movement between said bars and duct means feed necks, whereby a telescoping joint is formed between said bars and their duct means to permit said bars to shift in their duct means and in a direction toward and away from said web.

4,787,548

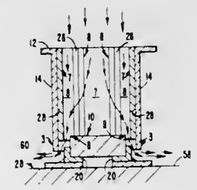
NOZZLE STRUCTURE FOR SOLDERING AND DESOLDERING

Louis A. Abbagnaro, Silver Spring, Md., and Bobby L. Mason, Alexandria, Va., assignors to Pace Incorporated, Laurel, Md.

Filed Jul. 27, 1987, Ser. No. 78,170

Int. Cl.⁴ B23K *3/04, 37/04*

U.S. Cl. 228—6.2 **23 Claims**



15. A nozzle for use with a device for melting solder at a joint between terminals of an electronic component and contact elements of a substrate by supplying heated fluid to the nozzle to melt the solder, comprising:

a tubular body having a plurality of sidewalls;

a plurality of elongated flanges where at least one of the flanges is attached to and projects outwardly from the inner side of each sidewall of the tubular body and extends between a first end of the tubular body and a skirt portion formed by an opposite end of the tubular body; and

engagement means, formed on said flanges, for engagement said component and precisely locating it in spaced relationship relative to said skirt portion of the tubular body.

4,787,549

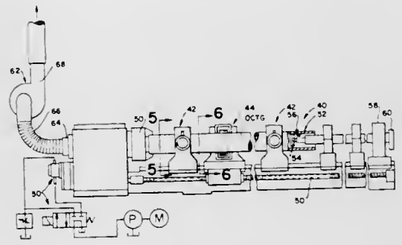
AUTOMATIC PIPE INSPECTION AND REPAIR SYSTEM

Istvan M. Matay, N. Royalton, Ohio, and John D. Lydick, Manhattan Beach, Calif., assignors to TRW, INC., Cleveland, Ohio

Filed Jan. 30, 1984, Ser. No. 575,370

Int. Cl.⁴ B23K *15/00*

U.S. Cl. 228—8 **7 Claims**



1. An apparatus for preparing tubular workpieces having interior and exterior surfaces, said apparatus comprising:

a readying means for readying said workpieces for inspection;

an inspecting means for nondestructively inspecting the workpiece to measure wall thickness and concentricity between the interior and exterior surfaces along the workpiece;

a comparing means for comparing the measured wall thickness and concentricity with preselected wall thickness and concentricity specifications;

a switching means for separating the inspected workpieces at least into acceptable workpieces which conform with the preselected specifications and repairable workpieces which are physically alterable to conform with the preselected specifications;

an interior surface repair head disposed to be positioned longitudinally within the workpiece, the interior surface repair head including an interior surface material depositing means for selectively depositing material on interior surfaces of the workpiece and an interior surface material removing means for selectively removing material from interior surfaces of the workpiece;

an exterior surface repair head disposed to be positioned longitudinally along exterior surfaces of the workpiece, the exterior surface repair head including an exterior surface material depositing means for selectively depositing material on exterior surfaces of the workpiece and an exterior surface material removing means for selectively removing material from the exterior surfaces; and,

repair head control means for selectively positioning the interior and exterior surface repair heads along the workpiece and for controlling the interior and exterior surface material depositing and removing means.

4,787,550

AUTOMATIC SOLDERING APPARATUS

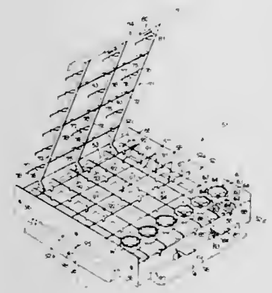
Tsugunori Masuda; Shinsaku Kuranari, and Yu Fukuhara, all of Saitama, Japan, assignors to Kabushiki Kaisha Tamura Seisakusho, Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,675

Claims priority, application Japan, Dec. 3, 1986, 61-288490

Int. Cl.⁴ B23K *37/04*

U.S. Cl. 228—47 **3 Claims**



1. An automatic soldering apparatus for soldering a plurality of works while said works are being held in a plane by a fixture conveyed on an automatic soldering line, said fixture characterized by comprising:

an outer frame;

a grid formed inside said outer frame of said fixture and having crossing portions;

work receiving beds integrally mounted at said crossing portions of said grid in such a manner as to be positioned above said works at the time of soldering;

each of said work receiving beds of said fixture consisting of

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a round pipe member of a predetermined length and having work fitting grooves therein;

a work support frame mounted on said outer frame above said grid in such a manner as to be positioned below said grid at the time of soldering;

a hinge means connected between said outer frame and said work support frame to permit the latter to be pivoted relative to said outer frame between an open works receiving position and a closed works holding position;

work support means disposed on said work support frame to support said works from below when said support frame is in said closed position with said works fitted into said work receiving beds at the time of soldering; and

latch means disposed on said outer frame and said work support frame and engageable and disengageable to releasably secure said work support frame in said closed position to permit said work frame to be positioned below said grid at the time of soldering and to permit said fixture to be turned upsie down to allow said work support frame to be opened upward for the fitting and removal of said work therein.

4,787,551

METHOD OF WELDING THERMOCOUPLES TO SILICON WAFERS FOR TEMPERATURE MONITORING IN RAPID THERMAL PROCESSING

Judy L. Hoyt, Palo Alto; Kenneth E. Williams, Los Altos, and James F. Gibbons, Palo Alto, all of Calif., assignors to Stanford University, Stanford, Calif.

Filed May 4, 1987, Ser. No. 46,848
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—179 **8 Claims**



7. A method of welding a temperature-sensing thermocouple to a silicon wafer comprising the steps of

supporting said wafer on a tantalum plate with an edge of said wafer extending beyond said plate,

positioning said thermocouple on said silicon wafer near said edge,

providing a sheet of molybdenum on said wafer with said edge exposed,

striking an arc with a TIG welder on said molybdenum surface, and

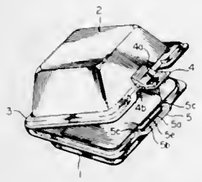
moving said arc to said silicon wafer near said edge portion of said wafer.

4,787,552

CASE FOR PACKAGING

Eiji Natori, Konosu, Japan, assignor to Chuo Kagaku Kabushiki Kaisha, Saitama, Japan

Filed Sep. 30, 1987, Ser. No. 103,479
Int. Cl.[4] B65D *45/00*
U.S. Cl. 229—2.5 R **1 Claim**



1. A case for packaging, comprising an outwardly protruding tab, a slot into which the engaging tab can be inserted, the engaging tab and the slot being placed in an opposing and engageable manner on the case body side and the lid side, respectively,

the outer surface of the engaging tab is formed of a first elevated face that protrudes substantially laterally to the direction of protrusion and a step-gap part that is provided on the rear side,

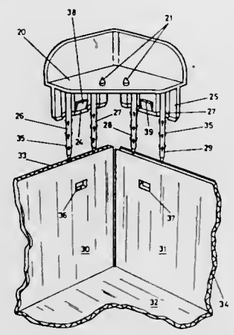
the slot is provided with a second elevated face on the outer surface of the case body side or on the edge part on the lid side, in such a manner that the elevated face is opposite to and engageable with the engaging tab, the second elevated face protruding in the same direction as the direction of the protrusion of the engaging tab, the second elevated face being provided with a major cut line of such a length that the engaging tab can be inserted in the longitudinal direction to the second elevated face, and the second elevated face being provided also with sub cut lines that start from both ends of the major cut line, towards the inside.

4,787,553

CORNER FASTENING DEVICE

William M. Hoskins, 11 Aitken Street, Berri, South Australia, Australia

Filed Nov. 30, 1987, Ser. No. 126,559
Claims priority, application Australia, Dec. 2, 1986, PH9283
Int. Cl.[4] B65D *21/02*
U.S. Cl. 229—49 **9 Claims**



1. A box or tray corner fastening and reinforcing device comprising a substantially planar base having an upper and a lower side, a plurality of pins extending from the lower side of the base and a pair of walls mutually at right angles to each other and to the planar base extending from the upper side of the base, at least two of the pins of the plurality pins being positioned and sized to be inserted into the fluted sections of two adjacent sides of a corrugated cardboard box or tray, there being two sets of two pins, each pair of pins being adapted to be inserted into one each of the adjacent sides of the corrugated cardboard box or tray.

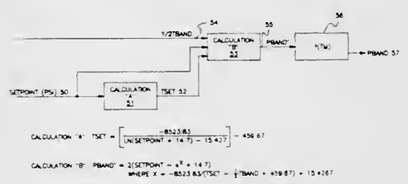
4,787,554

FIRING RATE CONTROL SYSTEM FOR A FUEL BURNER

James I. Bartels, Hudson, Wis., and Kenneth B. Kidder, Coon Rapids, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1988, Ser. No. 151,056
Int. Cl.[4] F23N *1/00*; **G06F** *15/20*
U.S. Cl. 236—26 R **6 Claims**

1. A boiler control system having a firing rate control function, including: microcomputer means including memory means, and further including input-output means; said input-output means connected to said microcomputer means and said memory means to provide said microcomputer means and said memory means with a plurality of control parameters for a fuel burner and a boiler which are adapted to be controlled by said boiler control system; firing rate control means connected to said microcomputer means and said memory means with said firing rate control means establishing a pressure control band which is a function of a selected setpoint control pressure and a selected temperature band; said firing rate control means converting said setpoint control pressure into a temperature setpoint; said firing rate control means further converting said selected temperature band and said temperature setpoint into a pressure control band; means to measure a pressure in said boiler; comparator means responsive to said pressure control band and a said measured pressure from said boiler to which said system is adapted to be connected; and said comparator means having output means connected to said fuel burner for said boiler to control said fuel burner to in turn control said pressure in said boiler.

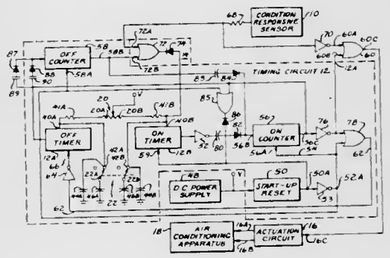


4,787,555

ENVIRONMENTAL CONTROL SYSTEM WITH CONDITION RESPONSIVE TIMER AND METHOD

Alfred T. Newell, III, 324 Redwood, Birmingham, Ala. 35210, and E. Lane Nichols, Clearwater, Fla., assignors to Alfred T. Newell, III, Birmingham, Ala.

Division of Ser. No. 779,509, Sep. 24, 1985, Pat. No. 4,722,475. This application Sep. 15, 1987, Ser. No. 97,513
Int. Cl.[4] F23N *5/20*
U.S. Cl. 236—46 R **12 Claims**



1. In an environmental control system having apparatus for conditioning the air within an environmentally controlled space, an improved time controller of the apparatus comprising:

a pair of cycle timers;

means for complementarily varying the duty cycles of both of said timers with a single control, manual movement of said control increasing the duty cycle of one of said timers and substantially reducing the timing cycle of the other by a substantially equal amount relative to the total cycle period; and

means for actuating the apparatus during a preselected portion of the cycle of one of said timers.

4,787,556

GRIP PLATE

Gary J. Heisson, 86 Rockland Rd., Auburn, Mass. 01501

Filed Apr. 13, 1987, Ser. No. 37,340
Int. Cl.[4] E01B *63/00*
U.S. Cl. 238—14 **7 Claims**



1. A grip plate for engagement with the tire of a vehicle stuck on a surface having insufficient traction, to enable the vehicle to drive off such surface,

said grip plate comprising a flat main body including two opposite ends, a downwardly extending lip at one end, and an upwardly extending lug at the other end,

a portion of the main body at the lug end extending upwardly at an angle thereto, the entire lug being located above the plane of the flat main body portion and there being a bend in the latter between the upwardly angled portion and the remainder of the main body,

the lug being adapted to be placed under a portion of a tire on the vehicle with the bend on the surface and the main body of the grip plate extending upwardly at an angle from the surface,

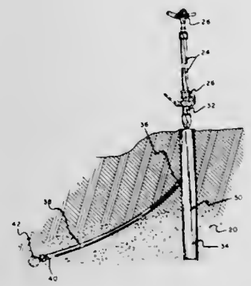
whereby the main body of the grip plate rotates in toward the tire as the wheel turns toward the grip plate due to engagement with the lug, the bend acting as a fulcrum, to provide friction of the tire with the grip plate, drawing the latter in under the tire and between the tire and the surface, the lip then engaging the surface and inhibiting motion of the grip plate.

4,787,557

SOLID SET SPIKE IRRIGATION HEAD CONNECTING DEVICE

Miles E. Jackson, R.D. #4, Box 304, Elmer, N.J. 08318

Filed Jan. 15, 1988, Ser. No. 144,062
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—200 **15 Claims**



1. An irrigation head support and pipe connection device comprising:

(a) a pipe of a length sufficient to extend from a top proximate ground level to a bottom at a depth below ground level suitable for connection to an irrigation lateral pipe,

(b) a quick disconnect connection means attached to the top of the pipe to allow easy connection and disconnection of a sprinkler head means to deliver and distribute water in a fashion and at a height suitable to irrigate crops,

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(c) a cementous composition encasement and spike integral mass encapsulating the pipe with the top of the pipe extending out of a top of the encasement and the bottom of the pipe extending out a side of the encasement, the length of the encasement and spike being sufficient to extend downwardly to a depth wherein operation of the sprinkler head means cannot significantly move the spike,

(d) an angle bend in the pipe sufficient to angle the bottom of the pipe to:

(i) extend the pipe out a side of the encasement at an intermediate position along the length of the encasement,

(ii) allow a cleaning means inserted downwardly through the top of the pipe to turn the bend to clean the pipe and the connection pipe,

(iii) to angle in the direction of the lateral pipe so that there is little or no bending necessary in the connection pipe, and

(iv) cause essentially full drainage of any water from the bend into the connection pipe to the lateral pipe, and

(e) an attachment means on the bottom end of the pipe to attach with the irrigation connection pipe.

4,787,558

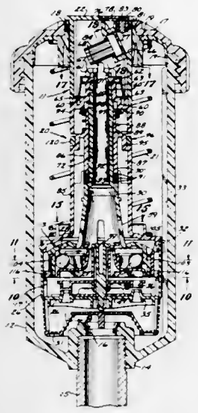
ROTARY DRIVE SPRINKLER

Timothy C. Sexton, Walnut, Calif.; George H. Lockwood, Wilton Manors, Fla.; David E. Robertson, Covina, Calif.; Joseph D. Mason, Monteclair, Calif.; Mark J. Mattson, San Dimas, Calif., and Robert W. Patterson, LaVerne, Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.

Division of Ser. No. 876,239, Jun. 19, 1986, abandoned, which is a division of Ser. No. 735,071, May 16, 1985, Pat. No. 4,625,914. This application Apr. 20, 1987, Ser. No. 41,661

Int. Cl.[4] B05B *3/16, 15/10*

U.S. Cl. 239—205 **16 Claims**



14. A rotary drive sprinkler, comprising:

sprinkler housing means adapted for connection to a supply of irrigation water;

a spray head for spraying irrigation water outwardly therefrom;

a rotary drive assembly within said housing means for rotatably driving said spray head in a succession of small rotational steps;

reverse means for reversing the direction of driving of said spray head, said reverse means including a first stop rotatable with said spray head, a second stop, means for mounting sid second stop for rotation with said spray head and said first stop, said second stop mounting means being releasable to permit relative rotation between said first and second stops, a trip member engageable with said first and second stops for switching said rotary drive assembly respectively between forward- and reverse-drive modes of operation;

means for supporting said spray head for movement relative to said housing means, betwen a normal operating position with said second stop rotating with said first stop and an adjustment position with said second stop released from rotation with said first stop, said spray head and said first stop being rotatable relative to said second stop when in said adjustment position to adjust the arcuate spacing between said stops; and

interengageable lock means ooperating between said housing means and said second stop for locking said second stop against rotation with said first stop and said spray head when said spray head is in said adjustment position.

4,787,559

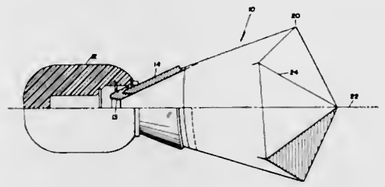
ROCKET MOTOR EXTENDIBLE NOZZLE EXIT CONE

Victor Singer, Newark, Del., assignor to Morton Thiokol, Inc., Chicago, Ill.

Division of Ser. No. 762,472, Aug. 5, 1985, abandoned. This application Oct. 10, 1986, Ser. No. 897,958

Int. Cl.[4] F02K *1/08*

U.S. Cl. 239—265.43 **7 Claims**



1. A rocket motor extendible nozzle for attachment to a rocket motor nozzle having a longitudinal axis and a throat area for increasing the ratio of the effective rocket motor nozzle/extendible nozzle exit cone effective area to the rocket motor nozzle throat area comprising:

an arcuate-shaped membrane of ductile heat resistant material, said membrane having opposed arcuate sides one of which is longer than the other and having ends that are adapted to be brought into edge-to-edge relationship to form a frustum of a cone having an aft end and a longitudinal axis in alignment with the longitudinal axis of the rocket motor nozzle, said membrane having a portion forming the aft end of said frustum of a cone, said membrane portion being deformed by a plurality of cooperating crease lines of first and second sets, each of the crease lines of said first and second sets having an apex, with the apex of each of the crease lines of the first set pointing at a viewer from the exterior of the membrane as formed into a frustum of a cone and the apex of each of the crease lies of the second set pointing away from the viewer, the crease lines of said first set running both transversely and longitudinally of said frustum of a cone with respect to the longitudinal axis thereof and the crease lines of the second set running longitudinally only thereof whereby said frustum of a cone may be folded inwardly, axi-symmetrically thereof, in multiple layers from the aft end thereof for compact stowage relative to said rocket motor, and whereby said extendible nozzle may be unfolded to the extended position thereof by a forward-to-aft flow of rocket motor gas therethrough upon firing of said rocket motor.

4,787,560

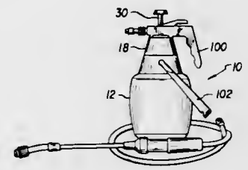
PORTABLE LIQUID SPRAYER

Sal G. DeYoreo, Andover, Mass., assignor to Blue Mountain Products Inc., Utica, N.Y.

Filed Dec. 4, 1985, Ser. No. 804,503

Int. Cl.[4] A01G *25/14*

U.S. Cl. 239—373 **6 Claims**



1. A portable liquid sprayer comprising: a tank adapted to contain a supply of liquid received through a fill opening; a pump for pressurizing liquid contained in said tank; a first spraying mechanism including a first control valve carried on said tank and a first nozzle removably connected to said tank; a second spraying mechanism and a second nozzle forming part of a wand assembly, said wand assembly being located at one end of a flexible hose, said hose having a coupling at the opposite end thereof adapted to be interchangeably connected to said tank in the place of said first nozzle, said first control valve having a valve seat included as an integral component of said first nozzle and without which said first valve is incapable of preventing the flow of pressurized liquid therethrough from said tank.

4,787,561

FINE GRANULAR METALLIC POWDER PARTICLES AND PROCESS FOR PRODUCING SAME

Preston B. Kemp, Jr., Athens, and Robert J. Holland, Sr., Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 13, 1986, Ser. No. 896,150

Int. Cl.[4] B02L *23/00*

U.S. Cl. 241—30 **6 Claims**



1. A process for producing powder particles of a ductile and/or malleable material selected from the group consisting of metals, metal alloys, and metal-ceramic composites, said process comprising net grinding with grinding media, a starting ductile particulate material selected from the group consisting of metals, metal alloys, and metal-ceramic composites with the grinding media being placed in a mill so that said media are in close proximity to one another and thereby resulting in a densely packed state to produce said powder particles wherein said powder particles are characterized by a substantially granular appearance and an aspect ratio of from greater than 1 to about 100 and a mean particle size of less than about 20 micrometers in diameter.

4,787,562

GRINDING MILL WITH MEANS FOR DAMPING ROLLER DISPLACEMENT

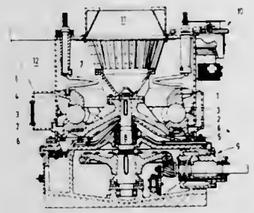
John Templeton, Colinslee Crescent, United Kingdom, assignor to Charles W. Taylor & Son Limited, Tyne and Wear, United Kingdom

Filed Aug. 12, 1987, Ser. No. 84,214

Claims priority, application United Kingdom, Aug. 23, 1986, 8620561

Int. Cl.[4] B02C *15/12*

U.S. Cl. 241—117 **3 Claims**



1. A vertical spindle type grinding mill which comprises in combination, upper and lower rings together defining a track, rolling grinding means on said track, yoke means supporting the upper and lower rings for resisting forces tending to separate such rings, means for holding the upper ring against rotation and for exerting vertical pressure thereon, drive means for effecting rotation of said lower ring via the lower of said yoke means and elastomeric material interposed between such lower yoke means and said lower ring to distribute and absorb dynamic bending forces in said lower ring due to vertical displacement of said rolling grinding means.

4,787,563

BEARING SYSTEM FOR CONE TYPE CRUSHER

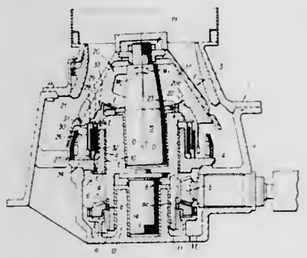
Takeshi Tanaka, and Masao Jotatsu, both of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 564,359, Dec. 22, 1983. This application Aug. 15, 1984, Ser. No. 640,558

Claims priority, application Japan, Nov. 17, 1979, 54-149717

Int. Cl.[4] B02L *2/04*

U.S. Cl. 241—208 **4 Claims**



1. A cone type crusher having a vertical main axis, said crusher comprising:

(a) a barrel type outer frame;

(b) a cap ring mounted on said outer frame;

(c) an inner frame fixedly mounted on said outer frame;

(d) a drive shaft assembly fixedly mounted on said outer frame;

(e) a drive pinion rotatably driven by said fixedly mounted drive shaft assembly;

(f) a horizontally disposed follower gear mounted in said

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inner frame for rotation about the vertical main axis of the crusher and in position to engage said drive pinion, said follower gear having a plurality of radially inwardly projecting, vertically oriented axial splines formed thereon;

(g) a drive cylinder mounted for vertical motion along the vertical main axis of the crusher, said drive cylinder having a spline gear formed thereon which engages said plurality of radially inwardly projecting axial splines formed on said horizontally disposed follower gear, said spline gear being sized and shaped to receive rotary torque from said splines and to permit said drive cylinder to move vertically relative to said follower gear at the same time that said spline gear is receiving rotary torque from said splines;

(h) a cylindrical upper bearing which supports the upper portion of said drive cylinder, said cylindrical upper bearing being located radially outwardly of said drive cylinder and between said drive cylinder and said inner frame;

(i) a cylindrical lower bearing which supports the lower portion of said drive cylinder, said cylindrical lower bearing being located radially inwardly of said drive cylinder and between said drive cylinder and said outer frame;

(j) lift means for axially moving said drive cylinder along the vertical main axis of the crusher at the same time that said spline gear is receiving rotary torque from said splines, during which vertical motion said drive cylinder slides vertically in both said cylindrical upper bearing and said cylindrical lower bearing and said spline gear slides vertically relative to said plurality of radially inwardly projecting axial splines on said horizontally disposed follower gear;

(k) a main crusher shaft generally vertically mounted in said drive cylinder, said main crusher shaft being rotatable about an eccentric axis disposed at a small angle relative to the vertical main axis of the crusher;

(l) a crushing head mounted on said main crusher shaft in position to define a crushing chamber in cooperation with said cap ring; and

(m) an annularly shaped spherical thrust bearing disposed between said crushing head and said drive cylinder radially outwardly of said main crusher shaft,

whereby,

(n) when said lift means is activated to move said drive cylinder vertically, there is relative axial movement between said horizontally disposed follower gear and said spline gear, but the axis of rotation of said drive pinion remains fixed;

(o) a moment on one side of said main crusher shaft produced by an asymmetric load on said crushing head is offset by an opposite moment acting through said annularly shaped spherical thrust bearing; and

(p) said cylindrical upper and lower bearings reduce vibrations of said drive cylinder to a minimum and distribute radial thrusts produced by loads in said crushing chamber over a large contact surface area.

4,787,564

ROCK-CRUSHER SHOE

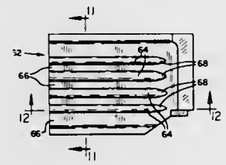
Garry Tucker, P.O. Box 171, Tualatin, Oreg. 97062

Continuation-in-part of Ser. No. 674,082, Nov. 23, 1984, abandoned. This application Feb. 9, 1987, Ser. No. 15,484

Int. Cl.⁴ B02C *19/00*

U.S. Cl. 241—275 **3 Claims**

1. An impeller shoe mounted on a turntable in a centrifugal inpact rock crushing machine, said turntable having an axis of rotation, said impeller shoe having a wear surface for receiving a stream of particulate matter flowing in a direction outwardly from said turntable and away from said axis of rotation, said wear surface having more than two substantially rounded ridges aligned parallel to one another and extending in the direction of the flow of said stream of particulate matter, each



of said ridges having a gently sloping tip at an end thereof closest to said axis of rotation.

4,787,565

METHOD AND ASSEMBLY FOR FORMING THREAD RESERVE ON SPOOL TUBE IN THREAD WINDING APPARATUS

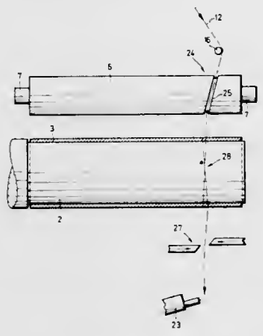
Alfred Tschentscher, Cologne, Fed. Rep. of Germany, assignor to FMN Schuster GmbH & KG, Hürth, Fed. Rep. of Germany

Filed Mar. 3, 1987, Ser. No. 21,236

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607342

Int. Cl.⁴ B65H *54/02, 54/34*

U.S. Cl. 242—18 PW **14 Claims**



1. An assembly for forming a thread reserve winding when spooling a thread onto a rotatably mounted spool tube in a thread winding apparatus, said assembly comprising:

(a) a spool pin, a pressure roller and reverse thread roller device located with respect to each other to form said thread winding apparatus,

(b) the spool pin including means for carrying the spool tube; a motor connected to rotate the spool tube,

(c) means mounting said spool tube to swing in a direction toward the pressure roller disposed adjacent the spool pin to effect a thread winding function upon operation of the reverse thread roller device,

(d) said spool tube including a smooth peripheral surface at least in the area of the thread reserve winding,

(e) said pressure roller having a thread entry end; a thread blocking device being disposed at said entry end of the pressure roller for holding back the thread from being introduced to the reverse thread roller device until the thread reserve winding has been wound onto the spool tube, and

(f) thread directing means for directing an incoming thread to-and-fro over a length of the spool tube defining the breadth of the thread reserve winding being formed,

(g) said thread directing means being located ahead of the spool tube when viewing the assembly in the direction of the course of the thread through the thread winding apparatus,

(h) said thread directing means includes an oblique channel located on the reserve roller,

(i) said channel being closed in itself.

4,787,566

METHOD AND MEANS FOR GUIDING SPLICED YARN IN A TEXTILE WINDER

Dieter Oellers, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,257

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637033

Int. Cl.⁴ B65H *54/22*

U.S. Cl. 242—35.6 R **14 Claims**



1. In a method of automatically splicing yarn ends on a textile winder wherein yarn ends are picked up from a supply bobbin and a winding package and positioned at a splicer for splicing out of the normal path of winding with the spliced yarn then being released to assume the winding path under the tension of winding, the improvement comprising: guiding said spliced yarn from said splicer to said winding path during start-up of winding subsequent to splicing while controlling said guiding to maintain the spliced yarn under winding tension without substantial slack as it is guided from said splicer to said winding path, thereby minimizing kinking and yarn breaks.

4. In a textile winder of the type having means for automatically splicing yarn ends and means for picking up yarn ends from a supply bobbin and a winding package and positioning said yarn ends at said splicing means out of the winding path, the improvement comprising: means for guiding said spliced yarn from said splicing means to said winding path during start-up of winding subsequent to splicing and means for controlling said guiding means to maintain the spliced yarn under winding tension without substantial slack as it is guided from said splicing means to said winding path, thereby minimizing kinking and yarn breaks.

4,787,567

APPARATUS FOR HOLDING RECORDING MEDIUM

Hideo Fushimoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 852,718, Apr. 16, 1986, abandoned. This application Sep. 10, 1987, Ser. No. 97,282

Claims priority, application Japan, Apr. 24, 1985, 60-86523; Dec. 27, 1985, 60-292972

Int. Cl.⁴ B41J *15/04*

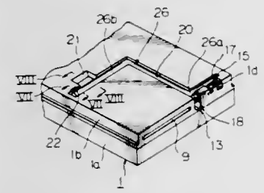
U.S. Cl. 242—55.2 **14 Claims**

1. An apparatus for holding a recording medium, comprising:

a casing equipped with a recording member to record onto a recording medium;

holding means having a rotary member for rotatably supporting said holding means to said casing and a holding portion for holding said recording medium; and

restricting means provided for said casing, for restricting said holding portion of said holding means at a position away from the casing when said holding portion holds said recording medium, and for positioning said holding portion within a concave enclosing portion disposed in a bottom surface of said casing when said holding portion does not hold said recording medium;



wherein when said holding portion does not hold said recording medium, said holding portion is rotated by more than 180 degrees from the position away from the casing where said restricting means restricts said holding portion when said holding portion holds said recording medium, and said holding portion is positioned within said concave enclosing portion.

4,787,568

WINDING APPARATUS FOR CONTINUOUS STRIPS OF MATERIAL

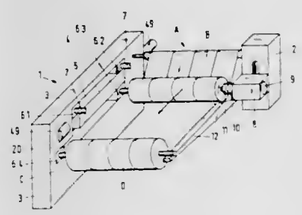
Werner Mulfarth, Kirchheim, and Dragan Djordjevic, Erkrath, both of Fed. Rep. of Germany, assignors to ER-WE-PA Maschinenfabrik und Eisengiesserei GmbH, Erkrath, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,380

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 3633897

Int. Cl.⁴ B65H *19/22*

U.S. Cl. 242—56.9 **16 Claims**



1. Apparatus for successively winding continuous strips of material into rolls, comprising a first upstanding guide frame comprising a first outer frame member having a rectangular opening a first inner frame member in the form of a shiftable rectangular bar extending into said opening and having a width less than the width of said opening so as to define upper and lower horizontal guide tracks with said outer frame member, said bar being longitudinally shiftable within said opening between a first position defining a forward vertical guide track between a forward end of said bar and an opposing end wall of said opening, and a second position defining a rearward vertical guide track between a rearward end of said bar and an opposing end wall of said opening, said outer frame member having a slot defining a forward extension of said lower guide track, first slide bearings rotatably supporting a plurality of

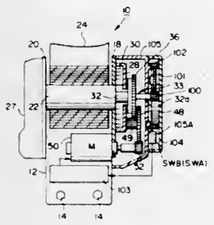
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winding shafts at one end thereof and being movable along said tracks from a roll forming station at said lower guide track to a roll removal station at said extension and to and from said upper guide track at empty roll stations via said vertical guide tracks as determined by the shifted position of said bar, and support means having movable means removably coupled to an opposite end of one of said shafts for rotatably supporting at least said one shaft at said roll forming station.

4,787,569
WEBBING RETRACTOR

Shigeyasu Kanada, and Yoshio Nakano, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Oct. 21, 1986, Ser. No. 921,135
Claims priority, application Japan, Oct. 22, 1985, 60-161833[U]
Int. Cl.⁴ A62B *35/00*
U.S. Cl. 242—107 **19 Claims**



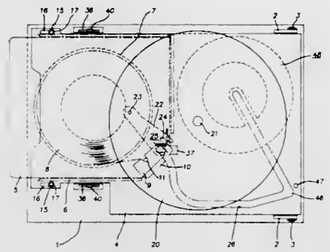
1. A webbing retractor for use in a seatbelt system for a vehicle designed to protect an occupant in an emergency vehicular situation, comprising:
(a) a take-up shaft for winding up a webbing;
(b) driving means for applying a relatively strong wind-up force on the take-up shaft;
(c) biasing means for applying a relatively weak wind-up force on the take-up shaft until said driving means is actuated;
(d) detecting means including sensors disposed at least two positions, respectively for detecting whether or not a predetermined amount of said webbing unfastened form the occupant's body has been wound up on said take-up shaft; and
(e) control means including means for actuating said driving means operatively connected to said take-up shaft, and adapted to activate said driving means only when said detecting means senses that a predetermined amount of said webbing has been wound up on said take-up shaft, so that said webbing is initially wound up by means of a relatively weak biasing force in the webbing wind-up operation carried out after the occupant has unfastened said webbing, and said webbing is finally wound up by means of a relatively strong biasing force after said initial wind-up is concluded.

4,787,570
APPARATUS FOR GUIDING A LEADER BLOCK IN A TAPE CARTRIDGE FOR A MAGNETIC INSTRUMENT

Fuyuki Nakagome, Kodaira, Japan, assignor to Nakamichi Corporation, Kodaira, Japan

Filed Oct. 23, 1987, Ser. No. 113,167
Claims priority, application Japan, Oct. 27, 1986, 61-254874
Int. Cl.⁴ G11B *15/66*
U.S. Cl. 242—195 **5 Claims**

1. An apparatus for guiding along a guide path a leader block contained in a tape cartridge for a magnetic instrument having a single reel and connected to a leader end of a tape in the tape cartridge characterized by:
drive means including an arm at an end thereof having a drawing pin which is guided along said guide path so as to guide said leader block along said guide path and a rotary member pivotally supporting said arm at another end thereof and having a rotary axis:

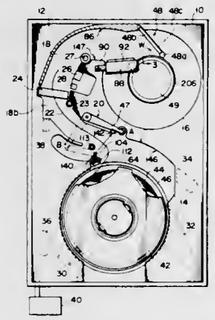


and means including a member to engage with said one end of said arm at the position of said arm where said axis of said rotary member, a pivotal axis of said arm, and said drawing pin are arranged in a substantially straight line to prevent said leader block from being moved in a backward direction along said guide path.

4,787,571
AUTOMATIC LOADING HORIZONTAL TYPE OF OPEN-REEL MAGNETIC TAPE DRIVE UNIT

Ken-ichi Kosugi; Yuuji Asahara, and Kazumi Watanabe, all of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Division of Ser. No. 573,896, Jan. 25, 1984, Pat. No. 4,653,704.
This application Feb. 18, 1987, Ser. No. 16,050
Claims priority, application Japan, Jan. 31, 1983, 58-14418
Int. Cl.⁴ G11B *15/32, 15/38, 15/43*
U.S. Cl. 242—195 **9 Claims**



1. An automatic-threading horizontal type of magnetic tape drive unit, comprising:
a housing with the interior thereof horizontally disposed;
a base horizontally disposed within said housing;
a tape supply section disposed on said base, comprising means for retaining and rotating about a substantially vertical axis a tape reel having a coil of magnetic tape wound thereon terminating in a free end;
a tape take-up section disposed on said base, comprising a take-up hub and means for supporting and rotating said take-up hub about a substantially vertical axis;
an S-shaped tape transport path means formed as an open channel in said base and extending between said tape supply section and said tape take-up section, said tape transport path means defining a tape transport path for said magnetic tape;
magnetic head means disposed at a position along said tape transport path between said tape supply section and said tape take-up section, for performing read and write operations on said magnetic tape;
a source of air under high pressure;
a plurality of high-pressure air outlets for producing high pressure air flows, supplied with air from said high-pressure air source, and disposed variously adjacent to the periphery of said tape reel and at positions along said tape transport path, for directing said high-pressure air flows such as to separate said tape free end from adjacent portions of said magnetic tape wound on said tape reel and to guide and transport said tape free end after said separation, along a substantially central region of said tape transport path to said tape take-up section;
winding securing means disposed in said tape take-up section, acting to wind said magnetic tape onto said takeup hub after said tape free end has been transported to said tape take-up section by said high-pressure air flows;
a main tension arm operable to be moved between a first position in which said main tension arm is disposed substantially outside said tape transpoft path and a second position in which said main tension arm extends into said tape transport path such that said main tension arm bears against said magnetic tape and deflects said magnetic tape from said tape transport path to thereby produce a predetermined amount of tension;
an auxiliary tension arm rotatable about a substantially vertical axis between a first and a second stable position, spring means biasing said auxiliary tension arm in said first and second stable positions, said auxiliary tension arm being in said first stable position prior to winding said magnetic tape onto said take-up hub, said tape being subjected to tension immediately after said tape is wound onto said take-up hub such that a portion of tape which has just been tensioned bears against said auxiliary tension arm and thereby rotates said auxiliary tension arm from said first stable position to an intermediate position, said intermediate position being between said first and second stable positions;
switch means actuated by said auxiliary tension arm when said auxiliary tension arm is rotated from said first position to said intermediate position, said actuated switch means generating a signal to move said main tension arm from said first to said second position thereof;
said auxiliary tensionarm being disposed within the path of movement of said main tension arm such that said main tension arm contacts a portion of said auxiliary tension arm where said main tension arm moves from said first position toward said second position, said main tension arm in moving from said first towards said second position thereby shifting said auxiliary tension arm from said intermediate position to said second stable position.

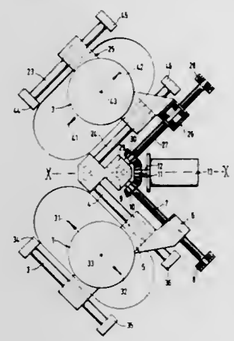
4,787,572
MULTI-SIZE TAPE CASSETTE WINDING APPARATUS

Karl-Heinz Rademacher, Alsbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 79,832
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626942
Int. Cl.⁴ G11B *25/06, 15/675;* **F16H** *27/02*
U.S. Cl. 242—201 **3 Claims**

1. Magnetic tape winding apparatus for combination with any one of a set of magnetic tape cassettes
in which the winding centers of tapes within the cassettes of the sets differ from each other,

said apparatus having two reel tables (**1, 2**) located in a common plane;
the centers of the reel tables being movable in a plane parallel to said common plane; and
wherein said reel tables are movable in converging angled paths symmetrical with respect to an axis of symmetry (X—X) between the angled converging paths; and
motor drive means (**13**) are provided to position the reel tables (**1, 2**) in accordance with the position of the winding centers of a specific cassette of the set,



comprising, in accordance with the invention,
coupling means (**7, 10, 11, 12, 27, 30**) coupling the drive means to both of said reel tables for moving the reel tables in said common plane, said coupling means being characterized by comprising coupling elements displaceable respectively in linear paths extending in the same directions as said converging angled paths by a distance which, with respect to rotation of said drive means has a linear distance vs. angle-of-rotation relationship.

4,787,573
AIRCRAFT WITH ROTARY WINGS

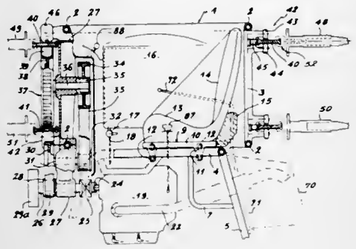
Daniel Pauchard, Garches, France, assignor to Bernard Solinhac, Paris, France

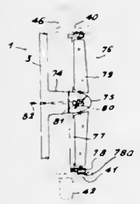
PCT No. PCT/FR86/00330, § 371 Date May 26, 1987, § 102(e) Date May 26, 1987, PCT Pub. No. WO87/02004, PCT Pub. Date Apr. 9, 1987
PCT Filed Sep. 26, 1986, Ser. No. 60,242
Claims priority, application France, Sep. 27, 1985, 85 14320
Int. Cl.⁴ B64C *27/10*
U.S. Cl. 244—17.23 **4 Claims**

1. Rotary-wing aircraft, characterized in that it comprises a nacelle (**1**) surrounding the user who is seated on a seat (**9**) mounted in the median plane of said nacelle for sliding motion substantially in the normal direction of displacement of the aircraft in flight, two parallel rings (**40–41**) carried by the nacelle and driven in identical movements of rotation but in opposite directions about a common axis extending substantially at the center of the nacelle at right angles to the plane of said rings, the function of each ring being to support at least one pair of wing-blades (**48–49, 50–51**) or airfoils which are diametrically opposite and located in the line of extension of each other, means (**19–37**) for driving the rings about the nacelle and means (**66–67**) whereby the blade pitch in each pair of blades can be varied in an equal but opposite manner in each case, each ring (**40–41**) being provided opposite to each blade (**48** to **50**) with an axial stud (**54**) which supports this latter, which is fitted with a needle thrust-bearing (**58**) and on which is engaged a sleeve (**55**) so designed as to be capable of pivoting about the stud, said sleeve being provided with an extension in the form of a stirrup-piece (**61**), the end of the blade being mounted and fixed between the two arms of said stirrup-piece

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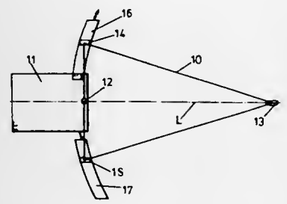
so as to permit a variation in pitch of the blade with respect to the ring by relative rotation of the sleeve, each blade of the airfoil having two transverse extensions (**63–64**) located in alignment with each other, the blades of one and the same pair (**48–49, 50–51**) being joined together around the nacelle by means of two crossed and tensioned cables (**66, 67**) fixed at the





end of said extensions respectively at the opposite extremities thereof so that a tractive force exerted in one direction on one of the cables results in an opposite tractive force on the other cable and conversely, the two blades of the same pair being thus capable of pivoting about their axial supporting studs with an equal and opposite amplitude of rotation.

4,787,574
AIRCRAFT HANDLING SYSTEMS ON SHIPS
Thomas M. Craig, Loanhead, Scotland, assignor to Mactaggart, Scott (Holdings) Limited, Loanhead, Scotland
Filed Jun. 16, 1986, Ser. No. 874,945
Claims priority, application United Kingdom, Jun. 20, 1985, 8515708
Int. Cl.[4] B64F *1/24*
U.S. Cl. 244—116 **7 Claims**



1. Apparatus for positioning an aircraft, said apparatus comprising an aircraft landing means (**11**) on which an aircraft can be engaged for rotation about a harpoon (**12**) of the aircraft characterised in that there is provided laterally adjustable aligning means comprising an arcuate member or members (**16, 17**) associated with the landing means (**11**), the curvature of said arcuate member or members (**16, 17**) being the same as that of a circle having nosewheel at its center and drawn through the centres of spaced main wheels (**14, 15**) of an aircraft and being adapted to receive the spaced main wheels (**14, 15**) of the aircraft on movement thereof from the landing means (**11**) and being movable laterally to position said main wheels (**14,15**) at a desired location on either side of an intended path (L) of travel of the aircraft.

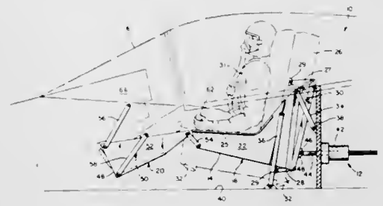
4,787,575
SIGNAL BALLOON DEVICE
Ronald R. Stewart, Sumner, Wash., assignor to David L. Huskey, Sumner, Wash., a part interest
Filed Feb. 25, 1987, Ser. No. 18,399
Int. Cl.[4] B64B *1/50*
U.S. Cl. 244—33 **14 Claims**



1. A signal device comprising:
a housing;
an inflatable balloon having a deflated stowed position inside the housing; said balloon, when inflated, having a horizontally elongated configuration with opposite tapered ends and being shaped and dimensioned to cause the balloon to ascend in response to an increase in wind speed; and said balloon having first and second laterally opposite sidewalls each of which has a light transmitting portion and a reflective portion, said light transmitting portion of each sidewall being substantially laterally opposite the reflective portion of the opposite sidewall;
light means positioned between sidewalls to be visible through said light transmitting portions; said reflective portions being positioned to reflect light from the light means through the light transmitting portions;
a tether having opposite ends attached to the housing and that balloon, respectively; and
means carried by the housing for inflating the balloon and allowing it to ascend out of the housing.

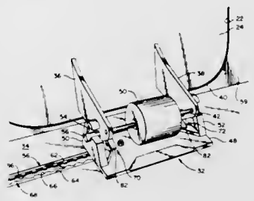
4,787,576
AUTOMATIC MULTI-POSITION G-PROTECTIVE EJECTION SEAT ASSEMBLY
Michael B. McGrady, Federal Way; James M. Huber, Seattle; Gerald F. Herndon, Bellevue; Stephen F. Sielaff, Federal Way, and Jerry T. Shearer, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 29, 1986, Ser. No. 913,482
Int. Cl.[4] B64D *25/04, 25/10*
U.S. Cl. 244—122 R **33 Claims**

1. A G-protective ejection seat assembly for an occupant of the cockpit of an aircraft utilizing a separable ejection seat including propulsion means for separating the ejection seat from the cockpit and propelling the seat with the occupant therein free of the cockpit during ejection, comprising:
a cradle having a non-articulated upper portion and a lower portion, said cradle upper portion being attachable to the aircraft for selective angular movement within the cockpit between an upright position and a reclined position, said cradle upper portion being selectively positionable during use in said upright and reclined positions, said cradle having control support means for supporting hand and foot flight controls of the aircraft for movement with said cradle, the ejection seat being releasably carried by and substantially stationary with respect to said cradle upper portion during non-ejection use, the seat being moved with said cradle upper portion as said cradle upper portion moves between said upright and reclined positions, said cradle being arranged to support the occupant in the seat in a normally upright position when said cradle upper



portion is in said upright position and in a supine position when said cradle upper portion is in said reclined position, the ejection seat being movable upon ejection independent of said cradle and the hand and foot flight controls supported by said cradle, upon ejection said cradle and the hand and foot controls remaining in place within the aircraft while the seat is propelled out of the cockpit; and
power means for selectively angularly moving said cradle upper portion between said upright and reclined positions.

4,787,577
CLOSURE SYSTEMS
Cornelius R. Whittle, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Oct. 21, 1985, Ser. No. 789,499
Int. Cl.[4] B64C *1/14*
U.S. Cl. 244—129.4 **13 Claims**



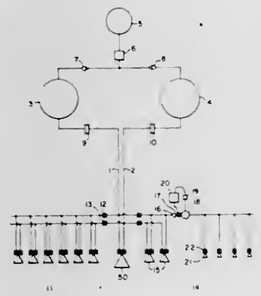
1. A closure system for a structure having a vertically extending wall with a doorway therein and floor means extending from said wall means at the lower edge thereof, said closure system comprising: a closure for blocking said doorway, bracket means for detachably securing the lower end of said closure to said floor means with said closure blocking said doorway, and wheel means fixed to the lower end of said closure which can be lowered to said floor means by rotation of said closure relative to said bracket means to detach said closure from said bracket means and on which said closure can then be rolled away from said doorway to provide clear access to said doorway.

4,787,578
WEIGHT COMPENSATING MECHANISM PARTICULARLY FOR AIRCRAFT HATCHES, DOORS OR GATES
Dieter Nitsch, Delmenhorst, Fed. Rep. of Germany, assignor to MBB GmbH, Bremen, Fed. Rep. of Germany
Filed Mar. 12, 1987, Ser. No. 25,268
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3608735
Int. Cl.[4] B64C *1/14*
U.S. Cl. 244—129.5 **2 Claims**



1. Cargo or freight hatch, door, or gate, including a weight compensation mechanism, the gate, door, or hatch being of the plug-type that can be opened towards the inside, there being a hinge axis to swing the door, gate, or hatch upwardly, comprising in combination:
a torsion rod arranged parallel to the hinge axis of the gate, door, or hatch, there being hollow shafts or sleeves at the ends of the torsion rod, both sleeves being secured to the torsion rod;
one of said sleeves being connected to a door frame by means of a lever that is not a continuation of the torsion rod, and a further length adjustable rod; and
the other one of the sleeves being connected to a further lever, said further lever being connected to the door, gate, or hatch through a adjustable tension screw.

4,787,579
GAS THRUSTER
Peter Smith, Portsmouth, England, assignor to The Marconi Company Limited, England
Filed Apr. 29, 1987, Ser. No. 43,850
Claims priority, application United Kingdom, May 2, 1986, 8610849
Int. Cl.[4] B64G *1/26*
U.S. Cl. 244—169 **5 Claims**



1. A thruster system for a spacecraft of the type including a

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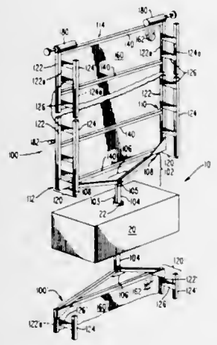
main bi-propellant propulsion system having a propulsion engine and a bi-propellant supply for the engine which has a tank for a liquid oxidizing agent and a tank for a liquid fuel, the thruster system comprising: a subsidiary cold propellant thruster; a supply line leading from the oxidizing agent tank to said cold propellant thruster; pressure reducing means in the supply line for reducing pressure therein; a control valve in the supply line for controlling the flow of liquid oxidizing agent along the supply line; and means in the supply line for vaporizing the liquid oxidizing agent prior to delivery of vaporized oxidizing agent to the cold propellant thruster.

4,787,580

LARGE SOLAR ARRAYS WITH HIGH NATURAL FREQUENCIES

Eugene R. Ganssle, Skillman, N.J., assignor to General Electric Company, East Windsor, N.J.

Filed Jun. 27, 1985, Ser. No. 749,228
Int. Cl.[4] B64G *1/44*
U.S. Cl. 244—173 **20 Claims**



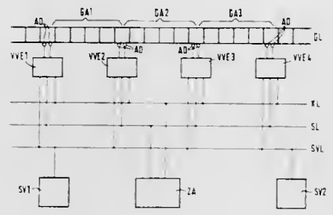
1. A solar array having a stowed and a deployed configuration for use with a satellite, said array comprising:
an array support frame comprising a pair of spaced-apart substantially parallel spanwise continuous structural members; and
a solar array substrate which is supported by said frame and which has a major surface;
each of said spanwise members including a deployable stiffener member and being fabricated of a material and having a stowed configuration in which said array support frame including said stiffener member can be wound about said satellite in a direction perpendicular to said major surface of said substrate without exceeding the yield stress of said spanwise members and which provides said spanwise members with a straightening force to unwind said array frame from said satellite;
said stiffener members being deployed when said array is in its deployed configuration, said stiffener members in their deployed configuration providing said spanwise members with a substantially increased stiffness in said direction perpendicular to said major surface of said substrate.

4,787,581

TRAIN DETECTION SYSTEM OPERATING IN ACCORDANCE WITH THE AXLE-COUNTING PRINCIPLE

Karl U. Dobler, Toronto, Canada, and Helmut Uebel, Gerlingen, Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 767,932, Aug. 21, 1985, abandoned. This application Jul. 6, 1987, Ser. No. 70,633
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1984, 3431171
Int. Cl.[4] B61L *1/16*
U.S. Cl. 246—247 **5 Claims**



1. In a train detection system for sections of track each defined by at least two detection points each of which is formed by at least two axle detectors staggered one relative to the other, arranged along the rails of the track and providing axle-presence signals:
a central evaluation unit which indicates a particular track section as being occupied or unoccupied depending upon the number of axles counted at the associated detection points as axles entering the track section and as axles leaving the track section,
a preprocessing unit provided in the immediate vicinity of each detection point and associated therewith, each preprocessing unit containing
processing means for separate processing of the axle detector signals only from the associated detection point and accumulating a separate multi-bit count which is incremented each time an axle is detected as having passed the associated detection point in a first direction and which is decremented each time an axle is detected as having passed said associated detection point in a second direction, as well as
a data transmitter-receiver for call-controlled transfer of the accumulated multi-bit count to the central evaluation unit, and
call-up means associated with said central evaluation unit for cyclically calling up the counts stored by each of the preprocessing units.

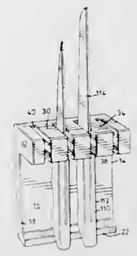
4,787,582

DEVICE FOR HOLDING PLANAR IMPLEMENTS

Rimas J. Geleziunas, 3900 Yonge Street, Toronto, Ontario, Canada M4N 3N6

Filed May 14, 1987, Ser. No. 49,475
Int. Cl.[4] A47G *21/14*
U.S. Cl. 248—37.3 **17 Claims**

1. A device for holding a plurality of planar implements, the device comprising:
a body, which includes a portion extending horizontally outwardly therefrom;
a plurality of generally vertical slots in said portion with each slot including a pair of facing side walls, each of which includes an elongate opening; and
for each slot, a pair of gripping elements disposed on either side of the slot, each gripping element including an elongate flange that extends through a corresponding opening, with the flanges facing one another and shaped to define an entry zone that tapers inwards, to enable the gripping elements to be urged apart by insertion of a planar implement; and
a spring means urging the gripping elements together to grip side faces of a planar implement between their flanges.

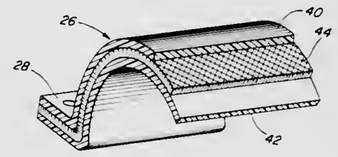


4,787,583

CLAMP FOR ARCTIC PIPELINE SUPPORT

Arthur W. Morton, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 12, 1982, Ser. No. 433,935
Int. Cl.[4] F16L *3/16*
U.S. Cl. 248—55 **5 Claims**



1. A ring clamp for supporting and anchoring a large diameter metallic arctic pipeline comprising substantially rigid, curved clamp portions adapted to completely encircle said pipeline and fastening means connecting said clamp portions, said clamp portions having inner and outer layers of fiber reinforced rigid polymer material and an intermediate core layer of honeycomb-form aramid paper.

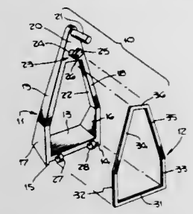
4,787,584

TRASH BAG SUPPORTING DEVICE

David Palmer, 6539 Varnum Way, Northhighlands, Calif. 95660

Filed Mar. 11, 1988, Ser. No. 166,997
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—99 **8 Claims**

1. A two piece portable, stable and upright trash bag supporting device comprising:
an upright right main support member including a base support having a lower planar surface adapted to rest on a supporting surface and an inclined ramp portion on its upper surface;
said main support member further including a pair of upwardly extending vertical side walls on each side of said base support,
a first upwardly and inwardly extending wall member integral with one of said pair of side walls and a second upwardly and inwardly extending wall member integral with the other of said pair of side walls, said wall members meeting to form an apex portion with an opening through said device defined by said apex portion, said wall members, said side walls and said base support with said ramp portion leading into the bottom of said opening; and
a detachable vertically upright frame member having a central opening and a peripheral structure surrounding said central opening similar to said first mentioned opening of a dimension generally related to the boundaries of said first mentioned opening and a seperate locking means for detachably locking the frame member to said main support member, said side walls and said base support so that an open area is provided through both said frame member and said main support member, said open are being provided by the alignment of both said openings.

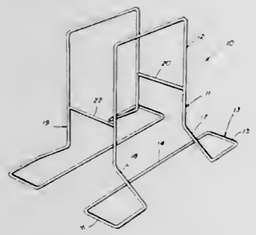


4,787,585

ADAPTER SUPPORT

Thomas A. Tedham, Boston, and See C. Leung, Tewksbury, both of Mass., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 11, 1987, Ser. No. 61,928
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—175 **2 Claims**



1. An adapter support comprising
a first element comprising a closed bent loop of rod, said first element having
an upward bight portion disposed in a first vertical plane with a pair of sides spaced to fit snugly between pad supports of an enclosure,
a floor contacting portion disposed in a second horizontal plane with a linear portion longer than the space between the sides of said bight portion, and two generally "L" shaped stabilizing bends extending angularly outward from each end of said linear portion and to the same side of the linear portion,
two transition portions extending downwardly and outwardly joining the ends of the stabilizing bends with the ends of the bight portion, and holding the first and second planes perpendicular to each other with said linear portion in the plane of the bight portion,
a second element identical to the first element,
a first spacer comprising a straight rod and a length equal to

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the thickness of said enclosure, and a second spacer identical to the first spacer,

including means for affixing said spacers and the first and second elements together, wherein the spacers adjoin the first and second elements from positions on opposite sides of said bight portions, and the transition portions of the second element extend in a direction opposite from the direction in which the transition portions of the first element extend.

4,787,586

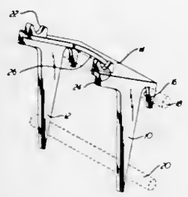
CONTAINER SUPPORT DEVICE

W. Kenneth Crain, P.O. Box 691, Cherryville, N.C. 28021

Filed May 29, 1986, Ser. No. 868,373

Int. Cl.[4] E06C *7/14*

U.S. Cl. 248—210 **2 Claims**



1. A container support device, attachable to a rung of a ladder having a plurality of rungs, for supporting a container in a vertical position in any operative angular position of the ladder, said container support device comprising:

a top portion forming a pair of spaced container support arms and having an inwardly extending curved edge between said support arms;

a pair of spaced ladder-rung hook members fixed to and depending from said top portion;

a pair of spaced upright elongate members fixed to and depending from said top portion, and adapted to contact a next lower rung from that engaged by said hook members; and

upwardly open container receiving notches at the extremity of each arm;

whereby said container support device is laterally stable, and said support arms are generally horizontally oriented in the operative position on a ladder.

4,787,587

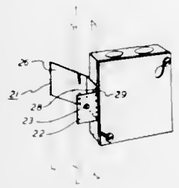
UNIVERSAL BRACKET FOR METAL OR WOOD STUDS

Dale R. Deming, Pittsburgh, Pa., assignor to FL Industries, Inc., Livingston, N.J.

Continuation of Ser. No. 7,635, Jan. 28, 1987. This application Oct. 13, 1987, Ser. No. 106,865

Int. Cl.[4] A47B *96/00*

U.S. Cl. 248—205.1 **2 Claims**



1. An apparatus, comprising:

a junction box; and

a bracket attached to said junction box for mounting said junction box, said bracket comprising:

a first flat portion including at least one opening for receiving a fastening means;

a second flat portion located in a plane at a right angle to the plane in which the first flat portion is located, said second flat portion being fastened against said junction box;

a notch located between said first flat portion and said second flat portion, said notch comprising two essentially perpendicular panels; and

a third flat portion forming an obtuse angle with said second flat portion, said third flat portion including at least one score line for severing a portion of said third flat portion from said bracket.

4,787,588

ARRANGEMENT FOR MOUNTING A HOUSING AT A CARRIER, PARTICULARLY FOR MOTOR VEHICLES

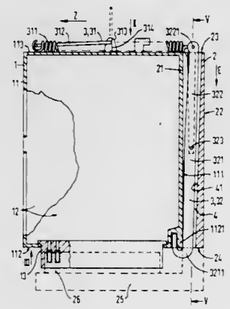
Helmut Deeken, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 115,897

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640667

Int. Cl.[4] E04G *5/06*

U.S. Cl. 248—222.1 **8 Claims**



1. An arrangement for mounting at least one housing comprising a bearing side at a carrier which acts as a cooling member and has a bearing surface comprising a guide means with which the position of the housing at the carrier is determined, and

comprising a clamping mechanism with which the housing has its bearing side clamped against the bearing surface of the carrier, characterized in that a guide channel in the bearing surface of the carrier serves as guide means in combination with a guide part at the bearing side which engages into the guide channel; and

the clamp mechanism is arranged at a side of the housing which proceeds at a right angle relative to the bearing side and is composed of the guide part and of a tension means which is connected to the guide part.

4,787,589

MOUNTING AND MULTI-POSITIONAL CONNECTING BRACKET AND METHOD FOR MULTI-POSITIONAL CONNECTION TO AN ATTACHMENT MEANS

Richard A. Willingham, P.O. Box 5594, Vancouver, Wash. 98668

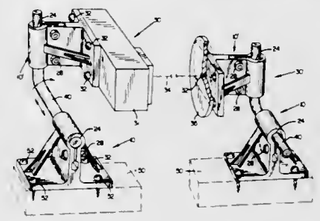
Filed Oct. 8, 1987, Ser. No. 106,520

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—278 **21 Claims**

1. A mounting and multi-positional connecting bracket, which comprises a unitary bracket means including a mounting portion, without externally-yieldable openings, for directly securedly fastening said bracket means in a fixed position to a first attachment means, and a connector portion including

means defining a fully enclosed internally-yieldable passageway, without externally-yieldable openings, adapted for adjustably securedly engaging a second attachment means within



said passageway without unfastening said bracket means from said first attachment means, said passageway means defining a fully-enclosed, internally-yieldable aperture and slot, respectively.

4,787,590

SUSPENSION OF OBJECTS

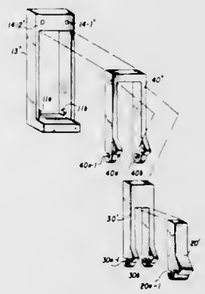
Thomas E. Melvin, P.O. Box 15809, Arlington, Va. 22215

Continuation-in-part of Ser. No. 650,837, Sep. 17, 1984, Pat. No. 4,651,961. This application Feb. 24, 1987, Ser. No. 17,927

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—293 **19 Claims**



1. Apparatus for the suspension of objects which comprises a housing having opposed side walls;

a longitudinally extendable member pivotally and removably positioned within said housing between said side walls;

means on said member for facilitating the pivoting thereof with respect to said housing and controlling the extent of the pivoting;

said apparatus further including a second longitudinally extendable member directly adjoining the first mentioned longitudinally extendable member;

wherein said second longitudinally extendable member is formed by two legs which straddle and directly adjoin said first longitudinally extendable member and are bridged together above the end of said first member;

a set of opposed protuberances extending towards one another from the opposed side walls of said housing for receiving said second longitudinally extendable member, each protuberance having a maximum diameter; and

means associated with said second longitudinally extendable member in the form of openings with side walls narrower than the maximum diameter of each protuberance for permitting said member to be snapped into position on said opposed protuberances.

4,787,591

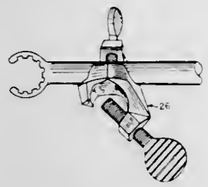
LABORATORY CLAMP

Gilberto M. Villacorta, 17 E. Milton Rd., Brookline, Mass. 02146

Filed Aug. 29, 1986, Ser. No. 901,813

Int. Cl.[4] A44B *21/00*

U.S. Cl. 248—316.7 **12 Claims**



1. An easy to fasten and release clamp comprising:

(i) one or more resilient fixed-diameter plastic clamping means having a curved circular member with an inner and an outer surface an an open gap such that said clamping means is "C"-shaped when viewed from the top, said curved member having a uniform thickness which allows said curved member to expand and contract in response to lateral pressure directed at said open gap when an object is forced against said open gap, and wherein said inner surface bears a continuous corrugated pattern of vertical cog-like teeth; and

(ii) a rigid cylindrical plastic extension rod having a forward and a rear end, said forward end being joined to said outer surface of said curved member substantially opposite said open gap, and wherein said forward end is tapered and narrowed along vertical planes to match the thickness of said curved member.

4,787,592

DEVICE FOR HANGING BUILDING MEMBER

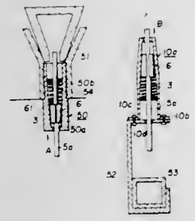
Takayuki Aoshika, Tokyo, Japan, assignor to 501 Ultima Ltd., Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,454

Claims priority, application Japan, Oct. 3, 1986, 61-234515

Int. Cl.[4] A47H *1/10*

U.S. Cl. 248—327 **6 Claims**



5. A device for hanging a building member comprising wire article securing means adapted to be secured to an anchor member secured to a ceiling wall of a building for hanging and securing a wire article, and building member securing means adapted to be hung and secured by said wire article for hanging a building member, at least one of said wire article securing means and said building member securing means comprising a kit consisting of a wire article gripper and a wire article extraction tool, said wire article gripper including an outer casing

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having an inner surface tapering towards one end of the casing and having an opening for introducing a wire article therethrough, a split gripping element accommodated within said outer casing and having a tapered outer surface complementary to said tapered inner surface, and a spring member held between a spring holding element secured within said outer casing and said split gripping element, said spring member normally biasing said split gripping element towards said one end, the arrangement being such that, when the wire article is forced to be inserted through said opening into said outer casing against the action of said spring member, said gripping element is moved along said tapered surfaces while being extended radially outward to permit said wire article to be introduced into the inside of said outer casing and after the wire article is introduced to a predetermined position and when the forcing operation is discontinued, the spring member thrusts the split gripping element along the tapered surfaces until the wire article is clamped and secured in position by the gripping element, a through-hole being formed in said outer casing for introducing a tool therethrough into the inside of said outer casing to move said spring member such that said gripping element is moved along said tapered surfaces and simultaneously extended radially outward to permit said wire article to be passed freely through the gripper to release the wire article.

4,787,593

DEVICE FOR ADJUSTING THE TRIM OF A VEHICLE SEAT

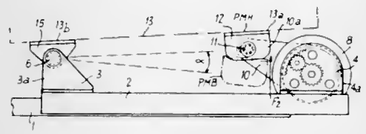
Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A & MN Cousin & Cie, Flers, France

Filed Mar. 7, 1986, Ser. No. 837,190

Claims priority, application France, Mar. 7, 1985, 85 03383

Int. Cl.[4] A47D *19/04*

U.S. Cl. 248—396 **8 Claims**



1. A device enabling a trim adjustment of a vehicle seat, comprising

a slide member having an upper section for each of two respective sides of said seat, for moving said seat forward and backward,

two square members fixed at opposite upper end portions of each said upper section, each said square member having a vertical wing,

a respective shoe-square operatively connected to said vehicle seat and a respective spindle for supporting each said shoe-square, each said shoe-square and spindle being associated with a respective one of said vertical wings,

wherein at least one of the two square members on each said upper section of each said slide member carries an articulation fitting for providing rotation about a respective colinear axis of each pair of the articulation fittings at the same ends of said upper sections, each said articulation fitting including a fixed flange supported on the respective vertical wing and a mobile flange connected with a reduction lever, each said mobile flange and the respective reduction lever rotating about the axis of the respective articulation fitting for enabling, by means of each respective reduction lever rotating with the respective mobile flange of each articulation fitting about the axis of the respective articulation fitting, a raising of the respective shoe-square, in order that a frame of said seat fixed on the shoe-squares is selectively displaceable, at least for a rear part of the seat or for a front part of the seat, between respective lower and upper dead points PMB and PMH, each said reduction lever being connected at an end thereof by the respective spindle to the respective shoe-square.

4,787,594

SEAT FOR MOTOR VEHICLES

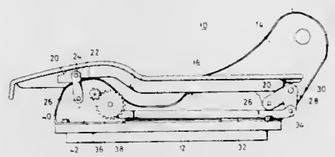
Isao Ikegaya; Makoto Uesugi; Akihisa Yamamoto, and Shinya Nakamura, all of Shizuoka, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1987, Ser. No. 20,698

Claims priority, application Japan, Mar. 3, 1986, 61-44015; May 22, 1986, 61-116061; May 22, 1986, 61-116062; May 22, 1986, 61-116063; Sep. 8, 1986, 61-209715; Nov. 14, 1986, 61-269914

Int. Cl.[4] A47D *19/04*

U.S. Cl. 248—421 **11 Claims**



1. A seat for motor vehicles having an elevation mechanism for the rear side of the seat, which comprises:

a base frame adapted to be arranged on a floor surface of a vehicle body, said base frame having a front section and a rear section;

a cushion frame having front and rear portions, the front portion of said cushion frame being supported rockably on the front section of said base frame;

a control shaft rotated by drive means;

a bell crank having two rocking ends, said bell crank being rockably supported on the rear section of said base frame, with one of said rocking ends being coupled with the rear portion of said cushion frame;

crank means for imparting the rotation of said control shaft to said bell crank in a manner such that during one rotation of said crank means, said bell crank performs one rocking motion, said crank means having a crank pin; and

coupling means having two ends, one of said ends being coupled with the crank pin of said crank means and the other of said ends being coupled with the other rocking end of said bell crank.

4,787,595

MULTI-POSITIONABLE DOCUMENT SUPPORT STAND AND INTERLOCKING MODULAR DOCUMENT HOLDER

David Hegarty, 36 Wyatt Rd., Garden City, N.Y. 11530

Continuation-in-part of Ser. No. 791,743, Oct. 28, 1985, abandoned. This application May 1, 1987, Ser. No. 45,630

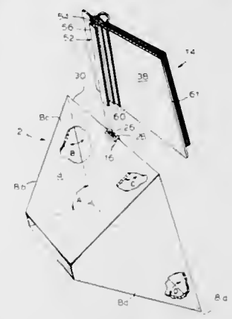
Int. Cl.[4] A47G *1/24*

U.S. Cl. 248—454 **31 Claims**

1. A document support stand for removably mounting a document holder thereon, which comprises:

a main body, the body including a viewing side, a first support side and a second support side, the viewing side having at least first and second edges disposed transversely to each other, the first support side being joined to the viewing side at the first edge thereof, the second support side being joined to the viewing side at the second edge thereof, each of the viewing side and the first and second support sides being substantially planar, the first and second support sides extending angularly from the viewing side on the same side of the plane in which the viewing side resides, the first support side and the viewing side defining therebetween an acute first angle at the first edge, the second support side and the viewing side defining therebetween an acute second angle at the second edge; and

means for removably mounting a document holder on the body, the document holder mounting means being situated on the body at the viewing side thereof to allow the document holder to be mounted on the viewing side, the stand being selectively positionable to rest on one of the



first support side, thereby supporting a document holder mounted thereon in a first viewing position, and the second support side, thereby supporting a document holder mounted thereon in a second viewing position which is transverse to the first viewing position, the viewing side residing in an x-y coordinate plane which is perpendicular to a z-axis of rotation, the document support stand being adapted to be rotated about the z-axis of rotation so that the viewing side thereof is correspondingly turned within the x-y coordinate plane and adjusted in position within the x-y coordinate plane.

4,787,596

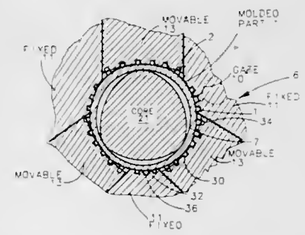
MOLD FOR FORMING PLASTIC LUER NUTS

Lawrence V. Folding, Sterling, Mass., and Roy A. Rosen, Woodstock, Conn., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 22,701, Mar. 6, 1987, Pat. No. 4,737,334. This application Dec. 11, 1987, Ser. No. 131,865

Int. Cl.[4] B29C *33/44, 33/76*

U.S. Cl. 249—59 **11 Claims**



1. A mold for forming internally threaded plastic nuts which have a polygonal internal cross-section of n number of sides, comprising:

a housing having first and second plates meeting along a parting line;

said first plate having a cavity therein, said cavity having a wall with n number of fixed sectors and n number of movable sections arranged circumferentially around a central axis of said cavity, each movable sector being radially movable relative to said central axis and further being disposed between a respective pair of fixed sectors;

holding means coupled to the first plate for maintaining the movable sectors in fixed relationship with the fixed sectors while a threaded nut is being formed;

an externally threaded core having a polygonal external cross-section with n number of sides coupled to the second plate and longitudinally extending into spaced relationship with the cavity wall, so that said threaded nut can be formed between an outer surface of the threaded core and an inner surface of the cavity wall; and

turning means coupled to the housing for rotating the threaded core after the holding means has released the movable sectors.

4,787,597

CLOTH FACED FORM FOR FORMING CONCRETE

Takayoshi Yokota, Kodaira; Shigekazu Horiya, Sagamihara, and Kenjiroh Tanaka, Zushi, all of Japan, assignors to Kabushiki Kaisha Kumagaigumi, Fukui, Japan

Continuation-in-part of Ser. No. 863,565, May 15, 1986, Pat. No. 4,730,805. This application Feb. 29, 1988, Ser. No. 162,228

Claims priority, application Japan, May 28, 1985, 60-115139; May 28, 1985, 60-79781[U]; Jul. 3, 1985, 60-101467[U]

Int. Cl.[4] E04G *9/10;* **B28B** *7/36*

U.S. Cl. 249—113 **5 Claims**



1. A form for forming concrete comprising:

a first cloth sheet permitting surplus water in concrete cast in said form to pass through said first sheet, but capable of blocking the passage of said concrete;

a second cloth sheet secured to said first sheet by strings disposed over substantially the entire area of said first sheet and permitting said surplus water to be absorbed into said second sheet; and

a plate secured to said second sheet.

4,787,598

APPARATUS FOR THE CONTINUOUS PRODUCTION OF PIPES WITH CROSS-PROFILED WALLS

Horst Rahn, Königsberg/Bayern, and Helmut Grüll, Riedbach, both of Fed. Rep. of Germany, assignors to Unicor GmbH, Hassfurt, Fed. Rep. of Germany

Filed Nov. 13, 1987, Ser. No. 119,871

Claims priority, application European Pat. Off., Nov. 13, 1986, 86115806.1

Int. Cl.[4] B29C *33/34, 49/30*

U.S. Cl. 249—162 **14 Claims**

1. In apparatus for the continuous production of pipes with cross-profiled walls from a pipe strand of thermoplastic plastic emerging in still plastic state from an extrusion nozzle comprising

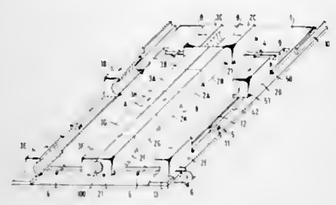
two sequences, moving in endless paths, of mould halves which run adjacent each other along a straight working section following the extrusion nozzle and complement

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. each other in pairs to form a travelling hollow mould for the profiling of the tube walls,

and a return means which for each of said sequences at the end of the working section moves the arriving mould halves transversely of the working section apart into positions adjacent the end of the working section, then conveys the mould halves back to positions adjacent the start of the working section in a state not joined together within the sequence by means of return conveyors extending along the working section spaced from the latter and places them there again at the start of the hollow mould, and a plurality of mould halves of each sequence may be disposed simultaneously in the return conveyor,

the sequences of mould halves circulating guided on a horizontal base and the return means having for each mould half sequence separate transverse conveyor means at the start and end of the working section to convey the mould



halves for each of the sequences from the position adjacent the start of the working section to the start of the hollow mould and from the end of the hollow mould into the position adjacent, the end of the hollow mould, the improvement wherein

the conveyors each comprise beneath the mould half path an endless pulling member having a run circulating in the conveying direction of the respective conveyor,

that the pulling members carry drivers which at the start of the conveying path come into engagement with the mould halves entrain the latter and at the end of the conveying path come out of engagement with the mould halves again,

that the mould halves in the region of the return means are moved in spaced relationship with each other,

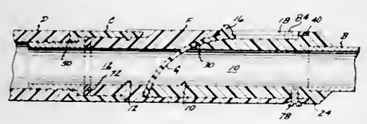
and that guide elements are provided for parallel guiding of the mould halves in the region of the return means.

4,787,599

SLIDE VALVE

Robert P. Nyboer, 819 W. Wilshire Blvd., Fullerton, Calif. 92632

Filed Feb. 4, 1988, Ser. No. 152,236
Int. Cl.⁴ F16K *3/00*
U.S. Cl. 251—148 **5 Claims**



1. A manually operated slide valve capable of being intermediately and removably disposed between a tubular aspirator assembly and a resilient tube in communication with a source of negative pressure, said valve characterized by being defined by a plurality of components that are removably connected to one another and may be separated for cleansing purposes, said valve including:

a. a first valve body component that includes a first elongate body of non-circular transverse cross section that has first and second ends, with a first portion of said first body adjacent said first end of greater transverse cross section than the balance of said first body, said first body having an elongate convex surface thereon of substantial width that extends longitudinally from said second end towards said first portion, and a first bore that extends longitudinally through said first body;

b. a second valve body component that includes a second elongate body that has first and second ends and a flat upper surface in which an elongate longitudinal opening is defined that is in communication with a cavity in said second body that extends longitudinally from said first end thereof towards said second end of said second body, a tubular member that extends from said second end of said second body and is in communication with a second bore in said second body that extends towards said first end thereof and a transverse concave surface defined in said second body at the junction of said second bore and cavity, said cavity of such transverse cross section as to sealingly engage said first body when the latter is disposed therein, and said first body of such length that when said first portion of said first body is in abutting contact with said first end of said second body a transverse arcuate slot is defined between said convex and concave surfaces;

c. first means for removably holding said first and second valve body components together to define a valve body;

d. an elongate resilient slide member longitudinally movable in said slot and extending under said longitudinal opening, said slide member when in a first position blocking communication between said first and second bores, and said slide member when in a second position establishing communication between said first and second bores;

e. second means for moving said slide member between said first and second positions;

f. third means for maintaining said slide member in said second position until such time as said slide member is moved manually to said first position by said second means;

g. fourth means for removably supporting said tubular aspirator assembly from said first end portion of said first body and in communication with said first bore; and

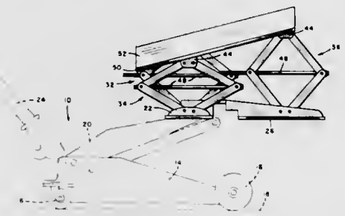
h. fifth means for removably securing said resilient tube to said tubular member.

4,787,600

TRANSMISSION JACK ATTACHMENT

Dale A. Bode, Ochelata, Okla., assignor to American Industrials Group, Tulsa, Okla.

Filed Aug. 12, 1987, Ser. No. 84,676
Int. Cl.⁴ B66F *3/00*
U.S. Cl. 254—126 **6 Claims**



1. An attachment for supporting a heavy object, such as an automobile or truck transmission, to a mobile lifting jack of the type having a conventional, generally horizontal saddle member means, the saddle member means being elevationally positionable by operation of the lifting jack, comprising:

a base plate means having a bottom surface attachable to a mobile lifting jack saddle member means in generally coplanar relationship therewith and having a top surface:

a plurality of independently operable spaced apart secondary jacks (means) each having a base supported on said base plate means top surface and each having a top bracket means, the vertical spacing between said base and said top bracket means of each secondary jacks (means) being independently adjustable; and

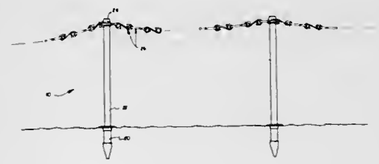
a load support plate means having an upper surface and a lower surface, said (tip) top bracket means of each of said secondary jack means being secured to said load support plate lower surface, said top surface of said load support plate being adaptable to receive a heavy object, such as a transmission(,) thereon, said load support plate being elevationally positional by operation of either one or both of the mobile lifting jack and said secondary jacks.

4,787,601

DECORATIVE BORDER FENCE SYSTEM

Richard A. Rybak, Oldsmar, Fla., assignor to Markers, Inc., Avon Lake, Ohio

Filed Feb. 4, 1987, Ser. No. 10,628
Int. Cl.⁴ E04H *17/14*
U.S. Cl. 256—19 **13 Claims**



1. A decorative border fence system adapted to be dismantled without destruction after being installed in the ground, the fence system comprising:

a ground anchor comprising a lowermost conical portion adapted to be secured within the ground in use and an uppermost flat peripheral collar adapted to be flat on the ground in use, the ground anchor containing an interior vertical cavity defined by the interior walls of the ground anchor and extending to the lowermost conical portion, the lowermost conical portion containing a plurality of interior stops secured to the interior wall of the lowermost conical portion and adapted to engage means for forcing the ground anchor into the ground while erecting the fence system;

a vertical post adapted to be secured within the interior vertical cavity of the ground anchor in use, said vertical post supported by said interior stops secured to the interior walls of the conical portion, whereby said ground anchor containing said vertical post provides a border fence system adapted to be easily dismantled;

where the border fence system includes a plurality of ground anchors each fitted with one said vertical post, and chain-link means are supported between adjacent posts;

where each chain-link means comprises chain-links having locking means for securing adjacent chain-links together; and

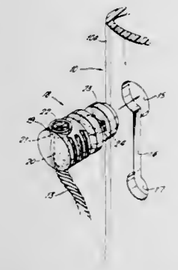
where each chain-link comprises an S-shaped link comprising an intermediate body extending into a loop at each end of the chain-link where the terminis thereof extends backwardly toward the intermediate body section, and at least one terminis of each chain-link having a backward extending elongated flat member extending toward the intermediate body section of the S-shaped link to provide the locking means for each chain-link.

4,787,602

TETHERS/ANCHORAGE ASSEMBLIES

Andrew D. Pidgeon, Marton, England, assignor to Glasdon Limited, Blackpool, England

Filed May 1, 1987, Ser. No. 44,724
Int. Cl.⁴ A01G *17/06*
U.S. Cl. 256—23 **8 Claims**



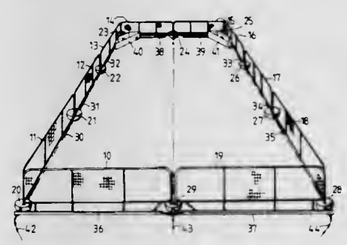
1. A tether/anchorage assembly, comprising: an elongate plug having a body to receive an end of a tether extending transversely to the lengthwise direction of the plug, a head, and a flat tongue extending between and connecting the head to the body, the tongue being narrower than the head and the body, the anchorage having a wall with a slot extending between spaced first and second apertures, the first aperture being larger than the second aperture to pass both the head and tongue of the body to enable the latter to be engaged in the slot with the head of the plug on the opposite side of the anchorage wall to the body of the plug, said second aperture at the other end of the slot being smaller than the first aperture and being sufficiently large to receive and allow the tongue to rotate in the aperture but not to pass the head of the plug, whereby the tongue can be engaged in the second aperture and rotated out of alignment with the slot to prevent the plug from being disengaged from the anchorage wall, the connection of the tether to the plug and the plane of the tongue being oriented so that when the tether hangs dependent from the plug in the anchorage wall, the tongue is out of alignment with the slot.

4,787,603

RELOCATABLE GRAZING YARDS

Clive N. Norton, P.O. Box 111, Wallan Vic., Australia

Continuation of Ser. No. 903,236, Sep. 3, 1986, abandoned. This application Dec. 30, 1987, Ser. No. 139,606
Claims priority, application Australia, Sep. 5, 1985, PH2290
Int. Cl.⁴ E04H *17/16, 17/14, 17/18;* **A01K** *3/00*
U.S. Cl. 256—25 **27 Claims**



1. In a relocatable grazing enclosure comprising a plurality of wall units and an associated plurality of base units linked together to define the periphery of said enclosure, the combination comprising:

a wall unit including a frame member supporting a barrier element, said wall unit being adapted to prevent passage

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of grazing animals through said wall unit; said frame member having at least one leg member; and

at least one base unit adapted to maintain said wall unit in an upright position and having at least one recess adapted to receive a leg member of said frame member, said base unit having a rounded ground contacting surface and means adapted for linking like base units together to facilitate movement of the base units, and concomitantly an assembled grazing enclosure, across a pasture as a unitary structure.

4,787,604

SLAG RETENTION ON DISCHARGE OF A LADLE

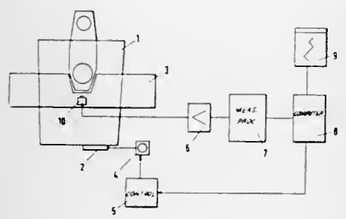
Manfred Kornet, Moers; Hans U. Franzen, Duisburg, and Josef Glaser, Duesseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 57,983

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619416

Int. Cl.[4] C21B *13/00*

U.S. Cl. 266—44 **3 Claims**



1. Method of insuring slag-free discharge of molten metal from a ladle or vessel having a bottom tap being closable and openable by a closure element, comprising the steps of:

weighing said vessel continuously and providing a sequence of weight indicating values on a running basis;

forming from said measuring values respective earlier and respective later average values and forming difference values on a running basis between the earlier and later measuring values;

determining by comparing the difference values with a reference value or values whether or not the rate of outflow of metal from the vessel suddenly decreases and thereby directly indicates the inclusion or absence of slag; and

closing the bottom top of said vessel when slag inclusions are ascertained.

4,787,605

COOLABLE FURNACE WALL STRUCTURE

Frank Kaptein, Beverwijk, Netherlands, assignor to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed Sep. 28, 1987, Ser. No. 101,440

Claims priority, application Netherlands, Oct. 3, 1986, 02492/86

Int. Cl.[4] C21B *7/10*

U.S. Cl. 266—194 **12 Claims**

1. A coolable furnace wall structure comprising:

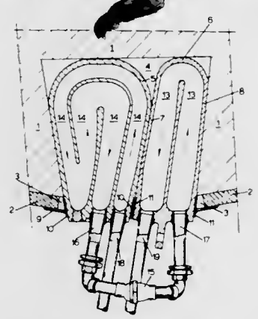
a steel shell,

a refractory lining of the steel shell on the inside thereof,

a plurality of spaced apart openings through the shell,

recesses in the refractory lining corresponding to said openings, each recess extending inwardly from the respective opening and having a transverse width which increases away from the shell,

for each said opening and corresponding recess, an assembly of at least two hollow cooling plates which are removably connected to the shell and extend from the shell into the recess and have supply and discharge openings for coolant, wherein at least a first one of said cooling plates of the assembly has a transverse width which does not increase away from the shell opening whereby that cooling plate can be removed first from the assembly through the opening and at least one other cooling plate of the assembly has a maximum transverse width which permits its removal through the opening after the removal of said first plate.



4,787,606

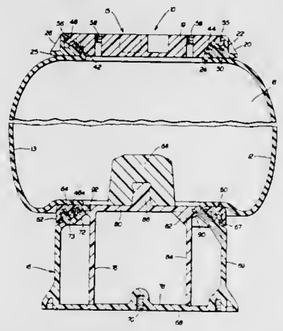
BEADLESS AIR SPRING

Wayne H. Geno, Cicero, and Robert S. Harris, Indianapolis, both of Ind., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 17, 1987, Ser. No. 62,984

Int. Cl.[4] F16F *9/04*

U.S. Cl. 267—64.27 **7 Claims**



1. An improved air spring including:

(a) first and second end members adapted to be mounted at spaced locations on structure moveable in a general axial direction with respect to each other;

(b) a flexible, generally tubular-shaped sleeve formed of an elastomeric material containing reinforcing cords and having first and second open ends sealingly engaged with the first and second end members, respectively, forming a chamber therebetween for containing a pressurized fluid wherein a longitudinal centerline axis of said sleeve extends in the axial direction between said end members;

(c) the first end member having an end cap extending within the first open end of the sleeve and a clamp ring extending about said first sleeve end, said end cap and clamp ring having opposed mating surfaces extending in a generally transverse radial direction with respect to the sleeve axis and being in clamped engagement with said sleeve end axially compressing said sleeve end therebetween; and

(d) at least two annular curved axially extending projections formed on each of the opposed mating surfaces of the end cap and clamp ring and spaced in a stepped radial direction with respect to each other compressing said end of the sleeve therebetween in the axial direction, and an intervening area formed between said projections having a greater axial separation than an axial separation between the projections to permit the sleeve material to expand therein, and a third generally diagonally extending compression area formed between said opposed mating surfaces radially outwardly beyond the axially extending projections terminating in an additional expansion area, whereby said compressed sleeve end extends generally radially outward in the same direction as an uncompressed sleeve area adjacent the compressed sleeve end to form a reverse bend so the clamped sleeve end can withstand the forces exerted by the pressurized fluid within the sleeve chamber due to the radially spaced axial compression areas and friction provided by the reverse bend on the compressed sleeve end.

4,787,607

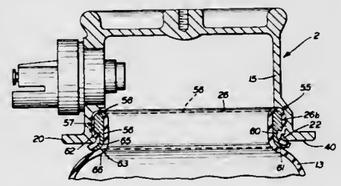
AIR SPRING HAVING INTERNAL SEALING BAND AND METHOD OF INSTALLING SAME

Wayne H. Geno, Cicero, and Keith E. Hoffman, Atlanta, both of Ind., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 910,715, Sep. 24, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 94,479

Int. Cl.[4] F16F *9/04, 5/00*

U.S. Cl. 267—64.27 **14 Claims**



14. An improved air spring for vehicles including:

(a) a cap means for mounting the air spring on a vehicle, said cap means having a cup-like configuration with an annular side wall terminating in an inwardly extending annular lip which defines an open end, and an inner annular sealing surface recessed in an inner surface of the side wall adjacent to and outwardly of said annular lip and generally adjacent said open end;

(b) a piston member adapted to be mounted on the vehicle and located in a spaced relationship from the open end of the cap means;

(c) a fluid pressure chamber formed between the cap means and piston member by a flexible sleeve sealingly connected at opposite ends thereof to the cap means and piston member; and

(d) a continuous annular sealing ring located within the open end of the cap means concentric with the inner annular sealing surface of said cap means with one end of the flexible sleeve being located between the sealing ring and the sealing surface and placed in a state of compression by the sealing ring which is in a non-deformed state to form a generally air tight seal with said sealing ring and annular sealing surface, said sealing ring having an annular configuration with inner and outer circumferential surfaces connected at both ends by convex smooth rounded surfaces; the diameter of the outer circumferential surface of said sealing ring being greater than an inner diameter of the annular lip so that said lip extends inwardly beyond the outer circumferential surface of the sealing ring to engage a portion of said one end of the flexible sleeve therebetween, and, to retain the sealing ring within the open end of the cap means by said annular lip.

4,787,608

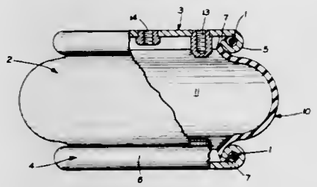
NYLON BEAD REINFORCEMENT RING FOR FLUID PRESSURE DEVICES

Robert F. Elliott, Westfield, Ind., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 15, 1987, Ser. No. 3,513

Int. Cl.[4] F16F *9/04;* **F16J** *3/00;* **B60C** *5/01, 15/0)*

U.S. Cl. 267—64.27 **6 Claims**



1. A fluid pressure device including a pair of spaced end members and an intervening flexible elastomeric sleeve forming a fluid pressure chamber therein; a solid one-piece bead ring having a uniform cross section formed of a nonreinforced nylon and molded within each of the ends of the elastomeric sleeve, said bead rings being free of any interconnecting reinforcing members extending therebetween and connected to said bead rings; and said spaced end members each having an annular rolled end crimped about a respective one of the bead rings forming a fluid tight seal therebetween.

4,787,609

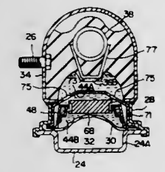
VIBRATION ISOLATING APPARATUS

Takuya Dan, and Tatsuro Ishiyama, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 2, 1987, Ser. No. 127

Int. Cl.[4] B60G *15/04;* **F16M** *5/00;* **F16F** *13/00*

U.S. Cl. 267—140 **19 Claims**



1. A vibration isolating apparatus comprising:

a support shaft which is able to be connected to either one of a vibration generating portion and a vibration receiving portion;

a base member which is able to be connected to the other of said vibration generating portion and said vibration receiving portion;

a resilient member interposed between said base member and said support shaft and deformable in response to movement of said support shaft in a direction which is substantially perpendicular to the longitudinal axis of said support shaft;

a vibration absorbing liquid chamber defined between said base member and said resilient member and disposed on one of two side which oppose each other across the longitudinal axis of said support shaft; and

first stopper means defined by a bent portion of a bracket which is a part of said base member, said first stopper means being disposed on the other of said two sides of said support shaft for limiting the movement of said support shaft.

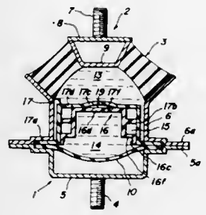
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4,787,610

VIBRATION ISOLATING DEVICES

Hiroshi Kojima; Michihiro Orikawa, and Takuya Dan, all of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

PCT No. PCT/JP85/00498, § 371 Date May 2, 1986, § 102(e) Date May 2, 1986, PCT Pub. No. WO86/01567, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 5, 1985, Ser. No. 862,350
Claims priority, application Japan, Sep. 5, 1984, 59-185789
Int. Cl.⁴ F16F *9/06. 15/04*
U.S. Cl. 267—140.1 **4 Claims**



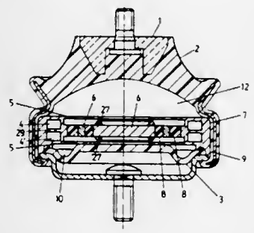
1. A vibration isolating device comprising: two frame bodies connecting to separate members, an elastic member arranged between said two frame bodies and contributing to form a closed chamber, a liquid filling the closed chamber, a partition member secured at a peripheral edge thereof to one of the two frame bodies and dividing the closed chamber into two liquid chambers, and a passage extending circumferentially in the peripheral portion of the partition member to establish fluid communication to both of the liquid chamber, said partition member comprising two partition plates, at least one of which being made from an elastomeric material, and said partition member provided at the peripheral portion between the two plates with said passage and at the central portion with gas chamber isolated from the liquid chambers.

4,787,611

HYDRAULICALLY DAMPED ENGINE MOUNT HAVING IMPROVED THROTTLE PORTS

Giacomo Sciortino, Heidelberg, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Filed Apr. 8, 1987, Ser. No. 35,987
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617812
Int. Cl.⁴ F16F *9/34*
U.S. Cl. 267—140.1 **14 Claims**



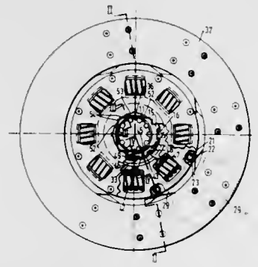
1. An engine mount having hydraulic damping comprising:
a bearing member, a bearing wall, and an annular bearing spring connecting said bearing member to said bearing wall, together defining a working chamber;
means comprising a resilient buffer wall defining a compensating chamber;
a partition wall disposed between said working chamber and said compensating chamber;
a plurality of channels arranged in parallel and having different lengths, said channels further having a common inlet connected to said working chamber and a common outlet connected to said compensating chamber, said channels forming throttle port means for connecting said working chamber and said compensating chamber in fluid communication, with said throttle port means, said working chamber, and said compensating chamber filled with an incompressible fluid.

4,787,612

TORSIONAL VIBRATION DAMPER

Robert J. Ball, and John D. Banks, both of Leamington Spa, England, assignors to Automotive Products PLC, Warwickshire, England

Filed Apr. 29, 1987, Ser. No. 43,810
Claims priority, application United Kingdom, Apr. 30, 1986, 8610577
Int. Cl.⁴ F16D *3/12, 13/64*
U.S. Cl. 267—273 **5 Claims**



1. A torsional vibration damper comprising:
a hub;
a flange extending radially out from said hub;
an outer member comprising an annular side plate arranged to one side of said flange and having a central aperture such that the side plate surrounds the hub with a clearance, the side plate being capable of limited angular movement relative to the flange;
circumferentially directed resilient means acting between said flange and side plate to control said angular movement; and
friction damping means located in the clearance between said hub and side plate and comprising a plurality of resilient friction elements in the form of circumferentially directed leaf springs having outer ends supported in the aperture of said side plate and central regions bearing slidably against the outer surface of said hub.

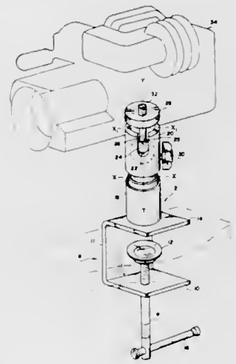
4,787,613

CAMERA REPAIR AND SUPPORT DEVICE

Michael Hayes, 21808 Craggy View, Chatsworth, Calif. 91311

Filed Apr. 13, 1987, Ser. No. 39,119
Int. Cl.⁴ B25B *1/22*
U.S. Cl. 269—75 **1 Claim**

1. A portable device suitable for use in repairing and supporting cameras, comprising:
a. a gripping member adapted to be secured to a fixed surface;
b. a longitudinally adjustable telescoping first member, said first member being fixedly secured at its bottom end to the top section of said gripping member and including a plurality of cooperating rigid sleeve members adapted to slidably expand and retract along the longitudinal axis of said first member and means to fix said sleeve members in place along said axis consisting of the incremental engagement of the outer wall of one or more of said sleeve members with the respective inner wall of said sleeve member next in succession along said access;
c. a second member rotatably connected to said first member and adapted to swivel 360 degrees relative thereto about a first axis;
d. a third member connected to said second member by a ball and socket joint that includes a rod member secured to and extending between said ball and said third member, said joint allowing said third member to swivel relative to said second member about a second axis and permitting angular displacement of said second axis relative to said first axis along a third axis located between a position that is parallel with said first axis and a position that is perpendicular thereto;
e. a means formed within said second member to receive said rod member when the angular displacement of said second axis is generally normal to said first axis; and,
f. a means adapted to simultaneously lock said second and third members from rotating about said first, second and third axes, respectively.

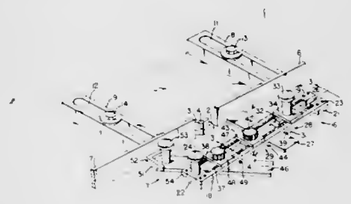


4,787,614

WORKHOLDER FOR MACHINE TOOLS

Morris C. Givens, 12618 NE. 72nd, Kirkland, Wash. 98033

Filed Oct. 31, 1985, Ser. No. 793,570
Int. Cl.⁴ B23Q *3/00*
U.S. Cl. 269—303 **6 Claims**



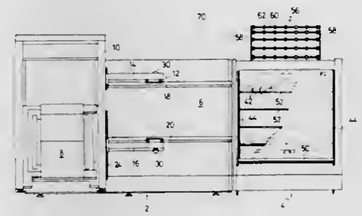
1. A work holder for use with a machine tool, of the type which includes; a work table having a generally horizontal planar table surface, a power driven cutter means extending vertically through the table surface and projecting a given elevation above the table surface, and an upstanding guide means disposed at right angles to the table surface, wherein the guide means is adjustable relative to said machine tool with an elongated guide surface means thereon, said work holder comprising;
an elongated work holding frame having a bottom surface means for slidably supporting said frame on the table surface, said frame also including a follower surface for contacting the guide surface of a machine tool when in use to be guided therealong,
work-piece clamping means mounted on said frame for clamping a work-piece to said frame so that the work piece will contact the table surface and an end surface of the work-piece is substantially flush with the follower surface,
said clamping means including for directing lateral clamping forces against a work-piece in use, and wherein said clamping forces are directed substantially parallel to said bottom surface means,
said follower surface being located along the longitudinal length of said frame on a side edge thereof and spaced a sufficient distance higher than said bottom surface means to define a recess means under said follower surface for a cutter of a machine tool when in use therewith, to limit a cut depth within said recess means and said clamping means having an edge surface spaced inward from said follower surface so as not to extend into said recess means,
whereby when said work holder is in use with a machine tool, said frame may be slidably moved on a table surface and along a guide surface of the machine tool with said follower in contact with the guide surface and a work-piece may be held by said clamping means such that when said frame is slidably moved the work-piece comes into cutting contact with a cutter without interference between the cutter, said work holding frame and said clamping means.

4,787,615

DEVICE FOR AUTOMATICALLY SUPPLYING/DISCHARGING PHOTOSENSITIVE MATERIAL IN AN INCLINED-TYPE STEP AND REPEAT MACHINE

Fumihiko Nishida; Isamu Itoi, both of Kyoto; Masaji Mizuta, and Koichi Fujii, both of Uji, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 20, 1987, Ser. No. 28,719
Claims priority, application Japan, Mar. 20, 1986, 61-63749
Int. Cl.⁴ B65H *5/22*
U.S. Cl. 271—3 **5 Claims**



1. A device for automatically supplying/discharging photosensitive material in an inclined-type step and repeat machine comprising:
an exposing table having a surface that is rearwardly inclined at an angle of more than zero degrees relative to the horizontal for exposing photosensitive material thereon;
a supplying holder disposed on a side of said exposing table for supplying thereto photosensitive material yet to be exposed, said holder having a surface thereof rearwardly

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inclined at substantially the same angle relative to the horizontal as that of said surface of said exposing table;

discharging means disposed in spatially superposed relation to said supplying holder for discharging exposed photosensitive material outside of said device; and

transporting means for transporting said photosensitive material yet to be exposed from said holder to said exposing table and transporting said exposed photosensitive material from said exposing table to said discharging means.

4,787,616

SHEET STACKING DEVICE AND IMAGE FORMING APPARATUS PROVIDED WITH SAME

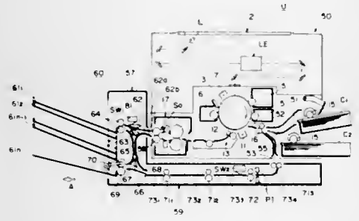
Nobukazu Sasaki, Tokyo; Toshirou Kasamura, Yokohama; Atsushi Kubota, Machida; Yasuyoshi Yamamoto; Masashi Ohashi, both of Tokyo; Michiro Koike, Kawasaki; Tatsuya Shiratori, Yokohama; Akiyoshi Kimura, Tokyo, and Takashi Ozawa, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1985, Ser. No. 791,404

Claims priority, application Japan, Oct. 26, 1984, 59-226283; Oct. 26, 1984, 59-226284; Nov. 30, 1984, 59-254375; Nov. 30, 1984, 59-254376; Dec. 18, 1984, 59-267094; Dec. 18, 1984, 59-267095; Dec. 18, 1984, 59-267096; Dec. 18, 1984, 59-267097; Dec. 20, 1984, 59-269197

Int. Cl.⁴ B65H *3/00*

U.S. Cl. 271—3.1 **14 Claims**



1. A sheet stacking device usable with an image forming apparatus capable of forming a superimposed image on a side of a sheet, comprising:

a sheet sorter portion, having a plurality of movable sheet accommodating bin trays and a fixed re-feeding tray, each tray for receiving a sheet adjacent one end thereof from the image forming apparatus, for sorting and stacking sheets received thereby;

a reversibly rotatable feeding member for leading the sheets to the movable bin trays from the image forming apparatus;

sheet re-feeding means for re-feeding the sheet which has entered said fixed refeeding tray by reverse feeding the sheet from said one end of said fixed refeeding tray; and

a conveyor portion for conveying back into the image forming apparatus the sheet re-fed from the fixed re-feeding tray, whereby plural sheets can be re-fed.

4,787,617

BILL PRESSING-DOWN APPARATUS FOR BILL RECEIVING AND DISPENSING MACHINE

Hideyuki Ebihara, Hachioji, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

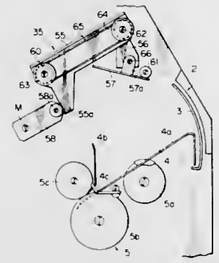
Filed Oct. 20, 1987, Ser. No. 110,364

Claims priority, application Japan, Oct. 31, 1986, 61-167584[U]

Int. Cl.⁴ B65H *29/44*

U.S. Cl. 271—3.1 **1 Claim**

1. A bill pressing-down apparatus for a bill receiving and dispencing machine including a bill accumulating plate arranged at a bill receiving and dispensing mouth and fixed to the machine body in inclined condition with its rear end lowered; bill feeding-out means having a feeding-out roller arranged below the bill accumulating plate for feeding out in order the lowermost of bills accumulated on the bill accumulating plate to a predetermined bill transferring route with friction acting between the roller and the lowermost bill; a bill supporting plate usually being in a stand-by position above the bill accumulating plate for supporting thereon accumulated bills to be dispensed to the bill accumulating plate; and bill transferring mechanism for transferring the accumulated bills on the bill supporting plate to the bill accumulating plate by driving the bill supporting plate toward and from the bill receiving and dispensing mouth, characterized in that the bill pressing-down



apparatus comprising: a supporting frame one end of which is pivotably supported on a shaft fixed to the machine body above the bill accumulating plate and the other end of which is moved toward and from the bill accumulating plate due to the pivotal motion of the supporting frame; a mounting plate pivotably supported on the supporting frame so that it pivots relative to the supporting frame in reverse to the pivotal direction of the supporting frame due to the pivotal motion of the supporting frame; and a bill pressing-down plate rotatably mounted on the mounting plate for pressing down the bills accumulated on the bill accumulating plate, the bill pressing-down plate is connected to the mounting plate at a position offset from the center of gravity thereof so that the bill pressing-down plate is always kept at the same inclination as that of the bill accumulating plate.

4,787,618

SYSTEM FOR FEEDING FLAT SHEETS

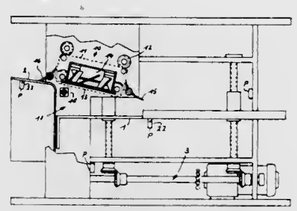
Guy Martin, 4 rue des Alisiers, 4331 Flémalle, Belgium

Filed Dec. 28, 1987, Ser. No. 138,827

Claims priority, application Luxembourg, Dec. 30, 1986, 86728

Int. Cl.⁴ B65H *3/12*

U.S. Cl. 271—94 **11 Claims**



1. A system for feeding flat sheets of material one by one from a pile of sheets placed on a feed table (1), comprising a

movable grill (11) mounted on a frame in such a way that the grill (11) is capable of being moved forward a certain distance (13) above the feed table (1) towards an ejection point (2); suction means (14) mounted above a section (13) of the grill which moves towards the ejection point (2), an air-tight rear sealing skirt (15) suspended from the frame and in contact with the section (13) of the grill and the top of the pile of sheets (20) on the feed table (1); and a forward air-tight sealing skirt (16) in contact with the section (13) of the grill and the ejection point (2), such that the vacuum created by said suction means (14) causes eddies of air around the edges of the pile of sheets (20) in such a way that the top sheet (21) of the pile of sheets is caused to vibrate and is drawn up to said section (13) of the grill in order that said top sheet (21) can move with the grill towards the ejection point (2).

4,787,619

SHEET FEED BENCH WITH BLOWER JETS AND A METHOD OF REMOVING SHEETS FROM A STACK

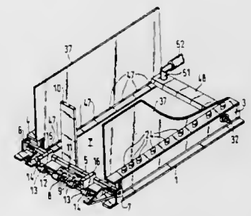
Manfred Fuss, St. Georgen, and Joachim Kurtz, Schiltach, both of Fed. Rep. of Germany, assignors to Mathias Bäuerle GmbH, Fed. Rep. of Germany

Filed Apr. 29, 1987, Ser. No. 43,929

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614623

Int. Cl.⁴ B65H *3/14*

U.S. Cl. 271—98 **13 Claims**



1. A sheet feed bench comprising a horizontal bench plate, first and second parallel sheet feed rails on said bench plate at least one of which is adjustably movable toward and away from the other, a plurality of fluid pressure blower jets carried by each feed rail and located directly above the level of said bench plate on the sides of said rails facing one another, said bench plate being adapted to be supplied with sheets to form a stack which is refillable from the top of the stack, single sheet separator means located adjacent said bench plate operable to remove the bottom sheet from a stack of sheets, each of said feed rails resting substantially airtight on the surface of said bench plate and having a groove defining respective enlargements on the surface of said rails which face one another at the level of said blower jets and which extend substantially over entire length of the each rail.

4,787,620

METHOD AND APPARATUS FOR CONTROLLING THE WITHDRAWAL OF ARTICLES

Gerhard Goldkuhle, Konstanz, Fed. Rep. of Germany, assignor to Licentia-Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

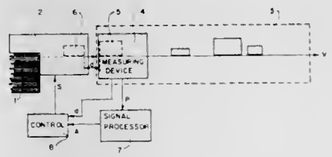
Filed Dec. 11, 1986, Ser. No. 940,626

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544093

Int. Cl.⁴ B65H *7/08*

U.S. Cl. 271—111 **21 Claims**

3. An arrangement for controlling the withdrawal of articles from a stack of articles comprising a: a singling device having means for feeding the articles one at a time to a conveyor receiving area; a conveyor having a gripping area located to receive each article in succession from the singling device and to feed it in a feed direction; a measuring device disposed in the path of movement of each article having sensor means for measuring at least one of the parameters of height, length, thickness, weight, stiffness, and surface roughness information of each withdrawn article, for measuring the spacing distance between successive articles including the distance between an article last withdrawn and an article not yet withdrawn from the receiving area to said gripping area and for producing parameter signals representing each measurement made; a signal processing device electrically connected to said measuring device for receiving said parameter signals and generating



output signals dependent on the respective parameter signals of the withdrawn article, said output signals representing a measure of the minimum distance to be maintained between the previously withdrawn article and the next article; and a control unit, connected to said signal processing device and connected to said singling device means for feeding articles one at a time, for receiving the output signals of said signal processing device, and for generating a control signal when the distance between the article last withdrawn and the article not yet withdrawn coincides with the minimum distance to be maintained, said control signal actuating the singling device means for feeding articles one at a time.

4,787,621

SHEET STACKING DEVICE WITH SUBDIVIDED BOUNDARY PLATES

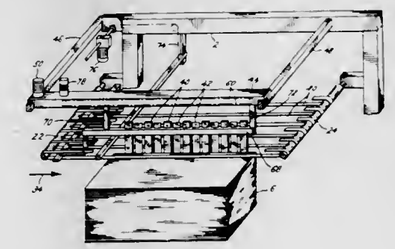
Peter Sattler, Zwingenberg, Fed. Rep. of Germany, assignor to Valmet Strecker GmbH, Fed. Rep. of Germany

Filed Jan. 16, 1987, Ser. No. 3,759

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601294

Int. Cl.⁴ B65H *31/20, 31/38*

U.S. Cl. 271—221 **13 Claims**

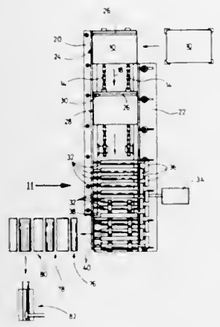


1. A sheet stacking device comprising a lift table automatically lowerable in correspondence to the height of a forming stack, a face-side sheet feeder, at least one stop plate positioned opposite said sheet feeder, and at least two lateral boundary plates lying opposite one another on either side of the upper end of said stack, said boundary plates being subdivided into a plurality of individual sections following one another in longitudinal direction along the sides of said stack, a first means for selectively removing and supporting one or more individual boundary plate sections remote from said stop plate at a position out of engagement with said stack, and a second means for

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supporting one or more individual boundary plate sections at a position in engagement with said stack, whereby the effective length of said boundary plates are adjusted so as to correspond substantially to the length of said stack.

4,787,622
CONVEYING DEVICE FOR METAL SHEETS, PARTICULARLY ON A CAN WELDING MACHINE
Felix Kramer, and Günther Westerhold, both of Friedlisberg, Switzerland, assignors to Elpatronic AG, Switzerland
Filed Jun. 25, 1987, Ser. No. 66,870
Claims priority, application Switzerland, Jul. 7, 1986, 02738/86
Int. Cl.[4] B65H *5/16*
U.S. Cl. 271—225 **6 Claims**



1. A conveying device for metal sheets (10), particularly on a can welding machine, comprising:
- a plurality of rotatable magnetic rollers having a gap between adjacent rollers for adhering to the sheets and sequentially conveying the sheets along a conveying direction, the sheets limited in movement along the conveying direction by a stop;
- a plurality of pushers positioned in a comb-like manner in said magnetic roller gaps, at least some of said pushers being movable from a retracted position where said magnetic rollers engage the conveyed sheets to an extended position where said pushers engage the conveyed sheets at a distance from said magnetic rollers, said pushers further for moving the conveyed sheets transversely to the conveying direction; and
- a withdrawal device disposed to a side of some of the magnetic rollers for receiving said transversely conveyed sheets.

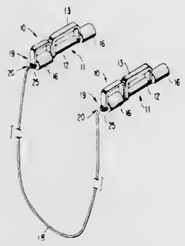
4,787,623
AEROBIC EXERCISE DEVICE
Larry Cedar, P.O. Box 319, Van Nuys, Calif. 91408
Continuation-in-part of Ser. No. 927,399, Nov. 6, 1986, Pat. No. 4,693,469. This application Sep. 8, 1987, Ser. No. 93,955
Int. Cl.[4] A63B *5/22*
U.S. Cl. 272—74 **9 Claims**

2. An aerobic exercise device comprising:
- a handle element having a first end and a second end;
- a tubular element having a first end and a second end;
- an elongated member having a first end rotatably mounted with respect to said handle element, and a second end, said elongated member being operatively coupled with said tubular element whereby said tubular element and said elongated member are rotatable together as a unit with respect to said handle element;
- means operatively associated with said first end of said elongated member for rotatably mounting said first end to said handle element;
- weight element means having a hollow interior for receiving therethrough a portion of said tubular element, said weight element means being positioned about the outer circumferential surface of said portion of said tubular element; and
- means for adjustably positioning said weight element means at a desired portion of said tubular element such that said weight element means is movable to any desired outer circumferential portion of said tubular element by the movement thereof along said outer circumferential surface;



said elongated member comprising a longitudinal axis and being stretchable and flexible, so that, upon rotation thereof about said handle element, centrifugal force causes the stretching thereof along said longitudinal axis; said first end of said elongated member being thicker and wider than the remainder of said elongated member in order to provide stiffness so that upon rotation of said elongated member, wobbling is substantially prevented and rotation thereof is constrained substantially in a plane of rotation perpendicular to the longitudinal axis of said handle element; said elongated member extending substantially through the hollow interior of said tubular element.

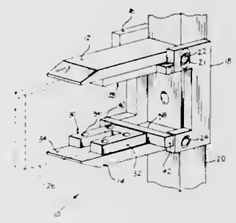
4,787,624
JUMP ROPE ATTACHMENT FOR HANDWEIGHTS
Jerry A. Grant, 3200 Leesburg Rd., Columbia, S.C. 29209
Filed Oct. 24, 1986, Ser. No. 923,037
Int. Cl.[4] A63B *5/20*
U.S. Cl. 272—75 **5 Claims**



1. A jump rope apparatus, in combination with a pair of aerobic handweights having an elongate handle with two ends and threaded extensions protruding longitudinally from each end connectable to a full range of detachable weights, comprising:
- a jump rope,

- two C-shaped adapters, each said C-shaped adapter having
- a first portion, housing a swivel means for attaching said jump rope so that said jump rope can rotate freely in a 360 degree arc, and
- a second portion, having a circular-opening for slidably attaching a threaded extension of one of said aerobic handweights, and
- a middle portion, for holding said first portion and said second portion of said C-shaped adapter in a parallel relationship to one another, whereby said detachably weights can be located between said first and second portions of said C-shaped adapter.

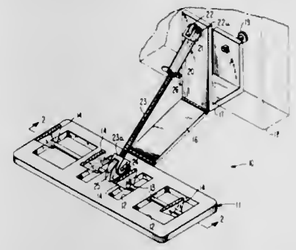
4,787,625
KARATE BOARD HOLDING DEVICES
John A. Chaloux, R.F.D. 2, Box 239, Cate's Hill, Berlin, N.H. 03570
Filed Jul. 24, 1986, Ser. No. 888,953
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 **2 Claims**



1. A karate board holding device, comprising:
- a. board holding means for holding a board to be broken, said board holding means comprising a pair of holding jaws;
- b. board positioning means for holding said board at a desired orientation relative to said board holding means, said board positioning means being selectively adjustable with respect to said board holding means, said board positioning means including a slot for holding said board in substantial vertical alignment with said holding jaws, said board positioning means being reversible within said holding jaws, said board positioning means further including a cross-extending member abuttable with said board to hold said board in substantial perpendicular alignment with said holding jaws; and,
- c. device holding means for effecting an attachment of said karate board holding device to a support, said device holding means comprising holding members positionable on opposed sides of said support, said holding members being joined together by at least one through-extending carriage bolt, said device holding means being rotatably attachable to a vertical support, thereby to provide for a rotatable movement of said holding jaws relative to said vertical support.

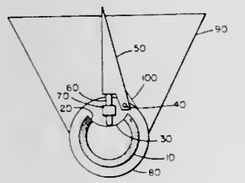
4,787,626
SIT-UP SUPPORT DEVICE
Timothy Gallagher, 1040 6th St. #7, Novato, Calif. 94945
Filed Jul. 3, 1986, Ser. No. 882,151
Int. Cl.[4] A63B *23/02*
U.S. Cl. 272—93 **4 Claims**

1. A sit-up support device comprising, a substantially rectangular base including foot strap means, a clamp adapted to be secured to a door bottom by clamp screw means, hinge means pivotally connecting said base to said clamp, and an adjustable



length shaft means connected between said base and said clamp so as to prevent upward movement of said base.

4,787,627
VISUAL PRESSURE MONITOR FOR RESPIRATORY BREATHING APPARATUS
J. Andrew Daubenspeck, West Lebanon, N.H., assignor to The Trustees of Dartmouth College, Hanover, N.H.
Filed May 12, 1987, Ser. No. 48,655
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—99 **4 Claims**



1. A visual pressure monitor for respiratory breathing apparatus comprising:
- (a) a rigid breathing tube containing an aperture in the wall thereof;
- (b) a flexible membrane covering said aperture;
- (c) a pointer mechanism in communication with the flexible membrane which is movable to indicate deflection in the flexible membrane;
- (d) a pushrod located between the flexible membrane and the pointer mechanism; and
- (e) a means for providing a visual indication of the magnitude of deflection of the flexible membrane.

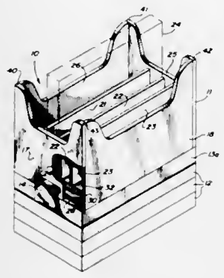
4,787,628
WEIGHT ADJUSTABLE AUXILIARY BASE UNIT FOR A WEIGHT LIFTING DEVICE
Milton C. Harwick, and Margaret M. Harwick, both of 3205 S. Third St., Whitehall, Pa. 18052
Continuation-in-part of Ser. No. 839,639, Mar. 14, 1986, Pat. No. 4,712,793. This application Sep. 28, 1987, Ser. No. 101,807
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **6 Claims**

1. A weight adjustable base unit for a weight lifting device of the type having adjustable weight plates connected to one end of a cable, the cable trained over various pulleys on a frame and a handgrip connected to the other end of the cable, said auxiliary base unit comprising:
- (a) a compartmentalized box having four sides, an open top and a bottom plate, said bottom plate being sized to gener-

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ally span the width of said weight plates of said weight lifting device;

(b) means for securing said box to the uppermost of said weight plates; and



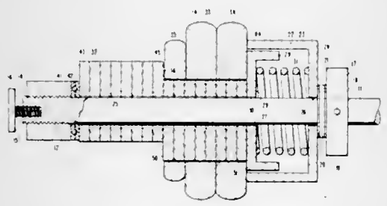
(c) a plurality of auxiliary weight bars sized to fit one each in one of said box compartments, said bars being generally rectangular and including at least one weighing one-half pound, at least one weighing one pound and at least one weighing two pounds.

4,787,629

EXERCISE LIFTING BAR WITH SELF-CONTAINED WEIGHT MOUNTS

David W. DeMyer, 4008 Cooper Rd., Indianapolis, Ind. 46208

Filed Dec. 21, 1987, Ser. No. 135,601
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **10 Claims**



1. An exercise lifting bar comprising:

a bar with a first end and a second opposite end to removably receive weights thereon and having a longitudinal axis;

first stop means on said bar and located inward of said first end limiting inward movement of weight when mounted on said first end;

second stop means on said bar located inward of said second opposite end and limiting inward movement of weight when mounted on said second opposite end;

a plurality of first members individually and independently movably mounted on said bar on said first end, said members are each selectively movable from a first position blocking outward movement of weight on said first end to a second position allowing weight on said first end to move outwardly thereon;

a plurality of second members individually and independently movably mounted on said bar on said second opposite end, said second members are each selectively movable from a third position blocking outward movement of weight on said second opposite end to a fourth position allowing weight on said second opposite end to move outwardly thereon; and, wherein:

said first members when all moved to said second position allow weights to be moved on to and off of said first end while said first members remain on said bar; and,

said second members when all moved to said fourth position allow weights to be moved on to and off of said second opposite end while said second members remain on said bar.

4,787,630

EXERCISE DEVICE

Robert Watson, 2515 N. 61st Ter., Kansas City, Kans. 66104, and Harold T. Pehr, 3920 W. 96th St., Overland Park, Kans. 66207

Filed Apr. 14, 1987, Ser. No. 38,321
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—146 **18 Claims**



1. An exercise device, which comprises:

(a) a base assembly including a base plate with upper and lower surfaces;

(b) a platform assembly including a platform plate with upper and lower surfaces;

(c) a bearing connected to said base plate upper surface and said platform plate lower surface, said bearing being adapted to permit rotational movement about a rotational axis extending in a direction substantially normal to said base and platform plates and to maintain said base and platform plates in substantially parallel, spaced relation;

(d) stop means adapted for limiting the rotational movement of said platform assembly relative to said base assembly and comprising a stop lug mounted on said base plate upper surface and a stop pin projecting downwardly from said platform plate lower surface and adapted to engage said stop lug;

(e) said platform plate including a plurality of spaced stop pin receivers extending between its upper and lower surfaces and arranged in a circular pattern around said rotational axis; and

(f) said stop pin comprising a shank adapted to be slidably and removably received in a respective stop pin receiver, a head and a pull tab received on said shank below said head and adapted to engage said platform plate upper surface.

4,787,631

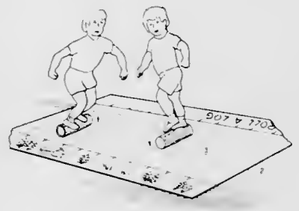
ACTION GAME FOR CHILDREN

Mary C. Erumsele, 2503 Fowler's La., Reston, Va. 22091

Filed Nov. 14, 1986, Ser. No. 930,264
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—1 GF **2 Claims**

1. An action game comprising an elongated playing surface comprising an elongated playing area having scoring indicia alongside each edge of said surface in reverse order and a pair of hollow log-like playing pieces, wherein each of said log-like playing pieces comprises a hollow cylindrical object having an outer surface resembling the bark-like texture of a natural log

segment, said playing area having an underface which is resistant to longitudinal movement of the area as a reaction to the rolling motion of said log-like playing pieces, said playing area having a flexibility to permit it to be folded and rolled up so as



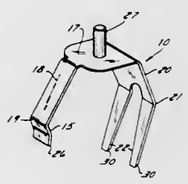
to be fitted completely into at least one of said hollow log-like playing pieces for storage and transport of the game, and the other of said log-like playing pieces is of a diameter to accept the one of said log-like playing pieces as an insert.

4,787,632

GOLF CLUB ACCESSORY FOR RETRIEVING A GOLF BALL

Nicholas B. Nigrelli, 13239 West View Rd., Cleveland, Wis. 53015, and James Grau, R.R. #1, Elkhart Lake, Wis. 53020

Filed Feb. 16, 1988, Ser. No. 156,412
Int. Cl.[4] A63B *53/00, 47/02*
U.S. Cl. 273—32 B **8 Claims**



1. A golf accessory for retrieving a golf ball, repairing a divot and placing a marker, said accessory comprising a planar member having means on one edge for holding a regulation size golf ball and means on the opposite edge of said member for biasing the golf ball into said holding means, said biasing means including a plate extending outwardly from the planar member and a pair of tines extending outwardly from the plate to provide a guide for pushing the ball into the space between said holding means and said plate.

4,787,633

METHOD OF PLAYING A BOWLING GAME

William H. Fritzemeier, Muskegon, Mich., assignor to Brunswick Corporation, Muskegon, Mich.

Filed Nov. 9, 1987, Ser. No. 118,246
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—37 **24 Claims**

24. A method of playing a bowling game in which players are allowed a preselected number of balls to knock down all pins in at least one pin setup, said method comprising:

(a) selecting at least one pin setup;

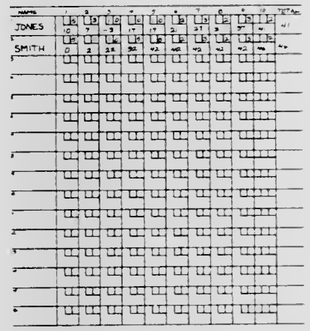
(b) allotting each player a given number of betting points;

(c) requiring each player to bet at least some of his betting points on his chances in said pin setup;

(d) requiring each player to deliver at least one ball in said pin setup;

(e) counting the number of balls delivered by each player in said pin setup in order to knock down all the pins;

(f) recording a score for each player in each pin setup, the score being related to the respective player's bet; and



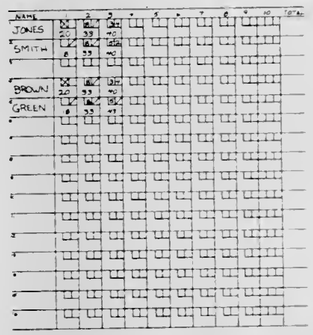
(g) comparing the players' scores to determine the winner of the game.

4,787,634

METHOD OF PLAYING A BOWLING GAME

Michael G. Gautrand, Muskegon, Mich., assignor to Brunswick Corporation, Muskegon, Mich.

Filed Nov. 9, 1987, Ser. No. 118,249
Int. Cl.[4] A63D *5/00*
U.S. Cl. 273—37 **13 Claims**



1. A method of playing a bowling game in which players are allowed to knock down all pins in each of a plurality of frames, said method comprising:

(a) requiring each player to deliver at least one ball in each of said frames;

(b) counting the number of pins knocked down by each player in each frame, with strikes recorded for all pins being knocked down by a first ball and spares recorded for all pins being knocked down by a second ball;

(c) allowing a player to change the pin setup before delivering the second ball;

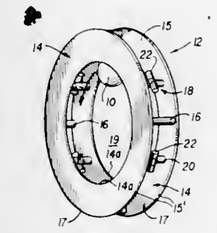
(d) recording each player's frame score as determined by adding the number of pins knocked down by the respective player on the next two balls if a strike was recorded in the previous frame, the number of pins knocked down by the respective player on the next one ball if a spare was recorded in the previous frame, and only the number of pins knocked down if pins remained standing after two balls in the previous frame;

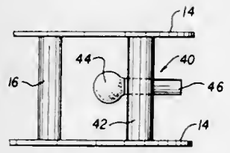
(e) adding each player's frame scores to determine said player's total score for the game; and

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(f) comparing the players' game scores to determine the winner of the game.

4,787,635
BALL AND HOOP GAME
Allen G. Mynatt, Jr., 308 Clevend Ave., Lehigh Acres, Fla. 33936
Filed Jun. 1, 1987, Ser. No. 55,834
Int. Cl.[4] A63B *67/14;* **A63H** *33/08, 5/00*
U.S. Cl. 273—109 **7 Claims**

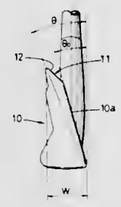




4. A device for improving eye-hand and body coordination, comprising:
a hoop assembly including a pair of rings and a cooperating unconstrained ball;
each of said rings being spaced apart, planar and identical to the other of said rings and having an inner periphery;
a plurality of posts connecting said rings in an axially spaced manner; and,
a plurality of mechanically actuated clicking assemblies within said hoop assembly engageable by said ball as it is rolled about said ring inner peripheries.

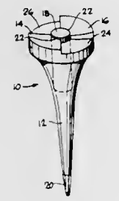
4,787,636
GOLF CLUB HEAD
Yukihiro Honma, Kawasaki, Japan, assignor to Kabushiki Kaisha Honma Gorufu Kurabu Seisakusho (Honma Golf Club Mfg., Co., Ltd.), Yokohama, Japan
Continuation-in-part of Ser. No. 740,363, Jun. 3, 1985, abandoned. This application Dec. 2, 1986, Ser. No. 936,873
Claims priority, application Japan, Feb. 13, 1985, 60-17746
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—167 R **3 Claims**

1. A golf head of the iron type comprising a golf club head attached to a golf club shaft, said golf club shaft having an axis, said golf club head comprising a body, said body having a front face, said front face having a heel portion and a toe portion with the vertical extent of said toe portion being greater than the vertical extent of said heel portion, said front face having an actual ball-contacting face which is adapted to engage a golf ball when the golf club head is swung, said actual ball-contacting face being disposed at an actual acute angle relative to vertical when a player addresses the ball in which the ball-contacting face is in a position to engage the ball, said actual acute angle defining an actual loft angle, said front face having an upper sighting face disposed at an obtuse angle relative to said actual ball-contacting face, an imaginary plane defined by said sighting face extending upwardly and away from said axis of said shaft, said sighting face intersecting said actual ball-contacting face along an elongated intersection, said sighting face being substantially narrower in a generally vertical direction than said actual ball-contacting face and being disposed such that said sighting face does not engage a golf ball when the golf club head is swung, said sighting face extending longitudinally between said heel portion and said toe portion and being generally uniform in width throughout its longitudinal length, said sighting face having an upper edge which defines the upper boundary of the head body, said actual ball-contacting face



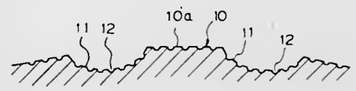
having a lower edge which defines the lower boundary of the head body, said sighting face and said actual ball-contacting face being disposed to intersect at said obtuse angle at said intersection such that when a player addresses the ball, said front face which includes both said sighting face and said ball-contacting face is perceived by a ball-addressing player as a single continuous surface which is disposed at a perceived acute angle relative to vertical, said perceived acute angle being greater than said actual acute angle, whereby the ball-addressing player perceives a loft angle which is greater than said actual loft angle.

4,787,637
GOLF TEE WITH COMPRESSION INSERT
Richard J. Lima, 844 Sevely, Mountain View, Calif. 94041; John Remen, 3805 Magnolia Dr., Palo Alto, Calif. 94306, and Robert N. Wilms, 10340 Castine Ave., Cupertino, Calif. 95814
Filed Apr. 8, 1987, Ser. No. 36,289
Int. Cl.[4] A63B *57/00*
U.S. Cl. 273—212 **18 Claims**



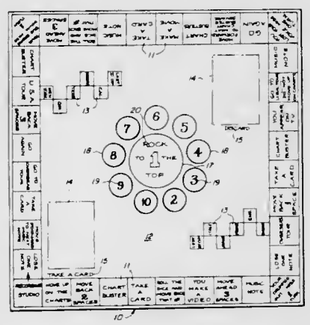
1. A golf tee for insertion into soil comprising,
a tee body having a stem and a longitudinal axis,
a ball-supporting means atop said tee body for supporting a golf ball, and
a frangible, resiliently compressible insert extending partially through said tee body along said longitudinal axis, said insert having an upper exposed surface disposed for contact with a golf ball supported by said ball-supporting means, said insert having a length relative to said longitudinal axis of the tee body within the range of 0.3 inches to 0.6 inches.

4,787,638
GOLF BALL
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Jan. 30, 1987, Ser. No. 8,888
Claims priority, application Japan, Jan. 31, 1986, 61-11718[U]
Int. Cl.[4] A63B *37/14*
U.S. Cl. 273—232 **6 Claims**



1. A golf ball, comprising:
a body having a generally spherical outer surface;
a plurality of dimples disposed substantially uniformly on said spherical outer surface; and
a plurality of indentations, smaller than said dimples, formed in each dimple and on the spherical outer surface.

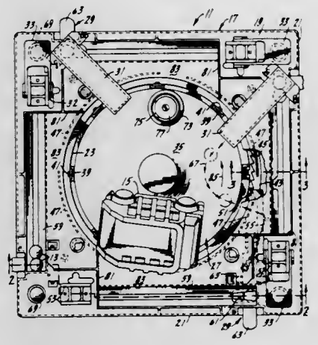
4,787,639
GAME OF CHANCE
Robert J. Ross, 485 Coates Ave., Holbrook, N.Y. 11741
Filed Apr. 8, 1987, Ser. No. 36,362
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—249 **1 Claim**





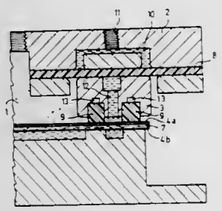
1. A game of chance, comprising, a game board, a plurality of imprinted squares and circles imprinted on said board, with numerical and instructional indicia printed within to facilitate playing the game, and arranged so as to constitute a play path over which playing pieces can move, a plurality of playing pieces employed in playing said game of chance, and a plurality of circular discs provided for playing said game of chance, wherein each playing piece of said plurality of playing pieces is a figure of a musician and an instrument and each of said plurality of circular discs has two parallel surfaces and is provided with four radially and equally spaced holes perpendicular to said surfaces, wherein a plurality of flags with a musical note imprinted on faces of said flags, are removably received in the holes provided in said discs.

4,787,640
MECHANICALLY ACTUATED TURNTABLE TARGET GAME
Gordon A. Barlow, Highland Park, Ill., assignor to Gordon Barlow Design, Skokie, Ill.
Filed Nov. 23, 1987, Ser. No. 124,152
Int. Cl.[4] A63F *9/02*
U.S. Cl. 273—357 **8 Claims**



1. A tabletop action game including:
a generally square frame having a central opening,
a turntable mounted in the central opening for rotation relative to the frame,
means located at each corner of the frame to rotate the turntable in one direction,
means located at each corner of the frame adjacent to the turntable rotating means to propel marbles onto the turntable,
a first container means mounted on the turntable for receiving properly directed, propelled marbles and retaining them, and
means formed as parts of the turntable and frame for returning the propelled marbles that are not received and retained by the first container means to the corner propelling means that propel them.

4,787,641
ARRANGEMENT FOR SEALING A CHAMBER CONTAINING PRESSURE MEDIUM
Paavo Rautakorpi, Tampere; Pekka Majaniemi, Pirkkala, and Jukka Lehtinen, Helsinki, all of Finland, assignors to Oy Tampella AB, Tampere, Finland
Filed Dec. 22, 1987, Ser. No. 136,560
Claims priority, application Finland, Nov. 2, 1987, 870569
Int. Cl.[4] F16J *15/40, 15/46*
U.S. Cl. 277—135 **7 Claims**



1. An arrangement for sealing a chamber containing pressure medium against a movable band arranged to form one side of the chamber, comprising a sealing framework fastened to a

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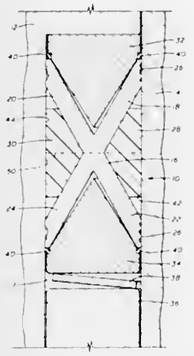
body part of the chamber by means of a resilient membrane, a sealing means being arranged in said sealing framework for obtaining a sealing effect between the movable band and the rest of the chamber, whereby the sealing means is arranged to be pressed against the band by the pressure effect of a load medium to be fed on one side of the resilient membrane, said means for providing a sealing effect being formed by at least two sealing elements arranged in parallel and between which a sealing liquid is provided.

4,787,642

X-SHAPED HIGH PRESSURE SEALING STRUCTURE

Reggie H. Etheridge, Houston, Tex., assignor to Seaboard Wellhead, Inc., Houston, Tex.

Filed Apr. 27, 1987, Ser. No. 42,849
Int. Cl.[4] F16J *15/24*
U.S. Cl. 277—206 A **31 Claims**



1. In a high pressure seal structure adapted for mounting within a housing to seal against fluid pressure around a cylinder member disposed within an opening formed by said housing, the combination of:

(1) an integral circular metal sealing ring comprising:

(a) a pair of first circular sealing lips having a cross section of chevron shape axially opening in a first direction to flexibly extend with a first inner lip in sealing relation against the cylindrical surface of said cylinder member and with a first outer lip in sealing relation against a cylindrical wall formed in said housing;

(b) a pair of second circular sealing lips having a cross section of chevron shape axially opening in a second direction to flexibly extend with a second inner lip in sealing relation against said cylindrical surface and with a second outer lip in sealing relation against said cylindrical wall;

(2) a deformable inner sealing ring having a triangular cross-section closely fitted in the space defined by said first inner lip, said second inner lip, and said cylindrical surface;

(3) a deformable outer sealing ring having a triangular cross-section closely fitted in the space defined by said first outer lip, said second outer lip, and said cylindrical wall;

(4) a first circular and movable metal engagement ring having a cross-section of chevron shape axially extending into the opening formed by said first sealing lips to expand said first sealing lips;

(5) a second circular and moveable metal engagement ring having a cross-section of chevron shape axially extending into the opening formed by said second sealing lips to expand said second sealing lips;

(6) axially moveable circular adjustment means urging said first engagement ring and said second engagement ring together for expanding said first and sealing lips and said second sealing lips; and

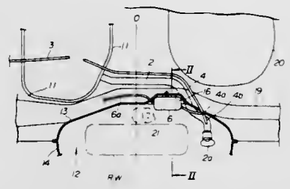
(7) deformable juncture sealing rings interposed at the juncture of said inner lips, said outer lips, and said engagement rings for establishing initial low pressure sealing.

4,787,643

ARRANGEMENT OF CANISTER-USED EMISSION CONTROL SYSTEM IN MOTOR VEHICLE

Tomonori Shirata, Yokohama, Japan, assignor to Nissan Motor Co. Ltd., Yokohama, Japan

Filed Dec. 23, 1987, Ser. No. 137,331
Claims priority, application Japan, Dec. 26, 1986, 61-313038
Int. Cl.[4] B60K *15/00*
U.S. Cl. 280—5 A **9 Claims**



1. In a motor vehicle having a floor panel, a fuel tank mounted beneath said floor panel, a side member connected to a lateral side of said floor panel and extending along the same, and a tire wheel housing constructed of a panel and secured to said floor panel through said side member,

an emission control system comprising:

first means providing the panel of said tire wheel housing with a recess which is open to the interior of the tire wheel housing;

an activated charcoal canister received in said recess;

second means detachably connecting said canister to said panel; and

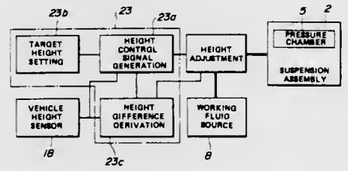
a fuel vapor conveying tube extending from said fuel tank to said canister.

4,787,644

HEIGHT CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE WITH VEHICULAR PROFILE REGULATING FEATURE

Masatsugu Yokote; Hideo Ito; Kenzi Kawagoe, and Kazunobu Kawabata, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed May 6, 1987, Ser. No. 46,520
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—6 R **21 Claims**



1. A height control system for an automotive vehicle comprising:

first and second suspension assemblies arranged at different positions of a vehicle body;

first and second height adjusting means, respectively associated with said first and second suspension assemblies for adjusting a first height at a first position of the vehicle body where said first suspension assembly is arranged and a second height at a second position of the vehicle body where said second suspension assembly is arranged;

first and second vehicle height sensors monitoring said first and second heights at said first and second positions for producing first and second vehicle height indicative signals;

a height adjusting means comparing said first and second vehicle height indicative signals with upper and lower thresholds respectively representative of upper and lower criteria of a target vehicle height range to output first and second height control signals to said first and second adjusting means for adjusting said first and second heights within said target height range; and

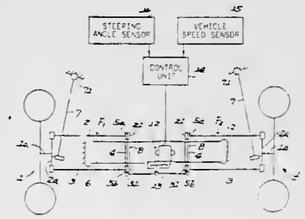
a vehicular attitude regulating means, active when both of said first and second heights are within said target height range, for deriving a difference between said first and second heights to output an attitude adjusting signal to at least one of said first and second height adjusting means to adjust a corresponding one of said first and second heights so as to maintain said height difference between said first and second heights within a given acceptable height balance range.

4,787,645

SYSTEM FOR STEERING REAR WHEELS OF A MOTOR VEHICLE

Shingo Ohbayashi, Ohta; Fusami Oyama, Ohra; Akira Takahashi, and Takeo Inoue, both of Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1987, Ser. No. 68,544
Claims priority, application Japan, Jul. 8, 1986, 61-160130; Jul. 8, 1986, 61-160131; Jul. 8, 1986, 61-160132
Int. Cl.[4] B62D *6/02*
U.S. Cl. 280—91 **6 Claims**



1. A system for steering rear wheels of a motor vehicle, comprising:

a pair of frames for suspending rear wheels,

each frame including;

a shaft longitudinally disposed and rotatably supported on a body of the motor vehicle,

at least one eccentric supporting means provided on one end portion of the shaft,

a pair of laterally disposed links,

an inner end portion of one of the links being rotatably mounted on the eccentric supporting means of the shaft and an inner end of the other link being rotatably mounted on the other end portion of the shaft, and

an axle provided on outer ends of the links for supporting one of the rear wheels; and

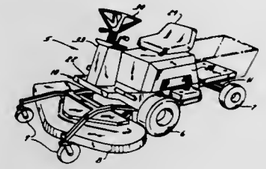
means for rotating the shafts in accordance with steering conditions of front wheels of the motor vehicle so as to laterally move the links in a direction and an amount depending upon the eccentricity of the supporting means to turn the rear wheels.

4,787,646

RIDING MOWER CHASSIS WITH FLOATING STEERABLE REAR WHEELS

Igor Kamlukin, and John W. Schanz, both of Mequon, Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed May 7, 1987, Ser. No. 47,870
Int. Cl.[4] A01D *35/26*
U.S. Cl. 280—95 R **12 Claims**



11. A riding mower comprising:

a rigid frame;

a floating axle mounted on said frame so as to be floatably movable relative to said frame;

a steerable wheel mounted on said floating axle;

linkage means mounted on said floating axle and movable thereon to effect steering motion of said steerable wheel;

an actuatably movable steering controller mounted on said frame and spaced from said linkage means;

cable means comprising a flexible cable stretch connected between said steering controller and said linkage means, said cable being axially movable in response to an actuating movement of said steering controller to effect movement of said linkage means and a steering motion of said steerable wheel;

and cable guide means mounted on said frame between said steering controller and said linkage means,

said cable stretch having a first portion which is slidably engaged by and confined against transverse movement by said cable guide means,

said cable stretch having a second portion extending between said cable guide means and said linkage means which is unconfined and is free to flex transversely to accommodate the floating movement of said floating axle effected by corresponding movement of said steerable wheel.

4,787,647

FOUR WHEEL CYCLE

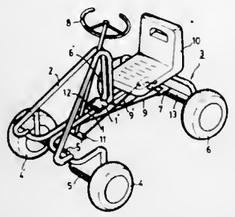
Myoun-Keon Oh, No. 9-85, Dukeon-ri, Sindo-eop Kyounggi-do, Rep. of Korea

Filed Nov. 21, 1986, Ser. No. 933,752
Claims priority, application Rep. of Korea, Nov. 26, 1985, 1985/15581
Int. Cl.[4] B62K *21/00*
U.S. Cl. 280—240 **1 Claim**

1. A four wheel cycle comprising a body **3** having an "H" shaped frame (**1**) and a support frame (**2**) banded and spot welded together; a seat (**10**) on the body; foot crank pedals (**5,5'**); a pair of front wheels (**4,4'**) rotatably attached non-steerably to a front end of the "H" shaped frame and connected directly to opposite ends of the foot crank pedals; a pair of rear wheels (**6,6'**); and a steering mechanism comprising a steering wheel (**8**), a steering arm (**11**), a steering shaft rotatably attached to the body with the steering wheel and steering arm fixed at opposite ends, a steering unit (**7**) and at least one steer-

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ing yoke (13) rotatably connected between the rear wheels and steerably attached to a rear end of the "H" shaped frame, and



steering connecting rods (9,9') crossly connected respectively between opposite ends of the steering arm and unit.

4,787,648

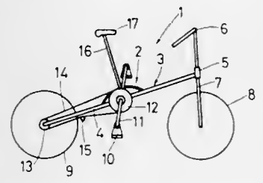
SUSPENSION MECHANISM

Abel O. Coetzee, London, Great Britain, assignor to International Bicycle Corporation, Tortola, British Virgin Isls.

Filed Sep. 5, 1986, Ser. No. 904,344

Int. Cl.[4] B62K *3/02, 25/04*

U.S. Cl. 280—275 **19 Claims**



1. A vehicle frame having a suspension machanism including a hub comprising outer, middle and inner concentric members which are relatively rotatable within predetermined limits on a common axis, two generally oppositely directed support arms and a centrally located load-bearing member each mounted to a respective one of said outer member, said middle member and said inner member, said load-bearing member extending transversely to said common axis, and biasing means extending between each support arm and said load-bearing member for biasing the support arms to support loads applied to said load-bearing member in a direction transverse to said common axis.

4,787,649

VEHICLE SUSPENSION SYSTEM

Kenichi Watanabe, Hiroshima; Shin Takehara, Higashi-Hiroshima; Hiroo Shimoe, and Haruyuki Taniguchi, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

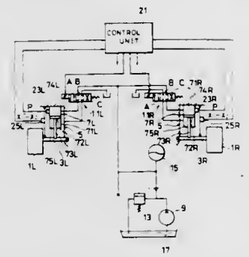
Filed Aug. 4, 1987, Ser. No. 81,720

Claims priority, application Japan, Aug. 5, 1986, 61-183753; Aug. 5, 1986, 61-183755

Int. Cl.[4] B60G *17/08*

U.S. Cl. 280—707 **16 Claims**

1. A vehicle suspension system for plural vehicle wheels comprising support means disposed between each wheel and a vehicle body exerting suspension force which can be changed irrespective of relative displacement between the wheel and the vehicle body, a separate sensing means for each wheel for detecting one of the parameters representing changing condition of the relative displacement between the wheel and the vehicle body, control means for controlling the respective support means when supplied with a signal from the respective sensing means, by extracting low frequency components therefrom and, according these components, controlling the support means to exert the suspension force in such a way that said relative displacement can be suppressed, wherein each support means includes a fluid actuator having a fluid cylinder disposed between the respective wheel and the vehicle body, the system further including a fluid reservoir, pumping means for supplying pressurized fluid from the reservoir to the respective fluid



cylinders, and a separate valve means interposed between the pump means and the respective cylinders for controlling fluid flow applied to and discharged from the respective cylinders, and wherein said control means controls each of said valve means so that pressurized fluid is applied to and discharged from each of said cylinders to exert suspension forces from each fluid actuator according to each of said displacements.

4,787,650

ACTIVE SUSPENSION APPARATUS

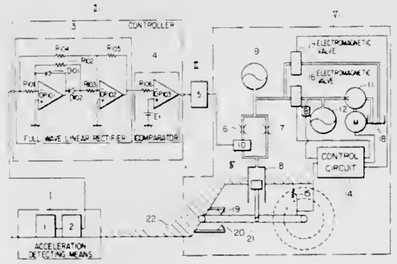
Shunichi Doi; Noboru Sugiura; Yasutaka Hayashi, and Yuzo Yamamoto, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed May 20, 1985, Ser. No. 735,830

Claims priority, application Japan, May 21, 1984, 59-102235

Int. Cl.[4] B60G *17/04*

U.S. Cl. 280—707 **19 Claims**



1. An active suspension apparatus using hydropneumatic springs for suspending a body of a vehicle on wheels by utilizing fluid and gas pressures, comprising:

hydropneumatic suspension means including an actuator supported by a trailing arm connected to a wheel of the vehicle, said actuator including a piston, a hydropneumatic spring and means connecting said hydropneumatic spring and said actuator and including a restrictor;

acceleration detecting means, located at a floor of a passenger compartment where passengers are located, for detecting an absolute acceleration of said passenger compartment, said acceleration detecting means comprising an acceleration meter arranged on the floor of the passenger compartment to detect vertical acceleration of said floor;

a controller for comparing an output signal generated from said acceleration detecting means with a reference value and generating a travel state signal; and

driving means for controlling opening of said restrictor in accordance with a signal from said controller, whereby damping force characteristics are controlled by controlling the opening of the restrictor in accordance with a vibration state of the passenger compartment during travel of the vehicle.

4,787,651

PASSIVE SAFETY BELT APPARATUS

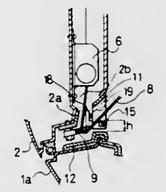
Hidetaka Shinozaki, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,632

Claims priority, application Japan, Jun. 2, 1986, 61-82472[U]

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—803 **3 Claims**



1. A passive safety belt apparatus for a vehicle, the vehicle including a body having a center line, a door pivotally mounted on the body to one side of the center line, a seat in said body between the door and the center line, and an engaging member having emergency release means fixed to a portion of the seat located adjacent the center line of the body; said apparatus comprising:

a lap belt retractor mounted inside of the door,

a lap belt extending between said retractor and the engaging member, said lap belt being taken out of said retractor through a recessed opening provided at the lower most portion of the door, said lap belt having a lower surface, a forward end, and means on said forward end for engaging the engaging member,

a through ring attached to a lower portion of the door and having an opening and a lower surface, said lap belt extending downwardly from said retractor inside the door through said opening of said through ring and around said lower surface of said through ring, and

a bar-shaped guide member attached to the door at said lowermost portion such that no interference occurs between said guide member and said lap belt which the door is in a closed position, said guide member having a guide portion with an upper surface, said upper surface of said guide portion being located at a position higher than said lower surface of said through ring and nearer to the center line of the vehicle body than said through ring, said lower surface of said lap belt contacting said upper surface of said guide portion.

4,787,652

CROSSCOUNTRY SKI STICKS PARTICULARLY FOR THE NEW TECHNIQUE CALLED "SKATING"

Attilio Pronzati, Via Monasterolo, 16, 20010 Vanzago, Italy

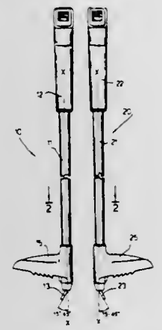
Filed Mar. 13, 1987, Ser. No. 25,715

Claims priority, application Italy, Mar. 17, 1986, 21253/86[U]

Int. Cl.[4] A63C *11/24*

U.S. Cl. 280—824 **8 Claims**

1. A crosscountry ski stick comprising an elongated staff having at one end a hand grip and at the other end an imperforate snow wheel, said hand grip having a hand strap emerging rearwardly of the ski stick, the snow wheel having a sleeve surrounding and secured to the staff and having downwardly concave portions which project only laterally and rearwardly from said sleeve, said portions having a laterally outwardly projecting straight edge and a reawardly projecting straight



edge, said edges comprising the laterally outermost boundary edges of the snow wheel and being disposed at an angle between 60° and 90° to each other.

4,787,653

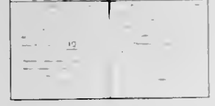
NON-BUCKLING NEWSPAPER AND DEVICE FOR THE PRODUCTION THEREOF

Robert B. Stewart, Jr., 7813 Widdecomb Rd., Powell, Tenn. 37849

Filed Jun. 22, 1987, Ser. No. 65,009

Int. Cl.[4] B42D *1/00, 9/00;* **G09B** *29/00;* **B31B** *1/25*

U.S. Cl. 281—2 **3 Claims**



1. In a doubly folded folio format newspaper having a nesting fold line and a secondard fold line which perpendicularly bisects said nesting fold line, the improvement comprising a slit of between about 2 and 5 inches length penetrating all the pages of the newspaper along the nested fold line perpendicular to and substantially symmetrical about said secondary fold line, whereby the turning of the pages is simplified because of a diminished occurrence of buckling of the pages adjacent said slit.

4,787,654

FLANGE CONNECTION WITH IMPROVED SEAL AND BOLT-NUT DESIGN

Alexander Zeitlin, White Plains, N.Y., assignor to Press Technology Corporation, White Plains, N.Y.

Continuation of Ser. No. 856,707, Apr. 28, 1986, abandoned. This application Jun. 30, 1987, Ser. No. 65,615

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—101 **2 Claims**

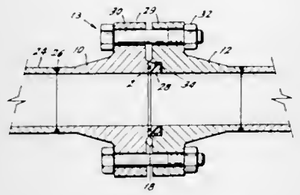
1. A flange connection for relatively high pressure applications, comprising:

a first conduit section;

a first flange having a conduit mating end and a flange mat-

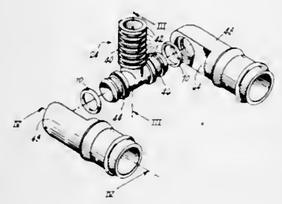
VOL 1096 ISS 5 NO 29 1988 UMI

ing end, said conduit mating end connected to said first conduit section;
a second conduit section;
a second flange having a conduit mating end and a flange mating end, a cutout section disposed in said flange mating end of said second flange, said conduit mating end connected to said second conduit section wherein said flange mating end is adjacent said first flange;
self-energizing seal means disposed between said flange mating ends of said first and said second flanges and in said cutout section disposed in said second flange;
a high pressure medium disposed in said first and second conduit sections, said high pressure medium having a



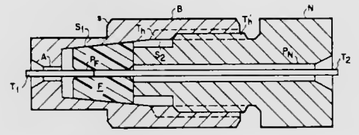
pressure of at least 2,500 pounds per square inch, said high pressure medium being effective to bear on said self-energizing seal means and to increase pressure exerted by said seal means on said flange by a pressure factor which increases with the pressure of said high pressure medium; and
threaded fastening means for connecting said first flange and said second flange, said threaded fastening means including a plurality of sets of bolts and nuts, each bolt having a plurality of threads and substantially all of said threads being truncated in a manner which is effective to distribute, substantially uniformly, the stresses on said bolt along all said threads.

4,787,655
AIRTIGHT CONNECTION FOR BREATHING CIRCUITS
James R. Gross, St. Charles, Ill., and Edward R. Tasher, Long Beach, Calif., assignors to The Kendall Company, Boston, Mass.
Filed Apr. 24, 1986, Ser. No. 856,076
Int. Cl.⁴ F16L *41/00*
U.S. Cl. 285—151 **5 Claims**



1. A swivel adapter for a ventilator breathing system to permit a patient to inhale and exhale gases through a plurality of independent movable arrangeably disposable conduits, said adapter comprising:
a swivel wye tee member having a hollow central body member;
a pair of hollow branch members disposed across one end of said central body member, and in fluid communication therewith;
a locking means disposed on the end of each of said branches;
a hollow cylindrically shaped arm having an orifice through a sidewall thereof into which a branch member extends, said locking means of said branch engaging the inner side of said sidewall to securely lock yet permit articulation between each of said branches and said arms; and
a sealing means disposed about each of said branches to prevent gases leaking out of the juncture between said branches and said arms, while also permitting the free swiveling between said arms.

4,787,656
CAPILLARY TUBING COUPLER
Bruce L. Ryder, Strasburg, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jun. 19, 1985, Ser. No. 746,614
Int. Cl.⁴ F16L *49/00*
U.S. Cl. 285—177 **5 Claims**

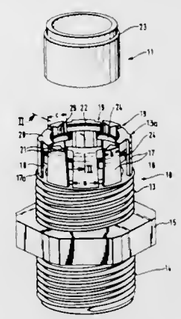


1. A device for coupling the ends of two tubes in abutting relationship comprising:
a body,
means defining a cavity in said body having a tapered surface,
means defining an aperture in said body communicating with said cavity,
a ferrule made of material that is more compressible than the material from which said body is made, said ferrule having an exterior tapered surface that is positioned in said cavity with the tapers sloping in the same direction,
means defining a passageway extending through said ferrule that communicates with said aperture, and
means coupled to said body that can be operated so as to force the tapered surface of said ferrule into said cavity in such a manner that the only radial compression of the ferrule occurs the portion bounded by its tapered surface.

4,787,657
SCREW COUPLING
Dieter Henniger, Schalksmühle, Fed. Rep. of Germany, assignor to Hermann Kleinhuis GmbH & Co. KG., Lüdenscheid, Fed. Rep. of Germany
Filed Sep. 30, 1986, Ser. No. 913,736
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1985, 3535595
Int. Cl.⁴ F16L *5/00*
U.S. Cl. 285—323 **21 Claims**

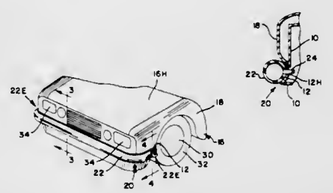
1. A screw coupling, particularly for surrounding cables, hoses, conduits, conductors and like bodies, comprising a nipple including an externally threaded first annular section and a second annular section fast with said first section and having an end face remote from said first section, said second section including a set of flexible prongs having first end portions at said first section and second end portions at said end face, and slots alternating with said prongs, the width of said prongs as measured circumferentially of said second section decreasing in a direction from said first section toward said end face, and said second end portions being enlarged and extending circumferentially of said second section and transversely of the neighboring slots; and a nut having a first internally threaded annular portion arranged to mate with said first section and a second annular portion having an inside diameter

smaller than the maximum outside diameter of said second section so that said second annular portion can flex said prongs and thereby move at least the second end portions of the



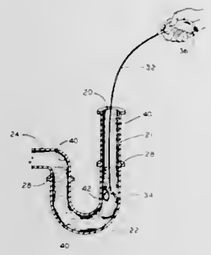
prongs nearer to the axis of said second section in response to rotation of said nut in a direction to thread said first portion onto said first section.

4,787,658
UNIBODY BUMPER SYSTEM
John Harris, Jr., 14051 Laverman St., Cedar Lake, Ind. 46303
Filed Jul. 29, 1986, Ser. No. 891,234
Int. Cl.⁴ B60R *19/20*
U.S. Cl. 293—107 **3 Claims**



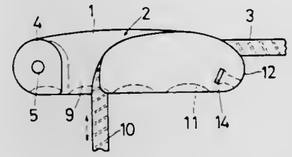
1. In an automobile body of the unibody type having primary framing provided by formed sheet metal:
a generally concave elongated bumper back plate welded to or otherwise integrated along its length into the unibody sheet metal, to form a vertically continuous part thereof, and said back plate not being mounted extended therefrom nor so as to move independently therefrom, said back member extending across the outside of at least one of the front or back of the unibody;
an elongated bumper member formed of closed resilient sheeting material of a generally tubal shape, hermetically enclosing a volume of gas under pressure, said bumper member extending along and outside said back plate and being sealed at its ends, said member being secured to and conforming to said back plate;
wherein said bumper member is sealed at its ends by having its sides collapsed one toward the other and held together by metal clamping means; and
said metal clamping means is a metal tube section which surrounds the end of the bumper member and is flattened at the sealed end.

4,787,659
APPARATUS AND METHOD FOR RETRIEVING ARTICLES LOST IN DRAINS
R. Richard Durham, 25841 Shoemaker Rd., Circleville, Ohio 43113
Filed Dec. 9, 1987, Ser. No. 130,525
Int. Cl.⁴ B25J *1/02*; F16L *55/00*
U.S. Cl. 294—1.1 **3 Claims**



1. A device for retrieving small items lost in a common household drain of the type having a drain opening communicated to a U-shaped trap portion of the drain via conventional piping having interior walls, comprising in combination, an elongate, hollow, flexible tubing portion having an outer diameter significantly smaller than the piping of said drain and a length greater than the distance between said drain opening and a distal end of the U-shaped trap portion; an inflatable resilient pouch normally disposed in a deflated condition having a port opening mounted in sealed communication to one end of said flexible tubing portion to form a flexible tip; and means for inflating and deflating said pouch connectable to the opposing end of said tubing portion for selectively inflating said pouch to a diameter at least equal to the inner diameter of the piping of said drain for drawing said pouch in slideably and sealed engagement with said interior walls of said piping in a direction toward said drain opening while maintaining said pouch in an inflated condition; said means for inflating and deflating said pouch forming a closed pressure system with said pouch and said tubing.

4,787,660
ROPE PULLER
Karl F. Mrazek, 4 Botes Road, Albemarle, Germiston, Transvaal Province, South Africa
Filed Sep. 18, 1987, Ser. No. 98,312
Claims priority, application South Africa, Sep. 19, 1986, 86/7135
Int. Cl.⁴ F16G *11/04*
U.S. Cl. 294—1.1 **5 Claims**



1. A device for use in manually exerting a tensile force on a rope comprising
an elongated handle having a forward and a rearward end adapted to fit in the palm of a user's hand;
a passage for a rope extending from the rearward end of the handle to a side of the handle at a position between the

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ends thereof, the passage being open to the exterior of the handle along its entire length; and

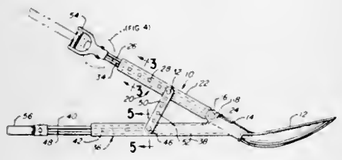
a rope gripping cleat located in the passage with the direction of operation of the cleat being to restrain a rope in the passage when tension is applied to the portion of the rope emerging from the side of the handle.

4,787,661

ADJUSTABLE DOUBLE HANDLED SHOVEL

Thomas G. Rutledge, Chicago, Ill., assignor to Work Made Easy, Inc., Chicago, Ill.

Filed Jun. 1, 1987, Ser. No. 56,380
Int. Cl.[4] A01B *1/22*; B25G *1/04*
U.S. Cl. 294—58 **19 Claims**



1. A fixedly adjustable double handled shovel, comprising:

a substantially planar blade;

a pair of elongate, length adjustable handles; means for fixedly attaching one of the elongate, length adjustable handles to the blade;

means for pivotally mounting another of said pair of length adjustable handles to the blade for angular movement relative to the one length adjustable handle only in a plane substantially transverse to that of the blade and in which part of said fixedly attaching means, said pivotally mounting means, part of the one handle fixedly attached to the blade and the blade comprises an integral piece of rigid material to which the remaining part of the one handle and the entire other elongate, length adjustable handle are removably attached; and

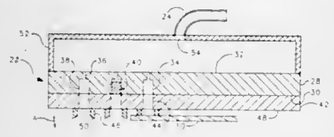
angle securing means releasibly securing said first and second elongate, length adjustable handles at selected ones of relative angles therebetween.

4,787,662

VACUUM DRIVEN GRIPPING TOOL

John F. Dewez, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 28, 1987, Ser. No. 90,716
Int. Cl.[4] B66C *1/02*
U.S. Cl. 294—64.1 **19 Claims**



1. Apparatus for gripping an article, comprising;

vacuum source means for applying a vacuum; and

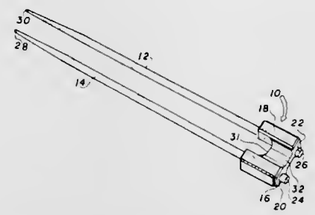
a plurality of vacuum conduction tubes, a first end of at least some of said tubes being positioned to contact a surface of an article to be gripped and a second end communicating with said vacuum source means, at least a portion of the length of each of said tubes having a constricted cross sectional area such that the total air flow, under vacuum, possible through all of said tubes taken together is less than a preselected pumping capacity.

4,787,663

CHOPSTICK HOLDER

Leon A. Laramie, P.O. Box 3493, Redwood City, Calif. 94064

Filed Jun. 2, 1987, Ser. No. 56,809
Int. Cl.[4] A47G *21/10*; A47J *43/28*
U.S. Cl. 294—99.2 **16 Claims**



1. A chopstick holder, comprising:

a pair of elongated holding portions having a pair of respective through holes of a predetermined dimension for holding a pair of chopsticks of a predetermined transverse dimension in a generally parallel relationship and with the dimensions of said through holes being such that said chopsticks will be held by frictional engagement when they are inserted into said respective through holes, and

connecting means for holding said holding portions a fixed distance apart, and in a generally parallel relationship, said fixed distance being at least twice the dimension of each of said through holes,

said holding portions having a predetermined thickness, greater than said chopsticks, when measured in a predetermined direction perpendicular to their direction of elongation and perpendicular to their direction of separation,

said connecting means comprising a web portion of a narrower thickness, when measured in said predetermined direction, than said holding portions, said web portion being integral with said holding portions, said web portion having a generally rectangular shape with a length, as measured in the direction of elongation of said holding portions, which is greater than its thickness and at least as great as the separation between said holding portions, said web portion being made of a resilient material so as to premit said holding portions to move with respect to each other.

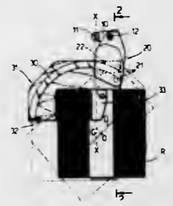
4,787,664

ELECTROMECHANICAL APPARATUS FOR HOLDING AND TURNING OVER HOLLOW CYLINDRICAL BODIES, IN PARTICULAR ROLLED STEEL COILS

Aleardo Borriello, Zane', Italy, assignor to Trasmec S.A.S. Di Valtorta Italo E C., Macherio, Italy

PCT No. PCT/EP86/00399, § 371 Date Apr. 23, 1987, § 102(e) Date Apr. 23, 1987, PCT Pub. No. WO87/00156, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 7, 1986, Ser. No. 31,067
Claims priority, application Italy, Jul. 10, 1985, 21525 A/85
Int. Cl.[4] B66C *1/22*
U.S. Cl. 294—103.2 **6 Claims**

1. An electromechanical apparatus for handling and tilting hollow cylindrical bodies (R) such as reels of sheet metal comprising a rotating clamp (31) having two jaws (32 and 33) which hold, by means of a nut (36) travelling along a rotating screw (35) driven by a motor (34), the external and internal walls respectively of the cylindrical body (R), the rotating clamp being connected to a crane hooking device by means of a support (20, 20') moving along a guide (30) provided on the rotating clamp body (31), wherein the hold on the internal wall of the body (R) takes place only along a portion of it, a means (13, 38*b*, 37, 38; 40) being provided to compensate the reduction in the holding force produced during the rotation of the hollow cylindrical body (R) chara rized by the compensating means (13, 38*b*, 37, 38; 40 causing an additional movement



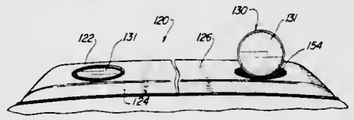
of the rotating s rew (35) in a direction to move the jaws closer together.

4,787,665

AUTOMOTIVE ROOF SPOILER HA ING RETRACTABLE LAMPS

Lawrence D. Rich, New Baltimore, Mich., assignor to Riverside International, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 930,833, Nov. 14, 1986, Pat. No. 4,707,014. This application Oct. 13, 1987, Ser. No. 107,071
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] B62D *35/00*; B60Q *1/00*
U.S. Cl. 296—180.1 **9 Claims**



1. An automotive roof spoiler having at least one retractable lamp, said roof spoiler having an elongated body portion, mounting means for mounting said spoiler body portion generally transversely to a longitudinal axis of a vehicle adjacent an upper extent of said vehicle, said body portion having a forward leading end generally parallel to a longitudinal axis of said elongated body portion, said body portion having a forwardly facing wall inclined upwardly and rearwardly defining an air foil surface reducing frictional air drag, said wall having an opening therethrough and a lamp assembly including a lamp having a lens mounted in said opening, said lamp assembly rotatably mounted about an axis generally parallel to said spoiler body portion longitudinal axis, and power means operably connected to said lamp assembly , said power means adapted to rotate said lamp assembly about said axis of rotation from an upright position with said lens of said lamp facing forwardly for off-road use to a retracted position within said spoiler body portion for on-road use, said lamp assembly having a surface generally coplanar with said inclined body portion wall when said lamp assembly is in said retracted position further reducing air drag of said roof spoiler.

4,787,666

STREAMLINING AIRFOIL FOR VEHICLES

Phares A. Noel, 2435 W. Boston Blvd., Detroit, Mich. 48206

Filed Nov. 23, 1987, Ser. No. 123,956
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—180.1 **10 Claims**

1. Apparatus for improving the aerodynamic performance of vehicles comprising:

a vehicle including:

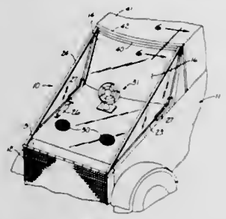
a windshield, said windshield having a top,

bottom, and sides;

a radiator for cooling an engine coolant;

a grille extending in front of said radiator for allowing air to enter said radiator;

a hood extending from the top of said grille to the bottom of said windshield, said hood having a front portion



located above said grille, a rear portion adjacent to the bottom of said windshield and two side portions generally overlying the front wheels of the vehicle; and

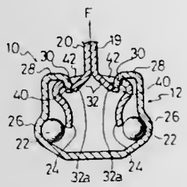
a transparent airfoil extending from the front portion of said hood to the top of the windshield and from one side of the hood to the other side thereof, said airfoil having an interior and an exterior.

4,787,667

SEAT SLIDE DEVICE

Takaichi Nishino, Akishima, Japan, assignor to Tachi-S Co., Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 61,535
Int. Cl.[4] B60N *1/02*
U.S. Cl. 296—65.1 **11 Claims**



1. A seat slide device having an upper rail to be fixed to a floor of an automobile and a lower rail to be fixed to the side of a seat, said upper rail being slideably fitted to said lower rail, wherein a seat belt is provided on one of said seat or upper rail, said seat slide device comprising:

a plurality of easily bendable incised portions formed in said upper rail such that they are spaced apart from one another at a predetermined interval and until bent, said incised portions lying in the same plane as adjacent portions of said upper rail and forming a substantially unperforated surface with said adjacent portions; and

a plurality of projected pieces formed in said lower rail, said projected pieces being so arranged that they are disposed at points corresponding to the respective said incised portions;

whereby, when an upward pulling force is exerted upon said upper rail, causing said upper rail to move upwards, said projected pieces of said lower rail are pressed against, and strongly gripped by engagement with said incised portions of said upper rail to bend said incised portions and pass therethrough, so as to effect a mutual engagement of said upper and lower rails, which prevents removal of said upper rail from said lower rail.

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4,787,668

WEATHER STRIP

Haruhisa Kawase; Yoshinobu Suzuki, and Masahiro Nozaki, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Continuation of Ser. No. 921,814, Oct. 21, 1986, abandoned, which is a continuation of Ser. No. 713,683, Mar. 20, 1985, abandoned. This application Feb. 17, 1988, Ser. No. 159,428
Claims priority, application Japan, Mar. 21, 1984, 59-54934
Int. Cl.[4] B60J *1/02, 1/20*
U.S. Cl. 296—93 2 Claims



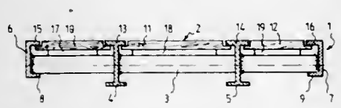
1. A weather strip comprising:
a channel-shaped solid-rubber retainer having side walls, a bottom wall and an open mouth,
two pairs of opposed flange-like retainer lips composed at least in part of solid rubber, said retainer lips projecting inward from said side walls with the lips of each of said pairs inclined toward said bottom wall and adapted to receive therebetween, press on, engage and retain said strip on, a flange of an automobile body when said strip is pressed thereon open mouth first, one side of said flange facing the outside of said body;
a pair of opposed flange-like sub-lips composed at least in part of solid rubber, said sub-lips protruding inward from the tips of the lips of at least that pair of said lips located closer to said retainer bottom wall than the other pair, said sub-lips being inclined toward said bottom wall at a greater angle than that of said lips and facing said open mouth being divergent theretoward, said sub-lips having convexly rounded tips and being substantially devoid of concave surfaces and the sides thereof being disposed generally at an angle other than zero with respect to the corresponding sides of their respective lips,
at least the side portion of one of the lips of the other pair closest the retainer open mouth, and which lip side portion faces said open mouth and inward of said body, being made of sponge rubber,
whereby the area of contact of said retainer with said flange is increased with resultant increase of the retaining force of said retainer while the force required to press said retainer on said flange is reduced.

4,787,669

SEMI-TRAILER PLATFORM

Guy Wante, Pas-de-Calais, France, assignor to Benalu S.A., Pas-de-Calais, France

Filed Jun. 1, 1987, Ser. No. 55,936
Claims priority, application France, Feb. 20, 1987, 87 02725
Int. Cl.[4] B62D *21/02*
U.S. Cl. 296—182 17 Claims



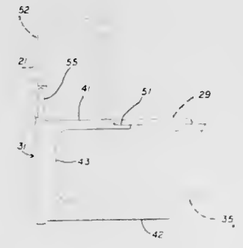
1. A vehicle platform for supporting a vehicle body, said platform comprising:
an assembly of cross members, intermediate longitudinal members, and longitudinal side members, wherein each of said side members comprises a lower flange, wherein each of said cross members comprises a substantially polygonal cross-sectional shape comprising a lower area which is adapted to be positioned flat against a respective one of said lower flanges of a respective one of said side members, wherein said cross members intersect with said intermediate longitudinal members, and wherein at areas of intersection between respective ones of said cross members and intermediate members, said cross members comprise at least two converging bearing areas.

4,787,670

FLOOR SUBFRAME FOR CARGO TRUCK SLEEPER CAB

Richard A. Bentz, Fort Wayne, Ind., assignor to Bentz Metal Products Co., Inc., Fort Wayne, Ind.

Filed Sep. 11, 1987, Ser. No. 95,830
Int. Cl.[4] B62D *33/06*
U.S. Cl. 296—190 1 Claim



1. In a sleeper cab for a tractor/trailer rig adapted to be located behind the driver's cab and to be supported on the tractor frame, the sleeper cab having vertical exterior wall sections and a floor panel formed of metal sheet, the floor panel being supported on an exterior metal floor subframe attached to a tractor frame mounting means by vertically positioned bolts, the improvement wherein said floor subframe comprises:
parallel front and rear main beams;
a plurality of interior cross members extending perpendicular to and between the main beams; and
exterior side members connected between the outer ends of the beams, and defining with the beams and the cross members coplanar supporting surfaces for the floor panel;
each of the beams having:
upper and lower horizontal flanges spaced apart and joined by a vertical web at the outer ends of the flanges to define with the flanges an inwardly facing open channel, the lower flange having a top surface on which the cross members are supported and secured and having openings formed therein to receive the bolts for securing the sleeper cab to the tractor frame, the ends of the bolts being located in the channel, and
a vertical rib extending upwardly from the top surface of the upper flange and having an outer surface to which the lower ends of the respective wall sections are welded.

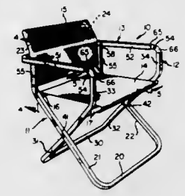
4,787,671

FOLDING 3-PIECE CHAIR WITH LINK CONTROL

Michael C. Wilson, Glen Ellyn, Ill., assignor to The Tyke Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 895,054, Aug. 11, 1986, abandoned. This application Feb. 20, 1987, Ser. No. 17,331
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—35 21 Claims

1. A folding chair having a seat, a back rest, supporting legs which are crossed and pivotably connected together at the sides, and arm rests carried above the level of the seat, wherein each arm rest extends between a pivot at a front side of the chair and a link means for pivotally engaging said arm rest and supporting the arm rest with respect to one of the supporting



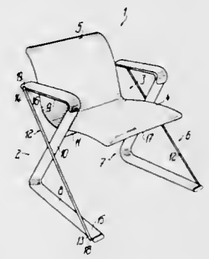
legs, the arm rests in an open position of the chair being fixed by said link means in a position generally above the seat and in a folded position of the chair hanging from said pivots behind and below the back rests and via the link means locking the chair into said folded position.

4,787,672

SEATING FURNITURE, MORE PARTICULARLY CHAIR

Hans-Hugo Werner, Stuttgart, Fed. Rep. of Germany, assignor to VS Vereinigte Spezialmoebelfabriken Verwaltungs GmbH, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 48,760
Claims priority, application Fed. Rep. of Germany, May 23, 1986, 3617298
Int. Cl.[4] A47C *3/00*
U.S. Cl. 297—296 32 Claims



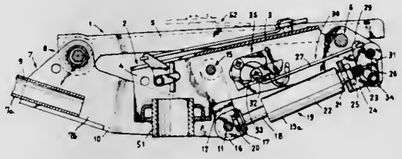
1. An article of furniture for seating, having a front, back and two lateral sides, the article comprising:
a seat member (4);
at least one elastic lateral support (7) made of an elongated profile material and disposed laterally of said seat member (4);
said lateral support (7) defining a plurality of supporting sections located in different orientations as viewed from the sides, and having profile cross-sections;
an intermediate section (10) of said supporting sections being provided between an upper end section (9) and a lower end section (8) of said lateral support (7), said intermediate section (10) having a non-vertical orientation and adjoining at least one of said end sections (8) pivotably, resiliently and at an angle with respect to said at least one of said end sections (8),
wherein the end sections (8,9) of the lateral support (7) are interconnected via a substantially elongated reinforcing member (12) having, when viewed from said sides, an orientation out of registration with the intermediate section (10), said reinforcing member (12) being a compression rod and a tension rod and having a cross-section smaller than the profile cross-section of said lateral support (7).

4,787,673

CHAIR SUPPORT WITH ADJUSTMENT DEVICE

Hermann Locher, Dornach, Switzerland, assignor to Giroflex Entwicklungs AG, Koblenz, Switzerland

Filed Sep. 14, 1987, Ser. No. 96,334
Claims priority, application Switzerland, Sep. 24, 1986, 03843/86
Int. Cl.[4] A47C *3/00, 1/08*
U.S. Cl. 297—301 13 Claims



1. A chair support for a chair, comprising:
a seat holder having a front end and a backrest end;
a backrest holder;
a supporting structure having a front end and forming a part of a foot support for the chair;
means for connecting said seat holder at least at its front end with said supporting structure;
means defining a swivel joint possessing a substantially horizontal axis of rotation for connecting said seat holder at its backrest end with said backrest holder;
an arm structure having an end region and connected with said backrest holder;
said arm structure extending in a direction towards the front end of the seat holder;
means defining a further swivel joint possessing a substantially horizontal axis of rotation and positioned at the end region of said arm structure;
a spring element exerting a force on said backrest holder;
said spring element being positioned between the front end of said supporting structure and the end region of said arm structure;
an actuating mechanism;
an adjusting lever for operating said actuating mechanism;
said spring element being blockable and freely movable by means of said actuating mechanism operated by said adjusting lever;
said spring element including an operating slide tappet;
said actuating mechanism being constructed as an operating rod system displacing said operating slide tappet of said spring element into a blocking position and into a freely moving position of the spring element;
a locking mechanism operatable by said adjusting lever and provided for said operating rod system; and
said adjusting lever serving to adjust blocking and freeing movement of said spring element.

4,787,674

SEAT ADJUSTING APPARATUS

Yasuhisa Inaba, Handa; Kenichi Kazaoka, Nagoya, and Hiroshi Okazaki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 716,770, Mar. 27, 1985. This application Jul. 31, 1987, Ser. No. 80,195
Claims priority, application Japan, Mar. 29, 1984, 59-62040
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—317 10 Claims

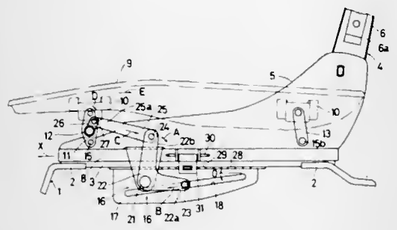
1. A seat assembly adjusting apparatus, which comprises:
a main frame assembly including a first frame supporting a backrest and a second frame supporting a seat;

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means for slidably mounting said first frame on a vehicle floor so that the backrest can slide in a forward direction and a backward direction;

attaching means for attaching said second frame to said first frame and for urging the seat in a forward direction and a backward direction with respect to the first frame; and

connecting means between the mounting means and the attaching means for moving the attaching means in response to the sliding of the first frame and backrest, such that the attaching means urges the seat in the forward direction through a first distance when the backrest slides in the backward direction through a second distance greater than the first, and such that the seat is urged in the



backward direction through the first distance when the backrest slides in the forward direction through the second distance;

said attaching means including first link means pivotally interconnecting said first and second frame; and

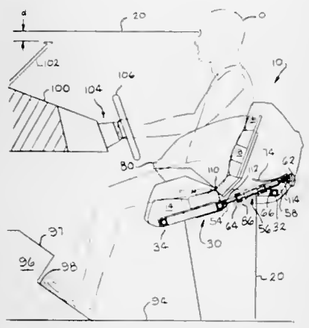
said connecting means including a second link means connected at a first end to said first link means and supporting a cam follower at a second end, and a cam plate connected to said mounting means, with said cam plate having a cam slot shaped to receive said cam follower such that said first and second link means are actuated in response to sliding of said first frame to move said second frame and seat relative to said first frame.

4,787,675

ADJUSTABLE SEAT TO SUPPORT AN OCCUPANT AT A CONSTANT HEIGHT

Michael E. McLeod, 28645 South Pointe Dr., Grosse Ile, Mich. 48138

Continuation of Ser. No. 831,662, Feb. 19, 1986, abandoned. This application Nov. 24, 1986, Ser. No. 931,955
Int. Cl.⁴ A47C *1/12*
U.S. Cl. 297—335 **12 Claims**



1. A seat supported by means such as legs above a floor, a deck or the like, said seat comprising

a seat back frame,

a seat back secured to and supported by said seat back frame,

a seat bottom frame having a forward portion,

a seat bottom having an upper rear edge, said seat bottom being secured to and supported by said seat bottom frame,

pivot means pivotally connecting said seat bottom frame to said seat back frame for rotation about the upper rear edge of said seat bottom between a first position wherein said seat bottom frame is substantially parallel to and at a given distance from the floor, deck or the like and a second position wherein said forward portion of said seat bottom frame is positioned substantially less than the given distance from the floor, deck or the like, said deck or the like, said pivot means being positioned forward of said seat back frame to the extent that, as the seat bottom frame is rotated from said first position to said second position and back to said first position, the torso of an occupant of said seat whose back is positioned against said seat back and whose buttocks is positioned on said seat bottom, is supported at a constant height relative to said seat back frame, and

adjustment means operable to selectively retain said seat bottom frame is said first position and said second position, and

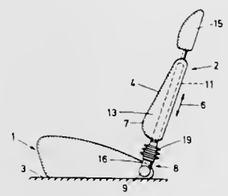
footrest means having an upper surface for supporting the feet of an occupant of the seat when said seat bottom is in the first position and a lower surface for supporting the feet of an occupant of the seat when the seat bottom is in the second position.

4,787,676

VEHICLE SEAT, NOTABLY FOR MOTOR VEHICLE

Marcel Neve de Mevergnies, La Pasture, 6419 Marbaix-la-Tour, Belgium

Filed Apr. 15, 1987, Ser. No. 38,771
Claims priority, application Belgium, Apr. 15, 1986, 0/216532
Int. Cl.⁴ A47C *1/00, 7/40*
U.S. Cl. 297—353 **8 Claims**



1. A vehicle seat comprising a seat bottom for an occupant to sit on and a seat back, the seat back having a portion for the occupant's back to rest against and means for minimizing transmission of vibrations with a frequency higher than 10 Hz from the seat bottom to said portion of the back, including resilient means connected between said portion of the seat back and the seat bottom for providing vertical reciprocation of said portion of the seat back relative to the seat bottom.

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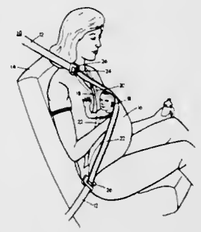
INFANT VEHICLE SAFETY RESTRAINT

Gregory A. Reighter, Panama City, Fla., assignor to Secure Concepts, Inc., Englewood, Colo.

Filed Jun. 8, 1987, Ser. No. 59,299
Int. Cl.⁴ A47C *31/00*; B60R *22/10*
U.S. Cl. 297—464 **12 Claims**

1. A safety restraint device for use in combination with an unmodified seat belt to secure an infant in a face-to-face relationship with an attending adult occupying and using the seat belt which comprises:

(a) a pouch means having an opening adapted to receive an infant and being of a shape effective to support the head, backside and rump of said infant to secure said infant therein;



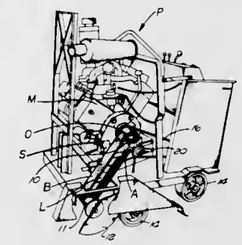
(b) at least two connector means attached to said pouch means approximately at each end of said opening for immovably securing said pouch assembly to said seat belt, said pouch supportedly secured by said connectors independent of the said attending adult.

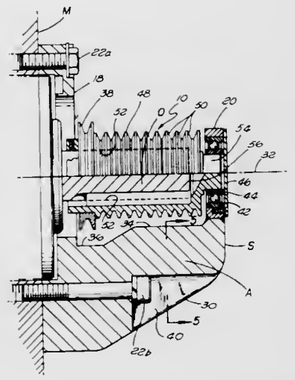
4,787,678

OUTBOARD BEARING SUPPORT

William K. Holmes, Simi Valley, and Albert E. Joneikis, Long Beach, both of Calif., assignors to Cushion Cut, Inc., Torrance, Calif.

Filed Jan. 25, 1988, Ser. No. 147,844
Int. Cl.⁴ F16C *35/12*; B28D *1/04*
U.S. Cl. 299—39 **15 Claims**





12. A device for supporting a free end of an output shaft of a primary rotary structure which is linked to a secondary structure through at least one flexible force transmitting member forming a continuous loop, comprising:

a base portion mountable to the primary structure in a preselected operative position of the support device;

a rigid arm extending from the base portion and through the loop formed by the force transmitting member to a location adjacent the free end of the output shaft in said operative position; and

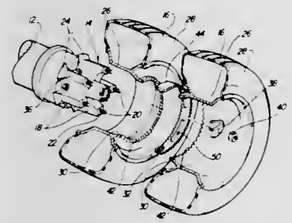
a bearing portion carried by the rigid arm at said location to support the free end against transverse deflection.

4,787,679

TWIN WHEEL ASSEMBLY

Roderick W. Arnold, 14571 Whitcomb St., Detroit, Mich. 48227

Filed Aug. 13, 1987, Ser. No. 84,895
Int. Cl.⁴ B60B *11/06*
U.S. Cl. 301—36 R **1 Claim**



1. A twin wheel rim assembly for use with an axle having a hub, said hub having a plurality of circumferentially spaced spokes, said hub having an outwardly extending lip adjacent its inner end, said twin wheel rim assembly comprising:

a pair of substantially identical wheels, each wheel having a rim with an outwardly flared circumferential portion and a continuously serrated surface on said outwardly flared portion,

a tubular cylindrical spacer, said spacer having two axial ends and a continuously serrated surface on each axial end, said spacer serrated surfaces being dimensioned to intermesh with said rim serrated surfaces,

said spacer further comprising a plurality of radially inwardly and circumferentially extending ribs,

said wheels and said spacer being adapted to be coaxially positioned over said hub so that the outwardly flared circumferential portion of one of said wheels abuts against said outwardly extending lip of the hub and so that said spacer is sandwiched between said rims,

means attached to said hub for compressibly urging the other wheel rim towards said one wheel so that said serrated surfaces on said hubs and said spacer intermesh and prevent relative rotation between said wheel rims and

wherein said ribs are dimensioned so that each of said ribs extends entirely between two adjacent spokes on said hub.

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SEMI-RIGID AXLE FOR A VEHICLE

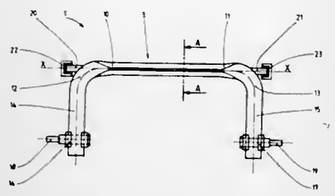
Didier Bonjean, Asnieres S/Seine, and Raymond Deslande, Chalons S/Marne, both of France, assignors to Vallourec, Paris, France

Filed Dec. 2, 1986, Ser. No. 936,779
Claims priority, application France, Dec. 2, 1985, 85 18367
Int. Cl.⁴ B60B *35/06*
U.S. Cl. 301—124 R **10 Claims**

1. In a semi-rigid one-piece vehicular axle construction including a pair of tubular axle arms, the combination comprising, a generally U-shaped tubular body having a central trans-

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verse portion and a pair of axle arms extending perpendicularly therefrom in a common plane, said axle arms each including a stub axle, said transverse portion being formed to include a



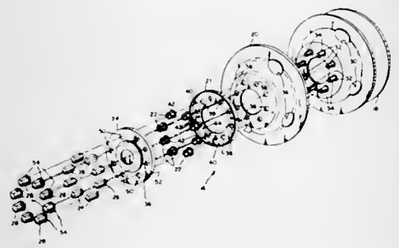
cross-sectional profile region of double wall thickness and having at least one flanged portion and being prolonged at each end, beyond the profile region, by a tubular region bent to merge at a right angle with each of said axle arms.

4,787,681

SIMULATED CUSTOM WHEELS

Mike Wang, 2044 W. 236th Pl., Torrance, Calif. 90501, and David Gaines, 28761 Charreadas, Lugan Beach, Calif. 92677

Filed Jan. 4, 1988, Ser. No. 140,613
Int. Cl.[4] B60B *7/06*
U.S. Cl. 301—375 **7 Claims**



1. A universal decorative wheel covering for use with automotive or truck wheels;

a decorative wheel cover having a substantially concave shape and matching holes adapted to accept attaching studs used to hold wheels;

a circular retaining ring having a flanged rim on the periphery defining a shoulder portion and located adjacent the wheel cover with the shoulder portion pointing away from the wheel, whereby the attaching studs project through said cover and said retaining ring;

a plurality of lug nuts, one for each stud, for securing said retaining ring and said cover to said wheel in a fixed relationship;

a universal center hub having matching holes aligned with said studs and each hole having a diameter sufficient to expose said lug nut;

said universal center hub having a flanged rim on the periphery defining a shoulder portion adapted to frictionally engage said shoulder portion on said retaining ring whereby the center hub is supported and held only by the frictional relationship existing between the shoulder portion on said retaining ring and the shoulder portion on said center hub; and

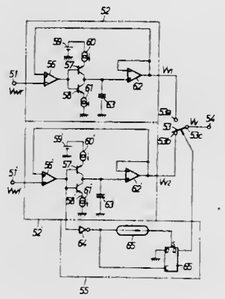
a plurality of decorative lug nut covers, one for each stud, for covering each of said lug nuts whereby the wheel is covered by the decorative cover and the lug nuts are covered by the decorative lug nut covers.

4,787,682

METHOD OF ESTIMATING VEHICLE SPEED

Tetsuji Muto, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 32,471
Claims priority, application Japan, Mar. 28, 1986, 61-71552
Int. Cl.[4] B60T *8/68, 8/60;* **G06G** *7/78*
U.S. Cl. 303—109 **12 Claims**



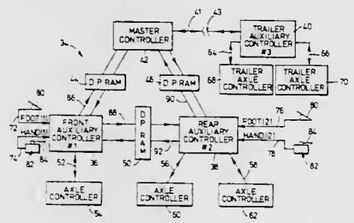
1. A method of estimating a vehicle speed of a vehicle, comprising estimating a vehicle speed on the basis of a wheel speed and comparing a reference threshold derived from said estimated vehicle speed with said wheel speed to control the supplying of a hydraulic braking pressure to a wheel brake, wherein when the wheel speed is larger than the estimated vehicle speed, a first predetermined value is added to that estimated vehicle speed to give a new estimated vehicle speed, and when the wheel speed is smaller than the estimated vehicle speed, a second predetermined value is subtracted from that estimated vehicle speed to give a new estimated vehicle speed, and wherein said first and second predetermined values are independent of the wheel speed.

4,787,683

ELECTRO-PNEUMATIC BRAKING SYSTEM WITH DECELERATION CONTROL

William A. Singleton, Grafton, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 11, 1987, Ser. No. 95,276
Int. Cl.[4] B60T *8/64*
U.S. Cl. 303—110 **18 Claims**



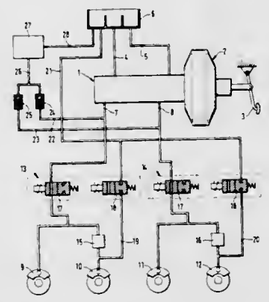
1. Fluid pressure braking system for a vehicle having wheels and brakes controlling said wheels comprising wheel speed sensing means for generating a wheel speed signal which varies as a function of the rotational speed of a vehicle wheel, means responsive to said speed signal for generating a vehicle deceleration signal as a function of said wheel speed signal representing calculated deceleration of said vehicle, operator responsive means for generating an output signal, means responsive to said output signal for generating a deceleration request signal representing a requested vehicle deceleration desired by the vehicle operator, means for generating a difference signal as a function of the difference between said vehicle deceleration signal and said deceleration request signal, and means for controlling braking pressure communicated to said brakes as a function of said difference signal.

4,787,684

HYDRAULIC BRAKE SYSTEM, IN PARTICULAR FOR AUTOMOTIVE VEHICLES

Juergen Schonlau, Walluf, and Horst P. Becker, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,208
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620561
Int. Cl.[4] B60T *8/64*
U.S. Cl. 303—111 **3 Claims**



1. A hydraulic brake system of the type for automotive vehicles, comprising a braking pressure generator, at least one brake cylinder connected by a brake line to the braking pressure generator and serving to actuate a wheel brake, a hydraulic braking pressure regulator in said brake line, a normally open first valve in said brake line, an inlet of the brake cylinder in parallel to the braking pressure regulator connected between said braking pressure regulator at said brake cylinder to an unpressurized reservoir through a normally closed second valve, said first valve and said second valve being actuatable by a brake slip control apparatus, actuation of said brake slip control apparatus causing hydraulic braking pressure at said brake cylinder to decrease by directing hydraulic pressure from said brake cylinder to said unpressurized reservoir bypassing said braking pressure regulator whereby the inherent hysteresis of said braking pressure regulator is not effective during said pressure decrease.

4,787,685

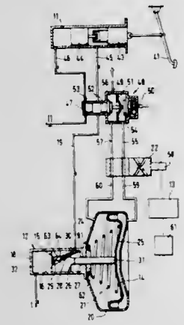
SLIP-CONTROLLED BRAKE DEVICE FOR AUTOMOTIVE VEHICLES INCLUDING VACUUM POWER GENERATOR ASSEMBLY USED BOTH AS BRAKE POWER BOOSTER AND AS MODULATOR

Hans-Christof Klein, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,693
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625960
Int. Cl.[4] B60T *8/32*
U.S. Cl. 303—114 **9 Claims**

1. A slip-controlled brake device for automotive vehicles, said device comprising a hydraulic pressure generating arrangement connected to at least one hydraulic wheel cylinder brake circuit via a pneumatically actuated pressure modulator, the pressure modulator comprising a vacuum power generator having a piston wall and further comprising a compensating cylinder including a hydraulic piston connected with the piston wall of the vacuum power generator, the piston wall being pre-loaded into an inoperative position by means of a return spring, said compensating cylinder including a compensating chamber communicating with the wheel cylinder brake circuit, and brake slip control circuitry for detecting a wheel slip and issuing a brake slip signal, said brake slip signal being operative to apply a higher pressure to the piston wall of the vacuum power generator in the direction in which the volume in the compensating chamber is increased, said piston wall being normally supplied a vacuum on both sides, a normally open isolating valve inserted in a connecting line from the pressure generating arrangement to the compensating chamber, said brake slip signal closing said isolating valve, said vacuum power generator being operative as a brake power booster in that

(a) the hydraulic piston assumes, in the inoperative position,



the end position providing the largest possible volume in the compensating chamber;

(b) a vacuum-atmospheric pressure-control valve is, via an alternating valve, connected to the vacuum power generator via an alternating valve such that, during normal braking, a first cylinder chamber is located so that in the event of a pressurization it acts upon the piston wall in the direction in which the volume in the compensating cylinder is decreased, said first cylinder chamber being pressurized to a smaller or larger degree by atmospheric pressure and is controlled by the hydraulic pressure of the pressure generating arrangement, a second cylinder chamber connected to the vacuum, after switching over of the alternating valve, the first cylinder chamber is connected to the vacuum and the second cylinder chamber is pressurized to atmospheric pressure when a brake slip signal is issued and

(c) said isolating valve being closed each time at the beginning of the pressure build-up by means of the pressure generating arrangement.

4,787,686

MONOLITHIC PROGRAMMABLE ATTENUATOR

Yusuke Tajima, Acton, Mass., and Toshikazu Tsukii, Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 810,900, Dec. 20, 1985, Pat. No. 4,684,965, which is a continuation of Ser. No. 492,857, May 9, 1983, abandoned. This application Feb. 17, 1987, Ser. No. 44,924
Int. Cl.[4] H03K *5/08;* **H03H** *11/24*
U.S. Cl. 307—568 **4 Claims**

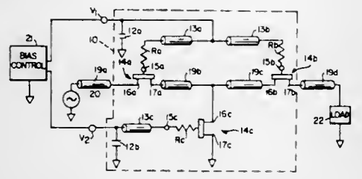
1. A radio frequency circuit having an input terminal and an output terminal comprising:

a pair of field effect transistors, each transistor having drain, source and gate electrodes, with a first one of such drain and source electrodes of a first one of such pair of transis-

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tors being electrically coupled to the input terminal, a first one of such drain and source electrodes of a second one of the pair of transistors being electrically coupled to the output terminal, and the remaining one of drain and source electrodes of each one of the pair of transistors being electrically coupled at a common point;

a third field effect transistor having a drain, source and gate electrodes with first one of such drain and source electrodes being electrically coupled with the aforementioned pair of transistors at the common point and the remaining



one of such drain and source electrodes being electrically coupled to a reference potential;

each field effect transistor having at least one pair of drain and source contacts disposed on a corresponding pair of drain and source regions and coupled to respective ones of the drain and source electrodes, and at least one gate contact disposed on a corresponding gate region between said pair of drain and source contacts; and

wherein a selected portion of the gate region of each field effect transistor is physically separated from the gate contact having the gate electrode attached thereto.

4,787,687

NEWSPAPER VENDING BIN

Milton J. Merl, New City, N.Y., assignor to Gannett Co., Inc., Arlington, Va.

Filed Aug. 14, 1987, Ser. No. 85,417
Int. Cl.[4] A47B *81/00*
U.S. Cl. 312—100 **12 Claims**



1. A newspaper vending bin for displaying newspapers for self-service free access by prospective readers, comprising:

an open-front box body-like bin comprising a bin body having a back wall integrally joined with an outer peripheral wall including a generally vertical left wall, a generally vertical right wall, a generally horizontal bottom wall and a generally horizontal top wall, adjoining ones of said walls being joined along respective corners; said outer peripheral wall having a front edge which defines a frontal opening into said bin body, said bin body being sized to receive a stack of newspapers resting on said bottom wall, between said left and right walls;

said back wall including at least one pair of laterally spaced rib means extending vertically thereon; for each said pair of rib means, a slot being formed in said top wall at a location disposed between said pair of rib means; a stop web means extending transversally between each rib means of each pair; at least one post extending down through a respective said slot, between two respective rib means and engaged on a respective stop web, leaving a respective stub portion extending up out of the respective said slot; and

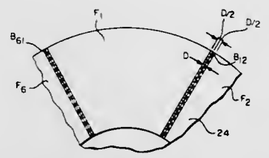
a second container for removably containing at least one newspaper, said second container comprising a back wall joined with an outer peripheral wall including a generally vertical left wall, a generally vertical right wall and a generally horizontal bottom wall; means defining an opening into said second container so that said at least one newspaper may be inserted in and retrieved from within said second container; said second container having means associated with said back wall securing each said stub portion to said second container with said bottom wall of said second container supported on said top wall of said bin body.

4,787,688

HOLOGON AND METHOD OF MANUFACTURING A HOLOGON

Ross E. Rumfola, Avon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,539
Int. Cl.[4] G02B *5/32, 26/10;* **G03H** *1/04, 1/26*
U.S. Cl. 350—3.71 **5 Claims**



1. A method of manufacturing a hologon having a plurality, 'n', of facets, including the steps of:

providing a substrate having an axis about which the hologon is rotated in use;

providing a photosensitive layer on said substrate;

directing beams of radiation from being producing means at said photosensitive layer to create a first interference pattern on said layer to form in said layer a precursor of a diffraction grating;

masking said beams with a mask whereby said interference pattern is on only a preselected region of said layer having an arcuate extent slightly greater than (360/n)°, measured at said axis;

relatively rotationally displacing said substrate and said beams and mask through an angle of (360/n)° about said axis and repeating the aforesaid steps of directing beams and masking said beams whereby an interference pattern is created on, and a diffraction grating precursor is formed in, a second preselected region of said photosensitive layer similar in size to and slightly overlapping the first-mentioned region, whereby diffraction effects created by an edge of said mask during the creation of the interference pattern in said second region overlap the diffraction effects created by another edge of said mask during the creation of the interference pattern in the first-mentioned region;

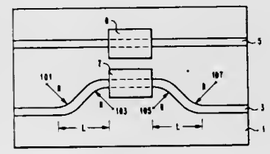
and processing said photosensitive layer whereby diffraction gratings are created from said precursors formed in the photosensitive layer by the interference patterns.

4,787,689

DEVICES HAVING LOW LOSS CURVED OR TAPERED OPTICAL WAVEGUIDES

Steven K. Korotky, Toms River, and Enrique A. J. Marcatili, Rumson, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 3, 1985, Ser. No. 730,672
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.12 **15 Claims**



1. A device comprising, a substrate, an optical waveguide, said waveguide being in said substrate, said device having a cross-sectional profile of refractive index through and in the vicinity of said waveguide which can be represented as a sum of a first profile of refractive index and a second profile of refractive index,

said first profile of refractive index being such as to result in guidance of an electromagnetic wave at least in the absence of bends or tapers, and

said second profile of refractive index being such as to essentially equalize optical path length around a bend or through a taper,

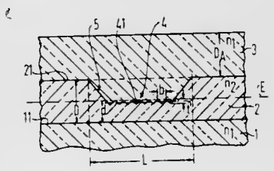
whereby radiation loss at said bend or taper is minimized.

4,787,690

CUT-OFF FILTER FOR INTEGRATED OPTICS

Reinhard Maerz, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,268
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1986, 3609891
Int. Cl.[4] G02B *27/42*
U.S. Cl. 350—96.12 **14 Claims**



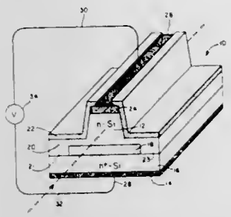
1. In a cut-off filter for integrated optics in the form of a relief-like surface grating on a strip waveguide, the improvements comprising said strip waveguide having a region of reduced layer thickness and said grating being fashioned in said region and having a constant corrugation depth.

4,787,691

ELECTRO-OPTICAL SILICON DEVICES

Joseph P. Lorenzo, Stow, and Richard A. Soref, Newton Centre, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 26, 1987, Ser. No. 36,822
Int. Cl.[4] G02B *6/10, 6/00;* **H01L** *29/42, 29/06*
U.S. Cl. 350—96.14 **19 Claims**



1. An electrooptic phase modulator comprising:

(a) a silicon substrate;

(b) an insulating dielectric layer positioned upon said silicon substrate;

(c) a crystalline silicon layer deposited upon said dielectric layer, said crystalline silicon layer formed into a waveguide for the transmission of light;

(d) a first doped region forming a part of said crystalline silicon layer adjacent to said waveguide;

(e) a second doped region forming a part of said crystalline silicon layer adjacent to said waveguide and differently doped than said first doped region;

(f) a passivating layer substantially covering said crystalline silicon layer;

(g) a first electrical contact connected to said first doped region layer; and

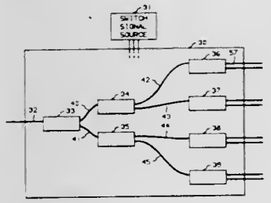
(h) a second electrical contact electrically connected to said second doped region wherein connection of said electrical contacts to an electric voltage source affects the phase of light transmitted through said waveguide.

4,787,692

ELECTRO OPTICAL SWITCH ARCHITECTURES

Ronald A. Spanke, Wheaton, Ill., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 13, 1987, Ser. No. 25,331
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 **9 Claims**



1. An optical switching network having N input ports and M output ports where M and N are non-zero powers of 2 comprising:

a number of switch stages equal to log M plus log N where each stage is assigned a number from 1 to log M plus log N in sequence from the input ports to the output ports;

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where the stage numbered log M comprises M×N/2 optical 1 by 2 switch elements and each stage between the stage log M and the input ports comprises one-half of the number of 1 by 2 optical switch elements in the next nearer stage to the stage log M and where the stage numbered (log M)+1 comprises M×N/2 optical 2 by 1 switch elements and each stage between stage (log M)+1 and the output ports comprises one-half of the number of 2 by 1 optical switch elements in the next nearer stage to the stage (log M)+1;

interconnection means for interconnecting the M×N outputs of stage log M to the M×N inputs of stage (log M)+1;

input interconnection means for connecting the outputs and inputs of adjacent stages of the stages numbered 1 through log M;

output interconnection means for connecting the outputs and inputs of adjacent stages of the stages numbered (log M)+1 through log M plus log N;

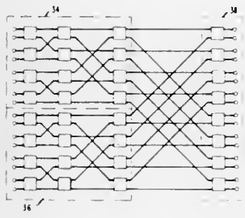
wherein the connections between at least one of the stages connected by said input and said output interconnection means comprise optical crossovers of optical waveguides diffused in a substrate.

4,787,693

PASSIVE STAR COUPLER

Herwig W. Kogelnik, Rumson, and Adel A. M. Saleh, Holmdel, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 2, 1987, Ser. No. 115,942
Int. Cl.⁴ G02B *6/28*
U.S. Cl. 350—96.16 **3 Claims**



1. A single mode fiber passive star coupler having a number of ports n equal to an arbitrary multiple (l) of a perfect square (m^2) of an arbitrary number (m); characterized by ml transmissive m×m stars, the ports i of the l transmissive m×m stars of l-group i, i=1,2, . . . , m, are coupled together via a reflective l star; and the ports i of the l transmissive m×m stars of l group #j,i,j=1,2 . . . , m, i≠j, are coupled via(m−1) transmissive l×l stars to ports j of the l transmissive m×m stars of the l-group #i.

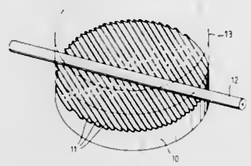
4,787,694

OPTICAL FIBRE POLARIZER

Roger J. Brambley, Romsey, and David N. Payne, Bursledon, both of Great Britain, assignors to STC PLC, London, England, England

Filed Mar. 16, 1987, Ser. No. 25,945
Claims priority, application United Kingdom, Mar. 19, 1986, 8606736
Int. Cl.⁴ G02B *6/34*
U.S. Cl. 350—96.19 **2 Claims**

1. A polariser which for a given optical frequency exhibits differential attenuation of light of two orthogonal planes of polarisation, which polariser is constituted by a length of polarisation maintaining single mode fibre strained at regular intervals along a region of its length at a periodicity that promotes, for said given frequency, coupling of one of the two orthogonally polarized guided modes of the fibre into an unguided mode, which coupling is strong compared with the



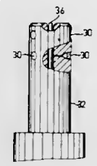
coupling it induces at that given frequency between the other of the two orthogonally polarized guided mode of the fibre and any unguided mode.

4,787,695

OPTICAL FIBER CONNECTOR AND ASSEMBLY METHOD THEREOF

Herzl Laor, 8 Rehov Pines, Rehovot, Israel

Filed Dec. 24, 1985, Ser. No. 813,248
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **8 Claims**



1. A method for producing a fiber optic connector comprising the steps of:

providing a ferrule having formed therein an elongate bore for receiving an optical fiber, the dimensions of said bore being larger than those of said fiber, whereby the orientation of said fiber in said bore may be selectably determined;

inserting an optical fiber having an outer diameter smaller than the inner diameter of the elongate bore within the elongate bore;

selectably precisely positioning said optical fiber in said bore, and

soldering the optical fiber in place in the ferrule.

4,787,696

MOUNTING APPARATUS FOR OPTICAL FIBERS AND LASERS

Peter E. Norris, Cambridge, and Robert J. Regan, Needham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 18, 1987, Ser. No. 135,808
Int. Cl.⁴ G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **15 Claims**

1. Apparatus for mounting an array of laser devices in alignment with an array of optical fibers comprising:

a carrier member of semiconductor material;

a slot in said carrier member;

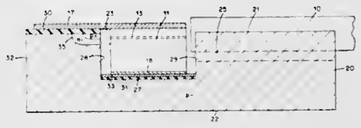
an integral laser structure comprising an array of semiconductor laser devices;

said carrier member being adapted to receive said laser structure in said slot;

a plurality of grooves in said carrier member, each groove

being adapted to receive an optical fiber and to position the optical fiber with an end thereof in light-receiving relationship adjacent to one of said laser devices; and

a plurality of light detecting devices in said carrier member



adjacent to said slot, each of said light detecting devices being aligned with a different one of said grooves with one of said laser devices being interposed between a light detecting device and the groove which is aligned therewith.

4,787,697

OPTICAL FIBER CONNECTOR HAVING MAGNIFYING LENS

Mark E. Alrutz; David L. Dean, and Dennis M. Knecht, all of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Nov. 20, 1987, Ser. No. 123,239
Int. Cl.⁴ G02B *6/36, 7/26*
U.S. Cl. 350—96.20 **8 Claims**



1. Apparatus comprising:

(a) two optical fibers; and

(b) a frame holding the two optical fibers in an end to end abutting relationship, the frame having a transparent portion comprising a magnifying lens transverse to the area of abutment of the optical fibers.

4,787,698

METHODS OF AND APPARATUS FOR RECONFIGURING OPTICAL FIBER CONNECTOR COMPONENTS AND PRODUCTS PRODUCED THEREBY

Robert P. Lyons, Middlesex County, N.J.; John M. Palmquist, Gwinnett County, Ga.; Susan S. Sachs, Middlesex County; Ralph A. Treder, Jr., Mercer County, both of N.J., and Thomas L. Williford, Jr., Gwinnett County, Ga., assignors to American Telephone and Telegraph Co., AT&T Bell Labs, Murray Hill and AT&T Technologies, Inc., Berkeley Heights, both of, N.J.

Filed Nov. 27, 1985, Ser. No. 802,500
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **25 Claims**

1. A method of reconfiguring an end portion of a plug, which is adapted to terminate an optical fiber, said method comprising the steps of:

holding the plug, which includes a passageway within which is adapted to be disposed an end portion of an optical fiber having a transverse cross section substantially equal to that of the passageway, on a support having an axis of rotation such that the end portion of the plug is exposed;

determining the location of the axis of rotation in an end face of the plug;

causing relative motion between the plug and the support to cause the plug to be moved in a manner to cause the centroid of the cross sectional area of a beam of light within the passageway at the end face of the plug to be moved to become disposed along the axis of rotation; and

reconfiguring the end portion of the plug to cause the centroid of the cross-sectional area of the beam of light in the end face of the plug to be in a predetermined location with respect to an alignment surface of the reconfigured end portion.

14. An apparatus for reconfiguring an end portion of a plug, which is adapted to terminate an optical fiber, said apparatus comprising:



support means having an axis of rotation for holding a plug along a portion of the plug spaced from the end portion which includes a passageway that is adapted to receive an end portion of an optical fiber;

light means for launching a beam of light along the passageway;

means for determining the location of the axis of rotation in an end face of the plug;

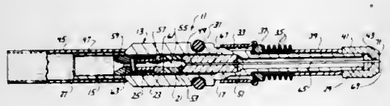
means for moving the plug to cause the centroid of the cross sectional area of the beam of light at its intersection with the end face of the plug to be disposed along the axis of rotation; and

means for reconfiguring the end portion of the plug to cause the centroid of the cross sectional area of the beam of light in the end face of the plug to be in a predetermined loca-

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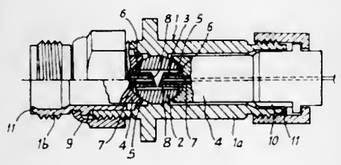
tion with respect to an alignment surface of the reconfigured end portion of the plug.

4,787,699
FIBER OPTIC TERMINUS
Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Sep. 1, 1987, Ser. No. 91,932
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **20 Claims**



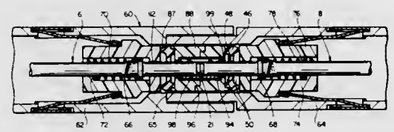
1. A fiber optic terminus comprising:
a body having a passage therein and an outer surface, said passage having an opening at said outer surface for receiving an optical fiber;
means in said passage for guiding the optical fiber;
a temperature-activated adhesive carried by said body, said adhesive being flowable when its temperature is raised to a predetermined level; and
means for applying a compressive force to said adhesive whereby when the temperature of the adhesive is raised to said predetermined level the adhesive flows under the influence of said applying means to adhere the optical fiber in the passage.

4,787,700
ATTENUATOR FOR SINGLE-MODE OPTICAL FIBERS AND PROCESS FOR ITS FABRICATION
Huan B. Yin, Paris, France, assignor to Radiall Industrie, Rosny-S/Bois, France
Filed May 6, 1987, Ser. No. 50,621
Claims priority, application France, May 15, 1986, 86 06991
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **4 Claims**



1. An attenuator for single-mode optical fibers comprising:
two male ferrules each having an axial protuberance with a conduit passing through the protuberance and ferrule into which an optical fiber is positioned and immobilized so that its end coincides with the end of the axial protuberance, each of the ferrules further having a conical groove set back from and surrounding the axial protuberance;
a female access coupler having in a central part thereof a generally spherical thrust bearing body to support aligned male ferrules face to face, said body having a transverse axial orifice for receiving the axial protuberances of the male ferrules and having contact projections for engaging the grooves in the male ferrules under the action of a longitudinal means of pressure;
wherein the end of the protuberance of each of the male ferrules and the end of the immobilized optical fiber are tilted in relation to a plane perpendicular to the longitudinal axis of the ferrule; and
wherein the male ferrule and female access coupling include corresponding indexing references that determine a fixed angular orientation of the optical fibers; and
wherein the axes of said fibers are offset from the optical axis of the attenuator by a fixed amount.

4,787,701
OPTICAL FIBER CONTACT ASSEMBLY
Donald C. Stenger, Pleasanton, and Roger H. Ellis, Atherton, both of Calif., assignors to Raychem Corp., Menlo Park, Calif.
Filed Nov. 13, 1984, Ser. No. 671,145
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **16 Claims**



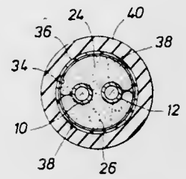
1. An assembly for optically aligning a first optical fiber contact with a second optical fiber contact, comprising:
first and second interconnected shells, said first shell retaining said first contact so as to be matable with said second contact retained by said second shell;
means for axially biasing said first contact towards said second contact;
means for aligning ends of said first and second contacts to be optically aligned;
first and second dynamic seals for sealing opposite ends of said alignment means where said first and second contacts enter said alignment means, each of said dynamic seals being secured to said opposite ends of said alignment means, said first and second dynamic seals having holes therein having inside diameters smaller than an outside diameter of said first and second contacts, respectively, spaces being provided on opposite axial ends of each of said dynamic seals in a vicinity of said holes to allow movement of said dynamic seals in an axial direction during shock and vibration loads.

10. An assembly for optically aligning a first optical fiber contact with a second optical fiber contact, comprising:
first and second interconnected shells, said first shell retaining said first contact so as to be matable with said second contact retained by said second shell;
means for axially biasing said first contact towards said second contact;
means for aligning ends of said first and second contacts to be optically aligned, said aligning means comprising an alignment sleeve having a cylindrical shape, said alignment sleeve being split longitudinally along the axial direction thereof; and
first and second dynamic seals for sealing front ends of said first and second contacts from the environment, each of said dynamic seals being secured to opposite ends of said alignment means.

4,787,702
FIBER OPTIC CABLE AND METHOD OF MAKING THE SAME
Hanna T. Khalil, Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.
Filed Oct. 26, 1987, Ser. No. 112,236
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **50 Claims**

1. A method of making a fiber optic cable comprising the steps of laying two optical fibers and two strands of fibers with the optical fibers being fed by the layer from opposite sides of the axis of rotation of the layer and the two strands of fibers being fed from opposite sides of the axis of rotation of the

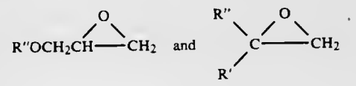
layer, closer to the axis of rotation and at 90° to the optical fibers to cause the optical fibers to be separated by portions of



the fibers in the strands and for the strands to be shorter in length than the optic fibers and covering the optic fibers and the strands with an outer jacket.

4,787,703
CABLE CONTAINING EPOXY-MODIFIED ENCAPSULATION COMPOSITION
Richard F. Tomko; Revati Ranganathan, both of Homewood, Ill.; William D. Sigworth, Naugatuck, Conn., and Dong-Hak Bae, The Woodlands, Tex., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.
Continuation-in-part of Ser. No. 787,870, Oct. 16, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 58,000
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **17 Claims**

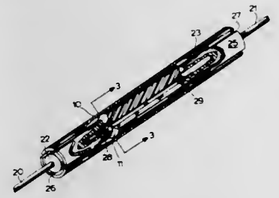
1. A telecommunication cable segment having at least a portion thereof coated with a pourable liquid composition consisting essentially of:
(A) a liquid graft polymer having a Brookfield viscosity of less than about 1,000,000 centipoise at 25° C., said graft polymer either possessing no melting transition peak or possessing a melting transition peak having a maximum value below 25° C. as measured by Differential Scanning Calorimetry; said graft polymer being comprised of: a polymeric backbone selected from the group consisting of polyalphaolefin, ethylene/alphaolefin, copolymer, ethylene/alphaolefin/non-conjugated polyene terpolymer, polyisoprene, polybutadiene, and alphaolefin/polyene copolymer;
said polymeric backbone having grafted thereto a sufficient amount of at least one compound selected from the formulae:



wherein
R″ is a C_2-C_{16} hydrocarbon radical containing an ethylenically unsaturated bond or a C_3-C_{12} radical containing one or more carbonyl groups and an ethylenically unsaturated double bond; ,and
is hydrogen or C_1-C_4 alkyl; such that said graft polymer is rendered crosslinkable;
said graft polymer having a number average molecular weight of between about 500 and about 20,000; and
(B) a sufficient amount of a suitable curative to cure the composition.

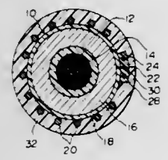
10. The telecommunication cable segment of claim 1 wherein said cable segment is composed of fiber optic filaments.

4,787,704
REMATABLE OPTICAL SPLICE UTILIZING RODS WITH RESILIENT COATING
Dennis M. Knecht, and David L. Dean, both of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.
Continuation-in-part of Ser. No. 933,875, Nov. 24, 1986, abandoned. This application Jul. 27, 1987, Ser. No. 80,239
Int. Cl.[4] G02B *7/26*
U.S. Cl. 350—96.21 **34 Claims**



1. A splice comprising:
(a) a frame having a channel in lengthwise communication with an exterior surface of the frame;
(b) two rigid rods beside each other in the channel of the frame delimiting a groove therebetween into which two optical fiber terminal end portions may be abutted one against the other, each rod having a resilient lengthwise coating thereon;
(c) a lid at least partially covered by a resilient coating adapted to be in lengthwise contact with the two rigid coated rods when the lid is closed; and,
(d) a device to compress the frame and the lid into mating relationship, said device comprising (i) a housing larger than the frame and lid placed around the frame and lid, the end portions of the housing extending beyond the frame and lid, and (ii) resilient tubular members nested within the housing on either end of the frame and lid.

4,787,705
COMPOSITE OPTICAL FIBER AND POWER CABLE
Takashi Shinmoto, Nagareyama, and Masato Koike, Tokyo, both of Japan, assignors to Fujikura Ltd., Tokyo, Japan
Filed Feb. 6, 1987, Ser. No. 11,798
Claims priority, application Japan, Sep. 5, 1986, 61-208884
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **1 Claim**



1. A composite power cable comprising:
(a) an elongated cable core having an electrical conductor extending longitudinally along the length thereof and a shield layer of a semiconductive material provided around said conductor;
(b) an outer sheath of polyethylene encompassing said cable core;
(c) a plurality of concentric neutral wires embedded in said outer sheath and helically wound around said cable core; and
(d) at least one elongated flexible optical fiber unit embedded in said outer sheath and wound around said cable core so as to extend along said neutral wires, said optical fiber unit comprising an elongated body of polyvinyl chloride ex-

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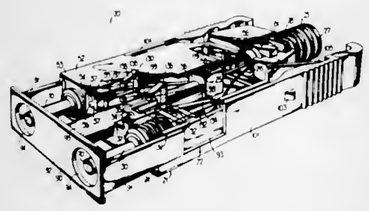
tending longitudinally along the length thereof, at least one flexible tube of nylon embedded in said body to extend longitudinally along the length of said body, at least one optical fiber loosely received in said tube to extend longitudinally along the length of said tube and at least one elongated tension member embedded in said body to extend longitudinally along the length of said body, said outer sheath and said optical fiber unit having colors different from each other so as to be distinguishable from each other as viewed in cross-section, said body of said optical fiber unit being flat and having one side held in contact with an outer peripheral surface of said cable core, a thickness of said body between said one side thereof and the other side thereof being not greater than a diameter of said neutral wires.

4,787,706

DUPLEX OPTICAL FIBER CONNECTOR

Thomas C. Cannon, Jr.; Arthur W. Carlisle, both of Dunwoody, and Bruce V. Darden, Lawrenceville, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 3, 1987, Ser. No. 10,508
Int. Cl.⁴ G02B *6/36*
U.S. Cl. 350—96.20 **36 Claims**



1. A duplex optical fiber connector for terminating two optical fibers of a cable and being adapted to be joined to another connector, said duplex connector comprising:

a housing which comprises first and second mating portions and which includes a cable entrance end and a plug end;

force transfer means adapted to be disposed adjacent to said cable entrance end and through which the optical fibers extend for transferring tensile forces applied to the cable to the housing;

plug means adapted to be associated with each of the optical fibers and disposed within said housing adjacent to said plug end of said housing a predetermined distance from said force transfer means, each said plug means including a plug adapted to be associated with and to terminate one of the optical fibers of the cable, and protruding from said plug end of said housing; and

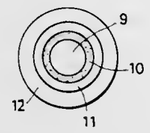
protective means mounted on said housing in which said plug means are disposed for reciprocal movement with respect to said housing for protecting end portions of the plugs which protrude from said housing and which is caused to be retracted when said connector is joined to another connector to expose said plugs and allow them to be operatively connected to plugs of the other connector.

4,787,707

COMPOSITE OVERHEAD TRANSMISSION CABLE

Yoshinobu Kitayama, and Yasunori Saito, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 722,472, Apr. 12, 1985, abandoned. This application Sep. 18, 1987, Ser. No. 99,695
Claims priority, application Japan, Apr. 16, 1984, 59-75018
Int. Cl.⁴ G02B *6/44*
U.S. Cl. 350—96.23 **8 Claims**



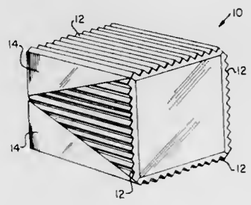
1. A composite overhead transmission cable comprising a plurality of stranded conductors (5) wound around an optical fiber protective tube (4) of a metallic material which has a plurality of optical fibers (3) and/or optical fiber bundles accommodated therein, characterized by: said optical fibers and/or optical fiber bundles being composed of glass, a spacer (1) having spiral grooves (2) formed in its periphery sealingly accommodated in said protective tube, said optical fibers and/or optical bundles composed of a plurality of said optical fibers being accommodated in said spiral grooves and thus sealed within said tube, and means for suppressing the formation of OH groups that form as a result of hydrogen gas diffusing from the tube and reacting with defects in the optical fibers, said suppressing means including fluorine doping provided exclusively in a cladding of said optical fibers.

4,787,708

APPARATUS FOR CONTINUOUSLY CONTROLLED EMISSION OF LIGHT FROM PRISM LIGHT GUIDE

Lorne A. Whitehead, Vancouver, Canada, assignor to TIR Systems Ltd., Burnaby, Canada

Filed May 8, 1987, Ser. No. 47,661
Int. Cl.⁴ G02B *6/00*
U.S. Cl. 350—96.28 **46 Claims**



16. A light guide, having:

(i) a central path comprising as the locus of points which are the centroids of the segments contained with in said light guide of all planes which intersect said light guide and which are oriented such that the area of each of said plane segments is a minimum; and,

(ii) an average cross-sectional dimension comprising, for each one of said plane segments, the average length of those portions of all lines within said light guide which lie on said one plane segment and which intersect said light guide;

wherein:

(a) the length of said light guide is substantially greater than the average cross-sectional dimension of substantially all of said plane segments;

(b) the fractional rate of change, along said light guide, of substantially all randomly selected cross-sectional dimensions of said light guide, is substantially less than the reciprocal of the average cross-sectional dimension of substantially all of said plane segments;

(c) the radius of curvature of said central path at substantially all randomly selected points on said central path is substantially greater than the average cross-sectional dimension of substantially all of said plane segments; and

(d) said light guide contains a mechanism which causes light to escape from said light guide at a rate which varies along the length of said light guide, such that the amount of light escaping, per unit length, along said light guide has a selected distribution of values,

and further comprising

an external cover over at least a portion of said light guide, whereby:

(a) a portion of the light which escapes from said light guide is transmitted through said cover and away from said light guide; and

(b) the remaining portion of said escaping light is reflected by said cover back into said light guide.

4,787,709

OPTICAL FIBER HAVING GLASS CORE AND FLUORO-COPOLYMER CLADDING

Akira Kawada, Tokyo; Takashi Yasumura, Fujimi, and Toshio Koishi, Sakado, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 6, 1986, Ser. No. 826,588
Claims priority, application Japan, Feb. 20, 1985, 60-30622
Int. Cl.⁴ G02B *6/16*
U.S. Cl. 350—96.34 **5 Claims**



1. An optical fiber of the step-index type comprising:

a solid cylindrical core which is formed of an inorganic glass; and

a cladding layer which is in close contact with said core and is formed of a copolymer of vinylidene fluoride with hexafluoroacetone wherein the molar ratio of vinylidene fluoride to hexafluoroacetone in said copolymer is in the range from 96:4 to 88:12.

4,787,710

VARIABLE RATIO BEAM SPLITTER

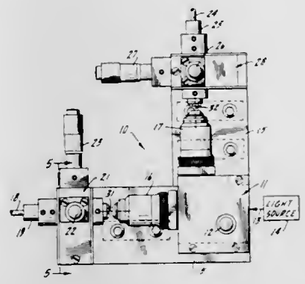
William E. Durell, 41310 N. Westlake, Antioch, Ill. 60002

Filed Jul. 3, 1986, Ser. No. 881,933
Int. Cl.⁴ G02B *27/10, 27/14, 6/26, 6/32*
U.S. Cl. 350—173 **10 Claims**

1. A variable ratio beam splitter for dividing an initial p-polarized beam of light into two polarized output beams, over a given intensity ratio range, comprising:

an optical array including first, second and third right angle prisms each having a hypotenuse surface and two side surfaces and a penta prism having two right-angle surfaces, a first side surface of each of the first and second right angle prisms affording an output comprising one of the two output beams and the third right angle prism affording an input for the initial beam through a first one of its side surfaces,

the first and third right angle prisms being aligned facing each other along their hypotenuse surfaces, the penta prism being aligned with the third right angle prism with a first one of the two right angle surfaces of the penta prism facing the second side surface of the third right angle prism, and the second right angle prism being aligned with the penta prism with the second side surface of the second right angle prism facing the second right angle surface of the penta prism and the hypotenuse surface of the second right angle prism projecting at an angle of 45° from the second side surface of the third right angle prism;



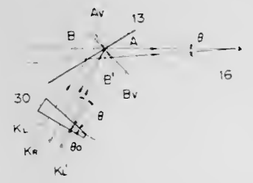
and means to rotate the optical array relative to a source of an initial polarized beam of light directed toward and impinging upon the first side surface of the third right angle prism, over a predetermined angular range to vary the ratio of intensities of the two output beams over the aforeaid intensity ratio range.

4,787,711

ON-VEHICLE HEAD UP DISPLAY DEVICE WITH OPTICAL MEANS FOR CORRECTING PARALLAX IN A VERTICAL DIRECTION

Yoshiyuki Suzuki; Tatsumi Ohtsuka; Tadashi Iino, all of Susono; Akihisa Kasahara, and Noriyasu Tomiyama, both of Tokorozawa, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Sep. 12, 1986, Ser. No. 907,148
Claims priority, application Japan, Jan. 23, 1986, 61-11123; Mar. 28, 1986, 61-68467
Int. Cl.⁴ G02B *27/10, 5/04*
U.S. Cl. 350—174 **2 Claims**



1. An on-vehicle head-up display apparatus wherein a windshield glass having inner and outer surfaces of a vehicle is utilized as a catoptric system to reflect an image of various information on the vehicle from said inner surface of the windshield glass, comprising:

display means for indicating said information;

first optical means for forming a virtual image of said information displayed on said display means; and

second optical means positioned between said first optical means and said windshield glass, for correcting parallax of said virtual image reflected on said inner surface of said windshield glass, in a vertical direction.

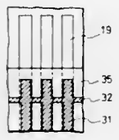
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4,787,712

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY DEVICE HAVING CAPACITIVE ELECTRODES OPPOSITE THE SOURCE BUSES

Yasuhiro Ukai; Teizo Yukawa, and Tomihisa Sunata, all of Kobe, Japan, assignors to Hosiden Electronics Co., Ltd, Osaka, Japan

Filed Jan. 4, 1988, Ser. No. 140,681
Claims priority, application Japan, Jan. 16, 1987, 62-7656
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—333 **6 Claims**



1. An active matrix liquid crystal display device in which liquid crystal is sealed in between a pair of opposed first and second transparent substrates, picture element electrodes are arranged in a matrix form on the inner surface of the first transparent substrate, gate buses are each disposed along one of the row arrangements of the picture element electrodes, source buses are each disposed along one of the column arrangements of the picture element electrodes, a thin film transistor is provided at each intersection of the gate and source buses, and the gate, source and drain of the thin film transistor are connected to the gate bus, the source bus and the picture element electrode corresponding to the thin film transistor, whereby a liquid crystal display element is constituted;

wherein a plurality of outputs of a source driver are connected to the source buses, respectively;

capacitive electrodes are provided on the first transparent substrate in opposing relation to the source buses, respectively, with an insulating layer sandwiched therebetween; and

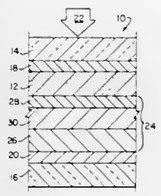
the capacitive electrodes are connected to a common potential point to form a desired electrostatic capacitance between each of the capacitive electrode and the corresponding source bus.

4,787,713

TRANSPARENT LASER-ADDRESSED LIQUID CRYSTAL LIGHT MODULATOR CELL

Sun Lu, San Jose, and Aharon Hochbaum, Berkeley, both of Calif., assignors to The Mead Corporation, Dayton, Ohio

Filed May 22, 1987, Ser. No. 53,216
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—342 **26 Claims**



1. A laser-addressable liquid crystal cell, comprising:

first and second transparent substrate layers for defining the outer surfaces for said cell;

first and second electrode layers, each formed from a transparent electrically conductive material, said first electrode layer disposed adjacent said first substrate layer, and said second electrode layer disposed adjacent said second substrate layer;

a smectic liquid crystal layer disposed between said electrode layers; and

means disposed between said liquid crystal layer and said second electrode layer for absorbing infrared radiation while permitting visible radiation to pass therethrough;

said infrared absorbing means including a layer of radiation absorbing material, a layer selectively reflective to infrared radiation and transparent to visible radiation, and a spacer layer of dielectric material disposed therebetween.

4,787,714

OPTICAL SYSTEM INCLUDING DEVICE FOR OPTICALLY PROCESSING ELECTROMAGNETIC RADIATION AT A REPETITION RATE GREATER THAN ABOUT 1.25×10^4 HZ

Benjamin I. Greene, Westfield; Rebecca R. Millard, New Providence; Joseph Orenstein, Red Bank, all of N.J., and Leah R. Williams, Cambridge, Mass., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 17, 1986, Ser. No. 875,268
Int. Cl.[4] G02B *5/23, 6/10;* G02F *1/01;* H01S *3/10*
U.S. Cl. 350—354 **7 Claims**



1. An optical system, comprising:

at least a first source of electromagnetic radiation;

means, in optical communication with said first source, for processing the electromagnetic radiation emitted by said first source; and

a detector of electromagnetic radiation, in optical communication with said means, characterized in that

said means includes a material region essentially free of inorganic semiconductor material, exhibiting a nonlinear optical response at one or more resonant wavelengths of electromagnetic radiation, and at least a second source of electromagnetic radiation in optical communication with said material region, the wavelength, duration and intensity of the electromagnetic radiation emitted by said second source, and impinging upon said material region, being chosen to achieve a resonant, nonlinear optical response, essentially free of any relatively slow component, in said material region, at a repetition rate greater than about 1.25×10^4 Hz.

4,787,715

FUEL ASSEMBLY GRID INSPECTION APPARATUS

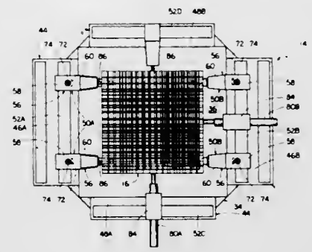
Hassan J. Ahmed, and Michael J. Field, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1987, Ser. No. 64,980
Int. Cl.[4] G21C *17/00, 21/00*
U.S. Cl. 356—244 **14 Claims**

1. In a fuel assembly grid inspection apparatus, the combination comprising:

(a) a precision noncontact measurement device having illuminating means and viewing means defining an inspection field of view, said viewing means being adapted to view and record an image of a fuel assembly grid located in said field of view to provide information about the grid from which measurements can be calculated; and

(b) a fixture adapted to support the grid within said inspection field of view and having a plurality of grid engaging portions which project into said field of view to support



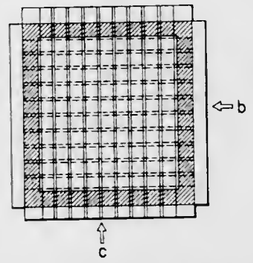
the grid, said portions being substantially transparent to said viewing means of said measurement device.

4,787,716

COLOR MEMBER AND METHOD FOR MANUFACTURING SAME

Naoki Kato; Koji Iwasa; Hitoshi Kamamori; Mitsuru Suginoya; Yutaka Sano, and Yumiko Terada, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,479
Claims priority, application Japan, Feb. 28, 1984, 59-36786
Int. Cl.[4] G02F *1/01*
U.S. Cl. 350—357 **39 Claims**



1. A colored article comprising: a substrate; a first electroconductive layer disposed on said substrate; a second electroconductive layer directly superposed on said first electroconductive layer, the second electroconductive layer being comprised of a material selected from the group consisting of tin oxide, antimony oxide, zinc oxide, cadmium oxide, gallium oxide, germanium oxide, gold, silver, nickel, aluminum and silicon; and a colored layer superposed on the second electroconductive layer.

4,787,717

ELECTROCHROMIC INDICATOR DEVICE WITH REFLECTING BACKGROUND

Jutta Heinz geb Belgardt, Gerlingen; Helmut Sautter, Ditzingen; Rainer Schink, Leonberg, and Lothar Weber, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,616
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211638
Int. Cl.[4] G02F *1/01;* B05D *5/12*
U.S. Cl. 350—357 **2 Claims**

1. A process of producing an electrochromic indicating device with a porous reflecting background layer comprising the steps of:

applying a counterelectrode layer, having the capability of taking up or giving off ions according to the polarity of voltage applied to the device, to a metal substrate, said counterelectrode layer being thereby supported on said substrate;

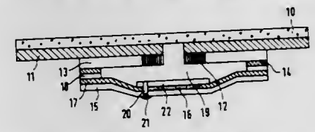
preparing a paste or varnish comprising an inorganic pigment and a synthetic resin binder, as material for making a reflecting background layer;

applying said paste or varnish in a layer on top of said counterelectrode layer by a screen printing method,

baking said substrate, counterelectrode layer and paste or varnish layer in a baking process such that a porous reflecting background layer is formed when said binder therein becomes hardened by baking;

subjecting said metal substrate and said baked layers thereon to deep drawing deformation producing a depression therein for forming a cavity in said electrochromic device for containing an electrolyte;

preparing a second substrate, wherein said substrate is transparent and is overlaid with a transparent electric conducting layer, said conducting layer being covered on one surface both in a central region, by a layer of a transition metal oxide, and in a contiguous surrounding region, by a protective layer, such that said protective layer laterally surrounds the metal oxide layer, said conductive and oxide layers together constituting an electrochromic electrode, assembling the two substrates together such that the electrochromic electrode and paste or varnish layer face each other across said depression produced by drawing said metallic substrate, said assembly being fluid-tight except for a filling inlet, and



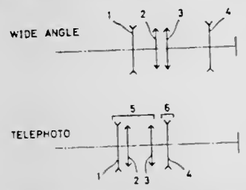
filling the space corresponding to said depression with an electrolyte and sealing said electrolyte therein.

4,787,718

ZOOM LENS SYSTEM

Michio Cho, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1987, Ser. No. 34,144
Claims priority, application Japan, Apr. 7, 1986, 61-78397
Int. Cl.[4] G02B *15/14, 15/177*
U.S. Cl. 350—427 **8 Claims**



1. A zoom lens system adjustable for wide-angle photography and telephotography by varying the focal length thereof, said zoom lens system comprising, in order from the object side:

front lens means including, in order from the object side, first lens means having a negative refraction power, and second and third lens means each having a positive refraction power; and

rear lens means including a fourth lens means having a negative refraction power;

said front and rear lens means being axially movable relative to each other to decrease the distance therebetween and said second lens means being movable toward said first lens means to decrease the distance therebetween and to

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increase the distance between said second and third lens means, thereby to lengthen said focal length so as to adjust said zoom lens system for telephotography; and

said front and rear lens means being axially movable relative to each other to increase said distance therebetween and said second lens means being movable toward said third lens means to decrease the distance therebetween and to increase the distance between said first and second lens means, thereby to shorten said focal length so as to adjust said zoom lens system for wide-angle photography.

4,787,719

ZOOM LENS SYSTEM

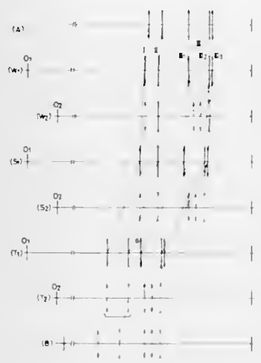
Toshihiro Imai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,222

Claims priority, application Japan, Oct. 18, 1984, 59-217284

Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **6 Claims**



1. A zoom lens system comprising a plurality of lens groups disposed along an optical axis, one of which is located on the most object side of such axis and is movable along said optical axis at the time of zooming, another of said lens groups, arranged at another position on said axis and comprising a positive lens component and a negative lens component, whereby focusing is done by moving said another lens group along said optical axis at the same time changing the relative distance between said positive lens component and said negative lens component, and the moving amounts of said another lens group and said positive and negative lens components is constant for any value of focal length of the lens system as a whole, wherein one of said lens groups, except said another lens group for focusing, is movable along said optical axis so that focusing for objects positioned in a range is done, except the range for which focusing can be done by moving said another lens group.

4,787,720

LENS MOUNTING

Susumu Fukita, and Yoshitaka Noh, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1987, Ser. No. 29,894

Claims priority, application Japan, Apr. 8, 1986, 61-052946[U]

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—429 **3 Claims**

1. A zoom lens comprising:

an optical system having first and second movable lenses simultaneously moving when zooming and having an optical axis;

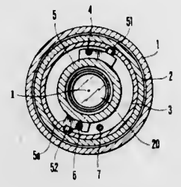
a fixed barrel accommodating said optical system;

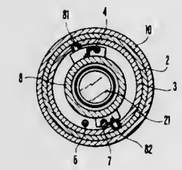
a cam sleeve supported on said fixed barrel rotatably about the optical axis;

a first pair of camming grooves for controlling the movement of said first movable lens provided in said cam sleeve;

a second pair of camming grooves for controlling the movement of the second movable lens provided in said cam sleeve;

a first holding ring holding said first movable lens and having projected portions in engagement with said first pair of camming grooves;





a second holding ring holding said second movable lens and having projected portions in engagement with said second pair of camming grooves;

a first guide bar for guiding the axial movements of said first and said second holding rings provided on said fixed barrel so as to lie above said optical axis;

a second guide bar for guiding the axial movement of said first holding ring fixed to said fixed barrel; and

a third guide bar for guiding the axial movement of said second holding ring provided on said fixed barrel.

4,787,721

PHOTOGRAPHIC LENS SYSTEM

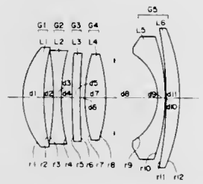
Akira Fukushima, and Yoshinobu Kudo, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1985, Ser. No. 766,822

Claims priority, application Japan, Aug. 18, 1984, 59-172268; Dec. 10, 1984, 59-261365

Int. Cl.[4] G02B *13/18, 9/60, 9/62*

U.S. Cl. 350—432 **28 Claims**



1. A photographic lens system comprising from the object side to the image side;

a front lens unit of a positive refractive power including at least four lens components containing a front lens component with an aspheric surface; and

a rear lens unit of a negative refractive power including a rear lens component with an aspheric surface;

wherein the lens system fulfills the following condition when $0.5\ R_F < h < R_F$ is maintained:

$$t_F(h) > r_l\left(1-\sqrt{1-\left(\frac{h}{r_l}\right)^2}\right)-$$

$$r_k\left(1-\sqrt{1-\left(\frac{h}{r_k}\right)^2}\right)+d_F$$

wherein,

h; the height from the optical axis,

$t_F(h)$; the thickness of the front lens component on the height h,

r_k; the paraxial radius of curvature of the object side surface of the front lens component,

r_l; the paraxial radius of curvature of the image side surface of the front lens component,

d_F; the axial thickness of the front lens component, and

R_F; the minimum value among $|r_k|$, $|r_l|$, and the effective height of the aspheric surface of the front lens component.

4,787,722

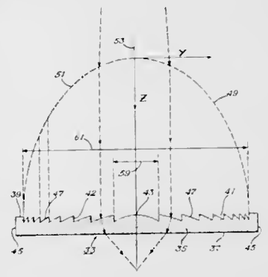
FRESNEL LENS WITH ASPITERIC GROOVES

Richard N. Claytor, Arlington, Tex., assignor to Fresnel Technologies, Inc., Fort Worth, Tex.

Filed Apr. 10, 1986, Ser. No. 850,256

Int. Cl.[4] G02B *3/08, 13/18*

U.S. Cl. 350—452 **2 Claims**



1. A Fresnel lens formed of a material capable of transmitting infrared energy rays, the lens comprising:

a body, having a grooved surface;

the grooved surface having a plurality of grooves, which extend to the same depth;

the grooves being of different widths; and

a substantial portion of the grooves each individually having a surface formed thereon which is entirely aspherical and differs in contour from the surfaces of the other grooves.

4,787,723

ULTRA-WIDE ANGLE F-θ LENS SYSTEM

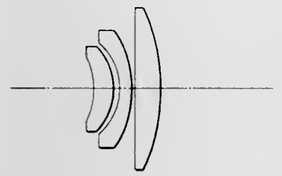
Toshifumi Uetake, Tokyo, Japan, assignor to Copal Electronics Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 919,022

Claims priority, application Japan, Oct. 15, 1985, 60-227828

Int. Cl.[4] G02B *9/14, 26/10*

U.S. Cl. 350—475 **6 Claims**



1. An ultra-wide angle f-θ lens system comprising, in the order from the light beam deflector side, a first lens component having positive power, a second lens component having negative power, and a third lens component having positive power, said ultra-wide angle f-θ lens system fulfilling the following conditions:

$$0.19F_0 \leqq L \leqq 0.23F_0 \quad (1)$$

$$-0.35 \leqq R_2/F_0 \quad (2)$$

$$1.60 \leqq n \quad (3)$$

$$-5.0F_0 \geqq F_{12} \quad (4)$$

where, reference symbol L represents the overall length of the lens system as a whole, reference symbol F_0 represents the focal length of the lens system as a whole, reference symbol R_2 represents the radius of curvature of the surface on the light beam deflector side of the first lens component, reference symbol n represents the refractive index of the third lens component for the wavelength of 780 nm, and reference symbol F_{12} represents the total focal length of the first and second lens components.

4,787,724

TRIPLET TYPE OBJECTIVE WITH A DIAPHRAGM ARRANGED BEHIND THE LENS SYSTEM

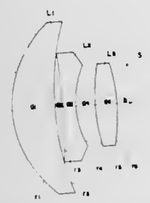
Yoshinobu Kudo, Sakai; Akira Fukushima, Osaka, and Kazuo Kimura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 6, 1987, Ser. No. 11,980

Claims priority, application Japan, Feb. 7, 1986, 61-26610

Int. Cl.[4] G02B *9/14*

U.S. Cl. 350—475 **9 Claims**



1. A triplet type objective lens system with a diaphragm arranged behind the lens system, comprising from the object side:

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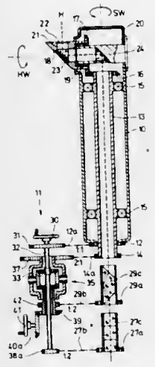
a first positive meniscus lens element made of a glass material and having a positive refractive power on the object side surface;
a second biconcave lens element made of a plastic material;
a third biconvex lens element made of a plastic material, and
a diaphragm, wherein the lens system fulfills the following conditions:

$$0.25f < \Sigma d + b < 0.45f$$

$$0.18 < N_1 - N_3 < 0.4$$

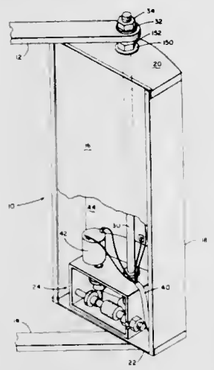
wherein:
f represents a focal length of the whole lens system;
Σd represents an axial distance from the object side surface of the first lens element to the image side surface of the third lens element;
b represents an axial distance from the image side surface of the third lens element to the diaphragm;
N_1 represents a refractive index of the first lens element, and
N_3 represents a refractive index of the third lens element.

4,787,725
PANORAMIC PERISCOPE
Theodor Preussner, Ermlaadstrasse 92 E, D-3004 Tseruhagen (NB), and Jochen S. Fischinger, Baddeynhansen, both of Fed. Rep. of Germany, assignors to Theodor Preussner, Isernhagen, Fed. Rep. of Germany
Filed Jan. 9, 1987, Ser. No. 1,683
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1986, 3600752
Int. Cl.⁴ G02B *23/08*
U.S. Cl. 350—539 **9 Claims**



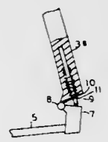
1. In a panoramic periscope having a ray path for the visual observation of objects and having a central tube with an ocular disposed laterally thereon, the central tube being provided with a system of lenses, prisms and mirrors and having a peripheral viewing window which is mounted so as to be rotatable with an angle speed about the longitudinal axis of the central tube through a horizontal angle of 360° or more, said window being mounted in a viewing hood disposed above the central tube and lying at an angle relative to the longitudinal axis of the central tube, the window being radially disposed in a viewing housing which has a prism or the like and is mounted so as to be additionally rotatable with an angle speed about its own longitudinal axis at a vertical angle relative to the longitudinal axis of the central tube, the improvement comprising a system of prisms and/or mirrors connected into the ray path of the periscope and being constructed in such a manner that, when the viewing window is rotated in one direction passing the zenith, a real, true-to-side, upright image appears in the eye lens or ocular; and in the event of the ray path of the viewing window passing the zenith, an additional prism system is incorporated into the ray paths between the eye lens and the viewing window which, despite the ray path overhead, permits a true-to-side, upright image to appear and which is pivoted out of the ray path between the ocular and the viewing window prior to the ray path passing the zenith.

4,787,726
REMOTELY CONTROLLED VEHICLE MIRROR WITH SLIP CLUTCH
Richard M. Hendricks, 4431 Beulah Cove, Claremore, Okla. 74017
Filed Mar. 9, 1987, Ser. No. 23,547
Int. Cl.⁴ G02B *7/18;* **B60R** *1/06*
U.S. Cl. 350—637 **7 Claims**



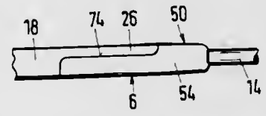
1. A remotely rotatable mirror and housing assembly for attachment to a support bracket on a vehicle, the outside of said housing assembly connected to top and bottom cap members,
a transmission case positioned inside said housing on one of said top and bottom caps,
a longitudinal support rod, the ends of said rod being threaded and connected to said vehicle support bracket, said rod extending through bushing located in axially aligned openings in said top and bottom caps and in said transmission case, said top and bottom caps retained to said support rod by threaded top and bottom nuts, the said nut that retains said cap where said transmission case is positioned, being used to prevent vibration of said mirror and housing assembly by connecting an assembly of a pair of opposed flat spring washers which act against said cap and the bushing of that said cap;
said transmission case comprising;
an electric motor mounted internally to said case,
an output shaft from said motor,
a motor pinion gear on said shaft,
a first driven shaft parallel to said motor output shaft and having assembled thereto a first spur gear and a first worm, said first spur gear in engagement with said motor pinion gear;
a second driven shaft transverse to said first driven shaft and having assembled thereto a first worm gear, and a second worm, said first worm gear in engagement with said first worm;
a second worm gear assembled about said support rod between a top stop and bottom stop, said second worm gear in engagement with said second worm, means to adjust the torque of one of said top and bottom stops to permit controlled slippage between said support rod and said second worm gear when said mirror and housing is turned by a force other than that provided by electric motor.

4,787,727
MEANS TO ADJUST EYEGLASSES
Leon Boodman, 262 Storm Dr., Holtsville, N.Y. 11742, and James P. Malone, 1 Hillside Ave., Rockville, N.Y. 11571
Filed Aug. 21, 1986, Ser. No. 898,418
Int. Cl.⁴ G02C *5/20*
U.S. Cl. 351—118 **1 Claim**



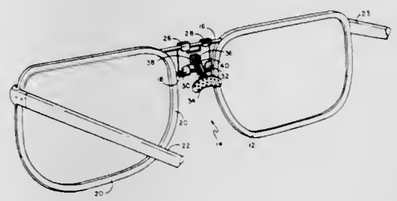
1. In a pair of eyeglasses of the type having a front lens holding member, and side members, which hook over the users ear, each side member being mounted on a hinge,
means to adjust the length of a side member by turning the side member to adjust the pressure of the side member against the head of the user, comprising a threaded shaft mounted in the side member, the end of the shaft bearing against the front member, whereby rotation of the shaft lengthens the end which, in turn, bears against the frame in such a way that the side members are displaced toward the wearer's temples, thereby increasing pressure.

4,787,728
TEMPLE FOR A SPECTACLE FRAME
Wilhelm Anger, Chesa Pas-Cjira, 7500 St. Moritz-Suvretta, Switzerland
Filed Aug. 24, 1987, Ser. No. 88,867
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1987, 3701034
Int. Cl.⁴ G02C *5/20*
U.S. Cl. 351—118 **16 Claims**



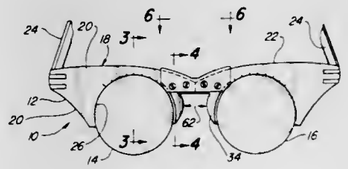
1. Temple for a spectacle frame comprising: a longitudinally extending, essentially straight shaft; means at a first end of said shaft for connecting said shaft to the remainder of the spectacle frame; a temple end piece having a first segment that extends in the longitudinal direction of the shaft, a second segment connected to the first segment and extending downwardly therefrom at an angle of less than 180°, said first segment of the temple end piece and the second end of the shaft being connected to one another by means of a plug connection comprising a plug and a borehole having engageable surfaces; and means for clamping the first segment and the second end of the shaft in their relative position to one another, at least one of the engageable surfaces of the plug connection being cylindrical in form over its entire length of engagement with the other surface, said clamping means comprising a sliding clamping element having a groove extending in the longitudinal direction of the plug, said groove having a bottom and two spaced flanks defining a cross section which becomes wider in the direction toward said bottom, said plug having a longitudinally extending exterior protrusion with two spaced flanks such that said protrusion has a cross section complimentary to that of said groove, said two flanks of said groove converging toward one another in the direction toward a free end of said sliding clamping element whereby as said clamping element is slid onto said protrusion, said clamping element engages and radially deforms an exterior wall of said plug connection surrounding the borehole in an amount depending on the axial position of said clamping element on said exterior wall.

4,787,729
EYEGLASS NOSE SUPPORT
Kenneth T. Ruffen, 84 Walnut St., Hyannis, Mass. 02601
Filed Aug. 24, 1987, Ser. No. 88,667
Int. Cl.⁴ G02C *5/12*
U.S. Cl. 351—137 **3 Claims**



1. An eyeglass frame nose bridge support for attachment to eyeglasses of the type which include a lower bridge member and upper bridge member comprising:
a support member of H-shaped configuration having upper arms, lower arms and a cross member on said H-shaped configuration;
means to attach the upper arms of said H-shaped support member to said upper bridge member of said eyeglass frame;
means to attach the lower arms of said H-shaped support member to said lower bridge member of said eyeglass frame;
a nosepiece member disposed above the bridge of the nose and attached to the cross member of said H-shaped support member; and
means to adjust the positioning of said nosepiece to said support member.

4,787,730
EYEGLASS ASSEMBLY
Alexander Bristol, 5840 SW. 85 St., Miami, Fla. 33143
Filed Apr. 6, 1987, Ser. No. 34,690
Int. Cl.⁴ G02C *5/12*
U.S. Cl. 351—138 **5 Claims**



1. An eyeglass assembly comprising
a left frame part,
a right frame part,
a left lens,
a right lens,
wherein said left and right lenses are detachably secured to said left and right frame parts, respectively,
means for joining said left and right frame parts in a side by side relationship and for simultaneously securing said left

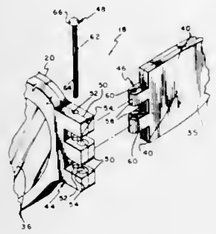
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and right lens to said left and right frame parts, respectively, comprising a nosepiece adapted to rest on the bridge of a nose, said right and left frame parts being detachably secured to said nosepiece so that said left and right lenses may be removed from said eyeglass assembly and replaced with different right and left lenses,

wherein each frame part includes an arcuate edge having a groove adapted to receive an edge of its corresponding left or right lens, said frame part groove extending through an arc of less than 180 degrees, and wherein said nosepiece comprises two oppositely facing edges, each nosepiece edge having an arcuate groove adapted to receive a portion of the edge of its respective left or right lens,

wherein the arcuate groove of each nosepiece edge registers with its respective frame part groove and forms a combined arcuate groove of greater than 180 degrees.

4,787,731
REVERSIBLE EYEGLASS STRUCTURE
James E. Rogers, 3736 SE. 27th, Topeka, Kans. 66605
Filed Jul. 7, 1986, Ser. No. 882,834
Int. Cl.⁴ G02C *5/14*
U.S. Cl. 351—153 **6 Claims**



1. A reversible eyeglass structure operable in one of two usage positions to present a variable different outward appearance, comprising:

(a) an eyeglass frame assembly;

(b) an ear frame support assembly having spaced, ear piece support members;

(c) a hinge connector assembly to pivotally connect said ear piece support members to said eyeglass frame assembly so as to be movable 180 degrees from one usage position to another; and

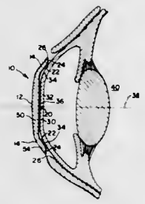
(d) said hinge connector assembly includes a support lug having a dimpled portion to engage said ear piece support members and bias same toward the usage position.

4,787,732
CONTACT LENS AND METHOD OF MAKING SAME
Nick Siviglia, c/o Lancaster Contact Lens, Inc., 700 Eden Rd., Lancaster, Pa. 17601
Continuation of Ser. No. 856,077, Sep. 24, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,577
Int. Cl.⁴ G02C *7/04;* **B24B** *1/00*
U.S. Cl. 351—160 R **18 Claims**

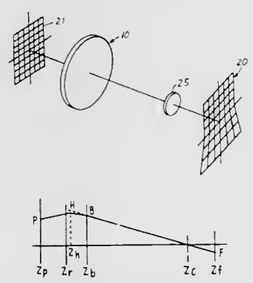
1. A contact lens for the eye of a patient with a cornea having a central surface, the contact lens comprising:

a posterior surface including a generally flat circular first zone having a diameter at least 0.5 mm greater than the greatest dimension of the central corneal surface, the first posterior zone having a radius of curvature at least as small as the radius of curvature of the central corneal surface, a generally annular second posterior zone extending radially beyond the first posterior zone, the second posterior zone having a radius of curvature less than the radius of curvature of the first posterior zone and generally corresponding to the curvature of the corneal surface surrounding the central corneal surface; and

an anterior surface including a first generally circular corrective zone for correcting the patient's vision, and a second generally annular zone extending radially beyond the corrective zone and generally paralleling the second posterior zone.



4,787,733
METHOD FOR DESIGNING PROGRESSIVE ADDITION LENSES
Donald E. Silva, Cardiff, Calif., assignor to Polycore Optical Pte Ltd, Singapore
Filed Nov. 24, 1986, Ser. No. 934,203
Int. Cl.⁴ G02C *7/06*
U.S. Cl. 351—177 **3 Claims**



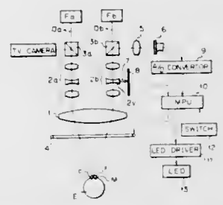
1. A method of designing the surface of a progressive addition lens having an upper portion for distance viewing, a lower portion for close-up vision, a transition zone between the upper and lower portion, and two peripheral zones, comprising the following steps:

producing a desired pattern of grid lines in which the astigmatism is distributed over the entire pattern of grid lines in a predetermined manner,

applying ray tracing to determine what lens surface is required to obtain said desired pattern of grid lines, by assuming a grid viewing system from which rays are traced, calculating surface normals for each grid crossing by using the grid object and grid image as known quantities and solving for each surface normal using the law of refraction, and

determining the surface heights of the lens directly from said calculated surface normals for each said grid crossing.

4,787,734
STEREOSCOPIC MICROSCOPE
Isao Matsumura, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1986, Ser. No. 881,382
Claims priority, application Japan, Jul. 11, 1985, 60-153002
Int. Cl.⁴ A61B *3/10;* **G02B** *21/22;* **G01B** *9/00*
U.S. Cl. 351—212 **12 Claims**



1. A stereoscopic microscope comprising:

a stereoscopic optical system for observing a curved object under examination;

means for projecting a light beam onto the object;

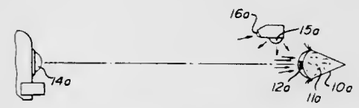
light-receiving means for indicating the position of an image of the light beam reflected by the object;

image variable magnification means for changing a size of the reflected image on said light-receiving means;

variable magnification detection means which indicates the position of said image variable magnification means for detecting the magnification selected by said image variable magnification means; and

operation means which receives data from said detection means and said light receiving means for calculating a curved shape of the object.

4,787,735
NIGHT VISION SYSTEM AND METHOD
Consta Jolson, 207 N. Jasper Ave., Margate, N.J. 08402
Filed Dec. 23, 1985, Ser. No. 812,756
Int. Cl.⁴ A61B *3/10*
U.S. Cl. 351—221 **9 Claims**

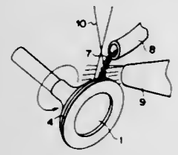


6. In the method of enhancing night vision, the steps comprising: directing a pupil lamp toward the user's eye to moderate dilation of the pupil, sensing oncoming illumination in the path directly ahead of the user, and increasing the intensity of the pupil lamp responsive to sensed oncoming illumination, to contract the pupil for more comfortably receiving radiation from said oncoming illumination.

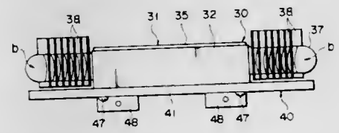
4,787,736
LASER CLAD VALVE FOR INTERNAL COMBUSTION ENGINE
Kazuhiko Mori; Katsuhiko Ueda; Soya Takagi, all of Toyota, and Isao Torii; Shigeki Yamada, both of Obu, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisan Kogyo Kabushiki Kaisha, both of Aichi, Japan
Filed Jun. 15, 1987, Ser. No. 61,550
Int. Cl.⁴ F01L *3/00*
U.S. Cl. 251—368 **5 Claims**

1. A valve comprising a valve body of an iron base material and a valve face portion, said valve face portion comprising a cladding layer of an alloy having higher abrasion resistance and heat resistance than said iron base material and an interface layer between said cladding layer and said valve body,

said valve face portion having been formed by a process of laser cladding which diffuses iron from said iron base material throughout a thickness of said cladding layer in an amount of 5 to 15% by weight of said cladding layer, and forms and iron content of said interface layer which continuously decreases across a thickness of said interface layer from an iron content of said iron base material at said valve body to an iron content of said cladding layer at said cladding layer.



4,787,737
PROJECTION DISPLAY APPARATUS
Masahiro Ogawa, and Tatsuo Shimazaki, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Mar. 16, 1987, Ser. No. 26,673
Claims priority, application Japan, Mar. 26, 1986, 61-42975[U]; Sep. 26, 1986, 61-147234[U]
Int. Cl.⁴ G03B *21/16*
U.S. Cl. 353—57 **9 Claims**



1. A projection display apparatus, comprising:

housing means partitioned by partitioning means into a light source compartment and a display compartment, said light source and display compartments being provided with vent openings, respectively, and said partitioning means including light transmitting means;

light source means disposed in said light source compartment and including a lamp and a reflector;

display means disposed in said display compartment for displaying an optical image, said display means being driven by electrical energy;

heat radiation means adhered to said display means for cooling said display means and including a heat conductive pipe having a plurality of radiation fins thereon, said heat radiation means having a symmetrical structure so as to circulate an air flow in said display compartment;

projection means for enlarging and projecting said image displayed on said display means on a screen; and

vent fan means for ventilating both said light source compartment and said display compartment through said vent openings.

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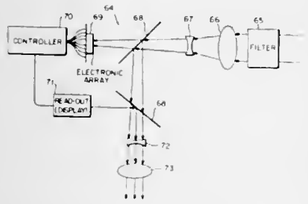
4,787,738
HOLDER FOR OVERHEAD PROJECTION SYSTEM TRANSPARENCIES
Edward J. Joffe, 940 Park Ave., Linden, N.J. 07036
Filed Oct. 14, 1987, Ser. No. 107,981
Int. Cl.[4] G03B *21/00*
U.S. Cl. 353—120 **8 Claims**



1. A device for holding a plurality of overhead projection system transparencies which are provided with holes along one edge thereof and for positioning the transparencies on the stage of an overhead projector comprising:
an elongated, straight edged ruler-like bar;
two suction cups mounted on said bar at spaced intervals adjacent one of the principal edges thereof for affixing the holder to the stage of the projector; and a plurality of generally U-shaped arms, each arm having a first leg retained in a bore provided in said bar adjacent said one of said principal edges for rotation about the axis of said leg and a second leg the end of which is releasably received in an opening provided in said bar adjacent the other of said principal edges thereof in transverse alignment with said bore.

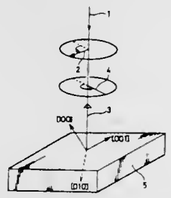
4,787,739
RANGE FINDER
Thomas W. Gregory, 1252 Sunflower, Glendora, Calif. 91740
Continuation of Ser. No. 595,414, Mar. 30, 1984, abandoned. This application Dec. 2, 1986, Ser. No. 936,796
Int. Cl.[4] G01C *3/08;* **F41G** *1/38;* **G02B** *27/32;* **G01B** *11/00*
U.S. Cl. 356—4 **16 Claims**





2. A range finder for determining distances to objects, comprising:
a housing through which an object is viewed;
means associated with the housing for storing multiple images of said object, said multiple images having different sizes representative of the object at different distances from the observer; and
means for comparing all or part of the viewed object with all or part of the stored images and correlating the viewed object with the images to determine the distance of the object from the observer based on the correlation, said means including means for electronically varying the size and orientation of the image, resulting in a moving image which facilitates the ability to rapidly and accurately compare the image with the object.

4,787,740
APPARATUS AND METHOD FOR DETERMINING CRYSTAL ORIENTATION
Yasuo Inoue; Tadashi Nishimura; Kazuyuki Sugahara, and Shigeru Kusunoki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 5, 1987, Ser. No. 11,329
Claims priority, application Japan, Feb. 8, 1986, 61-26166
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—31 **8 Claims**

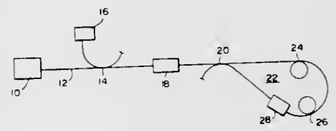


1. An apparatus for determining crystal orientation, comprising:
a light source for emitting an incident light beam;
a spectroscopic filter through which the beam is passed;
a polarizer for polarizing the beam;
a lens for focusing the beam on a specimen in order to cause Raman scattered light;
a polarization analyzer for selecting light having a selected polarization direction in said scattered light;
means for enabling synchronous rotation of said polarizer and said polarization analyzer in phase with and at the same angular speed as each other;
a depolarizer for depolarizing said scattered light;
a spectrometer for separating said scattered light into spectral components thereof;
a lens for focusing said scattered light on said spectrometer;
a photodetector for detecting said spectral components of said scattered light and obtaining data; and
a computer for processing said data to determine said crystal orientation.

4,787,741
FIBER OPTIC SENSOR
Eric Udd, Huntington Beach; Ronald J. Michal, Orange; Steven F. Watanabe; John P. Theriault, both of Fountain Valley, and Richard F. Cahill, El Toro, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Oct. 9, 1986, Ser. No. 917,390
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—35.5 **29 Claims**

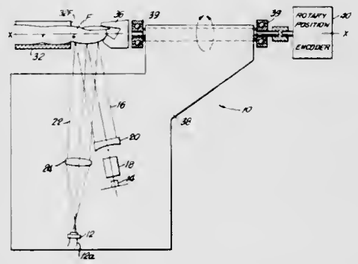
1. A fiber optic sensor, comprising:
(a) A light source means for producing a first beam of light;
(b) a first beam splitting means for receiving the first beam of light having a polarizing means connected to one output for polarizing a portion of the first light beam;
(c) a second beam splitting means connected to the polarizing means for splitting the polarized portion of the first beam of light into second and third beams of light and recombining the second and third beams into a fourth beam of light;

(d) an optical fiber loop connected to the second beam splitter means for directing the second and third beams of light in counterpropagating directions;
(e) a reference fiber optic coil within the optical fiber loop isolated from environmental effects and having the counterpropagating light beams pass therethrough;
(f) a sensing fiber within the optical fiber loop exposed to environmental effects and having the counterpropagating light beams pass therethrough;
(g) an intensity maintenance element within the optical fiber



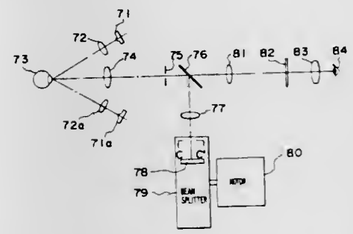
loop for preventing signal fadeout having the counterpropagating light beams pass therethrough;
(h) a detection means connected to the first beamsplitting means for detecting the fourth light beam recombined at the second beamsplitting means including electrical circuitry means for measuring the environmental effects on the sensing fiber optic coil by detecting the nonreciprocal phase shift of the counterpropagating beams; and
(i) a phase modulating means for offsetting the nonreciprocal phase shift induced in the sensing fiber by environmental effects.

4,787,742
DIRECT FINGER READING
Michael Schiller, Riverdale, and Daniel H. Marcus, New City, both of N.Y., assignors to Fingermatrix, Inc., North White Plains, N.Y.
Continuation-in-part of Ser. No. 630,012, Jul. 12, 1984. This application Jan. 29, 1987, Ser. No. 8,590
Int. Cl.[4] G06K *9/20*
U.S. Cl. 356—71 **10 Claims**



1. An optical finger image processing apparatus comprising:
finger positioning means to provide an exposed finger surface for a finger positioned therein,
an optical interrogating and detecting unit for interrogating the surface of a finger held in said positioning means with a coherent light beam having a interrogating zone in the form of a slit to provide a reflected light beam having a modulated light zone in the form of a slit, the plane of the modulated zone and the plane of the interrogating zone being substantially coplanar to define an illumination plane,
said optical unit including a source of said light beam, a beam forming lens optically upstream from the finger being interrogated, an imaging lens optically downstream from the finger being interrogated, and a linear array of photoelectric transducers optically downstream from said imaging lens, the optical axis defined by said beam forming lens and imaging lens and a line of said linear array of transducers being within and defining said illumination plane, and
means to rotate said optical interrogating and detecting unit through a predetermined arc about a predetermined axis, said predetermined axis being the nominal central axis of a finger positioned by said finger positioning means, rotation through said arc causing said illumination plane to scan an exposed surface of the finger in said support means,
said illumination plane being parallel to said predetermined axis during all positions of said rotation.

4,787,743
APPARATUS FOR MEASURING THE RADIUS OF CURVATURE
Masao Nohda, Yokosuka, Japan, assignor to Sun Hig-Tech Kabushiki Kaisha, Kenagawa, Japan
Division of Ser. No. 791,894, Oct. 28, 1985, Pat. No. 4,702,596. This application Jul. 15, 1987, Ser. No. 73,514
Claims priority, application Japan, Jun. 5, 1985, 60-121938
Int. Cl.[4] A61B *3/10;* **G01B** *9/00*
U.S. Cl. 356—124 **5 Claims**



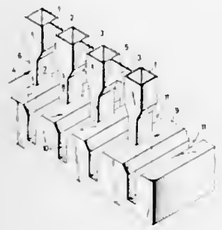
1. An apparatus for measuring the radius of curvature of an optical system, having a plurality of sources of light adapted to impinge light from different directions on the optical system under investigation, said light being reflected from said optical system along the optical axis thereof, and operational means for determining the radius of curvature comprising at least two pairs of photoelectric converting elements, means for converting said reflected light into a sequence of light beams each light beam being elongated in cross section and being scanned across said photoelectric converting element in a single direction, said sequence of light beams being arranged in at least two groups with the elongated cross sections of light beams of said groups inclined in at least two different angles of inclination relative to the direction of scanning and wherein said operational means includes means for comparing the output signals received from each pair of converting elements to identify the angle of inclination of the respective light beams scanning said optical system and employing said identification in determining the radius of curvature.

4,787,744
CELL ARRANGEMENT AND CELL HOLDER FOR RECEIVING THE CELL ARRANGEMENT IN A SINGLE ORIENTATION
Alfred R. Hissung, Marburg-Marbach, Fed. Rep. of Germany, assignor to Behringwerke Antiengesellschart, Marburg, Fed. Rep. of Germany
Filed Jan. 14, 1986, Ser. No. 818,763
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 8500884[U]
Int. Cl.[4] G01N *1/10, 21/03*
U.S. Cl. 356—246 **5 Claims**

1. A cell arrangement for optical investigations, comprising

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a cell holder for receiving a plurality of cells of the cell arrangement, wherein said plurality of cells are arranged in strips in which the individual cells are held at different spacings from one another by connecting elements to form a single unambiguously defined configuration, and said cell holder is provided with cell wells which are disposed in sequence and the spacings of which correspond to said single unambiguously defined configuration of the cells so that the cells may only be inserted in said cell holder in said configuration.

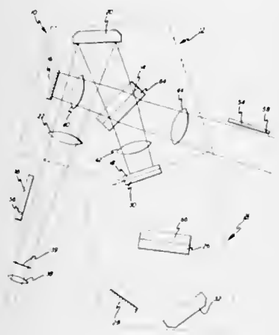


4,787,745

CONJUGATE INTERFEROMETER

Jens P. Dybwad, Acton, Mass., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 24, 1983, Ser. No. 525,914
Int. Cl.[4] G01B *9/02*; G01J *3/12*
U.S. Cl. 356—346 **8 Claims**



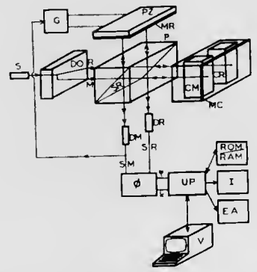
1. A conjugate interferometer comprising:
a source beam of light;
a first interferometer having a first beamsplitter, first means to direct the source beam of light to said first beamsplitter, a first translatable mirror in spaced angular relation to said first beamsplitter defining a first optical path, a first fixed mirror in spaced angular relation to said first beamsplitter defining a second optical path;
a second interferometer having a second beamsplitter, second means to direct the source beam of light to said second beamsplitter, a second translatable mirror in spaced angular relation to said second beamsplitter defining a third optical path, a second fixed mirror in spaced angular relation to said second beamsplitter defining a fourth optical path, said second translatable mirror being in back-to-back relation to said first translatable mirror;
directing means for directing the source beam of light to either said first or said second interferometer.

4,787,746

REFRACTOMETRIC DETECTOR FOR LIQUID PHASE CHROMATOGRAPH

Francois Couillard, Cpuk, France, assignor to Compagnie Europeenne D'Instrumentation Cedi, Societe Anonyme Francaise, Lannemezan, France

Filed Apr. 22, 1987, Ser. No. 41,732
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—361 **4 Claims**



1. A refractometric detector for high performance liquid chromatography comprising:
a monochromatic light source for emitting a base;
an optical dividing means for splitting said beam into two parallel beams;
an optical system having a first mirror and a second mirror disposed perpendicular to the path of said two parallel beams;
a piezoelectric device which moves said first mirror perpendicularly to its plane;
a first cuvette containing a reference liquid, and a second cuvette containing a measurement liquid;
a system having a semi-reflecting surface at 45° for receiving said two beams and reflecting a first part of said beams toward said cuvettes and a second part of said beams to said first mirror, said second part of said two beams being reflected by said first mirror so as to pass through said cuvettes, said second mirror being disposed so as to reflect said first part of said two beams after it passes through said cuvettes toward said semi-reflecting surface along a reverse path, said first and second parts being reflected by said first and second mirrors toward said semi-reflecting surface where said reflected first and second parts are joined together;
a photodiode detection unit for receiving the joined beams from said semi-reflecting surface and for emitting measurement signals which excite the piezoelectric device, said unit comprising a photodiode means for each beam, said photodiode means sending the emitted signals to a phasemeter which measures the phase shift and the number of cycles of phase shift between the beams.

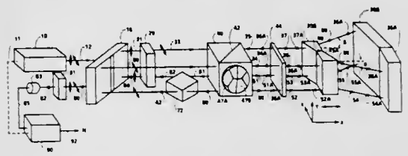
4,787,747

STRAIGHTNESS OF TRAVEL INTERFEROMETER

Gary E. Sommargren, Santa Cruz, Calif., and Peter S. Young, Middlefield, Conn., assignors to Zygo Corporation, Middlefield, Conn.

Filed Nov. 13, 1987, Ser. No. 120,371
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—349 **43 Claims**

1. An interferometer system capable of measuring accurately a deviation from straightness of travel of a mechanical apparatus, said system comprising a source of a frequency stabilized input beam with two linear orthogonally polarized components; means for converting said input beam into two separated, parallel, orthogonally polarized beams; means located in one of said separated beams, for converting said two separated, orthogonally polarized beams into first and second beams which are spatially separated, parallel, and have the same polarization; means for transmitting said first and second beams; means disposed in the path of said transmitted beams and attached to said mechanical apparatus whose straightness of travel is to be measured for refracting said parallel first and second beams into diverging third and fourth beams; means disposed in the path of said third and fourth beams for producing converging fifth and sixth beams which are refracted by



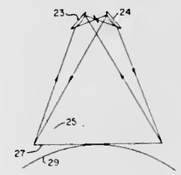
said refracting means to produce parallel seventh and eighth beams; means for producing parallel ninth and tenth beams, said ninth and tenth beams being converted into eleventh and twelfth diverging beams by said refracting means; means for producing converging thirteenth and fourteenth beams which are refracted by said refracting means to produce parallel fifteenth and sixteenth beams which are transmitted by said transmitting means; means for transposing said fifteenth and sixteenth beams for providing a single output beam having two orthogonally polarized components in which a phase difference between the two components of said output beam is related to said deviation from straightness of travel; means for mixing said orthogonal components of said output beam; means for producing an electrical measurement signal; and means for indicating a measured phase, said measured phase being related to said deviation from straightness of travel.

4,787,748

SYNCHRONOUS OPTICAL SCANNING APPARATUS

Marc Rioux, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 6, 1987, Ser. No. 46,391
Int. Cl.[4] G01C *3/00*; G01B *11/24*
U.S. Cl. 356—376 **10 Claims**



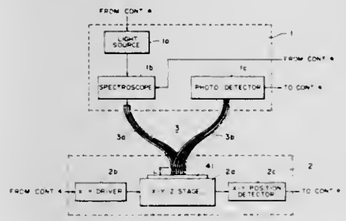
1. In an imaging device for determining the profile of a surface in a direction relative to a reference plane, a synchronous optical scanning apparatus, comprising:
rotating scanning means including two or more rotating mirrors for synchronously scanning the surface along a scanning line by a scanning light beam and receiving a scanned beam scattered back from the surface; and
a pair of reflecting mirrors, one in each of the optical paths of the scanning light beam and the scattered scanned beam;
the invention being characterized in that
the reflecting mirrors are curved.

4,787,749

METHOD AND APPARATUS FOR MEASURING THE THICKNESS OF A THIN FILM USING THE SPECTRAL REFLECTION FACTOR OF THE FILM

Mikichi Ban, Yokohama; Yuki Toriumi, Tokyo, and Kazuhiko Hara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1986, Ser. No. 935,381
Claims priority, application Japan, Nov. 28, 1985, 60-267915; Nov. 28, 1985, 60-267916; Nov. 28, 1985, 60-267917; Nov. 28, 1985, 60-267918; Nov. 28, 1985, 60-267919; Jan. 17, 1986, 61-008627
Int. Cl.[4] G01B *11/06*
U.S. Cl. 356—381 **8 Claims**



1. A device, usable with an object having a layer, for measuring the thickness of the layer, said device comprising:
means for irradiating the object with light of a plurality of wavelengths, said irradiating means having a light-emitting portion disposed opposed to the surface of the object;
means for detecting the light of the plurality of wavelengths from the object being irradiated by said irradiating means, said light detecting means having a light-receiving portion disposed opposed to the surface of the object and substantially around said light-emitted portion of said irradiating means;
means for detecting the thickness of the layer of the object in accordance with the detection by said light detecting means; and
positioning means for positioning the object relative to said light-emitting portion and said light-receiving portion at a distance that corresponds to an extremum of the quantity of light received by said light-receiving portion.

4,787,750

GAS SPECTROMETER CONSTRUCTION HAVING AN IMPROVED ALIGNMENT FEATURE

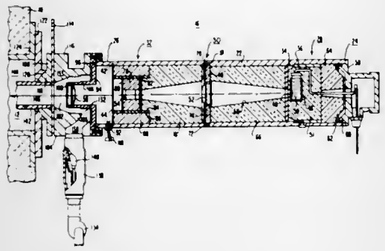
Robert L. Nelson; William H. McIntyre, both of Orrville, and William J. Danley, Green Township, Wayne County, all of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1987, Ser. No. 35,835
Int. Cl.[4] G01N *21/15, 21/31*
U.S. Cl. 356—437 **14 Claims**

1. For an across-the-stack gas analyzing spectrometer of the type including a gas detector assembly on one side of the stack, and a radiation source assembly on the opposite side of the stack, with a stack opening associated with each assembly to permit the transmission of radiation therebetween, the improvement of said radiation source assembly comprising:
a cylindrical tube housing, in succession from the outer end toward the stack end, a radiation emitting assembly, a first lens assembly, and an acousto optic tunable filter (AOTF) assembly in optically aligned relation;
a first cap means on said outer end of said tube;
a second cap means on said stack end of said tube including a centered lens nozzle projecting toward said stack opening;
air window assembly means including a cylindrical body part having a hollow central core part accommodating

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said lens nozzle with a first annular space around said nozzle; and



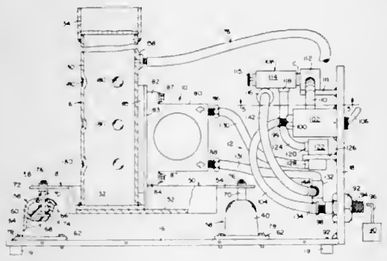
spherical joint means between said air window assembly means and said stack to accommodate aligning said radiation source assembly with said detector assembly across said stack.

4,787,751

BONE CEMENT MIXING DEVICE

Marinus Bakels, 3896 Burns Rd., Palm Beach Gardens, Fla. 33410

Filed Jun. 20, 1986, Ser. No. 876,839
Int. Cl.[4] B01F *11/00, 13/06*
U.S. Cl. 366—110 **10 Claims**



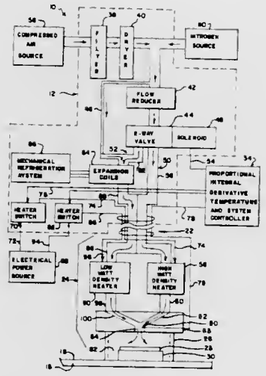
1. A device for mixing bone cement comprising a housing plate means, a cylinder means being open at the top and having a closed bottom, said cylinder means defining a cylindrical holding chamber, mounting means for mounting said cylinder means on said housing plate means to permit vibration of said cylinder means thereon, vibration means fixedly connected to the side of said cylinder means for vibrating said cylinder means, means for turning said vibration means on and off, a removable cartridge for mixing bone cement being positioned in said cylindrical holding chamber of said cylinder means for vibration therewith, means for spacing said removable cartridge from the wall of said cylindrical holding chamber forming a space therebetween, said removable cartridge being cylindrical and shorter than said cylindrical holding chamber, said removable cartridge being open at its upper end to receive elements of a bone cement for mixing together, a vacuum source, means for turning said vacuum source on and off, conduit means for connecting said vacuum source to said holding chamber through the wall of said cylinder means below the open upper end of said removable cartridge, said conduit means drawing gases from the cylindrical holding chamber from below the open upper end of said removable cartridge through said space when said vacuum source is on.

4,787,752

LIVE COMPONENT TEMPERATURE CONDITIONING DEVICE PROVIDING FAST TEMPERATURE VARIATIONS

Douglas S. Fraser, Bloomingtion, and Taylor N. Thompson, Jr., Kingston, both of N.Y., assignors to FTS Systems, Inc., Stone Ridge, N.Y.

Filed Oct. 24, 1986, Ser. No. 922,520
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—45 **21 Claims**



1. A temperature conditioning device adapted for thermally stressing an electronic component with a gas at a selected temperature other than ambient temperature while obtaining the electrical characteristics of such component, said device receiving said gas from a source and comprising:

A. cooling means, including an elongate cold gas path, to effect in said gas adapted to be applied to said component said selected temperature substantially at or below said ambient temperature;

B. heating means, including an elongate hot gas path, to effect in said gas adapted to be applied to said component said selected temperature substantially at or above said ambient temperature, the cooling and heating means being arranged parallel one another and capable of independently of affecting the temperature of said gas;

C. directing valve means for directing the quantity of gas from said source through one or the other of said cooling means and said heating means;

D. nozzle means adapted to apply said gas from said heating and cooling means to said electronic component; and,

E. said cooling means including a by-pass path continuously carrying a small quantity of gas from said source around said directing valve means to said cold gas path.

4,787,753

LEAF HOOPS

William D. Barnhart, 629 Ransom St., Ripon, Wis. 54971

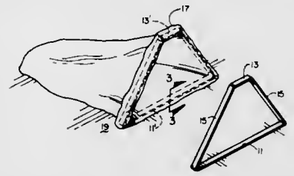
Filed Jun. 9, 1986, Ser. No. 871,928
Int. Cl.[4] B65D *33/02*
U.S. Cl. 383—33 **4 Claims**

3. Apparatus for receiving leaves and similar yard material comprising:

a. a bag made of thin flexible material and having a mouth defined by a free edge of bag material, the bag having a wall with a predetermined peripheral length adjacent the free edge;

b. an inner member formed into a closed hoop having an outer periphery with a peripheral length approximately equal to the periphery of the bag wall adjacent the free edge of the bag, the inner member having a predetermined wall thickness and a predetermined width, the inner member being made from a slightly flexible plastic material; and

c. a slightly flexible plastic outer member formed into a closed hoop that is freely and completely passable over the inner member and having an inner periphery selectively nestable over the inner member outer periphery to create a generally uniform clearance of approximately



0.01 inches between the outer periphery of the inner member and the inner periphery of the outer member, the outer member having a predetermined wall thickness and width, the wall of the flexible bag near the free edge thereof being interposed in the clearance between the inner and outer members,

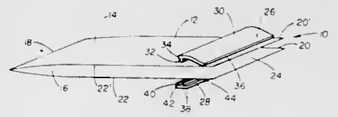
so that the flexible bag is loosely retained in the clearance between the inner and outer members to hold the mouth of bag open and thereby aid in filling the bag with leaves.

4,787,754

RECLOSABLE FLEXIBLE BAGS HAVING FASTENER PROFILES ATTACHED TO EXTERIOR WALLS THEREOF AND A METHOD OF MAKING SAME

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 000,019, Jan. 2, 1987, abandoned. This application Mar. 1, 1988, Ser. No. 165,450
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—63 **13 Claims**



1. A reclosable flexible bag comprising:

a pouch having front and back walls and a pouch opening at the upper edge thereof;

a first fastener profile comprising a first tape having first and second edges and a protrusion disposed along the first edge and extending from the surface of the tape;

a second fastener profile comprising a second tape having first and second edges and a substantially C-shaped member disposed along the first edge and extending from the surface of the tape;

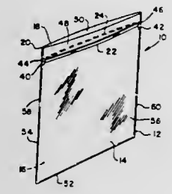
the second edges of the first and second tapes being affixed to the exterior of the walls of the pouch and parallel to the pouch opening so that upon closing, the protrusion and C-shaped members interlock, with the front and back walls being interposed therebetween.

4,787,755

RECLOSABLE FLEXIBLE CONTAINER HAVING FASTENER PROFILES SEALED AT THEIR ENDS TO THE OUTSIDE OF THE BAG

Mark Branson, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Continuation of Ser. No. 796,632, Nov. 8, 1985, abandoned. This application Aug. 11, 1987, Ser. No. 84,334
Int. Cl.[4] B65D *33/24*
U.S. Cl. 383—65 **12 Claims**



1. A reclosable flexible container comprising:

a pouch having front and back walls and a pouch opening at the upper edge thereof;

a first fastener profile disposed on the exterior of said back wall and extending longitudinally thereon proximate said pouch opening;

a second fastener profile disposed on the exterior of said back wall, said first and second fastener profiles being constructed and arranged for selectively releasable interlocking with said front and back walls of said pouch being interposed therebetween;

said first and second profile fastener profiles each comprising a strip of flexible plastic material having a base and an interlocking portion projecting from said base; and

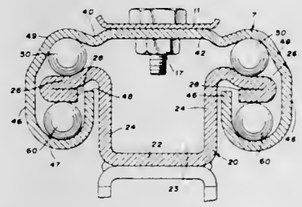
each of said fastener profiles having a proximal end and a distal end, said profiles being sealed only at said ends to the exterior of said pouch.

4,787,756

APPARATUS AND METHOD OF SEAT ADJUSTER SLIDE

Regis V. Pilarski, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 26, 1988, Ser. No. 160,661
Int. Cl.[4] F16C *29/04*
U.S. Cl. 384—47 **6 Claims**



1. A vehicle seat adjuster slide assembly, said assembly in combination comprising:

a sheet metal formed lower rail for connection to said vehicle, said lower rail including;

a channel floor;

spaced apart generally upward extending legs forming a bay with said channel floor; and

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projecting flanges extending generally transversely from said legs away from said bay;

at least one bearing ball nested on the top of each of said flanges laterally spaced of said bay;

at least one bearing ball nested on the bottom of each of said flanges laterally spaced of said bay; and

an upper rail for connection to said seat, said upper rail including;

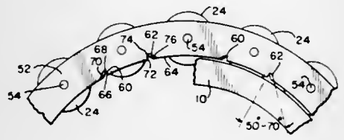
a ceiling section covering said bay; generally C-shaped side bellies laterally spaced from one another and joined to said ceiling, each said side belly surrounding and nesting said upper and lower bearing balls and, the ends of said bellies extending under said flanges of said upper rail whereby said upper rail can slide on said lower rail without contact between said side bellies and said flanges except when an excessive force is placed on said upper rail causing said side belly ends to contact said flanges to prevent separation of said upper rail from said lower rail.

4,787,757

BEARING CONSTRUCTION WITH A CAGE PROVIDED WITH LUBRICATION GROOVES

Leslie D. Finger, Winsted, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Feb. 8, 1988, Ser. No. 152,991
Int. Cl.[4] F16C *33/66*
U.S. Cl. 384—470 **5 Claims**



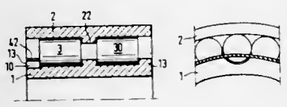
1. A roller bearing comprising: a race having an annular raceway and an annular flange extending from one axial end of said annular raceway; a cage and roller assembly having a pair of axially spaced annular rings and a plurality of rollers having their axial ends supported by said rings; one axial end of each of said rollers adapted to abut the annular flange, the annular ring supporting that axial end of each roller which abuts the annular flange having angularly extending grooves extending across the radial surface facing said annular flange for forcing lubricant through said grooves, between the annular flange and the abutting roller axial ends, and along the annular raceway.

4,787,758

ROLLER BEARING WITH CYLINDRICAL ROLLERS

Werner Jacob, Briandring 29, 6000 Frankfurt 70, Fed. Rep. of Germany

PCT No. PCT/DE85/00308, § 371 Date Aug. 4, 1986, § 102(e) Date Aug. 4, 1986, PCT Pub. No. WO86/01566, PCT Pub. Date Mar. 13, 1986
PCT Filed Sep. 5, 1985, Ser. No. 876,885
Int. Cl.[4] F16C *43/04, 43/06, 33/58*
U.S. Cl. 384—559 **18 Claims**



1. A roller bearing comprising:

a plurality of cylindrical rollers;

an integral inner race and an integral outer race for the rollers, the inner and outer races being coaxial, the races being provided with lipped rims for axial retention of the cylindrical rollers, at least one of the races having a feed notch in an outer one of the rims, the feed notch to be blocked to prevent dropping out of the rollers into the feed notch; and,

a retaining ring blocking the feed notch, the retaining ring being disposed on one of the rims and bearing directly against an exposed end surface of the cylindrical rollers at the feed notch,

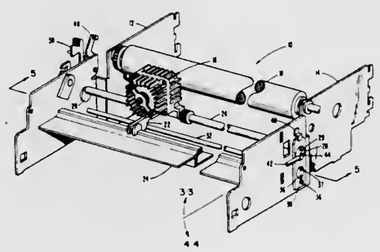
wherein the retaining ring is closed on itself and comprises an elastic material and bears directly against the end surface of the cylindrical rollers.

4,787,759

PRINT HEAD GAP ADJUSTMENT MECHANISM WITH SKEW COMPENSATION

David G. Geis, Niles, and Kurt Rothlisberger, Morton Grove, both of Ill., assignors to American Telephone and Telegraph Company - AT&T Information Systems, Holmdel, N.J.

Filed May 29, 1987, Ser. No. 56,505
Int. Cl.[4] B41J *11/20*
U.S. Cl. 400—55 **8 Claims**



1. A serial printer comprising:

a print head for printing characters on a record medium;

first and second spaced apart side walls, said second wall having first and second apertures extending therethrough;

a first eccentric member rotatably mounted in said first side wall;

a platen for supporting said record medium located between said side walls;

a guide rod and a guide rail located between said side walls and positioned substantially parallel to said platen for slidably supporting said print head across said record medium, said print head having a first opening through which said guide rod passes and having an elongated second opening which slidably accommodates said guide rail;

an elongated plate pivotally mounted on the outside surface of said second side wall;

second and third eccentric members rotatably mounted in said plate;

said guide rod passing through said first aperture in said second wall having its ends secured to said first and second eccentric members respectively;

means for establishing and varying a printing gap between said print head and said platen; and

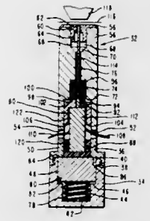
means for sensing and compensating for skewing which may occur between said side walls when said printer is positioned on an uneven surface.

4,787,760

DOT MATRIX PRINT HEAD

Hideo Nagasawa, Oiso, Japan, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 13, 1987, Ser. No. 108,232
Claims priority, application Japan, Nov. 13, 1986, 61-268800
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **15 Claims**



1. A dot matrix print head operable with a platen and comprising a

first cylindrical portion, a

second cylindrical portion threaded into said first portion, a

cavity defined within said second portion, a

first guide member and a second guide member positioned within the cavity in opposing manner, an

actuating member contained and secured to said first and second guide members, a

print wire secured to said actuating member and movable thereby to a printing position,

first resilient means engageable with said second guide member for returning the print wire to a non-printing position,

movable base means engageable with said first guide member for absorbing rebound energy upon return of the print wire to the non-printing position, and

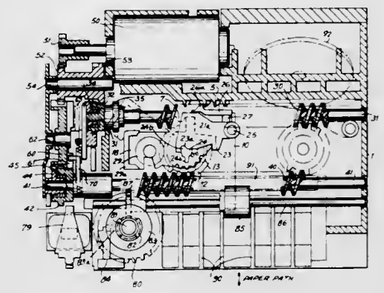
means for applying a voltage pulse across the actuating member for driving the print wire into impact with said platen.

4,787,761

MINIATURE PRINTER

Chikao Tezuka; Yukihiro Hanaoka, and Hiroyuki Nakayama, all of Shiojiri, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,593
Claims priority, application Japan, May 13, 1985, 60-100778
Int. Cl.[4] B41J *1/32, 25/28*
U.S. Cl. 400—145.2 **9 Claims**



1. A drive mechanism useful in miniature printers and the like, the drive mechanism comprising:

a frame;

a motor means mounted on the frame;

a first rotatable worm gear means and a second rotatable worm gear means supported parallel to one another on the frame;

worm wheel means in mesh with both of the first and second worm gear means;

print wheel means coupled to the worm wheel means, the print wheel means comprising a plurality of print characters each of which is operable for printing an image of itself on a print line of a recording medium;

drive means for coupling rotary motion from the motor means to each of the worm gear means and including intermediate gear means to which rotary motion is fed from the motor means; first and second incompletely toothed gear means each of which has an incomplete set of teeth and is operable for coupling to the first and second worm gear means, respectively, wherein the first incompletely toothed gear means is also coupled to the intermediate gear means; and first and second movable tooth means coupled respectively to the first and second incompletely toothed gear means, the first and second movable tooth means being normally positioned so as to complete the incomplete set of teeth of the first and second incompletely toothed gear means, respectively; and

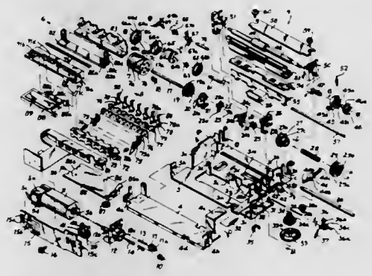
control means for selectively operating the drive means, whereby each worm gear means can be caused to rotate or to stop independently of the other; the control means causing displacement of the first and second moveable tooth means whereby the first and the second incompletely toothed gear means is disengaged from the drive means to stop rotation of the associated worm gear means.

4,787,762

POWER TRANSMISSION APPARATUS

Kenichiro Arai, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,257
Claims priority, application Japan, Apr. 16, 1986, 61-87630
Int. Cl.[4] B41J *23/00*
U.S. Cl. 400—187 **22 Claims**



1. An apparatus for controlling the transmission of power from a continuously operating motor to at least a first device and a second device during an operating cycle, the apparatus comprising:

means for providing at least one first trigger signal and at least one second trigger signal during the operating cycle;

trigger means responsive to each first trigger signal at first predetermined periods of time in the operating cycle and to each second trigger signal at second predetermined periods of time in the operating cycle;

first control means coupled to the motor and responsive to the trigger means for transmitting said power to the first device at the first predetermined periods of time;

second control means coupled to the motor and responsive

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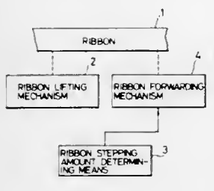
to the trigger means for transmitting said power to the second device at the second predetermined periods of time and including cam means and lever means; said lever means operable in response to the cam means at one of the first predetermined periods of time for preventing the transmission of said power to said second device and at one of the second predetermined periods of time for permitting the transmission of said power to said second device.

4,787,763

PRINTING RIBBON POSITIONING APPARATUS AND METHOD OF OPERATION THEREOF

Shinji Kondo, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 19, 1986, Ser. No. 841,438
Claims priority, application Japan, Mar. 20, 1985, 60-57169
Int. Cl.⁴ B41J *33/36, 33/56*
U.S. Cl. 400—213 **7 Claims**



1. A printing ribbon positioning apparatus for use with a printing apparatus in which a printing mechanism prints characters or symbols on a printing medium through a ribbon that includes a plurality of print rows spaced across the width thereof, that is confronted with the printing surface of the printing medium, and that is stepped in a longitudinal direction whenever a printing operation is carried out, the apparatus comprising:

a ribbon lifting mechanism for sequentially positioning the print rows of the ribbon to a printing position as a sequence of printing operations is carried out;

means for determining a ribbon stepping amount in the longiduinal direction associated with a character to be printed in accordance with the widths of a predetermined number of characters most recently printed and the width of said character to be printed; and

a ribbon stepping mechanism for advancing the ribbon in the longitudinal direction thereof by said ribbon stepping amount.

4,787,764

SHEET FEEDER IN PRINTERS, HAVING AN IMPROVED OPERABILITY IN SHEET SETTING

Hiroshi Ikeda, and Mikio Moriya, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

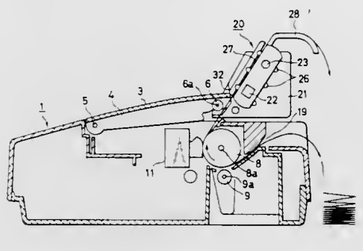
Continuation of Ser. No. 894,883, Aug. 8, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 127,535
Claims priority, application Japan, Aug. 17, 1985, 60-180058; Sep. 7, 1985, 60-196876
Int. Cl.⁴ B41J *11/30, 13/03*
U.S. Cl. 400—616.2 **8 Claims**

1. A sheet feeder for use in a printer having a main unit including a printing section said sheet feeder having a platen disposed at a location opposite said printing section and adapted to be rotatively driven, comprising at least one feed roller and means for rotatably supporting the feed roller on the printer, coupling means for operatively coupling said at least one feed roller to said platen for drivingly rotating said feed roller positioned in a working location in response to rotation of the platen,

said at least one feed roller at said working location being spaced out of contact from said platen so as to avoid pinching the sheet between said at least one feed roller and said platen; and

at least one urging means for engaging a printing sheet with said at least one feed roller in the working location, said at least one urging means comprising a pair of urging portions respectively disposed at opposite sides of a corresponding one of said at least one feed roller in an axially spaced direction of said corresponding one feed roller, and overlapping with said corresponding one feed roller in a direction radially thereof for urging the printing sheet so as to engage the printing sheet with said corresponding at least one feed roller each of said urging portions comprising a ramp-like static guide means;

whereby the printing sheet is smoothly settable on the platen;



said supporting means being operable to move said at least one feed roller between said working location and an inoperative location on said printer, further comprising said supporting means being operable to release the drive coupling between said at least one feed roller and said platen through said coupling means in the inoperative location,

a removably mounted tractor unit including means for detachably mounting said tractor unit on said main unit, the detachable mounting means including an engaging portion,

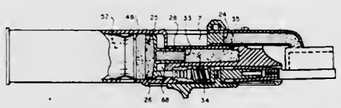
wherein said at least one feed roller in said inoperative location enables said tractor unit to be mounted on said main unit of said printed by allowing the engaging portion to detachably engage said main unit for feeding a printing sheet of continuous form to said tractor unit.

4,787,765

DENTIFRICE DISPENSING TOOTHBRUSH

Youti Kuo, 88 Foxbourne Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 830,467, Feb. 18, 1986, Pat. No. 4,695,177. This application Sep. 10, 1987, Ser. No. 94,938
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.⁴ A46B *11/02*
U.S. Cl. 401—191 **10 Claims**



1. A dentifrice dispensing toothbrush comprising:

a. a housing;

b. a reservoir situated within the housing for storing dentifrice material;

c. a brush which contains a head member and a set of bristles having their bottom end portions attached to the head member and their top end portions unattached so as to collectively provide a brush surface for supporting dentifrice material, said brush being releasably attached to the housing;

d. pumping means attached to the reservoir and comprising a piston for applying a pumping force to the dentifrice material to cause a controlled quantity of it to flow from the reservoir, and a plunger for driving the piston wherein one end of the plunger is in communication with the brush head member when a pumping force is applied;

e. a channel situated within the housing for the passage of the controlled quantity of dentifrice material as it is pumped from the reservoir, said channel having a first opening for receiving dentifrice material as it is pumped from the reservoir into the channel and a second opening for discharging dentifrice material from the channel; and

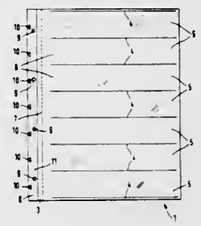
f. a movable applicator comprising a tube attached to the housing, said tube having first and second openings, such that when the movable applicator is positioned in a depositing relationship with the brush surface, dentifrice material is permitted to be pumped from the reservoir, through the channel, into the applicator through its first opening, and to be deposited onto the brush surface upon discharge from the applicator through its second opening, and such that when the movable applicator is its second opening, and such that when the movable applicator is positioned in a non-depositing relationship with the brush surface, dentifrice material is prevented from being pumped from the reservoir.

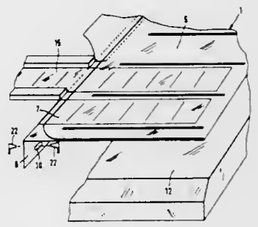
4,787,766

STORAGE POCKET ARRANGEMENT FOR FILM MATERIAL AND APPARATUS FOR INTRODUCING FILM MATERIAL THEREINTO

Johannes Lörsch, An Der Bleiche 49, D-4172 Straelen, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 79,689
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1986, 3627955
Int. Cl.⁴ B42D *15/00;* **B65B** *5/10*
U.S. Cl. 402—79 **6 Claims**





1. A storage pocket arrangement for film material in combination with an apparatus for automatically inserting film strips into the storage pocket arrangement comprising:

a plurality of individual pockets in substantially contiguous relationship in a substantially flat article, each for accommodating respective film strips, each said individual pocket having a film-receiving opening for receiving said respective film strip adjacent a first edge of said storage pocket arrangement,

a strip portion along said first edge of said storage pocket arrangement,

holding means on said strip portion for holding the arrangement in an archive-filing system,

machine-recognisable marks on said strip portion, said marks spaced apart and corresponding to each said individual pocket, said marks adapted thereby for permitting cyclic transportation of the arrangement in the apparatus for inserting said respective film strips into said individual pockets, and

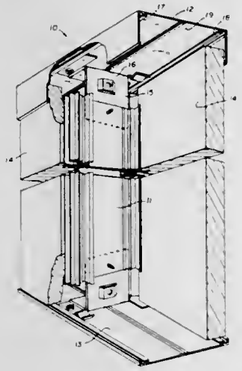
at least one of said marks containing information for identification of the size of said individual pockets, said marks adapted thereby for preventing cyclic transportation of the arrangement in the apparatus for inserting respective film strips into said individual pockets responsive to an identified individual pocket size less than said respective film strip.

4,787,767

STUD CLIP FOR THE TOP RAIL OF A PARTITION

Alan C. Wendt, Barrington, Ill., assignor to USG Interiors, Inc., Chicago, Ill.

Continuation of Ser. No. 30,172, Mar. 25, 1987, abandoned. This application Apr. 29, 1988, Ser. No. 188,722
Int. Cl.⁴ F16B *7/08*
U.S. Cl. 403—187 **12 Claims**



1. A partition system comprising:

a channel form top rail having an elongate web, a pair of flanges depending from opposite edges of the web, and a pair of elongate tracks in a plane lower than and parallel to the web, each of which extends inwardly in relation to the flanges to form a slot between the track and the web;

a stud; and

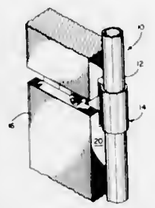
a stud clip having a base plate, a standard depending at a right angle from the central portion of the plate in engagement with the stud, the remaining lateral portions of the plate being skid elements which fit within the slots of the top rail and engage the tracks thereof, and a locking tab which extends from the plate beyond the vertical plane of the standard and is in edgewise abutment with one of the tracks in the top rail;

whereby the clip is slidable along the tracks of the rail until

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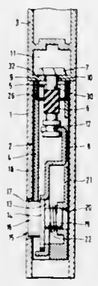
fastened thereto and twisting of the clip within the rail is prevented by the locking tab.

4,787,768
FASTENER APPARATUS
Fredric A. Lange, Osseo, Minn., assignor to Interlock Structures International, Inc., Minneapolis, Minn.
Filed Mar. 2, 1988, Ser. No. 162,985
Int. Cl.[4] B25G *3/00*; F16B *9/00*
U.S. Cl. 403—235 **7 Claims**



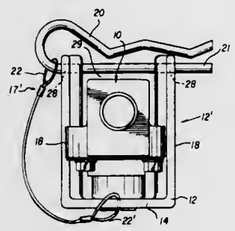
1. Fastener apparatus, comprising:
an elongated member;
a wall with a face and an edge, said wall having a T-shaped groove with a base slot and a cross slot, said groove having an end opening along said edge, said base slot opening along said face and communicating with said cross slot, said cross slot having an unbroken inner side and a broken inner side intersecting with said base slot; and
means for holding the edge of said wall adjacent to said elongated member, said holding means including means for fitting from said groove around said elongated member, said fitting means including a portion extending into the end of said cross slot, said holding means further including means extending through said base slot for retaining said portion of said fitting means in said cross slot.

4,787,769
CONNECTING ELEMENT
Roy Michael, Cologne, Fed. Rep. of Germany, assignor to Exibelco GmbH, Basel, Switzerland
PCT No. PCT/EP85/00108, § 371 Date Apr. 15, 1987, § 102(e) Date Apr. 15, 1987, PCT Pub. No. WO85/04220, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 16, 1985, Ser. No. 943,266
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1984, 3409983
Iot. Cl.[4] B25G *3/00*
U.S. Cl. 403—252 **27 Claims**



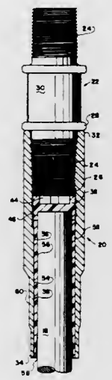
1. In a connecting element for releasably connecting two structural members of a stand, particularly a frame member having a hollow interior and a support member having an undercut groove, said connecting element including a housing to be positioned in a stationary manner in the hollow interior of the frame member, at least one locking element having a longitudinal axis and positioned within said housing for movement in a lon ;itudinal direction therein, said locking element having at a fir.t end thereof a clamping portion extending from said housing to be introduced into the undercut groove of the support member and clamped therein, and an eccentric mounted in said housing for rotation about an axis transverse to said longitudinal direction, said eccentric having a head portion to engage in a bore through a wall of the frame member to enable selective rotation of said eccentric about said transverse axis and an eccentric portion for transducing rotation of said eccentric into longitudinal movement of said locking element, the improvement comprising:
a pulling element separate from said locking element, said pulling element having a first end acting on by said eccentric portion to move said pulling element longitudinally and a second end loosely connected to a second end of said locking element such that longitudinal movement of said pulling element is transferred to said locking elements;
said locking element and said housing having cooperating means for, upon said locking element moving longitudinally, causing said clamping portion to rotate about said longitudinal axis within a limited angular range; and
said clamping portion comprising a bar extending transversely of said longitudinal axis.

4,787,770
LOCKING DEVICE FOR AIR HOSE COUPLING DEVICES OF TRACTOR TRAILERS
Buford Lewis, 490 Corte Arqueta, Morgan Hill, Calif. 95037
Filed Jul. 7, 1987, Ser. No. 70,390
Iot. Cl.[4] B25G *3/00*
U.S. Cl. 403—317 **6 Claims**



1. A securing device for restraining the movement of a pair of joined couplings, said joined couplings forming a pair of circular surfaces which are constrained within said securing device, comprising:
housing means including a base and a pair of opposed side walls extending upwardly from said base;
each of said side walls having a pair of vertically disposed, inwardly directed projections, said pair of projections on each said side wall laterally spaced apart from one another a distance less than the diameter of said circular surfaces of said joined couplings, each said projection on one said side wall spaced fron one said projection on the other one said side wall a distance less than the diameter of said circular surfaces of said joined couplings, and said projections defining a cavity therebetween whereby, when said joined couplings are positioned within said cavity of said housing means said projections limit the extent to which said joined couplings may move relative to each other and relative to said housing means.

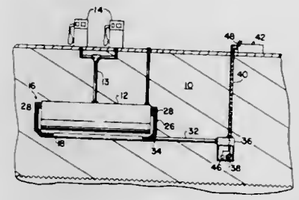
4,787,771
LOADED SUCKER ROD FITTING
Loy F. Allen, 4317 Springbrook, Odessa, Tex. 79762
Continuation-in-part of Ser. No. 849,497, Apr. 8, 1986, Pat. No. 4,740,101. This application Dec. 16, 1986, Ser. No. 942,171
Int. Cl.[4] B25G *3/20*; F16B *2/00*
U.S. Cl. 403—370 **9 Claims**



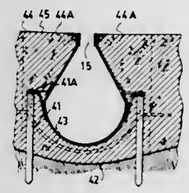
1. A metal socket unit for a composite sucker rod comprising:
a. a tubular body having
i. a length,
ii. a coupler end, and
iii. a rod end,
b. standard internal sucker rod pin threads for at least one third the length of the body at the coupler end,
c. a tapered bore for at least one half the length of the body, said tapered bore having
i. a big end and
ii. a little end
d. the tapered bore beginning at the pin threads with the big end, the big end being the same diameter as the diameter of the threads,
e. the tapered bore having a smooth conical surface to the little end at the rod end, and
f. a metal plug threaded in the internal pin threads,
g. a circumferential flange around a coaxial bore having a radial face in the surface of the metal plug facing the rod end, and
h. rotational drive means in the surface of the plug facing the coupler end.

4,787,772
DEVICE FOR DETECTING LEAKS IN UNDERGROUND FLUID TANKS
Richard Wagner, Denver, Colo., assignor to Eljen Corporation, Storrs, Conn.
Filed Jun. 26, 1987, Ser. No. 67,639
Int. Cl.[4] E02D *3/00*; E02B *3/16*
U.S. Cl. 405—53 **7 Claims**

1. A device for detecting leaks in an underground fluid tank, said device comprising:
an axially elongated drain pipe arranged below the tank, said drain pipe extending along the length of the tank and having openings defined in the side wall of said drain pipe to provide passageways for fluid to pass into the interior thereof;
a tank liner arranged below the tank and extending across the bottom of the tank, said tank liner also extending upwardly along the sides of the tank, said liner having a fluid impervious core arranged generally tangentially to said drain pipe, and a sheet of fluid pervious material wrapper around said core and said drain pipe, said core having opposing surfaces wherein one of said surfaces faces the tank and said other surface faces away from the tank, said surfaces having raised lands and associated valleys defining a plurality of fluid passageways for directing fluid across said one surface facing said tank and into said openings in said pipe, said sheet material also preventing surrounding underground fill material from plugging said fluid passageways defined by said core and said openings in said drain pipe;
an underground leak tank arranged in fluid communication with said drain pipe for receiving fluid therefrom; and
sensor means for determining if there is fluid from said fluid tank within said leak tank.



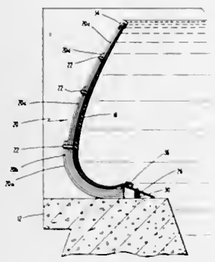
4,787,773
SURFACE DRAINAGE SYSTEM
Glen M. Kehler, 846 Oakdale Drive, Winnipeg, Manitoba, Canada R3R 1A3
Filed May 28, 1987, Ser. No. 55,190
Claims priority, application Canada, Jun. 4, 1986, 510787
Int. Cl.[4] E02B *5/00*; E01C *11/22*
U.S. Cl. 405—118 **21 Claims**



1. A culvert assembly for use in a trench type floor drain system comprising in combination a pair of longitudinally extending upper members in spaced and parallel relationship defining an elongated, unobstructed drainage slot therebetween, a culvert component secured to and depending from said members, said culvert component including a longitudinally extending through-like base portion below the drainage slot and sloping with respect to the upper members from a first end of the assembly to a second end thereof, and side flange portions converging upwardly from respective side edges of said through-like base portion and being secured along upper edges thereof to respective ones of said upper members, depth registration and support snchor members extending outwardly from the sides of said culvert component along the length thereof, said depth registration and support anchor members all being equidistantly spaced downwardly from said upper members.

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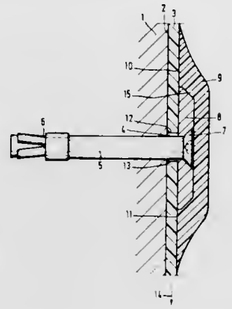
4,787,774
FLUID CONTROL APPARATUS
William M. Grove, 1701 Minot Ave., Auburn, Me. 04210
Filed Jul. 1, 1987, Ser. No. 68,418
Int. Cl.[4] E02B *7/44*
U.S. Cl. 405—94 **11 Claims**



1. A fluid control apparatus for mounting on a waterway foundation comprising:
a flexible membrane barrier means for retaining fluid above said foundation, said membrane barrier means having at least an upper portion and bottom portion;
cantilever means for supporting said membrane barrier means, said cantilever means operative to assume a fluid-retaining support position in response to fluid levels at or below a predetermined maximum fluid level above said foundation and operative to assume a fluid-releasing support position in response to fluid levels above said predetermined maximum level;
means anchoring said cantilever means to said foundation;
means attaching the upper portion of said membrane barrier means to said cantilever means; and
means for securing the bottom portion of said membrane barrier means adjacent to said foundation to retain fluid above said foundation.

4,787,775
ARRANGEMENT FOR TRANSMITTING FORCE FROM A SHEET MADE OF POLYMER MATERIAL ONTO A SUPPORTING SURFACE
Heiner I. Hammer, Seevetal, Fed. Rep. of Germany, assignor to Schlegel Lining Technology GmbH, Hamburg, Fed. Rep. of Germany
Continuation of Ser. No. 789,634, Oct. 21, 1985. This application Feb. 16, 1988, Ser. No. 158,100
Int. Cl.[4] E21D *11/38*
U.S. Cl. 405—150 **8 Claims**

1. Apparatus for supporting a sheet of weldable polymer material on a supporting surface comprising:
a plurality of fastening elements extending through a plurality of openings in the sheet of weldable polymer material, each of said fastening elements having a first portion connected firmly with respect to the supporting surface, and a second portion extending beyond the sheet;
an elongated rod carried by the second portion of at least two of said fastening elements and extending parallel to the surface of the sheet; and
a body of polymer material welded to the sheet along a welding surface and enveloping the rod for transmitting



force from the sheet to the rod for supporting the sheet on the surface by force transmitted by the fastening members.

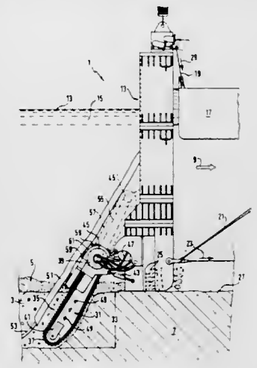
4,787,776
METHOD OF DIRECTING OR HOLDING WATER
Sam A. Brady; Michael D. Meddaugh; Michael G. Elias, and John D. Gavin, Jr., all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
Filed Jul. 30, 1981, Ser. No. 288,265
Int. Cl.[4] E02B *5/02*
U.S. Cl. 405—270 **35 Claims**

1. A method of constructing a means suitable for directing or holding water comprising
(A) laying cloth on an earth surface of a depression suitable to direct, transport or hold water,
(B) fastening the cloth at seams, then
(C) coating the cloth with liquid silicone elastomeric composition curable at atmospheric conditions,
(D) allowing the composition to cure at atmospheric conditions to yield a covering impervious to liquid water, and
(E) stabilizing the cloth at unseamed edges.

4,787,777
METHOD AND DEVICE FOR PROGRESSIVELY PRODUCING AN UNDERWATER LAYING-OUT CHANNEL
Rudolf Harmstorf, Stauffenbergstrasse 6m, 2000 Hamburg 55, Fed. Rep. of Germany
Division of Ser. No. 872,541, Jun. 10, 1986, Pat. No. 4,721,409. This application Nov. 9, 1987, Ser. No. 118,860
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—163 **9 Claims**

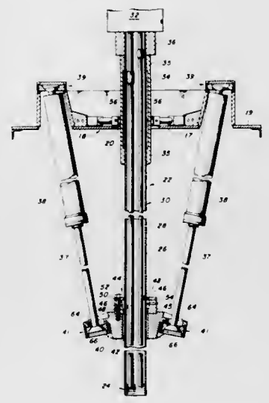
1. An apparatus for progressively producing an underwater channel in which an object such as a cable or the like is to be laid out and buried in an underwater ground comprised of a base layer of a formation solid enough to resist the formation of a channel by a flushing operation and requiring a mechanical loosening operation to form the channel, said apparatus comprising a flushing device movable through any flushable ground area of the underwater ground above the base layer, and a mechanical loosening device arranged in the lower end

area and to the rear of the flushing device in the direction of travel along the channel being formed, said loosening device



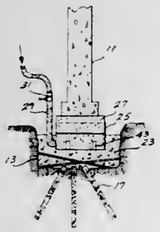
being supported at least in part on the upper surface of the base layer by said flushing device.

4,787,778
METHOD AND APPARATUS FOR TENSIONING A RISER
Roderick J. Myers, and Jorge H. Delgado, both of Houston, Tex., assignors to Conoco Inc., Ponca City, Okla.
Continuation-in-part of Ser. No. 936,579, Dec. 1, 1986, Pat. No. 4,733,991. This application Apr. 24, 1987, Ser. No. 41,904
Int. Cl.[4] E21B *43/01*
U.S. Cl. 405—195 **13 Claims**



1. A tensioner system for tensioning a riser from a producing subsea well and for compensating for relative movement between said riser and a production platform, said riser having a longitudinal axis, said apparatus comprising:
a plurality of at least three riser tensioners interconnected between said platform and said riser, each said tensioner comprising a piston cylinder arrangement with a rod-mounted piston slidably mounted therein;
a tensioner ring surrounding a portion of said riser and having a plurality of attachment points for connecting said tensioners at a first radial distance from said riser, said plurality of attachment points being equal in number to said plurality of tensioners;
means for securing said tensioner ring to said riser;
means for pivotally attaching an end of each of said tensioners to one of said attachment points;
means for pivotally attaching a second end of each of said tensioners to said platform at a point above said tensioner ring at a second radial distance greater than said first;
whereby said piston cylinders, with said piston rods in their median position, act along force lines which define a first angle with respect to said riser and which pass through a common point lying along the longitudinal axis of said riser such that failure of one of said tensioners will not result in torsional forces being applied to said riser by the tensioner system.

4,787,779
METHOD AND APPARATUS FOR RAISING AND SUPPORTING A FOUNDATION
Howard E. Clark, 20402 78th Pl. West, Edmonds, Wash. 98020
Filed Jan. 29, 1987, Ser. No. 8,482
Int. Cl.[4] E02D *27/48*
U.S. Cl. 405—230 **12 Claims**



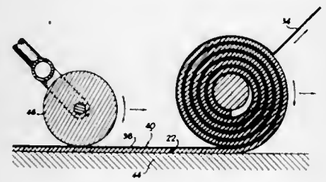
1. A method of raising and supporting a settled foundation, comprising the steps of:
(a) excavating a hole beneath a portion of the foundation;
(b) driving one or more pipes into the earth at the bottom of the hole to solid ground to form a piling;
(c) placing a jack in the hole above the piling and forming a pool of selfhardening liquid in the hole and floating the jack in the pool into alignment with the foundation and allowing the liquid to harden; and
(d) operating the jack by foring a self-hardening fluid into the jack to raise the foundation.

4,787,780
METHOD OF WATERPROOFING WITH A SELF-HEALING BENTONITE SHEET MATERIAL COMPOSITE ARTICLE
Todd D. Harriett, Elk Grove Village, Ill., assignor to American Colloid Company, Arlington Heights, Ill.
Continuation of Ser. No. 816,266, Mar. 4, 1986, Pat. No. 4,733,989, and a continuation of Ser. No. 676,279, Nov. 29, 1984, Pat. No. 4,656,062, said Ser. No. 816,266, is a continuation-in-part of Ser. No. 676,279, , which is a continuation-in-part of Ser. No. 604,990, Apr. 27, 1984, Pat. No. 4,634,926, which is a continuation-in-part of Ser. No. 443,225, Nov. 22, 1982, Pat. No. 4,534,925. This application Nov. 9, 1987, Ser. No. 118,616
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] E02D *31/02*
U.S. Cl. 405—270 **20 Claims**

1. A method of waterproofing an area of potential water leakage comprising disposing a multilayer article of manufacture in contact with said area of potential water leakage to provide a flexible sheet material primary seal and a bentonite composition secondary seal, said multi-layer article of manu-

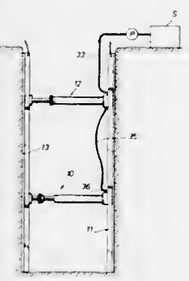
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facture comprising a first layer of a clay composition including 35% to 90% by weight clay, and 10% to 65% polypropene,



polybutene or mixture thereof, adhered to a second layer of a flexible sheet material.

4,787,781
SHORING DEVICE
George Bradberry, Hebert, La., assignor to Walter Lipscomb, Dallas, Tex., a part interest
Filed May 14, 1987, Ser. No. 50,088
Int. Cl.[4] E02D *17/04*
U.S. Cl. 405—282 **3 Claims**



1. A device for shoring the side walls of a trench or the like, comprising

a pair of elongate rails,

a pair of parallel, extendible and contractible actuators each connected at its opposite ends to the rails for lowering and raising with the rails into and out of positions in which the rails are opposite the walls, and adapted, when extended, to hold the rails tightly against the walls,

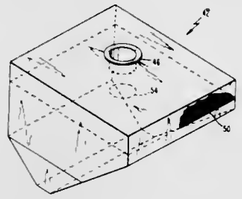
each actuator including a cylinder connected to one rail and a piston on a rod connected to the other rail and sealably reciprocable within the cylinder to form a pressure chamber between one end of the piston and a closed end of the cylinder adjacent its connection to the one rail,

each cylinder having a passageway therein connecting the pressure chamber with a fitting to which a hose may be connected for introducing hydraulic fluid into the chamber for extending the piston with respect to the cylinder, and

a nut threadedly connected to each rod for movement lengthwise of the rod intermediate its connection to the other rail and the piston thereon,

said nut being engageable with the cylinder adjacent its open end, when moved longitudinally of the rod in one direction, so as to prevent contraction of the rod with respect to the cylinder in the event of the loss of hydraulic fluid pressure.

4,787,782
OPEN MESH DEVICE FOR IMPROVED IN-CAR SLURRYING
Ronald L. Younger, and John S. Coulter, both of Athens, Tenn., assignors to J. M. Huber Corporation, Rumson, N.J.
Filed Oct. 13, 1987, Ser. No. 108,906
Int. Cl.[4] G65G *53/30*
U.S. Cl. 406—46 **6 Claims**

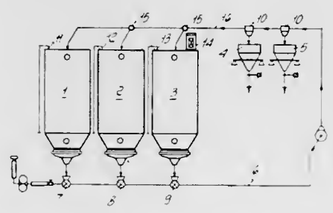


1. A method for improved in-car slurrying of dry bulk powder contained in hopper compartments in a hopper car, each compartment having means for admitting air under pressure and water into the compartment at the bottom thereof comprising the steps of:

providing a porous obstruction across the upper portion of the compartment at about the level of the bulk powder therewithin which will admit the passage of air therethrough but not clumps of unwet powder,

admitting water and air to the bottom of the bulk to pump said material upwardly against said obstruction.

4,787,783
APPARATUS FOR THE PNEUMATIC CONVEYANCE OF PULVERIZED OR GRANULATED MATTER
Maurizio Girardelli, Voghera, Italy, assignor to Brambati S.p.A., Codevilla-PV, Italy
Filed Oct. 15, 1986, Ser. No. 919,169
Claims priority, application Italy, Oct. 24, 1985, 22602A/85
Int. Cl.[4] B65G *53/60*
U.S. Cl. 406—106 **5 Claims**



1. An apparatus for pneumatic conveyance of pulverized and granulated material with a closed material conveyance circuit,

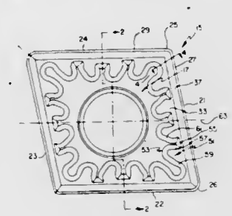
said conveyance circuit comprising material collecting stations, material drawing stations and a pneumatic line connecting said collecting stations to said drawing stations,

said pneumatic line including a transport section for transporting the material from said collecting stations to said drawing stations along a material flow direction and a recycling section for transporting material residues from said drawing station to said collecting stations,

said drawing stations comprising each means for drawing the material from the pneumatic line during conveyance thereof inside said line and discharging said material inside the drawing stations,

said means for drawing the material comprising rotating blade means mounted on said pneumatic line and having a rotation axis, said rotation axis being substantially parallel to said material flow direction inside said pneumatic line.

4,787,784
POLYGONAL CUTTING INSERT
Thomas J. Bernadic, Madison Heights; Tony M. Lowe, Royal Oak; John H. Patterson, Hazel Park; Karl A. Kathi, Troy; Charles F. Zimmerman, Southfield, and Yefim Val, Troy, all of Mich., assignors to GTE Valenite Corporation, Troy, Mich.
Filed Aug. 3, 1987, Ser. No. 81,266
Int. Cl.[4] B23B *27/22*
U.S. Cl. 407—114 **5 Claims**



1. A polygonal indexable cutting insert comprising a pair of substantially parallel faces and peripheral side surfaces normal to said parallel faces,

said faces and said side surfaces being joined to form corners,

a pair of cutting edges extending away from each corner substantially within the plane of a respective one of said faces,

a pair of floor surfaces,

each floor surface being substantially parallel to a respective face and spaced downwardly therefrom,

a ramp surface extending downwardly from a respective cutting edge to said floor surface whereby said insert has a positive rake,

a backwall surface extending between a respective floor surface and respective face surface, and

said backwall extending in a sinuous path from each corner to an adjacent corner in a manner tending to deflect chips inwardly toward the center of said insert wherein said sinuous path comprises a plurality of undulations wherein each undulation includes a curved section near the center of the insert and a pair of outwardly extending keg portions.

4,787,785
MACHINE TOOL WITH A SPINDLE HEAD
Norbert Hiller; Erwin Deuschle, both of Wendlingen, and Heinz Vogel, Oberboihingen, all of Fed. Rep. of Germany, assignors to Gebrueder Heller, Maschinenfabrik, GmbH, Fed. Rep. of Germany
Filed Jun. 5, 1987, Ser. No. 58,446
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1986, 3619071
Int. Cl.[4] B23C *1/00*
U.S. Cl. 409—136 **14 Claims**

1. A machine tool which provides uninterrupted coolant flow to a tool, comprising:

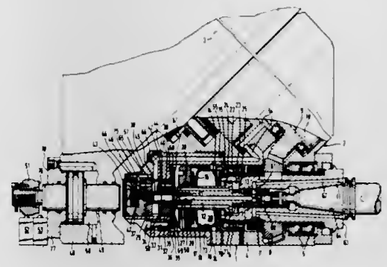
a spindle head movable between a vertical and a horizontal working position;

a tool spindle rotatably mounted in said spindle head and provided with a toolholder having a coolant passage communicating with the tool;

a clamping means mounted in said spindle for selectively clamping and release the tool, said clamping means having inner end portions which are engageable during releasing of the tool;

an axially movable tension rod having opposed axial ends, and means for axially moving said rod so that one axial end thereof is adapted to engage said inner end portion of said clamping means to cause said clamping means to release the tool, said tension rod having a coolant bore extending axially therethrough, said coolant bore having a sealing means at an open end opposite said one axial end of said tension rod; and

a transfer piston, and means for moving said transfer piston axially relative to said tension rod to selectively contact



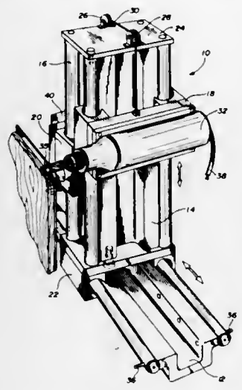
the other axial end of said tension rod to transfer axial movement to said tension rod, said transfer piston surrounding a coolant supply line communicating with said coolant bore in said tension rod and having sealing means in sealing engagement with said coolant bore sealing means, said transfer piston being axially movable with respect to said coolant supply line whereby said respective sealing means maintain said coolant bore and said coolant supply line in constant communication so that coolant can be flowed uninterrupted through said coolant supply line, said coolant bore and said coolant passage to the tool irrespective of the axial position of said transfer piston.

4,787,786
LAMINATE CUTTING DEVICE
Ivan B. Freud, 21 Lamb La., Manalapan, N.J. 08049, and Alan Melcer, 308 Kase Rd., Lakewood, N.J. 08701
Filed Aug. 24, 1987, Ser. No. 88,709
Int. Cl.[4] B27C *5/00*
U.S. Cl. 409—180 **5 Claims**

1. A laminate cutting device comprising a horizontal motion means having a dual shaft rail system with a first carriage mounted thereon said carriage being moveable from one end of said rail system to the other end of said rail system; a vertical motion means comprising a pair of U-shaped dual shaft rail systems each having a carriage mounted thereon said pair of dual shaft rail systems being attached base to base and mounted vertically on said first carriage, each vertical carriage being moveable vertically to ascend or descend from substantially one end of its rail system to substantially the other end of its rail system; a cable connecting the carriages of the vertical dual shaft rail systems which cable extends over the uppermost portion of said vertical motion means through at least one pulley; a cutting blade comprised of a router having a bearing

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router bit with a depth guide said router being mounted on one of said vertical dual shaft rail system carriages and a counter-



balance weight mounted on the other of said vertical dual shaft rail system carriages.

4,787,787

SHEET MATERIAL MACHINING SYSTEM

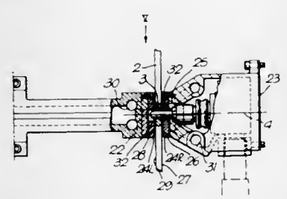
Ernest E. Hopwell, Kilsby, and Michael G. Bayes, Willenhall, both of United Kingdom, assignors to Marwin Production Machines Limited, Wednesfield and British Aerospace Public Limited Co., London, both of, England

Filed Mar. 27, 1987, Ser. No. 31,053

Claims priority, application United Kingdom, Mar. 27, 1986, 8607645

Int. Cl.⁴ B23Q *3/00, 11/10*

U.S. Cl. 409—219 **5 Claims**



1. Workpiece support apparatus for hydrostatically supporting resilient sheet material in the vicinity of a machine tool spindle during a machining operation for example routing, in which said resilient sheet material is fixedly located in a substantially vertical plane and said machine tool spindle lies along a substantially horizontal datum, said workpiece support apparatus comprising first fixed support pad means spaced apart from but closely adjacent one exposed outer face of said resilient sheet material and second support pad means including lateral adjustment means for receiving varying thicknesses of sheet and for adopting a substantially similar gap to said first support pad means, each of said support pad means being connected to fluid supply means for interposing and maintaining at pressure a balanced supporting layer of non-gaseous hydrostatic fluid between said pad means and said adjacent exposed outer face of said resilient sheet material whereby said workpiece support apparatus is constrained to move in a planar sense with said machine tool spindle to support and said resilient sheet material against induced vibration and distortions during cutting, spent hydrostatic fluid falling away from said support apparatus being utilized for dispersion of cutting swarf from the vicinity of said support apparatus.

4,787,788

DEVICE FOR CARRYING BOMBS

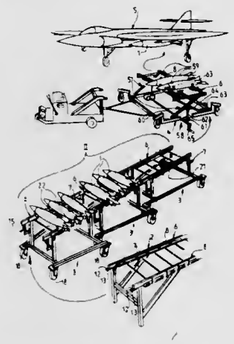
Gijsbert Versteeg, Nunspeet, Netherlands, assignor to B.V. Industriele Handelsondernedming, Etc., Nunspeet, Netherlands

Filed Jun. 2, 1987, Ser. No. 57,906

Claims priority, application Netherlands, Jun. 2, 1986, 8601419

Int. Cl.⁴ B60P *1/52;* B64D *7/00*

U.S. Cl. 410—49 **11 Claims**



5. In a system for handling bombs, the combination of a mobile frame and a pair of rails on the frame disposed in parallel relation thereon to define an entrance end of the rails and a remote end of the rails, a plurality of pairs of carrying members, each pair of carrying members guided along a respective one of the rails and each carrying member having means for cradling a corresponding end of a bomb so that each bomb is supported by a pair of carrying members on the rails while extending transversely thereof, locking means for positively locating the pairs of carrying members at specific transverse, aligned locations along the lengths of the rails from the entrance end toward the remote end of the rails, and control means at each location for loading the mobile frame with a plurality of bombs in reverse sequence toward the entrance end of the rails by selective and separate actuation of the locking means from an inoperative condition in which the carrying members are not arrested at such aligned location to an operative condition in which the pairs of carrying members are arrested at an aligned location.

4,787,789

FIXING AND LOCKING DEVICE FOR CONTAINERS OF THE BOX PALLET TYPE WHICH ARE TO BE TRANSPORTED ON VEHICLES

Hans-Werner Stagars, Bevenroder Str. 90A, 3300 Braunschweig, Fed. Rep. of Germany, and K. H. H. F. Karl-Christian Amme, Braunschweig, Fed. Rep. of Germany, assignors to Hans-Werner Stagars, Fed. Rep. of Germany

Filed Apr. 3, 1987, Ser. No. 35,907

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3611837

Int. Cl.⁴ B60P *1/64, 7/13*

U.S. Cl. 410—80 **16 Claims**

1. A fixing and locking device for containers of the box pallet type which are to be transported on vehicles, having fork-engaging channels and elongated feet which are to be fixed to the underside of the container in each case in the area of the four corners, and having fixing rails which are to be rigidly connected to a supporting body and are provided with openings into which the feet engage, with the feet (**36, 38**) in each case having a perpendicular web (**40**) which extends parallel to the fork-engaging channels (**32**) of the containers (**30**) and which, with its upper margin (**42**), can be connected to

the underside of the container and is provided on its underside with flange legs (**46, 48**) projecting on both sides, the fixing rails (**2**) essentially extending over the depth of the container and being made essentially U-shaped in cross-section and being provided with two sections (**50, 56**) which are at a distance from one another in the longitudinal direction of the rails and in which flanges (**10, 12**), which extend toward one another



and form undercuts, are provided on the leg ends of the fixing rails so that the undercut sections are at a distance (L_3) from one another which is greater than the length (L_5) of the flange legs (**46, 48**) of the feet (**36, 38**) on the container and, at one end, are at a distance (L_1) from the end of the fixing rail, and means (**38**) being provided for locking at least one of the feet of the container in the fixing rail.

4,787,790

STUD FASTENING ASSEMBLY

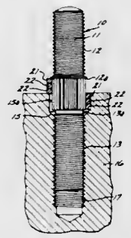
Yoji Shirai, Kanagawa, Japan, assignor to Rexnord Inc., Torrance, Calif.

PCT No. PCT/US86/02799, § 371 Date Aug. 24, 1987, § 102(e) Date Aug. 24, 1987, PCT Pub. No. WO87/03942, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 23, 1986, Ser. No. 183,740

Int. Cl.⁴ F16B *37/12*

U.S. Cl. 411—109 **4 Claims**



1. A stud fastening assembly comprising:

a stud having a end section adapted to threadedly engage a threaded hole in a workpiece and further having a central section with longitudinal serrations; and

lower and upper fastening rings, each ring having inner serrations complementary to the longitudinal serrations of the stud and outer serrations configured to engage the threaded hole in the workpiece, wherein the lower and upper fastening rings are positioned to encircle the stud, and wherein the lower ring includes fewer outer serrations than does the upper ring.

4,787,791

LOCK WASHER FOR BUBBLE CAP ASSEMBLY

George G. Lambousy, Texas City; Benjamin H. Reaves, West Texas City, and William E. Nelson, Dickinson, all of Tex., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 925,325, Oct. 31, 1986, Pat. No. 4,715,996. This application Jul. 23, 1987, Ser. No. 76,909

Int. Cl.⁴ F16B *39/10*

U.S. Cl. 411—124 **1 Claim**

1. A lock washer, for use in a bubble cap assembly having a headed fastener and for mating engagement with a keyway in a mating part therein for holding the assembly, the bubble cap assembly being in a reactor of a hydrocarbon processing plant, the lock washer comprising:

a generally planar upper surface;

a generally planar lower surface;

said surfaces cooperating with each other to define a substantially circular shaft-receiving central hole having a center;

an arcuate base comprising a segmental quadrant support surface with a curved arcuate edge extending for about 90 degrees;

a set of only four bendable radial locking tabs connected to said arcuate base and extending arcuately about said central hole, each of said tabs extending from about 30 degrees to about 40 degrees and having a radial center, and each of said radial centers being spaced about 55 degrees from the radial center of an adjacent tab;



said four radial locking tabs being spaced from each other by three substantially similar trapezoidal openings, said trapezoidal openings including an intermediate trapezoidal opening;

one of said tabs being bent and extending upwardly in an axial direction to provide a transverse locking lug for interlockingly engaging and abutting against one of the faces of the head of a fastener to substantially prevent the fastener from rotating; and

a substantially rectangular radial key extending substantially downwardly from said base in a direction away from said locking lug for engaging a keyway of a mating part, said rectangular radial key being aligned with said center of said central hole and extending radially outwardly, and said rectangular radial key being positioned diametrically opposite said intermediate trapezoidal opening.

4,787,792

DRILL SCREW

George Jesson, and Frank Piacenti, both of Campbellsville, Ky., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 765,581, Aug. 14, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 27,141

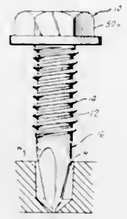
Int. Cl.⁴ F16B *25/00*

U.S. Cl. 411—387 **3 Claims**

1. A drilling and thread forming fastener comprising a threaded shank and a pilot end, said pilot end having a transverse major axis and a transverse minor axis intersecting at the centerline of said fastener, a pair of flutes extending longitudinally over the length of said pilot end to form a pair of cutting surfaces in cross-section defining said major axis, a pair of lands concentric with the centerline of said shank and disposed on

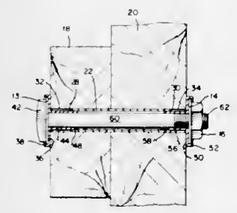
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opposite sides of said major and said minor axes, each of said lands formed of a convex arcuate surface projecting outwardly from said major axis to define said minor axis at its radial extent on any cross-section of said pilot end, each said convex arcuate surface extending from the outer edge of one of said cutting surfaces to a concave arcuate surface of smaller radius formed between said land and a planar surface which extends from said concave arcuate surface to the inner edge of the other of said cutting surfaces wherein said convex arcuate surface and said



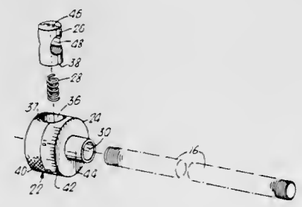
concave arcuate transition between said land and said planar surface have a smooth contour and a substantially wedge shaped cutting tip formed at the terminal portion of said pilot ene wherein said minor axis increases in a linear progression from adjacent said cutting tip to a point remote from said cutting tip to thereby form an angular portion of said pilot end which longitudinal outer surface defines an angle with said fastener center line and wherein said cutting surfaces are substantially parallel to one another over a greater portion of said pilot end angular portion.

4,787,793
BOLT GUARD
Gary R. Harris, Fairfield, Ill., assignor to Terrell Lee Sharp, Mt. Vernon, Ill., a part interest
Filed Mar. 27, 1987, Ser. No. 30,637
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—339 **10 Claims**



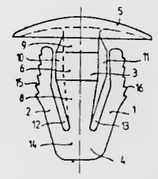
1. A bolt guard assembly for use in separating a fastener used in joining treated wood product members from the treated wood members, said bolt guard assembly comprising:
- a central sleeve, said sleeve being freely sildably positionable in aligned bores formed in the treated wood product members; said central sleeve having an inner dimension greater than a shank portion of the fastener;
- a first end cap having a fastener head receiving pocket, and a first barrel, said first barrel having a free end which is slidingly telescopingly positionable within a first end of said central sleeve;
- a second end cap having a fastener nut receiving pocket, and a second barrel, said second barrel having a free end which is slidingly telescopingly positionable within a second end of said central sleeve; said central sleeve and said first and second end caps being made of a material impermeable to the treated wood products and preventing the fastener from being contacted by the treated wood products, said central sleeve having a length such that at least said first or said second end of said sleeve is spaced from said fastener head receiving pocket or said fastener nut receiving pocket when said bolt guard assembly is in use.

4,787,794
DRILL PRESS WITH QUICK ADJUSTING STOP NUT ASSEMBLY
Gerald Guthrie, Stillwater, Minn., assignor to 5W Enterprises, Inc., Stillwater, Minn.
Continuation of Ser. No. 528,576, Sep. 1, 1983, Pat. No. 4,693,656. This application Sep. 11, 1987, Ser. No. 96,512
The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.
Int. Cl.[4] F16B *37/08*
U.S. Cl. 411—433 **4 Claims**



1. A drill press comprising a drill stop and a cylindrical threaded shaft having a predetermined major diameter, said drill stop and cylindrical threaded shaft being mounted to afford relative movement therebetween with said drill stop along the periphery of said shaft, and a stop nut assembly adjustably mounted on said shaft and adapted for engagement by said drill stop to limit relative movement between said drill stop and said shaft, said stop nut assembly comprising:
- a body having a generally cylindrical peripheral surface portion, having a through axial passageway including cylindrical portions slightly larger than the major diameter of the shaft to closely receive the shaft while affording free movement of the body axially along the shaft, and having a cylindrical transverse socket extending generally radially into said body, said transverse socket intersecting said axial passageway and opening through the periphery of said body;
- a cylindrical plunger disposed in said socket, said plunger having an outer end manually accessible from the periphery of said body, an inner end portion disposed within said body, and an axis extending between said outer end and end portion, said plunger also having a transverse through aperture which has an inner portion partially defined by threads adjacent the inner end portion of saitd plunger adapted for engagement with the threads of the shaft, and has an outer portion adjacent the outer end of said plunger affording free transverse movement of the plunger axially along the shaft, said plunger being movable within said socket between a released position with the outer portion of said aperture aligned with said passageway to afford axial movement of said nut assembly along the shaft, to an engaged position with the threads on said plunger engaging with the threads on the shaft; and
- biasing means between the said plunger and said body for biasing said plunger to said engaged position;
- said aperture being elongate axially of the plunger and said threads adjacent the inner end of said plunger being adapted for engagement with the threads on the shaft to lock said nut assembly against longitudinal movement on the shaft without relative rotation therebetween when said plunger is moved to said engaged position under the influence of said biasing means.

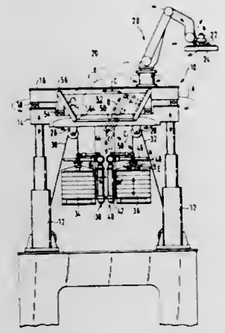
4,787,795
PUSH-IN FASTENER
Willibald Kraus, Grunstadt, Fed. Rep. of Germany, assignor to TRW United-Carr GmbH, Alsenborn, Fed. Rep. of Germany
Filed Sep. 9, 1986, Ser. No. 905,290
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535210
Int. Cl.[4] F16B *19/00*
U.S. Cl. 411—510 **4 Claims**



1. A push-in type fastener for use in a preformed cylindrical opening in a workpiece comprising:
- an axially elongated, relatively rigid main body formed from a plastic material;
- an enlarged head member formed on a first end of said main body;
- an elliptical portion formed on a second end of said main body;
- a pair of resilient arm members integrally joined to said elliptical portion in alignment therewith on diametrically opposite sides of said body, each said arm member extending outwardly of said body toward said first end and having a free end which includes at least one outwardly facing catch notch axially spaced from said head member;
- a pair of axially extending generally semicylindrical sections carried by said body on diametrically opposite sides thereof at locations intermediate said first and second ends and offset approximately 90 degrees from said arm members, said semi-cylindrical sections defining outer guide surfaces lying generally at a diameter corresponding to the diameter of said preformed cylindrical opening;
- said body further including a first truncated cone section extending from said semi-cylindrical sections toward said second end and joined with said elliptical portion, a second truncated cone section extending between said semi-cylindrical sections and said head member, said first and second truncated cone sections merging into said semi-cylindrical sections; and,
- tongue members lying diagonally opposite on another and forming extension of said outer guide surfaces and merging into said first and second truncated cone sections.

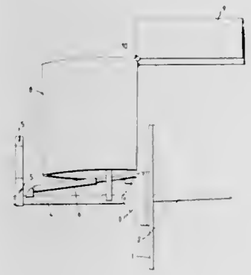
4,787,796
APPARATUS FOR LINING THE INNER WALL OF A VESSEL WITH BRICKS
Corneille Melan; Victor Kremer; Michel Kirchen, all of Luxembourg; Emile Lonardi, Bascharage; Jean Liesch, Esch sur Alzette; Andre Boch, Luxembourg; Joseph Colon, Belvaus, and Charles Hennico, Useldange, all of Luxembourg, assignors to Paul Wurth S.A. and Arbed S.A., both of Luxembourg, Luxembourg
Filed Oct. 2, 1987, Ser. No. 104,313
Claims priority, application Luxembourg, Oct. 3, 1986, 86619
Int. Cl.[4] C21C *5/44;* E04G *21/16*
U.S. Cl. 414—10 **12 Claims**

1. Apparatus for lining the inner wall of a vessel with bricks including an operating station capable of being moved vertically along an axis of the vessel, the operating station comprising:
- rotary work platform means;
- non-rotary supporting stage means supporting said work platform means by first bearing means;
- robot means on said work platform means for laying bricks;
- means for raising and lowering brick pallets;



- at least one automatic brick-depalletizing means for transferring the bricks from the pallets towards stand-by station means and wherein said stand-by station means comprises;
- turret means for holding a reserve of bricks, said turret means being supported by said stage means by second bearing means wherein said turret means is rotatable independently of said stage means and said work platform means about a vertical axis of the vessel.

4,787,797
APPARATUS FOR HANDLING AND UNWINDING ROUND BALES
Samuel P. Harper, Annamult, Stoneyford, Kilkenny, Ireland
Filed Jul. 10, 1987, Ser. No. 72,218
Int. Cl.[4] A01D *87/12*
U.S. Cl. 414—24.6 **20 Claims**



1. Apparatus for handling and unwinding a round bale of loose fibrous material, comprising
- a wheeled frame,
- a turntable adapted to receive and retain a round bale thereon, mounted for rotation on the frame, such that a bale placed on the turntable may unwound with its axis in a substantially upright position, and
- means to contain a bale upon the turntable, extending from the frame around the periphery of the turntable, having at least one openable sidewall section adapted to permit loose fibrous material unwound from the bale to be dis-

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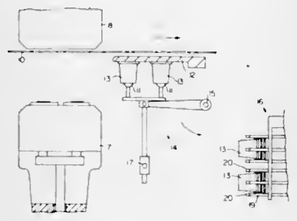
pensed there-through and directed to one side of the apparatus.

4,787,798

INLET CHECKING DEVICE FOR A STACKING CHANNEL

Pietro Padovani, Verona, Italy, assignor to O.M.V. SpA (Officine Meccaniche Veronesi), Parona, Italy

Filed May 21, 1987, Ser. No. 53,329
Claims priority, application Italy, Jun. 12, 1986, 84931 A/86
Int. Cl.[4] B65G *57/16*
U.S. Cl. 414—30 **5 Claims**



1. An inlet checking device for a stacking channel, said checking device comprising:

at least one jaw having two generally opposing ends, said jaw being formed of a small bar and defining in its surface at least one annular seat near at least one of said ends, said jaw also defining in its surface a plurality of inclined planes which are gullet toothed to form check grooves which face said channel, said stacking channel defining in its surface annular seats and recesses, one of said jaw being located in one of said recesses;

at least two jaw loading springs provided generally at said ends of said jaw to raise said jaw from the bottom of said recess;

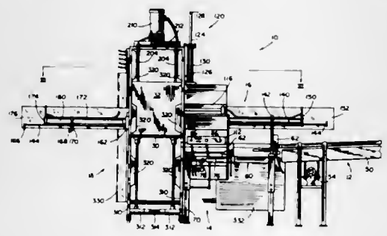
control means for adjusting the projection of said jaw inside said channel, said control means being comprised of two rings housed in said annular seats of said bar.

4,787,799

EGG CARTON STACKING-LOADING DEVICE AND METHOD

Kornelis Platteschorre, 4273 Mohave Ct., Grandville, Mich. 49418

Filed Sep. 12, 1986, Ser. No. 907,225
Int. Cl.[4] B65G *57/30*
U.S. Cl. 414—36 **23 Claims**



10. A stacking and transfer device for packages, comprising:

a frame;

a stacking region and a laterally aligned transfer region;

a package conveyor adapted to convey packages to said stacking region;

means for selectively raising said packages at said stacking region to a stacked position;

means for selectively holding said packages above said conveyor at said stacked position and providing for the addition by said raising means of subsequent packages to the bottom of the stack held thereby;

a first generally vertical transfer plate and a second generally vertical transfer plate laterally aligned therewith, said first transfer plate having a first retracted position at a side of said stacking region opposite said transfer region and a first advanced position, and said second transfer plate having a second retracted position at a side of said transfer region opposite said stacking region and a second advanced position; and

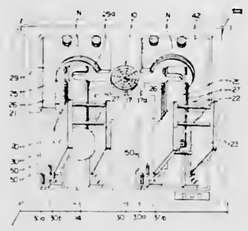
means for independently advancing said second transfer plate from said second retracted position across said transfer region to said stacking region, for simultaneously retracting said second transfer plate from said second advanced position to said second retracted position and advancing said first transfer plate from said first retracted position across said stacking region to said transfer region, and for independently retracting said first transfer plate from said first advanced position to said first retracted position, whereby packages are stacked at said stacking region by said raising means and said holding means and said transfer plated laterally transfer the package stack from said holding means to said transfer region.

4,787,800

TRANSFER MACHINE IN A SURFACE INSPECTION APPARATUS

Kazuyoshi Sone; Katsuya Okumura, both of Kawasaki; Tomio Nakajima, and Kanji Ikegaya, both of Tokyo, all of Japan, assignors to Toshiba Corporation, Kawasaki and Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 18, 1985, Ser. No. 789,088
Claims priority, application Japan, Oct. 19, 1984, 59-218297
Int. Cl.[4] B65G *1/04*
U.S. Cl. 414—222 **34 Claims**



1. A transfer machine for a surface inspection apparatus comprising:

a first storage means positioned at a first point for storing a plurality of wafers therein;

a first transfer means for receiving the wafers from the first storage means one by one in order and transferring the wafers;

a first receiver means for receiving the wafers from the first transfer means one by one, the first receiver means being movable vertically between a lower position and an upper position, so as to receive each of the wafers from the first transfer means at its lower position and moving with the wafer to its upper position;

a chuck means for receiving each of the wafers from the first receiver means and holding each of the wafers, the chuck means being movable only along a horizontal plane in such a manner that the chuck means can move to a predetermined point positioned under each of the wafers which is received by the first receiver means when the first receiver means is at, or near, its upper position and the chuck means can receive each of the wafers from the first receiver means when the first receiver means moves from its upper position to its lower position;

a second receiver means for receiving each of the wafers from the chuck means, the second receiver means being movable vertically between a lower position and an upper position, for receiving each of the wafers from the chuck means at its lower position and moving with the wafer to its upper position;

a second transfer means for receiving the wafers from the second receiver means one by one and transferring the wafers, the second transfer means being designed to receive each of the wafers from the second receiver means when the second receiver means moves from its upper position to its lower position, so as to transfer the wafers from the second receiver means to the second storage means;

a second storage means for receiving the wafers from the second transfer means one by one in order and storing the wafers therein; and

means for moving horizontally the chuck means along a given horizontal moving course between the first receiver means and the second receiver means while the chuck means continues to hold each of the wafers;

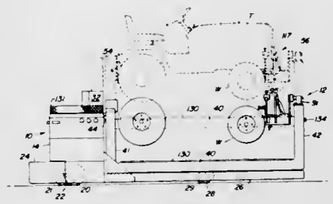
wherein the first and second receiver means have a receiving edge for supporting a peripheral portion of each of the wafers, the receiving edge having a cut portion thereof so as to prevent the chuck means from interfering with the first and second receiver means in operation.

4,787,801

TRANSPORT UNIT FOR FLEXIBLE ASSEMBLY SYSTEM

Bertil J. B. Ahlsén, Hinsdale, Ill.; Kurt J. Dahlstrom, Gothenburg, Sweden; Samuel J. Greshay, Jr., Horicon, Wis.; James F. Mathia, West Bend, Wis., and Wendell M. Hottmann, Cottage Grove, Wis., assignors to Deere & Company, Moline, Ill.

Filed Oct. 27, 1986, Ser. No. 923,672
Int. Cl.[4] B65H *1/00*
U.S. Cl. 414—222 **34 Claims**



1. A transport unit having floor-engaging wheels for use in a flexible assembly system wherein the transport unit travels selectively and sequentially between a plurality of stations and comprising, in combination:

an automatic guided vehicle having said floor-engaging wheels and controllable to travel between stations, and a work carrier associated with the automatic guided vehicle for holding a component of a device to which additional components are to be assembled at a plurality of said stations;

said work carrier having a U shape with a base and a pair of spaced legs each having a free end and extending from opposite ends of said base;

tooling adjacent the free ends of said legs;

means for mounting said tooling to said work carrier for rotation about an axis extending lengthwise of and parallel to said base and through said legs adjacent the free ends thereof;

said tooling including means for engaging said component adjacent the ends thereof and constructed and arranged to hold the component for rotation about said axis and to have said axis extend approximately through the center of gravity of said device to be assembled;

means connected to one of said legs at least adjacent its said free end for moving said work carrier up and down;

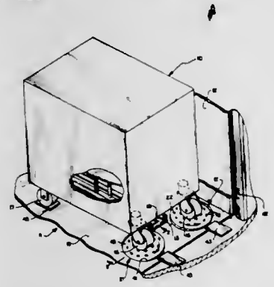
and means, operatively connected to said means for mounting said tooling for rotation, for selectively rotating said tooling relative to said work carrier and about said axis to position said component with one side facing either up or down or in any orientation therebetween.

4,787,802

CART WHEEL CONTROL FOR HOISTWAY CAR

Angelo M. Vaccaro, Charlotte, N.C., and Robin C. Morse, Elizabethtown, N.Y., assignors to The Peelle Company, Bay Shore, N.Y.

Continuation-in-part of Ser. No. 803,103, Nov. 27, 1985, abandoned. This application Sep. 18, 1986, Ser. No. 909,036
Int. Cl.[4] B65G *1/04*
U.S. Cl. 414—259 **7 Claims**



1. In combination, a vertical hoistway, a car guided for vertical movement in the hoistway, a cart on the car, the car being adapted to receive and discharge the cart along a line of movement, the cart being supported on front and rear wheels including a castored swivel set adjacent one end of the cart, the swivel wheels being of the type that make contact with a support surface at a point offset from a generally vertical swivel axis, the car having a generally horizontal platform of a size sufficient to underlie the front and rear wheels of the cart, the platform including surface means adapted to support the swivel wheels at respective contact points offset from associated swivel axii when the cart is fully received on the platform, said surface means being shiftable laterally of said line of movement when the cart is fully received on the platform, said shiftable surface means being adapted to shift laterally with a lateral component of swivel movement of said swivel wheels and said platform being arranged to permit such swivel movement, whereby such swivel wheels are allowed to swivel about their respective axii to reverse castor directions between loading and unloading cart movement without lateral shifting of the car, said shiftable surface means including an inclined area supported on bearing means, said bearing means being arranged to reduce resistance of said area to move laterally, the inclination of said area permitting gravity to promote swiveling of said swivel wheels when said area moves laterally.

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4,787,803

STORAGE SYSTEM FOR PRODUCTS USING SUPPORTING UNITS

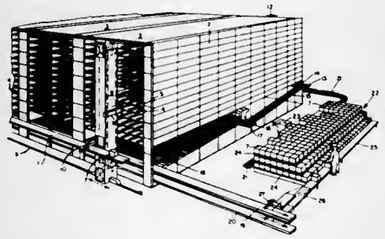
Gerrit J. van Elten, Vorrthuizen; Antonius Hurkmans, Baarn, and Hugo V. de Vries, Ermelo, all of Netherlands, assignors to Technisch Ontwikkelingsbureau Van Elten B.V., Barneveld, Netherlands

Continuation of Ser. No. 317,953, Oct. 30, 1981, abandoned. This application Aug. 23, 1985, Ser. No. 769,991

Claims priority, application Netherlands, Mar. 6, 1980, 8001352; Aug. 11, 1980, 8004549

Int. Cl.[4] B65G *1/06, 25/02*

U.S. Cl. 414—281 **2 Claims**



1. A storage system for product-containing crates or the like of substantially identical dimensions, comprising, in combination:

(a) a staging having a plurality of storeys extending between entry and exit sides of said staging,

(b) at least one crate supply conveyor at said entry side and at least one crate removal conveyor at said exit side,

(c) at least one entry elevating device at said entry side for receiving crates from a supply conveyor, and at least one exit elevating device at said exit side for delivering crates to a removal conveyor, said elevating devices being longitudinally movable along said entry and exit sides respectively,

(d) operating means on each entry and exit elevating device which means are vertically movable along said elevating devices into alignment with selected storeys, and are adapted respectively to receive crates from an entry elevating device and insert them into a selected storey, and to extract crates from a selected story and insert them into an exit elevating device, and

(e) one or more step conveyors for the crates, mounted in each storey and extending from the entry to exit sides of the staging, and adapted for operative interconnection with an operating means on an elevating device when said operating means is aligned with a selected storey, each step conveyor comprising a channel member provided with shoulder means along the length thereof for supporting crates and a channel therebetween having reciprocating means in said channel with forward and return strokes, said reciprocating means being adapted to move upwardly to engage the bottom of a crate supported on said shoulder means on a forward stroke towards said exit side, and to move downwardly to disengage the bottom of said crate on the return stroke toward said entry side, thus leaving the crate in a forwardly moved position resting on said shoulder means, said reciprocating means being activated when an operating means on an elevating device is in interconnected position with a corresponding step conveyor,

whereby crates are successively received at said entry side, inserted into the step conveyor of a selected storey, advanced step-wise along said shoulder means, and then successively extracted from the exit side as desired

and wherein said reciprocating means comprises at least one oscillating beam in the channel of the step conveyor, each beam having segments on the underside thereof hinged on shafts mounted crosswise in the channel, said segments having spiral tread surfaces engaging the bottom of the channel and shaped so that on the forward stroke of the beam a portion of a segment moves around its hinge to urge the beam upwardly to engage the bottom of an overlying crate to move it forwardly, and on the return stroke of beam, another portion of said segment urges the beam downwardly to disengage from the bottom of the crate, and leave the crate in a forwardly advanced position on said shoulder means of the channel.

4,787,804

MATERIAL HANDLING SYSTEM

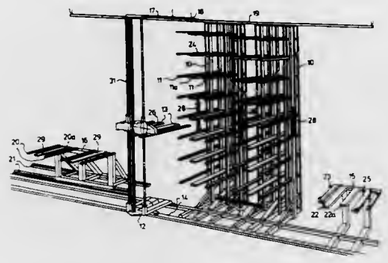
Bernt Edenäs, Västerås, Sweden, assignor to Aktiebolaget Knight Konsulterande Ingenjorer, V terås, Sweden

Continuation of Ser. No. 906,740, Sep. 11, 1986, abandoned. This application Mar. 25, 1988, Ser. No. 175,596

Claims priority, application Sweden, Sep. 16, 1985, 85042711

Int. Cl.[4] B66F *9/07;* **B65G** *1/04*

U.S. Cl. 414—281 **14 Claims**



1. A material handling system suitable for machine tools or the like, comprising:

a carriage assembly having a vertically extending column, a load carrier, means for moving said load carrier vertically along said column, and means for moving said carriage assembly horizontally along a first given direction, said load carrier extending horizontally away from said column in a second given direction perpendicular to said first given direction;

a staging structure having a front, a back, and two sides, and comprising a plurality of horizontal supporting surfaces spaced from each other by a vertical space, said first given direction being between said two sides and parallel to the front, and said second given direction being from the front to the back, at least one side of the staging structure being open to admit a transporting pallet loaded on said load carrier therethrough;

a loading station positioned laterally of said staging structure along said first given direction, and including at least one horizontal supporting surface;

said load carrier extending in said second given direction to overlap the supporting surfaces of the staging structure and loading station to be in an overlapping position when located, respectively, in front thereof;

means on at least one of said load carrier and the supporting surfaces of both the staging structure and loading station for permitting relative vertical movement therebetween so that an upper surface of the load carrier can be moved between a height at least equal to that of an upper surface of said supporting surfaces and a height below a lower surface of the supporting surfaces while being in said overlapping position; and

a horizontal passage along the first given direction passing completely through the staging structure to said loading station, and extending widthwise from the front toward the back of the staging structure, and a vertical passage adjacent the at least one open side of said staging structure, said vertical passage being in communication with said horizontal passage and with each said vertical space between adjacent supporting surfaces of the staging structure; and

said vertical and horizontal passages, and each said vertical space, being sized to accommodate said transporting pallet loaded on the load carrier, said carriage assembly moving means being for moving said carriage assembly between the staging structure and loading station with the load carrier being in said horizontal passage.

4,787,805

DEVICE FOR THE INSERTION INTO AND REMOVAL FROM A SUSPENDED FRAME OF PARTS BEING GALVANIZED

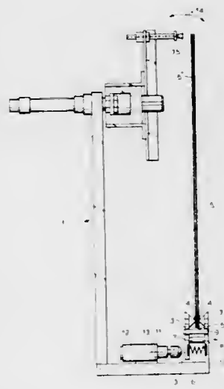
Thomas Kosikowski, Nuremberg, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 26, 1987, Ser. No. 19,524

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606493

Int. Cl.[4] C25D *17/06;* **H05K** *3/00*

U.S. Cl. 414—416 **9 Claims**



2. A combination of a device for bringing plate-shaped objects to and removing said objects from a suspended frame, by means of which said objects are vertically suspended in a galvanization bath, with the suspended frame, comprising a plurality of pneumatically operated suction cups horizontally spaced from each other and engaging the objects to be galvanized; a plurality of grippers horizontally spaced from each other and engaging a respective plate-shape object and applying thereto a force acting to lift or lower said object, said suction cups being engageable to either side surface of said object and securing said object against a lateral tilting motion; and a moveable common lifting frame, said grippers and said suction cups being provided on said lifting frame, said grippers being positioned at a lower end of said lifting frame whereas said suction cups being positioned at an upper end of said lifting frame, each gripper being spring-biased and including two pliers-shaped halves each including a tip tapering to a point at which each half of each gripper engages a side of the object being lifted, one of said halves of each gripper being stationary and rigidly connected to said lifting frame and another of said halves of each gripper being movable to bring said tapering tip thereof to engage the object or move said tip from the object to release the same, said stationary half carrying a supporting bar which supports a lower edge of said object, said lifting frame with said grippers and said suction cups being operative to bring said objects to said suspended frame and to remove said objects from the latter.

4,787,806

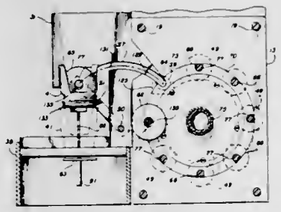
LOADING AND UNLOADING SYSTEM FOR PIECE PART CARRIER

Donald P. Aupperle, Seattle, Wash., assignor to Robbins & Craig Welding & Manufacturing Co., South El Monte, Calif.

Division of Ser. No. 743,696, Jun. 10, 1985, Pat. No. 4,659,281. This application May 15, 1986, Ser. No. 863,748

Int. Cl.[4] B65G *47/02*

U.S. Cl. 414—416 **12 Claims**



1. Loading and unloading apparatus for a piece part carrier, comprising:

A ferris wheel piece part carrier wherein a plurality of mandrels rest in notches around the periphery of a pair of rotating wheels mounted on a common shaft;

means for moving said mandrels by a pair of hydraulically actuated mechanical arms adapted to grasp each mandrel at both ends from the ferris wheel, one at a time, to a load location having a plurality of bearing surfaces lying in a single plane along a common axis; and

means for loading each mandrel with a plurality of piece piece parts to be processed;

whereby said mandrel moving means move the loaded mandrels back to a notch in the periphery of the rotating wheels in the ferris wheel carrier.

4,787,807

APPARATUS FOR AUTOMATICALLY EXTRACTING OBJECTS FROM CONTAINERS

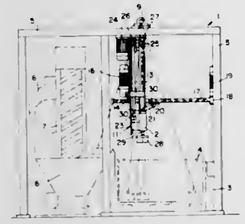
Hermann Spicher, Forststrasse 7, 5060 Bergisch Gladbach 1, Fed. Rep. of Germany

Continuation of Ser. No. 644,620, Aug. 27, 1984, abandoned. This application Dec. 30, 1986, Ser. No. 4,221

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332196

Int. Cl.[4] G06F *15/46*

U.S. Cl. 414—416 **8 Claims**



1. An apparatus for the automatic extraction of objects, individually or in groups, from containers, including a stand beneath which at least one container in which the objects to be

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extracted is positioned, an extractor arm disposed in a movable manner on the stand in the area above the container, a device for the axial extension and retraction of the extractor arm, and a device for guiding a grasping element of the extractor arm toward various interior areas in each said container, comprising:

a holding means for the extractor arm and a cardan join suspension connecting said holding means to said stand,

first drive means for displacing the extractor arm longitudinally relative to said holding means, and

second drive means for pivoting said holding means in various planes located at angles from one another,

wherein said supporting beam has first and second supporting arms rigidly connected therewith, each said arm being located in a pivoting plane in which said holding means with said extractor arm is effectively limited to pivot, said pivoting plane containing said support beam and being perpendicular to said cross beam, and said second drive means includes a first drive mechanism for pivoting the holding means about the cross beam, said first drive mechanism being disposed between said first and second supporting arms.

4,787,808

TRAILER

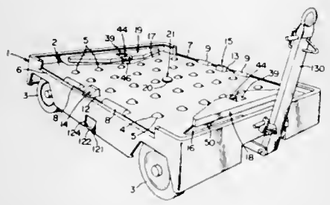
Morio Shimoji, Hyogo, and Masato Yokoyama, Shiga, both of Japan, assignors to Kabushiki Kaisha Suehiro Sharyo Seisakusho, Tokyo, Japan

Filed May 21, 1987, Ser. No. 52,277

Claims priority, application Japan, Oct. 13, 1986, 61-242838

Int. Cl.[4] B65G *67/02*

U.S. Cl. 414—531 **2 Claims**



1. A trailer comprising:

a body frame supported by wheels rotatably mounted at front and rear, and left and right side portions thereof, said frame having

an upper surface portion, and

a cargo base member on said upper surface portion;

a plurality of rotors for supporting and facilitating the transfer of a cargo container onto and off of the trailer, said rotors

being rotatably mounted on said cargo base member in spaced relation relative to each other, and

each having a top surface portion located above said cargo base member;

side stoppers mounted on said left and right side portions of said body frame, to be freely movable vertically with respect to each of said rotors between a lower position allowing the container to be loaded and a higher position projecting to a level above said top surface of each of said rotors, said side stoppers each having

an outwardly inclined side guide surface at an upper side thereof for guiding the container as it is being loaded onto the trailer, and

a vertical locking surface at an inner side thereof for stopping the container when it has been loaded onto the trailer;

a spring means mounted to normally bias said side stoppers to said higher position;

front and rear stoppers mounted at said front and rear portions of said body frame to be movable vertically with respect to each of said rotors on said cargo base member, said front and rear stoppers having

front and rear guide surfaces respectively for guiding the container as it is being loaded, and

locking portions for locking the container on said trainer after loading;

a central stopper mounted on a central portion of said cargo base member for vertical and rotational movement relative thereto and having an upper portion and a support member mounted on said upper portion;

means for selectively lowering said central stopper and associated support member below said roter top surfaces when the container is being loaded and for moving said central stopper up to cause said support member to engage and support the bottom of the container to permit rotation of the container when required;

first and second operating rods rotatably mounted on said body frame and interconnected with all of said stoppers, to move said front, rear, left and right stoppers in the same vertical direction, and also automatically

to move said central stopper in a vertical direction which is opposite to the vertical direction in which said front, rear, left and right stoppers are moved; and

an operating lever means connected to rotate said operating rods to either cause

said front, rear, left and right stoppers to rise while also automatically causing said central stopper to lower to permit the container to be guided onto and locked into position on said trailer, or

cause said front, rear, left and right stoppers to lower while also automatically causing said central stopper to move up and support said container for rotation thereof.

4,787,809

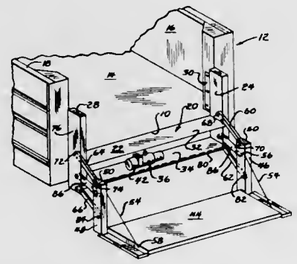
HYDRAULIC LIFT GATE

Francis L. Zrostlik, Garner, Iowa, assignor to Iowa Mold Tooling Company, Incorporated, Garner, Iowa

Filed Mar. 13, 1987, Ser. No. 25,653

Int. Cl.[4] B60P *1/44*

U.S. Cl. 414—557 **8 Claims**



1. A lift gate assembly for a truck or the like comprising:

a generally U-shaped base having a generally horizontal central section flanked by generally parallel, upstanding legs;

a gate;

a pair of upstanding legs secured to said gate in spaced relation so as to be aligned with a corresponding leg on said base;

two pair of links, pivotally connected to and extending between each of said legs on said base and the corresponding leg in said pair whereby each pair of links and associated legs defines a parallelogram;

motor means interconnecting said base and said gate and

operable to cause relative movement between the same along a path defined by said parallelogram linkages; and

a torsion bar pivotally mounted between said base legs and extending between and rigidly attached to a corresponding link in each of said pairs.

4,787,810

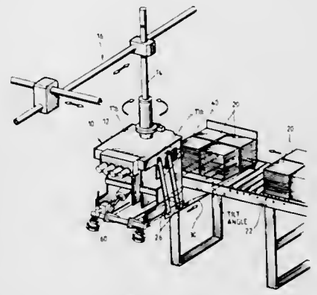
METHOD AND APPARATUS FOR HANDLING STACKS OF LOOSE SHEET MATERIAL

Wesley D. Cawley, and Clifton M. Cawley, both of 721 Grigsby Dr., Port Neches, Tex. 77651

Filed Sep. 4, 1987, Ser. No. 92,930

Int. Cl.[4] B66F *9/14, 9/18, 9/19*

U.S. Cl. 414—591 **5 Claims**



1. An apparatus for handling stacks of loose sheet material comprising,

a movable body having a front face,

a pair of parallel arms forming a parallelogram linkage pivotally connected at their upper ends to and supported from the body for movement toward and away from the front face,

a pair of forks pivotally connected to the lower ends of the arms and positioned and movable generally horizontally from beneath the body to a position outside of the front face of the body for engaging and releasing only a portion of the bottom of a stack of material,

moving means connected between the body and the arms for extending and retracting the forks,

a clamp positioned outside of the body and pivotally connected to the body for engaging the top of the stack and holding the stack between the clamp and the extended forks,

means connected to the clamp for moving the clamp toward and away from the forks,

a probe lifter pivotally connected to the body and positioned outside of the body and movable between a lower position below the forks and an upper position between the extended forks for removing the weight of the stack from the forks, said lifter including a roller, and

means connected to the lifter for moving the lifter from the lower position to the upper position.

4,787,811

QUICK ATTACH MEANS FOR ATTACHMENTS

Joseph W. Langenfeld, and Neal W. Westendorf, both of Onawa, Iowa, assignors to Westendorf Mfg. Co., Inc., Onawa, Iowa

Filed Aug. 22, 1983, Ser. No. 525,134

Int. Cl.[4] E02F *3/81*

U.S. Cl. 414—723 **2 Claims**

1. In combination,

an end loader adapted to be mounted on a tractor and including a pair of pivotal booms,

said end loader including a pair of hydraulic cylinders which are each pivotally connected at one end to one of said booms,

a first hook-up bracket pivotally secured to one of said booms and operatively connected to one of said hydraulic cylinders,

a second hook-up bracket pivotally secured to the other of said booms and operatively connected to the other of said hydraulic cylinder means,

each of said hook-up brackets having upper and lower ends,

each of said hook-up brackets being curved along their lengths,

each of said hook-up brackets having a first horizontally disposed, elongated member at its upper end and a second horizontally disposed, elongated member at its lower end,

a materials handling attachment having a curved rearward side with upper and lower ends,

said attachment having first and second pairs of horizontally spaced, curved supports secured to the rearward side thereof, said first pair of supports comprising first and second tubes, said second pair of supports comprising third and fourth tubes, said tubes having upper and lower ends,



a first support means extending between the upper ends of said first and second tubes to define a first, horizontally disposed, elongated pocket,

a second support means extending between the upper ends of said third and fourth tubes to define a second horizontally disposed, elongated pocket,

a third support means extending between the lower ends of said first and second tubes to define a third horizontally disposed, elongated pocket,

a fourth support means extending between the lower ends of said third and fourth tubes to define a fourth horizontally disposed, elongated pocket,

each of said first and second pockets having an open lower end adapted to receive one of said first elongated members therein,

each of said third and fourth pockets having an open rearward end adapted to receive one of said second elongated members therein,

the ends of said first and second elongated members on each of said hook-up brackets closely positioned to the associated tube to prevent relative lateral movement between said hook-up brackets and said attachment,

and means for locking said second elongated members in said third and fourth pockets.

4,787,812

APPARATUS FOR LIFTING ARRAYS OF PAVING STONES AND THE LIKE

Reinhard Göpfert, Hannoverscbe Str. 156, D-3070 Nienbyrg, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 583,048

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306351; Jul. 7, 1983, 3324441; Nov. 24, 1983, 3342424

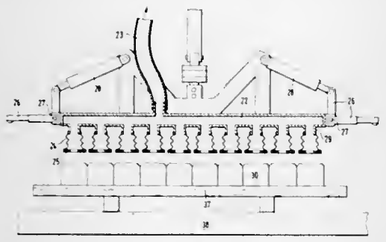
Int. Cl.[4] E01C *5/00*

U.S. Cl. 414—737 **22 Claims**

1. Self-propelled apparatus for manipulating liftable com-

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modities such as arrays of concrete, clinker brick and natural stone components of paving sets, comprising a mobile arm; means for moving said arm; a suction lifter including a support carried by said arm and a polygonal assembly of suction cups which depend from said support and each of which includes a bellows elastically deformable angularly and axially independently of the bellows of each other suction cup to engage a component of a set, said assembly having a plurality of lateral



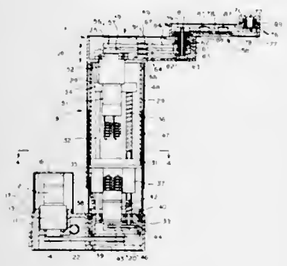
sides; directional jaws movably mounted on said support adjacent to all sides of the assembly of suction cups; and means for moving said jaws against the components of a set which is about to be lifted by said suction cups so that the jaws rearrange the components of an array wherein the distribution of components deviates from a desired distribution and the jaws move away from the rearranged components before the suction cups release the rearranged components of the set.

4,787,813

INDUSTRIAL ROBOT FOR USE IN CLEAN ROOM ENVIRONMENT

Craig L. Stevens, Felton, and Samuel S. Kurita, Soquel, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Filed Aug. 26, 1987, Ser. No. 89,591
Int. Cl.[4] B25J *11/00*
U.S. Cl. 414—744.5 **9 Claims**



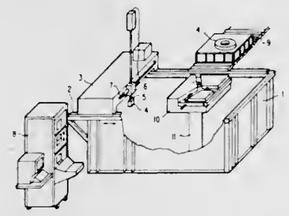
1. An industrial robot comprising:
a base;
a first arm;
an arm support assembly including a hollow support column for rotatably supporting one end of said first arm from said base and for raising and lowering the arm with respect to the base;
a second arm having an end rotatably supported at the other end of said first arm;
effectuator mounting means rotatably mounted at the other end of said second arm;
first drive means mounted on said base for rotating said arm support assembly;
second drive means mounted on said arm support assembly for raising and lowering the arm;
third drive means for rotating said second arm at the end of said first arm; and
fourth drive means for rotating said effectuator, said third and fourth drive means each including a motor mounted in said hollow support column of said arm support assembly; and
a cylindrical sleeve mounted on said base and extending upwardly adjacent to and surrounding said hollow support column to permit said arm support assembly to rotate and raise and lower while maintaining a seal.

4,787,814

APPARATUS FOR THE LOCATION FOR INSPECTION AND OTHER PURPOSES OF A GENERALLY CIRCULAR ARTICLE

Jean F. Vaerman, Vert-Saint-Denis, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jan. 14, 1987, Ser. No. 3,210
Claims priority, application France, Jan. 17, 1986, 86 00598
Int. Cl.[4] B25J *11/00*
U.S. Cl. 414—757 **14 Claims**



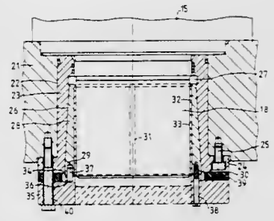
1. Apparatus for mounting and for locating an article where the article can be subjected to monitoring, inspection, measurement or machining at angularly spaced locations, said apparatus comprising
fixed support means carrying
cradle means,
gantry means movable relative to the fixed support means, including
gripper means mounted on the gantry means and movable horizontally in two orthogonal directions,
horizontal plate means,
drive means mounting the horizontal plate means for vertical motion relative to the fixed support means,
framework means for mounting and orientating the article to be monitored, the framework means having an opening to facilitate access to the article by monitoring means and including
first support and radially-acting means for centering and rotating the article when mounted on the framework, and
second securing and locating, means for the the article, said second means being adapted to contact one face of the article, the arrangement being such that vertical movement of the plate means can be effected between
a first location where the plate means equipped with the framework means can receive a pallet carrying the article to be monitored,
a second, upper, location where the article is engaged by the gripper means, the plate means being subsequently moved to the first location where the pallet is withdrawn from the plate means,
a third location where the framework rests on said cradle means, and
a fourth, rest location where the framework is removed from the plate means.

4,787,815

WICKET GATE MOUNTING WITH ADJUSTABLE PLAY FOR WATER TURBINES

Otto Weyh, Zang, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 8, 1987, Ser. No. 106,512
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635203
Int. Cl.[4] F04D *29/48*; F16C *23/02*
U.S. Cl. 415—164 **13 Claims**



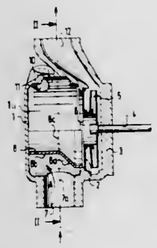
1. A wicket gate mounting for the wicket gate of a turbine, wherein the turbine includes an array of wicket gates arranged around a central axis, and each wicket gate is also supported on a respective wicket gate axis radially outward of the central axis, and the wicket gate having a wicket gate stem and the wicket gate being individually rotatable about its respective wicket gate stem at the respective axis;
the wicket gate mounting at each respective axis comprising a non-rotating outer bushing, a concentric inner bushing disposed inside the outer bushing and a stem for the wicket gate, the wicket gate stem being disposed inside and being relatively rotatable with respect to the inner bushing;
the outer bushing having an inner bore in which the inner bushing is located, the inner bore of the outer bushing being conically tapered, with the inner bore having a radially wider end and a radially narrower end;
the inner bushing disposed within the inner bore of the outer bushing having an outer surface which is conically tapered complementary to the taper of the inner bore of the outer bushing, the inner bushing being axially adjustable in position along the outer bushing, which adjusts the radial bearing play between the inner bore of he inner bushing and the outer surface of the wicket gate stem;
respective means on the inner and outer bushings which are adjustably spaceable apart axially corresponding to the axial adjustments in position between the outer and inner bushings;
and adjustment means at the means between the outer and inner bushings for holding the axial spacing between the outer and inner bushings at a selected dimension;
wherein the adjustment means comprises a ring that is attached to the inner bushing, that projects radially outwardly and that includes an axially directed surface, and the outer bushing includes a cooperating axially facing surface directed toward the axially facing surface of the inner bushing, and a spacer disposed between those cooperating axially facing surfaces; and
wherein the ring is separate from the inner busing; the mounting further comprising means for detachably connecting the ring which is connected to the inner bushing, the alignment ring and the outer bushing together.

4,787,816

ROTARY PUMP

Niels D. Jensen, Bjerringbro, Denmark, and Laszlo Sass, Enghien-les-Bains, France, assignors to Grundfos International a/s, Bierringbro, Denmark

Filed Oct. 12, 1987, Ser. No. 111,688
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637040
Int. Cl.[4] F01D *25/30*
U.S. Cl. 415—168 **5 Claims**



1. A rotary pump comprising
a pump housing with suction and delivery sides;
an impeller within said housing, formed with a suction aperture opening into the suction side of the housing;
a calming chamber on the suction side of the housing;
an air separator integrated in the housing on the suction side and communicating with said calming chamber to remove air from said fluid to the outside;
a fluid inlet to the housing on the suction side; and
a flow divider positioned between said fluid inlet and said calming chamber to split the incoming fluid into two partial flows before it reaches said calming chamber, the flow divider being shaped to impart, to the two partial flows, a rotational motion which is superimposed on the translatory displacement of the partial flows and to deflect the partial flows radially in a direction away from the suction aperture of the pump impeller, characterized in that the flow divider is provided with an inclined and curved impingement surface, the larger radius of which is situated towards the pump impeller, so that the partial flows are also deflected axially in a direction away from the said suction aperture.

4,787,817

DEVICE FOR MONITORING CLEARANCE BETWEEN ROTOR BLADES AND A HOUSING

Jean-Paul LaGrange, Le Chatelet en Brie, and Jean-Max M. Silhouette, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d-Aviation (SNECMA), Paris, France

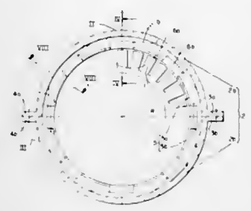
Filed Feb. 13, 1986, Ser. No. 829,006
Claims priority, application France, Feb. 13, 1985, 85 02022
Int. Cl.[4] F01D *11/08*
U.S. Cl. 415—174 **11 Claims**

1. In a turbojet engine having a housing and at least one rotor blade wheel rotatable with respect to the housing and having a plurality of rotor blades radially extending from its periphery, the improved device for maintaining a clearance around the rotor blade tips as they undergo centrifugal and thermal expansion and contraction, comprising:
(a) continuous inner annular wall having thermal characteristics substantially the same as the rotor blade wheel and rotor blades, and disposed about the rotor wheel at a predetermined minimum distance from the tips of the rotor blades, the annular wall comprising:
(i) a plurality of first segments having a relatively thin radial dimension and a relatively low thermal inertia,

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and inner wall of each of the first segments being exposed to the gas passing across rotor blades; and,

(ii) a plurality of second segments, each second segment interposed between and rigidly affixed to adjacent first segments such that peripheral expansion of contraction of the first and second segments causes radial expansion of contraction of the continuous inner annular wall to



maintain the predetermined distance from the rotor blade tips, the second segments having a larger radial dimention and a higher thermal inertia than the first segments; and

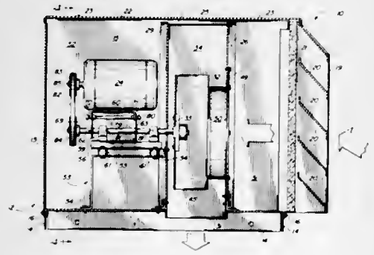
(b) attaching means to attach at least some of the second segments to the housing so as to permit the annular wall to radially expand to contract with respect to the housing.

4,787,818

CENTRIFUGAL BLOWER ASSEMBLY

Michael E. Bales, New Palestine; Michael McKinney, and Craig A. Sawyer, both of Indianapolis, all of Ind., assignors to Jenn Industries, Inc., Indianapolis, Ind.

Filed Jul. 27, 1987, Ser. No. 78,414
Int. Cl.[4] F04D *29/42*
U.S. Cl. 415—219 C **1 Claim**



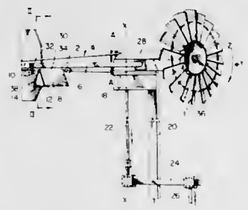
1. A centrifugal blower assembly, comprising: a box-like blower assembly enclosure including base means comprising a bottom wall, a side wall assembly comprising a plurality of generally vertical side walls supported on said base means, and removable cover means comprising a top wall supported on said side walls; blower housing means secured to said base means within said blower assembly enclosure and including first and second substantially flat end panels having a generally rectangular periphery, said end panels each defining a plurality of apertures spaced inwardly from said periphery and disposed along a line corresponding to the profile of a blower spiral and terminating at a blower exit opening, one of said end panels defining an air inlet opening and the other defining a drive shaft opening, and elongated sheet metal scroll means substantially free of side flanges and including a plurality of tab members spaced along each longitudinal side, said tab members extending through said apertures in said end panels with said scroll means disposed along said blower spiral profile, at least a portion of said plurality of tab members being deformed relative to said apertures to maintain a connection between said scroll means and said end panels to form said blower housing means, said scroll means and said end panels cooperatively defining said blower exit opening; means in said blower assembly enclosure defining an air ingress communicating with said air intake compartment and an air egress communicating with said blower exit opening; drive motor mounting means including structural means connected to said end panel having said drive shaft opening and to said base means for laterally supporting said blower housing means and further including bracket means defining a motor mounting surface; a drive motor mounted on said motor mounting surface; a blower wheel operably disposed in said blower housing means; means for drivingly connecting said drive motor to said blower wheel including a drive shaft extending through said drive shaft opening; and means for pivotally connecting said bracket means to said structural means, said means for pivotally connecting including a pivot member axially movable a fractional portion of its length from a first operating posture to a second disengaged posture for permitting removal of said drive motor without removing any portion of said side wall assembly from said base means.

4,787,819

WINDMILL DEVICE

Michael G. A. Bond, Box 563,, Mountain Township, Province of Ontario, Canada

Filed Dec. 7, 1987, Ser. No. 129,587
Int. Cl.[4] F03D *7/04*
U.S. Cl. 416—15 **9 Claims**



1. A windmill device, comprising:

(a) a fan assembly pivotally mounted to swivel about an upwardly extending axis for pointing into the wind,

(b) a windmill tail pivotally attached to a rear end of the fan assembly to swing upwardly to each side from alignment therewith,

(c) a laterally extending arm attached to the fan assembly to pivot therewith and extending well beyond the extremity thereof to be outside the wake thereof,

(d) a depending flap vane hingedly attached at the top to a portion of the arm spaced beyond the extremity of the fan assembly and outside the wake thereof, the flap vane having a side face generally pointing in the same direction as the fan assembly for, in operation, progressively turning the fan assembly out of the wind as the wind speed increases, and

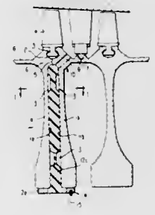
(e) means for holding the flap vane side face tilting downwardly towards the wind in the rest position.

4,787,820

TURBINE PLANT COMPRESSOR DISC WITH CENTRIPETAL ACCELERATOR FOR THE INDUCTION OF TURBINE COOLING AIR

Jacques M. P. Stenneler, Le Chatelet En Brie, and Jacky Naudet, Evry, both of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation "S.N.E.C.M.A." , Paris, France

Filed Jan. 5, 1988, Ser. No. 140,992
Claims priority, application France, Jan. 14, 1987, 87 00313
Int. Cl.[4] F01D *5/08*
U.S. Cl. 416—95 **5 Claims**



1. A turbine plant compressor disc provided with an integrated centripetal accelerator for the induction of turbine cooling air from the compressor, wherein said disc is formed by

two disc-halves disposed upstream and downstream with respect to the axis of rotation of said disc, said disc-halves being secured together to define an internal space therebetween in a plane of said disc perpendicular to said disc axis and having inner faces bounding said internal space,

said disc having

means defining a central bore through said disc,

an outer peripheral rim for forming part of a compressor drum and adapted to receive the roots of a peripheral array of compressor blades, and

a plurality of peripherally spaced air off-take passages through said rim on the downstream side of said disc, and wherein said centripetal accelerator comprises

a plurality of sectors removably mounted in said internal space of said disc and forming a perforated circular member disposed in said central bore of said disc, each of said sectors having

a flat web extending radially outwards in said internal space of said disc, and each pair of adjacent webs forming with said inner faces of said disc-halves a radial channel communicating with one of said air off-take passages in said rim of said disc.

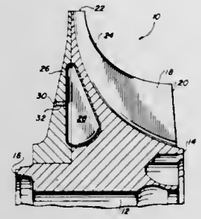
4,787,821

DUAL ALLOY ROTOR

Louis D. Cruse, Scottsdale, and E. Scott Wright, Mesa, both of Ariz., assignors to Allied Signal Inc., Morris, N.J.

Filed Apr. 10, 1987, Ser. No. 36,616
Int. Cl.[4] B63H *1/16*
U.S. Cl. 416—185 **20 Claims**

1. A dual-alloy rotor member comprising a disc-like annular first portion of first comparatively higher tensile strength material defining an axially extending central bore, said first portion defining an axially disposed radially extending first interbonding surface, a boss extending axially from said first surface and circumscribing said central bore to provide a radially outwardly disposed second interbonding surface; a disc-like annular second portion of second material having comparatively higher creep rupture strength at elevated temperatures, said second portion defining a central through passage of size larger than said central bore and matching said second interbonding surface to provide a radially inwardly disposed third interbonding surface, said second portion further defining an axially disposed radially extending fourth interbonding surface matching said first interbonding surface; said second portion being received at said central through passage thereof upon said boss of said first portion to engage said first interbonding surface with said fourth interbonding surface, and said second interbonding surface with said third interbonding surface; said



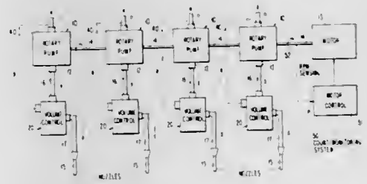
engaged interbonding surfaces diffusion bonding to unite said portions into a unitary body, wherein said first portion and said second portion cooperatively define a cavity within said rotor member, and wherein a passage extends from said cavity to open outwardly upon said rotor member.

4,787,822

VOLUME CONTROL FOR MULTI-NOZZLE ROTARY PUMP FILLING SYSTEMS

Richard N. Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

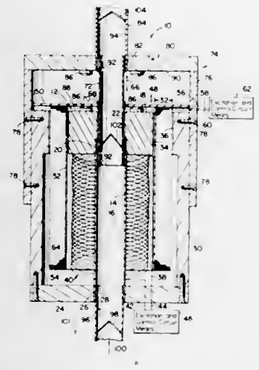
Filed Apr. 10, 1986, Ser. No. 850,017
Int. Cl.[4] F04B *49/02, 49/08, 17/00;* B05B *9/00*
U.S. Cl. 417—2 **18 Claims**



1. A volume control for multi-nozzle rotary pump filling systems in which several containers are to be filled simultaneously with the same amount of fluid product, comprising a plurality of rotary pump means, each having an in-feed side and a discharge side, a plurality of nozzle means, common drive means for said rotary pump means including monitoring means for monitoring at least the number of revolutions made by the pump means and operable to control the common drive means in such a manner that said pump means deliver the fluid product to said nozzle means at the same time, and connecting means operatively connecting a respective pump means with a corresponding nozzle means to provide a multi-nozzle filling system, said connecting means including, in each operative connection between a respective pump means and the corresponding nozzle means of the multi-nozzle filling system control means in each such operative connection for individually controlling the amount of product dispensed by a corresponding nozzle means by adjustably varying the back pressure on the respective pump means operatively connected therewith, and said control means including adjustable restricted passage means in the connection means between a respective pump means and the corresponding nozzle means to enable fine adjustment of the amount of fluid product delivered by a given nozzle means.

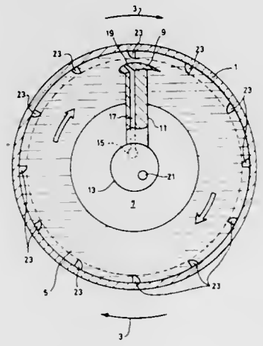
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4,787,823
ELECTROMAGNETIC LINEAR MOTOR AND PUMP APPARATUS
Barry W. Hultman, P.O. Box 1864, Bristol, Conn. 06010
Continuation-in-part of Ser. No. 736,837, May 22, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 946,372
Int. Cl.[4] F04B *17/04*
U.S. Cl. 417—45 10 Claims



1. An electromagnetic linear motor having a controllable variable length stroke, said motor comprising:
(a) a magnetic structure including an inner magnetic circuit means and an outer magnetic circuit means,
(b) said inner magnetic circuit means including,
i. an axially elongated cylindrical core of magnetic material supported at one end by a bottom plate and having a diametrically enlarged portion at the end opposite the supported end, said core having a conductor wound around it between said supported end and said enlarged portion to form a first electric coil means,
said inner magnetic circuit means including a first-applied electric signal having a controllable magnitude,
said first electric coil means producing in response to said first applied electric signal, a first magnetic field having a variable intensity, and
ii. an outer concentric shell supported by said bottom plate and made of a magnetic material for forming an air gap between said enlarged end portion and said concentric shell to support said first field thereacross,
(c) said outer magnetic circuit means including shuttle means coaxially arranged between said core and said outer concentric shell and extending through said air gap in an axial direction along said elongated cylindrical core, said shuttle means including a bobbin having a conductor would thereon to form a second electric coil means,
said outer magnetic circuit means including a second-applied electric signal having a controllable magnitude,
said second electric coil means producing in response to said second applied electric signal, a second magnetic field having a variable intensity
(d) means for continuously controlling said controllable magnitude of said first-applied electric signal and and controllable magnitude of said second-applied electric signal,
said shuttle means traveling between two predetermined spaced apart positions for a desired displacement along a rectilinear path in one and an opposite direction through the air gap, respectively in response to said second magnetic field interacting with said first magnetic field, said displacement by said shuttle means being directly proportional to and controllable by the magnitude of the intensity of said magnetic field whereby the stroke length of said shuttle means is controlled by said means for continuously controlling said controllable magnitudes of said first and second-applied electric signals to produce the desired displacement.

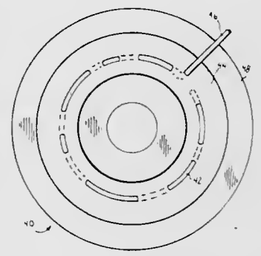
4,787,824
ROTATING LIQUID RING VACUUM PUMP
Michael Cole, Ipswich, England, assignor to Genevac Limited, Ipswich, England
Filed Aug. 20, 1987, Ser. No. 87,416
Claims priority, application United Kingdom, Aug. 23, 1986, 8620546
Int. Cl.[4] F04C *19/00*
U.S. Cl. 417—54 9 Claims



1. A pump for pumping a fluid, comprising means for producing a rotating ring of a liquid whose density is greater than that of said fluid, a stationary probe having external surfaces immersed in the liquid and facing radially outward and inward respectively relative to said rotating ring of liquid, an outward aperture formed in said outward surface, the shape of said outward surface being such that fluid is drawn out of said outward aperture by virtue of the reduction in pressure in the liquid caused by rotation of said ring of liquid over said outward surface, means to deliver fluid to be pumped to said outward aperture, a collection region for the fluid to which the fluid migrates after being drawn out of said outward aperture, means to discharge fluid from said collection region, an inward aperture formed in said inward surface, a gas supply passage extending to said inward aperture, and supply means to supply a gas to said inner aperture and into the liquid.

6. A method of pumping a fluid such as a water vapor, comprising the steps of:
(a) causing a ring of a liquid having a greater density than that of the fluid to pass over an external surface having an aperture therein, the surface being so shaped that fluid is drawn out of the aperture by virtue of the reduction in pressure in the liquid caused by the passage of the ring of liquid over the surface;
(b) collecting the fluid at a collection region free of the liquid, after its migration through the liquid; and
(c) supplying a gas so that said gas flows into the collection region in addition to the fluid being pumped, said gas being of a type which does not condense at the temperature and pressure of the pumping operation.

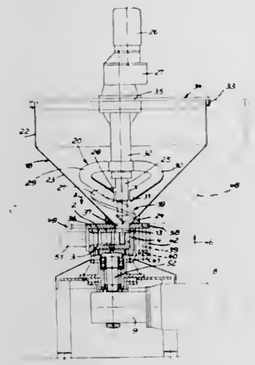
4,787,825
FAILURE SENSING DEVICE FOR A DIAPHRAGM PUMP
Myron Mantell, 4 Rudden La., Morris Plains, N.J. 07950
Division of Ser. No. 828,411, Feb. 11, 1986, Pat. No. 4,740,139, which is a continuation-in-part of Ser. No. 655,369, Sep. 27, 1984, Pat. No. 4,669,634. This application Feb. 8, 1988, Ser. No. 153,192
Int. Cl.[4] F04B *21/00, 43/06;* G08B *21/00*
U.S. Cl. 417—63 7 Claims



1. A failure sensing system for use in a diaphragm pump having a housing, a first chamber within said housing, a second chamber within said housing and a diaphragm mounted in said housing between said first chamber and said second chamber, said failure sensing system comprising: a chemically inert, electrically non-conductive diaphragm containing sensing means completely enclosed within said diaphragm and not exposed to the liquid being pumped and not in direct electrical contact with the pump housing said sensing means including sorbent means and electrically conductive sensing means carried by said sorbent means, said electrically conductive sensing means being in electrical contact with electrically conductive lead means, said electrically conductive lead means extending from said diaphragm to the exterior of said housing to failure indicating means whereby when failure occurs, conductive liquid contacts said sensing means and completes a circuit to activate said failure indicating means.

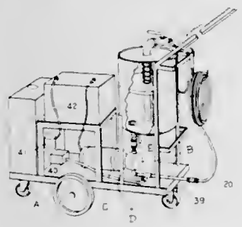
4,787,826
PUMP, PARTICULARLY FOR HIGHLY VISCOUS MATERIALS
Karl Schnell, Winterbach, Fed. Rep. of Germany, assignor to Karl Schnell GmbH & Co. Maschinenfabrik, Winterbach, Fed. Rep. of Germany
Filed May 22, 1987, Ser. No. 53,962
Claims priority, application Fed. Rep. of Germany, May 24, 1986, 3617495
Int. Cl.[4] F04B *23/14*
U.S. Cl. 417—203 34 Claims

1. A pump, particularly for pasteous masses, comprising
a rotatable outer wheel provided with a plurality of inner teeth;
a pinion rotatable inside the outer wheel eccentrically thereto and having a plurality of outer teeth engaging with said inner teeth, said outer wheel and said pinion forming an intermediate space therebetween;
a pressure segment located in said intermediate space between said outer wheel and said pinion; and
a rotatable drive shaft;
filling means connected with said inlet, said filling means including
a filling container having a conical container end associated with said inlet,
movable feeding means including a worm gear attached to the drive shaft and arranged in said filling container and having a feeding direction so as to feed a mass toward said inlet;
a guiding bush surrounding the rotatable drive shaft and fixed in position relative to the filling container and protruding into the filling container; and
an immovable stopper attached to the guiding bush and



extending in a radial direction from said guide bush arranged in said conical container end for preventing entraining of a mass to be filled, in the region of said conical container end.

4,787,827
PORTABLE LUBRICATING APPARATUS
Charles G. Hinkle, and Eugene W. Ware, Jr., both of Greer, S.C., assignors to General Enterprises, Inc., Greer, S.C.
Filed Apr. 6, 1987, Ser. No. 34,644
Int. Cl.[4] B67D *5/52*
U.S. Cl. 417—234 4 Claims

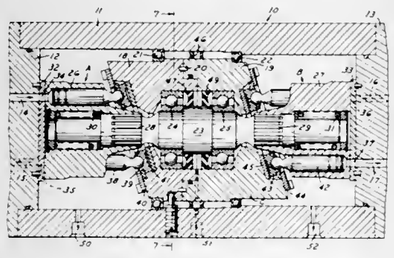


1. A portable lubricating apparatus utilizing an upright removable and replaceable container of grease for delivery through a hose and nozzle comprising:
an elongated horizontal wheeled chassis;
a pump carried adjacent one end of said chassis;
an electric motor and a battery therefor carried in a portion of said chassis opposite said pump;
a vertical frame comprised of a plurality of spaced upright guide members carried by said chassis about said pump adjacent said end of the chassis and extending thereabove for receiving an upright removable and replaceable container of grease; and
an upwardly projecting coupling means carried by said pump for communicating with a lower end of said container of grease receiving grease automatically upon reception of said container in said vertical frame supplying grease to said hose under pressure;
whereby the spaced upright members of said vertical frame guide said removable and replaceable container of grease

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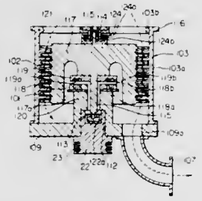
to position for immediately delivering grease to said pump through said coupling to serve as a temporary grease supply and to position same preparatory to removal for replacement by another removable and replaceable container of grease.

4,787,828
POWER TRANSMISSION
Jean J. Schweitzer, Brandon, and Howard J. Sculthorpe, Jackson, both of Miss., assignors to Vickers, Incorporated, Troy, Mich.
Filed Mar. 23, 1987, Ser. No. 28,892
Int. Cl.[4] F04B *1/20, 35/00*
U.S. Cl. 417—271 2 Claims



1. A reversible power transmission unit comprising
a housing,
a cam block,
means rotatably mounting said cam block in said housing,
said cam block having opposed inclined surfaces which are inclined circumferentially relative to one another,
a pumping mechanism associated with each of said opposed inclined surfaces of the cam block,
a common shaft rotatably mounted in said cam block and having its ends extending beyond the cam block,
each pumping mechanism including a cylinder barrel coupled to said shaft for rotation with said shaft and having a plurality of cylinders with pistons slidable therein and operatively associated with a surface of the cam block,
a valve plate associated with each barrel,
inlet and outlet openings at each end of said housing,
each cylinder barrel having a port opening to its respective valve plate provided with inlet and outlet ports in communication with said inlet and outlet passages at each end of the housing,
one of said pumping mechanisms having a greater flow capacity than the other of said pumping mechanisms,
means on said housing for limiting rotation of said cam block between preselected angularly spaced limits relative to said housing, said cam block being freely rotatable within said housing between said limits,
such that when fluid pressure is applied to said one of the pumping mechanisms having the greater flow capacity, said one mechanism functions as a motor and the pressure of fluid rotates said cam block toward one of said limits corresponding to maximum displacement of said one mechanism and causes said other pumping mechanism to function as a pump.

4,787,829
TURBOMOLECULAR PUMP
Masayuki Miyazaki; Yoshihisa Kitora; Shin Sekiya; Kiyoshi Taketoh, all of Amagasaki, and Yoshiyuki Itaya, Fukuoka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Mar. 3, 1987, Ser. No. 21,246
Claims priority, application Japan, May 8, 1986, 61-105425
Int. Cl.[4] F04B *17/00;* F04D *29/04*
U.S. Cl. 417—353 7 Claims

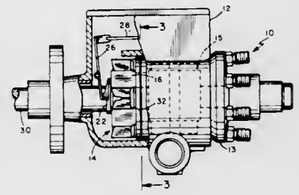


1. A turbomolecular pump comprising:
a cylindrical housing having a plurality of stator vanes provided on the inner peripheral surface thereof, said cylindrical housing having inlet port means and outlet port means;
a rotary shaft having an upper end and a lower end and vertically supported on said cylindrical housing for rotation about a vertical axis;
an upper bearing rotatably supporting an upper end of said rotary shaft;
a lower bearing rotatably receiving said lower end of said rotary shaft and supporting said rotary shaft within said housing in a vertical position between said upper and lower bearings;
a rotary member fixedly mounted on said rotary shaft and having a plurality of rotor vanes provided on the radially outer peripheral surface thereof, said rotor vanes being interlaced with said stator vanes in face-to-face relation with each other so that during rotation of said rotary member, said rotor and stator vanes cooperate with each other to produce a undirectional flow of a fluid from said inlet port means toward said outlet port means; and
an electric motor including a stator and a rotor disposed in said cylindrical housing about said axis and in a position which is radially inward of some of the vanes for electromagnetically driving said rotary member to rotate relative to said housing, said rotor comprising an annular disc-like member fixedly secured at its one side surface to one end surface of said rotary member and having a first operating surface formed at its other side, and said stator being mounted on said housing and having a second operating surface disposed in an axially face-to-face relation with said first operating surface of said motor, said first and second operating surfaces being disposed substantially perpendicular to said axis of said rotary shaft and being located within said housing between said upper and lower bearings.

4,787,830
RESILIENT DIESEL GOVERNOR COUPLING
Rayburn Johnson, 10860 Elderwood Rd., San Diego, Calif. 92131, assignor to Rayburn Johnson and William Loud, both of San Diego, Calif.
Filed Aug. 14, 1987, Ser. No. 85,144
Int. Cl.[4] F04B *29/00;* F02M *41/00*
U.S. Cl. 417—462 6 Claims

1. A coupling device for use in diesel fuel injector pumps, as used in diesel engine fuel flow regulation and timing, where the pumps have a main housing for confining a plurality of rotary

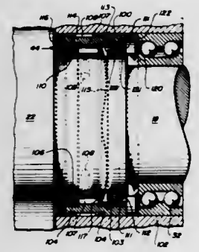
pumps positioned in series along a longitudinal axis and being connected through a drive shaft to a driving source, and having a generally cylindrical weight retention housing positioned adjacent to the rotary pumps with a central opening for passage of the drive shaft therethrough and a series of recesses about its circumference for rotatably supporting a plurality of flyweights which are coupled to a fuel control system, comprising:
an annular drive ring having a central aperture for passage of said drive shaft with at least one key extending therefrom for engaging said shaft, being positioned on said shaft adjacent said governor weight housing with one of two opposing planar surfaces facing said weight retention housing, having a plurality of elongated apertures extending between the opposing surfaces at predetermined radial and angular positions about the ring and an annular depression centrally located between an outer edge and an



inner edge on a back surface facing away from said weight retention housing;
a plurality of drive pins, corresponding in number to said elongated apertures being secured on a first end to said weight retention housing and extending through said drive ring elongated apertures, with a second end of said drive pins not extending beyond said back surface, the drive pins having a diameter smaller than a width of the apertures to allow freedom of motion therein;
a plurality of resilient inserts positioned within said elongated apertures immediately adjacent said drive pins so as to occupy substantially all volume not occupied by said pins; and
an annular capture ring having an outer and inner diameter corresponding to dimensions for said annular depression in said drive ring, being connected in several locations to said second ends of said drive pins so as to capture said inserts within said elongated apertures.

4,787,831
DUAL SEAL SYSTEM FOR ROOTS BLOWER
Edmund P. Thomas, Bethlehem; John H. Muir, Kunkletown, and Bruce C. Hargus, Slatington, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Sep. 20, 1983, Ser. No. 534,044
Int. Cl.[4] F04C *27/00*
U.S. Cl. 418—104 3 Claims

1. In a Roots blower comprising:
a housing having an inlet and outlet port and walls defining a cavity therein;
closure plates secured at the ends of the housing for enclosing said cavity;
a pair of parallel shafts having cylindrical portions extending transversely between said inlet and said outlet port and extending through said closure plates;
a bearing compartment embracing said cylindrical portions of said parallel shafts and external to said cavity and adjacent to said closure plates;
bearings disposed within each bearing compartment and embracing said cylindrical portions for permitting rotation of the shaft therein;
lubricating means for said bearings while in said bearing compartment;
sealing means between the cavity and bearing compartment for preventing leakage of contaminants into and out of said compartment; and
lobed impellers disposed within said cavity and mounted on said shaft in coacting relationship with each other and the walls of the cavity wherein in operation a gaseous fluid is introduced through the said inlet port, trapped and compressed between adjacent lobes of each impeller and the walls of the cavity and then exhausted at some higher pressure through said outlet port, the improvement residing within said sealing means which comprises in combination:
(a) a seal housing disposed between said bearings and said closure plate;
(b) a floating seal disposed within said seal housing and embracing a cylindrical portion of said shaft proximate



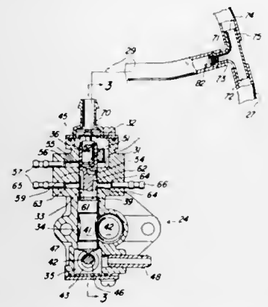
said closure plate, said floating seal having a diameter slightly larger than said shaft thereby providing a circumferential clearance space between it and said shaft;
(c) a face seal disposed within said seal housing and embracing a cylindrical portion of said shaft, said face seal proximate said bearing;
(d) a fluid inlet passage disposed within said seal housing and in communication with said floating seal and said face seal, said passage permitting continuous flow of gas through said clearance space between said floating seal and said shaft and into said cavity and flow to said face seal;
(e) an exterior mating ring disposed about said shaft and proximate said face seal, said exterior mating ring having a contact surface designed for seal contact with said face seal, and adapted for rotation relative to said face seal, and
(f) means for urging said face seal and said external mating ring toward each other to provide sealing contact therewith.

4,787,832
AUTOMATIC AIR VENT DEVICE FOR FLUID PUMP OF INTERNAL COMBUSTION ENGINE
Masaho Fukasawa, and Koji Abe, both of Hamamatsu, Japan, assignors to Sanshin Industries Co., Ltd., Hamamatsu, Japan
Filed Feb. 17, 1987, Ser. No. 15,443
Claims priority, application Japan, Feb. 18, 1986, 61-34455
Int. Cl.[4] F04B *7/06;* F01M *9/00*
U.S. Cl. 417—500 9 Claims

1. A fluid pump of an internal combustion engine comprising an outer housing, a fluid inlet in said outer housing, a fluid outlet in said outer housing, a fluid path formed within said outer housing extending between said fluid inlet and said fluid outlet and including a pumping cavity containing means for pressurizing fluid for fluid flow through said fluid outlet, a vent passage extending vertically upwardly from said fluid path for venting air under its own buoyancy in the pumped fluid there-

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from, and means for precluding reverse air flow from said vent passage into said fluid path while permitting air to flow by its



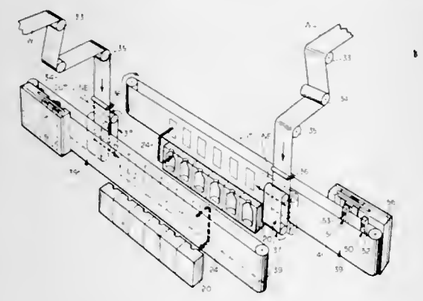
own buoyancy in the pumped fluid from said fluid path to said vent passage.

4,787,833

APPARATUS FOR APPLYING LABELS TO BLOW MOLDED ARTICLES

Thomas J. Krall, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Jul. 31, 1987, Ser. No. 80,372
Int. Cl.[4] B29C *49/24*
U.S. Cl. 425—126.1 **3 Claims**



1. In an apparatus for making a hollow plastic articles wherein a label is positioned in each of a plurality of spaced partible molds in a predetermined array, a preform is positioned in each set of partible molds and the molds are closed and the preform is blown outwardly to the confines of the mold to apply the label to the resultant hollow plastic article, and an apparatus for receiving an array of longitudinally spaced labels, the improvement comprising an apparatus for indexing an endless conveyor in precise increments for receiving longitudinally spaced labels providing an array of labels which are thereafter simultaneously removed from the endless conveyor and delivered between the open partible molds, said indexing apparatus comprising

a fixed conveyor gripper in a first position,

a second conveyor gripper mounted for movement longitudinally of the conveyor and means for individually controlling the gripping of the first and second grippers such that the second gripper can be actuated to engage the conveyor while the first gripper is disengaged and said second gripper can be moved longitudinally to thereby move the conveyor a predetermined distance,

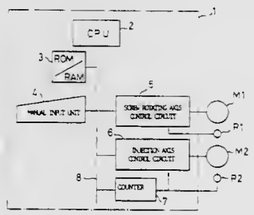
the first gripper can then be engaged with the conveyor and the second gripper released and returned to its original position for moving the conveyor in successive and predetermined increments for precise positioning of the labels on the conveyor.

4,787,834

METERING APPARATUS OF INJECTION MOLDING MACHINE

Noriaki Neko, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP86/00594, § 371 Date Jul. 9, 1987, § 102(e) Date Jul. 9, 1987, PCT Pub. No. WO87/03244, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 19, 1986, Ser. No. 80,563
Claims priority, application Japan, Nov. 20, 1985, 60-258594
Int. Cl.[4] B29C *45/77*
U.S. Cl. 425—145 **2 Claims**



1. A metering apparatus of an injection molding machine which includes a screw, a screw rotating motor for rotating the screw, an injection mechanism for moving said screw in an axial direction during metering, and an injection servo motor for driving said injection mechanism, said metering apparatus comprising:

means for detecting a position of said screw;

memory means for storing a screw completion position indicating a metering point at which metering is to be completed;

metering point detecting means for comparing the detected screw position and the screw completion position stored in said memory means for determining whether the screw has reached the metering point;

screw deceleration point detecting means for comparing the detected screw position and a decelerating screw position, the decelerating screw position being set at a position slightly prior to the metering point, and for determining whether said screw has reached a screw deceleration position; and

rotation control means for decreasing rotation speed of said screw rotating motor when said screw deceleration point detecting means indicates that said screw has reached the decelerating screw position and for stopping said screw rotating motor at the metering point as prescribed by said metering point detecting means.

4,787,835

NIP INDICATOR FOR CASTING MACHINES

Kenneth M. Cavanagh, Warwick, R.I., assignor to Marshall and Williams Company, Providence, R.I.

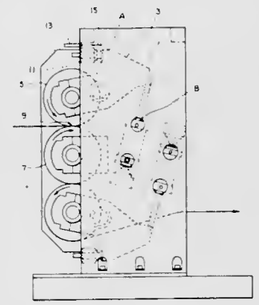
Filed Jan. 27, 1987, Ser. No. 148,874
Int. Cl.[4] B29C *59/04*
U.S. Cl. 425—150 **7 Claims**

1. In a casting machine having a nip formed by cooperating rolls with thermal fluid circulating therein, movable toward and away from each other through which material to be compressed is passed, a bank of material feeding into said nip, a pair of fluid cylinders exerting force on a pair of pivot arms, said pivot arms exerting force on one of said rolls relative to the other by exerting force on both ends of one of said rolls in the direction of the other of said rolls and exerting excess force on

a pair of adjustable mechanical stops, said mechanical stops blocking said pivot arms for maintaining a predetermined minimum distance between center portions of said rolls, the improvement comprising:

means for measuring nip size by pivot arm position;

means for measuring the temperatures of said rolls;



means for calculating thermal expansion of the rolls from said temperatures;

means for correcting said positional nip size measurement by adding in the thermal expansion of the rolls; and

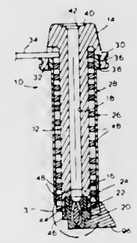
means for displaying the corrected nip size.

4,787,836

INJECTION MOLDING NOZZLE

Jesus M. Osuna-Diaz, Rochester Hills, and Robert D. Ameel, St. Clair, both of Mich., assignors to Fairchild Industries, Inc., Chantilly, Va.

Filed Jun. 30, 1987, Ser. No. 67,868
Int. Cl.[4] B29C *45/10, 45/74*
U.S. Cl. 425—190 **8 Claims**



1. An injection molding nozzle for use with a flowable molding material in a mold die comprising an elongated member having an input and an output end portion and a material passage therethrough from the input to the output end portion, a cap having a passage therethrough with an exit orifice removably mounted on the output end portion of said elongated member, a heater surrounding at least a portion of said elongated member and a removable torpedo member located within said cap, said removable torpedo member having a substantially cylindrical projection, said substantially cylindrical projection extending into the exit orifice in said cap whereby the junction of the molding material between the exit orifice and a part being molded has an annular shaped hollow cross section.

4,787,837

WEAR-RESISTANT CERAMIC, CERMET OR METALLIC EMBOSSING SURFACES, METHODS FOR PRODUCING SAME, METHODS OF EMBOSSING ARTICLES BY SAME AND NOVEL EMBOSSED ARTICLES

Norman D. Bell, Hazelcrest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 7, 1986, Ser. No. 894,199
Int. Cl.[4] B28B *11/08*
U.S. Cl. 425—385 **9 Claims**

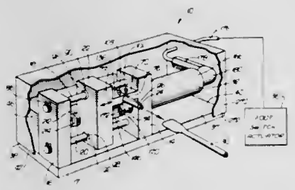
1. A wear-resistant, pressure contact embossing tool having an embossing surface formed with an embossing pattern for providing a matte finish and an embossed design to an article having a surface embossable by pressure contact therewith, said embossing surface having a ceramic, cermet or metallic coating bonded thereto by a thermal spray process, wherein the external surface of said coating generally conforms to said embossing pattern and contains an average of about 50 to 2,000 peaks per inch covering said external surface of said coating, whereby said peaks indent the embossable surface of said article when pressure contacted with the external surface of said coating to provide the embossable surface of said article with a matte finish and said embossing surface provides an embossed design thereto.

4,787,838

TUBING EXPANDER

Mark C. Doyle, San Diego, Calif., assignor to Pacific Device, Inc., San Diego, Calif.

Filed Jan. 12, 1987, Ser. No. 2,005
Int. Cl.[4] B29C *57/04*
U.S. Cl. 425—393 **11 Claims**



1. Apparatus for expanding resilient tubing, comprising:

a base;

a first block rigidly mounted on said base;

a guide supported in relation to said first block;

a second block slidably carried by the guide for movement in a first direction relative to said first block, from a first position adjacent said first block to a second position spaced apart from said first block; and

first and second pins carried by the first and second blocks, respectively for movement therewith, said pins extending from said blocks in substantially the same direction, which differs from said first direction, and being configured to substantially abut each other and be received within said resilient tubing when said blocks are in said first position and to separate from each other when said blocks are in said second position, whereby said pins expand said tubing in a diametric direction.

4,787,839

REMOVABLE SPRING-LOADED PLATEN ROLLERS

Milton Morse, 1 Horizon Rd., Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 914,821, Oct. 8, 1986, Pat. No. 4,731,009, which is a continuation-in-part of Ser. No. 786,674, Oct. 11, 1985. This application Dec. 9, 1987, Ser. No. 130,565
Int. Cl.[4] B30B *15/02*
U.S. Cl. 425—406 **16 Claims**

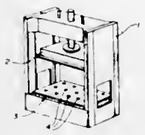
1. A mold-supporting arrangement for a press comprising:

a press platen having a plurality of spaced seating holes

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formed in an upper surface thereof, said seating holes being generally cylindrical in shape and having a hemispherical portion formed therein along the wall of said cylinder;

a plurality of load-bearing units seated in a selected number of said seating holes, each of said load-bearing units including a roller mounted on an axle, said axle extending across the entire diameter of said seating hole and into a said hemispherical portion for limiting the rotation of said load-bearing unit in said aperture, said axle being supported by a unit body having an upper axle supporting portion and a lower bottom portion; said roller having a roller aperture therethrough and extending to said axle;



first sealing means connected to said axle for sealing a portion of the space between said axle and said upper axle supporting portions;

second sealing means disposed in said roller aperture;

a compression spring coupled between said upper and lower portions; and

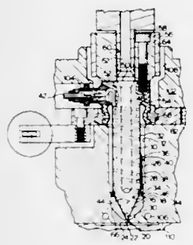
means connecting said upper and lower portions for compressing said spring.

4,787,840

INJECTION MOLDING SINGLE NOZZLE VALVE GATING

Jobst U. Gellert, A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Jan. 20, 1988, Ser. No. 145,969
Claims priority, application Canada, Dec. 17, 1987, 554,730
Int. Cl.[4] B29C *45/20*
U.S. Cl. 425—549 **7 Claims**



1. In a single cavity hot runner injection molding system having a heated nozzle with a hot runner passage which extends to convey pressurized melt from a molding machine to a gate in a temperature controlled cavity plate leading to a cavity, the nozzle being secured against rotational movement and extending into a well in the cavity plate having an inner surface, the nozzle having an outer surface with an air space between the outer surface of the nozzle and the inner surface of the well, the nozzle having a nose portion with a conical surface leading to a tip which is in alignment with the gate, the system including an actuating mechanism to drive the nozzle longitudinally between a retracted open position and a forward closed position wherein the tip of the nose portion of the nozzle is seated in the gate, the improvement wherein the actuating mechanism comprises:

(a) an inner collar secured against rotation to the nozzle,

(b) an outer collar extending around the inner collar in threadable engagement with the inner collar, the outer collar being secured against longitudinal movement, and,

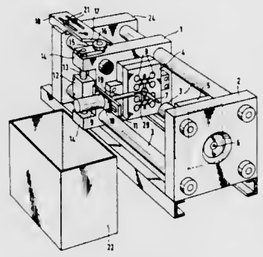
(c) power means connected to the outer collar to rotate the outer collar through a predetermined angle whereby the inner collar is driven longitudinally a distance sufficient to drive the nozzle from the retracted open position to the forward closed position.

4,787,841

SPRUE EJECTOR IN AUTOMATIC INJECTION MOLDING MACHINES

Hans Simon, Bruchhausener Str., D-5463 Unkel, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,227
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641135
Int. Cl.[4] B29C *45/42*
U.S. Cl. 425—556 **12 Claims**



1. In an injection molding machine having two mold halves and means for moving the mold halves relative to each other in an axial direction, an apparatus for removing a sprue from the molding machine, said apparatus comprising: a cylinder, an associated piston rod connected to said cylinder, said piston rod having a front end, means for extending the front end of the piston rod from the cylinder transversely to the axial direction and between said two mold halves into a space forming the sprue so that during injection molding material will be molded around the front end of said piston rod and form the sprue, and means for retracting the piston rod with the sprue, upon separation of the mold halves, into the cylinder and for separating the sprue from the front end of said piston rod.

4,787,842

AIR CIRCULATION AND EXHAUST CONTROL SYSTEM FOR COMMERCIAL OVENS

G. Wayne Stewart, Plano; Bill E. Davis, Irving; William M. Thomas, Garland; Michael J. Dobie, Plano, and Carlos Bacigalupe, The Colony, all of Tex., assignors to Stewart Systems, Inc., Plano, Tex.

Division of Ser. No. 936,160, Dec. 1, 1986, Pat. No. 4,726,766.
This application Sep. 28, 1987, Ser. No. 101,841
Int. Cl.[4] F23J *5/00*
U.S. Cl. 432—72 **4 Claims**

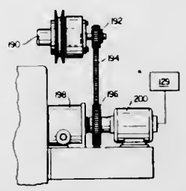
1. An exhaust flow control system for an oven comprising:

means forming an oven enclosure defining an oven interior;

burner means situated within the oven for receiving combustion air and gaseous fuel and for burning the combustion air and the gaseous fuel to generate heated gases for heating the oven interior;

means for generating an electrical signal representing the combined rate of flow of combustion air and gaseous fuel into the burner means;

discharge port means for directing exhaust gases out of the oven interior;



exhaust blower means for controlling the rate of flow of exhaust gases out of the interior through the discharge port means; and

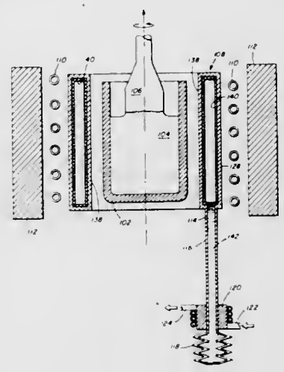
means responsive to the electrical signal representing said combined rate of flow of combustion air and gaseous fuel into the burner means of controlling the speed of the exhaust blower means to withdraw exhaust gases from the oven interior through the discharge port at a predetermined rate proportional to the rate of flow of combustion air and gaseous fuel into the burner means so as to control the pressure within said oven interior.

4,787,843

PRESSURE BALANCED HEAT PIPE

Fred N. Huffman, Sudbury, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jun. 22, 1987, Ser. No. 65,038
Int. Cl.[4] F27B *19/02;* **F28D** *15/02*
U.S. Cl. 432—91 **10 Claims**



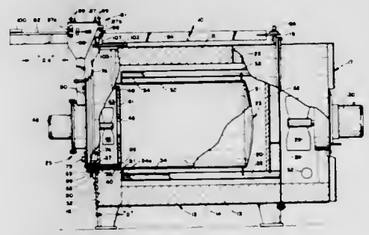
1. A pressure-balanced heat pipe comprising a uniform temperature enclosure for transferring heat from an input portion to an output portion thereof, said enclosure shaped as an annulus having an outer wall comprising said input portion and an inner wall comprising said output portion, said inner wall defining a work-heating volume for containing work to be heated by said heat pipe, said enclosure having an opening formed therein, a hollow stem appended to said enclosure and communicating with said enclosure by way of said opening, cooling means disposed about said stem for creating a temperature gradient along a length thereof upon the application of a predetermined amount of heat to said input portion of said enclosure, an expansible chamber connected to said stem, a quantity of working fluid normally disposed as a liquid within said chamber and primarily as a liquid within said stem and primarily as a vapor within said enclosure and a wick disposed within said enclosure for transferring liquid working fluid from said output portion to said input portion, whereby an increase of ambient pressure about said heat pipe after said application of a predetermined amount of heat to the input portion thereof results in a comparable increase of internal pressure within said heat pipe.

4,787,844

SEAL ARRANGEMENT FOR HIGH TEMPERATURE FURNACE APPLICATIONS

Klaus H. Hemsath, Toledo, Ohio, assignor to Gas Research Institute, Chicago, Ill.

Filed Dec. 2, 1987, Ser. No. 130,098
Int. Cl.[4] F27D *1/18*
U.S. Cl. 432—242 **21 Claims**



1. A sealing arrangement in combination with an industrial heat treat furnace comprising:

an imperforate, thin walled, metal cylindrical shell member for receiving workpieces to be heat treated therein, said shell member having a cylindrical body portion terminating at a flanged open end;

door means for opening and closing said flanged open end;

an elastomer seal between said door means and said flanged open end for sealing said door and said flanged end when said door is in a closed position;

heating means within said furnace for heating said work and said body portion of said shell member to a high furnace temperature;

liquid cooling means adjacent said seal for keeping said seal at a cool, non-destructive temperature;

insulating means extending from said flange end along said body portion a spaced distance for substantially shielding said inner surface of said shell member and said outer surface of said shell member over said spaced distance from heat flux emanating from said heating means; and

said liquid cooling means in combination with said insulating means gradually cooling said shell member from said furnace temperature to said cool non-destructive temperature at said flanged end over said spaced distance to establish a temperature gradient therebetween which prevents rupturing of said shell member.

4,787,845

ORAL IRRIGATOR

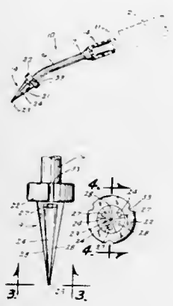
Rodney F. Valentine, 121 Glenview Dr., Des Moines, Iowa 50312

Filed Mar. 16, 1987, Ser. No. 26,035
Int. Cl.[4] A61G *17/02*
U.S. Cl. 433—88 **5 Claims**

1. An oral irrigator for attachment to and use with an instrument capable of selectively supplying fluid under pressure to the oral irrigator comprising:

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means for fluid attachment to the instrument;
stem means fluidly secured to said attachment means and having an open free end; and
tip means having a conical body fluidly secured to said stem means free end, said body tapered from a large end adjacent to said free end to a pointed end, one or more chan-



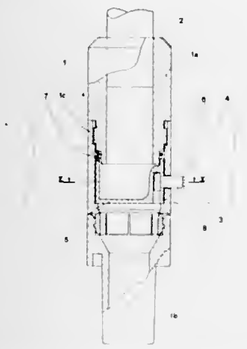
nels formed circumferentially about and within said body and extended longitudinally thereof, whereby fluid can be emitted at said pointed end, said large end having one or more grooves formed therein and disposed about its periphery; said grooves extended substantially parallel said channels.

4,787,846

DEVICE FOR SHUTTING OFF SUCTION GENERATED THROUGH THE SINGLE TUBES OF DENTAL SURGERY EQUIPMENT

Augusto Cattani, Parma, Italy, assignor to Officine Augusto Cattani & C. S.p.A., Italy

Filed Jun. 5, 1987, Ser. No. 58,562
Claims priority, application Italy, Jul. 24, 1986, 40076 A/86
Int. Cl.[4] A61C *17/04*
U.S. Cl. 433—95 **6 Claims**



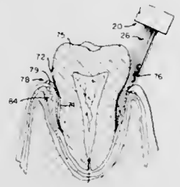
1. A device for closing suction generated through a tube of a dental surgery tool comprising
a substantially hollow grip having a bore going there through,
at least one tube being inserted into said grip, said tube connected to suction means,
a holder having an opening for receiving the grip and a location element,
an obturator position within an interior of and surrounded by the grip, said obturator is coaxial with the grip, said obturator having a closed position in which the bore of the grip is substantially blocked by the blocking portion and an open position in which at least one passage of the obturator is open,
a pin projecting externally from the grip, said pin connected to the obturator and movable therewith, said pin movable in relation to the grip.
said location element engaging the pin when the grip is received by the holder in such a way as to urge the obturator into the closed position,
spring means provided within the grip and impinging upon the obturator is such a way as to urge the obturator in the open position,
an interior of said grip having an intermediate section partially blocked by a web portion and having at least one channel going through said inter mediate section, said obturator rotatable about its own axis in such a way that said passage of the obturator coincides with the channel of the intermediate portion in said open position and in said closed position said passage coincides with the web portion of the intermediate section;
wherein said location element has a helical groove extending across the opening of the holder said groove having a cross-section adopted to slidably receive the pin.

4,787,847

DENTAL HYGIENE DEVICE

Roy W. Martin; L. David Engel, both of King County, Wash., and Joseph M. Miller, Washtenaw, Mich., assignors to The University of Washington, Seattle, Wash.

Filed Mar. 26, 1985, Ser. No. 716,371
Int. Cl.[4] A61C *3/03*
U.S. Cl. 433—119 **19 Claims**



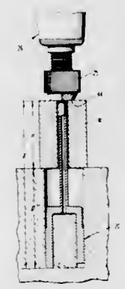
1. A dental hygiene device comprising:
an electronically insulated handle of non-conducting material;
an elongated, piezoelectric multimorph transducer having a length substantially greater than the width and a thickness substantially less than the width, said transducer having a first end portion rigidly attached to the handle for cantilever mounting thereto, an unattached second end portion which is free to vibrate with maximum displacement substantially at the transducer's resonant frequency and substantially transverse to the transducer length, and an unrestrained mid-portion extending outwardly from the handle and between the attached first end portion and the unattached second end portion, the transducer being bendable in response to an electrical signal for generating relatively low-energy vibrations of a predetermined frequency to disrupt and remove plaque and to interrupt and limit the process of plaque maturation and development;
means for transmitting electrical signals to the transducer; and
at least one applicator member fixed to the free second end portion of the transducer and extending therefrom for scrubbing exposed surfaces and for transmitting the vibrations to the gingival areas, the transducer being operable to cause mild cavitation within the subgingival fluid to disrupt plaque colonies and to demobilize motile bacteria without harming the surrounding soft tissue.

4,787,848

METHOD AND APPARATUS FOR DRILLING BORES IN JAW BONE TISSUE FOR THE RECEPTION OF DENTAL ANCHORS

Stanley E. Ross, Boca Raton, Fla., assignor to Ross Systems Corporation, Palm Beach, Fla.

Filed Nov. 25, 1986, Ser. No. 934,638
Int. Cl.[4] A61C *3/02*
U.S. Cl. 433—165 **5 Claims**



1. A method of drilling a bore of predetermined depth in a jaw bone of patient so that a dental anchor can be installed therein, said method comprising the steps of advancing a hollow head of a trephine drill longitudinally into the jaw bone to form a bore having a center core, said advancing step being continued relative to a stop member which is loosely mounted on a shank portion of said drill so as to be freely longitudinally slidable thereon until said stop member becomes sandwiched between the jaw bone and a surface movable with a motor housing carrying said drill, said shank portion being of smaller diameter than said drill head and extending from said drill head to a chuck portion of said motor housing, said stop member having an outer diameter greater than an outer diameter of said drill head and having a longitudinal length of such dimension that when said length is subtracted from a longitudinal distance between a front end of said drill head and said surface movable with said motor housing, the remainder equals said predetermined depth.

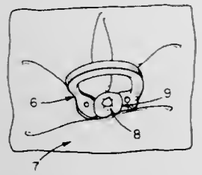
4,787,849

RADIOOLUCENT DENTAL DAM CLAMP

Steven R. Jacoby, 35635 Goldsmith, Fremont, Alameda Co., Calif. 94536; Thomas C. Wehman, 22422 Carnoustie Ct., Cupertino, Santa Clara Co., Calif. 95014; Mark Lieberman, and Fely Lieberman, both of 5714 McKellar, San Jose, Santa Clara Co., Calif. 95129

Filed Apr. 17, 1984, Ser. No. 601,250
Int. Cl.[4] A61C *5/12*
U.S. Cl. 433—139 **10 Claims**

1. A dental dam clamp comprising a pair of lateral wings lying substantially in a common plane and being substantially symmetrical about a center line, each of the wings having an interior surface adapted to lie against and hold a dental dam tightly against a tooth, the wings being joined by a spring-like transverse bridge, wherein said dental dam clamp comprises flexible radiolucent plastic having sufficient flexural strength to hold said dental dam against said tooth such that moisture leakage through the dam-tooth interface is substantially prevented while retaining the ability to return to its original shape when removed from the tooth.



4,787,850

PROCESS FOR PRODUCING DENTURES OF DENTURE PARTS AND STORABLE DENTAL MATERIALS SUITABLE FOR THIS

Rudolf J. Michl, Schaan; Peter Wollwage, Mauren, and Gerhard Zanghellini, Vaduz, all of Liechtenstein, assignors to Uexkull & Stolberg, Schaan, Liechtenstein

Filed Feb. 20, 1986, Ser. No. 831,459
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3506020
Int. Cl.[4] A61C *13/00*
U.S. Cl. 433—201.1 **11 Claims**

1. A two stage process for producing artificial teeth or crowns, inlays or other tooth parts using a curable dental material, in which process the first stage comprises producing a rubbery elastic blank by hardening at ambient temperature a composition comprising
(a) at least one polyfunctional isocyanate,
(b) at least one polyol,
(c) at least one methacrylate monomer having at least two hydroxyl groups,
(d) a catalyst for the heat or light initiated polymerization of the methacrylate monomer, and
(e) a catalyst for accelerating the formation of a polyurethane from (a), (b) and (c) which does not catalyze the radical polymerization of (c), shaping and mechanically finishing the blank, and the second stage comprises curing the shaped rubbery composition to provide said hard artificial teeth or parts thereof.

4,787,851

ATTACHMENT FOR DENTAL PROSTHESIS

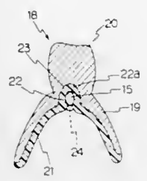
Takae Kusano, and Masato Ueno, both of Hiroshima, Japan, assignors to Molten Corporation and Kabushiki Kaisha Four Brain, both of Hiroshima, Japan

Division of Ser. No. 740,595, Jun. 3, 1985, Pat. No. 4,634,382. This application Jun. 30, 1986, Ser. No. 880,449
Claims priority, application Japan, Jun. 7, 1984, 59-85375; Jun. 11, 1984, 59-87126; Jun. 26, 1984, 59-97021; Jun. 26, 1984, 59-97022
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 **1 Claim**

1. An attachment for a dental prosthesis comprising:
(a) a male member of rigid material fixedly attached in the patient's mouth adjacent the area to receive the prosthesis; and
(b) a female member at the area receiving said prosthesis, said female member facing said male member, said male and female members being in intimate interengaging contact with each other without any gap therebetween,
said male member having a bar as the engaging portion with the opposite ends of said bar secured to spaced dental roots, said bar having an approximate circular section, said female member having a recess portion with an elastic

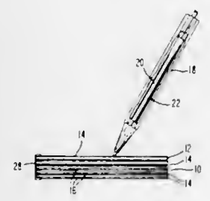
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resilient lining therein forming a groove for receiving and gripping said bar, said elastic, resilient lining extending outwardly of said recess and along the inner wall of said



female member and forming an elastic, resilient cushioned lining between the inner surface of the prosthesis base and the alveolus ridge in contact with said alveolus ridge at said inner surface.

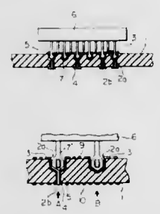
4,787,852
MULTICOLOR INTERACTIVE NOTEPAD
David W. Melnick, 358 Westgate Dr., Edison, N.J. 08820
Filed Apr. 24, 1987, Ser. No. 42,123
Int. Cl.[4] G09B *3/00;* **B41M** *5/12*
U.S. Cl. 434—328 **1 Claim**



1. A kit for producing symbols of unpredictable color on paper comprising:
(a) a plurality of paper substrates each having a coating means on both sides thereof, each of said coating means including one of a plurality of different reactant means, said paper substrates each displaying one of a plurality of different base colors;
(b) a binding means for securing together a plurality of said paper substrates with respect to one another; and
(c) a marking pen means containing a clear colorless fluid therein including an oxidizing agent therein being reactable with respect to each different one of said reactant means of said coating means from displaying an associated different opaque coloration after interaction therewith.

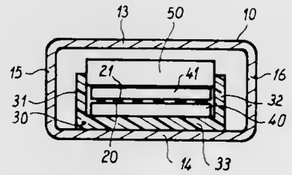
4,787,853
PRINTED CIRCUIT BOARD WITH THROUGH-HOLE CONNECTION
Yutaka Igarashi, Ohme, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 27, 1987, Ser. No. 30,505
Claims priority, application Japan, Mar. 29, 1986, 51-71431
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—55 **6 Claims**

3. An assembly, comprising:
a printed circuit board having one surface and an opposite surface;
a plurality of non-through holes formed in the thickness direction of said printed circuit board in said one surface,
a plurality of through holes formed in selected ones of said non-through holes to open through to said opposite surface, said through holes having a smaller inside diameter than said non-through holes,
a plurality of first conductive lands formed on the periphery of the openings of said non-through holes in said one surface,
a plurality of second conductive lands formed on the periphery of the openings of said through holes on said opposite surface and having a smaller outside diameter than said first lands formed on the periphery of the openings of said non-through holes,



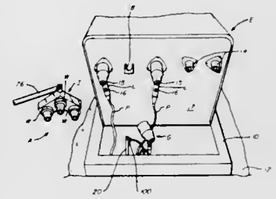
a plurality of conductive connecting means formed on the inside wall of said non-through holes and said through holes respectively, for connecting said first conductive lands in said one surface with said second conductive lands in said opposite surface,
conductive patterns formed on said one surface and said opposite surface respectively, and
a Pin Grid Array having a plurality of terminal pins, said terminal pins being received in selected ones of said plurality of non-through holes and through holes to mount the Pin Grid Array on said printed circuit board.

4,787,854
CONNECTOR FOR FLAT CONNECTIONS
Guy Le Parquier, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Jun. 19, 1987, Ser. No. 64,020
Claims priority, application France, Jun. 24, 1986, 86 09102
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—67 **5 Claims**



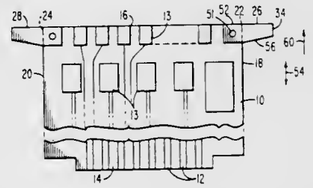
1. A connector for flat connections adapted for connecting electrically together printed circuit tracks or printed circuit tracks to a flat cable or two flat cables together, said connector comprising:
(a) a sleeve made from a shape memory material in which, during use, conducting elements are superimposed, said sleeve being adapted for applying transverse forces under the effect of a predetermined temperature so that electric continuity may be provided between the conducting elements, and
(b) an elastic seal placed between a conducting element support and a face of said sleeve, said seal resting on a wedge-piece placed on one of the supports of the conducting elements.

4,787,855
MULTIPLE BUSHING CONNECTOR APPARATUS
Ronald J. Finke, Houston, Tex., assignor to Houston Industries Incorporated, Houston, Tex.
Filed Jun. 5, 1987, Ser. No. 58,578
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—92 **16 Claims**



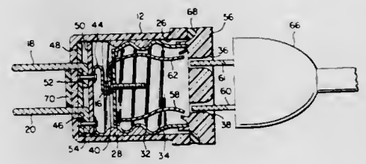
1. An apparatus for grounding power distribution cable at the connection of connector elbows of the cable to power distribution equipment, comprising:
(a) at least three bushing wells for receiving conductor bushing inserts, one of which inserts is a load-breaking insert adapted to receive a connector elbow of a grounding cable, the other inserts being adapted to receive the connector elbows of the cable;
(b) at least three electrical conductor means, each mounted in a separate one of said bushing wells for making electrical connection with a bushing inert when inserted therein;
(c) bus means joining said electrical conductor means electrically in common;
(d) insulative means for containing said bushing wells and said bus means therein; and
(e) means for mounting said insulative means to the power distribution equipment.

4,787,856
PRINTED CIRCUIT BOARD EJECTION INSERTION TAB
Morris Chazin, Willingboro, N.J., assignor to General Electric Company, Schenectady, N.Y.
Filed Mar. 20, 1987, Ser. No. 28,269
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—152 **1 Claim**



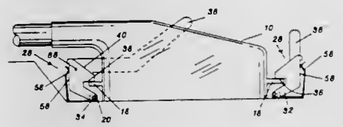
1. In combination:
a printed circuit board having first and second edge surfaces meeting at a corner and an aperture through the board spaced from said edge surfaces;
a retraction tab secured cantilevered from and abutting the first edge surface, said tab including a pair of legs straddling said board at said first edge surface; and
a pin secured to the legs and passing through said aperture for securing the tab to the board, said abutment with said first edge surface being arranged to preclude the tab from rotating about said pin, said tab being dimensioned so that when secured to the board said tab including said legs is at most flush with said board second edge surface.

4,787,857
RECTIFIER HOUSING FOR USE BETWEEN A LINE CORD AND A WALL OUTLET
William J. Kretchmar, 6900 NW. 4th Ave., Boca Raton, Fla. 33431, and Dale N. Strickland, 9483 Burlington Pl., Boca Raton, Fla. 33434
Filed Aug. 1, 1986, Ser. No. 892,912
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—189 **5 Claims**



1. A rectifier housing for connecting a lamp cord plug to a source of electrical energy, said housing comprising:
(a) a plug formed from non-conductive material and defining an enclosure, said plug having a plurality of electrically conductive contact blades extending outwardly from a first face of said enclosure for engaging blade-receiving slots in an electric outlet;
(b) a receptacle received in and carried by said enclosure and having blade-receiving slots for receiving blades of said lamp cord plug, said blade-receiving slots provided in a face of said receptacle that defines a second face of said housing on a side of said housing opposite to said first face;
(c) a plurality of conductor means positioned within said enclosure for providing electrical contact between said contact blades in said plug and contact blades positioned into respective ones of said blade-receiving slots in said receptacle;
(d) rectifier means for rectifying electric energy carried by one of said conductor means, said rectifier means positioned within said enclosure and between one of said contact blades in said plug and one of said blade-receiving slots in said receptacle, said rectifier means being a part of said one of said conductor means for providing rectified electric energy to said lamp cord plug; and
wherein said enclosure includes an internally threaded casing and said receptacle is provided in an externally threaded adapter for threaded engagement with said casing.

4,787,858
LATCHING SYSTEM FOR COMPUTER PLUG
John C. Killian, Jr., Sudbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Mar. 23, 1987, Ser. No. 29,333
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—350 **20 Claims**



1. In an assembly including a plug and socket wherein the plug has a tabular projection on each of opposed ends and the socket has raised members having bores therein for pivotally mounting a latch for releasably engaging a said projection to hold the plug in the socket, a latch comprising:
(a) a pivot rod disposed in and between the bores in the raised members;
(b) a body portion disposed between the bores in the raised

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members and including a bore therethrough adjacent a front edge by means of which said body portion is pivotally mounted on said pivot rod, said body portion having an engaging lip extending towards the said projection when the plug is seated in the socket and disposed to snap over the said projection in a first locking position to hold the plug in the socket, said engaging lip forming a horizontal stop surface over the said projection and the pivot point formed by said bore in said body portion and said pivot rod therein, said body portion being pivotable to a second retracted position wherein said engaging lip is removed from engagement with the projection so that the plug can be removed; and

(c) an operating arm carried by said body portion whereby said body portion can be moved between said first and second positions by said operating arm; wherein

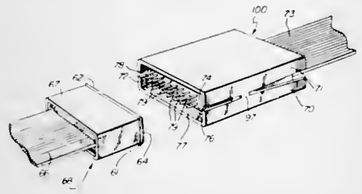
said operating arm is shaped to extend from said body portion alongside the plug to the opposite end of the plug when the plug is in the socket whereby said body portion can be moved between said first and second positions by said operating arm from the opposite end of the plug from said body portion.

4,787,859

MOLDED COUPLER

Peter V. N. Heller, 213 Esplanade, San Clemente, Calif. 92672

Filed Mar. 3, 1987, Ser. No. 21,303
Int. Cl.[4] H01R *13/627*
U.S. Cl. 439—352 **18 Claims**



1. A one piece molded coupler for providing a removeable connection between two elements of a system, said molded coupler comprising:

a center sleeve defining a first end configured to be joined to one of said system elements;

a pair of half sleeves generally conformed to and spaced from said center sleeve in a surrounding relationship, said half sleeves defining first and second clasp means; and

a pair of resilient hinge members coupled between said half sleeves and said center sleeve to permit said half sleeves to be pivotally attached to said center sleeve in a closed position, said resilient hinge members being elastically deformed by pivoting motion of said half sleeves with respect to said center sleeve to an open position and providing a restoring spring force to return said half sleeves to said closed position.

4,787,860

CONNECTOR SYSTEM HAVING COMBINED LATCH AND POLARIZATION MEMBER

Frederick A. Bender, Etters, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 28, 1987, Ser. No. 90,556
Int. Cl.[4] H01R *13/639, 13/648*
U.S. Cl. 439—358 **11 Claims**

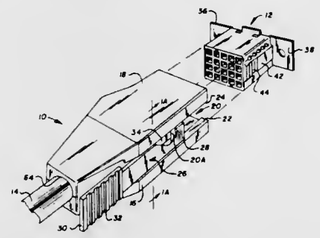
1. An electrical connector system having combined latch and polarization means comprising:

a first connector member having a plurality of electrical contacts therein of a first type;

a second connector member having a plurality of electrical contacts therein of a second type of effecting electrical connection with the electrical contacts of the first type of said first connector member, said first and second connector members inter-engageable with one other to effect connection between said first and second contact types;

raised projection means associated with a one of said first and second connector members;

means associated with the other of said first and second connector members defining a slot for accepting said raised projection means and for polarizing the alignment of the first and second connector members in a preferred alignment; and



latching means mounted on the other of said first and second connector members and co-aligned with said slot for releasably latching the first and second connector members together, said latching means engaging the raised projection means of the one connector member to latch the members together, whereby said raised projection means, said latching means and said slot provide said combined latch and polarization means.

4,787,861

RESILIENT CONTACT PIN AND A METHOD OF ITS MANUFACTURE

Gustav Krüger; Klaus Giringer, both of Herrenberg, and Sven Hinnerwisch, Nufringen, all of Fed. Rep. of Germany, assignors to Feinmetall GmbH, Herrenberg, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 64,868
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1986, 3620946; Dec. 29, 1986, 3644643
Int. Cl.[4] H01R *4/40*
U.S. Cl. 439—482 **52 Claims**



1. A resilient contact pin for contacting electrical or electronic items to be tested, such as conductor plates, printed circuit boards or the like, the resilient contact pin being electrically conductive and intended for mounting on a testing arrangement, comprising

a straight cylindrical member including a metallic tube constituted by a punched and bent sheet metal part;

a contact member including a piston accommodated in said metallic tube for axial sliding and a frontward end portion projecting out of said metallic tube and serving for contacting the item to be tested;

spring means accommodated in said metallic tube and urging said contact member in a frontward direction relative to said metallic tube; and

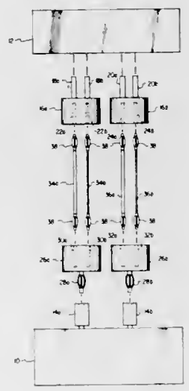
at least one lug constituted by an integral region of a circumferential wall of the metallic tube and extending into the interior of the metallic tube to constitute an abutment which limits the extent of the frontward movement of said piston of said contact member, at least said lug of said tube being resiliently elastic, said lug forming an elastically resilient back hook which is so arranged that it permits the introduction of said piston into said tube with attendant resilient outward bending thereof caused by said piston during said introduction thereof into said tube.

4,787,862

APPARATUS FOR ELECTRICALLY CONNECTING TWO AUDIO COMPONENTS UTILIZING DIFFERENT SIZED CONDUCTORS

Noel Lee, 47 W. Park Dr., Daly City, Calif. 94015

Filed May 26, 1987, Ser. No. 54,014
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—502 **5 Claims**



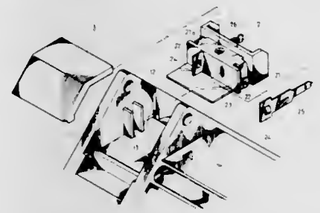
1. Apparatus for electrically connecting two audio components for transferring an audio signal between said components; said apparatus comprising two connector blocks, one of said connector blocks having at least one terminal means for electrically and mechanically connecting to one of said components and the other connector block having at least one terminal means for electrically and mechanically connecting to said other component, each of connector blocks having at least two additional terminal means electrically connected to it one terminal means, and means electrically connecting said additional terminal means of said one connector block to said additional terminal means of said other connector block, respectively, each of said connecting means comprising a flexible electrical conductor and a male plug disposed at each end of said flexible electrical conductor and adapted to quick-detachably engage its corresponding terminal means, the sizes of said flexible electrical conductors varying so that different portions of said audio signal are transferred by different conductors.

4,787,863

PLUG STRUCTURE FOR VENTILATING FANS

Alex Horng, No. 149, Yi Yung Rd., Kaohsiung, Taiwan (800)

Filed May 20, 1987, Ser. No. 51,617
Int. Cl.[4] H01R *19/16*
U.S. Cl. 439—557 **2 Claims**



1. A plug structure for a ventilating fan comprising:

a main body having a base plate in one corner thereof and two sidewalls on the base plate, two partition walls extending inwardly from each sidewall, a recess formed between the two partition walls, an inwardly extending projection adjacent the bottom of each said recess, and a hole in each sidewall below said projection;

a base for fitting on the main body between said sidewalls, the base having opposite sides with slots to mate with said partition walls and depressible hooks between the respective slots to releasably engage the respective projections, the hooks being accessible for release through the holes in the respective sidewalls, electrical connector blades set in apertures in the base extending transversely to the slots, and a round hole in the base extending parallel to the slots for connection of a cover; and

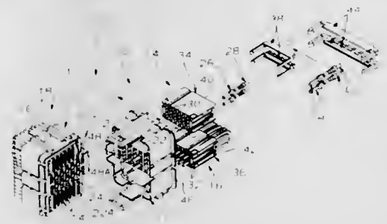
a cover for covering the base, the cover having a pin protruding downwardly for inserting into said round hole of the base, the pin having engagement means for retaining same in the round hole.

4,787,864

TERMINAL STABILIZATION AND RETENTION SYSTEM FOR AN ELECTRICAL CONNECTOR

Alexander Hunt, III, Harrisburg; John M. Myer, Lancaster; Charles R. Rhoads, Harrisburg, and Dennis E. Smith, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 25, 1987, Ser. No. 30,409
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—595 **7 Claims**



1. A retention system for assuring the retention of terminals terminated to electrical conductors of cables within respective passageways of a connector housing into which they are insertable, comprising:

housing means having a plurality of passageways arranged in at least one row extending therethrough from a rearward face to a mating face and adapted to receive thereinto

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from said rearward face respective terminals terminated to electrical conductors of cables, said passageways of said at least one row communicating at rearward ends thereof with an insert-receiving cavity extending along a common side thereof and forwardly from said rearward housing face;

terminals terminated at conductor-connecting sections to electrical conductors of respective insulated cables and adapted to be insertable into corresponding said passageways from said rearward housing face, each said terminal including a contact section at a forward end thereof and further including an annulus rearward of said conductor-connecting section and defining a substantially annular rearwardly facing stop means spaced radially from the insulation of a respective said cable after termination substantially around the circumference of the cable, each said stop means being adjacent said insert-receiving cavity of said housing means after assembly of said terminal in said housing means;

an insert member associated with said at least one row of said passageways, said insert member including a transverse body section adapted to be received into and within said insert-receiving cavity of said housing means after said terminated terminals have been assembled into said at least one row of passageways, said body section including a cable-proximate portion extending transversely toward and to the cables of said at least one row after assembly rearward from said terminals and including a surface having semi-cylindrical recesses within which portions of said cables are disposed, and a forwardly facing surface of said cable-proximate portion defining forwardly facing stop surface means at least at locations corresponding to each said passageway of said row and adapted to stoppingly engage a said terminal in said passageway behind said stop means of said annulus thereof; and

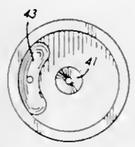
means for securing said insert member in said insert-receiving cavity of said housing means when said stop surface means stoppingly engage said stop means of the terminals of said at least one row, whereby said terminals of said row are assuredly secured against rearward withdrawal from said housing means in any angular orientation within the insert-receiving cavity.

4,787,865

THREE-WAY LAMP BASES AND METHOD FOR MAKING THEM

Phillip A. Livera, Cedar Groove, and Paul P. Bracaglia, Fairfield, both of N.J., assignors to North American Philips Lighting Corp., New York, N.Y.

Filed Dec. 4, 1986, Ser. No. 937,761
Int. Cl.[4] H01J *5/52*
U.S. Cl. 439—614 **10 Claims**



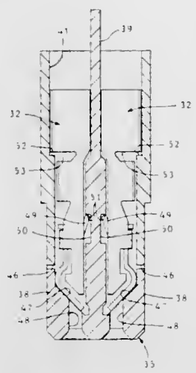
1. A base for a three-way lamp including a tubular shell with an open end and an end with a shoulder around it and a round wall about a longitudinal axis, glass insulation around said shoulder and extending outside said shell with a central recess in it, said central recess having a given diameter in a predetermined plane perpendicular to said longitudinal axis, which plane passes through the upper half of said central recess, an eyelet embedded in said glass insulation located in the center of said glass insulation so that the center of the eyelet is aligned with the center of the central recess in said glass insulation, and a contact ring surrounding said eyelet and embedded in said glass insulation, said contact ring being separated from said eyelet and from said shell by said glass insulation, said contact ring having a radial wall with a predetermined width and an aperture in it, said glass insulation having an off centered recess extending through said insulation and having an aperture in line with the aperture in said contact ring, said off centered recess being between the central recess and said round wall of said shell, said insulation having a depth between said contact ring and said shell, said off dimension about said longitudinal axis which is at least as large as said given diameter, and which decreases smoothly in the direction away from said predetermined plane to a narrow opening at said aperture in said contact ring to serve as a guide means for a wire to be fed through said off centered recess for connection to said contact ring.

4,787,866

CONNECTOR FOR UNLOCKING CONDUCTIVE MEMBERS FROM CONDUCTIVE PINS

Leroy J. Morningstar, Middletown, and Charles I. Tighe, Jr., Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 14, 1988, Ser. No. 181,360
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—268 **4 Claims**



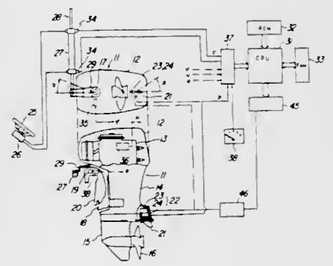
1. In an electrical connector comprising; locking members constructed for locking to conductive pins projecting from a printed circuit board, an insulative housing containing the conductive locking members and a movable housing for movement against the locking members to deflect the locking members to unlock them from the pins, the improvement comprising; electrical contacts in the insulative housing for unlocked connection to corresponding said conductive pins, the locking members are mounted in the movable housing, the movable housing is mounted for axial movement within the insulative housing, and the insulative housing contains the movable housing and is adapted to fit among a plurality of like connectors for connection to closely spaced apart pins projecting from a printed circuit board.

4,787,867

TRIM TAB ACTUATOR FOR MARINE PROPULSION DEVICE

Toshio Takeuchi, and Shinya Atsumi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 20, 1987, Ser. No. 52,712
Claims priority, application Japan, May 23, 1986, 61-117467
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—1 **16 Claims**



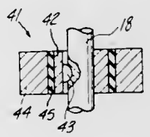
1. In a marine outboard drive mounted for steering movement about a generally vertically extending steering axis, a trim tab supported for movement relative to said outboard drive from a neutral position to a position for generating a hydrodynamic force for assisting in the steering movement of said outboard drive, a steering member adapted to be activated by an operator for steering said outboard drive by applying a force to said outboard drive directly from said steering member, force sensing means for detecting the occurrence of an operator induced steering force, power operated means for moving said trim tab immediately in response to the detection of an operator's steering input from said force sensing means including a plurality of preprogrammed maps for achieving the desired trim tab angle, and operator controlled means for selecting the map which controls said trim tab angle.

4,787,868

TORSIONAL VIBRATION DAMPING MEANS FOR MARINE PROPULSION DEVICE

Akihiko Hoshiba, and Hiroaki Fujimoto, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 12, 1985, Ser. No. 764,766
Claims priority, application Japan, Aug. 30, 1984, 59-179226
Int. Cl.[4] B63H *1/15*
U.S. Cl. 440—52 **11 Claims**



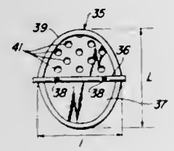
1. In a marine outboard drive comprising a power head containing an internal combustion engine having an output shaft, a flywheel drive from one end of said output shaft, a drive shaft housing depending from said power head and journaling a drive shaft driven by the other end of said output shaft, a lower unit containing propulsion means for propelling an associated watercraft and means for driving said propulsion means from said drive shaft, the improvement comprising torsional vibration damping means directly connected to said drive shaft for reducing the effects of torsional vibrations on said drive shaft, said torsional vibration damping means comprising a first annular member detachably affixed for rotation with said drive shaft, an annular inertial member axially aligned with said first annular member and rotatably relative to said drive shaft, and means for coupling said inertial member to said first member for relative movement therebetween.

4,787,869

WATER LOCK DEVICE FOR MARINE PROPULSION

Shigeki Shiozawa, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 10, 1987, Ser. No. 119,053
Claims priority, application Japan, Nov. 14, 1986, 61-271194
Int. Cl.[4] F01N *3/00*
U.S. Cl. 440—89 **15 Claims**



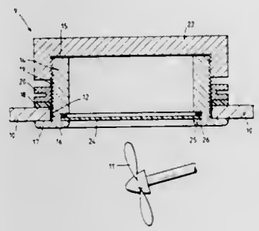
1. In an exhaust system for a marine propulsion unit having an engine with an exhaust system including a discharge designed at times to be submerged, an exhaust control valve moveable between an opened position for unrestricted flow through said exhaust system and a closed position wherein water is restricted from entering the engine through the exhaust system, the improvement comprising means for permitting exhaust gases to flow through said exhaust system when said exhaust control valve is in its closed position.

4,787,870

PROPELLER CLEARING MEANS

John D. Britton, Lymington, England, assignor to Herco David Limited, Reading, England

Filed Oct. 19, 1987, Ser. No. 109,953
Claims priority, applicatioo United Kingdom, Nov. 17, 1986, 8627444
Int. Cl.[4] B63H *19/00*
U.S. Cl. 440—113 **5 Claims**



5. A motor boat comprising a hull, a lower portion of said hull, an aperture formed in said lower portion of the hull and a propeller located below said lower portion, said hull having a water line at a given height above said lower portion, a propeller clearing construction including a tube having a lower end and an upper end, an interior and an exterior surface, a radially outwardly projecting flange at the lower end of said tube, an external thread formed on the exterior surface of said tube, a pierceable plastics material transparent panel extending

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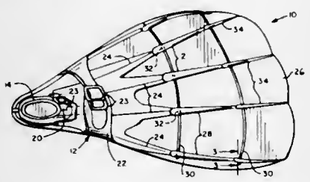
across said lower end of the tube, and sealing the interior of the tube from the lower end, said tube being passed through said aperture formed in said lower portion of and extending upwardly whereby said upper end of the tube is above said water line, the radially outwardly flange abutting said lower portion of said hull from below, a nut threaded onto said external thread within said hull to pull said flange upwardly against said lower portion of said hull, around said aperture and a gasket sealingly surrounding said tube and sealingly engaging said lower portion of said hull.

4,787,871

WATER SURFACE RUNNING FINS FOR THE FEET

Peter B. Tomlinson, 309 Asharoken Ave., Northport, N.Y. 11768

Filed Jan. 21, 1988, Ser. No. 146,565
Int. Cl.[4] A63B *31/08*
U.S. Cl. 441—61 **4 Claims**



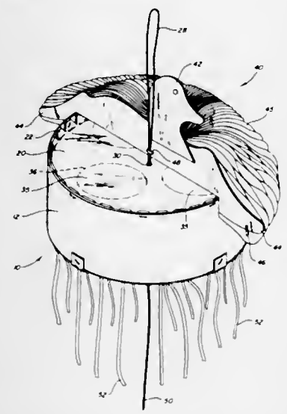
1. A fin for water surface running by a wearer, comprising, a main body, a foot receiving member secured to a rear portion of said main body, a plurality of spaced spoke portions secured to said body, providing a means for mounting and pivotally receiving a plurality of first fingers, a plurality of pivotal second fingers received on said first fingers, and a pair flexible wires received through said first fingers and said second fingers, providing upward stop means of pivoting of said first fingers and said second fingers.

4,787,872

PINATA CONSTRUCTION

Ricardo Bajo, 214 Morris St., Fairview, N.J. 07022

Filed Apr. 20, 1987, Ser. No. 40,335
Int. Cl.[4] A63H *33/00*
U.S. Cl. 446—5 **5 Claims**



1. A reusable pinata comprising a body having a top closure surface and a bottom closure surface, said bottom closure surface being frangible and replaceable, means depending from said body for rupturing said frangible bottom surface, and means for suspending said body from an overhead point, said top closure surface extending entirely across the top of said body and said body being normally sealed by said top closure surface and said bottom closure surface but said top closure surface being formed with openable areas in the form of areas of demarcation to permit access to the interior of said body for the introduction of items therein and a hood overlying and concealing said top closure surface but overlying only an upper portion of the side walls of said body; said hood being substantially bell-shaped and being formed form a pair of decorative expansible paper units.

4,787,873

MODULAR COIN BANK

Lela R. Borrmann, and Judson P. Borrmann, both of 647 S. Bermuda Cir., Mesa, Ariz. 85206

Filed Dec. 17, 1987, Ser. No. 134,372
Int. Cl.[4] A45C *1/12*
U.S. Cl. 446—8 **22 Claims**



1. A modular coin bank including in combination:
a coin storage base having at least first and second coin entry slots therein;
a hollow coin receiving member having a coin entry end and a coin discharge end therein;
a plurality of hollow guideway members having input ends and exit ends therein;
at least one hollow guideway splitting member having an input end and first and second exit ends therein; and
means for interconnecting said coin receiving member, said guideway splitting member, and said plurality of guideway members with said first and second coin entry slots in said storage base to provide at least two alternate paths for coins to travel between said coin receiving member and said base.

4,787,874

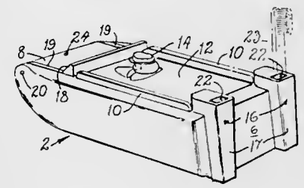
TOY HAVING THE APPEARANCE OF A BOAT

John C. Hardy, and Roberta M. Hardy, both of 25, Pottery Road, Parkstone, Poole, Dorset BH14 8RA, England

Filed Feb. 24, 1987, Ser. No. 17,521
Claims priority, application United Kingdom, Feb. 24, 1986, 8604489
Int. Cl.[4] A63H *23/02*
U.S. Cl. 446—160 **4 Claims**

1. A child's toy comprising a structure capable of floating on water and having the outward appearance of the hull of a boat; said structure having a bow end, a stern end, and a lengthwise dimension extending from the bow end to the stern end; said structure further having a bottom surface and a flat surface at the stream end which is substantially at right angles to the bottom surface and to the lengthwise dimension; a part of the structure at the bow end being displaceable into and out of a

position where it serves as a carrying handle for the toy; and the structure including a hollow compartment and a lid for the



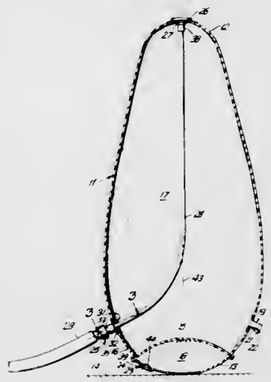
compartment, said lid being hinged to the structure along a line extending from the bow end to the stern end of the structure.

4,787,875

WATER SPROUTING INFLATABLE BOP BAG

William J. Baron, New York, and Marie F. Gredel, Middle Village, both of N.Y., assignors to Kid Biz, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 772,442, Sep. 4, 1985, Pat. No. 4,655,722. This application Apr. 6, 1987, Ser. No. 34,382
The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.
Int. Cl.[4] A63H *3/06, 13/18;* **B05B** *15/00*
U.S. Cl. 446—226 **10 Claims**



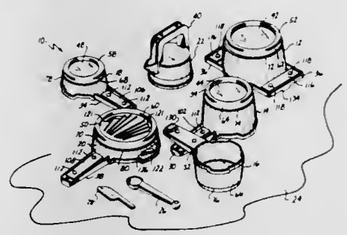
1. A bop bag comprising:
an elongated housing generally having an upper end and a lower end and having an upper gas compartment and a lower ballast compartment;
inflation means penetrating the housing in the gas compartment at a location closer to the lower end than to the upper end for introducing air under pressure into the gas compartment to inflate the bop bag;
means for introducing ballast into the ballast compartment whereby when the inflated bop bag is displaced from an initial stable upright position the ballast returns it thereto; the housing provided with water inlet means in proximity with the lower end and disengageably coupleable to a supply of water under pressure and water outlet means in proximity with the upper end arranged to spout the water from the housing; and
water delivery means within the housing for delivering a flow of the water from the water inlet means to the water outlet means.

4,787,876

TOY MUSICAL PLAYSET

Tuyen Nguyen, Los Angeles, and Donald E. Herring, Redondo Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 23, 1988, Ser. No. 159,634
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—408 **7 Claims**



6. A toy musical playset comprising:
a pan having musical ribs attached thereto, tambourine symbols engaged to posts attached thereto and a handle with a xylophone key;
a plurality of pots gradually varying in size from a large pot to a small pot, each of said pots having a handle with a xylophone key, said large pot capable of being stacked on top of said pan, each of said pots capable of being stacked on top of a larger one of said pots so that said pots are capable of being stacked on top of said pan and upon one another in descending order of size with said large pot at the bottom of said stacked pots and on top of said pan and said small pot at the top of said stacked pots;
a hollow teapot filled with beads having a handle with at least one xylophone key, said teapot capable of being stacked on top of said small pot, said beads capable of generating audible musical sounds when said teapot is shook, said pan and each of said pots having an annular portion and an annular ledge at the bottom thereof in order to facilitate stacking of said pots, said pan and said teapot, and in order to allow said pots, said pan and said teapot to be rotated with respect to each other when stacked;
a spoon; and
a spatula, said spoon capable of being used with said xylophone keys in order to produce musical sounds and said spatula capable of being used with said musical ribs in order to produce musical sounds.

4,787,877

STRUCTURE FOR POSITIONING A FRICTION MEMBER IN A DAMPER DISC

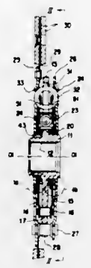
Tamio Nagao, Hirakata; Toru Hamada, Takatsuki, and Toshiaki Kikuchi, Kadoma, all of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Dec. 12, 1986, Ser. No. 941,127
Claims priority, application Japan, Dec. 16, 1985, 60/193321[U]
Int. Cl.[4] F16D *3/14*
U.S. Cl. 464—64 **2 Claims**

1. A structure for radially positioning a friction member in a damper disc comprising an output hub including a radial flange; a pair of side plates rotatably disposed at opposite sides of the flange; a torsion spring mechanism operable to circumferentially connect the side plates to the flange; and a friction mechanism rotatably fitted around the hub and associated to one of said side plates for generating a friction force in accordance with relative torsion between said one of said side plates and said flange; said friction member including an annular friction member, said one of said side plates having a plurality

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of circumferentially spaced projections each cut along three sides of said projection from said one of said side plates and bent inwardly at the fourth side and engaging the outer periph-



eral end of said annular friction member and radially holding and concentrically guiding said annular friction member concentrically to said hub.

4,787,878

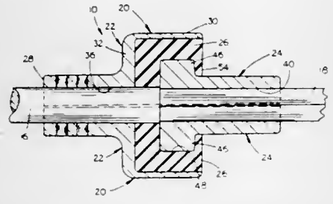
HIGH TORQUE CUSHION DRIVE COUPLING

Lee F. Nikkel, P.O. Box 117, Madrid, Nebr. 69150

Filed Jul. 28, 1986, Ser. No. 889,740

Int. Cl.[4] F16D *3/50*

U.S. Cl. 464—83 **10 Claims**



1. A high torque cushion drive coupling for drivingly connecting an output shaft to a drive shaft, comprising:

a pair of separate coupling half sections, each half section including,

a first jaw portion adapted to cooperate with the first jaw portion of the other half section to secure the output shaft therebetween,

a second jaw portion adapted to cooperate with the second jaw portion of the other half section to secure the drive shaft therebetween,

said first and second jaw portions being arranged in longitudinally overlapping radially spaced-apart relation, and

a body of resilient material substantially filling the space between said first and second jaw portions and being securely bonded to said first and second jaw portions thereby to form a unitary coupling half section, and

coacting fastener means on said pair of coupling half sections for securing the output shaft to said first jaw portions and the drive shaft to said second jaw portions whereby said output and drive shafts are drivingly coupled for rotation in unison.

4,787,879

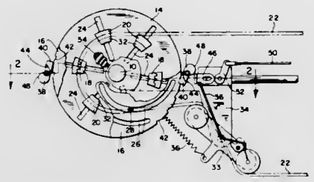
FIFTEEN SPEED VARIABLE RADIUS BICYCLE TRANSMISSION

James F. Pritchard, Leominster, Mass., assignor to Exeter Granddiorite Trust, Leominster, Mass.

Filed Nov. 2, 1987, Ser. No. 115,112

Int. Cl.[4] F16H *55/52*

U.S. Cl. 474—49 **15 Claims**



1. A bicycle transmission for a bicycle having a drive wheel and a chain to drive it, comprising a drive plate fixed with relation to the drive wheel, a cam plate in parallel side by side co-axial relation to the drive plate, radial mutually spaced slots in the drive wheel, corresponding curved cam slots in the cam plate, sliders, said radial slots and cam slots cooperating in pairs to accommodate a slider in each pair of slots whereby relative rotational motion of the plates causes the sliders to be moved radially, chain engaging sprockets on two only diametrically opposed sliders, the chain being engaged with one sprocketted the slider and trained over the other sliders,

notches at the periphery of the cam plate, said notches being mutually spaced, a locking pawl on the drive plate in position to lock the plates together by engagement with a notch, means to temporarily disengage the pawl from the notch, means normally urging the pawls toward plate locking position,

and means to cause relative rotation of cam plate and drive plate while the pawl is disengaged.

4,787,880

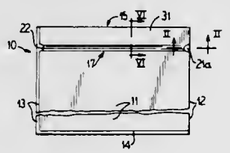
METHOD OF MAKING EXTRUDED ZIPPER STRIPS AND BAGS CONTAINING THE SAME

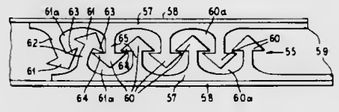
Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 812,467, Dec. 23, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 75,636

Int. Cl.[4] B31B *1/84*

U.S. Cl. 493—213 **3 Claims**





1. A method of making a bag with an extruded plastic zipper strip attached therein and having a plurality of spaced parallel profile parts, one side of the strip being adjacent to the mouth

end of the bag and the other side of the strip being at the inner side of the bag, and comprising:

forming all of said profiles of generally arrow shape having arrowhead profile portions connected to a base by respective stems;

folding the strip upon itself within the bag for separable interengagement of said profiles of the folded portions of the strip; and

forming the profile at said other side of said strip with its stem biased toward the next adjacent profile so that in the interengaged folded strip separation of the profiles by forces from the inside of the bag will be resisted to a greater extent than forces applied for separating the profiles from the outside of the bag.

4,787,881

ARRANGEMENT FOR THE RAISING OF PACKING CONTAINER BLANKS

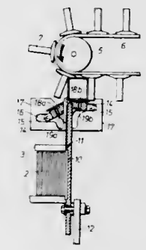
Roland Andersson, Malmö; Lars Carlsson, Blentarp, and Anders Sjöström, Lund, all of Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Apr. 16, 1987, Ser. No. 39,027

Claims priority, application Sweden, Apr. 18, 1986, 8601783

Int. Cl.[4] B31B *1/80*

U.S. Cl. 493—316 **2 Claims**



1. An apparatus for raising flattened, tubular packing container blanks comprising:

a movable driving element having suction elements attachable to the blanks, said suction elements being formed by arms in hinged connection with each other which are movable away from each other and which are provided with suction heads that are directed toward one another in a first position of said driving element to allow attachment of the suction elements to two opposite sides of the flattened blank;

supporting plates on which said arms are suspended and which are provided with guiding tracks which are curved away from each other; and

a driving plate which drives said arms and advances the flattened container blanks, said driving plate being arranged at an outlet end of a magazine for stacked, flattened container blanks, said driving plate including a feed edge projecting toward the container blanks, said feed edge being of a height corresponding to the thickness of a flattened container blank, said driving plate being movable between a lower position wherein said feed edge is directly beneath a longitudinal edge of an outermost container blank in the magazine and an upper position wherein said feed edge is at least as high as a top longitudinal edge of the container blanks in the magazine.

4,787,882

TWO STAGE VENOUS RETURN CATHETER

Jan S. Clarén, Lund, Sweden, assignor to Gambro AB, Sweden

Filed Dec. 23, 1986, Ser. No. 945,848

Claims priority, application Sweden, Jan. 16, 1986, 8600188

Int. Cl.[4] A61M *1/03, 25/00*

U.S. Cl. 604—4 **18 Claims**



1. A cardiac catheter comprising a tubular catheter body including a first end and a second end, said first end of said catheter body being adapted for insertion into heart and including at least one inlet opening for admitting fluid into said catheter body, and said second end of said catheter body comprising an outlet for said fluid, said catheter body including an intermediate portion between first end and said second end, said intermediate portion of said catheter body including at least one intermediate opening for admitting additional fluid into said catheter body, and intermediate opening closure means movable between a first position wherein said intermediate opening closure means leaves both said at least one inlet opening and said at least one intermediate opening open for the admission of fluid into said catheter body therethrough, and a second position wherein said intermediate opening closure means leaves said at least one inlet opening free for the admission of fluid into said catheter body therethrough while closing said at least one intermediate opening, said catheter body including a longitudinal axis and said second end of said catheter body including bendable extension means comprising bellow means for permitting said second end of said catheter body to be bent in a direction which forms an angle with respect to said longitudinal axis of said catheter body.

4,787,883

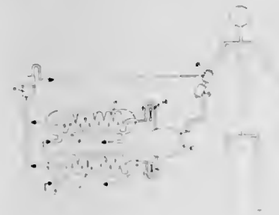
EXTRACORPORAL THERMO-THERAPY DEVICE AND METHOD FOR CURING DISEASES

Karl K. K. Kroyer, 19 Boulevard de Suisse, Monte-Carlo, Monaco 98000

Filed Mar. 10, 1986, Ser. No. 837,688

Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—4 **5 Claims**



1. An extracorporal thermo-therapy apparatus for use in continuously treating the blood of a patient for disease, said extracorporal apparatus comprising

first connector means for removing a flow of blood from a patient,

second connector means for returning said flow of blood to said patient, and

a flow circuit connected between said first connector means and said second connector means, said flow circuit including

a separator for separating said flow of blood into a first blood flow portion which is enriched in red blood cells

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and a second blood flow portion which is enriched in white blood cells,

a first heating means for raising the temperature of said first blood flow portion,

a first pump for moving said first blood flow portion through said first heating means,

a second heating means for raising the temperature of said second blood flow portion,

a second pump for moving said second blood flow portion through said second heating means, and

a filter for filtering said first and second blood flow portions after they have been recombined.

4,787,884

URETERAL STENT GUIDEWIRE SYSTEM

Jay Goldberg, Northbrook, Ill., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Sep. 1, 1987, Ser. No. 91,976
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—8 **5 Claims**



1. A dual wire guidewire system for use in inserting a ureteral stent having an open proximal end of reduced diameter into a patient, said guidewire system comprising an elongated, tubular pusher wire of generally uniform diameter having a lumen which is open at both ends; a relatively flexible guidewire, said guidewire being longer than the pusher wire and sized to fit in and move freely in the lumen of said pusher wire so that the leading edge of said guidewire can be advanced out of the lumen of the pusher wire; and retaining means for keeping the leading end of the guidewire within the lumen of the pusher wire, said retainer means comprising a chuck having a bore for receiving the guidewire and a chuck tightening means which can be tightened to deform the bore and lock the guidewire within the chuck of the retaining means.

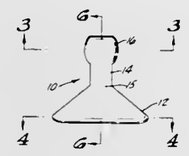
4,787,885

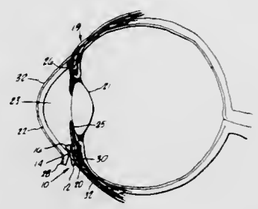
HYDROGEL SETON

Perry S. Binder, 6870 La Valle Plateada, Rancho Santa Fe, Calif. 92062

Continuation of Ser. No. 767,190, Aug. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 597,530, Apr. 6, 1984, Pat. No. 4,634,418. This application Mar. 6, 1987, Ser. No. 22,558
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—8 **38 Claims**

1. A seton for relieving intraocular pressure comprising a body portion, said body portion having a cross section which varies from being substantially eliptical to substantially oval, a neck portion extending from said body portion, and a lip portion formed about said neck portion, said seton being made from a biocompatible porous hydrogel material.



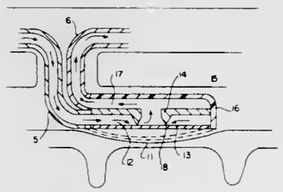


4,787,886

PRESSURE SENSOR CONTROLLED VALVE

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178

Continuation of Ser. No. 011,384, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 848,325, Apr. 2, 1986, abandoned, which is a continuation of Ser. No. 563,404, Dec. 25, 1983, abandoned. This application Mar. 14, 1988, Ser. No. 170,064
Int. Cl.[4] A61M *27/00*
U.S. Cl. 604—9 **10 Claims**



1. A fluid pressure-sensor valve adapted to be implanted in the living body as part of a fluid shunting system comprising:

(a) a housing which encloses a first chamber and a second chamber;

(b) a first tube means which is in fluid communication with said first chamber;

(c) a second tube means which is in fluid communication with said second chamber, said first and said second tube means connected in said fluid shunt system so as to transport a bodily fluid that is within said shunt system;

(d) aperture means located within said housing and between said first and second chambers having an aperture designed to allow fluid to pass through it between said first and second chambers;

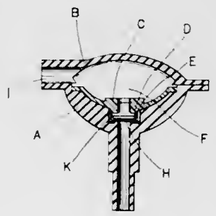
(e) a flexible portion of the walls of said enclosure which communicates on its inside surface with the fluid pressure in said first chamber and on its outside surface with pressure in a bodily region outside said housing, said flexible portion being in mechanical communication with the pressure in the bodily region located outside of the housing and, said flexible portion being designed to distort in shape according to the difference in pressure of the fluid in said first chamber and the pressure in the bodily region located outside of said housing and in pressure communication with said flexible wall portion, said flexible portion being so positioned and cooperatively designed relative to said aperture means that the flexible portion closes said aperture means when the pressures on both sides of the flexible portion are equal and that said flexible portion will distort with changes in the difference in pressure in said first chamber relative to the pressure in said bodily region thereby changing the degree of opening of said aperture to fluid flow through said aperture; whereby said pressure sensor valve is implanted in the living body as part of a shunt system to allow flow of a bodily fluid through said shunt system and through said aperture of said pressure-sensor valve, the flow of said bodily fluid through said aperture between said first and second chambers will be dependent on said difference in pressures in said first chamber and said bodily region outside said housing and adjacent to said flexible means, and the flow of said bodily fluid will be changed by a deformation of said flexible portion relative to said housing.

4,787,887

VENTRICULAR BY-PASS VALVE FOR DRAINING THE CEPHALORACHIDIAN LIQUID IN THE HYDROCEPHALUS

Luis Saenz Arroyo, Mexico City, Mexico, assignor to Biomedica Mexicana, S.A., Mexico City, Mexico

Continuation of Ser. No. 741,367, Jun. 5, 1985, abandoned. This application Jun. 2, 1987, Ser. No. 57,724
Claims priority, application Finland, Aug. 16, 1984, 843252
Int. Cl.[4] A61N *5/00*
U.S. Cl. 604—9 **4 Claims**



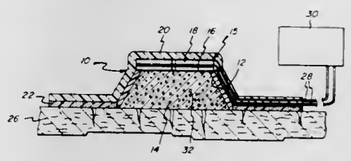
1. A ventricular by-pass device for draining the cephalorachidian liquid in the hydrocephalus, comprising a check device which obstructs a brain suction orifice carved at the Calvarium, during the impelling force and allows the flow of cephalorachidian liquid during suction, said device comprising a one-way check valve of the wafer type independently located in a cylindrical chamber located at a cavity formed in a dome base and protected by a rigid cup located on the dome base and housed on a bone trepanation, said cup having at its lower middle portion an orifice surrounded by three teeth projecting downward and being positioned at 120° from each other around said orifice said lower middle portion assembled with a chamber having the form of an empty cylindrical cartridge with a through orifice communicating with an upper chamber, the lower portion of said cylindrical chamber, which has an inner diaphragm, is in direct communication with the brain, said cylindrical chamber carrying the check valve at the cavity formed at the dome base, said lower chamber in direct communication with the brain having a seat for supporting the check valve.

4,787,888

DISPOSABLE PIEZOELECTRIC POLYMER BANDAGE FOR PERCUTANEOUS DELIVERY OF DRUGS AND METHOD FOR SUCH PERCUTANEOUS DELIVERY (A)

Martin D. Fox, Storrs, Conn., assignor to University of Connecticut, Storrs, Conn.

Filed Jun. 1, 1987, Ser. No. 56,471
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—20 **24 Claims**



1. A bandage assembly for percutaneous administration of a medicament comprising:

a. a bandage member having inner and outer surfaces and a cavity functionally opening on said inner surface thereof, said bandage member including a body element extending across said cavity adjacent said outer surface of said bandage member and fabricated from a piezoelectric polymer to generate vibrations perpendicularly to said inner surface, said bandage member having said inner surface adapted to be placed against the skin;

b. a medicament composition in said cavity;

c. electrical leads on said body element to supply energy thereto; and

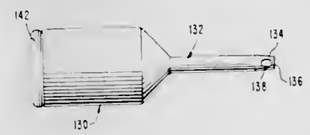
d. sonic generator means connected to said leads to generate sonic vibrations in said body element to induce percutaneous transfer of the medicament composition, said vibrations being within a frequency range of about 20 Hz to 2 kHz.

4,787,889

RIGID, TRANSPARENT FLUID CONDUIT FOR SURGICAL IRRIGATION

Dennis L. Steppe, Tustin, and Stephen W. Haines, Santa Ana, both of Calif., assignors to CooperVision, Inc., Menlo Park, Calif.

Continuation of Ser. No. 780,813, Sep. 27, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 119,268
Int. Cl.[4] A61B *17/20*
U.S. Cl. 604—22 **27 Claims**



11. An ophthalmological surgical instrument providing irrigating and aspirating functions comprising:

(A) an elongated handpiece;

(B) an irrigation fluid supply conduit positioned in said handpiece;

(C) an elongated tool connected to said handpiece; and

(D) an irrigation fluid conduit comprising:

a hollow body portion including body walls surrounding an axis, a first end open for fluid transmissive communication with said irrigation fluid supply conduit, a second end having an axial opening therein, and an engaging means for engaging said handpiece,

a tubular sleeve portion in fluid transmissive communication with said axial opening in said second end and

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having a thin sleeve wall whose thickness is not greater than 0.006 inches,

said hollow body portion and said tubular sleeve portion being homogeneously molded from a polyolefin synthetic resin which is transparent when immersed in the aqueous humor of the eye, so that said tool, when in the eye, and the adjacent tissues can be visualized by the surgeon through said sleeve portion, and which resin is easy flowing to fully fill said thin sleeve wall, and which has a diametric rigidity great enough to prevent collapse of said sleeve portion when inserted into an ocular incision, and

an elastomeric sealing ring overmolding said first end opening of said body section.

4,787,890

FEEDING SYSTEM FOR ENTERAL FEEDING

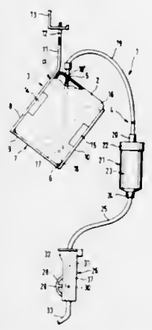
Rüdiger Ufermann, Moers, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg von der Hohe, Fed. Rep. of Germany

Filed Jan. 9, 1987, Ser. No. 1,723

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 8600458; Apr. 3, 1986, 3611112

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—128 **24 Claims**



1. A feeding system for enteral feeding comprising:

a container for receiving the food, the container having an opening which is provided with a pierceable or rupturable closure;

a suspension means for the container; and

a tubing system having a first end and a second end, said first end being disposed in the container and said second end for coupling to a person to be fed, said suspension means suspending the container with said opening (5) directed upwardly and inclined at an angle to the horizontal; and

wherein said first end comprises a piercing tube (17) with an end opening (18), said piercing tube (17) protruding through said container opening (5), said end opening being disposed at the lowermost point (6) of the container (2) upon suspension by said suspension means.

4,787,891

SYRINGE HOLDER AND APPLICATOR

Paul D. Levin, 1595 Soquel Dr., Santa Cruz, Calif. 95065, and John D. Harding, Santa Cruz, Calif., assignors to Paul Levin, Santa Cruz, Calif.

Filed Jul. 13, 1987, Ser. No. 72,773

Int. Cl.[4] A61M *5/20*

U.S. Cl. 604—136 **12 Claims**

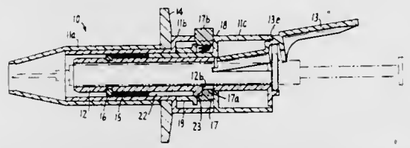
1. A syringe holder and applicator comprising:

a tubular housing;

slider means for mounting a syringe within said housing for reciprocal movement,

a finger engageable latch pivotally mounted to said slider means, said latch having a first flange for capturing a syringe in one position and allowing removal of the syringe in a second position,

spring means for resiliently moving said slider means and latch toward one end of said housing,



detent means for retaining said slider means and latch in an axial position of retraction against the resilient force of said spring means, and

a finger engageable contact for moving said detent means to allow said spring means to move said slider means and latch, together with a syringe mounted thereto, within said tubular housing.

4,787,892

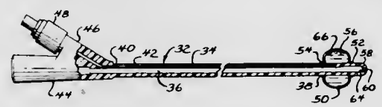
NEPHROSTOMY CATHETER WITH FORMED TIP

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 920,324, Oct. 17, 1986, abandoned, which is a division of Ser. No. 683,056, Dec. 18, 1984, Pat. No. 4,645,490. This application Jan. 4, 1988, Ser. No. 140,355

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—170 **3 Claims**



1. A nephrostomy catheter assembly, comprising:

an elongated shaft having a drainage lumen extending through the shaft, a distal end and an inflatable sleeve adjacent the distal end and attached to the shaft, and means for inflating the sleeve;

a formed tip bonded to a distal end of the shaft and having a distal opening communicating with the lumen to receive a guide wire, said tip defining an inner flat shoulder;

a hollow elongated stylet removably received in the drainage lumen of the catheter with a distal end defining a distal edge of the stylet engaging against the tip shoulder without passing through the opening; and

an elongated guide wire received in and in direct contact with the stylet and passing through the tip opening.

4,787,893

INSTRUMENT FOR INJECTING BIOCOMPATIBLE PRODUCTS THROUGH BONE TISSUE

Alain Villette, Les Vannes, FR-79700 St Pierre des Echaubrognes, France

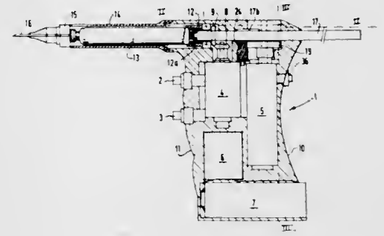
Filed Jun. 25, 1986, Ser. No. 878,134

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—188 **12 Claims**

1. An instrument for injecting a biocompatible liquid or semi-liquid formulation through bone tissue, comprising an hollow body and means at its upper part to bear a carpule containing the formulation, a needle removably mounted at one end of the carpule, the other end being closed by a moving base wall wherein said hollow body includes an electronic circuit and two motors, the first motor rotating said carpule via a first gear train, the second motor driving a piston

having a front portion bearing against said moving wall of the carpule, said piston being driven via a second gear train, said motors being controlled by switches connected to said elec-



tronic circuit, the rear portion of the carpule being in a friction fit with a sleeve fixed to a gear wheel, said rear portion passing through the sleeve.

4,787,894

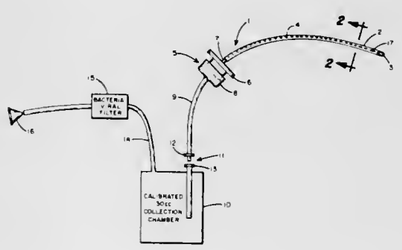
MECONIUM ASPIRATION DEVICE

Christopher J. Turnbull, 1134 Summit Ave., St. Paul, Minn. 55105

Filed Oct. 26, 1987, Ser. No. 112,550

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—319 **4 Claims**



1. A meconium aspiration device comprised of:

(a) an endotracheal tube having an elongated, flexible, plastic, generally annular wall surrounding a central lumen of a generally uniform diameter and extending the entire length thereof from a proximal end to a distal end through which meconium tainted fluid materials can be aspirated and a stiffening wire totally embedded in said wall without encroachment into the central lumen, said stiffening wire extending substantially the length of said tube from a location a predetermined distance distal of said proximal end to a location just short of said distal end;

(b) a fluid collection chamber coupled to said endotracheal tube;

(c) disconnectable adapter means interposed between said endotracheal tube and said collection chamber for allowing rapid exchange of a vacuum source used during aspiration with a source of breathable gas for allowing ventilation through said endotracheal tube; and

(d) an evacuation tube also coupled in fluid communication with said collection chamber and having a bacterial/viral filter disposed within said evacuation tube.

4,787,895

ADHESIVELY HELD SPIRAL WOUND TAMPON AND METHOD OF ITS FORMATION

Bruce G. Stokes, Cherokee County, Ga.; Richard R. Tews, and Donald A. Sheldon, both of Outagamie County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 29, 1987, Ser. No. 55,680

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—358 **15 Claims**



9. A tampon comprising an absorbent wound to form a cylinder, an adhesive band between layers of said absorbent, said adhesive band being located adjacent the withdrawal end of said tampon and a withdrawal cord exiting said tampon at said withdrawal end wherein said adhesive is located between the layers of the wound absorbent and thereby concealed in the wound tampon absorbent, and said tampon will not expand substantially at said withdrawal end.

4,787,896

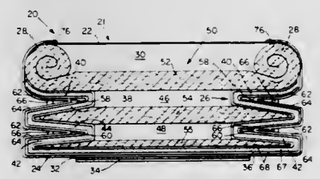
ABSORBENT ARTICLE HAVING LIQUID IMPERVIOUS SHELVES

Dawn I. Houghton, Fairfield, and Nicholas A. Ahr, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 794,905, Nov. 4, 1985, abandoned. This application Aug. 18, 1987, Ser. No. 88,022

Int. Cl.[4] A61F *13/16, 13/18, 13/20*

U.S. Cl. 604—385.1 **16 Claims**



1. An absorbent article comprising:

a liquid pervious topsheet;

a liquid impervious backsheet joined with said topsheet;

a layered absorbent core positioned between said topsheet and said backsheet, said absorbent core comprising a mixture of fiber material and hydrogel particles and having

(i) a base layer positioned adjacent to said backsheet and

(ii) two coplanar side margin layers disposed between said base layer and said topsheet, said side margin layers comprising said mixture of fiber material and hydrogel particles, one of said side margin layers being positioned in each longitudinal side of the absorbent article and in a longitudinally spaced relation to each other to define a central channel between said side margin layers, said side margin layers being spaced so that said central

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channel has a transverse width of at least about one-half of the total transverse width of the absorbent article.

wherein said topsheet covers said central channel; and

at least two liquid impervious shelves disposed one in each longitudinal side of the absorbent article in a longitudinally spaced relation to each other between said base layer and said side margin layers so as to result in a more efficient use of said hydrogel particles in said absorbent core; the maximum transverse width of each of said shelves being about one-fourth of the total transverse width of the absorbent article so that said shelves do not present a mechanical barrier to the flow of liquid within the absorbent article.

4,787,897

STRETCHABLE FASTENING TAPE FOR DISPOSABLE DIAPER

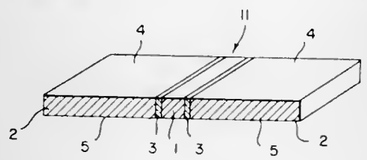
Yasuhiro Torimae; Heihachiro Kawaguchi, both of Wakayama, and Yoshinori Takahashi, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 29, 1987, Ser. No. 55,360

Claims priority, application Japan, Jun. 3, 1986, 61-128710

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—389 **12 Claims**



1. A stretchable, fastening tape comprising a middle portion made of an elastic material and two end portions made of a non-elastic material and integrally bonded through respective boundary regions to said middle portion, said end and middle portions having substantially the same structural dimensions and wherein said elastic material is a composition comprising (a) and (b), or (a), (b) and (c) as defined below, and said non-elastic material is (d) as defined below:

(a) 100 parts by weight of a hydrogenated block copolymer represented by a general formula, $A-(B-A)_n$, wherein A is a block polymer of a monovinyl-substituted aromatic hydrocarbon, B is an elastomeric block polymer of a conjugated diene, the weight ratio of A to B being 20/80 to 40/60, and n is an integer of 1 to 4;

(b) 10 to 80 parts by weight of a resin having a melting or softening point of 80° C. or higher and an average molecular weight of 400 to 2,000;

(c) 0 to 50 parts by weight of a thermoplastic olefin resin; and

(d) a resin selected from the group consisting of polyethylene, polypropylene, poly(ethylene-propylene), poly(ethylene-vinyl acetate), and poly(styrene-butadiene), used along or as a composite resin thereof.

4,787,898

VENTED NEEDLE WITH SIDEPORT

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed May 12, 1987, Ser. No. 48,824

Int. Cl.⁴ A61M *5/00*

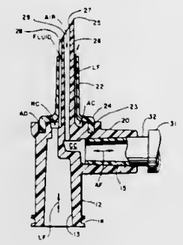
U.S. Cl. 604—411 **11 Claims**

1. A vented drug reconstitution device comprising:

a main body having two ports at substantially right angles to each other therein;

said body having a needle with a central aperture for air flow therethrough substantially in line with one port for liquid, but not contiguous therewith;

the other port in said body being transverse to the needle and one port, and contiguous with the central aperture of the needle for air flow therethrough; and



tubular means affixed to the body substantially concentric with said needle for effecting liquid flow therealong from said one port.

4,787,899

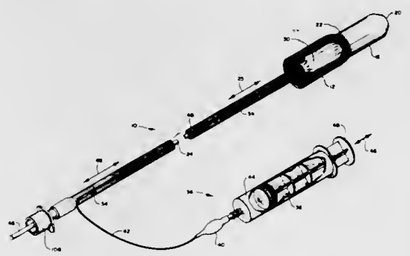
INTRALUMINAL GRAFT DEVICE, SYSTEM AND METHOD

Harrison M. Lazarus, 324 Tenth Ave.-260, Salt Lake City, Utah 84103

Continuation of Ser. No. 559,935, Dec. 9, 1983, abandoned. This application Dec. 10, 1986, Ser. No. 940,907

Int. Cl.⁴ A61F *2/06;* **A61B** *17/04*

U.S. Cl. 623—1 **7 Claims**



1. A system for intraluminally engrafting in a fluid conducting corporeal lumen comprising:

a hollow graft of preselected cross-section and length and having a proximal end for placement upstream within said lumen, said graft being deformable to substantially conform to the interior surface of said lumen;

a plurality of staples adapted proximate the proximal end of said graft and extending therethrough for stapling said graft to and within said lumen;

placement means for emplacing said graft into said lumen, for positioning it at a preselected position within said lumen, and for causing at least one of said staples to engage said lumen, said placement means including:

guide means having a front and back and sized for positioning in said lumen, said guide means having road means adapted to the back thereof sized in length to extend exterior said lumen for manipulation by the user, said guide means back having a cavity formed therein with said rod being centrally positioned within said cavity wherein said proximal end of said graft is retained within said cavity for purposes of positioning said graft in said lumen; and

operation means for removing said graft from said guide means and for positioning said staples into said lumen; said operation means including a hollow tube for slideable positioning over said rod and sized in length to extend

from said cavity to exterior said lumen, said tube having an inflatable membrane proximate the cavity end of said tube, and a channel in communication with said inflatable membrane and extending along the length of said tube, and inflation means connectable to said channel exterior said lumen for inflating and deflating said inflatable membrane.

4,787,900

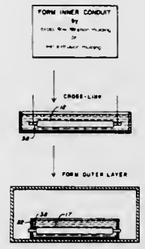
PROCESS FOR FORMING MULTILAYER BIOREPLACEABLE BLOOD VESSEL PROSTHESIS

Ioannis V. Yannas, Newton Center, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 369,614, Apr. 19, 1982, abandoned. This application Jan. 12, 1987, Ser. No. 3,178

Int. Cl.⁴ A61F *2/06;* **B28B** *1/26;* **B01D** *13/04*

U.S. Cl. 623—1 **14 Claims**



1. A process for forming a blood vessel prosthesis comprising:

A. forming a generally tubular non-porous inner layer of a covalently cross-linked reaction product of collagen and an amino polyssccharide wherein the inner layer is at least 0.1 to 5 mm thick and has a relatively smooth inner surface with a number average molecular weight between cross-links of between 5,000 and 10,000 and an average pore diameter of less than 10 microns; and

B. thereafter forming an outer layer of a collagen-aminopolysaccharide polymer wherein the outer layer has a thickness of at least 1.0 mm and is crosslinked to produce a porous bioreplaceable outer surface with a number average molecular weight between cross-links of between 10,000 and 20,000 and mean pore diameter of 50 microns or greater.

4,787,901

TWO-WAY ACTING VALVE AND CARDIAC VALVE PROSTHESIS

Doguhan Baykut, Senator-Balcke-Str. 56, D-2800 Bremen 61, Fed. Rep. of Germany

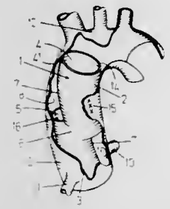
Continuation-in-part of Ser. No. 754,241, Jul. 11, 1985, abandoned. This application Dec. 23, 1986, Ser. No. 946,385

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1984, 3426300

Int. Cl.⁴ A61F *2/24*

U.S. Cl. 623—2 **21 Claims**

1. A heart valve prosthesis adapted to be implanted into the ascending aorta, the valve prosthesis comprising a pair of ducts which define an orifice through the aorta and which are separated from each other at least along a portion of their length by a common wall, the common wall being deformable under the pressure of blood in the ascending aorta to selectively open a



first one of the ducts and at least partially close the second one of the ducts.

4,787,902

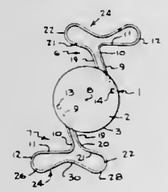
MULTI-POSITIONABLE INTRAOCULAR LENS

John H. Sheets, 104 Chukar Run, Odessa, Tex. 79763; Roger E. Lagerquist, 6826 Pasado Rd., and Bruce A. Christie, 40 San Rossano Dr., both of, Goleta, Calif. 93117

Filed Apr. 1, 1982, Ser. No. 364,280

Int. Cl.⁴ A61F *2/16*

U.S. Cl. 623—6 **7 Claims**



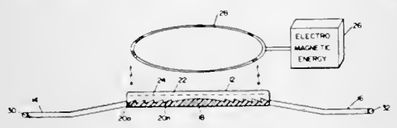
1. An intraocular lens assembly dimensioned and shaped for positioning in either the anterior chamber or posterior chamber of the eye comprising a lens body; first and second support members extending form the lens body for engaging adjacent portions of the anterior or posterior chamber of the eye, at least one of said support members comprising a resilient spring-like asymmetric support loop extending outwardly from the periphery of said lens body, said support loop having first and second end portions attached to the lens body at first and second attachment locations, first and second sloped leg portions respectively extending outwardly from said first and second end portions and a transverse portion extending generally transversely relative to said first and second leg portions and with opposite sides being respectively unitarily connected to outer ends of said first and second leg portions and having at least one outer contact portion dimensioned and shaped to engage adjacent portions of the anterior or posterior chambers of the eye with an outward radial force when positioned therein so that said outer contact portion is deflected inwardly form the normal relaxed position by the adjacent portion of the eye to provide support for said lens body, said transverse portion lying in a plane which is spaced apart from but substantially parallel to the plane of said lens body,

wherein said first and second end portions are axially parallel at their inner extent and are received in chordal bores provided in the lens body, and

wherein said chordal bores are both on one side of a diameter of the lens body with respect to which said bores are parallel.

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4,787,903
INTRAOCULAR LENS
Dennis T. Grendahl, Excelsior Bay Gables, Excelsior, Minn. 55331
Filed Jul. 24, 1985, Ser. No. 758,331
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 7 Claims



1. An intraocular lens comprising:
a. a lens optic including an anterior surface and a plano posterior surface, said anterior surface including a Fresnel lens portion;
b. said lens incluсding a composite overlay material over the front surface of said Fresnel lens portion wherein said composite overlay material includes a material having an alternate bulk optical index of refraction; and
c. a plurality of haptic loops which support the lens in the eye, extending outwardly from said lens optic, said loops including conducive portions connected to said alterable material for coupling electrical power applied from a source external to the eye.

4,787,904
HYDROPHILLIC INTRAOCULAR LENS
Sanford L. Severin, 1313 Solano Ave., Albany, Calif. 94706, and Carl S. Johnson, 61 Sugarloaf La., Alamo, Calif. 94570
Filed Jul. 6, 1984, Ser. No. 628,431
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 41 Claims

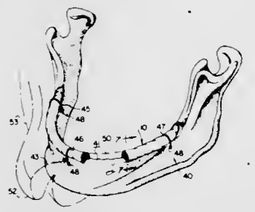


1. An intraocular lens assembly for implantation in the human eye so that the optical Z axis of said lens assembly is coincident with optical axis of the eye when implanted comprising:
(a) an optically transparent lens body formed from a hydrophilic synthetic resin material and having a transverse dimension defining an outer periphery disposed about said optical Z axis, said outer periphery lying in a vertical plane perpendicular to said optical Z axis, said lens having X and Y axes lying in said vertical plane and mutually perpendicular to each other;
(b) a pair of resilient support members attached to said lens body at diametrically opposed attachment locations adjacent corresponding opposed intersections of said X-axis with said periphery of said lens body, said resilient support members projecting radially outwardly and extending circumferentially about said lens body in the direction of said Y-axis to provide resilient lens-body support portions which are diametrically opposed and which are spaced from the periphery of said lens body a distance greater than one-half the transverse dimension of said lens body; and
(c) first and second contact portions formed on at least one of said resilient support portions extending radially outwardly from said optical Z axis a distance greater than the remainder of said support portion, said first contact portion lying on the opposite side of said Y-axis from said second contact portion.

4,787,905
GEL FOR BREAST PROSTHESIS
Chay H. Loi, Monterey Park, Calif., assignor to Nearly Me, Los Angeles, Calif.
Filed Jul. 24, 1987, Ser. No. 77,368
Int. Cl.[4] A61F 2/52
U.S. Cl. 623—7 2 Claims

2. A gel suitable for use in breast prostheses consisting essentially of, by weight percent, 9.9% hydroxyl terminated polybutadiene resin, 89.1% 1,2-benzenedicarboxylic acid diundecyl ester, 0.9% polymethylene polyphenyl isocyanate, and 0.1% dibutyltin dilaurate catalyst wherein the components are thoroughly mixed, allowed to stand for about 16 hours and cured for at least two hours at a temperature of 93° C. (200° F.) thereby resulting in a gel having, after 24 hours, a recording of about 180 on the precision penetrometer.

4,787,906
CONTROLLED TISSUE GROWTH AND GRAFT CONTAINMENT
Andras G. Haris, No. 2 Weirwood Rd., Radnor, Pa. 19087
Filed Mar. 2, 1987, Ser. No. 20,986
Int. Cl.[4] A61F 2/28
U.S. Cl. 623—16 6 Claims

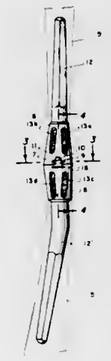


1. The technique of implanting a flexible tissue matrix in an alveolar ridge in the edentulous state, comprising slitting the skin area over the said ridge, transversely of the ridge, inserting through said slit and along said ridge a tunneling tool comprising a rigid outer sheath and a telescoping inner rod, attaching to the inner rod at its end remote from the said slit a flexible device comprising an outer tube of porous, inert material containing particles of inert porous matrix material, attaching one end of said device to the end of the telescoping rod, withdrawing the rod through the outer sheath to a position over the alveolar ridge, and withdrawing the tunneling sheath through the slit, while maintaining the flexible device in place along the alveolar ridge.

4,787,907
MORSE TAPER
Roger G. Carignan, Camarillo, Calif., assignor to Techmedica, Inc., Camarillo, Calif.
Filed Feb. 3, 1987, Ser. No. 10,473
Int. Cl.[4] A61F 2/30
U.S. Cl. 623—18 4 Claims

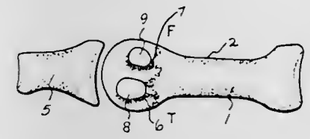
1. An improved orthopedic taper joint for holding two bones together comprising two segments, one segment having a cylindrical male taper narrower at its connecting end and the other segment having a mating female taper wider at its connecting end, each segment having a face around the taper such that said faces are opposing when said segments are assembled, wherein a recess is located on the periphery of one of said faces such that a rotatable key can be inserted and rotated to force

said segments longitudinally apart to disconnect the two bones held together, and wherein an interfitting lug is positioned on the face opposite the face defining said recess, said lug being substantially the width of said recess, but shorter than the depth of said recess, causing the formation of a slot between the end of the lug and the bottom of said recess when assembled, and wherein said rotatable key has a cam mounted on one end of a handle, wherein said cam is sized to fit within said slot and is rotatable therein, and wherein said segments have retaining wire mesh sections along the sides of said segments to allow tissue and bone to grow into said wire mesh sections and securely affix said structure to the bones to be joined.



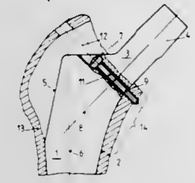
4,787,908
METATARSAL-PHALANGEAL REPLACEMENT JOINT
Urs Wyss, Inverary; Gerald A. B. Saunders, Sydenham; David Siu; Theodore D. Cooke, both of Kingston, all of Canada; Yuki Yoshioka, Kobe, Japan, and J. Timothy Bryant, Kingston, Canada, assignors to Queen's University at Kingston, Kingston, Canada
Filed Apr. 30, 1987, Ser. No. 44,194
Int. Cl.[4] A61F 2/42
U.S. Cl. 623—21 14 Claims

1. An endoprosthetic device for replacement, in a living body, of a first metatarsal phalangeal joint, comprising a metatarsal component having:
(i) a distal head having a substantially concave proximal surface with a smooth distal surface having a superior part-spherical convex phalangeal surface and two inferior, side-by-side concave sesamoidal surfaces, which are separated by an intersesamoidal ridge, blending smoothly with each other,
and including a phalangeal component having:
(i) an axially extending distal stem for intramedullar implantation into a proximal phalanx; and



(ii) a proximal head, integrally formed with said distal stem, having a smooth proximal circular surface at least a major portion of which has a part spherical concave surface having a similar radius of curvature as said superior part-spherical convex phalangeal surface.

4,787,909
SHANK FOR A FEMUR HEAD PROSTHESIS
Otto Frey, Winterthur, and Rudolf Koch, Berlingen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Sep. 3, 1986, Ser. No. 903,554
Claims priority, application Switzerland, Oct. 3, 1985, 4278/85-6
Int. Cl.[4] A61F 2/32
U.S. Cl. 623—23 7 Claims



1. In combination
a collarless shank for a femur head prosthesis having a proximal region; a medial arc in said proximal region for positioning against a calcar arc of a femur; a prosthesis neck extending from said medial arc; and an unthreaded bore in said proximal region disposed at least nearly perpendicularly of said medial arc and perpendicular to said neck; and
a screw passing through said bore in unthreaded relation for threading into the calcar arc to secure said proximal region to and against said calcar arc.

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4,787,910

CONDENSATION PRODUCTS AND PROCESSES FOR THE AFTER-TREATMENT OF DYED POLYAMIDES

Udo Hendricks, Odenthal, and Ergun Tamer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 20, 1987, Ser. No. 18,105

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3607963

Int. Cl.[4] D06M *15/00*

U.S. Cl. 8—115.61 **6 Claims**

1. Process for the after-treatment of fiber materials dyed with anionic dyestuffs and containing polyamide groups, wherein the dyed fiber materials are treated with an aqueous solution of a condensation product of an alkylenediamine of the formula

$$H_2N—C_nH_{2n}—NH_2$$

in which

n represents 4–10, with an epihalogenohydrin or 1,3-dihalogeno-2-hydroxypropane.

4,787,911

SURFACE-ACTIVE OLIGOMERS, A PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 557,212, Dec. 2, 1983, Pat. No. 4,656,030, which is a division of Ser. No. 285,422, Jul. 20, 1981, Pat. No. 4,430,250. This application Dec. 17, 1986, Ser. No. 942,718

Claims priority, application Luxembourg, Jul. 21, 1980, 82646

Int. Cl.[4] A61K *7/13*

U.S. Cl. 8—405 **6 Claims**

1. A hair dye composition comprising in an aqueous, alcoholic or aqueous alcoholic medium an effective amount of a hair dye to dye said hair and surface-active random oligomer having the formula

$$R_1—O—C_2H_3(Z)—O]_{\overline{n}}H$$

wherein

R_1 represents a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical, a cycloaliphatic radical, an aromatic radical or an alkyl aromatic radical, containing up to 30 carbon atoms,

Z represents (i) a group having the formula, $R_2O—C_2H_3(A)—O]_{\overline{m}}CH_2—$, or (ii) a mixture of (i) and A, wherein

A represents a non-ionic, cationic, anionic, or zwitterionic group,

R_2 represents a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical, a cycloaliphatic radical, an aromatic radical or an alkyl aromatic radical, containing 8 to 30 carbon atoms,

$\overline{n}$ represents an average statistical value ranging from 1 to 20, and

$\overline{m}$ represents an average statistical value ranging from 0.5 to 10.

4,787,912

DYEING ASSISTANT AND USE THEREOF FOR DYEING OR WHITENING SYNTHETIC NITROGEN-CONTAINING FIBRE MATERIALS

Heinz Abel, Reinach, and Helmut Raisin, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 28, 1987, Ser. No. 8,022

Claims priority, application Switzerland, Jan. 31, 1986, 364/86

Int. Cl.[4] D06L *3/12;* **D06P** *1/62, 3/24;* **D06M** *3/38*

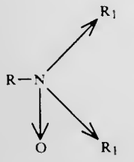
U.S. Cl. 8—582 **10 Claims**

1. A dyeing assistant for dyeing or whitening synthetic nitrogen-containing fibre materials, which assistant comprises

(A) 10 to 30% by weight of a bisalkyl sulfosuccinate or sulfosuccinamide,

(B) 25 to 50% by weight of an anionic surfactant,

(C) 5 to 20% by weight of an amine oxide of the formula



wherein R is C_8-C_{22}alkyl and R_1 is C_1-C_4alkyl,

(D) 5 to 20% by weight of a water-soluble organic polar solvent selected from the group consisting of an aliphatic C_1-C_6-alcohol, an alkylene glycol, a monoalkyl ether of a glycol, a ketone, an ether, an acetal, pyridine, acetonitrile, γ-butyrolactone, N,N-dimethylformamide, N,N-dimethylacetamide, tetramethylurea and tetramethylene sulfone, and

0 to 55% by weight of water.

4,787,913

COAL BRIQUETTING PROCESS

Joseph Goleczka, Cheltenham; Walter Harris; Stephen Sawyer, both of Tewkesbury, and Simon Kelly, Cheltenham, all of England, assignors to Coal Industry (Patents) Limited, United Kingdom

Filed Mar. 7, 1988, Ser. No. 164,913

Claims priority, application United Kingdom, Mar. 26, 1987, 8707223

Int. Cl.[4] C10L *5/12, 5/14*

U.S. Cl. 44—16 R **7 Claims**

7. A coal briquette comprising a mixture of fine coal and a binder comprising up to 2%, by weight of the mixture, of polyvinyl alcohol solids and up to 4% by weight of a hardening agent for the polyvinyl alcohol, selected from iron oxide, phosphate rock and bauxite or a combination of two or more thereof.

4,787,914

BRIQUET FOR GAS AND ELECTRIC GRILLS

Robert J. Crace, Brentwood, Tenn., assignor to Crace Associates, Inc., Ocala, Fla.

Continuation-in-part of Ser. No. 20,760, Mar. 2, 1987, abandoned. This application Jun. 1, 1987, Ser. No. 56,589

Int. Cl.[4] C10L *5/12, 5/40*

U.S. Cl. 44—16 A **34 Claims**

23. A partially combustible briquet having good flavor producing characteristics and which does not shed ash as it burns, consisting essentially of about 40 percent to 80 percent by weight of clay, from about 20 percent to 60 percent by weight of at least one combustible flavor producing material, from about 10 percent to 20 percent by weight of a hydraulic cement, and from about 1 to 15 percent by weight of a starch binder.

VOL 1096 ISS 5 NO 29 1988 UMI

4,787,915

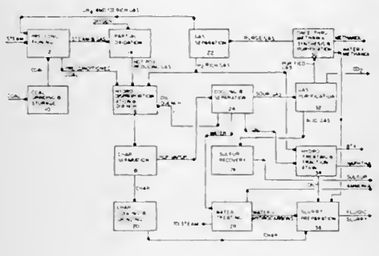
METHOD OF VARYING RHEOLOGY CHARACTERISTICS OF NOVEL COAL DERIVED FUEL SYSTEM

Edmond G. Meyer, Laramie, Wyo.; Lee G. Meyer, and Gerald F. Cavaliere, both of Englewood, Colo., assignors to Carbon Fuels Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 59,288, Jun. 8, 1987, which is a continuation-in-part of Ser. No. 722,689, Apr. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 658,880, Oct. 9, 1984, Pat. No. 4,658,936, and Ser. No. 658,878, Oct. 9, 1984, Pat. No. 4,671,800, said Ser. No. 658,880, and Ser. No. 658,878, is a continuation-in-part of Ser. No. 427,937, Sep. 29, 1982, Pat. No. 4,475,924, which is a continuation-in-part of Ser. No. 247,382, Mar. 24, 1981, abandoned. This application Aug. 11, 1987, Ser. No. 84,270

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 27 Claims



1. A method of varying the rheology of a substantially completely combustible, non-polluting fluidic fuel system derived from coal comprising a portion of a particulate coal char dispersed in an amount of a liquid organic material effective to produce a transportable, liquid/solid mixture, wherein said liquid organic material is at least partially derived from the hydropyrolysis of coal, comprising the step of varying the viscosity of said liquid organic material by admixing with said admixture an amount of a fluidic aqueous mixture effective to enhance the rheological characteristics of the resultant liquid/-solid mixture.

4,787,916

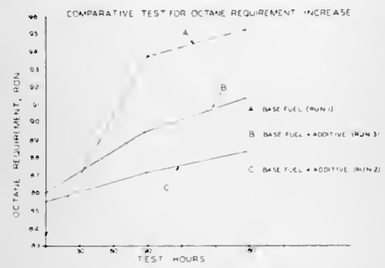
METHOD AND FUEL COMPOSITION FOR REDUCING OCTANE REQUIREMENT INCREASE

Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 31, 1986, Ser. No. 925,168

Int. Cl.[4] C10L *1/22*

U.S. Cl. 44—92 13 Claims



1. A method of controlling the octane requirement increase of spark ignition internal combustion engines which comprises operating said engines on a fuel containing a major portion of a liquid hydrocarbon base fuel boiling in the boiling range of gasoline and from about 0.001 to about 0.075 weight percent of a quaternary ammonium hydroxide selected from tetrabutylammonium hydroxide, tricaprylicmethyl ammonium hydroxide, and mixtures thereof.

4,787,917

METHOD FOR PRODUCING TORREFIED WOOD, PRODUCT OBTAINED THEREBY, AND APPLICATION TO THE PRODUCTION OF ENERGY

Jacques Leclerc de Bussy, 80290 Poix de Picardie, Bussy, France

PCT No. PCT/FR86/00177, § 371 Date Jan. 9, 1987, § 102(e) Date Jan. 9, 1987, PCT Pub. No. WO86/06930, PCT Pub. Date Dec. 4, 1986

PCT Filed May 26, 1986, Ser. No. 10,975

Claims priority, application France, May 24, 1985, 85 07839; Oct. 7, 1985, 85 14792; Jan. 10, 1986, 86 00307; Feb. 13, 1986, 86 01969

Int. Cl.[4] C10L *5/00, 5/44*

U.S. Cl. 44—606 18 Claims

15. Torrefied, unbarked wood products which are generally cylindrical in shape and which have diameters between 5 and 20 mm and uniform lengths of about 10 and 25 mm, said torrefied, unbarked wood products being made by the steps of

(a) cutting substantially straight, unbarked woody suckers having diameters of 5 to 20 mm from plants,

(b) sectioning said substantially straight, unbarked woody suckers so as to produce unbarked green sticks of a uniform length, said uniform length being between about 10 and 25 mm,

(c) placing said unbarked green sticks provided in step (b) in a reactor so as to form a bed therein,

(d) passing a hot, non-oxidizing gas having a temperature greater than 280° C. through said bed so as to first dry and then torrify the unbarked green sticks therein, thus providing torrefied wood products, the velocity of said hot, non-oxidizing gas being sufficiently low to avoid conveying of torrefied wood products away from said bed yet sufficiently high to raise the temperature of the unbarked green sticks from 100° C. to a torrification temperature of 250° to 280° C. in no more than 10 minutes, and

(e) cooling said torrefied wood products.

4,787,918

PROCESS FOR PRODUCING DEEP CLEANED COAL

Ken K. Ho, Worthington, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 31, 1986, Ser. No. 925,182

Int. Cl.[4] C10L *5/00*

U.S. Cl. 44—624 3 Claims

1. A physio-chemical process for producing deep cleaned coal, comprising the steps of:

providing a supply of air-dried coal of particle size fractions of no greater than ¼ inch×0 mesh;

immersing the coal in an organic solvent selected from the group consisting of butylamine, propylamine, and ethylene diamine, to form a mixture, having coal in an amount to provide no greater than 40 weight percent solids content, for a time period sufficient to swell the coal and to induce natural fracturing of the coal;

processing the mixture to recover the organic solvent;

subjecting the swelled coal to grinding to a particle size range of minus 28 mesh or finer;

subjecting the swelled coal to leaching with a 10 to 20% aqueous hydrogen peroxide solution containing 1 to 2% sulfuric acid at ambient conditions to remove residual pyrite from the coal; and

subjecting the swelled coal to leaching with an aqueous solution containing 3 to 6% ammonium hydrogen fluoride and 2 to 3% of nitric acid or hydrochloric acid to remove residual ash from the coal.

4,787,919

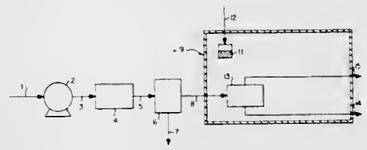
MEMBRANE SEPARATION SYSTEM AND PROCESS

Michael J. Campbell, Clarence Center; James Smolarek, Boston, and Timothy S. Van Lente, Buffalo, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 23, 1987, Ser. No. 65,472

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 18 Claims



1. An improved air separation process comprising:

(a) compressing a feed air stream containing condensible water vapor to a desired feed air pressure;

(b) cooling said compressed feed air stream to below the design operating temperature level of the air separation process, thereby supersaturating the feed air so that the feed air stream comprises said feed air saturated with condensible water vapor together with free water droplets;

(c) removing said free liquid droplets from the feed air stream;

(d) passing the compressed, cooled feed air stream, free of water droplets, into an insulated enclosure adpated to control and/or minimize the lose of heat therefrom, without superheat of said feed air stream prior to its passage into said insulated enclosure and without predrying said feed air stream to a temperature dew point lower than said design operating temperature prior to said passage of the feed air stream into the insulated enclosure;

(e) supplying sufficient heat within said insulated enclosure so as to superheat the feed air stream therein to a temperature where the saturation temperature thereof at the feed air pressure, said insulated enclosure serving to control and/or minimize the loss of heat therefrom such that any loss of heat is not greater than that being supplied within said insulated enclosure, so that the feed air within said insulated enclousre is mintained under superheat conditions at a temperature below its dew point to avoid undesired condensation of water present in the feed air within a permeable membrane system positioned within said insulated enclosure to effect the desired air separation;

(f) passing the thus-superheated feed air stream to said permeable membrane system positioned within said insulated enclosure, said permeable membrane system containing at least one membrane module capable of selectively permeating oxygen together with condensible water vapor, as a more permeable component of the feed air stream from nitrogen as a less readily permeable component thereof, said membrane module or modules not being individually insulated for the retention of heat therein;

(g) withdrawing nitrogen from the membrane system and from said insulated enclosure as non-permeate gas at essentially said feed air pressure; and

(h) separately withdrawing oxygen and condensible water vapor from the membrane system and from said insulated enclosure as permeate gas at a lower pressure,

whereby condensation of water from the feed air stream within the membrane system is effectively precluded.

4,787,920

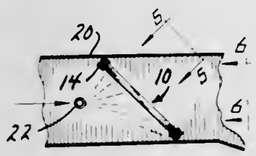
SCRUBBER FILTER

Donald E. Richard, Rte. 3, Box 205A, Rockport, Ind. 47635

Continuation-in-part of Ser. No. 4,113, Jan. 16, 1987, abandoned. This application Sep. 8, 1987, Ser. No. 96,248

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—90 20 Claims



1. In a method of scrubbing air with a flooded bed scrubber to remove dust particles generated by underground mining the improvement comprising conducting air containing dust through a flooded bed scrubber, spraying water into the air containing dust, conducting the air containing dust and water spray through a filter, the filter comprising a plurality of spaced apart brushes, the brushes being flexible bristles extending outwardly from axial cores, the brushes being placed with the cores thereof extending substantially parallel and extending substantially across the flow of air containing the dust and water spray, the axes of the brushes being inclined at an angle to the perpendicular of the air flow, the inclined filter brushes in this configuration presenting an apparent dense aspect to the air flow, the filter being effective, in this configuration, to scrub the dust and water spray without plugging and without excessive pressure drop in normal use and being effective to prevent stalling and excessive noise of the scrubber fan, but also being effective to maintain sufficient pressure drop to produce effective scrubbing of dust particles from the air stream and prevent substantial entrainment of dust particles in the scrubbed air stream, the filter being effective to be rapidly cleaned and returned to service with periodic maintenance in regular use.

4,787,921

DEGASSING TUBE

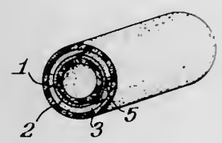
Yoshihiko Shibata; Satoshi Ichiyasu, and Kanako Omori, all of Okayama, Japan, assignors to Japan Gore-Tex, Inc., Japan

Filed Sep. 10, 1987, Ser. No. 95,329

Claims priority, application Japan, Sep. 10, 1986, 61-138026

Int. Cl.[4] B01D *19/00*

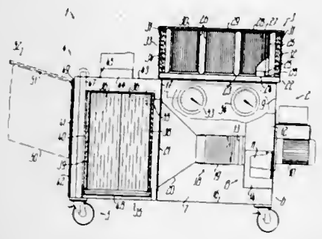
U.S. Cl. 55—159 2 Claims



1. A degassing tubular device comprising an inner tube of a porous polymeric resin positioned inside an outer tube of a porous polymeric resin, and a tube-form body formed from a porous polymeric film interposed between said inner and outer tubes, wherein said porous polymeric film has a mean pore size of 0.2 to 3.0 microns.

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4,787,922
FILTER APPARATUS
Günter Kulitz, Ulm/Donau, Fed. Rep. of Germany, assignor to ESTA Apparatebau GmbH & Co. KG, Fed. Rep. of Germany
Filed Jan. 7, 1987, Ser. No. 1,202
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—274 21 Claims

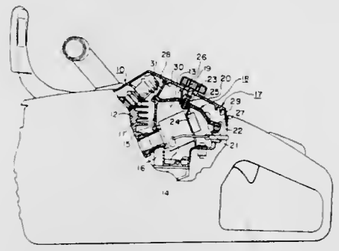


1. A filter apparatus for contaminated air containing contaminents such as dust particles and smoke, said apparatus comprising:
an apparatus housing (6) having upright sides and a top side, said apparatus housing (6) having a suction opening (44) for the contaminated air and an external air exhaust (33) for filtered air;
means in the housing defining a flow path connecting said suction opening (44) and said air exhaust (33), said flow path defining a flow direction;
a suction fan (8) having an inlet (13) and an outlet (14), said suction fan (8) being interposed in said flow path between a suction part and a pressure part of the flow path;
at least two filter units (39, 36, 38, 26, 34) interposed in said flow path between said suction opneing (44) and said air exhaust (33), at least one of said filter units having at least one flat filter (39, 38) covering at least a part of a cross-section of a flat filter housing (35) disposed in the flow path, wherein a cartridge filter (3) having a plurality of parallel-connected filter cartridges (26) is provided downstream along the flow direction from the flat filter (39, 38) and the outlet (14) of the suction fan in the pressure part of the flow path, said cartridge filter (3) having an inlet base (23) mounted on a top side of the housing.

4,787,923
APPARATUS FOR CLEANING AN AIR FILTER
Mark J. Fleigle, Maple Grove; Robert A. Geyer, Champlin, and Mark D. Kinter, Spring Park, all of Minn., assignors to Tennant Company, Minneapolis, Minn.
Continuation of Ser. No. 900,747, Aug. 27, 1986, abandoned. This application Oct. 20, 1987, Ser. No. 110,937
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—304 24 Claims

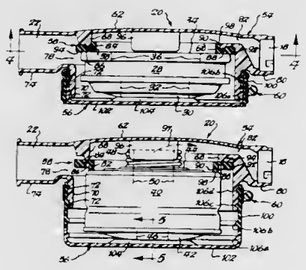
1. In an air filter assembly, a support housing, a filter frame in the support housing, a filter medium in the filter frame formed with pleats having height, width, and length, said filter medium being joined to and supported by said filter frame, a resilient mounting between the filter frame and the support housing so that the filter frame is resiliently isolated from the support housing at least in the direction of the width of the filter pleats, and vibrating means in continuous contact with said filter frame for vibrating said filter medium and filter frame to dislodge dirt and dust from the medium with the major effective component of the vibrations being across the width of the filter pleats.

4,787,924
AIR CLEANER
Akira Nagashima, Kawasaki, and Keisuke Isbii, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan
Filed Dec. 3, 1987, Ser. No. 129,317
Claims priority, application Japan, Dec. 9, 1986, 61-189689[U]
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—385.1 3 Claims



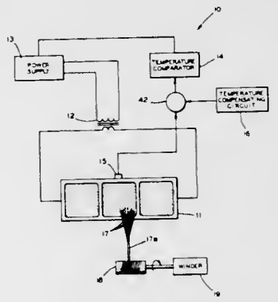
1. An air cleaner for cleaning air and supplying it to a carburetor of an internal combustion engine through an air inlet, the carburetor being disposed in a carburetor chamber, said air cleaner adapted to be disposed within a machine body, said air cleaner comprising:
a filter member rotatably supported on an upper edge surface of a peripheral wall around the carburetor chamber;
a cover member provided above said filter member so as to define a filteration room therebetween;
a first air-intake port to suck air from outside the machine body into the filtration room;
a second air-intake port to such air from an engine room into the filtration room; and
closure means for selectively closing either of the first and second air-intake ports, said closure means comprising an upwardly protruding partition wall integrally formed on one side of the filter member, wherein one of said first and second-air intake ports is selectively closed by said partition wall by turning the position of the filter member.

4,787,925
GAS FILTER CANISTER HOUSING ASSEMBLY
William K. Ansite, Glendale, Calif., assignor to Figgie International Inc., Richmond, Va.
Filed Apr. 15, 1983, Ser. No. 485,165
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—496 9 Claims



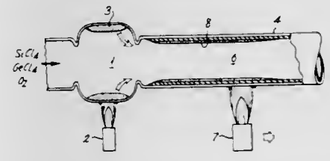
1. A gas filter housing assembly adapted to receive gas filter canisters; said housing assembly comprising:
a first housing portion having an end wall, an outlet adjacent said end wall, an annular sealing structure having a sealing surface spaced away from said end wall, a generally cylindrical side wall portion open to one side opposite said end wall whereby it may receive gas filter canisters of greater and lesser heights but approximately the same width, each of said gas filter canisters including a generally cylindrical side wall portion and spaced apart first and second end walls, there being an inlet in the first end wall and an outlet in the second end wall, said second end wall further being provided with a peripheral sealing surface of a configuration approximately the same as the sealing surface on the first housing portion, and the gas filter canister of greater height having a threaded portion disposable adjacent the outlet and adapted to be utilized to secure the filter canister in its assembled position, at least one annular groove being provided in the exterior surface of said cylindrical side wall portion, an inlet disposed between said sealing surface and said side wall portion, and threaded means attached to said end wall to which the threaded portion of a canister of greater height may be secured;
a second housing portion having a closed end wall of substantially the same diameter as the cylindrical side wall portion and peripheral cylindrically extending skirt means so constructed that it is capable of being folded back upon itself, said skirt means being provided with internal beads which may be selectively secured to said at least one annular groove to position the second housing portion in first and second positions of adjustment, at least the skirt means of said second housing portion being made of flexible material impervious to gas;
sealing means adapted to be disposed between a gas filter canister when disposed within the first and second housing portions to seal the inlet of the first housing portion from said outlet of the first housing portion except when air passes through said gas filter canister; and
holding means disposable about said skirt means and capable of holding said skirt means to said side wall portion in one of said positions of adjustment.

4,787,926
DIGITALLY CONTROLLED TUBE BUILD-UP COMPENSATOR FOR A GLASS FIBER FORMING MACHINE METHOD
Eugene C. Varrasso, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Sep. 14, 1987, Ser. No. 95,971
Int. Cl.[4] C03B *37/02*
U.S. Cl. 65—2 12 Claims



1. A method for forming a plurality of glass fibers having a substantially uniform diameter comprising:
(a) passing molten glass through a plurality of apertures formed in a bushing to form the plurality of glass fibers;
(b) generating a signal representative of the actual temperature of the bushing;
(c) generating a digitally controlled temperature compensating signal which changes as a function of time;
(d) generating a composite feedback signal indicating that the actual temperature of said bushing is decreasing over a period of time in response to the actual temperature signal and the temperature compensating signal; and
(e) increasing the temperature of said bushing over said period of time in response to the composite feedback signal.

4,787,927
FABRICATION OF OPTICAL FIBERS
Robert J. Mears; Laurence Reekie; Simon B. Poole, and David N. Payne, all of Hampshire, England, assignors to National Research Development Corporation, London, England
PCT No. PCT/GB86/00484, § 371 Date Apr. 9, 1987, § 102(e) Date Apr. 9, 1987, PCT Pub. No. WO87/01110, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 13, 1986, Ser. No. 64,943
Claims priority, application United Kingdom, Aug. 13, 1985, 8520300; Aug. 13, 1985, 8520301
Int. Cl.[4] C03B *37/023*
U.S. Cl. 65—3.12 8 Claims



1. A method of fabricating a preform for the manufacture of optical fibres incorporating a doped glass in which a dopant material is deposited in a dopant chamber and is subsequently vaporized from said chamber and deposited on the inner surface of a tubular glass member, comprising the sequential steps of:
heating the dopant chamber to fuse said dopant to the chamber wall,
subsequently heating said chamber to cause said dopant to vaporize at a predetermined rate,
passing a gaseous source material through said dopant chamber to mix said dopant material with said source material,
depositing from the mixture of said source material and said dopant material a mixture of solid components on said inner surface, and
fusing said solid components on said inner surface to form a doped glass for said preform.

4,787,928
HYDRATED FIBROUS MATS
Leslie L. Balassa, Shore Dr., Blooming Grove, N.Y. 10914
Division of Ser. No. 744,119, Jun. 12, 1985, Pat. No. 4,665,993. This application Apr. 24, 1987, Ser. No. 20,110
Int. Cl.[4] C05F *5/00*
U.S. Cl. 71—23 5 Claims

1. A method of applying an agricultural compound to a desired location comprising the steps of:
preparing a hydrated fibrous mass by the steps including introducing a source of cellulosic fibers to water with continuous mixing until a ratio of water to fibers of about 50 to 1 is obtained, and mixing the water and source of cellulosic fibers until the source of cellulosic fibers has been comminuted to substantially individual cellulose fibers, introducing a surfactant to said mass, and introducing to said mass an agricultural compound; selected from

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the group consisting of fertilizers, herbicides and pesticides and



applying said mass containing said agricultural compound to a desired location.

4,787,929

PHENOXYPROPIONYLOXYALKANE - PHOSPHONATES HAVING HERBICIDAL PROPERTIES

Theodor Pfister, Monheim; Heinz Förster, Wuppertal; Ludwig Eue, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach, and Hans-Joachim Santel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

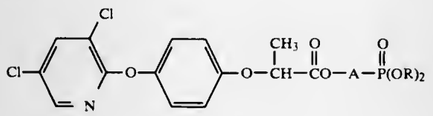
Division of Ser. No. 694,548, Jan. 24, 1985, Pat. No. 4,670,040. This application Jan. 7, 1987, Ser. No. 1,117

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1984, 3402982

Int. Cl.[4] C07F *9/58;* **A01N** *43/40*

U.S. Cl. 71—86 **10 Claims**

1. A phenoxypropionyloxyalkanephosphonate of the formula



in which

R is optionally substituted alkyl with 1 to 6 carbon atoms the substituents being selected from halogen,

A is substituted alkanediyl with 1 to 6 carbon atoms the substituents being selected from the group consisting of pyridyl and substituted pyridyl, the pyridyl substituents being selected from the group consisting of fluorine, chlorine, bromine, nitro, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms, halogenoalkoxy with 1 to 4 carbon atoms, phenoxy and methylenedioxy.

8. A method of combating weeds, which comprises applying to the weeds, or to their habitat, a herbicidally effective amount of a phenoxypropionyloxyalkanephosphonate as claimed in claim **1**.

4,787,930

5-AMINO-1-PHENYL-PYRAZOLE HERBICIDES AND PLANT GROWTH REGULATORS

Reinhold Gehring, Wuppertal; Otto Schallner, Monheim; Jörg Stetter, Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, and Klaus Lürssen, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

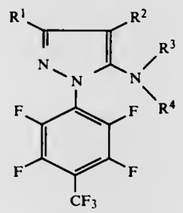
Filed Jan. 16, 1987, Ser. No. 4,353

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1986, 3603291

Int. Cl.[4] A01N *43/56;* **C07D** *231/38*

U.S. Cl. 71—92 **15 Claims**

1. A 5-amino-1-phenyl-pyrazole of the formula



in which

R^1 represents hydrogen, or represents straight-chain or branched alkyl with 1 to 8 carbon atoms,

R^2 represents hydrogen, nitro, nitroso, fluorine, chlorine, bromine or iodine, or represents a radical



wherein

R^5 represents hydrogen, hydroxyl or straight-chain or branched alkyl with 1 to 8 carbon atoms, or represents in each case straight-chain or branched alkenyl, alkinyl, alkoxyalkyl, alkylthioalkyl, alkoxy, alkylthio, alkylamino, dialkylamino or halogenoalkyl with in each case up to 4 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl, with up to 9 identical or different halogen atoms, or furthermore represent cycloalkyl which has 3 to 7 carbon atoms and is optionally monosubstituted or polysubstituted by identical or different substituents from the group comprising halogen, C_1–C_4-alkyl and C_1–C_4-halogenoalkyl, or represents phenyl, phenoxy, phenylthio or phenylamino, in each case optionally substituted on the phenyl by halogen, alkyl, alkoxy or halogenoalkyl with in each case 1 to 4 carbon atoms and, if appropriate, up to 9 halogen atoms,

R^3 represents hydrogen, or represents a radical



or represents a radical $-S(O)_n-R^7$ and

R^4 represents hydrogen, or represents a radical



or represents a radical $-S(O)_n-R^7$, or represents straight-chain or branched alkyl with 1 to 6 carbon atoms, or, in the case where R^3 represents a radical $-SO_2-R^7$ or a radical $-CO-C_mF_{2m+1}$, also represents one equivalent of an alkali metal cation, alkaline earth metal cation or

transition metal cation, bonded in salt form, or represents an ammonium ion, which is unsubstituted or mono- or polysubstituted by identical or different substituents from the group consisting of C_1–C_6-alkyl, phenyl and benzyl,

wherein

R^6 represents hydrogen, or represents straight-chain or branched alkyl with 1 to 12 carbon atoms, or represents in each case straight-chain or branched alkenyl or alkinyl with in each case 2 to 4 carbon atoms, or represents in each case straight-chain or branched alkoxyalkyl, alkylthioalkyl, alkoxy, alkylthio, alkylsulphonyalkyl, alkylsulphinylalkyl, alkylamino, dialkylamino or halogenoalkyl with in each case 1 to 4 carbon atoms in the individual alkyl parts and, in the case of the halogenoalkyl, with up to 9 identical or different halogen atoms, or furthermore represents cycloalkyl which has 3 to 7 carbon atoms and is optionally monosubstituted or polysubstituted by identical or different substituents from the group consisting of halogen, C_1–C_4-alkyl and C_1–C_4-halogenoalkyl, or represents phenyl, phenoxy, phenylthio or phenylamino, in each case optionally substituted on the phenyl by halogen, alkyl, alkoxy or halogenoalkyl with in each case 1 to 4 carbon atoms and, if appropriate, up to 9 halogen atoms, and

X represents oxygen or sulphur,

n represents the number 0, 1 or 2,

m represents the number 1, 2 or 3 and

R^7 represents in each case straight-chain or branched alkyl or halogenoalkyl with in each case 1 to 4 carbon atoms and, if appropriate, 1 to 9 identical or different halogen atoms, or represents phenyl which is optionally substituted by halogen, alkyl, alkoxy or halogenoalkyl with in each case 1 to 4 carbon atoms and, if appropriate, up to 9 identical or different halogen atoms, but wherein, in the case where R^1 and R^3 represents hydrogen and R^2 represents nitro, R^4 does not simultaneously represents a propionyl radical.

12. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim **1**.

14. A method or regulating the growth of plant which comprises applying to such plants or to a locus in which such plants are grown or to be grown a plant growth regulating effective amount of a compound according to claim **1**.

4,787,931

N-PHENYL-N'-(PYRIDINYL-N-OXIDE)UREA PLANT REGULATORS

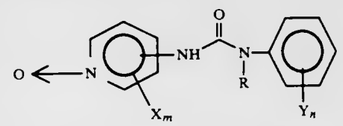
Robert Henrie, II, E. Windsor; Christine M. Green, Skillman, both of N.J., and Robert E. Sticker, Middleport, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 586,574, Mar. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 480,055, Mar. 29, 1983, abandoned. This application Jun. 17, 1986, Ser. No. 875,415

Int. Cl.[4] A01N *43/40;* **C07D** *213/75*

U.S. Cl. 71—94 **22 Claims**

1. A compound of the formula



in which R is hydrogen or a lower alkyl group; and

(a) the pyridinyl ring is attached at position 4; each X group is independently selected from halogen, (C_{1-4})alkyl, $(C_{1-5}$-$)$alkoxy, (C_{1-6})haloalkyl, (C_{1-2})alkoxycarbonyl, aminocarbonyl, (C_{1-4})alkylamino, di(C_{1-2})alkylamino, di$(C_{1-2}$-$)$alkylaminocarbonyl, di(C_{1-2})- alkylamino-N-oxide, (C_{1-2})alkylthio, (C_{1-2})alkylsulfonyl, pyridinyl, phenylthio, phenylsulfonyl, phenyl, or benzylamino in which the aromatic ring is in turn unsubstituted or substituted with 1 to 5 halogen atoms; each Y group is independently selected from halogen, (C_{1-2})alkyl, (C_{1-2})alkoxy, (C_{1-2})alkylthio, (C_{1-2})alkylsulfonyl, hydroxyl, or trihalomethyl; m is 0, 1 or 2; and n is 0 to 5; or

(b) the pyridinyl ring is attached at position 3; X is chloro, methoxy, or an acetylmethylamino group; Y is halogen; m is 0 or 1; and n is 0 or 1.

4,787,932

N-(BENZENESULFONYL) CARBAMATES HERBICIDAL ANTIDOTES

Martin D. Mahoney, Lansing, Mich.; Edmund J. Gaughan, Berkeley, Calif.; Ferenc M. Pallos, and Hsiao-Ling Lam, both of Walnut Creek, Calif., assignors to Stauffer Chemical Co., Westport, Conn.

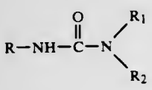
Division of Ser. No. 69,486, Aug. 24, 1979, Pat. No. 4,434,000. This application Oct. 3, 1983, Ser. No. 538,613

Int. Cl.[4] A01N *37/18, 47/30, 41/00*

U.S. Cl. 71—103 **30 Claims**

1. A method of controlling undesirable vegetation and protecting soybeans from injury due to a urea herbicide which comprises applying to a locus where control is desired

(a) an herbicidally effective amount of a urea herbicide of the formula



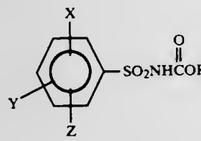
in which

R is chloro-substituted phenyl:

R_1 is selected from the group consisting of hydrogen and 1–4 carbon alkyl; and

R_2 is selected from the group consisting of 1–4 carbon alkyl and 1–4 carbon alkoxy; and

(b) a non-phytotoxic but antidotally effective amont of a N-(benzenesulfonyl) carbamate of the formula



in which

X and Y are independently selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of hydrogen, methyl, chloro and trifluoromethyl; and

R' is selected from the group consisting of 1–4 carbon alkyl, 1–4 carbon haloalkyl, 3–6 carbon alkenyl, 3–6 carbon haloalkenyl, 3–6 carbon alkynyl, cyanoethylthioethyl, 2–6 carbon alkoxyalkyl, diethylhydroxylamine, acetoxime, methylthioacetimidate, chloro-substituted phenyl, chloro-substituted benzyl, and sulfolane.

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4,787,933

HERBICIDE COMPOSITIONS CONTAINING A NITRILE DERIVATIVE AS ANTIDOTE

Katalin Gorog nee Privitzer; Maria Kocsis nee Bagyi; Gyorgy Orosz; Tamas Torok, all of Budapest; Istvan Laszlo, Balassagyarmat; Laszlo Kondar, Velence; Istvan Toth, Miskolc; Karoly Balogh, Miskolc; Tibor Bodi, Miskolc; Erzsebet Grega nee Toth, Miskolc; Zsolt Dombay, Miskolc; Jozsef Nagy, Miskolc, and Csaba Pavliscsak, Sajóbábony, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

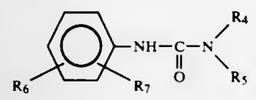
Filed Jun. 22, 1987, Ser. No. 65,265

Claims priority, application Hungary, Jun. 26, 1986, 2664/86

Int. Cl.[4] A01N *37/34, 47/30*

U.S. Cl. 71—105 **5 Claims**

1. An herbicide composition containing a nitrile derivative as antidote which comprises as herbicidally active ingredient an urea derivative of the formula (II)

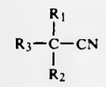


(II)

wherein

R_4 and R_5 which are the same or different, stand for a methyl or methoxy group; and

R_6 and R_7 which are the same or different, represent hydrogen, halogen, a C_{1-3} alkyl or a methoxy group, together with a nitrile derivative of the formula (I),



(I)

wherein

R_1 and R_2 which are the same or different, stand for hydrogen or a methyl, ethyl, allyl, phenyl or benzyl group;

R_1 and R_2 together may stand for a benzylidene group; and

R_3 means a methyl, phenyl, chlorophenyl, or lower alkoxyphenyl group in a mass ratio from 40:1 to 1:2 of the herbicidally active ingredient to the antidote nitrile derivative, together with an agriculturally acceptable inert carrier.

4,787,934

HYDROMETALLURGICAL PROCESS FOR PRODUCING SPHERICAL MARAGING STEEL POWDERS UTILIZING SPHERICAL POWDER AND ELEMENTAL OXIDIZABLE SPECIES

Walter A. Johnson, Towanda; Nelson E. Kopatz, Sayre, and Joseph E. Ritsko, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 4, 1988, Ser. No. 140,515

Int. Cl.[4] B22F *9/08, 9/22*

U.S. Cl. 75—0.5 AA **14 Claims**

1. A process comprising:

(a) forming an aqueous solution containing the metal values of iron, cobalt, nickel and molybdenum, said metals being present in a predetermined ratio,

(b) forming from said solution a reducible solid material selected from the group consisting of salts of said metals, oxides of said metals, hydroxides of said metals and mixtures thereof,

(c) reducing said material to form metallic powder particles,

(d) entraining at least a portion of said powder particles in a carrier gas,

(e) feeding said entrained particles and said carrier gas into a high temperature zone and maintaining said particles in said zone for a sufficient time to melt at least about 50% by weight of said particles, and to form droplets therefrom,

(f) cooling said droplets to form essentially spherical shaped metal alloy particles,

(g) agglomerating said spherical shaped particles with a predetermined amount of particles of at least one readily oxidizable metal selected from the group consisting of aluminum, titanium and vanadium,

(h) entraining at least a portion of said agglomerates in a carrier gas,

(i) feeding said entrained agglomerates and said carrier gas into a high temperature zone and maintaining said agglomerates in said zone for a sufficient time to melt at least about 50% by weight of said agglomerates and to form droplets therefrom, and

(j) cooling said droplets to form essentially spherical shaped particles of a maraging steel alloy containing at least one readily oxidizable metal.

4,787,935

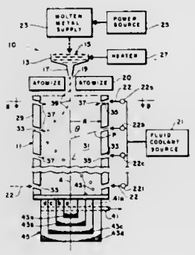
METHOD FOR MAKING CENTRIFUGALLY COOLED POWDERS

Daniel Eylon, Dayton, Ohio, and Steven J. Savage, Farsta, Sweden, assignors to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1987, Ser. No. 42,075

Int. Cl.[4] B22F *9/10*

U.S. Cl. 75—0.5 C **5 Claims**



1. A method for producing powder of metal or alloy material comprising:

(a) providing a molten stream of said material;

(b) providing a pressurized source of fluid;

(c) providing a housing having a substantially cylindrical wall defining along a central first axis a generally cylindrical chamber having preselected radius and an inlet at a first end thereof and an outlet at a second end thereof, said cylindrical wall including means defining a plurality of passageways through said wall along respective second axes each oriented with respect to said wall along a vector having preselected mutually orthogonal components respectively along a radius of said chamber, along said first axis and tangent to said wall, said passageways spaced both circumferentially and lengthwise of said cylindrical wall;

(d) atomizing said molten stream into molten droplets of said material;

(e) injecting said fluid through said passageways into said chamber under pressure sufficient to generate a plurality of vaporous fluid of preselected flow rate whereby said vaporous fluid is helically swirled within said chamber and directed generally toward said second end of said chamber;

(f) directing said molten droplets through said chamber in contact with said vaporous fluid jets whereby said droplets are swirled within said chamber toward said second end thereof and cooled to form powder of said material within said chamber; and

(g) collecting said powder.

4,787,936

HYDRAULIC CEMENT-BASED COMPOSITION FOR DIP COATING OF STEEL AND IRON ARTICLES

Kiyoshi Suzuki, Kanagawa; Toshiaki Murata, and Isao Nakata, both of Tokyo, all of Japan, assignors to Zairyo Kagaku Kenkyusho Co., Ltd. and Mitsui Engineering & Shipbuilding Co., Ltd., both of Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 78,238

Claims priority, application Japan, Jul. 28, 1986, 61-176898

Int. Cl.[4] C04B *24/00*

U.S. Cl. 106—90 **5 Claims**

1. A cement-based coating composition which comprises:

(a) 100 parts by weight of a hydraulic cement;

(b) from 10 to 36 parts by weight of an aqueous emulsion of a polymer capable of exhibiting good adhesion to the surface of steel and withstanding the attack of chloride ions, the amount of the emulsion being calculated as the content of the polymer therein; and

(c) from 3 to 30 parts by weight of an aqueous emulsion of a hydrocarbon solvent containing from 0.5 to 2.0% by weight of a saccharide compound and a combination of from 0.8 to 2.0% by weight of a first non-ionic surface active agent soluble in the hydrocarbon solvent having an HLB value in the range from 10 to 14.5, from 0.8 to 2.0% by weight of a second non-ionic surface active agent soluble in water having an HLB value in the range from 15 to 18 and from 0.3 to 1.0% by weight of a cationic surface active agent soluble in water, the amount of the emulsion being calculated as the content of the hydrocarbon solvent and the amounts of the saccharide compound and the surface active agents each being based on the amount of the hydrocarbon solvent combined in the emulsion.

4,787,937

HIGH SOLIDS CORRUGATING ADHESIVE

Craig H. Leake, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sep. 30, 1987, Ser. No. 103,084

Int. Cl.[4] C08L *3/00*

U.S. Cl. 106—213 **12 Claims**

1. An alkaline curing starch-based corrugating adhesive comprising

a. from about 23 to 42% of an ungelatinized tapioca starch,

b. from about 1 to 9% of a gelatinized starch comprising at least 40% by weight of amylose,

c. from about 0.2 to 1.3% of alkali,

d. from about 0.2 to 1.3% of borax, and

e. from about 55 to 70% water, wherein the percentages of the components are based on the total weight of the adhesive.

4,787,938

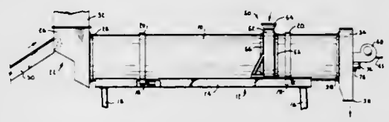
COUNTERCURRENT DRUM MIXER ASPHALT PLANT

Michael R. Hawkins, Prairie Village, Kans., assignor to Standard Havens, Inc., Kansas City, Mo.

Filed Jun. 30, 1986, Ser. No. 879,996

Int. Cl.[4] C09D *3/24;* **C08L** *95/00*

U.S. Cl. 106—281.1 **4 Claims**



1. A method for continuously producing an asphaltic composition from asphalt and aggregates, the steps of said method comprising:

introducing aggregate material interiorly of a first end of an inclined, horizontal rotating drum to flow generally from said first end to the second end of said drum;

generating a hot gas stream within said drum to flow through said drum to said first end in countercurrent relation to said aggregate material;

isolating a zone of said rotating drum from said hot gas stream;

delivering said heated and dried aggregate material to said zone isolated from said hot gas stream;

mixing said aggregate material with liquid asphalt within said zone isolated from said hot gas stream to produce an asphaltic composition; and

discharging said asphaltic composition from said rotating drum.

4,787,939

SOLUBILIZATION AND HYDROLYSIS OF CARBOHYDRATES

Sidney A. Barker, Selly Oak, and Peter J. Somers, Bournville, both of England, assignors to Imperial Chemical Industries PLC, Great Britain

Division of Ser. No. 561,148, Dec. 14, 1983, Pat. No. 4,715,118, which is a continuation of Ser. No. 278,614, Jun. 29, 1981, abandoned. This application Jan. 16, 1986, Ser. No. 819,428

Claims priority, application United Kingdom, Jul. 11, 1980, 8022715

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] C13K *1/02, 1/06;* **C13L** *1/08*

U.S. Cl. 127—37 **7 Claims**

1. A process for modifying a glycosidically linked carbohydrate having reducing groups comprising:

contacting said carbohydrate at a temperature within the range of −5° C. to 125° C. with a mixture comprising an aqueous inorganic acid at a concentration within the range of 1 to 10 molar and a halide of a metal selected from the group consisting of lithium, magnesium and calcium or a precursor of said halide which is a compound selected from the group consisting of a carbonate, a bicarbonate and a hydroxide, the metal halide being present at a concentration within the range from 1 molar to saturation concentration, the process being carried out for a period of time sufficient to cause modification of the carbohydrate without producing significant solubilization and hydrolysis, whereby the carbohydrate is modified so as to be more accessible and susceptible to reaction with enzymes, microbes and chemicals.

4,787,940

METHOD FOR PURIFYING SUGAR PHOSPHATES OR THEIR SALTS

Shigeto Kayane; Mitsugu Morishita; Takashi Imamura; Masanobo Tanigaki, all of Wakayama, and Tomihiro Kurosaki, Osaka, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,496

Claims priority, application Japan, Feb. 20, 1986, 61-36441

Int. Cl.[4] C13D *3/18;* **B01D** *17/06*

U.S. Cl. 127—54 **6 Claims**

1. A method for purifying a feed material selected from the group consisting of glucose-1-phosphate, glucose-6-phosphate, fructose-6-phosphate, glucose-1,6-diphosphate, fructose-1,6-diphosphate and a sodium or potassium salt thereof and mixtures thereof; said feed material further containing as an impurity phosphoric acid, an alkali metal salt of phosphoric acid, or a mixture thereof, which comprises electrodialyzing said mixture in the presence of a mono- or polysaccharide in an amount of at least 0.5 g/l.

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4,787,941

CLEANING METHOD FOR KEYBOARD ASSEMBLIES

Joseph P. LaPlaca, Merrimack, N.H., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Jun. 30, 1986, Ser. No. 880,437
Int. Cl.[4] B08B *3/12*
U.S. Cl. 134—1 **20 Claims**

1. A process for cleaning data entry keyboards, said keyboards having plunger-type, Hall-effect keys, the process comprising the steps of:

(a) immersing the keyboard in a mild aqueous detergent solution;

(b) subjecting said keyboard and solution to ultrasonic vibration;

(c) removing the detergent from the keyboard; and

(d) drying said keyboard.

19. A process for cleaning data entry keyboards, said keyboards having plunger-type, Hall-effect keys, the process comprising the steps of:

(a) immersing the keyboard in a mild aqueous detergent solution;

(b) subjecting said keyboard and solution to ultrasonic vibration at a level of approximately 60 to 85 dB;

(c) removing the detergent from the keyboard by rinsing the keyboard with water; and

(d) immersing said keyboard into a water-absorbing fluorinated solvent.

4,787,942

METHOD FOR PREPARING REACTIVE METAL SURFACE

Daniel X. Wray, 6585 Corte Cisco Ct., Carlsbad, Calif. 92008

Filed Jan. 27, 1987, Ser. No. 6,806
Int. Cl.[4] C23C *22/24*
U.S. Cl. 148—6.15 **10 Claims**

1. A method for the preparation of a reactive metal surface to provide a chemically uniform film bonded thereon, said method comprising the steps of:

a. treating said metal surface to remove existing oxidative coatings formed therefrom and to expose the reactive metal underlying the oxidative coatings,

b. essentially simultaneously contacting said reactive metal with a working fluid containing film forming molecules selected from the group of molecules having the formula

$$[CX_3—(CX_2O)m—(C_2X_4O)n—CX_2] \text{ and}$$

$$[CX_3—(CX_2)n]—$$

wherein X comprises fluorine, chlorine, iodine hydrogen or methyl, m and n are integers of between 0 and about 12, and where X is hydrogen the hydrocarbon groups may be ethylenically unsaturated, said film forming molecules having a terminal group selected from the phosphate, sulfate, chromate, sulfonate, hydroxyl, carboxyl and oxide groups, said working fluid comprising a solvent for said film forming molecules and being inert with respect to said reactive metal surface thereby to cause said molecules to bond directly to said metal surface while said surface is maintained in a reactive, essentially reduced condition and to form thereon a uniform film.

4,787,943

DISPERSION STRENGTHENED ALUMINUM-BASE ALLOY

Yashwant R. Mahajan, Kanchanbagh, India; Susan D. Kirchoff, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 30, 1987, Ser. No. 45,970
Int. Cl.[4] C22C *21/00*
U.S. Cl. 148—437 **6 Claims**

1. An aluminum alloy dispersion strengthened with at least one rare earth metal consisting essentially of about 2 to 6 weight percent titanium, about 3 to 11 weight percent of at least one rare earth of the Lanthanide Series and up to about 3



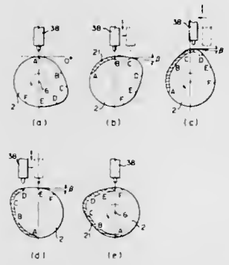
weight percent of at least one Group VIII element, balance aluminum.

4,787,944

PROCESS FOR PRODUCING SURFACE REMELTED CHILLED LAYER CAMSHAFT

Akiyoshi Morita, Nagoya; Hideo Nonoyama, Toyota; Toshiharu Fukuizumi, Toyota, and Kiyokazu Uruno, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 894,829, Aug. 8, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 129,349
Claims priority, application Japan, Aug. 9, 1985, 60-174333
Int. Cl.[4] C21D *9/30*
U.S. Cl. 148—152 **7 Claims**



1. A process for producing a surface remelted chilled layer camshaft, comprising the steps of:

controlling a rotation of a camshaft such that a cam thereof rotates about the center axis of said camshaft;

relatively oscillating one of a torch and said cam in the direction of said center axis;

irradiating a sliding surface of said cam with high density energy from said torch so as to melt a portion of said sliding surface at a melting position;

controlling a position of said torch in two transfer directions, said transfer directions comprising a horizontal Y-axis direction perpendicular to a center axis direction of said camshaft and a vertical Z-axis direction perpendicular to said center axis direction, such that a portion of a tangent to said sliding surface at said melting position, said portion of said tangent extending upstream from said melting position as measured in said rotation direction and extending below a horizontal line passing through said melting position, forms an angle of between 0° and 30° with the horizontal line, said angle being non-zero when said melting position is at a nose portion of said cam; and

permitting a melted portion of said sliding surface to cool, whereby a chill layer is formed.

4,787,945

HIGH NICKEL CHROMIUM ALLOY

Gaylord D. Smith, and Curtis S. Tassen, both of Huntington, W. Va., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Dec. 21, 1987, Ser. No. 135,351
Int. Cl.[4] C22C *19/05*
U.S. Cl. 148—428 **19 Claims**

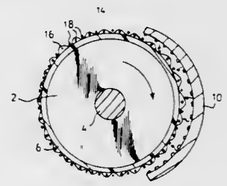
1. A nickel-chromium-iron alloy characterized by (i) ease of manufacturing, (ii) a controlled grain size, (iii) enchanced oxidation resistance upwards of 1000° C. (1832° F.), and (iv) good stress rupture strength at temperatures upwards of about 1100° C., said alloy consisting essentially of about 19 to 28% chromium, about 55 to 75% nickel, about 0.75 to 2% aluminum, up to about 1% titanium, zirconium in a small but effective amount sufficient to facilitate the manufacturing process and up to about 0.5%, up to 1% each of silicon, molybdenum, manganese and niobium, up to about 0.1% carbon, a small but effective amount of nitrogen sufficient to combine with the zirconium to effect grain size control and up to about 0.1%, up to about 0.2% yttrium, with the balance being iron.

4,787,946

METHOD OF MAKING A PAPER MACHINE PRESS BELT

Eric R. Romanski, Delmar, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Aug. 7, 1987, Ser. No. 83,698
Int. Cl.[4] B29D *17/00*; F16G *1/00*; B32B *31/00*
U.S. Cl. 156—137 **9 Claims**



1. A method of making a belt for use in papermaking comprising the steps of:

providing a mandrel having a smoothly polished surface;

applying a first coat of liquid urethane to the mandrel.

drying the first coat of liquid urethane;

placeing a fabric sleeve onto the coated mandrel;

applying a second coat of liquid urethane to the fabric encapsulated urethane coated mandrel; and drying the second coat of urethane.

4,787,947

METHOD AND APPARATUS FOR MAKING PATTERNED BELT BONDED MATERIAL

Alfred T. Mays, East Windsor, N.J., assignor to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 661,288, Oct. 17, 1984, abandoned, which is a continuation of Ser. No. 430,309, Sep. 30, 1982, abandoned. This application Jun. 22, 1987, Ser. No. 65,627
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—160 **14 Claims**

1. A method of producing a fused nonwoven fabric comprising thermoplastic fibers, said method comprising:

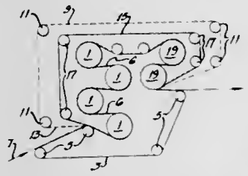
(a) superimposing a high loft, low density fibrous web comprising at least 5 percent thermoplastic fibers on a first endless carrier belt;

(b) superimposing a second endless carrier belt on said web so as to form a two belt laminate with said web sandwiched between the first and second endless carrier belts;

(c) at least one of said carrier belts having an open mesh structure formed by spaced, intersecting mesh elements so as to define open areas between said mesh elements;

(d) directing said two belt laminate to travel in a tensioned path consecutively around substantial portions of first and second heated rolls, which are offset from each other and spaced apart a sufficient distance to avoid a compression nip between said first and second heated rolls, the peripheral surfaces of said first and second heated rolls cooperating to provide a portion of said path thereby said two belt laminate travels out of contact with said first and second heated rolls, so as to initially apply heat to a first side of said web as said two belt laminate is directed around said first heated roll and thereby fuse at least the thermoplastic fibers adjacent to said mesh elements to fibers adjacent the first side thereof and to thereafter apply heat to a second side of said web as said two belt laminate is directed around said second heated roll and thereby fuse at least the thermoplastic fibers adjacent to said mesh elements to fibers adjacent the second side thereof, so as to form a web having a patterned surface defining regions corresponding to the open areas between said mesh elements that substantially maintain the high loft and low density of the web that are bordered by fused regions corresponding to the mesh elements; and

(e) cooling the two belt laminate after it has traveled around the first and second heated rolls so as to cool the fibers in the web sandwiched between the first and second endless carrier belts.



8. Apparatus for forming a nonwoven fabric comprising thermoplastic fibers, said apparatus comprising:

(a) a frame;

(b) first and second heated rolls rotatably mounted to said frame in offset relationship to each other, said rolls being spaced apart a sufficient distance to avoid a compression nip between said first and second rolls;

(c) a first endless carrier belt means mounted to said frame for travel in a path consecutively around substantial portions of said first and second heated rolls;

(d) a second endless carrier belt means mounted to said frame for travel along said path around substantial portions of said first and second heated rolls adjacent to said first belt means;

(e) at least one of said carrier belt means having an open mesh structure formed by spaced, intersecting mesh elements so as to define open areas between said mesh elements;

(f) means for superimposing a fibrous web, comprising at least 5 percent thermoplastic fibers, onto said first belt means so that said first and second belt means form a two belt laminate with said web sandwiched therebetween, said two belt laminate being caused to travel in said path consecutively around a substantial portion of said first heated roll to initially apply heat to a first side of said web and thereby fuse at least the thermoplastic fibers adjacent to said mesh elements to fibers adjacent the first side thereof and then around a substantial portion of said second heated roll to apply heat to a second side of said web and thereby fuse at least the thermoplastic fibers adjacent to said mesh elements to fibers adjacent the second side

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thereof, so as to form a web having a patterned surface defining regions corresponding to the open areas between said mesh elements that substantially maintain the high loft and low density of the web that are bordered by fused regions corresponding to the mesh elements;

(g) the peripheral surfaces of said first and second heated rolls cooperating to provide a portion of said path whereby said two belt laminate travels out of contact with said first and second heated rolls; and

(h) means for cooling said two belt laminate after it has travelled around said first and second heated rolls to cool the fibers in the web sandwiched between said first and second endless carrier belts.

4,787,948

PROCESS FOR THE PRODUCTION OF ELASTIC TAPES FROM POLYURETHANE

Wolfgang Ermert, Fallingbostel, Fed. Rep. of Germany, assignor to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Jun. 29, 1987, Ser. No. 68,077

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624303

Int. Cl.⁴ B32B *31/08*

U.S. Cl. 156—164 **4 Claims**

1. In the production of elastic tapes by extruding a thermoplastic polyurethane elastomer to form a flat or tubular film, orienting the film and slitting the film into tapes, the improvement which comprises orienting the extruded film lengthwise with a take-off ratio of at least 1:1.5, cooling the film and storing it under tension until the modulus of elasticity, according to DIN 53,455, has increased by at least 25% prior to slitting, including the additional steps of stretching the tape, bonding the stretched tape to a substrate with a hot melt adhesive, cooling and releasing the stress, and subjecting the substrate-tape structure to a further heat treatment to shrink said tape.

4,787,949

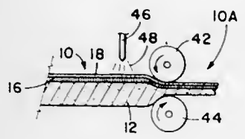
METHOD OF MANUFACTURING HIGHLY WATER ABSORBENT PLEATED FILTER LAMINATE

Frederic W. Cole, Greensboro, N.C., and John E. Thurber, Tulsa, Okla., assignors to Facet Automotive Filter Co., Tulsa, Okla.

Filed Jun. 30, 1986, Ser. No. 880,206

Int. Cl.⁴ B01D *39/16*

U.S. Cl. 156—222 **4 Claims**



1. A method of manufacturing highly water absorbent pleated filter laminate for use in a filter comprising the steps of:

applying onto the surface of a flat base sheet of filter material a substantially uniform layer of highly water absorbent powder;

applying a layer of thin, porous tissue over the layer of water absorbent powder to form a three layer substrate;

applying water vapor to the substrate;

applying pressure to the water vapor treated substrate to form a bonded laminate; and

rotary pleating the bonded laminate on a scoring machine.

4,787,950

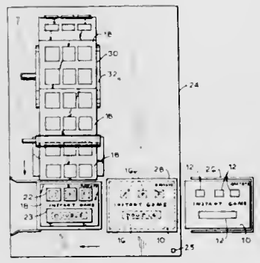
METHOD FOR FABRICATING IMPRINTED TICKET WITH SCRATCH-OFF COATING

Robert Meloni, Baltimore, and Robert Tegtmeier, Phoenix, both of Md. 21131, assignors to General Instrument Corp., N.Y.

Division of Ser. No. 912,915, Sep. 29, 1986, Pat. No. 4,738,473. This application Apr. 22, 1987, Ser. No. 41,775

Int. Cl.⁴ B32B *31/00;* **F16L** *13/04*

U.S. Cl. 156—249 **3 Claims**



1. A method for fabricating a ticket from a base and opaque coated, adhesive-backed transparent sheet comprising the steps of:

dispensing a base and transferring same to print means;

imprinting indicia on a section of the surface of the base;

removing an oaque coated, adhesive-backed transparent sheet from a carrier;

aligning the sheet with the base such that the opaque coating covers the imprinted indicia; and

affixing the sheet to the base such that an attempt to remove same will result in obvious damage to the surface of the base; said opaque material being adapted to be removed so as to permit observation of the indicia.

4,787,951

METHOD AND APPARATUS FOR ADHERING A TAPE OR SHEET TO A SEMICONDUCTOR WAFER

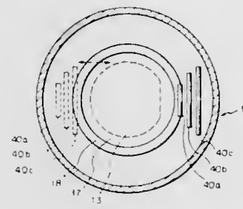
Tadahiro Okamoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 24, 1987, Ser. No. 65,548

Claims priority, application Japan, Jul. 2, 1986, 61-154110

Int. Cl.⁴ B32B *31/04*

U.S. Cl. 156—285 **20 Claims**



1. A method for adhering a tape or sheet to a semiconductor wafer, comprising the following steps of:

placing said semiconductor wafer on a table in a vacuum working chamber in such a manner that only the peripheral portion of said wafer is in contact with said table;

setting an adhesive-backed tape or sheet having at least one adhesive surface at a predetermined position in said chamber, in such a manner that the at least one adhesive surface thereof is located opposite a surface of said semiconductor wafer and a predetermined small clearance is maintained therebetween;

reducing an air pressure in said vacuum working chamber;

exerting a slight physical pressure on said adhesive-backed tape or sheet to press said tape or sheet against said semiconductor wafer, so that said adhesive-backed tape or sheet is provisionally adhered to the wafer surface by rollingly moving a plurality of rubber rollers over said adhesive-backed tape or sheet, said rollers having different axial lengths from each other; said physical pressure-exerting process comprising a plurality of steps, as follows, first exerting pressure on a small area including a central portion of the wafer surface by rollingly moving a shortest axial length roller along a diametrical line of the wafer, then exerting pressure on a larger areaby rollingly moving a longer axial length roller thereover, and finally, exerting pressure over an entire area of the wafer surface by rollingly moving a longest axial length roller thereover; and,

increasing the air pressure in said vacuum working chamber to completely adhere said adhesive-backed tape or sheet to the entire surface of said semiconductor wafer due to the change in said pressure.

4,787,952

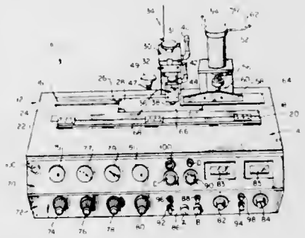
TEMPERATURE MODULATED GLUE BEAD TESTING APPARATUS

Curtis H. Broz, Roseville, Minn.; Eugene A. Koll, Moundsview, and Theodore Peltier, Hugo, both of Minn., assignors to Champion International Corporation, Stamford, Conn.

Filed Mar. 28, 1985, Ser. No. 717,001

Int. Cl.⁴ B29F *3/08*

U.S. Cl. 156—359 **17 Claims**



1. A glue bead testing apparatus for applying a bead of glue to a first sheet of paper or paperboard material and adhering a second sheet of paper or paperboard material thereto, said apparatus comprising:

a housing;

guide means mounted to said housing and defining a test path;

pusher means for moving the first sheet of material along the test path;

glue tank means mounted to said housing for storing the glue;

glue head means for applying the glue from said glue tank means to the first sheet of material, said glue head means being mounted to the glue tank means and being substantially in line with but spaced from the test path;

air pressure means in communication with said glue tank means and said glue head means for selectively directing air pressure to said glue tank means and said glue head means and urging glue onto the first sheet of material;

glue tank temperature control means in communication with said glue tank for measuring and controlling the temperature of the glue in the glue tank means;

glue head temperature control means in communication with said glue head for measuring and controlling the temperature of glue in the glue head; and

compressor means for compressing the second sheet of material against the first sheet of material after the application of the glue to the first sheet of material.

4,787,953

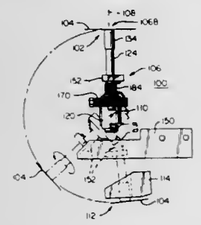
APPARATUS FOR LABEL TRANSFER

Lee E. Trouteaud, Huber Heights, and Fritz F. Treiber, Centerville, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Jan. 12, 1987, Ser. No. 2,597

Int. Cl.⁴ B65C *9/08*

U.S. Cl. 156—387 **4 Claims**



1. In a labeling system having a source of labels each having a printed side and an adhesive side, and a label applier for applying the labels to packages, a label transfer device for receiving labels having the adhesive sides up from the label source and transferring the labels to the label applier with the adhesive sides down and having one of at least two selectable angular orientations relative to the packages, said label transfer device comprising:

a label transfer arm having a central axis, a base end and a distal end adapted to engage a label from the label source by means of vacuum, said transfer arm being mounted for first rotational motion about its central axis and second rotational motion about a horizontal axis through its base end, said second rotational motion swinging said arm between a first label pickup position adjacent the label source and a second label delivery position adjacent the label applier;

angle selector means for selectively setting said arm to a fixed angular orientation about its central axis when in said first label pickup position or to an angular orientation displaced 90 degrees in either direction from said fixed orientation;

guide means positioned on both sides of the path of said arm as it is rotated from said first position to said second position; and

arm rotation means secured to said arm for engaging said guide means as said arm is rotated from said first position to said second position and moving said arm to said fixed angular orientation whereby said label transfer device is able to provide no label rotation or 90 degrees of label rotation in either direction.

4,787,954

VACUUM TUBE HOLDER FOR CORRUGATING MACHINES

Willem A. Nikkel, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,484

Int. Cl.⁴ B29C *53/22;* **B31F** *1/20*

U.S. Cl. 156—459 **9 Claims**

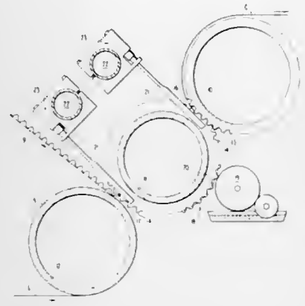
1. A web corrugating machine having a vacuum system for securing a corrugated web to the corrugated surface profile of a fluted roll comprising:

(a) a plurality of circumferential slots in said corrugated

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surface extending to a depth below trough portions of corrugation flutes;

(b) vacuum drafting tubes, each having a pickup end positioned in said troughs approximately tangent thereto and a socket end having a flared tube wall; and,



(c) holding means having a slotted socket for receiving the socket end of one of said vacuum tubes and resiliently biased mandrel means for holding said vacuum tube socket end aligned in said socket, said mandrel means including vacuum conduit means therein connected with a vacuum source means for drafting a vacuum from said tube through said conduit means.

4,787,955

APPLICATION ROLLER FOR A LABELLING DEVICE

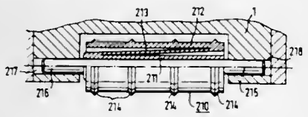
Gerhard Nagel, Augsburg, and Ulf Koch, Eberbach, both of Fed. Rep. of Germany, assignors to Esselte Meto International GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 854,426, Apr. 21, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 132,657

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515610

Int. Cl.[4] B65C *1/00;* **B44C** *7/00, 7/04;* **B60B** *9/00*

U.S. Cl. 156—488 **7 Claims**



1. A labelling device for attaching self-adhesive labels to a substrate, comprising in combination: a labelling device having a housing, a means for supplying labels, a means for feeding labels, and an application roller for applying labels to a substrate;

said application roller mounted for rotation relative to said housing, and including a generally cylindrical inner sleeve having a predetermined external diameter, a generally cylindrical outer sleeve having a predetermined internal diameter greater than the predetermined external diameter of said inner sleeve, and an intermediate sleeve for connecting the inner sleeve and the outer sleeve such that said outer sleeve is generally coaxially disposed about said inner sleeve, said intermediate sleeve being disposed between the inner sleeve and the outer sleeve, said outer sleeve having two ends, said inner sleeve having two ends which are respectively adjacent the two ends of said outer sleeve, said intermediate sleeve having a first end and a second end, said intermediate sleeve being connected at the first end thereof to the one end of the inner sleeve, and the second end of the intermediate sleeve being connected to an end of said outer sleeve at an end thereof adjacent the other end of said inner sleeve,.

whereby said outer sleeve is resiliently movable relative to said inner sleeve during application of a label to the substrate.

4,787,956

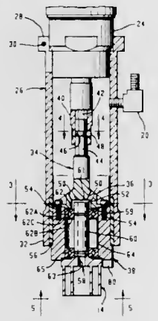
FRICTION WELDING APPARATUS

John A. Hoefer; David S. Perry, and Edward J. Schelmbauer, all of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 19, 1988, Ser. No. 145,130

Int. Cl.[4] B29C *65/06*

U.S. Cl. 156—497 **9 Claims**



1. Apparatus for holding and spinning a plastic part during a friction welding operation to join the plastic part to a plastic work piece comprising:

a driver to impart rotational movement;

a vacuum chamber; and

a rotatable part driver assembly connected to the driver for rotational movement and having air ports in air flow communication with the vacuum chamber and having means to rotate the plastic part in unison therewith, said part driver assembly including a vacuum head member with a hollow body rotatable independent of the part driver assembly, one end of the vacuum head member adapted to receive a plastic part for friction welding to a plastic work piece and the other end in air flow communication with the air ports in the part driver assembly to hold the plastic part on the vacuum head member by vacuum pressure during the friction welding operation.

4,787,957

DESMEAR AND ETCHBACK USING NF_3/O_2 GAS MIXTURES

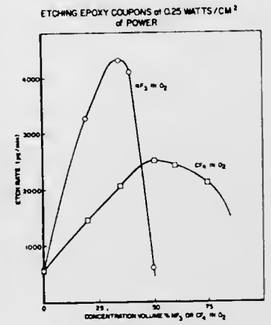
John A. Barkanic, Schnecksville, and Donna M. Reynolds, Pottsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 25, 1987, Ser. No. 101,222

Int. Cl.[4] C09K *13/08;* **B29C** *37/00*

U.S. Cl. 156—643 **6 Claims**

1. In a method for desmearing printed circuit boards using a plasma gas desmearing medium produced between a pair of electrodes in an evacuated chamber wherein the material being desmeared is selected from the group consisting of epoxy and polyimide, the improvement comprising desmearing with a plasma comprising a gas mixture of 20–45% NF_3 the remainder being O_2 wherein the chamber is evacuated to a pressure in the range of 1000 to 3000 milli-Torr, and wherein the power density used to create the plasma is in the range of 0.08 to 0.25 wat/cm^2.



4,787,958

METHOD OF CHEMICALLY ETCHING TIW AND/OR TIWN

William H. Lytle, Chandler, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Aug. 28, 1987, Ser. No. 90,823

Int. Cl.[4] H01L *21/28, 21/308*

U.S. Cl. 156—652 **5 Claims**

1. A method of chemically etching a semiconductor device comprising:

providing a semiconductor device having a substrate, a layer of titanium-tungsten-nitride coupled to said substrate, a layer of titanium-tungsten coupled to said layer of titanium-tungsten-nitride, and a metal contact coupled to a first portion of said titanium-tungsten layer; and

etching said titanium-tungsten and titanium-tungsten-nitride layers in a 30% solution of hydrogen peroxide at a temperature between approximately 80°–90° C. to remove a second portion of said titanium-tungsten layer and a portion of said titanium-tungsten-nitride layer adjacent said second portion of said titanium tungsten layer.

4,787,959

PROCESS FOR PREPARING CHEMICAL PAPER PULPS BY COOKING, INTERMEDIATE GRINDING AND A FINAL ALKALINE PEROXIDE DELIGNIFICATION

Dominique Lachenal, Grenoble; Christian de Choudens, Gieres, and Pierre Monzie, Grenoble, all of France, assignors to Atochem, Paris, France

Continuation-in-part of Ser. No. 886,947, Jul. 23, 1986, abandoned, which is a continuation-in-part of Ser. No. 362,163, Mar. 26, 1982, abandoned, which is a continuation of Ser. No. 138,294, Apr. 11, 1980, abandoned, which is a continuation of Ser. No. 928,891, Jul. 28, 1978, abandoned. This application Nov. 18, 1987, Ser. No. 122,593

Claims priority, application France, Jul. 29, 1977, 77 24137; Jul. 5, 1978, 78 20715

Int. Cl.[4] D21C *3/02, 3/20, 3/26, 9/16*

U.S. Cl. 162—25 **15 Claims**

1. A process of making chemical paper pulps by delignification of lignin-cellulose material which comprises:

(a) subjecting the lignin-cellulose material to a first cooking stage performed in the presence of an aqueous sodium hydroxide solution containing between about 10 and 30% of sodium hydroxide by weight of the dry initial material and at a temperature between about 150° and 180° C. until the yield of cooked material is between about 50 and 60% by weight of the dry initial material to partially delignify the material;

(b) grinding the material thus treated; and

(c) subjecting the material thus ground to a second cooking stage performed at a temperature in the range of from about 90° C. to 120° C. in the presence of an aqueous solution of a peroxide, sodium hydroxide and a peroxide stabilizing agent which is present in an amount sufficient to slow but not prevent the decomposition of the peroxide into oxidizing species and wherein the amount of peroxide is between about 0.1 and 10% by weight of the dry ground material and the amount of sodium hydroxide is between about 1 and 10% by weight of the dry ground material, for a sufficient time to further delignify the material, the combination of steps (a), (b) and (c) removing at least about 80% of the lignin from the material, thus forming a chemical paper pulp.

4,787,960

CATIONIC AND ANIONIC LIGNIN AMINE SIZING AGENTS

Peter Schilling, Charleston, and Patti E. Brown, Goose Creek, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 76,948, Jul. 23, 1987. This application Mar. 28, 1988, Ser. No. 172,807

Int. Cl.[4] D21D *3/00;* **D21H** *3/18*

U.S. Cl. 162—158 **12 Claims**

1. In a method for sizing wood pulp under substantially neutral pH conditions, the improvement of enhancing size retention on the pulp comprising sizing the wood pulp in the presence of a lignin derivative prepared by reacting lignin with an aldehyde, or an aldehyde producing substance, and a polyamine.

4,787,961

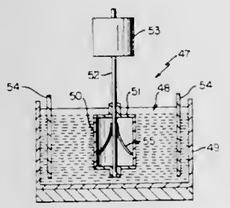
BELT CONSTRUCTION, TENSILE BAND SET THEREFOR AND METHODS OF MAKING THE SAME

James B. Rush, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Filed Dec. 23, 1987, Ser. No. 137,285

Int. Cl.[4] C25D *1/02*

U.S. Cl. 204—9 **30 Claims**



1. In a method of making a tensile band set wherein said band set comprises a plurality of separate looped endless bands disposed in superimposed relation, the improvement comprising the step of electroforming at least one band of said set.

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METHOD OF ELECTROLYTICALLY DEPOSITING METAL ON TITANIUM

Serge Temprano, Eaunes, and Bernard Artéro, Cugnaux, both of France, assignors to Alcatel Espace, Courbevoie Cedex, France

Filed May 26, 1987, Ser. No. 53,895
Claims priority, application France, May 26, 1987, 86 07475
Int. Cl.[4] C25D *5/34*
U.S. Cl. 204—32.1 4 Claims

A method of electrolytically depositing metal on titanium comprising the following steps:

chemical degreasing followed by washing;

electrolytic degreasing followed by washing;

pickling using sulfuric acid at 95% RP, with the temperature of the bath lying between 30° C. and 80° C., with the concentration lying between 20% and 80% in water, and with the immersion time lying between 30 seconds and 5 minutes;

depositing an underlayer of nickel; and

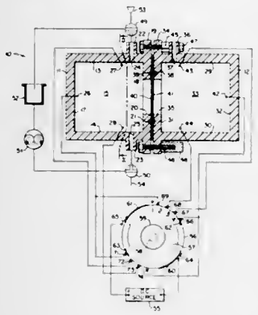
depositing a final layer.

4,787,963

METHOD AND MEANS FOR ANNEALING COMPLEMENTARY NUCLEIC ACID MOLECULES AT AN ACCELERATED RATE

William P. MacConnell, Cardiff, Calif., assignor to Syntro Corporation, San Diego, Calif.

Filed May 4, 1987, Ser. No. 46,652
Int. Cl.[4] C12N *15/00*
U.S. Cl. 204—180.1 38 Claims



1. The method comprising the steps of binding first nucleic acid molecules to membrane means comprising at least a liquid permeable membrane impermeable to nucleic acid molecules; contacting said membrane means and first molecules with an aqueous medium containing second nucleic acid molecules; and then passing a first electric current through said aqueous medium and said membrane means in a direction to move the second nucleic acid molecules electrophoretically toward said membrane means and into contact with said bound first nucleic acid molecules.

4,787,964

GAS DIFFUSION ELECTRODES, ELECTROCHEMICAL CELLS AND METHODS EXHIBITING IMPROVED VOLTAGE PERFORMANCE

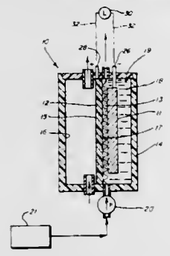
Arnold Z. Gordon, Lyndhurst; Ernest B. Yeager, East Cleveland; Donald A. Tryk, Cleveland Heights, and M. Sobrab Hossain, Cleveland, all of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio

Filed May 11, 1987, Ser. No. 48,386
Int. Cl.[4] C25B *11/00*
U.S. Cl. 204—282 50 Claims

1. A gas diffusion cathode adapted for use in an oxygen consuming electrochemical cell, said cathode being prepared by the method comprising the steps of:

(a) forming a porous body defining a gas contacting surface and an opposed liquid contacting surface of electronically conductive active carbon having a transition metal macrocycle catalyst adsorbed thereon;

(b) disposing said porous body in contact with an aqueous alkaline electrolyte at said liquid contacting surface and in



contact with a hydrogen or an inert gaseous atmosphere at said gas contacting surface; and,

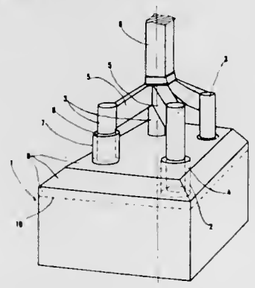
(c) passing current through said porous body while in contact with said electrolyte and said gaseous atmosphere at an intensity and for a duration sufficient to effect a desired predetermined degree of improvement in the oxygen reduction polarization behavior of said cathode.

4,787,965

PROTECTIVE COATING FOR THE CARRIER BARS OF PREBAKED ANODES AND THE EMERGING PART OF SAID ANODES

Gabriel Audras, Lyon, and Bernard Samanos, Ste Foy Les Lyon, both of France, assignors to Societe Des Electrodes and Refractaires Savoie (SERS), both of Courbevoie, France

Filed Nov. 6, 1987, Ser. No. 118,023
Claims priority, application France, Nov. 14, 1986, 8616285
Int. Cl.[4] C25C *7/00*
U.S. Cl. 204—290 R 10 Claims



1. A carbonaceous prebaked anode for the production of aluminum of high purity by the Hall-Heroult process, comprising a carrier iron bar, wherein at least a portion of said anode and a portion of said bar are coated with a composition consisting essentially of:

carbonaceous aggregate selected from the group consisting of coke, graphite, semigraphite and electrode scrap;

calcium aluminate cement having an alumina content of at least 70% by weight, and having a total content of impurities SiO_2, Fe_2O_3, TiO_2, K_2O, Cr_2O_3, and Mn_2O_3 of less than 5% by weight;

0 to 5% by weight of an anti-oxidant aluminum powder aggregate; and

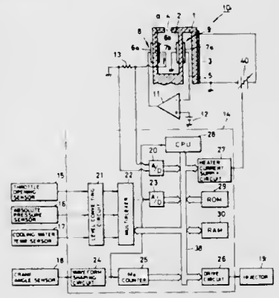
alumina powder aggregate in an amount of 0 to 50% of the weight of total aggregate.

4,787,966

OXYGEN CONCENTRATION SENSOR FOR AN INTERNAL COMBUSTION ENGINE

Toyohei Nakajima; Yasushi Okada; Toshiyuki Mieno, and Nobuyuki Cono, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 71,961
Claims priority, application Japan, Jul. 14, 1986, 61-165329
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—406 3 Claims



1. An oxygen concentration sensor, comprising:

an oxygen ion conductive solid electrolyte member forming a gas diffusion restricted region into which a measuring gas is introduced;

a pair of electrodes sandwiching said solid electrolyte member;

pump current supply means applying a pump voltage to said pair of electrodes through a current detection element to generate a pump current; and

a heater element connected to said solid electrolyte member for heating said solid electrolyte member when a heater current is supplied from a heater current source;

wherein said oxygen concentration sensor detects an oxygen concentration in said measuring gas in terms of a current value of said pump current supplied through said current detection element and controls oxygen concentration in said gas diffusion restricted region by conducting oxygen ions through said solid electrolyte member in accordance to the flow of said pump current; and

wherein said current detection element is connected to the electrode of said pair of electrodes facing said gas diffusion restricted region for insuring that said current value is representative of said pump current and possible leakage current from said heater current.

4,787,967

PROCESS FOR TWO-PHASE FLUID CATALYTIC CRACKING SYSTEM

Joseph A. Herbst, Turnerville; Hartley Owen, Belle Mead, both of N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 3, 1986, Ser. No. 903,367
Int. Cl.[4] C10G *51/04, 11/18*
U.S. Cl. 208—74 13 Claims

1. A fluid catalytic cracking process, comprising the steps of:

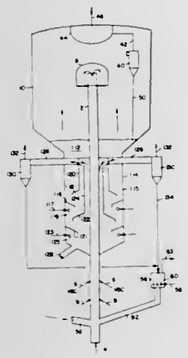
introducing particles comprising large pore crystalline zeolite cracking catalyst, particles comprising intermediate pore crystalline zeolite cracking catalyst, and a lift gas into a first zone of a fluid catalytic cracking reactor riser, wherein said large port particles require more frequent regeneration and are more hydrothermally stable than said intermediate pore catalyst, at least one physical characteristic of said intermediate pore particles and said large pore particles differing sufficiently, such that said intermediate pore particles are more elutriatable than said large pore particles;

introducing a hydrocarbon feedstock having an initial boiling point of at least 400° F. into a second zone of said riser to form a mixture under fluid catalytic cracking conditions, said second zone being located downstream of said first zone;

discharging said mixture from said riser and passing a stream comprising said catalyst of said mixture to a first catalyst stripping vessel;

countercurrently contacting said mixture catalyst in said first stripping vessel with upwardly passing stripping gas to upwardly direct a first portion of said catalyst;

passing said first portion of said catalyst out of said first stripping vessel and passing a remaining portion of said catalyst downwardly through said first stripping vessel, said first portion having a higher ratio of intermediate pore catalyst to large pore catalyst than said remaining portion;



stripping said first portion in a second stripping vessel;

regenerating said remaining portion of catalyst in a fluid catalytic regenerator; and

recycling said first portion from said second stripping vessel, and said remaining portion from said regenerator, to said reactor riser,

wherein said riser terminates within a reactor vessel and said first stripping vessel is located within a lower portion of said reator vessel and defined by sidewalls which are concentric with said riser,

wherein said catalyst of said mixture in said first stripping vessel passes downwardly through a first annulus between a cylinder and said sidewalls;

said catayst of said mixture passes across a perforated tray attached to said cylinder;

said first portion of catalyst passes upwardly through a second annulus between said cylinder and said riser; and

said first portion passes from said second annular zone to said second stripping vessel.

4,787,968

CATALYST DEMETALLIZATION AND PROCESS FOR USING DEMETALLIZED CATALYST

Frank J. Elvin, Kenner, La., assignor to ChemCat Corporation, New Orleans, La.

Division of Ser. No. 881,334, Jul. 2, 1986, Pat. No. 4,686,197.
This application Jun. 29, 1987, Ser. No. 66,971
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 11 Claims

1. In a hydrocarbon cracking process employing a catalyst to promote the cracking of a substantially hydrocarbon feedstock, the improvement comprising employing a demetallized

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catalyst obtained from a catalyst demetallization process, said catalyst comprising at least one synthetic crystalline material capable of promoting said hydrocarbon cracking, said catalyst demetallization process including the steps of contacting a metal contaminated cracking catalyst with at least one chlorine-containing component to form a chlorinated catalyst and contacting said chlorinated catalyst with at least one aqueous liquid composition substantially free of ammonium ions to produce a demetallized catalyst having a reduced content of said contaminant metal, provided that said chlorinated catalyst is cooled by at least about 50° F. prior to the contacting of said chlorinated catalyst with said aqueous liquid composition substantially free of ammonium ions, thereby forming a demetallized catalyst with improved hydrocarbon cracking catalytic activity.

4,787,969

REFORMING WITH POLYMETALLIC CATALYSTS

William C. Baird, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 933,380, Nov. 21, 1986, Pat. No. 4,701,255. This application May 4, 1987, Ser. No. 45,524
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.⁴ C10G *35/08*
U.S. Cl. 208—139 **18 Claims**

1. In a process for catalytically reforming, with hydrogen, a hydrocarbon naphtha feed at reforming conditions, the improvement comprising contacting said naphtha feed, and hydrogen, with a halogenated, supported platinum-rhenium catalyst promoted with iridium agglomerated to exhibit a crystallinity greater than 50 percent, as measured by X-ray.

4,787,970

PROCESS AND SYSTEM FOR DEWATERING METAL OXIDE SLUDGE

Russell L. Sutphen, Chittenango, N.Y., assignor to Specialized Process Equipment, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 41,442, Apr. 23, 1987, abandoned. This application Mar. 18, 1988, Ser. No. 170,364
Int. Cl.⁴ B01D *9/04, 17/00*
U.S. Cl. 210—179 **12 Claims**

1. A system for receiving metal hydroxide sludge from a raw sludge supply and separating said sludge into primarily solid and liquid phases, said system comprising, in combination:

(a) a first tank in which said raw sludge from said supply is deposited;

(b) at least one pair of essentially flat, heat conducting plates arranged in spaced, parallel relation with inwardly and outwardly facing, vertically disposed, major surfaces;

(c) a first distribution header positioned above said plates to discharge liquid downwardly upon said outwardly facing plate surfaces;

(d) a first line connecting said first tank with said first header to conduct said raw sludge thereto for discharge onto said outwardly facing plate surfaces;

(e) means for chilling said plates to a temperature below the freezing point of said raw sludge, whereby some of said raw sludge is frozen on and adheres to said outwardly facing plate surfaces, and some drains by gravity off the lower portions of said plates;

(f) means for directing said raw sludge which drains off said plates back to said first tank for recirculation through said first header;

(g) means for releasing the frozen sludge from said outwardly facing plate surfaces, permitting said frozen sludge to fall from said plate surfaces by gravity;

(h) breaking means positioned below said plates to receive said frozen sludge released from said plate surfaces, and break the frozen sludge into pieces not larger than a predetermined size; and to discharge said pieces;

(i) a second tank positioned to receive said pieces of frozen sludge discharged from said breaking means;

(j) means for increasing the temperature of said pieces of frozen sludge in said second tank to effect thawing thereof;

(k) a second line through which thawed sludge from said second tank is circulated out of and back to said second tank; and

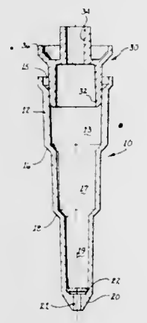
(l) a third line through which thawed sludge from said second tank is circulated to a processing area for separation into said primarily solid and liquid phases.

4,787,971

MINIATURIZED COLUMN CHROMATOGRAPHY SEPARATION APPARATUS AND METHOD OF ASSAYING BIOMOLECULES EMPLOYING THE SAME

Alan Donald, 3330 Second Ave., San Diego, Calif. 92103

Filed Jan. 23, 1987, Ser. No. 6,120
Int. Cl.⁴ B01D *15/08*
U.S. Cl. 210—198.2 **24 Claims**



1. A miniaturized column chromatography apparatus, comprising:

a generally tubular column member having a plurality of chambers, each of said plurality of chambers being disposed in fluid flow communication with another of said plurality of chambers, said tubular column member further having an eluent inlet and eluate outlet, said inlet having a relatively larger diameter than and in fluid flow communication with said eluate outlet, said eluate outlet further having a generally frusto-conical shape;

a planar disc-shaped porous filter horizontally disposed within said generally tubular column member and subtending said eluate outlet;

chromatographic separatory medium packed within said generally tubular column member, said chromatographic separatory medium being selected dependent upon the materials to be separated;

vented capping means for closing said eluate inlet disposed within eluate inlet opening and comprising a cap and a cap adapter, wherein said cap further comprises a generally cylindrical hollow lower stalk portion and a generally planar upper cap portion having a lower ring portion depending therefrom, wherein said lower ring portion has an inside diameter corresponding to an outside diameter of an upper rim portion of said generally tubular column member; and wherein said cap adapter further comprises a generally cylindrical hollow upper portion, a generally cylindrical hollow lower portion depending therefrom and a radial flange extending outwardly from an upper surface of said generally cylindrical lower portion, said upper portion having outside diameter corresponding to an inner diameter of said generally cylindrical hollow lower stalk portion of said cap and said lower portion

having an outside diameter corresponding to an inside diameter of an upper portion of said generally tubular column member; and

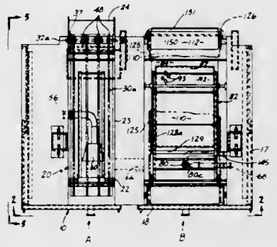
an eluate receiving member having a rounded bottom portion for forming a pellet therein; said eluate receiving member being disposed in fluid communication with said generally tubular column member.

4,787,972

TWO-STAGE FILTER APPARATUS

Warren Stubblebine, Sandusky, Ohio, assignor to Stein Associates, Inc., Sandusky, Ohio

Filed May 15, 1987, Ser. No. 50,191
Int. Cl.⁴ B01D *33/04, 36/00*
U.S. Cl. 210—196 **2 Claims**



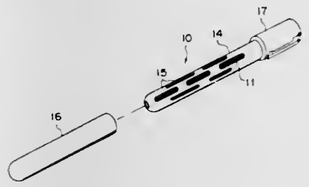
1. A two-stage filter apparatus for removing particles entrained in a liquid comprising a frame, first and second filter stages mounted in side-by-side relation to each other in said frame, reservoir means in said first filter stage for holding a quantity of liquid containing particles, means for supplying liquid containing entrained particles to said reservoir means, mesh-type endless filter belt means in said reservoir means movable as the liquid enters into said reservoir means and being operable to entrap at least a portion of the entrained particles therein and thereby partially filter said liquid, said second filter stage having a cyclone generating filter means provided with an inlet, outlet and an under flow exit, pump means connecting the reservoir means to the first filter stage to the inlet of said cyclone generating filter means, reservoir means in said second filter stage disposed below the under flow exit of said filter means and positioned to receive a flow of liquid therefrom, said cyclone generating filter means being operable to divide the liquid entering the inlet into a first portion that is substantially free of any particles and a second portion containing entrained particles which egresses from said cyclone generating filter means through said under flow exit and into the reservoir means to said second filter stage, mesh-type endless filter belt means movable through the liquid in said latter reservoir means being operable to entrap at least a portion of the entrained particles therein and to thereby remove said entrapped particles from said second portion and thereby additionally filter said second portion, and suction means connecting the reservoir means of the second filter stage to the reservoir means of the first filter stage to return the filtered second portion of the liquid to said reservoir means of said first filter stage.

4,787,973

DEVICE FOR CONVERTING WATER INTO MINERAL WATER

Shoichiro Ando, Flower Bldg., Room #803 1-3-3 Nakameguro, Meguro-ku, Tokyo, and Hiroshi Maki, 4-5-9 Ogawa, Machida-shi, Tokyo, both of Japan

Filed Sep. 23, 1987, Ser. No. 100,213
Int. Cl.⁴ C02F *1/28, 1/68*
U.S. Cl. 210—282 **7 Claims**



1. A device for converting water into mineral water, comprising:

a tubular porous filter element;

a tubular plastic inner case, said tubular porous filter element being received in said inner case, said inner case having a plurality of discontinuous elongated slots formed therein for passing water therethrough;

said inner case having opposite ends each of which have openings, one of said opposite ends being externally threaded;

a tubular plastic outer case surrounding said inner case except for said externally threaded end thereof;

an internally threaded cap in threaded engagement with said externally threaded end of said inner case; and

ceramic pellets as a calcium and magnesium source and small active carbon masses as a deodorizer randomly held in said tubular porous filter element.

4,787,974

BLOOD PURIFICATION

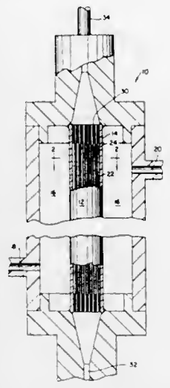
Clara M. Ambrus, and Csaba Horvath, both of Samuels, Gauthier, Stevens & Kehoe, 225 Franklin St., Suite 3300, Boston, Mass. 02110

Division of Ser. No. 711,304, Mar. 13, 1985, Pat. No. 4,714,556, which is a continuation-in-part of Ser. No. 406,495, Aug. 9, 1982, abandoned, and a continuation-in-part of Ser. No. 650,772, Sep. 13, 1984, Pat. No. 4,612,122, which is a continuation-in-part of Ser. No. 473,814, Mar. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 278,631, Jun. 29, 1981, abandoned. This application Oct. 22, 1987, Ser. No. 111,298
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—321.8 **20 Claims**

1. Apparatus for removing selected antigens from a physiological fluid comprising an anisotropic membrane surface of the type having a retentive skin side and a porous substrate exterior side and forming a diffusion barrier permeable to water and said selected antigens but substantially impermeable to formed elements of blood, a flow path forming means for directing said fluid to flow in contact with the retentive skin side of said membrane; pump means to move said blood along said flow-path, said pump means being the only blood-moving means of said apparatus; a closed, constant-volume compart-

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ment enclosing the exterior of said membranes; and an immunoreactive scavenging agent effective to scavenge predetermined antigens from said blood immobilized on the porous substrate side of said anisotropic membrane.



4,787,975

DISPOSABLE CARTRIDGES FOR CENTRIFUGAL SEPARATORS

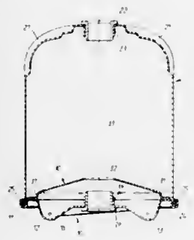
Ronald J. Purvey, Devon, England, assignor to AE PLC, Rugby, England

Filed Feb. 27, 1986, Ser. No. 833,592

Claims priority, application United Kingdom, Feb. 27, 1985, 8504880

Int. Cl.⁴ B04B *9/06*

U.S. Cl. 210—360.1 **13 Claims**



1. A disposable cartridge for a centrifugal separator for cleaning fuel or lubricating oil; said cartridge comprising a cover member, an inner flow directing and debris-retaining member, a base member, two bearings, one each associated with said cover member and said base member and wherein said base member is a sheet metal pressing having at least two nozzles therein and through which oil leaves said cartridge in a direction so as to produce a reaction force to spin said cartridge, said nozzles being provided in recesses in said base member, said recesses being in the form of smoothly-contoured circumferentially extending troughs of gradually deepening section starting with minimum depth at the beginning of the trough remote from said nozzle and finishing with maximum depth near to the plane in which said nozzle lies, and the minimum depth beginning of each trough lying closely adjacent the maximum depth nozzle area of an adjacent trough such that the troughs extend over approximately 360°.

4,787,976

NON-ADSORPTIVE, SEMIPERMEABLE FILTRATION MEMBRANE

Marc E. Parham, Sharon, and Karen E. Milligan, Lowell, both of Mass., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,008

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—500.23 **41 Claims**

1. A self-supported substantially protein non-adsorptive, semipermeable filtration membrane consisting essentially of an interpenetrating polymer network prepared from a casting solution comprising (i) an isocyanate capped urethane prepolymer polymerizable upon contact with a coagulating liquid, (ii) a polymer that will not react readily with the prepolymer and that is substantially insoluble in said coagulating liquid, said polymer selected from the group acrylonitrile-vinyl chloride copolymer, polysulfone and cellulose acetate, and (iii) solvent.

4,787,977

BLOOD-PURIFYING MEMBRANE

Hiroo Nakano, Nobeoka; Kazushige Seita, Tokyo; Kazuo Imamura, and Tetsuo Watanabe, both of Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 14, 1985, Ser. No. 797,973

Int. Cl.⁴ A61M *1/34;* **B01D** *13/01*

U.S. Cl. 210—500.23 **13 Claims**

1. A blood-purifying regenerated cellulose membrane which comprises a membrane composed of regenerated cellulose, a blood-contacting surface of said membrane being coated with a polymeric substance comprising as one component units derived from one or more basic vinyl monomers having a side chain containing an amino group.

4,787,978

METHOD FOR THE PURIFICATION OF WASTE WATER, NOTABLY OF URBAN WASTE WATER

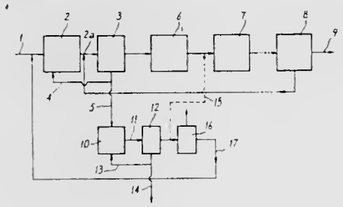
Roger Nicol, Issy Les Moulineaux, France, assignor to Degremont, S.A., Rueil-Malmaison Cedex, France

Filed Jan. 28, 1987, Ser. No. 7,634

Claims priority, application France, Feb. 7, 1986, 86 01704

Int. Cl.⁴ C02F *3/30*

U.S. Cl. 210—605 **9 Claims**



1. A method for treating waste water comprising the steps of:

(a) introducing waste water into a single aeration basin with a high mass load, said aeration basin including a predetermined amount of purifying bacteria;

(b) purifying said waste water by allowing said waste water to dwell in said single aeration basin for a predetermined period of time, thereby allowing said purifying bacteria to react with carbonated pollutants present in said waste water;

(c) separating the purified water obtained in step (b) into a slurry and a liquid portion by discharging the purified water into a clarifier-thickener apparatus;

(d) recycling a first portion of said slurry in said single aeration basin and supplying a second portion of said slurry to a hydrolysis reactor for a biological treatment, said second portion comprising a fermentable portion and a non-fermentable portion;

(e) liquifying said fermentable portion of said second portion of said slurry in said hydrolysis reactor;

(f) separating the liquified slurry obtained in step (e) into

(I) a dry portion, said dry portion including said non-fermentable portion; and

(II) a residual liquid; and

(g) methanizing a first portion of said residual liquid in an apparatus including an anaerobic fluidized bed.

4,787,979

LIQUID-LIQUID EXTRACTION PROCESS

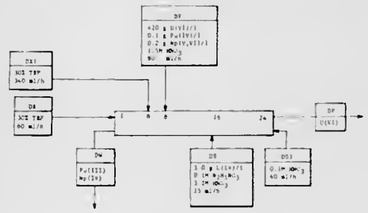
Zdenek Kolarik, Karlsruhe; Ulrich Galla, Neuthard, and Klaus Roth, Bad Königshofen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 16, 1986, Ser. No. 942,401

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546128

Int. Cl.⁴ B01D *11/04*

U.S. Cl. 210—634 **20 Claims**



1. In a liquid-liquid two-phase extraction process including the steps of

introducing into an intermediate stage of a multistage extraction apparatus a feed solution comprised of water and one or more valuable material to be recovered by extraction, which feed solution contributes to an aqueous phase of the two-phase extraction process and which multistage extraction apparatus has a first end and a second end;

introducing into the first end of the multistage extraction apparatus an organic extractant comprised of an organic solvent, which organic extractant flows though the multistage extraction apparatus in a first direction and contributes to an organic phase of the two-phase extraction process;

contacting the feed solution and the organic extractant to transfer by extraction the one or more valuable material from the feed solution into the organic extractant to provide a charged organic phase;

introducing into the second end of the multistage extraction apparatus at least one aqueous extractant comprised of water for washing the charged organic phase to provide a washed organic phase comprised of one of said one or more valuable material, which at least one aqueous extractant flows through the multistate extraction apparatus in a second direction, which second direction is countercurrent to the first direction, and contributes to the aqueous phase, the improvement comprising:

dividing the organic extractant into at least two organic extractant streams prior to introducing the organic extractant into the multistage extraction apparatus; and

introducing each of the at least two organic extractant streams into the multistage extraction apparatus at different stages, which different stages are both ahead of, with respect to the first direction, the intermediate stage at which the feed solution is introduced.

4,787,980

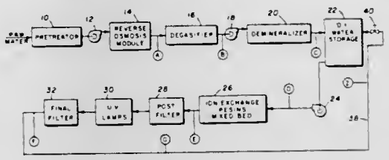
ULTRA PURE WATER SYSTEM MONITORING

Arthur J. Ackermann, Kirkwood, and Robert A. Craven, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 1, 1986, Ser. No. 914,093

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—638 **23 Claims**



1. A method of continuously sampling one or more points in a fluid purification system and/or in a distribution system loop for using the purified fluid and analyzing each sample for one or more characterizations comprising continuously feeding each sample stream to a multiplex unit and manipulating said multiplex unit to direct each continuous sample stream to the desired analytical instrument for analysis, or to a drain or recycled to the fluid purification system.

4,787,981

PROCESS FOR PURIFICATION OF CRUDE GLYCERIDE OIL COMPOSITIONS

Seiichi Tanahashi; Kaoru Nagano; Massaki Kasai; Fujihiko Tsubone, all of Aichi; Akio Iwama, Osaka; Yoshitaka Kazuse, Osaka; Kentaro Tasaka, Osaka, and Yutaka Isooka, Osaka, all of Japan, assignors to Pinoru Oil Mills Co., Tokyo and Nitto Electric Industrial Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 695,134, Jan. 25, 1985, abandoned, which is a continuation of Ser. No. 493,190, May 10, 1983, abandoned. This application Nov. 10, 1986, Ser. No. 928,585

Claims priority, application Japan, May 10, 1982, 58-77748

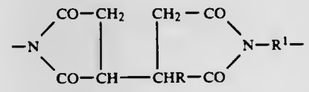
Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—639 **13 Claims**

1. A process for purification of crude glyceride oil compositions comprising:

(A) diluting a crude glyceride oil composition containing gum material and wax as main components of impurities, with an organic solvent,

(B) bringing the diluted crude glyceride oil composition into contact with a semipermeable membrane having a molecular weight cut-off value of 10,000–20,000, comprising polyimide consisting essentially of a repeating unit represented by the general formula:



wherein R^1 represents a divalent organic group, under pressure to obtain a semipermeable membrane permeable liquid in which the gum material in the glyceride oil after removal of said organic solvent is 100 ppm or less, and subjecting the semipermeable membrane permeable liquid to acid treatment by adding at least one kind of acid or salt thereof selected from the group consisting of oxalic acid, citric acid, acetic acid, glacial acetic acid, phosphoric acid, sodium phosphate, sodium polyphosphate and sulfuric acid, wherein the amount of the acid added is 0.001 to 0.5% by weight based on the weight of the glyceride oil,

(C) carrying out bleaching of the glyceride oil obtained from said semipermeable membrane permeable liquid with at least one kind of an adsorbent selected from the group

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consisting of clay, activated clay, activated carbon and bone black, wherein the adsorption treatment is carried out by dispersing the adsorbant in the degummed oil and heating to a temperature of 80° to 120° C. for five to sixty minutes with stirring under a reduced pressure of 1 to 200 mm Hg abs, and then

(D) carrying out deodorizing to obtain a purified glyceride oil wherein the deodorizing is carried out by stripping the glyceride oil with sparge steam in an amount of 2 to 20% by weight based on the weight of the glyceride oil at a temperature of 240° to 270° C. under a reduced pressure of 1 to 10 mm Hg abs,

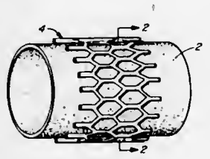
wherein the cut-off value is a minimum molecular weight of a polyethylene glycol having a removal rate of at least 95%, as measured using toluene solutions of polyethyleneglycols having different average molecular weights at a temperature of 25° C. and a pressure of 3 kg/cm^2.

4,787,982

MEMBRANE SEPARATION APPARATUS AND METHOD

Ricardo F. Caro, 1515 NW. 13th St., Corvallis, Oreg. 97330, and Robert J. Salter, 30636 Peterson Rd., Corvallis, Oreg. 97333

Filed Dec. 9, 1986, Ser. No. 939,699
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—641 **10 Claims**



9. Membrane separation apparatus for separating from one another components of different molecular weights carried by fluids, said apparatus comprising a series of sequentially adjoining chambers, through each of which fluid can flow, each chamber being separated from each adjoining chamber by a semipermeable membrane,

reinforcing means made of supple, soft material and provided with interstices engaging said membrane to restrain said membrane against rupture when said membrane is subjected to transmembrane pressure substantially less than the minimum at which any significant ultrafiltration occurs with said membrane but sufficient to bulge said membrane into said interstices to a distance equal to at least the thickness of the elements of said material bounding the interstices,

said membrane forming a barrier common to the two adjoining chambers which can be contacted on one of its surfaces by fluid in one of the two adjoining chambers and can be contacted on the other of its surfaces by fluid in the other of said two adjoining chambers,

any two membrane barrier that serve as two separate boundaries for the same chamber constituting a pair of adjacent membrane barriers,

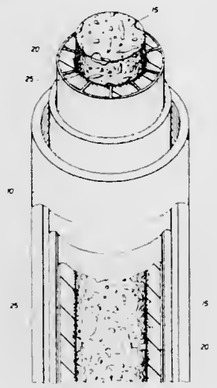
and each membrane barrier of at least one pair of adjacent membrane barriers having a molecular weight cutoff value different from that of the other membrane barrier of said pair.

4,787,983

METHOD FOR DETERMINING THE AMOUNT OF OIL IN A SPONGE CORE

Rocco DiFoggio; William E. Ellington, and Kailash C. B. Dangayach, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 814,334, Dec. 27, 1985, abandoned. This application Nov. 17, 1987, Ser. No. 122,622
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—656 **15 Claims**



15. For use in determining the oil saturation of an earth formation by means of sponge coring, a method for extracting oil from the sponge without substantially affecting the sponge, comprising:

(a) extracting the oil from the sponge by dissolving the oil in a predetermined quantity of a solvent selected from the group consisting of cycloalkanes, ethers, and freons, and

(b) determining the amount of oil dissolved into the solvent by:

(i) preparing a standard solution of oil in another quantity of the selected solvent, and

(ii) comparing the concentration of the oil extracted from the sponge in the predetermined quantity of solvent with the concentration of the oil in the standard solution, using supercritical fluid chromatography to determine the concentrations of the oil.

4,787,984

CLEANING COMPOSITION AND ITS METHOD OF USE

Richard S. Hutchings, Cincinnati, Ohio, and Carey B. Bottom, Overland Park, Kans., assignors to The Drackett Company, Cincinnati, Ohio

Filed Jun. 8, 1987, Ser. No. 59,352
Int. Cl.[4] C02F *5/10*
U.S. Cl. 210—698 **18 Claims**

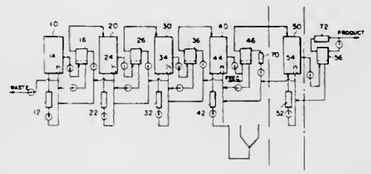
1. A method of treating a water-containing reservoir, the water in the reservoir containing a staining concentration of heavy metal ions, the method comprising the step of administering to the reservoir a water-dissipatable polyester polymer which is the reaction product of (a) a difunctional dicarboxylic acid, (b) a difunctional sulfomonomer, and (c) a glycol or a glycol and diamine mixture, the polyester having an inherent viscosity of at least 0.1, the polyester in the reservoir being in a concentration effective to capture said heavy metal ions, whereby the staining of the reservoir is inhibited.

4,787,985

MULTI-STAGE PURIFICATION UNIT PROCESS

Jacobus P. Roodenrijs, St. Michielsgestel, and Wilhelmus H. J. M. Van Pelt, Liempde, both of Netherlands, assignors to Grenco Process Technology B.V., Hertogenbosen, Netherlands

Filed Aug. 25, 1987, Ser. No. 89,160
Int. Cl.[4] B01D *9/04*
U.S. Cl. 210—772 **17 Claims**



1. A processing unit for the continuous purification of chemicals comprising,

(a) a purification section comprised of a first wash column having a feed inlet and at least one stage, said stage comprised of,

(i) a second wash column,

(ii) a recrystallizer intermediate said wash columns,

(iii) at least one filter associated with said recrystallizer, and

(iv) at least one crystallizer for forming crystals to be fed to said recrystallizer,

(b) a recovery section comprised of a plurality of stages, each stage except the stage adjacent said first wash column comprised of,

(i) a recrystallizer,

(ii) at least one filter associated with said recrystallizer,

(iii) at least one crystallizer for forming crystals to be fed to said recrystallizer, and

(iv) a thickener for concentrating the crystals removed from said recrystallizer, and

(c) said stage adjacent said wash column comprised of,

(i) a recrystallizer,

(ii) at least one filter associated with said recrystallizer, and

(iii) at least one crystallizer for forming crystals to be fed to said recrystallizer.

4,787,986

PROCESS AND APPARATUS FOR MELTING SILICON POWDER

Josef Dietl, Neuötting, and Jörg Kotilge, Mehring-Öd, both of Fed. Rep. of Germany, assignors to Heliotronic Forschungs- und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,960
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629231
Int. Cl.[4] B01D *17/00*
U.S. Cl. 210—773 **9 Claims**

1. A hollow melting crucible for melting silicon powder, the crucible having a base and generally vertically extending side walls, comprising:

a melting zone adjacent the base; and

an outlet aperture formed in the base of the crucible and having an inlet located at a predetermined height above the base including means for enabling molten silicon in said melting zone to be maintained at a constant minimum height sufficient to preclude oxide formation in said molten silicon.

4. A process of melting silicon powder charged into a melting crucible comprising the steps of:

placing a silicon powder bed in the melting crucible;

forming a pool of molten silicon within said powder bed by melting a part of said powder bed so that a pool of molten silicon within said powder bed and providing an incipient melting zone which in turn is covered by a zone of silicon powder;

maintaining a minimum height of said pool of molten silicon in the melting crucible sufficient to preclude oxide formation in said molten silicon by drawing off the amount of melt exceeding this minimum height and being produced in the incipient melting zone; and

maintaining a zone of silicon powder covering the incipient melting zone by adding silicon powder onto the zone of silicon powder.

4,787,987

FILTER APPARATUS AND METHOD

Clifford J. Hensley, P.O. Box 6847, Odessa, Tex. 79762

Filed Jan. 9, 1987, Ser. No. 1,912
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—792 **24 Claims**

1. Method of removing suspended contaminants from a liquid comprising the steps of:

(1) arranging a screen means within the interior of a vessel to divide the vessel into chambers;

(2) partially filling the interior of the vessel with a filter media which is located upstream of said screen means; said media being made of individual pieces of filter material having an average size which is greater than the size of the openings in said screen means;

(3) carrying out a filtration step by flowing liquid containing suspended contaminants therein into the upper end of the vessel and forcing the liquid to flow through the media, through the screen means, and then away from the vessel, thereby removing a significant quantity of the contaminants from the liquid and depositing the removed contaminants onto the media;

(4) carrying out a fluidization step by discontinuing step (3) and then scrubbing a substantial quantity of the deposited contaminants from the media by flowing a relatively large stream of the liquid contained within the vessel along a flow path within the vessel to cause the media to become fluidized and suspended within the liquid, and which thereby transfers the contaminants from the media into the liquid;

(5) carrying out a discharge step by flowing the contaminants laden liquid through said screen means and along the same flow path followed during step (3) while circulating relatively clean liquid through the vessel;

(6) setting the scrubbed media to the location upstream of the screen means;

(7) normalizing the filter bed by circulating relatively clean liquid through the vessel;

(8) and than resuming the filterng operation of step (3).

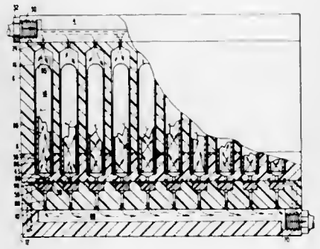
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4,787,988

CELL HARVESTER

Joseph Bertoncini, Gaithersburg, and William J. Kinnier, Timmonium, both of Md., assignors to Biomedical Research and Development Laboratories, Inc., Gaithersburg, Md.

Filed Feb. 20, 1987, Ser. No. 17,095
Int. Cl.[4] B01D *29/00*
U.S. Cl. 210—808 **28 Claims**



1. A method for the simultaneous filtering of the contents in a plurality of sample containers using a device comprising:
(a) a support means having a bottom side and means defining a plurality of vertical barrels having a bottom portion, said support means further including means defining a passage from said bottom portion to an inlet means;
(b) first manifold means complementary with said support means and barrels to define a plurality of enclosed chambers, said first manifold means including means to define a plurality of first passages extending through said first manifold and in communication with said chambers;
(c) means for forming a substantially tight seal around said barrels between said first manifold means and support means to define a plurality of sealed chambers;
(d) second manifold means complementary with said first manifold means and having means defining a plurality of second passages complementary with said first passages;
(e) means for forming a substantially tight seal between said first and second manifold means around said first and second passage;
(f) said method including the steps of inserting filter means between said first and second manifold means;
(g) positioning at least one sample container in said barrels;
(h) positioning and clamping said first and second manifold means onto said support means;
(i) applying a vacuum to said second passage;
(j) inverting said device including filter means;
(k) collecting solids of said sample container onto said inverted filter means; and
(l) removing said filter means.

4,787,989

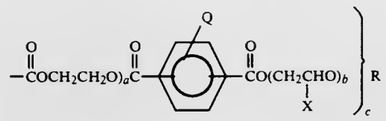
ANIONIC SOIL RELEASE COMPOSITIONS

Joseph J. Fanelli, Alpharetta; Randy L. Rayborn, Winder; Donald Jenkins, Duluth, and Anthony J. O'Lenick, Jr., Lilburn, all of Ga., assignors to GAF Corporation, Wayne, N.J.

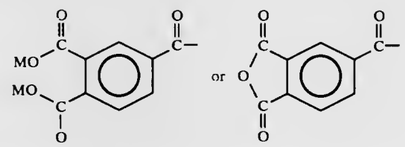
Filed Jan. 13, 1988, Ser. No. 143,581
Int. Cl.[4] D06M *00/00;* **C11D** *3/37, 1/00*
U.S. Cl. 252—8.6 **12 Claims**

1. A detergent composition comprising a surfactant and an effective soil releasing amount of a compound having the formula





wherein
R is



Q is selected from the group consisting of H and SO_3Na
X is H or CH_3
a is an integer from 1-5
b is an integer from 1-200
c is an integer from 1-50
M is selected from the group consisting of Na, H, K, Li and NH_4.

4,787,990

LOW TOXICITY OIL-BASED DRILLING FLUID

Phillip A. Boyd, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Feb. 4, 1983, Ser. No. 463,779
Int. Cl.[4] C09K *7/06, 7/02*
U.S. Cl. 252—8.511 **7 Claims**

1. A drilling fluid for use in rotary drilling of earthen formations consisting essentially of at least one drilling fluid additive selected from the group consisting of emulsifiers, viscosifiers, alkalinity control agents, filtration control reagents, weighting agents, brine, and wetting agents and further including a low polynuclear aromatic oil consisting essentially of 95 to 99% by weight branched-and cyclic-paraffins having 11 to 17 carbon atoms per molecule, said low polynuclear aromatic oil containing less than about 1% by weight aromatic hydrocarbons and less than about 5% by weight normal paraffins.

4,787,991

RESIN COMPOSITION HAVING LUBRICATING PROPERTIES

Mituharu Morozumi, Yokohama, and Masaki Egami, Yokkaichi, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,389
Claims priority, application Japan, Oct. 18, 1985, 60-230955
Int. Cl.[4] C10M *139/04, 155/02*
U.S. Cl. 252—12.4 **19 Claims**

1. A resin composition having lubricating properties, which comprises:
(i) 100 parts by weight of a synthetic resin,
(ii) from 0.5 to 20.0 parts by weight of an organopolysiloxane, and
(iii) from 0.5 to 20.0 parts by weight of a fluorine-containing elastomer or from 0.05 to 7.0 parts by weight of an alkoxysilane,

wherein at least one of said organopolysiloxane, fluorine-containing elastomer and alkoxysilane has a functional group, and wherein said organopolysiloxane's functional group is a functional group selected from the group consisting of amino groups, glycidyl groups, carboxyl groups and alcoholic hydroxyl groups, said fluorine-containing elastomer's functional group is a glycidyl group and said alkoxysilane's functional group is a glycidoxy group.

4,787,992

CALCIUM SOAP THICKENED FRONT-WHEEL DRIVE GREASE

John A. Waynick, Bolingbrook, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 830,710, Feb. 18, 1986, abandoned. This application May 22, 1987, Ser. No. 53,262
Int. Cl.[4] C10M *125/00, 135/10*
U.S. Cl. 252—18 **8 Claims**

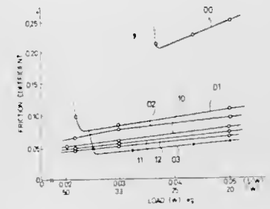
1. A lubricating grease, comprising:
a substantial proportion of a base oil;
a calcium-containing thickener comprising a calcium soap selected from the group consisting of simple calcium soap and calcium complex soap; and
a combined carbonate and phosphate additive package comprising both a carbonate and a phosphate in the absence of sulfur-containing compounds comprising arylene sulfide polymers, said carbonate selected from the group consisting of a carbonate of a Group 2a alkaline earth metal and a carbonate of a Group 1a alkali metal, and said phosphate selected from the group consisting of a phosphate of a Group 2a alkaline earth metal and a phosphate of a group 1a alkali metal;
said alkaline earth metal selected from the group consisting of beryllium, magnesium, calcium, strontium, and barium;
said alkali metal selected from the group consisting of lithium, sodium, and potassium; and
said carbonate interacting with said phosphate in said calcium-containing thickener in the absence of an arylene sulfide polymer for substantially enhancing the performance of said grease.

4,787,993

LUBRICANT

Taizo Nagahiro, Yokobama, Japan, assignor to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,217
Claims priority, application Japan, Jul. 17, 1986, 61-166576; Nov. 28, 1986, 61-282052
Int. Cl.[4] C10M *125/22, 125/26*
U.S. Cl. 252—18 **4 Claims**



1. A lubricant which comprises dispersing 0.001-50% by weight of at least one finely powdered resin selected from the group consisting of polyphenylene sulfides, polycarbonates, polysulfones, polyetherimides, polyether ketones, polyetherether ketones, polyether sulfones and polyarylates into fluids fats and oils.

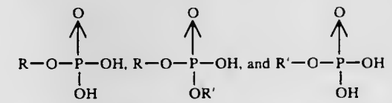
4,787,994

METHOD FOR PREPARATION OF HYDROCARBON FRACTURING FLUIDS, FLUIDS PREPARED THEREBY, AND METHODS RELATED THERETO

Michael A. Thorne, Kirkwood, and Gary A. Scherubel, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Apr. 11, 1988, Ser. No. 179,921
Int. Cl.[4] C10M *137/04*
U.S. Cl. 252—32.5 **19 Claims**

1. A method for viscosifying a liquid hydrocarbon-based fracturing fluid, comprising mixing together a liquid hydrocarbon, an acid, a phosphate composition and an aluminate activator, the phosphate composition comprising an organic phosphate ester selected from the group consisting of orthophosphate esters of the formulae



wherein R is an alkyi group containing one to about eight carbon atoms and R' is selected from the group consisting of alkyl groups containing about six to about eighteen carbon atoms, alkenyl groups containing about six to about eighteen carbon atoms and mixtures thereof.

4,787,995

LANOLIN CONTAINING METALWORKING FLUIDS AND CONCENTRATES

Daniel R. Nichols, Milwaukee County, and Curtis R. Petersen, Racine County, both of Wis., assignors to Chem-Trend, Incorporated, Howell, Mich.

Continuation of Ser. No. 730,020, May 3, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 13,230
Int. Cl.[4] C10M *173/00*
U.S. Cl. 252—49.5 **11 Claims**

1. In a metalworking operation in which a metalworking fluid that carries a lubricant in aqueous solution is continuously circulated over the metal involved to continuously impart both lubricity and cooling to the operation, the improvement for maintaining substantial stability of the fluid by preventing any appreciable formation of insolubles and their attendant deposition onto the metal, including the maintenance of substantial stability both in hard water and at extended aqueous dilutions, which comprises: formulating said fluid as a wax-free lanolin emulsion that in concentrated form before any dilution consists essentially of anhydrous lanolin in an amount from about 3% to about 12% by weight, fatty acid from about 0.15 to about 6 parts by weight per each part lanolin, at least one amine in an amount from about 0.12 to about 1.5 parts by weight per part fatty acid; and non-ionic surfactant in an amount from about 0.25 to about 2 parts by weight per each part lanolin and selected from the group consisting of alkylene oxide-treated phenols, alcohols, esters, amines, amides, fatty acids and mixtures thereof, and the balance being water.

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MANNICH BASE OIL ADDITIVES

Andrew G. Horodysky, Cherry Hill, and Robert M. Gemmill, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 868,181, May 21, 1986, abandoned, which is a continuation of Ser. No. 705,867, Feb. 28, 1985, abandoned, which is a continuation of Ser. No. 485,525, Apr. 15, 1983, abandoned, which is a division of Ser. No. 329,773, Dec. 11, 1981, abandoned. This application Apr. 14, 1987, Ser. No. 38,468

The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.

Int. Cl.[4] C10M *133/00*

U.S. Cl. 252—51.5 R 16 Claims

1. A method for reducing the coefficient of friction of a liquid lubricating oil which comprises adding to such an oil a coefficient of friction-reducing amount of the product resulting from reacting

an aldehyde;

at least one amine selected from the group consisting of primary amines containing from 8 to 18 carbon atoms and polyalkylenepolyamines of the formula

$$NHX(R^4NH)_nR^2$$

wherein R^2 and X are selected from the group consisting of hydrogen, a hydrocarbyl group and a hydroxyhydrocarbyl group,

either containing 6 to 18 carbon atoms, R^4 is an alkylene group containing 1 to 5 carbon atoms and n is 1 to 10; and,

at least one alkyl-substituted phenol wherein the alkyl is branched, contains from 16 to 40 carbon atoms and is derived from a 1-olefin oligomer containing from 8 to 12 carbon atoms,

the reaction being carried out from about 60° C. to about 130° C. using the reactants in a respective molar ratio of 1.0–2.0:1.0–2.0:1.0.

9. A liquid lubricating oil composition which comprises a liquid lubricating oil and a coefficient of friction-reducing amount of the product resulting from reacting

an aldehyde;

at least one amine selected from the group consisting of primary amines containing from 8 to 18 carbon atoms and polyalkylenepolyamines of the formula

$$NHX(R^4NH)_nR^2$$

wherein R^2 and X are selected from the group consisting of hydrogen, a hydrocarbyl group and a hydroxyhydrocarbyl group,

either containing 6 to 18 carbon atoms, R^4 is an alkylene group containing 1 to 5 carbon atoms and n is 1 to 10; and,

at least one alkyl-substituted phenol wherein the alkyl is branched, contains from 16 to 40 carbon atoms and is derived from a 1-olefin oligomer containing from 8 to 12 carbon atoms,

the reaction being carried out from about 60° C. to about 130° C. using the reactants in a respective molar ratio of 1.0–2.0:1.0–2.0:1.0.

4,787,997

ETCHING SOLUTION FOR EVALUATING CRYSTAL FAULTS

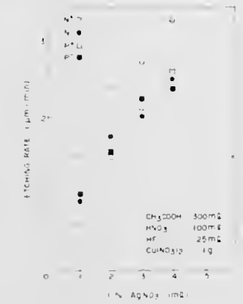
Yoshihiko Saito, Yokosuka, and Yoshiaki Matsushita, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 163,033

Claims priority, application Japan, Mar. 4, 1987, 62-49042

Int. Cl.[4] H01L *21/306;* B44C *1/22*

U.S. Cl. 252—79.4 2 Claims



1. An etching solution for evaluating crystal defects of a silicon wafer, comprising: acetic acid, hydrofluoric acid, nitric acid, silver nitrate, and copper nitrate.

4,787,998

FRAGRANT LIQUID CLEANING COMPOSITION

George K. Rennie, and Paul D. Hardman, both of Bebington, Great Britain, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 772,289, Sep. 4, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 28,030

Claims priority, application United Kingdom, Sep. 5, 1984, 8422372

Int. Cl.[4] C11D *3/50*

U.S. Cl. 252—174.11 7 Claims

1. A fragrant aqueous liquid cleaning composition comprising from 0.05–20% by weight of one or more surface-active detergents, from 0.1–1.5% by weight of one or more perfumes, from about 0–0.5% by weight of a builder, greater than 75% water and from 0.1–3% by weight of one or more polymers in an aqueous medium, wherein the polymer is an acrylic copolymer that is shear thinning, having a viscosity, at 25° C. in deionised water at a concentration of 3% by weight or less, of between 0.3 and 0.006 Pa.s at a shear rate of 2000 sec^{-1}, of between 0.7 and 0.03 Pa.s at a shear rate of 30 sec^{-1}, and of between 0.6 and 50 Pa.s at a shear rate of 0.5 sec^{-1}.

4,787,999

COMPOSITIONS FOR CLEANING ALUMINUM

John A. Dingess, 540-F W. Lodge Trail, Wheeling, Ill. 60090

Filed Sep. 22, 1986, Ser. No. 910,873

Int. Cl.[4] C11D *7/06, 7/26, 7/60*

U.S. Cl. 252—174.17 7 Claims

1. An aluminum cleaning composition comprising, in combination, from about 0.6 to 3.3 parts by weight of a strong alkali metal hydroxide, from about 0.08 to about 0.18% of calcium ion from a calcium ion donor, from about 0.2 to about 3.0 parts by weight of sucrose, from about 0.5 to about 1.5 parts by weight of a citrate ion from sodium citrate, and up to about 5% of an organic antifoaming agent, with the balance being water.

4,788,000

LIQUID-CRYSTAL COMPOSITION

Yutaka Ishii, Nara; Fumiaki Funada, Yamatokoriyama, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan and Merck Patent Gesellschaft met beschrankter haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 642,775, Aug. 21, 1984, Pat. No. 4,643,841, and a continuation-in-part of Ser. No. 834,357, Feb. 28, 1986, Pat. No. 4,722,804, which is a continuation of Ser. No. 614,013, May 25, 1984, abandoned. This application Aug. 15, 1986, Ser. No. 896,502

Claims priority, application Japan, May 26, 1983, 58-93812; Aug. 30, 1983, 58-158510

The portion of the term of this patent subsequent to Feb. 17, 2004, has been disclaimed.

Int. Cl.[4] G02F *1/13;* C09K *19/34*

U.S. Cl. 252—299.61 20 Claims

1. In a liquid crystal display device of the matrix display type having a high contrast ratio and a broad effective viewing-angle range, which contains a liquid crystal composition having a positive dielectric anisotropy in the nematic phase, said composition comprising 3 wt.% or more of 2-(4-alkoxyphenyl)-5-alkylpyrimidine compounds and a p-type component comprising cyanobiphenyl compounds selected from the group consisting of a 4-alkyl-4'-cyanobiphenyl, a 4-alkoxy-4'-cyanobiphenyl, a 4-alkoxy-ethyleneoxy-4'-cyanobiphenyl, and a 4-cyano-4'-(4-alkyl)-cyclohexylbiphenyl, the improvement comprising said composition further including a low-viscosity material having a viscosity (η) at 20° of 20 $mm^2.s^{-1}$ or lower and a high clearing-point material having a clearing point (T_{cp}) of 100° C. or higher, each of said materials being present in an effective amount so that the clearing point of the composition is 60° C. or higher and the viscosity at 20° C. is 35 $mm^2.s^{-1}$ or lower.

4,788,001

OIL-IN-WATER EMULSION

Dipak Narula, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 718,974, Apr. 2, 1985, abandoned. This application Sep. 26, 1986, Ser. No. 912,020

Int. Cl.[4] B01J *13/00;* C09K *3/00*

U.S. Cl. 252—312 23 Claims

1. An oil-in-water emulsion composition consisting essentially of 100 parts by weight of a water-insoluble oil, at least 0.05 millimol of a nonionic tertiary surfactant having an HLB number of at least 16, at least 3 millimols of a nonionic primary surfactant having an HLB number of from 13 to 15, from 1 to 5 millimols, per millimol of said primary surfactant, of a nonionic secondary surfactant having an HLB number of from 7 to 9, and at least 10 parts by weight of water.

4,788,002

SOLVENT CEMENT

Lloyd H. King, Sr., 5222 Green Farms Rd., Edina, Minn. 55436

Division of Ser. No. 822,861, Jan. 27, 1986, Pat. No. 4,687,798. This application Jul. 1, 1987, Ser. No. 48,833

Int. Cl.[4] B01F *1/00*

U.S. Cl. 252—364 1 Claim

1. A solvent cement for joining insoluble water polymers wherein the solvent cement exceeds the standard specified in ASTM Bulletin D-2564-80, consisting of a solution of a solvent of ethyl acetate and N-methyl-2-pyrrolidone and wherein the ethyl acetate ranges from a minimum of approximately 3% to a maximum of about 90%, with the balance N-methyl-2-pyrrolidone.

4,788,003

PARTIAL OXIDATION OF ASH-CONTAINING LIQUID HYDROCARBONACEOUS AND SOLID CARBONACEOUS

Mitri S. Najjar, Hopewell Junction, N.Y.; John Stevenson, Gardena, and Michael W. Becker, Westminster, both of Calif., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 749,375, Jun. 27, 1985, Pat. No. 4,668,428, and a continuation-in-part of Ser. No. 749,376, Jun. 27, 1985, Pat. No. 4,668,429. This application May 4, 1987, Ser. No. 45,632

Int. Cl.[4] C07C *3/36*

U.S. Cl. 252—373 28 Claims

1. A process for the production of gaseous mixtures comprising H_2+CO by the partial oxidation of a feedstock comprising a heavy liquid hydrocarbonaceous fuel having a nickel and vanadium-containing ash or petroleum coke having a nickel and vanadium-containing ash, or mixtures thereof; and said feedstock includes a minimum of 0.5 wt. % of sulfur; and said ash includes a minimum of 5.0 wt. % vanadium, a minimum 2.0 wt. % of nickel, and silicon said process comprising: (1) introducing an ash-removal agent into a reaction zone along with said feedstock; wherein the weight ratio of ash-removal agent to ash in the reaction zone in (2) is in the range of about 1.0–10.0 to 1.0; (2) reacting said mixture from (1) at a temperature in the range of 1700° F. to 3000° F. and above the slag fusion temperature, and a pressure in the range of about 5 to 250 atmospheres in said reaction zone comprising a down flowing unobstructed free-flow refractory lined partial oxidation reaction chamber with a free-oxygen containing gas in the presence of a temperature moderator and in a reducing atmosphere to produce a hot raw effluent gas stream comprising H_2+CO and entrained molten slag; and (3) removing sensible heat from said hot effluent gas stream from (2) by passing said effluent gas through a discharge outlet in the bottom of said reaction chamber and then through either (i) a steel quench ring and a vertical steel dip-tube into a body of quench liquid below, or through (ii) a steel tubular heat exchanger in indirect heat exchange with a coolant fluid or (iii) simultaneously through (i) and (ii); wherein the metal surfaces of said steel quench ring and tubular heat exchanger that were directly contacted by said entrained molten slag were protected with a metal and metal alloy, and said protective metal was selected from the group of metals consisting of aluminum and titanium and was electrodeposited at high temperature from a electrolytic bath of molten fluorides maintained in an inert atmosphere, and wherein the electrodeposited metal rapidly diffused into and formed an alloy of solid solution with the subsurface metal of said cooling means, wherein sticking and buildup of slag upon contacting said cooling means were substantially reduced.

4,788,004

CATALYTIC PROCESS

Alwyn Pinto, Middlesbrough; Peter J. Davidson, Darlington, and Antony P. J. Limbach, Stockton-on-Tees, all of England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 20, 1987, Ser. No. 52,004

Claims priority, application United Kingdom, May 27, 1986, 8612777; Apr. 13, 1987, 8708776

Int. Cl.[4] C01J *3/46*

U.S. Cl. 252—373 12 Claims

1. A method of start-up of a continuous process for the production of a gas stream containing hydrogen and carbon oxides wherein reactant streams including

(a) a stream containing a gaseous hydrocarbon, or hydrocarbon derivative, feedstock, and

(b) a stream containing an oxidant gas containing free oxygen,

are separately fed, at elevated pressure, to a burner where partial combustion takes place, and the combustion products

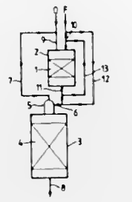
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are fed over a catalyst to bring the combustion products towards equilibrium, comprising

(i) producing a hot gas stream by effecting at least partial combustion of a stream of a gaseous combustible material and an oxidant gas containing free oxygen,

said hot gas stream being produced at least initially by catalytic combustion by passing said combustible material and said oxidant gas over a combustion catalyst;

(ii) heating at least one of the reactant streams, directly or



indirectly, with said hot gas stream to a temperature above the autoignition temperature of said reactants and feeding the reactants streams to said burner,

whereby autoignition of said reactant streams is effected to produce a flame at said burner and self-sustaining combustion of said feedstock is established; and thereafter

(iii) discontinuing the production of said hot gas stream while continuing feed of said reactant streams to the burner.

4,788,005

THICKENED AQUEOUS ABRASIVE CLEANSER EXHIBITING NO SYNERESIS

James M. Castro, Dublin, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed May 15, 1987, Ser. No. 50,838

Int. Cl.[4] C11D *3/065*

U.S. Cl. 252—539 **19 Claims**



1. A pourable thickened abrasive cleanser having a plastic rheology and substantially no syneresis comprising, in aqueous solution

(a) a particulate abrasive, present in a scouring-effective amount;

(b) a LAS surfactant, having an alkyl group of between about 8 and 18 carbons, and present in an amount of about 0.5 to 5 weight percent;

(c) a thickener, present in an amount of about 3 to 25 percent by weight, including $M_2O\ (SiO_2)_n$ wherein M is an alkali-metal and n is between 0.5 and 5, and a source of borate anion, the borate anion and $M_2O\ (SiO_2)_n$ being present in a ratio of about 1:5 to 4:1; and wherein

the cleanser has a composition pH of between about 9.0–11.5, a viscosity of between about 10,000 and 250,000 cP and a yield value of between about 1 to 80 Pa.

4,788,006

SHAMPOO COMPOSITIONS CONTAINING NONVOLATILE SILICONE AND XANTHAN GUM

Raymond E. Bolich, Jr., Maineville, and Theresa B. Williams, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 694,870, Jan. 25, 1985, abandoned. This application Jan. 30, 1986, Ser. No. 824,034

Int. Cl.[4] C11D *1/14, 3/22*

U.S. Cl. 252—550 **17 Claims**

1. A shampoo composition consisting essentially of:

(a) from about 5% to about 50% of synthetic anionic surfactant or mixtures thereof;

(b) from about 0.1% to about 10% of a dispersed, insoluble, nonvolatile silicone or mixtures thereof;

(c) from about 0.4% to about 5% of xanthan gum; and

(d) the remainder water.

4,788,007

OPHTHALMIC U.V. ABSORPTIVE EMOLLIENT

Neville A. Baron, 146 Sanpiper Key, Secaucus, N.J. 07094

Filed Nov. 28, 1986, Ser. No. 935,838

Int. Cl.[4] F21V *9/06*

U.S. Cl. 252—589 **11 Claims**

1. An ophthalmic aqueous gel for preventing UV-B and UV-C radiation from reaching the eye retina upon placement in the eye to establish a UV absorption spectrum equilibrium between the tear film and epithelium of the cornea of the eye, said gel comprising an aloe vera chromophore emollient gel present in amounts of from about 1% to about 8% by weight in said ophthalmic aqueous gel.

4,788,008

FLAME RETARDANT VINYLIDENE CHLORIDE LATEXES AND COATINGS THEREOF

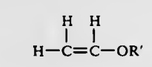
Terry C. Neubert, Kent, Ohio, assignor to GenCorp Inc., Akron, Ohio

Filed Apr. 6, 1987, Ser. No. 34,976

Int. Cl.[4] C09K *21/00*; C09D *5/16, 5/18*

U.S. Cl. 252—609 **11 Claims**

7. A flame retardant carboxylated vinylidene chloride type latex copolymer coating composition, comprising: a carboxylated vinylidene chloride latex copolymer, at least one flame retardant agent, and from about 0.1 to about 10 parts by weight per 100 parts by weight of said latex copolymer of an amine flexibilizing agent, said latex copolymer made from latex forming monomers containing from about 20% to about 80% by weight per 100 parts by weight of the total latex forming monomers of a vinylidene chloride monomer, from about 10% to about 80% by weight based upon the weight of all monomers forming said latex copolymer of a conjugated diene monomer having from 4 to 8 carbon atoms, from about 1% to about 60% by weight based upon the weight of all monomers forming said latex copolymer of a vinyl substituted aromatic monomer having from about 8 to about 12 carbon atoms, and from about 0.5% to about 10% by weight based upon the weight of all monomers forming said latex copolymer of a functional monomer, wherein said functional monomer is an acrylamide, a methacrylamide, or alkyl derivatives thereof having from 1 to 2 carbon atoms attached to the nitrogen atom or to the vinyl group, a vinyl ether having the formula



wherein R′ is an alkyl group having from 1 to 6 carbon atoms, or a substituted chloroalkyl group having from 1 to 6 carbon

atoms; or an unsaturated monocarboxylic acid or an unsaturated dicarboxylic acid having a total of from 3 to 8 carbon atoms,

wherein the amount of said flame retardant agent is from about 5 to about 150 parts by weight per 100 parts by weight of said latex copolymer of a halogenated paraffin wax having a molecular weight of from about 200 to about 2,000, optionally from about 5 to about 150 parts by weight per 100 parts by weight of said latex copolymer of a halogenated phosphate, optionally from about 10 parts by weight to about 500 parts by weight per 100 parts by weight of a metallic hydrate, optionally from about 5 to about 300 parts by weight per 100 parts by weight of said latex copolymer of a metal oxide, and

wherein said amine flexibilizing agent is a primary amine having from 0 to 30 carbon atoms, a secondary amine having from 1 to 30 carbon atoms, a tertiary amine having from 2 to 30 carbon atoms, a polyamine, or an amine alcohol having from 2 to 30 carbon atoms.

4,788,009

METHOD OF PREPARING ROSIN ESTERS OF IMPROVED THERMAL STABILITY WITH INORGANIC SALT OF PHOSPHOROUS OR HYPOPHOSPHOROUS ACID

Robert W. Johnson, Jr., Savannah, Ga., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 14, 1986, Ser. No. 931,532

Int. Cl.[4] C09F *1/00*

U.S. Cl. 260—104 **12 Claims**

1. A method of preparing a polyol ester of rosin, which comprises; esterifying the rosin with the polyol in the presence of a catalytic proportion of a catalyst compound selected from the group consisting of alkali metal salts of phosphorous acid, alkaline earth metal salts of phosphorous acid, alkali metal salts of hypophosphorous acid or alkaline earth metal salts of hypophosphorous acid.

4,788,010

AMINO SUBSTITUTED BENZENEPROPANOLS

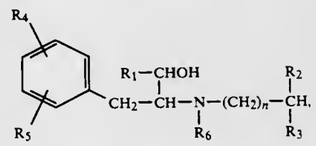
David M. Floyd, Pennington; Spencer D. Kimball, East Windsor, and Steven Brandt, Plainsboro, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 24, 1985, Ser. No. 726,549

Int. Cl.[4] C07C *91/16, 93/08*

U.S. Cl. 260—501.17 **12 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is hydrogen or alkyl;

R_2 and R_3 are each independently cycloalkyl;

R_4 and R_5 are the same or different and each is hydrogen, hydroxy, alkoxy, alkanoyl or alkyl;

R_6 is hydrogen or alkyl; and

n is 1, 2, 3 or 4.

4,788,011

PROCESS FOR THE PREPARATION OF CHEMICAL COMPOUNDS OBTAINED AS SOLIDS FROM LIQUID STARTING SUBSTANCES

Roland Busse, Leverkusen; Herbert Emde, Cologne; Friedrich Dürholz, Remscheid; Dietmar Mayer, Bergisch Gladbach, and Dorde Jovcic, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 643,900, Aug. 23, 1984, abandoned. This application Jul. 1, 1986, Ser. No. 880,623

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330445

Int. Cl.[4] C07C *143/52, 143/56, 143/24*

U.S. Cl. 260—507 R **13 Claims**

1. In a process for the preparation of solid salts of organic sulphonic acids by contacting a first reactant in liquid phase with a second reactant in liquid phase, the improvement wherein said first reactant is formed into a first spray cone in the form of a spiral thread, said second reactant is formed into a second spray cone in the form of a sprial thread said first spray cone is caused to penetrate said second spray cone and said second spray cone is caused to penetrate said first spray cone wherein said first spray cone in the form of a spiral thread and said second spray cone in the form of a spiral thread emanate in opposite directions from one another.

4,788,012

PROCESS FOR THE PREPARATION OF BENZYL TRIFLUOROMETHYL SULFIDE

Catherine Francese, L'Hay les Roses; Marc Tordeux, Sceaux, and Claude Wakselman, Paris, all of France, assignors to Rhone-Poulenc Chimie, Cedex, France

Filed May 21, 1987, Ser. No. 52,074

Claims priority, application France, May 28, 1986, 86 07854

Int. Cl.[4] C07C *143/70, 149/273*

U.S. Cl. 260—543 R **12 Claims**

11. A process for the preparation of trifluoromethane sulfonyl chloride comprising:

(1) contacting a benzyl thiocyanate and trifluoromethyl bromide with zinc in a solvent selected from the group consisting of a polar aprotic solvent, substituted pyridine and pyridine for a time sufficient to form a benzyl trifluoromethyl sulfide, and

(2) contacting the benzyl trifluoromethyl sulfide resulting from stage (1) with chlorine in water for a time sufficient to form trifluoromethane sulfonyl chloride.

4,788,013

FOUR-WAY AIRFLOW INDUCED DRAFT CROSSFLOW COOLING TOWER

Ohler L. Kinney, Jr., Leawood; James R. Jones, Shawnee; Mark A. Kauffmann, Merriam, and Paul W. Hink, Kansas City, all of Kans., assignors to The Marley Cooling Tower Company, Mission, Kans.

Filed May 11, 1987, Ser. No. 48,542

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—24 **16 Claims**

1. An induced draft, crossflow cooling tower comprising:

hot water distribution means presenting a horizontal flume for receiving incoming hot water to be cooled and having an outer, upstanding structural water retaining peripheral wall and a floor provided with a central, hot air discharge orifice;

common cold water collection basin means disposed beneath said distribution means;

four spaced upright fill structure sections interposed between said distribution means and said collection basin means for receiving hot water from said distribution means and for enabling gravitational passage of said water to said collection basin means therebelow,

each of said fill structure sections presenting an upright air

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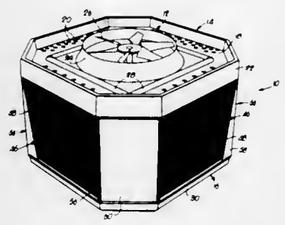
inlet face for admitting generally horizontal currents of air to a respective section of said fill structure in transverse flow relationship to said hot water gravitating therethrough,

each of said fill structure sections presenting an upright air outlet face for discharging air passing through the respective section,

said fill structure sections being disposed in a rectangular arrangement in horizontal sectional view with a first two of said sections being opposed and spaced from each other and the remaining two sections being located transversely between said first two sections in spaced, opposed relationship to each other,

said air outlet face of each of said fill structure sections being transversely oriented relative to the air outlet face of each adjacent fill structure section,

said air outlet faces facing inwardly of said tower and presenting a common, generally rectilinear plenum centrally disposed between said four fill structure sections for receiving generally horizontal currents of air simultaneously from all four of said fill structure sections and communicating with said orifice in the hot water distribution means;



fan means operable to pull cool air in through the fill structure sections and communicating with said plenum to discharge hot air in an upward direction out of said tower through said orifice in the floor of the hot water distribution means; and

transversely L-shaped air baffle corner structural supports carried by and extending upwardly from said cold water collection basin means to said hot water distribution means for supporting said hot water distribution means over said fill structure sections, each of said corner supports having a pair of upright, inwardly converging, angle-defining walls serving to carry respective fill structure sections between adjacent pairs of said air baffle supports, and located to substantially block inflow of ambient air between adjacent fill sections, and means joined to each pair of angle-defining walls preventing relative movement therebetween,

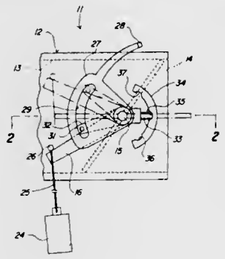
said air baffle corner supports, the hot water distribution means and the cold water collection basin means being constructed of corrosion resistant synthetic resin material.

4,788,014
AUTO-CHOKE DEVICE

Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 28, 1987, Ser. No. 55,453
Claims priority, application Japan, May 28, 1986, 61-121235
Int. Cl.⁴ F02M *1/10*
U.S. Cl. 261—39.2 **10 Claims**

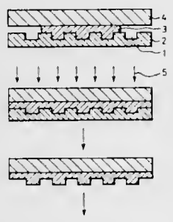
1. In an automatic choke for an internal combustion engine comprising a choke valve movable within an induction passage between an opened position and a closed position, biasing means for urging said choke valve to its opened position, an automatic actuator for applying a biasing force upon said choke valve in response to temperature variations for moving said choke valve to its closed position in opposition to the action of said biasing means, and a manual actuator operatively connected to said choke valve for operating said choke valve.



4,788,015
PROCESS FOR PREPARATION OF OPTICAL DISK SUBSTRATE

Kazunari Sakai, Chiba, and Yoshio Yokokawa, Sakura, both of Japan, assignors to Dainippon Ink and Chemical Inc., Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,412
Claims priority, application Japan, Dec. 23, 1986, 61-305446
Int. Cl.⁴ B29C *35/08, 43/20*; B29D *11/00*
U.S. Cl. 264—1.3 **5 Claims**

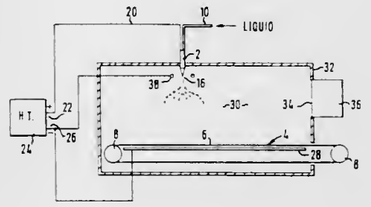


1. A process for the preparation of a substrate for an optical disk having spiral or concentric guide grooves formed on the surface thereof, which comprises steps of casting a radiation- and heat-curable liquid resin mixture between a duplicating mold and a transparent parent substrate, curing the liquid resin mixture by irradiating it with radiation from the side of the transparent substrate, peeling the molded body from the duplicating mold and heat-polymerizing the obtained molded body by heating, wherein a mixture comprising a liquid resin having a terminal acrylic group and/or a terminal methacrylic group and an organic peroxide is used as the radiation- and heat-curable liquid resin mixture.

4,788,016
APPARATUS AND PROCESS FOR PRODUCING POWDERS AND OTHER GRANULAR MATERIALS

Michael L. Colclough, Surrey, and Timothy J. Noakes, Hampshire, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 16, 1987, Ser. No. 62,653
Claims priority, applicatioo United Kingdom, Jun. 16, 1986, 8614566
Int. Cl.⁴ B29B *9/00*; B05B *5/02*
U.S. Cl. 264—10 **24 Claims**



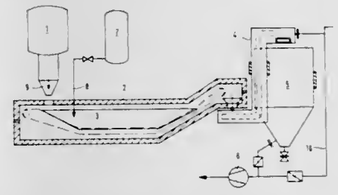
1. Apparatus for manufacturing powders or granular materials from liquids capable of quickly forming a coalescent resistant surface in a particular environment, comprising: an electrostatic spray head having a spraying site, an electrically conducting or semiconducting liquid contacting surface and means for delivering the said liquid to the spraying site a reference surface external to the sprayhead; high voltage supply means for charging the liquid contacting surface to said high voltage of one polarity relative to a reference surface, said voltage being sufficiently high and in combination the spraying site being sufficiently sharp, as to intensify the electric field strength at the spraying site sufficiently when covered, in use, by the liquid to be sprayed, that the liquid at the spraying site is drawn out preponderantly by electrostatic forces into a spray of at least one cone from which a corresponding ligament issues and breaks up into electrostatically charged droplets; means for providing said environment in a space sufficient that droplets from the spray head form, in flight, particles having a substantially coalescent resistant surface; and means for collecting the particles so formed.

14. A process for manufacturing powders or granular materials from liquids capable of forming a coalescent resistant surface in a particular environment, comprising: delivering said liquid to a spraying site of an electrostatic spray head; making electrical contact with said liquid via an electrically conducting or semiconducting liquid contacting surface; charging the liquid contacting surface to a high voltage of one polarity relative to a reference surface, to intensify the electric field strength at the spraying site sufficiently that the liquid at the spraying site is drawn out preponderantly by electrostatic forces into at least one cone from which a corresponding ligament issues and breaks up into a spray of electrostatically charged droplets; providing said environment in a space sufficient that droplets from the spray head form, in flight, particles having a substantially coalescent resistant surface; and collecting the particles so formed.

4,788,017
PROCESS FOR THE IMPROVEMENT OF THE HOMOGENEITY OF HIGHLY REACTIVE OF HIGHLY REACTIVE POLYCONDENSATES

Franz-Robert Schlomer, Dormagen; Wolfgang Volker, Tonisvorst; Hartwig Hupfer, Bargteheide; Karl E. Ott, and Bodo Muller, both of Hamburg, all of Fed. Rep. of Germany, assignors to Messer. Griesheim GmbH, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 89,837
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1986, 3630928
Int. Cl.⁴ B29C *35/16, 47/88*
U.S. Cl. 264—28 **9 Claims**



1. In a procedure for obtaining a product from highly reactive polycondensate including the steps of producing the polycondensates in batch operations in a reactor, extruding the polycondensates, cooling the extruded polycondensates by a coolant to the point of solidification, milling the cooled solidified polycondensates to obtain ground polycondensates, using the ground polycondensates as a binder for composite materials by mixture with the materials, and heating and hardening the mixture to obtain the final product, the improvement comprising cooling the extruded polycondensates by using a low-boiling, liquified gas as the coolant to uniformize hardening time of the polycondensates.

4,788,018
METHOD FOR PRODUCING HIGH-DENSITY SINTERED SILICON CARBIDE ARTICLES

Koichi Yamada, and Masahide Mouri, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 3, 1986, Ser. No. 925,919
Claims priority, application Japan, Aug. 29, 1986, 61-204831
Int. Cl.⁴ C04B *35/56*
U.S. Cl. 264—63 **10 Claims**

1. A method for producing high-density sintered silicon carbide articles which comprises mixing powdery silicon carbide composed mainly of α-phase silicon carbide, a boron compound of from about 0.05 to about 0.15 wt. %, as converted to boron, based thereon and a carbonizable organic substance so that total of combinable carbon content of the powdery silicon carbide and combinable carbon content of the carbonizable organic substance is from about 4 to about 8 wt. %, molding the resulting mixture, and subjecting the molded product to heating at a temperature of from about 1,000° C. to about 2,000° C. in a vacuum and then sintering at a temperature of about 2,300° C. or less in an inert atmosphere to obtain a sintered silicon carbide article having a sintered density of about 90% or more of the theoretical density.

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4,788,019

METHOD OF MOLDING A POLYMER COMPOSITION CONTAINING A TETRAALKENYL ORTHOSILICATE

Lyle R. Kallenbach, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 657,112, Oct. 2, 1984, Pat. No. 4,661,552.
This application Feb. 4, 1987, Ser. No. 10,877
Int. Cl.[4] B29C *41/04*
U.S. Cl. 264—122 22 Claims

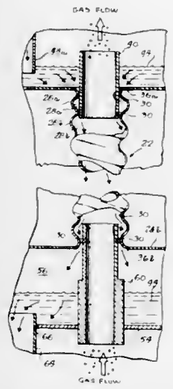
1. A method for producing molded articles which comprises:
(a) supplying to a mold a measured amount of a powdered thermoplastic material comprising a high density solid mono-olefin polymer containing catalyst residue, a crosslinking amount of an acetylinic diperoxy compound, and an amount of at least one tetaalkenyl orthosilicate compound sufficient to accomplish at least one of increased crosslinking, lowered bubble formation and increased storage modulus;
(b) heating the mold to fuse the powdered thermoplastic material; and
(c) cooling the mold to cause the fused thermoplastic material to solidify resulting in a molded article of improved properties.

4,788,020

METHOD FOR EFFECTING MASS TRANSFER

Jack S. Yampolsky, San Diego, Calif., and Robert H. Roberts, Crosby, Tex., assignors to General Atomics, San Diego, Calif.

Filed Dec. 10, 1982, Ser. No. 448,517
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—153 1 Claim



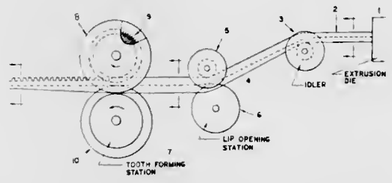
1. A method for effecting mass transfer between a liquid and a gas capable of mass transfer therebetween by increasing the velocity of gas flow consequently the Reynolds number of the gas before the phenomena of flooding occurs,
forming a reservoir of liquid above a plurality of spirally fluted tubes each having a substantially vertical axis,
providing twenty to forth flutes inclined at angle of between 25° to 50° relative to the tube axis in each of said spirally fluted tubes, introducing liquid from said reservoir into twenty to forty fluted channel starts formed at the upper ends of the spirally fluted tubes, said channel starts being defined by crests on the spirally fluted tubes abutting at spaced locations the cylindrical surface of a downwardly projecting hollow member,
flowing the liquid in said channel starts along the inner flute valley surfaces to begin a spiral flow and flowing the liquid to a location below the lower ends of said hollow members with a thicker film of liquid on the fluted valley surfaces than the liquid film on the crests,
and passing a gas at a velocity of up to about 80 feet per second without flooding through said hollow members and said spirally fluted tubes in contacting relation with said liquid film so as to effect mass transfer therebetween without flooding, said liquid film flowing downwardly continually at an angle of inclination substantially equal to the helical angle for said fluted surfaces and; flowing the gas into the spiral flutes of the tubes and establishing therein secondary rotation of the gas in the flutes in a counter direction to the direction of liquid rotation to cause a bulk rotation of the upwardly flowing gas.

4,788,021

METHOD FOR FABRICATING A SAWTOOTH CLAMP CUSHION

John E. Griffiths, 13 Peaceful Dr., Morrisville, Pa. 19067

Filed Oct. 6, 1987, Ser. No. 105,656
Int. Cl.[4] B29C *47/00, 59/04*
U.S. Cl. 264—177.17 10 Claims



1. A method of fabricating a clamp cushion for use with a clamp device comprising the steps of:
(a) extruding an uncured resilient material through an extrusion die to form an extrusion having a raised upper surface on one side and a lower surface, side walls and cover flaps at a right angle to the side walls to define a passageway for accommodating the clamp device, thereafter
(b) spreading the cover flaps so that the cover flaps are spaced apart;
(c) pressing a toothed surface into the raised upper surface of the extrusion while the cover flaps are spread open to form a plurality of longitudinally spaced transverse nodes; and
(d) curing the extrusion so formed.

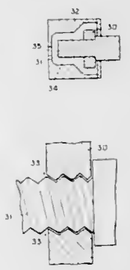
4,788,022

METHOD OF MANUFACTURING WATERPROOF NUTS

Kiyoshi Sakayori, Kodaira; Shinichi Iwasaki, Musashino; Yozo Ishida, Higashimurayama; Toshikazu Shinogaya, Kodaira, and Yuzo Ishizuka, Shiki, all of Japan, assignors to Bridgestone Corp., Tokyo, Japan

Division of Ser. No. 830,867, Feb. 19, 1986, abandoned. This application Sep. 3, 1987, Ser. No. 92,623
Claims priority, application Japan, Feb. 22, 1985, 60-34176; Sep. 17, 1985, 60-204938; Jul. 5, 1987, 60-148052
Int. Cl.[4] B29C *45/00;* B21D *53/24*
U.S. Cl. 264—275 15 Claims

1. A method of manufacturing a waterproof nut, comprising the steps of:
screwing a threaded core into a threaded hole of a nut body from a front surface of the nut body in such a manner that a free end of said core projects from a rear surface of said nut body, the threaded hold of the nut body having an inner diameter sufficient to threadably accept a threaded bolt having a predetermined outer diameter, said core having an outer diameter which is larger than the predetermined outer diameter of the threaded bolt for screwing into the nut body, said threaded hole of said nut body having an inner diameter which is larger than the outer diameter of said core;
setting an assembly of the engaged nut body and core in a mold which has a first section for forming a synthetic resin outer layer which covers an outer periphery of said nut body, a second section for forming a front surface covering layer which covers the front surface of said nut body



and a third section for forming a cap-shaped portion which covers the rear surface of said nut body;
charging molten polyamide resin into said mold while maintaining a temperature of said nut body and said core at 25° to 50° C., to prevent the molten resin from flowing into an annular clearance between said nut body and said core;
hardening said resin about the nut body and the free end of said core to form the cap-shaped portion at the rear surface of the nut; and
unscrewing said core from said out body to form an internal threaded hole in said cap-shaped portion.

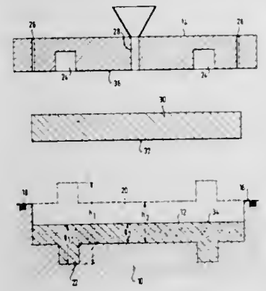
4,788,023

PROCESS AND APPARATUS FOR PRODUCING A DRY-PRESSED MOULDING FROM A PARTICULATE OR GRANULAR MOULDING MATERIAL

Eugen Bühler, Burtenbach; Klaus Strobel, and Karl Schwarzmeier, both of Selb, all of Fed. Rep. of Germany, assignors to Eugen Bühler and Hutschenreuther AG, Selb, Fed. Rep. of Germany

Continuation of Ser. No. 666,886, Oct. 31, 1984, abandoned.
This application Dec. 5, 1986, Ser. No. 939,253
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1983, 3339487
Int. Cl.[4] B29C *59/00*
U.S. Cl. 264—517 5 Claims

1. A process for producing a dry-pressed final molding from a particulate or granular molding material comprising:
(a) providing a loading cavity (**20**) formed by a first mold half (**10**) and a vacuum shooting head (**14**), said first mold half (**10**) having a first mold half forming surface corresponding to the final form of a first face of the final molding, said vacuum shooting head (**14**) having a shooting head forming surface different from a corresponding second face of the final molding, said first mold half forming surface and said shooting head forming surfaces defining said molding cavity (**20**) and being separable from each other in a direction perpendicular to a plane of separation, said first mold half forming surface and said shooting head forming surface being substantially rigid or made of an elastomeric layer which is always rigidly supported by corresponding rigid supporting faces of said first mold half and said vacuum shooting head, respectively, said shooting head forming surface having recessed partial faces in areas opposed to recessed partial faces of said first mold half forming surface such that the ratio $h_1:g_1$, $h_2:g_2$ of the heights h_1, h_2 of said molding cavity in a direction perpendicular to said plane of separation with respect to the respective heights g_1, g_2 of the final molding to be produced being substantially constant over the plane of separation;
(b) applying a vacuum to said loading cavity by evacuating passage means (**26**) provided in said vacuum shooting head (**14**) such as to suck said granular molding material into said loading cavity (**20**) through loading channel means (**28**) defined by said shooting head (**14**), said sucked-in molding material filling said loading cavity completely and being precompressed such as to form a premold, said premold having the shape of said loading cavity and having oppositely directed projections corresponding to said recessed partial faces of said first mold half forming surface and said shooting head forming surface;
(c) removing said vacuum shooting head from said first mold half and leaving said premold behind in said first mold half;
(d) aligning a second mold half with said first mold half, said second mold half having a second mold half body and a second mold half forming surface corresponding to said second face of said final molding, said second mold half forming surface being a rigid face of said second mold half body or being made by an elastomeric layer supported by a rigid supporting face of said second mold half body;



(e) approaching said second mold half towards said first mold half body until the distance of said second mold half forming surface from said first mold half forming surface in a direction perpendicular to said plane of separation corresponds to the wall thickness of said final molding over the total surface of said plane of separation, said premold being engaged by said second mold half forming surface in the areas of increased wall thickness of said premold as defined by said projections before it is engaged in areas of reduced wall thickness, and said final molding being finally pressed exclusively by said approaching of said second mold half body towards said first mold half body said second mold half forming surface substantially evening said projection on said second face of said final molding.

5. Apparatus for producing a dry-pressed final molding having a first molding surface and an oppositely directed second molding surface in its final form from a particulate granular molding material comprising a first mold half and a vacuum shooting head disposed in opposed relation and forming a loading cavity (**20**) therebetween having a plane of separation, said first mold half having a first mold body and a first mold half forming surface with recessed partial faces corresponding to the final form of the first face of the final molding, said vacuum shooting head (**14**) having a shooting head body and a shooting head forming surface different from the corresponding final second face of the final molding in the final form thereof, said shooting head forming surface having recessed

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partial faces opposed to said recessed partial faces of said first mold half forming surface, said first mold half forming surface and said shooting head forming surface defining said loading cavity (**20**) and said shooting head being displaceable from said first mold half in a direction perpendicular to the plane of separation, said first mold half forming surface and said shooting head forming surface being rigid faces of said first mold half body and said shooting head body, respectively, or being made of an elastomeric layer which is rigidly supported by corresponding rigid supporting faces of said first mold half body and said shooting head body, respectively, said shooting head having a charge passage therethrough open to said loading cavity, means for applying a vacuum to said loading cavity for sucking the molding material into the loading cavity through said charge passage and to form a precompressed premold within said loading cavity, said premold having oppositely directed projections corresponding to said recessed partial faces of said first mold half forming surface and said shooting head forming surface, said shooting head being removable from said first mold half with the premold formed in the loading cavity being retained on said first mold half forming surface, a second mold half arranged to be aligned opposite said first mold half in place of said shooting head for pressing the premold into the final form, said second mold half having a second mold half body and a second molding half forming surface corresponding to the final form of the second molding surface of the final molding, said second mold half forming surface being substantially rigid or being made of an elastomeric material supported by a rigid supporting face on said second mold half body said second mold half forming surface being substantially free of recessed partial faces in the areas corresponding to said recessed partial faces of said shooting head forming surface, means for moving said second mold half body toward said first mold half body with the premold located in said first mold half forming surface and being contacted by the second mold half forming surface until the field of the distances between said second mold half forming surface and said first mold half surface in the direction perpendicular to the plane of separation corresponds to the field of thicknesses of the final molding whereby the premold is engageable by said second mold half forming surface with said projection on the face of said premold corresponding to said second face of said final molding before it engages the regions of the reduced wall thickness of said premold, the relationship of the heights h_1, h_2 of said loading cavity (**20**) in a direction perpendicular to said plane of separation to the corresponding heights g_1, g_2 between said first mold half forming surface and said second mold half forming surface in a direction perpendicular to said plane of separation at maximum approach of said second mold half body to said first mold half body being substantially constant over the total field defined by said first mold half forming surface within said loading cavity.

4,788,024

APPARATUS AND METHOD FOR OBTAINING A SELF-COLLIDING BEAM OF CHARGED PARTICLES OPERATING ABOVE THE SPACE CHARGE LIMIT

Bogdan Maglich, New York, N.Y., and Stephen Menasian, Allentown, N.J., assignors to Aneutronic Energy Labs, Inc., Princeton, N.J.

Filed Feb. 24, 1986, Ser. No. 833,128
Int. Cl.[4] G21B *1/02*
U.S. Cl. 376—107 **3 Claims**

2. A method for obtaining a self-colliding beam of charged particles operating above the space charge limit, comprising the following steps:

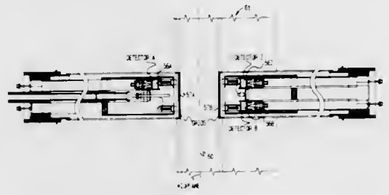
(a) reducing the pressure within a vacuum zone means to a pressure less than 10^{-8} torr;

(b) injecting a beam of charged particles within a magnetic field inside said vacuum zone means;

(c) dissociating said beam of charged particles;

(d) containing said dissociated beam of charged particles in a magnetic field formed by a superconducting magnet means having a mirror ratio greater than 1, so that said dissociated beam of charged particles is trapped within said magnetic field in self-colliding orbits;

(e) neutralizing said dissociated beam of charged particles within an electrostatic stabilizing means comprising at least one pair of electrostatic grids placed perpendicular to said magnetic field with negative potential applied to each grid; and,



(f) stabilizing said neutralized, dissociated self colliding beam of charged particles with said electrostatic stabilizing means, so that the stored charged particle density and the charged particle confinement time is increased above the space charge limit, which further increases the number of collisions between the charged particles in the self-colliding beam of charged particles.

4,788,025

POWER SOURCE FOR NUCLEAR FUSION REACTOR

Isao Oyabu, Kobe, and Satarou Yamaguchi, Hino, both of Japan, assignors to Mitsubishi Denki Kabusbiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1985, Ser. No. 801,804
Claims priority, application Japan, Nov. 29, 1984, 59-250510; Dec. 27, 1984, 59-274053; Dec. 27, 1984, 59-274054; Dec. 27, 1984, 59-274055; Dec. 27, 1984, 59-274056
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—143 **19 Claims**



1. In a nuclear fusion reactor having a load coil, a power source comprising:

a current source having a capacitor for supplying a rising current through a main circuit switch to said load coil for supplying a current to said load coil together with the current of said capacitor after starting discharging of said capacitor,

a clover circuit having a series connection unit of a resistor and a diode for forming a circuit of an attenuating current flowed to said capacitor and said load coil upon completion of flowing the current of said current source,

a contact unit having a tank sealed with compressed gas, a stationary contact, and a movable contact contained in the tank, and

a closing switch having a control valve for controlling the opening and closing of said contact unit and an actuating valve for operating the movable contact in response to the operation of said control valve for bypassing said main

circuit switch in high closing accuracy after a predetermined time from the start of discharging said capacitor,

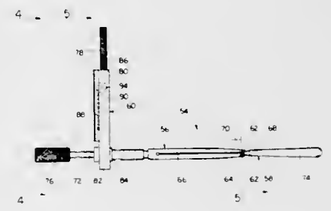
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4,788,026

NUCLEAR FUEL ASSEMBLY GRID SLEEVE/GUIDE THIMBLE BULGE ORIENTATION GAGE AND INSPECTION METHOD

Wade H. Widener, Cayce, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 24, 1987, Ser. No. 137,621
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—245 **18 Claims**



18. A method of inspecting a fuel assembly to determined the orientation of a plurality of externally-projecting mated bulges connecting a grid sleeve to a guide thimble of the assembly, said method comprising the steps of:

(a) inserting a radially-expandable tubular member within the guide thimble, the tubular member having externally-projecting embossments thereon spaced circumferentially from one another about the tubular member, the embossments being the same in number as the bulges of the guide thimble and configured to fit therewithin;

(b) axially moving an elongated expansion member, which extends through and rotatably mounts the tubular member, relative to the tubular member from a first position in which the expansion member permits inward contraction of the tubular member and displacement of embossments thereon away from the interior of the guide thimble bulges for removing the embossments from registry therewith and a second position in which the expansion member produces radial expansion of the tubular member and displacement of the embossments thereon toward the interior of the guide thimble bulges for placing the embossments in registry therewith;

(c) rotating the tubular member relative to the expansion member so as to bring the embossments on the tubular member into alignment with the guide thimble bulges as the embossments on the tubular member are being displaced toward and into registry with the interior of the bulges; and

(d) responsive to rotation of the tubular member away from a reference position, providing an indication of the orientation of the guide thimble bulges relative to a reference point upon displacement of the embossments into registry therewith.

4,788,027

METHOD AND MEANS FOR REMOTE REMOVAL OF GUIDE BALLS FROM NUCLEAR REACTOR CONTROL RODS

Adrian H. Krieg, 119 Maplevale Dr., Woodbridge, Conn. 06525

Filed Jul. 14, 1987, Ser. No. 73,152
Int. Cl.[4] G21C *19/00*
U.S. Cl. 376—260 **18 Claims**

2. A method of remotely removing guide balls from nuclear reactor control rods using a punch mechanism, comprising:

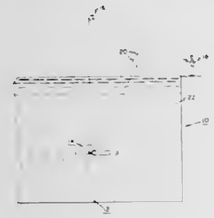
(a) providing attachment means in said punch mechanism for attaching said punch mechanism to means for reversibly lowering said punch mechanism over the top of one of said control rods;

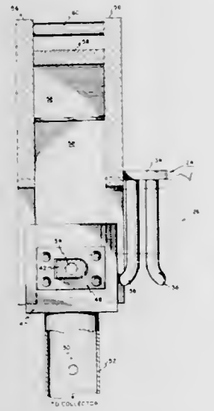
(b) providing a die within said punch mechanism;

(c) providing cylinder means within said punch mechanism operatively connected to said die for axially moving said die in a back-and-forth direction;

(d) providing a die block within said punch mechanism cooperating with said die;

(e) providing guide means within said punch mechanism for





self-aligning said punch mechanism so that said die and said die block are automatically aligned with a first one of said guide balls therebetween when said punch mechanism is lowered over the top of said control rod;

(f) lowering said punch mechanism over said control rod so that said die, said die block, and said first guide ball are in alignment; and

(g) then operating said cylinder means so that said die advances into said die block, thereby removing said first guide ball from said control rod.

4,788,028

MACHINE AND METHOD FOR HANDLING A NUCLEAR FUEL ASSEMBLY

Joseph Leclerco, Saint Didier au Mont D'or, and Jean-Claude Leroux, Villeurbanne, both of France, assignors to Framatome, Courbevoie and Compagnie Generale Des Matieres Nucleaires, Velizy Villacoublay, both of, France

Filed Oct. 10, 1986, Ser. No. 917,650
Claims priority, application France, Oct. 11, 1985, 85 15122
Int. Cl.[4] G21C *19/10*
U.S. Cl. 376—264 **2 Claims**

1. In a nuclear reactor having:

a core support plate,

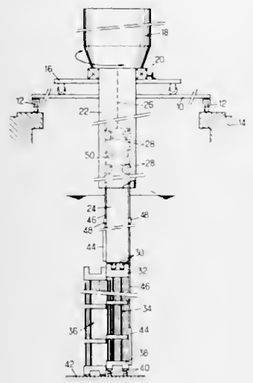
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a plurality of sets of indexing pins fixed to said core support plate and of water inlet passages formed in said core support plate, each said set defining a fuel assembly receiving position and all said fuel assembly receiving positions being mutually adjacent, and

a plurality of identical vertical fuel assemblies of square horizontal cross-section supported by said core support plate each at one of said fuel assembly receiving positions, each having a lower end nozzle shaped for engaging the pins of a respective one of said sets,

a fuel assembly handling system comprising, in combination:

a handling machine having a platform mounted for controlled horizontal movement above the core; a mast carried by said platform and having a vertically movable gripping tool, arranged for connection to an upper portion of a fuel assembly;





at least one vertically elongated rigid element constituting a dummy assembly having a body formed to be received by said core support plate at one of said mutually adjacent fuel assembly receiving positions, provided with lower lug means so shaped as to be engageable in said water inlet passages of a respective one of said sets and with means for connection with said gripping tool, said body being defined by three vertical sides and by a fourth side intended to be located adjacent to a fuel assembly receiving position for a fuel assembly to be inserted and which is slanted upwardly and inwardly over substantially the whole of its height, the cross section of said dummy assembly at the lower end thereof being substantially identical to that of a fuel assembly.

4,788,029

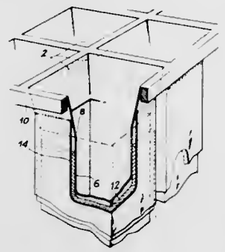
APPARATUS FOR STORING FUEL ASSEMBLIES IN POOL

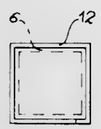
Joël Kerjean, Saint Herblain, France, assignor to Ets. Lemer & Cie., Carque Fou Cedex, France

Continuation-in-part of Ser. No. 732,792, Apr. 26, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 39,858

Int. Cl.⁴ G21C *19/40*

U.S. Cl. 376—272 **3 Claims**





1. Apparatus for the storage of irradiated nuclear fuel assemblies, said apparatus being located in a storage pool and comprising cells defined by first metal walls for receiving said fuel assemblies, each of said first metal walls being separated from adjacent first metal walls by a water gap having a thickness between 40 and 60 mm, said first metal walls being covered by a layer of nutrophage material constituted by a single cadmium sheet having a thickness between 0.1 and 1 mm and being located on the periphery of said cells and on at least part of a vertical outer surface of said walls of said cells, so as to cover without discontinuity the periphery of said cells, and wherein said sheet is held in place and protected by a second metal plate having a thickness between 0.5 and 1 mm, said single cadmium sheet and said second metal plate extending over at least part of the vertical surface of said cells.

4,788,030

STORAGE RACK FOR NUCLEAR FUEL ELEMENTS

Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 28, 1987, Ser. No. 55,425

Claims priority, application Switzerland, Jun. 2, 1986, 02229/86

Int. Cl.⁴ G21C *19/40*

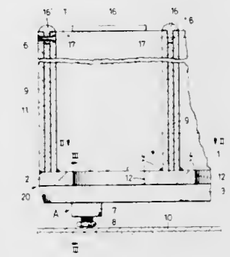
U.S. Cl. 376—272 **5 Claims**

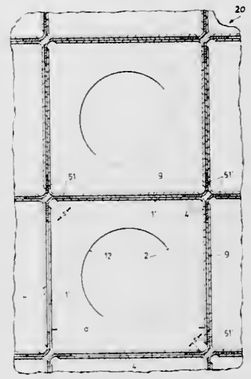
1. A storage rack for nuclear fuel elements comprising

a baseplate;

a plurality of vertically disposed tubes secured to said base plate in parallel rows for receiving fuel elements therein, each said tube being disposed in spaced apart relation to an adjacent tube and formed of a pair of bent angle plates disposed in spaced relation at two diagonal edges;

a plurality of spacer strips secured between and to said tubes to laterally define a seal-tight chamber between each pair of adjacent tubes for receiving neutron absorbing material, each said spacer strip being disposed in bridging relation to a respective diagonal edge of a tube; and





a plurality of covers releasably attached to said tubes to sealingly close said chambers.

4,788,031

CONCRETE REACTOR PRESSURE VESSEL FOR A GAS COOLED NUCLEAR REACTOR OF LOW CAPACITY

Gerhard Becker, Mannheim, and Josef Schoening, Hambruecken, both of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 866,921, May 22, 1986, Pat. No. 4,701,298. This application Jan. 30, 1987, Ser. No. 8,833

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603090

Int. Cl.⁴ G21C *1/22, 13/02, 15/12*

U.S. Cl. 376—296 **17 Claims**

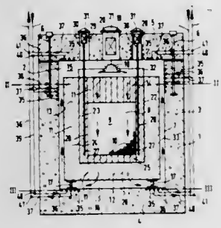
1. A low capacity 10–20 MW spherical fuel element, gas cooled nuclear reactor concrete pressure vessel comprising:

a pressure vessel defined by a cylindrical concrete jacket having a bottom plate and a cover plate;

a metal liner positioned adjacent the interior surfaces of said pressure vessel to seal said pressure vessel;

a primary heat exchanger comprising a plurality of cooling pipes adapted for the flow of cooling water therethrough, said pipes being positioned within said cylindrical concrete jacket and attached to said metal liner and anchoring same to said concrete jacket,

said cooling pipes comprising respective portions of mutually independent heat exchange systems which further include separate collector pipe means outside of said reactor pressure vessel and connected to said cooling pipes and adapted to both provide cooling water and recover



steam resulting from passage of said cooling water through said cooling pipes.

4,788,032

NUCLEAR REACTOR WITH FLOW GUIDANCE IN THE UPPER INTERNALS

Jacques Baujat, Versailles; Guy Desfontaines, Puteaux, and Alain Heuze, Paris, all of France, assignors to Framatome, Courbevoie, France

Filed Apr. 1, 1987, Ser. No. 32,691

Claims priority, application France, Apr. 1, 1986, 86 04594

Int. Cl.⁴ G21C *15/00*

U.S. Cl. 376—352 **8 Claims**

1. A nuclear reactor having:

a pressure resistant vessel;

inlet pipes and outlet pipes all of which open substantially at a same horizontal level into said vessel, for delivery of a pressurized liquid coolant to said vessel and delivery of said coolant out of said vessel, respectively;

a core consisting of fuel assemblies located vertically and side by side within said vessel at a horizontal level lower than said same horizontal level of said inlet and outlet pipes; and

internals located within said vessel, having a barrel supporting the core and defining with said vessel a downward coolant path from the inlet pipes to a space under the core and having upper internals located above the core including an upper extension of said barrel above the core, and defining an outlet flow path for said coolant flowing up out of the core towards said outlet pipes;

wherein said upper internals further include dividing wall means connecting said upper extension of said barrel to said vessel, consisting of first circumferential sections situated at a level higher than the inlet and outlet pipes, second circumferential sections situated at a level lower than said inlet and outlet pipes and sections connecting said circumferential sections and fractionating an annular space between the vessel and said upper extension into angularly distributed first volumes and second volumes alternating around a vertical axis of said vessel, said connecting sections being so located that said first volumes

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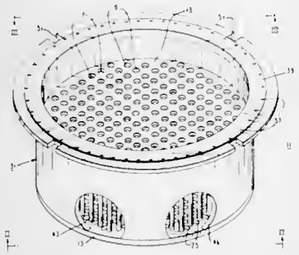
are in communication with said inlet pipes and said downward cooling path while said second volumes are in communication with said outlet pipes, and

wherein said upper extension of said barrel is formed with passage means opening into said second volumes, whereby said outlet flow path impresses flow lines to said coolant which are successively vertical and then bent into a radially outward direction into said second volumes through said passage means.

4,788,033
CALANDRIA

Luciano Veronesi, O'Hara Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1983, Ser. No. 490,059
Int. Cl.[4] G21C *1/04*
U.S. Cl. 376—353 **8 Claims**



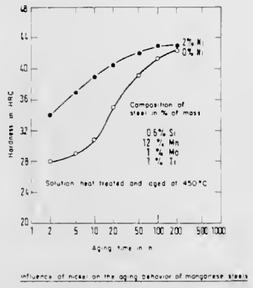
1. In a nuclear reactor which in operation has a coolant flowing therethrough and includes at least one outlet nozzle through which said coolant flows out of said reactor, a calandria disposed therein, said calandria including, as an integrated unit which may be readily installed in, or be removed from, said reactor as a separate piece, an upper support plate, a lower support plate, a plurality of hollow members supported between said plates, a shell interposed between said plates enclosing said hollow members, said plates being open in the areas where they are connected to said hollow members, said lower plate having openings externally to said hollow members permitting the inflow of coolant to the region bounded by said plates and said shell external of said hollow members, and said shell having, in a region thereof, at least one opening lateral of said hollow members positioned for direct communication with said outlet nozzle to direct the outflow of said coolant, transversely of said hollow members, from the volume bounded by said plates and said shell each said hollow member being dimensioned to have a mass, stiffness and strength to preclude failure by reason of transverse flow of coolant and also on the occurrence of a loss-of-coolant event.

4,788,034
AGE HARDENABLE MAETENSITIC STEEL

Helmut Brandis, and Paul Gümpel, both of Krefeld, Fed. Rep. of Germany, assignors to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Aug. 21, 1987, Ser. No. 87,853
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1986, 3628395
Int. Cl.[4] C22C *39/20, 38/04*
U.S. Cl. 420—075 **3 Claims**

1. A mold for casting plastics comprised of a martensitic steel with the following composition (in % by weight):
0.001 to 0.1% carbon
0.50 to 2.0% silicon
8.0 to 14.0% manganese
0.3 to 5.0% titanium
0.001 to 1.0% aluminum
0 to 2.0% chromium
0 to 3.0% molybdenum
0 to 4.0% nickel
0 to 4.0% tungsten



Influence of nickel on the aging behavior of manganese steels

0 to 5.0% cobalt
remainder iron, including impurities caused by the manufacture.

4,788,035
TRI-TITANIUM ALUMINIDE BASE ALLOYS OF IMPROVED STRENGTH AND DUCTILITY

Michael F. X. Gigliotti, Jr., Scotia, N.Y., and Brian J. Marquardt, Cincinnati, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1987, Ser. No. 56,515
Int. Cl.[4] C22C *14/00*
U.S. Cl. 420—420 **3 Claims**

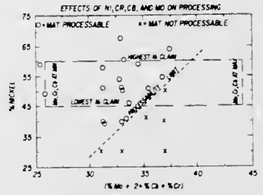
1. A composition having a titanium aluminide base and having good tensile strengths and ductilities and high creep resistance which comprises a composition containing a matrix phase based on Ti_3Al and containing additions of vanadium, columbium and tantalum wherein the additions are in the following proportions:
(a) no less than about 2 atomic % tantalum;
(b) no more than about 5 atomic % of either vanadium or columbium;
(c) the sum of atomic % tantalum, columbium and vanadium exceeding 5%.

4,788,036
CORROSION RESISTANT HIGH-STRENGTH NICKEL-BASE ALLOY

Herbert L. Eiselstein; Jerry A. Harris; Darrell F. Smith, Jr.; Edward F. Clatworthy, all of Huntington, W. Va.; Stephen Floreen, Schenectedy, N.Y., and Jeffrey M. Davidson, Milburn, N.J., assignors to INCO Alloys International, Inc., Huntington, W. Va.

Continuation-in-part of Ser. No. 566,601, Dec. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 255,158, Apr. 17, 1981. This application Oct. 1, 1986, Ser. No. 914,137
Int. Cl.[4] C22C *19/05*
U.S. Cl. 420—448 **19 Claims**

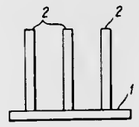
1. A nickel-base alloy characterized by good workability and fabricability and further characterized in both the cold-rolled and aged conditions by high strength, good ductility and resistance to pitting, hydrogen embrittlement and stress-corrosion cracking said alloy consisting essentially of, in weight percent, about 15 to 25% chromium, about 5 to about 15% iron, about 6.5 to 9% molybdenum, about 2.5 to 5% columbium, from 0.5 to 2.5% titanium with the proviso that when the titanium is less than 1% the columbium is at least 3.5%, up to about 0.5% aluminum and the balance nickel with nickel constituting about 50 to about 60% of the alloy.



4,788,037
HIGH STRENGTH, CORROSION-RESISTANT ALUMINUM ALLOYS FOR BRAZING

Masaharu Kaifu, Yamaguchi; Jun Takigawa, Tochigi; Hideo Fujimoto, Tochigi; Tomohiro Nishimura, Tochigi, and Masao Takemoto, Tochigi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 556,597, Nov. 30, 1983, abandoned. This application Jul. 15, 1986, Ser. No. 884,655
Claims priority, application Japan, Nov. 30, 1982, 57-210508
Int. Cl.[4] C22C *21/16*
U.S. Cl. 420—534 **6 Claims**



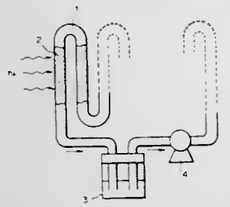
1. A high strength, corrosion-resistant alloy for brazing which consists essentially of 0.3–1.0 wt. % of Cu, 0.1–0.5 wt. % of Mg, 0.2–1.0 wt. % of Si, and one or more of Zr, Cr and Mn each in the amount of 0.15–0.3 wt. %, and the balance of Al and inevitably present impurities, with the weight ratio of Si/Mg being in the range of 1–2.5.

4,788,038
PROCESS FOR KILLING CELLS

Tadashi Matsunaga, Fuchu, Japan, assignor to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 866,493, filed as PCT JP 85/00525 on Sep. 20, 1985, published as WO 86/01691 on Mar. 27, 1986, abandoned.
This application Jun. 1, 1987, Ser. No. 56,305
Claims priority, application Japan, Sep. 21, 1984, 59-196903
Int. Cl.[4] A61L *2/08*
U.S. Cl. 422—22 **5 Claims**

1. A method of killing cells comprising the steps of placing living cells in contact with a non-conductor carrying photosemiconductor material and irradiating light to said non-conductor carrying photosemiconductor material to generate a photoelectromotive force, so as to kill said cells.



4,788,039
PROCESS AND TEST KIT FOR THE DETECTION OF EXPLOSIVES

Baruch Glattstein, Jerusalem, Israel, assignor to Erez Forensic Technology, Ltd., Israel

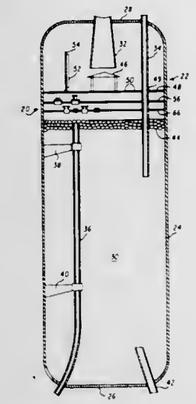
Filed Oct. 14, 1987, Ser. No. 108,280
Claims priority, application Israel, Oct. 15, 1986, 80311
Int. Cl.[4] G01N *31/22, 33/00*
U.S. Cl. 422—61 **7 Claims**

1. A multi-reagent test kit for the presumptive identification of traces of explosives, said kit containing a first reagent comprising about 2.5 to 20% V/V of a tetra alkyl ammonium or phosphonium hydroxide in a solvent comprising at least 60% V/V dimethylsulfoxide and about 0 to 30% V/V of methanol or of water; and a second reagent comprising a diazotization and a coupling Griess reagent pair.

4,788,040
INLET DISTRIBUTOR FOR FIXED BED CATALYTIC REACTOR

Joseph F. Campagnolo, Oradell; Tai-Sheng Chou, Sewell; William F. Heaney, Hamilton Township, Mercer County, all of N.J., and John D. Ruggles, Surrey, England, assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 576,816, Feb. 3, 1984, abandoned. This application Jul. 10, 1986, Ser. No. 883,848
Int. Cl.[4] B01D *47/00;* B01J *8/04*
U.S. Cl. 422—220 **11 Claims**



1. An inlet distributor for a fixed bed catalytic reactor of the

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type having a hollow shell with means defining an upper entry opening, means defining a lower drain opening, and a catalytic bed in the shell, the inlet distributor comprising:

an inlet deflector cone positioned in the shell beneath the entry opening, said cone defining a circumference, and a splash plate located near the circumference of the cone, whereby liquid introduced into the shell is deflected onto a liquid distributor trough positioned therebelow, said trough including means defining openings in said trough;

an upper distributor tray positioned beneath the distributor trough to receive liquid which passes through said openings in the distributor trough;

the upper distributor tray having vapor passage means for passing vapor through the tray and liquid passage means for passing liquid received from the distributor trough from above to below the upper distributor tray; and

a lower distributor tray positioned beneath the upper distributor tray to receive liquid from said liquid passage means of the upper distributor tray;

the lower distributor tray having a series of risers and downpipes thereon, each of the series of lower tray risers and downpipes extend through, above and below the tray and each comprises a passageway for liquid to pass through the lower tray when received from the upper distributor tray, each of the lower tray risers comprising a vapor passageway, the lower tray downpipes having a smaller inside diameter than that of the lower tray risers;

the upper ends of the lower tray risers and the upper ends of the lower tray downpipes being lower than the lower ends of said vapor passage means and the lower ends of said liquid passage means of the upper distributor tray.

4,788,041

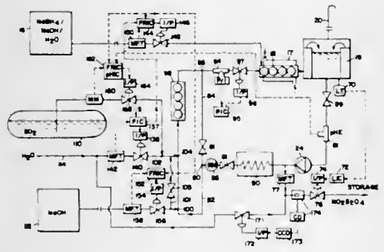
APPARATUS FOR THE PRODUCTION OF SODIUM HYDROSULFITE

Philippe R. Sanglet, Gent, Belgium, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Dec. 22, 1986, Ser. No. 945,747

Int. Cl.[4] B01J *8/00*

U.S. Cl. 422—234 **9 Claims**



1. Apparatus for the production of sodium hydrosulfite, comprising:

a. input means connected to a first flow line for introducing sodium hydroxide solution into said first flow line, said flow line for transporting a process stream;

b. water input means connected to said first flow line for introducing water into said first flow line;

c. input means connected to said water input means at a location downstream from said sodium hydroxide input means for introducing sulfur dioxide into said water line input means, at which location sodium hydroxide and sulfur dioxide can react to form an aqueous solution of sodium bisulfite;

d. first process stream recycling means connected to said first flow line at a point downstream from said water input means and also connected to said first flow line upstream from said sodium hydroxide input means and said water input means for recycling at least a portion of said sodium hydroxide, water, sulfur dioxde and sodium bisulfite;

e. a mixer connected to said first flow line at a location downstream of said first process stream recycling means, said mixer also connected to input means for introducing a mixture of sodium borohydride, sodium hydroxide, and water into said mixer whereby sodium bisulfite and sodium borohydride can react to form an aqueous solution of sodium hydrosulfite; an outlet of

f. said mixer being connected by a second flow line to degassing means for removing hydrogen from said aqueous solution of sodium hydrosulfite; and

g. a third flow line connected to said degassing means for removing sodium hydrosulfite from said degassing means, said third flow line also connected to storage means for storing said sodium hydrosulfite and a second process stream recycling means connected to said third flow line and also connected to said first process stream recycling means whereby said sodium hydrosulfite solution can be recycled.

4,788,042

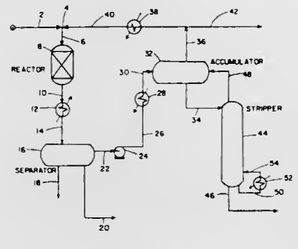
SYSTEM FOR CONVERSION OF METHANOL TO GASOLINE

Susan K. Marsh, East Brunswick; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 815,438, Dec. 31, 1985, abandoned. This application Oct. 5, 1987, Ser. No. 104,617

Int. Cl.[4] F08D *7/00*

U.S. Cl. 422—235 **1 Claim**



1. An apparatus for producing gasoline boiling range hydrocarbons from C_1 to C_3 oxygenates comprising:

(a) a fixed bed reaction zone containing a crystalline zeolite catalyst;

(b) means for transporting the reactor effluent from a reaction zone to a separation zone;

(c) phase separator means wherein the reactor effluent is split into a gas stream, a water stream, and a liquid hydrocarbon stream;

(d) means for transporting the liquid hydrocarbon stream to a heat exchange evaporator;

(e) a heat exchange evaporator wherein the liquid hydrocarbon stream is partially vaporized;

(f) means for transporting said partially vaporized stream to an accumulator;

(g) an accumulator operatively connected as the first stage of a fractionating column wherein a vapor phase comprising C_3-C_4 saturated hydrocarbons is separated from a liquid phase;

(h) means for passing said liquid phase to a gasoline stripping zone;

(i) a gasoline stripping zone wherein a stabilized gasoline product is prepared;

(j) means for conducting said vapor phase from (g) to a further heat exchange evaporator;

(k) a heat exchange evaporator wherein said vapor phase is heated to a temperature sufficient for entrance into a fixed bed reaction zone;

(l) means for passing said heated vapor phase to a mixing zone;

(m) a mixing zone wherein said heated vapor phase comprising C_3-C_4 saturated hydrocarbons is combined with an oxygenate feedstock; and

(n) means for passing said mixture to the fixed bed reaction zone of step (a).

4,788,043

PROCESS FOR WASHING SEMICONDUCTOR SUBSTRATE WITH ORGANIC SOLVENT

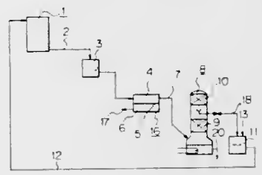
Yasuhiro Kagiyama, Tokuyama; Koichi Doi, Tabuse; Toru Nonaka, Tokuyama; Yuji Ishiyama, Shin-Nanyo, and Shigeo Komatsubara, Yokohama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Apr. 17, 1986, Ser. No. 853,139

Claims priority, application Japan, Apr. 17, 1985, 60-80335; Dec. 4, 1985, 60-271365

Int. Cl.[4] B01J *8/00*; B01D *13/00*

U.S. Cl. 422—292 **8 Claims**



1. A unitary apparatus for conducting organic solvent washing of semiconductor substrates to remove at least water and particulate matter therefrom, said apparatus comprising:

an upper vapor washing zone comprising

a washing space for receivably containing a semiconductor substrate and washing at least water and particulate matter therefrom,

a vapor condensing space, disposed above said washing space and fluidically connected thereto, for condensing an organic solvent vapor,

a collection means, disposed below said washing space and fluidically connected thereto, for receiving said condensed organic solvent vapor containing water and particulate matter;

a lower vapor generating zone comprising a distillation means for generating said organic solvent vapor from an organic solvent containing particulate material, said particulate material being entrainable in said organic solvent vapor;

an intermediate demisting zone, disposed between said upper vapor washing zone and said lower vapor generating zone, for fluidically connecting said upper vapor washing zone and said lower vapor generating zone so as to allow passage of said vapor from said lower vapor generating zone to said upper vapor washing zone and to inhibit passage of said particulate material from said lower vapor generating zone to said upper vapor washing zone;

a pervaporation means for removing water from said organic solvent containing water and particulate matter, said pervaporation means comprising

a liquid treating chamber, receivable of organic solvent containing water and particulate matter,

a permeation vapor chamber, receivable of water, and

a substantially selective water-permeable membrane fluidically connecting said liquid treating chamber and said permeation vapor chamber, wherein water contained in said organic solvent in said liquid treating chamber substantially selectively passes through said membrane to said permeation vapor chamber;

first fluid connection means for fluidically connecting said collection means and said liquid treating chamber to feed condensed organic solvent vapor containing water and particulate matter from said collection means to said liquid treating chamber;

second fluid connection means for fluidically connecting said liquid treating chamber and said lower vapor generating zone to feed organic solvent containing water and particulate matter, from which said water has been substantially removed, from said liquid treating chamber to said lower vapor generating zone;

water-removal means for removing water from said permeation vapor chamber.

4,788,044

METHOD FOR RECOVERING VANADIUM FROM RESIDUES FROM THE COMBUSTION OF PETROLEUM FRACTIONS

Francesco Corigliano; Sebastiana Di Pasquale, both of Messina; Patrizia Primerano, Faro Superiore, and Cesare Zipelli, Ragusa, all of Italy, assignors to Ente Minerario Siciliano, Palermo, Italy

Filed Jul. 13, 1987, Ser. No. 72,484

Claims priority, application Italy, Jul. 17, 1986, 21161 A/86

Int. Cl.[4] C01G *31/00, 53/04*

U.S. Cl. 423—62 **10 Claims**

1. Method for recovering vanadium from the residues from the combustion of petroleum fractions, comprising:

(i) extracting vanadium together with other polyvalent cations contained in said residues which interfere with the vanadium recovery by acid leaching of said residues whereby obtaining a solution of said vanadium and said interfering cations, and

(ii) treating the resulting acid solution with an oxidizing agent for vanadium and said interfering cations, wherein said method further comprises

(iii) adding to said acid solution from (ii) containing oxidized vanadium and interfering cations a complexing agent able to selectively form soluble complexes with the oxidized interfering cations, and

(iv) adding to said solution ammonia at a pH of 1.7-2.3 and heating to 70°-100° C., whereby the uncomplexed vanadium is selectively precipitated as ammonium polyvanadate in a form substantially free of said interfering cations.

4,788,045

STABILIZED ZIRCONIA A PROCESS FOR ITS PREPARATION AND ITS APPLICATION IN CERAMIC COMPOSITIONS

Jean-Francois Colombet, Rueil-Malmaison, and Claude Magnier, Paris, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 3, 1986, Ser. No. 835,212

Claims priority, application France, Mar. 1, 1985, 85 03023

Int. Cl.[4] C04B *35/48*

U.S. Cl. 423—85 **13 Claims**

1. A process for preparing a fine powder of stabilized zirconia, comprising the steps of forming a suspension containing particles by mixing a zirconia hydrate sol having a pH of from about 0.5 to 5 and containing elementary acicular crystals of ZrO_2 having dimensions from about 10 to 500 Å, which crystals are agglomerated into submicron aggregates of ZrO_2 having dimensions from about 100 to 5,000 Å in diameter with a solution having a concentration of a stabilizing agent; drying said suspension to obtain a dried product; and calcining the dried product at a temperature of from about 700° C. to about 1,300° C. to obtain said powder of stabilized zirconia.

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4,788,046

METHOD FOR PRODUCING MATERIALS FOR CO-SINTERING

Eric A. Barringer, Waltham; Sheldon I. Lieberman, Burlington; Mark S. Schmidt, West Newton, and James D. Hodge, Medway, all of Mass., assignors to Ceramics Process Systems Corporation, Cambridge, Mass.

Filed Aug. 13, 1987, Ser. No. 85,078
Int. Cl.⁴ C03C *3/064, 3/020*
U.S. Cl. 423—122 **22 Claims**

1. A method of producing composite ceramic particles having a relatively low sintering temperature, comprising:
   (a) preparing a reagent solution including glassy compounds consisting essentially of calcium oxide, silicon dioxide, boron oxide, and optionally at least one of magnesium oxide and aluminum oxide;
   (b) mixing into the reagent solution a suspension of ceramic particles selected from the group consisting of alumina, spinel, cordierite, mullite, forsterite, quartz, spodumene, eucryptite, and mixtures thereof, to form a mixture; and
   (c) adding to the mixture of precipitating agent so that the glassy compounds precipitate onto and coat the ceramic particles, forming composite ceramic particles.

4,788,047

PROCESS FOR CAUSING THE GASEOUS SULFUR COMPOUNDS OF FLUE GASES TO REACT TO FORM SOLID COMPOUNDS WHICH CAN BE SEPARATED FROM THE FLUE GASES

Sirpa Hämäläi; Timo Kenakkala; Pentti Janka; Tuomo Ruohola, all of Tampere, and Martti Lehtimäki, Sarkola, all of Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed Nov. 5, 1985, Ser. No. 795,251
Claims priority, application Finland, Apr. 24, 1985, 1624
Int. Cl.⁴ B01J *8/00;* **C01B** *17/00*
U.S. Cl. 423—244 **9 Claims**

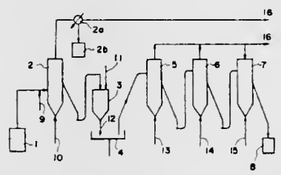
1. A process for the removal of gaseous sulfur compounds including sulfur dioxide from combustion gases formed in a combustion chamber and containing such compounds, said process comprising:
   (a) introducing into a boiler above the combustion zone of the combustion chamber, a pulverous solid selected from the group consisting of the carbonates, hydroxides and oxides of an alkaline earth metal such that any carbonates and hydroxides are converted to oxide by the heat of combustion and some of the oxide reacts with sulfur dioxide to form a solid sulfate reaction product;
   (b) flowing the resulting mixture of combustion gases, unreacted oxide, sulfate reaction product and sulfur dioxide upwardly along a vertically elongated reaction zone having a much longer length than cross-section with the effective length of the reaction zone being 10 times its diameter or more;
   (c) separately introducing water into the reaction zone;
   (d) flowing the mixture of combustion gases, sulfate reaction product, sulfur dioxide and water upwardly along the reaction zone to effect reaction of water with alkaline earth metal oxide which is a sorbent material to form alkaline earth metal hydroxide which is also a sorbent material and to effect reaction of the hydroxide with sulfur dioxide to form a solid particulate sulfite reaction product, the lengthy of said reaction zone and the gas velocity therein creating sufficient retention time in said reaction zone to permit said reactions to occur;
   (e) the mixture of combustion gases, sulfate reaction product, sulfur dioxide, water and sorbent material flows in a uniform manner with a similar velocity as the flue gases, and having the same residence time within the reaction zone for gases and sorbent material without recirculation of any of the sorbent material;
   (f) adjusting the amount of water introduced into said interaction zone such that the reaction products are particulate and essentially dry; and
   (g) wherein the molar ratio of introduced alkaline earth metal compound to sulfur in the combustion gases is 0.52 to 4.1 and wherein the reduction of the sulfur in the combustion gases is from 56% to 98%; and
   (h) separating the solid reaction product from the gases.

4,788,048

PROCESS FOR CONVERSION OF UF_6 TO UO_2

Hiroshi Tanaka, and Akio Umemura, both of Saitama, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,171
Claims priority, application Japan, Jun. 11, 1985, 60-126855
Int. Cl.⁴ C01G *43/025*
U.S. Cl. 423—261 **6 Claims**



1. A process for conversion of UF_6 to UO_2 by using a fluidized bed reaction apparatus comprising
   (a) a first step of pyrohydrolizing gaseous UF_6 and steam in said fluidized bed to obtain UO_2F_2 particles at temperatures of less than 400° C.,
   (b) a second step of hydrating said UO_2F_2 particles with water to UO_2F_2 hydrate at temperatures of less than 100° C.,
   (c) a third step of dehydrating said UO_2F_2 hydrate by heating to UO_2F_2 anhydride at temperatures of less than 200° C.,
   (d) a fourth step of reducing said UO_2F_2 anhydride with hydrogen gas or a mixture of hydrogen gas and steam to convert to UO_2 powders at temperatures of less than 700° C.

4,788,049

METHOD FOR CONTROLLING THE CRYSTAL MORPHOLOGY OF SILICON NITRIDE

Robert A. Long; Harrison Shallenberger, both of Towanda, Pa., and Dale E. Wittmer, Carbondale, Ill., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 21, 1986, Ser. No. 842,597
Int. Cl.⁴ C01B *21/063, 33/06*
U.S. Cl. 423—344 **9 Claims**



SILICON NITRIDE PRODUCED FROM AN INTERMEDIATE HAVING A BULK DENSITY OF ABOUT 0.07g/cc

1. A method for producing silicon nitride wherein the crystal morphology of said silicon nitride is controlled, said method comprising:
   (a) heating a mixture consisting essentially of a chlorosilane and ammonia at a temperature of at least about 300° C. for a sufficient time to produce silicon chloroimide as an intermediate product;
   (b) commminuting said intermediate product by a comminuting method selected from the group consisting of milling, compacting and combinations thereof, to control the bulk density of said intermediate to greater than about 0.3 g/cc to result in said silicon nitride having a crystal morphology which is essentially all equiaxial, or comminuting said intermediate product by said comminuting methods to control the bulk density of said intermediate to between about 0.1 g/cc and about 0.3 g/cc to result in said silicon nitride having a crystal morphology which is a mixture of fibrous and equiaxial; and
   (c) heating the resulting intermediate product having controlled bulk density at a temperature of at least about 700° C. for a sufficient time in a non-oxidizing atmosphere to produce the controlled crystal morphology silicon nitride.

4,788,050

PROCESS FOR PRODUCING PITCH-BASED CARBON FIBERS

Takao Hirose, Kamakura; Yoshio Sohda; Kazuyoshi Okamoto, both of Kawasaki, and Seiichi Uemura, Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Mar. 27, 1987, Ser. No. 31,935
Claims priority, application Japan, Mar. 28, 1986, 61-68746
Int. Cl.⁴ D01F *9/12*
U.S. Cl. 423—447.2 **5 Claims**
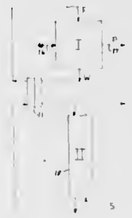
1. In a process for producing carbon fibers from a carbonaceous pitch, the improvement characterized in that a trailing end portion of infusibilized fiber or carbonized fiber to be first subjected to a carbonizing or graphitizing treatment and the leading end of infusibilized fiber or carbonized fiber to be next subjected to the same treatment are bonded together using a composition consisting essentially of (a) at least one member selected from the group consisting of phenolic resins and pitches and (b) graphite powder in an amount in the range of 10 to 90 parts by weight per 100 parts by weight of component (a); wherein said bonding is carried out prior to or subsequent to the infusibilization of said fibers, and the thus-bonded fibers are fed successively to a carbonizing apparatus or a graphitizing apparatus.

4,788,051

IMPROVEMENTS IN ENRICHMENT SYSTEMS FOR ISOTOPES OF HYDROGEN AND/OR OXYGEN

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, Nev.

Division of Ser. No. 712,171, Aug. 6, 1976, Pat. No. 4,221,774.
This application May 8, 1979, Ser. No. 38,176
Int. Cl.⁴ C01B *5/00*
U.S. Cl. 423—579 **31 Claims**



1. A process for producing from a flow of steam from a source external to the process which flow contains initial concentrations of a desired heavy isotope and of another lighter isotope of the same element, said element being of the group of elements consisting of hydrogen and oxygen, a substance enriched in said desired isotope without materially affecting the utility of the steam as a source of energy, which process comprises in combination:
   (a) providing at substantially the temperature of said flow of steam a flow of liquid to step (b) containing said isotopes of said element and containing a lesser concentration of said desired isotope than said initial concentration thereof,
   (b) extracting desired isotope from said flow of steam by passing said flow of liquid from step (a) in direct contact countercurrent isotope exchange with said flow of steam for increasing the quantity of said desired isotope in said flow of liquid to a concentration approaching said initial concentration thereof with corresponding increase of said other isotope in the steam,
   (c) further processing said flow of liquid contacted in step (b) to produce therefrom a flow of substance enriched in said desired isotope and to cause said flow of liquid to become depleted in said desired isotope to said lesser concentration thereof,
   (d) recirculating to step (a) the depleted flow of liquid from said processing in step (c),
   (e) withdrawing substance enriched in said desired isotope from step (c), and
   (f) withdrawing the steam contacted in step (b) and delivering it for use as a source of energy.

29. Isotope extracting and concentrating apparatus comprising in combination: (I) an isotope concentrator, (II) an isotope regenerator, and (III) feed means interconnecting the same;
   said isotope concentrator having (a) means for concentrating in a substance a desired isotope of at least one element selected from the group consisting of hydrogen and oxygen, and for delivering therefrom said substance enriched in said desired isotope, (b) a feed liquid inlet for supplying feed liquid containing said desired isotope thereto, and (c) a depleted liquid outlet for delivering liquid depleted in said desired isotope therefrom;
   said isotope regenerator having (a') a direct contact countercurrent gas/liquid contactor, (b') supply liquid inlet means for supplying liquid thereto, (c') contacted liquid outlet means for delivering liquid therefrom, (d') steam inlet means for delivering thereto feed steam from an external source having a content of said desired isotope, and (e') steam outlet means for delivering therefrom steam depleted in said content of desired isotope; and
   said feed means comprising (a'') first conduit means for delivering liquid from said depleted liquid outlet to said supply liquid inlet means, and (b'') second conduit means for recirculating liquid from said contacted liquid outlet means to said feed liquid inlet;
   whereby steam from an external source containing said desired isotope is depleted in said isotope by transfer thereof to a liquid in said isotope regenerator, which liquid supplies said desired isotope for concentration in said substance by said isotope concentrator and is recycled to said isotope regenerator.

4,788,052

STABLE HYDROGEN PEROXIDE DENTAL GEL CONTAINING FUMED SILICAS

Shirley M. Ng, Bridgewater, and Denise-Marie DiTomasso, Iselin, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 17, 1987, Ser. No. 40,438
Int. Cl.⁴ A61K *7/20, 33/40*
U.S. Cl. 424—53 **7 Claims**

1. A cosmetic and chemically stable aqueous hydrogen peroxide dental gel having a pH between about 3–6, comprising hydrogen peroxide as the sole chemically active agent in an amount of 1.5–3.5% by weight, a combination of hydrophilic and hydrophobic fumed silica gelling agent, about 20–40% by weight of a polyethylene glycol humectant, a nonionic surfactant, a sweetener, sodium benzoate and a flavor prepared by homogenizing the fumed silicas in the polyethylene glycol and water phases and the sequential addition of the premixed ho-

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mogenized hydrophobic fumed silica in the polyethylene glycol (Phase A) to the premixed homogenized hydrophilic fumed silica in water containing hydrogen peroxide (Phase B) and mixing for about 30 minutes while maintaining the temperature at room temperature, adding the predissolved sodium saccharin and sodium benzoate in water (Phase C) with mixing which effects immediate gellation, adding the pre-solubilized flavor in the nonionic surfactant and water (Phase D) and mixing for about 5-10 minutes until a clear, homogeneous rigid stable dental gel is obtained.

4,788,053

METHOD AND COMPOSITION FOR PREVENTION AND TREATMENT OF ORAL DISEASE

Perry A. Ratcliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Continuation of Ser. No. 017,241, Dec. 29, 1986, Pat. No. 4,696,811. This application Jul. 22, 1987, Ser. No. 76,543

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] A61K *7/20, 33/20*

U.S. Cl. 424—53 **3 Claims**

1. A method for reducing dental plaque, said method comprising the step of retarding degradation of sucrose into glucose or fructose by killing and by reducing the number of *Streptococcus mutans* to a more than 90% level through topical application within the oral cavity for a period of ten seconds of a solution of stabilized chlorine dioxide in the form of a paste and of a concentration in the range of 0.005% to 0.2%.

4,788,054

N-PHENYLPHTHALISOMIDES AS ULTRAVIOLET RADIATION ABSORBERS

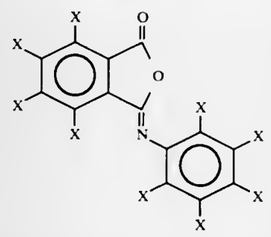
Randal J. Bernhardt, Mundelein, and William J. Ferrell, Des Plaines, both of Ill., assignors to Stepan Company, Northfield, Ill.

Filed Jul. 11, 1986, Ser. No. 884,350

Int. Cl.[4] A61K *7/06, 7/42, 9/10, 9/12*

U.S. Cl. 424—59 **19 Claims**

1. A sunscreen composition comprising in combination (A) at least one compound of the formula:



wherein:

each X is independently selected from the group consisting of hydrogen, —OR, —NR_1R_2, —Cl, —Br, —I, —NO_2, —C(O)OR, and hydrocarbyl,

R is selected from the group consisting of alkyl radicals and alkenyl radicals containing less than 11 carbon atoms each, and

R_1 and R_2 are each independently selected from the group consisting of hydrogen, alkyl radicals containing less than 11 carbon atoms each, and alkenyl radicals containing less than 11 carbon atoms each, and

(B) a cosmetic oil, said component (A) being dispersed in said component (B) in an effective sunscreening amount.

4,788,055

RESINATE SUSTAINED RELEASE DEXTROMETHORPHAN COMPOSITION

Franz X. Fischer, Riehen, and Satish C. Khanna, Bottmingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,879

Int. Cl.[4] A61K *31/74, 31/44*

U.S. Cl. 424—79 **20 Claims**

1. An antitussive pharmaceutical composition suitable for controlled, sustained release of dextromethorphan comprising (a) a sulfonated polystyrene resin in salt-form crosslinked with about 3% to about 10% by weight (based on the total resin) of cross-linking agent, said resin having an average particle size of at least 40 μm and less than 100 μm, (b) an effective amount of a pharmaceutically acceptable acid addition salt of dextromethorphan, which has been loaded onto said resin in a weight ratio of dextromethorphan-acid addition salt:resin of about 1:5 to about 1:10, and (c) at least one pharmaceutically acceptable adjuvant.

4,788,056

COMBINED VACCINE FOR VIRAL AND BACTERIAL INFECTIONS

Heinrich D. Lütticken; Nicolaas Visser, both of Boxmeer, and Eric O. Rijke, Am Beugen, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Apr. 9, 1987, Ser. No. 36,408

Claims priority, application Netherlands, Apr. 21, 1986, 8601001

Int. Cl.[4] A61K *39/02, 39/12;* **C12N** *9/00, 9/52*

U.S. Cl. 424—89 **11 Claims**

1. Combined live-stock vaccine, comprising an effective amount of a combination of at least one type of immunogenic material of *E. coli*, selected from pili, pili proteins and *E. coli* antigens, and immunogenic viral material of pseudorabies virus or pseudorabies antigen in a pharmaceutically acceptable carrier.

4,788,057

PROCESS FOR THE TREATMENT OF PSORIASIS USING TYPHOID VACCINE

Salvatore J. Catapano, 66 S. Brush Dr., Valley Stream, N.Y. 11580

Filed Oct. 2, 1987, Ser. No. 103,814

Int. Cl.[4] A61K *39/112*

U.S. Cl. 424—92 **4 Claims**

1. A method of treating a human patient to effect the remission of symptoms associated with psoriasis, which comprises parenterally administering, in multiple injections, to the patient in need of such treatment typhoid vaccine in a therapeutically effective amount which is sufficient to provide immunostimulating activity.

4,788,058

***B. PERTUSSIS* VACCINE PRODUCTION USING CARBODIIMIDES**

Roger Parton, Jordanhill, and Duncan E. S. Stewart-Tull, Uddingston, both of Scotland, assignors to The University Court of the University of Glasgow, Scotland

Filed May 21, 1986, Ser. No. 866,157

Claims priority, application United Kingdom, May 22, 1985, 8512972

Int. Cl.[4] A61K *39/10*

U.S. Cl. 424—92 **14 Claims**

1. A method of preparing a substantially non-toxic immunogenic preparation of pertussis toxin comprising treatment of pertussis toxin with a carbodiimide, said pertussis toxin being in the form of an intimate admixture with filamentous haemagglutinin.

4,788,059

EQUINE STRANGLES VACCINE AND THE METHOD OF PREPARING AND USING THE SAME

Myron G. Usdin, Prairie Village, Kans., assignor to Coopers Animal Health, Inc., Kansas City, Kans.

Filed Jul. 15, 1985, Ser. No. 754,909

Int. Cl.[4] A61K *39/00, 37/00;* **C12N** *15/00, 1/20*

U.S. Cl. 424—93 **4 Claims**

1. A vaccine effective in protecting equines against infection by virulent strains of *Streptococcus equi* comprising an immunizing dosage of an attenuated *Streptococcus equi* organism rendered avirulent while retaining its antigenicity through prolonged culturing in the presence of acriflavine hydrochloride.

4,788,060

MULTIPLE ELECTROLYTE DOUCHE AND WIPE COMPOSITION

Clarence J. Endicott, Libertyville, and Donald E. Hartung, Arlington Heights, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 27, 1986, Ser. No. 923,788

Int. Cl.[4] A61K *9/70;* **A61M** *5/18;* **B65D** *83/10;* **A01N** *59/00*

U.S. Cl. 424—443 **36 Claims**

1. A kit containing both (a) an internal vaginal douche in the form of either a ready-to-use solution or a concentrate to be diluted, and (b) an external vulval wipe product wherein said douche comprises (1) a solution of inorganic salts that mimic the electrolyte balance of normal tissue selected from the group comprising sodium acetate, sodium chloride, magnesium chloride, potassium chloride and sodium gluconate; (2) a buffering agent, and optionally; (3) a preservative, and wherein said external vulval wipe product is a towelette impregnated with a solution which comprises (a) caprylic/capric triglyceride; (b) at least one non-ionic surfactant; (c) an anti-inflammatory agent; and (d) citric acid.

4,788,061

EXTENDED OCCLUSIVE TREATMENT OF SKIN DISORDERS

Ronald N. Shore, 9900 Georgia Ave., Silver Spring, Md. 20902

Filed Jul. 5, 1985, Ser. No. 752,406

Int. Cl.[4] A61L *15/06*

U.S. Cl. 424—448 **25 Claims**

1. A process for treating a skin disorder for which healing or improvement is significantly sided by occlusion and/or hydration which comprises tightly occluding affected skin continuously for a period of at least three days.

22. A process for treating a skin disorder for which healing or improvement is significantly aided by occlusion and/or hydration which comprises tightly occluding affected skin continuously for a period of at least three days and wherein occlusion is effected with closely adhering adhesive tape which has low water-vapor transmission, which is flexible and elastic, which has adhesive with sufficient holding strength to maintain the tape in place on skin for a period of at least one week and wherein the tape has an adhesive surface comprising an agent which suppresses bacterial overgrowth.

4,788,062

TRANSDERMAL ADMINISTRATION OF PROGESTERONE, ESTRADIOL ESTERS, AND MIXTURES THEREOF

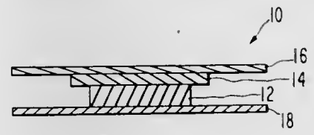
Robert M. Gale, Los Altos; David J. Enscore, Sunnyvale; Diane E. Nedberge, Los Altos; Melinda Nelson, Sunnyvale; Yu-Ling Cheng, Cupertino, and Shari B. Libicki, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Feb. 26, 1987, Ser. No. 19,162

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—449 **42 Claims**

1. A composition of matter for the transdermal administration of a drug selected from the group consisting of progesterone, an estradiol ester and mixtures thereof, comprising said drug and a skin permeation enhancer selected from the group consisting of sucrose monolaurate, glycerol monooleate, glyc-



erol monolaurate, propylene glycol laurate, and neopentyl glycol dicaprate.

4,788,063

DRUG DELIVERY SYSTEM

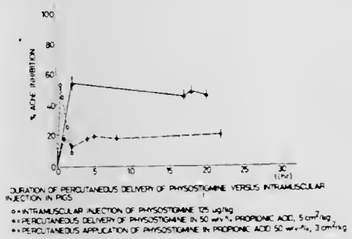
Abraham Fisher, Holon; Drora Levy, Herzeliya B; Michael Y. Spiegelstein; Jacob Grunwald, both of Rehovot; Aharon Levy, Moshav Beith Hanan, and Moshe Kushnir, Nir Zevi, all of Israel, assignors to State of Israel, Represented by Prime Minister's Office Israel Institute for Biological Research, Ness-Ziona, Israel

Filed Jul. 30, 1985, Ser. No. 760,609

Claims priority, applicatioo Israel, Aug. 14, 1984, 72684

Int. Cl.[4] A61F *13/02*

U.S. Cl. 424—449 **5 Claims**



1. A pharmaceutical composition for transdermal application of, as the active ingredient, a drug of high intrinsic specific activity comprising in combination said active ingredient and a low molecular weight C_2–C_{10} fatty acid, said active ingredient being a cholinergic or anticholinergic agent selected from the group consisting of physostigmine, tetrahydroaminoacridine, arecoline, oxotremorine, pilocarpine, acceclidine, scopolamine, atropine, benztropine, aprophen, artane, trihexyphenidyl and benactyzine.

4,788,064

TRANSDERMAL DELIVERY SYSTEM

Niranjan M. Patel, Dover; Mohan B. Kabadi, Marlboro, and Susan C. Moniot, Chester, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 31, 1987, Ser. No. 79,965

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—444 **7 Claims**

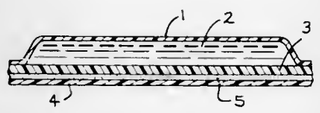
1. A multi-layered device for the transmembranal delivery of procaterol comprising: an impermeable backing whose perimeter contains an adhesive; a composition saturated in a synthetic sponge layered on the inside of the backing wherein the composition comprises

(a) about 0.1 to about five weight percent procaterol or pharmaceutically acceptable salt thereof;

(b) about five to about 30 weight percent of an essential fatty acid;

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(c) about 15 to about 40 weight percent of a solvent for (a), and
(d) about 25 to about 55 weight percent of a cosolvent for (a);



a porous barrier membrane covering the composition; and a release liner covering in turn the barrier membrane and adhered to the backing.

4,788,065

FEEDING METHOD IN BREEDING SOWS

Kimiyoshi Nakamura; Takashi Nakaoyama, both of Ibaraki; Toshiaki Eida, and Hidemasa Hidaka, both of Kanagawa, all of Japan, assignors to National Federation of Agricultural Co-operative Associations and Meiji Seika Kaisha, Ltd., both of Tokyo, Japan

Filed Apr. 27, 1987, Ser. No. 43,011
Claims priority, application Japan, Jul. 7, 1986, 61-160341
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 **2 Claims**

1. A method of reducing an interval from weaning to estrus in sows comprising feeding to sows a saw animal diet containing an effective amount of sugar composed mainly of fructooligosaccharides for a period of time after pregnant sows are separated from other pigs for parturition until weaning.

4,788,066

PREPARATION OF LOW ALCOHOL BEER

Paul R. Witt, Muscatine, Iowa, assignor to Grain Processing Corporation, Muscatine, Iowa

Filed Dec. 14, 1987, Ser. No. 132,427
Int. Cl.[4] C12C *11/00*
U.S. Cl. 426—16 **4 Claims**

1. A process for producing an all-malt beer of low alcohol content which comprises:
mashing barley malt in water with an alpha-amylase enzyme at a temperature of about 78°–80° C. in an amount and for a time sufficient to liquefy the malt starch,
adding a cellulase enzyme which is not deactivated at temperatures up to 80° C. in an amount sufficient and for a period of time sufficient to reduce the viscosity of the mash to about 50 to 60 centipoises at 75° C.,
separating wort from the resulting mash,
fermenting the separated wort with yeast,
separating the fermented wort and yeast,
incorporating into the fermented wort a starch hydrolyzate having a dextrose equivalent value of not more than about 25,
filtering the fermented wort, and
diluting the filtered fermented wort with water to provide a beer containing not more than about 0.5% alcohol by volume.

4,788,067

PREPROOFED, FROZEN AND 84% BAKED, CRUSTY BREAD AND METHOD OF MAKING SAME

Bernard Seneau, Woodbridge, Conn., assignor to General Foods Corporation, White Plains, N.Y.

Filed Jun. 23, 1987, Ser. No. 65,821
Int. Cl.[4] A21D *6/00, 10/00, 10/02, 13/00*
U.S. Cl. 426—19 **13 Claims**

1. A method of producing a frozen, partially-baked, fully-proofed, crusty bread product comprising the steps of:
(a) mixing dry ingredients comprising flour and yeast with water to form a dough;
(b) allowing said dough to rise;
(c) fully proofing said dough in a high humidity atmosphere;
(d) placing said dough in a preheated oven for baking;
(e) injecting said oven, during baking, with a first amount of steam; thereafter,
(f) continuing to bake the dough; thereafter,
(g) injecting said oven with a second amount of steam, said second amount of steam enabling the partially-baked bread product of step (h) to possess at least 20% more moisture than present in a 100% baked bread product; and thereafter,
(h) removing said dough from said oven after only about 84% of the final baking is accomplished;
(i) cooling the partially-baked product of step (h); and then,
(j) flash freezing the cooled product of step (i).

4,788,068

AEROSOL FOOD FLAVORING COMPOSITIONS

Gregory A. Konishi, Phoenix, and Peter F. Davy, Scottsdale, both of Ariz., assignors to The Dial Corporation, Phoenix, Ariz.

Filed Nov. 10, 1986, Ser. No. 929,249
Int. Cl.[4] B65D *83/14;* **A23L** *1/035;* **A23D** *5/00, 3/04*
U.S. Cl. 426—116 **9 Claims**

1. An aerosol food flavoring composition comprising a major amount of a concentrate and a minor amount of suitable propellant, and wherein said concentrate comprises from about 50 to 75 weight percent of a food grade oil, from about 5 to 50 weight percent of undissolved solids, substantially no moisture, and from about 0.2 to 12 weight percent of an emulsifier system comprising a blend of a lipophilic and hydrophilic emulsifier, and wherein the HLB value of said system ranges from about 7 to 12.

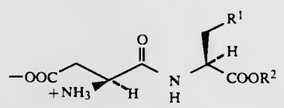
4,788,069

INTENSELY SWEET L-ASPARTYL-3-(BICYCLOALKYL)-L-ALANINE ALKYL ESTERS

Guillermo A. Iacobucci; James G. Sweeney, and James G. King, III, all of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Mar. 27, 1987, Ser. No. 32,129
Int. Cl.[4] C07K *5/06;* **A23L** *1/236*
U.S. Cl. 426—548 **22 Claims**

1. An intensely sweet compound of the formula:



wherein R^1 is a bicycloalkyl ring, said ring having 7 to 8 carbon atoms, the 2-position ring carbon atom is bound to the alanine moiety, and the two carbon atoms of the ring vicinal to said 2-position carbon are each substituted by a hydrogen or lower alkyl of 1–5 carbons, the total number of alkyl groups bound to the vicinal carbons is less than three, and R^2 is a lower alkyl group of 1–5 carbons; and edible salts thereof.

4,788,070

PROCESS FOR ACIDIFYING GROUND MEATS

Eugene Brotsky, Pittsburgh; Charles W. Everson, McMurray, both of Pa., and William E. Swartz, Trumbull, Conn., assignors to Stauffer Chemical Company Division of Rhone-Poulenc, Inc., Shelton, Conn.

Filed Sep. 5, 1986, Ser. No. 903,796
Int. Cl.[4] A23B *4/00*
U.S. Cl. 426—264 **20 Claims**

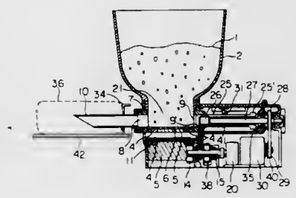
1. A process for preparing acidified ground meat particles comprising:
(a) treating ground meat to extract binding protein from the meat;
(b) forming the treated meat into particulate form and cooking the formed meat particles in a solution containing salt sufficient to prevent loss of salt from the meat during cooking for a period of time and at a temperature sufficient to denature at least a portion of the protein and set the shape of the meat particles;
(c) contacting the product of step (b) with a food grade acid solution containing sufficient salt to prevent gelatinization of the meat for a period of time sufficient to decrease the internal pH of the meat to a pH of 4.6 or below.

4,788,071

METHOD FOR QUANTITATIVELY EXTRUDING FOOD MATERIAL

Torahiko Hayashi, and Yasunori Tashiro, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Tochigi, Japan

Division of Ser. No. 834,579, Feb. 28, 1986, Pat. No. 4,669,967. This application Feb. 19, 1987, Ser. No. 938,413
Claims priority, application Japan, Mar. 2, 1985, 60-41482
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—281 **2 Claims**



1. A method of quantitatively extruding a fluid food material containing solid food material comprising the steps of:
feeding the fluid food material from a hopper to a cylindrical chamber provided on the bottom of said hopper, temporarily enclosing the food material in the chamber to form a cylindrical body, and extruding said cylindrical body from the chamber with a piston into an edible article via a nozzle inserted in the edible article, said nozzle having approximately the same inner diameter as that of said cylindrical chamber.

4,788,072

METHOD OF DEHYDRATING FOODS

Toshimitsu Kawamura, 4-5-15, Sagamidai, Sagamihara shi, Kanagawa ken, Japan

Filed Jul. 30, 1986, Ser. No. 910,140
Claims priority, application Japan, Aug. 15, 1985, 60-178609; Oct. 23, 1985, 60-235332
Int. Cl.[4] A23L *1/10*
U.S. Cl. 426—441 **24 Claims**

1. A method of preparing a dehydrated food product which comprises subdividing the food to be dehydrated into pieces of desired size; contacting said food pieces within a sealed vessel with an aqueous solution of a sugar of a concentration sufficient to absorb water from said food pieces by osmotic action while elevating the pressure within said vessel to force said solution into the cells of said food pieces; when sufficient water is absorbed by said osmotic action terminating such contact and immediately reducing the pressure within said vessel significantly below atmospheric pressure to promote rapid volatilization of moisture of said solution from said cells but without violently disrupting those cells; while said food pieces are under reduced pressure, contacting the same with an edible oil heated to at least about 90° C. but below the temperature at which the food pieces would undergo superficial degradation, such contact with said oil continuing for a time sufficient to reduce the moisture content of a final food product defined by said food pieces to a level adequate for storage life; and then removing unabsorbed oil from said food pieces and cooling the thus-treated food pieces to ambient temperature.

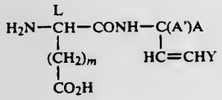
4,788,073

SWEETENING WITH L-AMINODICARBOXYLIC ACID ALKENES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glean M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 730,967, May 6, 1985, Pat. No. 4,760,175. This application Feb. 26, 1988, Ser. No. 160,788
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—548 **31 Claims**

1. A composition of an edible composition and a sweetening effective of a compound having the formula;



wherein
A is hydroxyalkyl containing 1–3 carbon atoms;
A' is hydrogen or alkyl containing 1–3 carbon atoms;
Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;
R_1 is cycloalkyl, alkyl-substituted cycloalkyl, cycloalkenyl, alkyl-substituted cycloalkenyl, bicycloalkyl, alkyl-substituted bicycloalkyl, bicycloalkenyl or alkyl-substituted bicycloalkenyl each containing up to 7 ring carbon atoms and up to a total of 12 carbon atoms;
R_2 is H or alkyl containing 1–4 carbon atoms;
R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;
n is 0 or 1; and
m is 0 or 1;
and food-acceptable salts thereof.

4,788,074

Patent Not Issued For This Number

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4,788,075

METHOD FOR PRODUCING ASEPTICALLY-PACKAGED PUDDINGS

Theodore H. Joseph, Cranbury; Douglas M. Lehmann, Howell; Joyce P. St. John, Crosswicks, and Natale Butera, Englishtown, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 914,204, Oct. 1, 1986. This application Jul. 1, 1987, Ser. No. 68,685
Int. Cl.[4] A23L *1/04*
U.S. Cl. 426—579 9 Claims

1. A process for preparing an aseptically-packaged, ready-to-eat, starch-containing pudding comprising the steps of:
(a) preparing a pudding formulation comprised of milk solids, water, 3.5 to 10% of fat having a lauric acid content of at least 20%, sweetener, flavor and color agents, 2.5 to 4.2% of an essentially amylose-free, chemically-modified starch and from about 0.12 to 0.2% of an anionic surfactant selected from the group consisting of calcium- or sodium-stearyol 2-lactylate and sodium lauryl sulfate, wherein said formulation is essentially-free of hydrocolloid thickeners;
(b) mixing and heating the said formulation at a temperature of from 125° to 160° F. in order to thoroughly melt and disperse the fat and the surfactant;
(c) homogenizing the mix of step (b) while maintaining the temperature of the mix at from 125° to 160° F.;
(d) subjecting the homogenized mixture to a high-temperature, short-time heating step at about 265° to 305° F. in order to both cook the starch and sterilize the mix;
(e) initially cooling the cooked and sterilized pudding mix in one or more fixed plate or tube heat exchangers to a temperature of below about 130° F.; thereafter,
(f) further cooling the pudding mix to a temperature of from 60° to 90° F., said further cooling being effected in a fixed plate, tube or swept-surface heat exchanger; and then
(g) aseptically-packaging the pudding mix.

4,788,076

POWDERED LACQUER, ITS MANUFACTURE AND USE

Joern-Volker Weiss, Haltern, Fed. Rep. of Germany, assignor to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed May 4, 1987, Ser. No. 45,437
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624177
Int. Cl.[4] C08L *63/00, 67/00;* C09D *5/46*
U.S. Cl. 427—27 19 Claims

14. A method for the manufacture of a flat finish coating, comprising the steps of:
(i) mixing at least one epoxide-containing compound, a nitrogen-containing salt in an amount effective as hardener, and 0.5 to 1 wt %, relative to the total weight of the coating, of 1,4-diazabicyclo-[2.2.2]-octane;
(ii) extruding said mixture at a temperature between about 160°–240° C.; cooling said extrusion, and grinding said cooled extrusion;
(iii) applying said ground mixture to a substrate to coat said substrate; and
(iv) heating said coated substrate at a temperature from about 160°–240° C. for about 5–35 minutes, wherein said epoxide-containing compound comprises in the average more than one epoxide group per molecule having a melting point above 40° C., and said nitrogen-containing salt comprises a salt prepared from an acid and a base, said acid selected from the group consisting of phosphoric acid and sulfuric acid, and said base selected from the group consisting of primary C_{4-18} aliphatic and C_{4-18} cycloaliphatic diamines, at least one equivalent of said acid group reacting with an amino.

16. The method of claim 14, wherein said applying step is performed by electrostatic powder spraying, whirl sintering, or electrostatic whirl sintering.

4,788,077

THERMAL SPRAY COATING HAVING IMPROVED ADDHERENCE, LOW RESIDUAL STRESS AND IMPROVED RESISTANCE TO SPALLING AND METHODS FOR PRODUCING SAME

Chih-Tsung Kang, Indianapolis, Ind., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 22, 1987, Ser. No. 64,530
Int. Cl.[4] B05D *1/08*
U.S. Cl. 427—34 16 Claims



1. A method of thermal spraying a multilayer coating on a substrate to improve the adherence of the coating to the substrate and provide improved low residual stress in the coating by projecting heat-softened particles onto said substrate comprising the steps of:
(a) establishing a body of hot gases,
(b) contacting said hot gases with particles to be projected and coated onto said substrate,
(c) heating said particles in said hot gases to a temperature above their melting point,
(d) impinging said heated particles against a substrate selected from the group consisting of metallic, carbon, graphite or polymer substrates for a period of time sufficient to provide a first layer of a coating on said substrate,
(e) reducing the heat of said particles in said hot gases to a temperature below that of step (c) but above about their melting point, and
(f) impinging said heated particles on said first layer to provide an overall layer having good adhesion to said substrate and wherein the thickness of the coating deposited in step (d) is from 2 percent to 25 percent of the total thickness of the overall layer.

4,788,078

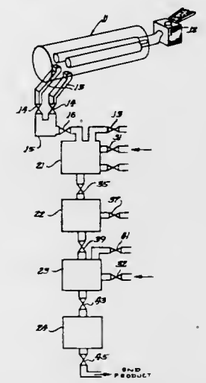
METHOD FOR PLATING AND COATING ARTICLES

Donald J. Broomfield, Elgin, Ill.; Paul C. Briggs, North Andover, Mass.; Eric G. Parker, Algonquin, Ill., and David P. Wagner, Geneva, Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Division of Ser. No. 850,517, Apr. 11, 1986, Pat. No. 4,715,316, which is a division of Ser. No. 712,597, Mar. 18, 1985, Pat. No. 4,600,662. This application Oct. 16, 1987, Ser. No. 108,957
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 24 Claims

1. A method of producing a coated article comprising: applying a non-oxidized plating material under vacuum conditions on a substrate while maintaining the substrate in an inert atmosphere to prevent oxidation of the plating material and then applying to and chemically bonding a coating material with the non-oxidized plating material the coating material

being a material selected from the group consisting of (1) epoxy; (2) a primer and a polymer; (3) stearic acid; (4) boron



tri-fluoride and a polymer; and (5) the combination of calcium, silicon and oxygen.

4,788,079

METHOD OF MAKING HAZE-FREE TIN OXIDE COATINGS

Georg H. Lindner, KV Vlissingen, Netherlands, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Continuation of Ser. No. 793,023, Oct. 30, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 116,423
Int. Cl.[4] C03C *17/22*
U.S. Cl. 427—166 8 Claims

1. A method of forming haze-free tin oxide coatings on a substrate from an organotin compound which usually forms only hazy films under advantageous deposition conditions which comprises:
forming a haze-free tin oxide undercoat film on said substrate by contacting said substrate at a temperature of 450° C. to 650° C. with a vapor of monophenyltin trichloride and thereafter depositing a desired tin oxide overcoat from the thermal decomposition of a tin compound selected from the group of tin tetrachloride, dibutyltin diacetate, dimethyl tin chloride and monobutyltin trichloride whereby the tin oxide overcoat assumes the haze-free characteristics of said undercoat.

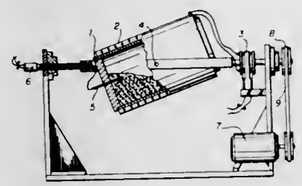
4,788,080

PROCESS AND APPARATUS FOR COATING PARTICLES WITH FINE POWDER

Junichi Hojo, Boucherville; Serge Dallaire, Longueuil, and Blaise Champagne, Boucherville, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Apr. 27, 1987, Ser. No. 42,715
Int. Cl.[4] B05D *7/24, 1/00*
U.S. Cl. 427—204 19 Claims

1. a process for coating ceramic or metallic particles with fine powder selected from metal powders, ceramic powders, and carbon or plastic powders which comprises:
a. providing a mixture comprising said particles and a binder which is capable of slowly melting to viscous state at temperatures up to about 85° C.,
b. tumbling said mixture while slowly heating same to enable said binder to reach said viscous state while allowing said particles to be substantially covered with said binder,
c. cooling the mixture substantially to room temperature and thereafter breaking up agglomerates that have formed during said tumbling and heating, to give individual particles covered with said binder,



d. adding said fine powder to said individual particles covered with said binder and tumbling and heating again to said viscous state under conditions effective to provide a coating of said fine powder on said particles.

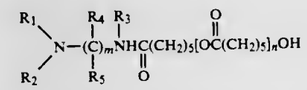
4,788,081

BIODEGRADABLE COATINGS OF IONOMER POLYMER

Warren A. Thaler, Flemington; Pacifico V. Manalastas, Edison; Evelyn N. Drake, Lebanon, and Robert D. Lundberg, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 883,533, Jul. 9, 1986, Pat. No. 4,741,956. This application Feb. 1, 1988, Ser. No. 151,179
Int. Cl.[4] B05D *7/00;* A01N *25/00;* C05G *5/06*
U.S. Cl. 427—212 10 Claims

1. A process for preparing a coating composition susceptible to chemical degradation in the environment which comprises:
(a) preparing a composition comprising a sulfonated polymer which has about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone having the formula:



wherein R_1 or R_2 is an alkyl, cycloalkyl or aryl group; R_3, R_4 and R_5 are a hydrogen or alkyl, cycloalkyl or aryl groups; m equals 1 to 20; and n equals 1 to 500; and
(b) coating said composition of said sulfonated polymer neutralized with said polycaprolactone on an urea.

4,788,082

METHOD AND APPARATUS FOR THE DEPOSITION OF SOLID FILMS OF A MATERIAL FROM A JET STREAM ENTRAINING THE GASEOUS PHASE OF SAID MATERIAL

Jerome J. Schmitt, 265 College St. (12N), New Haven, Conn. 06510

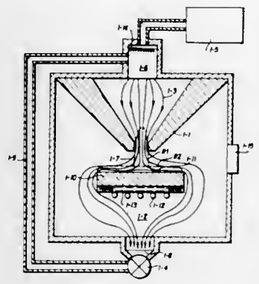
Continuation-in-part of Ser. No. 579,676, Feb. 13, 1984, abandoned. This application Dec. 12, 1985, Ser. No. 888,590
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—248.1 28 Claims

1. A method of depositing a condensible gaseous material entrained in an inert carrier gas as a solid onto a substrate surface unreactive to the condensible gaseous material comprising:
(a) forming a stream of inert carrier gas;
(b) generating the condensible gaseous component to be deposited on the substrate substantially contiguous to or within a means for forming a jet of the inert carrier gas;
(c) transporting the condensible gaseous material and the

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stream of the inert carrier gas through the jet forming means toward the substrate;

(d) decelerating the jet stream of inert carrier gas by impinging the jet against the substrate and thereby effecting a deposit in solid form of the condensible gaseous material; and



(e) effecting relative movement having a lateral component between the substrate surface and the stream of inert carrier gas to dispose a substantially uniform thickness of solid condensible gaseous material on the substrate surface.

4,788,083

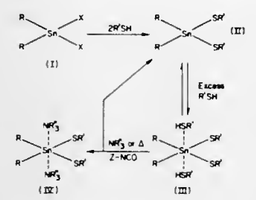
TIN OR BISMUTH COMPLEX CATALYSTS AND TRIGGER CURE OF COATINGS THEREWITH

Laurence G. Dammann, Westerville, and Gary M. Carlson, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 844,810, Mar. 27, 1986, abandoned. This application Nov. 17, 1986, Ser. No. 931,610

Int. Cl.[4] B01J *31/00;* **B05D** *3/04;* **C08G** *18/22*

U.S. Cl. 427—340 **68 Claims**



1. An activatable catalyst effective for the reaction of a hydroxyl compound and an isocyanate compound and being activated in the presence of an amine activator or heat, comprising the reaction product of:

(a) a metal catalyst selected from a tin catalyst, a bismuth catalyst, and mixtures thereof; and

(b) a molar excess of a complexing agent selected from:

(1) a mercapto compound;

(2) a polyphenol with adjacent hydroxyl groups and characterized by being reactable with an isocyanate group in the presence of a tertiary amine activator; and

(3) mixtures thereof

said reaction product being dispersed in organic solvent.

30. A method for curing a catalyzed reaction mixture which comprises:

(A) applying said catalyzed reaction mixture as a film onto a substrate, said catalyzed reaction mixture comprising a polyol, a polyisocyanate, and an activatable catalyst comprising the reaction product of:

(a) a metal catalyst selected from a tin catalyst, a bismuth catalyst, and mixtures thereof; and

(b) a molar excess of a complexing agent selected from:

(1) a mercapto compound;

(2) a polyphenol having adjacent hydroxyl groups and characterized by being reactable with an isocyanate group in the presence of a tertiary amine activator; and

(3) mixtures thereof; and

(B) exposing said applied film to one or more of heat or an amine activator for cure of said applied film.

4,788,084

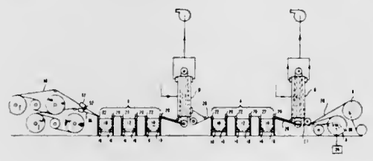
PROCESS FOR SIZING METAL OXIDE COATED NON-METALLIC OR SEMIMETALLIC FILAMENTS

Louis G. Morin, Tarrytown, N.Y., assignor to American Cyanamid Co., Stamford, Conn.

Filed Jun. 24, 1983, Ser. No. 507,602

Int. Cl.[4] B05D *3/04, 3/10*

U.S. Cl. 427—343 **14 Claims**



1. A process for sizing metal coated nonmetallic or semimetallic filaments said process comprising:

(a) providing said filaments with a metal oxide surface;

(b) passing said filaments through a sizing medium; and

(c) heating said filaments to dry and set the sizing material on the filaments.

4,788,085

COMPOSITION AND METHOD FOR THE PRESERVATION OF PLANTS

John E. DeLuca, and Sharon K. DeLuca, both of Aurora, Colo., assignors to Foliage Plus, Inc., Shakopee, Minn.

Filed Nov. 4, 1986, Ser. No. 927,317

Int. Cl.[4] A01G *5/06;* **A01N** *3/00;* **A41G** *1/00*

U.S. Cl. 428—18 **37 Claims**

14. A process for preserving a plant comprising introducing to the nutrient transport system of the plant for systemic transport throughout the plant a composition comprising:

(a) a preservative in an amount sufficient to preserve the plant; and

(b) a facilitator in an amount sufficient to increase the rate of systemic aspiration of said composition into said plant, said facilitator being selected from the group consisting of glyme, dioxane, pyridine, dimethylformamide, diglyme, acetone, tetrahydrofurane, acetonitrile, triglyme, and 1-methyl-2-pyrrolidone.

15. A process as claimed in claim **14** wherein said preservative comprises glycerine.

17. A preserved tree produced by the process of claim **15**.

4,788,086

COPPER-BASED METALLIC MEMBER HAVING A CHEMICAL CONVERSION FILM AND METHOD FOR PRODUCING SAME

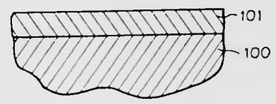
Shigeki Matsuda, Okazaki, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 12, 1985, Ser. No. 754,231

Claims priority, application Japan, Jul. 14, 1984, 59-146499; Aug. 11, 1984, 59-168238; Sep. 7, 1984, 59-188673

Int. Cl.[4] B65D *65/28*

U.S. Cl. 428—34.1 **8 Claims**



1. A copper-based metallic member comprising a substrate consisting of a copper-based metallic material; and a chemical conversion film layer formed on at least a portion of the surface of the substrate, said chemical conversion film layer comprising at least one metal phosphate selected from phosphates of zinc, manganese, iron, calcium and magnesium, ard at least one copper halide selected from the group consisting of cuprous chloride, cuprous bromide and cuprous iodide.

4,788,087

TUBULAR CASINGS

Michaela Wilke, Schneverdingen; Hartmut Klusik, Fallingbostel, and Klaus Balser, Walsrode, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed May 28, 1987, Ser. No. 55,205

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620165

Int. Cl.[4] F16L *11/00;* **A22C** *13/00;* **428** *36, 508, 479.3*

U.S. Cl. 428—34.8 **7 Claims**

1. A regenerated cellulose tubular packaging casing having an internal coating of a film-forming plastic resin, which contains 10 to 200 mg of a coagulant, the coagulant capable of coagulating proteins, the coagulant having at least one carboxyl-group or a salt thereof per m^2 of said internal coating.

4,788,088

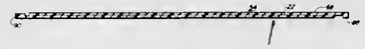
APPARATUS AND METHOD OF MAKING A REINFORCED PLASTIC LAMINATE STRUCTURE AND PRODUCTS RESULTING THEREFROM

John O. Kohl, 229 S. Sixth St., Bayport, Minn. 55003

Division of Ser. No. 784,423, Oct. 4, 1985, abandoned. This application Oct. 2, 1986, Ser. No. 914,503

Int. Cl.[4] B32B *23/02*

U.S. Cl. 428—34.5 **13 Claims**



1. A reinforced plastic laminate structure comprising:

an elongated reinforcing material; and

an extruded flattened solid wall plastic tube having its interior wall flattened and in physical contact with and forming a continuous structure around said reinforcing material and forming a substantially flat laminate structure, said flattened tube including extruded fastening means along at least a portion of an edge of said structure.

4,788,089

HEAT-RECOVERABLE ARTICLE

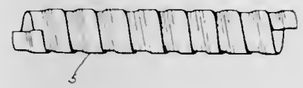
Richard S. Skipper, Preston, England, assignor to Raychem Limited, London, England

Filed Mar. 5, 1986, Ser. No. 836,359

Claims priority, application United Kingdom, Mar. 6, 1985, 8505785

Int. Cl.[4] F16L *11/16*

U.S. Cl. 428—34.9 **9 Claims**



1. An article comprising a strip of heat-recoverable polymeric material pre-formed into a self-supporting, self-locating helical configuration capable of being wrapped around a substrate, wherein the strip is pre-formed into a helical configuration having overlapping windings, each having a stepped formation such that each successive winding fits into the step of the previous winding.

4,788,090

FIRE RESISTANT PLASTIC PIPE

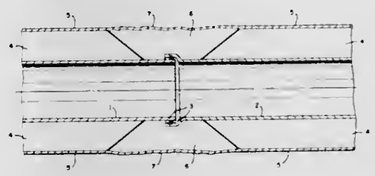
Paul R. Marks, Hoole, and Michael H. Collins, Ince, both of United Kingdom, assignors to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Feb. 9, 1987, Ser. No. 12,929

Claims priority, application United Kingdom, Apr. 2, 1986, 8608055

Int. Cl.[4] F16L *9/00, 59/16*

U.S. Cl. 428—34.5 **3 Claims**



1. A plastic pipe coated at the outer surface thereof with a thermal insulating layer consisting of a phenolic foam wherein said layer is enclosed in an integrity retaining layer serving as a top layer, said integrity retaining layer, comprising fibers which fuse together upon exposure to fire thereby providing mechanical strength to the foam if the pipe is exposed to fire, said integrity retaining layer consisting of a member of the group consisting of an epoxy impregnated woven glassfiber mat and a phenolic impregnated woven glassfiber mat.

4,788,091

FLAME RETARDANT EMBOSSING FILM

Conrad Rossitto, Andover, and Leon Pechinski, Danvers, both of Mass., assignors to Emhart Enterprises Corp., Farmington, Conn.

Filed Aug. 17, 1987, Ser. No. 86,326

Int. Cl.[4] C08K *5/04, 3/22*

U.S. Cl. 428—40 **13 Claims**

1. A curing adhesive film which comprises:

(a) an organic binder portion comprising a hydroxyl terminated polyurethane elastomer, a phenoxy resin, and a blocked aliphatic isocyanate prepolyer wherein the phenoxy and polyurethane are employed in a phenoxy to polyurethane weight ratio of about 1:3 to about 2:1; and

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(b) from about 50 to about 85% by weight of the total film composition of a fire retardant agent comprising:

decabromophenylene oxide and antimony trioxide in a ratio of from about 3:2 to about 1:2 wherein said film has a total OSU heat release of from about 20 to about 40, adheres to polyvinylfluoride film, and is capable of preserving a pattern imparted to the polyvinylfluoride film in an embossing operation.

12. A curing adhesive film which comprises:

from about 5 to about 25 weight percent, based upon the total film composition, of a phenoxy resin;

from about 5 to 20 weight percent hydroxyl terminated polyurethane elastomer;

from about 2 to about 7 weight percent blocked aliphatic isocyanate prepolymer;

from about 15 to 60 weight percent decabromophenylene oxide;

from about 10 to about 25 weight percent antimony trioxide; and

from about 20 to about 40 weight percent aluminum oxide trihydrate.

4,788,092

DISC-SHAPED MAGNETIC RECORDING MEDIUM

Ryoji Chubachi; Yoshihisa Kawamura, both of Sendai, and Nobuyuki Nihei, Shiogama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00007, § 371 Date Sep. 9, 1983, § 102(e) Date Sep. 9, 1983, PCT Pub. No. WO83/02520, PCT Pub. Date Jul. 21, 1983

PCT Filed Jan. 10, 1983, Ser. No. 535,011

Claims priority, application Japan, Jan. 14, 1982, 57-4356

Int. Cl.⁴ G11B *5/714*

U.S. Cl. 428—65 **5 Claims**

1. A disc-shaped magnetic recording medium characterized in that a non-magnetic substrate is provided with a magnetic layer in which particles of a ferromagnetic powder comprising a metal or an alloy consisting mainly of iron and having a coercive force of about 1,000 Oe or higher and a BET specific surface area in the range from about 25 to 70 m^2/g are oriented at random or in a circumferential direction, said magnetic layer having a residual magnetic flux density in the circumferential direction of at least 1500 gauss.

4,788,093

PILE COMPOSITION HAVING EXPANDED FIBERS

Shoichi Murata, Takasago; Yoshinori Shibukawa, Himeji, and Muneto Makiyama, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 918,180, Oct. 14, 1986, abandoned.

This application Mar. 22, 1988, Ser. No. 171,235

Claims priority, application Japan, Oct. 24, 1985, 60-238255

Int. Cl.⁴ B32B *3/02, 33/00*

U.S. Cl. 428—97 **4 Claims**



1. Animal hair-like pile compositions comprising 2% by weight or more of porous expanded fibers formed of acrylonitrile-based polymers with expansion ratios greater than or equal to 3% through gas contained in the fibers during their manufacturing process and less than or equal to 98% weight of non-porous expanded fibers as the fibers comprising the pile part.

4,788,094

LIGHT CONTROLLING SHEET

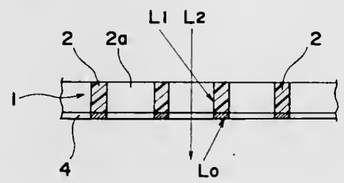
Masayuki Morita, Komaki; Noboru Takeuchi, Aichi; Masakazu Goto, Konan; Hiroaki Takahashi, Gifu, and Takeshi Kojima, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 9, 1986, Ser. No. 917,141

Claims priority, application Japan, Sep. 25, 1986, 61-147562[U]

Int. Cl.⁴ B32B *3/10;* **G02B** *5/30, 27/28*

U.S. Cl. 428—136 **4 Claims**



1. A light controlling sheet for use in indicators comprising:

a louver element including an arbitrary pattern of walls having openings therebetween, inner surfaces of said walls defining said openings and extending in a direction of thickness of said louver element, said walls being opaque such that oblique light striking the inner surfaces of said walls may be absorbed by said walls while substantially parallel light may only travel through said openings in a direction which is substantially parallel to said walls; and

an electrically conductive film mounted on one surface of said louver element, said film permitting light to pass through openings therein, said film acting as a protective cover for said louver element and acting to avoid electromagnetic waves.

4,788,095

METAL OXIDE MAGNETIC SUBSTANCE AND A MAGNETIC FILM CONSISTING THEREOF AND THEIR USES

Hazime Machida, Tokyo; Hitoshi Nakamura, Numazu; Fumiya Omi, Numazu; Atsuyuki Watada, Numazu, and Yuziro Kaneko, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

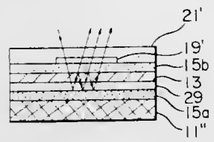
Continuation of Ser. No. 696,535, Jan. 30, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 97,301

Claims priority, application Japan, Feb. 6, 1984, 59-19671; Oct. 9, 1984, 59-211852; Oct. 9, 1984, 59-211853; Oct. 9, 1984, 59-211854; Oct. 9, 1984, 59-211855

The portion of the term of this patent subsequent to Dec. 31, 2002, has been disclaimed.

Int. Cl.⁴ G11B *7/24*

U.S. Cl. 428—172 **26 Claims**



1. A substrate and a magnetic film thereon comprising poly-

crystals of a metal oxide magnetic substance represented by the following general formula:

$$MeO.n[Ma_xMb_yCo_zFe_{2-(x+m/y+2/3z)}O_3]$$

wherein, Me, Ma, Mb, x, y, z, m and n are each as mentioned below:

Me: at least one divalent metal selected from the group consisting of Ba, Sr and Pb,

Ma: at least one trivalent metal selected from the group consisting of Ga, Al, Cr and Rh,

Mb: at least one divalent to tetravalent metal selected from the group consisting of Zn (divalent); Ni, In, Sc, Cr, Sb, Bi, Y and Sm (trivalent), and Mo, Ti, Sn, Ta, V, Mn, Ir, Hf, Pd, Nb, Re, Pt, Os, Zr, Tc, Rh, Ge, Ru, W, Te, Pr and Ce (tetravalent) (wherein, the metal represented by Mb is not the same as that represented by Me or Ma)

x: $0<x\leqq0.5$

y: $0<y\leqq0.5$

z: $0<z\leqq0.5$ (wherein, $0<x+y+z\leqq1$)

m: an ionic valency of Mb

n: $5\leqq n\leqq6$,

and wherein said minute polycrystals of the magnetic film are arranged to form a continuous thin film on the substrate and have a strong crystal magnetic anisotropy in the direction perpendicular to the surface of the magnetic film.

4. A magneto optical recording medium comprising a magnetic film on a substrate and an undercoat film between the substrate and the magnetic film, wherein said undercoat film has an epitaxial effect in the region between the substrate and the magnetic film, and wherein the magnetic film consists essentially of a metal oxide magnetic substance represented by the following general formula:

$$MeO.n[Ma_xMb_yCo_zFe_{2-(x+m/3y+2/3z)}O_3]$$

wherein, Me, Ma, Mb, x, y, z, m and n are each as mentioned below:

Me: at least one divalent metal selected from the group consisting of Ba, Sr and Pb,

Ma: at least one trivalent metal selected from the group consisting of Ga, Al, Cr and Rh,

Mb: at least one divalent to tetravalent metal selected from the group consisting of Zn (divalent); Ni, In, Sc, Cr, Sb, Bi, Y and Sm (trivalent), and Mo, Ti, Sn, Ta, V, Mn, Ir, Hf, Pd, Nb, Re, Pt, Os, Zr, Tc, Rh, Ge, Ru, W, Te, Pr and Ce (tetravalent) (wherein, the metal represented by Mb is not the same as that represented by Me or Ma)

x: $0<x\leqq0.5$

y: $0<y\leqq0.5$

z: $0<z\leqq0.5$ (wherein, $0<x+y+z\leqq1$)

m: an ionic valency of Mb

n: $5\leqq n\leqq6$.

4,788,096

DEVICES FOR MAKING PIEZOELECTRIC CERAMIC OR CERAMIC-BASE COMPOSITE SENSORS

Ilmar L. Kalnin, Millington; Howard Furst, Berkeley Heights; George J. Breckenridge, Clark, and O. Richard Hughes, Chatham Township, Morris County, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 741,925, Jun. 6, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 18,210

Int. Cl.⁴ B32B *3/20;* **C04B** *35/00;* **G04F** *5/00*

U.S. Cl. 428—188 **15 Claims**

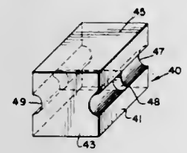
1. In the fabrication of a hydrophone assembly, wherein a plurality of selected cubelets, molded from a piezoelectrically active ceramic material, must be arranged in a precision array and embedded in a liquid polymer resin which is then cured with the array in place,

a cubelet/lattice assembly as an improvement for facilitating said arranging and embedding, comprising:

A. a plurality of said cubelets; and

B. a lattice comprising a frame, a bottom, and a plurality of intersecting plates which define a precision array of snug-fitting cavities having the dimensions of said cubelets, wherein:

(1) said frame, said bottom, and said plates are fabricated from an engineering resin yielding a stiff plastic, and



(2) said engineering resin is a thermocasting resin suitable for precision injection molding, said resin being a polymer selected from the group consisting of polyacetals, nylons, and polyacrylates.

4,788,097

INFORMATION RECORDING MEDIUM

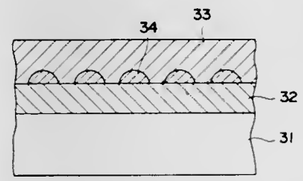
Shinichiro Ohara; Masao Yabe, and Younosuke Takahashi, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Feb. 12, 1987, Ser. No. 13,814

Claims priority, application Japan, Feb. 12, 1986, 61-28241; Mar. 20, 1986, 61-64567; Mar. 26, 1986, 61-69070; Mar. 26, 1986, 61-69071

Int. Cl.⁴ G01D *15/14;* **B32B** *3/00*

U.S. Cl. 428—201 **16 Claims**



1. In an information recording medium comprising a substrate, an intermediate layer arranged on the substrate, and a recording layer arranged on the intermediate layer, said recording layer comprising a low melting metal selected from the group consisting of In, Te, Sn, Pb and Bi and a metal compound selected from a metal sulfide, a metal fluoride and a metal oxide, the improvement wherein:

the recording layer further contains a metal having a high surface tension of not less than 600 dyne/cm within temperatures from its melting point to a temperature higher than the melting point by 300° C., the concentration of said metal varying along the depth direction of the recording layer in such manner that the concentration of said metal on the side facing the substrate is higher than that of said metal on the opposite side, and

the intermediate layer comprises a compound selected from the group consisting of a chlorinated polyolefin, a polymer material having a thermal decomposition temperature of not higher than 300° C., and an organic compound having a surface energy of not higher than 40 $dyne/cm^2$.

8. In an information recording medium comprising a substrate and a recording layer arranged on the substrate, said recording layer comprising a low melting metal selected from the group consisting of In, Te, Sn, Pb and Bi and a metal compound selected from GeS, a metal fluoride and a metal oxide, the improvement wherein:

the recording layer further contains a metal having a high

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surface tension of not less than 600 dyne/cm within temperatures from its melting point to a temperature higher than the melting point of 300° C., said high surface tension metal being arranged in the form of islands on the surface facing the substrate.

4,788,098

AROMATIC POLYIMIDE LAMINATE SHEET

Takahiko Sado, and Hiroaki Mori, both of Tokyo, Japan, assignors to Ube Industries, Inc., Ube, Japan

Filed Dec. 15, 1986, Ser. No. 941,432

Claims priority, application Japan, Dec. 17, 1985, 60-281957

Int. Cl.[4] B32B *7/02, 27/08*

U.S. Cl. 428—215 **14 Claims**

1. An aromatic polyimide laminate sheet having a thickness of 50 μm or more and comprising:

(1) at least one first film layer comprising an aromatic imide polymer consisting essentially of a polymerization-imidization product of an aromatic tetracarboxylic acid component containing 80 to 100 molar % of a principal acid ingredient consisting of at least one biphenyltetracarboxylic acid compound with an aromatic diamine component containing 80 to 100 molar % of a principal diamine ingredient consisting of at least one aromatic diamine compound having two or more benzene rings, and having a glass transition temperature of from 250° C. to 350° C.; and

(2) at least one second film layer comprising an aromatic imide polymer,

the at least one first film layer and the at least one second film layer being alternately laminated on and directly heat-press-bonded to each other without in any way arranging a bonding material layer therebetween.

12. The laminate sheet as claimed in claim 1, wherein the first and second film layers respectively have, independently from each other, a thickness of 10 to 200 μm.

4,788,099

VIBRATION-DAMPING MATERIAL WITH EXCELLENT WORKABILITY

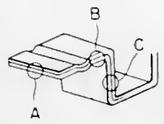
Nobuo Fukushima, Otsu; Shuji Kitamura, Nagaokakyo; Kiyohiko Nakae, Nishinomiya; Yoshiaki Togawa, Kyoto; Kozo Kotani, Toyonaka; Toshitsugu Kikuchi, Ibaraki, and Seiichi Shibata, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company Limited and Sumitomo Metal Industries, Ltd., both of Osaka, Japan

Continuation of Ser. No. 658,633, Oct. 9, 1984, abandoned. This application Sep. 3, 1987, Ser. No. 94,021

Claims priority, application Japan, Oct. 13, 1983, 58-192019; Jul. 12, 1984, 59-145782; Jul. 12, 1984, 59-145783

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—215 **7 Claims**



1. A vibration-damping material with excellent workability consisting of two metal plates and a vibration-damping layer of a thermoplastic resin interposed between the two metal plates, in which the vibration-damping layer of a thermoplastic resin has a total thickness of 30 to 100μ and consists of a film as a middle layer and a polyolefin type resin (B) provided on both sides of the film as an upper and lower layer, the middle layer being composed of (1) at least one resin (A) selected from the group consisting of an ethylene-vinyl acetate copolymer, an ethylene-acrylic acid copolymer and a saponification product of an ethylene-vinyl acetate copolymer each having a modulus of elasticity in shear at 20° C. of 3×10^9 to 1×10^7 dyne/cm^2, a percentage of elongation at 20° C. of 50% or above and a peak temperature of dissipation factor (tan δ) of −120° to 80° C. or (2) a resin mixture of the resin (A) and a synthetic rubber having a percentage of elongation at 20° C. of 100% or above and a peak temperature of dissipation factor (tan δ) of −120° to 50° C., and the polyolefin type resin (B) being selected from the group consisting of a mixture of a modification product of a linear low density polyethylene with maleic anhydride and (meth)acrylic acid ester polymer, or a mixture of said mixture and a linear low density polyethylene, said mixtures having a modulus of elasticity in shear at 20° C. larger than that of the resin (A), a percentage of elongation at 20° C. of 10% or above, a peak temperature of dissipation factor (tan δ) of −40° to 180° C. and a bonding strength toward the metal plates at 20° C. and 180°-peeling of 3 kg/cm or above.

4,788,100

LENGTH OF MATERIAL, IN PARTICULAR FOR FILTERING, METHOD FOR ITS MANUFACTURE AND APPLICABILITY

Eberhard Janssen, Düren-Echtz, and Willi Hunold, Merzenich, both of Fed. Rep. of Germany, assignors to Thomas Josef Heimbach GmbH & Co., Dueren, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,871

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614949

Int. Cl.[4] B32B *5/02*

U.S. Cl. 428—234 **18 Claims**



1. A fabric for paper machines and the like, comprising:

(a) a needle felt substrate comprised of a non-woven air permeable fabric having spaced surfaces; and,

(b) an open pore air permeable plastic foam incorporated into said substrate and extending from one surface toward the other.

4,788,101

FIBROUS STRUCTURE FOR REINFORCING A COMPOSITE MATERIAL AND A METHOD FOR MANUFACTURING THE FIBROUS STRUCTURE

Yoshiaki Sakatani; Tetsuya Yamamoto; Shigeru Nishiyama, all of Nagoya, and Tetsuro Hirokawa, Omihachiman, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Shikishima Canvas Kabushiki Kaisha, Osaka, both of, Japan

Filed Feb. 1, 1988, Ser. No. 151,049

Claims priority, application Japan, Feb. 3, 1987, 62-23752

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—34.5 **3 Claims**

1. A fibrous structure for reinforcing a composite material, said fibrous structure being a bottomed hollow pillar-shaped body comprising a plurality of yarn sections disposed in a longitudinally adjoining arrangement, each of said yarn sections comprising a plurality of longitudinally adjoining layers of a first continuous yarn, said first continuous yarn being disposed within each layer in a plane substantially perpendicular to the longitudinal direction; a second continuous yarn extending through said layers in a plurality of longitudinally extending segments uniformly distributed with said section, each segment being substantially perpendicular to the plane of each of said layers and having a loop formed therein adjacent the last layer of first continuous yarn within the section; and a third continuous yarn extending through said loops, said second continuous yarn functioning as a common, longitudinal component yarn in coextensive portions of the adjoining yarn sections and as an independent longitudinal component yarn in



portions of the yarn sections which are not coextensive with other yarn sections.

4,788,102

DATA-CARRYING CARD, METHOD FOR PRODUCING SUCH A CARD, AND DEVICE FOR CARRYING OUT SAID METHOD

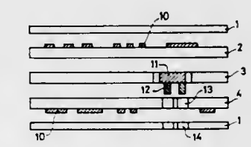
Anthony A. Koning, Haren, and Wim Dijkhuizen, Zuidlaren, both of Netherlands, assignors to Papier-Plastic-Coating Groningen B.V., Groningen, Netherlands

Filed May 21, 1987, Ser. No. 53,131

Claims priority, application Netherlands, May 30, 1986, 8601404

Int. Cl.[4] A61F *13/02*

U.S. Cl. 428—40 **9 Claims**



1. A data-carrying card comprising:

at least three layers comprising a first outer cover layer, a second inner layer, and a third outer cover layer, said at least three layers being laminated to each other, said second layer including an integrated circuit; and

adhesive means, coating at least one of each pair of adjacent surfaces of said layers, for bonding said pairs of adjacent surfaces at ambient temperature without high pressure to form the lamination.

4,788,103

MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Kazuko Hanai, and Yasuyuki Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 20, 1987, Ser. No. 39,860

Claims priority, application Japan, Apr. 18, 1986, 61-89510

Int. Cl.[4] G11B *5/702*

U.S. Cl. 428—425.9 **12 Claims**

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer containing ferromagnetic fine particles dispersed in a binder including a polyurethane resin, wherein the number average molecular weight of said polyurethane resin is from 40,000 to 100,000, containing (1) as a main polymer chain a polyester polyol containing alcoholic and acid components comprising at least one of (A) at least one alcoholic component selected from alicyclic divalent alcohol and aromatic divalent alcohol in an amount of 50 mol% or more based on the total amount of alcoholic components or (B) at least one acid component selected from alicyclic dicarboxylic acid and aromatic dicarboxylic acid in an amount of 50 mol% or more based on the total amount of acid components, and (2) at least one polyisocyanate selected from tolylene diisocyanate, diphenyl-methane-4,4'-diisocyanate, isophrorone diisocyanate, dicyclohexylmethane-4,4'-diisocyanate, and p-phenylene diisocyanate in an amount of 5 mol% or more based on the total amount of all alcoholic components and all acid components, and further containing (3) a polar group selected from $-SO_3M$, $-CO_2M$, and $-PO_3M_2$, wherein M represents an H, Na, or K atom, in an amount of from 0.05 to 1.5 wt% based on the total amount of the polyurethane resin.

4,788,104

GRANULAR COMPOSITE CONTAINING CRIMPED FIBERS AND PLASTIC ARTICLES MADE THEREFROM

Ludo Adriaensen, Deerlijk, and Frans Verhaeghe, Kortrijk-Heule, both of Belgium, assignors to N. V. Bekaert S.A., Belgium

Filed May 1, 1987, Ser. No. 44,779

Claims priority, application Belgium, Jan. 30, 1987, 8700067

Int. Cl.[4] B32B *9/00, 15/00;* **D04H** *1/58*

U.S. Cl. 428—288 **24 Claims**

1. A composite strand for use in the manufacture of plastic articles, said strand comprising fibers embedded as a plurality of bundles in a polymer, wherein at least one of said bundles comprises crimped fibers, and wherein said crimped fibers in said at least one of said bundles possess an almost sinusoidal zigzag crimp with a wavelength W between 2 and 30 mm and an amplitude A between 0.2 and 7 mm and in which W/A is larger than 2.

4,788,105

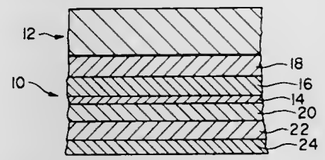
OXYGEN BARRIER LAMINATES

Walter B. Mueller, Inman, and Henry G. Schirmer, Spartanburg, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Sep. 9, 1986, Ser. No. 905,364

Int. Cl.[4] B32B *27/08*

U.S. Cl. 428—412 **3 Claims**



1. A thermoplastic laminate comprising:

(a) a first film comprising a first layer of an ethylene vinyl acetate copolymer, a second layer of a linear low density polyethylene, a third layer of a polymeric adhesive, a fourth layer of a polymeric material having an oxygen transmission rate of less than 100 cubic centimeters per square meter in 24 hours at 73 degrees centigrade, a fifth layer as in said third layer, and a sixth bonding layer of an ethylene vinyl acetate copolymer; and

(b) a second film adhered to the first film comprising a polymeric material selected from the group consisting of polyester, polyamide, polypropylene, and polycarbonate.

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4,788,106

SILOXANE-POLYESTER COMPOSITIONS

Anthony G. Sbort, Llandaff, Wales, assignor to Dow Corning, Ltd., Barry, Wales

Filed Feb. 8, 1988, Ser. No. 153,613

Claims priority, application United Kingdom, Feb. 14, 1987, 8703491; May 19, 1987, 8711813

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—447 6 Claims

1. A composition which comprises (A) a siloxane-polyester copolymer resin having on average at least two ≡SiOM and/or ≡COH groups per molecule, wherein M represents a hydrogen atom or an alkyl group having from 1 to 4 inclusive carbon atoms, (B) one or more solvents for the siloxane-polyester copolymer, (C) a silane of the general formula

$$\begin{matrix} X_a \\ | \\ ZSi(OY)_{3-a} \end{matrix}$$

wherein Z represents an organic group composed of carbon, hydrogen and oxygen having therein at least one group of the formula

$$-CH\overset{O}{\diagdown\diagup}CH_2,$$

X represents a methyl or a phenyl group, Y represents an alkyl or an alkoxyalkyl group having less than 5 carbon atoms and a has a value of 0 or 1, (D) aluminium acetylacetonate and (E) a tetraalkyl titanate.

4,788,107

SUBSTRATES COATED WITH NONAQUEOUS COMPOSITIONS COMPRISING ACRYLIC POLYMERS CONTAINING HYDROLYZABLE MOIETIES FROM ORGANOSILANE COMPOUNDS

Wen H. Chang, Gibsonia; Paul J. Prucnal; John R. Peffer, botb of Pittsburgh; Edward L. Dufford, Sarver, and Ronald R. Ambrose, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 728,973, Apr. 30, 1985, Pat. No. 4,714,738. This application Aug. 24, 1987, Ser. No. 88,357

Int. Cl.[4] B32B *9/04*

U.S. Cl. 428—447 2 Claims

1. A substrate having thereon a cured film comprising a nonaqueous composition comprising: an ungelled acrylic resin composition containing an arcylic polymer having in a molecule thereof at least one group containing a silicon atom said group selected from:

$$-C-O-Si(R)_2-R, \quad -C-O-Si(R)_2-O-Si(R)_2-R, \text{ and}$$

$$-C-O-Si(R)_2-O-Si(R)_2-O-Si(R)_2-R$$

wherein each R independently is selected form the group of moieties consisting of Y, hydrogen, a C_1-C_{10} group joined to Si through an Si-C linkage, and OR^7—in which R^7—represents alkyl having at least 4 carbon atoms, aryl, alkylaryl, arylalkyl, aryloxyalkyl, or alkyloxyalkyl, wherein Y represents an easily hydrolyzable group; provided that said acrylic resin composition contains an amount of easily hydrolyzable Y moieties such that the ratio of the number of grams of said ungelled acrylic resin composition to equivalents of easily hydrolyzable Y moieties in said ungelled acrylic resin composition is in a range of from 40 to 667.

4,788,108

ULTRAVIOLET LIGHT CURABLE COMPOSITIONS BASED ON IMINATED UNSATURATED POLYESTERS FOR APPLICATION TO POROUS SUBSTRATES

John B. Saunders, Jr., Allison Park; Robert M. Piccirilli; William J. Schillinger, both of Gibsonia, and Ken W. Niederst, Allison Park, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 15, 1987, Ser. No. 62,029

Int. Cl.[4] B32B *27/10*; C08G *63/46*

U.S. Cl. 428—481 17 Claims

1. A porous substrate having adhered to a surface of said substrate, but not substantially penetrating said substrate, a cured filler from a composition comprising (1) a liquid, ungelled binder of an unsaturated polyester resin having a number average molecular weight of from 500 to 3,000 derived from an ethylenically unsaturated carboxylic acid or anhydride thereof having an acid functionality of at least two and an organic polyol, said unsaturated polyester resin having been reacted with an alkylenimine containing a hydroxyl group reactive with an acid group of said unsaturated polyester resin, (2) one or more ethylenically unsaturated compounds different from and cocurable with said unsaturated polyester resin, (3) a pigment, (4) a free radical initiator, and (5) optionally a carrier solvent for said filler composition.

4,788,109

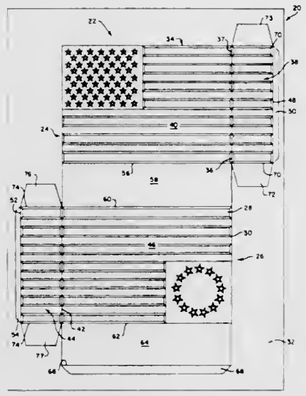
THREE-DIMENSIONAL DISPLAY DEVICE FOLDED FROM A SINGLE SHEET OF MATERIAL

Allen B. Mage, 5113 Baltimore St., Los Angeles, Calif. 90042

Continuation-in-part of Ser. No. 886,652, Jul. 18, 1986, Pat. No. 4,708,911. This application Aug. 28, 1987, Ser. No. 90,532

Int. Cl.[4] A63H *33/16*

U.S. Cl. 428—542.8 18 Claims



1. A decorative display device having a design on a face thereof capable of use as a relatively flat suspendable poster and capable of being folded to a three-dimensional display object, said display device comprising:

(a) a flat sheet of foldable material initially having a front face with upper and lower edges and a pair of spaced apart side edges,

(b) a design on the front face allowing the device to be suspended in the position of a poster and said design being characterized by a plurality of individual design elements, and some of said design elements being generally horizontally extending design elements,

(c) a plurality of first fold lines extending across said sheet generally between said spaced apart side edges forming individual segments which extend between said side edges and at least certain of said segments being generally horizontally extending and corresponding to certain of the individual design elements,

(d) embossed portions on certain of said horizontally extending individual segments and which portions extend outwardly beyond and on opposite horizontal sides of other of said generally horizontally extending segments, said embossed portions corresponding to certain of said design elements and cooperating with said design elements to provide a design with a three-dimensional effect, and

(e) a plurality of second fold lines extending between the upper and lower edges of said sheet permitting folding of said sheet into spaced apart front and back walls and spaced apart side walls forming a three-dimensional continuous shell with a interior cavity and which is initially open at its upper or lower end.

4,788,111

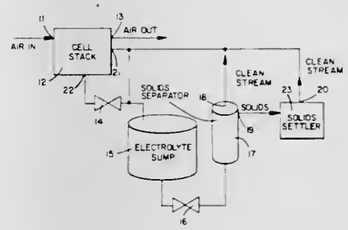
EFFICIENT ELECTRICAL POWER GENERATION SYSTEM

Marilyn J. Niksa, Concord; Kenneth J. Branchick, and Thomas R. Turk, botb of Mentor, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Division of Ser. No. 17,806, Mar. 5, 1987, Pat. No. 4,719,156. This application Aug. 24, 1987, Ser. No. 88,314

Int. Cl.[4] H01M *12/06*

U.S. Cl. 429—27 8 Claims



1. An efficient, electrical power source comprising:

at least one battery comprising a metal electrode and a liquid electrolyte containing solid particulate;

a solid separation means comprising a container having an axis and an impeller;

means for conveying said liquid electrolyte to said container;

means for withdrawing solids concentrated effluent from an annulus zone of fluid within said container opposite from the end of said container containing said impeller; and

means for withdrawing supernatent liquids from said container from a zone removed from said annuls zone, coupled with means for recycling withdrawn supernatent liquid to said battery.

4,788,110

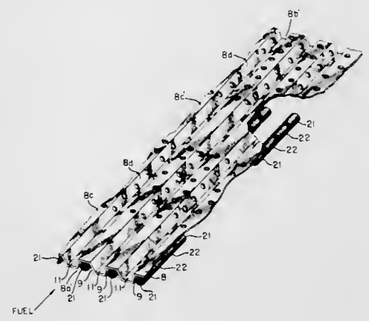
FUEL CELL WITH PARTIALLY SHIELDED INTERNAL REFORMER

Randolph Bernard, New Preston, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Oct. 20, 1987, Ser. No. 110,942

Int. Cl.[4] H01M *8/06*

U.S. Cl. 429—19 22 Claims



1. An electrochemical cell system comprising:

a gas diffusion electrode;

a first passage means having a gas entry and gas exits ends and at least one first section and at least one second section therebetween, each said first section being an isolated section in relation to said electrode and each said second section being a communicative section in relation to said electrode;

a catalyst for reforming hydrocarbons situated in at least a first one of said first sections, said first one of said first sections being closer to said gas entry end of said first passage means then a first one of said second sections.

4,788,112

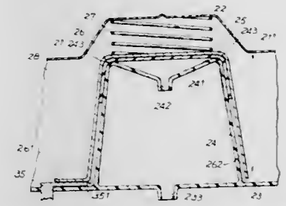
RECHARGEABLE STORAGE BATTERY

Chin-Chung Kung, P.O. Box 10160, Taipei, Taiwan

Filed Aug. 17, 1987, Ser. No. 86,300

Int. Cl.[4] H01M *2/12*

U.S. Cl. 429—54 4 Claims



1. A rechargeable storage battery comprising:

a container having an outer cylindrical casing, an inner lining encased in said outer casing, and a bottom plate secured under the inner lining;

a gas venting and circuit-breaker means including: a top cover having a positive terminal formed as a cap on its central portion and a venting hole therethrough, a partition plate having a cylindrical wall secured under said top cover and engaged on an upper portion of said inner lining having a neck portion with a through hole extending downwardly from said partition plate, a venting stack extending upwardly from said partition plate having a baffle shaped as an inverse truncated cone formed on the

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stack top and having a neck portion with a through hole formed on a central portion of said baffle, an elastormer cap yieldably sealing on the the upper portion of said stack, a contactor bell disposed around said stack as packed by said elastomer cap having a contactor plate protruding transversely from a lower perimeter of said bell and forming an aperture between said bell and said stack, a metallic tensioning spring resiliently retaining said bell downwardly as backed against said positive terminal, and a neutralizing absorber filled in a degassing chamber as defined among said top cover, said partition plate and said bell; and a concentric electrode assembly including:

a plurality of negative electrode plates, separators for retaining an electrolyte and positive electrode plates of which every two adjacent, opposite plates are sandwiched with each separator and are concentrically wrapped up subsequently and cyclically from a core-portion electrolyte absorber inserted in a central portion of the asembly and finally encased by a wrapping cloth and a side-portion electrolyte absorber, an upper electricity collector welded and secured above said positive electrode plates as spaced apart from each negative plate with a void, a positive-terminal connector protruding upwardly from said upper collector through said partition plate and extending transversely a spring plate on the upper end of said connector in said degassing chamber normally touching said contactor plate of said bell for electrically connecting said bell, said tensioning spring and said positive terminal, a lower electricity collector welded and secured under said negative electrode plates as spaced from each positive plate with a void, and a negative terminal protruding downwardly from said lower collectror through said bottom plate, whereby upon the acting of an excessive gas pressure as overcharged in said battery, the gas pressure may bias the elastomer cap and the bell upwardly against said tensioning spring to disconnect said contactor plate from said spring plate of said positive-terminal connector to cut off a charging current and the gas may escape through an aperture between said bell and said stack to let the entrained electrolyte being absorbed and neutralized by said absorber in said degassing chamber and finally discharge through said venting hole.

4,788,113

SHEET MATERIAL AND SEPARATOR ENVELOPES MANUFACTURED THEREFROM FOR THE ELECTRODE PLATES OF BATTERIES

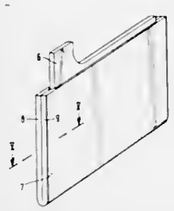
Christian Böhle, Soest, and Eberhard Nann, Deiringsen, both of Fed. Rep. of Germany, assignors to Hagen Batterie AG, Soest, Fed. Rep. of Germany

Filed Jun. 24, 1987, Ser. No. 72,255

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622492

Int. Cl.⁴ H01M *2/18*

U.S. Cl. 429—139 **6 Claims**



1. A jacketed positive battery plate for a lead-acid battery comprising a positive electrode plate having opposite side faces, opposite side edges and an end edge, and a separator jacket on said electrode plate, said jacket being made from an elongated flexible foldable sheet including a pair of elongated longitudinally extending marginal edge portions and an elongated longitudinally extending central portion therebetween, the width of said central portion being approximately the same as the width of said plate, the thickness of said sheet being substantially greater in said marginal edge portions than in said central portion, said sheet being folded over the end edge of said electrode plate so that said marginal edge portions are overlayed on themselves, said marginal edge portions being sealed to themselves adjacent the side edges of said plate.

4,788,114

ELECTRODE AND ELECTROCHEMICAL CELL

Ulf S. E. Rothman, Skanör, Sweden, assignor to Inclusion AB, Malmo, Sweden

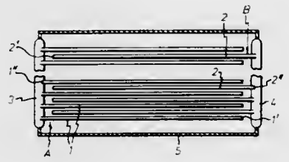
PCT No. PCT/SE86/00384, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/01516, PCT Pub. Date Mar. 12, 1987

PCT Filed Aug. 29, 1986, Ser. No. 49,108

Claims priority, application Sweden, Aug. 30, 1985, 8504036

Int. Cl.⁴ H01M *4/62, 4/72*

U.S. Cl. 429—217 **7 Claims**



1. An electrode structure for an electrochemical cell, said electrode structure comprising:

(a) a plurality of microporous hollow fibres formed of a substantially non-conductive material permeable to electrolyte; each of said fibres having: a diameter of less than 3 millimeters; a wall thickness of less than 300 micrometers; and, a pore diameter of less than 20 microns; and,

(b) solid active electrode material contained within said hollow fibres.

4,788,115

PROCESSING HOLOGRAMS

William E. Loog, Wilmslow, and David W. Butcher, Goostrey, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 10, 1986, Ser. No. 940,047

Claims priority, application United Kingdom, Dec. 11, 1985, 8530454

Int. Cl.⁴ G03H *1/04;* **G03C** *5/00, 5/04*

U.S. Cl. 430—2 **13 Claims**

1. A method of preparing a hologram which uses gelatin as the binder which method comprises holographically exposing the material by use of coherent light, developing the holographic image by a chemical or physical process and before processing, simultaneously or subsequently, treating the material with a solution of a gelatin reactive compound which has a molecular weight of over 200 and which reacts with the gelatin to form covalent bond therewith to increase the molecular bulk of the gelatin, the increase in the molecular bulk of the gelatin achieving a bathochromic shift in the replay wavelength of the hologram in the range of from 10 to 248.1 nm.

4,788,116

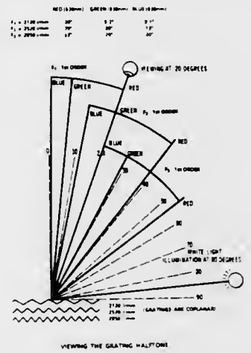
FULL COLOR IMAGES USING MULTIPLE DIFFRACTION GRATINGS AND MASKING TECHNIQUES

Eric B. Hochberg, Altadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1986, Ser. No. 846,535

Int. Cl.⁴ G03C *11/00, 5/00;* **G03F** *9/00*

U.S. Cl. 430—21 **9 Claims**



1. A method of full-color reproduction of continuous-tone color pictures, images or scenes by the use of diffraction grating techniques comprising:

creating individual separation masks which delineate areas or zones dedicated to the reproduction of each of the primary colors,

exposing a single photosensitive plate with an interference pattern representative of a primary color through each of said individual separation masks to form multiple diffraction grating latent images on said photosensitive plate,

developing said photosensitive plate to convert said multiple diffraction grating latent images into surface relief diffraction gratings,

replicating said photosensitive plate where the replicas exhibit the same diffraction effects of said plate, and

selectively causing gratings or portions thereof on the plate or a replica to be masked in order to leave the gratings or portions thereof all or partially diffracting so as to further render said plate or said replica into a unique pattern of active and inactive diffraction gratings reproducing the original colors in the original scene, image or picture.

7. A method of full-color reproduction of continuous-tone color pictures, images, or scenes by the use of diffraction grating techniques comprising:

creating individual separation masks which delineate areas or zones dedicated to the reproduction of each of the primary colors,

exposing a single photosensitive plate with an interference pattern representative of a primary color through each of said individual separation masks to form multiple diffraction grating latent images on said photosensitive plate,

developing said photosensitive plate to convert said multiple diffraction grating latent images into surface relief diffraction gratings,

replicating said photosensitive plate where the replicas exhibit the same diffraction effects of said plate,

separating a color picture, image, or scene into its primary component colors, and

selectively causing gratings or portions thereof on the plate or a replica to be masked in order to leave the gratings or portions thereof all or partially diffracting so as to further render said plate or said replica into a unique pattern of active and inactive diffraction gratings representative of the primary component colors in the original scene, image, or picture.

8. The method as set forth in claim 7 further including illuminating said photosensitive plate or said replicas so as to reveal the original colors in the original picture, image, or scene.

4,788,117

SEMICONDUCTOR DEVICE FABRICATION INCLUDING A NON-DESTRUCTIVE METHOD FOR EXAMINING LITHOGRAPHICALLY DEFINED FEATURES

John D. Cuthbert, Bethlehem; Dennis E. Schrope, and Tungsheng Yang, both of Lower Macungie Township, Lehigh County, all of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 28, 1987, Ser. No. 7,560

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—30 **3 Claims**





1. A method of semiconductor integrated circuit fabrication comprising the steps of:

coating a substrate surface of at least one wafer of a lot having a plurality of wafers with a positive resist;

exposing selectively said resist to radiation at least two times, one of said times defining integrated circuit features, one of said times defining edge type features, at least one of said edge type features overlapping at least one of said integrated circuit features;

developing said resist;

examining at least one region where said integrated circuit features and edge type features overlap to produce a photocleave at said integrated circuit features, said photocleave generating a cross section of said integrated circuit features; and

continuing device fabrication of said wafers of said lot if information derived from the photocleave is adequate.

4,788,118

ELECTROPHOTOGRAPHIC PLATE FOR PRINTING PLATE MAKING

Kazuchiyo Takaoka, and Takao Senga, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,259

Claims priority, application Japan, Mar. 18, 1986, 61-61909

Int. Cl.⁴ G03G *13/32*

U.S. Cl. 430—49 **11 Claims**

1. An electrophotographic plate for printing plate making which comprises a conductive support and an alkali soluble light sensitive layer provided on said support, said light sensitive layer comprising a photoconductive substance, an alkali soluble resin binder and an organic polymer fine powder having a particle diameter of 10 μm or less.

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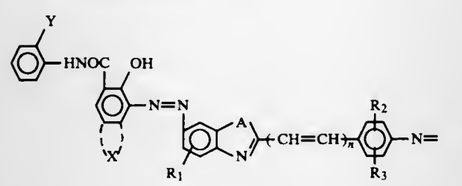
4,788,119

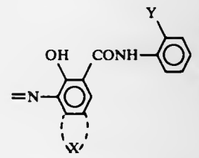
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER CONTAINING A DISAZO PIGMENT

Masataka Yamashita, Kawasaki; Hajime Miyazaki, Yokohama; Takao Takiguchi, Tokyo; Masakazu Matsumoto, Yokohama; Masaaki Hiro, Kanagawa, and Shozo Ishikawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1986, Ser. No. 867,140
Claims priority, application Japan, May 29, 1985, 60-114000
Int. Cl.⁴ G03G 5/06
U.S. Cl. 430—58 **7 Claims**

1. An electrophotographic photosensitive member comprising a photosensitive layer on a support, said photosensitive layer containing (a) a disazo pigment represented by the following general formula [I]:





wherein X represents a necessary residue for forming a polycyclic aromatic ring or a hetero ring which may have a substituent by condensation with a benzene ring; Y represents an electron attractive group; A represents —O—, —S—, or



where R_4 represents a hydrogen atom, alkyl, aralkyl or aryl which may have a substituent; R_1, R_2 and R_3 each represent a hydrogen atom, a halogen atom, alkyl or alkoxy group which may have a substituent; and n is 0 or 1, and (b) optionally, a binder resin.

4,788,120

LIGHT RECEIVING MEMBER FOR USE IN ELECTROPHOTOGRAPHY HAVING AN AMORPHOUS SILICON LAYER

Shigeru Shirai; Keishi Saito; Takayoshi Arai; Minoru Kato, and Yasushi Fujioka, Nagahama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 604,572, Jan. 26, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 165,401
Claims priority, application Japan, Jan. 20, 1986, 61-010387
Int. Cl.⁴ G03G 5/085
U.S. Cl. 430—66 **28 Claims**

1. A light receiving member for use in electrophotography comprising a substrate for electrophotography and a light receiving layer constituted by a photoconductive layer and a surface layer, the photoconductive layer being formed of an amorphous material containing silicon atoms as the main constituent atoms and at least one kind selected from hydrogen atoms and halogen atoms and the surface layer being formed of an amorphous material containing silicon atoms, carbon atoms and hydrogen atoms, and the amount of the hydrogen atoms contained in the surface layer being in the range of 41 to 70 atomic %.

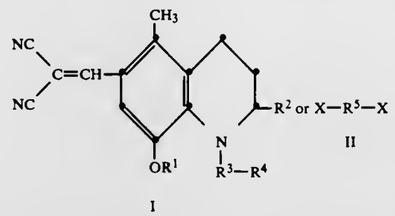
4,788,121

COLORED TONERS CONTAINING DICYANOMETHINE DYE COMPOUNDS

William H. Moore, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 17, 1986, Ser. No. 920,334
Int. Cl.⁴ G03G 9/08, 9/10
U.S. Cl. 430—106 **9 Claims**

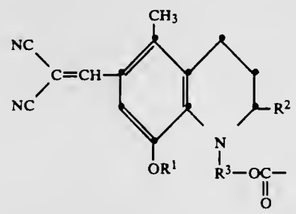
1. An electrostatographic toner comprising a thermoplastic polymer and a dye compound having the formula



I

II

wherein R^1 and R^2 are lower alkyl, R^3 is lower alkylene, R^4 is dicarboximido of 4 to 8 carbon atoms, benzothiazolyl-2-thio or alkylcarboxy of 4 to 18 carbon atoms, R^5 is alkylene of 4 to 10 carbon atoms or arylene of 6 to 10 carbon atoms and X is



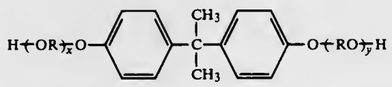
4,788,122

PRODUCTION OF POLYESTER AND ELECROPHOTOGRAPHIC TONER CONTAINING THE SAME

Kuniyasu Kawabe; Shinichiro Yasuda, and Hideyo Nishikawa, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

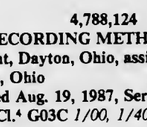
Filed Mar. 11, 1986, Ser. No. 838,382
Claims priority, application Japan, Mar. 14, 1985, 60-51310; Mar. 14, 1985, 60-51309; May 31, 1985, 60-117787
Int. Cl.⁴ G03G 9/08
U.S. Cl. 430—109 **15 Claims**

1. A toner composition, which comprises:
a polyester produced by a process of copolycondensing:
(a) a diol component of the formula (I):



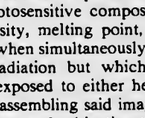
(I)

wherein R is an ethylene or propylene group and x and y are each an integer of at least 1, the total sum of x and y being 2 to 7 on the average, with
(b) an acid component of a polycarboxylic acid, an anhydride thereof or a lower alkyl ester thereof, said acid component containing
(II) a polycarboxylic copolymer of a styrene compound selected from alpha-methylstyrene and a compound of the formula (IIa):



(IIa)

wherein R^1 is hydrogen or a hydrocarbon group having 1 to 3 carbon atoms,
and a carboxylic group-containing vinyl monomer of the formula (IIb), an anhydride thereof or a lower alkyl ester thereof:



(IIb)

wherein R^2 and R^3 are each hydrogen, methyl or a carboxyl group; or
(III) a copolymer of an unsaturated aliphatic hydrocarbon (IIIa) having 2 to 21 carbon atoms and an unsaturated carboxylic acid (IIIb); or
(IV) a polymer or copolymer of an unsaturated carboxylic acid (IIIb); and a coloring matter.

4,788,123

PROCESS FOR MINIMIZING IMAGE DE-ENHANCEMENT IN FLASH FUSING SYSTEMS

John S. Berkes, Webster, and Stanley B. Swackhamer, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 8, 1987, Ser. No. 59,074
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.⁴ G03G 13/20, 9/08
U.S. Cl. 430—124 **20 Claims**

1. A process for the fusing of xerographic images comprising: (1) creating a xerographic latent image: (2) developing the image with a toner composition comprising a mixture of toner particles and added colloidal silica particles; (3) transferring the developed image to a substrate; and (4) subsequently fixing the developed image to the substrate with a flash fusing device by applying an energy pulse therefrom of from about 2 to about 5 milliseconds, wherein there results reduced image de-enhancement.

4,788,124

THERMAL RECORDING METHOD AND MATERIAL

Richard F. Wright, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 19, 1987, Ser. No. 86,853
Int. Cl.⁴ G03C 1/00, 1/40, 1/727, 5/00
U.S. Cl. 430—138 **14 Claims**

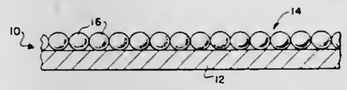
1. An imaging process which comprises image-wise simultaneously exposing to heat and light or ultraviolet radiation an imaging material comprising a support having a layer of photosensitive microcapsules on the surface thereof, said microcapsules containing an internal phase including an image-forming agent and a photosensitive composition which undergoes a change in viscosity, melting point, softening point or glass transition point when simultaneously exposed to heat and light or ultraviolet radiation but which remains essentially unchanged when exposed to either heat or light or ultraviolet radiation alone; assembling said imaging material with an image-receiving sheet and subjecting the assembly to a uniform transfer force such that said image-forming agent is image-wise transferred to said imaging material; wherein said photosensitive composition includes a free radical addition polymerizable or crosslinkable compound and an ionic dye-reactive counter ion compound, said ionic dye-reactive counter ion compound being capable of absorbing light and producing free radicals which initiate free radical polymerization or crosslinking of said polymerizable or crosslinkable material in the presence of heat.

4,788,125

IMAGING MATERIALS EMPLOYING MICROPARTICLES INCLUDING A SILVER INITIATOR

Paul D. Davis, Centerville, and Joseph G. O'Connor, Springboro, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 800,008, Nov. 20, 1986, abandoned. This application May 4, 1987 Ser. No. 46,380
Int. Cl.⁴ G03C 1/40, 1/00
U.S. Cl. 430—138 **10 Claims**



1. An imaging material comprising a support and a layer of photosensitive microparticles on one surface of said support, said microparticles including an image-forming agent and a photosensitive composition containing a polymer which is capable of undergoing cationically-initiated depolymerization and a photoinitiator including a silver halide and an organo silver salt, wherein, after exposing said microparticle to radiation, said microparticles, directly or with additional processing, release said image-forming agent or become permeable to a developer which reacts with said image-forming agent to form a visible image.

4,788,126

RADIATION DOSIMETER AND METHOD FOR MEASURING RADIATION DOSAGE

Lyudmila Feldman, Centerville; Paul C. Adair, Springboro, and Todd M. Hess, Columbus, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed May 20, 1987, Ser. No. 52,638
Int. Cl.⁴ G03C 1/72; G01N 21/00
U.S. Cl. 430—138 **12 Claims**

1. A radiation dosimeter comprising a support having a layer of microcapsules on the surface thereof, said microcapsules containing an image-forming agent and a radiation curable composition, said composition being essentially insensitive to visible light and ultraviolet radiation and being sensitive to gamma electron beam radiation such that when exposed to gamma or electron beam radiation, said composition polymerizes and hardens said microcapsules.

4,788,127

PHOTORESIST COMPOSITION COMPRISING AN INTERPOLYMER OF A SILICON-CONTAINING MONOMER AND AN HYDROXYSTYRENE

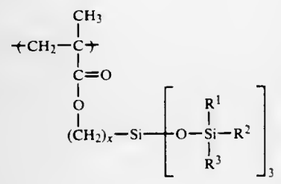
David B. Bailey, Webster, and Michael M. Feldman, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1986, Ser. No. 931,495
Int. Cl.⁴ G03C 1/60, 1/727
U.S. Cl. 430—192 **5 Claims**

1. A positive-working photoresist composition comprising in admixture a photosensitive o-quinone diazide compound which is responsive to activating radiation to provide a postive

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resist image after development and a film forming interpolymer having a glass transition temperature of at least 125° C.; said interpolymer being an interpolymer of an hydroxystyrene and a silicon-containing monomer and wherein said interpolymer comprises recurring units having the structural formulae:

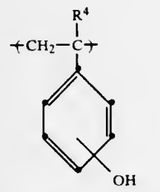


(i)

wherein

x is 1, 2 or 3,

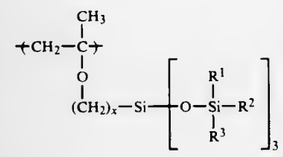
and each R^1, R^2 and R^3 is independently alkyl containing from 1 to 6 carbon atoms, and



(ii)

wherein R^4 is H or CH_3, said hydroxystyrene being present in said interpolymer in an amount sufficient to render said composition developable in an aqueous alkaline developer and said silicon containing monomer being present in said interpolymer in an amount sufficient to render said photoresist composition resistant to an oxygen plasma etch.

2. A negative-working photoresist composition comprising in admixture a photosensitive bisazide compound which is responsive to activating radiation to provide a negative resist image after development and a film forming interpolymer having a glass transition temperature of at least 125° C.; said interpolymer being an interpolymer of an hydroxystyrene and a silicon-containing monomer and wherein said interpolymer comprises recurring units having the structural formulae:



(i)

wherein

x is 1, 2 or 3,

and each R^1, R^2 and R^3 is independently alkyl containing from 1 to 6 carbon atoms, and

(ii)

wherein R^4 is H or CH_3, said hydroxystyrene being present in said interpolymer in an amount sufficient to render said composition developable in an aqueous alkaline developer and said silicon containing monomer being present in said interpolymer in an amount sufficient to render said photoresist composition resistant to an oxygen plasma etch.

4,788,128

TRANSFER PRINTING MEDIUM WITH THERMAL TRANSFER DYE AND INFRA-RED RADIATION PHTHALOCYANINE ABSORBER

William A. Barlow, Liverpool, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 716,140, Mar. 26, 1985, abandoned. This application Oct. 20, 1986, Ser. No. 920,948

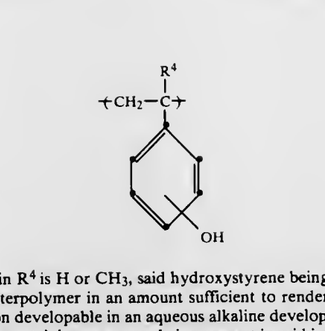
Claims priority, application United Kingdom, Mar. 30, 1984, 8408259

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] G03C *1/00, 5/16;* **G01D** *15/10, 15/16*

U.S. Cl. 430—200 **9 Claims**

1. A transfer printing medium comprising a substrate supporting a thermal transfer dye and a radiation absorber either intimately mixed in a common coating layer or arranged as separate layers on the same side of the substrate, thereby being positioned for the absorber to provide thermal energy to the transfer dye when subjected to radiation within the near infrared region of the electromagneic spectrum, said radiation absorber being a poly(substituted)phthalocyanine compound in which each of at least five of the peripheral carbon atoms in the 1, 4, 5, 8, 9, 12, 13 and 16 positions of the phthalocyanine nucleus of Formula I



I

is linked by an atom of nitrogen, sulfur, selenium or tellurium to a carbon atom of an organic radical, said organic radical being

(i) an unsubstituted aliphatic radical,

(ii) an unsubstituted cycloaliphatic radical,

(iii) an unsubstituted aromatic radical,

(iv) an aliphatic radical substituted by alkoxy, alkylthio, halo, cyano or aryl,

(v) a cycloaliphatic radical substituted by alkoxy, alkylthio, halo, cyano or aryl, or

(vi) an aromatic radical substituted by alkyl, alkenyl, alkoxy or alkylthio, or halo substituted derivatives thereof, aryl, arlythio, halogen, nitro, cyano, carboxyl, aralkyl, aryl-sulphonamido, alkyl-sulphonamido, aryl-sulphone, alkyl-sulphone, aryl-sulphoxide, alkyl-sulphoxide, hydroxy, primary amino, secondary amino or tertiary amino.

4,788,129

HIGH CONTRAST OPTICAL MEMORY TAPE

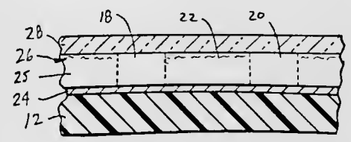
Eric W. Bouldin, Atherton, and Jerome Drexler, Los Altos Hills, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 896,988, Aug. 15, 1986, abandoned, and a continuation-in-part of Ser. No. 855,228, Apr. 23, 1986. This application Nov. 28, 1986, Ser. No. 935,999

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[4] G03C *1/72*

U.S. Cl. 430—273 **10 Claims**



1. Optical memory tape for laser recording optical information comprising,

a self-supporting, flexible web backing,

a vacuum or vapor deposited reflective metallic layer over said web backing,

a planar optical storage layer disposed over the reflective metallic layer, said optical storage layer having a planar crust of filamentary and oblong black silver particles within the top one-half micron of the layer distal to the backing and substantially clear gelatin below the crust.

4,788,130

1-AMINO-2,3-DIHYDRO-1H-INDENE COMPOUNDS

Yasuo Oshiro; Hiraki Ueda, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

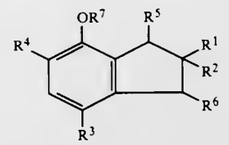
Filed Aug. 29, 1985, Ser. No. 770,677

Claims priority, application Japan, Aug. 31, 1984, 59-183514

Int. Cl.[4] A61K *31/135, 31/495;* **C07D** *131/02, 295/14*

U.S. Cl. 514—661 **14 Claims**

1. 2,3-Dihydro-1H-indene compounds and salts thereof represented by the formula (1),



(1)

wherein

R^1 and R^2 are each a hydrogen atom, a C_1-C_6 alkyl group, an unsubstituted phenyl group, a substituted phenyl group having 1 to 3 substituents selected from the group consisting of a halogen atom and a C_1-C_6 alkyl group on the phenyl ring, an unsubstituted C_3-C_8 cycloalkyl group, a substituted C_3-C_8 cycloalkyl group having 1 to 3 halogen atoms as the substituent on the cycloalkyl ring, a C_3-C_8 cycloakyl-C_1-C_6 alkyl group, a hydroxyl group, a phenyl-C_1-C_6 alkoxy group, an unsubstituted phenyl-C_1-C_6 alkyl group, a substituted phenyl-C_1-C_6 alkyl group having 1 to 3 substituents selected from the group consisting of a halogen atom, and a C_1-C_6 alkoxy group on the phenyl ring or a substituted phenyl-C_1-C_6 alkyl group having a C_1-C_4 alkylenedioxy group on the phenyl ring;

R^3 is a halogen atom or a C_1-C_6 alkyl group;

R^4 is a hydrogen atom, a halogen atom, a phenyl-C_1-C_6 alkyl group, a C_3-C_8 cycloakyl-C_1-C_6 akyl group, a piperidinyl-C_1-C_6 alkanoylamino-C_1-C_6 alkyl group, a pyridinium-C_2-C_6 alkanoylamino-C_1-C_6 alkyl group, a C_1-C_6 alkyl group, a 1-phenyl-2 propenyl group, a 1-methyl-2-propenyl group, or a 2-chlorobenzoyl group;

R^5 is a hydroxyimino group, an alkylamino group having 7 to 10 carbon atoms or a group of the formula —NHR^8, wherein R^8 is a hydrogen atom, a halogen-substituted C_1-C_6 alkanoyl group, a C_1-C_6 alkylamino-C_1-C_6 alkyl group, or a phenyl-C_1-C_6 alkyl group;

R^6 is a hydrogen atom or a phenyl group; and

R^7 is a hydrogen atom or a C_1-C_6 alkyl group;

provided that, when R^5 is a hydroxyimino group, R^6 and R^7 are each hydrogen atoms, or when R^5 is a group of the formula —NHR^8 (wherein R^8 is a hydrogen atom or a halogen-substituted C_1-C_6 alkanoyl group) and R^1 and R^2 are each a hydrogen atom, or C_1-C_6 alkyl group, then R^4 should not be a hydrogen atom, a C_1-C_6 alkyl group or a halogen atom.

13. A pharmaceutical composition for improving anoxemic and hypoxic symptoms and syndromes acompanied therewith containing a 2,3-dihydro-1H-indene compound or salt thereof of claim I and a pharmaceutically acceptable carrier therefor.

4,788,131

METHOD OF ELECTRONIC PROCESSING OF EXPOSED PHOTOGRAPHIC MATERIAL

Lillian M. Kellogg, Webster, and Joseph M. Hodes, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 30, 1987, Ser. No. 79,612

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—394 **12 Claims**



1. A method of electronic processing of a latent image from a photographic element comprising the steps of:

(a) providing an exposed photographic element comprising photosensitive silver halide grains;

(b) placing the element in an electromagnetic field and cooling the element to a temperature between about 4 to about 270K to prevent further image formation;

(c) subjecting the element to a uniform exposure of relatively short wavelength radiation;

(d) exposing the element to pulsed, high intensity, relatively longer wavelength radiation to excite electrons out of image centers; and

(e) measuring any resulting signal with radiofrequency photoconductivity apparatus.

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4,788,132

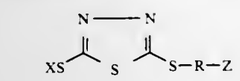
SILVER HALIDE COLOR REVERSAL PHOTOGRAPHIC MATERIAL

Naoyasu Deguchi; Tetsuro Kojima; Hideo Miyazaki; Shigeru Ohno, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

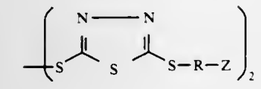
Filed Jul. 10, 1986, Ser. No. 884,169
Claims priority, application Japan, Jul. 10, 1985, 60-151863
Int. Cl.[4] G03C *5/50*
U.S. Cl. 430—505 **10 Claims**

1. A silver halide color reversal photographic material comprising a support, and at least one blue-sensitive silver halide emulsion layer, at least one green-sensitive silver halide emulsion layer and at least one red-sensitive silver halide emulsion layer on the support, wherein at least one light-sensitive silver halide emulsion layer or at least one layer adjacent thereto contains at least one of the compounds represented by the following general formulae (I), (II), (III) and (IV):

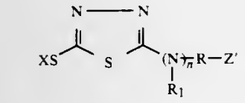
General Formula (I)



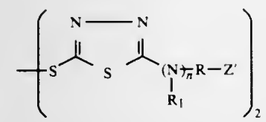
General Formula (II)



General Formula (III)



General Formula (IV)



wherein R represents a straight, branched or cyclic alkylene group, a straight or branched alkenylene group, a straight or branched aralkylene group, or an arylene group, R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group, Z represents a polar substituent selected from the group consisting of a substituted or unsubstituted amino group or a salt thereof; a quaternary ammoniumyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a heterocyclic oxy group, a heterocyclic thio group, a sulfonyl group, a carbamoyl group, a sulfamoyl group, a carbonamido group, a sulfonamido group, an acyloxy group, a ureido group, an acyl group, an aryloxycarbonyl group, a thioureido group, a sulfonyloxy group, a heterocyclic group, a cyano group, a nitro group, a halogen atom, and a hydroxyl group, and Z' represents a polar substituent selected from the group consisting of a substituted or unsubstituted amino group or a salt thereof; a quaternary ammoniumyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a heterocyclic oxy group, a heterocyclic thio group, a sulfonyl group, a carbamoyl group, a sulfamoyl group, a carbonamido group, a sulfonamido group, an acyloxy group, a ureido group, an acyl group, an aryloxycarbonyl group, a thioureido group, a sulfonyloxy group, a heterocyclic group, a cyano group, a nitro group, a halogen atom, a hydroxyl group, an alkoxycarbonyl group, and a carboxylic acid group or a salt thereof, X represents a hydrogen atom, a cation rendering the molecule neutral or a precursor thereof, n is 0 or 1.

4,788,133

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Wolfgang Sauerteig, Leverkusen; Günter Renner, Bergisch Gladbach; Sieghart Klötzer, Cologne, and Jens-Peter Grimm, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 17, 1987, Ser. No. 15,738
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1986, 3606086
Int. Cl.[4] G03C *1/46, 1/02, 7/32*
U.S. Cl. 430—505 **5 Claims**

1. A color photographic recording material comprising at least two blue-sensitive, at least two green-sensitive and at least two red-sensitive silver halide emulsion layers and associated coupler, wherein the improvement comprises the absence of a blue light absorbing filter layer and a green-sensitive silver halide emulsion layer arranged in such a way that, on exposure, it is closest of all the photosensitive silver halide emulsion layers to the subject to be photographed and contains a silver halide of which at least 50 mole-% consists of silver chloride, have a layered grain structure and show a crystal form in which the ratio of diameter to thickness is at most 5.

4,788,134

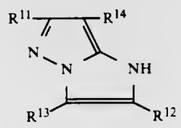
HEAT-DEVELOPABLE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Hiroyuki Ozaki, and Ken Kawada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

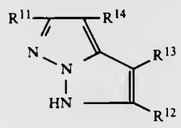
Filed Oct. 23, 1986, Ser. No. 922,494
Claims priority, application Japan, Oct. 24, 1985, 60-238300
Int. Cl.[4] G03C *1/06, 1/40*
U.S. Cl. 430—619 **8 Claims**

1. A heat-developable photographic light-sensitive material comprising, on a support, at least a light-sensitive silver halide, a binder, a reducing agent, and an organic silver salt, wherein said organic silver salt is a silver salt of a pyrazolazole-type compound wherein the pyrazolazole-type compound is selected from compounds of formulae (II), (III), (IV), (V), (VI) (VII), and (VIII)

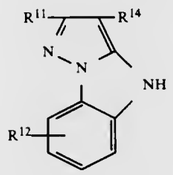
(II)



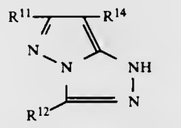
(III)



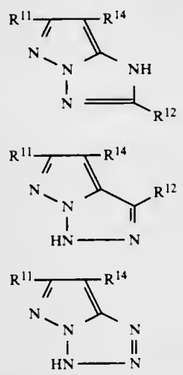
(IV)



(V)



-continued



wherein R^{11}, R^{12}, R^{13}, and R^{14} each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a heterocyclic group, a cyano group, an alkoxy group, an aryloxy group, a heterocyclic-oxy group, an acyloxy group, a carbamoyloxy group, a silyloxy group, a sulfonyloxy group, an acylamino group, an anilino group, a ureido group, an imido group, a sulfamoylamino group, a carbamoylamino group, an alkylthio group, an arylthio group, a heterocyclic-thio group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, a sulfonamido group, a carbamoyl group, an acyl group, a sulfamoyl group, a sulfonyl group, a sulfinyl group, an alkoxycarbonyl group, or an aryloxycarbonyl group; or R^{12} and R^{13} in formula (III) together form a 5-membered to 7-membered ring.

4,788,135

SYSTEM FOR EFFICIENT ISOLATION OF GENES USING PROBES

Ronald W. Davis, and Richard A. Young, both of Menlo Park, Calif., assignors to The Board of Trustees of the Leland Stanford, Jr. University, Stanford, Calif.

Continuation of Ser. No. 472,544, Mar. 7, 1983. This application Oct. 10, 1985, Ser. No. 786,883
Int. Cl.[4] C12Q *1/68;* **C12N** *15/00, 1/00*
U.S. Cl. 435—6 **2 Claims**

1. λgt11.

4,788,136

DIAGNOSTIC IMMUNOASSAY BY SOLID PHASE SEPARATION FOR DIGOXIN

Frank C. Grenier; Terry A. Pry, both of Libertyville, and Lawrence Kolaczkowski, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

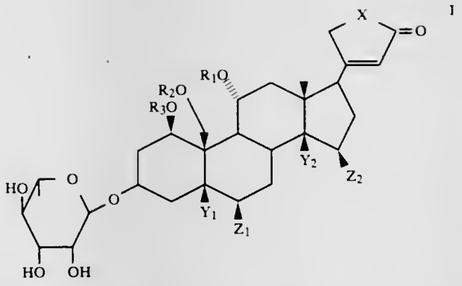
Filed Apr. 7, 1987, Ser. No. 35,673
Int. Cl.[4] G01N *53/00, 33/563, 33/552, 33/537*
U.S. Cl. 435—7 **21 Claims**

1. A method for conducting a diagnostic immunoassay for digoxin, comprising:

(a) forming a reaction mixture of a test sample with a molar excess of labeled anti-digoxin antibodies whereby said labeled antibodies are capable of forming complexes with digoxin present in said sample;

(b) contacting said reaction mixture with a solid phase material having immobilized thereon a compound of formula I:

(VI)



(VII)

(VIII)

wherein R^1=R^2=R_3=Ac, X=O, Y_1=Y_2=OH, Z_1=Z_2=H; or R_1=R_2=R_3=Ac, X=O, Y_1=OH, Z_1=H, Y_2 and Z_2=a bond connecting the two carbon atoms to which they are attached; or R_1=R_2=R_3=Ac, X=O, Y_1, Z_1 and Y_2, Z_2=a bond connecting the two carbon atoms to which they are attached; or R_1=R_2=R_3=H, X=N, Y_1=Y_2OH, Z_1=Z_2=H, said compound present in an amount capable of complexing with any of said excess labeled antibodies, to form solid phase complexes;

(c) separating said solid phase material from said reaction mixture; and

(d) determining the presence of digoxin in the test sample by measuring the amount of complex present in said liquid phase.

4,788,137

DETECTION OF ACTIVATED T-CELLS

Ellis L. Reinherz, Lincoln, Mass.; Andres Alcover, Madrid, Spain, and Michael J. Weiss, Brookline, Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Filed Oct. 29, 1985, Ser. No. 792,433
Int. Cl.[4] G01N *33/53;* **C12Q** *1/04*
U.S. Cl. 435—7 **1 Claim**

1. A method of determining whether exposure of a first population of T-cells to a second population of T-cells causes activation of said first population of T-cells, said method comprising

labeling the cells of said first population of cells with a first fluorophore which is also capable of labelling said second population of cells,

contacting said first population of cells with said second population of cells to form a mixture of cells,

the cytoplasm of said first population of cells being labelled with a second fluorophore which, when complexed with calcium ions or exposed to increased pH, emits or excites at a wavelength different from the wavelength which it emits or excites when not exposed to increased pH or complexed with calcium ions, or having an altered quantum efficiency when so exposed or complexed,

placing said mixture of cells in a dual laser flow cytometry system,

illuminating said mixture of cells with a first laser capable of causing said first fluorophore to emit light of a predetermined wavelength to cause self-identification of said first population of cells, and

illuminating said mixture of cells with a second laser capable of causing said second fluorophore to emit light of a predetermined weavelength as an indication of activation of said first population of cells.

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4,788,138

METHOD TO ACHIEVE A LINEAR STANDARD CURVE IN A SANDWICH IMMUNOASSAY

Ker-Kong Tung, Carlsbad; Linda K. Cragle, San Diego; Frederick W. Rood, Jr., Fallbrook, and Shih-Yun Lee, San Marcos, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 30, 1987, Ser. No. 44,099
Int. Cl.[4] G01N *33/532, 33/546, 33/574, 33/576*
U.S. Cl. 435—7 **27 Claims**

1. A method for performing an immunoassay for an antigen in a liquid sample comprising the steps of forming a complex between the antigen and at least two antibodies, one of said antibodies being a first antibody bound to an insoluble support and one of said antibodies being a second unbound labelled antibody, whereby a portion of said labelled antibody becomes bound to the insoluble support through said complex, and introducing thereto additional antibody selected from the group consisting of unlabelled unbound first antibody, unlabelled unbound second antibody, and mixtures thereof.

4,788,139

PLATELET AGGREGATION REAGENT, REAGENT CONTAINER AND METHOD OF DETERMINING PLATELET AGGREGATION IN EDTA-ANTICOAGULATED BLOOD

Wayne L. Ryan, Omaha, Nebr., assignor to Streck Laboratories, Inc., Omaha, Nebr.

Filed Aug. 6, 1987, Ser. No. 82,233
Int. Cl.[4] C12Q *1/56*
U.S. Cl. 435—13 **22 Claims**

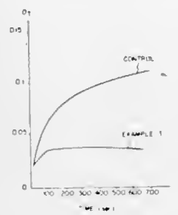
1. A platelet aggregation reagent for EDTA-anticoagulated blood, said reagent comprising
calcium chloride,
sodium citrate, and
a platelet-aggregating agent;
the calcium and the citrate being present in a proportion of about 1.5 micromoles:5 micromoles to about 7.5 micromoles:2.5 micromoles per at least about a platelet aggregating amount of the agent.

4,788,140

ANALYTICAL ELEMENT CONTAINING PHOTOSENSITIVE COMPOUND AND FILTER LAYER AND METHOD OF USE

John B. Findlay; Brent A. Burdick; Ronald A. Wellman, all of Rochester, and Mark E. Shafer, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1986, Ser. No. 830,036
Int. Cl.[4] C12Q *1/50, 1/28;* **G01N** *1/48*
U.S. Cl. 435—17 **20 Claims**



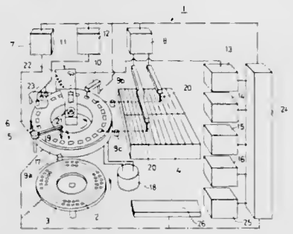
1. A self-supporting analytical element comprising:
a layer comprising an absorbent carrier material containing an interactive composition for a clinically significant enzyme analyte, said composition comprising a photosensitive compound capable of providing a detectable optical density change at a predetermined characteristic wavelength in response to reaction of the analyte with its substrate, and
a filter layer containing at least one filter dye selected to absorb incident radiation other than radiation at said characteristic wavelength produced in response to a reaction of the analyte with its substrate.

4,788,141

AUTOMATIC ANALYZER FOR GUANASE ACTIVITY

Seiichiro Yamasaki, Fukuoka; Setsuro Fujii, Kyoto; Isao Nakagawa, Sakai; Nobumoto Chikazawa, Nara, and Toshiharu Muraoka, Nagaokakyo, all of Japan, assignors to Maruho Co., Ltd., Osaka, Japan

Continuation of Ser. No. 749,263, Jun. 27, 1985, abandoned. This application Jul. 24, 1987, Ser. No. 78,009
Claims priority, application Japan, Jul. 4, 1984, 59-139370
Int. Cl.[4] C12Q *1/34;* **G01N** *35/04*
U.S. Cl. 435—18 **3 Claims**



2. A method for determining guanase activity in a blood sample comprising:
(a) providing a blood screening automatic analyzer including a plurality of blood sample containers arranged in at least one row, each of said sample containers having an open end for accommodating different blood samples individually, means for holding said sample containers with said open end facing upwardly and means for intermittently moving said sample containers along side at least one row, a plurality of reagent containers, each of said reagent containers having an open end for accommodating a reagent, means for holding each of said reagent containers with said open end facing upwardly and means for maintaining said reagent containers at a predetermined temperature, a plurality of reaction containers arranged in at least one row, each of said reaction containers having an open end, means for moving each of said reaction containers with said open end facing upwardly and means for intermittently moving said reaction containers along side at least one row, a temperature controlled bath for maintaining the reaction containers at a constant temperature, means for pouring a sample or reagent into each of the reaction containers having a nozzle reciprocatingly moveable from the sample container moving means and the reagent container holding means towards the reaction container moving means as well as in the opposite direction, cleaning vessels for the cleaning the pouring nozzle of the sample-reagent pouring means after each pouring disposed between said reactor container moving means and the sample container moving means, means for stirring the mixture of sample and reagent to be reacted and poured into the reaction container at a position forwardly of a sample-reagent pouring position with respect to the movement of the reaction container moving means, measuring means adapted to colorimetrically measure the absorbance of the reaction mixture and emit an analog measurement signal representing the measured absorbance at a position forwardly of the stirring means with respect to the movement of the reaction container moving means, means for cleaning the reaction container after completion

of the measurement at a position forwardly of the measuring means with respect to the movement of the reaction container, an analog-digital converter electrically connected to said measuring means for converting a said measurement signal emitted from the measuring means into a digital signal, counting-calculating means for counting and calculating the digital signal, display means for showing the calculated value as converted to a display signal, and means for controlling the operation of the reaction container moving means, the sample-reagent pouring means, the cleaning means, and the stirring means, said display means being adapted to produce a signal for excluding the measured blood sample corresponding to a display value when the display value is above a predetermined value;
(b) supplying a sample of blood to said blood sample containers;
(c) furnishing a reagent for an assay of a guanase activity of 1.8 IU/L;
(d) pouring a blood sample and reagent into said reaction containers and mixing said sample and said reagent together into a mixture;
(e) measuring colorimetrically the absorbance of said mixture;
(f) automatically converting the measurement of said absorbance into a digital signal representing guanase activity;
(g) calculating and converting said digital signal; and
(h) showing the calculated value as converted to a display signal on a display means programmed to produce a signal for excluding the measured blood sample corresponding to a display value when the display value is above a guanase activity level of 1.8 IU/L.

4,788,142

METHOD OF ASSAYING THE METABOLIC ACTIVITY OF CELLS CAPABLE OF ENDOCYTOSIS

Shuntaro Hosaka, Kamakura, and Takafumi Uchida, Tokyo, both of Japan, assignors to Toray Industries, Incorporated, Japan

Filed Aug. 9, 1984, Ser. No. 639,255
Claims priority, application Japan, Aug. 9, 1983, 58-145229
Int. Cl.[4] C12Q *1/02, 1/04, 1/06;* **G01N** *33/546*
U.S. Cl. 435—29 **6 Claims**

1. Method of assaying the cellular metabolic activity of cells capable of endocytosis which comprises mixing the cells with microbeads 0.03–20 um in diameter to which is bound a chemiluminescent substance capable of reacting with active oxygen in the cell and measuring intensity of the resulting luminescence wherein the cells are phagocytes or platelets.

4,788,143

METHOD FOR DETERMINING LEVELS OF CELL-MEDIATED IMMUNITY

Alexander A. Yabrov, 70 Roper Rd., Princeton, N.J. 08540, and Theodore Khavkin, 126 Montgomery St., Apt 2F, Highland Park, N.J. 08904

Filed Apr. 30, 1984, Ser. No. 605,321
Int. Cl.[4] C12Q *1/02*
U.S. Cl. 435—29 **12 Claims**

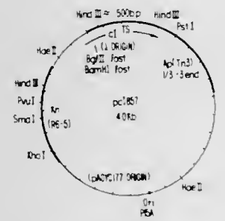
1. A method for determining levels of cell-mediated immunity by assaying autologous cells, comprising the steps of:
obtaining a whole blood sample from a host;
incubating cells comprising monocytes from the sample in a tissue culture medium containing Concanavalin A for between 18 and 48 hours; and
observing the number of short-lived monocyte polykaryons produced or the increase in number of nuclei per polykaryon or both to thereby determine the level of cell-mediated immunity of the host from which the blood sample was obtained.

4,788,144

FERMENTATION PROCESS FOR THE HIGH LEVEL PRODUCTION OF SWINE GROWTH

James R. McMullen, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jun. 28, 1985, Ser. No. 751,976
Int. Cl.[4] C12P *21/02;* **C12N** *15/00, 1/00*
U.S. Cl. 435—70 **21 Claims**



1. A method of producing swine growth hormone which comprises: inoculating an aqueous fermentation medium with a culture of a transformant *E. coli* strain containing an expression vector which directs the expression of swine growth hormone under the control of a phage lambda promoter-operator and an expression vector which directors the expression of the c1857 temperature-sensitive repressor protein; growing the transformant strain in the fermentation medium for an initial growth period during which the level of dissolved oxygen in the medium is maintained at from 20% to 60% of saturation and the temperature of the medium is maintained at 26° to 30° C.; raising the temperature of the fermentation medium to at least about 42° C. to inactivate the temperature-sensitive repressor protein, thereby initiating an induction period during which swine growth hormone is produced; then, after inactivation of the repressor protein, lowering the temperature of the medium to below the temperature necessary to completely inactivate the repressor protein by reducing the temperature to about 38° C. to 41° C. and then continuing to cultivate the transformant strain at a temperature below the temperature necessary to completely inactivate the repressor protein for the remainder of the induction period during which the level of dissolved oxygen in the medium is maintained at from 10% to 40% of saturation; and recovering the swine growth hormone from the transformant cells.

4,788,145

PROCESS FOR PREPARING 1-O-ALPHA-D-GLUCOPYRANOSIDO-D-FRUCTOSE

Mohammad Munir, Kindenheim, Fed. Rep. of Germany, assignor to Suddeutsch Zucker Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 550,672, Nov. 10, 1983, abandoned, which is a continuation-in-part of Ser. No. 482,829, Apr. 7, 1983, abandoned, Continuation-in-part of Ser. No. 890,964, Jul. 29, 1986. This applicatioo Oct. 14, 1986, Ser. No. 918,680
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241788
Int. Cl.[4] C12P *19/12*
U.S. Cl. 435—100 **7 Claims**

1. A process for preparing 1-O-α-D-glucopyranosido-D-fructose by the enzymatic conversion of isomaltulose, comprising contacting a 20–55% (w/w) aqueous solution of isomaltulose at a temperature of 25°–55° C. with a microorganism or an enzyme of a microorganism which forms isomaltulose from sucrose to form a first product solution containing isomaltulose and said 1-O-α-D-glucopyranosido-D-fructose; removing at least a portion of the isomaltulose from said first product solution by crystallization to form a mother liquor; and recovering

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said 1-O-α-D-glucopyranosido-D-fructose from the mother liquor.

4,788,146

LIQUID LOADED PAD FOR MEDICAL APPLICATIONS

David F. Ring, Skillman; Wilson Nashed, North Brunswick, and Thurman Dow, Somerville, all of N.J., assignors to Johnson & Johnson Patient Care, Inc., New Brunswick, N.J.

Division of Ser. No. 450,324, Dec. 16, 1982, Pat. No. 4,588,400. This application Jan. 9, 1986, Ser. No. 817,310

Int. Cl.⁴ C12P *19/04;* **A61F** *7/00;* **C12Q** *1/02*

U.S. Cl. 435—101 **20 Claims**

1. A method of producing a liquid loaded pad for medical applications comprising the steps of:

(a) culturing cellulose-producing microbial cells in a nutrient medium to produce a pellicle of microbially-produced cellulose loaded with the nutrient medium;

(b) replacing the nutrient medium of the pellicle with a physiologically-acceptable liquid; and

(c) sterilizing the pellicle loaded with said physiologically-acceptable liquid.

4,788,147

METHOD FOR PRODUCING ETHANOLAMINE OXIDASE

Shigeyuki Imamura, and Hideo Misaki, both of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 675,241, Nov. 16, 1984, abandoned, which is a continuation of Ser. No. 447,539, Dec. 7, 1982, abandoned. This application May 21, 1986, Ser. No. 865,584

Claims priority, application Japan, Dec. 7, 1981, 56-197554

Int. Cl.⁴ C12N *9/06;* **C12Q** *1/26*

U.S. Cl. 435—191 **3 Claims**

1. Method for producing ethanolamine oxidase, comprising the step of: culturing a broth of the microorganism Bacillus species B-0783 FERM-P No. 5798, and separating thus-produced ethanolamine oxidase from the microorganism.

4,788,148

PLASMID WITH STABILIZED INHERITANCE

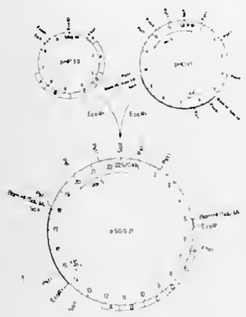
Lars A. J. Nilsson, Lund, and Stig G. Skogman, Akarp, both of Sweden, assignors to A C Biotechnics AB, Arlöv, Sweden

Filed Oct. 24, 1984, Ser. No. 664,435

Claims priority, application Sweden, Oct. 24, 1983, 8305838-8

Int. Cl.⁴ C12N *1/00, 1/20, 9/00;* **C12P** *13/22*

U.S. Cl. 435—320 **6 Claims**



1. A recombinant plasmid of stabilized inheritance, which comprises: a first nucleic acid fragment containing a production gene, said gene not normally found in the plasmid and encoding a polypeptide, and a second nucleic acid fragment containing a gene encoding valyl-tRNA synthetase, said first and second fragments each being situated in said plasmid so that each is operational, wherein said plasmid is one which is derived from an *E. coli* microorganism and wherein the plasmid containing said first and second nucleic acid fragments exhibits stabilized inheritance upon transformation and growth in a host *E. coli* microorganism due to expression of both the production gene and the valyl-tRNA synthetase gene.

4,788,149

PROTEOLYTIC ENZYME FROM BLOOD-SUCKING NEMATODES AND ITS USES AS AN ANTICOAGULANT AS A VACCINE AND AS AN ANTITHELMINIC AGENT

Anthony Cerami, Flanders, N.J., and Peter Hotez, New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 490,103, Apr. 29, 1983, abandoned. This application Jan. 30, 1985, Ser. No. 696,856

Int. Cl.⁴ C12N *9/48, 9/66, 9/50, 9/64*

U.S. Cl. 435—212 **5 Claims**

1. Purified helminthic proteolytic enzymes having molecular weight of about 37,000 daltons as determined by electrophoretic separation and isolated from *Ancylostoma caninum* hookworm and having optimum activity at a basic pH.

4,788,150

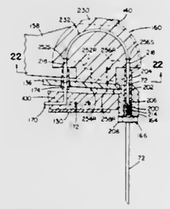
LIQUID HANDLING

Larry A. Nelson, and William A. Mace, both of Spokane, Wash., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Division of Ser. No. 706,070, Feb. 27, 1985, Pat. No. 4,670,219. This application Mar. 18, 1987, Ser. No. 27,558

Int. Cl.⁴ G01N *35/04, 37/00*

U.S. Cl. 436—45 **17 Claims**



1. A method of operating an analysis system that has

a first region in which sample materials are adapted to be stored.

a second region in which an analysis cuvette is adapted to be disposed,

transfer mechanism including a liquid handling probe, a probe transport carriage on which said liquid handling probe is mounted,

a drive for moving said transport carriage between said first and second regions, said transport carriage including a solid body of thermally conductive material, sample material storage chamber structure embedded in said body and connected to said liquid handling probe, thermal energy supply means in heat exchange relation with said body, and thermal sensor means carried by said transport carriage, and

liquid metering means connected to said storage chamber, said method comprising the steps of

maintaining said first region at an appropriate storage temperature,

disposing sample materials in said first region, disposing an analysis cuvette in said second region, maintaining said second region at an appropriate analysis temperature at least about 10° C. higher than said storage temperature such that said analysis cuvette is equilibrated to said analysis temperature,

supplying thermal energy to said thermal energy supply means in response to said thermal sensor means to maintain said transport carriage body at said analysis temperature, and

operating said drive and metering means to draw a predetermined quantity fo sample material for analysis from said first region through said probe into said storage chamber and to deliver said predetermined quantity of sample material to said analysis cuvette in said second region equilibrated in temperature to said analysis temperature in a time interval of about one second.

4,788,151

METAL COMPLEXED ACETYLENIC COMPOUNDS USEFUL AS ENVIRONMENTAL INDICATING MATERIALS

Anthony F. Preziosi, Ledgewood, and Thaddeus Prusik, Roosevelt, both of N.J., assignors to LifeLines Technology, Inc., Morris Plains, N.J.

Filed Sep. 29, 1986, Ser. No. 912,711

Int. Cl.⁴ G01K *11/16;* **G01N** *31/22;* **C07C** *127/15*

U.S. Cl. 436—2 **25 Claims**

1. An acetylenic complex comprising at least one effective complexing metal ion and at least one acetytenic compound of the general formula

$$[R—(C{\equiv}C)_a—(CH_2)_b—(C{\equiv}C)_c]_2$$

Wherein:

a is 1 or 2, b is a whole number from 0 to 5, c is 0 or 1; with the proviso that when a is 1, b and c are 0; and R is $—(CH_2)_n—NHC(O)NHR'$

Wherein

(1) n is an integer of about 1 to 10; and

(2) R′ is selected from the group consisting of:

(a) hydrogen;

(b) cycloalkyl;

(c) alkenyl;

(d) cycloalkenyl;

(e) alkyl;

(f) phenyl;

(g) alkoxy;

(h) alkoxyalkyl; and

(i) alkoxy carbonylalkyl.

21. An environmental exposure indicating device comprising a substrate having deposited thereon a complex in accordance with claim **1**; said complex on said substrate capable of undergoing one or more color changes upon exposure to environmental stimuli to indicate changes in environmental conditions.

4,788,152

APPARATUS FOR DETERMINING COAGULATION PARAMETER

Jürgen Doeding, Bensheim; Hans Wielinger, Langgewann, and Rolf Lerch, Ilvesheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

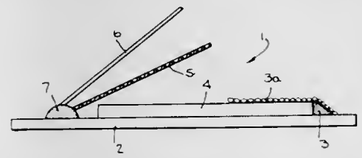
Filed Mar. 19, 1987, Ser. No. 27,628

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3610429

Int. Cl.⁴ G01N *1/18*

U.S. Cl. 436—69 **7 Claims**

1. Test carrier for determining a coagulation parameter of blood comprising a reagent for determining said parameter and a test layer, said test layer containing silanized glass fibers and



a coating layer of polyvinyl alcohol or polyvinyl alcohol/vinyl acetate.

4,788,153

METHOD FOR THE DETERMINATION OF BILIRUBIN AND AN ELEMENT USEFUL THEREIN

Richard L. Detwiler, and David M. Taylor, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 918,241, Oct. 14, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 106,759

Int. Cl.⁴ G01N *21/75, 33/72*

U.S. Cl. 436—97 **13 Claims**

1. A method for the determination of conjugated, unconjugated or total bilirubin comprising the steps of:

A. contacting a sample of a liquid suspected of containing conjugated or unconjugated bilirubin with an analytical element comprising a support having thereon, in order,

a gelatin-free mordant layer comprising a positively-charged interactive mordant having at least one binding site for bilirubin, said mordant being dispersed in a hydrophilic binder material other than gelatin or its derivatives, said hydrophilic binder material being present in an amount of from about 2 to about 20 g/m², and being selected from the group consisting of copolymers of acrylamide or methacrylamide and N-vinyl pyrrolidone and terpolymers of an N-vinyl pyrrolidone, a carboxy-containing vinyl monomer and an acrylamide or methacrylamide,

a radiation-blocking layer, and

a porous spreading layer,

provided that said element is free of colorimetric and fluorometric interactive compositions for bilirubin other than said mordant, and

B. measuring the amount of conjugated or unconjugated or total bilirubin bound to said interactive mordant.

4,788,154

METHOD AND APPARATUS FOR OBTAINING AND DELIVERING A PREDETERMINED QUANTITY OF PLASMA FROM A BLOOD SAMPLE FOR ANALYSIS PURPOSES

Jean Guigan, 9 rue Jean Mermoz, 75008 Paris, France

Filed Dec. 22, 1986, Ser. No. 944,406

Claims priority, application France, Dec. 20, 1985, 85 18954

Int. Cl.⁴ G01N *1/28;* **B01D** *21/26;* **B04B** *5/02*

U.S. Cl. 436—180 **4 Claims**

1. A method of delivering at least one predetermined quantity of plasma from a blood sample for analysis purposes, the method making use of the flowing items:

a longitudinal transfer strip made of transparent plastic material and comprising a housing enclosed by a lid, said housing comprising a bottom, first and second opposing end faces, first and second opposing longitudinal side faces, and being compartmented so as to present:

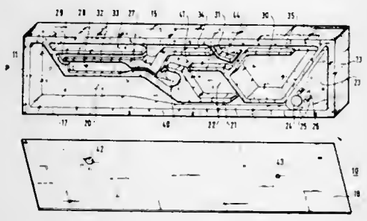
along said first longitudinal side face and running sequentially from said first end face, a receptacle for receiving a blood sample connected to an outlet channel, a plasma storage cell and a red corpuscle storage cell opening into

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said outlet channel; and parallel to said second longitudinal side face and starting from said first end face, a measurement cell connected by a capillary tube to a central plasma removal cell, having an outlet orifice through the bottom of said housing, and then to an overflow channel which opens into said plasma storage cell and then into an overflow tank, an end of the measurement cell opposite to said capillary tube being connected by a capillary duct to overflow cells;

and a turntable rotatable about its center and on which said transfer strip may be disposed radially in two positions A and B, the position A being one where said first end face is closer to the center of the turntable than said second end face, and the position B being one where the strip is symmetrical to that of position A and where the second end face is closer to the center of the turntable than the first end face;

said method comprising the steps in sequence of:



inserting a sample of a few millimeters of blood through an orifice provided in said lid of said transfer strip so that said blood drops into said receptacle;

disposing said transfer strip in said A position on said turntable and rotating said turntable to cause said sample of blood to pass into said plasma storage cell, said corpuscle storage cell, and said overflow tank, the rotating causing plasma to appear in said plasma storage cell and red corpuscles to appear in said corpuscle storage cell;

placing said transfer strip in the B position on said turntable, and rotating said turntable thereby causing said measurement cell to be filled with plasma from said plasma storage cell; and

placing said transfer strip in said A position on said turntable, and further rotating said turntable thereby emptying said measurement cell and causing a calibrated quantity of plasma to pass into said removal cell and thence out from said housing via said outlet orifice.

4,788,155

METHOD AND APPARATUS FOR MEASURING THE DEGREE OF REACTION BETWEEN A FOREIGN ENTITY AND A SUBJECT'S BLOOD CELLS

Mark J. Pasula, 369 NE. 116 St., Miami, Fla. 33161

Continuation-in-part of Ser. No. 547,767, Nov. 1, 1983, Pat. No. 4,614,722, and Ser. No. 902,313, Aug. 28, 1986. This application Oct. 1, 1986, Ser. No. 913,940

Int. Cl.[4] G01N *33/566;* **C12Q** *1/02*

U.S. Cl. 436—501 **18 Claims**

1. A method for diagnosing the presence or absence of an immune response indicative of a malady in a subject, said method comprising the steps of:

counting a number of blood cells of a single type selected from the group consisting of red blood cells and platelets, in a first blood sample drawn from said subject;

mixing a substance having a predetermined relationship with said malady and eliciting a cellular immune response with a second blood sample drawn from said subject to form a mixture, and thereby allow blood cells of said second blood sample to react with said substance;

counting a number of unreacted and reacted blood cells of said single type in said mixture; and

comparing said number of said blood cells counted in said first blood sample with said number of unreacted and reacted blood cells counted in said mixture, to determine if said blood cells in said second blood sample reacted with said substance, thereby diagnosing the presence or absence of said malady in said subject.

4,788,156

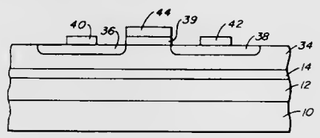
SUBCHANNEL DOPING TO REDUCE SHORT-GATE EFFECTS IN FIELD EFFECT TRANSISTORS

Edward B. Stoneham, Los Altos; Masahiro Omori, Palo Alto, and Arthur D. Herbig, San Jose, all of Calif., assignors to Microwave Technology, Inc., Fremont, Calif.

Filed Sep. 24, 1986, Ser. No. 911,270

Int. Cl.[4] H01L *21/265, 21/324*

U.S. Cl. 437—022 **12 Claims**



1. A method for manufacturing a transistor comprising the steps of:

providing a first region of semiconductor material of a first conductivity type;

depositing a second semiconductor region of a second conductivity type on said first region after said step of providing said first region; and

forming a gate on said second semiconductor region, a first portion of said second semiconductor region serving as a source of said transistor, a second portion of said second semiconductor region serving as a drain of said transistor, wherein the presence of said first region limits the distance from said gate that current carriers flow when traveling between said source and said drain.

4,788,157

METHOD OF FABRICATING A THIN FILM TRANSISTOR

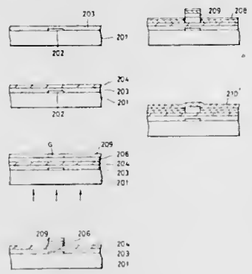
Takeshi Nakamura, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1987, Ser. No. 43,424

Claims priority, application Japan, May 2, 1986, 61-102638

Int. Cl.[4] H01L *7/00*

U.S. Cl. 437—046 **5 Claims**



1. A method for fabricating a stagger type thin film transistor in which inner ends of a highly doped amorphous silicon layer as an ohmic contact layer provide source and drain areas

which are defined by an upper insulating layer interposed between the source area and the drain areas, comprising the steps of:

(a) forming a gate electrode on a transparent substrate;

(b) depositing a lower insulating layer over said gate electrode and said transparent substrate;

(c) depositing an amorphous silicon layer on said lower insulating area;

(d) depositing an upper insulating layer on said amorphous silicon layer;

(e) coating a posi-type resist layer on said upper insulating layer;

(f) exposing said posi-type resist layer to light passing through from the underside of said trasparent substrate and developing said posi-type resist layer to retain a resist pattern at the position corresponding to said gate electrode;

(g) patterning said upper insulating layer using said resist pattern as the mask;

(h) depositing a highly doped amorphous silicon layer as an ohmic contact layer on said resist pattern and said amorphous silicon layer, and patterning said highly doped amorphous silicon layer by a lift-off method to remove said resist pattern;

(i) depositing a metal layer on a said patterned upper insulating layer and said patterned amorphous silicon layer;

(j) heating said highly doped amorphous silicon layer and said metal layer to generate a surface reaction between said metal layer and said highly doped amorphous silicon layer in order to selectively form a thin reaction layer therebetween; and

(k) patterning said metal layer to form source and drain electrodes on each side of said patterned insulating layer while retaining said reaction layer by selectively etching away by a photolithography method that portion of said metal layer which has not reacted with an underlying layer and which remains on an area where said highly doped amorphous silicon layer is not present.

4,788,158

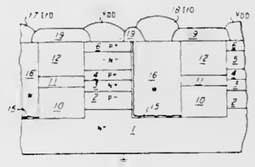
METHOD OF MAKING VERTICAL INVERTER

Pallab K. Chatterjee, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 780,500, Nov. 25, 1985, Pat. No. 4,740,826. This application Feb. 16, 1988, Ser. No. 156,128

Int. Cl.[4] H01L *27/06, 21/36*

U.S. Cl. 437—51 **3 Claims**



2. A process for forming an integrated electronic device, comprising the steps of:

forming a substrate of crystalline silicon of a first conductivity type;

epitaxially depositing a first channel layer of crystalline silicon and of a second conductivity type on the surface of said substrate;

epitaxially depositing a first drain layer of crystalline silicon and of said first conductivity type on the surface of said substrate;

epitaxially depositing a second drain layer of crystalline silicon and of said second conductivity type on the surface of said substrate;

epitaxially depositing a second channel layer of crystalline silicon and of said first conductivity type on the surface of said substrate;

epitaxially depositing a source layer of crystalline silicon and of said second conductivity type on the surface of said substrate;

etching a first cavity through said first and second channel layers, said first and second drain layers and said source layer into said substrate;

oxidizing the walls of said first cavity;

depositing a conductive material into said first cavity;

etching a second cavity through said first and second channel layers, said first and second drain layers and said source layer into said substrate;

filling said second cavity with an insulating material to a level above above the top surface of said first channel layer and below said first drain layer;

filling the remainder of said second cavity with a conductive material to a level above the top surface of said second drain layer and below said second channel layer; and

filling the remainder of said second cavity with an insulating material.

4,788,159

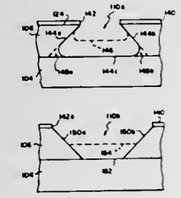
PROCESS FOR FORMING A POSITIVE INDEX WAVEGUIDE

Frank T. J. Smith, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1986, Ser. No. 908,741

Int. Cl.[4] H01L *7/00, 21/205;* **H01S** *3/19*

U.S. Cl. 437—90 **18 Claims**



1. A process of preparing a waveguide comprising

providing a monocrystalline substrate comprised of a III-V semiconductor,

epitaxially growing on the substrate one or more additional layers of a III-V semiconductor differing from the substrate semiconductor,

the substrate and the layers together forming a monocrystalline III-V compound structure, wherein the group V ions are arsenic and the group III ions are at least one of gallium and aluminum,

characterized in that a laterally confined positive index waveguide is formed by

providing a substrate having adjacent one major surface a monocrystalline gallium aluminum arsenide isolating portion having a resistivity greater than 10^5 ohm-cm epitaxially grown on an underlying portion of said substrate,

providing on the one major surface, a protective layer defining an opening,

through the opening creating a channel in the substrate to expose an unprotected portion of the substrate beneath the one major surface the channel having walls at least in part defined by the gallium aluminum arsenide isolating portion and

forming a waveguide region by selectively depositing epitaxially from a vapor phase gallium arsenide or gallium aluminum arsenide of a higher refractive index than the monocrystalline gallium aluminum arsenide forming the walls on only the unprotected portion of the substrate forming the channel.

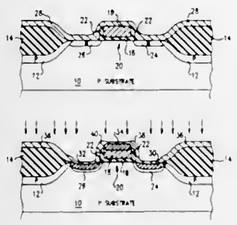
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,160

PROCESS FOR FORMATION OF SHALLOW SILICIDED JUNCTIONS

Robert H. Havemann, Garland; Roger A. Haken; Thomas E. Tang, both of Dallas, and Che-Chia Wei, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1987, Ser. No. 32,836
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—200 **28 Claims**



1. A method for forming junctions in an integrated semiconductor device, comprising:
providing a silicon substrate of a first conductivity type;
forming active areas in the substrate separated by thick insulating oxide regions;
forming polycrystalline gates on the surface of the active area separated therefrom by a layer of oxide to define a channel region;
forming a conformal layer of refractory metal over the substrate;
reacting the portions of the layer of refractory metal contacting the surface of the silicon in the substrate and the surface of the polysilicon in the gates to form corresponding layers of silicide of the refractory metal;
implanting impurity materials of a second conductivity type through the surface of the layers of metal silicide;
after said implanting removing the portions of the refractory metal layer not reacted to form silicide; and
driving the impurity materials into the substrate to form a metallurgical junction beneath the silicide layers.

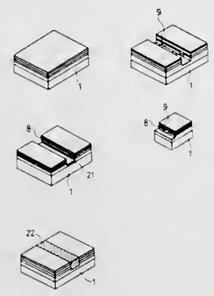
4,788,161

METHOD OF PRODUCING AN END SURFACE LIGHT EMISSION TYPE SEMICONDUCTOR DEVICE

Katsuhiko Goto; Shogo Takahashi, and Etsuji Omura, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 9, 1987, Ser. No. 130,547
Claims priority, application Japan, Feb. 4, 1987, 62-23940
Int. Cl.[4] H01L *21/306*
U.S. Cl. 437—228 **1 Claim**

1. A method of producing an end surface light emission type semiconductor device comprising:
producing a lower cladding layer, an active layer, and an upper cladding layer on a semiconductor substrate;
forming a stripe groove of a predetermined depth reaching said lower cladding layer at a predetermined position of the wafer thereby to produce an output end surface;
depositing photosensitive material in said groove;
producing a required number of lenses from said photosensitive material; and



dividing said wafer into a plurality of lens-appended end surface light emission type semiconductor devices.

4,788,162

COMPOSITE BY COMPRESSION

William B. Hillig, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 812,662, Dec. 23, 1985, abandoned.
This application Feb. 25, 1987, Ser. No. 18,677
Int. Cl.[4] C03C *10/04, 14/00*
U.S. Cl. 501—5 **19 Claims**

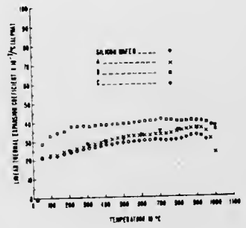
1. A process for producing a composite having a composition consisting essentially of from about 1% by volume to about 90% by volume of polycrystalline inroganic filler phase consisting essentially of particles and/or filaments and from about 10% by volume to about 99% by volume of continuous interconnecting polycrystalline alkaline earth silicate matrix phase, said composite containing amorphous glassy phase in an amount of less than aobut 5% by volume of said composite, said matrix phase enveloping more than 50% by volume of the individual filler particles and/or filaments, said composite having a porosity of less than about 10% by volume, which consists essentially of forming a mixture consisting essentially of a polycrystalline inorganic filler in the form of particles and/or filaments and an alkaline earth silicate in amounts required to produce said composite said filler being selected from the group consisting of boron carbide, chromium carbide, hafnium carbide, niobium carbide, silicon carbide, tantalum carbide, titanium, carbide, vanadium carbide, zirconium carbide, hafnium nitride, niobium nitride, silicon nitride, tanttalum nitride, titanium nitride, vanadium nitride, zirconium nitride, hafnium boride, niobium boride, tantalum boride, titanium boride, vanadium boride, zirconium boride, TaS_2, $MoSi_2$, WSi_2 and a mixture thereof, said alkaline earth silicate being represented by the stoichiometric formula $xMO/ZSiO_2$ where M=Ba, Ca, Mg, Sr and a mixture thereof, where x is 1, 2 or 2 and z is 1, 2 or 3, and wherein said MO and SiO_2 constituent of said stoichiometric formula ranges to less than $\pm 10\%$ from said stoichiometric formula, said alkaline earth silicate having a melting point ranging from about 250° C. to about 1850° C., said filler being a solid in said process and not significantly affected by said process, and compressing said mixture at a temperature at which said alkaline earth silicate is molten ranging from about 1300° C. to about 1900° C. under a pressure sufficient to produce a product having the composition of said composite, said compressing being carried out in a protective atomosphere or vacuum in which said filler and alkaline earth silicate are substantially inert thereby producing said composite free of reaction product detectable by scanning electron microscopy of said filler and alkaline earth silicate, and cooling said product to produce said composite.

4,788,163

DEVITRIFYING GLASS FRITS

Kenneth W. Hang, and Ashok N. Prabhu, both of Windsor Township, Mercer County, N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,547
Int. Cl.[4] C03C *8/14, 8/04*
U.S. Cl. 501—17 **8 Claims**



1. A devitrifying glass frit comprising, on a weight basis:
from about 19 to about 25 percent of zinc oxide;
from about 5 to about 20 percent of barium oxide;
from about 10 to about 30 percent of aluminum oxide;
from about 30 to about 50 percent of silicon dioxide;
from about 1 to about 6 percent of magnesium oxide, calcium oxide or mixtures thereof;
from about 0.5 to about 3 percent of phosphorus pentoxide; and
from about 1 to about 6 percent of zirconium silicate.

4,788,164

INORGANIC-ORGANIC COMPOSITE COMPOSITIONS WITH SUSTAINED RELEASE PROPERTIES

Tessie M. Che, Westfield, and Dagobert E. Stuetz, Watchung, both of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jan. 28, 1987, Ser. No. 7,548
Int. Cl.[4] C03C *11/00*
U.S. Cl. 501—39 **16 Claims**

1. A sustained release composite composition of an inorganic oxide glass monolith with a microporous structure and a physically incorporated organic content consisting essentially of (1) between about 10–90 weight percent, based on the incorporated organic content, of volatile organic component selected from the group consisting of fragrances and insect repellents; and (2) a nonvolatile organic component selected from the group consisting of esters, polyols, polyethers, hydrocarbons or substituted hydrocarbons, cyclic ketones, cyclic lactones, cyclic ethers, and polymers.

4,788,165

COPPER-EXUDING, BOROALUMINOSILICATE GLASSES

Gerald D. Fong, Beaver Dams, and Sheryl L. Hultman, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 7, 1987, Ser. No. 105,262
Int. Cl.[4] C03C *3/091*
U.S. Cl. 501—66 **4 Claims**

1. A family of low dielectric, copper-exuding, boroaluminosilicate glasses consisting essentially of, in percent by weight on the oxide basis, 56–64% SiO_2, 18–25% B_2O_3, 3–11% Al_2O_3, 0–2% CaO, 0–2% Li_2O, 0–1% K_2O, the total Li_2O+K_2O+CaO being 1.5–3%, and 1–20% CuO, and having a coefficient of thermal expansion of $30–35\times10^{-7}$ at 300° C., a dielectric constant not over 5.0 at 100 KHz, and a loss tangent not over 0.003 at 100 KHz.

4,788,166

HIGH-HARDNESS SINTERED ARTICLE AND METHOD FOR MANUFACTURE THEREOF

Masatada Araki, Handa, and Yutaka Kuroyama, Aichi, both of Japan, assignors to Nippon Oils & Fats Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1986, Ser. No. 834,805
Claims priority, application Japan, Mar. 4, 1985, 60-41190
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—96 **9 Claims**



1. A sinterable composition, comprising:
(A) 65 to 95% by volume of a high-pressure phase boron nitride consisting of a cubic phase boron nitride alone or a cubic phase boron nitride containing 5 to 30% by volume, based on the total amount of boron nitride, of a wurtzite type boron nitride;
(B) 4 to 34% by volume of an additive selected from the group consisting of
(a) at least one member selected from the group consisting of carbide, nitride, and carbonitride of titanium and
(b) a mixture of at least one member selected from the group consisting of carbide, nitride, and carbonitride of titanium with at least one member selected from the group consisting of carbide, nitride, and carbonitride of tantalum; and
(C) the balance of up to 100% by volume of aluminum and unavoidable impurities, said cubic phase boron nitride having a continuous grain size distribution ranging from a maximum grain size of 10 to 50 μm to a minimum grain size of less than 1 μm, said grain size distribution further characterized that when all of the particles of grain sized exceeding 1 μm are classified in stepped units of 5 μm, at least one particle of a grain size belonging to a given class is present in a total of 100 particles, and the number of particles of a grain size not exceeding 1 μm accounting for not less than 10% of the number of particles of grain sizes not smaller than 1 μm, said particles of boron nitride being bound to form a continuous matrix.

4,788,167

ALUMINUM NITRIDE/ALUMINUM OXYNITRIDE/GROUP IVB METAL NITRIDE ABRASIVE PARTICLES DERIVED FROM A SOL-GEL PROCESS

James P. Mathers, Woodbury, and William P. Wood, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 20, 1986, Ser. No. 933,014
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—98 **11 Claims**

1. A microcrystalline, nearly fully dense ceramic composite consisting of grains consisting essentially of
0 to 90 volume percent aluminum nitride or polytypes of aluminum nitride,
5 to 95 volume percent gamma-aluminum oxynitride, and
5 to 50 volume percent of at least one of Periodic Group IVB metal nitrides,
said composite being essentially free of alumina and containing less than 4 volume percent pores, and the size of said grains being less than 5 micrometers.

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4,788,168

METHOD FOR PRODUCING CARBON-CERAMIC COMPOSITE MATERIAL

Ichitaro Ogawa; Hisayoshi Yoshida, and Kazuo Kobayashi, all of Tosu, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,426
Claims priority, application Japan, Jun. 27, 1985, 60-142348
Int. Cl.⁴ C04B *35/52*
U.S. Cl. 501—99 **10 Claims**

1. A method for producing a high density high strength sintered carbon-ceramic composite material, consisting essentially of:

a. heating a ground powder mixture consisting essentially of low-temperature coke and a ceramic material in a non-oxidizing atmosphere at a temperature higher than 800° C., inclusive, and lower than an inceptive sintering temperature of said ceramic material, and then

b. molding the powder mixture to shape and sintering.

4,788,169

LOW ACIDITY ALUMINA-BOUND ZEOLITES CONTAINING TETRAHEDRAL BORON, GALLIUM, INDIUM AND/OR THALLIUM

Thomas F. Degman, Jr., Yardley, Pa.; John D. Lutner, Hamilton Sq., and Nai Y. Chen, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,342
Int. Cl.⁴ B01J *29/06, 29/28*
U.S. Cl. 502—61 **27 Claims**

1. A method of preparing a composition comprising a zeolite and a matrix comprising alumina wherein the composition exhibits an alpha value of said zeolite, wherein said zeolite has a SiO_2/Al_2O_3 molar ratio of at least about 10, has an alpha value of less than about 100 and contains a framework tetrahedral element selected from the group consisting of B, Ga, In and Tl, wherein the method comprises

(a) providing the zeolite containing an alkylammonium salt;

(b) ion exchanging the zeolite to replace alkali metal cations with ammonium cations;

(c) binding the zeolite with an aluminum containing material; and

(d) calcining the zeolite containing aluminum material to decompose organic material and convert the zeolite to the acid or hydrogen form, and thereby producing said composition having the alpha value which is the alpha value of said zeolite in said acid or hydrogen form, absent said matrix.

3. The method of claim 1, wherein the zeolite containing aluminum material is dried to eliminate excess water, prior to calcining.

4,788,170

METHOD FOR PREPARING TIN COMPLEX CURING CATALYST

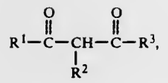
Jeffrey H. Wengrovius, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1987, Ser. No. 70,263
Int. Cl.⁴ B01J *31/12*
U.S. Cl. 502—152 **12 Claims**

1. A method for preparing a tin complex condensation catalyst which comprises effecting reaction, at a temperature in the range of about 20°-120° C., between the constitutents of a mixture comprising:

(A) at least one dialkyltin oxide;

(B) at least 2 moles, per gram-atom of tin in reagent A, of a diene of the formula



wherein each of R^1, R^2 and R^3 is independently hydrogen, R^4, $Si(R^4)_3$, acyl or nitrile and R^4 is a hydrocarbon radical containing from 1 to about 18 carbon atoms, and

(C) at least 1 mole, per gram-atom of tin in reagent A, of at least one polyalkoxysilane;

whereby water formed in the reaction between reagents A and B is removed by reaction with reagent C.

4,788,171

PHOSPHATED CALCINED ALUMINA

Douglas D. Klendworth, Bartlesville, Okla., assignor to Philips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1987, Ser. No. 10,258
Int. Cl.⁴ C08F *4/42, 4/24, 4/02;* **B01J** *27/188*
U.S. Cl. 502—155 **16 Claims**

1. A method of making a phosphated alumina comprising:

(a) calcining alumina at a temperature of about 450° C. to about 900° C.; and

(b) thereafter treating the thus calcined alumina with a phosphating agent selected from the group consisting of orthophosphoric acid, orthophosphates, $POCl_3$, PCl_3, phosphorous acid and $NH_4H_2PO_3$ to give a surface treatment wherein the atom ratio P/Al is in the range of about 0.2:1 to 2:1.

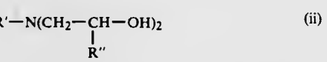
4,788,172

TITANIUM COMPOUNDS

Donald L. Deardorff, P.O. Box 853, East Greenwich, R.I. 02818

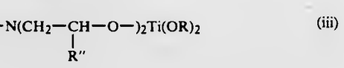
Filed Jul. 27, 1987, Ser. No. 77,905
Int. Cl.⁴ B01J *31/02*
U.S. Cl. 502—167 **5 Claims**

1. Compositions which are the reaction products of essentially molecular equivalent quantities of a tetra-isopropyl titanate, (i) $Ti(OR)_4$ and a dialkanolamine



(ii)

where R is isopropyl, R′ is H, phenyl or alkyl of 1 to 10 carbon atoms and R″ is H or alkyl of 1 to 6 carbon atoms, and said reaction products consist of free isopropyl alcohol and a titanium chelate adduct which is catalytically active and chemically reactive in a manner consistent with the functionality represented by structure,



(iii)

4,788,173

CATALYTIC MIXTURES FOR AMMOXIDATION OF PARAFFINS

Linda C. Glaeser, Cleveland Heights, and James F. Brazdil, Mayfield Village, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 811,842, Dec. 20, 1985, abandoned. This application Jul. 21, 1986, Ser. No. 887,478
Int. Cl.⁴ B01J *23/10, 23/28, 23/18, 21/02*
U.S. Cl. 502—204 **9 Claims**

1. A catalytic mixture suitable for the ammoxidation of propane to acrylonitrile, which comprises an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said first catalyst composition being 10–99 weight percent of a diluent/support and 90–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

$$VSb_mA_aB_bC_cT_tO_x, \qquad \text{formula (1)}$$

where

A is one or more of W, Sn, Mo, B, P and Ge;

B is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Te, Ga, In and As;

C is one or more of an alkali metal and Tl;

T is one or more of Ca, Sr and Ba; and

where m is greater than 1 and up to 20; a is 0–10; b is 0–20; c is 0–1; t is 0–20; a is equal to or less than m; b is equal to or less than m; t is equal to or less than m; wherein x is determined by the oxidation state of other elements, and wherein the antimony has an average valency higher than +3 and the vanadium has an average valency lower than +5,

said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

$$Bi_nCe_pD_dE_eF_fMo_{12}W_gO_y \qquad \text{formula (2)}$$

where

D is one or more of Fe, Mn, Pb, Co, Ni, Cu, Sn, P, Cr, Y, Mg, Ca, Sr, Ba and rare earths other than Ce and Sm

E is one or more of Sb, Ge, As, Se, Te and V

F is one or more of an alkali metal, Tl, Ag and Sm and where n is 0.01–24, p is 0.01–24, (n+p) is 0.1–24, d is 0–10, e is 0–10, f is 0–6, g is 0–8, y is determined by the oxidation state of other elements, wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

4,788,174

HEAT RESISTANT CATALYST AND METHOD OF PRODUCING THE SAME

Hiromichi Arai, Fukuoka, Japan, assignor to Catalysts and Chemicals Inc., Far East, Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,530
Claims priority, application Japan, Dec. 3, 1986, 61-286730; Apr. 7, 1987, 62-83711
Int. Cl.⁴ B01J *21/04, 23/02, 23/34, 23/70*
U.S. Cl. 502—324 **19 Claims**

1. A heat resistant catalyst consisting essentially of compositions of the formula $Al_{1-z}C_zB_xAl_{12-y}O_{19-\alpha}$ wherein, A is at least one element selected from the group consisting of Ba, Ca and Sr, C is K and/or Rb, B is at least one element selected from the group of Mn, Co, Fe, Ni, Cu and Cr, z is a value in a range of 0- about 0.4, x is a value in a range of about 0.1–4, is a value in a range of x–2x and α is a value which is determined by the valency X, Y, and Z of the respective element A, C and B and the value of x, y and z and is shown as $\alpha = 1 - \frac{1}{2}\{X - z(X - Y) + xZ - 3Y\}$.

4,788,175

CATALYST

Glyn D. Short, Yarm; Godfrey C. Chinchen, Spennymoor, and James G. Williamson, Stockton-on-Tees, all of England, assignors to Imperial Chemical Industries PLC, United Kingdom

Filed Aug. 20, 1986, Ser. No. 898,400
Claims priority, application United Kingdom, Aug. 30, 1985, 8521650
Int. Cl.⁴ B01J *21/04, 21/10, 23/06, 23/72*
U.S. Cl. 502—342 **4 Claims**

1. A catalyst precursor comprising an intimate mixture of finely divided oxidic materials and consisting essentially of copper oxide, zinc oxide, alumina, and magnesia, the proportion of magnesia being such that the magnesium atoms constitute 1.1 to 7% of the total number of copper, zinc and magnesium atoms in the precursor, and the proportion of alumina being such that the aluminum atoms constitute 3 to 30% of the total number of copper, zinc, aluminum, and magnesium atoms in the precursor.

4,788,176

ADSORBENT COMPRISING METAL OXIDE/HYDROXIDE PARTICLES REACTED WITH ONE OR MORE PHOSPHOROUS-CONTAINING MATERIALS HAVING SELECTED ORGANIC RADICALS ATTACHED THERETO

Larry F. Wieserman; Karl Wefers, both of Apollo; Kathryn Cross, Murrysville, and Edward S. Martin, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 946,870, Dec. 29, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,423
Int. Cl.⁴ B01J *20/22*
U.S. Cl. 502—401 **52 Claims**

1. A process for chemically bonding a monomolecular layer of phosphorous-containing organic material to metal oxide/hydroxide particles to form an active material suitable for use as an adsorbent and having good chemical stability over a pH range of from 1 to 14 which comprises:

(a) providing a liquid containing an organic material therein having 1–2 phosphorous-containing groups thereon selected from the class consisting of:

(i) phosphonic acid having the formula $RPO(OH)_2$; and

(ii) phosphinic acid having the formula RR′PO(OH);

where R comprises a 1–30 carbon-containing group and R′ comprises hydrogen or a 1–30 carbon-containing group; and

(b) contacting the metal oxide/hydroxide particles with said liquid to chemically bond said phosphorous-containing organic material to all of the exposed hydroxyl groups on the surface of said metal oxide/hydroxide particles to form a monomolecular layer of said organic material thereon forming said active material.

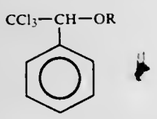
4,788,177

USE OF ALKYL ETHERS OF 2,2,2-TRICHLORO-1-PHENYLETHANOL AS ODORIFEROUS SUBSTANCES

Ernst-Joachim Brunke, Holbeinstrasse 6, and Claus-Hermann Kappey, Schratweq 1, both of 3450 Holzminden, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 77,806
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3626085
Int. Cl.⁴ A61K *7/46*
U.S. Cl. 512—20 **1 Claim**

1. A process for augmenting or enhancing the aroma of a perfume composition or a cologne comprising the step of adding to a perfume base or a cologne base an aroma augmenting quantity of at least one alkyl ether of 2,2,2-trichloro-1-phenylethanol with the general formula A



A

wherein R is an alkyl group having from 1 to 5 carbon atoms.

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4,788,178

USE OF GONADOLIBERIN AND GONADOLIBERIN AGONISTS FOR THE TREATMENT OF CLIMACTERIC COMPLAINTS

Wolfgang König, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

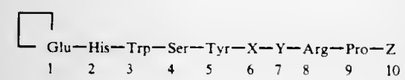
Filed Apr. 17, 1985, Ser. No. 724,331

Claims priority, applicatioo Fed. Rep. of Germany, Apr. 18, 1984, 3414595

Int. Cl.[4] A61K *37/02*

U.S. Cl. 514—15 **9 Claims**

1. A method for the treatment of climacteric complaints and pathological conditions in which the level of parathyroid hormone is too high, comprising administering to a patient in need of treatment of said complaints and conditions, a pharmacologically effective amount of gonadoliberin or a pharmacologically effective amount of a gonadoliberin agonist of formula II:



(II)

in which

(a)

Z denotes Gly—NH_2,

Y denotes Leu, and

X denotes D-Nle, D-Nva, D-Abu, D-Phe, D-Ser, D-Met, D-Pgl, D-Lys, D-Leu, D-Arg, D-Ser(But), D-Thr(But), D-Cys(But), D-Asp, D-Asp(OBut), D-Glu(OBut), D-Orn(Boc), D-Lys(Boc), D-Trp, D-Tyr, ϵ-lauryl-D-Lys or ϵ-dextran-D-Lys, D-His(Bzl) or

(b)

Z denotes Gly—NH_2, NH—(C_1-C_3)-alkyl or NH-cyclopropyl, which can be substituted by OH or F,

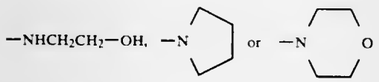
Y denotes Leu, Ser(But), Cys(But), Glu(OBut), Orn(Boc) or Lys (Boc), and

X denotes D-Ser(But), D-Cys(But), O-Asp(OBut), D-Glu(OBut), D-Orn(Boc) or D-Lys(Boc), D-His(Bzl)

or said, agonist wherein Ser^4 is replaced by Ala or Thr, or wherein Tyr is replaced by Phe, or wherein Arg is replaced by Orn, Lys or homoarginine, or

(c)

Z denotes —$NHCH_3$, —NH—CH_2—CH_3, —NH—$CH_2CH_2CH_3$,



Y denotes Leu, and

X denotes Gly or

(d)

Z denotes —NHC_2H_5,

Y denotes Leu, and

X denotes D-Trp, D-Leu, D-Ala, D-Ser(But), D-Tyr, D-Lys or D-His(Bzl) or

(e)

Z denotes Gly—NH_2 or NH—C_2H_5,

Y denotes N-α-methyl-Leu, and

X denotes Gly or

(f)

Z denotes NH-cycloporpyl,

Y denotes Leu, and

X denotes D-Leu or

(g)

Z denotes Gly—NH_2, NH—(C_1-C_3)-alkyl or NH-cyclopropyl,

Y denotes Ser(But), Cys(But), Asp(OBut), Glu(OBut), Orn-(Boc) or Lys(Boc), and

X denotes Gly.

4,788,179

METHOD OF TREATING AMYOTROPHIC LATERAL SCLEROSIS WITH DIPEPTIDE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS FOR USE THEREIN

Leopold Flohe, Roetgen, and Hans Barth, Aachen, both of Fed. Rep. of Germany, assignors to Gruenenthal GmbH, Stolberg, Fed. Rep. of Germany

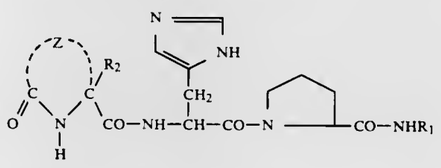
Filed Dec. 11, 1985, Ser. No. 807,845

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446127; Dec. 22, 1984, 3447260

Iot. Cl.[4] A61K *37/02*

U.S. Cl. 514—19 **10 Claims**

1. A method of treating patients suffering from amyotrophic lateral sclerosis to obtain improvement in the clinical symptoms thereof comprising administering an effective amyotropic lateral sclerosis symptom counteracting amount of a dipeptide derivative corresponding to the formula

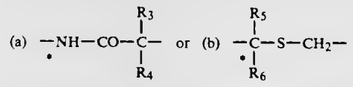


I

wherein

R_1 represents a hydrogen atom, an alkyl group containing one to six carbon atoms, a cyclohexyl group or a benzyl group,

Z is one of the following groups (attached to the CO-group in the ring by the valence marked with an asterisk)



wherein if Z represents a group (a), R_2 and R_3 together represent an additional bond between the carbon atoms to which R_2 and R_3 are attached, or if Z represents a group (b), R_2 is a hydrogen atom,

R_4 and R_5 may be the same or different and each represent hydrogen or an alkyl group containing one to three carbon atoms, or R_5 also may represent a phenyl group, and

R_6 represents a hydrogen or a methyl group, in anhydrous or hydrated form, or a pharmaceutically acceptable salt of such a compound with an acid.

4,788,180

PHARMACEUTICAL COMPOSITIONS

Maurice Bloch, 4 Lansdowne Road, London, N3 1ES, United Kingdom

PCT No. PCT/GB84/00099, § 371 Date Nov. 26, 1984, § 102(e) Date Nov. 26, 1984, PCT Pub. No. WO84/03623, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 26, 1984, Ser. No. 675,900

Claims priority, application United Kingdom, Mar. 24, 1983, 8308126

Int. Cl.[4] A61K *9/22, 33/08, 33/06*

U.S. Cl. 514—26 **13 Claims**

1. A method of treating a human patient suffering from magnesium/potassium deficiency, said method comprising the step of orally administering to such human patient a therapeutically meaningful dosage of a pharmaceutical composition

which consists essentially of a magnesium compound selected from the group consisting of magnesium oxide, magnesium hydroxide and pharmaceutically-acceptable salt of magnesium, and a pharmaceutically-acceptable carrier, said pharmaceutically-acceptable carrier functioning to control the release of magnesium into the digestive tract of said human patient over a period of from 2 to 24 hours.

4,788,181

5-SUBSTITUTED-2',3'-DIDEOXYCYTIDINE COMPOUNDS WITH ANTI-HTLV-III ACTIVITY

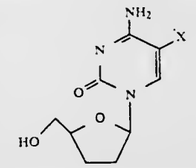
John S. Driscoll, Rockville; Victor E. Marquez, Gaithersburg; Chong-Ho Kim, Hyattsville, and James A. Kelley, Silver Spring, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 29, 1986, Ser. No. 913,575

Int. Cl.[4] A61K *31/70;* **C07H** *19/06, 19/10*

U.S. Cl. 514—49 **8 Claims**

1. A 5-substituted 2',3'-dideoxycytidine compound of the formula:



wherein X is selected from the group consisting of bromine and fluorine.

4,788,182

PHOSPHATIDYL COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE, AND THEIR USE

Gerhard Baschang, Bettingen; Bruno Fechtig, Reinach, both of Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany; Bohumir Lukas, and Oskar Wacker, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

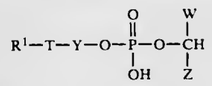
Continuation of Ser. No. 757,823, Jul. 22, 1985, abandoned. This application Oct. 23, 1987, Ser. No. 113,359

Claims priority, application Switzerland, Jul. 25, 1984, 3598/84

Int. Cl.[4] C07F *9/10;* **A61K** *31/66*

U.S. Cl. 514—114 **19 Claims**

1. A phosphatidyl compound of formula I



(I)

wherein

R^1 is an alpha-amino-lower alkanoyl the alpha-amino group of which may be substituted by lower alkanoyl, by lower alkoxycarbonyl or by benzyloxycarbonyl and said alpha-amino-lower alkanoyl radical is substituted by phenyl or by 4-hydroxyphenyl;

T is NH that is unsubstituted or substituted by lower alkyl, or is oxygen;

Y is dimethylene which is unsubstituted or substituted by carboxy, lower alkoxycarbonyl, phenoxycarbonyl, benzyloxycarbonyl, benzhydryloxycarbonyl, carbamoyl or N-lower alkylcarbamoyl that is unsubstituted or is substituted in the lower alkyl moiety by carboxy or lower alkoxycarbonyl; and

(a) W is hydrogen and

Z is 1,2-dihydroxyethyl, 2-hydroxyethyl, or hydroxymethyl wherein at least one of the hydroxy groups is esterified by an aliphatic C_8-C_{30} carboxylic acid or is etherified by an aliphatic C_8-C_{30} alcohol or

(b) each of W and Z is hydroxymethyl that is esterified by an aliphatic C_8-C_{30} carboxylic acid or etherified by an aliphatic C_8-C_{30} alcohol; or a pharmaceutically acceptable salt thereof or a mixture of said pharmaceutically acceptable salt and said compound.

16. A method for the prophylaxis or treatment of a viral infection in a warm blooded animal in need thereof comprising administering to said animal a therapeutically effective amount of a compound or pharmaceutically acceptable salt thereof according to claim 1.

4,788,183

METHOD FOR TREATMENT OF DYSLIPIDEMIA IN HUMANS

William Darrow, Basking Ridge, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Nov. 30, 1987, Ser. No. 126,441

Int. Cl.[4] A61K *31/615*

U.S. Cl. 514—166 **10 Claims**

1. A method for treating dyslipidemia in humans by administering a therapeutically effective amount of 5-{(S)-1-hydroxy-2-[(R)-(1-methyl-3-phenylpropyl)amino]-ethyl}salicylamide, 5-{(R)-1-hydroxy-2-[(R)-(1-methyl-3-phenylpropyl)amino]e-thyl}salicylamide or a pharmaceutically acceptable salt thereof as well as a mixture thereof to a human in need thereof.

4,788,184

SUBSTITUTED 3-CYCLOBUTENE-1,2-DIONES AS ANTI-ULCER AGENTS

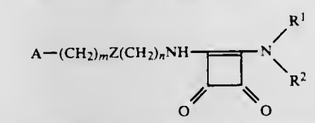
Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 926,874, Nov. 6, 1986, abandoned, which is a continuation of Ser. No. 656,203, Oct. 1, 1984, abandoned, which is a division of Ser. No. 503,996, Jun. 13, 1983, Pat. No. 4,503,051, which is a division of Ser. No. 369,971, Apr. 21, 1982, Pat. No. 4,522,943, which is a continuation-in-part of Ser. No. 264,533, May 18, 1981, Pat. No. 4,390,701. This application Nov. 13, 1987, Ser. No. 132,615

Int. Cl.[4] A61K *31/55, 31/38;* **C07D** *409/06, 409/14*

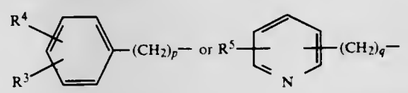
U.S. Cl. 514—183 **10 Claims**

1. A compound of the formula



I

wherein R^1 and R^2 each are independently hydrogen or (lower)alkyl, and, when R^1 is hydrogen, R^2 also may be allyl, propargyl, cyclo(lower)alkyl(lower)alkyl, cyclo(lower)alkyl, cyano(lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, hydroxy, 2,3-dihydroxypropyl,



in which p is an integer of from 1 to 6 inclusive, q is an integer of from 1 to 6 inclusive, R^3 and R^4 each are independently hydrogen, (lower)alkyl, hydroxy, (lower)alkoxy or halogen, and, when R^3 is hydrogen, R^4 also may be trifluoromethyl, or R^3 and R^4, taken together, may be methylenedioxy, R^5 is hydrogen, (lower)alkyl, (lower)alkoxy, hydroxy, amino or halogen;

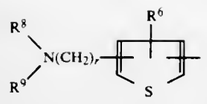
m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is sulfur, oxygen or methylene; and

A is

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in which R^6 is hydrogen, (lower)alkyl, (lower)alkoxy or halogen;

r is an integer of from 1 to 4 inclusive; and

R^8 and R^9 each are independently hydrogen, (lower)alkyl, allyl, propargyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, cyclo(lower)alkyl, or phenyl(lower)alkyl, provided that R^8 and R^9 may not both be cyclo(lower)alkyl, or R^8 and R^9, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, hydroxypiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, 3-pyrrolino, momopiperidino, heptamethyleneimino, octamethyleneimino or 3-azabicyclo[3.2.2]nonane;

or a nontoxic, pharmaceutically acceptable salt, hydrate or solvate thereof.

9. A method of inhibiting gastric acid secretions in an animal in need thereof comprising administering to said animal an effective antisecretory amount of at least one compound of claim 1.

4,788,185

CEPHALOSPORIN COMPOUNDS

Akio Miyake, Hirakata; Masahiro Kondo, Osaka, and Masahiko Fujino, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

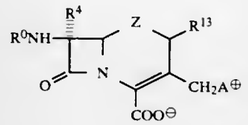
Filed Apr. 23, 1985, Ser. No. 726,438

Claims priority, application PCT Int'l Appl., Apr. 23, 1984, PCT/JP84/00212; May 25, 1984, PCT/JP84/00270; Mar. 1, 1985, PCT/JP85/00102; Norway, Apr. 17, 1985, 851538

Int. Cl.[4] **C07D** *501/46;* **A61K** *31/545*

U.S. Cl. 514—205 **34 Claims**

1. A compound of the formula:



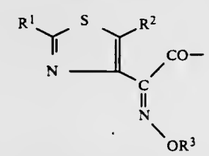
wherein

R^0 stands for:

(i) hydrogen;

(ii) 2-pyrrolyl, 3-pyrrolyl, 3-pyrazolyl, 4-pyrazolyl, 5-pyrazolyl, 2-imidazolyl, 4-imidazolyl, 5-imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1H-tetrazolyl, 2H-tetrazolyl, 2-oxazolyl, 4-oxazolyl, 5-oxazolyl, 3-isoxazolyl, 4-isoxazolyl, 5-isoxazolyl, 1,2,3-oxadiazol-4-yl, 1,2,3-oxadiazol-5-yl, 1,2,4-oxadiazol-3-yl, 1,2,4-oxadiazol-5-yl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 2-thiazolyl, 4-thiazolyl, 5-thiazolyl, 4-isothiazolyl, 5-isothiazolyl, 1,2,3-thiadiazol-4-yl, 1,2,3-thiadiazol-5-yl, 1,2,4-thiadiazol-3-yl, 1,2,4-thiadiazol-5-yl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyridyl-N-oxide, 3-pyridyl-N-oxide, 4-pyridyl-N-oxide, 3-pyridazinyl, 4-pyridazinyl, 3-pyridazinyl-N-oxide, 4-pyridazinyl-N-oxide, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl, 2-pyrimidinyl-N-oxide, 4-pyrimidinyl-N-oxide, 5-pyrimidinyl-N-oxide, pyrazinyl, 2-piperidinyl, 3-piperidinyl, 4-piperidinyl, piperazinyl, 3H-indol-2-yl, or 3H-indol-3-yl that is unsubstituted or substituted by one to three of C_{1-6} alkyl group, C_{3-10} cycloalkyl group, C_{6-10} aryl group, C_{7-12} aralkyl group, hydroxyl group, C_{1-6} alkoxy group, mercapto group, C_{1-6} alkylthio group, amino group, mono-C_{1-6} alkylamino group, di-C_{1-6} alkylamino group, halogen atom, nitro group, azido group, cyano group, carboxyl group, C_{1-10} alkoxycarbonyl group, C_{1-6} alkanoyl group, C_{1-6} alkanoyloxy group, carbamoyl group, mono-C_{1-6} alkylcarbamoyl group, di-C_{1-6} alkyl-carbamoyl group, carbamoyloxy group, mono-C_{1-6} alkylcarbamoyloxy group, or di-C_{1-6} alkylcarbamoyloxy group;

(iii) a group of the formula



wherein R^1 stands for an amino group or a protected amino group, R^2 stands for hydrogen atom, halogen atom, or nitro group, and R^3 stands for hydrogen atom or C_{1-6} alkyl group, C_{2-6} alkenyl group, C_{2-6} alkynyl group, C_{3-10} cycloalkyl group or C_{5-6} cycloalkenyl group that is unsubstituted or substituted by one or two of hydroxyl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{3-10} cycloalkyl, C_{5-6} cycloalkenyl, C_{6-10} aryl, C_{7-19} aralkyl, 2- or 3-pyrrolyl, 3-,4- or 5-pyrazolyl, 2-, 4- or 5-imidazolyl, 1,2,3-or 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, 2- or 3-furyl, 2- or 3-thienyl, 2-, 4- or 5-oxazolyl, 3-, 4- or 5-isoxazolyl, 1,2,3-oxadiazol-4- or 5-yl, 1,2,4-oxadiazol-3- or 5-yl, 1,2,5- or 1,3,4-oxadiazolyl, 2-, 4- or 5-thiazolyl, 3-, 4- or 5-isothiazolyl, 1,2,3-thiazidazol-4- or 5-yl, 1,2,4-thiadiazol-3- or 5-yl, 1,2,5- or 1,3,4-thiadiazolyl, 2- or 3-pyrrolidinyl, 2-, 3- or 4-pyridyl, 2-, 3- or 4-pyridyl-N-oxide, 3- or 4-pyridazinyl, 3- or 4-pyridazinyl-N-oxide, 2-, 4- or 5-pyrimidinyl, 2-, 4- or 5-pyrimidinyl-N-oxide, pyrazinyl, 2-, 3- or 4-piperidinyl, piperazinyl, 3H-indol-2- or 3-yl, 2-, 3- 4-pyranyl, 2-, 3- or 4-thiopyranyl, benzopyranyl, quinolyl, pyrido[2,3-d]pyrimidyl, 1,5-, 1,6-, 1,7-, 1,8-, 2,6- or 2,7-naphthylidyl, thieno[2,3-d]-pyridyl, pyrimidopyrimidyl, pyrazinoquinolyl, benzopyranyl, C_{1-6} alkoxy, C_{3-10} cycloalkyloxy, C_{6-10} aryloxy, C_{7-19} aralkyloxy, thiazolyloxy, mercapto, C_{1-6} alkylthio, C_{3-10} cycloalkylthio, C_{6-10} arylthio, C_{7-19} aralkylthio, thiazolylthio, amino, mono-C_{1-6} alkylamino, di-C_{1-6} alkylamino, tri-C_{1-6} alkylammonium, C_{3-10} cycloalkylamino, C_{6-10} arylamino, C_{7-19} aralkylamino, thiazolylamino, thiadiazolylamino, cyclic amino, azido, nitro, halogen, cyano, carboxyl, C_{1-10} alkloxy-carbonyl, C_{6-10} aryloxycarbonyl, C_{7-19} aralkyloxy-carbonyl, benzoyl, naphthoyl, phthaloyl, phenylacetyl, C_{1-6} alkanoyl, C_{3-5} alkenoyl, benzoyloxy, naphthoyloxy, phenylacetoxy, C_{2-6} alkanoyloxy, C_{3-5} alkenoyloxy, carbamoyl, N-methylcarbamoyl, N,N-dimethylcarbamoyl, N-ethylcarbamoyl, N,N-diethylcarbamoyl, N-phenylcarbamoyl, N-acetylcarbamoyl, N-benzoylcarbamoyl, N-(p-methoxyphenyl)carbamoyl, pyrrolidinocarbonyl, piperidinocarbonyl, piperazinocarbonyl, morpholino-carbonyl, thiocarbamoyl, N-methylthiocarbamoyl, N-phenylthiocarbamoyl, carbamoyloxy, N-methylcarbamoyloxy, N,N-dimethylcarbamoyloxy, N-ethylcarbamoyloxy, N-phenylcarbamoyloxy, phthalimido, C_{1-6} alkanoylamino, benzamido, naphthoylamido, phthalimido, carboxyamino, C_{1-10} alkoxy-carboxamido, C_{6-10} aryloxy-carboxamido or C_{7-19} aralkyloxy-carboxamido; or

(iv) methoxy-carbonyl, ethoxycarbonyl, n-propoxycarbonyl, isopropoxy-carbonyl, n-butoxycarbonyl, tert-butoxycarbonyl, cyclohexyloxycarbonyl, norbornyloxycarbonyl, phenoxycarbonyl, naphthyloxycarbonyl, benzyloxycarbonyl, methoxymethyl-oxycarbonyl, acetylmethyloxycarbonyl, 2-trimethylsilyl-ethoxycarbonyl, 2-methanesulfonylethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, 2-cyanoethoxycarbonyl, p-methylphenoxycarbonyl, p-methoxyphenoxycarbonyl, p-chlorophenoxycarbonyl, p-methylbenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, p-chlorobenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, benzhydryloxycarbonyl, cyclopropyloxycarbonyl, cyclopentyloxycarbonyl, or cyclohexyloxycarbonyl;

R^4 stands for hydrogen atom, methoxy group or formamido group,

Z stands for S or S→O;

R^{13} stands for hydrogen atom, methyl group, hydroxyl group or halogen atom; and

A stands for substituted or unsubstituted imidazol-1-yl group forming a condensed ring at the 2,3- or 3,4-position

or a physiologically or pharmaceutically acceptable salt or ester thereof.

4,788,186

6-SUBSTITUTED-S-TRIAZOLO[3,4-A]PHTHALAZINE DERIVATIVES

Emilio Occelli, Parabiago; Domenico Barone, Milan; Giorgio Tarzia, Milan, and Adele Giunta, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Gerenzano, Italy

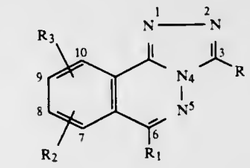
Continuation of Ser. No. 18,812, Feb. 20, 1987, abandoned, which is a continuation of Ser. No. 458,003, Jan. 14, 1983, abandoned. This application Oct. 20, 1987, Ser. No. 112,015

Claims priority, application United Kingdom, Jan. 18, 1982, 8201273

Int. Cl.[4] **A61K** *31/535, 31/50;* **C07D** *487/04*

U.S. Cl. 514—210 **29 Claims**

1. A s-triazolo[3,4-a]phthalazine having the formula



wherein

R represents phenyl, phenyl substituted with monohydroxy or from 1 to 3 substituents selected from (C_1–C_6)alkyl, (C_1–C_6)alkoxy, chloro, fluoro, bromo, phenyl, amino, mono- and di-(C_1–C_4)-alkylamino, (C_2–C_4)alkanoylamino, piperidino, cyano, nitro, trifluoromethyl, carboxy, and carbamyl with the proviso that the phenyl group cannot be substituted with mixtures of amino and nitro, alkanoylamino and alkylamino, or hydroxy and alkoxy groups, R is carbo(C_1–C_4)-alkoxy, chloro, (C_1–C_4alkylsulfinyl, (C_1–C_4)-alkylsulfonyl, a substituted amino group of the formula



wherein R_4 and R_5, each independently, represents (C_1–C_4)alkyl, (C_2–C_4)alkyl substituted with one or two groups independently selected from hydroxy, (C_1–C_4)alkoxy, halogen, carboxy, cyano, aminocarbonyl, mono- or di-(C_1–C_4)alkylaminocarbonyl, (C_1–C_4)alkoxycarbonyl, (C_1–C_4)alkoxythiocarbonyl and (C_1–C_4)alkyl-thiocarbonyl, or R_4 and R_5 independently are phenyl-(C_1–C_4)alkyl or substituted phenyl(C_1–C_4)alkyl wherein the alkyl portion as well as the phenyl portion may be substituted as defined above, or R_4 and R_5 taken together with the adjacent nitrogen atom may represent a saturated 4, 5 or 6-membered ring selected from the group consisting of azetidine, pyrrolidine, piperidine, piperazine and morpholine, and optionally bears one or two substituents independently seleted from (C_1–C_4)alkyl, phenyl, hydroxy, and carbo(C_1–C_4 alkoxy, or R represents an alkoxy or cycloalkoxy group of formula —OR_6 wherein R_6 stands for a (C_1–C_6)alkyl, substituted with one or two groups independently selected from hydroxy, amino, mono- or di-(C_1–C_4)alkylamino, (C_1–C_4)alkoxy, halogen, oxo, carboxy, aminocarbonyl, mono- or di-(C_1–C_4)alkylamino, (C_1–C_4)alkoxycarrbonyl, (C_1–C_4)alkoxythiocarbonyl and (C_1–C_4)alkylthiocarbonyl, or R_6 is a saturated 4, 5 or 6-membered ring selected from the group consisting of azetidine, pyrrolidine, piperidine, piperazine and morpholine, and optionally bears one or two substituents independently selected from (C_1–C_4)alkyl, phenyl, hydroxy, and carbo(C_1–C_4)alkoxy, or R_6 is a (C_5–C_8)cycloalkyl group optionally substituted with one or more hydroxy and (C_1–C_4)alkoxy groups;

R_1 is selected from halogen, hydroxy, (C_1–C_4)alkylthio, (C_1–C_4)alkylsulfinyl, ($_1$–C_4)alkylsulfonyl, phenyl, phenyl substituted as above, a substituted amino group of the formula



wherein R_7 or R_8 are as defined above for R_4 and R_5, and an alkoxy or cycloalkoxy group of formula —OR_9 wherein R_9 is defined as R_6 above;

R_2 is hydrogen; and

R_3 represents hydrogen, halogen, ($_1$–C_4)alkyl, (C_1–C_6)alkoxy and nitro; with the proviso that when R_3 is hydrogen and R_1 is chloro, R cannot be hydrogen, halogen, methyl, phenyl or 4-nitrophenyl, and that when R_1 is hydroxy, R must be different from phenyl; with the further proviso that when R and/or R_1 are —OR_6 or —OR_9, respectively, wherein the R_6 and/or R_9 are a saturated heterocyclic ring as above defined, the heteroatom of said heterocycle cannot be directly linked to the oxygen atom.

4,788,187

BENZOCYCLOBUTENE AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITION AND USE

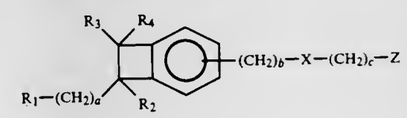
Donald E. Kuhla, Doylestown; Henry F. Campbell, Lansdale, and William L. Studt, Harleysville, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 891,197, Jul. 28, 1986, Pat. No. 4,743,600, which is a division of Ser. No. 798,697, Nov. 1, 1985, Pat. No. 4,639,442, which is a continuation-in-part of Ser. No. 664,222, Oct. 23, 1984, Pat. No. 4,558,719, which is a continuation-in-part of Ser. No. 604,813, Apr. 27, 1984, Pat. No. 4,638,001, which is a continuation-in-part of Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This application Feb. 26, 1988, Ser. No. 160,855

Int. Cl.[4] **A61K** *31/165, 31/535;* **C07C** *161/00;* **C07D** *295/14*

U.S. Cl. 514—212 **10 Claims**

1. A compound of the formula



wherein:

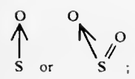
a is 1 or 2;

b is 0 or 1;

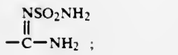
c is 2, 3 or 4;

X is oxygen, sulfur,

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Z is



or

R_1 is $-NR_5R_6$,

R_2, R_3 and R_4 are each independently hydrogen, lower alkyl, allyl, arylloweralkyl wherein aryl is phenyl or substituted phenyl, loweralkoxycarbonyl or lower alkyl substituted by hydroxy, loweralkoxycarbonyl or NR_5R_6;

R_5 and R_6 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;

or a pharmaceutically acceptable salt thereof.

8. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an anti-secretory effective amount of a compound according to claim 1.

4,788,188

QUINOLYLGLYCINAMIDE DERIVATIVES, THE PROCESS FOR PREPARATION THEREOF AND THEIR THERAPEUTIC APPLICATION AS PSYCHOTROPIC DRUGS

Jean-Claude Vernieres, Muret; Etienne Mendes, Toulouse; Michel Morre, Toulouse; Peter Keane, Toulouse, and Jacques Simiand, Muret, all of France, assignors to Sanofi (S.A.), France

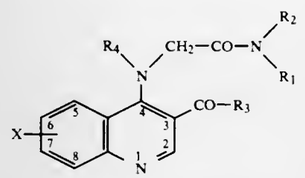
Filed May 6, 1986, Ser. No. 860,051

Claims priority, application France, May 6, 1985, 85 07247

Int. Cl.[4] C07D *215/54, 215/02, 401/12;* **A61K** *31/47*

U.S. Cl. 514—212 **10 Claims**

1. A quinolylglycinamide compound having a quinoline nucleus, said compound having the formula:



(I)

in which R_1 and R_2 are each, independently of each other, hydrogen or a lower alkyl group, or R_1 is an alkyl group and R_2 is a cyclohexyl group, a phenyl group, a benzyl group, a chlorophenyl group, or R_1 and R_2 form with the nitrogen atom to which they are directly attached a pyrrolidino, a piperidino or a homopiperidino, all of which can be substituted with a C_1–C_4 alkyl;

R_3 is hydrogen, a hydroxyl group, a C_1–C_4 alkyl or alkoxy group, a phenoxy group, a benzyloxy group, a phenoxy group, or a benzyloxy group, or R_3 denotes a group (—N—H—R_5), in which R_5 is hydrogen, a lower alkyl or phenyl group;

R_4 is hydrogen or a lower alkyl group; and

X is is hydrogen, a halogen, a C_1–C_4 alkyl group, a cyclohexyl group, a C_1–C_4 alkoxy group, a nitro group, a trifluoromethyl group, or a methylthio group;

or the addition salts of said quinolylglycinamide compound with pharmaceutically acceptable inorganic or organic acids or, when R_3 denotes OH, the salts with pharmaceutically acceptable alkali metal bases or organic bases.

4,788,189

METHOD TO TREAT SMOKING WITHDRAWAL SYMPTOMS BY POTENTIATED CENTRAL NORADRENERGIC BLOCKING

Howard I. Glazer, 225 E. 64th St., Ste. 202A, New York, N.Y. 10021

Filed Feb. 29, 1988, Ser. No. 161,799

Int. Cl.[4] A61K *31/24, 31/54, 31/415, 31/495*

U.S. Cl. 514—221 **42 Claims**

1. A method for treating cigarette smoking withdrawal symptoms of a nicotine-habituated patient comprising the following steps:

a. administering to said patient, a predetermined initial dosage of clonidine hydrochloride;

b. simultaneously with step a., hereinabove, administering a imipramine derivative to potentiate the blocking effect of the clonidine hydrochloride;

c. administering during the initial smoking cessation period successive daily treatment dosages of clonidine hydrochloride;

d. simultaneously with step c., hereinabove, for relief of withdrawal symptoms administering successive daily treatment dosages of one of a specific subclass of anxiolytic substances selected from the group consisting of benzodiazepines, azospirodecanediones, and meprobamates.

whereby the withdrawal symptoms experienced upon cessation of smoking are relieved.

4,788,190

2,4,4-TRI- AND 2,2,4,4-TETRA SUBSTITUTED-1,3-DIOXOLANE ANTIFUNGAL, ANTIALLERGY COMPOUNDS

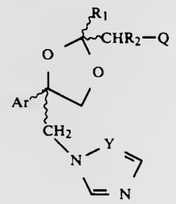
Anil K. Saksena, Upper Montclair; Alan B. Cooper, West Caldwell, both of N.J.; Henry Guzik, Brooklyn, N.Y.; Viyoor M. Girijavallabhan, Parsippany, and Ashit K. Ganguly, Upper Montclair, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Dec. 24, 1986, Ser. No. 946,352

Int. Cl.[4] A61K *31/54, 31/395;* **C07D** *405/04, 249/08*

U.S. Cl. 514—227.8 **20 Claims**

1. A compound represented by the formula I:

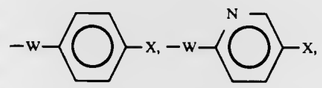


(I)

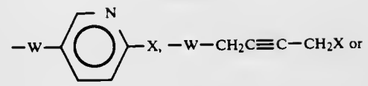
wherein Ar is thienyl, pyridyl, biphenyl, phenyl or phenyl substituted by one or more of halo, nitro, cyano, lower alkyl, lower alkoxy or perhalo(lower)alkyl;

Y is CH or N;

Q is



-continued



$-W-CH(R_3)-(CH_2)_p-CO_2R_4$

W is $-NR_5-$, $-O-$ or $-S(O)_n-$;

X is NO_2, NR_6R_7 or COR_8;

R_1, R_2, R_3 and R_4 are independently hydrogen or lower alkyl; R_5 is hydrogen, lower alkyl or (C_2–C_6)alkanoyl; R_6 and R_7 are independently hydrogen, lower alkyl, phenyl or phenyl substituted by one or more of halo, perhalo(lower)alkyl, (C_2–C_8)alkanoyl, lower alkyl, lower alkoxy, or 2-(lower)alkyl-3-oxo-1,2,4-triazol-4-yl, or R_6 and R_7 taken together with the nitrogen atom in NR_6R_7 form unsubstituted or substituted five- or six-membered heterocyclic ring systems containing at least one carbon atom and one to four heteroatoms chosen from N, O, S, SO and SO_2, said heterocyclyl substituents being (C_2–C_6)alkanoyl, lower alkyl, phenyl or phenyl substituted by one or more of halo, perhalo, lower alkyl, C_2–C_6)alkanoyl, lower alkyl, lower alkoxy, or 2-loweralkyl-3-oxo1,2,4-triazol-4-yl; R_8 is a lower alkyl, lower alkoxy, $—NR_1R_2$, phenyl or phenyl substituted by one or more of halo, perhalo lower alkyl, lower alkoxy, nitro, cyano, (C_2–C_6)alkanoyl; p is 0, 1, 2, 3, 4 or 5; n is 0, 1 or 2; and the stereochemical isomers thereof in racemic or optically actiye form; or a pharmaceutically acceptable salt thereof.

4,788,191

1,3-DITHIOLANO-, 1,4-DITHIINO- AND 1,4-DITHIEPINO[2,3-C]PYRROLE DERIVATIVES, THEIR PRODUCTION AND USE

Kentaro Hiraga, Nagaokakyo, and Yoshiaki Saji, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

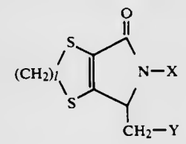
Division of Ser. No. 478,478, Mar. 24, 1983, Pat. No. 4,590,189. This application Apr. 23, 1986, Ser. No. 832,138

Claims priority, application World Int. Prop. O., Apr. 2, 1982, PCT/JP82/00096; Oct. 7, 1982, PCT/JP82/00401; Feb. 5, 1983, PCT/JP83/00032

Int. Cl.[4] A61K *31/33, 31/495, 31/50, 31/505;* **C07D** *413/14, 403/14, 409/14*

U.S. Cl. 514—230.8 **9 Claims**

1. A compound of the formula



wherein X is a cyclic group of the class consisting of phenyl, naphthyl, pyridyl, pyridazinyl, pyrazinyl, pyrimidinyl, quinolyl, naphthyridinyl, thiazolyl, benzothiazolyl or C_{3-7}cycloalkyl, which cyclic group is attached through a carbon atom thereof and is unsubstituted or substituted by one halogen atom or C_{1-4}alkoxy group;

Y is —COOH, —$COOR^1$ or —CO—NR^2R^3,

wherein R^1 is C_{1-4} alkyl, phenyl-C_{1-4}alkyl or phenyl, and wherein R^2 and R^3 are the same or different members of the class consisting of hydrogen, C_{1-4}alkyl, phenyl-C_{1-4}alkyl, phenyl, thiazolyl or benzothiazolyl, which are unsubstituted or substituted by a member of the class consisting of halogen, hydroxyl, C_{1-4}alkoxy, C_{2-5}alkoxycarbonyl and di-C_{1-4}alkylamino, or wherein NR^2R^3 is a cyclic group of the class consisting of pyrrolidinyl, piperidino, hexahydroazepinyl, piperazinyl, morpholino or thiazolidinyl, which cyclic group is unsubstituted or substituted by a member of the class consisting of hydroxyl, C_{1-4}alkoxy, C_{1-4}alkyl, C_{2-5}alkoxycarbonyl, phenyl-C_{1-4}alkyl, phenyl, piperidino and pyridyl;

and l is 1, 2 or 3;

or pharmaceutically acceptable salts thereof.

9. An anti-anxiety composition which comprises (a) as the active ingredient an amount sufficient to produce an anti-anxiety effect of at least one compound of claim 1 and (b) a pharmaceutically acceptable carrier.

4,788,192

2-SULFAMOYLBENZO(B)THIOPHENE DERIVATIVES PHARMACEUTICAL COMPOSITIONS AND USE

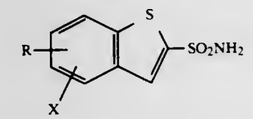
Kenneth L. Shepard, North Wales, and Samuel L. Graham, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 600,695, Apr. 16, 1984, Pat. No. 4,668,697, which is a continuation-in-part of Ser. No. 547,191, Oct. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 506,092, Jun. 20, 1983, abandoned. This application Mar. 12, 1987, Ser. No. 25,242

Int. Cl.[4] A61K *31/38, 31/535;* **C07D** *333/62, 413/02*

U.S. Cl. 514—233.5 **9 Claims**

1. A compound of structural formula:



or an ophthalmologically or pharmaceutically acceptable salt thereof, wherein:

X is hydrogen, chloro, bromo or fluoro, C_{1-3}alkyl, hydroxy or C_{1-3}alkoxy; and

R is:



wherein

R^5 and R^6 are independently:

(a) hydrogen,

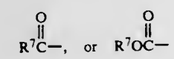
(b) C_{1-18} alkyl, either straight or branched chain,

(c) C_{3-6} cycloalkyl,

(d) C_{3-6} cycloalkyl-C_{1-3} alkyl,

(e) aryl-C_{1-3} alkyl wherein the aryl group is phenyl or naphthyl and is either unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3} alkyl or C_{1-3} alkoxy,

(f)



wherein R^7 is

(i) C_{1-18} alkyl, either straight or branched chain,

(ii) aryl as previously defined, either unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3} alkyl, or C_{1-3} alkoxy,

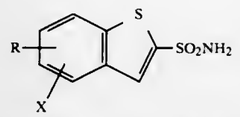
(iii) aryl-C_{1-3} alkyl wherein the aryl group is as previously defined and is either unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3} alkyl or C_{1-3} alkoxy,

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(iv) amino-C_{1-18} alkyl either straight or branched chain; or

(g) R^5 and R^6 if lower alkyl, are joined together directly or through a heteroatom selected from O or N to form a 5 or 6-membered heterocycle selected from pyrrolidine, piperidine, morpholine, and piperazine.

4. An ophthalmic composition for the topical treatment of glaucoma and elevated intraocular pressure comprising an ophthalmologically acceptable carrier and an effective intraocular pressure lowering amount of a compound with structural formula:



or an ophthalmologically acceptable salt thereof, wherein R and X are as defined in claim 1.

4,788,193

1-ARYLOXY-3-(SUBSTITUTED ALKYLAMINO)-2-PROPANOLS, PHARMACEUTICAL COMPOSITIONS AND USE

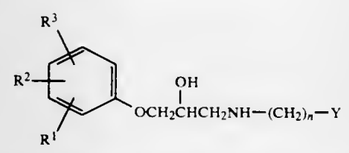
John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 600,693, Apr. 16, 1984. This application May 18, 1987, Ser. No. 51,094

Int. Cl.[4] A61K *31/495, 31/535;* **C07D** *295/14*

U.S. Cl. 514—237.8 **6 Claims**

1. A compound of structural formula



or a pharmaceutically acceptable salt thereof, wherein:

Y is a 6-membered nitrogen containing heterocycle selected from morpholino, piperazino or N-C_{1-3} alkyl-piperazino;

R^1 is hydrogen;

R^2 is hydrogen;

R^3 is cyano, and

n is 2, 3 or 4.

4,788,194

HETEROCYCLIC COMPOUNDS

Rodney B Hargreaves, Poynton; Bernard J. McLoughlin, and Stuart D. Mills, both of Macclesfield, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

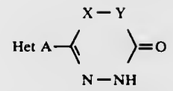
Division of Ser. No. 793,264, Oct. 31, 1985, Pat. No. 4,716,164, which is a division of Ser. No. 660,102, Oct. 12, 1984, Pat. No. 4,558,045, which is a division of Ser. No. 438,728, Nov. 3, 1982, Pat. No. 4,489,073. This application Sep. 14, 1987, Ser. No. 95,952

Claims priority, application United Kingdom, Nov. 12, 1981, 8134174

Int. Cl.[4] C07D *409/06, 409/04, 407/06;* **A61K** *31/53*

U.S. Cl. 514—242 **7 Claims**

1. A heterocyclic compound of the formula:



wherein A is a direct link, or is alkylene of 1 to 4 carbon atoms or alkenylene of 2 to 4 carbon atoms; werein X is —NH— and Y is —CR^1R^2—, wherein R^1 and R^2, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms; and wherein Het is a 2-, 3- or 4-pyridyl which is unsubstituted or bears one chloro, bromo, cyano, carbamoyl or methyl substituent;

or Het is 2- or 3-thienyl which is unsubstituted or which bears one or two chloro or methyl substituents;

or Het is unsubstituted benzothienyl, benzofuryl, indolyl or quinolyl;

or Het is 3-methyl-2-quinoxalinyl or salt thereof where appropriate.

7. A method for treatment of acute or chronic heart failure, or of hypertension, in a warm-blooded animal in need of such treatment, which comprises administering to said animal an effective amount of a heterocyclic compound claimed in claim 1.

4,788,195

4,5,6-SUBSTITUTED-N-(SUBSTITUTED-PHENYL)-2-PYRIMIDINAMINES

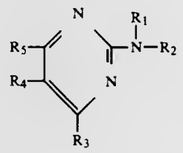
Lawrence W. Torley, Washingtonville; Bernard D. Johnson, and John P. Dusza, both of Rockland, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 817,951, Jan. 13, 1986, abandoned. This application Nov. 6, 1986, Ser. No. 927,572

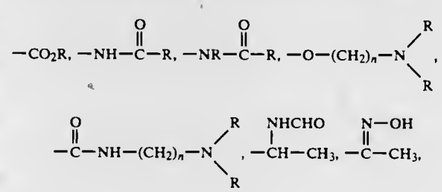
Int. Cl.[4] A61K *31/505;* **C07D** *403/04*

U.S. Cl. 514—252 **16 Claims**

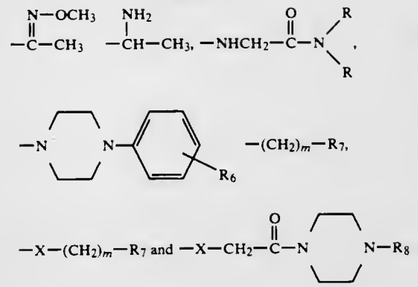
1. A compound selected from the group consisting of those of the formula:



wherein R_1 is hydrogen, alkyl(C_1–C_3), —$COCO_2C_2H_5$ or N,N-dimethylaminoethyl; R_2 is mono- or poly-substituted phenyl wherein the substituents are alkyl(C_1–C_6), alkoxy(C_1–C_3), chloro, bromo, iodo, trifluoromethyl, hydroxy, phenyl, amino, monoalkyl(C_1–C_3)amino, dialkyl(C_1–C_3)amino, alkyl(C_1–C_3)keto, propenyloxy, carboxyl, oxyacetic acid, oxyacetic acid ethyl ester, sulfanilamido, N,N-dialkyl(C_1–C_3)sulfanilamido, N-methylpiperazinyl, piperidinyl, 1H-imidazol-1-yl, 1H-triazol-1-yl, 1H-benzimidazol-2-yl, 1-naphthyl, cyclopentyl, 3,4-dimethylbenzyl or moieties of the formulae:



-continued



wherein R is alkyl(C_1–C_3), X is oxygen (—O—) or sulfur (—S—), m is 1–3, n is 2 or 3, R_6 is hydrogen, alkyl(C_1–C_3), alkoxy (C_1–C_3), chloro, bromo, iodo or trifluoromethyl, R_7 is 1H-imidazol-1-yl or morpholino and R_8 is alkyl(C_1–C_3), phenyl or monosubstituted phenyl wherein the substituents are alkyl (C_1–C_3), halogen or trifluoromethyl; R_3 is 2-pyridinyl, 3-pyridinyl, 4-pyridinyl, 2-methyl-3-pyridinyl, 4-methyl-3-pyridinyl, 2-furanyl, 5-methyl-2-furanyl, 2,5-dimethyl-3-furanyl, 2-thienyl, 3-thienyl, 5-methyl-2-thienyl, 2-pheno-thiazinyl, 4-pyrazinyl, 2-benzofuranyl, 2-(pyridine-N-oxide), 3-(pyridine-N-oxide), 4-(pyridine-N-oxide), 1H-indol-2-yl, 1H-indol-3-yl, 1-methyl-1H-pyrrol-2-yl, 4-quinolinyl, 4-pyri-dinyl methyl iodide, dimethylaminophenyl or N-acetyl-N-methylaminophenyl; R_4 is hydrogen or alkyl(C_1–C_3); and R_5 is hydrogen or alkyl(C_1–C_3); and the pharmacologically acceptable acid-addition salts thereof.

16. A composition of matter in dosage unit form comprising from about 5 mg to about 1500 mg of a compound of claim 1 in association with a pharmaceutically acceptable carrier.

4,788,196

PHENYL PIPERAZINE ANTI-ARRHYTHMIA AGENTS

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

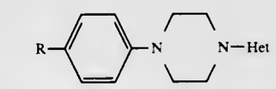
Filed Apr. 17, 1987, Ser. No. 39,508

Claims priority, application United Kingdom, Apr. 19, 1986, 8609630

Int. Cl.[4] A61K *31/495, 31/415, 31/44;* **C07D** *401/02*

U.S. Cl. 514—252 **10 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof,

wherein

R is R^3SO_2NH—, R^3CONH—, $R^1R^2NSO_2$—, or R^1R^2NCO—;

R^1 and R^2 are each independently H or C_1–C_4 alkyl;

R^3 is C_1–C_4 alkyl, C_3–C_7 cycloalkyl or NR^1R^2; and

"Het" is 2, 3 or 4-pyridyl optionally substituted by one or more substituents each independently selected from C_1–C_4 alkyl and NH_2; or 2-imidazolyl optionally substituted by one or more C_1–C_4 alkyl groups.

4,788,197

PYRAZINE DERIVATIVES USEFUL AS PLATELET AGGREGATION INHIBITORS

Toshio Wakabayashi, Tama; Hirokazu Hasegawa, Chofu, and Akihiro Ohta, Tokyo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

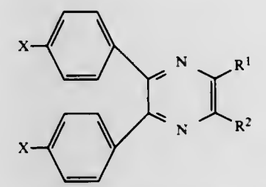
Continuation of Ser. No. 844,103, Mar. 14, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,692

Claims priority, application Japan, Mar. 15, 1985, 60-52115

Int. Cl.[4] A61K *31/495;* **C07D** *241/12*

U.S. Cl. 514—255 **6 Claims**

1. A pyrazine compound having the formula



(I)

wherein X is independently selected from a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a di-lower alkyl-amino group, R^1 represents a hydrogen atom or a lower alkyl group and R^2 represents a lower alkyl group; a benzyl group; a substituted benzyl group having as the substituent a lower alkyl group, a lower alkoxy group or a methylenedioxy group; a thienylmethyl group; or a substituted thienylmethyl group having as the substituent a lower alkyl group, a lower alkoxy group or a methylenedioxy group; with the proviso that if both X groups are a hydrogen atom and R^1 is a hydrogen atom, then R^2 cannot be methyl or ethyl; if both X groups are a hydrogen atom and R^2 is a hydrogen atom, then R^1 cannot be methyl or ethyl; and if both X groups are a hydrogen atom then R^1 and R^2 cannot both be methyl.

4,788,198

DIAZINE-ETHYENYLPHENYL OXAMIC ACIDS AND ESTERS AND SALTS THEREOF

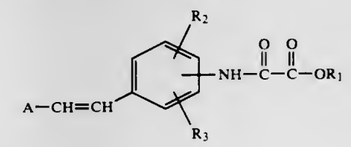
Karl G. Grozinger, Ridgefield, and James T. Oliver, Middlebury, both of Conn., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

Division of Ser. No. 733,007, May 10, 1985, Pat. No. 4,681,884, which is a continuation-in-part of Ser. No. 528,522, Sep. 1, 1983, abandoned. This application Apr. 27, 1987, Ser. No. 43,018

Int. Cl.[4] C07D *241/06, 241/08;* **A61K** *31/495*

U.S. Cl. 514—255 **15 Claims**

1. A compound of the formula



wherein

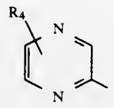
R_1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R_2 is hydrogen, methyl, hydroxyl, alkoxy of 1 to 4 carbon atoms, di(alkyl of 1 to 2 carbon atoms) amino-(alkoxy of 1 to 4 carbon atoms) or halogen;

R_3 is hydrogen or NHCOCOOR$_1$;

A is

VOL 1096 ISS 5 NO 29 1988 UMI



R_4 is hydrogen, methyl, alkoxy of 1 to 4 carbons atoms, hydroxyl, amino, alkanoyloxy of 1 to 2 carbon atoms, di(alkyl of 1 to 2 carbon atoms)-amino-(alkoxy of 1 to 4 carbon atoms) or acetamido; and

R_5 is hydrogen, amino, alkoxy of 1 to 4 carbon atoms, halogen or $NHCOCOOR_1$;

or, when R_1 is hydrogen, a nontoxic, pharmaceutically acceptable salt thereof.

4,788,199

PHARMACOLOGICALLY ACTIVE AMIDES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jesus Benavides, Rueil-Malmaison; Marie-Christine Dubroeucq, Enghien-les-Bains; Gérard Le Fur, Montmorency, and Christian Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

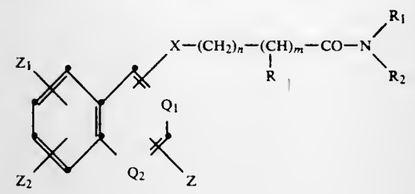
Division of Ser. No. 867,555, May 28, 1986. This application Mar. 11, 1988, Ser. No. 167,126

Claims priority, application France, May 30, 1985, 85 08111

Int. Cl.[4] A61K *31/505;* **C07D** *239/96*

U.S. Cl. 514—259 **12 Claims**

1. A racemic or stereoisomeric compound of formula:



(I)

in which

Q_1 denotes a nitrogen atom,

Q_2 denotes a nitrgen atom,

Z_1 and Z_2, which may be identical or different, denote hydrogen, halogen, alkyl or alkoxy of 1 to 3 carbon atoms each, nitro, or trifluoromethyl,

Z is bound in the ortho or para position with respect to Q_2 and denotes phenyl, thienyl, pyridyl, or phenyl substituted by one or two substituents chosen from halogen, alkyl and alkoxy of 1 to 4 carbon atoms each, trifluoromethyl and nitro, the chain $—X—(CH_2)_n—(CHR)_m—CONR_1R_2$ is bound in the ortho or para position with respect to Q_2,

R denotes hydrogen or alkyl of 1 to 3 carbon atoms,

R_1 and R_2, which may be identical or different, denote a linear or branched alkyl of 1 to 6 carbon atoms each, cyloalkylalkyl of 3 to 6 carbon atom, phenyl, phenylakyl or cycloalkyl in each of which the alkyl contains 1 to 3 carbon atoms, and in which the cycloalkyl contains 3 to 6 carbon atoms, or alkenyl of 3 to 6 carbon atoms in which the double bond is not situated in the 1,2 position with respect to the nitrogen atom,

R_1 and R_2 can also form, together with the nitrogen atom to which they are attached, a pyrrolidine, piperidine, morpholine or thiomorpholine ring,

X denotes $>CH—R_3$, $>N—R_4$, $>SO$, $>SO_2$, oxygen, or sulphur,

R_3 denotes hydrogen or alkyl of 1 to 3 carbon atoms,

R_4 denotes alkyl of 1 to 3 carbon atoms,

m is 0 or 1, and

n is 0, 1 or 2,

provided that, when X denotes $>SO$, $>SO_2$ or $>N—R_4$, the sum m+n is equal to at least 1, and, when Z is in the para position with respect to Q_2, X is not $>CH—R_3$, and also, where it can exist, a salt of such compound with an acid.

12. Method of treating a subject in need of anxiolytic, therapy which comprises amdinistering to such subject an effective amount of a compound as claimed in claim **1**.

4,788,200

METHOD AND COMPOSITION FOR TREATING ARTERIOSCLEROSIS

Ryuji Niwa, Tokorozawa; Nobuya Katagiri; Tetsuzo Kato, both of Sendai; Yoshiyasu Shitori, Tokyo, and Jiro Horiuchi, Iruma, all of Japan, assignors to MECT Corporation, Tokyo, Japan

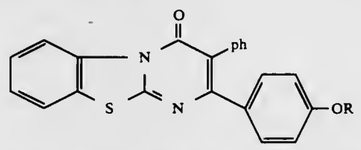
Filed Aug. 27, 1987, Ser. No. 89,867

Claims priority, application Japan, Aug. 28, 1986, 61-202357

Int. Cl.[4] A61K *31/505;* **C07D** *487/04*

U.S. Cl. 514—267 **10 Claims**

1. A composition for the treatment of arteriosclerosis or hyperlipedemia, or for inhibiting coagulation of blood platelets, comprising an effective amount of a pyrimido [2,1-b]benzothiazole of the formula (I):



(I)

wherein ph is a phenyl group, and R is an alkyl group having 1 to 5 carbon atoms, in combination with a pharmaceutically acceptable carrier.

4,788,201

3-METHYLENESPIRO (BENZOFURANPIPERIDINES)

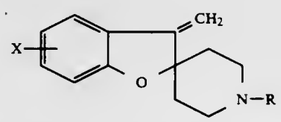
Raymond W. Kosley, Jr., Bridgewater, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Sommerville, N.J.

Filed Jan. 22, 1987, Ser. No. 6,035

Int. Cl.[4] A61K *31/445, 31/42;* **C07D** *413/14*

U.S. Cl. 314—278 **19 Claims**

1. A compound of the formula



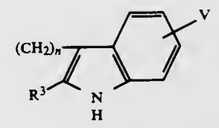
wherein R is hydrogen, loweralkyl of 1 to 6 carbon atoms, aralkyl, loweralkoxyloweralkyl having 1 to 6 carbon atoms in the alkoxy and alkyl groups, benzyloxyloweralkyl having 1 to 6 carbon atoms in the alkyl group, a group of the formula



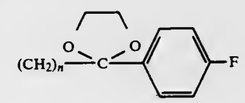
wherein R^1 is aryl or loweralkyl of 1 to 6 carbon atoms, a group of the formula



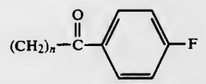
wherein R^2 is hydrogen or loweralkyl of 1 to 6 carbon atoms, a group of the formula



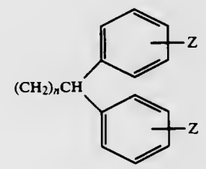
wherein R^3 is hydrogen or loweralkyl of 1 to 6 carbon atoms, V is hydrogen or halogen and n is 2, 3 or **4**, a group of the formula



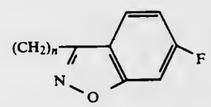
wherein n is 2 or 3, a group of the formula



wherein n is 2 or 3, a group of the formula



wherein Z is hydrogen, halogen, loweralkyl of 1 to 6 carbon atoms, loweralkoxy of 1 to 6 carbon atoms, trifluoromethyl or hydroxy and n is 1, 2, 3, or **4** or a group of the formula



wherein n is 2, 3 or **4**; X is hydrogen, halogen, loweralkyl of 1 to 6 carbon atoms, loweralkoxy of 1 to 6 carbon atoms, hydroxy or trifluoromethyl, an optical antipode thereof or a pharmaceutically acceptable acid addition salt thereof.

10. A method of reducing blood pressure comprising administering to a mammal in need of blood pressure reduction a blood pressure reducing effective amount of a compound as defined in claim **1**.

4,788,202

SULPHONAMIDE DERIVATIVES AS α_2-ADRENOCEPTOR ANTAGONISTS

Terence J. Ward, Maidenhead, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

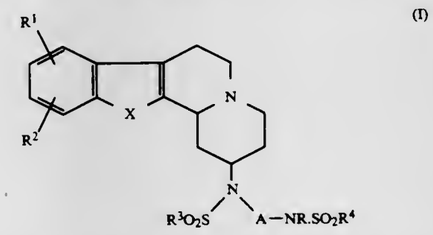
Continuation-in-part of Ser. No. 893,421, Aug. 5, 1986, abandoned. This application Jul. 9, 1987, Ser. No. 71,504

Claims priority, application United Kingdom, Aug. 10, 1985, 8520151; Mar. 11, 1986, 8605923

Int. Cl.[4] A61K *31/435;* **C07D** *471/14, 491/147, 495/14*

U.S. Cl. 514—285 **7 Claims**

1. A compound selected from the group consisting of a sulphonamide of the formula (I)



(I)

and a pharmaceutically acceptable acid addition salt thereof, wherein R represents hydrogen or lower alkyl, R^1 and R^2 which may be the same or different each represents hydrogen, lower alkyl, lower alkoxy or halogen, R^3 and R^4 which may be the same or different each represents lower alkyl, halo(lower-)alkyl or phenyl or pheny substituted by one or more substituents selected from halogen, lower alkoxy, lower alkyl, alkylenedioxy, nitro, amino, lower acylamino, lower alkylamino, diloweralkylamino and trifluoromethyl, A represents a lower alkylene group having 1 to 3 carbon atoms in the chain between the two N atoms and X represents O, S or NR^5 (where R^5 is hydrogen or lower alkyl).

4,788,203

CYCLIZED N-SUBSTITUTED-TETRAHYDROPYRIDINE COMPOUNDS, USEFUL IN THE TREATMENT OF CARDIOVASCULAR DISORDERS

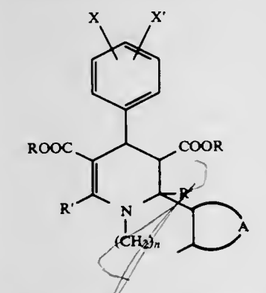
George D. Hartman, Lansdale, and Wasyl Halczenko, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 26, 1985, Ser. No. 802,127

Int. Cl.[4] A61K *31/38, 31/335, 31/395;* **C07D** *471/12*

U.S. Cl. 514—291 **12 Claims**

1. A compound having the formula:



wherein

X and X' are independently hydrogen, halogen, lower alkyl, lower alkoxy, nitro or trifluoromethyl;

R is lower alkyl;

R' is lower alkyl;

A is the chain —CH=CH—Y— wherein Y is O, S, NH or NR" wherein R" is lower alkyl, and wherein the ends of

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said chain may be attached to the double bond in either orientation,

n is 2 or 3;

and pharmaceutically acceptable salts thereof.

4,788,204

PHARMACOLOGICALLY ACTIVE AMIDES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jesus Benavides, Rueil-Malmaison; Marie-Christine Dubroeucq, Enghien-Les-Bains; Gérard LeFur, Montmorency, and Christian Renault, Taverny, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

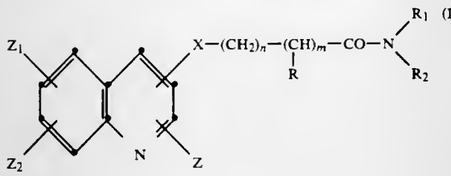
Filed May 28, 1986, Ser. No. 867,555

Claims priority, application France, May 30, 1985, 85 08111

Int. Cl.[4] A61K *31/47;* **C07D** *215/36*

U.S. Cl. 514—311 **7 Claims**

1. A racemic or levorotatory compound of formula:



(I)

in which

Z_1 and Z_2, which may be identical or different, denote hydrogen, halogen, alkyl or alkoxy of 1 to 3 carbon atoms each, nitro, or trifluoromethyl,

Z is bound in the ortho or para position with respect to the nitrogen atom and denotes phenyl, thienyl, pyridyl, or phenyl substituted by one or two substituents chosen from halogen, alkyl and alkxoy of 1 to 4 carbon atoms each, trifluoromethyl and nitro,

the chain—$X—(CH_2)_n—(CHR)_m—CONR_1R_2$ is bound in the ortho or para popsition with respect to the nitrogen atom,

R denotes hydrogen or alkyl of 1 to 3 carbon atoms,

R_1 and R_2, which may be identical or different, denote a linear, or branched alkyl of 1 to 6 carbon atoms each, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylalkyl or cycloalkylalkyl in each of which the alkyl contains 1 to 3 carbon atoms and in which the cycloalkyl contains 3 to 6 carbon atoms, or alkenyl of 3 to 6 carbon atoms in which the double bond is not situated in the 1,2 position with respect to the nitrogen atom,

R_1 and R_2 can also form, togehter with the nitrogen atom to which they are attached, a piperidine, or thiomorpholine ring,

X denotes $>CH—R_3$, $>N—R_4$, $>SO$, $>SO_2$, oxygen, or sulphur,

R_3 denotes hydrogen or alkyl of 1 to 3 carbon atoms,

R_4 denotes alkyl of 1 to 3 carbon atoms,

m is 0 or 1, and

n is 0, 1 or 2,

provided that, when X denotes $>SO$, $>SO_2$ or $>N—R_4$, the sum m+n is equal to at least 1, and, when Z is in the ortho position with respect to the nitrogen atom, X denotes oxygen, and R denotes hydrogen, the sum m+n is other than 1, and when X denotes $—CH_2—$ and R denotes hydrogen the sum m+n is other than 2, and excluding 2-phenyl-4-quinolyl N,N-dimethylcarbamate, and also, where it can exist, a salt of such compound with an acid.

7. Method of treating a subject in need of anxiolytic therapy which comprises administering to such subject an effective amount of a compound as claimed in claim **1**.

4,788,205

DIHYDROPYRIDINE ANTI-ALLERGIC AND ANTIINFLAMMATORY AGENTS

Kelvin Cooper; Michael J. Parry, both of Deal; Peter E. Cross, Canterbury, and Kenneth Richardson, Birchington, all of England, assignors to Pfizer Inc., New York, N.Y.

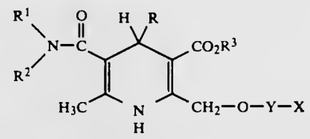
Filed Jul. 20, 1987, Ser. No. 75,379

Claims priority, application United Kingdom, Aug. 29, 1986, 8620880

Int. Cl.[4] C07D *401/12;* **A61K** *31/415*

U.S. Cl. 514—333 **11 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein R is phenyl, fluorophenyl, chlorophenyl, trifluoromethylphenyl, difluorophenyl, methylphenyl or methoxyphenyl; R^1 is hydrogen, alkyl having one to six carbon atoms, cycloalkyl having from three to seven carbon atoms, cycloalkylmethyl having four to eight carbon atoms, phenyl, phenylalkyl having seven to nine carbon atoms, indanyl, thenyl, pyridyl, methylpyridyl, picolyl, chloropyridyl, 2-thiazolyl, methyl-2-thiazolyl, dimethyl-2-thiazolyl, 2-benzothiazolyl, 6-alkoxy-2-benzothiazolyl said alkoxy having one to three carbon atoms, 1,3,4-thiadiazol-2-yl, 5-methyl-1,3,4-thiadiazol-2-yl, quinolyl, 3-isoxazolyl, 5-methyl-3-isoxazolyl, methylpyrazol-1-ylmethyl, or alpha-carboalkoxybenzyl said alkoxy having from one to three carbon atoms; R^2 is hydrogen or alkyl having one to six carbon atoms; R^1 and R^2 taken together with the nitrogen to which they are attached form a heterocyclic ring selected from piperidine, morpholine, thiomorpholine, piperazine or N-substituted piperazine where said substituent is alkyl having one to five carbon atoms, phenyl or alkanoyl having one to four carbon atoms; R^3 is alkyl having one to six carbon atoms or ethoxyalkyl having four to six carbon atoms; Y is alkylene having two to eight carbon atoms, having at least two carbon atoms in the chain linking X to the oxygen atom; and X is imidazol-1-yl optionally substituted with from one to three substituents selected from methyl and chloro.

4,788,206

PENTADIENEAMIDES

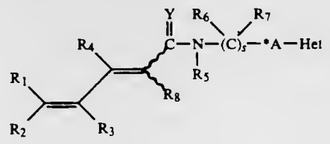
Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 10, 1987, Ser. No. 72,389

Int. Cl.[4] C07D *213/00;* **A61K** *31/44*

U.S. Cl. 514—346 **30 Claims**

24. A method of treating a disease state characterized by an excess of platelet activating factor which comprises administering to a host requiring such treatment an effective amount of a compound of the formula,



(I)

Y is O or S, *A is paraphenylene or $*—(CH_2)_n—(X)_m—(CH_2)_r—$, X is O, S or $—CH=CH—$, n or r, independently, are integers from 0 to 3, s is an integer from 0 to 1, m is an integer from 0 to 1, provided that when m is 1, n+s must be at least 2, R_1 and R_2, independently, are hydrogen, lower alkyl, cycloalkyl, lower alkenyl, pyridinyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, R_3, R_4 and R_8, independently, are hydrogen, lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, dior trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, R_5 and R_6, independently, are hydrogen or lower alkyl, R_7 is hydrogen, lower alkyl, cycloalkyl, pyridinyl-lower alkyl, naphthalenyl, phenyl or phenyl or naphthalenyl mono-, di- or trisubstituted by halogen, trifluoromethyl, lower alkyl, phenyl, lower alkoxy or nitro, Het is pyridinyl unsubstituted or substituted by lower alkyl, halogen or phenyl, and the asterisk denotes the point of attachment, and wherein R_6 and R_7 are different, an enantiomer or racemic mixture thereof, when R_1 and R_2 are different, a geometric isomer, or a pharmaceutically acceptable acid addition salt thereof.

4,788,207

PHOTOACTIVATED MITICIDAL AND INSECTICIDAL ETHYNYLTHIAZOLES

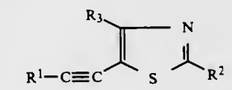
Kathryn A. Lntomski, Hightstown; David M. Roush, Princeton, both of N.J., and Richard B. Phillips, Diamond Bar, Calif., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 29, 1988, Ser. No. 161,867

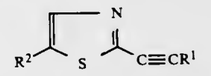
Int. Cl.[4] C07D *417/06, 277/22;* **A01N** *43/78*

U.S. Cl. 514—365 **6 Claims**

1. A photoactive acaricidal ethynylthiazole of formula I or II:



I



II

in which, when said ethynylthiazole is of formula I,

(a) R^1 is phenyl or phenyl substituted with a substituent selected from lower alkyl, halogen and lower haloalkyl;

R^2 is phenyl, phenyl substituted with a substituent selected from lower alkyl, halogen, lower haloalkyl and $—OCF_2O—$ bridging adjacent ring carbon atoms, thienyl, thienyl substituted with lower alkyl, halogen or lower alkoxycarbonyl; and

R^3 is hydrogen, lower alkyl, phenyl or methylphenyl; or

(b) R^1 is selected from the group consisting of methylthienyl, and C_4–C_6 alkyl;

R^2 is phenyl or phenyl substituted with a substituent selected from halogen, lower haloalkyl, and $—OCF_2O—$ bridging adjacent ring carbon atoms;

R^3 is hydrogen; or when said compound is of formula II, R^1 is phenyl, and

R^2 is phenyl, thienyl, or phenyl substituted with a substituent selected from lower alkyl and halogen.

4,788,208

2,4-DICHLOROTHIAZOLE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Gunther Beck, Leverkusen, and Rüdiger Schubert, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

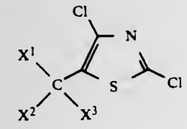
Continuation of Ser. No. 826,470, Feb. 5, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 150,364

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505900

Int. Cl.[4] C07D *277/32;* **A01N** *43/78*

U.S. Cl. 514—365 **4 Claims**

1. A 2,4-dichlorothiazole derivatives of the formula



in which

X^1 represents chlorine,

X^2 represents hydrogen or chlorine and

X^3 represents hydrogen or chlorine.

4,788,209

ANTIFUNGAL 2-ANILINOTHIAZOLINES

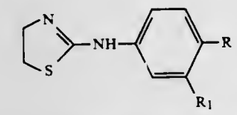
Russell J. Baumann, and Boyd L. Harrison, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Feb. 17, 1987, Ser. No. 15,246

Int. Cl.[4] C07D *277/42;* **A61K** *31/425*

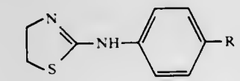
U.S. Cl. 514—370 **15 Claims**

1. A method for the treatment of a fungal infection which comprises topical administration of an effective amount of a compound of formula



wherein (a) R is a straight chain alkyl group having from 4 to 8 carbon atoms and R_1 is hydrogen or (b) R is hydrogen and R_1 is a straight chain alkyl group having from 5 to 8 carbon atoms, or a pharmaceutically acceptable salt thereof, in a pharmaceutically acceptable carrier.

12. A compound of the formula



wherein R is a straight chain alkyl group having from 6 to 8 carbon atoms or a pharmaceutically acceptable salt thereof.

VOL 1096 ISS 5 NO 29 1988 UMI

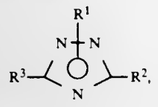
4,788,210

1,2,4-TRIAZOLE COMPOUNDS

Christoph Lüthy, Schwerzenbach, and René Zurflüh, Bülach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 16, 1985, Ser. No. 808,962
Claims priority, application Switzerland, Dec. 21, 1984, 6105/84; Sep. 25, 1985, 4151/85
Int. Cl.[4] A01N *43/653;* **C07D** *249/08*
U.S. Cl. 514—383 **16 Claims**

1. A compound for the control of mites and insects of the species Homoptera, of the formula



wherein

R^1 is attached to the 1- or 2-position of the 1,2,4-triazole ring and is methyl, ethyl or C_{1-4}-haloalkyl;

R^2 is o-halophenyl, o,o'-dihalophenyl or o,p-dihalophenyl, which halogen atoms are selected from the group consisting of fluorine, chlorine, bromine and iodine atoms; or phenyl which is substituted in the ortho position with a methyl, trifluoromethyl, methoxy or cyano group; and

R^3 is o-trifluoromethyl-phenyl, or an acid addition salt of such a compound.

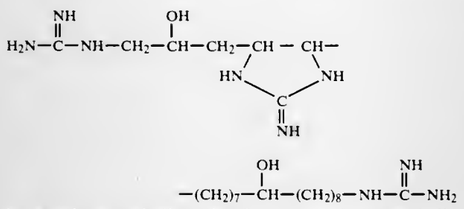
4,788,211

ANTIFUNGAL COMPOUND AND AFC COMPLEX PRODUCED FROM ACTINOMADURA SCC 1838

Vinod R. Hegde, Rockaway; Mahesh G. Patel, Verona; Ann C. Horan, Summit, and Ingrid-Agneta Gunnarsson, Hacketts-town, all of N.J., assignors to Schering Corporation, Kenil-worth, N.J.

Filed Aug. 25, 1987, Ser. No. 89,297
Int. Cl.[4] A61K *31/415;* **C07D** *233/02*
U.S. Cl. 514—392 **5 Claims**

1. The compound represented by the formula



in racemic or optically active form, or a pharmaceutically acceptable salt thereof.

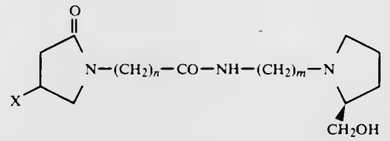
4,788,212

PYRROLIDIN-2-ONE DERIVATIVES HAVING NOOTROPIC ACTIVITY

Silvia Scolastico, Milan, Italy, assignor to Gibipharma S.p.A. and Istituto Biochimico Italiano Giovanni Lorenzini S.p.A., both of Milan, Italy, a part interest

Filed Jul. 29, 1987, Ser. No. 79,172
Claims priority, application Italy, Aug. 1, 1986, 21397 A/86
Int. Cl.[4] A61K *31/40;* **C07D** *207/12*
U.S. Cl. 514—422 **5 Claims**

1. A pyrrolidin-2-one compound of formula I



(I)

wherein X is hydrogen or an OR group, wherein R has one of the following meanings: hydrogen, saturated or unsaturated C_1–C_6 alkyl, cycloalkyl, aralkyl or phenyl; n represents zero or 1 and m represents 2 or 3.

5. A pharmaceutical composition having nootropic activity, for use in the therapy of mental syndromes due to cerebral insufficiency and to troubles of mental performance of the elderly patient, comprising as the principal active ingredient a compound according to claim **1** in admixture with a pharmaceutically acceptable carrier.

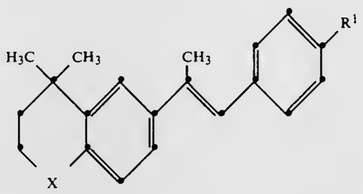
4,788,213

BENZOPYRANYL AND BENZOTHIOPYRANYL COMPOUNDS AND USES

Michael Klaus, Weil, Fed. Rep. of Germany, and Peter Loeliger, Muttenz, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

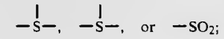
Filed May 5, 1983, Ser. No. 491,618
Claims priority, application Switzerland, May 12, 1982, 2956/82
Int. Cl.[4] A61K *31/35, 31/38;* **C07D** *311/58, 335/06*
U.S. Cl. 514—432 **40 Claims**

1. A compound of the formula:

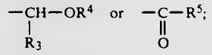


wherein

X is —O—,



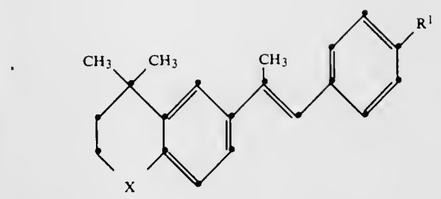
or —SO_2; R^1 is methyl,



R^3 is hydrogen or methyl; R^4 is hydrogen, lower alkyl or alkanoyl; R^5 is hydrogen, lower alkyl, amino, lower alkyl-amino, di(lower alkyl)-amino or OR^6; and R^6 is hydrogen or lower alkyl;

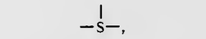
or pharmaceutically acceptable salts thereof.

29. A method for combatting acne or psoriasis comprising administering to a patient an effective amount of a compound of the formula:

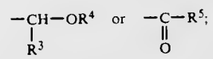


wherein

X is —O—,



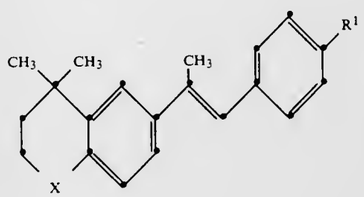
—SO, or —SO_2; R^1 is methyl,



R^3 is hydrogen or methyl; R^4 is hydrogen, lower alkyl or alkanoyl; R^5 is hydrogen, lower alkyl, amino, lower alkyl-amino, di(lower-alkyl)amino or OR^6; and R^6 is hydrogen or lower alkyl;

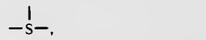
or pharmaceutically acceptable salts thereof.

34. A method for combatting neoplasms comprising administering to a patient in an effective amount of a compound of the formula:

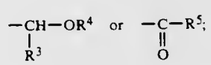


wherein

X is —O—,



—SO, or —SO_2; R^1 is methyl,



R^3 is hydrogen or methyl; R^4 is hydrogen, lower alkyl or alkanoyl; R^5 is hydrogen, lower alkyl, amino, lower alkyl-amino, di(lower-alkyl)amino or OR^6; and R^6 is hydrogen or lower alkyl;

or pharmaceutically acceptable salts thereof.

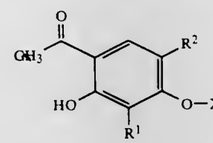
4,788,214

3,4-DIHYDRO-2H-1-BENZOPYRAN DERIVATIVES

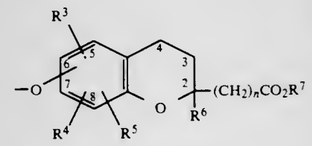
Noal Cohen, Montclair, and Giuseppe F. Weber, Cedar Grove, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 758,256, Jul. 24, 1985, abandoned, which is a division of Ser. No. 614,368, May 29, 1984, which is a continuation-in-part of Ser. No. 507,383, Jun. 24, 1983, abandoned. This application Sep. 15, 1986, Ser. No. 907,244
Int. Cl.[4] A61K *31/35;* **C07D** *311/58*
U.S. Cl. 514—456 **15 Claims**

1. A compound of the formula



I



wherein R_1 is hydrogen or lower alkyl; R^2 is hydrogen or halogen; R^3, R^4 and R^5, independently, are hydrogen, alkanoyl, benzoyl or lower alkyl; R^6 and R^7, independently, are hydrogen or lower alkyl; X is alkylene of 3 to 6 carbon atoms; and n is zero; provided that one of R^3, R^4 or R^5 is alkanoyl or benzoyl and the other two, independently, are hydrogen or lower alkyl;

an enantiomer thereof, or, when R^7 is hydrogen, a salt thereof, with a pharmaceutically acceptable base.

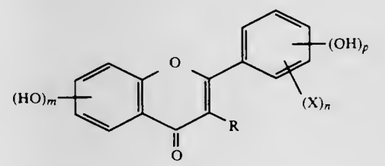
4,788,215

HALOGENOHYDROXYFLAVONES

Josef Krämer, Seeheim-Jugenheim; Klaus Irmscher, Darmstadt; Helmut Prücher, Heppenheim, and Rolf-Dieter Hesch, Hanover-Kleefeld, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darm-stadt, Fed. Rep. of Germany

Division of Ser. No. 801,703, Nov. 26, 1985, Pat. No. 4,713,465. This application Sep. 18, 1987, Ser. No. 98,584
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1984, 3443007; Feb. 19, 1985, 3505611
Int. Cl.[4] A61K *31/35;* **C07D** *311/30*
U.S. Cl. 514—456 **12 Claims**

1. A halogenohydroxyflavone of the formula



whereln

R is alkyl of 1–3 C atoms,

X is F, Cl, Br or I, and

each of m, n and p is 1, 2 or 3, or an ester thereof with sulfuric acid or phosphoric

acid, or a physiologically acceptable salt thereof.

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4,788,216

MEDICINAL USES FOR PODOPHYLLOTOXINS

Kurt Leander, Neuchâtel, Switzerland, and Börje Rosén, Karlstad, Sweden, assignors to Conpharm AB, Karlstad, Sweden

PCT No. PCT/SE85/00541, § 371 Date Aug. 28, 1986, § 102(e) Date Aug. 28, 1986, PCT Pub. No. WO86/04062, PCT Pub. Date Jul. 17, 1986

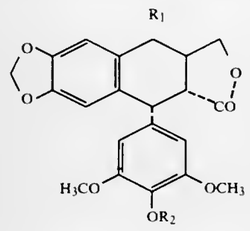
PCT Filed Dec. 20, 1985, Ser. No. 908,801

Claims priority, application Sweden, Dec. 28, 1984, 8406660

Int. Cl.[4] A61K *31/34*

U.S. Cl. 514—468 5 Claims

1. A method of treating psoriasis which comprises administering to a host in need thereof, an antipsoriasis effective amount of a compound having the formula:



wherein R_1 is H or OH and R_2 is H or CH_3.

4,788,217

PESTICIDAL CARBAMATES

Grörgy Lányi, Budapest; Lajos Nagy, Szentendre; Éva Somfai, Budapest; Valéria Dénes née Lustig, Budapest; Erzsébet Radvány née Hegedos, Budapest; Lészloó Pap, Budapest; Tamás Detre, Nagymaros; András Szego, and Mária Visnyovszky neée Bvez, both of Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU85/00068, § 371 Date Jul. 21, 1986, § 102(e) Date Jul. 21, 1986, PCT Pub. No. WO86/03202, PCT Pub. Date Jun. 5, 1986

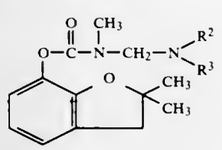
PCT Filed Nov. 15, 1985, Ser. No. 901,448

Claims priority, application Hungary, Nov. 23, 1984, 4346/84

Int. Cl.[4] A01N *47/10*; C07D *307/86*

U.S. Cl. 514—469 17 Claims

1. A compound of the Formula I



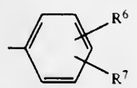
(I)

or a salt thereof, wherein

R^2 stands for hydrogen or C_{1-4} alkyl; and

R^3 represents a group of the Formula R^4-$(CH_2)_n$- wherein n is 1 or 2;

R^4 represents C_1 to C_4 alkoxy-carbonyl or a group of the Formula II,



(II)

and

R^6 and R^7 stand for C_{1-4} alkoxy.

4,788,218

17 A β-HYDROXY-7 α-METHYL-D-HOMO-19-NORANDROST-4,16-DIENE-3-ONE AND THE 17-ESTERS THEREOF: METHODS OF PREPARATION AND USES

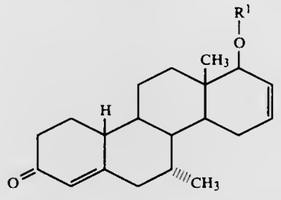
Masato Tanabe, Palo Alto; David F. Crowe, Yreka; George Detre; Peters, Richard H., both of San Jose, and Mitchell A.g34 Avery, Palo Alto, all of Calif., assignors to SRI International, Menlo Park, Calif.

Cootinuation-in-part of Ser. No. 612,415, May 21, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 856,386

Int. Cl.[4] C07C *69/34*, *49/727*; A61K *31/23*

U.S. Cl. 514—510 21 Claims

1. A compound of the formula



wherein R^1 is hydrogen or an acyl of the formula

$$-(C=O)-R^2$$

wherein R^2 is an organic substituent selected from the group consisting of a 1 to 24 carbon atom alkyl, a 2 to 24 carbon atom alkenyl, a 2 to 24 carbon atom alkynyl, a 3 to 8 carbon atom cycloalkyl, a 4 to 32 carbon atom cycloalkylalkylene, a 1 to 24 carbon atom haloalkyl, phenyl or 1 or 2 naphthyl aryl containing up to 4 one to six carbon atom alkyl substituents, a halophenyl and a halonaphthyl each containing up to 4 one to six carbon atom alkyl substituents, and an aralkyl made up of a 1 to 6 carbon atom alkyl substituted with a phenyl or a naphthyl each containing from 0 to 4 one to six carbon atom alkyls.

4,788,219

ANTIMETASTATIC AGENT

Yoshio Sakurai, Mitaka, and Takashi Tsuruo, Tokyo, both of Japan, assignors to Cancer Institute, Japanese Foundation for Cancer Research and Eisai Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 725,027, Apr. 19, 1985, abandoned. This application Jan. 16, 1987, Ser. No. 4,005

Claims priority, application Japan, Apr. 20, 1984, 59-79632

Int. Cl.[4] A61K *31/275*

U.S. Cl. 514—523 7 Claims

1. A method for the reduction of metastasis in a patient afflicted with cancer consisting essentially of administering to said patient an amount of verapamil or a pharmaceutically salt thereof to reduce the metastasis of cancer cells without treating the cancer per se.

4,788,220

PEDIATRIC IBUPROFEN COMPOSITIONS

Dhiraj S. Mody, Hammonton, and Annabelle Mogavero, Deptford, both of N.J., assignors to American Home Products Corporation (Del.), New York, N.Y.

Filed Jul. 8, 1987, Ser. No. 71,115

Int. Cl.[4] A61K *31/19*

U.S. Cl. 514—557 2 Claims

1. A taste neutral pediatric ibuprofen composition containing about 1% to about 2% weight ibuprofen by volume of the total composition comprising a primary suspension stabilizing combination of ingredients and a primary taste masking combination of ingredients, the suspension stabilizing combination of ingredients comprising about 1.25% to about 1.5% weight suspension stabilizing combination by volume of the total composition and consisting essentially of xanthan gum, microcrystalline cellulose, sodium carboxymethylcellulose and polysorbate 80, the taste masking combination comprising about 55% to about 75% weight taste masking combination by volume of the total composition and consisting essentially of sucrose and sorbitol solution, the composition also containing citric acid as a flavor enhancer in an amount sufficient to adjust the pH to about 3.5 and 5 and water qs to 100% by volume of the composition.

4,788,221

PHARMACEUTICAL COMPOSITIONS COMPRISING CALCITONIN AND AN ABSORPTION-PROMOTING SUBSTANCE

Seiya Kagatani; Shunji Hasumi; Takashi Sonobe, and Masayoshi Aruga, all of Shizuoka, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 800,983, Nov. 22, 1985, Pat. No. 4,690,952. This application May 5, 1987, Ser. No. 46,278

Claims priority, application Japan, Nov. 26, 1984, 59-248898

The portion of the term of this patent subsequent to Sep. 1, 2004, has been disclaimed.

Int. Cl.[4] A61U *27/00*

U.S. Cl. 514—808 6 Claims

1. An intranasal pharmaceutical composition of calcitonin suitable for applying to nasal mucous membrane, said composition comprised of (a) from about 200 to 6000 IU/ml of calcitonin, (b) from about 0.05 to about 15 weight percent by volume of an absorption enhancer consisting of salicylic acid or a salt thereof, and (c) a pharmaceutically acceptable carrier.

4,788,222

METHOD FOR THE PRODUCTION OF HYDROCARBONS USING IRON-CARBON-BASED CATALYSTS

Gary W. Rice, Scotch Plains; Rocco A. Fiato, Basking Ridge, and Stuart L. Soled, Pittstown, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 735,768, May 20, 1985, Pat. No. 4,659,681, and a continuation-in-part of Ser. No. 735,769, May 20, 1985, Pat. No. 4,668,647. This application Apr. 15, 1987, Ser. No. 38,637

Int. Cl.[4] C07C *1/04*

U.S. Cl. 518—700 22 Claims

1. A process for producing C_2+ aliphatic hydrocarbons from a CO and H_2 mixture comprising the step of contacting said mixture with a catalyst comprising finely divided nonpyrophoric iron-carbon catalyst particles comprising iron and carbon, in the substantial absence of silicon, a substantial portion of which is dementite, which was produced in a reaction zone in the presence of laser radiation under such conditions of laser flux density, power adsorption, concentration of iron compound reactants selected from the group consisting of iron carbonyls, iron acetylacetonate, and ferrocene, and pressure sufficient to produce non-pyrophoric iron-carbon particles having average diameters between 1 and 100 nm.

4,788,223

LOW-RINSE, HIGH-CAPACITY, WEAKLY BASIC ACRYLIC ION EXCHANGE RESIN

Michael P. Bigwood, Oreland, and John O. Naples, Dresher, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 26, 1985, Ser. No. 759,529

Int. Cl.[4] B01J *41/14*

U.S. Cl. 521—32 18 Claims

1. A weakly basic anion exchange resin having low rinse-volume requirements and high anion exchange capacity, which comprises a copolymer of acrylonitrile with an aliphatic cross-linking monomer having two or more unconjugated allylic groups, functionalized with a polyamine.

4,788,224

TWO STAGE PROCESS FOR THE PRODUCTION OF MOLDED ARTICLES

Hanns P. Müller, Bergisch Gladbach; Walter Uerdingen, and Heinrich Heine, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,959

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644382

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—104 8 Claims

1. A two-stage process for the production of molded articles comprising

(a) reacting

(1) at least one organic polyisocyanate with

(2) at least one organic compound containing at least two epoxide groups

in quantities such that the ratio of isocyanate groups to epoxide groups is from 1.2:1 to 500:1, in the presence of

(3) a tertiary amine catalyst

to form an intermediate product containing oxazolidinone and isocyanurate groups,

(b) stopping reaction (a) after no more than 65% of the isocyanate groups present in polyisocyanate (1) have reacted by adding an alkylating sulfonic acid alkyl ester, methyl iodide and/or dimethyl sulfate in a quantity which is at least equivalent to the quantity of tertiary amine (3) present,

(c) adding at least one latent catalyst capable of being activated by heat to the mixture of (b),

(d) supplying the mixture of (c) to a mold, and

(e) heating to complete the crosslinking of the intermediate product.

4,788,225

LOW DENSITY POROUS ELASTIC CROSS-LINKED POLYMERIC MATERIALS AND THEIR PREPARATION

Christopher John C. Edwards, Buxtehude, Fed. Rep. of Germany; Donald P. Gregory, and Martin Sharples, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 4, 1987, Ser. No. 22,143

Claims priority, application United Kingdom, Mar. 26, 1986, 8607535

Int. Cl.[4] C08J *9/28*

U.S. Cl. 521—147 5 Claims

1. An elastic cross-linked porous polymer derived from vinyl polymerization of a mixture of monomer, comprising from about 2% to about 20% of a difunctional unsaturated cross-linking monomer, up to 50 weight % styrene and at least 50 weight % of a monomer selected from the group consisting of an alkyl acrylate, methacrylate and mixtures thereof, said polymer having a porosity in the range 75 to 95% internal phase volume and having interconnected pores, said pores having a mean pore diameter in the range 15 μm to 80 μm, said polymer having an elastic return from 50% compression to 90% of initial thickness of less than 120 seconds.

4,788,226

POLYAMIDE MEMBRANES

Richard Curry, Houghton-Le-Spring, England, assignor to Domnick Hunter Filters Limited, Birtley, England

PCT No. PCT/GB87/00439, § 371 Date Feb. 18, 1988, § 102(e) Date Feb. 18, 1988, PCT Pub. No. WO87/07849, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 23, 1987, Ser. No. 159,583

Claims priority, application United Kingdom, Jun. 23, 1986, 8615268

Int. Cl.[4] C08J *9/28*, *9/30*

U.S. Cl. 521—184 8 Claims

1. A microporous membrane comprising a hydrophilic,

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skinless sheet of polytetramethylene adipamide, either alone or in admixture with at least one other polyamide.

4,788,227

CONTACT LENS FORMED FROM A HYDROGEL FUNDAMENTAL MATERIAL

Yasukichi Yanagihara, Kakamigahara, and Takuo Kato, Kasugai, both of Japan, assignors to Tomei Sangyo Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 712,814, Mar. 18, 1985, Pat. No. 4,699,946. This application Mar. 18, 1987, Ser. No. 27,379
Claims priority, application Japan, Mar. 24, 1984, 59-56585
Int. Cl.[4] C08J *3/00*
U.S. Cl. 523—106 **10 Claims**

1. A contact lens prepared from a hydrogel forming material comprising a copolymer a (A) an optically transparent polyester having a number average molecular weight of 1,000 to 100,000 obtained by reacting an epoxy compound and a cyclic acid anhydride and having at least one polymerizable group in the molecule and (B) an N-vinyllactam.

4,788,228

HIGH TEMPERATURE PROFILE MODIFICATION AGENTS AND METHODS FOR USING SAME

Roderick G. Ryles, Milford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 24, 1986, Ser. No. 946,265
Int. Cl.[4] E21B *33/138, 43/20;* **C08F** *8/42*
U.S. Cl. 523—130 **14 Claims**

1. A gellable composition comprising:
(a) water,
(b) a water thickening and crosslinkable amount of a water-dispersible polymer consisting essentially of:
(i) from about 5 to about 75 mol percent of N,N[1]-dimethylacrylamide, and
(ii) from about 5 to about 35 mol percent of acrylic acid units or salts thereof, and
(iii) from about 10 to about 90 mol percent of 2-acrylamido-2-methylpropanesulfonic acid units or salts thereof, and
(c) an amount of a trivalent chromium or aluminum compound or a redox couple of a hexavalent chromium compound and a reducing agent chromium compound capable of cross-linking said polymer to form a stable gel.

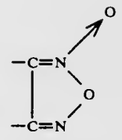
4,788,229

PROCESS, MODIFIED RUBBERS AND RUBBER COMPOSITIONS

Georg G. A. Bohm, Akron, and Daniel F. Graves, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

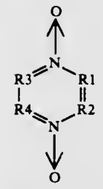
Filed Dec. 7, 1987, Ser. No. 129,562
Int. Cl.[4] C08K *3/04, 9/04*
U.S. Cl. 523—215 **49 Claims**

1. A process of preparing chemically modified uncured rubber compositions comprising mixtures of at least one elastomer and at least one reinforcing filler which comprises the steps of
(A) preparing a first mixture comprising an elastomer, at least one reinforcing filler and at least one chemical agent capable of promoting the formation of filler-elastomer linkages;
(B) preparing a second mixture comprising an elastomer, at least one reinforcing filler and at least one chemical agent capable of promoting the formation of filler-elastomer linkages, wherein at least one of the elastomer, filler or chemical agent in the second mixture is different from the elastomer, filler or chemical agent in the first mixture; and
(C) blending the first and second mixtures to form a third mixture wherein the chemical agents in the mixtures of (A) and (B) are selected from the group consisting of
(A) aromatic furazan oxides of the partial formula



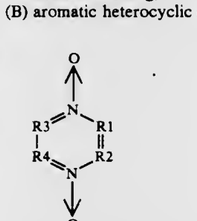
(I)

wherein the depicted carbon atoms are a part of a single fused armatic ring,
(B) aromatic heterocyclic di-N-oxides of the formula



(II)

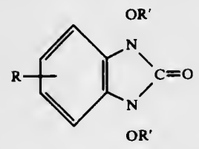
wherein R1, R2, R3 and R4 may be hydrogen, hydrocarbyl, hydrocarbyloxy, halogen, halohydrocarbyl, hydrocarbyl sulfonyl, hydrocarbyl thio, hydrocarbyl sulfoxide, amino, cyano,
—OH
—CHO
—CH(O hydocarbyl)2
—C(O)R[5]
—C(O)OR[5]
—C(O)NR[5]R[8]
—CH=N—NH—C(O)OR[5]
—$CH_2OC(O)CH_3$
—R[6]YR[5]
—C(O)NHR[6]OH
—C(NH)NRR[6]OH
—C(NH)NR[9]R[10], or
—C(O)NHN(R[5])$_2$
wherein each R[5] is independently hydrogen or a hydrogcarbyl group, R[6] is a divalent hydrocarbyl group, R[8] is hydrogen, hydrocarbyl, —R[6]OR[5], or —R[6]COOR[5]; R[9] is hydrogen or hydrocarbyl group; R[10] is hydrogen or a hydrocarbyl, an amino, or a hydroxyl group; R[9] and R[10] may be hydrocarbyl groups joined together to form a ring including the nitrogen atom, and Y is O, divalent S, —NH—, —S(O)— or —S(O)— or —S(O)$_2$ or R[5] and R[6] may be joined together to form a ring including the nitrogen atom, and Y is O or divalent S, or R[1] and R[2] and/or R[3] and R[4] may be joined together to form further ring systems which may be saturated or unsaturated, and further substituted or unsubstituted,
(C) 1-hydroxy-benzimidazole 3-oxide compounds of the formula



(III)

wherein R is hydrogen, or a halogen, hydroxyl, lower acyl, lower hydrocarbyl, lower hydrocarbyloxy, lower hydrocarbylthio, carboxyl, cyano, amino, amide or —C(O)— lower hydrocarbyl group, and R′ is hydrogen, or a lower hydrocarbyl, lower hydrocarbyl amide, carboxamide carboxy acid, carboxy ester or aryl group,

(D) 1,3-hihydroxy-benzimidazolinone compound of the formula



(IV)

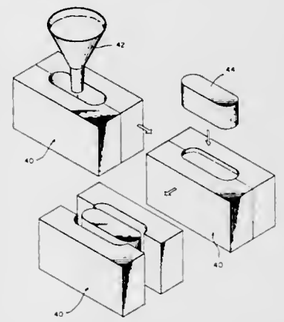
wherein R is hydrogen, or a halogen, hydroxyl, lower hydrocarbyl, lower hydrocarbyloxy, lower hydrocarbylthio, lower hydrocarbyl nitrile, carboxyl, cyano, nitro, amino, amide or —C(O)—R″ where R″ is an aryl or a lower hydrocarbyl group; each R′ independently is H, lower alkyl, acyl, CONR″2 or CONHR″ where R″ is alkyl or aryl, or
(E) aromatic nitroso compounds selected from the group consisting of nitroso-substituted aromatic amines and phenols.

4,788,230

PROCESS FOR MAKING A LOW DENSITY SYNTACTIC FOAM PRODUCT AND THE RESULTANT PRODUCT

Robert S. Madge, Altamonte Springs, Fla., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 781,866
Int. Cl.[4] C08J *9/32*
U.S. Cl. 523—219 **17 Claims**



1. A process for mixing a magma for producing a low density syntactic foam, comprising:
mixing microspheres in a rotating tumbler mixer until a uniform mixture is achieved;
spraying a resin/solvent solution into said mixture while tumbling said mixture by rotating said mixer and while agitating said mixture with a rotating paddle agitator until said mixture is uniformly coated with a thin coating of resin, said resin/solvent solution having less than a 1.0 ml per 4 grams of resin.

4,788,231

PROCESS FOR PRODUCING POURABLE POWDERED RUBBER CONTAINING FILLER

Hans-Jürgen Smigerski, Marl, and Uwe Ernst, Borken, both of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 5, 1988, Ser. No. 177,946
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723213
Int. Cl.[4] C08L *21/00;* **C08K** *3/00;* **C08J** *3/16, 3/20*
U.S. Cl. 523—334 **13 Claims**

1. A process for preparing a pourable powdered rubber containing filler, comprising:
preparing a blend by mixing a portion of said filler to be incorporated in said rubber product with 0.1 to 6.5 phr of a water-soluble salt of a Group IIa, IIb, IIIa or VIII metal of the Periodic Table and a rubber latex or aqueous emulsion of a rubber solution;
adjusting the pH of the blend to a pH ranging from 3.2 to 8.6 by addition of an acid;
adding the remaining amount of filler to the pH adjusted blend;
separating the rubber containing filler from the aqueous phase of the blend; and
drying the powdered rubber product obtained.

4,788,232

PIGMENT CONCENTRATES FOR RESINS

Donald G. Needham, Ramona, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 829,053, Feb. 13, 1986, Pat. No. 4,720,514, which is a division of Ser. No. 710,887, Mar. 11, 1985, Pat. No. 4,600,736. This application Oct. 23, 1987, Ser. No. 111,539
Int. Cl.[4] C08K *5/01, 5/09*
U.S. Cl. 523—351 **16 Claims**

1. A resinous pigment concentrate comprising a major portion of a resinous polymer containing at least one polymerized conjugated diene monomer in proportions in the range of from about 5 to about 40 weight percent, based upon the total resinous polymer; a minor portion of at least one pigment, and a dispersing additive consisting essentially of a naphthenic extender oil.

4,788,233

EPOXY RESIN COMPOSITION

Toshimori Sakakibara, Shiga; Takahiro Nakano, Ashiya, and Tatsuya Okuno, Otsu, all of Japan, assignors to Sunstar Giken Kabushiki Kaisha, Takatsuki, Japan

Filed Nov. 18, 1987, Ser. No. 122,220
Claims priority, application Japan, Nov. 27, 1986, 61-283818
Int. Cl.[4] C08L *63/10;* **C08K** *5/51, 5/41, 5/10*
U.S. Cl. 523—400 **6 Claims**

1. An epoxy resin composition which comprises a reaction product of 100 parts by weight of an epoxy resin and 2 to 100 parts by weight of a synthetic rubber reactive with the epoxy resin and incorporated in the reaction product 1 to 20 parts by weight of a nonionic or anionic surfactant.

4,788,234

CATALYZED CATIONIC PAINT BINDERS

Rudolf Schipfer; Wolfgang Daimer, and Gerhard Schmölzer, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Oct. 19, 1987, Ser. No. 109,521
Int. Cl.[4] C08L *63/00*
U.S. Cl. 523—402 **16 Claims**

1. Process for catalyzing cationic paint binders crosslinkable through at least one of transesterification, transamidation, transurethanization, or reaction of chain end double bonds comprising adding to said binder, as a catalyst, the reaction product of lead(II) oxide with β-hydroxyamino structure carrying compounds..

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4,788,235

PHOSPHITE MODIFIED EPOXY RESIN

Michael A. Johnson, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 23, 1987, Ser. No. 123,794
Int. Cl.[4] C08K 5/52; C08L 63/00
U.S. Cl. 523—451 13 Claims

1. Composition comprising an epoxy resin, a phosphite ester, an adduct of a tetra-substituted titanate and a di-substituted hydrogen phosphite, and a curing agent for said epoxy resin, provided that said phosphite ester is present in an amount sufficient, if it were present by itself, to bring about reduction of viscosity of the epoxy resin, further provided that said adduct is present in an amount sufficient, if it were present by itself, to bring about reduction of viscosity of the epoxy resin.

4,788,236

PROCESS FOR PRODUCING PARTICULATE NOVOLAC RESINS AND AQUEOUS DISPERSIONS

Peter W. Kopf, Hillsborough Township, Somerset County, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 335,448, Dec. 29, 1981, abandoned. This application Oct. 4, 1984, Ser. No. 657,474
Int. Cl.[4] C08L 61/00
U.S. Cl. 524—55 4 Claims

1. A process for producing particulate novolac resin comprising steps of: (a) condensing phenol with an aldehyde in the presence of a catalyst under acidic conditions to produce a novolac resin; (b) adding water before, during or after the condensation reaction step (a) to provide a novolac resin/water mixture; (c) neutralizing the acid catalyzed novolac resin using a base; (d) forming a particulate novolac resin dispersion by adding an effective amount of protective colloid to the aqueous mixture wherein the protective colloid is a polysaccharide selected from the group consisting of gum arabic, gum ghatti, gum tragacanth, and guar gum or it hydroxypropylate derivative; and (e) isolating the particulate novolac resin from the aqueous dispersion; said process including dephenolating the particulate novolac resin by separating out a sufficient amount of unreacted phenol prior to isolation of the resin so that less than about 6 percent of unreacted phenol remains in the dispersion.

4,788,237

SUGAR-CONTAINING WATER-ABSORBING COMPOSITION WHICH FACILITATES FIBER FORMATION

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Company, Newtown Square, Pa.

Filed Dec. 15, 1986, Ser. No. 941,872
Int. Cl.[4] C08B 37/00; C08K 05/15
U.S. Cl. 524—55 37 Claims

1. A composition which is water-absorbent upon curing comprising:

(a) a copolymer containing from about 25 to about 75 mole percent recurring units of at least one α, β-unsaturated monomer bearing at least one pendant unit selected from the group consisting of carboxylic acid units and derivatives of carboxylic acid units and from about 75 to about 25 mole percent recurring units of at least one copolymerizable comonomer, wherein from about 20 to about 80 percent of the total pendant units introduced through the recurring units of the α, β-unsaturated monomer must either be carboxylic acid units or must be converted into carboxylic acid units, and wherein from about 80 to about 20 percent of the total pendant units must either be carboxylate salt units or must be converted into carboxylate salt units; and

(b) at least one carbohydrate compound selected from the group consisting of disaccharides and oligosaccharides.

4,788,238

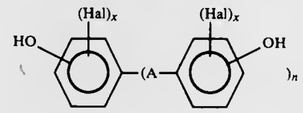
THERMOPLASTIC MOULDING COMPOSITIONS HAVING FLAME-RETARDANT PROPERTIES

Gert Tödtemann; Klaus Reinking, both of Wermelskirchen; Otto Koch, Cologne; Kress Hans-Jürgen, Krefeld; Lindner Christian, Cologne; Friedemann Müller, Neuss; Horst Peters, Leverkusen, and Josef Buekers, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 797,408, Nov. 12, 1985, abandoned. This application Sep. 21, 1987, Ser. No. 99,100
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444868
Int. Cl.[4] C08K 5/51, 5/52, 5/53
U.S. Cl. 524—130 8 Claims

1. Thermoplastic moulding compositions consisting essentially of:

(A) 50–90 parts by weight of a halogen-containing copolycarbonate from a dihydric phenol and a dehydric halogenated phenol of the formula (II)



(II)

wherein

A is a single bond, a C_1–C_5-alkylene, a C_2–C_5-alkylidene, a C_5–C_6-cycloalkylidene, —S— or SO_2—,

Hal is chlorine or bromine,

x is 0, 1 or 2 and

n is 1 or zero,

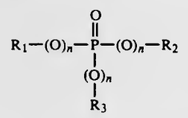
said copolycarbonate containing 3–20% by weight of halogen in the form of cocondensed, halogenated diphenols,

(b) 10–50 parts by weight of copolymer of random structure from

(b)(i) 95–70% by weight of styrene, alpha-methylstyrene, ring-alkylated styrene or mixtures of said vinyl aromatics and

(b)(ii) 5–30% by weight of maleic anhydride,

(c) 1–20 parts by weight, relative to 100 parts total weight of (a)+(b), of a dimethyl methanephosphonate, diphenyl methanephosphonate, diethyl phenyl phosphonate, or a phosphorus compound of the formula (I)



wherein

R_1, R_2, and R_3, independently of one another, are optionally halogenated C_1–C_8-alkyl an optionally halogenated C_6–C_{20}-aryl, and n stands for 0 or 1, and

(d) 0.05–5 parts by weight, again relative to 100 parts total weight of (a)+(b), of a tetrafluoroethylene polymer having a particle size of 100 to 1,000 μm.

4,788,239

WATER-BASED NEOPRENE CONTACT CEMENT COMPRISING IONIZABLE RESIN MIXTURE IN A COPOLYMER OF CHLOROPRENE AND METHACRYLIC ACID

Wei T. Chang, Dayton, Ohio, assignor to Beecham Home Improvement Products Inc., Dayton, Ohio

Filed Aug. 8, 1986, Ser. No. 894,930
Int. Cl.[4] C08J 23/00, 29/04, 93/00
U.S. Cl. 524—271 12 Claims

1. An aqueous contact cement, which comprises a dispersion

in water of a chloroprene copolymer of 2-chloro-1,3-butadiene and methacrylic acid and a resinous polyelectrolyte of an ionizable resinous mixture which is ionized with a volatile ionizing agent, said ionizable resinous mixture being the reaction product of a rosin, a carboxylic acid, and a C_1–C_{18} monoalcohol, said ionizable resinous mixture having a softening point not substantially above about 125° C. and an acid number of between about 30 and 150, said reaction product comprising the carbocyclic nucleus of rosin having at least one carboxylic acid group and at least one carboxylic acid ester group of said mono-alcohol.

4,788,240

CURABLE POLYORGANOSILOXANE COMPOSITIONS

Tetsno Fujimoto, Ohta, Japan, assignor to Toshiba Silicone Co., Ltd., Japan

Filed May 28, 1986, Ser. No. 868,216
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.[4] C08L 83/04
U.S. Cl. 524—290 4 Claims

1. Polyorganosiloxane compositions comprising:

(A) a polyorganosiloxane (A) having two or more of the following units, in each molecule, represented by the formula:

$$(R^1)_a(R^2)_bSiO_{\frac{4-(a+b)}{2}}$$

wherein, R^1 represents an alkenyl radical; R^2 represents a substituted or unsubstituted monovalent hydrocarbon radical having no unsaturated aliphatic bond; a is an integer of 1 or 2; b is an integer of 0 to 2; and a+b is an integer of 1 to 3;

(B) a polyorganohydrogensiloxane (B), having units represented by the formula:

$$(R^3)_cH_dSiO_{\frac{4-(c+d)}{2}}$$

wherein, R^3 represents a substituted or unsubstituted monovalent hydrocarbon radical; c is an integer of 0 to 2; d is an integer of 1 or 2; and c+d is an integer of 1 to 3, and having at least three hydrogen atoms bonded to silicon atoms in each molecule, in an amount such that the number of the hydrogen atoms bonded to silicon atoms may be 0.5 to 4.0 per R^1 radical contained in polyorganosiloxane (A);

(C) a catalyst selected from the group consisting of platinum and platinum compounds, in an amount of 1 to 100 ppm in terms of platinum atom relative to polyorganosiloxane (A); and

(D) from 1 to 2,000 ppm of a dye selected from the group consisting of anthraquinone dye and azo dye, relative to polyorganosiloxane (A).

4,788,241

TIRE HAVING TREAD COMPOSITION COMPRISING AN IMPROVED PROCESSING AID

Robert J. Cornell, Naugatuck, and Sung W. Hong, Cheshire, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Oct. 22, 1987, Ser. No. 112,178
Int. Cl.[4] C08L 7/00, 9/00, 9/02, 9/06
U.S. Cl. 524—311 11 Claims

1. A tire having a tread composition formed by curing a blend comprised of:

A. a rubber selected from the group consisting of natural rubber, cis-polyisoprene, polybutadiene, solution poly(styrene-butadiene), emulsion poly(styrene-butadiene), ethylene/propylene/nonconjugated diene terpolymer and poly(acrylonitrile-butadiene);

B. between about 0.2 and about 5 phr of a curative selected from the group consisting of sulfur, sulfur donor compounds, hydroperoxides and peroxides;

C. between about 30 and about 100 phr of carbon black; and

D. between about 0.5 and about 10 phr of a processing aid comprised of:

(1) C_{12}–C_{50} parraffin wax: and

(11) pentaerythritol tetrastearate wherein the weight ratio of pentaerythritol tetrastearate to C_{12}–C_{50} paraffin wax is between abaout 12:1 and about 2:1.

4,788,242

POLYVINYL ALCOHOL-BASED REVERSIBLY HYDRATED GEL, HIGHLY WATER-ABSORPTIVE RESIN AND METHOD FOR THE PREPARATION THEREOF

Akira Takahashi, Aichi, and Tadaya Kato, Mie, both of Japan, assignors to Shin-Estu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 105,554
Claims priority, application Japan, Oct. 6, 1986, 61-237525
Int. Cl.[4] C08F 2/16
U.S. Cl. 524—459 5 Claims



1. A reversibly hydrated, polyvinyl alcohol-based gel which comprises:

(a) a polyvinyl alcohol having a gelled structure;

(b) water as a hydrating agent of the gelled polyvinyl alcohol; and

(c) a polymer of an ethylenically unsaturated, water-soluble ionic monomer impregnating the hydrated gel of the polyvinyl alcohol, the polymer being formed by the in situ polymerization of the ethylenically unsaturated, water-soluble ionic monomer impregnating the hydrated gel of the polyvinyl alcohol.

4,788,243

CREPING ADHESIVES CONTAINING POLYVINYL ALCOHOL AND THERMOPLASTIC POLYAMIDE RESINS DERIVED FROM POLY(OXYETHYLENE) DIAMINE

Dave A. Soerens, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 917,640, Oct. 8, 1986, Pat. No. 4,684,439. This application Apr. 8, 1987, Ser. No. 35,700
Int. Cl.[4] C08L 29/04
U.S. Cl. 524—503 7 Claims

1. A creping adhesive comprising an aqueous admixture of polyvinyl alcohol and a water-soluble, thermoplastic polyamide resin which is phase-compatible with the polyvinyl alcohol, said polyamide resin comprising the reaction product of a polyalkylene polyamine, a saturated aliphatic dibasic carboxylic acid, and a poly(oxyethylene) diamine.

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4,788,244

FLAME-RESISTANT POLYAMIDE RESIN COMPOSITION

Junnichi Nakahashi; Takuo Shigetomi, and Shinichi Kai, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1988, Ser. No. 149,141

Claims priority, application Japan, Jan. 27, 1987, 62-15182; Oct. 21, 1987, 62-264005

Int. Cl.[4] C08K *5/03*

U.S. Cl. 524—469 18 Claims

1. A flame-resistant polyamide resin composition comprising a blend of

(I) a polyamide,

(II) a brominated polystyrene, and

(III) a copolymer comprising an aromatic vinyl compound and an α,β-unsaturated dicarboxylic acid anhydride; wherein the α,β-unsaturated dicarboxylic acid anhydride component of the copolymer is present in an amount of 0.06–0.75 wt% based on the total weight of (I), (II), and (III).

4,788,245

SELF-AMALGAMATING MATERIAL

James Anderson, Massillon, Ohio, assignor to Radiation Dynamics, Inc., Melville, N.Y.

Continuation of Ser. No. 842,248, Mar. 21, 1986, abandoned. This application Oct. 22, 1987, Ser. No. 112,041

Int. Cl.[4] C08K *3/04*

U.S. Cl. 524—518 12 Claims

1. A conduit wrapping, comprising:

a uniformly blended strip of self-amalgamating material composed of 3–14 parts polyolefin, 10–20 parts solid polyisobutylene tackifier, carbon black and a rubber blend composed of conjugated diene butyl rubber and halo C_4–C_5 olefin rubber.

4,788,246

CATIONIC MICRO GEL PARTICLE DISPERSION AND A COATING COMPOSITION THEREFROM

Yasuyuki Tsuchiya, Hirakata, and Kenshiro Tobinaga, Kawanishi, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Nov. 30, 1987, Ser. No. 126,963

Claims priority, application Japan, Nov. 28, 1986, 61-285770; Nov. 28, 1986, 61-285771; Jan. 7, 1987, 62-1334; Sep. 4, 1987, 62-222687; Sep. 4, 1987, 62-222688

Int. Cl.[4] C25D *13/06;* C08L *63/00;* C08K *3/00*

U.S. Cl. 524—554 11 Claims

1. A process for preparing a cationic micro gel particle dispersion comprising:

emulsifying in an aqueous medium a resin composition comprising

(A) 100 parts by weight of a cationic film-forming aqueous polybutadiene resin having amino groups, and

(B) 10 to 250 parts by weight of a thermosetting crosslinking agent which is self-crosslinked or crosslinked with said aqueous resin (A) in terms of condensation or addition reaction;

parts by weight being based on the solid content of the resin composition, and

heating the resultant emulsion to above a crosslinkable temperature of said crosslinking agent (B).

4,788,247

TERPOLYMERS OF ACRYLAMIDE, ALKYL POLYETHEROXYACRYLATE AND BETAINE MONOMERS

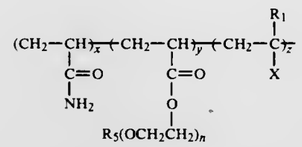
Donald N. Schulz, Annandale; Ilan Duvdevani, Leonia; Jan Bock, Bridgewater, and Jeff J. Kaladas, S. Bound Brook, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 907,479, Sep. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 815,218, Dec. 31, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 121,399

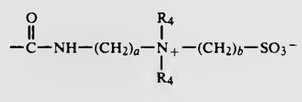
Int. Cl.[4] C08F *28/02, 20/38, 20/60*

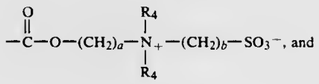
U.S. Cl. 524—547 2 Claims

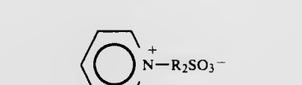
2. A method for increasing the viscosity of an aqueous solution which comprises the step of dissolving in said aqueous solution a water or brine soluble terpolymer having the structure:



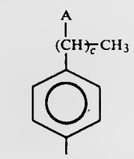
wherein x is selected from the group consisting of







wherein x is about 70 to about 95 mole percent; y is about 0.1 to about 5.0 mole percent; z is about 1 to about 30 mole percent; R_1 is methyl or hydrogen; R_3 is an alkyl group of 3 to 4 carbon atoms; R_4 is an alkyl group of 1 to 5 carbon atoms; R_5 is selected from the group consisting of an alkyl group having 1 to 30 carbons, a hydrocarbon aryl group having 6 to 20 carbons and an alkylaryl group having the structure of



wherein A is selected from the group consisting of hydrogen, methyl groups, ethyl groups and propyl groups and mixtures thereof and c is about 6 to about 20; and n is about 1 to about 60; wherein the aqueous solution is selected from the group consisting of water or salt solution, wherein the salt concentration is about 0.01 to about 20 weight percent.

4,788,248

THERMOPLASTIC RESINS AND POLYAMIDES COMPATIBILIZED WITH POLYAMIDE-POLYARYLATE BLOCK COPOLYMERS

Louis M. Maresca, and Sheldon J. Shafer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 4, 1987, Ser. No. 117,746

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—66 21 Claims

1. A compatibilized thermoplastic resin composition comprising:

(i) at least one resin selected from the group consisting of aromatic polycarbonate, poly(ester carbonate) or polyarylate;

(ii) a polyamide resin; and

(iii) an effective compatibilizing amount of a polyamide-polyarylate block copolymer.

4,788,249

THERMOPLASTIC RESINS AND POLYAMIDES COMPATIBILIZED WITH POLYAMIDE-POLYESTER BLOCK COPOLYMERS

Louis M. Maresca, and Sheldon J. Shafer, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 4, 1987, Ser. No. 117,244

Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—66 22 Claims

1. A compatibilized thermoplastic resin composition comprising:

(i) a high molecular weight thermoplastic resin selected from a thermoplastic polyester, an aromatic polycarbonate, a poly(ester carbonate) or a mixture of any of the foregoing.

(ii) an amorphous polyamide resin; and

(iii) an effective, compatibilizing amount of a polyamide-polyester block copolymer.

4,788,250

THERMOPLASTIC RESIN COMPOSITION OF ETHYLENE-PROPYLENE-NON-CONJUGATED DIENE TERPOLYMER RUBBER HAVING IMPROVED COMBINED PROPERTIES OF WEATHER RESISTANCE AND MOLDING APPEARANCE

Haruyoshi Kitahara; Yasuaki Ii, and Yutaka Toyooka, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,540

Claims priority, application Japan, Oct. 9, 1986, 61-239201

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 3 Claims

1. A thermoplastic resin composition comprising 5 to 80 parts by weight of a graft polymer resin (1) obtained by polymerizing 10 to 60% by weight of at least one monomer (b) selected from the group consisting of aromatic vinyl compounds and ethylenically unsaturated compounds of the general formula

$$CH_2=CRX$$

where R is —H or $-CH_3$, X is —CN or $-COOR^1$, and R^1 is an alkyl group having 1 to 3 carbon atoms, in the presence of 90 to 40% by weight (on a solid basis) of latex of an ethylene-propylene-non-conjugated diene terpolymer rubber (a) having a gel content of 50 to 95% and a particle diameter of 0.05 to 2 um, the combined amount of (a) and (b) being 100% by weight; and 20 to 95 parts by weight of a rigid thermoplastic resin (2), provided that the combined amount of (1) and (2) is 100 parts by weight;

said graft polymer resin (1) having a degree of grafting of 10 to 100%, and the free polymer resin obtained by extracting said graft polymer resin (1) with acetone has a reduced viscosity (η_{sp}/c) of 0.3 to 1.

4,788,251

POLYESTER-POLYCARBONATE COMPOSITIONS WITH FAVORABLE MELT VISCOSITY PROPERTIES

Sterling B. Brown, Schenectady, N.Y., and James L. DeRudder, Mt. Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 11, 1987, Ser. No. 84,069

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 20 Claims

1. A composition comprising the following and any reaction products thereof:

(A) at least one linear polyester or copolyestercarbonate containing a measurable proportion of epoxide-reactive functional groups;

(B) at least one polycarbonate or copolyestercarbonate which is substantially inert to epoxy groups; and

(C) at least one poly(O- or N-epoxyalkyl-substituted) cyclic amide, imide or imidate;

the proportion of component B being at least about 35% by weight of components A and B, and the proportion of component C employed being about 0.05–3.0 parts by weight per 100 parts of component A.

4,788,252

MIXTURES BASED ON POLYCARBONATES HAVING IMPROVED PHYSICAL AND CHEMICAL PROPERTIES

Jan de Boer, Bergen op Zoom, Netherlands, and Jean M. H. Heuschen, Evansville, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 22, 1987, Ser. No. 76,460

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 4 Claims

1. A polymer mixture comprising aromatic polycarbonate resin having two polymeric additives one of Which is formed by 0.5–10% by weight, related to the said three components, of one or more graft copolymers having an elastomeric core which is built up for more than 50% by weight from a polymerised diene, optionally at least one intermediate phase of vinyl monomer polymerised thereon by grafting and a shell built up from a product of one or more monomers polymerised on the preceding phase by grafting and selected from the group consisting of: C_1–C_6 alkylacrylates, C_1–C_6 alkylmethacrylates, acrylic acid, methacrylic acid and mixtures of two or more of these monomers, with a crosslinking agent, and the other one is a block copolymer, characterised in that, related to the three components, the quantity of aromatic polycarbonate resin is 80–99% by weight and that the third component is formed by 0.5–10% by weight, related to the three components, of a block copolymer of polycarbonate and polysiloxane.

4,788,253

THERMOPLASTIC MOLDING MATERIAL

Juergen Hambrecht, Heidelberg; Burghard Schmitt, Worms; Johann Swoboda; Georg Wassmuth, both of Ludwigshafen; Claus Bernhard, Eisenberg, and Rudolf Stephan, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 580,220, Feb. 15, 1984, Pat. No. 4,634,734, which is a continuation-in-part of Ser. No. 446,437, Dec. 3, 1982, abandoned. This application Apr. 17, 1987, Ser. No. 627

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149358

Int. Cl.[4] C08L *33/08, 51/00*

U.S. Cl. 525—83 3 Claims

1. A thermoplastic molding material consisting of

(A) 1 to 25 percent by weight based on the weight of A+B+C of at least one elastomeric polymer which has a glass temperature, Tg, of less than 0° C. and consists of:

(1) 50 to 99.9 percent by weight of at least one alkyl acrylate having 1 to 8 carbon atoms in the alkyl radical

(2) 0.1 to 5 percent by weight of a polyfunctional monomer having a crosslinking effect and

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(B) 5 to 40 percent by weight based on the weight of A+B+C of a shell grafted to the elastomeric polymer A, the graft polymer having an average particle size of 200 to 750 nm (d_{50}—value of the integral mass distribution) wherein the polymerization of the grafted shell consisting of (B) takes place in two stages with 30 to 70 percent by weight of a monomer (B1) selected from the group consisting of styrene, α-methylstyrene para-methylstyrene and tertiary butylstyrene in the first stage and 30 to 70 percent by weight of a mixture of the monomer (B1) and a monomer (B2) selected from the group consisting of ethylacrylate and methylacrylate in a weight ratio of 90:10 to 60:40 in the second stage and

(C) 35 to 94 percent by weight based on the weight of A+B+C of a copolymer consisting of a styreneacrylonitrile copolymer.

4,788,254

CURABLE POLYMER COMPOSITION

Fumio Kawakubo; Sadao Yukimoto; Miyako Takanoo; Katsuhiko Isayama, and Takahisa Iwahara, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry, Co., Ltd., Osaka, Japan

Continuation of Ser. No. 758,216, Jul. 23, 1985, abandoned. This application Jul. 13, 1987, Ser. No. 75,229

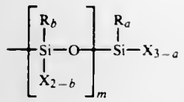
Claims priority, application Japan, Jul. 26, 1984, 59-156674

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—100 **6 Claims**

1. A moisture curable polymer composition comprising

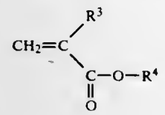
(A) an organic polymer having (i) at least one reactive silicon-containing group in a molecule which group is capable of effecting a condensation reaction in the presence of moisture or a cross linking agent and represented by the formula:



wherein R is a C_1-C_{20} alkyl or cycloalkyl group, a C_6-C_{20} aryl group, a C_7-C_{20} aralkyl group or a triorganosiloxy group of the formula:

$(R')_3SiO-$

wherein R' is, the same or different, a C_1-C_{20} monovalent hydrocarbon group, X is a hydroxyl group or, the same or different, a hydrolyzable group, a is 0, 2, or 3, b is 0, 1 or 2, and m is an integer of 0 to 18, and (ii) said organic polymer having a backbone selected from the group consisting of a backbone comprising units derived from an acrylate or methacrylate monomer of the formula:



wherein R^3 is a hydrogen atom or a methyl group and R^4 is a C_1-C_{20} C_{20} alkyl group and a backbone comprising units of the formula:

$-R^{11}-O-$

wherein R^{11} is a C_1-C_8 organic divalent group, and

(B) a compound selected from the group consisting of a compound having one silanol group in a molecule and a compound which reacts with water to form a compound having one silanol group in a molecule.

4,788,255

POWDER COATING COMPOSITIONS

Paul H. Pettit, Jr., Allison Park, and Marvin L. Kaufman, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 912,463, Sep. 29, 1986, Pat. No. 4,727,111. This application Oct. 9, 1987, Ser. No. 106,463

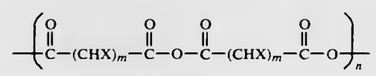
Int. Cl.⁴ C08L *75/04, 67/02*

U.S. Cl. 525—131 **11 Claims**

1. A thermosetting powder coating composition comprising a co-reactable particulate mixture of:

(A) 35–85 percent by weight based on weight of resin solids of an acid group-containing acrylic polymer having a Tg in the range of 35°–100° C.;

(B) from 1–25 percent by weight based on weight of resin solids of a second carboxy group-containing material selected from the class consisting of aliphatic dicarboxylic acid containing from 4 to 20 carbon atoms per molecule and a polymeric polyanhydride including mixtures thereof wherein the polymeric polyanhydride is of the structure:



where X equals hydrogen, methyl or ethyl and m equals 4 to 10 and n is a number such that the polymeric polyanhydride has a number average molecular weight of 400 to 2500;

(C) a beta-hydroxyalkylamide curing agent; and

(D) from 5–40 percent by weight based on weight of resin solids of an acid group-containing polymer selected from the class consisting of carboxylic acid group-containing polyesters, carboxylic acid group-containing polyurethanes and mixtures thereof;

the equivalent ratio of beta-hydroxyalkylamide to carboxy functionality being within the range of 0.6 to 1.6:1.

4,788,256

INSTANTANEOUSLY CURABLE COMPOSITION

Kei Aoki, Ikoma; Noriyuki Tsuboniwa, Higashiosaka; Satoshi Urano, and Ryuzo Mizuguchi, both of Yawata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

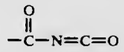
Filed May 27, 1986, Ser. No. 867,022

Claims priority, application Japan, May 28, 1985, 60-117301; May 28, 1985, 60-117302; May 28, 1985, 60-117306; May 28, 1985, 60-117309; May 28, 1985, 60-117311; May 28, 1985, 60-117312

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—326.8 **37 Claims**

1. A curable composition comprising (A) an isocyanatocarbonyl group-containing polymer having a carbon-carbon backbone and isocyanatocarbonyl groups pendent therefrom of the formula



and a molecular weight between 1,000 and 100,000 and (B) an active hydrogen atom-containing compound.

4,788,257

PROCESS FOR PREPARING REGULATED MOLECULAR WEIGHT PERFLUORO-POLYETHERS HAVING NEUTRAL AND FUNCTIONAL END GROUPS

Gerardo Caporiccio, Milan; Gian T. Viola, Cervia; Giuseppe Marchionni, Milan; Pio De Iorio, Milan, and Adriana Tasca, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 13, 1986, Ser. No. 929,832

Claims priority, application Italy, Nov. 19, 1985, 22902 A/85; Nov. 20, 1985, 22922 A/85

Int. Cl.⁴ C07C *51/58, 49/04;* **C08G** *65/32*

U.S. Cl. 525—403 **6 Claims**

1. A process for the dissociation of perfluoropolyethers obtained from photo-oxidation processes of perfluoroolefins or by anionic polymerization of their epoxides which comprises heating the perfluoropolyether to a temperature from 150° to 380° C. in the presence of 0.1–10% by weight of catalysts comprising:

oxides of the following metals:

Ti, Cr, Mn, Fe, Co, Ni, V, Cu, Mo, Sn, Sb, Zr, Zn;

or fluorides and oxyfluorides of:

Co, Mn, Fe, Cu, Mo, Sn, Sb, Zr, Zn.

4,788,258

LOW TG NON-CRYSTALLINE ACETAL COPOLYMERS

George L. Collins, Maplewood; Paul Zema, Roselle Park, and William M. Pleban, Stanhope, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Sep. 14, 1987, Ser. No. 96,187

Int. Cl.⁴ C08G *63/76;* **C08L** *59/04*

U.S. Cl. 525—414 **21 Claims**

1. A low Tg non-crystalline copolymer of trioxane and 1,3-dioxolane having a 1,3-dioxolane content greater than 65 mol percent and less than about 75 mol percent, said percentages being based on the total mols of trioxane and 1,3-dioxolane present in said copolymer, and an intrinsic viscosity of from about 1.0 to about 2.3.

4,788,259

FLAME-PROOF POLYAMIDES

Werner Nielinger; Hermann Kauth, both of Krefeld, and Heinz-Josef Füllman, Leichlinger, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 37,033

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613490; Apr. 22, 1986, 3613491

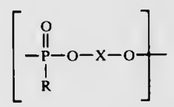
Int. Cl.⁴ C08L *77/00*

U.S. Cl. 525—420 **6 Claims**

1. Flame-proof polyamide materials which can be processed by a thermoplastic method and comprise blends of

1. 60–97% by weight of amorphous, partly aromatic polyamide and

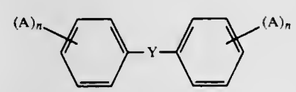
2. 3–40% by weight of polyphosphonate, the sum of the two components 1 and 2 always being 100% by weight, and wherein the polyphosphonates contain recurring units having the structure



wherein

R represents an alkyl having 1–6 carbon atoms, cycloalkyl having 5–30 carbon atoms, an alkyl having 7–30 carbon atoms, or an aryl having 6–30 carbon atoms,

X denotes at least one of phenylene or a radical of the formula



wherein n is an integer from 0 to 4,

Y is a single bond or a C_1-C_5-alkylene, a C_5-C_{12}-cycloalkylene or an S, O, SO_2, CO or $C(CH_3)_2$ bridge member, and the aromatic rings are unsubstituted or substituted with C_1-C_4-alkyl groups (A) having up to 4 alkyl groups in each ring.

4,788,260

WATER-DISPERSIBLE BINDERS FOR CATIONIC ELECTROPAINTS, AND A PROCESS FOR THEIR PREPARATION

Wolfgang Batzill, Münster; Horst Diefenbach, Nottuln; Michael Geist, Münster, and Eberhard Schupp, Schwetzingen, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Muenster, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,738

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210307

Int. Cl.⁴ C08F *283/04;* **C08G** *59/14;* **C08L** *63/00*

U.S. Cl. 525—423 **29 Claims**

1. A water-dispersible binder for cationic electropaints based on reaction products which are formed from modified epoxy resins and primary amines, secondary amines, or mixtures thereof, comprising:

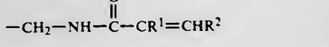
(I) a first reaction product having terminal epoxy groups containing 10–45% of aromatic groups, calculated as the phenylene groups from:

(A) low molecular weight epoxide resins containing aromatic groups and having an epoxide equivalent weight of below 375; and

(B) a first polyfunctional compound having a molecular weight below 350 selected from the group consisting of polyfunctional alcohols and carboxylic acids, said polyfunctional alcohols selected from the group consisting of aliphatic polyfunctional alcohols and alicyclic polyfunctional alcohols;

(II) a second reaction product and chain lengthened product of the terminal epoxy groups of (I) and:

(C) phenolic hydroxyl groups of a mononuclear or polynuclear phenol which has at least two of said phenolic hydroxyl groups and at least one α-β-olefinically unsaturated amidomethyl group of the following formula



as a substituent on the aromatic ring(s) and in which R^1 and R^2 are identical to or different from one another and represent hydrogen or a methyl group, and

(III) a third reaction product of II and:

(D) an amine compound selected from the group consisting of primary amines, secondary amines, and an ammonium salt.

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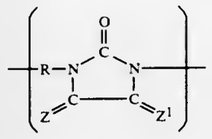
4,788,261

POLYARYLENE SULFIDE RESIN COMPOSITION

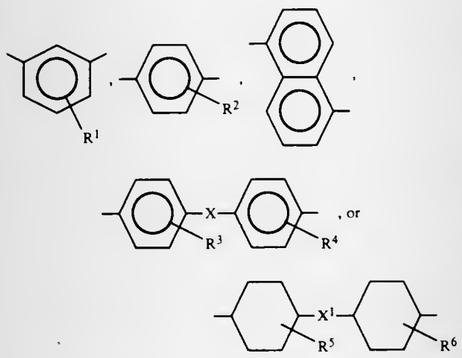
Yoshio Taguchi, Tokorozawa; Youichi Imai, Saitama; Tadashi Niwa, Saitama; Masayuki Kato, Saitama, and Chihiro Imai, Yokohama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 77,865
Claims priority, application Japan, Jul. 30, 1986, 61-177859
Int. Cl.[4] C08L *81/02*
U.S. Cl. 525—452 5 Claims

1. A polyarylene sulfide resin composition comprising a blend of (a) 40 to 99% by weight of a polyarylene sulfide resin and (b) 1 to 60% by weight of a polyparabanic acid having the following recurring unit:



wherein Z and Z^1 are oxygen atoms or NH group, Z and Z^1 being not simultaneously NH groups, and R is



wherein R^1, R^2, R^3, R^4, R^5 and R^6 are hydrogen atoms or methyl groups, and X and X^1 are bonds, CH_2 groups, oxygen atoms, sulfur atoms, SO_2 groups, CO groups or



4,788,262

POLYISOCYANATE BLENDS WITH IMPROVED COMPATIBILITY WITH COREACTANTS

Peter H. Markusch, McMurray; James W. Rosthauser, Imperial, and Michael C. Beatty, Pittsburgh, all of Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Dec. 8, 1986, Ser. No. 938,909
Int. Cl.[4] C08F *40/00*
U.S. Cl. 525—457 2 Claims

1. A polyisocyanate mixture which comprises, based on solids,

(a) about 15 to 85 wt. % of an isocyanurate group-containing polyisocyanate based on hexamethylene diisocyanate and

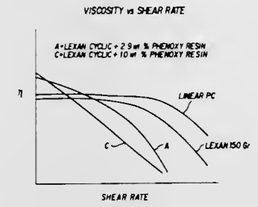
(b) about 15 to 85 wt. % of biuret group-containing polyisocyanate based on hexamethylene diisocyanate.

4,788,263

AROMATIC POLYCARBONATE RESIN BLENDS

Dwight J. Patterson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 16, 1987, Ser. No. 133,855
Int. Cl.[4] C08F *283/02*
U.S. Cl. 525—463 15 Claims



1. A method for preparing an aromatic polycarbonate resin blend having improved flow properties for blow molding, said method comprising:

blending (by weight) with each 100 parts of a cyclic polycarbonate oligomer or a polycarbonate molding resin about 0.5 to 25 parts of a thermoplastic hydroxyplated resin with an average molecular weight range of about 15,000 to 75,000 and an amount of anionic polymerization catalyst effective to cure said blend when heated to a temperature above 150° C.; and,

curing said blend at a temperature of 150° C. to about 300° C.

4,788,264

METHOD OF PREPARING MODIFIED POLYETHYLENES

Mamoru Ukita, Ichihara, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 147,277
Int. Cl.[4] C08F *255/02*
U.S. Cl. 525—285 16 Claims

1. A method of preparing a modified polyethylene which comprises melt kneading 100 parts by weight of (A) a high density polyethylene having a branching degree of not more than 5 per 1,000 carbon atoms of principal chain, from 0.2 to 3 parts by weight of (B) an unsaturated carboxylic acid or a derivative thereof, and from 0.01 to 0.5 part by weight of (C) an organic peroxide, the weight ratio of (C) to (B), (C)/(B), being from 0.01 to 0.5.

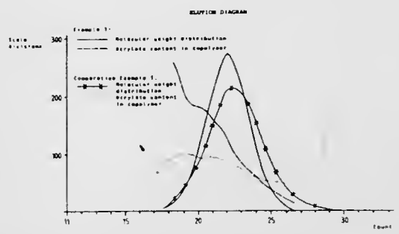
4,788,265

PREPARATION OF COPOLMERS OF ETHYLENE WITH ACRYLIC ACID ESTERS IN A TUBULAR REACTOR AT ABOVE 500 BAR

Klaus Pfleger; Klaus Boettcher, both of Wesseling; Oskar Buechner, Dudenhofen; Friedrich Kanne, Wesseling; Siegfried Kursawe, Wesseling, and Wieland Zacher, Wesseling, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 22, 1987, Ser. No. 41,232
Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615562
Int. Cl.[4] C08F *2/00, 2/38, 220/02, 220/10*
U.S. Cl. 526—64 5 Claims

1. A process for preparing a copolymer of ethylene with an acrylic acid ester by copolymerizing 100 parts by weight of ethylene with from 0.1 to 25.0 parts by weight of an acrylic acid ester or of a solution of free acrylic acid in an acrylic acid ester in a continuously operated tubular polymerization reactor at pressures of from 500 to 5,000 bar and at temperatures of from 50° to 450° C. in the presence of a polymerization initiator which decomposes into free radicals which process further comprises: feeding a mixture of ethylene, comonomer and initiator into the tubular polymerization reactor in the form of a main stream at the inlet point of the reactor; passing said mixture along said reactor where the ethylene and comonomer polymerize to form a copolymer; feeding into the reactor an additional amount of said mixtures in one or more secondary streams(I) at a point or points where a maximum temperature



is reached in the reactor due to the heat of polymerization, and feeding a further amount of said mixture into the reactor in one or more secondary streams(II) at a point or points which, relative to the direction of flow of the ehtylene, are positioned upstream of the feed points of secondary streams(I) and upstream of the points at which a maximum temperature is reached in the reactor.

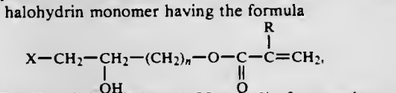
4,788,267

BASE-CATALYZED, LOW TEMPERATURE SELF-CROSSLINKING POLYMERS

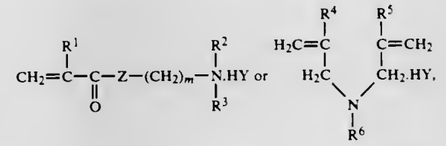
Wen B. Chiao; Carmine P. Iovine, both of Bridgewater, and Samuel Gold, Watchung, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation of Ser. No. 764,165, Aug. 9, 1985, abandoned. This application Feb. 10, 1987, Ser. No. 13,151
Int. Cl.[4] C08F *228/02, 226/04*
U.S. Cl. 526—287 13 Claims

1. A low temperature curable, base-catalyzed, self-crosslinking polymer, which consists essentially of (a) about 1-15 mole % of a halohydrin monomer having the formula



where R is H or CH_3; (b) about 1-25 mole % of a secondary or tertiary amine salt monomer having the formula



where R^1 is H or CH_3, R^2 is H when R^3 is a C_1-C_4 linear alkyl, or R^2 and R^3 are independently a lower alkyl R^3 is H when R^2 is a C_1-C_4 linear alkyl, R^4, R^5, and R^6 are independently H or a C_1-C_4 linear alkyl, n is 1, m is 2 or 3, X is chlorine, bromine, or iodine, Z is —NH— or —O—, and HY is an organic or inorganic acid; and (c) about 65-98 mole % of a vinyl polymerizable monomer other than (a) or (b), with the mole percentage totaling 100%, wherein the polymer crosslinks, in the presence of a base, at a lower temperature than a polymer without (b).

4,788,266

SOLUBLE AND CURABLE FLUORINE-CONTAINING COPOLYMER

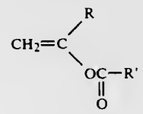
Toshio Koishi, Sakado, and Isao Tanaka, Kawagoe, both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Apr. 23, 1987, Ser. No. 41,429
Claims priority, application Japan, Apr. 23, 1986, 61-92335
Int. Cl.[4] C08F *214/18*
U.S. Cl. 526—249 8 Claims

1. A curable copolymer comprising:

25 to 75 mol % of first repeating units which originate from chlorotrifluoroethylene;

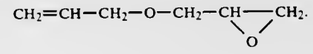
10 to 70 mol % of second repeating units which originate from a fatty acid ester represented by the general formula (1),



(1)

wherein R is hydrogen atom or methyl group and R' is an alkyl group having 1 to 12 carbon atoms; and

3 to 40 mol % of third repeating units which originate from allylglycidyl ether represented by the formula



4,788,268

METHOD FOR PREPARATION OF EPOXYSILICONE COMPOUNDS AND ALLYL-TERMINATED SILICONE COMPOUNDS

Kreisler S. Y. Lau, Alhambra; Susan L. Oldham, Torrance, and William E. Elias, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

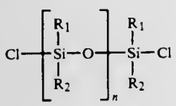
Filed May 5, 1987, Ser. No. 46,012
Int. Cl.[4] C08G *77/04*
U.S. Cl. 528—27 13 Claims

1. A method for preparing epoxysilicone compounds comprising the steps of:

(a) reacting a dibromobenzene compound with magnesium in anhydrous ether solvent to form a first Grignard reagent and subsequently reacting said first Grignard reagent with allyl bromide to form a 3-(bromophenyl) propene compound;

(b) reacting said 3-(bromophenyl)propene compound with magnesium in anhydrous tetrahydrofuran to form a second Grignard reagent and subsequently reacting said second Grignard reagent with a compound of the formula I below:

(1)



where

n=1 to 6,

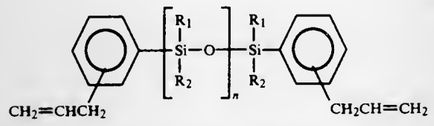
R_1 and R_2 are each chosen from the group consisting of a

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C_1 to C_4 alkyl group, a substituted aryl group, and an unsubstituted aryl group,

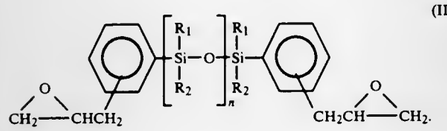
in tetrahydrofuran solvent to form an intermediate compound of formula II below:

(II)



(c) reacting said compound of formula II with an epoxidizing agent selected from the group consisting of: trichloroacetonitrile and hydrogen peroxide in a biphasic medium; and 3-chloroperoxybenzoic acid, to form said epoxysilicone compound of formula III below:

(III)



4,788,269

POLYURETHANE COATINGS FOR BRIDGE DECKINGS AND THE LIKE

Cung Vu, Gaithersburg; Susan P. Buxbaum, Towson, both of Md.; Norman E. Blank, Heidelberg, Fed. Rep. of Germany, and Richard C. Hartwig, Laurel, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation-in-part of Ser. No. 128,956, Dec. 4, 1987, abandoned. This application Jan. 7, 1988, Ser. No. 141,452

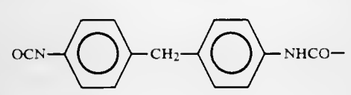
Int. Cl.[4] C08G *18/10, 18/30*

U.S. Cl. 528—60 **16 Claims**

1. Composition consisting essentially of two separate components, A and B:

Component A consisting essentially of, in parts by weight, a low-molecular weight polyol having at least 3 hydroxyl groups and a molecular weight between 92 and about 200, about 3–10 parts; a poly(oxypropylene) triol containing only secondary hydroxyl groups, molecular weight about 500 to 3,000, 80–120 parts; and an elastomer, 0–60 parts;

Component B, about 60–110 parts; being a polyisocyanate of the group consisting of (i) a mixture consisting essentially of a major portion of 4,4'-diphenylmethane diisocyanate and the balance 2,4'-diphenylmethane diisocyanate; or (ii) a polyisocyanate material comprising about 45–50 weight % 4,4'-diphenylmethane diisocyante and balance to make 100% of a polyisocyanate of the structure K—O—$(CH_2CH[CH_3]O)_m$—K, where K is



and m is about 2–5.

4,788,270

PROCESS FOR PREPARING A URETHANE COATING COMPRISING FREEZING A PREMIX OF AN ISOCYANATE AND A POLYOL IN A SOLVENT

Edward A. Anderson, Yorba Linda; Ivars Miculs, Studio City, and Koji Tomikawa, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 5, 1987, Ser. No. 58,476

Int. Cl.[4] C08G *18/32, 18/34;* **C08F** *6/00;* **C08K** *5/06*

U.S. Cl. 528—77 **12 Claims**

1. A process for preparing a urethane coating material, comprising the steps of:

mixing together an isocyanate, a hydroxy terminated aliphatic polyol, and an organic solvent to form a premix, the premix having a freezing point of less than about 0° C., the solvent being present in an amount of at least about 75 weight percent of the total weight of the mixture; and freezing the premix.

4,788,271

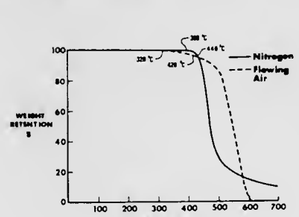
POLYPHENYLQUINOXALINES CONTAINING ALKYLENEDIOXY GROUPS

Paul M. Hergenrother, Yorktown; Stephen J. Havens, Newport News, both of Va., and Frank W. Harris, Akron, Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

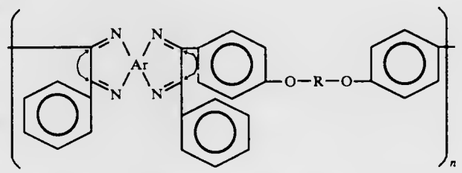
Filed Mar. 23, 1987, Ser. No. 28,831

Int. Cl.[4] C08G *73/06, 33/02*

U.S. Cl. 528—125 **1 Claim**

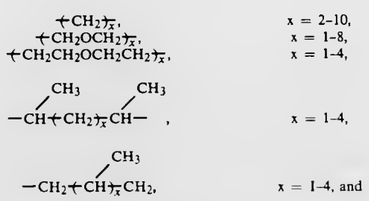


1. A polyphenylquinoxaline having the general structural formula:

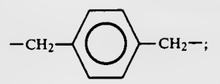


(a) wherein n is an integer between 4 and 100;

(b) wherein R is a radical selected from the group consisting of:

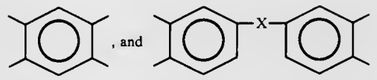


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and

(c) wherein Ar is a radical selected from the group consisting of:



wherein X is a bond or X is a linking group selected from the group consisting of:



O, S, C, and SO_2.

4,788,272

WHOLLY AROMATIC MESOMORPHIC POLYESTER AMIDE IMIDES AND THE PREPARATION THEREOF

Bernd Hisgen, Limburgerhof; Michael Portugall, Wachenheim, and Rolf Steinberger, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 938,057

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542796

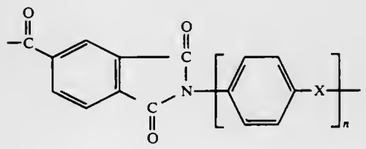
Int. Cl.[4] C08G *73/16*

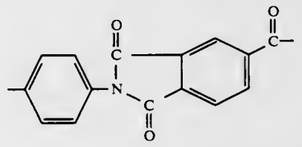
U.S. Cl. 528—170 **10 Claims**

1. A wholly aromatic mesomorphic polyester amide imide which forms a liquid-crystalline fiber-forming melt below 320° C., composed of

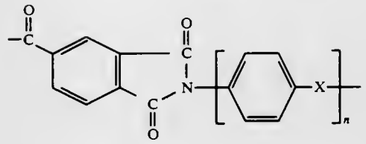
(a) from 5 to 35 mole % of repeat units of the formula I or II or mixtures thereof

I

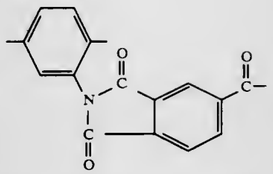




II



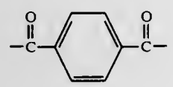
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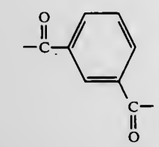
where the Xs in the formulae I and II are identical or different and each is —O—, —S—, —SO_2—, —CO—, —CH_2— or —$C(CH_3)_2$ and n is 0 or 1,

(b) from 0 to 30 mole % of repeat units of the formulae III or IV or mixtures thereof

III

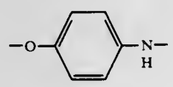


IV

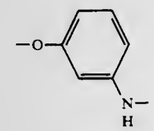


(c) a molar amount corresponding to the total amount of components a and b of repeat units of the formulae V, VI, VII or IX or mixtures thereof, with the stipulation that a molar quantity greater than zero of V, VI or mixtures thereof must be present at all times

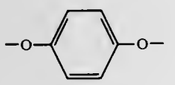
V



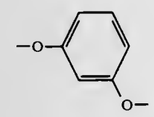
VI



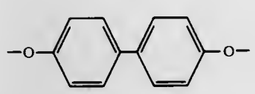
VII



VIII

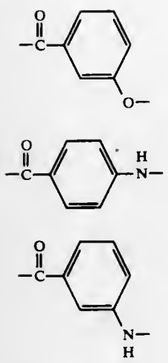


IX

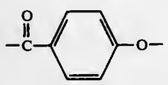


from 5 to 25 mole % of repeat units of the formula X, XI or XII or mixtures thereof:

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(e) repeat units of the formula XIII



the mole percentages of components (a), (b), (c), (d) and (e) adding up to 100 mole % in each case.

4,788,273

BRANCHED POLYCARBONATES CONTAINING TETRACARBOXYFUNCTIONAL HETEROCYCLIC COMPOUNDS AND PROCESS FOR THEIR PREPARATION

Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine, S.p.A., Milan, Italy

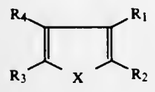
Filed Jul. 17, 1987, Ser. No. 74,554

Claims priority, application Italy, Jul. 23, 1986, 21231 A/86

Int. Cl.⁴ C08G *63/62*

U.S. Cl. 528—176 **17 Claims**

1. Thermoplastic, blow moldable, branched polycarbonate derived from at least one aromatic dihydroxy compound, phosgene, and aliphatic polyfunctional acid branching agent compound having the formula:



(I)

wherein

R_1, R_2, R_3 and R_4 are the same or different from each other, and represent —COOH or COCL;

X is O or S or the corresponding saturated compounds.

4,788,274

COPOLYESTER-CARBONATE RESINS HAVING PENDANT CARBOXYL GROUPS DERIVED FROM POLYCARBOXYLIC ACID MONOESTERS AND CROSSLINKED PRODUCTS THEREFROM

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 22, 1986, Ser. No. 944,034

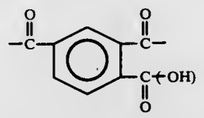
The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.⁴ C08G *63/62*

U.S. Cl. 528—176 **5 Claims**

1. A thermoplastic polyester-carbonate resin containing in the polymer chain, at least one divalent moiety selected from those of the formulae:

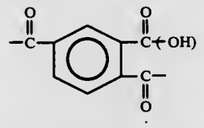
X



XI

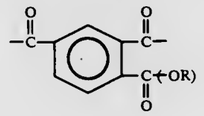
or

XII

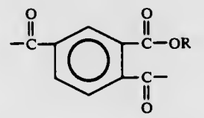


2. A thermoplastic polyester-carbonate resin containing in the polymer chain, at least one divalent moiety selected from those of the formulae:

XIII



or



wherein R is a hydrocarbyl group selected from alkyl or cycloalkyl groups amenable to removal by thermal degradation.

4,788,275

AROMATIC COPOLYESTER CARBONATE ENDCAPPED WITH CHROMANYL I COMPOUND

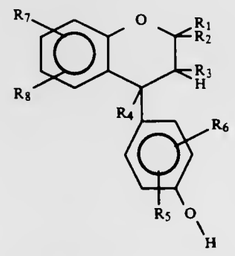
Kenneth F. Miller, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 23, 1986, Ser. No. 945,738

Int. Cl.⁴ C08G *63/76*

U.S. Cl. 528—179 **13 Claims**

1. An aromatic copolyestercarbonate having from above 50 to about 95 mole percent ester content which comprises isophthalate or isophthalate and terephthalate units, said copolyestercarbonate endcapped with a compound of the formula



wherein R_1–R_8 are independently selected from the group consisting of hydrogen and alkyl radicals of 1–9 carbon atoms and wherein R_5–R_8 are further independently selected from the group consisting of bromo and chloro.

4,788,276

COPOLYESTER CARBONATE WITH CYCLOALKYLPHENYL END GROUPS

Victor Mark, deceased, late of Evansville, Ind. (by Carol M. Mark,), and legal representatives Ester H. Mark, Springville, N.Y., assignors to General Electric Company, Mt. Vernon, Ind.

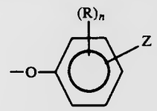
Division of Ser. No. 797,410, Nov. 12, 1985, Pat. No. 4,699,971.

This application May 20, 1987, Ser. No. 51,805

Int. Cl.⁴ C08G *63/64*

U.S. Cl. 528—179 **2 Claims**

1. An aromatic copolyestercarbonate having an isophthalate group, a terephthalate group, or a mixture of isophthalate and terephthalate groups and containing at least one terminal group represented by the formula



wherein

R is independently selected from alkyl radicals;

Z represents a cycloalkyl radical; and

n is an integer having a value of from 0 to 4 inclusive.

4,788,277

METHOD FOR PRODUCING A POLYPHENYLENE ETHER

Sadao Ibe, Tokyo; Tokio Sakurai, Yokohama; Kazuhiro Takahashi, Kimitsu, and Yoshiro Unno, Kimitsu, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

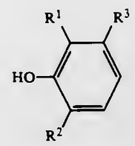
Filed Dec. 2, 1987, Ser. No. 127,842

Claims priority, application Japan, Dec. 4, 1986, 61-287788; Feb. 13, 1987, 62-29591; Apr. 1, 1987, 62-77570

Int. Cl.⁴ C08G *65/44*

U.S. Cl. 528—215 **10 Claims**

1. A method for producing a polyphenylene ether, which comprises reacting a phenol compound represented by the formula:



(I)

wherein R^1 represents a hydrocarbon residue having 1 to 4 carbon atoms or a substituted or unsubstituted phenyl group, R^2 represents a member selected from the group consisting of a halogen atom, a hydrocarbon residue having 1 to 4 carbon atoms and a substituted or unsubstituted phenyl group, and R^3 represents a member selected from the group consisting of a hydrogen atom, a halogen atom, a hydrocarbon residue having 1 to 4 carbon atoms and a substituted or unsubstituted phenyl group, with an oxidizing agent in a reaction medium containing at least one alcohol selected from the group consisting of methanol and ethanol in the presence of a catalyst comprising at least one copper compound, at least one 1,3-diamine compound selected from the group consisting of N,N,N′,N′-tetramethyl-1,3-diaminopropane and an N,N,N′,N′-tetramethyl-1,3-diaminopropane having a substituent on its propane chain, and at least one halogen compound selected from the group consisting of a bromine compound and a chlorine compound.

4,788,278

POLYVINYLENE CARBONATE AND POLYHYDROXYMETHYLENE, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Otto Mauz, Liederbach, Fed. Rep. of Germany, assignor to Hoechst Aktiegesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 721,913, Apr. 11, 1985, abandoned.

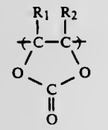
This application Jan. 9, 1987, Ser. No. 1,918

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413904

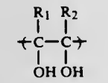
Int. Cl.⁴ C08G *63/62*

U.S. Cl. 528—370 **10 Claims**

1. A polymer consisting substantially of a base polymer which comprises units (II) or a mixture of units (I) and (II) containing more than 50% by weight of units (II) based on said mixture, said units (I) and (II) having the following structural formulas

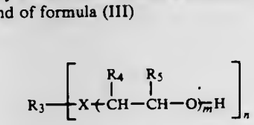


(I)



(II)

in which R_1 and R_2 are hydrogen or a monovalent hydrocarbon radical with up to 8 carbon atoms, which polymer also contains up to 30% by weight, based on the base polymer, of covalently bonded units which are derived from at least one compound of formula (III)



(III)

and are grafted onto the base polymer in which:

R_3 is a hydrocarbon radical with 4 to 30 carbon atoms;

X is a member selected from the group consisting of —O—, COO— and mixture thereof;

R_4 and R_5 are hydrogen or a monovalent hydrocarbon radical with 1 to 8 carbon atoms, with the proviso that at least one of the radicals R_4 and R_5 is hydrogen;

m is an integer from 1 to 40; and

n is an integer from 1 to 4.

4,788,279

CATALYST COMPOSITIONS AND PROCESSES FOR POLYMERIZING CARBON MONOXIDE AND OLEFINICALLY UNSATURATED HYDROCARBONS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 10, 1986, Ser. No. 940,876

Claims priority, application Netherlands, Dec. 10, 1985, 8503395

Int. Cl.⁴ C08G *67/02*

U.S. Cl. 528—392 **49 Claims**

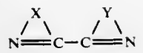
1. A process for preparing a polymer which comprises contacting carbon monoxide and at least one olefinically unsaturated hydrocarbon in the presence of a catalyst wherein the catalyst is obtained by reacting.

(1) a compound of a Group VIII metal selected from the group consisting of palladium, cobalt and nickel,

(2) an anion of a non-hydrohalogenic acid with a pKa less than 6,

(3) a nitrogen bidentate ligand of the general formula

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wherein X and Y represent similar or different organic bridging groups, each bridging group containing three or four atoms, wherein at least two of the atoms in each bridging group are carbon atoms, and

(4) an organic oxidant, and under conditions suitable to prepare a polymer.

4,788,280

POLYSACCHARIDE DERIVATIVES CONTAINING ALDEHYDE GROUPS ON AN AROMATIC RING, THEIR PREPARATION FROM THE CORRESPONDING ACETALS AND USE IN PAPER

Robert L. Billmers, Stockton; Martin M. Tessler, Edison; David M. Del Giudice, Somerset, and Craig Leake, Edison, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 27,975, Mar. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 829,675, Feb. 14, 1986, Pat. No. 4,703,116, which is a continuation-in-part of Ser. No. 758,634, Jul. 24, 1985, Pat. No. 4,675,394, which is a continuation-in-part of Ser. No. 641,820, Aug. 17, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 93,939

Int. Cl.[4] C08B *31/02, 31/08, 11/04, 37/14*

U.S. Cl. 536—104 **29 Claims**

1. An aldehyde-containing polysaccharide derivative having the formula



(I)

or Sacch-O—CH_2—Ar—CHO (II), wherein Sacch-O— represents a polysaccharide molecule and Ar in formula I is a divalent aryl group or an alkaryl group and Ar in formula II is a conjugated heterocyclic aryl or alkaryl group.

4,788,281

DEXTRAN HEXONIC ACID DERIVATIVE, FERRIC HYDROXIDE COMPLEX AND METHOD MANUFACTURE THEREOF

Anthony L. Tosoni, 7 Green Briar Rd., Willowdale, Ontario, Canada (M2K1H4); Natu Patel, 54 Cottesmore Crescent, Markham, Ontario, Canada (L3R3X6), and Kenneth Coelho, 585 Jane St., Apt. 401, Toronto, Ontario, Canada (M6S4A3)

Filed Jan. 4, 1984, Ser. No. 568,124

Int. Cl.[4] C08B *37/02*

U.S. Cl. 536—113 **5 Claims**

1. A dextran dexonic acid derivative having one or more terminal D-gluconic acid residues obtained by the oxidation of dextran having an average molecular weight of from about 2000 to 6000 with sodium chlorite at a pH of about 2.5–4.5 and at a temperature of about 20°–30° C.

4,788,282

DEPROTECTION OF ALLYLIC ESTERS AND ETHERS

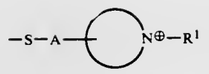
Robert Déziel, Quebec, Canada, assignor to Bristol-Myers Company, New York, N.Y.

Filed Jun. 7, 1985, Ser. No. 742,495

Int. Cl.[4] C07D *513/04*

U.S. Cl. 540—350 **5 Claims**

1. A process for the deprotection of an allyl ester of a carbapenem derivative, said carbapenem derivative being characterized by a 2-substituent of the formula



in which A represents a C_1–C_6 straight or branched chain alkylene group; R^1 represents an optionally substituted aliuphatic, cycloaliphatic, cycloaliphatic-aliphatic, aryl, araliphatic, heteroaryl, heteroaraliphatic, heterocyclyl or heterocyclyl-aliphatic radical and



represents a nitrogen-containing aromatic heterocycle attached to the alkylene group A at a ring carbon atom and quanternized by substituent R^1 which comprises reacting said allyl ester of the carbapenem derivative with from 1.0 to 1.5 molecular proportions of pyrrolidine and a catalytic amount of an organic-soluble palladium complex having a coordinating phosphine ligand in an inert organic solvent at −50° C. to 30° C. during a period of from 10 min. to 4 hrs. to cleave the allyl moiety and recovering the resulting carbapenem derivative.

4,788,283

1-DIORGANOCARBAMOYL-POLYALKYLPIPERIDINES

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

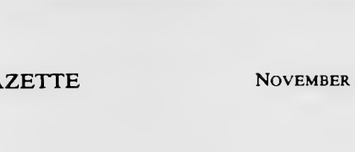
Division of Ser. No. 490,288, May 2, 1983, Pat. No. 4,590,268. This application Mar. 21, 1986, Ser. No. 842,610

Claims priority, application Switzerland, May 10, 1982, 2890/82

Int. Cl.[4] C07D *211/16*

U.S. Cl. 544—82 **1 Claim**

1. A compound of the formula VI



VI

wherein R is hydrogen; R^2 and R^3 independently are C_1–C_{18}-alkyl; or R^2 and R^3, together with the Natom to which they are bonded, form a piperidine, pyrrolidine, morpholine, or 4-alkylpiperidine ring; and R^5 is a divalent acyl radical of an aliphatic or cycloaliphatic dicarboxylic acid.

4,788,284

DIPHENYLIMIDAZOLE TYPE DYES

Toyoaki Masukawa; Yasuo Tsuda; Hidetaka Ninomiya, and Noritaka Nakayama, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 60,057, Jun. 9, 1987. This application Aug. 10, 1987, Ser. No. 84,311

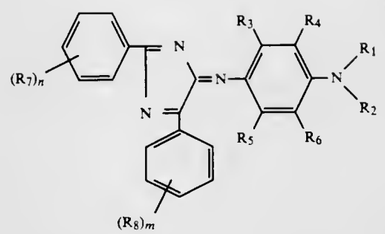
Claims priority, application Japan, Jun. 13, 1986, 61-138868

Int. Cl.[4] C07D *403/12, 401/12, 233/96*

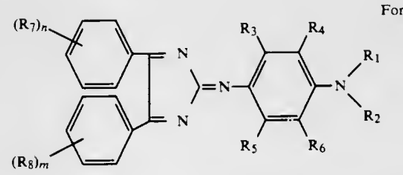
U.S. Cl. 544—139 **7 Claims**

1. A diphenylimidazole type dye represented by the following Formula [I] or [II]:

Formula [I]



Formula [II]



wherein R_1 and R_2 represent each a hydrogen atom, an alkyl group or a substituted alkyl group, and R_1 and R_2 may be coupled to each other so as to complete a 5- or 6-membered ring optionally containing a hereto atom; R_3, R_4, R_5 and R_6 represent each a halogen atom, an alkyl group, a substituted alkyl group, an alkoxy group or a substituted alkoxy group; R_7 and R_8 represent each a halogen atom, or a monovalent substituent; n and m are each an integer of from 0 to 5, provided that, when n is an integer of not less than 2, R_7s may be the same with or different from each other and that, when m is an integer of not less than 2, R_8s may be the same or different from each other.

4,788,285

INDOLE-PHTHALIDE DERIVATIVES

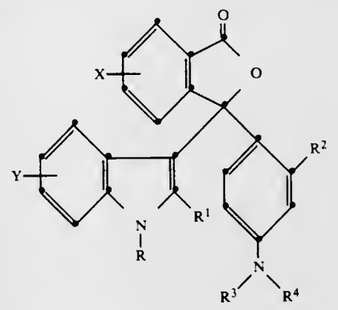
William M. Hung, 91760 Millcliff Dr., Cincinnati, Ohio 45231, and Angelique M. Black, 115 Meadow Hill Dr., Covington, Ky. 41017

Division of Ser. No. 937,782, Dec. 4, 1986, Pat. No. 4,736,027, which is a division of Ser. No. 745,555, Jun. 17, 1985, Pat. No. 4,660,060. This application Dec. 7, 1987, Ser. No. 129,620

Int. Cl.[4] C07D *405/04, 405/14, 413/14*

U.S. Cl. 544—144 **1 Claim**

1. A 3-(1-R-2-R^1-5/6-Y-indol-3-yl)-3-(2-R^2-4-N-R^3-N-R^4-aminophenyl) -X-phthalide having the formula



wherein:

R represents alkylene-O-R^5 in which alkylene represent —C_2H_4— or —C_3H_7— and R^5 represent non-tertiary C_1 to C_6 alkyl;

R^1 represents non-tertiary C_1 to C_4 alkyl or phenyl;

R^2 represents hydrogen, ahlogen, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_8 alkoxy, dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl, N-alkylamido in which alkyl is non-tertiary C_1 to C_4 alkyl, or trifluoromethyl

R^3 and R^4 independently represent non-tertiary C_1 to C_8 alkyl, alkylene-O-R^5, alkylene-O-alkylene-O-R^5 benzyl, or benzyl substituted in the phenyl ring by one or two non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or nitro, or R^3 and R^4, taken together with the nirtogen represent piperidinyl, pyrrodidinyl or morpholinyl;

X represents



in which Z represent OR^6 wherein R^6 represents hydrogen, a non-teriary C_1 to C_{16} alkyl, benzyl or benzyl substituted in the phenyl ring by one or two of non-teritary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or nitro, or one to four halogen; and

Y represents hydrogen or one or two non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or nitro.

4,788,286

PROCESS FOR OBTAINING SOLID CYANURIC CHLORIDE

Hubertus Klima, Tacherting, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 854,344, Apr. 21, 1986, abandoned. This application Oct. 21, 1987, Ser. No. 111,129

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514840

Int. Cl.[4] C07D *251/28*

U.S. Cl. 544—191 **11 Claims**

1. In a process for obtaining solid cyanuric chloride from cyanuric chloride vapor obtained by trimerizing cyanogen chloride, the improvement, comprising: introducing the cyanuric chloride vapor into the center of a plurality of separated annularly disposed inert gas streams being substantially dry and having a temperature lower than a temperature of the cyanuric chloride vapor and disposed in the lower part of a condensor to cool and condense the cyanuric chloride vapor to a solid with the transfer of heat to the inert gas stream, and removing the condensed solid cyanuric chloride from the bottom of the condensor and the heated inert gas from the side of the condensor.

4,788,287

HIGH PERFORMANCE WATER AND OIL REPELLANT

Masashi Matsuo; Masayuki Tamura, and Katsuji Ito, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

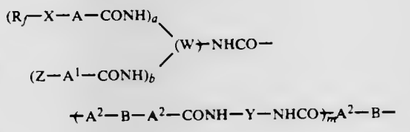
Filed Sep. 3, 1986, Ser. No. 903,197

Claims priority, application Japan, Sep. 17, 1985, 60-203485

Int. Cl.[4] C07D *251/30*

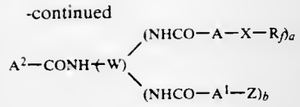
U.S. Cl. 544—196 **1 Claim**

1. A high performance water and oil repellant having a molecular weight of from 800 to 20,000 of the formula:



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-continued



wherein R_f is a perfluoroalkyl group of the formula C_nF_{2n+1}, X is —R—, —CON(R^1)—Q— or —SO_2N(R^1)—Q—, each of A, A^1 and A^2 is —O—, —S— or —N(R^2)—, [Z] Z—A^1 is a monovalent alcohol, thioalcohol or primary or secondary amine residue, a is an integer of from 1 to 5, b is an integer of from 0 to 4, a +b is an integer of from 1 to 5, W is a t-valent organic residue obtained by removing the t —NCO groups from a t-functional aliphatic, cycloaliphatic, aromatic or heterocyclic isocyanate compound having t —NCO groups, wherein t is an integer of a +b +1, B is a bivalent organic residue obtained by removing the two —A^2—H groups from a bifunctional polyvalent active hydrogen compound, and wherein B may have another organic group bonded by A^2, Y is a bivalent organic residue obtained by removing the two —NCO groups from a bifunctional aliphatic, cycloaliphatic, aromatic or heterocyclic isocyanate compound, and wherein Y may have another organic group bonded by a —NHCO— group, m is an integer of from 1 to 50, R is a bivalent alkylene group, R^1 is a hydrogen atom or a lower alkyl group, Q is a bivalent alkylene group, R^2 is a hydrogen atom or a monovalent aliphatic, cycloaliphatic, aromatic or heterocyclic group, or Z and R^2 may form a ring.

4,788,288

SELF-AND HYDROXYL REACTIVE FORMALDEHYDE-FREE CYCLIC HEMIAMIDAL AND HEMIAMIDE KETAL CROSSLINKING MONOMERS

Robert K. Pinschmidt, Jr., Allentown; Dale D. Dixon, Kutztown, and William F. Burgoyne, Jr., Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 760,442, Jul. 30, 1985, Pat. No. 4,691,026. This application Jun. 12, 1987, Ser. No. 62,540

Int. Cl.[4] C07D *401/12, 211/40*

U.S. Cl. 544—212 **18 Claims**

1. A compound represented by the following formula:

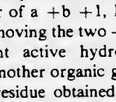
wherein

R is an olefinically unsaturated organic radical represented by one of the following formulas



(a)

where R^5 is a C_2-C_{23} organic radical of the formula



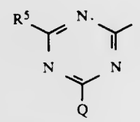
where

X is hydrogen, C_1-C_{10} alkyl, phenyl, —C(O)NH_2, or —CO_2R^8 where R^8 is hydrogen or a C_1-C_9 alkyl group,

Y is —O—, —CH_2O—, —NR^6—, —CH_2NR_6—, —(-CO)—O—(CH_2)$_a$—NR^6—, where R^6 is hydrogen or a C_1-C_4 alkyl radical and a is 1 to 4, —O(CO)—, —N(-CO)—, a branched or unbranched C_1 to C_8 alkylene group, or —C_6H_4—,

Z is hydrogen, C_1-C_4 alkyl, —C(O)NH_2, —CO_2R^7 where R^7 is hydrogen or a C_1-C_3 alkyl group,

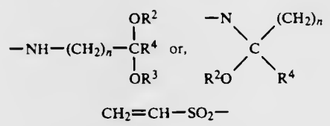
m is 0 or 1;



(b)

where R^5 is as defined above,

Q is hydrogen, hydroxyl, C_1-C_4 alkoxy or alkylamino,



(c)

where

R^2 is hydrogen or a C_1-C_4 alkyl group,

R^4 is hydrogen or a C_1-C_4 alkyl group, and

n is 4.

4,788,289

PROCESS FOR PREPARING PYRAZINES FROM HYDROXYAMINES

Wei-Yang Su, and John F. Knifton, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 24, 1986, Ser. No. 922,918

Int. Cl.[4] C07D *241/12*

U.S. Cl. 544—336 **12 Claims**

1. A process for preparing pyrazines which comprises the steps of cyclocondensation of a hydroxyamine from the group consisting of ethanolamine, 1-amino-2-butanol, 1-amino-3-butanol and 1-amino-2-propanol in the presence of a catalyst consisting essentially of a rhodium, ruthenium or palladium-containing salt of hydrochloric acid and a phosphine containing compound from the group consisting of tri-n-butylphosphine, triphenylphosphine and 1,3-bis(diphenylphosphino)propane at a temperature of at least 100° C. and at atmospheric pressure to 400 psi.

4,788,290

SEROTONERGIC PYRAZINE DERIVATIVES

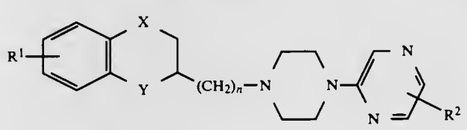
Gary P. Stack, Merion, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,868

Int. Cl.[4] C07D *405/14, 407/14, 409/14, 411/14*

U.S. Cl. 544—357 **5 Claims**

1. A compound of the formula:



in which

X and Y are, independently, —O— or —S—;

R^1 and R^2 are, independently, hydrogen, halo, trifluoromethyl, cyano, hydroxy, amino, alkylamino of 1 to 6 carbon atoms, dialkylamino of 2 to 12 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkyl of 1 to 6 carbon atoms or alkanoylamido of 2 to 6 carbon atoms; and

n is one of the integers 1, 2, 3 or 4;

or a pharmaceutically acceptable salt thereof.

4,788,291

4,5-DISUBSTITUTED 1,3-THIAZOL-2-YLOXYACETAMIDE HERBICIDES

Heinz Förster, Wuppertal; Gunther Beck, Leverkusen; Erich Klauke, Odenthal; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

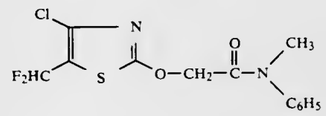
Filed Feb. 5, 1986, Ser. No. 826,479

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505902

Int. Cl.[4] C07D *277/34, 417/12;* **A01N** *43/78*

U.S. Cl. 548—187 **1 Claim**

1. A compound, wherein such compound is 2-(4-chloro-5-difluoromethylthiazol-2-yloxy)-acetic acid N-methyl-anilide of the formula



4,788,292

PERFLUOROALKYL SUBSTITUTED BENZOTRIAZOLES

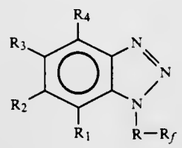
Kirtland P. Clark, Bethel, Conn., and Athanasios Karydas, Brooklyn, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 31, 1986, Ser. No. 892,219

Int. Cl.[4] C07D *249/18;* **C23F** *11/14*

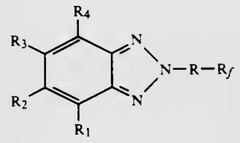
U.S. Cl. 548—260 **12 Claims**

1. A compound of the formula



I

or



II

wherein

R is an alkylene or alkenylene having 1 to 16 carbon atoms which is unsubstituted or substituted by hydroxyl or by lower alkoxy; and said alkylene is uninterrupted or is interrupted by a group selected from oxygen, sulfur, carboxamido, sulfonamido, aminocarbonyl, aminosulfonyl, carbonyloxy, sulfinyl and sulfonyl;

R_f is a C_4-C_{16}-perfluoroalkyl or a C_4-C_{16}-perfluoroalkoxy; and

R_1, R_2, R_3 and R_4 are each independently (a) hydrogen, halogen or hydroxyl; or (b) alkyl of up to 10 carbon atoms, lower alkoxy, lower alkanoyloxy or lower alkanoylamino each of which is independently unsubstituted or further substituted by C_6-C_{10}-aryl, C_4-C_7-cycloalkyl, C_3-C_6-azacycloalkyl, lower alkoxy, hydroxy, halogen, cyano or poly-lower alkyleneoxy; or R_1 and R_4 are hydrogen, R_2 is methoxy and R_3 is N-(1-ethyl-2-pyrrolidinylmethyl)carbamoyl.

4,788,293

PREPARATION OF 1-PYRAZOLINES

Eckhard Stroefer, Mannheim; Wolfgang Rohr, Wachenheim; Gerhard W. Rotermund, Mannheim; Rolf Fischer, Heidelberg, and Reinhard Neudert, Bissersheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

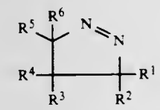
Filed Jul. 15, 1986, Ser. No. 886,407

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1985, 3525268

Int. Cl.[4] C07D *231/06*

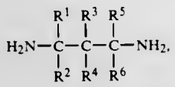
U.S. Cl. 548—356 **2 Claims**

1. A process for the preparation of a 1-pyrazoline of the formula I



I

by oxidation of a 1,3-diaminopropane of the formula II in a reaction vessel



II

where R^1, R^2, R^3, R^4, R^5 and R^6 independently of one another are each hydrogen or alkyl of 1 to 3 carbon atoms, or two of the stated radicals which are bonded to the same carbon atom or to two adjacent carbon atoms together form an alkylene radical of 3 to 5 carbon atoms, in aqueous solution, which process comprises: simultaneously passing into said vessel a 10–30% strength solution of the diamine, an aqueous solution of hypochlorite containing from 5 to 22% by weight of hypochlorite ions and a 20–50% strength by weight aqueous solution of an oxidizing agent of the formula III



III

where R^3 is hydrogen, alkyl of 1 to 5 carbon atoms or an aliphatic acyl radical of 2 to 5 carbon atoms, in a molar ratio of hypochlorite to III of from 0.5:1 to 1.5:1, while stirring, and care is taken to ensure that the reaction temperature does not exceed 60° C., and as soon as possible after complete conversion of the diamine the resulting pyrazoline is extracted at room temperature with a hydrophobic organic solvent which dissolves pyrazoline, and is distilled under reduced pressure at below 100° C.

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4,788,294

PROCESS FOR THE PRODUCTION OF 4-ALKOXY-3-PYRROLIN-2-ONES

Laurent Duc, Sion; John McGarrity, and Thomas Meul, both of Visp, all of Switzerland, assignors to Lonza Ltd., Gampel/-Valais, Switzerland

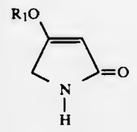
Continuation of Ser. No. 907,011, Sep. 15, 1986, abandoned. This application Mar. 14, 1988, Ser. No. 170,702

Claims priority, application Switzerland, Jun. 19, 1986, 2486/86

Int. Cl.⁴ C07D *207/38*

U.S. Cl. 548—544 **1 Claim**

1. In the process for the production of a 4-alkoxy-3-pyrrolin-2-one having the formula:



wherein R_1 is a C_1 or C_2 alkyl, consisting of the ammonolysis of 4-halo-3,3-di-[(C_1–C_2)-alkoxy]-butyric acid-(C_1–C_4)-alkyl ester, the improvement of effecting said ammonolysis by contacting said 4-alkoxy-3-pyrrolin-2-one and an aqueous ammonia solution having an NH_3 content of 10 to 25 percent at a temperature of 20° to 100° C.

4,788,295

FUNCTIONAL MONOMALEIMIDE AND THERMOSETTING COMPOSITION THEREFROM

Michel Rakoutz, deceased, late of Brignais, France (by Michelle Rakoutz, legal representative), assignor to Rhone-Poulenc Specialites Chimiques, Courbevole, France

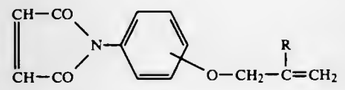
Filed Jul. 1, 1986, Ser. No. 880,838

Claims priority, application France, Jul. 1, 1985, 85 10190; Apr. 17, 1986, 86 05744

Int. Cl.⁴ C07D *207/244*

U.S. Cl. 548—549 **7 Claims**

1. A monomaleimide having the following general formula (I):



(I)

wherein R is hydrogen or methyl.

4,788,296

PROCESS FOR THE PRODUCTION AND RECOVERY OF TRIMELLITIC ANHYDRIDE

Bonnie M. Robbins, St. Charles; Joseph P. Egan, Downers Grove; Daniel A. Morlang, Joliet, and Aaron R. Slagel, Morris, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 29, 1987, Ser. No. 56,118

Int. Cl.⁴ C07D *307/89*

U.S. Cl. 549—245 **5 Claims**

1. An improved process for the manufacture of trimellitic acid anhydride having a 97 to 98% anhydride content and having a triethylene glycol color of 170 or less, in yields in the range of 89 to 90% and higher based on the total trimellitic acid produced by catalytic air oxidation of pseudocumene, including the steps of catalytic oxidation of pseudocumene in the presence of acetic acid in an oxidation zone wherein liquid-phase conditions are maintained and wherein the weight ratio of acetic acid to pseudocumene is in the range of about 0.5–5.0:1.0 and the catalyst comprises one or more heavy metal oxidation catalysts comprising zirconium, cobalt, and manganese to provide about 0.1 to about 0.4 weight percent total metals based on pseudocumene and a source of bromine and to provide a total of about 0.1 to about 0.3 weight percent total bromine based on pseudocumene, wherein the total weight ratio of bromine ions to total metal ions is about 0.5 to about 2.0, the zirconium content is about 1 to about 5%, and the manganese content is about 14 to about 60%, each metal by weight of the total metals and wherein the cobalt content is about 35 to about 80 weight percent, temperatures in the oxidation are in a range of about 220° F. to about 480° F., cooling the oxidation reaction effluent to crystallize trimellitic acid, separating and recovering crystallized trimellitic acid from the acetic acid solvent mother liquor, distilling from the acetic acid mother liquor to obtain a mixture of acetic acid and water for concentration of the acetic acid content to provide acetic acid solvent concentrate for recycle to the oxidation and to obtain a bottoms fraction containing high melting solids, heating the crystalline trimellitic acid to convert it to its anhydride and distilling the anhydride to obtain trimellitic acid anhydride product; the improvements comprising conducting the conversion continuously in two series staged dehydration zones with heat removal by evaporation from the liquid in each of the dehydration zones operated at temperatures in a range of about 400° to about 500° F. thereby converting trimellitic acid to its anhydride and evaporating acetic acid solvent, distilling the liquid crude trimellitic anhydride, condensing the vaporized overhead fraction to obtain trimellitic anhydride product, combining the vapor from the first dehydration zone and the acetic acid mother liquor as feed for distilling acetic acid and water mixture therefrom leaving the residue containing high melting solids, combining the residue and the bottom fraction from the distillation of the trimellitic anhydride containing catalyst metals, and continuously adding up to about 50 weight percent of the combined residue and bottom fraction containing high melting solids and catalyst metals to the first dehydration zone.

4,788,297

SEPARATION OF ISOMERS

Alan J. Whittle, Aldershot, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 26, 1985, Ser. No. 769,492

Int. Cl.⁴ C07D *311/56*

U.S. Cl. 549—285 **4 Claims**

1. A process for the selective removal of the cis-isomer and the relative enrichment of a 3-substituted-1-(4-hydroxycoumarin-3-yl)-1,2,3,4-tetrahydronaphthalene rodenticide with respect to the trans-isomer which comprises the steps of:

(a) dissolving a quantity of a cis/trans mixture of said rodenticide in just sufficient of a heated lower alkanol containing up to four carbon atoms to effect solution,

(b) allowing the solution to cool to a temperature within the range which is less than the temperature at which solution occurs but above the ambient temperature,

(c) maintaining the solution temperature within this range whilst precipitation of the cis-isomer occurs,

(d) separating the precipitated cis-isomer from the solution, and

(e) recovering a product enriched with respect to the trans-isomer from the solution.

4,788,298

PROCESS FOR THE PREPARATION OF COUMARIN COMPOUNDS

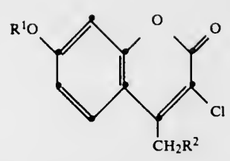
Richard H. S. Wang, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,489

Int. Cl.⁴ C07D *311/16*

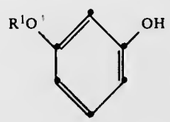
U.S. Cl. 549—289 **2 Claims**

1. Process for the preparation of a coumarin compound having the formula

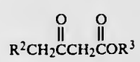


which comprises

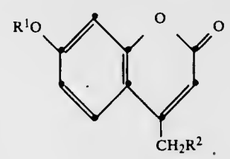
(1) reacting a resorcinol compound having the structure



with a β-ketoester having the structure



at elevated temperature in the presence of a catalytic amount of a protonic acid condensation catalyst and an inert solvent while distilling off reaction by-products to form an intermediate having the structure



(2) forming a mixture of acetic acid or an alkyl acetate with the reaction mixture obtained from (1); and

(3) adding sulfuryl chloride to the mixture obtained from (2) and heating the resulting mixture;

wherein

R^1 is hydrogen or alkyl of about 1 to 8 carbon atoms;

R^2 is hydrogen or alkyl of about 1 to 6 carbon atoms, chlorine, bromine or an aryl radical; and

R^3 is alkyl of about 1 to 6 carbon atoms.

4,788,299

KETOLACTONES

Bernhard Riefling, Darmstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschrUM/a/ nkter Haftung, Darmstadt, Fed. Rep. of Germany

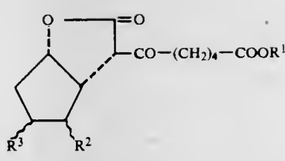
Filed Jun. 17, 1987, Ser. No. 63,044

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1986, 3620442

Int. Cl.⁴ C07D *307/93, 307/935*

U.S. Cl. 549—300 **7 Claims**

1. A ketolactone of the formula



wherein

R^1 is H, C_{1-6}-alkyl or C_{6-14}-aryl or C_{5-14}-aryl substituted by methyl, fluoro, chloro, methoxy, acetamido or benzamido and

R^2 and R^3 together are an O atom or a single bond, or a salt thereof.

4,788,300

SUBSTITUTED BUTANAMIDO ACETATE COMPOUNDS FOR THE PREPARATION OF PYRROLIDONE DERIVATIVES

Mario Pinza, Corsico, and Ugo C. Pfeiffer, Milan, both of Italy, assignors to I.S.F. Societa per Azioni, Milan, Italy

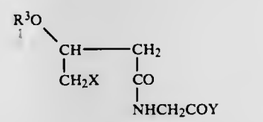
Division of Ser. No. 718,242, Mar. 29, 1985, Pat. No. 4,629,797. This application Aug. 29, 1986, Ser. No. 902,268

Claims priority, application Italy, Apr. 2, 1984, 20358 A/84

Int. Cl.⁴ C07D *309/12;* **C07C** *101/30, 103/183*

U.S. Cl. 549—419 **3 Claims**

1. A compound of structure (5)



(5)

in which X is chloro or bromo, Y is NR^1R^2 or OR where R^1 and R^2, which can be the same or different, are hydrogen or C_{1-3} alkyl and R is C_{1-3} alkyl, and R^3 is hydrogen or a hydroxy-protecting group which is tetrahydropyranyl or α-ethoxyethyl.

4,788,301

NOVEL ALLYLIC AMINES

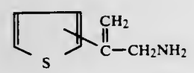
Thomas M. Bargar, Zionsville; Robert Broersma, Jr., Noblesville, and James R. McCarthy, Zionsville, all of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cleveland, Ohio

Continuation of Ser. No. 871,638, Jun. 6, 1986, abandoned, which is a continuation of Ser. No. 687,628, Dec. 31, 1984, abandoned. This application Jun. 15, 1987, Ser. No. 62,813

Int. Cl.⁴ A61K *31/38;* **C07D** *333/20*

U.S. Cl. 514—438 **4 Claims**

1. A compound of the formula



I

and the non-toxic pharmaceutically acceptable acid addition salts thereof.

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4,788,302

ANTI-FOULING COMPOUND AND METHOD OF USE

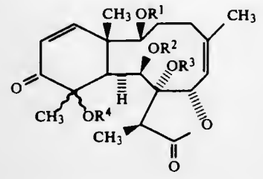
John D. Costlow; Irving R. Hooper, and Daniel Rittschof, all of Beaufort, N.C., assignors to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 744,523, Jun. 14, 1985, abandoned. This application Jan. 31, 1986, Ser. No. 824,959

Int. Cl.[4] **C07D** *307/92;* **A61K** *31/34;* **C09D** *5/14*

U.S. Cl. 549—458 **7 Claims**

1. A compound of the formula



in which R^1-R^4 independently represent H or a C_{1-18} alkanoyl or alkenoyl group.

4,788,303

EPOXIDIZED ISOCYANATES AND PROCESS FOR THEIR PREPARATION

Paul S. Waterman, Shelton, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 926,051, Nov. 3, 1986, Pat. No. 4,731,428. This application Dec. 14, 1987, Ser. No. 132,837

Int. Cl.[4] **C07D** *301/14, 301/19, 303/36*

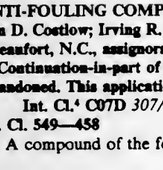
U.S. Cl. 549—525 **9 Claims**

1. A process for preparation of a compound selected from those of the formulae:



(I)

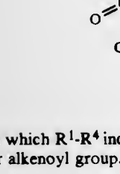
or



(II)

or a mixture of (I) and (II), said process comprising reacting

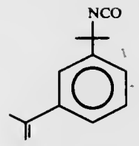
(a) a tertiary aralkyl isocyanate of the formulae:



(III)

or

-continued



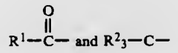
(IV)

or a mixture of any of (III) and (IV), with

(b) an effective amount of an epoxidizing agent of the general formula

ROOH

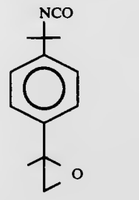
wherein R is selected from



wherein R^1 and R^2 are independently selected from alkyl and halo-substituted alkyl of 1 to 12 carbon atoms and aryl and halo substituted aryl-alkaryl, halo-substituted alkaryl, aralkyl and halo-substituted aralkyl of from 1 to 12 carbon atoms; in

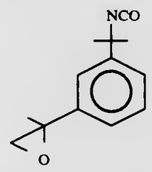
(c) an inert organic solvent at a temperature of from about −35° C. to about 50° C. until formation of (I) or (II) or a mixture of (I) and (II) is substantially complete.

7. A compound selected from those of the formulae:



(I)

or



(II)

or a mixture of (I) and (II).

4,788,304

PHOSPHOLIPASE A2 INHIBITORS

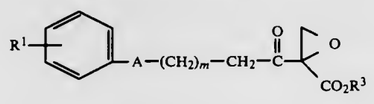
Lisa A. Marshall, Wayne; Kurt E. Steiner, Devon, and Guy A. Schiehser, Malvern, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,259

Int. Cl.[4] **C07D** *303/48*

U.S. Cl. 549—549 **4 Claims**

1. A compound having the formula



wherein

R^1 is hydrogen, hydroxy, lower alkyl, lower alkoxy, haloloweralkyl, halo or nitro;

R^3 is hydrogen, lower alkyl, or aryl of 6–10 carbon atoms;

A is —CH_2— or —O—;

m is 0–8;

or a pharmacologically acceptable salt thereof.

4,788,305

NOVEL RESOLUTION PROCESS

Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous Bois, both of France, assignors to Roussel Uclaf, Paris, France

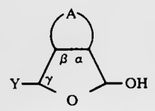
Division of Ser. No. 846,570, Mar. 31, 1986, Pat. No. 4,701,542, which is a continuation of Ser. No. 446,705, Dec. 3, 1982, abandoned. This application Jul. 17, 1987, Ser. No. 74,682

Claims priority, application France, Dec. 9, 1981, 81 23003

Int. Cl.[4] **C07D** *307/77*

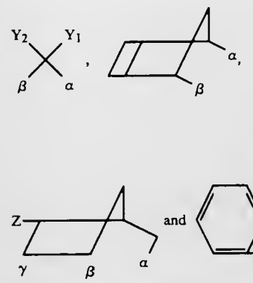
U.S. Cl. 549—466 **4 Claims**

1. A hemiacetal in all possible isomeric forms of the formula



III

wherein A, represents an optionally substituted hydrocarbon chain selected from the group consisting of



wherein

Y_1 and Y_2 are individually selected from the group consisting of hydrogen, fluorine, chlorine, bromine and alkyl of 1 to 6 carbon atoms, or Y_1 and Y_2 together with the carbon to which they are attached form a carbon homocycle of 3 to 7 carbon atoms; and Z is selected from the group consisting of hydrogen, chlorine, bromine and iodine;

Y is selected from the group consisting of alkyl of 1 to 18 carbon atoms optionally substituted with a halogen; and —CY_3' and a β,γ bond together with Y may be included in A and Y′ is bromine or chlorine.

4,788,306

FLUOROOXIRANE CARBOXYLATES AS HYPOGLYCEMIC AGENTS

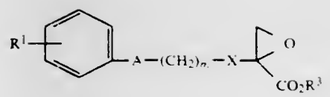
Guy A. Schiehser, Malvern, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 34,528, Apr. 3, 1987, abandoned, which is a continuation-in-part of Ser. No. 26,339, Mar. 16, 1987, abandoned. This application Aug. 21, 1987, Ser. No. 88,189

Int. Cl.[4] **C07D** *303/48*

U.S. Cl. 549—549 **11 Claims**

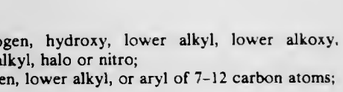
1. A compound having the formula



wherein:

R^1 is hydrogen, hydroxy, lower alkyl, lower alkoxy, haloloweralkyl, halo or nitro;

R^3 is hydrogen, lower alkyl, or aryl of 7–12 carbon atoms;

X is  ;

A is—CH_2—, –O– or –S–;

m is 1–8;

or a pharmacologically acceptable salt thereof.

4,788,307

OLIGOSACCHARIDIC FRACTIONS DEVOID OR PRACTICALLY DEVOID OF ANTITHROMBOTIC ACTIVITY

Jean-Claude Lormeau, Maromme, and Jean Choay, Paris, both of France, assignors to Choay S.A., Paris, France

Continuation-in-part of Ser. No. 681,017, Dec. 13, 1984, Pat. No. 4,686,288. This application Jan. 29, 1987, Ser. No. 8,631

Int. Cl.[4] **A61K** *31/725;* **C08B** *37/10;* **C07H** *1/00*

U.S. Cl. 536—21 **12 Claims**

1. An oligosaccharide fraction of the heparin chain which has antithrombotic activity in vivo (as measured by the (Yin-Wessler test) lower than that of heparin, which oligosaccharidic fraction (1) is soluble in a 50/50 v/v water-alcohol 0.5% NaCl pH 3.8 mixture, (2) comprises oligosaccharides, the majority of which are between 2 and 14 saccharide units in length and which have at the reducing end a 2,5-anhydromano unit, (3) has essentially no anticoagulant activity (as determined by the U.S.P. method), (4) has anti-Xa activity less than that of heparin, and (5) has an HPLC profile comprising a molecular weight average of about 2,430, a number average of about 1,980, and a peak molecular weight of about 1,850.

4,788,308

RHODIUM OXYMETALLATE CATALYSTS

Allen R. Siedle, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 825,663, Feb. 3, 1986, Pat. No. 4,673,753. This application Mar. 23, 1987, Ser. No. 29,435

Int. Cl.[4] **C07F** *15/00, 11/00, 5/00, 7/00*

U.S. Cl. 556—15 **6 Claims**

1. A method comprising the steps:

(a) reacting $(aryl_3P)_3Rh(CO)^+HC(SO_2CF_3)_2^-$ with a hydrated Keggin ion acid $(H_3O)_{8-n}X^{+n}M_{12}O_{40}$ or $(H_3O)_{9-n}X^{+n}M_{12}O_{40}$ in the presence of an alkylnitrile to form a rhodium oxymetallate $[(aryl_3P)_2Rh(CO)(alkylCN)]_{8-n}X^{+n}M_{12}O_{40}$ or $[(aryl_3P)_2Rh(CO)(alkylCN)]_{9-n}X^{+n}M_{12}O_{40}$,

wherein

alkyl is lower alkyl (C_1 to C_4),

aryl is phenyl or phenyl substituted by 1 to 3 lower alkyl or alkoxy groups,

X is a transition element of Periodic Table groups IIIA, IVA, or VA,

M is Mo or W, and

n is an integer having a value of 2 to 5, and

(b) isolating said resulting rhodium oxymetallate.

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4,788,309

METHOD OF FORMING COMPOUNDS HAVING SI-N GROUPS AND RESULTING PRODUCTS

Richard M. Laine, Palo Alto, and Yigal Blum, Menlo Park, both of Calif., assignors to SRI International, Menlo Park, Calif.

PCT No. PCT/US86/00458, § 371 Date Mar. 4, 1986, § 102(e) Date Mar. 4, 1986, PCT Pub. No. WO86/06377, PCT Pub. Date Nov. 6, 1986

Continuation-in-part of Ser. No. 727,415, Apr. 26, 1985, Pat. No. 4,612,383. This PCT application Mar. 4, 1986, Ser. No. 908,685

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] C07F *7/10*

U.S. Cl. 556—412 29 Claims

1. A method of producing a silazane containing at least two Si—N groups which comprises

(a) providing a precursor containing at least one Si—N group, catalytically cleaving an Si—N bond in the presence of a metal catalyst capable of activating Si—N bonds, such cleavage being carried out in the presence of hydrogen or a hydrogen donor, and reacting the cleavage product to produce the desired silazane, or

(b) providing one or more reactants which provide an Si—H group and an —NH group and causing reaction to occur between Si—H and —NH groups in the presence of a catalyst capable of activating Si—H and Si—N groups, such reaction resulting in formation of an Si—N group.

4,788,310

N-SILYLALKYLAMIDES AND THEIR USE AS ADHESION PROMOTERS IN ROOM TEMPERATURE VULCANIZABLE POLYDIORGANOSILOXANE COMPOSITIONS

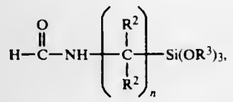
Judith Stein, Schenectady; Jeffrey H. Wengrovius, Scotia; Lori P. Engle, Clifton Park; David C. Gross, Schenectady, and John E. Hallgren, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 13, 1987, Ser. No. 72,948

Int. Cl.[4] C07F *7/10*

U.S. Cl. 556—419 4 Claims

1. An N-silylalkylformamide compound having the formula



wherein each R^2 is independently hydrogen or a primary or secondary alkyl radical containing from 1 to about 4 carbon atoms, R^3 is an alkyl radical containing from 1 to about 8 carbon atoms and n is from 2 to about 8.

4,788,311

NOVEL ORGANOSILICON COMPOUNDS USEFUL AS A STABILIZER FOR ORGANOPOLYSILOXANE COMPOSITIONS

Yoshio Inoue, Annaka, and Takeo Inoue, Yokohama, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

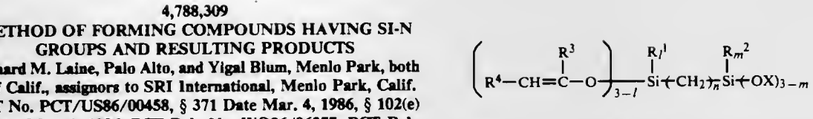
Filed Feb. 4, 1988, Ser. No. 152,416

Claims priority, application Japan, Feb. 5, 1987, 62-25225

Int. Cl.[4] C07F *7/08*

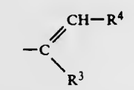
U.S. Cl. 556—435 6 Claims

1. An organosilicon compound of the following general formula (I)



(I)

in which R^1 and R^2 independently represent an unsubstituted or substituted monovalent hydrocarbon group having from 1 to 8 carbon atoms, R^3 and R^4 independently represent a hydrogen atom or an unsubstituted or substituted monovalent hydrocarbon group having from 1 to 8 carbon atoms, X has the same meaning as R^1 or is a group of the following formula



in which R^3 and R^4 have, respectively, the same meanings as defined above, l and m are, respectively, 0, 1 or 2, and n is an integer of from 2 to 8.

4,788,312

TRISILAHYDROCARBON LUBRICANTS

Kazimiera J. L. Paciorek, Corona del Mar; Robert E. Pratt, South Pasadena, and Joseph G. Shih, La Palma, all of Calif., assignors to Technolube Division Lubricating Specialties Co., Los Angeles, Calif.

Filed Mar. 16, 1988, Ser. No. 169,225

Int. Cl.[4] C07F *7/08*

U.S. Cl. 556—435 5 Claims

1. A trisilahydrocarbon synthetic lubricant base stock having the general formula

$$R_1R_2—Si[—A—Si(R_3R_4R_5)]_2$$

wherein R_1, R_2, R_3, R_4, and R_5 are alkyl groups having from one to twelve carbon atoms and mixtures thereof and —A— is an alkylene group or mixture of alkylene groups having from four to sixteen carbons.

4,788,313

SILALACTONES AND METHODS FOR THEIR PREPARATION AND USE

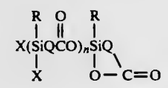
Grish Chandra, and Donnie R. Juen, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 23, 1983, Ser. No. 565,075

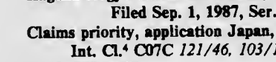
Int. Cl.[4] C07F *7/08, 7/18*

U.S. Cl. 556—442 14 Claims

1. A method comprising heating, under substantially anhydrous conditions, a reaction mixture comprising a halide salt catalyst selected from the group consisting of quaternary ammonium halide salts, quaternary phosphonium halide salts and alkyl pyridinium halide salts and an ester having the formula $X_2RSiQCOOR'$ wherein X denotes a chlorine or bromine atom, R denotes a monovalent hydrocarbon radical, Q denotes a divalent hydrocarbon radical, there being at least two carbon atoms in Q separating a silicon atom and a carbonyl carbon atom, and R' denotes an alkyl radical, said heating being sufficient to produce a silalactone composition having the formula



wherein X, R and Q have the meanings recited above and n has an average value greater than zero and further comprising mixing water with the silalactone composition in sufficient amount to hydrolyze substantially all hydrolyzable bonds attached to silicon in the silalactone composition and to provide an organopolysiloxane containing one or more siloxane units having the formula



wherein R and Q have the stated meanings.

4,788,314

METHOD FOR PRODUCING POLYMERIZABLE MONOMERS CONTAINING A SULPHATE GROUP

John N. Hay, Woking, and Ian G. Meldrum, Leatherhead, both of England, assignors to The British Petroleum Company p.l.c., London, England

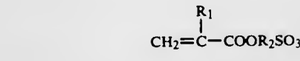
Continuation of Ser. No. 854,884, Apr. 23, 1986, abandoned, which is a continuation of Ser. No. 510,837, Jul. 5, 1983, abandoned. This application May 21, 1987, Ser. No. 53,566

Claims priority, application United Kingdom, Jul. 22, 1982, 8221267

Int. Cl.[4] C07C *141/10*

U.S. Cl. 558—32 10 Claims

1. A method for producing polymerizable monomers having the general formula:

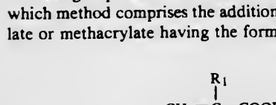


wherein

R_1 is a hydrogen atom or a methyl group

R_2 is one or more alkoxylate groups each of which alkoxylate group has from one to four carbon atoms,

which method comprises the addition of a hydroxy alkyl acrylate or methacrylate having the formula:



where R_1 and R_2 are the same as defined above, to chlorosulphonic acid wherein the reaction is carried out at a temperature in the range 0° to 10° C. and in which the reaction mixture is purged with a sparging gas.

4,788,315

2,5-SUBSTITUTED-CYCLOHEXANE-1,4-DIONES AND A PROCESS FOR PRODUCTION THEREOF

Takeo Kawabata, Hirakata, Japan, assignor to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

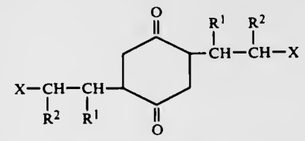
Filed Sep. 1, 1987, Ser. No. 91,691

Claims priority, application Japan, Sep. 3, 1986, 61-208276

Int. Cl.[4] C07C *121/46, 103/19, 62/20, 69/608*

U.S. Cl. 558—430 8 Claims

1. A 2,5-bis-substituted-cyclohexane-1,4-dione of the general formula



wherein R^1 and R^2 each is hydrogen or methyl; X is $—COOR^3$ (R^3=H or alkyl), $—CONR^4R^5$ (R^4 and R^5 each is hydrogen or alkyl) or —CN.

4,788,316

PREPARATION OF SULPHONATED AROMATIC ESTERS

David W. Thornthwaite, Neston; David W. Roberts, Bebington, both of Great Britain, and Stephen A. Madison, Valley Cottage, N.Y., assignors to Lever Brothers Company, New York, N.Y.

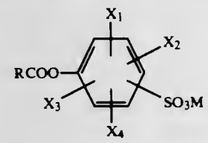
Filed Dec. 16, 1986, Ser. No. 942,564

Claims priority, application United Kingdom, Dec. 20, 1985, 8531392

Int. Cl.[4] C07C *143/38*

U.S. Cl. 558—268 13 Claims

1. A process for preparing substituted or unsubstituted sulphonato-phenyl carbonates having the general formula:



werein R is a C_1–C_{18} normal alkoxyl radical; X_1–X_4 may be hydrogens, or one or more may be halogens, C_1–C_4 alkyl or alkoxyl radicals, RCOO- wherein R is defined as above, or SO_3M; and M is an alkali metal, earth alkali metal or ammonium group, comprising the steps of:

(1) preparing the corresponding unsulphonated phenyl carbonate ester;

(2) sulphonating said unsulphonated phenyl carbonate ester to form a sulphonic acid derivative; and

(3) neutralising said sulphonic acid derivative of phenyl carbonate ester in a non-aqueous organic solvent with an alkali meal, earth alkali metal or ammonium carboxylate in an amount in excess over the amount needed to neutralise the sulphonic acid groups and any free or complexed SO_3 present in the product mixture from the sulphonation reaction.

4,788,317

AMMOXIDATION OF PARAFFINS AND CATALYSTS THEREFOR

Andrew T. Guttmann, Maple Heights; Robert K. Grasselli, Aurora, and James F. Brazdil, Jr., Mayfield Village, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 826,695, Feb. 6, 1986, abandoned, which is a division of Ser. No. 724,226, Apr. 17, 1985, Pat. No. 4,746,641, which is a continuation-in-part of Ser. No. 643,208, Aug. 22, 1984, abandoned, and a continuation-in-part of Ser. No. 919,105, Oct. 15, 1986, abandoned. This application May 8, 1987, Ser. No. 47,949

Int. Cl.[4] C07C *120/14*

U.S. Cl. 558—319 23 Claims

1. A process for the ammoxidation of a paraffin selected from propane and isobutane to make acrylonitrile and methacrylonitrile, respectively, by the catalytic vapor phase reaction of such a paraffin in admixture with oxygen and ammonia by contact with a complex metal oxide catalyst which is essentially free of bismuth, and has the elements and the proportions which are represented by the following empirical formula:

$$VSb_mA_aD_bC_cO_x,$$

where

A is one or more of W, Sn, B Mo and Ge;

D is one or more of Fe, Co, Ni, Cr, Mn, Cu, Pb, Zn, Se, Te and As;

C is one or more of an alkali metal, Ca, Sr, Ba, Tl and where m is greater than 1 and up to 20; a is 0.2–10; b is 0–5; c is 0–1; a is equal to or less than m; b is equal to or less than m; wherein x is determined by oxidation state of the other

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elements present, and wherein the antimony has an average valency higher than +3 and the vanadium has an average valency lower than +5, wherein A includes at least 0.2 atoms of W, crystalline Sb_2O_4 is present in said catalyst, and wherein the foregoing catalyst is on an inorganic oxide support material selected from silica, alumina, titania, zirconia, silica-niobia, silica-zirconia, silica-titania, silica-alumina, Nb_2O_5 and magnesia.

4,788,318

PROCESS FOR THE PRODUCTION OF 4,4,8,8,10-PENTAMETHYL-10-CYANO-BICYCLO[4.4.0]-DEC-1,6-EN-2-ONE

Wilfried Buschken, Haltern, and Klaus Rindtorff, Recklinghausen, both of Fed. Rep. of Germany, assignors to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 25, 1987, Ser. No. 89,129

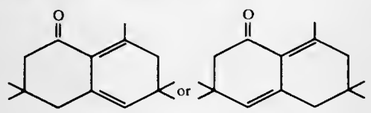
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640306

Int. Cl.⁴ C07C *120/02*

U.S. Cl. 558—335 **10 Claims**

1. A process for the production of the bicyclic compound 4,4,8,8,10-pentamethyl-10-cyanobicyclo[4.4.0]-dec-1,6-en-2-one, comprising the steps of:

reacting a ketone fraction comprising



or mixtures thereof,

by adding HCN to said ketone fraction in the presence of a base, at a temperature of 150°–200° C. to obtain an addition product comprising said bicyclic compound, and isolating said addition product.

4,788,319

NOVEL ISOCARBACYCLINS AND PROCESSES FOR PRODUCTION THEREOF

Atsuo Hazato; Toshio Tanaka, both of Hino; Noriaki Okamura, Chofu; Kiyoshi Bannai, Hino; Kurozumi, Seizi, Kokubunji; Suzuki, Masaaki, Nagoya, and Noyori, Ryoji, Aichi, all of Japan, assignors to Teijin Limited, Tokyo, Japan

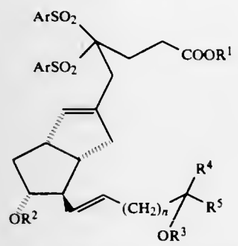
Filed May 1, 1987, Ser. No. 44,957

Claims priority, application Japan, May 1, 1986, 61-99470; Sep. 19, 1986, 61-219117; Sep. 19, 1986, 61-219118; Sep. 19, 1986, 61-219119

Int. Cl.⁴ C07C *147/107*

U.S. Cl. 560—011 **7 Claims**

1. A novel isocarbacyclin which is a compound represented by the following formula [1]



[1]

wherein R^1 represents a hydrogen atom, or a C_1–C_4 alkyl or alkenyl group; R^2 and R^3 are identical or different and each represents a hydrogen atom, a tri(C_1–C_7)hydrocarbon-silyl group or a group forming an acetal linkage together with the oxygen atom of the hydroxyl group; R^4 represents a hydrogen atom, a methyl group or a vinyl group; R^5 represents an unsubstituted linear or branched C_3–C_8 alkyl group which may be interrupted by an oxygen atom, a substituted linear or branched C_1–C_5 alkyl group in which the substituent is a C_1–C_6 alkoxy group or a phenyl, phenoxy or C_3–C_{10} cycloalkyl group which may be substituted further, a phenyl group which may be substituted, a phenoxy group which may be substituted, or a C_3–C_{10} cycloalkyl group which may be substituted; n is 0 or 1; and Ar represents a substituted or unsubstituted phenyl group, its enantiomorph, or a mixture both in an arbitrary ratio.

4,788,320

BENZOYLACETIC ACID ESTER DERIVATIVES AND PROCESS FOR THEIR PREPARATIONS

Tsutomu Irikura, Tokyo; Seigo Suzue, Kuki; Satoshi Murayama, Tochigi; Keiji Hirai, Kuki, and Takayoshi Ishizaki, Saitama, all of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

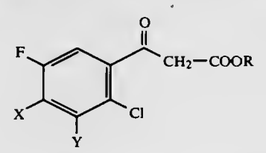
Filed Jan. 16, 1987, Ser. No. 4,043

Claims priority, application Japan, Jan. 20, 1986, 61-9649; Dec. 1, 1986, 61-286524

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—54 **5 Claims**

1. Benzoylacetic acid ester derivatives of the formula (I),



(I)

wherein R is a lower alkyl group, X is a halogen atom and Y is a chlorine or bromine atom.

4,788,321

PERFLUOROALKENYLOXYBENZOIC ACID DERIVATIVE, PROCESS FOR PREPARING THE SAME AND PREPOLYMER OF THE DERIVATIVE

Motonobu Kubo, Toyonaka, and Sinji Tamaru, Suita, both of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

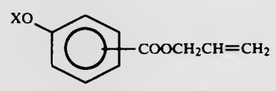
Filed Dec. 28, 1987, Ser. No. 138,398

Claims priority, application Japan, Dec. 29, 1986, 61-311326; Feb. 25, 1987, 62-43549

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—65 **6 Claims**

1. A perfluoroalkenyloxybenzoic acid derivative of the formula



(1)

wherein X is perfluoroalkenyl group having 6 to 14 carbon atoms.

4,788,322

PROCESS FOR PREPARING ACHPA

Paul F. Schuda, New Providence; William J. Greenlee, Teaneck; Prasun K. Chakravarty, Edison, and Philip Escola, Spring Lake Heights, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 31, 1987, Ser. No. 80,943

Int. Cl.⁴ C07C *125/065*

U.S. Cl. 560—115 **2 Claims**

1. A process for preparing (3S, 4S)-(N-α-BOC)-4-amino-5-cyclohexyl-3-hydroxypentanoic acid ethyl ester comprising treatment of N-α-BOC-amino-3-hexahydrophenylpropionic acid with 1,1-carbonydiimidazole to form an acylimidazole-activated derivative of N-α-BOC-amino-3-hexahydrophenyl-propionic acid, then

(a) coupling said acylimidazole-activated derivative with the magnesium salt of malonic acid monoethylester to afford the β-ketoester;

(b) reducing said β-ketoester using sodium cyanoborohydride in tetrahydrofuran and glacial acetic acid to produce a mixture of (3S,4S)-(Nα-BOC)-4-amino-5cyclohexyl-3-hydroxypentanoic acid ethyl ester and (3S,4S)-(Nα-BOC)-4-amino-5-cyclohexyl-3-hydroxypentanoic acid ethyl ester; and

(c) crystallizing off the (3R,4S) compound and purifying the remaining product to afford optically-pure (3S,4S)-(Nα-BOC)-4-amino-5-cyclohexyl-3-hydroxypentanoic acid.

4,788,323

METHOD FOR RACEMIZATION OF OPTICALLY ACTIVE CHRYSANTHEMIC ACID OR ITS ESTER

Gohfu Suzukamo, Osaka; Yoji Sakito, Hyogo; Masami Fukao, Shiga, and Koji Hagiya, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

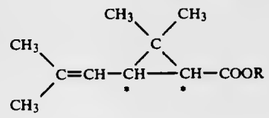
Filed Sep. 4, 1987, Ser. No. 93,234

Claims priority, application Japan, Sep. 4, 1986, 61-208768; Feb. 10, 1987, 62-28581; Feb. 10, 1987, 62-28582

Int. Cl.⁴ C07C *69/747*

U.S. Cl. 560—124 **30 Claims**

1. A method for the racemization of optically active chrysanthemic acid or its ester of the formula:



(I)

wherein R represents a hydrogen atom, an alkyl group of 1–20 carbon atoms, a cycloalkyl group of 3–20 carbon atoms or an aralkyl group of 7–20 carbon atoms and * mark represents an asymmetric carbon atom, which comprises contacting the acid or its ester with hydrogen bromide or a phosphorus bromide compound.

4,788,324

PREPARATION OF O-(1-METHOXY-2-CHLORO)-ETHOXYPHENYL N-METHYLCARBAMATE

Gernot Reissenweber, Boehl-Iggelheim; Siegfried Kersten, Frankenthal, and Detlef Doehnert, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 794,456, Nov. 4, 1985. This application Sep. 25, 1987, Ser. No. 102,290

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1984, 3441108

Int. Cl.⁴ C07C *175/04*

U.S. Cl. 560—132 **4 Claims**

1. A process for the preparation of o-(1-methoxy-2-chloro)-ethoxyphenyl N-methylcarbamate by reacting pyrocatechol carbonate with methylamine and then reacting the resulting pyrocatechol monomethylcarbamate with 1,2-dichloroethyl methyl ether in the presence of an amine, wherein both the reaction of pyrocatechol carbonate with methylamine and the subsequent conversion of the pyrocatechol monomethylcarbamate are carried out in the presence of a secondary amine HNR_2 selected from the group consisting of diisopropylamine and dicyclohexylamine.

4,788,325

CONVERSION OF AN ALLYLIC ETHER TO ITS CORRESPONDING CARBONYL COMPOUND

Biau-Hung Chang, West Chester, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

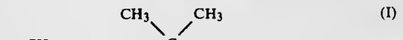
Filed May 29, 1987, Ser. No. 55,393

Int. Cl.⁴ C07C *45/51*

U.S. Cl. 560—174 **27 Claims**

1. A process for making a carbonyl-containing compound selected from the group consisting of aldehydes and ketones comprising contacting an allylic ether having the structural formula

where R^1 and R^3 are the same or different and are hydrogen or a cyclic or an acyclic hydrocarbyl group containing up to about 15 carbon atoms which may be substituted with a carboxylate group, a carbonyl group, a nitrile group, an ether group or mixtures thereof; and R^2 is a cyclic or acyclic hydrocarbyl group containing up to about 12 carbon atoms with water in the presence of a cobalt-containing material under an atmosphere of carbon monoxide gas whereby a carbonyl-containing compound having the structural formula



where R^1 and R^3 have the meanings given above is formed.

19. A process for making alkyl 9-oxononanoates comprising contacting an alkyl 9-alkoxy-7-nonenoate with water in the presence of a cobalt-containing material under an atmosphere of carbon monoxide gas.

4,788,326

PREPARATION OF 4-PENTENOATES

Wolfgang Hoelderich, Frankenthal; Wolfgang Richter, Wachenheim; Hubert Lendle, Ludwigshafen, and Klaus-Dieter Malsch, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,121

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521381

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.⁴ C07C *67/333*

U.S. Cl. 560—205 **11 Claims**

1. A process for the preparation of 4-pentenoic esters by the isomerization of 3-pentenoic esters which comprises:

heating 3-pentenoic esters in a reactor to a temperature of from 50° C. to 300° C. in the presence of a zeolite catalyst having a pentasil structure, and

distilling off from the reaction mixture the 4-pentenoic esters that are formed.

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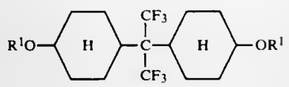
4,788,327

4,4'-(PERFLUOROISOPROPYLIDENE)DICYCLOHEXANOL, DERIVATIVE THEREOF AND PROCESS FOR PREPARING THE SAME

Sinji Tamaru, Suita, and Motonobu Kubo, Toyonaka, both of Japan, assignors to Daiken Industries, Ltd., Osaka, Japan

Filed Feb. 19, 1988, Ser. No. 157,871
Claims priority, application Japan, Feb. 20, 1987, 60-50544
Int. Cl.[4] C07C *69/52*
U.S. Cl. 560—220 5 Claims

1. 4,4'-(Perfluoroisopropylidene)dicyclohexanol or its organic acid ester of the formula



(I)

wherein R^1 is hydrogen atom or acyl group having 1 to 10 carbon atoms.

4,788,328

HYDROXY ALKYL (AMINO) ACRYLATE MONOMERS AND COPOLYMERS THEREOF

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

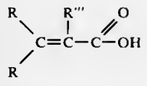
Filed Jul. 7, 1986, Ser. No. 882,330
Int. Cl.[4] C07C *69/52*
U.S. Cl. 560—222 4 Claims

1. The process comprising reacting at a temperature in the range of from about 0° C. to about 100° C. a bicyclic amide acetal having the formula I



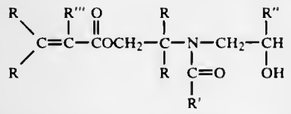
I

with olefinically unsaturated carboxylic acid having the formula II



II

to form a hydroxy alkyl (amido) acrylate monomer having the formula III



III

wherein R, R', R'' and R''' independently represent hydrogen, an alkyl group or an alkyl ether group having from 1 to 20 carbon atoms, an aryl group or aryl ether group having from 6 to 12 carbon atoms wherein the molar ratio of bicyclic amide acetal to unsaturated carboxylic acid is in the range of from about 1:0.9 to 0.9:1.

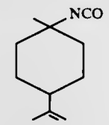
4,788,329

PREPARATION OF CYCLOHEXYL MONO- AND DIURETHANES AND ISOCYANATES DERIVED THEREFROM BY ADDITION OF METHYLCARBAMATE TO LIMONENE, PROCESS AND COMPOSITIONS

Laurence J. Nummy, Newburgh, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 3, 1986, Ser. No. 926,068
Int. Cl.[4] C07C *119/045*
U.S. Cl. 560—330 2 Claims

1. A compound having the formula



(V)

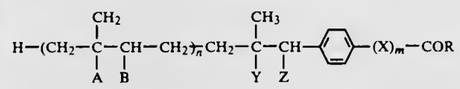
4,788,330

POLYPRENYL COMPOUNDS

Kouji Nakamoto, Tsuchiura; Takeshi Suzuki; Shinya Abe, both of Ushikumachi; Kenji Hayashi; Akiharu Kajiwara, both of Yatabemachi; Isao Yamatsu, Ushikumachi; Issei Otsuka, Niihari, and Hiroyuki Shiojiri, Yatabemachi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 37,472
Claims priority, application Japan, Mar. 15, 1985, 60-50544
Int. Cl.[4] C07C *63/04*
U.S. Cl. 562—493 11 Claims

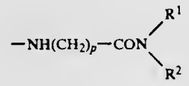
1. A pharmaceutical composition having antihypercholesterolemic activity or antiarteriosclerotic activity, which comprises a polyprenyl compound having the formula:



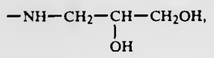
wherein A, B, Y and Z are hydrogens, or the pair A and B, and the pair Y and Z, each form a single valence bond between the carbon atoms to which they are attached, n is an integer of 0 to 2, X is a group having the formula



wherein K and L are hydrogens or the pair K and L forms a single valence bond between the carbon atoms to which they are attached, a group having the formula $—CH_2—$ or a group having the formula $—(CH_2)_2—$, m is an integer of 0 or 1, and R is hydroxy, a group having the formula



wherein R^1 and R^2 are the same or different and each is hydrogen or lower alkyl and p is an integer of 1 or 2, a group having the formula $—NH—(CH_2)_q—OH$ wherein q is an integer of 1 or 2, or a group having the formula



or a pharmacologically acceptable salt thereof, and a pharmaceutically acceptable carrier.

4,788,331

METHOD OF PREPARING 5-AMINO SALICYLIC ACID

Ulf Sjöstrand, Karlskoga, Sweden, assignor to Nobel Kemi AB, Karlskoga, Sweden

Filed Jul. 7, 1987, Ser. No. 79,591
Claims priority, application Sweden, Jul. 7, 1986, 8603007
Int. Cl.[4] C07C *99/00*
U.S. Cl. 562—453 7 Claims

1. A method of producing 5-amino salicylic acid with sulphanilic acid as auxiliary chemical, characterized in that 5-(p-sulphophenyl azo) salicylic acid, produced by linking of the double sodium salt of the salicylic acid with a diazonium salt of sulphanilic acid, is split by hydrogenation with hydrogen gas and a catalyst at elevated pressure and temperature in excess of 50° C., whereafter the thus obtained 5-amino salicylic acid is precipitated from the mother liquor by acidification thereof.

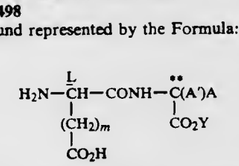
4,788,332

L-AMINODICARBOXYLIC ACID ESTERS

Paul R. Zanno, Nannet, N.Y.; Ronald E. Barnett, Barrington, and Glenn M. Roy, Streamwood, both of Ill., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 82,246, Aug. 5, 1987, which is a continuation-in-part of Ser. No. 898,063, Aug. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 723,603, Apr. 15, 1985, abandoned. This application Jan. 19, 1988, Ser. No. 145,786
Int. Cl.[4] C07C *103/37*
U.S. Cl. 562—498 79 Claims

1. A compound represented by the Formula:



and food-acceptable salts thereof, including a food acceptable salt of N-L-aspartyl-D-alanine[β(+)fenchyl]ester and a food acceptable salt of N-L aspartyl-2-methylalanine[β(+)fenchyl]-ester wherein

A is hydrogen, and alkyl containing 1–3 carbon atoms,

A' is hydrogen or alkyl containing 1–3 carbon atoms; alternatively

A and A' taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;

Y is $—(CHR_2)_n—R_1$ or $—CHR_3R_4$;

R_1 is a β,β-dialkyl cycloalkyl, a β,β'-dialkyl cycloalkyl, a β,β,β'-trialkyl cycloalkyl, β,β,β',β'-tetraalkyl cycloalkyl on which the alpha substituent is hydrogen and wherein the cycloalkyl ring contains up to 6 ring carbon atoms and a total of 12 carbon atoms;

with the proviso that when the double asterisked carbon is an asymmetric or chiral center, the configuration around said carbon is in the D form.

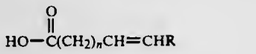
4,788,333

HYDROCARBOXYLATION OF UNSATURATED CARBOXYLIC ACIDS TO LINEAR DICARBOXYLIC ACIDS

Patrick M. Burke, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 7, 1985, Ser. No. 689,165
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] C07C *51/14*
U.S. Cl. 562—517 8 Claims

1. A process for the preparation of linear saturated dicarboxylic acids which comprises contacting an unsaturated monocarboxylic acid having the formula



wherein R is selected from the class consisting of hydrogen, methyl and ethyl, n is 0–8 with carbon monoxide and water in the presence of a rhodium-containing catalyst, an iodide compound and a hydrolysis resistant saturated halocarbon solvent, except fluorocarbon, and mixtures thereof having 1–2 carbon atoms and when the solvent has two carbon atoms not more than two halogen atoms are attached to each carbon atom, at a temperature in the range of 100°–240° C. and a pressure in the range of 14–240 atmospheres while maintaining the concentration of water less than 4.3% by weight based upon the weight of the solvent.

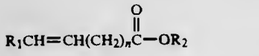
4,788,334

ACID ACCELERATED HYDROCARBOXYLATION

Patrick M. Burke, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1986, Ser. No. 943,310
Int. Cl.[4] C07C *51/14*
U.S. Cl. 562—522 6 Claims

1. A process for the hydrocarboxylation of an olefinically unsaturated straight chain compound selected from the class consisting of linear olefinically unsaturated esters having the formula:



wherein n is 0 to 5, R_1 is H, CH_3 or C_2H_5 and R_2 is alkyl, and terminally unsaturated alkenes having 4 to 16 carbon atoms to form a mixture containing an increased amount of linear carboxylate acid, which comprises dissolving said compound in a solvent selected from the class consisting of methylene chloride; 1,2-dichloroethane and aromatic solvents having 6 to 9 carbon atoms, mixing the thus formed solution with carbon monoxide, water, rhodium catalyst, iodide promoter and an accelerator selected from the class consisting of aliphatic and aromatic acids having a pKa in the range of 4.2 to 5.2 in an amount at least equal, on a molar basis, to the amount of olefinically unsaturated straight chain compound, and reacting the mixture at temperature of from 50° to 300° C. to form linear carboxylic acid.

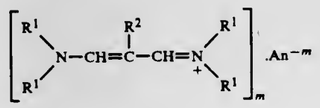
4,788,335

HYPOGLYCEMIC N-(2-SUBSTITUTED-3-DIALKYLAMINO-2-PROPENYLIDENE)-N-ALKYLALKANAMINIUM SALTS

Eugene R. Wagner, Carmel; Donald P. Matthews, and Charlotte L. Barney, both of Indianapolis, all of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 656,827, Oct. 2, 1984, abandoned, which is a division of Ser. No. 494,471, May 16, 1983, abandoned. This application Oct. 20, 1987, Ser. No. 111,373
Int. Cl.[4] C07C *119/08*
U.S. Cl. 564—279 4 Claims

1. A compound of the formula



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wherein R^1 is methyl or ethyl; R^2 represents a group of formula R^3S- or R^4O-; R^3 is selected from the group consisting of straight or branched chain alkyl having from 1 to 12 carbon atoms, straight or branched chain alkenyl having from 2 to 12 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, cycloalkylalkyl having from 4 to 10 carbon atoms, benzyl, or phenyl optionally substituted by from 1 to 3 substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, hydroxy, benzyloxy, di(lower alkyl)amino, nitro, phenyl or benzyl, or by a single 2,3- or 3,4-methylenedioxy moiety; R^4 represents cycloalkyl of from 3 to 8 carbon atoms, straight or branched chain alkyl or alkenyl of from 3 to 12 carbon atoms or cycloalkylalkyl of from 4 to 10 carbon atoms; An is a pharmaceutically acceptable anion; and m is an integer corresponding to the valence of the anion.

4,788,336

NOVEL ORGANIC COMPOUNDS FOR USE IN ELECTROPHOTOGRAPHIC ELEMENTS

Norman G. Rule, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

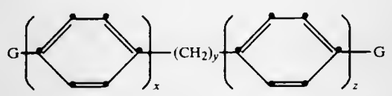
Filed Jan. 23, 1987, Ser. No. 6,400

Int. Cl.[4] C07C *87/50*

U.S. Cl. 564—315 **8 Claims**

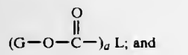
1. An organic compound having the formula selected from the group consisting of:

(a)



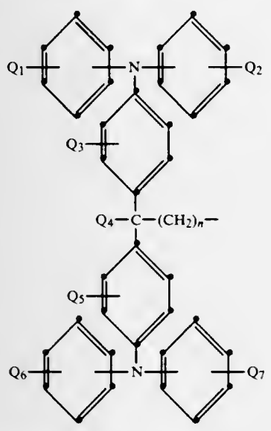
wherein x is an integer from 0 to 2, y is an integer from 1 to 6, and z is an integer from 0 to 2;

(b)



(c)

wherein L is aliphatic, alicyclic or aromatic and a is an integer from 2 to 6; and wherein G has the formula



wherein n is an integer from 0 to 6; Q_1, Q_2, Q_3, Q_5, Q_6, Q_7, which may be the same or different, represent H or CH_3, and Q_4 represents H or CH_3 when x and z are 0 or n is greater than 0, or Q_4 represents CH_3 when x or z are 1 or 2 and n is 0.

4,788,337

2-ALKANOYL-2-(1-PENTEN-1-YL)CYCLOHEXANONES, PROCESS FOR PREPARING SAME, AND ORGANOLEPTIC USES THEREOF AND INTERMEDIATES USEFUL IN SAID PROCESS

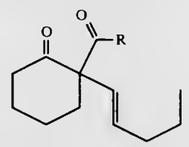
Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,657

Int. Cl.[4] C07C *49/647*

U.S. Cl. 568—376 **3 Claims**

1. An 2-alkanoyl-2-(1-penten-1-yl)cyclohexanone defined according to the structure:



wherein R represents methyl or ethyl.

4,788,338

PREPARATION OF KETONES

Robert G. Beevor, Twickenham, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jun. 12, 1987, Ser. No. 61,105

Claims priority, application United Kingdom, Jun. 19, 1986, 86 14910

Int. Cl.[4] C07C *45/49*

U.S. Cl. 568—387 **7 Claims**

1. A process for the preparation of ketones, said process comprising reacting an alkene with carbon monoxide and a secondary alcohol at elevated temperature in the presence of a rhodium catalyst and a promoter selected from monoalkanolamines, dialkanolamines, trialkanolamines or etherified analogs thereof.

4,788,339

PERFLUOROAMINOETHERS

George G. I. Moore, Afton, and John C. Hansen, Lakeland, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 773,314, Sep. 6, 1985, abandoned. This application Aug. 14, 1986, Ser. No. 894,311

Int. Cl.[4] C07C *87/22*

U.S. Cl. 564—457 **21 Claims**

1. Perfluorinated aminoether compositions comprising perfluoroaminoethers having two or more tertiary amino nitrogen atoms each of which is connected to the other(s) adjacent thereto by (1) a catenary, ether oxygen-containing perfluoroalkylene linking group, the catenary carbon atoms of which are in the form of perfluoroalkylene segments of carbon atoms that are 2 to 4 in number, said segments having up to 5 carbon atoms, (2) a catenary ether oxygen-containing perfluorocyclohexylene linking group, or (3) a catenary ether oxygen-containing linking group having said perfluoroalkylene segments and perfluorocyclohexylene moieties, the sum of the catenary ether oxygen atoms in said linking groups being 1 to 3 and each of the terminal amino nitrogen atoms having bonded thereto two perfluoroalkyl radicals.

4,788,340

BORATED HYDROXYL-CONTAINING COMPOSITIONS AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 862,155, May 12, 1986, Pat. No. 4,692,257, which is a continuation of Ser. No. 753,098, Jul. 9, 1985, abandoned, which is a continuation of Ser. No. 304,482, Sep. 22, 1981, abandoned. This application Jul. 1, 1987, Ser. No. 68,379

Int. Cl.[4] C10M *141/02*

U.S. Cl. 568—1 **5 Claims**

1. The reaction product resulting from the reaction of a 1,2-hydrocarbyl vicinal diol having the formula:

$$R(-OH)_2$$

wherein R is a hydrocarbyl group containing about 10 to about 30 carbon atoms with a boron compound of the formula

$$(R_1O)_xB(OH)_y$$

where R_1 is a C_1 to C_6 alkyl group, x is 0 to 3, and y is 0 to 3, the sum of x and y being 3.

4,788,341

PROCESS FOR PREPARING 2-ACETONAPHTHONES

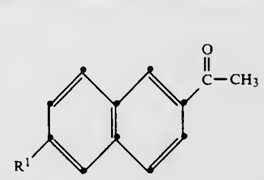
Joseph R. Zoeller, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 13, 1987, Ser. No. 107,745

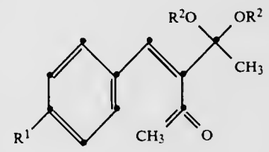
Int. Cl.[4] C07C *45/45*

U.S. Cl. 568—315 **18 Claims**

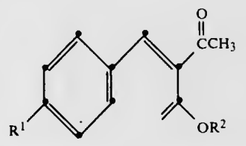
1. A process for preparing a 2-acetonaphthone of the formula



wherein R^1 is H, halo or (C_1-C_{12})alkoxy, acyloxy, carboxy, carbalkoxy, acyl, alkyl or thioalkyl, said process comprising heating at a temperature within the range of 150° C. to 800° C. and a pressure within the range of about 0.1 mmHg to 3 atm a compound selected from the group consisting of a ketal of the formula



wherein R^1 is described above, and each R^2 is (C_1-C_{12})alkyl or the two R^2 taken together are (C_2-C_{12})alkylene, or an enol ether of the formula



wherein R^1 is as defined above and R^2 is (C_1-C_{12})alkyl or C_2-C_{12} acyl at a temperature effective to cyclize the compound and obtain said 2-acetonaphthones.

4,788,342

PROCESS FOR PREPARATION OF 4,4,8,8,10-PENTAMETHYLBICYCLO[4,4,0]-DECENE-(1,6)-ONE(2)

Wilfried Büschken, Haltern, Fed. Rep. of Germany, assignor to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,353

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3639921

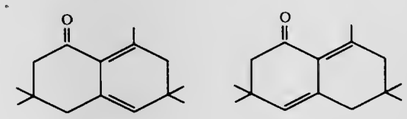
Int. Cl.[4] C07C *45/62*

U.S. Cl. 568—350 **21 Claims**

1. A process for preparing 4,4,8,8,10-pentamethylbicyclo [4,4,0]-decene-(1,6)-one(2), comprising:

(a) carrying out a condensation reaction of acetone to isophorone in a pressure distillation reaction column having a bottom product wherein a pressure of about 30 atmospheres gage is maintained in said column having a head temperature of about 205 degrees Centigrade and a sump temperature of about 235 degrees Centigrade;

(b) fractionalizing said bottom product at pressures between 1 and 100 mbars and a head temperature of about 125 to 145 degrees centigrade and isolating ketone blend consisting essentially of C_{15} compounds comprising predominantly isomers [B] and [C] having the following general formulas:



[B] [C]

(c) selectively hydrating said isolated ketone blend in the presence of a noble metal catalyst selected from the group consisting of platinum and palladium at hydrogen pressures of 20 to 250 bars and at temperatures between 25° and 150° C. to produce a hydrated output; and

(d) separating said 4,4,8,8,10-pentamethylbicyclo [4,4,0]-decene-(1,6)-one(2) from said hydrated output.

4,788,343

PRODUCTION OF CYCLOHEPTANONE

Walter Kleine-Homann, Dülmen, Fed. Rep. of Germany, assignor to Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,186

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1986, 3637787

Int. Cl.[4] C07C *45/45*

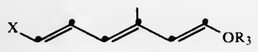
U.S. Cl. 568—355 **13 Claims**

1. A process for the preparation of cycloheptanone from a suberic-acid ester, comprising evaporating a suberic-acid ester and reacting said ester in the gas phase on aluminum oxide support catalysts doped with a catalytic amount of an oxide selected from the group consisting of zinc oxide, cerium oxide or a mixture thereof at temperatures between 300° and 600° C. and diluting said evaporated ester with a compound selected from the group consisting of alcohol, water or a mixture thereof.

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4,788,344
PROCESS FOR THE PREPARATION OF POLYENE ETHERS
Lucette Duhamel; Pierre Duhamel, both of Mont-Saint Aignan, and Jean-Pierre Lecouve, Caluire, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France
Division of Ser. No. 24,677, Mar. 11, 1987. This application Mar. 14, 1988, Ser. No. 167,488
Claims priority, application France, Mar. 14, 1986, 86 03668
Int. Cl.⁴ C07C *43/225*
U.S. Cl. 568—614 **2 Claims**

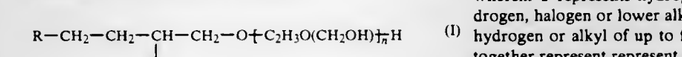
1. A compound of the formula:



in which X is halogen and R_3 is alkyl of 1 to 4 carbon atoms.

4,788,345
POLYGLYCEROL ETHERS AND THEIR USE IN COSMETICS AND IN PHARMACY
Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France
Filed Jan. 20, 1987, Ser. No. 4,498
Claims priority, application Luxembourg, Jan. 27, 1986, 86258
Int. Cl.⁴ C07C *43/11*; A61K *7/135, 7/06*
U.S. Cl. 568—623 **2 Claims**

1. Mixture of compounds of formula:



(I)

in which R denotes a saturated hydrocarbon radical, or mixture of such radicals, having 10 carbon atoms and n denotes a mean statistical value from 2 to 15.

4,788,346
PROCESS FOR THE PREPARATION OF PARA-NITROPHENOL
Michel Desbois, Rillieux La Pape, France, assignor to Rhone-Poulenc Chimie, Courbevoie Cedex, France
Filed May 27, 1987, Ser. No. 54,852
Claims priority, application France, May 29, 1986, 86 07918
Int. Cl.⁴ C07C *79/24, 76/02*
U.S. Cl. 568—706 **12 Claims**

1. A process for the preparation of para-nitrophenol comprising the steps of nitrating a phenyl ester of an inorganic acid with a nitrating agent selected from nitric acids with a minimum concentration of 65%, alkali metal salts of nitric acid and nitronium salts, in the presence of liquid hydrofluoric acid at a temperature ranging from −20° C. to 150° C., and hydrolyzing the nitrated product obtained by said nitration reaction, said hydrolysis being carried out simultaneously with said nitration reaction or said hydrolysis being carried out sequentially with said nitration reaction.

4,788,347
PROCESS FOR PRODUCING FORMALDEHYDE
Masakazu Sagou, Tokyo, and Hideyo Fujii, Ehime, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
Filed Sep. 18, 1987, Ser. No. 98,274
Claims priority, application Japan, Sep. 24, 1986, 61-225530
Int. Cl.⁴ C07C *47/04*
U.S. Cl. 568—487 **18 Claims**

1. A process for producing formaldehyde comprising:
dehydrogenating methanol in the substantial absence of oxygen wherein the dehydrogenation is performed in the presence of a catalyst which is a zinc-silicon complex oxide obtained by
(A) either (i) mixing a solution containing a zinc salt of an inorganic or organic acid with a solution containing an inorganic silicate compound, or (ii) adding urea to a solution containing a zinc salt of an inorganic or organic acid and an organic silicate compound until a precipitate is formed; and
(B) subsequently baking the precipitate at a temperature of at least 500° C.

4,788,348
INSECTICIDAL ALKENES
Alan J. Whittle, Aldershot, England, assignor to Imperial Chemical Industries PLC, London, England
Filed Aug. 12, 1987, Ser. No. 84,199
Int. Cl.⁴ C07C *43/257, 43/20*
U.S. Cl. 568—638 **2 Claims**

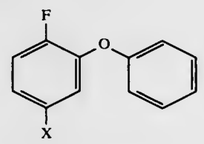
1. A compound for formula:



wherein Y represents hydrogen or halogen; Z represents hydrogen, halogen or lower alkyl; and R^1 and R^2 each represent hydrogen or alkyl of up to four carbon atoms, or R^1 and R^2 together represent represent an alkylene group of from two to five carbon atoms.

4,788,349
HALOGENATED DIPHENYL ETHER DERIVATIVES
Alan J. Whittle, Aldershot, England, assignor to Imperial Chemical Industries PLC, London, England
Filed May 22, 1987, Ser. No. 52,969
Claims priority, application United Kingdom, Jun. 9, 1986, 8614002
Int. Cl.⁴ C07C *43/225*
U.S. Cl. 568—639 **3 Claims**

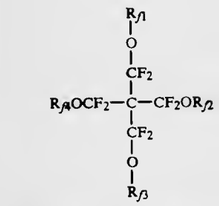
1. A compound of formula:



wherein X is selected from bromine and chlorine.

4,788,350
SPHERICAL PERFLUOROETHERS
Richard J. Lagow, 100 Navajo Trail, Georgetown, Tex. 78628
Filed Sep. 1, 1987, Ser. No. 91,659
Int. Cl.⁴ C07C *43/12*
U.S. Cl. 568—677 **6 Claims**

1. Perfluoroethers of the formula:



wherein R_{f1}, R_{f2}, R_{f3} and R_{f4} are the same of different and are selected from short, straight or branched chain perfluoroalkyl or perfluoroether groups.

4,788,351
PROCESS FOR THE PRODUCTION OF 2,3-DICHLORO-1-PROPANOL
Sadao Takakuwa, Suita; Tetsuya Nakada, and Keishiro Nagao, both of Amagasaki, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan
Filed Aug. 10, 1987, Ser. No. 83,190
Claims priority, application Japan, Jul. 18, 1985, 60-158790; Jul. 26, 1985, 60-166320
Int. Cl.⁴ C07C *24/62*
U.S. Cl. 568—848 **6 Claims**

1. In a process for the production of 2,3-dichloro-1-propanol comprising reacting allyl alcohol and chlorine gas in aqueous hydrochloric acid, the improvement comprises using an aqueous solution of hydrochloric acid having a concentration of 25 to 40% by weight and carrying out the reaction of allyl alcohol and chlorine gas by supplying allyl alcohol and chlorine gas simultaneously to the reaction system.

4,788,352
TRIFLUOROALKENES AND A METHOD FOR THEIR PREPARATION
Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Continuation of Ser. No. 887,454, Jul. 21, 1986, abandoned, which is a division of Ser. No. 780,522, Sep. 25, 1985, abandoned. This application Oct. 20, 1987, Ser. No. 110,610
Int. Cl.⁴ C07C *17/28, 21/18*
U.S. Cl. 570—153 **7 Claims**

1. A selective process for the preparation of trifluoroalkenes of the formula RCF_3, wherein R is C_5 to C_6 unsaturated alkyl, which comprises contacting and reacting 3,3,3-trifluoropropylene with one or more C_3 to C_4 olefins in the presence of a liquid solution of one or more palladium (II) compounds.

4,788,353
METHOD FOR THE SYNTHESIS OF IODOBENZENE
Giuseppe Paparatto, Milan, and Marco Saetti, Priolo, both of Italy, assignors to Montedipe S.p.A., Milan, Italy
Continuation of Ser. No. 784,571, Oct. 4, 1985, abandoned. This application Mar. 4, 1987, Ser. No. 22,599
Claims priority, application Italy, Oct. 5, 1984, 23004 A/84
Int. Cl.⁴ C07C *17/15*
U.S. Cl. 570—203 **7 Claims**

1. In a method for the synthesis of iodobenzene by the catalytic oxidative iodination of benzene, at 200° to 550° C. and in the gaseous phase, with iodine and elemental oxygen or an oxygen-containing gas, the improvement consisting essentially in that the catalyst is selected from the class consisting of zeolites of the ZSM5 type and zeolites of the ZSM11 type, exchanged with a bivalent or trivalent metal cation.

4,788,354
METHOD FOR THE SYNTHESIS OF IODOBENZENE
Giuseppe Paparatto, Cinisello Balsamo, and Marco Saetti, Priolo, both of Italy, assignors to Montedipe S.p.A., Milan, Italy
Continuation-in-part of Ser. No. 786,483, Oct. 11, 1985. This application Feb. 27, 1987, Ser. No. 19,630
Claims priority, application Italy, Oct. 16, 1984, 23169 A/84
Int. Cl.⁴ C07C *17/15*
U.S. Cl. 570—203 **11 Claims**

1. A method for the synthesis of iodobenzene at 200°-500° C., characterized in that iodine, benzene and air or other gas containing molecular oxygen, are brought into contact, in the gaseous phase, with at least one zeolite of the X or the Y type, such zeolite having been exchanged with sodium.

4,788,355
OXYIODINATION CATALYST
Mark Rule, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 16, 1987, Ser. No. 109,029
Int. Cl.⁴ C07C *17/152, 17/15*
U.S. Cl. 570—203 **9 Claims**

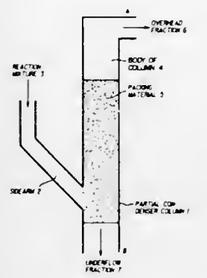
1. A process for preparation of mono and diiodo benzene, naphthalene or diphenyl by iodinating a fluoro, chloro, bromo, iodo, hydroxy, or cyclo substituted benzene, naphthalene or diphenyl, which comprises reacting, at a temperature in the range of 100° to 500° C., a source of iodine with the substituted benzene, naphthalene or diphenyl in the presence of molecular oxygen over a zeolite catalyst with a pore size of 6 angstroms or greater and greater than ten percent of the exchangeable cations being alkali, alkaline earth or rare earth metal cations, wherein said catalyst contains an amount of a modifier effective to substantially prevent deactivation of said catalyst by alkyl substituted aromatic compounds, said modifier being selected from the group consisting of hydrogen, copper, zinc, cadmium, silver, and mercury ions or salts thereof.

4,788,356
NOVEL METHOD FOR OXYIODINATION PRODUCT PARTIAL PURIFICATION
Gerald C. Tustin, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 16, 1987, Ser. No. 109,030
Int. Cl.⁴ C07C *17/152, 17/15*
U.S. Cl. 570—203 **6 Claims**

1. A process for the preparation of an iodoaromatic compound selected from the group consisting of diiodobenzene, diiodonaphthalene or diiododiphenyl comprising the steps of (1) reacting benzene, naphthalene or biphenyl with oxygen and iodine over a zeolite X catalyst exchanged with potassium, rubidium or cesium ions to produce a product mixture, (2) partially condensing the product mixture in the presence of water into a portion enriched in the iodoaromatic compound

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and a portion which is depleted in the iodoaromatic compound and contains water, and (3) recovering the iodoaromatic compound from the portion of the product mixture enriched in the iodoaromatic compound.



4,788,357
VINYL CHLORIDE PRODUCTION

Gerhard Dummer, Burgkirchen; Klaus Haselwarter, Burghausen; Hermann Klaus, Marktl; Ludwig Schmidhammer, Haiming, and Rudolf Strasser, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 786,811, Oct. 11, 1985, abandoned. This application Jul. 16, 1987, Ser. No. 74,137

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440685

Int. Cl.[4] C07C *21/06*

U.S. Cl. 570—226 **1 Claim**

1. In a method of producing vinyl chloride by pyrolysis of purified 1,2-dichloroethane at temperatures from 480° C. to 540° C. at a pressure of 10 to 36 bar absolute with partial utilization of the heat content of the flue gases from the pyrolysis furnace firing to preheat liquid 1,2-dichloroethane almost to its boiling temperature utilizing the flue gas waste heat to generate steam, cool the pyrolysis gas mixture in several stages and separate the hydrogen chloride from the pyrolysis gas mix in a hydrogen chloride column as well as separate vinyl chloride from the pyrolysis gas mix in a vinyl chloride monomer column, the improvement comprising the heavy ends column for the purification of the 1,2-dichloroethane operated at a top pressure of 2 to 3.1 bar absolute is reboiled by heat exchange between the bottom and the gaseous overhead compressed to 3.2 to 6.2 bar absolute at a temperature difference from 8° to 22° C.; the bottom temperature being held between 120° C. and 135° C. by appropriate bottom purge; the heat deficit resulting from the heat of vaporization reduced in accordance with the higher temperature on the heat emission side of the heat exchanger is compensated by flashing appropriate amounts of reflux; the condensate component from the bottom heat exchanger which is returned to the column as reflux is cooled to the saturated vapor temperature corresponding to the respective top pressure by heat exchange with bottom product from the hydrogen chloride column fed to the vinyl chloride monomer column, the rest of the vapor condensate collected in the vapor phase condensate vessel and representing the purified 1,2-dichloroethane is pumped uncooled at a temperature from 125° C. to 155° C. directly into the economizer of the pyrolysis apparatus; and medium pressure steam is generated from the flue gases of the pyrolysis furnace firing at a temperature level from 350° C. to 550° C. in a waste heat boiler by heat exchange with boiling water, the boiler feed water for the waste heat boiler at a correspondingly lower temperature level of 60° C. to 120° C. being preheated to the boiling point in the waste heat boiler in a heat exchanger downstream of the waste heat boiler by heat exchange with the flue gases.

4,788,358
PROCESS FOR THE MANUFACTURE OF 1,2-DICHLOROETHANE

Josef Riedl; Wenzel Kühn, both of Burgkirchen/Alz, and Peter Widmann, Altötting, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 362,094, Mar. 26, 1982, abandoned, which is a continuation of Ser. No. 152,996, May 27, 1980, abandoned. This application Aug. 5, 1985, Ser. No. 762,767

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922375

Int. Cl.[4] C07C *17/02, 17/15*

U.S. Cl. 570—241 **7 Claims**

1. In a process for the manufacture of 1,2-dichloroethane by chlorination of ethylene at 180° to 300° C. and 0.09 to 1.1 MPa in the presence of a solid fluidized catalyst containing a copper salt, removing the heat formed in the reaction space by indirect cooling and recovering 1,2-dichloroethane from the reaction products after having removed said products from said reaction space,

the improvement which comprises introducing separately or at least partially separated from one another hydrogen chloride, ethylene, and an inert gas containing oxygen at one end of a tubular reactor, introducing chlorine into the same reactor at a distance of 40 to 85% of the total reaction space from the last of the gas inlets for the hydrogen chloride, ethylene or oxygen-containing inert gas in the direction of flow of the gas, and the reaction products are removed at the other end of the reactor, and

wherein the molar proportions are 2 moles of hydrogen chloride, 1.01 to 3 moles of ethylene, at least 0.5 mole or oxygen and 0.009 to 2 moles of chlorine with the quantity of chlorine being adjusted such that less than 0.001% by weight of free elementary chlorine is found in the mixture of gases leaving the reaction space.

4,788,359
PROCESS AND APPARATUS FOR RECOVERING 1,2-DICHLOROETHANE FROM OFF-GAS

Kurt Schuchardt, Brühl; Harald Scholz, Erftstadt; Erich Niehus, Bornheim, and Harald Adam, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,372

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1986, 3626853

Int. Cl.[4] C07C *17/15, 17/38*

U.S. Cl. 570—243 **5 Claims**

1. A continuous process for completely removing and recovering 1,2-dichloroethane from the off-gas obtained during the production of 1,2-dichloroethane by subjecting ethylene to an oxychlorination reaction with hydrogen chloride and oxygen, the off-gas being initially contacted with active carbon, then incinerated at temperatures higher than 900° C. and ultimately freed from hydrogen chloride and chlorine, and the active carbon being freed from 1,2-dichloroethane and regenerated by treating it with hot steam, which comprises: heating the off-gas loaded with the 1,2-dichloroethane and having a temperature of 1° C. to 10° C. to a temperature at least 20° C. higher than the respective dew point of water and contacting it with the active carbon, the active carbon being placed in two zones resembling one another and in one of which the 1,2-dichloroethane is being absorbed from the off-gas over a period of 8 to 16 hours, the other zone being regenerated in three stages, charging the active carbon zone loaded with the 1,2-dichloroethane in a first regenerating stage with steam under a pressure of 4 to 10 bars and freeing it from the 1,2-dichloroethane, drying it in a second regenerating stage by means of off-gas heated to 100°–150° C. and being free from 1,2-dichloroethane, and cooling it in a third regenerating stage by injecting off-gas free from 1,2-dichloroethane, condensing the freed 1,2-dichloroethane and steam, the condensed 1,2-dichloroethane and a portion of the condensed steam being recycled into the oxychlorination reaction and the off-gas being incinerated.

4,788,360
PROCESS FOR THE PRODUCTION OF REGENERATED HUMIC ACIDS FROM COAL

Vincenzo Calemma, and Riccardo Rausa, both of Milan, Italy, assignors to Enricerche S.p.A., Milan, Italy

Filed Dec. 8, 1987, Ser. No. 129,827

Claims priority, application Italy, Dec. 18, 1986, 22744 A/86

Int. Cl.[4] C07C *59/00*

U.S. Cl. 562—465 **10 Claims**

1. Process for the production of humic acids by means of the oxidation of coal, characterized in that the oxidation is carried out in dry phase with oxygen or mixtures of oxygen and nitrogen, inside a fluidized-bed reactor, carried out by using coal with a granulometry comprised within the range of from 100 μm to 3 mm, and operating at a temperature comprised within the range of from 150° to 300° C., under a partial pressure of oxygen comprised within the range of from 1.1 abs. atm to 10 abs. atm, for a contact time comprised within the range of from 30 to 600 minutes.

4,788,361
POLYMERIC VISCOSITY INDEX IMPROVER AND OIL COMPOSITION COMPRISING THE SAME

Danford H. Olson, Cypress, and Dale L. Handlin, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 30, 1987, Ser. No. 115,683

Int. Cl.[4] C10M *107/00, 119/02*

U.S. Cl. 585—10 **5 Claims**

1. A lubricating oil composition comprising a triblock copolymer containing terminal hydrogenated polyisoprene blocks and a central polymeric block containing predominantly monoalkenyl aromatic hydrocarbon monomer units.

4,788,362
LIQUID LUBRICANT MIXTURE COMPOSITE

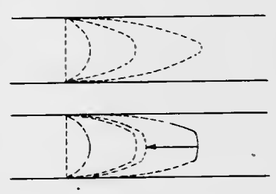
Kazuo Kaneko, 865 Shukugawara Tama-ku, Kawasaki-shi, Kanagawa, Japan

Filed Sep. 30, 1987, Ser. No. 102,688

Claims priority, application Japan, Oct. 3, 1986, 61-236008

Int. Cl.[4] C10M *143/06*

U.S. Cl. 585—10 **4 Claims**



1. A liquid lubricant oil mixture comprising,

an oil solution of polyisobutylene having a viscosity average molecular weight (Flory) in the range of 350,000 to 2,100,000, said oil solution being in a concentration in the range of 10 to 90 wt. %, and

a liquid lubricant oil which contains an additive.

4,788,363
NEMATIC METHYLTOLANS

Haruyoshi Takatsu, Tokyo; Yuji Tamura, and Kunihiko Kotani, both of Saitama, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

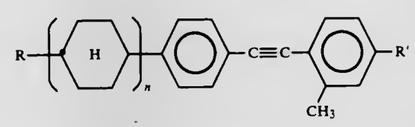
Filed Jul. 16, 1987, Ser. No. 74,670

Claims priority, application Japan, Jul. 17, 1986, 61-168299

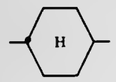
Int. Cl.[4] C09K *19/30, 19/54;* **C07C** *13/28*

U.S. Cl. 585—20 **13 Claims**

1. A compound of the general formula:



wherein R and R' each independently represent a straight-chained alkyl group with 1 to 9 carbon atoms; n is an integer of 1 or 2; and



has a trans (equatorial-equatorial) configuration.

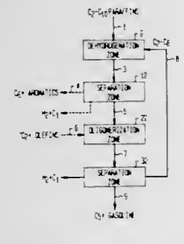
4,788,364
CONVERSION OF PARAFFINS TO GASOLINE

Mohsen N. Harandi, Lawrenceville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1987, Ser. No. 137,112

Int. Cl.[4] C07C *1/00, 12/00, 2/02*

U.S. Cl. 585—312 **39 Claims**



1. A continuous process for conversion of C_2–C_4 alkanes to aromatic rich hydrocarbons boiling in the gasoline range comprising:

maintaining a dual vertical column reactor comprising a lower transport riser reaction zone and an upper turbulent fluidized bed reaction zone, both zones containing fluidized catalyst comprising acid medium pore metallosilicate zeolite;

contacting a feedstock comprising at least one C_2–C_4 alkane with fluidized catalyst in the lower transport zone under high temperature dehydrogenation conditions to dehydrogenate the feedstock and substantially prevent cracking reacations to obtain an intermediate product comprising dehydrogenated hydrocarbons and aromatics; and

contacting the intermediate hydrocarbon product with fluidized catalyst in the upper turbulent zone under lower temperature oligomerization conditions to obtain a final product comprising C_5+ gasoline boiling range hydrocarbons.

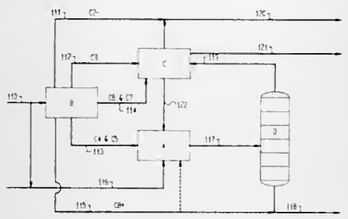
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4,788,365

HIGH OCTANE GASOLINE AND DISTILLATES FROM OXYGENATES

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 8, 1987, Ser. No. 130,256
Int. Cl.[4] C07C *1/20, 2/00*
U.S. Cl. 585—312 **12 Claims**



1. An integrated process for the conversion of methanol to high octane gasoline and distillate, comprising the steps of:

(a) contacting oxygenated hydrocarbon feed with solid conversion catalyst in a conversion zone under oxygenate conversion conditions to produce an effluent stream comprising a major portion of olefinic hydrocarbons wherein said catalyst has a moderately low Bronsted acid activity;

(b) fractionating said effluent stream to produce olefinic hydrocarbon streams comprising, first C_2- olefinic stream, second C_3 olefinic stream, third C_4 & C_5 olefinic stream, fourth C_6 & C_7 olefinic stream and fifth C_8+ olefinic stream;

(c) passing said second C_3 olefinic stream and said fourth C_6 and C_7 olefinic stream to an olefins oligomerization zone under oligomerization conditions in contact with medium pore size shape selective zeolite catalyst whereby C_5+ gasoline and distillate are produced;

(d) passing a hydrocarbon feedstream comprising a portion of step (c) C_5+ gasoline, step (b) third C_4 and C_5 olefinic hydrocarbon stream in conjunction with a methanol feedstream to an etherification zone in contact with an acid etherification catalyst under etherification conditions to produce a mixture of high octaine ether-rich gasoline;

(e) recovering a stream comprising unreacted methanol and C_4 and C_5 hydrocarbons and a stream comprising ether-rich gasoline;

(f) passing step (e) stream comprising unreacted methanol and C_4 and C_5 hydrocarbons to step (c) oligomerization zone for conversion to gasoline and distillate.

4,788,366

PRODUCTION OF HEAVIER HYDROCARBONS FROM LIGHT OLEFINS IN MULTISTAGE CATALYTIC REACTORS

Mohsen N. Harandi, Lawrenceville; Hartley Owen, Belle Mead, and Samuel A. Tabak, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

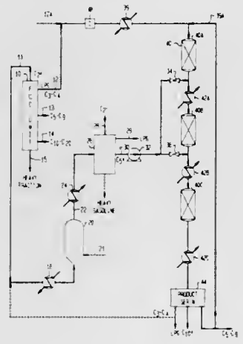
Filed Dec. 28, 1987, Ser. No. 137,913
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—314 **4 Claims**

1. A continuous multistage catlytic process for conversion of light olefins to distillate range hydrocarbons rich in C_{10}+ aliphatics, comprising the steps of:

maintaining a fluidized bed of medium pore acid zeolite catalyst particles in a primary reaction stage in a turbulent reactor bed maintained under reaction severity conditions effective to convert a primary ethene-containing olefinic feedstream by passing hot feedstock vapor upwardly through the fluidized catalyst bed at reaction severity conditions sufficient to convert ethene substantially to intermediate range olefins and aromatics in the C_5–C_9 range;

recovering primary stage effluent, including a liquid stream containing a major amount of aromatics-rich C_5+ hydrocarbons;

contacting a secondary olefinic feedstream comprising C_3–C_4 olefins in a secondary catalytic reactor stage with a series of fixed catalyst bed reactors containing shape selective medium pore acid zeolite oligomerization catalyst at high pressure under distillate mode oligomerization conditions;



mixing at least a portion of liquid primary stage effluent containing aromatic hydrocarbons with at least one hot inter-reactor stream containing partially upgraded olefins in the secondary stage, thereby quenching said inter-reactor stream; and

coreacting said mixed stream containing partially upgraded olefins and intermediate primary stage hydrocarbons in at least one secondary stage reactor to provide distillate range hydrocarbon product.

4,788,367

SYNTHESIS OF OLEFINS FROM KETONES USING BIS(ALKYLCHLOROALUMINO)METHANE

Andrzej M. Piotrowski, Houston, and Dennis B. Malpass, La Porte, both of Tex., assignors to Texas Alkyls Inc., Deer Park, Tex.

Filed Nov. 5, 1987, Ser. No. 116,846
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—357 **11 Claims**

1. A process for the methenylation of the carbonyl oxygen atom of a ketone which comprises reacting the ketone with a bis(alkylchloroaluino)methane to form the corresponding olefin.

4,788,368

SYNTHESIS OF OLEFINS FROM KETONES USING A BIS(SUBSTITUTED ALUMINO) SUBSTITUTED METHANE

Andrzej M. Piotrowski, Houston; Dennis B. Malpass, La Porte, both of Tex.; John J. Eisch, Vestal, and Marek P. Boleslawski, Binghamton, both of N.Y., assignors to Texas Alkyls Inc., Deer park, Tex.

Filed Nov. 5, 1987, Ser. No. 116,845
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—357 **7 Claims**

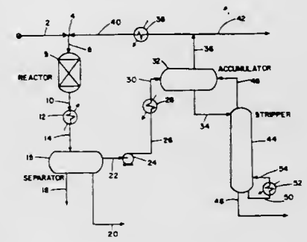
1. A process for the alkylenation of the carbonyl oxygen atom of a ketone which comprises reacting the ketone with a bis(substituted alumino)substituted methane to form the corresponding olefin.

4,788,369

CONVERSION OF METHANOL TO GASOLINE

Susan K. Marsh, East Brunswick; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 815,438, Dec. 31, 1985, abandoned. This application Oct. 5, 1987, Ser. No. 104,616
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—408 **13 Claims**



12. A continuous process for converting oxygenated hydrocarbon feedstock containing methanol, dimethyl ether or mixtures thereof to gasoline boiling range hydrocarbons in a fixed bed adiabatic reaction zone with a medium pore crystalline acid zeolite catalyst at elevated temperature and pressure comprising:

contacting oxygenate feedstock with said catalyst in said fixed bed reaction zone in the presence of C_3–C_4 saturated hydrocarbons under conditions to convert substantially all oxygenates and a portion of said saturated hydrocarbons to produce gasoline range hydrocarbons;

cooling reaction effluent from said fixed bed reaction zone to form an aqueous liquid phase, a gas phase rich in C_2− hydrocarbons, and a liquid hydrocarbon phase rich in C_3+ hydrocarbons;

separating at a pressure below reaction zone pressure the effluent into a byproduct aqueous stream, a byproduct gaseous stream, and a condensed C_3+ liquid hydrocarbon stream;

pumping the condensed liquid stream to a pressure above reaction zone pressure;

heating and partially vaporizing said pressurized hydrocarbon stream to form a vapor phase rich in C_3–C_4 saturated hydrocarbons and a first liquid product stream rich in gasoline product;

separating said partially vaporized stream into a second liquid product stream and a C_3–C_4 rich vapor recycle stream;

heating and mixing said vapor recycle stream with oxygenate feedstock; and

passing the feedstock-recycle mixture to said fixed bed catalytic reaction zone at reaction temperature and pressure whereby adiabatic temperature rise resulting from heat of reaction is moderated by the recycled C_3–C_4 hydrocarbon vapor.

4,788,370

CATALYTIC CONVERSION

Clarence D. Chang, Princeton; David S. Shihabi, Pennington, both of N.J., and Paul B. Weisz, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 864,746, May 13, 1986, Pat. No. 4,701,313, which is a continuation of Ser. No. 683,768, Dec. 19, 1984, abandoned. This application Aug. 6, 1987, Ser. No. 82,397
Int. Cl.[4] C07C *12/02, 12/42*
U.S. Cl. 585—415 **16 Claims**

1. A process for converting a feedstock comprising C_2+ olefins, C_2–C_7 paraffins or mixtures thereof to conversion product comprising C_5+ hydrocarbon compounds, which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst composition comprising a siliceous zeolite prepared by the method comprising providing a boron-containing zeolite Beta with initial boron and aluminum contents each greater than the numeral 0, treating the zeolite with silicon tetrachloride at a temperature and for a time sufficient to replace boron with silicon, and recovering the siliceous zeolite having reduced boron content but substantially preserved initial aluminum content.

4,788,371

CATALYTIC OXIDATIVE STEAM DEHYDROGENATION PROCESS

Tamotsu Imai, and Deng-Yang Jan, both of Mt. Prospect, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 30, 1987, Ser. No. 139,690
Int. Cl.[4] C07C *4/02, 5/09, 5/333*
U.S. Cl. 585—443 **24 Claims**

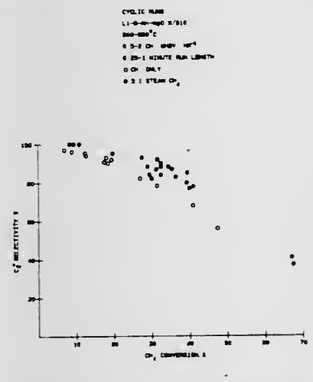
1. A process for the steam dehydrogenation of a dehydrogenatable hydrocarbon with oxidative reheating which comprises contacting a C_2–C_{30} dehydrogenatable hydrocarbon, steam, and an oxygen-containing gas in a reaction zone at conditions sufficient to promote both oxidation and dehydrogenation reactions with a catalyst comprising a Group VIII noble metal component, one or more components selected from the group lithium, potassium, rubidium, cesium, and francium, and a component selected from the group consisting of boron, gallium, indium, germanium, tin, and lead, all on an inorganic oxide support, and recovering the products of the reaction.

4,788,372

METHANE CONVERSION PROCESS

Anne M. Gaffney, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 13, 1987, Ser. No. 14,406
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—500 **13 Claims**



1. In a method for converting methane into higher hydrocarbon products and coproduct water which comprises contacting a gas comprising methane with a solid comprising at least one reducible metal oxide of a least one metal, which oxide when contacted with methane at 500° to 1000° C. produces higher hydrocarbons, coproduct water, and reduced metal oxide, in the substantial absence of added gaseous oxidant, the improvement comprising conducting at least a portion of said contacting in the presence of added water.

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4,788,373

PROCESS FOR ETHYLENE OLIGOMERIZATION TO A PRODUCT RICH IN LINEAR BUTENES USING ZINC-PROMOTED, NICKEL-BASED CATALYST COMPOSITIONS

Philip O. Nubel, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Jun. 30, 1987, Ser. No. 68,891
Int. Cl.[4] C07C *2/02*
U.S. Cl. 585—525 **10 Claims**

1. A process for the oligomerization of ethylene to a product rich in linear butenes comprising contacting ethylene under oligomerization conditions with a catalyst composition comprising a minor amount of nickel as the oxide and a minor amount of zinc as the oxide both incorporated in a major amount of a support consistihg of (1) a HAMS-1B crystalline borosilicate molecular sieve composited in an inorganic matrix, or (2) an amorphous silica-alumina.

4,788,374

ZEOLITE CATALYSIS

Pochen Chu, West Deptford; William E. Garwood, Haddonfield, both of N.J., and Albert B. Schwartz, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1987, Ser. No. 137,223
Int. Cl.[4] C07C *2/02*
U.S. Cl. 585—533 **10 Claims**

1. A process for preparing hydrocarbons boiling in the gasoline and/or distillate range by contacting a feedstock comprising lower molecular weight olefins in a reaction zone under conditions of elevated temperature and pressure with a shape selective crystalline aluminosilicate catalyst, comprising:

reducing the non-shape selective surface-cracking and/or surface isomerization activity of the aluminosilicate catalyst by a process comprising:

preparing an aqueous solution comprising colloidal silica, optionally an organic directing agent, and a source of hydroxide ions;

mixing the aqueous solution with an aqueous dispersion of shape-selective crystalline aluminosilicate to form a homogeneous mixture which is subsequently heated;

adding an aqueous solution comprising a source of fluoride ions to the homogeneous mixture to form a reactive composition;

heating the reactive composition at a temperature to effectively form a surface-deactivated catalyst comprising a crystalline fluoride-containing silica outer shell on an aluminosilicate;

withdrawing the surface-deactivated catalyst from the reactive composition for washing, drying, and calcining of the catalyst; and

removing the catalyst to the reaction zone for contact with the olefin feedstock.

4,788,375

OLEFIN CONVERSION TO LUBRICANT RANGE HYDROCARBONS

William E. Garwood, Haddonfield; Guenter G. Kuehl, Cherry Hill, and Rene B. LaPierre, Medford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,906
Int. Cl.[4] C07C *2/02*
U.S. Cl. 585—533 **16 Claims**

1. In the process of converting light olefins to lubricant range hydrocarbons comprising contacting such at high pressure and elevated temperature with a medium pore size shape selective metallosilicate zeolite catalyst having Bronsted acid activity, to produce a $C_{20}+$ hydrocarbon fraction comprising a major portion of 343° C.+ lubricant range hydrocarbons, the improvement comprising, contacting said light olefins with said metallosilicate zeolite catalyst, said catalyst having been extracted with a metal chelating agent, whereby 343+° C. lubricant range hydrocarbons are produced having a viscosity index of at least 80 with yields of at least 40%.

4,788,376

PROCESS FOR PRODUCING HIGHER HYDROCARBONS FROM LOWER OLEFINS

Harry Mazurek, Bala Cynwyd, and John A. Sofranko, West Chester, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 13, 1987, Ser. No. 84,720
Int. Cl.[4] C07C *2/12*
U.S. Cl. 585—533 **12 Claims**

1. In a process for the oligomerization of a lower olefin contaminated with a minor amount of a diene or methyl acetylene oligomerization catalyst deactivating agent, the improvement which comprises

(a) contacting the contaminated lower olefin with an admixture of zeolitic oligomerization catalyst and at least one of a metathesis catalyst and an alkaline earth oxide at oligomerization conditions, or

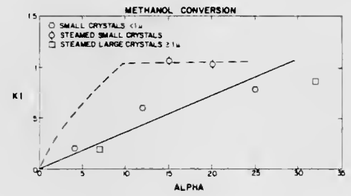
(b) contacting the contaminated lower olefin with a metathesis catalyst at metathesis conditions and thereafter contacting the olefin with a zeolitic oligomerization catalyst at oligomerization conditions.

4,788,377

PROCESS FOR MANUFACTURING OLEFINS

Clarence D. Chang, Princeton, and Cynthia T. Chu, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 721,145, Apr. 10, 1985, abandoned, which is a continuation of Ser. No. 636,088, Aug. 2, 1984, abandoned, which is a continuation of Ser. No. 487,549, Apr. 22, 1983, abandoned. This application Sep. 21, 1987, Ser. No. 98,713
Int. Cl.[4] C07C *1/24*
U.S. Cl. 585—640 **3 Claims**



1. In a method for producing a hydrocarbon mixture rich in olefins wherein a feedstock consisting essentially of an alcohol or ether or mixture thereof is contacted with crystalline zeolite having an alpha value the improvement which comprises utilizing a crystalline zeolite ZSM-5 of no greater than 50, in the hydrogen form having a crystal size of about 0.02–0.5 micron which has been steamed from a higher alpha value down to an alpha value between 5 and 35 prior to contact with said feedstock.

4,788,378

DEWAXING BY ISOMERIZATION

Clarence D. Chang, Princeton; David S. Shihabi, Pennington, both of N.J., and Paul B. Weisz, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 864,746, May 13, 1986, Pat. No. 4,701,313, which is a continuation of Ser. No. 683,768, Dec. 19, 1984, abandoned. This application Aug. 6, 1987, Ser. No. 82,396
Int. Cl.[4] C07C *5/13*
U.S. Cl. 585—739 **14 Claims**

1. A process for dewaxing a hydrocarbon feedstock containing paraffins which comprises contacting the feedstock under isomerization conditions with a catalyst comprising a hydrogenation component and siliceous zeolite having been prepared by a method comprising providing a boron-containing zeolite Beta with initial boron and aluminum contents each greater than the numeral 0, treating the zeolite with silicon tetrachloride at a temperature and for a time sufficient to replace boron with silicon, and recovering the siliceous zeolite having reduced boron content but substantially preserved initial aluminum content.

4,788,379

PRODUCTION OF ACETYLENE

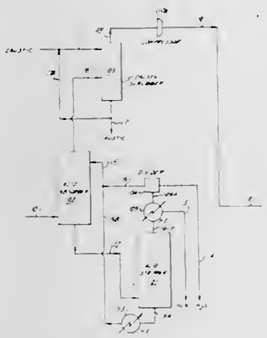
Michael Katz, New City, N.Y.; Frank Carluccio, Towaco, N.J.; Gil Mallari, Jersey City, N.J.; Kevin FitzPatrick, Irvington, N.J.; Ashok Desai, Wayne, N.J.; Robert Casciano, Hewitt, N.J., and Jane Tsai, Upper Montclair, N.J., assignors to GAF Corporation, Wayne, N.J.

Continuation of Ser. No. 219,756, Dec. 23, 1980, Pat. No. 4,367,363. This application Oct. 1, 1982, Ser. No. 432,214
The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.
Int. Cl.[4] C07C *7/10*
U.S. Cl. 585—809 **7 Claims**

1. The process for recovering essentially pure acetylene from the gaseous out-put stream from a coal to acetylene conversion process, comprising the steps of:

(a) processing said gaseous out-put stream in an acid gas removal first stage by absorbing HCN and H_2S in an organic solvent, and scrubbing with a caustic agent to remove CO_2;

(b) scrubbing said gaseous out-put stream with organic solvent in a sweet gas treatment second stage and removing essentially pure acetylene as a product; and



(c) in a third stage, first hydrogenating, then desulfurizing and then methanating the remaining gases from said second stage.

4,788,380

TITANIUM-ALUMINUM-SILICON-OXIDE MOLECULAR SIEVE COMPOSITIONS

Brent Mei Tak Lok, New City; Bonita K. Marcus, Rye, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 604,236, Apr. 26, 1984, Pat. No. 4,707,345. This application Aug. 5, 1987, Ser. No. 81,680
Int. Cl.[4] C07C *7/13*
U.S. Cl. 585—820 **12 Claims**

1. Process for separating mixtures of molecular species wherein such mixtures contain molecular species having different degrees of polarity and/or kinetic diameters, comprising contacting said mixture with at least one composition selected from crystalline molecular sieves having chemical compositions in the anhydrous form represented by the unit empirical formula:

$$mR:(Ti_xAl_ySi_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the moles of "R" present per mole of $(Ti_xAl_ySi_z)O_2$ and has a value of from zero to about 0.3; and "x", "y" and "z" represent the mole fractions of titanium, aluminum and silicon, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the compositional area defined by points A, B, C and D of FIG. 1 and having a characteristic x-ray powder diffraction pattern selected from the group consisting of Tables V, VII, XI and XVIII.

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4,788,381

DEVICE FOR SEALING BETWEEN TWO METAL PLATES USED AS ELECTROMAGNETIC FIELD SCREENS

Uno S. Nilsson, Saltsjö-boo, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

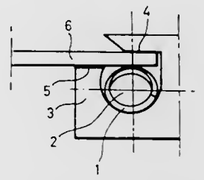
PCT No. PCT/SE86/00362, § 371 Date Apr. 22, 1987, § 102(e) Date Apr. 22, 1987, PCT Pub. No. WO87/01901, PCT Pub. Date Mar. 26, 1987

PCT Filed Aug. 12, 1986, Ser. No. 49,998

Claims priority, application Sweden, Sep. 13, 1985, 8504257

Int. Cl.⁴ H05K *9/00*

U.S. Cl. 174—35 GC **3 Claims**



1. A connection arrangement for use in providing a seal between edge portions of two metal plates used as screens against electromagnetic fields comprising:

a connection section having an edge and a groove extending along the edge, the groove having an axially extending curved surface and an axially extending substantially flat surface opposing the curved surface; and

a helically wound metallic sealing strip positioned in the groove and having cornered edges, the sealing strip and the flat surface defining therebetween a receiving space adapted to receive a metal plate to be connected with the connection section, the sealing strip being resilient in the axial direction of the helical winding and in the radial direction thereof to present a cornered edge of the sealing strip to the receiving space upon the insertion of a metal plate into the space.

4,788,382

DUPLEX GLASS PREFORMS FOR HERMETIC GLASS-TO-METAL COMPRESSION SEALING

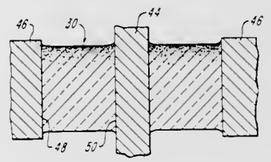
John E. Ahearn, Middleboro; Raymond A. Frates, Fairhaven; Dennis Girard; Richard A. Koepke, both of New Bedford; Robert M. O'Hern, Taunton, all of Mass.; James K. Schmidt, Mt. Pleasant, and C. Dodd Manon, Ligonier, both of Pa., assignors to Isotronics, Inc., New Bedford, Mass.

Filed May 18, 1987, Ser. No. 51,664

The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.

Int. Cl.⁴ B32B *17/06*

U.S. Cl. 174—52 FP **18 Claims**



1. A duplex glass preform for forming hermetic glass-to-metal compression seals, comprising:

a soft glass matrix, said soft glass matrix having a coefficient of thermal expansion mismatched with respect to coefficients of thermal expansion of metals used to form the hermetic glass-to-metal compression seals and a peripheral interfacing surface for glass-to-metal sealing;

a dispersion zone in at least one end of said soft glass matrix, said dispersion zone extending inwardly from a surface of said at least one end into said soft glass matrix for a predetermined depth;

an essentially ceramic-free zone intermediate said dispersion zone and said peripheral interfacing surface; and

a plurality of ceramic particles selectively distributed said dispersion zone of said soft glass matrix to form a ceramic particle density gradient therein, and wherein said ceramic particle density has a maximum value at said surface of said at least one end and gradually decreases to a near zero value at said predetermined depth.

4,788,383

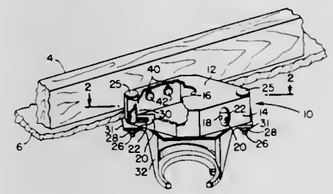
ELECTRICAL JUNCTION BOX FOR SUPPORT OF A HANGING APPLIANCE

Gregory W. Caison, Fayetteville, N.C., assignor to Fasco Industries, Inc., Lake Forest, Ill.

Filed Sep. 8, 1987, Ser. No. 93,699

Int. Cl.⁴ H02G *3/20*

U.S. Cl. 174—54 **10 Claims**



1. An electrical junction box for supporting a hanging load, said junction box including a base plate and a peripheral sidewall extending therefrom, said base and sidewall together forming a junction box cavity;

said base plate defining a spaced plurality of base plate bolt holes adjacent said sidewall;

said sidewall including a spaced plurality of inwardly extending tabs each defining a tab bolt hole in alignment with one of said base plate bolt holes; said sidewall further defining a plurality of mounting holes for side mounting of said junction box for a supporting structure; and

a bolt extending through each of said base plate bolt holes and the tab bolt hole aligned therewith, and a lock nut engaged with each of said bolts for supporting said hanging load on said box.

4,788,384

DEVICE FOR TWO-DIMENSIONAL LOCALIZATION OF EVENTS THAT GENERATE CURRENT ON A RESISTIVE SURFACE

Roger Bruere-Dawson, Saulx Les Chartreux, and Marcel Froissart, Paris, both of France, Bernard M. Marechal, Marcio N. DeSouza, both of Rio De Janeiro, Brazil, assignors to Centre National de la Recherche Scientifique, France

Filed Dec. 17, 1987, Ser. No. 134,354

Claims priority, application France, Dec. 18, 1986, 86 17744

Int. Cl.⁴ G08C *21/00*

U.S. Cl. 178—18 **11 Claims**

1. A device for two-dimensional localization of current-generating events on a resistive surface, the device comprising:

a resistive surface;

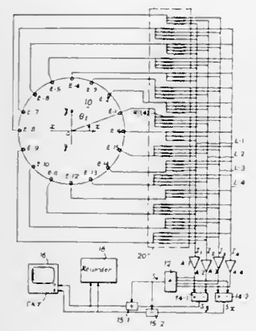
a plurality of electrodes fixed to the resistive surface around its periphery in order to pick up currents generated by injecting current or electric charge into points on the resistive surface; and

at least three current summing lines connected to the electrodes via discrete resistive components in such a manner

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as to obtain analog signals on said summing lines whose amplitudes are functions of the co-ordinates of said points in a predetermined reference co-ordinate system;

the device including the improvement whereby:



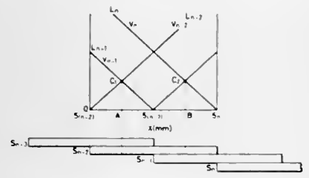
each of said electrodes is connected by means of respective resistive components to at least three summing lines in such a manner that at least two of the said lines deliver analog signals whose amplitudes are substantially linear functions of the desired co-ordinates.

4,788,385

METHOD OF DETECTING A COORDINATE

Kiyoshi Kimura, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Dec. 3, 1986, Ser. No. 937,318
Claims priority, application Japan, Dec. 25, 1985, 60-290797
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—19 **5 Claims**



1. A coordinate detection method for detecting a position of a pointer in an input plane composed of a plurality of conductor loops arranged at spaced intervals in parallel along at least one coordinate direction, comprising the steps of:

transmitting scanning signals through each of the loops in order;

detecting magnetic field signals at the position of the pointer resulting from transmitting the scanning signals through each of the loops, and detecting at which loop an inversion of polarity in the magnetic field signals occurs;

detecting a first voltage value of the magnetic field signal for the loop at which the polarity inversion is detected, and a second voltage value of the magnetic field signal for another loop prior to the detected loop;

comparing a ratio of the first and second voltage values to a reference value; and

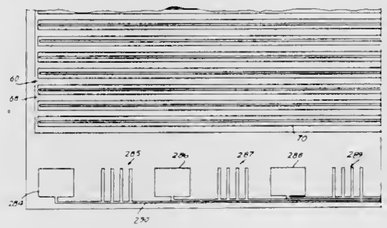
selecting one of a series of overlapping segments, each corresponding to an interval defined by a respective spaced pair of loops along the one coordinate direction, as a general region in which the pointer is detected to occur, wherein the selection of the one segment is varied as between adjacent overlapping segments depending upon the comparison of the ratio of voltage values to the reference value.

4,788,386

MENU FOR A CHARGE RATIO DIGITIZER

Henry G. Matthews, Haddam; Thomas Zalenski, Killingworth; Jamie L. Barbetti, Milford, and Al Mletzko, Woodbury, all of Conn., assignors to Summagraphics Corporation, Fairfield, Conn.

Filed Mar. 20, 1987, Ser. No. 28,495
Int. Cl.⁴ G08C *21/00*
U.S. Cl. 178—19 **25 Claims**



1. A digitizer comprising:

a digitizer tablet having a generally planar top surface and first, second and third electrodes lying in a plane substantially parallel to said top surface, said first electrode having a first geometric pattern, said first pattern varying with a first coordinate in a two-coordinate system, said second electrode having a second geometric pattern, said second pattern varying with the second coordinate in said two-coordinate system, and said third electrode having a third geometric pattern and being arranged between said first and second electrodes, said first, second and third electrodes being made of electrically conductive material and lying within a first area;

a first menu electrode fixedly arranged in said digitizer tablet in a second area outside said first area, having a fourth geometric pattern, and being made of electrically conductive material;

a coupling means movable on said digitizer tablet top surface, said coupling means including a coupling electrode capable of electrostatic coupling with said first, second and third electrodes and with said menu electrode; and

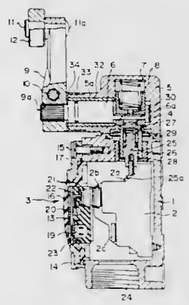
signal generating means for outputting a predetermined driving electrical signal to at least one of said first, second, and third electrodes during each of a plurality of driving cycles in accordance with a predetermined sequence, application of said predetermined driving signal inducing a signal in said coupling electrode when said coupling electrode is capacitively coupled to a driven electrode, wherein said first, second, third and fourth geometric patterns are configured whereby when said coupling electrode overlies said first area and is positioned for maximal capacitive coupling with said first, second and third electrodes, the signal induced in said coupling electrode in response to the simultaneous supply of respective predetermined driving signals to each of said first, second and third electrodes has a magnitude in a first range, and when said coupling electrode overlies said first menu electrode and is positioned for maximal capacitive coupling therewith, the signal induced in said coupling electrode in response to the supply of said predetermined driving signal to said first menu electrode has a magnitude in a second range, said first and second ranges being mutually exclusive.

4,788,387

LIMIT SWITCH WITH CURVED OR PARTLY SPHERICAL CONVEX COVER

Hiroshi Kasegi, and Takao Kitamura, both of Kurayoshi, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 30, 1986, Ser. No. 924,904
Claims priority, application Japan, Oct. 30, 1985, 60-241623
Int. Cl.⁴ H01H *13/06*
U.S. Cl. 200—47 **6 Claims**



1. A limit switch for use in the vicinity of a welding machine comprising:

a casing;

a switch mechanism housed in said casing;

a cover covering said casing; and

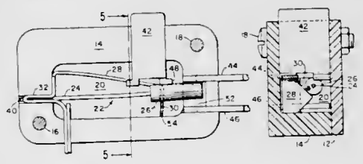
an actuator mounted in said casing for operating said switch mechanism, wherein said cover has an inner face and an outer face, said inner face being substantially flat and said outer face being spherically curved with respect to said inner surface, so as to scatter welding spatters, thus inhibiting the spatters from adhering to said outer face.

4,788,388

SNAP ACTING SWITCHES

Lyndon W. Burch, Boston, Mass., and Hadley K. Burch, Pittsfield, Vt., assignors to B/K Patent Development, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 759,412, Jul. 26, 1985, abandoned. This application Oct. 23, 1986, Ser. No. 922,283
Int. Cl.⁴ H01H *13/38*
U.S. Cl. 200—77 **12 Claims**



1. A snap acting switch comprising, in combination,

a support,

an elongate spring member cantilever mounted at one end on the support, extending in a first direction and having a contact portion spaced from said end and deflectable in second and third directions perpendicular to one another and to said first direction,

an electrically conductive element having a contact portion extending in said second direction and being resiliently deflectable in said third direction, and

an actuator comprising a leaf spring mounted on the support and having surfaces intersecting at an angle, said actuator and conductive element being arranged to cause an engagement position on one of said surfaces to bear on the spring member with the spring member deflected in said second and third directions and with its contact portion bearing with a contact force on the deflectable contact portion of said conductive element,

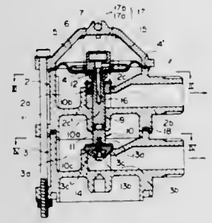
the actuator and said conductive element being relatively movable in said third direction by an applied force to increase said deflection of the spring member and said contact portion of the conductive element until said engagement position reaches the intersection of said surfaces, whereupon further relative movement permits a force resulting from deflection of the contact portion of the conductive element to accelerate the spring member past said intersection and to snap it away from said conductive element.

4,788,389

FLOW SWITCH VALVE

Tatsuo Okazaki, Kamifukuoka, Japan, assignor to Omco Co., Ltd., Saitama, Japan

Filed Dec. 14, 1987, Ser. No. 132,249
Claims priority, application Japan, Dec. 19, 1986, 61-303185; Mar. 3, 1987, 62-48320; Apr. 18, 1987, 62-58947[U]
Int. Cl.⁴ H01H *35/34, 35/40*
U.S. Cl. 200—81.9 M **5 Claims**



1. A flow switch valve comprising:

a housing main body including a plurality of valve casings which are stacked contiguously with each other, and each of which is in the shape of a hollow body having a fluid inlet portion and a fluid exit portion partitioned from each other by a valve seat member disposed in the hollow body,

a control chamber disposed to the outside of said fluid inlet portion of one of said valve casings by way of a diaphragm resiliently supported on said casings,

a valve member comprising a shaft supported by said diaphragm and extended and passing through the plurality of said valve casings and a plurality of valve bodies disposed to said shaft, each corresponding to said valve seat member in each of said valve casings,

a fluid channel formed through the shaft of said valve member so as to communicate said control chamber with the fluid exit portion in one of said valve casings, and

a signal generation device for generating a switching signal upon a predetermined movement of said valve member.

4,788,390

SHUNT CAPACITOR SWITCH WITH AN IMPEDANCE INSERTION ELEMENT

Arthur D. Crino, Portland, Oreg., assignor to Siemens Energy & Automation, Inc., Atlanta, Ga.

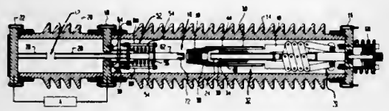
Filed Apr. 26, 1988, Ser. No. 186,412
Int. Cl.⁴ H01H *33/16*
U.S. Cl. 200—144 AP **20 Claims**

1. A high voltage shunt capacitor switching apparatus comprising:

an insulating tube means having a first and a second terminal means, the terminal means communicating with the internal portion of the insulating tube means;

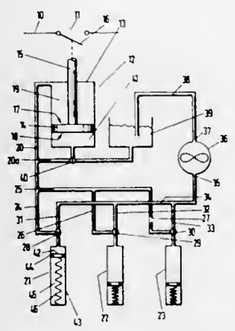
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a first electrical contact means in electrical contact with the first terminal means;
a second electrical contact means;
a third electrical contact means for electrically engaging the first and second electrical contact means and adapted to move relative to the first and second electrical contact means;
volume of insulative gas;
a third terminal means, the third terminal means communicating with the internal portion of the insulating tube means, wherein the insulating tube means includes a first



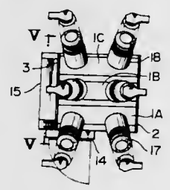
and a second tube section, the second electrical contact means being in electrical contact with the third terminal means, the third electrical contact means being in electrical contact with the second terminal means and the first, second and third contact means being disposed within the insulating tube means; and
an impedance means coupled between the second electrical contact means and the third electrical contact means such that current can flow through the shunt capacitor switch when the second electrical contact means is disengaged from the third electrical contact means.

4,788,391
HYDRAULIC OR PNEUMATIC DRIVE FOR ACTUATING THE MOVABLE SWITCH CONTACT OF A MEDIUM AND/OR HIGH-VOLTAGE POWER SWITCH
Ferdinand Lutz, Heppenheim, Fed. Rep. of Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland
Filed Mar. 28, 1988, Ser. No. 174,089
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709988
Int. Cl.⁴ H01H *33/28*
U.S. Cl. 200—148 F **15 Claims**



1. Hydraulic or pneumatic drive for actuation of a movable switch contact of a medium and/or high-voltage power switch, comprising a drive piston coupled to the movable switch contact, a fluid reservoir configuration, means for delivering fluid under pressure from said fluid reservoir configuration to said drive piston in order to perform one switching cycle having a given number of required switching operations, said fluid reservoir configuration having said given number of mutually separate independently acting storage chambers each having an energy content sufficient for a required switching operation.

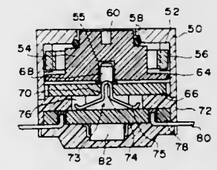
4,788,392
TANK TYPE GAS CIRCUIT BREAKER
Yoshihito Asai, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 14, 1987, Ser. No. 132,359
Claims priority, application Japan, Dec. 30, 1986, 61-311437
Int. Cl.⁴ H01H *33/54*
U.S. Cl. 200—148 R **15 Claims**



1. A tank type gas circuit breaker for a three-phase alternating current, comprising:
three hollow members spaced in parallel with each other;
a single stationary side end plate air-tightly fixed to first ends of said three hollow members;
a single mechanism side end plate fixed to second ends of said three hollow members;
three stationary contacts each supported to said stationary side end plate and extending in said three hollow members;
three movable contacts each supported to said mechanism side end plate and extending in said three hollow members;
insulated rods extending in said three hollow members while passing through said mechanism side end plate for interrupting contacts between said movable contacts and said stationary contacts;
an operational rotary shaft mechanism disposed adjacent to said mechanism side end plate and connected to said insulated rods for driving each of said insulated rods;
an actuator for driving said operational rotary shaft mechanism;
two bushing porcelain insulators provided for each phase, said bushing porcelain insulators being located on a top surface of each of said hollow members;
current transformers each arranged in a lower side of each of said bushing porcelain insulators;
conductors disposed within said bushing porcelain insulators and connected to said movable contacts and said stationary contacts; and
arc-extinction gas filled in said hollow members.

4,788,393
DIP ROTARY CODE SWITCH
Masayuki Muramatsu, and Atsuo Yamazaki, both of Iruma, Japan, assignors to Copal Electronics Co. Ltd., Tokyo, Japan
Filed Jan. 6, 1987, Ser. No. 878
Claims priority, application Japan, Jan. 29, 1986, 61-017305
Int. Cl.⁴ H01H *19/58, 21/78*
U.S. Cl. 200—292 **4 Claims**

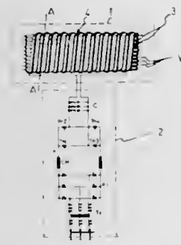
1. A DIP rotary code switch comprising:
a housing and a base and in which a cavity is defined, said base having a plurality of slits extending therethrough, each of said slits including a narrow central section and a respective generally rectangular section open to the narrow section at each end of the narrow central section;
a rotor rotatably mounted in said cavity,
said rotor having a lower surface, patterns of electrically conductive material disposed on said lower surface, and a hole that is open to said lower surface;
a contact holder member disposed between said lower surface of the rotor and said base, said contact holder member having a boss extending into said hole of the rotor for rotatably supporting said rotor and said contact holder member also having a plurality of holes extending therethrough, each of said plurality of holes extending through said contact holder member open to both a respective one of the slits extending through said base and the lower surface of said rotor;
a circuit board fixed to said base opposite said contact holder member, the circuit board having electrically conductive elements exposed to the slits extending through said base and a plurality of plate terminals operatively electrically connected to the conductive elements; and
a plurality of forked contact members for selectively electrically connecting the patterns of electrically conductive material disposed on the lower surface of said rotor with the conductive elements of said circuit board,



each of said plurality of contact members extending respectively in both one of said holes extending through said contact holder member and the slit open to said one of said plurality of holes, and
each of said plurality of contact members comprising a pair of legs extending in said narrow section of said slit and fitted therein so as to restrain the contact member from slipping in said slit, each of said pair of legs having a respective free end loosely received in a respective one of said generally rectangular sections of said slit and contacting the conductive elements of said circuit board that are exposed to said slit at the rectangular sections, and each of said contact members also comprising an apex from which said pair of legs extend, said apex loosely received in said one of said plurality of holes and extending therethrough for selectively contacting the conductive material disposed on the lower surface of said rotor as the rotor is rotated.

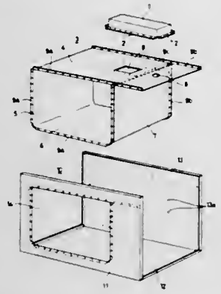
4,788,394
MULTI-WIRE INDUCTION HEATING
Godfried Vanneste, Ingelmunster, and Michel Neirynck, Kortrijk, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium
Continuation of Ser. No. 834,790, Feb. 28, 1986. This application Dec. 29, 1987, Ser. No. 142,352
Claims priority, application United Kingdom, Mar. 6, 1985, 8505811
Int. Cl.⁴ H05B *5/00*
U.S. Cl. 219—10.61 R **57 Claims**

1. In an apparatus for inductively heating simultaneously a plurality of elongate workpieces to a generally similar temperature over the length thereof, said workpieces having a substantially uniform cross-section over their respective lengths, and wherein said workpieces are individually conveyed at the same predetermined uniform rate of speed longitudinally along a plurality of similar work paths; the improvement comprising, inductor heating means having at least one elongated heating zone, said heating zone comprising multi-channel inductor coils, each coil having an entrance and an exit end and having electrical windings which completely envelop said plurality of work paths over the length of said coil, each coil also beig divided into at least two adjacent coil lengths, wherein the direction of the current flow and the direction of the coil winding are reversed simultaneously between at least two adjacent coil lengths, said multi-channel inductor coils being



longitudinally disposed about said plurality of work paths to form a stack of separate, closely spaced guide channels defining a linear heating path of prescribed length; and means for activating said inductor heating means to a prescribed adjustable energization level.

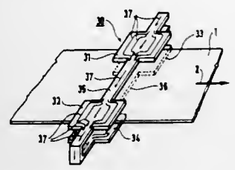
4,788,395
CONFIGURATION FOR JOINING COMPONENTS OF A MICROWAVE OVEN
Yasuhiko Sakoda, Wakayama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 724,187, Apr. 17, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 913,611
Claims priority, application Japan, Jun. 15, 1984, 59-89597[U]
Int. Cl.⁴ H05B *6/64*
U.S. Cl. 219—10.55 R **8 Claims**



1. A microwave oven structure having its constituent components thereof joined by an interlocking configuration, comprising:
a sheet material bent to define a top, a first bottom, and two side walls each having first mating members formed about their edges and
an exterior cover of at least one sheet material defining a front, a second bottom and a rear wall having corresponding second mating members positioned to engage said first mating members;
at least one of said first and second mating members having openings therein and the remaining of said first and second corresponding mating members having a folded end portion, said end portion being provided with projections which are inserted into said openings and pressed to be parallel with said folded end portion to form said interlocking configuration.

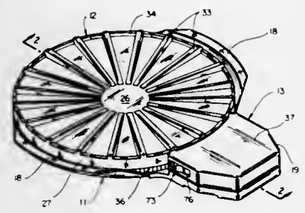
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4,788,396
METHOD OF SINTERING BY INDUCTION
Christian Mangein, Saint Germain du Puch, and Roland Ernst, Grenoble, both of France, assignors to Centre National de la Recherche Scientifique G.I.S. Madylam, Grenoble, France
Filed Dec. 8, 1987, Ser. No. 130,221
Claims priority, application France, Dec. 11, 1986, 86 17357
Int. Cl.⁴ H05B *6/40*
U.S. Cl. 219—10.43 **6 Claims**



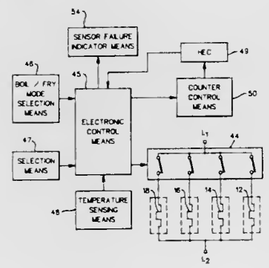
1. A method of sintering by induction an electrode for an electrochemical cell, said electrode being constituted by a metal strip having a mixture of metal powder and of active material powder previously compressed onto the faces thereof, the method comprising displacing said strip longitudinally through an inductor having a high frequency current flowing therein, said inductor being generally in the form of a hairpin having two branches situated on opposite sides of said strip and extending perpendicularly to its direction of displacement, wherein the improvement comprises: providing each branch of said hairpin with widened portions extending parallel to the strip in the zones facing the edges of the strip so as to serve to locally increase the cross-section through which the inducing current passes in such a way that the whole electrode remains at a uniform temperature suitable to sintering said metal powder without damage to said active material powder.

4,788,397
DRIVE MOTOR ASSEMBLY AND TURNTABLE UTILIZABLE THE SAME
Allen M. Danley, Eagan, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Continuation of Ser. No. 801,496, Nov. 22, 1985, Pat. No. 4,647,745, which is a continuation of Ser. No. 397,326, Jul. 12, 1982, abandoned. This application Jan. 13, 1987, Ser. No. 2,799
The portion of the term of this patent subsequent to Mar. 3, 2004, has been disclaimed.
Int. Cl.⁴ H05B *6/80;* **A47B** *11/00*
U.S. Cl. 219—10.55 F **23 Claims**



1. A portable turntable for use in a microwave oven, comprising a base, a horizontally extending platform mounted on the base for rotation about a vertically extending axis, a microwave reflective enclosure, means including a metallic energy storage spring wound in spiral fashion in a generally horizontal plane within the enclosure for effecting relative rotation of the platform and base without substantial leakage of microwave energy into the enclosure, and means fabricated of a material which does not interact with microwave energy coupled to the platform for regulating the speed at which the platform is rotated.

4,788,398
TEMPERATURE SENSOR FAILURE DETECTION ARRANGEMENT USING A HEATER ENERGY COUNTER
Richard E. Hornung, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Sep. 30, 1987, Ser. No. 103,051
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—483 **10 Claims**



1. In a temperature controlled heating device of the type having heater means, control means for controlling the power level applied to the heater means and temperature sensing means for sensing the temperature of a load heated by the heater means, an improved temperature sensor failure detection arrangement wherein:

said control means includes heater energy counter means, means for incrementing and decrementing said heater energy counter means at rates determined as a function of the power level applied to the heater means such that the count of said heater energy counter approximately tracks the temperature of the heater means, and means responsive to the temperature sensing means and said heater energy counter means, operative to detect a first abnormal operating condition of the temperature sensing means when the count of said heater energy counter is within a predetermined reference range and the sensed temperature is outside a correlative predetermined reference temperature range.

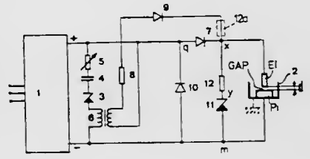
4,788,399
ELECTRICAL CIRCUIT FOR ELECTRO-DISCHARGE MACHINES
Nicolas Mironoff, 1295 Mies, Switzerland
PCT No. PCT/CH85/00103, § 371 Date Apr. 7, 1986, § 102(e) Date Apr. 7, 1986, PCT Pub. No. WO86/00249, PCT Pub. Date Jan. 16, 1986
PCT Filed Jun. 27, 1985, Ser. No. 848,379
Claims priority, application PCT Int'l Appl., Jun. 29, 1984, PCT/CH84/00108
Int. Cl.⁴ B23H *1/02*
U.S. Cl. 219—69 P **9 Claims**

3. An electrical discharge machining circuit for a machine working a workpiece by electro-erosive discharges through a dielectric medium in a machining gap between an electrode-tool and said workpiece which constitutes itself the second electrode of said gap, comprising:

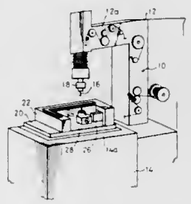
erosive discharge means comprising a capacitor and means for charging and discharging said capacitor, and means responsive to the discharge of said capacitor for supplying said electrodes with repetitive pulses of erosive electrical energy, and

preignition means for providing, in prologue to said erosive pulses, preignition pulses of a higher voltage but of a lower energy than said erosive pulses, said preignition pulses ionizing said dielectric medium in said machining gap so as to create each time a channel which thereafter allows an erosive discharge to flow therethrough,

said preignition means comprising a step-up transformer having a primary winding and a secondary winding, first clamping means including a first Zener diode connecting said capacitor to said primary winding of said transformer, said first clamping means being operative to control the initiation of current flow through said primary winding during the charging of said capacitor, the secondary winding of said transformer being connected across said machining gap, and second clamping means connected across said machining gap on the secondary side of said transformer, said second clamping means including a second Zener diode and having high voltage and low energy parameters which correspond to the voltage and energy parameters of said preignition pulses, said second clamping means being operative to limit the voltage of said preignition pulses across said gap if the voltage of said preignition pulses tends to exceed a reference value related to said high voltage parameter of said second clamping means.

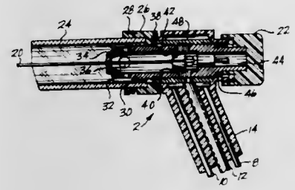


4,788,400
WIRE CUT ELECTRIC DISCHARGE MACHINE EQUIPPED WITH A CONDUCTIVE WORK TABLE
Toshiyuki Aso, Hino, and Sadahiro Watanabe, Kunitachi, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP87/00338, § 371 Date Dec. 24, 1987, § 102(e) Date Dec. 24, 1987, PCT Pub. No. WO87/07193, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 146,166
Claims priority, application Japan, May 29, 1986, 61-122274
Int. Cl.⁴ B23H *7/02*
U.S. Cl. 219—69 W **2 Claims**



1. A wire cut electric discharge machine equipped with a work table comprising a horizontal slide table mounted on a metallic bed thereof, and a work rest fixedly mounted on said horizontal slide table, characterized in that said horizontal slide table and said work rest are formed of an electro-conductive ceramic material to electrically connect said work table directly to said metallic bed so that said work table is held at ground potential.

4,788,401
INERT GAS WELDING TORCH
Arthur L. Kleppen, Kent, Wash., assignor to C-K Systematics, Inc. div. of Conley & Kleppen, Int'l., Auburn, Wash.
Filed Aug. 17, 1987, Ser. No. 85,556
Int. Cl.⁴ B23K *9/16*
U.S. Cl. 219—75 **12 Claims**



1. A tungsten inert gas or similar welding torch which comprises:

a head means for holding an electrode and providing a shield of inert gas to the weld zone, said head means having upper and lower ends and containing a collet body means, a collet means for gripping the electrode, and a tightening means to tighten the collet means about the electrode;

a side arm means attached to the head means, said side arm means containing inert gas and any other fluid supply lines and electrical connections and serving as a handle for the torch during use;

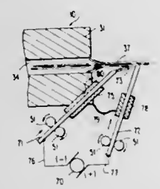
a heat shield means attached to the lower end of the head means;

gas cup means having a lower end mounted in the heat shield means and a distal end, said heat shield means providing at least some thermal and mechanical isolation between the gas cup means and head means,

the collet body means extending axially and concentrically into the gas cup means and having mounted thereon a gas diffusion means,

said gas diffusion means being located within the gas cup means and bearing against an inner circumference of said gas cup means to provide resilient support and center the cup means about the longitudinal axis of the electrode.

4,788,402
HIGH POWER EXTENDED ARC PLASMA SPRAY METHOD AND APPARATUS
James A. Browning, P.O. Box 6, Hanover, N.H. 03755
Filed Mar. 11, 1987, Ser. No. 24,485
Int. Cl.⁴ B23K *9/00*
U.S. Cl. 219—76.16 **10 Claims**



1. In a plasma arc spray process comprising the steps of:

feeding a plasma producing gas under pressure through a chamber housing a first cathode electrode and from said chamber through a spray nozzle forming a second anode electrode and defining an anode nozzle passage aligned with said first electrode and being spaced therefrom, while creating an electric arc between said first and second electrodes to set up a plasma flame jet exiting said

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nozzle passage, and feeding material into said flame jet for melting said material and accelerating the same within said flame jet for coating a substrate by impingement placed in front of and downstream of the nozzle exit, the improvement comprising the steps of:

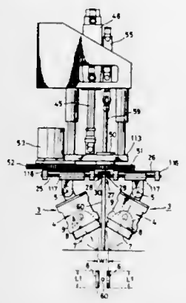
establishing a vortex flow of plasma-producing gas to create a low pressure core of gas flow extending through the anode passage with said low pressure core, establishing an extended ionized arc column throughout the anode nozzle passage, and adjusting the rate of gas flow and the arc current to the anode nozzle passage diameter to produce a supersonic extended ionized arc column which extends beyond the end of the nozzle by a distance which is approximately four times the nozzle passage diameter.

4,788,403

APPARATUS FOR AUTOMATIC SOLDERING

Futomi Hayakawa, and Kazuo Onoda, both of Tokyo, Japan, assignors to Hy-Bec Corporation, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 4,414
Claims priority, application Japan, Jan. 20, 1986, 61-9628
Int. Cl.⁴ B23K *1/12*
U.S. Cl. 219—85 BA **5 Claims**



1. An apparatus for the automatic soldering if lead pins distributed on a package IC chip in quadrilateral rows with corresponding contact pins, which are distributed on a substrate printed circuit board in rows corresponding to said rows of lead pins and have previously been pasted with solder, comprising a heat ray soldering head for focusing in a said row of pins a line of focus in the form of a segment of a line corresponding to a soldering line, a memory-operated section (A), a control section (B) and an actuation section (C), the control section (B) operating in response to commands from the memory-operation section (A) and controlling the actuation section (C) to actuate means to move the heat ray soldering head along x coordinates on the substrate board to a position for the package IC chip to be soldered and to effect soldering along a said row where electric junctions are to be built up by said focussed heat ray and also to actuate means then to rotate said head 90° and move said head along y coordinates on the substrate board to effect soldering along another said row at right angles to said focussed-on row of pins.

4,788,404

SELF-SOLDERING FLEXIBLE CIRCUIT CONNECTOR

Harold B. Kent, San Carlos, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

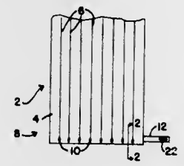
Filed Jun. 20, 1985, Ser. No. 746,796
Int. Cl.⁴ H05B *3/58*
U.S. Cl. 219—85 R **31 Claims**

1. In combination

a flexible circuit having at least one conductor disposed in and surrounded by insulating material covering said conductor,

said material having large opposed surfaces,

a heater disposed along and in contact with one of said surfaces to heat a limited region of said conductor,



said at least one conductor having the insulating material removed along the other of said opposed surfaces opposite the limited region of said conductor to be heated,

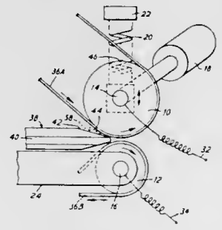
said heater including means for connection to a source of energy.

4,788,405

WELD THICKNESS MONITORING IN RESISTANCE WELDING APPARATUS

Stephen J. Haigh, Cholsey; Martin J. Melville, Sparsholt, both of United Kingdom, and Martin J. Melville, both of Oxfordshire, United Kingdom, assignors to Metal Box Public Limited Company, Reading, United Kingdom

Filed May 27, 1987, Ser. No. 54,583
Claims priority, application United Kingdom, May 30, 1986, 8613130
Int. Cl.⁴ B23K *11/24*
U.S. Cl. 219—109 **19 Claims**



19. Resistance welding apparatus comprising first and second mutually co-operable electrodes, said first electrode being arcuate and the second electrode a rotary wheel;

means mounting said second electrode for guided movement towards and away from the first electrode;

a light source located laterally of the periphery of the second electrode to direct light towards a position where the periphery is inclined to the direction of movement of the second electrode; and

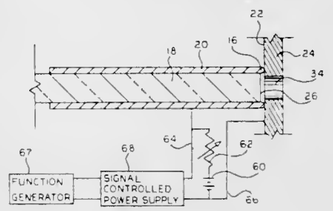
a light collector located on the opposite side of the second electrode from the light source to receive light and in a position where light from the light source directed at light collector is partially eclipsed by the second electrode, the collector thereby generating a signal which is a function of the relative displacement between the electrodes and therefore also a function of weld thickness present between the electrodes.

4,788,406

MICROATTACHMENT OF OPTICAL FIBERS

Robert L. Holman, Powell; Doyle P. Skinner, Jr., Westerville, and Lynda M. Johnson, Worthington, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Jan. 23, 1987, Ser. No. 6,164
Int. Cl.⁴ B23K *11/00*
U.S. Cl. 219—113 **21 Claims**



1. A method for bonding an optical fiber to an object having a metal surface, comprising:

(a) coating at least a portion of the periphery of the optical fiber with a metallic layer in the area of the fiber where bonding is to take place;

(b) positioning said metallic layer in electrical contact with the metal surface of said object along an interface between the fiber and the object; and

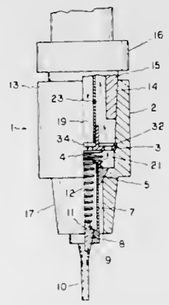
(c) applying at least one preselected and controlled electrical current pulse through said interface sufficient to cause local melting of the metallic surfaces and welding at the interface.

4,788,407

SPOT WELDING ELECTRODE APPARATUS

Anders H. Flater, 2360 Sheridan Rd., Highland Park, Ill. 60035

Filed Oct. 28, 1987, Ser. No. 113,492
Int. Cl.⁴ B23K *9/24*
U.S. Cl. 219—120 **10 Claims**



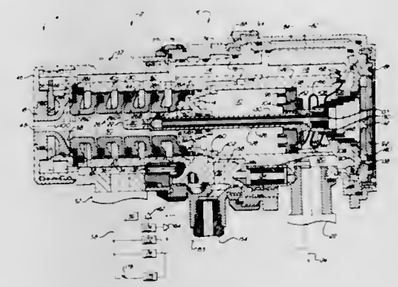
1. A spot welding electrode apparatus comprising: a body having an upper end removably emplaceable on an electrode holder and a lower end on which there is removably emplaceable weld cap, a stem valve seated inside the body and containing a spring and a sensor, the sensor having a valve portion seated inside the stem valve; a retainer contained in the body and having a seat for the stem valve; the body comprising a conduit for electrical current and coolant fluid between the electrode holder and the welding cap, the emplacement of the welding cap on the lower end activates the sensor to position the stem valve and valve portion whereby the coolant fluid is flowing from the electrode holder and circulated inside the body and the welding cap, the emplacement of the welding cap off the lower end activates the sensor to position the stem valve and valve portion whereby the coolant fluid is flowing from the electrode holder and circulated inside the body.

4,788,408

ARC DEVICE WITH ADJUSTABLE CATHODE

Janusz Wlodarczyk, Jackson Heights; Henry C. Thompson, Huntington Bay; Thomas F. Bernecki, Elmont, and Henry A. Budke, Kings Park, all of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 8, 1987, Ser. No. 47,757
Int. Cl.⁴ B23K *9/00*
U.S. Cl. 219—121.49 **7 Claims**



1. An arc generating system including an arc device with a cathode member located in spaced relationship with an anode operable to maintain an arc therebetween, fluid passage means receptive of pressurized liquid cooling fluid for cooling the arc device, discharge means for discharging the cooling fluid at an intermediate pressure, and cathode positioning means for adjusting relative axial spacing between the cathode member and the anode, the cathode positioning means comprising:

a closed cylinder member extending from the arc device;

a piston affixed to the cathode member and slidingly positioned in the cylinder member partitioning therein a first chamber and a second chamber, the first chamber being receptive of the cooling fluid from the discharge means and having an exit means of sufficient resistance to maintain the cooling fluid in the first chamber at the intermediate pressure;

first valve means for selectively infusing pressurized liquid control fluid into the second chamber such as to move the piston against the intermediate pressure of the cooling fluid in the first chamber and thereby move the cathode member in a first direction with respect to the anode; and

second valve means for selectively discharging the control fluid from the second chamber such that the intermediate pressure of the cooling fluid in the first chamber moves the piston against the discharging control fluid in the second chamber and thereby moves the cathode member axially in a second direction opposite the first direction.

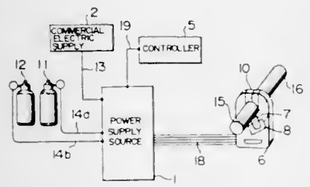
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4,788,409

METHOD OF AND APPARATUS FOR AUTOMATICALLY CONDUCTING ALL POSITION PLASMA WELDING OF PIPES

Takashi Yamade, Hitachi; Seishi Watahiki, Katsuta; Yasuzi Sakuma, Hitachi; Masayoshi Yamaguchi, Hitachi, and Shinichi Kurita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1987, Ser. No. 84,555
Claims priority, application Japan, Aug. 13, 1986, 61-188481
Int. Cl.[4] B23K *5/00*
U.S. Cl. 219—121.46 5 Claims



1. A method of automatically conducting an all position plasma welding of sections of pipes, comprising the steps of:

preparing a plasma welding apparatus including a welding torch, a welding head mounted on one of said pipe sections and having a torch-rotating means supporting said welding torch for rotation around said one pipe section at a desired speed, plasma and shield gas supply sources, a welding power supply source, means for driving said torch-rotating means to cause said welding torch to achieve an all position welding of said pipe sections one to the other, and a controller operative to control a rate of supply of a welding current from said welding power supply source, rates of supplies of the plasma and shield gases to said welding torch and a speed of said driving means;

placing said another of said pipe sections in abutting relation to said one pipe section;

pre-heating of weld portions of said pipe sections by a plasma flame produced by said welding torch while the rates of the supplies of the welding current and the plasma and shield gases and the speed of the movement of said welding torch are controlled by said controller;

then, tack-welding said pipe sections to tentatively fix the sections together;

thereafter, automatically conducting keyhole welding and finish padding by the plasma flame from said welding torch and in accordance with parameters of said pipes;

the pre-heating step being conducted such that the supplied welding current and plasma and shield gases are restricted and the welding speed is controlled by said controller in accordance with the sizes of the pipes to be welded; and

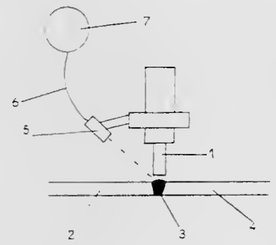
the tack-welding step being conducted such that the rates of supplies of the welding current and the plasma and shield gases are more restricted by said controller than in the keyhole welding and final padding steps.

4,788,410

PROCESS FOR CONTROLLING AND/OR GUIDING THE WELD SEAM DURING ARC WELDING AND A PAINT THEREFOR

Michael Grau, and Bernd Schubert, both of Hamburg, Fed. Rep. of Germany, assignors to Mankiewicz Gebr. & Co. (GmbH & Co.), Hamburg, Fed. Rep. of Germany

PCT No. PCT/EP86/00532, § 371 Date May 14, 1987, § 102(e) Date May 14, 1987, PCT Pub. No. WO87/01805, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 16, 1986, Ser. No. 71,342
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1985, 3533145
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.34 15 Claims



1. A process for controlling, guiding or controlling and guiding the production of a weld seam during the electric arc welding of workpieces, which process comprises the steps of:

(a) applying an elemental metal or an elemental metal alloy to an edge or surface of at least one workpiece, wherein the elemental metal or at least one of the metals of the elemental alloy is either not present or present in slight proportions only in the workpiece;

(b) applying a welding arc to the workpiece provided with the elemental metal or elemental metal alloy applied thereto;

(c) spectroanalytically observing at least one characteristic spectral line in the arc emitted by at least one metal of the applied elemental metal or elemental metal alloy and deriving spectral data therefrom; and

(d) controlling, guiding or controlling and guiding the arc in response to the spectral data so derived.

4,788,411

WELDING METHOD WHICH PROVIDES A WELD WITH CORROSION PROTECTION

Mark C. Skinner, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1987, Ser. No. 62,840
Int. Cl.[4] B23K *35/34*
U.S. Cl. 219—127 4 Claims

1. A method of welding metal parts, each of said parts having a surface area to be welded, said method comprising:

(a) preparing the surface areas of said parts to be welded to provide bare metal surfaces which are clean and dry;

(b) coating said bare metal surfaces with a protective coating comprising, zinc dust, manganomanganic oxide fume, and organic binder;

(c) permitting the coating to dry at least to the touch to provide a coated surface;

(d) contacting the coated surfaces of the metal parts to be welded; and

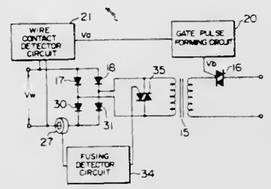
(e) welding said metal parts together through said coated surfaces by means of gas metal arc welding to provide a welded joint bearing said protective coating.

4,788,412

METHOD OF CONTROL AND APPARATUS FOR HOT-WIRE WELDING

Katsuyoshi Hori; Shigeyoshi Kawano; Masahiko Sadakane; Toshiharu Myoga, all of Kure, and Toshiaki Takuwa, Yokohama, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1987, Ser. No. 55,948
Claims priority, application Japan, May 30, 1986, 61-124869; Jul. 4, 1986, 61-156253
Int. Cl.[4] B23K *9/10*
U.S. Cl. 219—137 PS 21 Claims



1. A method of controlling a hot-wire welding apparatus which comprises an arc power supply source, an arc electrode connected to said arc power supply source, a filler wire delivered to a location where an arc is produced to form a molten pool with a base material, and a wire-heating power supply source for heating said filler wire by electrical energization thereof, said method comprising the steps of:

(a) increasing progressively an electric heating power supplied from said wire-heating power supply source for heating said filler wire until said filler wire is brought to a fusing state where fusing of said filler wire occurs or can immediately occur;

(b) detecting occurrence of said fusing state;

(c) decreasing said electric heating power supplied to said filler wire to a predetermined level at the moment when said fusing state is detected;

(d) increasing progressively said electric heating power again until said filler wire is again brought to said fusing state; and

(e) repeatedly executng said steps (a), (b), (c) and (d) in sequence.

4,788,413

SYSTEM INCLUDING A PORTABLE HEAT GUN FOR CURING ADVANCED COMPOSITE WORKPIECES

Berwyn S. Eng, San Diego, Calif., assignor to General Dynamics Corporation/Space Systems Division, San Diego, Calif.

Filed Oct. 21, 1987, Ser. No. 111,010
Int. Cl.[4] F24H *3/00;* H05B *1/00*
U.S. Cl. 219—364 10 Claims

1. A system for curing advanced composites including a portable hand held heat gun comprising:

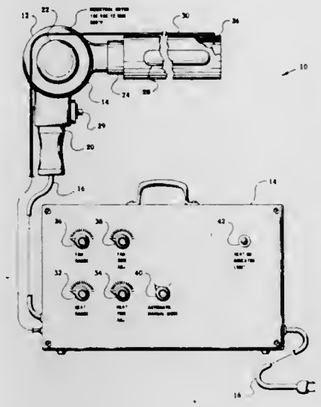
a hollow housing having a generally pistol grip configuration and provided with an air intake port and an air discharge port;

an air blower means positioned within said housing and adapted to draw air into the housing through the intake port and discharge air through the discharge port;

controllable heater means positioned within the housing and adapted to cooperate with the air blower means to selectively heat the air stream discharged through the discharge port;

means to position the discharge port a predetermined distance from an advanced composite to be cured; and,

control means cooperating with the heater means and blower means when the discharge has been positioned a predetermined distance from an advanced composite to be cured to cause the heat gun system to direct a flow of heated air against the advanced composite at a predetermined temperature for a predetermined time period and upon cessation of the time period to thereafter cause the heat gun system to direct an unheated flow of air against the advanced composite for a second period of time



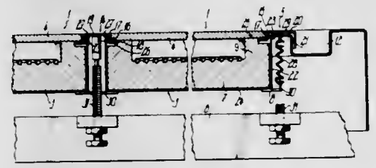
thereby causing a resin component of the advanced composite to flow within the composite in a prescribed manner and to cure to a desired hardness.

4,788,414

RADIANT HEATING UNIT FOR COOKERS OR THE LIKE

Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Apr. 24, 1987, Ser. No. 42,428
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613901
Int. Cl.[4] H05B *3/74*
U.S. Cl. 219—464 35 Claims



1. A radiant heating unit (2) for cooking and similar appliances, comprising:

a hotplate (4) having an inner side, an outer side and an edge face (16);

at least one radiant heater (1) having at least one radiant heating element (10,11) defining a heating field;

a support tray (3) having a bearing rim (9) formed from an insulating material and surrounding the heating field, an end face (25) of said bearing rim (9) engaging on the inner side of the hotplate (4);

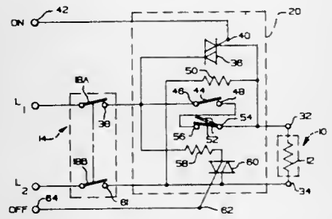
said support tray (3) receiving the radiant heater (1) and having a base side facing the hotplate;

wherein said bearing rim (9) is at least slightly shrinkably compressible over a predetermined maximum amount, and further comprising guiding means laterally slidably guiding said hotplate (4) and said support tray (3) permanently with respect to each other in a self-adjusting cen-

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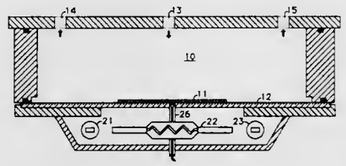
tering manner over a distance at least equal to said maximum amount.

4,788,415
DUAL BIMETAL POWER CONTROL SWITCHING ARRANGEMENT FOR ELECTRONICALLY CONTROLLED APPLIANCES
Robert Z. Whipple, Jr., Prospect, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Nov. 18, 1987, Ser. No. 122,329
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—508 **4 Claims**



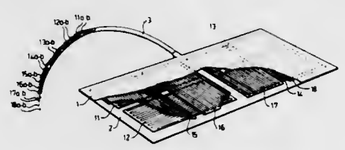
1. A power control switching arrangement for selectively coupling a power signal from an external power supply to an electrical load in response to trigger signals from an external controller, said arrangement comprising:
a first semiconductor switch means for coupling the power signal from the external power supply to the load, having a gate terminal, and being switched into conduction by a trigger signal at its gate terminal from the external controller;
a first thermally actuated switch means operative to switch when heated from a normally open state to a closed state;
a second thermally actuated switch means operative to switch when heated from a normally closed state to an open state;
said first and second thermally actuated switch means being electrically connected in parallel circuit with said first semiconductor switch means to shunt said first semiconductor switch member when both therally actuated switch means are in said closed states;
first heater means arranged for electrical connection in parallel circuit with the load operative when energized to heat said first thermally actuated switch means;
second heater means electrically connected in series circuit with a second semiconductor switch means, arranged for electrical connection across the power supply, operative when energized to heat said second thermally actuated switch means, said second semiconductor switch means having a gate terminal and being switched into conduction by a trigger signal from the controller applied to its gate terminal;
whereby a trigger signal at the gate of said first semiconductor switch means enables energization of the load and said first heater means, causing said first thermally actuated switch means to switch to its closed state thereby shunting said first semiconductor switch means, and a trigger signal applied to the gate terminal of said second semiconductor switch means enables energization of said second heater means causing said second thermally actuated switch means to switch to its open state thereby de-energizing the load, and de-energizing said first heater means to enable said first thermally actuated switch means to return to its normally open state.

4,788,416
DIRECT WAFER TEMPERATURE CONTROL
J. B. Price, Scottsdale, and Richard S. Rosler, Paradise Valley, both of Ariz., assignors to Spectrum Cvd, Inc., Del.
Filed Mar. 2, 1987, Ser. No. 20,278
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—516 **8 Claims**



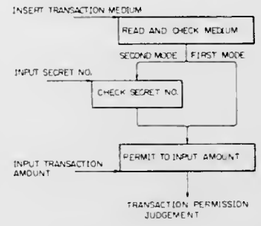
1. In apparatus for treating a semiconductor wafer in a vacuum, said apparatus having a chamber including a translucent window on which the wafer rests and including means for heating said wafer through the translucent window, the improvement comprising:
an aperture in said window at a location on which said wafer rests;
a translucent tube attached and sealed to said window at said aperture on the outside of said chamber;
temperature sensing means extending through said tube and said aperture to touch the surface of said wafer in contact with said window; and
means for sealing the end of said tube remote from said window.

4,788,417
ELECTRICAL HEATING PAD
Leif Graflind, Järfälla, Sweden, assignor to Kanthal Medical Heating AB, Järfälla, Sweden
PCT No. PCT/SE86/00216, § 371 Date Jan. 7, 1987, § 102(e) Date Jan. 7, 1987, PCT Pub. No. WO86/06920, PCT Pub. Date Nov. 20, 1986
PCT Filed May 7, 1986, Ser. No. 13,984
Claims priority, application Sweden, May 7, 1985, 8502249
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—528 **12 Claims**



1. An electrical heating pad, comprising a number of partially overlapping resistor foil elements (11–18), each such foil element having a separate pair of electrical feed terminals (11*a–b*, . . . , 18*a–b*), wherein
(a) substantially the whole area of the pad is divided into a plurality of sub-regions;
(b) the foil elements (11–18) are positioned in an overlapping configuration such that in each subregion (11/15, 11/16, 12/15, 12/16, 13/17, 13/18, 14/17, 14/18) of the pad there is a unique pair of overlapping foil element parts; and
(c) the feed terminals (11*a–b*, . . . , 18*a–b*, respectively) of each foil element in such a pair of partially overlapping foil elements is connectable to an electrical power unit so as to permit individual sensing of the respective temperature-dependent resistance thereof, whereby the temperature of each sub-region of the pad can be monitored individually.

4,788,418
AUTOMATIC TRANSACTION MACHINE
Setsuo Tsukui, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Jan. 21, 1987, Ser. No. 5,777
Claims priority, application Japan, Jan. 21, 1986, 61-10866; Jan. 21, 1986, 61-10867; Jan. 21, 1986, 61-10868; Jan. 22, 1986, 61-11667
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **12 Claims**

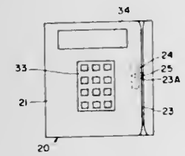


1. An automatic transaction machine comprising:
reading means for reading data recorded on a transaction medium for a user;
validity checking means for checking the validity of the data read by said reading means;
operation guidance means for providing operation guidance information to the user;
input means for inputting data input by the user in response to said operation guidance information; and
control means, having first and second input processing modes, for selecting the first input processing mode to control said operation guidance means so that a transaction amount can be immediately input through said input means directly after a validity check of the read data, and for selecting the second input processing mode to control said operation guidance means so that the transaction amount can be input only after inputting a user identification number through said input means after the validity check.

4,788,419
TICKET PROCESSING TERMINAL WITH A SINGLE-CYLINDER TICKET ADVANCING MECHANISM
James T. Walters, Oceanside; Paul M. Volpini, San Diego; Edward A. Hoppe, Oceanside, and Colin J. Gardyne, San Diego, all of Calif., assignors to International Totalizator Systems, Inc., San Diego, Calif.
Filed Sep. 19, 1986, Ser. No. 909,507
Int. Cl.[4] G06F *7/08*
U.S. Cl. 235—381 **17 Claims**

1. A ticket processing terminal, comprising:
a housing;
a substantially cylindrical ticket guide in said housing;
a single drive cylinder means conforming to and enclosed by said ticket guide for driving a ticket in said ticket guide in a revolutionary feeding direction in response to a drive signal;
a first, entry port in said ticket guide for inserting an information-bearing ticket into said ticket guide in said feeding direction;
a second, feed port in said ticket guide spaced from said entry port for feeding a ticket into said ticket guide in said feeding direction;
reading and writing means adjacent said ticket guide for selectively reading or writing information on a ticket being driven in said feed direction;
an exit port in said ticket guide for conducting a ticket from said ticket guide, said exit port displaced from said reading and writing means in said feeding direction;
positionable diverter means conditioned by a positioning signal for moving to a first position to divert a ticket from said ticket guide to said exit port or to a secnd position to guide a ticket in said ticket guide past said exit port in said feeding direction; and
terminal control means connected to said drive cylinder means, said diverter means, and said reading and writing means for providing said drive and positioning signals, said terminal control means including drive control means to generate said drive signal, reading and writing control means for operating said reading and writing means to read or write information on a ticket in said ticket guide, and diverter control means responsive to said drive control means and to said reading and writing control means for conditioning said positioning signal in sychronism with the reading and writing of a ticket being driven in said ticket guide.

4,788,420
SYSTEM AND METHOD FOR READING DATA RECORD STRIPES ON DATA CARDS
Karl Chang, Honolulu; William R. Pape, III, Papaaloa; Victor J. Crosetti, Jr., Honolulu; Lance S. Nakamura, Pearl City; Daniel B. C. Leong, and Robert K. L. Loui, both of Honolulu, all of Hi., assignors to Verifone, Inc., Redwood City, Calif.
Continuation of Ser. No. 770,725, Aug. 28, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 85,287
Int. Cl.[4] G06K *13/06*
U.S. Cl. 235—483 **13 Claims**



1. In a data card reading transaction terminal for reading a data record stripe on a data card and including a plurality of modules comprising at least one of a keypad and data display module and at least one electronic circuit board module,
an injection molded terminal case for housing said modules, said case having a cover portion and a base portion, said cover portion comprising a top wall portion having one or more prearranged apertures formed therein and operatively associated with said keypad or display module and a card guide extending below said top wall portion at a position separated from said apertures and near one side of said case, said cover portion including said card guide being formed as a single injection molded piece with said card guide including right and left side wall portions extending transverse to said top wall portion and being continuous from one end of said cover portion to an opposite end thereof and with a read head window integrally formed in one of said side wall portions;
a data read head assembly having a read head on a front face thereof; and
mounting means for mounting said data read head assembly to said cover portion adjacent said read head window with said read head projecting through said read head window into said card guide at an accurate position relative to the position of said data record stripe on a data card passing through said card guide.

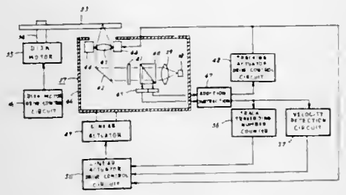
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,421

APPARATUS FOR CONTROLLING RELATIVE MOVEMENT OF AN OPTICAL HEAD TO AN OPTICAL DISK WITH VELOCITY DETECTION

Masaharu Ogawa, and Keiji Nakatsu, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,026
Claims priority, application Japan, May 15, 1985, 60-101439; May 15, 1985, 60-101440
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **14 Claims**



1. A control apparatus for controlling relative movement of an optical head to an optical disk, wherein said optical disk has a plurality of tracks in which information is stored and said optical head has light emitting means for emitting light on said optical disk and photo detecting means for receiving the reflected light from said optical disk and for generating a photoelectric conversion signal; said control apparatus comprising

an actuator for moving said optical head in a radial direction of said optical disk;

a velcoity detecting means for detecting relative moving velocity of said optical head to said optical disk during access to a track of said optical disk, said velocity detecting means comprising:

first means for generating a first signal which has a first relation to a period of said photoelectric conversion signal generated by said photo detecting means; and

second means responsive to said first signal for outputting a second signal which has a second relation, being an inverse of said first relation, to the period of said photoelectric conversion signal representing said relative moving velocity; and

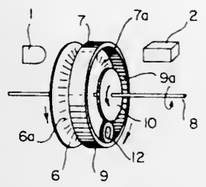
actuator control means for controlling said actuator in response to said second signal.

4,788,422

HIGH RESOLUTION ROTARY ENCODER HAVING APPOSITELY ROTATING DISKS

Toshiaki Fujiwara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1986, Ser. No. 933,146
Claims priority, application Japan, Nov. 25, 1985, 60-265338
Int. Cl.[4] H03M *1/24*
U.S. Cl. 250—231 SE **7 Claims**



1. A rotary encoder which comprises:

a first disk having a first plurality of slits formed at equal intervals in the peripheral edge thereof;

a second disk disposed adjacent to and coaxial with said first disk, wherein said second disk has a second plurality of slits formed at equal intervals in the peripheral edge thereof and aligned corresponding to said first plurality of slits, said first and second disks having first and second outer faces;

a light emitting source disposed at said first outer face; and

a light sensor disposed at said second outer face for sensing light emitted from said light emitting source through said first and second pluralities of slits;

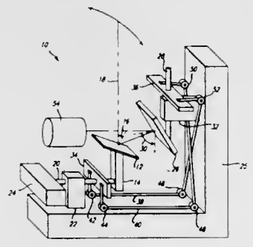
wherein said first and second disks rotate in opposite directions .

4,788,423

TWO-MIRROR SCANNING SYSTEM

Richard W. Cline, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed May 26, 1987, Ser. No. 53,974
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—235 **10 Claims**



1. An apparatus for receiving incident light from a scanned field of view and directing said incident light onto a sensor, said apparatus comprising:

(a) a first mirror;

(b) a second mirror;

(c) the first mirror being mounted at a first angle on a post, said post having an axis parallel to the incident light;

(d) the second mirror being mounted at a second angle for receiving incident light received from the first mirror, said second mirror serving to reflect light to the sensor;

(e) first rotation means for rotating the post about a first axis perpendicular to the incident light;

(f) second rotation means for rotating the second mirror about a second axis parallel to the incident light; and

(g) synchronization means for coupling the rotation of the post about the first axis with the rotation of the second mirror about the second axis, whereby the incident light is reflected from the first mirror to the second mirror and then to the sensor to permit a field of view to be scanned and imaged by the sensor.

4,788,424

METHOD AND APPARATUS FOR DETERMINING PARTITIONING OF BOREHOLE AND FORMATION CONSTITUENTS

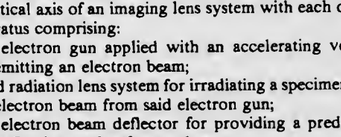
William E. Preeg, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,068
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—270 **39 Claims**

1. A method of determining the partition of constituents as between a subterranean formation and other material in the region of investigation of a well-logging sonde positioned in a borehole traversing said formation, comprising the steps of:

bombarding said material and said formation with high energy neutrons from said sonde;

detecting gamma radiation resulting from capture of said neutrons by constituents of said material and said formation, appproximating said gamma radiation detected, and generating a detection signal representative of time and energy of said gamma radiation approximation;



generating from said detection signal a first signal representative of change in rate of thermal neutron capture in said material;

generating from said detection signal a second signal representative of change in rate of thermal neutron capture in said formation; and

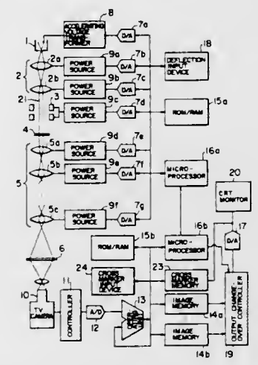
generating from said detection signal and said first and second signals an output signal representative of the partition of at least one constituent as between said material and said formation.

4,788,425

OPTICAL AXIS ADJUSTING APPARATUS FOR ELECTRON MICROSCOPE

Hiroyuki Kobayashi, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,253
Claims priority, application Japan, Oct. 8, 1986, 61-237967
Int. Cl.[4] H01J *37/26*
U.S. Cl. 250—311 **12 Claims**



1. An optical axis adjusting apparatus for an electron microscope for aligning an optical axis of a radiation lens system and an optical axis of an imaging lens system with each other, said apparatus comprising:

an electron gun applied with an accelerating voltage for emitting an electron beam;

said radiation lens system for irradiating a specimen with the electron beam from said electron gun;

an electron beam deflector for providing a predetermined deflection to the electron beam;

said imaging lens system for forming an enlarged image of said specimen, said imaging lens system including an objective lens;

display means for displaying the enlarged image;

means for changing one of a magnetization current of said objective lens and said accelerating voltage;

image taking-in means for taking in a plurality of images in the course of the change by said changing means and storing an image in a superimposed form of said plurality of images;

image output means for causing the image stored in said image taking-in means to be displayed on said display means; and

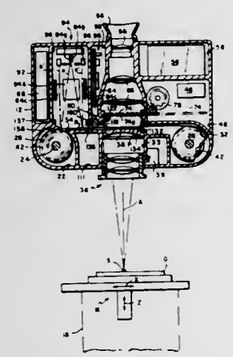
optical axis adjustment means for aligning the optical axis of said radiation lens system and the optical axis of said imaging lens system with each other on the basis of the image displayed on said display means.

4,788,426

INTERACTIVE IMAGE RECORDING METHOD AND MEANS

Manfred R. Kuehnle, P.O. Box 1020, Rt. 103A, New London, N.H. 03257

Filed Jun. 11, 1986, Ser. No. 872,891
Int. Cl.[4] H01J *37/21*; H04N *1/00*
U.S. Cl. 250—327.2 **31 Claims**



1. An electronic read/write system comprising

A. a housing;

B. lens means mounted in a wall of the housing for imaging a field of view at a focal plane in the housing;

C. means in the housing for positioning a wholly inorganic plural-layer optoelectronic medium in said plane; and

D. electron generating means mounted in said housing and spaced opposite said plane, said electron generating means including

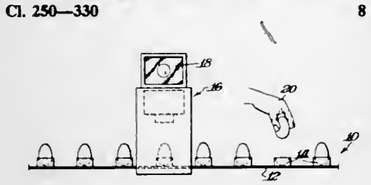
(1) means for producing a cloud of electrons from a first source to controllably charge an optoelectronic medium in said plane while the medium is simultaneously exposed to a light image in the field of view of said lens means whereby an electronic latent image of the field of view is generated and stored in the medium,

(2) means for producing a finely focused electron beam for scanning the medium so as to sweep out a raster on the medium whereby to produce a return beam of secondary electrons which is then modulated by the number of exposure generated charges representing said electronic image on the medium, and

(3) means for collecting said secondary electrons to produce an electrical signal representative of the electronic image stored on the medium.

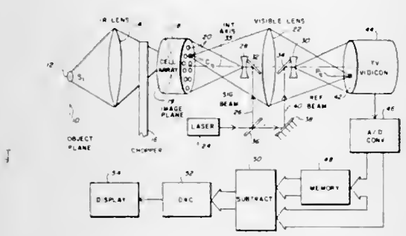
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4,788,427
FERTILIZATION DETECTION
Pierre L. LeRoy, 1101 N. Broom St., Wilmington, Del. 19806
Filed Sep. 4, 1986, Ser. No. 903,496
Int. Cl.[4] G01N *21/00*
U.S. Cl. 250—330 8 Claims



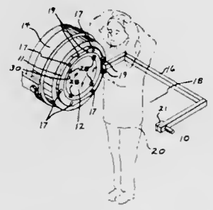
1. A method of detecting whether an egg is fertilized comprising the steps of providing a thermograph machine having a scanner, disposing an egg in proximity to the thermograph machine, scanning the egg with the scanner, providing a visual indication of any heat pattern from the egg as scanned by the thermograph machine, and comparing the visual indication with a reference heat pattern to determine if the visual indication is characteristic for a fertilized egg.

4,788,428
THERMODYNAMICS INFRARED IMAGING SENSOR
Travis W. Metcalf, El Cajon, and Steven E. Moran, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington D.C.
Filed Mar. 4, 1985, Ser. No. 708,136
Int. Cl.[4] H01L *25/00*; G02B *5/23*
U.S. Cl. 250—332 20 Claims



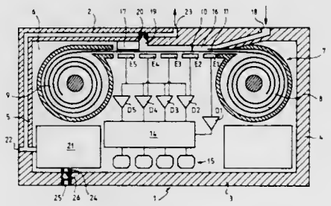
1. An infrared imaging system wherein a visual image of a viewed scene is obtained from thermal energy radiated from said scene, said system comprising:
- means for receiving and focusing infrared radiation from a viewed scene, said focusing of the radiation occurring at an image plane;
- means located at the image plane for absorbing and thermodynamically converting the focused radiation into a measureable physical change of the absorbing means;
- means connected to interact with the means for absorbing for measuring the physical change of the absorbing means, said means for measuring outputting a signal which represents the physical changes occurring over the entire image plane; and
- means for processing and visually displaying the signal output from the means for measuring, wherein said visual display is a two-dimensional representation of the image of the scene being observed;
- wherein the means for measuring comprises an interferometer system which compares changes in phase between a reference beam and a signal beam of light which is reflected from said means for absorbing.

4,788,429
DEVICE AND METHOD FOR MEASURING BONE MINERAL MASS
Charles R. Wilson, Wauwatosa, Wis., assignor to The Medical College of Wisconsin, Inc., Milwaukee, Wis.
Filed Apr. 21, 1986, Ser. No. 854,149
Int. Cl.[4] G01T *1/20*; G01N *23/08*
U.S. Cl. 250—363 S 12 Claims



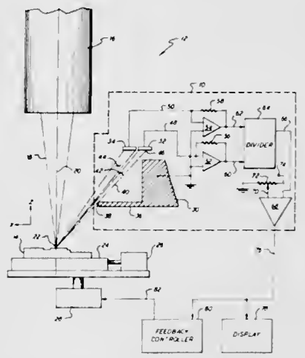
1. An attachment for a scintillation camera to enable the camera to be used for the in vivo measurement of bone mineral mass, in a living animal comprising:
- a grid holder for attachment to the camera;
- a grid mounted on said grid holder so that the grid lies directly in front of the camera when said grid holder is attached to the camera; and
- a generally U shaped arm attached at one end to said grid holder and, at the other end, including a source holder for holding a radioactive source, said source holder being entirely closed except that it defines an aperture directed toward said grid, said ends of said arm being spaced apart sufficiently to accommodate at least the portion of the body of a living animal in which the bone mineral mass is to be measured;
- wherein said source holder is at least 50 cm from said grid and said grid is focused on said source holder.

4,788,430
CONTAMINATION AND IRRADIATION MEASURING METHOD AND A UNIVERSAL SENSOR FOR IMPLEMENTING SAID METHOD
Bruno F. Gonthier, Parc de Monteillon - 11, rue du Dr. Roomefort, 33160 Saint Medard en Jalles, France
Filed Jan. 5, 1987, Ser. No. 352
Claims priority, application France, Jan. 6, 1986, 86 00081
Int. Cl.[4] G01T *1/18*
U.S. Cl. 250—376 18 Claims



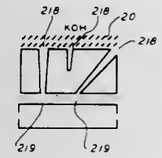
1. A method of measuring the contamination of a fluid having radioactive aerosols in suspension which emit radioactive radiations, said method comprising the following steps:
- i. attracting and trapping the radioactive aerosols with pairs of ions created by said radiations on an electrostatically charged face of an electret, made of dielectric material, by means of the electrostatic field generated by the electret in said fluid, such trapping causing a progressive discharge of the electret depending on the number of ions collected and on an interaction of the radiation emitted by the trapped aerosols with the dielectric material of the electret, and
- ii. measuring this discharge so as to deduce therefrom a useful parameter of said contamination.

4,788,431
SPECIMEN DISTANCE MEASURING SYSTEM
William A. Eckes, Hayward; Lee Veneklasen, Castro Valley; Glen E. Howard, Pleasanton; Donald J. McCarthy, Hayward; Allen M. Carroll, Oakland, and Daniel L. Cavan, Woodside, all of Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Apr. 10, 1987, Ser. No. 36,731
Int. Cl.[4] H01J *37/244*
U.S. Cl. 250—397 18 Claims



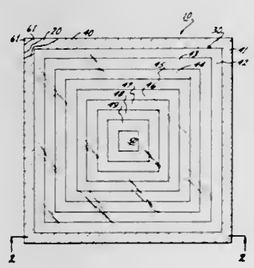
1. A sensor for use in determining the position of a substrate which is bombarded by a beam from a source of charged particles, wherein charged particles are backscattered from said substrate, said sensor comprising:
- a shadow edge positioned adjacent said substrate to cast a shadow by obstructing the flux of charged particles backscattered from said substrate, said shadow edge being fixed in space relative to the source of said charged particle beam to produce a shadow which moves in response to the position of said substrate; and
- a charged particle measurement detector having a detector surface area for intercepting the flux of charged particles backscattered from said substrate, said measurement detector being fixed in space relative to the source of said charged particle beam and said shadow edge, and said measurement detector being positioned with said detector surface area having a first area portion exposed to said backscattered particles and a second area portion in said shadow, said measurement detector having a measurement detector output providing an electrical measurement detector signal corresponding to the size of said first area portion so that said measurement signal varies in accordance with the movement of said shadow as said substrate is moved.

4,788,432
RADIATION MONITORING DEVICE
Gordhanbhai Patel, Somerset, N.J., assignor to JP Laboratories, Inc., Piscataway, N.J.
Filed Jul. 17, 1987, Ser. No. 74,592
Int. Cl.[4] G01T *1/04*
U.S. Cl. 250—472.1 40 Claims



1. A composite developable device for monitoring the presence of high energy radiation particles comprising:
- (a) at least one layer of track registering material capable of being penetrated by said particles to form tracks therein,
- (b) at least one indicator layer comprising a polymeric dispersion layer, having indicator dispersed therein, said indicator being capable of changing color in the presence of a solution of a water soluble developing agent in a hydroxylic solvent, said agent being selected from the group consisting of strong acids, strong bases, reducing agents and oxidizing agents, wherein one or more members of said group are also capable of etching the penetrated tracks in said track registering material, and
- (c) a carrier substrate wherein the indicator layer is coated on one side thereof on to said track registering material and on the other side thereof contacted by said carrier substrate.

4,788,433
ULTRAVIOLET LIGHT MONITORING DEVICE AND METHOD OF MAKING SAME
Thomas C. Wright, 516 Cavendis, Arlington, Tex. 76015, assignor to Thomas C. Wright, La Jolla, Calif.
Filed Jan. 12, 1987, Ser. No. 2,389
Int. Cl.[4] G01J *1/48*
U.S. Cl. 250—474.1 20 Claims



20. A device for monitoring exposure to ultraviolet light, comprising:
- a generally flat base member having a first outer surface to be viewed by a user and a second outer surface;
- adhesive means attached to the second surface for attaching the base member removably to the skin or clothing of the user;
- ultraviolet light sensitive means, including an ultraviolet light sensitive photographic emulsion material disposed upon the first surface so that the first surface becomes

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visible to the user only after the ultraviolet light sensitive emulsion material is exposed to a predetermined amount of ultraviolet light;

filter means, including an ultraviolet light inhibiting material juxtaposed in overlying relationship relative to said light sensitive means, and having a graduated pattern of varying opacity, for inhibiting passage selectively of ultraviolet light to the ultraviolet light sensitive emulsion material according to the graduated pattern, to cause the first surface to become exposed to view in a series of gradations indicative of a cumulative amount of ultraviolet light exposure;

a protective translucent material disposed over said filter means; and

said filter means and base member being bonded together with said emulsion material disposed therebetween.

4,788,434

RADIATION IMAGE RECORDING AND REPRODUCING METHOD

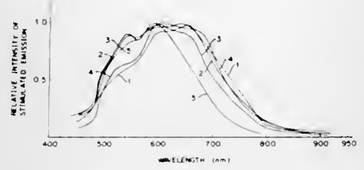
Kenji Takahashi; Yuichi Hosoi, and Yasushi Kojima, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 854,653, Apr. 15, 1986, abandoned, which is a continuation of Ser. No. 664,006, Oct. 23, 1984, abandoned. This application Jul. 20, 1987, Ser. No. 76,985

Claims priority, application Japan, Oct. 24, 1983, 58/198758

Int. Cl.⁴ H05B *33/00*

U.S. Cl. 250—484.1 **7 Claims**



1. A radiation image recording and reproducing method comprising the steps of:

causing a stimulable phosphor to absorb a radiation having passed through an object or having radiated from an object,

exciting said stimulable phosphor with an electromagnetic wave having a wavelength within the range of 450–900 nm to release the radiation energy stored therein as light emission, and

detecting the emitted light,

in which said stimulable phosphor is a divalent europium activated barium fluorohalide phosphor having the formula (I):

$$BaF(Br_{1-x}I_x):yEu^{2+} \quad (I)$$

in which x and y are numbers satisfying the conditions of $0.05 \leqq x \leqq 0.8$ and $0 < y \leqq 0.2$, respectively.

4,788,435

RADIATION IMAGE STORAGE PANEL

Hisashi Yamazaki, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

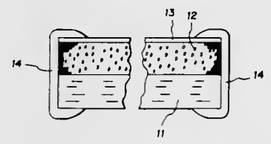
Filed Jun. 25, 1986, Ser. No. 878,273

Claims priority, application Japan, Jun. 28, 1985, 60-143367

Int. Cl.⁴ H05B *33/00*

U.S. Cl. 250—484.1 **5 Claims**

1. A radiation image storage panel comprising a support and a phosphor layer provided on the support which comprises a binder and a stimulable phosphor dispersed therein, characterized in that the side surfaces of said panel are covered with a polymer material composed of a linear polyester or a mixture



of a linear polyester and a vinyl chloride-vinyl acetate copolymer.

4,788,436

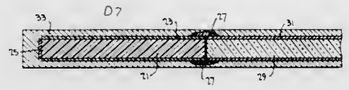
RADIATION SENSITIVE OPTICAL FIBER AND DETECTOR

Walter Koechner, 1054 Harriman St., Great Falls, Va. 22066

Continuation of Ser. No. 946,611, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 787,027, Oct. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 615,281, May 30, 1984, abandoned. This application Feb. 12, 1988, Ser. No. 158,072

Int. Cl.⁴ G02B *5/172*; G01J *5/08*

U.S. Cl. 250—485.1 **3 Claims**



1. An optical fiber sensitive to nuclear radiation, comprising:

a thin and elongated filament core which is scintillatable in the presence of the nuclear radiation, said core comprising a plastic material selected from the group consisting of polyvinyltoluene doped with organic scintillator material and styrene doped with organic scintillator material, said organic scintillator material being selected from the group consisting of 2,5-diphenyl- oxazole (PPO) and bis-MSB p-bis-(0-methyl-styryl) - benzene, dimethyl-POPOP and POPOP, wherein POPOP is the name for the organic material P-bis-benzene;

an optical cladding surrounding said filament core, said cladding comprising a low refractive index plastic material consisting of polymethylacrylate; and

an outer layer of opaque plastic material surrounding said optical cladding.

4,788,437

TRITIUM LIGHT

Donald A. Urquhart, and Douglas Hart, both of Toronto, Canada, assignors to Landus Inc., Campbellville, Canada

Filed Sep. 23, 1986, Ser. No. 910,537

Claims priority, application United Kingdom, Sep. 23, 1986, 8523422

Int. Cl.⁴ H01L *31/04*; F21K *2/00*

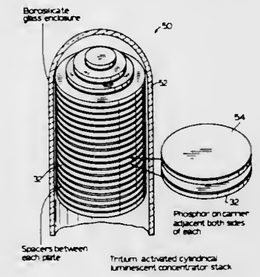
U.S. Cl. 250—486.1 **5 Claims**

1. A self-luminescent light source, comprising:

an enclosure containing tritium gas,

a plurality of planar sheets of transparent material provided in a closely spaced apart stack which is positioned in said enclosure, each said planar sheets having a fluorescent material contained therein capable of generating light of a predetermined range of wavelengths upon activation by illumination, and

a layer of phosphor material located in each gap defined by an adjacent pair of faces of said sheets in said stack, said phosphor material, upon beta radiation activation from said tritium gas, emitting light of a predetermined range of



wavelengths sufficient to illuminate and be absorbed by said fluorescent material and to activate light generation by said fluorescent material.

4,788,438

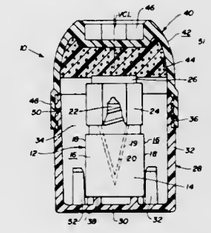
CONTAINER HAVING ENGAGING ABUTMENTS THEREON

John H. Evers, Bellingham, Mass., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 20, 1987, Ser. No. 4,703

Int. Cl.⁴ G21F *5/00*

U.S. Cl. 250—506.1 **8 Claims**



1. A container for carrying a vessel having a radionuclide therein, the vessel having a body portion with a cap threadedly secured thereto, the body portion having a plurality of planar walls that terminate in a predetermined number of corners, the cap having an exterior surface having a predetermined contour, the container comprising:

a receptacle having a base and a sidewall, the sidewall having an edge thereon, the sidewall and the base cooperating to define a volume therein, the base having an array of abutments extending from the base into the volume, each abutment having a holding edge thereon engaging against the exterior of the planar walls of a vessel when the vessel is received within the volume, the holding edges of adjacent abutments engaging against each of the planar walls of the vessel in the vicinity of the corners thereof; and

a lid having an open and a closed end and an exterior and interior surface thereon, the lid being detachably connectable at its open end to the edge of the sidewall, the exterior surface of the closed end of the lid having a recess contoured to conform to the contour of the cap so that the lid, when inverted, may be insertable onto the cap and the cap receivable into the recess therein such that a torque applied to the lid is transmitted into the cap to threadedly loosen the cap from the body of the vessel, the abutments engaging the exterior of the body of the vessel to prevent rotation of the body of the vessel within the receptacle as the torque is applied to the lid.

4,788,439

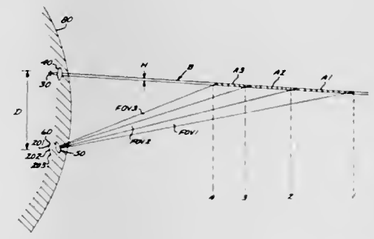
MULTIPLE DETECTOR FOG SUPPRESSION AND EDGE ENHANCEMENT

Arthur H. Hardy, Santa Barbara, and Leland V. Gardner, Buellton, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Feb. 5, 1987, Ser. No. 11,472

Int. Cl.⁴ G01V *9/04*

U.S. Cl. 250—561 **16 Claims**



1. A proximity sensing system comprising: transmitting means for transmitting electromagnetic radiation;

a plurality of detector elements having respective adjacent fields of view and respective active where said fields of view intersect said electromagnetic radiation, said detector elements providing respective detector outputs in response to returns within said respective active regions; and

processing means responsive to said detector outputs for providing a solid object target detection signal when the sum of a first group of said detector outputs exceeds the sum of a second group of said detector outputs by a predetermined amount.

4,788,440

ELECTRO-OPTICAL SYSTEMS FOR CONTROL OF ROBOTS, MANIPULATOR ARMS AND COORDINATE MEASURING MACHINES

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 777,280, Sep. 18, 1985, abandoned, which is a continuation of Ser. No. 592,443, Mar. 22, 1984, Pat. No. 4,602,163, which is a continuation of Ser. No. 262,492, May 11, 1981, Pat. No. 4,453,085. This application Apr. 3, 1987, Ser. No. 33,898

Int. Cl.⁴ G01N *21/86*

U.S. Cl. 250—561 **25 Claims**

1. A method for controlling robots, and other machines to cause a movable part to travel a predetermined path or to arrive at a location in space, comprising the steps of:

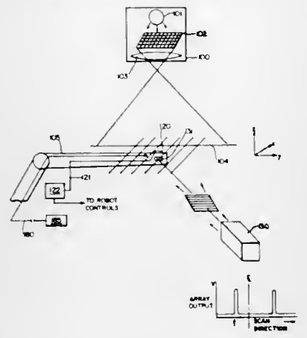
optically projecting a pattern into space in a work area of the robot,

providing a detector on the movable portion of the robot,

detecting at least a portion of the pattern when the movable portion is in the work area,

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determining a position of the movable part of the robot relative to the detected portion of the pattern, and



controlling the movement of the movable part of the robot based on the determined position.

4,788,441

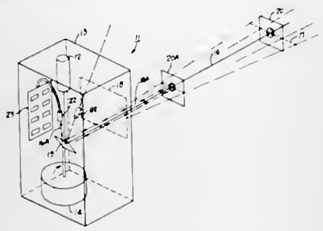
RANGE FINDER WHEREIN DISTANCE BETWEEN TARGET AND SOURCE IS DETERMINED BY MEASURING SCAN TIME ACROSS A RETROREFLECTIVE TARGET

Edward L. Laskowski, Seven Hills, Ohio, assignor to Acme-Cleveland Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 809,119, Dec. 16, 1985, abandoned. This application Sep. 17, 1987, Ser. No. 98,408

Int. Cl.[4] G01N *21/86*; G01V *9/04*

U.S. Cl. 280—561 **30 Claims**



1. A target determining apparatus comprising in combination;

a light source at a first location; means at said first location for scanning a beam from said light source along a scanning path at a known rate of angular velocity;

a retroreflector and a non-retroreflector adapted to be at a second location in said scanning path to reflect said light beam from said retroreflector back toward said scanning means;

one of said retroreflector and said nonretroreflector being a target having leading and trailing edges;

said light source beam being narrow in the direction of said scanning path and narrower than the scanned width of said target;

one of the target scan width and target distance being known;

a photoreceptor positioned at said first location to be responsive to any reflected light beam from said retroreflector; and

target determining means to determine the other of said target scan width and distance with distance related inversely, and the target scan width related directly, to the length of time between the light beam scan from the target leading edge across the target to the trailing edge.

4,788,442

DEVICE FOR DETECTING INCIPIENT TEARS ON A SHEET DURING MANUFACTURE

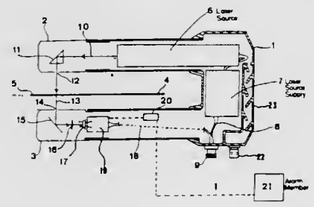
Jacques Sabater, Gif/Yvette, and Serge Bauduin, La Tronche, both of France, assignors to Centre Technique De L'Industrie Des Papiers, Cartons Et Celluloses, Grenoble, France

PCT No. PCT/FR86/00442, § 371 Date Jun. 30, 1987, § 102(e) Date Jun. 30, 1987, PCT Pub. No. WO87/04248, PCT Pub. Date Jul. 16, 1987

PCT Filed Dec. 23, 1986, Ser. No. 75,747

Int. Cl.[4] G01N *21/84*

U.S. Cl. 250—572 **10 Claims**



1. A device for detecting insipient cracks or tears on the edges of a moving sheet comprising:

a laser light source, and

an opto-electronic receiving cell for receiving the light transmitted by the laser light source through the sheet moving continuously between the laser light source and the receiving cell, wherein the receiving cell is placed whereby a solid angle under which the serviceable surface of said cell, or of an image of the serviceable surface of said cell produced by an optical system, can be seen from said moving sheet of paper is less than 0.01 steradian.

4,788,443

APPARATUS FOR MEASURING PARTICLES IN A FLUID

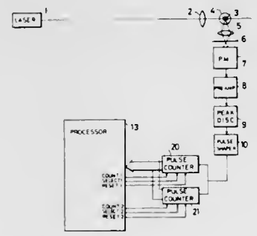
Yoshiyuki Furuya, Hino, Japan, assignor to Kowa Company Ltd., Aichi, Japan

Filed Jun. 8, 1987, Ser. No. 59,734

Claims priority, application Japan, Jun. 6, 1986, 61-130061

Int. Cl.[4] G01N *15/02*; G01D *5/36*

U.S. Cl. 250—574 **3 Claims**



1. An apparatus for measuring particles in a fluid by irradiating the fluid containing the particles with a laser beam and analyzing the laser light scattered by the particles to determine at least one of the diameter and concentration of the particles, the apparatus comprising:

a laser beam source for producing a laser beam;

an optical system for irradiating the fluid containing the particles with the laser beam and focusing laser light scattered by the particles;

a photoelectric converter for receiving laser light scattered by said particles and focused by the optical system and converting the same into an electrical signal,

a pulse generator for generating pulses in response to said electrical signal, the number of pulses corresponding to the diameter and concentration of said particles,

first and second pulse counters for counting the pulses from the pulse generator; and

a processor for processing the pulse count from the first and second pulse counters to derive therefrom at least one of the diameter and concentration of said particles, including means for alternately operating said first and second pulse counters

for pulse counting comprising means for generating a first count signal to activate the first pulse counter and deactivate the second pulse counter, means for generating a second count signal to activate the second pulse counter and deactivate the first pulse counter, means for generating a first select signal in synchronism with the generation of the second count signal to deactivate the first pulse counter and to read the count in the first pulse counter, means for generating a second select signal in synchronism with the generation of the first count signal to deactivate the second pulse counter and to read the count in the second pulse counter, means for generating a first reset signal to reset the count of the first pulse counter after the reading of its contents and before the generating of the next first count signal to initiate the counting by the first pulse counter, and means for generating a second reset signal to reset the count of the second pulse counter after the reading of its contents and before generating the next second count signal to initiate the counting by the second pulse counter.

4,788,444

LIQUID LEVEL DETECTION

David G. Williams, Birmingham, England, assignor to Lucas Electrical Electronics and Systems Limited, Birmingham, England

Filed Dec. 18, 1986, Ser. No. 943,097

Claims priority, application United Kingdom, Dec. 18, 1985, 8531170; Mar. 12, 1986, 8606021

Int. Cl.[4] G01H *15/06*

U.S. Cl. 250—577 **11 Claims**



11. An indicator system for indicating the presence or absence of liquid at a predetermined level in a container, the system comprising a sensor which produces an electrical output signal either when liquid is present at the predetermined level, or alternatively when liquid is absent at the predetermined level, a comparator which compares the output signal from the sensor with a predetermined reference, and an indicator device operable by the output of the comparator, the sensor thus having first and second alternative operative states, and the indicator device having alternative first and second operative states, and the system being so arranged that in order to effect a change in the operative state of the indicator device, a change in the operative state of the sensor must persist for a predetermined length of time, and furthermore the system being such that a return of the sensor to the previous operative state before elapse of predetermined period of time negates the effect of the previous change of state of the sensor in that a subsequent change of state of the sensor must persist for the full predetermined period of time before a change in operative state of the indicator device is effected.

4,788,445

LONG ARRAY PHOTOELECTRIC CONVERTING APPARATUS WITH INSULATED MATRIX WIRING

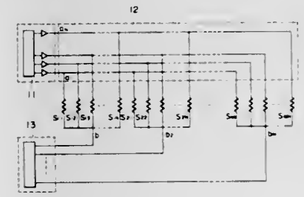
Katsunori Hatanaka; Yoshinori Isobe, both of Yokohama; Toshihiro Saika, Hiratsuka, and Katsumi Nakagawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 5,767

Claims priority, application Japan, Jan. 24, 1986, 61-11987; Jan. 24, 1986, 61-11988

Int. Cl.[4] H01J *40/14*; H01L *27/14*

U.S. Cl. 250—578 **4 Claims**



1. A photoelectric converting apparatus having an (N×M) plurality of photoelectric converting elements arranged in a one-dimensional array form, said elements being connected to N voltage applying electrodes and M signal readout electrodes in a matrix form which includes insulated wiring crossing portions, wherein

the wiring crossing portions of said matrix connectin are provided on the side of said voltage applying electrodes, and

the insulation of said wiring crossing portion is formed as a laminated structure by a photoconductive layer and a high resistance layer, both of said layers being formed by a low temperature process.

4,788,446

MONITORING CIRCUIT FOR AN ELECTRIC OR ELECTRONIC MODULE

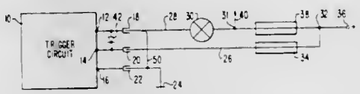
Georg Sterler, Grossmehring, and Heinz Bader, Karlshuld, both of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany

Filed Jun. 10, 1987, Ser. No. 60,311

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621589; Jun. 27, 1986, 3621590

Int. Cl.[4] H01H *85/30*; H02J *1/00*

U.S. Cl. 307—10 R **6 Claims**



1. A power supply and error indicating circuit for a first electric unit, said first electric unit including an error lead and a power lead, said circuit including a power source connected to said power lead of said first electric unit, an error indicating means connected to said error lead of said first electric unit, and a fuse connected in series between said power source and said error indicating means, said circuit including an electrical connection between said fuse and said error indicating means

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for providing power to a second electric unit, whereby failure of said fuse resulting in failure of power to said error indicating means also results in failure of power to said second electric unit, said circuit further including a second fuse connected between said power source and said power lead of said first unit, said second fuse being connected in parallel with said first fuse, and said circuit including an electrical conducting diode connected between said error lead and said power lead, said diode conducting in the direction of said power lead, whereby failure of said second fuse results in current flow through said diode and said error indicating means thereby providing an error indication.

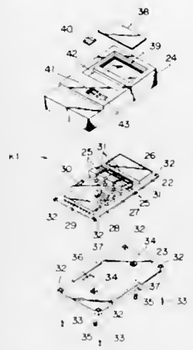
2. A power supply and error indicating circuit for a first electric unit, said first electric unit including an error lead and a power lead, said circuit including a power source connected to said power lead of said first electric unit, an error indicating means connected to said error lead of said first electric unit, and a fuse connected in series between said power source and said error indicating means, said circuit including an electrical connection between said fuse and said error indicating means for providing power to a second electric unit, whereby failure of said fuse resulting in failure of power to said error indicating means also results in failure of power to said second electric unit, said circuit further including a relay connected between said power lead and a ground lead of said first electric unit, said relay including a contact means for electrically connecting said error lead to said ground lead in response to a reduction of power on said power lead, whereby said error lead connected to said ground lead results in current flowing through said error indicating means thereby providing an error indication when power to said first electric unit is reduced.

4,788,447

SWITCH CONTROL DEVICE FOR MOTOR VEHICLE

Yasuhiro Kiyono, Nagaokakyo, and Yutaka Takeyama, Toyonaka, both of Japan, assignors to Omron Tateisi Electronics Co., Japan

Continuation of Ser. No. 929,851, Nov. 13, 1986, which is a continuation-in-part of Ser. No. 762,471, Aug. 5, 1985, Pat. No. 4,691,116. This application Sep. 2, 1987, Ser. No. 92,396
Claims priority, application Japan, Aug. 7, 1984, 59-165323
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.⁴ H01H *9/26*
U.S. Cl. 307—10 R **16 Claims**



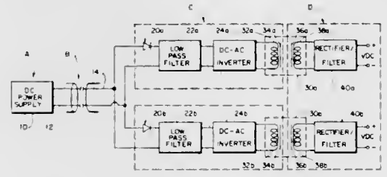
1. A switch control device for a motor vehicle comprising a plurality of switches for actuating a plurality of apparatuses of said vehicle, said plurality of switches comprising at least one stop mode switch and at least one moving mode switch, said device further comprising a means for selectively preventing the at least one stop mode switch or the at least one moving mode switch from being actuated, depending on whether or not the vehicle is in motion.

4,788,448

POWER TRANSFER OF DIRECT CURRENT WITH INDUCTIVE COUPLINGS

Wayne D. Crowe, Houston, Tex., assignor to Ferranti Subsea Systems, Ltd., England

Filed Dec. 6, 1984, Ser. No. 678,848
Int. Cl.⁴ H04M *11/04*
U.S. Cl. 307—31 **14 Claims**



1. A method of transmitting electrical power to equipment within a subsea module at a remote location, the method comprising:

transmitting DC electrical power via a transmission cable from a source of DC electrical power to the remote location;

at the remote location, passing the transmitted DC electrical power through a first rectifying means to provide DC electrical power of a first preselected polarity;

at the remote location, converting the DC electrical power to AC electrical power having a frequency in at least the kilohertz range; and,

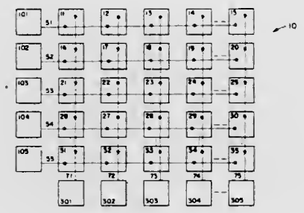
transmitting the AC electrical power across a selectively separable subsea inductive coupler operatively connected with the remotely located equipment to provide electrical power thereto.

4,788,449

REDUNDANT POWER DISTRIBUTION

Jonathon H. Katz, deceased, late of Brookline, Mass. (by Yetta E. Katz, heir), assignor to The Foxboro Company, Foxboro, Mass.

Filed Apr. 24, 1987, Ser. No. 42,137
Int. Cl.⁴ H02J *3/32*
U.S. Cl. 307—43 **16 Claims**



1. Redundant power distribution apparatus for use in an organization of electrical power consuming modules, comprising:

(a) at least one power bus in a set of power busses;

(b) at least one power supply in a set of power supplies, each of which power supplies is connected to a respective power bus from the set of power busses;

(c) a plurality of power consuming modules forming a group of modules, each being connected in turn to a power bus;

(d) additional individual power supplies;

(e) additional individual power busses, each of said additional power busses being connected in turn to one of said additional power supplies;

wherein each of said power consuming modules is connected to and receives power only from a unique combination of:

a power supply in the set of power supplies and a power bus in the set of power busses, and

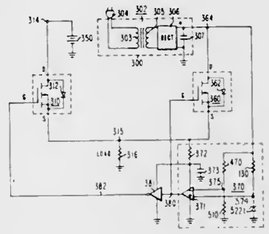
one of said additional power busses which is connected to one of said additional power supplies.

4,788,450

BACKUP POWER SWITCH

Robert W. Wagner, Cherry Hill, N.J., assignor to General Electric Company, Camden, N.J.

Filed Sep. 11, 1987, Ser. No. 99,433
Int. Cl.⁴ H02J *9/06*
U.S. Cl. 307—64 **6 Claims**



1. A control switch arrangement for supplying power to a load from one of a plurality of voltage sources of substantially equal potential, each of said voltage sources including a positive terminal and a negative terminal, said control switch arrangement comprising:

a plurality of P-channel field-effect transistor means formed within a single integrated circuit, each field-effect transistor means including at least a gate electrode, a source electrode and a drain electrode, each of said field-effect transistor means including at least one controllable path for the flow of current between said source and drain electrodes, said controllable path being enabled for the flow of current when the corresponding gate electrode is at a potential which is negative with respect to the potential of said source electrode, each of said field-effect transistor means also including an inherent semiconductor diode, the anode of which is connected to said drain electrode, and the cathode of which is connected to said source electrode, the drain electrode of each of said plurality of field-effect transistor means being adapted to be connected to the positive terminal of one of said voltage sources;

interconnection means coupled to said source electrode of each of said field-effect transistor means, and to said load, and adapted to be coupled to said negative terminal of each of said voltage sources, for connecting said source electrodes in common to a first terminal of said load, and for connecting a second terminal of said load in common to said negative terminal of each of said voltage sources, whereby said inherent diode of one of said field-effect transistor means is rendered conductive when that one of said voltage sources to which its anode electrode is connected is energized, to thereby render the potential at said first terminal of said load positive relative to said second terminal, and said load is thereby energized independent of field-effect operation of any one of said field-effect transistor means, but in the event that more than one of said voltage sources is available, power may undesirably be drawn from more than one voltage source, and power is undesirably dissipated due to the flow of load current through a conducting diode and the load voltage is also undesirably reduced by the forward junction potential of said inherent diode which conducts;

control means coupled to said gate electrode of each of said field-effect transistor means, and to said interconnection means, for rendering the potential of said gate electrode of only one of said field-effect transistor means negative relative to the source electrode of said one of said field-effect transistor means, and for rendering the potential of said gate electrodes of the other ones of said field-effect transistor means positive relative to said source electrodes of said other ones of said field-effect transistor means, whereby said one field-effect transistor means in which said controlled current path is rendered conductive results in a short-circuit of its associated inherent diode to thereby raise said load voltage to substantially equal the potential of said voltage sources, and to eliminate said undesirable power dissipation in a conducting diode, and to reverse-bias said inherent diodes of said other field-effect transistor means, and thereby eliminate said undesirable draw of power from more than one voltage source;

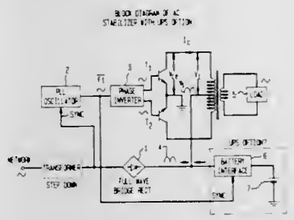
wherein each of said field-effect transistor means comprises four paralleled field-effect transistors.

4,788,451

AC VOLTAGE STABILIZER EASILY CONVERTIBLE INTO UNINTERRUPTIBLE POWER SUPPLY (UPS)

Hindrik Stoet, Laan van Leeuwesteijn 58, Voorburg, Netherlands

Continuation-in-part of Ser. No. 670,960, Nov. 13, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 94,332
Claims priority, application Netherlands, Mar. 14, 1983, 8300923; World Int. Prop. O., Mar. 14, 1984, PCT/NL84/00012
Int. Cl.⁴ H02J *9/00*
U.S. Cl. 307—66 **12 Claims**



1. A stabilizer for supplying stable AC voltage to a load from a source of incoming AC voltage, said stabilizer comprising:

an output stage, operative in response to a sinusoidal control voltage and to a network bubble voltage, for providing said stable AC voltage, said output stage having at least two output transistors connected in a push-pull configuration through coupling means to a load and powered by the network bubble voltage;

means for full-wave rectifying an incoming AC voltage to produce said network bubble voltage; and

means responsive to said incoming AC voltage for producing said control voltage such that said control voltage is phase-locked to said incoming AC voltage in order that the voltage appearing between the collector and emitter of each of said transistors is phase-locked to and synchronous in frequency with said network bubble voltage whereby a relatively low amount of power is dissipated by each of said transistors.

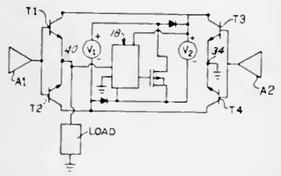
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,452

SWITCHABLE DC POWER SUPPLY WITH INCREASED EFFICIENCY FOR USE IN LARGE WATTAGE AMPLIFIERS

Gerald R. Stanley, Mishawaka, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Jun. 22, 1987, Ser. No. 64,744
Int. Cl.[4] H02J *1/10*
U.S. Cl. 307—71 **8 Claims**



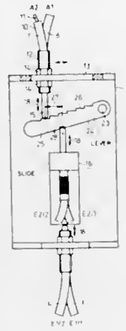
1. In combination, a voltage amplifier having internal signals derived from an input signal and a power source to supply voltage to said amplifier, the improvement wherein said power source includes first and second voltage sources, a sensing means connected to said amplifier signals and voltages proportionate to the first voltage source for monitoring the differential voltage level between said amplifier signals and said first voltage source, a switch means for placing said first and second voltage sources in series upon said sensing means monitoring a minimum differential voltage level, said switch means for placing said first and second voltage sources in parallel upon said sensing means monitoring a differential voltage level greater than said minimum differential voltage level.

4,788,453

ARRANGEMENT FOR THE LOGICAL INTERLINKAGE OF MECHANICAL SIGNALS

Peter Bohnen; Ludvik Godesa; Reinhard Kugler, and Ulrich Marquardt, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,741
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1986, 3611020
Int. Cl.[4] H01H *9/26*
U.S. Cl. 307—119 **10 Claims**



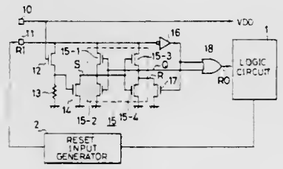
1. An arrangement for the logical interconnection of mechanical input signals which are made available in the form of limited travel distances, and for generating a least one output variable in the form of a limited travel distance from at least one of the input signals, comprising a plurality of plunger means each having a direction of motion and each assigned to respective ones of the input signals and the output signals, said plunger means being arranged spatially parallel to each other, and slide means guided parallel to the direction of motion of each of the plunger means provided for transmitting force between the plunger means, said slide means being guided independently of said plunger means whereby there is no rigid coupling of the slide means to the plunger means.

4,788,454

POWER-ON RESET CIRCUIT

Kouji Tanagawa, Tokyo, and Tomoaki Yoshida, Minatoku, both of Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,251
Claims priority, application Japan, Jul. 21, 1986, 61-171374
Int. Cl.[4] H03K *3/01, 5/153, 17/16, 19/017*
U.S. Cl. 307—296 R **16 Claims**



1. A reset circuit for a logic circuit, said logic circuit having a reference ground potential, comprising:

a MOS transistor having a gate coupled to a power supply, a source receiving an external reset input signal, and a drain, said drain having a high potential when the external reset input signal is high and the voltage of said power supply drops below a predetermined threshold;

a flip-flop having a set input connected to the drain of said MOS transistor, said flip-flop being set to produce an internal reset signal when the drain of said MOS transistor is high and being reset when the external reset input signal is low;

means for producing a reset output from said flip-flop when said flip-flop is in the set state; and

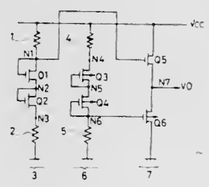
means for applying said reset output to said logic circuit.

4,788,455

CMOS REFERENCE VOLTAGE GENERATOR EMPLOYING SEPARATE REFERENCE CIRCUITS FOR EACH OUTPUT TRANSISTOR

Shigeru Mori; Hiroshi Miyamoto; Tadato Yamagata; Michihiro Yamada, and Kazutami Arimoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 1, 1986, Ser. No. 891,897
Claims priority, application Japan, Aug. 9, 1985, 60-176331; Nov. 20, 1985, 60-260195
Int. Cl.[4] G05F *3/24*
U.S. Cl. 307—297 **9 Claims**



1. An internal power supply voltage generator for a semiconductor integrated circuit device for generating an internal power supply voltage which is lower than the absolute value of an external power supply voltage from an external power supply on a semiconductor chip, comprising:

a first reference voltage generator including a first and a second resistor element and a first and a second N channel MOS transistor serially connected between said external power supply and ground, said first and second N channel MOS transistors being serialiy connected between said first and second resistor elements, for outputting a first reference voltage which is level shifted by the threshold voltage of said first N channel MOS transistor relative to said internal power supply voltage to be generated;

a second reference voltage generator including a third and a fourth resistor element and a first and a second P channel MOS transistor serially connected between said external power supply and ground, said first and second P channel MOS transistors being serially connected between said third and fourth resistor elements, for outputting a second reference voltage which is level shifted by the threshold voltage of said second P channel MOS transistor relative to said internal power supply voltage to be generated; and

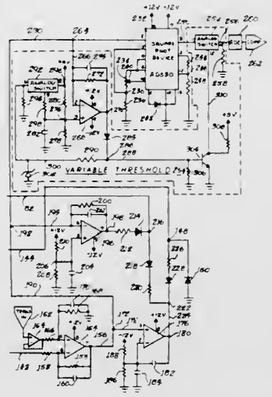
an internal power supply voltage outputting stage comprising an N channel and a P channel MOS transistor serially connected between said external power supply and ground, which transistors are coupled to the outputs of said first and second reference voltage generators, respectively, to produce said internal power supply voltage.

4,788,456

VARIABLE THRESHOLD FOR RATE VOLUME MONITOR

Robert Urman, Schaumberg; Alfred G. Brisson, Kildeer, and Christopher Nowacki, Arlington Heights, all of Ill., assignors to Trutek Research, Inc., Lake Zurich, Ill.

Filed Jul. 27, 1987, Ser. No. 77,746
Int. Cl.[4] H03K *5/153, 5/24, 17/30*
U.S. Cl. 307—350 **4 Claims**



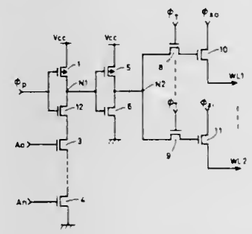
1. A variable threshold circuit for use with a signal transmission circuit carrying a varying D.C. signal having a high amplitude portion carrying information of high significance and a low amplitude portion carrying information of lesser significance, comprising switch means connected to said signal carrying circuit in series therewith, reference voltage means providing a predetermined reference voltage, voltage comparing means having two inputs and an output, said reference voltage means being connected to one of said inputs, means connecting said transmission circuit to the other of said inputs to compare said signal and said reference predetermined voltage, means connecting said comparing means output to said switch means to bias said switch means for non-conduction of said signal during the low amplitude portion of said signal, said comparing means output being connected to said reference voltage means and during the high amplitude voltage portion of said signal being effective to change said reference voltage and thereby to change the voltage on the output of said comparing means to bias said switch means for conduction of said signal during the high amplitude portion of said signal, said reference voltage means comprising a first resistor connected to a predetermined supply voltage and to a junction and a second resistor connected to said junction and to a voltage reference, said junction being connected to said one of said inputs, a third resistor, and means connecting said comparing means output to said first resistor and to said third resistor to connect said third resistor in parallel with said first resistor so as to raise the voltage on said junction during the high amplitude portion of said signal, said third resistor being not so connected during the low amplitude portion of said signal.

4,788,457

CMOS ROW DECODER CIRCUIT FOR USE IN ROW AND COLUMN ADDRESSING

Koichiro Mashiko; Kazutami Arimoto; Kiyohiro Furutani; Noriaki Matsumoto, and Yoshio Matsuda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,641
Claims priority, application Japan, Sep. 9, 1986, 61-213114
Int. Cl.[4] H03K *19/096*
U.S. Cl. 307—449 **4 Claims**



1. A row decoder circuit having a CMOS structure receiving a plurality of address signals included in external address signals for decoding the same, transmitting a word line driving signal produced in accordance with said external address signals to a word line and selecting the word line based on the decoded result, comprising:

a plurality of first MOS transistors of a first conductivity type connected in series with each other and each having a gate receiving one of said plurality of address signals,

a second MOS transistor of a second conductivity type connected between said plurality of first MOS transistors connected in series with each other and a power supply potential and having a gate receiving a first operation timing signal for providing decoding timing of said plurality of address signals,

a third MOS transistor of the first conductivity type connected between said plurality of first MOS transistors connected in series with each other and said second MOS transistor and having a gate receiving said first operation timing signal,

a fourth MOS transistor having a gate receiving a second operation timing signal for transmitting a signal corresponding to an output of a node between said second MOS transistor and said third MOS transistor, and

a fifth MOS transistor of the first conductivity type having a gate receiving a signal transmitted through said fourth MOS transistor for transmitting the applied word line driving signal to the word line connected thereto.

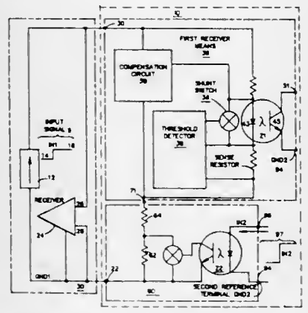
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,458

TWO WIRE INTERFACE CIRCUIT

Roy Y. Kinoshita, Anaheim, and Patrick E. McCollum, Yorba Linda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 15, 1987, Ser. No. 73,921
Int. Cl.[4] H03K *19/092, 5/08*
U.S. Cl. 307—475 **5 Claims**



1. An interface circuit having
a first reference terminal;
a first input terminal for receiving a first input current signal having a first and second value, each respective value representing a respective logic signal level, referenced to the first reference terminal from a first input current signal source;
at least a second input terminal for receiving a second input current signal referenced to a second reference terminal from a second input current signal source, said second input current signal having a first and second signal current level, said interface circuit comprising:
a first receiver means coupled between said first input terminal and a first receiver reference terminal, said first receiver means having a threshold detector responsive to a predetermined first input current signal threshold level for providing a first output signal (RS) at a first signal output terminal, said first output signal being a logic signal referenced to said second reference terminal;
second receiver means coupled between said first receiver reference terminal and said first reference terminal, said second receiver means being responsive to said second input current signal having a value greater than a first predetermined level for decreasing the value of resistance between said first receiver reference terminal and said first reference terminal to a value less than a first predetermined value and for increasing the value of resistance between said first receiver reference terminal and said first reference terminal to be greater than a second predetermined value in response to said second input current signal being greater than a second predetermined level, the value of input resistance between said first receiver reference terminal and said first reference terminal being substantially independent of said first input current signal first and second signal current levels.

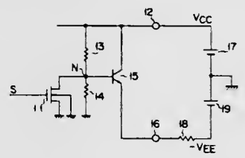
4,788,459

BI-CMOS VOLTAGE LEVEL CONVERSION CIRCUIT

Kazunori Tsugaru, and Yasuhiro Sugimoto, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1987, Ser. No. 24,164
Claims priority, application Japan, Mar. 31, 1986, 61-72905
Int. Cl.[4] H03K *19/092, 17/16, 19/02, 17/60*
U.S. Cl. 307—475 **7 Claims**

1. A voltage output circuit responsive to an input signal and connected between a positive power supply and a negative power supply, comprising:
a circuit output terminal;
means for connecting said circuit output terminal to said negative power supply;
a metal oxide semiconductor (MOS) transistor having a gate for receiving said input signal and a drain-source path, said drain-source path having a source end and a drain end, said drain end being connected to ground and having a current flow determined by said input signal;
a bias circuit connected between said positive power supply



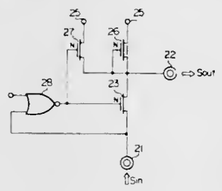
and ground, and having a bias output terminal connected to said source end of said drain-source path of said MOS transistor, said bias circuit having a bias voltage at said bias output terminal set in accordance with said current flow of said MOS transistor; and
means, including a first bipolar transistor having a collector, a base and an emitter, with said collector connected to said positive power supply, said base connected to said bias output terminal and said emitter connected to said circuit output terminal, for providing a circuit output voltage at said circuit output terminal in accordance with said bias voltage set by said bias circuit.

4,788,460

CIRCUIT ARRANGEMENT OF SENSE AMPLIFIER FOR RAPID EVALUATION OF LOGIC STATE

Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,833
Claims priority, application Japan, Mar. 24, 1986, 61-66507
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—530 **7 Claims**



1. A sense amplifier circuit comprising
(a) a signal input node;
(b) a signal output node;
(c) load means with a relatively large resistance coupled between a source of voltage and said signal output node;
(d) a first field effect transistor with a relatively small channel resistance coupled between said signal input node and said signal output node and having a gate electrode;
(e) a logic gate having at least one input node connected to said signal input node and an output node connected to the gate electrode of the first field effect transistor; and
(f) a second field effect transistor with a relatively small channel resistance with respect to said first field effect transistor, said second field effect transistor being coupled between said source of voltage and said signal output node

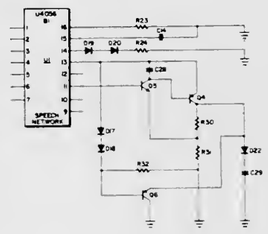
and having a gate electrode connected to the output node of said logic gate, in which said load means comprise an n-channel depletion-type field effect transistor having a source node, a gate electrode and a drain node connected to said source of voltage producing a positive voltage level, said source node and said gate electrode being connected to said signal output node and in which said first and second field effect transistors are of an n-channel enhancement type, wherein said logic gate has two input nodes, one of said two input nodes being connected to said signal input node, and performs a NOR operation in the presence of an activating signal applied to the other of said two input nodes.

4,788,461

SOLID STATE INDUCTANCE SIMULATOR

Gary K. Snyder, 5005 S. Ash Ave., Ste. No. A-19, Tempe, Ariz. 85282

Filed Jan. 8, 1987, Ser. No. 1,590
Int. Cl.[4] H03H *11/48*
U.S. Cl. 307—543 **1 Claim**



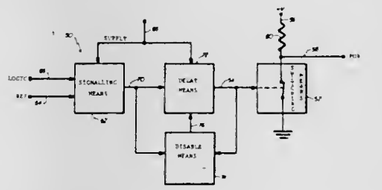
1. An active choke circuit for providing a high AC impedance, regulated DC and low DC voltage drop, said circuit including
(a) a DC input source;
(b) a first transistor having a base connected to said DC voltage source and having an emitter and a collector;
(c) a second transistor having a base connected to said collector of said first transistor and having an emitter and a collector;
(d) a third transistor having an emitter connected to the collector of said second transistor, having a collector connected to ground, and having a base;
(e) at least one diode
(i) connected between the base of said third transistor and the emitter of said second transistor, and
(ii) also connected to a first resistor, said resistor being connected between ground and the base of said third transistor,
such that third transistor is biased when current passes through said diode and said resistor;
(f) a second resistor connected to the emitter of said first transistor and connected to ground;
(g) a third resistor connected to said emitter of said first transistor and to the collector of said second transistor;
(h) a capacitor connected between the base and emitter of said second transistor and to said diode;
the resistance of said first resistor regulating the current bias input to said third transistor,
said circuit producing a regulated differential current output at the collector of said second transistor and at the emitter of said third transistor,
said base of said second transistor being biased by current from said second and third resistors flowing through said first transistor to said base of said second transistor,
said base of said third transistor being biased by current passing through said diode and said first resistor, and current taken from said collector of said second transistor flowing through said third transistor.

4,788,462

POWER-ON-RESET (POR) CIRCUIT

Richard V. Vesce, East Hampton, and John D. Repp, Jr., Canton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1987, Ser. No. 13,757
Int. Cl.[4] H03K *5/153, 17/22*
U.S. Cl. 307—597 **4 Claims**



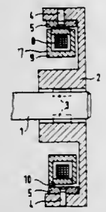
1. A POR circuit, comprising:
solid-state switching means, responsive to a drive signal for providing an open circuit in the presence of said drive signal and for providing a short circuit otherwise;
signalling means, responsive to a reference voltage and a logic voltage having a minimum valid magnitude, said signalling means providing a validity signal in the presence of the logic voltage magnitude being greater than that of the reference voltage, said reference voltage being greater than said logic voltage during startup while said logic voltage is still below said minimum valid magnitude;
delay means, responsive to said validity signal for providing said drive signal only after said validity signal has persisted for a selected period; and
disable means, responsive to said validity signal and to said drive signal for disabling said drive signal in the absence of said validity signal.

4,788,463

ELECTROMAGNETIC BRAKE

Hans-Dieter Layh, Zachersweg 17, D-7121, Gemmrigheim, Fed. Rep. of Germany

Filed Jun. 19, 1987, Ser. No. 64,080
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1985, 3620797
Int. Cl.[4] H02K *7/102*
U.S. Cl. 310—77 **15 Claims**



1. An electromagnetic brake comprising:
a shaft;
brake segments;
a stationary braking area mounted concentric to said brake segments and said shaft;
means mounting said brake segments concentric to said shaft

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for forcing said brake segments in a first radial direction away from said braking area; and

an electromagnetic brake stator mounted concentrical to said brake segments for generating magnetic forces which directly forces said brake segments in a second radial direction toward said braking area opposite said first radial direction.

4,788,464

DISC DRIVE WITH INTEGRAL SPINDLE YOKE

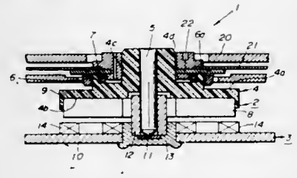
Mitsuo Nishikawa, Kanagawa, and Souichi Murakami, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 20, 1987, Ser. No. 110,276

Claims priority, application Japan, Oct. 29, 1986, 61-166078[U]

Int. Cl.⁴ H02K *1/02, 21/24*

U.S. Cl. 310—268 **12 Claims**



1. A disc spindle axial air-gap motor comprising:

a spindle portion having a center boss element and a disc support element provided around the center boss element;

a motor portion ha ving a rotor including a rotor magnet attached to a rotor yoke and a stator having stator windings arranged on a stator base said rotor magnet and stator windings having an axial air-gap therebetween to form an axial air-gap motor; and

wherein said center boss element and said disc support element of the spindle portion and said rotor yoke of said rotor are integrally formed as a single molded element from a resin and magnetic powder.

4,788,465

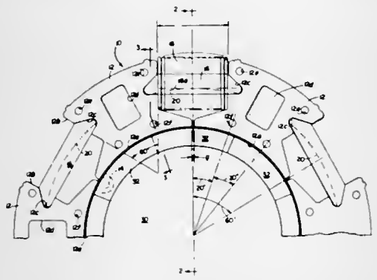
ARMATURE FOR DC MOTOR

Friedrich R. Hertrich, Boulder, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 10, 1987, Ser. No. 95,530

Int. Cl.⁴ H02K *1/24*

U.S. Cl. 310—269 **17 Claims**



1. An armature for a DC motor having a rotor axis, comprising

a plurality of circumferentially spaced armature segments arranged in a circle,

a plurality of prewound electrical coils, and

a plurality of flux links carrying respective ones of said electrical coils, said flux links bridging adjacent ones of said segments and being approximately aligned along a circular path centered on the rotor axis.

4,788,466

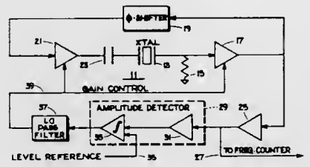
PIEZOELECTRIC SENSOR Q-LOSS COMPENSATION

David W. Paul, and Theodore L. Beeler, both of Fayetteville, Ark., assignors to University of Arkansas, Little Rock, Ark.

Filed Nov. 9, 1987, Ser. No. 118,769

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—316 **19 Claims**



1. A resonant vibratory mass measurement device comprising

(A) an electrically vibratable naturally resonant structure with a surface substantially parallel to the principle direction of vibration of said structure, said surface being adapted to receive a drop of liquid exceeding one microliter, and

(B) means for causing vibration of said structure at above audible frequencies including

(a) electrodes on said structure for supplying electrical signals to and from said structure,

(b) means for generating a signal responsive to the frequency and amplitude of vibration of said structure,

(c) a first variable gain amplifier connected to receive a signal from the means of (b),

(d) a second variable gain amplifier connected to receive a signal from said first variable gain amplifier, and further connected in a feedback path to supply a signal to cause vibration of said resonant structure,

(e) means for generating a reference signal,

(f) comparison means connected to receive a signal responsive to said first variable gain amplifier to be compared with said reference signal and adapted to produce a control signal responsive to the amplitude difference therebetween, and

(g) means for supplying said control signal to the respective gain control inputs of said first variable gain amplifier and said second variable gain amplifier.

4,788,467

DOWNHOLE OIL WELL VIBRATING SYSTEM

Eric D. Plambeck, Carpinteria, Calif., assignor to Piezo Sona-Tool Corporation, Carpinteria, Calif.

Division of Ser. No. 635,669, Jul. 30, 1984, Pat. No. 4,682,070. This application May 8, 1987, Ser. No. 47,267

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **5 Claims**

1. In combination for use in an oil well,

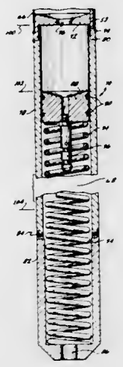
a housing,

at least one transducer disposed in the housing and having properties of receiving electrical energy and converting the electrical energy into expansions and contractions of the transducer for the pumping of oil in the oil well in accordance with such expansions and contractions,

passages extending into and out of the housing at opposite ends of the housing at a position below the transducer,

a piston disposed in the housing for movement in accordance with the pressure of the fluid in the oil well, and

a spring supported between the piston and the housing for



compression and expansion to inhibit any cavitation of the oil in the oil well as a result of such expansion and contraction of the transducer and as a result of changes in the temperature of the oil in the oil well.

4,788,468

VIBRATION WAVE MOTOR

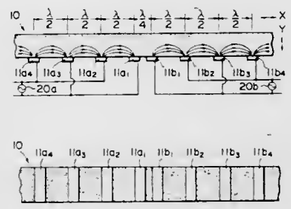
Kazuhiro Izukawa, Yokohama, and Ichiro Okumura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 623,334, Jun. 22, 1984. This application Jun. 23, 1987, Ser. No. 63,765

Claims priority, application Japan, Jul. 4, 1983, 58-121464

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—323 **15 Claims**



1. A vibration wave motor comprising:

(a) a vibration member having electrostrictive elements on one side surface thereof, and a plurality of electrodes arranged on the surface on which said electrostrictive elements are arranged with a predetermined space therebetween, said electrostrictive elements being polarized in a direction from on electrode to another electrode;

(b) periodic signal applying means for applying a periodic signal to said electrodes to generate an electric field on said electrostrictive elements between said electrodes in a direction from one electrode to another electrode; and

(c) a movable member driven by a progressive wave generated on the other side surface of said vibration member.

4,788,469

MULTI-USE LAMP VESSEL AND AN INCANDESCENT LAMP

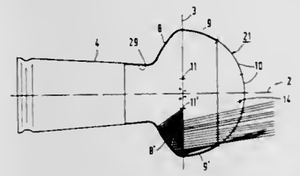
Petrus A. J. Holten, Weert, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Mar. 5, 1987, Ser. No. 22,159

Claims priority, application Netherlands, Feb. 25, 1987, 8700465

Int. Cl.⁴ H01K *1/28, 1/32*

U.S. Cl. 313—113 **12 Claims**



1. A multi-use symmetrical lamp envelope, comprising:

(a) a neck-shaped first portion;

(b) an internally concave second portion extending outwardly from said neck shaped portion and terminating at the largest diameter of said lamp envelope, said second portion extending more in a direction transverse to the axis of symmetry of said envelope than along said axis, said second portion being a body of revolution of a first circular arc about said axis of symmetry, said axis of symmetry being between the center of curvature of said first circular arc and said first circular arc, said center of curvature of said first circular arc being in a region which extends from said largest diameter away from said second portion;

(c) an internally concave third portion smoothly merging with said second portion at said largest diameter and extending away from said largest diameter more along said axis of symmetry than transverse to said axis of symmetry, said third portion being a body of revolution of a second circular arc about said axis of symmetry, said axis of symmetry lying between the center of curvature of said second circular arc and said second circular arc, said center of curvature of said second circular arc lying in a region which extends from the largest diameter towards said neck-shaped portion; and

(d) an internally concave fourth wall portion opposite said first and second portions joining said third portion.

4,788,470

DEFLECTION YOKE APPARATUS WITH COMPENSATION MAGNETIC FIELD GENERATING MEANS

Keiji Kohzuki, Yokohama, and Tsuneo Yoshida, Tokyo, both of Japan, assignors to Denki Onkyo Company Limited, Tokyo, Japan

Filed Aug. 8, 1986, Ser. No. 894,542

Claims priority, application Japan, Aug. 9, 1985, 60-175191

Int. Cl.⁴ H01J *29/72;* H01F *3/00*

U.S. Cl. 313—440 **5 Claims**

1. A deflection yoke apparatus for use on a cathode-ray tube in the neck of which three electron beams are aligned in an in-line alignment direction and emitted from an electron gun and a field controller made of a magnetic member is not provided, comprising:

(a) a pair of saddle type horizontal deflection coils which generate a deflection magnetic field for deflecting three electron beams in a horizontal dirction, said coils having a bend part made up by bending at its electron gun side.

(b) a pair of vertical deflection coils which generate a deflec-

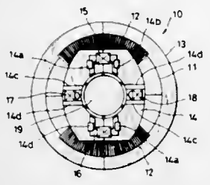
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tion magnetic field for deflecting three electron beams in a vertical direction,

(c) a coil separator which surrounds said horizontal deflection coils and electriclly insulates said horizontal deflection coils from said vetical deflection coils, said coil separator being made up by assembling a pair of bobbin halves made of a plastic material and provided with an expanded chamber, which is expanded in a direction at right angles to the axis of said cathode-ray tube, at said electron gun side to accommodate the bend part of said horizontal deflection coils,

(d) A pair of first auxiliary magnetic field generating means which are provided on the wall of said expanded chamber to oppose each other in a vertical direction with the neck of said cathode-ray tube interposed, wherein said first auxiliary magnetic field generating means includes a pair of U-shaped cores having legs extending proximal to the neck of the tube and first compensation coils mounted on said U-shaped cores.

(e) A pair of second auxiliary magnetic field generating means which are provided on the wall of said expanded chamber to oppose each other in a horizontal direciton with the neck of said cathode-ray tube inteposed, wherein said second auxiliary magnetic field generating means



includes a pair of I-shaped cores and second compensation coils mounted on said I-shaped cores, and

(f) a first circuit means for supplying a compensation current from a compenstion current source to said first and second auxiliary magnetic field generating means, and

(g) a second circuit means for interconnecting said first and second compensation coils such that opposing legs of said opposing pair of U-shaped cores are magnetized to have the same polarity and said I-shaped cores are magnetized to have opposite polarities such that legs of said U-shaped cores and said I-shaped cores alternate in polarity around the circumference of the neck of the tube, when the compensation current is supplied to said first compensation coils and said second compensation coils of said first and second auxiliary magnetic field generating means, and

wherein three electron beams are converged on the screen of the cathode-ray tube by raising a deflection sensitivity of an electron beam located at the center of three electron beams in the neck of said cathode-ray tube and reducing a deflection sensitivity of electron beams located at right and left positions by a compensation magnetic field generated from said first and second auxiliary magnetic field generating means when a compensation current is supplied from said current source to said auxiliary magnetic field generating means.

4,788,471

SEALING FOR CRT COMPONENTS

Paul Strauss, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

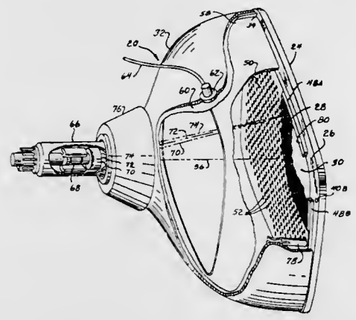
Filed Nov. 21, 1986, Ser. No. 933,646
Int. Cl.⁴ H01J *29/86*
U.S. Cl. 313—477 R **4 Claims**

1. A cathode ray tube assembly, comprising:

first and second components, each being composed of glass, ceramic, metal or other material amenable to being bonded together by use of a frit-based or other vitreous cement, said first and second components having first and second sealing areas, respectively; and

a single frit-based or other vitreous cement disposed at an interface of said first and second sealing areas and characterized by having properties of high cohesion and low propensity for wetting said components,

said assembly being characterized by said first and said second components having disposed on at least one of said first and second sealing areas and marginal surfaces adjacent to each a priming layer of said frit-based or other



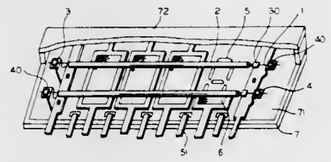
vitreous cement, wherein the terminations of said priming layer lie in regions of low stress outside the component interface, whereby the resultant component joint has a substantially reduced or non-existent tendency to form re-entrant seals in the interface where stresses may be high, thereby markedly reducing joint failures due to stress concentrations in the joint region, and whereby any stress concentrations resulting from re-entrancies formed at said terminations of said priming layer, being in regions of low stress, are relatively harmless.

4,788,472

FLUOROESCENT DISPLAY PANEL HAVING INDIRECTLY-HEATED CATHODE

Kanji Katakami, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 13, 1985, Ser. No. 809,052
Claims priority, application Japan, Dec. 13, 1984, 59-263421
Int. Cl.⁴ H01J *1/24, 61/06*
U.S. Cl. 313—496 **15 Claims**



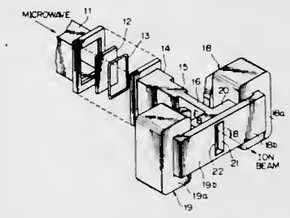
1. A fluorescent display panel having an indirectly heated cathode, siad cathode comprising a heating wire, an insulative layer coated on the surface of said heating wire, a metal sleeve, a portion of the surface of said heating wire being uncoated and exposed from said insulative layer, the insulative layer-coated portion of said heating wire passing through said metal sleeve, and an electron emissive material coated on the outer surface of said metal sleeve, one end of said metal sleeve being mechanically connected to the exposed surface of said heating wire and electrically connected to said heating wire with the remaining portion of said metal sleeve being isolated from said heating wire.

4,788,473

PLASMA GENERATING DEVICE WITH STEPPED WAVEGUIDE TRANSITION

Haruhisa Mori; Motoo Nakano, both of Yokohama; Yoshinobu Ono, Tokyo; Takashi Igarashi, Yokohama, and Masanao Hotta, Akigawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 19, 1987, Ser. No. 63,972
Claims priority, application Japan, Jun. 20, 1986, 61-142931; Jul. 30, 1986, 61-179360
Int. Cl.⁴ H01J *3/04*
U.S. Cl. 315—39 **25 Claims**



1. A plasma generating device comprising:

a rectangular wave guide for transmitting microwaves, a width of said rectangular wave guide being decreased in a direction of an electrical field of the microwaves;

a plasma generating chamber, connected to said rectangular wave guide, for generating a plasma by absorbing, in a gas, microwave energy transmitted by said rectangular wave guide, part of said plasma generating chamber having a rectangular cross-section taken along a plane perpendicular to a direction of microwave propagation, and a width of said plasma generating chamber in the direction of the electrical field of the microwaves being narrower than any width of said wave guide;

first and second magnetic field generating devices having the same axial direction as the direction of microwave propagation and disposed so that said plasma generating chamber is interposed therebetween such that said magnetic field generating devices a magnetic field having an electron cyclotron resonance intensity to the plasma generating chamber; and

a dielectric window provided in said rectangular wave guide to realize a vacuum seal between said plasma generating chamber and portions of said wave guide.

4,788,474

DIMMER APPARATUS

Sadao Kokubu; Koji Takizawa, both of Kani; Takao Sakakibara, Kasugai, and Makoto Okada, Nagoya, all of Japan, assignors to Kabushiki Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Dec. 1, 1986, Ser. No. 936,243
Claims priority, application Japan, Dec. 4, 1985, 60-186002; Dec. 16, 1985, 60-192138; Mar. 31, 1986, 61-046101
Int. Cl.⁴ H05B *37/00*
U.S. Cl. 315—119 **4 Claims**

1. A dimmer apparatus, comprising:

an oscillation circuit operable to change an on/off duty ratio thereof in response to one of input voltage from a rheostat light control and a variable resistor;

a driver circuit including at least one output power transistor cyclically switched in response to an output of said oscillation circuit;

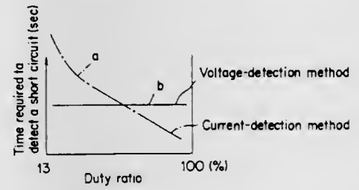
at least one dimmer lamp being lit up by said driver circuit;

protecting means for protecting said output power transistor when said lamp becomes short-circuited, said protecting means comprising:

a detecting circuit for detecting short circuit current flowing through said lamp while said lamp is short-circuited, said detecting circuit including an operational amplifier responsive to a power source voltage;

a holding circuit including a first comparator for holding said output power transistor in an off-state after a first predetermined time period in response to a detection signal of said detecting circuit; and

a timer circuit including a second comparator for releasing said off-state of said output power transistor to an



on-state after a second predetermined time period has passed since said output power transistor was turned off when said lamp is no longer short-circuited;

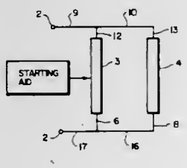
said protecting means functioning to repeat said detecting of said short circuit current and said holding of said output power transistor in an off-state if said lamp is short circuited until said lamp is no longer short-circuited, operation of said apparatus being resumed automatically when said lamp is no longer short-circuited.

4,788,475

MULTIPLE DISCHARGE DEVICE HID LAMP WITH PREFERENTIAL STARTING

Cornelis A. Jacobs, Bath, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,424
Int. Cl.⁴ H05B *35/00*
U.S. Cl. 315—183 **13 Claims**



1. In a high intensity discharge lamp, the improvement comprising:

an outer lamp envelope;

a plurality of high intensity high pressure discharge devices within said lamp envelope and each responsive to an applied voltage for developing an electrical discharge to emit highly intense light, wherein said discharge devices are each comprised of a discharge vessel, a pair of discharge electrodes within said discharge tube, an inert starting gas, and an ionizable material, and said discharge devices heating during operation and exhibiting a substantially higher starting voltage when hot than when cold;

mounting means for mounting said high pressure discharge devices within the lamp relative to each other such that heating of one discharge device during operation does not heat another discharge device sufficiently to substantially increase the starting voltage of said another discharge device; and

means for preferentially starting a particular one of said high pressure discharge devices when said discharge devices are unheated and exhibit their normal starting voltage

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with said another of said discharge devices remaining inoperative.

4,788,476

MACHINE FOR LAPPING TWO CURVED-TOOTH BEVEL GEARS

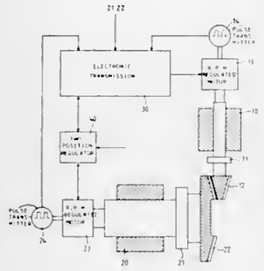
Ami Ginier, Bergdietikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Sep. 28, 1987, Ser. No. 102,158

Claims priority, application Switzerland, Oct. 3, 1986, 3950/86

Int. Cl.[4] H02P *7/67;* **B24B** *37/00*

U.S. Cl. 318—41 **6 Claims**



1. A machine for lapping bevel gears, especially two curved-tooth bevel gears having a predeterminate gear ratio, comprising:

a speed-regulated electric motor for driving one of the two bevel gears;

a position and speed-regulated electric motor for driving the other bevel gear of the two bevel gears;

an electronic transmission operatively connected to said speed-regulated electric motor for driving said one of the two bevel gears and to said position and speed-regulated electric motor for driving said other bevel gear;

said speed-regulated electric motor serving as a master motor;

said position and speed-regulated electric motor serving as a slave motor;

said electronic transmission containing means for causing said slave motor to synchronously follow said master motor as a function of the rotational speed of the master motor and the predeterminate gear ratio of the two bevel gears; and

means cooperating with said electronic transmission for controlling and regulating a selectable relative lapping torque for selective lapping of the gear teeth of the two bevel gears.

4,788,477

LINEAR MOTOR-DRIVEN X-Y TABLE

Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Jul. 18, 1986, Ser. No. 886,697

Claims priority, application Japan, Jul. 26, 1985, 60-165297

Int. Cl.[4] H02K *41/02;* **F16C** *29/06*

U.S. Cl. 318—135 **8 Claims**

1. Apparatus comprising:

(a) a stationary bed;

(b) a table body disposed juxtaposed to said stationary bed to be movable adapted for movement in both X-and Y-axis directions in an X-Y coordinate system;

(c) linear bearing means supporting said table body for movement providing

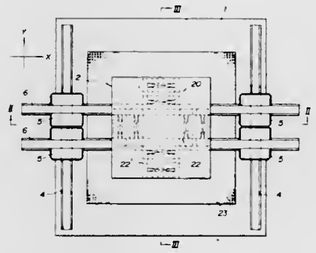
(1) a first track member secured to an upper surface of said stationary bed and extending in one of said directions,

(2) a second track member extending in the other of said directions, said second track member supporting said table body, and

(3) bearing body means operatively engaged with said first and second track members, said bearing body means permitting ease in sliding movement of said second track member along and in directions of said first track member and in directions perpendicular thereto; and

(d) a linear motor interposed between said stationary bed and said table body for driving said table body with respect to said stationary bed, said linear motor providing

(1) a fixed member disposed on one of an upper surface of the stationary bed and a lower surface of the table body,



said fixed member formed with fixed teeth located in a single plane.

(2) a first and second movable members also disposed in a single plane in operative association with said fixed member on the other of the lower surface of the table body and the upper surface of the stationary bed, one of said first and second members located along one of said directions and the other of said members located along the other of said directions, and

(3) magnetic means for moving said first and second movable members relative to said fixed member within said X-Y coordinate system.

4,788,478

SPEED CONTROL SYSTEM FOR DC MOTOR

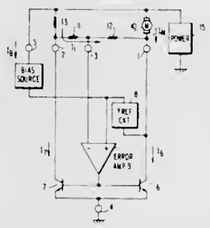
Eiichi Ishii, and Masuo Osuga, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 28, 1987, Ser. No. 101,710

Claims priority, application Japan, Sep. 26, 1986, 61-228595

Int. Cl.[4] H02P *7/285*

U.S. Cl. 318—345 B **10 Claims**



1. A motor speed control system comprising a power supply terminal, first, second and third terminals, a reference terminal, a motor connected between said power supply terminal and said first terminal, a first resistor connected between said power supply terminal and said second terminal, a second resistor connected between said first and third terminals, a third resistor connected between said second and third terminals, a first transistor having a collector-emitter path connected between said first and reference terminals, a second transistor having a collector-emitter path connected between said second and reference terminals, an error amplifier having first and second input terminals and an output terminal which is connected to bases of said first and second transistors, means coupled between said first terminal and said first input terminal of said error amplifier for generating a reference voltage thereacross, and means for connecting said third terminal to said second input terminal of said error amplifier.

6. A circuit combination comprising a first transistor having a collector-emitter path connected between a first terminal and a reference terminal, a second transistor having a collector-emitter path connected between a second terminal and said reference terminal, an error amplifier having first and second input terminals and an output terminal which is connected in common to bases of said first and second transistors, a bias current source connected between a power terminal and said first input terminal of said error amplifier and producing a bias current, a reference voltage circuit connected between said first terminal and said first input terminal of said error amplifier and generating a reference voltage in response to said bias current, a motor connected between said first terminal and said power terminal, a first resistor connected between said second terminal and said power terminal, second and third resistors connected in series between said first and second terminals, and means for level-shifting a potential at the node of said second and third resistors to supply the level-shifted potential to said second input terminal of said error amplifier.

4,788,479

CONTROL MECHANISM FOR A SEPARATELY EXCITED DC DRIVE MOTOR AND METHOD FOR CONTROL OF A DC DRIVE MOTOR

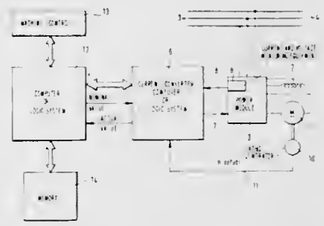
Anton Rodi, Leimen, Fed. Rep. of Germany, assignor to Druckmaschinen AG Heidelberger, Heidelberg, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,307

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541276

Int. Cl.[4] H02P *7/28*

U.S. Cl. 318—350 **11 Claims**



1. In combination, a control mechanism for a separately excited DC drive motor being operated under given current and voltage conditions, and a device for generating an exciter current to be supplied to a field winding of the motor, comprising a measuring device for measuring said operating current and voltage conditions; current adjusting means connected to said measuring device for adjusting the exciter current, in response to the measured motor operating current and voltage conditions, to a determined value such that at least one of a preselected ratio of armature voltage to rotary speed and a preselected ratio of armature voltage to torque is attained; and means for maintaining the exciter current constant at said determined value.

4,788,480

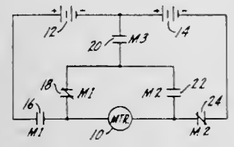
VOLTAGE CONTROL FOR BATTERY POWERED MOTOR OR THE LIKE

Bruce F. Field, Minneapolis; Richard A. Mason, Buffalo, both of Minn., and Steven J. A. Waldhauser, Niagara Falls, N.Y., assignors to Tennant Company, Minneapolis, Minn.

Filed Aug. 7, 1987, Ser. No. 82,665

Int. Cl.[4] H02P *7/14*

U.S. Cl. 318—442 **8 Claims**



1. A control circuit for use in connecting all or subparts of a battery supply to a battery driven motor, including:

relay means connected between a motor and each sub-part of a battery supply,

timing means having a predetermined time period and which changes its output condition at the end of each timing period,

a motor speed selector for selecting full motor speed or a portion thereof,

switch means interconnecting said relay means, timing means and motor speed selector whereby:

said relay means are operable in a first position to connect a first sub-part of the battery supply to the motor when said selector is in a less than full speed position and with said timing means having a first output condition;

said relay means are operable in a second position to connect a second sub-part of the battery supply to the motor when said selector is in a less than full speed position and with said timing means having a second output condition;

said relay means are operable in a third position to connect the full battery supply to the motor when said selector is in a full speed position.

7. A method of controlling the supply of all or sub-parts of a battery voltage to a battery driven motor including the steps of:

connecting the full battery voltage to the battery driven motor when full speed is selected for the motor,

connecting a first sub-part of battery voltage to the motor when less than full speed is selected,

timing the period of battery voltage first sub-part use when less than full speed is selected and maintaining use of the first battery sub-part for a predetermined period of time, which time period is continuous if selection of less than full motor speed is continuous and which time period is discontinuous if selection of less than full motor speed is discontinuous.

4,788,481

NUMERICAL CONTROL APPARATUS

Tomomitsu Niwa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1987, Ser. No. 24,216

Claims priority, application Japan, Mar. 10, 1986, 61-50322

Int. Cl.[4] G06F *3/14, 15/46*

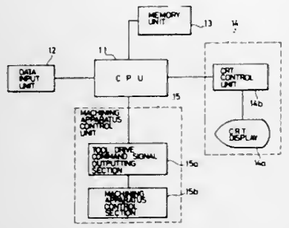
U.S. Cl. 318—600 **4 Claims**

1. A numerical control apparatus comprising:

a data inputting means for inputting data representing the configuration of a workpiece to be machined, machining paths of machining tools relative to said workpiece and the movement of said workpiece;

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a memory means for storing said data inputted by said data inputting means;
a display means for displaying the configuration of said workpiece and said machining path according to said data read out from said memory means; and
a central processing unit for controlling the operation of said memory means and for controlling said display means so



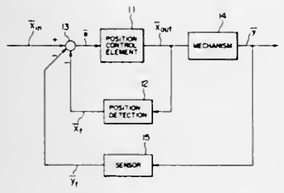
as to display not only the configuration of said workpiece and the machining paths of said machining tools relative to said workpiece, but also the movement of said workpiece as a machining path, said movement of said machining tool being relative to a stationary workpiece, data representing said machining path of relative movement of said machining tool being obtained based on said data representing the movement of said workpiece.

4,788,482

POSITION CORRECTING CONTROL SYSTEM FOR SERVOMECHANISM DEVICE

Kyozo Tachibana; Toshihiko Sakai; Hisaaki Hirabayashi, all of Yokohama; Koichi Sugimoto, Hiratsuka; Hiroshi Sugai, Sakura, and Hisakazu Ninomiya, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1987, Ser. No. 75,987
Claims priority, application Japan, Jul. 22, 1986, 61-170852
Int. Cl.⁴ G05B *5/01*
U.S. Cl. 318—616 **9 Claims**



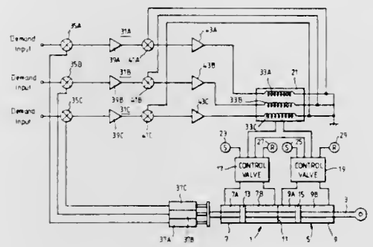
1. A position correcting control system for a servomechanism device having position detection means for detecting a position within full bounds of a movable range, said system further comprising:
means for changing a position of an acting point in accordance with a position target value;
sensor means for detecting a state quantity at high precision within a partial range, said state quantity being an endmost quantity in controlling said position of an acting point;
means using an output signal of said position detection means as a position feedback variable; and
means using an output signal of said sensor means for a correction of the position target value.

4,788,483

PARALLEL REDUNDANT ACTUATOR SYSTEMS

Richard B. Smith, Pinehurst, Queens Avenue, Maidstone, Kent, England

Filed Jun. 12, 1987, Ser. No. 62,125
Claims priority, application United Kingdom, Jun. 20, 1986, 8615145
Int. Cl.⁴ G05B *17/00*
U.S. Cl. 318—689 **10 Claims**



1. A parallel redundant actuator system comprising: an output member; a plurality of signal lanes each having an input, an output and a position feedback loop; means for applying to the input of each said lane a respective demand signal representing a desired position of said output member and a feedback signal produced by said position feedback loop representing the actual position of said output member, to produce at the output of that lane a signal representative of the difference between said demand and feedback signals; a summing arrangement having a plurality of inputs which are respectively connected to the outputs of said signal lanes to produce at an output of said summing arrangement an output signal representative of the sum of said output signals of said lanes; and an actuator connected between said summing arrangement and said output member and responsive to said output signal of said summing arrangement to control the position of said output member; said actuator system exhibiting a non-linear functional relationship between the input signal of each lane and the output signal of said summing arrangement over a range of values of input signal for which the lane is capable of operation whose slope over a range of values of input signals for which changes occur due to failure of another lane is greater than if said relationship were linear over said range of values of input signal for which the lane is capable of operation.

4,788,484

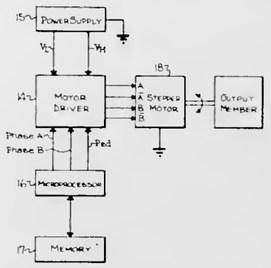
METHOD AND APPARATUS FOR DRIVING A STEPPER MOTOR WITH MULTIPLE VOLTAGES

John P. Bolash; Joel G. Goodwin, both of Concord, and Nicholas J. Krull, Charlotte, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 26, 1987, Ser. No. 89,688
Int. Cl.⁴ H02P *8/00*
U.S. Cl. 318—696 **24 Claims**

1. A method for driving a stepper motor with multiple excitations, the method comprising
applying a first excitation to a motor winding during a driving phase; and
subsequently applying a second excitation having a voltage

higher than the first excitation to the same motor winding during the same driving phase and at least just prior to and



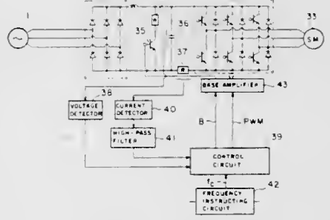
continuing substantially until the time that the winding is de-energized at the end of the driving phase.

4,788,485

APPARATUS FOR CONTROLLING ELECTRIC MOTOR

Kenshi Kawagishi, and Masaharu Udaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1987, Ser. No. 29,228
Claims priority, application Japan, Mar. 24, 1986, 61-65371
Int. Cl.⁴ H02P *5/28*
U.S. Cl. 318—811 **7 Claims**



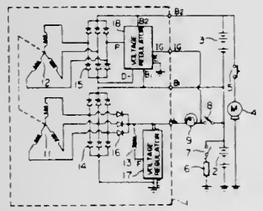
1. In a control apparatus for controlling a driving main circuit consisting of a diode converter for converting AC power to DC power and a PWM power converting device connected to a DC output side of said diode converter for driving an AC electric motor, said apparatus for controlling an electric motor comprising;
a current detector for detecting a DC current converted by said diode converter to be supplied to said electric motor;
a high-pass filter for filtering therethrough an AC component of said DC current detected by said current detector;
a control circuit in response to an output of said high-pass filter for controlling said PWM power converting device in a pulse-width-modulating manner so that said converting device may convert said DC power into the power of a predetermined value for driving said electric motor;
said control circuit including:
an A/D converting circuit for analog-to-digital converting the output of said high-pass filter;
means providing frequency-to-voltage conversion of a frequency instructing signal to provide a voltage instructing signal;
means for determining the deviation of said voltage instructing signal from the output of said A/D converting circuit and amplifying said deviation to provide a deviation signals;
a PWM counter and a comparator for comparing the output of said PWM counter with said deviation signal to provide a voltage instructing PWM signal; and
an adder for adding together a frequency instructing PWM signal provided in a frequency signal converting circuit by conversion of said frequency instructing signal and said voltage instructing PWM signal as the output of said comparator and for outputting the sum to said PWM power converting device.

4,788,486

VEHICULAR POWER SUPPLY SYSTEM HAVING A PLURALITY OF POWER SUPPLY VOLTAGES

Keiichi Mashino, and Souju Masumoto, both of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Eng. Co., both of Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 12,994
Claims priority, application Japan, Feb. 14, 1986, 61-28833; Jun. 13, 1986, 61-135984
Int. Cl.⁴ H02J *7/14*
U.S. Cl. 320—17 **6 Claims**



1. A vehicular power supply system comprising:
a generator including a first set of armature windings and a second set of armature windings electrically isolated from each other and a field winding supplying magnetic flux to said first and a second sets of armature windings;
first rectifier means connected to the first set of armature windings of said generator to convert a first a.c. output of said first set of armature windings into a first d.c. voltage;
second rectifier means connected to the second set of armature windings of said generator to convert a second a.c. output of said second set of armature windings into a second d.c. voltage;
a first battery connected to an output terminal of said first rectifier means to supply power to an electrical load connected thereto and to be charged by the output of said first rectifier means;
a second battery connected in series with said first battery and connected also to an output terminal of said second rectifier means to supply power to an electrical load connected thereto and to be charged by the output of said second rectifier means;
a first voltage regulator detecting the terminal voltage of said first battery thereby controlling current supplied to the field winding of said generator so as to maintain constant the terminal voltage of said first battery; and
a second voltage regulator connected between said second battery and said second rectifier means to regulate the charged voltage of said second battery, said second voltage regulator including switching means connected between said second battery and said second rectifier means, means for comparing the voltage of said second battery with a predetermined reference value, and conduction rate control means for controlling on-off of said switching means according to the result of comparison by said comparing means, said second voltage regulator further including means for transferring the result of comparison from said comparing means to said conduction ratio control means in synchronism with generating timing of a

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clock signal provided by the a.c. output of one of the phases of the second set of armature windings of said generator.

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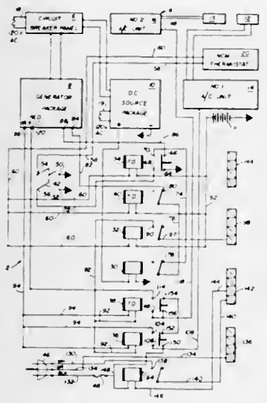
CONTROL DEVICES AND METHODS FOR MOTOR HOME A/C SYSTEMS

H. Hansel Picklesimer, 1702 Hispana Ave., Ft. Pierce, Fla. 33482

Continuation-in-part of Ser. No. 761,910, Aug. 2, 1985, abandoned. This application Jan. 27, 1987, Ser. No. 7,261

Int. Cl.[4] H02P *9/00;* **F25B** *27/00;* **B60H** *3/04*

U.S. Cl. 322—1 **6 Claims**



1. A control device for use in combination with the elecrical system supplied with a motor home air-conditioning (A/C) unit which is supplied with electric current, at least part of the time during its operation, by an internal combustion engine driven generator equipped with a cranking motor for starting sai engine, for the automatic control of the starting and stopping of said generator to minimize fuel and energy loss in the cyclic operation of said A/C unit which comprises:

first means for beginnning of the operation of said A/C unit a first predetemined amount of time after the start of the running of said generator,

second means to cause the running of said generator continuously with the operation of said A/C unit and

third means for discountinuing said running of said generator a second predetermined amount of time after the termination of operation of said A/C unit,

temperature sensing means for controlling operation of the A/C unit and starting of said engine,

a power cord for supplying electrical current to said A/C unit in said motor home from an external power source and

relay means for automatically disconnecting said power cord from said A/C unit when said generator is running,

whereby upon ambient temperature raising above a predetermined temperature, said generator automatically starts and runs for said first predetermined amount of time before said A/C unit begins to run,

said generator runs continuously with the running of said A/C unit and

running of said generator is discontinued a second predetermined amount of time after the termination of said running of said A/C unit caused by said ambient temperature falling below said predetermined temperature.

4,788,488

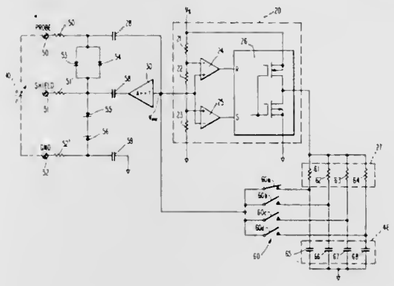
CONTINUOUS CONDITION SENSING SYSTEM

L. Jonathan Kramer, Warminster; Steven R. Peterson, Ambler, and Herbert A. Shauger, Jr., Doylestown, all of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Filed Oct. 14, 1986, Ser. No. 917,958

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 R **6 Claims**



1. A system for continuously measuring a varying condition of a material comprising:

a source of a material condition generating a variable voltage signal;

oscillator means responsive to the source for generating an oscillating signal having a period varying with the variable voltage signal;

a plurality of resistor means each having an end coupled to the oscillator means output for passing said oscillating signal through one or more separate resistances coupled to the oscillator means; and

an equal plurality of switches each having an end coupled to the source and a remaining end coupled with a remaining end of a different one of the plurality of resistor means for selectively coupling one or more of said plurality of resistor means with the source.

4,788,489

POSITION SENSOR FOR USE IN VARIABLE HEIGHT AUTOMOTIVE SUSPENSION OR THE LIKE

Hiroshi Kobayashi, Yokohama; Yoshinobu Kida, Atsugi, and Toshiro Ichikawa, Hiratsuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Atsugi Motor Parts Co., Ltd., Atsugi, both of, Japan

Filed Jul. 11, 1986, Ser. No. 884,511

Claims priority, application Japan, Jul. 12, 1985, 60-105421[U]; Jul. 12, 1985, 60-152549; Jul. 12, 1985, 60-152548; Sep. 9, 1985, 60-136791[U]

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 P **14 Claims**

1. A position sensor device comprising:

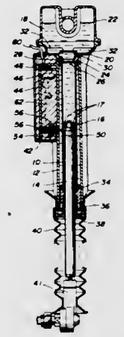
a housing containing a first fluid of known dielectric constant, said housing being formed of an electrically conductive material;

an outer elongated first hollow member insulatingly supported within said housing in a contact free relationship therewith and exposed to said first fluid, said outer hollow member being formed of an electrically conductive material;

an inner hollow member, said inner hollow member being disposed within said outer hollow member in a contact free and electrically isolated relationship therewith, said inner hollow member being filled with a second fluid,

a shaft reciprocatingly disposed in said inner hollow member in manner to define a clearance therebetween, said shaft being formed of an electrically conductive material and supported within said inner hollow member in a contact free and electrically insulated relationship therewith;

means for establishing simultaneous electrical connection between said housing, said inner hollow member and said shaft and with a source of electrical ground; and



a circuit for measuring capacitance developed in a first capacitor developed between said inner and outer hollow members and a second capacitor developed between said housing and said outer hollow member.

4,788,490

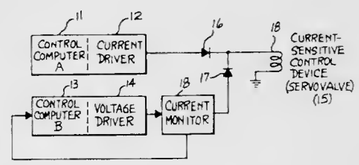
METHOD OF MEASURING RESISTANCE OF A CONTROL SERVOVALVE

Andrew M. Valaas, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 2, 1987, Ser. No. 68,690

Int. Cl.[4] G01R *27/02*

U.S. Cl. 324—62 **1 Claim**



1. In combination in a system comprising:

a first control circuit having a current driver output;

a second control circuit having a voltage driver output;

said first and second control circuits connected in parallel through series connected diodes to a current-sensitive control device; the method of determining the electrical resistance R of said current-sensitive control device comprising the sequential steps of:

applying an electrical control voltage V_1;

measuring the resultant electrical current output I_1;

applying a second electrical control voltage V_2;

measuring the second electrical current output I_2, and then determining the resistance R in accordance with the differential form of Ohms law:

$$R=(V_2-V_1)/(I_2-I_1);$$

wherein said first control circuit comprises an aircraft anti-skid control system and said second control circuit comprises a brake torque limiter control circuit.

4,788,491

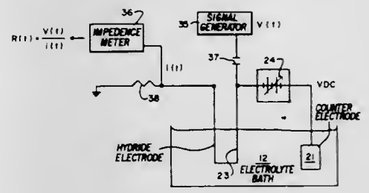
METHOD OF THE MEASUREMENT OF INTERSTITIAL ATOMS IN ALLOYS INCLUDING THE HYDROGEN CONTENT OF SOLID HYDRIDES, AND OF SORBED SPECIES ON SURFACE

William Ayers, Princeton, N.J., assignor to Electron Transfer Technologies, Inc., Princeton, N.J.

Filed Dec. 24, 1984, Ser. No. 685,414

Int. Cl.[4] G01N *27/02*

U.S. Cl. 324—71.1 **8 Claims**



1. A method of detecting the concentration and depth of incorporated mobile atoms into a host material from a surface of the host material, wherein the host material is surrounded by a conducting electrolyte fluid, and the incorporated mobile atoms have diffused through and electronically interacted with said host material, which comprises:

(a) propagating a variable frequency, periodic, electromagnetic signal along an axis of the host material;

(b) calculating the depth of penetration of the signal at a fixed frequency, according to the following formula:

Depth of Penetration = (2/(frequency of electromagnetic signal)(conductivity of host material)(electronic permeability of host material))$^{0.5}$;

(c) stepping the frequency of the electromagnetic signal to change the depth of penetration of the signal;

(d) detecting impedence components of the electromagnetic signal at it enters and leaves the host materials; and,

(e) calculating the volume fraction of incorporated mobile atoms at a specific depth based on the impedence data for each frequency as a function of the penetration depth of the signal at each frequency.

4,788,492

LOGIC ANALYZER

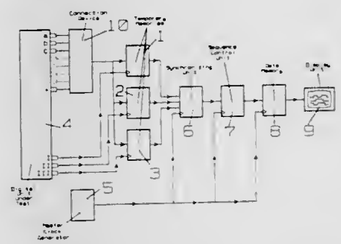
Wolfgang Schubert, Munich, Fed. Rep. of Germany, assignor to Robde & Schwarz GmbH & Co KG, Fed. Rep. of Germany

Filed Feb. 26, 1987, Ser. No. 19,366

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611872

Int. Cl.[4] G01R *31/28, 15/00*

U.S. Cl. 324—73 R **3 Claims**



1. A logic analyzer for representing the data of a digital circuit which simultaneously provides a plurality of data sig-

VOL 1096 ISS 5 NO 29 1988 UMI

nals and a plurality of different individual clock signals, comprising:

a plurality of data channels connected to the digital circuit for simultaneously receiving the data signals;

a plurality of clock channels connectible to the digital circuit for receiving the individual clock signals;

a plurality of temporary memories each connected to all of said plurality of data channels and each connected to a respective clock channel for sampling the data signals appearing in said plurality of data channels in response to its respective individual clock signal;

a master clock generator producing master clock signals;

analyzing means including a data memory connected to said master clock generator and display means connected to said data memory; and

control means connected between said plurality of temporary memories and said data memory and connected to and controlled by the master clock signals of said master clock generator to selectively connect said temporary memories through to said data memory in response to the master clock signals.

4,788,493

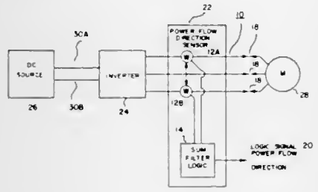
APPARATUS FOR DETECTING DIRECTION OF ELECTRIC POWER FLOW

J. Michael Liptak, Columbia, S.C., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 677,785, Dec. 4, 1984, abandoned. This application Jan. 6, 1988, Ser. No. 140,869

Int. Cl.[4] G01R *7/02, 19/14;* **H02P** *3/14*

U.S. Cl. 324—140 R **20 Claims**



1. An apparatus for measuring the direction of power flow through conductors connecting a load to a source of alternating electric current, said load being capable of generating electric current, and said source of alternating electric current being capable of accepting power flow from said load, comprising:

said source generating a pulsed supply voltage across said load and having a load current flowing in said load in response to said pulsed supply voltage;

at least one switch having contacts that close and open in response to said pulsed supply voltage turning on and turning off;

at least one sense electric current substantially proportional to said load current, and said sense electric current connected to flow through said contacts whereby the average electric current flow through said contacts is substantially proportional to an electric power flowing in said load;

a detector for detecting a sign of said power flowing in said load and generating an indicator signal responsive to said sign, said indicator signal having a first value when said power flows from said source of alternating electric current into said load and said indicator signal having a second value when power flows from said load into said source of alternating electric current.

4,788,494

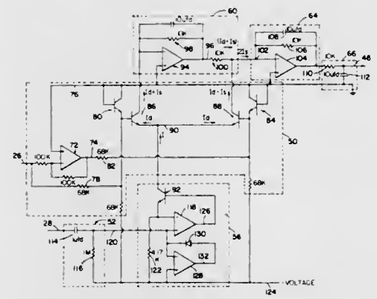
POWER MEASURING APPARATUS

Eric Faulkner, Cookham Dean, England, assignor to Refac Electronics Corporation, Winsted, Conn.

Filed Jan. 9, 1985, Ser. No. 670,757

Int. Cl.[4] G01R *22/00*

U.S. Cl. 324—142 **8 Claims**



1. Apparatus for measuring the mean value of instantaneous power supplied to an electrical device connected to an AC power source, said apparatus characterized by:

first circuit means for generating a first voltage signal proportional to the instantaneous voltage potential applied to said electrical device;

said second circuit means for generating a second voltage signal proportional to the instantaneous current delivered to said electrical device;

third circuit means responsive to said first and said second voltage signals for producing a third voltage signal representative of the product of said first and said second voltage signals and proportional to the instantaneous power supplied to said electrical device, said third circuit means including current mirror circuit means for cancelling DC error signals associated with said product of said first and second voltage signals,

said third circuit means including a dynamic, self-biasing current source circuit means for automatically generating a range of DC quiescent current signals each of which DC quiescent current signals is different and related to and associated with the instantaneous magnitude of said second voltage signal present, and a log-antilog multiplier circuit means, said multiplier circuit means being coupled to said current source means and to said first voltage signal for computing the product of said DC current signal and said first voltage signal,

said current source means including:

a high pass filter comprising a resistor and a capacitor and having an input terminal coupled to said second voltage signal and an output terminal, said capacitor being connected in series between said input and output terminals, said resistor being connected between said output terminal and a reference potential, said capacitor being charged in one direciton to produce a voltage having a first polarity when said second voltage signal is positive;

a first and second differential input instrumentation amplifier;

a diode;

an NPN bipolar transistor having emitter, base and collector terminals;

said first amplifier having its non-inverting input connected to said high pass filter ouput terminal and to said second amplifier inverting input, said first amplifier having its output connected to said transistor base terminal, said first amplifier having its inverting input connected to said transistor emitter terminal and to a high-ohmic value resistance element connected between said first amplifier

inverting input and a negative polarity supply voltage pontential, said first amplifier producing an output signal for biasing said transistor to conduct current through said emitter and collector terminals and said resistance element to maintain the voltage at said first amplifier inverting input equal to the magnitude of said second voltage signal appearing at said first amplifier non-inverting terminal when said second voltage signal is positive, and

said diode having its anode connected to the output of said second amplifier and its cathode to the junction of the inverting input of said second amplifier and the non-inverting input of said first amplifier and the output terminal of said high pass filter so that said diode is forward biased and conducts current from the output of said second amplifier into said junction when said second voltage signal is negative to maintain the polarity of the voltage appearing at said high pass filter output terminal the same as said first polarity and the mean magnitude of the voltage appearing at said filter output equal to one-half the peak-to-peak magnitude of said second voltage signal, said transistor being biased to produce a collector current mean value equal to one-half its peak-to-peak collector current value so that said DC current signal is produced in the linear operating region of said transistor for all instantaneous values of said second voltage signal.

4,788,495

METHOD FOR THE INDIRECT IDENTIFICATION OF THE INTENSITY DISTRIBUTION OF PARTICLE BEAM PULSES GENERATED IN A PARTICLE BEAM MEASURING INSTRUMENT

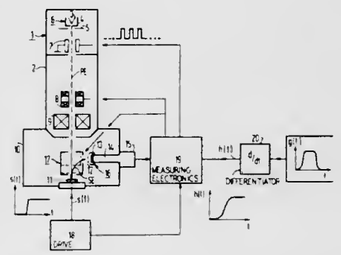
Erich Plies, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1986, Ser. No. 845,517

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1985, 3511372

Int. Cl.[4] G01R *13/02;* **G01N** *23/00*

U.S. Cl. 324—158 R **3 Claims**



1. A method for identifying a time dependent intensity distribution g(t) of particle beam pulses generated in a particle measuring instrument employing a beam blanking system, comprising steps of:

periodically applying a known signal s(t) known in terms of its time-dependency to a measuring point of a specimen;

positioning a particle beam to the measuring point and creating the particle beam pulses by gating of the particle beam in synchronization with the known signal s(t);

documenting secondary particles triggered at the measuring point by said particle beam pulses in a detector system which outputs secondary particle signals;

stroboscopically sampling the known signal s(t) by shifting gating time points of the gated particle beam;

deriving a measured signal h(t) from the secondary particle signal produced by the detector system; and

identifying the time-dependent intensity distribution g(t) of the particle beam pulses by de-convolution of said measured signal h(t).

4,788,496

ADAPTER FOR A PRINTED CIRCUIT BOARD TESTING DEVICE

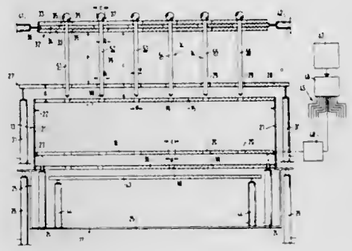
Martin Maelzer; Erich Luther, both of Hagenburgerstrasse 26, 3050 Wunstorf, Fed. Rep. of Germany; Ruediger Dehmel, Wunstorf, and Hans H. Higgen, Stadthagen, both of Fed. Rep. of Germany, assignors to Martin Maelzer and Erich Luther, both of Wunstorf, Fed. Rep. of Germany

Continuation of Ser. No. 661,182, Oct. 15, 1984, abandoned. This application Dec. 10, 1987, Ser. No. 132,669

Claims priority, application European Pat. Off., Nov. 4, 1983, 83111038.2; Fed. Rep. of Germany, Nov. 7, 1983, 3340184

Int. Cl.[4] G01R *31/02, 1/06*

U.S. Cl. 324—158 F **6 Claims**



1. Adapter for a printed circuit board testing device which has test contacts arranged in a grid, and which are to be connected via adapter pins with test points arranged out of grid on a printed circuit board, said adapter comprising a first guide plate provided with adapter pin guide holes, a second guide plate, first support means connected between said first and second guide plates and supporting said second guide plate at a fixed distance above and parallel to the first guide plate, said second guide plate also provided with adapter pin guide holes, the guide holes of one of said guide plates being arranged in a pattern of a grid and the guide holes of the other guide plate being arranged in a pattern out of said grid, a third guide plate provided with adapter pin guide holes arranged according to the pattern of the holes of said second guide plate, second support means connected between said third guide plate and said first and second guide plates to support said third guide plate parallel to and between the first and second guide plates, said guide plates being arranged to accomodate a plurality of adapter pins to extend through the guide holes of said second and third plates, the guide holes in said first and second plates being dimensioned to provide just sufficient clearance for guidance of such adapter pins and the diameter of the guide holes in the third plate being larger than the pin diameter to tolerate a limited amount of clearance for steering the adapter pins to fall into specific guide holes in the first guide plate, said second support means being constructed and arranged to maintain said third guide plate parallel to the first and second guide plates and to shift the third guide plate vertically in a direction from the first guide plate up to the second guide plate while being vibrated, whereby the guide holes of the third plate provide gradually increasing width of deflection so that pins will fall first into the guide holes which are nearest and ultimately fall into those guide holes which are farthest away in range of deflection.

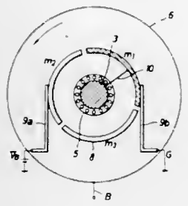
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,497

APPARATUS FOR MEASURING MOTOR ROTATION POSITION AND SPEED

Nobuo Katsumura, Hachioji, Japan, assignor to Konica, Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 13,139
Claims priority, application Japan, Feb. 12, 1986, 61-28561
Int. Cl.⁴ G01P *3/46*
U.S. Cl. 324—177 **6 Claims**



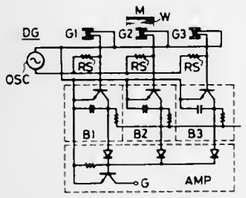
1. An apparatus for detecting the speed and position of a rotating shaft of an electrical motor comprising:
- a commutator associated with said shaft having three or more poles;
- first and second brushes in sliding contact with said commutator for supplying electrical power to said poles of said commutator;
- at least one of said poles being in electrical communication with said shaft; and
- rotation detection means for measuring the electrical potential difference between said shaft and ground and generating a rotation information signal in response thereto.

4,788,498

MAGNETIC DETECTOR FOR AN UNMANNED VEHICLE CONTROL SYSTEM

Saburo Uemura, Yokohama, Japan, assignor to Macome Corporation, Tokyo, Japan

Filed Jan. 23, 1987, Ser. No. 6,439
Claims priority, application Japan, Jan. 28, 1986, 61-16340; Feb. 8, 1986, 61-26225; Nov. 28, 1986, 61-283514
Int. Cl.⁴ G01B *7/14*
U.S. Cl. 324—207 **4 Claims**



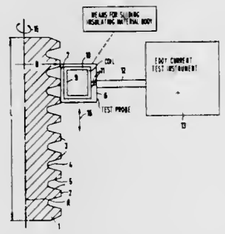
1. In an unmanned vehicle control system, a magnetic detector comprising:
- (a) a magnetic field generating substance formed as a magnetic belt along which said unmanned vehicle is guided; and
- (b) magnetic detecting means formed of a plurality of aligned saturable coils, said magnetic detecting means comprising a magnetic sensor circuit including a plurality of said saturable coils and a plurality of switch circuits respectively connected to the saturable coils in said magnetic sensor circuit; each of said switch circuits being formed of three saturable coils supplied with an AC voltage from an AC voltage source, three rectifiers for rectifying the AC output from said three saturable coils to a DC voltage and an amplifier connected in common to the outputs of said three rectifiers; said magnetic detecting means being mounted on said unmanned vehicle so that said magnetic sensor circuit produces an analog output signal corresponding to a predetermined position of said unmanned vehicle relative to said magnetic belt having a linear inclination in its mid portion and said switch circuits produce an ON-OFF signal which becomes ON within the range substantially corresponding to said linear inclination portion of said analog output, and ON-OFF signals which both become ON when said analog signal is displaced to left or right sides of said linear inclination portion of said analog output.

4,788,499

METHOD AND EDDY CURRENT TEST PROBE FOR THE INSPECTION OF SCREWS FOR NUCLEAR REACTOR PRESSURE VESSELS

Werner Meier, Erlangen; Edgar Friedrich, Möhrendorf, and Erich Modlich, Forchheim, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Nov. 6, 1985, Ser. No. 795,340
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442256
Int. Cl.⁴ G01N *27/90;* **G21C** *17/00*
U.S. Cl. 324—238 **11 Claims**



1. Eddy current probe for inspecting screws for nuclear reactor pressure vessels, comprising at least one coil disposed with its axis perpendicular to the direction of the axis of the screw, the coil having a high frequency alternating current flowing through it for creating a magnetic high frequency alternating field; an eddy current test instrument connected to the coil for evaluating impedance changes caused by irregularities in the screw threads; wherein said coil has at least one straight coil section which is oriented parallel with the axis of the screw and has dimensions such that said magnetic field completely covers at least two screw threads; and including an insulating material body for containing the coil; said insulating material body having a planar contact surface matching, for closely contacting, the cylindrical contoured surface of the screw; and means for sliding said insulating material body axially along the contoured surface of the screw.

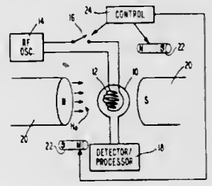
4,788,500

MEASUREMENT OF CAPILLARY FLOW USING NUCLEAR MAGNETIC RESONANCE

H. Samuel Patz, Wayland, Mass., and Robert C. Hawkes, Dry Drayton, England, assignors to Brigham & Women's Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 765,528, Aug. 14, 1985, abandoned. This application Oct. 1, 1987, Ser. No. 103,467
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—309 **42 Claims**

1. A method for providing an image of a sample, wherein individual elements of said image have intensities corresponding to the quantity of slowly flowing fluids contained in said sample, said method comprising the steps of:
- (a) generating a first image using an imaging technique wherein:
  - a first magnetization spatial periodicity is established;
  - a detected NMR signal from slowly flowing fluids is dependent on the value of said first magnetization spatial periodicity, and a detected NMR signal from stationary material is not substantially dependent on said first magnetization spatial periodicity; and
  - fast flowing fluids to not substantially contribute to the intensities of first image elements;
- (b) adjusting a magnetization spatial periodicity control parameter comprising an interpulse interval;



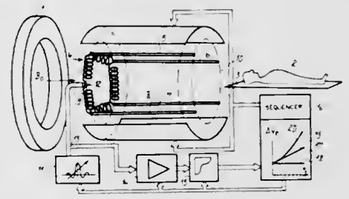
- (c) generating a second image using an imaging technique wherein:
  - a second magnetization spatial periodicity is established;
  - a detected NMR signal from slowly flowing fluids is dependent on the value of said second magnetization spatial periodicity, and a detected NMR signal from stationary material is not substantially dependent on said second magnetization spatial periodicity; and
  - fast flowing fluids do not substantially contribute to the intensities of second image elements; and
- (d) mathematically manipulating said first and second images to produce a third image the intensity of whose elements are determined substantially solely by the nuclear magnetic resonance of nuclei in slowly flowing fluids in said sample.

4,788,501

METHOD FOR CALIBRATING A RADIOFREQUENCY EXCITATION IN NMR EXPERIMENTATION

Patrick LeRoux, Paris, and Alain Marilier, Bourg La Reine, both of France, assignors to Thomson-CGR, Paris, France

Filed Apr. 13, 1987, Ser. No. 37,342
Claims priority, application France, Apr. 15, 1986, 86 05365
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—314 **7 Claims**



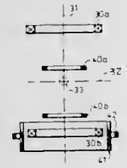
1. A method for calibrating a radiofrequency excitation in NMR experimentation involving the steps which consist of:
- exciting a body to be subjected to said experimentation with a radiofrequency excitation of given amplitude,
- measuring the return response emitted by the body,
- varying the amplitude of the excitation a predetermined number of times and repeating the first two steps each time,
- determining the amplitude of the excitation which is best suited to performance of the experimentation, and,
- wherein said step of varying includes the step of varying amplitude monotonically by progressively modifying the value of amplitude variation from one experimental step to the next.

4,788,502

APPARATUS FOR COMPENSATING FOR TIME-VIBRANT FIELD INTERFERENCE IN MAGNETIC FIELDS

Anton W. Keller, Odenwaldstrasse 14, D-7512 Rheinstetten, Fed. Rep. of Germany; Werner H. Tschopp, Eggenbergstrasse 11, CH-8127 Forch, and Anton Kuster, Müllerwis 25, CH-8606 Greifensee, both of Switzerland

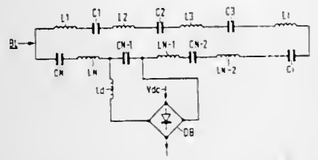
Filed Aug. 14, 1987, Ser. No. 85,374
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628161
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—318 **16 Claims**



1. In a magnet system including a superconducting field coil for producing a magnetic field having an axis and along its axis a specimen area of high homogeneity, compensating means for compensating for time-variant field interference in said magnetic field, said compensating means comprising:
- at least one sensing coil arranged coaxially with respect to said field coil and having a diameter which is greater than the diameter of said field coil,
- at least two compensating coils, each being arranged coaxially with respect to said field coil and having a diameter which is greater than the diameter of said field coil, said at least two compensating coils forming a compensating coil arrangement which is axially asymmetrical relative to said specimen area,
- a control unit connected to said at least one sensing coil and to said compensating coil arrangement for driving an electrical compensating current through said compensating coil arrangement in response to the voltage induced in said at least one sensing coil when variations of the magnetic field permeating said at least one sensing coil occur, said control unit including an electrical current divider for dividing said compensating current into at least two weighted portions, each portion being fed to one of said at least two compensating coils, and
- said at least one sensing coil, said control unit and said compensating coil arrangement forming a closed-loop control arranged for compensating for any variation of the magnetic field permeating said at least one sensing coil by the magnetic field produced by the compensating current fed to said compensating coil arrangement.

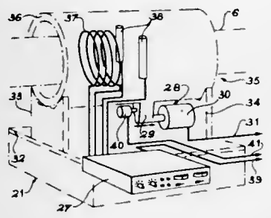
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4,788,503
MAGNETIC RESONANCE IMAGING APPARATUS HAVING A DETUNED RF COIL
Teunis R. Van Heelsbergen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 8, 1987, Ser. No. 59,283
Claims priority, application Netherlands, Dec. 22, 1986, 8603252
Int. Cl.⁴ G01R *33/20*
U.S. Cl. 324—322 **8 Claims**



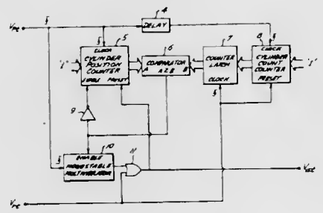
1. In a magnetic resonance imaging apparatus having first coil means for generating RF fields and second coil means for detecting magnetic resonance signals, said first coil means having a series connection of a plurality of coils and a plurality of capacitors, means for decoupling said first coil means from said second coil means comprising an inductive element connected through an electronic switch to bridge one of said capacitors.

4,788,504
APPARATUS FOR MEASURING THE RESIDUAL MAGNETIZATION VECTOR IN CYLINDRICAL COORDINATES OF A GEOLOGICAL CORE SAMPLE
Roland Blanpain, St Laurent du Pont; Patrick Le Masson, Villard de Lans; Jacques Pocachard, Voreppe, and Bertrand Sichler, Plouzane, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Nov. 12, 1987, Ser. No. 119,561
Claims priority, application France, Nov. 28, 1986, 86 16652
Int. Cl.⁴ G01V *3/08, 3/40;* **G01R** *33/12*
U.S. Cl. 324—377 **4 Claims**



1. Apparatus for measuring the residual magnetization vector in cylindrical coordinates (x, r, θ) of the geological core sample (7) about an axis of said sample (7), the residual magnetization vector having a longitudinal component (x) along said axis and a radial component (r) perpendicular to said axis, said radial component making an angular phase (θ) with a preset angular reference, said apparatus comprising: means (2, 3, 6) for supporting said sample (7) while rotating said sample about said axis, a carriage (21) sliding along said axis of said core sample and provided with transducers (38) for measuring the radial component and the phase of said vector by variation during rotation of said sample of a magnetic field generated by said radial component and detected by said transducers, said carriage being also provided with a solenoid (37) for measuring the longitudinal component (x), said solenoid being vibrated longitudinally to generate therein an electric current depending from induction by said longitudinal component, and means (39) for measuring said electric current in said solenoid.

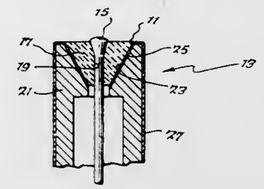
4,788,505
ADVANCE REFERENCE CYLINDER TRIGGER GENERATOR
Bill E. Bailey, Kent, Wash., assignor to Pacific Northwest Electronics, Seattle, Wash.
Filed Sep. 11, 1987, Ser. No. 96,140
Int. Cl.⁴ F02P *17/00*
U.S. Cl. 324—379 **16 Claims**



1. An advance reference cylinder trigger generator suitable for use in a cathode ray tube based internal combustion engine analyzer, said advance reference cylinder trigger generator comprising:
(a) a cylinder position counter for receiving pulses derived from the complex waveform signals created at the primary winding of the coil of an internal combustion engine when coil energy is dissipated to create a spark discharge and producing a related cylinder position count value;
(b) a cylinder count counter for receiving said pulses derived from the complex waveform signals created at the primary winding of the coil of an internal combustion engine when coil energy is dissipated to create a spark discharge and producing a related number of cylinders count value;
(c) a latch connected to said cylinder count counter for receiving and storing said number of cylinders count value;
(d) a comparator connected to said cylinder position counter and said latch for receiving and comparing said cylinder position count value to said number of cylinders count value stored by said latch and providing an enable signal when said cylinder position count value matches said number of cylinders count value; and,
(e) a trigger pulse generator connected to said comparator for receiving said enable signal and generating a trigger pulse.

4,788,506
MEASURING PROBE
Karl Weissmann, Oftersheim, Fed. Rep. of Germany, assignor to Pfaudler Company, Rochester, N.Y.
Filed Oct. 9, 1985, Ser. No. 785,696
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1984, 3437619
Int. Cl.⁴ G01N *27/07*
U.S. Cl. 324—446 **2 Claims**

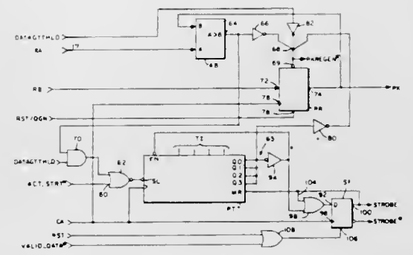
1. A measuring probe comprising:
(a) a hollow probe body, coated on its exterior surface with glass and having a conical bore in one end thereof, said conical bore also being glass coated;
(b) a conically shaped sintered ceramic insert, shaped and sized to mate with said conical bore of said probe body, said ceramic insert being mated with and fused to said glass coating of said conical bore, said ceramic insert having at least one bore therethrough which communicates with the hollow interior of said probe body;
(c) at least one electrode means, fused to said ceramic insert through said at least one bore, said at least one electrode means extending from within said hollow interior of said



probe body through said at least one bore to the exterior of said ceramic insert.

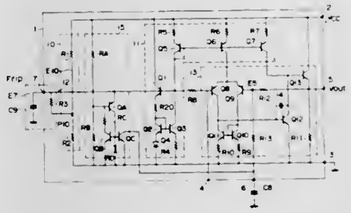
4,788,507
PEAK TIMEOUT INDICATOR/ENCODER AND METHOD
Murray L. Berkowitz, Forest Hills, and David J. Mazurek, Hauppauge, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio
Filed May 4, 1987, Ser. No. 45,335
Int. Cl.⁴ H03K *5/153;* **G01R** *19/04*
U.S. Cl. 328—151 **17 Claims**





1. A method for detecting the peak amplitude of a waveform comprising the steps of:
(a) sampling the amplitude of the waveform at successive times (A/D);
(b) storing an amplitude (PR);
(c) starting a predetermined time interval (PT);
(d) providing an attenuated value of a new amplitude that occurs during said time interval (SN, RA);
(e) storing the new amplitude itself if said attenuated value of said new amplitude exceeds the predecessor stored amplitude (PR);
(f) starting a predetermined time interval (PT);
(g) repeating the three immediately preceding steps using subsequently-occurring amplitudes until the most recently started of said time intervals is completed without occurrence of an amplitude whose attenuated value exceeds its predecessor stored amplitude.

4,788,508
POP NOISE SUPPRESSION CIRCUIT FOR AUDIO AMPLIFIER
Hiroaki Kawai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 1, 1988, Ser. No. 162,692
Claims priority, application Japan, Mar. 6, 1987, 62-51350
Int. Cl.⁴ H03F *1/26*
U.S. Cl. 330—51 **6 Claims**



1. A pop noise suppression circuit for an audio amplifier having a non-inverting input, an inverting input, and an output terminal, comprising:
bias means, inserted between first and second power supply circuits of said audio amplifier, for providing, from a bias potential supply terminal, a bias potential, corresponding to a potential difference between said first and second power supply circuits;
ripple filter means, inserted between the non-inverting input of said audio amplifier and the bias potential supply terminal of said bias means, for reducing ripple components in the bias potential, said ripple filter means including a first capacitor which is charged by the bias potential, a charging voltage of said first capacitor being supplied to the non-inverting input of said audio amplifier;
negative feedback means, inserted between the inverting input and the output terminal of said audio amplifier, for negatively feeding an output signal of said audio amplifier back to the inverting input, said negative feedback means including a second capacitor which is charged by a potential at the output terminal, a charging voltage of said second capacitor being supplied to the inverting input of said audio amplifier; and
forcible discharging means, coupled to said first and second capacitors and said first and second power supply circuits, for forcibly discharging a charge accumulated in said first and second capacitors when a voltage corresponding to the potential difference between said first and second power supply circuits is changed from a value greater than the charging voltage of said first capacitor to a value less than the charging voltage.

4,788,509
PHASE SHIFTER
Inder J. Bahl, Roanoke, and Gary K. Lewis, Salem, both of Va., assignors to ITT Gallium Arsenide Technology Center, a division of ITT Corporation, Roanoke, Va.
Filed Aug. 15, 1986, Ser. No. 896,779
Int. Cl.⁴ H03F *3/60*
U.S. Cl. 330—54 **4 Claims**

1. A multifunction circuit configured to function as a phase shifter comprising:
a first monolithic microwave integrated circuit including
a plurality of FET amplifier sections, each section having an output and a FET with a first and a second gate;
output means coupled to the outputs of said amplifier sections for providing an output signal representative of the combined output of said amplifier sections;
a first transmission line having a plurality of matching networks and first input means adapted for receiving a

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microwave input signal, said first gates connected to said first transmission line and separated one from another by a respective matching network of said first transmission line and first biasing means for applying a bias to said first gates;

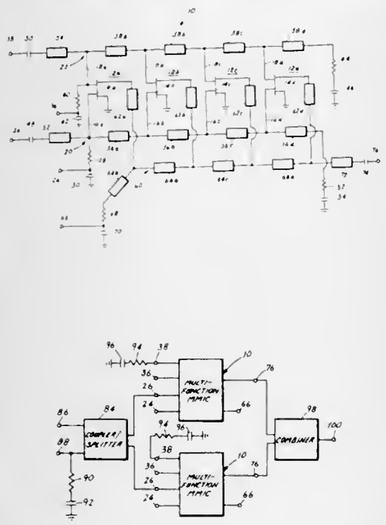
a second transmission line having a plurality of matching networks and second input means adapted for receiving a microwave input signal, said second gates connected to said second transmission line and separated one from another by a respective matching network of said second transmission line and second biasing means for applying a bias to said second gates, said first and second biasing means selecting drain source current and thereby an operating region of said FETs;

a first biasing voltage source coupled to said first biasing means;

a second biasing voltage source coupled to said second biasing means;

a second multifunction monolithic microwave integrated circuit including

a plurality of FET amplifier sections, each section having an output and a FET with a first and a second gate;



output means coupled to the outputs of said amplifier sections for providing an output signal representative of the combined outputs of said amplifier section;

a first transmission line having a plurality of matching networks and first input means adapted for receiving a microwave input signal, said first gates connected to said first transmission line and separated one from another by a respective matching network of said first transmission line and first biasing means for applying a bias to said first gates;

a second transmission line having a plurality of matching networks and second input means adapted for receiving a microwave input signal, said second gates connected to said second transmission line and separated one from another by a respective matching network of said second transmission line and second biasing means for applying a bias to said second gates, said first and second biasing means selecting drain source current and thereby an operating region of said FETs;

a first biasing voltage source coupled to said first biasing means:

a second biasing voltage source coupled to said second biasing means;

a coupler having a coupler input node for receiving a microwave input signal and two coupler output nodes, each coupler output node individually connected to one of said input means of each of said monolithic microwave integrated circuits, respectively; and

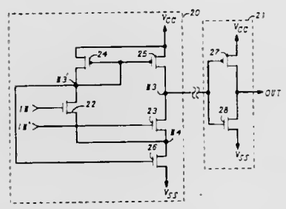
combiner means having two combiner inputs each coupled to said output means of one of said multifunction monolithic microwave integrated circuits for combining the respective output signals and providing a phase shifted representation of said coupler input signal.

4,788,510

DIFFERENTIAL INPUT STAGE FOR DIFFERENTIAL LINE RECEIVERS AND OPERATIONAL AMPLIFIERS

Ronald J. Wozniak, Allentown, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 29, 1987, Ser. No. 55,679
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—253 **9 Claims**



1. In an integrated circuit, a differential input amplifier stage (20) for converting a differential input signal into a single-ended output signal, having:

a pair of input transistors (22,23), responsive to the differential input signal, forming a differential pair with a common output node (N4) and two complementary output nodes (N3', N3);

a current mirror (24,25) having at least two transistors, each in series with the corresponding one of the two complementary output nodes of the differential input stage, the current mirror responsive to a first one of the two complementary output nodes and the second one of the two complementary output nodes having the single-ended output signal;

characterized by

a sink transistor (26), having an output coupled to the common output node of the differential input stage and directly connected to the first one of the two complementary output nodes;

wherein variations in voltage on the first one of the two complementary output nodes, in response to the differential input signal, are minimized; and

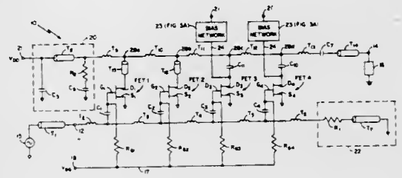
the transistors are scaled such that the combined equivalent resistance of each input transistor in series with the sink transistor is substantially the same as the equivalent resistance of the corresponding transistor in the current mirror.

4,788,511

DISTRIBUTED POWER AMPLIFIER

Manfred J. Schindler, Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 30, 1987, Ser. No. 126,542
Int. Cl.⁴ H03F *3/60, 3/16*
U.S. Cl. 330—277 **16 Claims**



1. In combination:

a plurality of successively coupled field effect transistors, each one thereof having an input electrode and an output electrode, with said transistors further having a predetermined reactive component between the output electrode and a reference potential;

input means for feeding input signals to the input electrode of each one of said transistors; and

output means for successively coupling the output electrode of each one of the transistors to an output terminal, said means further including:

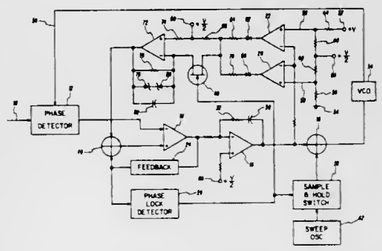
means, coupled between the output electrode of at least a selected one of the transistors and said means for successively coupling, for reducing the effective output capacitance of the selected transistor.

4,788,512

GAIN MAINTENANCE APPARATUS FOR USE WITH A HIGH GAIN AMPLIFIER INCORPORATED IN A CLOSED LOOP FEEDBACK SYSTEM

Charles R. Hogge, Jr., Richardson, and Karl A. Ireland, Plano, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 5, 1987, Ser. No. 58,733
Int. Cl.⁴ H03L *7/16*
U.S. Cl. 331—4 **3 Claims**



1. Phase-lock loop apparatus comprising, in combination:

phase detection first means;

voltage controlled oscillator second means;

third means, including high gain amplifier means and phase-lock detection means, for providing an output first signal when a lack of phase-lock of the loop is detected;

fourth means connecting said first, second and third means in a phase-lock loop feedback arrangement where said high gain amplifier means comprises a direct part of the feedback path of the phase-locked loop and is connected to supply signals to drive said voltage controlled oscillator second means;

sweep signal supplying fifth means, connected to said second and third means for supplying a sweep second signal to said second means while receiving said output first signal; and

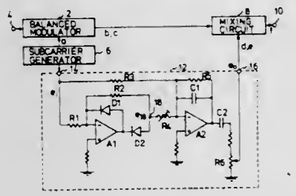
signal centering sixth means, connected in a signal feedback relation from an output to an input of said high gain amplifier portion of said third means and including a signal input means connected to said third means for receiving said first signal, for maintaining the voltage output of said high gain amplifier means at a substantially median value when the phase-lock loop is not in a locked condition.

4,788,513

REMANENT SUBCARRIER COMPONENT SUPPRESSING DEVICE FOR BALANCED MODULATOR

Tomoyuki Katayama, Kobe, Japan, assignor to DX Antenna Company, Ltd., Kobe, Japan

Filed Oct. 22, 1987, Ser. No. 111,261
Claims priority, application Japan, Oct. 27, 1986, 61-256176
Int. Cl.⁴ H03C *3/00*
U.S. Cl. 332—16 R **1 Claim**



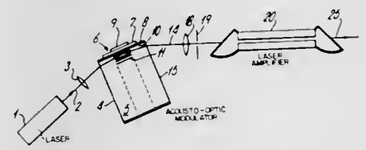
1. In a device for suppressing a remanent subcarrier component, in an output signal of a balanced modulator for modulating a subcarrier wave supplied to said modulator from a subcarrier generator with an input signal to said modulator, the improvement comprising a full-wave rectifier means, coupled to said subcarrier generator, for receiving said subcarrier wave also and for rectifying in full-wave fashion said subcarrier wave received by said modulator, a mixing means receiving the output signal of said balanced modulator and an output of said full-wave rectifier means for subtractively combining both said output signals, and said full-wave rectifier means comprising means for changing a balance between rectification sensitivities for positive and negative input levels to said rectifier means and means for controlling a level of said output signal from said rectifier means.

4,788,514

OPTICAL MODULATION ARRANGEMENT

Alan J. Fox, Crawley, England, assignor to U.S. Philips Corp., New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,713
Claims priority, application United Kingdom, Sep. 30, 1985, 8524082
Int. Cl.⁴ B41C *1/10;* H01S *3/10*
U.S. Cl. 332—7.51 **12 Claims**



1. An optical modulation arrangement for modulating a beam of optical radiation generated by a laser source, including

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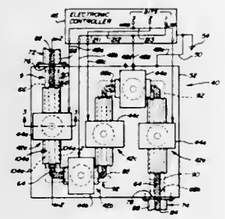
an optical modulator for modulating the amplitude of the beam by means of an electrical signal, followed by a laser amplifier for amplifying the modulated beam, characterised in that the optical modulator is an acousto-optic modulator employing Bragg diffraction from an acoustic wave propagating in an acoustic medium transparent to the optical radiation, said laser source and said laser amplifier are both gas lasers employing the same kind of lasing gas and at least one of said lasers operates at an elevated gas pressure such as to provide an amplification bandwidth with an increased frequency range which is sufficient to span the change in the optical frequency imposed on the diffracted modulated output beam by the acousto-optic modulator.

4,788,515

DIELECTRIC LOADED ADJUSTABLE PHASE SHIFTING APPARATUS

Mon N. Wong, Torrance, and Donald C. D. Chang, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 19, 1988, Ser. No. 158,016
Int. Cl.[4] H01P *1/18, 9/00*
U.S. Cl. 333—160 **26 Claims**



1. An adjustable phse-shifting apparatus for use in shifting the phase of a microwave signal being transmitted along a transverse electromagnetic transmission line of the type including an inner conductor, a coaxial outer conductor, and a first dielectric located between the conductors, the apparatus comprising:

a body having an elongated cavity therein which forms at least part of the outer conductor;

cover means, attached to the body, for forming at least part of the outer conductor, and having at least a first elongated opening therein which provides access to at least a first portion of the cavity; and

first member means for altering the phase of the signal as it passes through the first portion of the cavity, the first member means being provided with at least a first section including a second dielectric that is movable with respect to the first portion of the cavity in a direction transverse to the direction of the singal as it passes through the first portion to alter the phase of the signal, said first section including spaced apart projections respectively insertable into a position on opposite sides of at least a first segment of the center conductor.

4,788,516

ENCLOSED ELECTROMAGNETIC RELAY

Jack B. Meister, Convent Station, N.J., assignor to Beta Mfg. Co., Warren, Mich.

Filed Aug. 17, 1987, Ser. No. 86,021
Int. Cl.[4] H01H *51/22*
U.S. Cl. 335—84 **13 Claims**

1. An electromagnetic relay comprising in combination:

a bobbin of insulating material comprising a hollow spool sandwiched between a pair of end flanges, said spool and said end flanges defining a cavity centered along the principal axis of said spool;

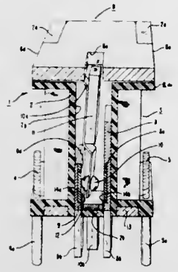
a coil of electrically conducting wire wound around said spool and forming therewith an electromagnet constructed, upon energization of said coil, to generate a stream of magnetic flux in said cavity directed along said axis;

at least one fixed electrical contact rigidly attached to an inner wall of said cavity;

at least one movable contact;

means for suspending said movable contact in said cavity, adjacent to said fixed contact;

a magnetically actuable armature connected to said last-named means, and responsive to the flow of flux in said



cavity to move said movable contact from a first position in open relation to said fixed contact, to a second position in closed relation with said fixed contact;

means comprising a magnetically permeable enclosure surrounding opposite sides of said coil externally for completing the magnetic circuit for said flux, wherein said magnetically permeable enclosure is electrically connected to said means for suspending said movable contact, and is magnetically connected to provide a magnetic flux path to said armature; and

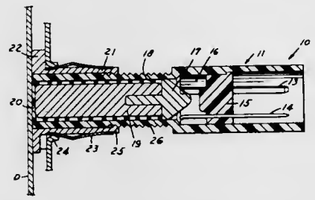
said movable contact comprising spring-biasing means anchored to said magnetically permeable enclosure.

4,788,517

SEALED PROXIMITY SWITCH ASSEMBLY

Jack B. Meister, Convent Station, N.J., assignor to Beta Mfg. Co., Warren, Mich.

Filed Oct. 8, 1987, Ser. No. 106,189
Int. Cl.[4] H01H *9/00*
U.S. Cl. 335—205 **19 Claims**



1. A sealed proximity switch assembly comprising

a closed housing of non-magnetic material,

said housing having a side wall, an outer end wall and an inner end wall,

a plurality of contacts mounted in said inner wall of said housing and extending into said housing,

a movable contact member of electrically conductive material mounted within said housing and guided therein for

movement toward and away from engagement with said contacts,

a permanent magnet within said housing and connected to said contact member,

a spring in said housing yieldingly normally urging said magnet and said contact member in one position relative to said contacts,

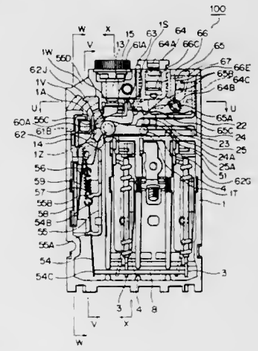
such that when the switch assembly is supported so that a ferromagnetic member is in proximity with the outer end wall of said housing, the magnet is attracted toward the ferromagnetic member moving the contact member to a second position relative to said contacts.

4,788,518

THERMALLY-SENSITIVE OVERCURRENT PROTECTIVE RELAY INCLUDING WIRE CONNECTION TERMINAL

Yuji Sako; Haruhiko Ito, both of Aichi, and Mineo Sano, Mie, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 110,083
Claims priority, application Japan, Oct. 17, 1986, 61-159004[U]
Int. Cl.[4] H01H *71/16, 37/70*
U.S. Cl. 337—49 **1 Claim**



1. A thermally-sensitive overcurrent protective relay comprising:

a housing case;

a bimetal strip bendable in response to an operating current flowing through a control circuit of said overcurrent protective relay;

a movable contact biased by a spring to form a toggle mechanism operable in response to bending of said bimetal strip;

a lever supporting bracket for mechanically supporting said movable contact at a fulcrum portioon of said lever supporting bracket and electrically connected to said movable contact, said lever supporting bracket including an adjustment mechanism, said adjusting mechanism rotatable at an end portion thereof by turning an adjusting screw for adjusting said operating current; and

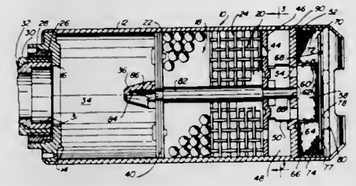
a terminal connected to said movable contact, and fixed to said housing case for supplying said operating current to said control circuit through a contact spring for electrically connecting said lever supporting bracket.

4,788,519

EXHAUST CONTROL DEVICE FOR CIRCUIT INTERRUPTER

Roy T. Swanson, N. Riverside, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Jun. 10, 1987, Ser. No. 60,720
Int. Cl.[4] H01H *85/38*
U.S. Cl. 337—280 **15 Claims**



1. An exhaust-control device for a circuit interrupter that expels exhaust gases during operation, the exhaust-control device comprising:

a housing defining inlet means for receiving exhaust gases from the circuit interrupter;

a first section of ceramic material supported by said housing adjacent said inlet means for receiving the exhaust gases and through which the exhaust gases pass; and

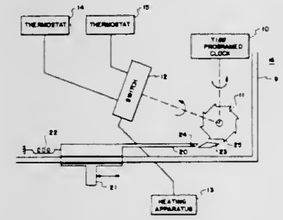
a second section of metallic heat-absorbing material supported by said housing and arranged with respect to said first section to receive the exhaust gases from said first section.

4,788,520

RATCHET MEANS SWITCH OPERATOR

Rolf L. Strand, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 24, 1987, Ser. No. 100,377
Int. Cl.[4] H01H *37/62*
U.S. Cl. 337—301 **4 Claims**



1. In a switch operator comprising:

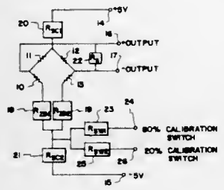
ratchet means connected to a switch means,

first means movable toward and away from said ratchet means to move said ratchet means a predetermined amount, and

guide means mounted adjacent said ratchet means for directing said first means against said ratchet means when said first means moves in a forward direction and for holding and directing said first means away from said ratchet means when said first means moves in a return direction.

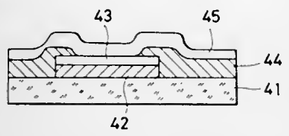
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,521
TEMPERATURE COMPENSATION SYSTEM FOR PIEZORESISTIVE PRESSURE SENSOR
Russell L. Johnson, New Brighton, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Continuation of Ser. No. 786,387, Oct. 10, 1985, abandoned. This application Apr. 7, 1988, Ser. No. 183,337
Int. Cl.[4] G01L *1/22*; H01C *7/06*
U.S. Cl. 338—3 **22 Claims**



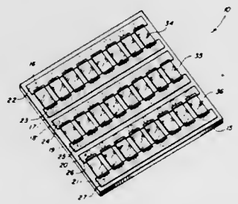
1. A system for sensing pressure comprising:
a pressure sensing means having output regions and including a piezoresistive device, said pressure sensing means being adapted to provide an output voltage at said output region indicative of stress on said piezoresistive device; and
compensation means for compensating said output voltage for errors caused by changes in environmental temperature, said compensation means containing only passive electrical components, wherein said compensation means includes a plurality of electrical resistor means, said piezoresistive device and each of said electrical resistor means having associate therewith a temperature coefficient of resistivity, the temperature coefficients of resistivity of said electrical resistor means being selected so as to provide said compensation to said output voltage, and wherein the temperature coefficient of resistivity of at least one of said electrical resistor means is positive if the temperature coefficient of resistivity of said piezoresistive device is positive and is negative if the temperature coefficient of resistivity of said piezoresistive device is negative.

4,788,522
IMAGE SENSING
Masanori Itagaki, Kawasaki; Kouji Mori, Yokohama; Tatsumi Ishiwata, Zushi, and Taizo Yoshida, Ikeda, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation of Ser. No. 459,353, Jan. 20, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,508
Claims priority, application Japan, Jan. 20, 1982, 57-5912; Jan. 26, 1982, 57-9564; Feb. 2, 1982, 57-14391; Mar. 3, 1982, 57-33284; Apr. 1, 1982, 57-54049; Apr. 23, 1982, 57-67150; Apr. 23, 1982, 57-68277
Int. Cl.[4] H01L *31/08*
U.S. Cl. 338—15 **3 Claims**



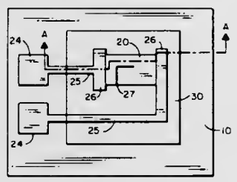
1. A photoelectric cell for converting light image information into electrical image signals, comprising:
a substrate;
a three-layer photoconductive structure formed on said substrate, said structure including a first photoconductive film formed on said substrate, a second photoconductive film on said first photoconductive film and a third photoconductive film formed on said second photoconductive film, said second photoconductive film having a band gap energy smaller than those of said first and third photoconductive films; and
a pair of electrodes either one or both of which is formed either on said substrate or on said third photoconductive film such that said electrodes are spaced apart from each other sidewise to define a window therebetween

4,788,523
VIAD CHIP RESISTOR
William L. Robbins, Newton, Mass., assignor to United States of America, Washington, D.C.
Filed Dec. 10, 1987, Ser. No. 130,839
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—309 **8 Claims**



1. An array of spaced electrical circuit components, comprising:
(a) a substrate of electrically insulating material having first and second surfaces;
(b) spaced apart rows of vias in said substrate, the rows having a pattern comprising single rows and double rows, the vias being inward from the edges of the substrate;
(c) conductive material regions, each surrounding at least one via on said first and second surfaces of said substrate;
(d) conductive material within said vias and electrically interconnecting the conductive material regions on the first and second surfaces surrounding those vias; and
(e) resistor elements on a surface of said substrate, each resistor element electrically interconnecting two conductive material regions, a conductive material region being associated with a double row of said vias, no via in the substrate being used in conjunction with more than one resistor element.

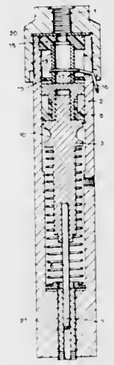
4,788,524
THICK FILM MATERIAL SYSTEM
Thomas Ozaki, Sycamore, Ill., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.
Filed Aug. 27, 1987, Ser. No. 90,192
Int. Cl.[4] H01C *1/012*
U.S. Cl. 338—309 **6 Claims**



1. A material system for manufacturing thick film resistors on a ceramic dielectric substrate comprising:

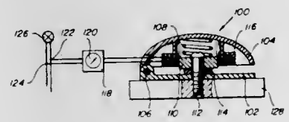
at least first and second resistor terminations located in a spaced relationship to one another and fixed to said dielectric substrate, said resistor terminations composed of a palladium-silver conductor material.
a ruthenium based resistive material fixed to portions of said first and second terminations and to said dielectric substrate;
at least first and second terminal pads fixed to said dielectric substrate, and first and second conductor traces extending from said first and second terminal pads respectively to at least first and second resistor interconnections respectively, said first and second resistor interconnections fixed to said first and second resistor terminations and to portions of said resistive material, said first and second terminal pads, first and second conductor traces and first and second resistor interconnections composed of a copper conductor material; and,
an infrared heat curable dielectric polymer encapsulant applied and cured substantially over said first and second resistor interconnections and resistive material.

4,788,525
ELECTRIC PNEUMATIC PRESSURE SENSOR
Bruno Lichtenstein, Rue Barreto Leite 87, Porto Alegre, Brazil
Continuation of Ser. No. 750,751, Jun. 28, 1985, abandoned. This application Apr. 10, 1987, Ser. No. 45,791
Claims priority, application Brazil, Jul. 10, 1984, 8403488
Int. Cl.[4] B60C *23/02*
U.S. Cl. 340—58 **10 Claims**



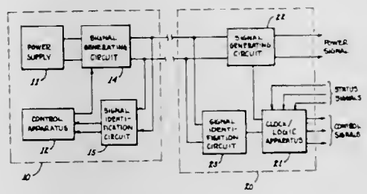
1. A vehicle tire pressure indicator device, comprising:
a housing having a wall which has an inner surface limiting an inner chanmber;
a tube arranged to communicate said inner chamber with an interior of a tire so as to establish in said inner chamber an air pressure corresponding to a tire air pressure, said tube being electrically isolated from said housing and formed as an electrical contact connectable with electrical indicating means, said tube having an end face;
a piston movable in said inner chamber relative to said tube and having an outer surface and an end face;
biasing means arranged to bias said piston toward said tube against an air pressure in said inner chamber so that when an air pressure in the tire and therefore an air pressure in said chamber reaches a predetermined level, said piston moves in said housing so that said outer surface of said piston is guided by said inner surface of said housing during an entire movement of said piston in said housing and only said end face of said piston becomes biased into contact with said end face of said tube, so that said tube activates said electrical indicating means in response to the contact of said end face of said piston with said end face of said tube; and
means for sealing said inner chamber and including an elastic element fixedly engaged to said piston and pressing against said inner surface of said wall of said housing to thereby seal said inner chamber, said elastic element being formed so that all of said elastic element is movable by said piston, said elastic element sliding along said inner surface of said wall of said housing when moved by said piston.

4,788,526
VEHICLE BRAKELIGHTS ACTIVATING DEVICE
Mordechai Eckstein, 49 Zahal Street, Kiron, and Adir Shapira, Moshav Tal-Shahar, both of Israel
Filed Jun. 13, 1986, Ser. No. 873,979
Claims priority, application Israel, Oct. 24, 1985, 76813
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—71 **10 Claims**



1. A signalling device for a light of a motor vehicle comprising
a first member for mounting to the accelerator pedal of a vehicle, a second member for being pressed by a foot of the driver, the first and second members being connected to be displaceable with respect to each other upon the driver pressing upon the second member and, through the connection between the first and second members, upon the accelerator pedal and also upon the driver releasing the pressure upon the second member;
a magnetic core on one of the first and second members and an induction coil on the other member, the core and coil being respectively positioned that upon the second member moving away from the first member, the core and coil move past each other;
means for operating the light to illuminate, and an electrical connection from the coil to the operating means such that movement of the core past the coil operates the operating means for the light.

4,788,527
APPARATUS AND METHOD FOR DEVICE CONTROL USING A TWO CONDUCTOR POWER LINE
Fritz H. Johansson, 2512 S. Playa, Mesa, Ariz. 85202
Filed Sep. 17, 1984, Ser. No. 651,440
Int. Cl.[4] G08B *1/08*; H04Q *7/00*
U.S. Cl. 340—310 A **5 Claims**



1. Apparatus for transferring interrogation, control and response data on a DC power transmission line electrically coupling a controller apparatus and a plurality of remote de-

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vices having sensor and electro-mechanical devices, said apparatus comprising:

(a) a system interrogation/control means which comprises,

(i) a control apparatus means for initializing and controlling generation of pulses on said DC power transmission line, said control apparatus having a program for synchronizing said initializing and controlling generation of pulses on said power transmission lines with said plurality of remote devices, said control apparatus comprising command means for generating a control command signal, timing/logic means for identifying at least one interval of predetermined duration after a pre-established delay,

(ii) a control signal generation means for applying a single one of initialization and control pulses onto said DC power line in response to said control command signal, said control signal generation means being coupled to said DC power line and to said control apparatus means, and

(iii) a response sensing means for receiving a response pulses from said DC power line, said response sensing means being coupled to said DC power line;

(b) a system response means which comprises:

(i) a control sensing means for receiving and sensing said initialization and control pulses from said DC power line, said control sensing means being coupled to said DC power line,

(ii) a clock/logic means for identifying at least one interval of predetermined duration after a pre-established delay, said clock/logic means being coupled to said response sensing means of said system receiving and response means, said delay commencing upon receiving an initial one of said command and control pulses from said DC power line,

(iii) a response signal generation means for applying a single one of said response pulse onto said DC power line, said response signal generation means of said system response means being coupled to said DC power line and to said clock/logic means.

4,788,528

METHOD AND APPARATUS FOR HIGH-RESOLUTION DIGITIZATION OF A SIGNAL

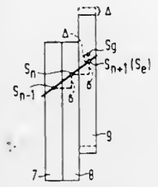
Hakan Elmqvist, Bromma, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 775,314, Sep. 12, 1985, abandoned. This application May 15, 1987, Ser. No. 51,162

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1984, 3433898

Int. Cl.⁴ H03M *1/46*

U.S. Cl. 341—155 **9 Claims**



1. A method for digitization of an analog signal to a required degree of high-resolution with a large dynamic range using an analog-to-digital coverter having a measuring region smaller than the total range of measurement of the analog signal comprising the steps of:

dividing said range of measurement into a plurality of smaller partially overlapping measurement segments, each measurement segment having a size corresponding to the measuring range of the analog-to-digital converter and an error bigger in size than the required degree of high-resolution;

utilizing the analog-to-digital converter to control selection of said measurement segments such that the analog signal to be digitized is within selected limits of a current selected segment;

changing to another measurement segment if said analog signal is beyond said selected limits of said current selected segment; and

if a change in said measurement segment is made, extrapolating a new digital signal value from at least the last two signals from said analog-to-digital converter.

4,788,529

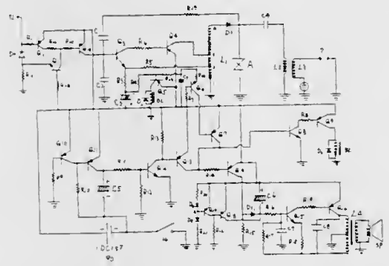
MULTIFUNCTIONAL SAFETY GAS FLOW REGULATOR'S CONTROLLER

Jiann-Yi Lin, Taipei Hsien, Taiwan, assignor to Pao Yin Co., Ltd., Taiwan

Filed Apr. 28, 1987, Ser. No. 43,398

Int. Cl.⁴ G08B *19/00*; F23N *5/24*

U.S. Cl. 340—521 **11 Claims**



1. A high voltage electronic ignition circuit of a controller for a multifunctional safety gas flow regulator having a main flame and a mother flame, said high voltage electronic ignition circuit comprising:

an induction electrode for detecting ignition of the mother flame and for stopping ignition after the mother flame ignites;

first biasing means, connected to said induction electrode, for biasing said induction electrode;

a first vibration loop means connected to said first biasing means, for producing an electric voltage;

a rectifying means connected to said first vibration loop means, for rectifying the voltage from said first vibration loop;

a charging circuit means, connected to said rectifying means, for producing a charging voltage;

an ignition electrode, connected to said charging circuit means and ground, for ignition of the mother flame by said charging voltage;

an automatic charging loop means, connected to said first biasing means, for controlling the gas supply for the mother flame and for ignition of the mother flame;

a power source means connected to said automatic charging loop means;

a switch means connected to said power source means, said automatic charging loop means and ground, for turning the high voltage electronic ignition circuit on and off;

a control means, connected to said automatic charging loop means and said first vibration loop means, for controlling gas supply of the mother flame and for controlling sounding an alarm;

a solenoid means connected to said control means and said automatic charging loop means, for controlling the gas to flow to the mother flame;

second biasing means connected to said control means and to ground for producing a biasing signal;

second vibration loop means connected to said second biasing means and said control means for producing an alarm generating signal and

horn means, connected to said second vibration loop means, for sounding the alarm, wherein the alarm is automatically started when either one of the main flame or the mother flame are extinguished and when a power shortage occurs and wherein said ignition circuit functions as a multifunctional safety controller which controls the gas supply to the main flame or mother flame when the induction electrode is grounded.

4,788,530

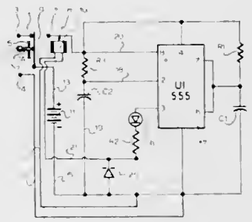
REMOTE SWITCHING DEVICE FOR SMOKE DETECTOR

Maurice Bernier, 11085 Paris, Montréal-Nord, Québec, Canada H1H 4L2

Filed Oct. 13, 1987, Ser. No. 107,094

Int. Cl.⁴ G08B *23/00, 17/10*

U.S. Cl. 340—527 **7 Claims**



1. A switching device for a smoke detector of the dry-cell operated type, including a casing adapted to be secured to a ceiling, or similar out-of-reach elevated location, a smoke-detecting and alarm circuit with positive and negative connectors adapted to be connected to a dry-cell battery in said casing, said device comprising a housing adapted to be secured to an accessible location below said smoke detector, a holding relay having a winding and an armature, a dry-cell battery, a pair of terminals and a time-delay circuit located in said housing, said terminals adapted to be connected by wires to said connectors in said casing; said battery in said housing connected to said armature and parallel-connected to one of said terminals and to said winding; the latter in turn connected to said time delay circuit, said armature having a first normal position in which it connects said battery across said terminals, and a second position held by said winding in which it disconnects said battery from the other of said terminals and connects said battery to said time-delay circuit, and spring means to return said armature to said first position upon opening of said time-delay circuit.

4,788,531

AUTOMATIC FAULT REPORTING SYSTEM

Charles E. Corwin, Kent, and Neal W. Moore, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 563,296, Nov. 17, 1983, Pat. No. 4,675,675. This application Apr. 14, 1986, Ser. No. 851,641

The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 340—945 **1 Claim**

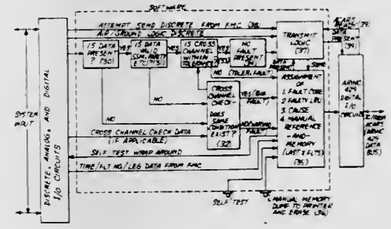
1. In an automatic fault reporting system:

means for providing fault code information;

an aircraft communication addressing and reporting system for providing a signal representative of a ready condition and a discrete signal representative of a transmission complete and received condition;

a transient logic circuit responsive to said fault code information and said signal representative of a ready condition of an aircraft communications addressing and reporting system for receiving said fault code information;

said transient logic circuit dumping said fault code information for transmission through said aircraft communica-



tions addressing and reporting system in response to the presence of said signal representative of a ready condition of said aircraft communications addressing and reporting system, and further repeating said dumping of said fault code information for transmission through said aircraft communications addressing and reporting system until receiving said discrete signal representative of said transmission complete and received condition from said aircraft communications addressing and reporting system.

4,788,532

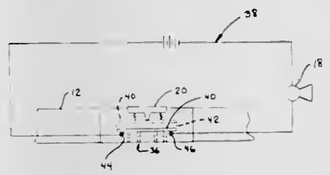
COMBINED BELT AND ALARM

Robert Maldonado, 12325 Lavina La., Garden Grove, Calif. 92641

Filed Jun. 10, 1987, Ser. No. 60,173

Int. Cl.⁴ G08B *15/00*

U.S. Cl. 340—574 **2 Claims**



1. A personal portable alarm system comprising:

belt means designed to be worn around a torso portion of a wearer;

audible alarm means comprising a siren fixedly secured to said belt means;

a battery pack for supplying operating power to said siren;

said battery pack being retained within a holding pocket formed in said belt means;

switch means for facilitating a selective manual actuation of said audible alarm means;

said switch means comprising a push button

switch positioned to operate a slide means associated therewith, said slide means serving to close an electrical circuit connecting said battery pack to said audible alarm means, and

key means operative to move said slide means into an open circuit condition; and wherein

said key means is insertible into a housing holding said slide means, said key means having a plurality of prongs which

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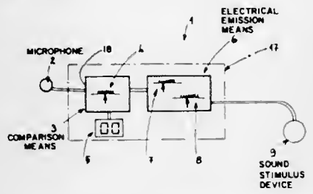
abut against said slide means during an insertion of said key means into said housing, said prongs moving said slide means into said open circuit condition when inserted into said housing.

4,788,533

DEVICE FOR INTERRUPTING THE SNORING OF A SLEEPING PERSON

Jean Claude Mequignon, 10 rue Honore de Balzac, 24120 Terrasson la Villedieu, France

Filed Jul. 26, 1985, Ser. No. 759,289
Claims priority, application France, Jul. 27, 1984, 84 12115
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—575 **8 Claims**



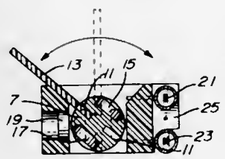
1. A device for interrupting the snoring of a sleeping subject as soon as it starts and which uses the phenomena of subconscious perception of a fixed frequency sound wave stimulus to cause a snoring sleeper to react to the sound stimulus which is maintained at a level not loud enough to wake the subject but sufficiently loud to cause a subconscious physical response, the result of which is to cause a behavioral change and interruption of the snoring without waking the subject, said device including a microphone (2) for picking up snoring noise emitted by the subject and means (3) for comparing the intensity of the noise picked up by the microphone (2) with a given alarm threshold, means (6) for disabling the microphone for a predetermined period upon the noise exceeding the alarm threshold and means for actuating a sound device so as to emit a fixed frequency sound stimulus within the range of 1700 and 2300 Hz and of an intensity between 50 db and 90 db such that the sound stimulus is perceived by the subconscious perception of the subject but insufficient to awaken the subject, said sound device being activated for a period between approximately 2 and 3 seconds so that the sound stimulus is emitted for a predetermined period less than the predetermined period of disablement of the microphone.

4,788,534

WIND ALARM SENSOR

Bernard Engelhardt, 51 Abbeywood Trail, Don Mills, Ontario, Canada M3B 3B4

Filed Jun. 6, 1986, Ser. No. 871,290
Int. Cl.[4] G01W *1/00*
U.S. Cl. 340—601 **2 Claims**



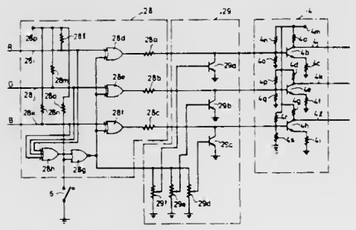
1. A wind alarm sensor comprising:
a frame member;
a pivoting member supported for pivoting motion in said frame member;
magnetic means for maintaining said pivoting member in an erect condition when said wind is less than a predetermined velocity;
switch means;
wherein, when the velocity of said wind is below a predetermined level, said magnetic means will maintain said pivoting member erect; and
when said wind velocity exceeds said predetermined level, said wind will cause said pivoting member to pivot to thereby actuate said switch.

4,788,535

DISPLAY APPARATUS

Yoshihisa Chikara; Mitsutoshi Hirata, both of Fukuoka, and Shuichi Takatori, Chikushi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 669,512, Nov. 8, 1984, abandoned. This application Nov. 2, 1987, Ser. No. 117,438
Claims priority, application Japan, Nov. 10, 1983, 58-211315; Nov. 10, 1983, 58-211316; Nov. 10, 1983, 58-211317
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—703 **5 Claims**



1. A display apparatus comprising:
means for receiving color component signals comprising red, green and blue signals representing pixels;
first means for (1) determining if said color component signals for a given pixel define a black signal or a white signals, (2) inverting said color component black or white signals to signals which define a reversed black or white signal, black becoming white and white becoming black and (3) selectively changing all signals representing other colors other than black and white into complementary color signals; and
switch means for controlling whether said first means changes said other color signals into said complimentary color signals.

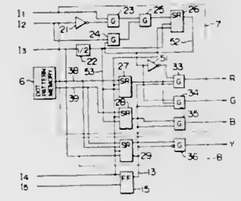
4,788,536

METHOD OF DISPLAYING COLOR PICTURE IMAGE AND APPARATUS THEREFOR

Kanji Tanabe, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 767,045
Claims priority, application Japan, Sep. 26, 1984, 59-201302
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—703 **8 Claims**

1. A display apparatus provided with an input means for indicating codes for data to be displayed on a picture screen, comprising:
(a) first memory means for storing said code indicated by said input means at positions in said first memeory means corresponding to the respective display positions of the data displayed on said picture screen, and from which said written-in code is read-out in synchronism with raster scanning on said picture screen;
(b) second memory means for storing in a single memory plane dot pattern data corrsponding to the data indicated by said codes stored in said first memeory means, said dot pattern data being stored in successive lines of storage locations in said single memory plane such that, for monochromtic disply data each picture element is stored in a respective storage location corresponding to one dot on said picture screen, and for color display data N color information signals are regularly stored in a predetermined pattern in N adjacent storage locations of said single memory plane for each picture element corresponding to N dots on said picture screen;
(c) third memory means for storing information indicating an attribute of said codes stored in said first memory means;
(d) control means for indicating whether monochromatic display or color display is to be performed with respect to said dot pattern data stored in said second memory means on the basis of said attribute information stored in said third memory means; and
(e) display means for performing said monochromatic display or said color display with respect to said dot pattern data stored in said second memory means, on the basis of the output of said control means, and including a monochromatic display circuit connected to said second memory means and including means for reading said dot pattern data from said second memory means such that each picture element in said second memory means defines one dot in said monochromatic display, and a color display circuit connected to said second memory means and including means for reading said dot pattern data from said second memory means such that one picture element of said second memory means defines N dots in said color display and in which said color display circuit reads each scanline of said second memory means such that, in combination with said predetermined pattern, color information corresponding to at least one color is applied to one display raster field and other colors are applied alternately along a corresponding scanline in at least another display raster field.

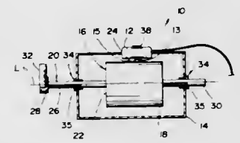


4,788,537

MOUSE INTERFACE ASSEMBLY

Lowell A. Potiker, 26100 Hawthorne, Franklin, Mich. 48025

Filed Sep. 17, 1987, Ser. No. 97,872
Int. Cl.[4] G09G *3/02*
U.S. Cl. 340—710 **15 Claims**



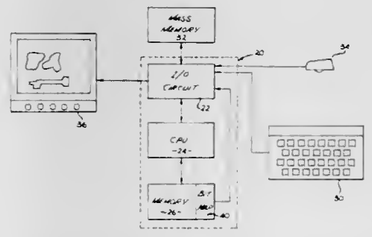
1. An assembly (10) for interfacing with a mouse (12) including a transducer (13) which controls movement of a cursor on a computer display, the assembly comprising:
a base (14);
a first member (16) having a peripheral surface (18) mounted on the base (14) for rotary and axial movement thereon; said base (14) also adapted to receive and retain said mouse (12) thereon with the transducer (13) interfacing with the peripheral surface (18); and
a second member (20) connected to the first member (16) and manually actuable for actuating driving movement of the first member (16).

4,788,538

METHOD AND APPARATUS FOR DETERMINING BOUNDARIES OF GRAPHIC REGIONS

Stephen A. Klein; David A. Rolfe, both of Pasadena; William T. Gross, La Canada, and Lawrence S. Gross, Santa Monica, all of Calif., assignors to Lotus Development Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 931,678, Nov. 17, 1986, abandoned. This application Apr. 24, 1987, Ser. No. 42,161
Int. Cl.[4] G09G *1/14*
U.S. Cl. 340—747 **35 Claims**



1. A computer display system having a central processing unit (CPU) coupled to display means including a display, said display having a plurality of selectively enabled and disabled display elements arranged in a matrix, such that each display element is identified by a unique X, Y address, comprising:
memory means coupled to said CPU for storing a plurality of binary quantities, each of said binary quantities disposed in a memory cell corresponding to a display element, said binary quantities defining regions on said display;
cursor control means coupled to said CPU for selecting an initial X, Y address on said display, and corresponding memory cell in said memory means, to identify an area on said display where the boundaries of a region are to be determined, said initial cell being defined as a seed cell;
logic means coupled to said CPU for determining if said initial X, Y address corresponds to a disabled memory cell, and in such event said logic means incrementing said initial X, Y address to search outwardly to adjacent memory cells until an enabled cell is located, said enabled cell then being defined as the new seed cell;
said CPU searching radially outward in M directions from the X, Y address of said seed cell for N consecutive disabled memory cells, and said logic means setting in each of said directions, the last enabled memory cell prior to said N consecutive disabled cells, as boundary cells;
said logic means defining an initial rectangular region through at least two of said boundary cells; said logic means determining if P consecutive rows and columns of disabled memory cells bound said initial rectangular region, said CPU selectively extending the boundaries of said initial region in X and Y directions until said region is bounded by P consecutive rows and columns of disabled cells;
whereby the boundaries of a region on said display are determined.

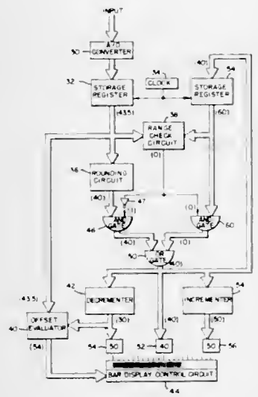
VOL 1096 ISS 5 NO 29 1988 UMI

4,788,539

DIGITAL DISPLAY DEVICE

Roger G. Frey, P.O. Box 1458, New Haven, Conn. 06506

Filed Sep. 15, 1986, Ser. No. 907,234
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—753 8 Claims



1. A digital display device for indicating the value of a function that may vary in a generally continuous manner comprising:

input means to receive the function to be displayed over a predetermined range of values;

indicator means including a viewing area connected to the input means and operable to provide a visual display of the varying value over said predetermined range of values;

said indicator means including means to dispaly invidually in the viewing area one at a time a plurality of discrete subranges extending over said predetermined range;

means providing each subrange display with a predetermined range of values having upper and lower limit values;

said indicator means including means providing subrange display indicia representing values within the subrange;

said indicator means further including value indicating means;

means to provide relative displacement between a displayed subrange and the value indicating means;

means to render stationary the displayed subrange;

means connected to said input means and to said indicator means to convert said function to a visual display representative of the instantaneous value thereof within the displayed subrange;

memory means to store the value identity of the displayed subrange;

means connected to the input means and to the memory means to control the selection of a displayed subrange;

said selected subrange having successive subranges on either side of its upper and lower limits;

means connected to the input means to select a subrange for a given input value; and

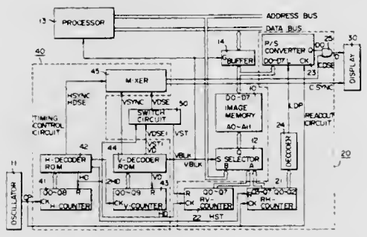
means for providing said selected subrange with a value on each side of the said given input value such that the values of the predetermined range of said selected subrange overlaps at least some of the predetermined range of values of at least one of said successive ranges other than the said limit values.

4,788,540

RASTER SCAN IMAGE DATA DISPLAY CONTROLLER INCLUDING MEANS FOR REDUCING FLICKERING

Shigenori Tokumitsu, and Masaaki Nishiura, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 17, 1986, Ser. No. 886,428
Claims priority, application Japan, Feb. 20, 1985, 60-30289; Jul. 19, 1985, 60-159340
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—789 6 Claims



1. A raster scan image data display controller comprising:

an image memory for storing image data items at horizontal and vertical display addresses corresponding to horizontal and vertical coordinates in an image display area, for display;

read-out means for supplying the horizontal and vertical display addresses to the image memory and reading out the image data item from the image memory;

display means for interlaced displaying of the read-out image data item on adjacent paired scanning lines of two types of fields which are to be formed by a raster scan, the interval between said adjacent paired scanning lines being substantially different from a predetermined distance;

timing control means for synchronizing the horizontal and vertical display addresses supplied from said read-out means with the raster scan of the display means; and

timing switching means for alternatively switching said adjacent paired scanning lines of said two types of fields formed by the raster scan, in association with a timing control of the horizontal and vertical display addresses by the timing control means, so as to select another adjacent paired scanning lines which are situated close to each other, said another adjacent paired scanning lines being formed by one scanning line of said adjacent paired scanning lines and one scanning line of adjacent paired scanning lines which are next to said adjacent paired scanning lines when the interval of said adjacent paired scanning lines of said display is wider than the predetermined distance.

4,788,541

SIGNAL COMMUNICATION SYSTEM

Torao Yamanaka, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 583,275, Feb. 27, 1984, abandoned. This application Jan. 29, 1987, Ser. No. 11,431
Claims priority, application Japan, Mar. 31, 1983, 58-58234
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.00 17 Claims

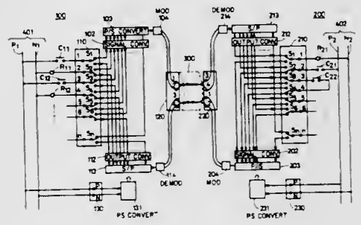
14. A signal communication system for serial signal transmission between two board devices via a cable, comprising:

a single signal input/output terminal board means for receiving therethrough signals from and providing therethrough signals to one of said two board devices;

transmitter means connected between said signal input/output terminal board means and the cable for receiving output signals from said one board device and converting the received output signals into logic signals of a bit serial format for supply to the cable for transmission to the other of said two board devices;

receiver means connected between said signal input/output terminal board means and the cable for receiving the logic signals from the other of said two board devices via the cable and converting the received logic signals into signals of a desired format for supply to said input/output terminal board means of said one board device;

terminal means having a plurality of input/output terminals associated with said input/output terminal board means,



each of said input/output terminals connected to a terminal of said board device; and

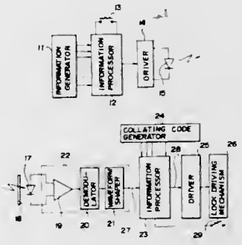
means for selectably connecting said receiver means or said transmitter means to said terminal means and for selecting at least one of said input/output terminals of said terminal means to be either an output terminal or a input terminal, thereby providing a flexible terminal interconnection for said one board device wherein each terminal of said one board device is connectable as either an input terminal connected to said receiver means or as an output terminal connected to said transmitter means.

4,788,542

REMOTE CONTROL DEVICE FOR VEHICLE LOCKS

Ritsushi Tanabe, Shiki, Japan, assignor to Yuhshin Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1986, Ser. No. 932,350
Claims priority, application Japan, Apr. 23, 1986, 61-92328; May 9, 1986, 61-104719
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.31 3 Claims



1. A remote control device for operating locks of a vehicle comprising, a receiver provided on the vehicle and a transmitter remote from the vehicle, said receiver being adapted to receive a remote control signal transmitted from said transmitter at a location remote from the vehicle and in response thereto control locking and unlocking of the vehicle locks, characterized in that:

said transmitter comprising, means for coding keyword information, means for converting said coded information into pulses, means for pulse-modulating said pulses, and means for transmitting the pulse-modulated pulses as a remote control signal;

said receiver comprising, means for receiving said remote control signal, means for demodulating the received signal, means for decoding the demodulated signal into an encoded information signal, means for comparing said encoded information signal with a preset code and means for generating an execution signal for operating said locks upon occurrence of a predetermined relationship between the encoded information signal and said preset code;

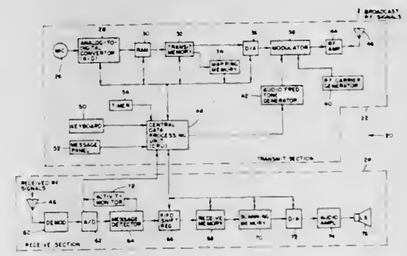
said means for coding keyword information including a plurality of coding elements for producing at least two output signals with each of said at least two output signals being one of a high level voltage, a low level voltage and a high impedance relating to the information to be coded, and a voltage signal generator for generating a varying voltage signal and for supplying said varying voltage signal through resistors common to respective outputs of said coding elements.

4,788,543

APPARATUS AND METHOD FOR BROADCASTING PRIORITY RATED MESSAGES ON A RADIO COMMUNICATIONS CHANNEL OF A MULTIPLE TRANSCEIVER SYSTEM

Richard Rubin, 800 Pine Hollow Rd., Bldg. 22, Apt. 1A, East Norwich, N.Y. 11732

Filed Nov. 5, 1986, Ser. No. 927,149
Int. Cl.[4] H04Q *7/00*
U.S. Cl. 340—825.44 12 Claims



1. Apparatus in a transceiver for broadcasting priority rated messages on a channel shared by a multiplicity of similar transceivers, comprising:

analog-to-digital convertor means for generating a new message in digitalized format corresponding to audio frequency message signals in analog format applied to said convertor means;

memory means connected to said convertor means for storing said digitalized new message;

message coding means;

central data processing means connected with and controlling said coding means, convertor means and memory means, and for adding a priority rating code, a recipient identity code and a sender's identity code to said new message;

message reception means for monitoring said channel to detect other messages broadcast one at a time thereon by others of said transceivers;

coding comparator means connected to said message reception means and said data processing means for comparing the priority rating of each of said other messages with the priority rating of said new message; and

message broadcast means connected to said memory and under control of said data processing means for broadcasting said new message only when said channel is clear of any other message of equal or higher priority than that of said new message, and permits said new message to inter-

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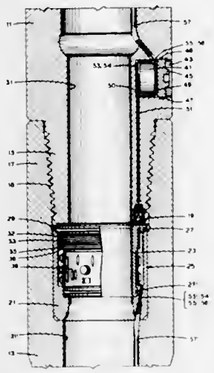
rupt the broadcast of any other message of lower priority rating than that of said new message and interrupts said new messages when broadcast starts of any other message of higher priority than that of said new message; and said interrupted message is rebroadcast in its entirety when broadcast of the last named other message of higher priority is completed; whereby the possibility of any two messages being simultaneously broadcast with consequent loss of intelligibility, is eliminated.

4,788,544

WELL BORE DATA TRANSMISSION SYSTEM

Mlg A. Howard, Houston, Tex., assignor to Hughes Tool Company - USA, Houston, Tex.

Filed Jan. 8, 1987, Ser. No. 1,286
Int. Cl.[4] G01V *1/00*
U.S. Cl. 340—853 **10 Claims**



1. An improved data transmission system for use in a well bore, comprising:
- a tubular member with threaded ends adapted for connection in a drill string having one end adapted for transmitting data signals and the other end adapted for receiving data signals;
- an electromagnetic field generating means carried by the transmitting end of the tubular member;
- a Hall Effect sensor means carried by the receiving end of the tubular member for receiving data signals;
- a signal conditioning means located in the tubular member and electrically connected to the Hall Effect sensor means and the electromagnetic field generating means for shaping the data signals received by the Hall Effect sensor means, prior to transmission by the electromagnetic field generating means; and
- a power supply means, located in the tubular member, for providing electrical power to the Hall Effect sensor means, and the signal conditioning means.

4,788,545

PARAMETER TELEMETERING FROM THE BOTTOM OF A DEEP BOREHOLE

Claude A. Farque, Tulsa, Okla., assignor to Oil Dynamics, Inc., Tulsa, Okla.

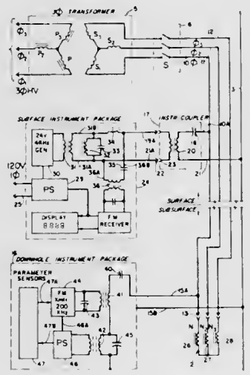
Continuation-in-part of Ser. No. 523,455, Aug. 15, 1983, Pat. No. 4,620,189. This application May 27, 1986, Ser. No. 866,896
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] G01V *1/00*; E21B *29/02, 47/00*
U.S. Cl. 340—856 **12 Claims**

1. In an apparatus for pumping a liquid from a borehole in the earth, including at least a string of tubing from the surface to a selected depth in said borehole, electric motor means and pump means supported at the bottom end of said tubing, three phase alternating current electrical power supply means at the surface, and a multiple conductor cable, said cable connected to said power supply means at the surface end, and to said motor means at the bottom end of said cable;

apparatus for use in combination with said multiple conductor cable to measure, in said borehole, at least one well parameter indicative of a condition contiguous to said motor and pump means and transmitting to the surface a signal representative of said at least one well parameter, comprising:

(a) means at the surface for generating an intermediate frequency signal independent of said three phase alternating current electrical power supply means;

(b) electrical coupling means at the surface for connecting said intermediate frequency signal to a circuit comprised of one conductor in said multiple conductor cable and a ground conductor means which is independent of said alternating current electrical power supply means;



(c) downhole instrument package means positioned in said borehole and connected to said circuit, said downhole instrument package means including;

(1) power supply means energized by said intermediate frequency signal;

(2) at least one non-eddy current sensor means for sensing said at least one parameter;

(3) means to create a low frequency signal as a function of said parameter which is of frequency lower than said intermediate frequency;

(4) means to generate a high frequency carrier signal of frequency greater than said intermediate frequency signal,

(5) means to modulate said carrier signal with said low frequency signal to create a modulated carrier signal;

(6) coupling means to transmit said modulated carrier signal to said circuit;

(d) means to demodulate said modulated carrier signal to reconstitute said low frequency signal; and

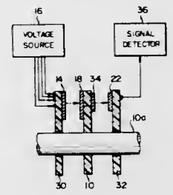
(e) means to indicate said well parameter as a function of said low frequency signal.

4,788,546

ELECTROSTATIC CAPACITY TYPE ENCODER

Kouji Sasaki, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 791,901, Oct. 28, 1985, abandoned. This application Oct. 9, 1987, Ser. No. 107,905
Claims priority, application Japan, Oct. 29, 1984, 59-228785
Int. Cl.[4] G01R *27/26*
U.S. Cl. 340—870.37 **2 Claims**



1. An electrostatic capacity type encoder comprising:

a rotary disk rotatingly secured to a rotary shaft of an encoder body; and

a first stationary disk and a second stationary disk fixed to the encoder body facing in parallel to each other with said rotary disk arranged therebetween,

a plurality of transmitting electrodes to which alternating currents from a source of electrical power with respective different phases are applied and said transmitting electrodes transmits a signal, wherein said transmitting electrodes are arranged on a flat surface of said first stationary disk at an equal distance therebetween along its circumference, a plurality of receiving electrodes for receiving said signal from the transmitting electrodes are provided on one side of said rotary disk facing said transmitting electrodes on the first stationary disk, a coupling electrode connected to said plurality of receiving electrodes for receiving said signal from said receiving electrodes is provided on the other side of the rotary disk, and an output electrode for receiving said signal from said coupling electrode is provided on one side of said second stationary disk facing said coupling electrode,

whereby the amount of relative rotating displacement of said rotary disk to said first stationary disk is determined by a signal detector based on periodic variations in electrostatic capacity signals which are outputted from said output electrode.

4,788,547

STATIC-SPLIT TRACKING RADAR SYSTEMS

Michael A. Jones, Stanmore, and John R. G. Woods, Bushey, both of England, assignors to The Marconi Company Limited, England

Filed Oct. 16, 1973, Ser. No. 408,294
Claims priority, application United Kingdom, Oct. 17, 1972, 47866
Int. Cl.[4] G02S *13/44*
U.S. Cl. 342—100 **16 Claims**

1. A static-split tracking radar system comprising

(A) an aerial

(i) having more than two outputs,

(B) a first combining circuit for combining signals from said aerial outputs to produce at least two receiver input signals,

(i) the relative phases and amplitudes of which contain information characterizing the orientation of a target relative to the aerial,

(C) a receiver having two channels to which said receiver input signals are respectively applied,

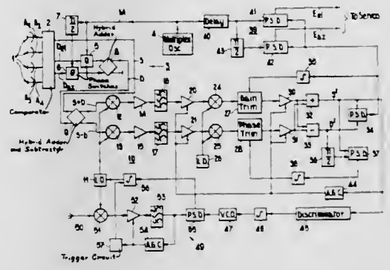
(D) a second combining circuit for combining output signals from the channels of said receiver to produce a feedback signal,

(E) said first and second combining circuits being such that said feedback signal characterizes the degree of mismatch between said channels,

(F) the system also comprising at least one trimming circuit which is connected in one of said channels and which is responsive to said feedback signal for automatically correcting mismatch between said channels,

(G) means to produce a modulating waveform,

(H) said first combining circuit including means to modulate said receiver input signals in synchronism with the modulating waveform to cause said receiver input signals to vary periodically in amplitude and phase relative to each other in such a manner that the average value of their difference over one period of said modulating waveform is zero, and



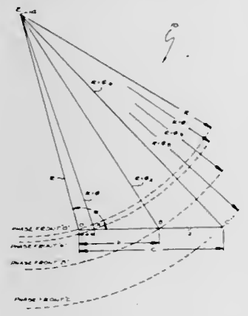
(I) differencing and averaging means coupled to receive the output signals from said receiver channels and to produce said feedback signal by averaging the difference of the output signals from said receiver channels over at least one period of said modulating waveform, whereby when said channels are equally matched, said feedback signal is zero, and when said channels are mismatched said feedback signal is non-zero.

4,788,548

PHASE MEASUREMENT RANGING

Earl L. Hammerquist, Thousand Oaks, Calif., assignor to ITT Gilfillan, A Division of ITT Corporation, Van Nuys, Calif.

Filed Sep. 8, 1987, Ser. No. 95,365
Int. Cl.[4] G01S *00/00*
U.S. Cl. 342—458 **48 Claims**



1. A passive radar ranging apparatus for determining the

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instantaneous range to an emitter source comprising, in combination:

receiving means for receiving a plurality of radiated electromagnetic energy, said received electromagnetic energy having a non-cooperative waveform and an unspecified frequency;

translating means in communication with said receiving means for translating a first parameter of said received electromagnetic energy for detection and phase measurement;

first resolving means in communication with said translating means for providing a plurality of distance oriented digital phase measurements, said phase measurements being determined directly from said received electromagnetic energy;

second resolving means in communication with said translating means for resolving said first parameter and for providing said resolved first parameter to said first resolving means for utilization in providing said phase measurements;

computing means connected to said first resolving means for receiving and manipulating said plurality of distance oriented digital phase measurements and for determining said instantaneous range to said emitter source of said radiated electromagnetic energy, and further including means for resolving phase ambiguities of said received electromagnetic energy wherein said phase measurements are available only from said emitter source and knowledge of relative motion between said emitter source and said receiving means is unknown; and

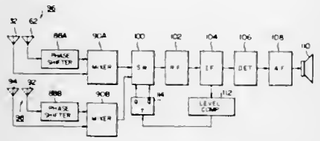
displaying means for displaying said instantaneous range to said emitter source wherein said displayed instantaneous range is equivalent to $R=[bc(c-b)(a^2-\phi_1^2)/2a^2(b\phi_3-c\phi_2)]$.

4,788,549

AUTOMOTIVE ANTENNA SYSTEM

Junzo Ohe, and Hiroshi Kondo, both of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 26, 1985, Ser. No. 801,772
Claims priority, application Japan, Nov. 27, 1984, 59-251242
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—72 **7 Claims**



1. An automotive antenna system comprising:

first high frequency pick up means for detecting vehicle surface high frequency currents induced on the vehicle surface by broadcast waves flowing concentratedly on the vehicle body and for outputting a signal in response to the detected vehicle surface high frequency currents, said first high frequency pick up means being disposed on a first side of the vehicle at the front of the vehicle;

second high frequency pick up means for detecting vehicle surface high frequency currents induced on the vehicle surface by broadcast waves flowing concentrically on the vehicle body and for outputting a signal in response to the detected vehicle surface high frequency currents, said second high frequency pick up means being disposed on the first side of the vehicle at the rear of the vehicle;

first combining means for combining the output signals received from said first and second high frequency pick up means and outputting a combined signal;

third high frequency pick up means for detecting vehicle surface high frequency currents induced on the vehicle surface by broadcast waves flowing concentratedly on the vehicle body and for outputting a signal in response to the detected vehicle surface high frequency currents, said third high frequency pick up means being disposed on the second side, opposite the first side, of the vehicle at the front of the vehicle;

fourth high frequency pick up means for detecting vehiole surface high frequency currents induced on the vehicle surface by broadcast waves flowing concentratedly on the vehicle body and for outputting a signal in response to the detected vehicle surface high frequency currents, said fourth frequency pick up means being disposed on the second side, opposite the first side, of the vehicle at the rear of the vehicle;

second combining means for combining the output signals received from said third and fourth high frequency pick up means and outputting a combined signal;

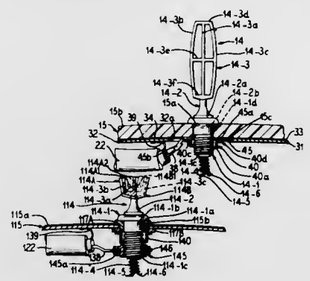
selection switching means for selecting any one of the combined output signals from said first and second combining means for input to a receiver, comparing the selected combined output signal to a predetermined thereshold level and switching to the other one of the combined output signals from said first and second combining means for input to the receiver when the selected combined output signal is lower than the predetermined threshold level.

4,788,550

FRONT HOOD ORNAMENT ANTENNA

George E. Chadima, Jr., 3624 Skylark La., S.E., Cedar Rapids, Iowa 52403

Continuation-in-part of Ser. No. 838,688, Mar. 12, 1986. This application Aug. 20, 1987, Ser. No. 87,367
Int. Cl.[4] H01Q *1/08, 1/32*
U.S. Cl. 343—712 **15 Claims**



1. In a radio system,

a mobile vehicle having a front hood portion with

an opening at a front hood ornament location, radio means carried within the vehicle, a front hood ornament which comprises an antenna means mounted on said vehicle front hood portion and extending through said opening,

and said hood ornament being of metal, and operable as an antenna in a frequency range above eight hundred megahertz,

radio signal transmission means coupling said metal hood ornament antenna with said radio means,

a ground plane conductive means adjacent said hood ornament but insulated therefrom,

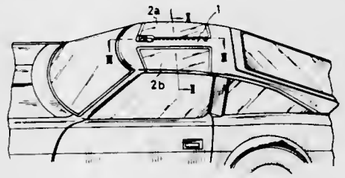
said radio transmission means having a ground plane feed conductor and an antenna feed conductor and said antenna feed conductor electrically connected to said front hood ornament and said ground plane feed conductor electrically connected to said ground plane conductive means.

4,788,551

APPARATUS FOR STORING AN ANTENNA FOR VEHICLE

Kengo Ishida, Ichikawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 31, 1986, Ser. No. 891,378
Claims priority, application Japan, Aug. 8, 1985, 60-174452
Int. Cl.[4] H01Q *1/32*
U.S. Cl. 343—713 **13 Claims**



1. An apparatus for storing an antenna for a vehicle comprising:

first roof means forming a portion of the vehicle roof, the first roof means having a central roof panel secured to the vehicle body;

second roof means cooperating with the first roof means to form therebetween a space for storing the antenna, the second roof means having moveable roof panels detachably disposed on both sides of the central roof panel and the space being defined by the central roof panel and one of the moveable roof panels in the forward and backward direction of the vehicle body; and

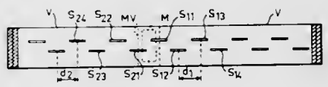
supporting means for supporting the antenna and allowing the antenna to be pivotally moved such that the antenna is put in and out of the space, the supporting means being attached to the central roof panel.

4,788,552

WAVE GUIDE ELEMENT FOR AN ELECTRICALLY CONTROLLED RADAR ANTENNA

Erik R. Karlsson, Göteborg, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 31, 1986, Ser. No. 925,177
Claims priority, application Sweden, Oct. 31, 1985, 85051522
Int. Cl.[4] H01Q *13/18*
U.S. Cl. 343—771 **4 Claims**



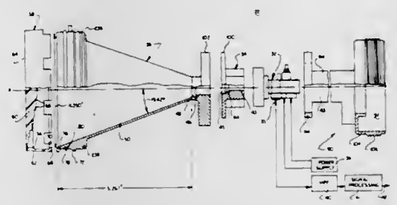
1. Waveguide antenna element of non-resonant type, provided with radiation openings in the form of slits, for use in constructing a wide-band, electrically controlled radar antenna having a lobe direction independent of a frequency of a fed-in electromagnetic field, the waveguide antenna element (V) including a feed opening (M) for the fed-in electromagnetic field, the feed opening dividing the waveguide antenna element in a longitudinal direction into a first part and a second part, the first and second parts being provided with absorbent terminations (A1, A2) at their outer ends, and a plurality of slits, the slits being arranged on a wide longitudinal side of the waveguide antenna element with their longitudinal directions substantially parallel to the longitudinal direction of the waveguide antenna element, the slits in the first part of the waveguide having centers separated by a first spacing (d_1), the first spacing being less than half a wavelength of the fed in field in the waveguide antenna element, and the slits in the second part of the waveguide having centers separated by a second spacing (d_2), the second spacing being greater than half the wavelength of the fed-in field, said first and second spacings being selected such that the lobe direction is substantially identical for the first and second parts.

4,788,553

DOPPLER RADAR VELOCITY MEASUREMENT APPARATUS

Oliver A. Phillips, Long Beach, Calif., assignor to TRW Inc., Lyndhurst, Ohio

Continuation of Ser. No. 482,527, Apr. 6, 1983, Pat. No. 4,660,050. This application Nov. 12, 1986, Ser. No. 929,748
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—786 **8 Claims**



1. Apparatus for use in a doppler radar velocity measurement system, comprising

means for generating an RF electromagnetic wave in the dominant TE_{11} mode and for guiding said wave to a horn,

a conical horn having a small diameter end and a large diameter end and being coupled adjacent its smaller diameter end to said generating means, said horn including means responsive to said RE_{11} mode RF wave for producing a higher order TM_{11} mode RF wave therefrom, both said TE_{11} mode RF wave and said TM_{11} mode RF wave propagating through said horn, the resultant RF wave being transmitted into free space, said horn having a flare angle substantially in excess of 12.5°, and

lens means covering the large diameter end of said horn for focusing said RF wave passing therethrough, said lens means having a focal length substantially equal to the distance from the phase center of said horn to said lens means.

4,788,554

PLATED PLASTIC INJECTION MOLDED HORN FOR ANTENNA

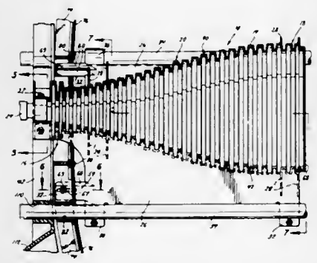
Edward W. Smith, Los Angeles, Calif., assignor to Satellite Technology Services, Inc., Maryland Heights, Mo.

Filed Mar. 28, 1985, Ser. No. 717,500
Int. Cl.[4] H01Q *13/00*
U.S. Cl. 343—786 **29 Claims**

1. An antenna horn, said horn being corrugated and profiled such that the wall of said horn in longitudinal cross section is

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generally S-shaped and constructed of multiple identical sections, each section of plastic molded construction, said sections



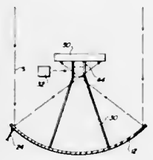
joined to form the horn, and said horn having an internal surface of an electromagnetic energy conductive material.

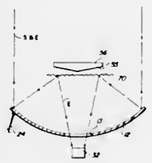
4,788,555

COMBINED SOLAR AND SIGNAL RECEPTOR DEVICE

Donald G. Schultz, 3005 Cerrado Los Palitas, Tucson, Ariz. 85718, and William R. Ferrell, 4091 E. 3rd St., Tucson, Ariz. 85711

Filed Jul. 29, 1985, Ser. No. 760,076
Int. Cl.[4] H01Q *19/10*
U.S. Cl. 343—840 **12 Claims**





1. A combined use solar energy receptor and electromagnetic signal receptor device comprising:

(a) a generally parabolic dish having a reflective surface for reflecting both solar and electromagnetic energy;

(b) solar energy conversion means positionable in the path of reflected solar energy rays;

(c) signal receptor means positioned to receive the reflected electromagnetic energy; and

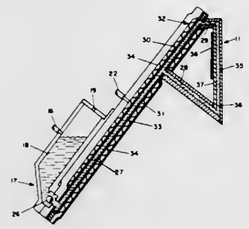
(d) means for shielding the signal receptor means from excessive solar energy.

4,788,556

DEAERATION OF INK IN AN INK JET SYSTEM

Paul A. Hoisington; Nathan P. Hine, both of Norwich, and Charles W. Spehrley, Jr., Hartford, all of Vt., assignors to Spectra, Inc., Hanover, N.H.

Filed Apr. 28, 1987, Ser. No. 43,372
Int. Cl.[4] G01D *9/00, 150/16;* **B01D** *19/00*
U.S. Cl. 346—1.1 **10 Claims**



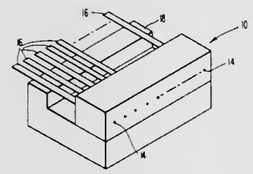
7. A method for removing gas dissolved in hot melt ink at elevated temperatures from the hot melt ink in a hot melt ink jet system comprising providing a gas-permeable/ink-impermeable barrier means having one side in contact with molten hot melt ink in the ink jet system and applying reduced gas pressure to the other side of the barrier means.

4,788,557

INK JET METHOD AND APPARATUS FOR REDUCING CROSS TALK

Stuart Howkins, Ridgefield, Conn., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Filed Mar. 9, 1987, Ser. No. 23,707
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—1.1 **14 Claims**



8. A method of reducing mechanical cross talk in ink jet apparatus including a print head, a plurality of transducers, attached to the print head, each of which is respectively coupled to an individual ink jet chamber within an array of such ink jet chambers that is formed within the print head, each of the chambers including an inlet for receiving a supply of ink and an ink droplet ejection orifice through which droplets of ink are ejected on demand in response to the volume of the chamber being varied by its respective transducer, wherein the method comprises the step of:

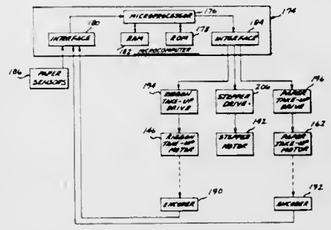
rigidly supporting each said transducer at a preselected point along its length to to decouple mechanical energy that is produced at resonant frequencies of said transducer from said print head, thereby preventing an activation of one said transducer from causing another said transducer to vary the volume of its respective chamber to eject a droplet of ink, when not demanded, through said orifice.

4,788,558

METHOD AND APPARATUS FOR CONTROLLING TENSION IN TAPE PROGRESSED ALONG A FEED PATH

Edward D. Caldwell, Seattle, and David A. Ballard, Federal Way, both of Wash., assignors to Intermec Corporation, Lynnwood, Wash.

Filed Feb. 6, 1987, Ser. No. 12,209
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—76 PH **31 Claims**



1. An apparatus for controlling the tension in a tape that is located in part upon a reel and that extends to tape advancement means, the tape advancement means being for cooperatively engaging a portion of said tape and producing a change in the position of said portion of said tape with respect to said reel, said apparatus comprising:

a tape advancement indicator for producing a reference signal representative of any change in position of said portion of said tape produced by said tape advancement means;

reel control means for applying an adjustable torque to said reel;

a reel control indicator for producing a feedback signal representative of any change in position of said reel resulting from said adjustable torque applied to said reel; and

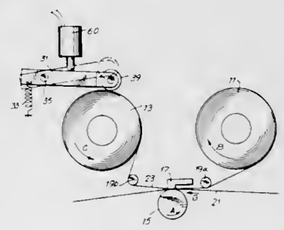
processing means for producing a control signal in response to said reference signal and said feedback signal, said control signal being provided to said reel control means to adjust said torque sufficiently to produce the desired tension in said tape.

4,788,559

APPARATUS AND METHOD FOR REMOVING AN IMAGE FROM THE RIBBON OF A THERMAL TRANSFER PRINTER

Don S. Ende, Commack, N.Y., assignor to Miltope Corporation, Melville, N.Y.

Filed Dec. 1, 1987, Ser. No. 127,154
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **16 Claims**



1. A printing apparatus comprising:

a receptor surface;

a printing ribbon having a first surface coated with an image transfer medium and a second surface;

means for transferring a selected portion of the image transfer medium to said receptor surface, whereby a negative image is left on said ribbon along said first surface; and

means for applying heat to said ribbon to substantially liquify the transfer medium which remains on the first surface of said ribbon, said heat applying means including heated means for selectively contacting said second surface of said ribbon, whereby the image left on the first surface of said ribbon is substantially obliterated.

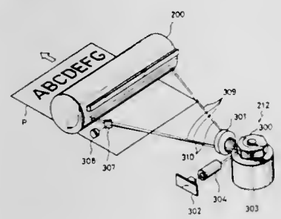
10. In a printing apparatus including a receptor surface and a printing ribbon having a first surface coated with an image transfer medium and a second surface, a method for removing the image which remains on the first surface of said ribbon after a selected portion of said transfer medium is transferred to said receptor, said method comprising applying heat to said ribbon by selectively contacting said second surface of said ribbon with a heated member to substantially liquify said transfer medium which remains on the first surface of said ribbon.

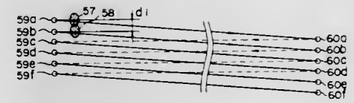
4,788,560

MULTI-BEAM SCANNING SYSTEM WITH TIME SHARING BEAM CONTROL

Kunihiko Miura, Hiratsuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1987, Ser. No. 136,934
Claims priority, application Japan, Dec. 26, 1986, 61-315396
Int. Cl.[4] G01D *9/42;* **G11B** *7/00*
U.S. Cl. 346—108 **15 Claims**





I. A multi-beam scanning apparatus comprising:

a plurality of light sources each for generating a beam;

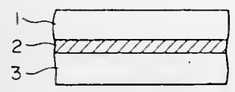
optical scanning means for receiving the beams from said plurality of light sources and directing the beams as a plurality of scanning beams to an object to be scanned;

photodetecting means, having a predetermined number of photosensors smaller than that of said plurality of light sources, for substantially detecting light amounts of the plurality of scanning beams by said optical scanning means in a time sharing manner; and

control means for controlling the light amounts of the respective beams from said plurality of light sources in accordance with time-sharing light amount detection signals corresponding to said predetermined number of photosensors of said photodetecting means.

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4,788,561
OPTICAL RECORDING CARRIER
Seiji Nishino, Osaka, and Yuzo Takada, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation of Ser. No. 886,236, Jul. 16, 1986, abandoned. This application Apr. 1, 1988, Ser. No. 177,901
Claims priority, application Japan, Jul. 19, 1985, 60-160573
Int. Cl.[4] G01D *15/34*
U.S. Cl. 346—135.1 **5 Claims**



1. An optical recording carrier comprising:
a substrate;
a layer of an amorphous phase made of an optical recording material containing one of Te and TeO_x (0×2) as a main component, said amorphous phase being changed to a crystalline phase by the irradiation of a laser beam or the like on said amorphous phase layer, thereby recording information on the optical recording material, and
a Te metal layer of a crystalline phase having a thickness of 50 to 300 Å, said Te metal layer being provided between the substrate and the optical recording material layer and being in direct contact with the optical recording material layer such that said Te metal crystalline layer accelerates the phase change of the optical recording material from said amorphous phase to said crystalline phase to facilitate said recording of information on the optical recording material.

4,788,562
OPTICAL RECORDING MEDIUM
Helmut Barzynski, Bad Duerkheim, and Herbert Naarmann, Wattenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany
Filed Jan. 15, 1987, Ser. No. 3,707
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1986, 3601067
Int. Cl.[4] G01D *9/00, 15/10;* **H01M** *4/60*
U.S. Cl. 346—135.1 **2 Claims**

1. An optical recording medium consisting essentially of, a base, a light-reflecting layer on said base, and a light-absorbing layer on said base and reflecting layer, said light-absorbing layer containing polypyrrole as the light-absorbing substance.

4,788,563
RECORDING APPARATUS
Shinichi Omo, and Hideaki Okamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 13, 1987, Ser. No. 49,159
Claims priority, application Japan, May 19, 1986, 61-114026; May 19, 1986, 61-114027
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—140 R **17 Claims**

1. A recording apparatus including:
means for storing image information to be recorded;
means for recording on a recording medium having first and second surfaces, an image stored in said storing means; and
drive control means having a first mode for controlling said recording means so that the image information in said storing means is recorded as an erected image of the stored image information when viewed from the side of the recording medium first surface, and a second mode for controlling said recording means so that the image information in said storing means is recorded as an erected

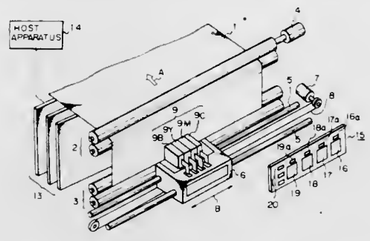
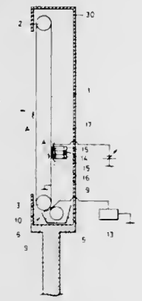


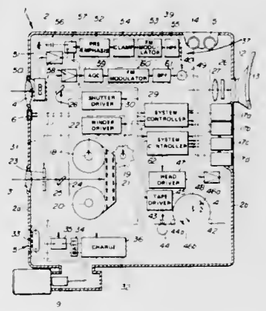
image of the stored image information when viewed from the side of the recording medium second surface.

4,788,564
BOARD RECORDING APPARATUS WITH REDUCED SMUDGE
Toshihiko Ochiai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 70,847, Jul. 2, 1987, abandoned. This application Feb. 9, 1988, Ser. No. 154,435
Claims priority, application Japan, Jul. 10, 1986, 61-162814; Nov. 25, 1986, 61-278748; Feb. 4, 1987, 62-25398
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—153.1 **15 Claims**



1. A board recording apparatus comprising a recording medium having a dielectric layer and an electrically conductive layer on one side of the dielectric layer, said recording medium being mounted for successive movement between an image formation station and a charge elimination station, said image formation station comprising recording electrodes arranged to apply voltages between said conductive layer and electrically conductive toner at selected regions on the other side of said dielectric layer to produce charges which cause said toner to adhere to the surface of said dielectric layer according to images to be recorded, said charge elimination station comprising a charge elimination electrode arranged to contact toner remaining on said recording medium and means for applying voltages to said charge elimination electrode of a polarity which may be opposite to that applied to said recording electrodes.

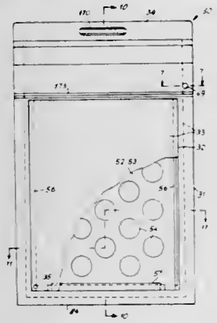
4,788,565
COMPOSITE CAMERA APPARATUS COMPOSED OF VIDEO CAMERA AND STILL CAMERA WITH STROBE DEVICE
Akira Masuda, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Sony Corporation and Fuji Photo Film, Co., both of Tokyo, Japan
Filed Dec. 15, 1987, Ser. No. 133,278
Claims priority, application Japan, Dec. 27, 1986, 61-310666
Int. Cl.[4] G03B *17/48*
U.S. Cl. 354—75 **15 Claims**



1. A composite camera apparatus comprising:
a video camera device for picking up a video image for recording a plurality of fields of video signals to be reproduced on a video monitor;
a still camera device for picking up a still image for recording on a still image recording medium;
a strobo-flashing device cooperative with said still camera device for synchronous operation for emitting a strobo-flashing light in response to a still image pick-up operation of said still camera device; and
means, incorporated in said video camera device, for modifying video image data in a field of said video signal picked up at a timing of the strobo-flashing operation for avoidance of influence of high intensity light.

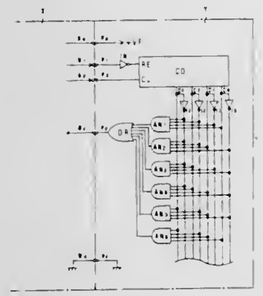
4,788,566
PHOTOGRAPHIC CASSETTE FOR MANIPULATION AND EXPOSURE OF A LIGHT-SENSITIVE SHEET
Carl Koch, Stetten, Switzerland, assignor to Sinar AG Schaffhausen, Feuerthalen, Switzerland
Filed May 28, 1987, Ser. No. 55,136
Claims priority, application Switzerland, May 30, 1986, 2194/86; Sep. 3, 1986, 3559/86
Int. Cl.[4] G03B *17/26, 19/10*
U.S. Cl. 354—283 **25 Claims**

1. Photographic cassette for use and exposure of a light-sensitive sheet, for application in a large format camera, comprising a flat rectangular housing for the reception of the light-sensitive sheet; the housing having an opening; a flat light-proof slider, movable within the housing, for opening or light-seal closing the opening; the light-proof slider having an actuating end and a path of movement parallel to its flat faces, said opening conforming in shape and size to the light-sensitive surface of the sheet and permitting not only the light to enter when exposing the sheet but also the sheet to pass therethrough when loading and unloading the cassette in a direction perpendicular to the sheet; a supporting surface in the housing for bracing the back side of the sheet opposite the light-sensitive front side thereof; and a plurality of retaining members in the housing for gripping the edges of the light-sensitive front side of the sheet; at least some of said retaining members being movable into operative and inoperative positions and, for loading and unloading the cassette, are moved out of their operative positions into their inoperative positions outside a path of motion, required for the light-sensitive sheet as the cassette is loaded or unloaded; at least one externally accessible actuator for interacting with the retaining members and being movable between an inactive position in which the retaining members are moved into their operative positions, and an active position in which the retaining members are moved into their inoperative positions, wherein a pressure plate contains the supporting surface, the plate being under the spring bias of at least one pressure spring which urges the pressure plate in a



direction against the opening of the housing for clamping the light-sensitive sheet between the supporting surface of the pressure plate and the retaining members moved into their operative positions; and wherein the actuator for moving the retaining members is connected to a controller interacting with the pressure plate such that each movement of the actuator into its active position also results in the pressure plate being forced back against the influence of the pressure spring in order to provide a free space between the supporting surface of the pressure plate and the retaining members.

4,788,567
OUTPUT INFORMATION SYSTEM FOR AN INTERCHANGEABLE LENS
Hideo Hamano, C-524, Dai-2 Koporasu, Kibougaoka, 144-1, Nakakibougaoka, Asahi-Ku, Kanagawa-Ken, Japan
Continuation of Ser. No. 946,538, Dec. 24, 1986. This application Dec. 4, 1987, Ser. No. 128,590
Claims priority, application Japan, Dec. 27, 1985, 60-292476
Int. Cl.[4] G03B *17/00*
U.S. Cl. 354—286 **5 Claims**



1. An output information system for an interchangeable lens usable with a microprocessor based camera system for transmitting specific defined logic data about said lens to said microprocessor for use by said microprocessor in controlling the operation of the camera to which said lens is interchangeably attached, said microporcessor being in the camera body, said

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microprocessor providing a clock pulse stream of n pulse in length to said interchangeable lens; said interchangeable lens consisting of counter means for counting each of said n clock pulses transmitted from said microprocessor in a specifictiming sequence, a discriminator condition responsive AND gate array circuit configuration having a plurality of output discriminating conditions providable at the output thereof and having the inputs thereof operatively connected to said counter means output, said output discriminating conditions being dependent on said counter ouput for calculating an output for said AND gate array based on said circuit configuration and enabling said AND gate array for providing a predetermined common logic level output signal, said counter output being dependent on said n clock pulse number in said specific timing sequence, said counter output being compared with the output discriminating condition of said AND gate array circuit configuration at a given clock pulse in said specific timing sequence for producing said predetermined common logic level as an output discriminated logic level serial bit from said AND gate array circuit configuration when the counted value of said counter means is in agreement with the output discrimination conditions of said AND gate array circuit configuration corresponding to said specific defined logic data, the opposite logic level to said predetermined common logic level being provided as said output serial bit from said AND gate array circuit configuration when said counted value of said counter means is not in agreement with said ND gate array circuit configuration output discrimination conditions and a disjunctive logic output gate configuration operatively connected to said AND gate array circuit configuration output for providing said output serial bit to said microprocessor from said lens output information system, said specific defined logic data being serially transmitted from said lens output information system bit by bit to said camera body for controlling the operation of said camera without retrievable storage of said lens data in said camera system.

4,788,568

IMAGE RECORDING APPARATUS

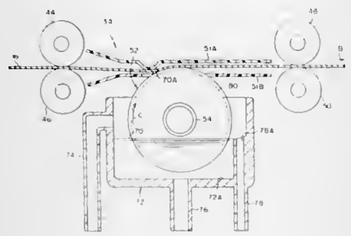
Shin-ichi Ichikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 17, 1987, Ser. No. 74,818

Claims priority, application Japan, Jul. 17, 1986, 61-168929

Int. Cl.[4] G03D *5/06*

U.S. Cl. 354—303 **8 Claims**



1. An image recording apparatus which forms an image on an image receiving medium by transferring an image recorded on a heat-developable photosensitive medium in the presence of an image forming solvent, said apparatus comprising:

a tank for storing said solvent;

roller means disposed in said tank for applying said solvent to said heat-developable photosensitive medium or said image receiving medium by rotating in correspondence with the movement of said heat-developable photosensitive medium or said image receiving medium; and

retaining means for making a part of said solvent stay on said roller, said retaining means being provided only on the outer peripheries of portions of said roller means in the vicinity of the opposite ends thereof.

4,788,569

DISPLAY DEVICE FOR USE IN A PHOTOGRAPHIC CAMERA

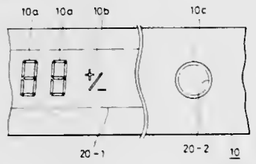
Akira Yamada, and Yoshihiko Aihara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1987, Ser. No. 41,479

Claims priority, application Japan, May 7, 1986, 61-68297[U]; Jan. 13, 1987, 62-6857[U]

Int. Cl.[4] G03B *17/20*

U.S. Cl. 354—409 **16 Claims**



1. A display device for use in a photographic camera, comprising:

(a) light receiving display means including a negative type, electro-optically photosensitive panel having a plurality of first segments occupying a first area of said panel and a second segment occupying a second area of said panel, said first segments comprising groups of display segments each displaying a character the configuration of which is varied by controlling the energization of said first segments, said second segment comprising a window-type segment which can be switched between the states of transmitting light and shielding light by controlling the energization of said second segment; and

(b) illuminating means for illuminating the areas occupied by said first segments and said second segment, said illuminating means including a light emitting arrangement for conducting the light from said illuminating means into the area occupied by said second segment.

4,788,570

THIN FILM DEVELOPING DEVICE

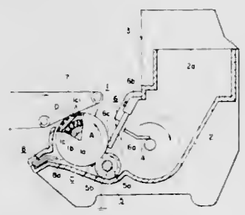
Yoshihiro Ogata; Fuchio Takeda; Akito Yoshimaru, all of Yokohama; Shuichi Endoh; Toshio Kaneko, both of Tokyo, and Toshihiko Takaya, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,503

Claims priority, application Japan, Apr. 15, 1985, 60-78525; Apr. 17, 1985, 60-80275

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **12 Claims**



1. A device for developing an electrostatic latent image by applying a film of developer thereto, comprising:

transporting means for transporting a developer as carried thereon along a predetermined path which includes a developing station where an electrostatic latent image is developed by said developer carried on said transporting means;

storing means for storing a quantity of developer;

a rotary member driven to rotate in a predetermined direction and pressed against said transporting means, wherein said rotary member caused said developer from said storing means to be supplied to said transporting means at a first side of a contact between said rotary member and said transporting means with respect to a direction of movement of said transporting means at said contact and causes any residual developer carried on said transporting means to be removed from said transporting means at a second side of said contact with respect to said direction of movement of said transporting means at said contact; and

voltage applying means for applying a first voltage to said transporting means and a second voltge to said rotary member to establish a desired voltage difference between said transporting means and said rotary member facilitating the supply of said developer from said rotary member to said transporting means.

4,788,571

RECORDING PAPER FEEDING DEVICE WITH PAPER POSITION REGULATING MEMBER

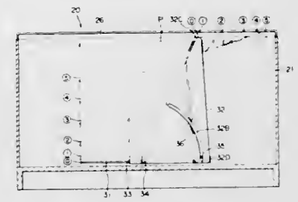
Hiroaki Ura, and Takao Shiozawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1987, Ser. No. 12,008

Claims priority, application Japan, Feb. 20, 1986, 61-36731; Mar. 6, 1986, 61-49081

Int. Cl.[4] G03G *15/00;* **B65H** *5/22, 1/00*

U.S. Cl. 355—3 SH **14 Claims**



1. A paper feeding device comprising:

lifting means for lifting to a predetermined position a backing plate for carrying papers thereon;

paper container means having a movable cover;

a rear regulating member mounted on said backing plate for regulating the rear end of papers carried on said backing plate, said rear regulating member having a crest portion arranged to contact said cover;

rotating means coupled at least to said rear regulating member for permitting rotation of said rear regulating member with respect to said backing plate while the crest portion of said rear regulating member contacts with said cover according to the elevation of said backing plate by said lifting means; and

paper feed means for feeding the paper from said paper container means in a substantially horizontal direction.

4,788,572

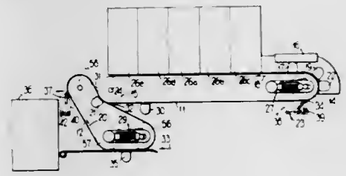
BELT CONTROLS FOR A PRINT ENGINE FOR COLOR ELECTROPHOTOGRAPHY

Danny L. Slayton, Lilburn; E. Neal Tompkins, Roswell, both of Ga.; Charles S. Palm, Pasadena, Calif.; Kirk W. Charles, Atlanta, Ga.; David R. Davis, Buford, Ga., and Peter Zuber, Norcross, Ga., assignors to Colorocs Corporation, Norcross, Ga.

Continuation-in-part of Ser. No. 791,218, Oct. 25, 1985, Pat. No. 4,652,115. This application Mar. 23, 1987, Ser. No. 28,973

Int. Cl.[4] G03G *15/14, 15/16*

U.S. Cl. 355—3 TR **4 Claims**



1. In a print engine for use in a color electrophotographic system of the type including imaging means for selectively creating an image on a photosensitive receptor, the improvement comprising:

first transfer means carrying said receptor thereon and having a characteristic first length;

first reference means for detecting passage of a first predetermined location on said first transfer means past a first predetermined reference point and for providing a first reference signal in response thereto;

second transfer means having a characteristic second length, said second length nominally being an integer submultiple of said first length;

second reference means for detecting passage of a second predetermined location on said second transfer means past a second predetermined reference point and for providing a second reference signal in response thereto;

first drive means for driving said first transfer means about a plurality of rollers, each roller of said plurality of rollers having an axis of rotation;

second drive means for driving said second transfer means along a second predetermined path comprising a contact area wherein said second transfer means contacts said first transfer means and said first transfer means wraps around a particular one of said plurality of rollers; and

control means connected to said first and second reference means for synchronizing said second drive means to said first drive means in response to said first and second reference signals such that said first transfer means and said second transfer means have a common predetermined angular velocity at said contact area, said predetermined angular velocity being measured with respect to said axis of rotation of said particular one of said plurality of rollers.

4,788,573

IMAGE FORMING APPARATUS

Masaki Nakaoka, and Tadashi Yagi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 735,193, May 17, 1985, abandoned. This application May 15, 1987, Ser. No. 51,248

Claims priority, application Japan, May 24, 1984, 59-105867

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 CH **11 Claims**

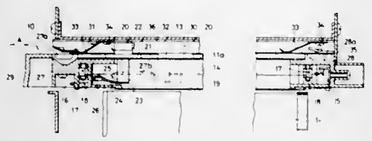
1. An image forming apparatus comprising:

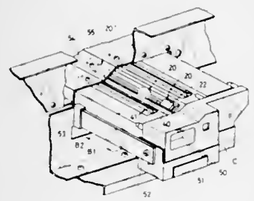
a removably mountable corona discharging device having a corona discharging electrode and cleaning means for cleaning said corona discharging electrode;

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guide means for guiding said corona discharging device when said corona discharging device is removably mounted in an operative position; and

stopper means adapted to be engaged with said cleaning means and to move said cleaning means relative to said corona discharging electrode in the direction opposite to the direction of movement of said corona discharging device when said corona discharging device is mounted in





said operative position and when said cleaning means is not positioned at a predetermined position in said corona discharging device, thereby to move said cleaning means to said predetermined position, said stopper means being disposed inside of a containing portion for containing said corona discharging device therein;

wherein said cleaning means is contained in said containing portion when said corona discharging device is mounted at said operative position.

4,788,574

MULTI-COLOR IMAGE FORMING APPARATUS IN WHICH A PLURALITY OF TONER IMAGES ARE SUCCESSIVELY TRANSFERRED ONTO A PRINTING MEDIUM FROM A PLURALITY OF IMAGE CARRIERS ONE ABOVE ANOTHER

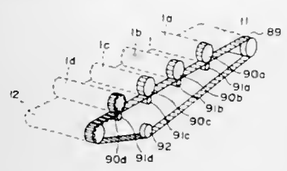
Kenichi Matsumoto, Tokyo; Kadowaki; Akihito Hosaka, both of Yokohama, and Shinnosuke Taniishi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1986, Ser. No. 901,820

Claims priority, application Japan, Sep. 3, 1985, 60-195079

Int. Cl.⁴ G03G *15/01*

U.S. Cl. 355—4 **18 Claims**



1 A color image forming apparatus of the type in which a multi-color image is formed by successively transferring a plurality of different color toner images onto a printing medium one above another, comprising:

a plurality of rotatably supported image carriers including driving power receiving portions;

toner image forming means located opposite each of said image carriers for forming a color toner image on the latter;

image transferring means disposed at an image transferring position, where a toner image formed on each of said image carriers is transferred onto the printing medium;

printing medium conveying means for endlessly moving under the effect of driving power to successively convey the printing medium to the image transferring position for each of said image carriers; and

driving means common to said plurality of image carriers and to said printing medium conveying means for providing driving power for said image carriers and said printing medium conveying means, respectively.

4,788,575

COPYING MACHINE FOR DETECTING A WORKABLE DOCUMENT TURNOVER UNIT

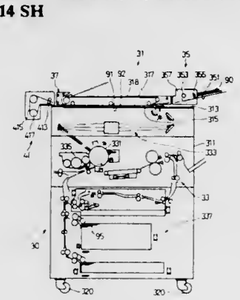
Masazumi Ito, Toyohashi; Syuji Maruta, and Tadashi Ohira, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1987, Ser. No. 7,753

Claims priority, application Japan, Jan. 29, 1986, 61-17403

Int. Cl.⁴ G03G *15/00*; B65H *29/00*

U.S. Cl. 355—14 SH **6 Claims**



1. A copying machine comprising:

a copying machine body having a glass plate on which a document to be copied is placed;

document feeding means for automatically forwarding said document to said glass plate;

document turnover means for turning over from one side to another side a document discharged from said document feeding means and sending said document back to said document feeding means;

copy side designating means selectively designating a two-sided copy mode by which both sides of said document are copied;

an attachment detecting means for detecting whether said document turnover means is attached to said copying machine body in a state ready to be used;

prohibiting means for inhibiting the use of said document feeding means when said two-sided copy mode is designated by said copy side designating means and said document turnover means is detected by said detecting means as not ready to be used.

4,788,576

MICROFILM DUPLICATING APPARATUS

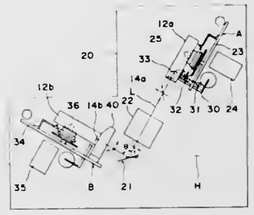
Eiichi Saito, Minami-ashigara; Sadaaki Nakaoka, Osaka; Kuniomi Abe, Kobe, and Takeshi Okano, Nishinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1987, Ser. No. 62,646

Claims priority, application Japan, Jun. 16, 1986, 61-140498; Jun. 19, 1986, 61-144302; Jnn. 19, 1986, 61-144303

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—43 **4 Claims**



1. A microfilm duplication apparatus for duplicating images, recorded on a master film, onto a duplicate film, which apparatus comprises:

a light source means for illuminating any one of the images on the master film from rear;

a single mirror member for reflecting a luminous flux, which has been emitted from the light source means and passed through the master film while carrying the image to be duplicated, so as to travel towards the duplicate film; and

an inage forming lens means disposed on the path of travel of the luminous flux;

said mirror memeber being so disposed that the luminous flux incident upon the mirror member and the luminous flux reflected from the mirror member forms an angle no greater than a right angle, and wherein said image forming lens means comprises a pair of image forming lens units of equal focal length each having an objective lens element, said lens units being arranged with respective objective lens elements facing each other and at a position intermediate of the path of travel of the luminous flux, and wherein the image forming lens units of equal focal length each have a focusing distance set at infinity thereby providing a photographic optical system of high resolving power with a one to one magnification anf constituting an inexpensive assembly, whereby, the close positioning of the dual image forming lens units thereby avoids vignetting of oblique rays with an afocal relationship created between the image forming lens units eliminating the need for precise optical adjustment of the spacing between the image forming lens units.

4,788,577

SUBSTRATE SURFACE DEFLECTING DEVICE

Nobuyuki Akiyama, Yokohama; Asahiro Kuni, Tokyo; Yukio Kembo, and Toshihiko Nakata, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 142,698

Claims priority, application Japan, Jan. 12, 1987, 62-3179

Int. Cl.⁴ G03B *27/42*

U.S. Cl. 355—53 **4 Claims**

1. An exposure apparatus comprising:

a stage;

a base plate provided on said stage;

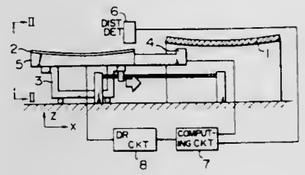
a flexible chuck plate which is capable of sucking under vacuum a substantially entire surface of a substrate to a surface thereof;

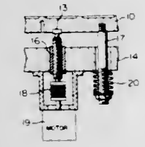
a plurality of vertical displacement generating means including a plurality of feedscrews provided at said base plate with predetermined intervals therebetween, a plurality of rotational actuators for rotatively driving each of said feedscrews, and a plurality of spring members interposed between said chuck plate and said base plate so as to allow a tip of each of said feedscrews to be engaged with a rear surface of said chuck plate;

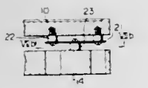
restricting means for restricting said chuck plate in such a manner as not to be displaced horizontally relative to said base plate;

a mask holder for holding a mask;

means for measuring a level of said mask held by said mask holder; and







means for measuring a level of the substrate sucked onto said chuck plate,

whereby each of said rotational actuators of said vertical displacement generating means is driven on the basis of gaps between said mask and said substrate measured by said means for measuring the level of said mask and said means for measuring the level of the substrate so as to subject the substrate to deflection via said flexible chuck plate, thereby producing a uniform gap between said mask and the substrate.

4,788,578

APPARATUS FOR PREPARING MOUNTING SHEET OF ORIGINALS TO BE SCANNED

Junichi Tamura, Tokorozawa, and Yuji Homma, Tsurugashima, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,750

Claims priority, application Japan, Jun. 24, 1985, 60-137434; Nov. 30, 1985, 60-270503; Mar. 14, 1986, 61-56614

Int. Cl.⁴ H04N *1/00*

U.S. Cl. 358—256 **15 Claims**

1. In an apparatus for preparing a sheet upon which an original having an image is pasted and which is used in a system in which said sheet is fed to a scanner so that said original is scanned and read out, an apparatus for preparing a mounting sheet of originals to be scanned comprising:

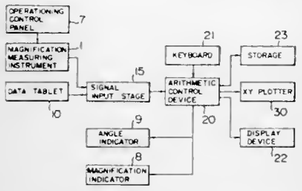
means for inserting an original into an optical system so as to focus the image of said original on a layout sheet and making said image to coincide or register with a rough

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sketch on said layout sheet, thereby obtaining a magnification data of said image relative to said original;

a data tablet for entering or inputting a position data of a reference line and said image on said layout sheet;

arithmetic control means for accomplishing arithmetic operations based on said magnification data and said position



data, thereby deriving or outputting original positioning lines and data representing an area to be trimmed; and

sheet output means for delivering or outputting a sheet upon which are drawn said original positioning or arrangement lines and an area to be trimmed in response to the output from said arithmetic control means.

4,788,579

SEMICONDUCTOR SUPERLATTICE

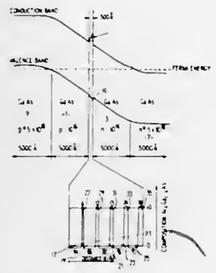
Nigel R. Couch, Pinner Green, and Michael J. Kelly, Hampstead, both of England, assignors to The General Electric Company, England

Filed Sep. 15, 1986, Ser. No. 906,925

Claims priority, application United Kingdom, Sep. 30, 1985, 8524070; Dec. 9, 1985, 8530294

Int. Cl.⁴ H01L *27/12, 29/161, 27/14*

U.S. Cl. 357—4 **5 Claims**



1. A semiconductor device, comprising: first and second regions of semiconductor materials of different conductivity types but having the same energy bandgap; and a stack sandwiched between said first and second regions and comprising pairs of layers of semiconductor materials which together define a superlattice in a direction from said first region to said second region each of said pairs of layers comprising a layer of a first semiconductor material and a layer of a second semiconductor material, the layers being arranged in said stack such that said first and second semiconductor material layers alternate within said stack; said layers of said first semiconductor material within said stack having respective thickness dimensions which vary from one of said regions to the other along said direction, and said layers of said second semiconductor material within said stack having respective thickness dimensions which vary from said one region to the other along said direction; and said material of that layer of said stack which is adjacent said first region being formed of substantially the same composition as said first region.

4,788,580

SEMICONDUCTOR MEMORY AND METHOD OF MANUFACTURING THE SAME

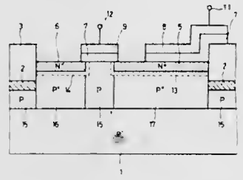
Kazutami Arimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1986, Ser. No. 932,222

Claims priority, application Japan, Nov. 22, 1985, 60-262770; Nov. 22, 1985, 60-262771

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.6 **8 Claims**



1. A semiconductor memory comprising:

a first conductivity type semiconductor substrate (1);

a first conductivity type first epitaxial layer (15) formed on said semiconductor substrate and being higher in impurity concentration than said semiconductor substrate, said first epitaxial layer defining a channel region;

at least two first conductivity type second epitaxial layers (16, 17) adapted to be separated by said first epitaxial layer defining said channel region, said second epitaxial layers being higher in impurity concentration than said first epitaxial layer;

a second conductivity type second region (6) formed on one of said second epitaxial layers to serve as a bit line;

a second conductivity type third region (5) formed on the other one of said second epitaxial layers to serve as a charge storage region;

a first gate electrode (9) formed on said portion of said first epitaxial layer defining said channel region to serve as a word line; and

a second gate electrode (8) formed on said second conductivity type third region to supply constant voltage.

4,788,581

MOS DOSIMETER

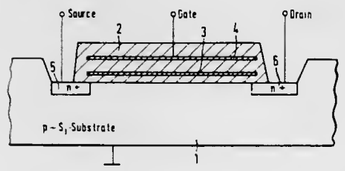
Meinhard Knoll, and Dietrich Bräunig, both of Berlin, Fed. Rep. of Germany, assignors to Hahn-Meitner-Institut Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,703

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413829

Int. Cl.⁴ H01L *27/14;* **G01T** *1/24, 1/22*

U.S. Cl. 357—29 **18 Claims**



1. An electrically resettable MOS dosimeter for non-destructively measuring energy doses of a radiation field in dependance upon corresponding measurable changes in electric charges relative to an initial value and which dosimeter is electrically resettable to such initial value for taking a new such measurement, which comprises a semiconductor substrate having source and drain electrodes, an insulator layer applied to said semiconductor substrate with said source and drain electrodes adjacent thereto, said insulator layer being composed of radiation resistant material which is capable of capturing radiation and which has been radiation hardened sufficiently to render said insulator layer hardened to radiation and resistant to damage by such radiation yet which is capable of capturing such radiation, an electrode gate contact connected to said insulator layer, a floating gate embedded in said insulator layer, and means for applying a voltage to said electrode gate contact such that when said insulator layer is exposed to a radiation field, and a voltage is applied to said electrode gate contact, charges are generated by said insulator layer and are collected by said floating gate in dependence upon the radiation dosage, which charges are electrically resettable to such initial value for taking a new such measurement.

4,788,582

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

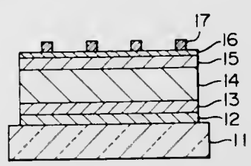
Hideaki Yamamoto, Tokorozawa; Koichi Seki; Toshihiro Tanaka, both of Hachioji; Akira Sasano, Tokyo; Toshihisa Tsukada, Tokyo; Yasuharu Shimomoto, Tokyo; Toshio Nakano, Tokyo, and Hideto Kanamori, Okazaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 562,225, Dec. 16, 1983. This application Nov. 10, 1986, Ser. No. 929,056

Claims priority, application Japan, Dec. 16, 1982, 57-220641

Int. Cl.⁴ H01L *23/48, 27/14, 45/00, 29/04*

U.S. Cl. 357—71 **22 Claims**



1. A semiconductor device comprising a substrate; a semiconductor layer made of amorphous silicon formed over said substrate; a transparent conductive layer formed by an interfacial reaction between the amorphous silicon layer and a portion of a metallic film directly formed on the amorphous silicon layer; and a reamining portion of said metallic film extending on said transparent conductive layer and being patterned to selectively expose a predetermined surface portion of said transparent conductive layer so that only said predetermined surface portion of said transparent conductive layer provides an exposed surface that serves as a light receiving window on which incident light directly impinges.

4,788,583

SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Toshimi Kawahara, Kawasaki; Michio Sono, Yamato, and Hiroaki Hayashi, Inagi, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu Vlsi Limited, Kasugai, both of, Japan

Filed Jul. 24, 1987, Ser. No. 77,292

Claims priority, application Japan, Jul. 25, 1986, 61-174854

Int. Cl.⁴ H01L *23/28, 23/02, 23/12;* **H02G** *13/08*

U.S. Cl. 357—72 **16 Claims**

1. A semiconductor device comprising:

a stage:

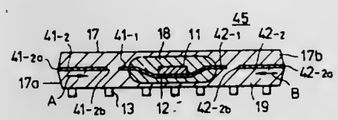
a semiconductor element mounted on said stage, said semiconductor element having a plurality of terminals;

a stage bar extending from said stage, said stage bar having a base end connected to said stage and a free tip end;

a plurality of leads which are isolated from said stage and said stage bar;

a plurality of wires connecting the terminals of said semiconductor element to corresponding ones of said leads; and

a resin package for sealing at least said stage, said semiconductor element and said wires, said resin package comprising an inner resin package portion and an outer resin package portion,



said inner resin package portion sealing said stage, said semiconductor element, said wires, and a portion of said stage bar and portions of said leads in a vicinity of said stage,

said outer resin package portion sealing said inner resin package portion and portions of the remaining portions of said leads,

said free tip end of said stage bar being located inside said outer resin package portion.

4,788,584

RF TRANSISTOR PACKAGE WITH CAPACITOR

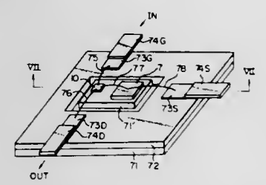
Yutaka Hirano, Atsugi; Masanobu Itoh, Inagi; Akira Izumi, Tokyo, and Yoshikazu Dooi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 20,178, Feb. 26, 1987, abandoned, which is a continuation of Ser. No. 549,646, Nov. 8, 1983, abandoned, which is a continuation of Ser. No. 138,280, Apr. 9, 1980, abandoned. This application Mar. 2, 1988, Ser. No. 166,731

Claims priority, application Japan, Apr. 12, 1979, 54-44490

Int. Cl.⁴ H01L *23/48*

U.S. Cl. 357—81 **7 Claims**



1. A high frequency semiconductor amplifier requiring a bypass capacitance for high frequency currents and a heat sink for high power operation, comprising:

a first, heat sink conductive layer having a main surface and having an electrical ground connection;

an insulating layer of a first predetermined thickness formed on the main surface of the heat sink conductive layer and having a generally, centrally located opening therein exposing therethrough a corresponding portion of the main surface of the heat sink conductive layer;

a second conductive layer formed on the exposed portion of the main surface of the first, heat sink conductive layer and of a second predetermined thickness;

an active semiconductor element, comprising a field effect transistor having source, gate and drain regions and corresponding connection points, mounted on and bonded to the second conductive layer and of a third predetermined thickness;

a bypass capacitor having top and bottom electrodes and of a fourth predetermined thickness, mounuted on and bonded to the second conductive layer in closely spaced relationship to the semiconductor element and defining a

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first alignment direction relatively to the semiconductor element and the opening in the insulting layer, the bottom electrode of the bypass capacitor being electrically connected to the second conductive layer, the first heat sink conductive layer and the electrical ground connection;

each of the third and fourth predetermined thickness of the active semiconductor element and the bypass capacitor, respectively, being substantially less than either of the first and second predetermined thickness of the first, heat sink conductive layer and the insulating layer, respectively;

a first metallized layer formed on the insulating layer and aligned in the first alignment direction, with the bypass capacitor positioned between the first metallized layer and the semiconductor element;

means for providing a series electrical connection of the source connection point of the semiconductor element, the top electrode of the bypass capacitor, and the first metallized layer;

second and third metallized layers formed on the insulating layer in a second alignment direction, transverse to the first alignment direction, and aligned with and spaced apart from the semiconductor element by at least the opening in the insulating layer;

means for providing an electrical connection between the drain connection point of the semiconductor element and the second metallized layer;

means for providing an electrical connection between the gate connection point of the semiconductor element and the third metallized layer; and

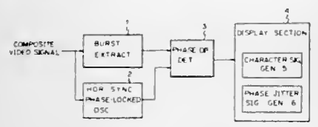
a source terminal plate oriented in the first alignment direction and bonded to the first metallized layer, and drain and gate terminal plates oriented in the second alignment direction and respectively bonded to the second and third metallized layers, the source, drain and gate terminal plates extending laterally from the first heat sink conductive layer and the insulating layer to provide external electrical connections to the amplifier.

4,788,585

APPARATUS FOR MEASURING SC/H PHASE OF COMPOSITE VIDEO SIGNAL

Mituyoshi Suzuki, Yokohama, Japan, assignor to Leader Electronics Corp., Kanagawa, Japan

Filed Dec. 30, 1987, Ser. No. 139,410
Claims priority, application Japan, Oct. 15, 1987, 62-260445
Int. Cl.[4] H04N *17/02*
U.S. Cl. 358—10 **21 Claims**



1. An SC/H phase measuring apparatus for measuring an SC/H phase of a composite video signal, comprising:

a. burst extracting means connected to receive said composite video signal for extracting a subcarrier burst from said composite video signal to output the extracted subcarrier burst;

b. oscillating means connected to receive said composite video signal for generating a horizontal sync phase-locked signal of a subcarrier frequency that is phase-locked to the leading edge of a horizontal sync pulse of said composite video signal;

c. phase difference detecting means connected to receive said extracted subcarrier burst and said horizontal sync phase-locked signal for comparing a phase of said extracted subcarrier burst with a phase of said horizontal sync phase-locked signal to generate a phase difference signal representative of the phase difference therebetween; and

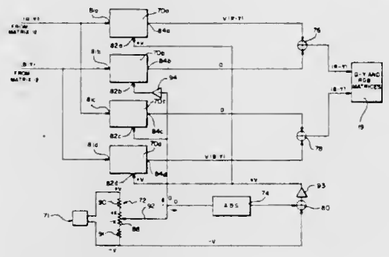
d. display means connected to receive said phase difference signal for providing a display of the SC/H phase in response to said phase difference signal.

4,788,586

CONTROLLER FOR ADJUSTING COLOR HUE AND SATURATION OF IMAGES GENERATED FROM SIGNALS IN A NON-BROADCASTING VIDEO SYSTEM

Robert R. Eckenbrecht, East Bethany, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 24, 1987, Ser. No. 100,801
Int. Cl.[4] H04N *9/68*
U.S. Cl. 358—28 **2 Claims**



1. A video system comprising:

a. means, in response to light reflected from an object, for generating video signals which represent an image of the object, and for converting these video signals to first and second color signals;

b. control means for adjusting the levels of the first and second color signals to generate a change in color of the image, the control means including

(1) first signal level changing means, including a first input receptive of the first color signal and a second input receptive of the second color signal, for changing the level of the first color signal and for generating a first signal output thereof, and for changing the level of the second color signal, and generating a second signal output thereof,

(2) first means for combining the first and second signal outputs to generate a first color adjusted signal,

(3) second signal level changing means, which include a third input receptive of the second color signal and a fourth input receptive of the first color signal, the second signal level changing means being coupled to the first signal level changing means in a manner that when the level of the first color signal received at the first output is changed and the level of the second color signal received at the second input is changed, the level of the second color signal received at the third input is also changed and a third output is generated thereof, and the level of the first color signal received at the fourth input is also changed and a fourth signal output is generated thereof,

(4) second means for combining the third and fourth outputs to generate a second color adjusted signal;

c. means for converting the third and second color adjusted signals to red, blue and green color signals; and

d. means, responsive to the red, blue and green color signals, for displaying the image of the object;

wherein:

e. the first level changing means includes means for changing the level of the first color signal in a first direction while changing the level of the second color signal in a second direction which is opposite to the first direction; and

f. the second signal level changing means including means for (i) changing the second color signal received at the third input in the first direction when the first color signal received at the first input is changed in the first direction, and (ii) for changing the level of the first color signal received at the fourth input in the second direction when the level of the second color signal received at the second input is changed in the second direction;

wherein:

g. the first level changing means includes

(1) first multiplier means, including the first input for receiving the first color signal and a control input for receiving a first control signal, the first multiplier means operating so as to multiply the color signal received from the first input with the first control signal to generate the first output signal which is fed to the first combining means,

(2) second multiplier means, including the second input for receiving the second color signal and a control input for receiving a second control signal, the second multiplier means operating so as to multiply the second color signal from the second input with the second control signal to generate the second output signal which is fed to the first combining means;

h. the second level adjusting means includes

(1) third multiplier means, including the third input for receiving the second color signal and a control input for receiving a third control signal, the third multiplier means operating so as to multiply the second color signal received from the third input with the third control signal to generate the third output signal which is fed to the second combining means,

(2) fourth multiplier means, including the fourth input for receiving the first color signal and a control input for receiving a fourth control signal, the fourth multiplier means operating so as to multiply the first color signal from the fourth input with the fourth control signal to generate the fourth output signal which is fed to the second combining means; and

i. the control means further includes

(1) means for generating an output signal having a selected level x in a range $-x</=0</=x$,

(2) means, receptive of the output signal, for generating the second and the fourth control signals therefrom so that the second and fourth control signals have equal magnitudes and opposite polarities, and for feeding the second control signal to the control input of the second multiplier means and the fourth control signal to the control input of the fourth multiplier means,

(3) means, receptive of the output signal, for generating the first and third control signals in a manner that changes in the level of the output signal cause changes in the opposite direction in the levels of the first and third control signals, and

(4) means for feeding the first control signal to the control input of the first multiplier means and the third control signal to the control input of the third multiplier means;

wherein:

j. the output signal generating means includes first potentiometer means having an output range between $-x$ and x; and

k. the first and third control signal generating means includes

(1) means, receptive of the output signal, for generating a signal which is an absolute value of the output signal,

(2) gain adjusting means for generating a signal having a selected level V,

(3) means for combining the absolute value signal with the V level signal to generate a signal output which is a difference signal between the V level signal and the absolute value signal, and

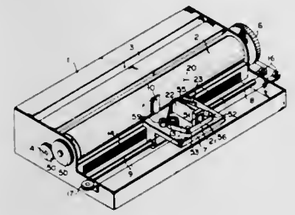
(4) means for feeding the difference signal to the control inputs of the first and third multiplier means.

4,788,587

DOCUMENT READING APPARATUS UTILIZING PRINTER MECHANISM WITH A COLOR FILTER TAPE

Hiroyasu Bitoh, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 680,508, Dec. 11, 1984, abandoned. This application May 28, 1987, Ser. No. 56,321
Claims priority, application Japan, Dec. 26, 1983, 58-244211; Dec. 27, 1983, 58-248713
Int. Cl.[4] H04N *1/46, 1/024*
U.S. Cl. 358—75 **2 Claims**



1. A document reading apparatus adapted to be integrated with a printer mechanism, comprising:

carriage means for moving along a longitudinal direction of a platen and having an upper surface, a shaft projecting from said upper surface, and a ribbon-feed driving hub mounted on said shaft and rotatable to feed an ink ribbon in an ink ribbon cassette;

means for rotating said ribbon-feed driving hub as said carriage means moves in the longitudinal direction while a printer mechanism is operating;

a printing head fixed on said carriage means;

means associated with said carriage means for supporting an ink ribbon cassette of a certan shape when a sheet is wound around the platen and a printing operation is to be performed by said printing head;

cassette case means of a shape replaceable in the supporting means with the certain shape of said ink ribbon cassette and adapted to be mounted on said carriage means when a document is wound around said platen to be read and including a recess for admitting said ribbon-feed driving hub, said ink ribbon cassette being removed from said carriage when said document is to be read, and said cassette case means being removed from said carriage when a printing operation is to be performed, said printing head remaining fixed on said carriage means for the printing operation as well as when a document is read;

filter tape means housed within said cassette case means having a red transmission filter portion, a blue transmission filter portion and a green transmission filter portion which are formed and positioned between the document and said reading means such that said filter tape means can be fed, and has filter tape drive means for driving said filter tape means, said reading means performing color reading of the document through said filter tape means; and

reading means housed inside said cassette case means and located at a position to avoid interference by said printing head during reading of the document while said cassette case means is mounted on said carriage means wherein said reading means has a lens barrel with an opening at one end opposing the document and housing therein an optical lens, an image sensor arranged at the other end of said lens barrel and on which an image of the document is made by said optical lens, and a light source for emitting light illuminating a reading point on the document.

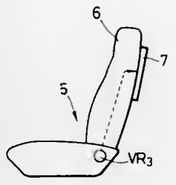
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4,788,588

LIQUID CRYSTAL DISPLAY APPARATUS

Hideo Tomita, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,725
Claims priority, application Japan, Dec. 4, 1986, 61-289334
Int. Cl.[4] H04N *7/18, 5/14*
U.S. Cl. 358—93 **14 Claims**



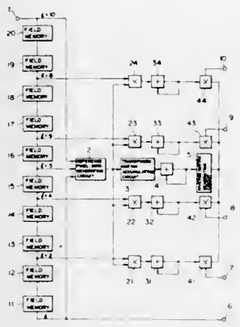
1. A liquid crystal display apparatus intended for mounting on a reclining mount and comprising:
a liquid crystal display panel which can be reclined relative to a viewer of the panel, the display panel having at least one control electrode to which an electrical signal can be supplied to control the quality of an image displayed on the display panel; and
means for detecting the reclining angle of the panel relative to the viewer and for controlling the magnitude of the electrical signal supplied to the control electrode of the display panel as a function of the detected angle to thereby control the quality of the displayed image as a function of the reclining angle.

4,788,589

METHOD AND APPARATUS FOR TRANSMITTING VIDEO DATA

Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 25, 1986, Ser. No. 934,804
Claims priority, application Japan, Nov. 30, 1985, 60-270554
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—133 **12 Claims**



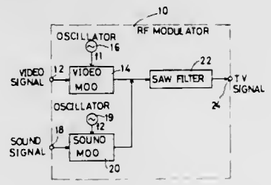
1. An apparatus for transmitting video signals comprising:
input means for receiving video data of sequential fields;
memory means for storing the video data of a plurality of fields;
parameters generating means for generating a predetermined number of respective parameters to specify a time spatial relation which is defined by a linear combination from reference pixel data of a plurality of non-adjacent, alternately odd and even fields to be periodically transmitted every predetermined number of fields and pixel data of a respective field to be skipped between said plurality of fields to be periodically transmitted, each being stored in said memory means; and
means for transmitting the video data of said fields to be periodically transmitted every said predetermined number of fields and said respective parameters instead of the video data of said respective field to be skipped.

4,788,590

RF CONVERTER EMPLOYING AN SAW FILTER

Selichi Arai, Kyoto, Japan, assignor to Murata Mfg. Co., Ltd., Japan

Continuation of Ser. No. 81,599, Aug. 3, 1987, abandoned, which is a continuation of Ser. No. 723,733, Apr. 16, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 129,396
Claims priority, application Japan, Apr. 17, 1984, 59-77324
Int. Cl.[4] H04N *7/06*
U.S. Cl. 358—143 **6 Claims**



1. An RF converter for enhancing high band components of a video signal, comprising:
first modulating means for modulating a video signal and outputting a modulated video signal having high band components and low band components,
second modulating means for modulating a sound signal and outputting a modulated sound signal,
combining means for combining said modulated video and sound signals and outputting a combined modulated signal, and
means for enhancing said high band components of said modulated video signal, including a surface acoustic wave filter receiving said combined modulated signal and outputting a television signal, said filter having a pass band with a predetermined amplitude characteristic which is enhanced at a high frequency side thereof, and a predetermined group delay characteristic which is substantially constant over said pass band.

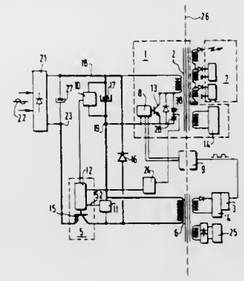
4,788,591

SWITCHED-MODE POWER SUPPLY FOR A TELEVISION RECEIVER PROVIDED WITH A STAND-BY SYSTEM

Alain Decraemer, Garches, France, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Dec. 1, 1987, Ser. No. 127,824
Claims priority, application France, Dec. 5, 1986, 86 17070
Int. Cl.[4] H04N *3/18*
U.S. Cl. 358—190 **8 Claims**

1. A television receiver provided with a stand-by device, comprising a switched-mode power supply with a storage inductor and a switching device for supplying first user circuits, a power stage for the line deflection, having a switching element and a line transformer which is supplied by the switched-mode power supply, second user circuits being supplied via secondary windings of the line transformer, the stand-by state being obtained by stopping the line deflection, characterized in that the stand-by device is also supplied by the switched-mode power supply, the latter including self-oscillating and regulating means to ensure that when the line deflection is stopped the switched-mode power supply continues to supply the same voltage to the stand-by device.

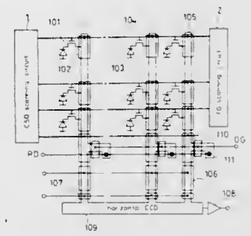


4,788,592

CSD TYPE SOLID-STATE IMAGING DEVICE WITH MEANS FOR DRAINING EXCESS CHARGES

Masao Yamawaki, Itami, and Takashi Ito, Nagaokakyo, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 8, 1987, Ser. No. 130,203
Claims priority, application Japan, Dec. 15, 1986, 61-298492
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.29 **4 Claims**



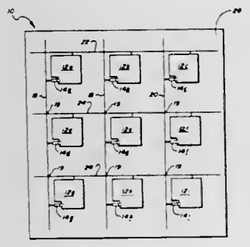
1. A CSD type solid-state imaging device comprising:
light-electricity conversion elements arranged in a two dimensional array;
a scanning circuit for selecting said light-electricity conversion elements;
vertical transfer means for transferring charges of said selected light-electricity conversion elements in the vertical direction;
storage electrodes for temporarily storing the charges transferred in the vertical direction;
horizontal transfer means for transferring charges stored at said storage electrodes in the horizontal direction;
gates for selecting elements having excess charges and drains for draining excess charges, both provided at said vertical transfer means at the neighbourhood of said storage electrode;
the charges of a plurality of said light-electricity conversion elements spaced apart from each other by a distance of more than two picture elements in the vertical direction being read out to said vertical transfer means within a same horizontal blanking period; and
signal charges corresponding to at least more than one picture element being swept out to said drain through said gate while transferring the charges in the vertical direction.

4,788,593

HIGH RESOLUTION SCANNING SYSTEM INCLUDING OPTICAL ENLARGEMENT

Stanford R. Ovshinsky, Bloomfield Hills, and Lawrence G. Norris, West Bloomfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 15, 1986, Ser. No. 918,953
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.13 **19 Claims**



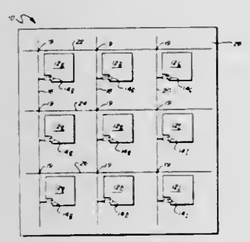
1. Apparatus for the high resolution sensing of a pattern of information, said apparatus comprising:
optical means adapted to generate an enlarged image of the pattern of information;
a thin film photosensor array operatively disposed relative to said optical system so as to sense the enlarged image and provide a signal corresponding thereto; and
said thin film photosensor array including a plurality of layers of semiconductor material chosen from the group consisting essentially of: amorphous silicon alloy materials, amorphous germanium alloy materials, and amorphous silicon germanium alloy materials.

4,788,594

SOLID STATE ELECTRONIC CAMERA INCLUDING THIN FILM MATRIX OF PHOTOSENSORS

Stanford R. Ovshinsky, Bloomfield Hills, and Lawrence G. Norris, West Bloomfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 15, 1986, Ser. No. 918,952
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.13 **31 Claims**



1. An electronic camera including:
a thin film photosensor array adapted to read a pattern of information incident thereon and generate a detectable electrical signal corresponding thereto;
means adapted to optically project a pattern of information corresponding to an object onto said photosensor array;

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means for triggering the reading of the pattern of information projected onto said photosensor array and

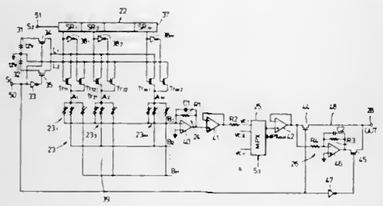
said array including a plurality of small area photoresponsive elements, each of said elements adapted to photogenerate an electrical signal in response to the illumination thereof and including at least one layer of a semiconductor alloy material chosen from the group consisting of: amorphous silicon alloy materials, amorphous germanium alloy materials, and amorphous silicon carbon alloy materials or amorphous silicon germanium alloy materials.

4,788,595

IMAGE SENSOR DRIVING CIRCUIT

Masayuki Tamada, Miyagi, and Junichi Takahashi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo and Tohoku Ricoh Co., Ltd., Miyagi, both of, Japan

Filed Nov. 13, 1987, Ser. No. 120,541
Claims priority, applicatioo Japan, Nov. 17, 1986, 61-273516
Int. Cl.⁴ H09N *3/14*
U.S. Cl. 358—213.31 **6 Claims**



1. An image sensor driving circuit for driving an image sensor by applying a voltage thereto, said image sensor driving circuit comprising:

voltage supplying means for supplying one of a positive polarity voltage and a negative polarity voltage to said image sensor responsive to a control signal;

converting means for converting an output photocurrent of said image sensor into a detection voltage;

inverting means for inverting the detection voltage responsive to the control signal; and

control means for generating the control signal, said control signal having a predetermined period so that said voltage supplying means alternately supplies the positive polarity voltage and the negative polarity voltage with the predetermined period and said inverting means inverts the detection voltage only during one of first and second halves of each period of the control signal.

4,788,596

IMAGE STABILIZING DEVICE

Eigo Kawakami, Kawasaki; Yukichi Niwa, Narashino; Mitsutoshi Ohwada; Yasuo Ogino, both of Yokohama; Minoru Yoshii, and Shigeyuki Suda, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

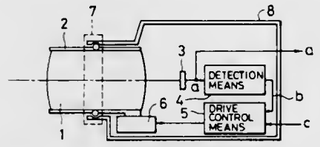
Filed Apr. 25, 1986, Ser. No. 855,732
Claims priority, application Japan, Apr. 26, 1985, 60-90116; May 24, 1985, 60-111472
Int. Cl.⁴ H04N *5/228*
U.S. Cl. 358—222 **6 Claims**

6. An image stabilizing device comprising:

a lens barrel having an imaging optical system and an image sensor;

a housing for supporting said lens barrel; and

a first intermediate member mounted on said lens barrel and a second intermediate member mounted on said housing, said first intermediate member and said second intermediate member having respectively rotatable sliding surfaces in contact with each other.

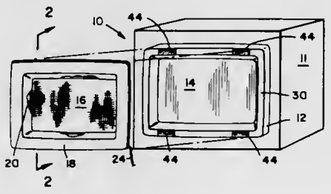


4,788,597

REMOVABLE CONFORMING VIDEO DISPLAY TERMINAL FILTER

Mark Gart, Novato, and Robert P. Glaser, Fairfax, both of Calif., assignors to Sun-Flex Company Incorporated, Novato, Calif.

Filed Feb. 23, 1988, Ser. No. 159,242
Int. Cl.⁴ H04N *5/72*
U.S. Cl. 358—253 **9 Claims**



9. A device adapted to be added to the face of a video display terminal for reducing glare and radiation from the face of said terminal, said terminal having a cathode ray tube and an enclosure for said cathode ray tube including a terminal bezel enclosing the face of said cathode ray tube, said device comprising:

(a) a fine mesh filter having a frame, said frame being formed to conform to the face curvature of said cathode ray tube at least within the enclosure of said terminal bezel,

(b) a filter bezel having complementary curvature and dimensions to the interior dimensions of said terminal bezel of said video display terminal, said filter bezel having an inner surface for engagement with the outer surface of said interior dimensions of said terminal bezel and an outer surface complementary to said enclosure of said video display terminal,

(c) and means for releasably securing said frame of said filter to the inside surface of said filter bezel,

whereby

(d) said frame of said filter may be placed next to the face of said cathode ray tube of said video display terminal by pressing said frame against said face of said cathode ray tube,

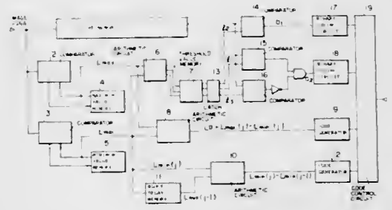
(e) and said filter bezel may be attached to said terminal bezel by pressing said filter bezel against said terminal bezel, said filter bezel being operative to press said filter against said face of said cathode ray tube to establish a conforming contact between said filter and said face of said cathode ray tube.

4,788,598

CODING METHOD AND APPARATUS

Hiroshi Ochi; Makoto Kobayashi, both of Yokosuka; Hisashi Ibaraki, and Tetsuji Yamamoto, both of Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Corp., Tokyo, Japan

Filed Oct. 28, 1986, Ser. No. 924,052
Claims priority, application Japan, Oct. 28, 1985, 60-239347
Int. Cl.⁴ H04N *1/40*
U.S. Cl. 358—260 **25 Claims**



1. A coding method comprising the steps of

dividing an image into a plurality of blocks each consisting of a plurality of intrablock picture elements,

dividing gray scale information of each intrablock picture element into three components:

(1) a reference level representing a position of a signal level of an intrablock picture element in a whole dynamic range of gray scale representation;

(2) a level difference representing a distribution range of the signal levels of the intrablock picture elements; and

(3) a level designating signal representing a level of each intrablock picture element within the distribution range, and

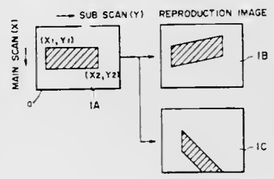
independently coding the three components.

4,788,599

IMAGE PROCESSING WITH IMAGE-SLANT CONTROL AND/OR IMAGE-SIZE CONTROL

Kiyohisa Sugishima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 32,012
Claims priority, applicatioo Japan, Apr. 1, 1986, 61-75146; Feh. 13, 1987, 62-31193
Int. Cl.⁴ H04N *1/21*
U.S. Cl. 358—296 **21 Claims**



1. An image processing apparatus comprising:

input means for inputting image signals representing an original image on a line by line basis;

memory means for storing the image signals entered from said input means on a line unit basis, said memory means being such as to permit the image signals stored in said memory means to be read out from an arbitrary memory location on a line unit basis;

image forming means for forming an image on a recording material on a line by line basis based on the image signals read out from said memory means on a line unit basis;

setting means for setting a slant amount of an image to be formed, relative to the original image; and

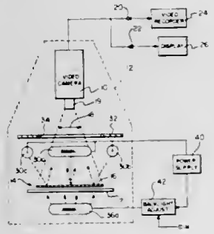
control means for changing a read-out start position of the image signals from said memory means each n lines, where n is a predetermined number, in accordance with the slant amount set by said setting means.

4,788,600

VIDEO APPARATUS FOR GENERATING AN ADJUSTABLE CONTRAST VIDEO SIGNAL FROM A PHOTOGRAPHIC PRINT

Carl M. Marsiglio, Spencerport, and James A. Reilich, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1987, Ser. No. 38,391
Int. Cl.⁴ H04N *5/76*; G03B *27/54*
U.S. Cl. 358—335 **4 Claims**



1. Video imaging apparatus for generating a video signal from an image of the illuminated face of a photographic print, said apparatus comprising:

a video camera for generating the video signal from the image;

a translucent, light-diffusing platen for supporting the print in the field of view of said video camera;

first illuminating means interposed between said camera and said platen for frontally illuminating the print, sid first illuminating means including a plurality of lamps positioned outside of the field of view of said video camera for illuminating the print from at least two sides thereof;

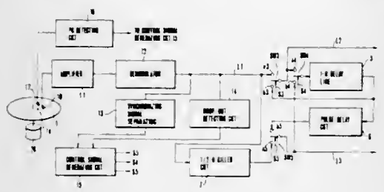
an opaque plate interposed between said plurality of lamps and said video camera for preventing direct rays from said lamps from reaching said video camera, said plate having an opening that allows frontal illumination reflected from the face of the print to reach said video camera;

second illuminating means for illuminating the rear of the print through said translucent, light-diffusing platen, said rear illumination being transmitted at least in part through the photographic print and the opening in said plate to said video camera; and

means for adjusting the illuminating level of said second illuminating means in order to vary the relative combination of transmitted and reflected illumination directed to said video camera thereby controlling the contrast of the video signal.

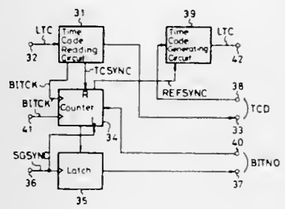
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4,788,601
VIDEO SIGNAL REPRODUCING APPARATUS WITH H SYNC DISCONTINUITY CORRECTION
Somei Kawasaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 22, 1986, Ser. No. 910,404
Claims priority, applicatioo Japan, Sep. 20, 1985, 60-206334
Int. Cl.[4] H04N *5/94*
U.S. Cl. 358—336 **16 Claims**



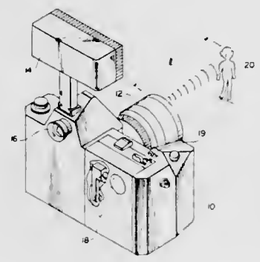
7. A video signal processing device comprising:
(a) separating means for receiving said video signal and for separating a synchronizing signal from said video signal;
(b) delay means for receiving and delaying an incoming signal for a predetermined period; and
(c) switching means for selectively supplying said delay means with either said separated synchronizing signal or with said video signal.

4,788,602
ROTARY HEAD TYPE RECORDING AND/OR REPRODUCING APPARATUS
Fukunori Sekiguchi; Yukihiro Maruyama; Masami Tsubaki; Kazuyoshi Ebata, and Kentaro Odaka, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 21, 1987, Ser. No. 76,026
Claims priority, application Japan, Jul. 22, 1986, 61-172562
Int. Cl.[4] H04N *5/91;* **G11B** *27/10*
U.S. Cl. 358—337 **11 Claims**



1. An apparatus for encoding time code comprising:
time code signal input terminal means for receiving a first time code signal including first time code data having a first synchronizing signal and time code series and comprised of a plurality of bits;
time code decoding means for decoding said first time code signal and generating second time code data;
synchronizing signal input terminal means for receiving a second synchronizing signal;
bit number data generating means for generating bit number data corresponding to the number of said plurality of bits of said first time code data in response to said second synchronizing signal; and
time code data output terminal means for deriving a second time code signal comprising said second time code data and said bit number data.

4,788,603
CAMERA FOR SEQUENTIALLY PHOTOGRAPHING A SUBJECT USING A REFERENCE OPTICAL SYSTEM AND A TELESCOPIC OPTICAL SYSTEM
Ikuo Fujimura; Mikio Utsugi, and Kimiaki Nakada, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Oct. 15, 1986, Ser. No. 919,090
Claims priority, application Japan, Oct. 19, 1985, 60-1600335[U]; Dec. 11, 1985, 60-190871[U]
Int. Cl.[4] H04N *5/781*
U.S. Cl. 358—342 **8 Claims**

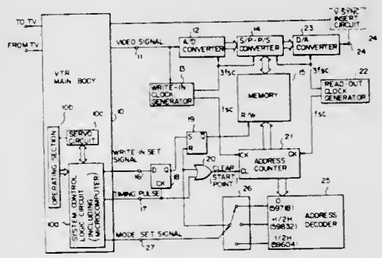


1. A camera for photographing a subject, comprising:
a first photographing optical system for photography in a reference mode;
a second photographing optical system for photography in a portrait mode wherein an image of said subject is enlarged relative to an image of said reference mode;
optical system change-over means for selecting said first photographing optical system and said second photographing optical system in response to selection of said reference mode and portrait mode, respectively;
recording means for recording the image of said subject onto a recording medium from said first and second photographing optical systems; and
control means actuated in response to selection of said portrait mode for sequentially causing said optical system change-over means to select said first photographing optical system, said recording means to record the image of said subject in the reference mode using said first photographing optical system, said optical system changeover means to change said first photographing optical system to said second photographing optical system, and said recording means to record said enlarged image of said subject using said second photographing optical system.

4,788,604
VIDEO SYSTEM WITH A SPECIAL REPRODUCTION MODE USING AN IMAGE MEMORY
Hisaharu Takeuchi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 15, 1986, Ser. No. 907,381
Claims priority, application Japan, Sep. 25, 1985, 60-210160
Int. Cl.[4] H04N *5/782*
U.S. Cl. 360—10.3 **17 Claims**

1. An image memory control device for a video signal special reproduction system, said device comprising:
special reproduction mode designating means for designating at least one special reproduction mode among still image reproduction, slow-motion reproduction, and high-speed reproduction;
a video signal supply source for special reproduction for outputting a video signal to be subjected to special reproduction in a special reproduction mode which is designated by said special reproduction mode designating means;
A/D converting means for A/D converting the video signal

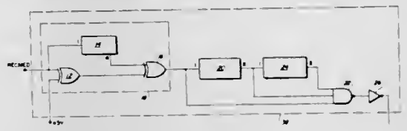
which is output from said video signal supply source for special reproduction to be subjected to special reproduction;
memory means having a memory capacity capable of storing about one field period of the video signal to be subjected to special reproduction which is A/D-converted by said A/D converting means;
write-in means for supplying a write signal for starting write-in of the video signal to be subjected to special reproduction which is A/D converted by said A/D converting means into said memory means at a predetermined timing and for stopping the write-in at elapsed about one field period of the video signal;
selection signal generating means for generating a first selection or a second selection signal when it is determined that the number of horizontal scan lines per field period of the video signal which is to be subjected to special reproduction in a mode designated by said special reproduction mode designating means is close to an integer or close to a multiple of one-half, respectively;



readout means for repeatedly reading out a number of times the video signal to be subjected to special reproduction which is written in said memory means, in response to a mode designated by said special reproduction mode designating means, by renewing a read-out address of said memory means into a starting address at elapsed one field period of the video signal when receiving said first selection signal or by renewing a read out address of said memory means into a starting address at elapsed sum or difference period between one field period of the video signal and $\frac{1}{2}$ horizontal scan period when receiving said second selection signal, so that the number of horizontal scan lines corresponding to a transient portion of adjacent fields of a readout video signal is constantly an integer or a multiple of one-half having a constant fraction smaller than $\pm\frac{1}{2}$; and
D/A converting means for D/A-converting the video signal read out from said memory means, in order to obtain a special reproduction output.

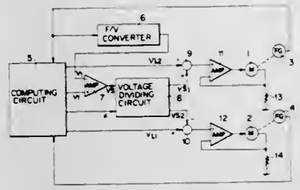
4,788,605
RECEIVE MANCHESTER CLOCK CIRCUIT
Robert L. Spiesman, Phoenix, and Burke B. Baumann, Glendale, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 30, 1987, Ser. No. 31,957
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—42 **2 Claims**

1. A receive Manchester clock circuit to which is applied Manchester encoded data (MED) signals having a basic period, said circuit comprising:
means for differentiating applied MED signals to produce a primary clock pulse for each voltage transition of the applied MED signals;
means for producing a secondary clock pulse a first predetermined period of time after each primary pulse is produced;
means for producing a tertiary clock pulse a second predetermined period of time after each secondary pulse is produced, said first and second predetermined periods of time being substantially equal to one-half the basic period of the applied Manchester encoded data signals; and



gate means to which the primary, secondary, and tertiary clock pulses are applied for producing a receive Manchester clock pulse in response to a primary, secondary or tertiary clock pulse being applied to said gate means.

4,788,606
TAPE FEED CONTROL DEVICE
Gohji Uchikoshi, Tokyo, Japan, assignor to Nakamichi Corp., Tokyo, Japan
Filed Sep. 16, 1987, Ser. No. 97,814
Claims priority, application Japan, Sep. 25, 1986, 61-147192[U]
Int. Cl.[4] G11B *15/32, 15/43*
U.S. Cl. 360—73 **3 Claims**



1. A tape feed control device, comprising:
two reel motors, a rotation detecting means for detecting rotation information signals of said reels, and a tension signal output means for effecting an operation based on said rotation information signals to determine tension currents to be applied to said reel motors respectively to establish a predetermined tension of a tape extending between said reels;
a reference speed signal output means for producing a reference speed signal which determines the speed of transporting said tape;
a difference information output means for comparing at least one of said rotation information of said reels with said reference speed signal and outputting a resulting difference information signal;
an acceleration and deceleration signal output means responsive to said difference information signal to produce acceleration and deceleration signals which determine acceleration and deceleration currents for driving respective said reel motors; and
reel motor driving means for producing motor drive currents based on said tension signals and said acceleration and deceleration signals to drive respective said reel motors.

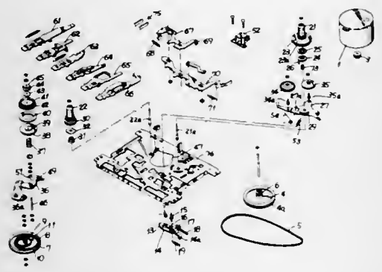
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4,788,607

TAPE WINDING END DETECTING DEVICE OF TAPE RECORDER

Hisashi Ogawa, Tokyo, Japan, assignor to Shinwa Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,037
Claims priority, application Japan, Oct. 3, 1986, 61-235767
Int. Cl.[4] G11B *15/18, 15/32*
U.S. Cl. 360—74.2 **2 Claims**



1. A tape winding end detecting device of a tape recorder wherein the state of operation of an operating lever selected by a selective operation of a plurality of operation levers is maintained by a lock lever and said operation lever is adapted to actuate a switch operation member so as to actuate an electric motor, and rotation of said electric motor causes rotation of one of a pair of reel mountings corresponding to said operation lever selected by way of selective engagement of gears so as to wind a tape by the rotation of said reel mounting, and the stopping of said reel mounting at the end of said tape is detected so as to release said lock lever and return said selected operation lever and also release said switch operation member comprising:

a cam which is provided on a reduced speed rotary body arranged in a driving system from said pair of reel mountings to the electric motor;

a switching lever which is engaged to said cam, and which is adapted to move said lock lever in accordance with the stopping of the rotation of said reel mounting and to release said operation lever;

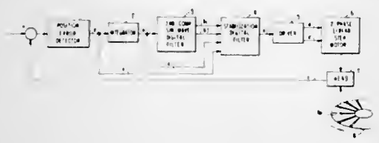
said electric motor switch operation member being engaged to said cam in such a manner that the return timing of said electric motor switch operation member is arranged to be delayed relative to the return timing of said lock lever.

4,788,608

HEAD POSITIONING SYSTEM FOR POSITIONING A MAGNETIC HEAD ON AN ECCENTRIC TARGET TRACK

Takahiko Tsujisawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,514
Claims priority, application Japan, Oct. 22, 1985, 60-234544; Feb. 17, 1986, 61-30709
Int. Cl.[4] G11B *5/596, 5/55*
U.S. Cl. 360—77 **7 Claims**



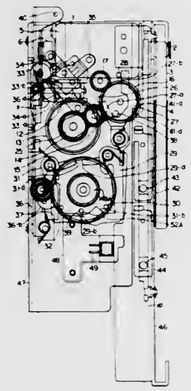
1. A head positioning system for positioning a magnetic head at a target track of a magnetic disk which rotates at a disk rotational frequency, comprising: a drive motor for driving said magnetic head in a radial direction of said magnetic disk, a position error detector for generating a position error signal which indicates a deviation of said magnetic head with respect to a center line of said target track, a compensation digital filter for generating a compensation signal having a frequency equal to an integer multiple of said disk rotational frequency, a stabilization digital filter connected to said position error detector and said compensation digital filter for generating an equilibrium point signal of said drive motor in accordance with said position error signal and said compensation signal, a motor driver for determining drive currents for said drive motor in response to said equilibrium point signal, and means for detecting a position of said magnetic head relative to said center line of said target track and for supplying the head position signal to said position error detector.

4,788,609

DRIVING POWER SWITCHING MECHANISM FOR CASSETTE TAPE REPRODUCING APPARATUS

Kimitika Yamada; Hidenori Muramatsu; Katsuya Nozawa, and Yoshihiko Goto, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1985, Ser. No. 788,249
Claims priority, application Japan, Oct. 19, 1984, 59-220237; Mar. 25, 1985, 60-61178
Int. Cl.[4] G11B *5/027*
U.S. Cl. 360—85 **3 Claims**



1. A cassette tape reproducing apparatus driving power changeover mechanism comprising:

a reversable rotary driving source;

a major power transmission mechanism connected to said driving source;

and movable in response to said driving source to produce a driving power;

a cassette loading mechanism responsive to movement of said power transmission mechanism for loading or unloading a cassette to or from a predetermined reproducing position;

a first subordinate power transmission mechanism for transmitting said driving power from said major power transmission mechanism to said cassette loading mechanism;

a tape loading mechanism responsive to movement of said power transmission mechanism for partly pulling out the tape from a cassette into a predetermined tape path and retracting said tape therefrom;

a second subordinate power transmission mechanism for transmitting said driving power from said major power transmission mechanism to said tape loading mechanism; and

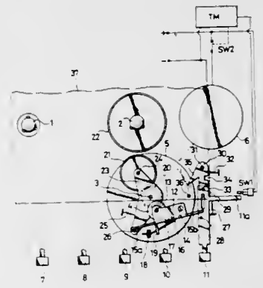
a driving power switching mechanism including a sun gear reversibly driven by the driving power from said major power transmission mechanism and a satellite gear engaging said sun gear for movement therearound, means for selectively moving said satellite gear between a first position for engagement with said first subordinate power transmission mecahnism and a second position for engagement with said second subordinate power transmission mechanism, wherein at least one of said first and second subordinate power mechanisms is disposed for grazing tangential engagment by said satellite gear so that release of said satellite gear from engagement with said one of said subordinate power mechanisms will allow it to move therepast to engage the other of said subordinate power mechanisms.

4,788,610

AUTOMATIC RECORDING APPARATUS

Tadao Arata, Inagi, Japan, assignor to Tanashin Denki Co., Ltd., Japan

Filed Jul. 28, 1987, Ser. No. 78,688
Claims priority, application Japan, Jan. 23, 1987, 62-8384[U]
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.3 **12 Claims**



1. An automatic recording apparatus, comprising:

a normally rotating rotary member;

a reel receiver normally connected to said rotary member for rotating a tape reel received thereon;

a stand-by mode selecting operating member manually movable from a home position to an actuated position and normally urged to the home position;

arresting means for arresting said stand-by mode selecting operating member at the actuated position;

a pause mechanism for interrupting a rotation transmitting route from said rotary member to said reel receiver to establish a recording mode stand-by condition when said stand-by mode selecting member is at the actuated position;

controlling means responsive to movement of said stand-by mode selecting operating member from the home position to the actuated position for stopping rotation of said rotary member and responsive to a starting signal for starting rotation of said rotary member; and

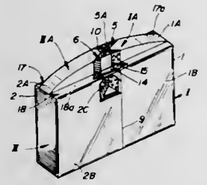
releasing means for transmitting a turning force of said rotary member at an initial stage after starting of its rotation to move said arresting means out of arresting engagement with said stand-by mode selecting operating member to allow said stand-by mode selecting operating member to return from the actuated position to the home position, thereby canceling the recording mode stand-by condition.

4,788,611

MAGNETIC TRANSDUCER HEAD

Tomio Kobayashi; Shoichi Kano; Osamu Maniwa; Seiki Konno, and Heikichi Sato, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 801,318, Nov. 25, 1985, abandoned. This application Jan. 26, 1988, Ser. No. 149,977
Claims priority, application Japan, Nov. 26, 1984, 59-249127
Int. Cl.[4] G11B *5/251, 5/12*
U.S. Cl. 360—120 **10 Claims**



1. A magnetic transducer head comprising

(a) a composite magnetic core having first and second composite magnetic core parts with respective planar confronting surfaces secured in close confronting relationship with each other, with an interface region therebetween defining an interface plane of the composite magnetic core, said composite magnetic core having a transducer head record contacting surface for engagment with a magnetic record medium, and having a transducer head coupling gap at the interface region between the planar confronting surfaces of the composite magnetic core parts for coupling of the composite magnetic core with a portion of a magnetic record medium at said record contacting surface,

(b) said first and second composite magnetic core parts having respective ferrite magnetic core elements and having notch configuration receiving respective magnetic pole piece layers of metallic magnetic material integrated with the respective ferrite magnetic core elements, the respective magnetic pole piece layers being disposed obliquely to the respective planar confronting surfaces of the composite magnetic core parts and having respective record confronting edges facing substantially flush with the record contacting surface, said record confronting edges being arranged substantially in a common straight line on said record contact surface and having respective gap defining pole piece edges at opposite sides of the interface region and defining the transducer head coupling gap,

(c) The notch configurations of the respective core parts, as viewed at the record contacting surface, having first notch defining surfaces extending obliquely from the respective planar confronting surfaces of the respective core parts along a side of each respective one of the magnetic pole piece layers of metallic magnetic material in close conforming relation thereto, and having further notch defining surfaces forming extensions of the first notch defining surfaces which extend from the respective first notch defining surfaces and include respective lateral extremities laterally outwardly of the respective first notch defining surfaces, said lateral extremities of said further notch defining surfaces being located out of said record contacting surface,

(d) said composite magnetic core having core lateral sides defining a core thickness dimension substantially greater than the width of the record contacting surface, the further notch defining surfaces having respective intermediate bends between the respective first notch defining surfaces and the respective lateral extremities, and the lateral extremities extending from the respective intermediate bends generally toward the interface plane, said lateral extremities being offset in a depth direction from

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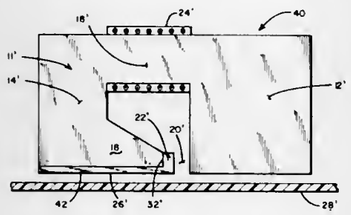
the level of the record contacting surface to offset the lateral extremities from the level of a magnetic record medium at the record contacting surface.

4,788,612

EXTENDED METAL IN GAP HEAD

Craig M. Perlov, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Jul. 22, 1987, Ser. No. 76,441
Int. Cl.[4] G11B *5/187, 5/193*
U.S. Cl. 360—120 **4 Claims**



1. An apparatus for reading and writing data onto and from a magnetic medium comprising:

a core constructed of a ferro-magnetic material having an air bearing surface which confronts the magnetic medium, said core having a transducing gap therein, said transducing gap forming a first confronting surface and a second confronting surface said first confronting surface having a smaller surface area than the second confronting surface;

means for inducing a magnetic flux in the core;

a first layer of magnetic material having a magnetic permeability greater than the ferro-magnetic material, said first layer deposited on said first confronting surface and forming a joint between said ferro-magnetic material and said first layer, the joint being substantially parallel to said transducing gap; and

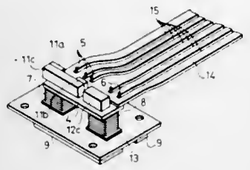
a second layer of magnetic material having a magnetic permeability greater than the ferro-magnetic material deposited on the air bearing surface of the core adjacent said first confronting surface, the second layer being integral with said first layer of higher permeability magnetic material.

4,788,613

MAGNETIC HEAD HAVING COIL BOBBIN FOR MOUNTING PRINTED CIRCUIT BOARD

Akihiko Yamashita, Nagaoka, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jul. 6, 1987, Ser. No. 70,106
Claims priority, application Japan, Jan. 30, 1986, 61-12440[U]
Int. Cl.[4] G11B *5/17, 5/127;* **H01F** *27/30*
U.S. Cl. 360—123 **3 Claims**



1. A magnetic head having a recording and reproducing core, an erasing core, a coil for recording and reproducing, and a coil for erasing on a magnetic medium with which the magnetic head is placed in moving contact, and a structure for holding said cores and coils comprising:

a bobbin member having a recording and reproducing coil bobbin and an erasing coil bobbin arranged in parallel in an upright direction and spaced apart from each other along a lateral direction, each having a hole therethrough for insertion of a corresponding one of said magnetic cores, and having a respective one of said coils wound therearound, wherein the respective magnetic cores inserted through said holes in said bobbin form a magnetic head at one end of said bobbin member along the upright direction;

a flange formed at another end of said bobbin member opposite from said one end forming said magnetic head;

a plurality of terminal pins for each of the coils wound on the bobbins arranged on said flange, said pins extending in parallel with each other in an upright direction perpendicular to said flange, wherein the ends of the coils wound on said coil bobbins are connected to respective ones of said terminal pins; and

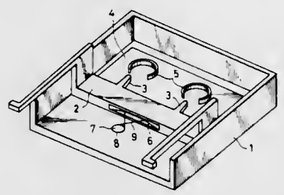
a flexible printed circuit board having terminal pin insertion holes arranged in a corresponding row at one end thereof parallel to said lateral direction, through which the terminal pins are inserted, and by which conductive patterns on said printed circuit board are directly physically and electrically connected to the terminal pins, wherein said printed circuit board being directly connected to said terminal pins can be flexed and follows movement of the magnetic head in moving contact with the magnetic medium and the need for any connecting wires between said terminal pins and said printed circuit board and the risk of breakage thereof can be avoided.

4,788,614

LOCKING MECHANISM IN A MAGNETIC TAPE CASSETTE

Shozo Onmori; Shingo Katagiri, and Kengo Oishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 26, 1986, Ser. No. 900,478
Claims priority, application Japan, Oct. 18, 1985, 60-158683
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—132 **6 Claims**



1. A tape cassette, comprising:

a first half case, having a protrusion at a central portion;

a second half case joined to said first half case and forming an internal space therein, wherein said protrusion projects into the internal space;

two hubs for winding tape rotatably mounted in said internal space;

a locking member slidable in a first direction away from said protrusion and toward said hubs within said internal space and including means for selectively locking said hubs, said locking member having a recess on a side facing in a second direction toward said protrusion and away from said hubs, said recess extending laterally in parallel to a joining line of said first and second half cases; and

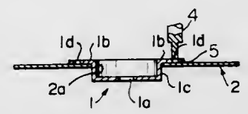
a spring coupled to said protrusion and having legs extending in said first direction and slidably held in said recess for biasing said locking member in said first direction.

4,788,615

MEANS FOR ADHERING THE MAGNETIC DISK TO THE CENTER CORE IN A MAGNETIC DISK CARTRIDGE

Kengo Oishi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 765,869, Aug. 14, 1985, abandoned.
This application Sep. 9, 1987, Ser. No. 96,272
Claims priority, application Japan, Sep. 4, 1984, 59-134325[U]
Int. Cl.[4] G11B *5/82, 23/03*
U.S. Cl. 360—135 **1 Claim**



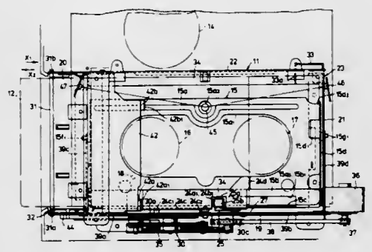
1. A magnetic disk cartridge comprising a cylindrical center core having a floor and provided with a circumferentially flat flange at its upper surface; and a circumferentially flat magnetic disk provided with a central hole into which the cylindrical core is fitted; the flange being provided with a plurality of through-holes such that after the flat lower surface of the flange has been brought into contact with the flat upper surface of the magnetic disk, the center core and the magnetic disk are adhered together by the insertion via said through-holes of a generally flowable adhesive under a pressurized force which permeates beyond the through-holes into a gap formed by the pressure of the adhesive only between the circumferentially flat lower surface of the flange and the circumferentially flat upper surface of the magnetic disk.

4,788,616

TAPE CASSETTE LOADING AND UNLOADING APPARATUS COMPRISING HOLDER MOVING MEANS AND MOVEMENT SYNCHRONIZING MECHANISM

Manabu Sato, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 27, 1986, Ser. No. 823,050
Claims priority, application Japan, Jan. 28, 1985, 60-13908; Jan. 29, 1985, 60-10705; Jan. 29, 1985, 60-10706; Jan. 29, 1985, 60-10707; Jan. 29, 1985, 60-10708; Jan. 29, 1985, 60-10709
Int. Cl.[4] G11B *5/008, 15/00, 17/00*
U.S. Cl. 360—96.5 **9 Claims**



1. A tape cassette loading and unloading apparatus for loading and unloading a tape cassette in and from a recording an/or reproducing apparatus, said tape cassette having an approximately rectangular parallelepiped shape with top and bottom surfaces respectively having a longer side and a shorter side and a lid provided on a front of the tape cassette along a longitudinal direction thereof for protecting a tape accommodated within the tape cassette, said tape cassette loading and unloading apparatus comprising:

a frame;

holder means movably provided within said frame for receiving and moving the tape cassette which is inserted into said holder means, said holder means comprising a holder for receiving the tape cassette which is inserted into said holder means, a slide member slidably coupled to said holder, said slide member being movable horizontally between a cassette receiving position where said holder receives the tape cassette and an insertion completion position and being movable vertically between said insertion completion position and a predetermined loading position, said tape cassette being partially inserted into said holder in the longitudinal direction of the tape cassette so as to push said slide member slightly past said cassette receiving position toward said insertion completion position, said slide member moving said holder vertically between upper and lower positions of said holder as said slide member moves vertically between said insertion completion position and said predetermined loading position;

moving means for moving said slide member horizontally to said insertion completion position and then to said predetermined loading position during a tape cassette loading mode in response to insertion of said tape cassette slightly past said cassette receiving position, and for moving said slide member from said predetermined loading position to said cassette receiving position via said insertion completion position during a tape cassette ejecting mode, said moving means and said slide member being provided exclusively on one side part of said frame;

a movement synchronizing mechanism for maintaining said holder in the horizontal state with a plurality of arms when said holder moves vertically;

holding members provided on said slide member for respectively holding the top and bottom surfaces of said tape cassette while said slide member is moved, said holding members being separated from the top and bottom surfaces of said tape cassette in said cassette receiving position and holding the top and bottom surfaces of said tape cassette in said insertion completion position and in said predetermined loading position; and

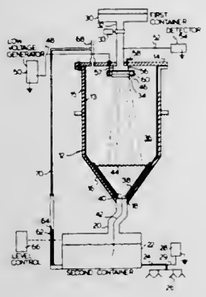
a lid opening member integrally provided on said frame for engaging the lid of the tape cassette and opening the lid as said slide member is moved from said insertion completion position to said predetermined loading position.

4,788,617

LIQUID TRANSFER APPARATUS

Gordon K. Davidson, P.O. Box 7445 Stn D., Victoria, BC, Canada V9B 5B8

Filed Nov. 4, 1987, Ser. No. 116,935
Int. Cl.[4] H02H *3/00*
U.S. Cl. 361—1 **10 Claims**



1. Apparatus for transferring an electrically conductive liquid from a first container to a second container in which the liquid is maintained at a substantially different electrical poten-

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tial from the electrical potential of the liquid in the first container without causing significant change in the electrical potential of the liquid in the first container, said aparatus comprising:

means forming a liquid transfer chamber with an electrically insulating inner surface,

means for sprinkling liquid from the first container into an upper portion of the liquid transfer chamber to cause liquid droplets to fall from the upper portion to a lower portion of the chamber,

a second container connected to the lower portion of the liquid transfer chamber to receive liquid therefrom,

means for maintaining liquid in the second container at a substantially different electrical potential from the electrical potential of liquid in the first container,

means for detecting flow of electric current from liquid in the second container to liquid in the first container, and

adjustable means for applying appropriate electrical potential to liquid droplets from said sprinkling means to reduce said current flow substantially to zero.

4,788,618

HIGH VOLTAGE PROTECTING CIRCUIT

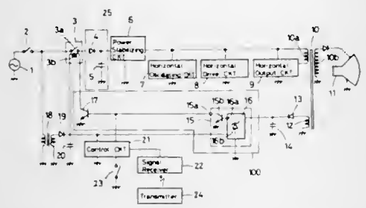
Kenji Kimura, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1987, Ser. No. 71,304

Claims priority, application Japan, Jul. 9, 1986, 61-161406

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—86 **8 Claims**



1. A high voltage protecting circuit in a cathode ray tube apparatus comprising:

a main power switch connected to an electric power source;

a flyback transformer having primary, secondary and tertiary windings;

rectifying circuit means connected to the main power switch for rectifying a power source voltage originating from the power source and supplying a rectified voltage to the primary winding of the flyback transformer;

switching means connected between the main power switch and the rectifying circuit and including means responsive to a control signal applied thereto for controlling the ON and OFF operating state of said switching means;

high voltage detecting and controlling means for comparing an output voltage produced across the tertiary winding of the flyback transformer with a reference voltage and generating a control signal when the output voltage exceeds the reference voltage, said control signal switching the switching means to the OFF state;

a standby transformer connected to the electric power source through the main power switch, said standby transformer having primary and secondary windings; and

additional rectifying circuit means, and wherein the secondary winding of the standby transformer generates a voltage thereacross which is supplied through the additional rectifying circuit means to the high voltage detecting and controlling means for keeping the high voltage detecting and controlling means in an operative condition regardless of the operating state of the switching means.

4,788,619

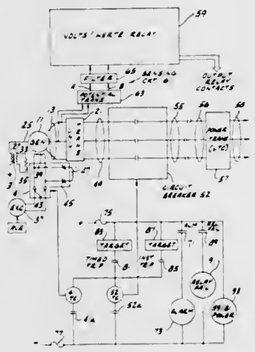
PROTECTIVE RELAYS AND METHODS

Matthew J. Ott, Highland, and Timothy M. Wilkerson, Madison County, both of Ill., assignors to Basler Electric Company, Highland, Ill.

Filed Apr. 24, 1987, Ser. No. 42,436

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 **61 Claims**



1. A protective relay for use in an electrical power system with a circuit breaker for connecting and disconnecting first and second electrical conductors which are energizable with an AC voltage, and means for sensing the AC voltage to produce an AC output that has zero crossings and a time period between zero crossings, the protective relay comprising:

means for supplying an electrical signal representing a preselected pickup value of volts-per-Hertz for the relay; and

means responsive to the AC output and to the electrical signal for generating an electrical level as a function of both the time period between zero crossings and the pickup value and for producing a trip signal for the relay to cause the circuit breaker to disconnect the conductors when the AC output exceeds the electrical level, whereby the circuit breaker is tripped when a volts-per-Hertz value of the AC voltage exceeds the preselected pickup value of volts-per-Hertz for the relay.

4,788,620

STATIC TRIP CIRCUIT BREAKER WITH AUTOMATIC CIRCUIT TRIMMING

Graham A. Scott, Avon, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 9, 1987, Ser. No. 118,574

Int. Cl.[4] H02H *3/093*

U.S. Cl. 361—96 **6 Claims**

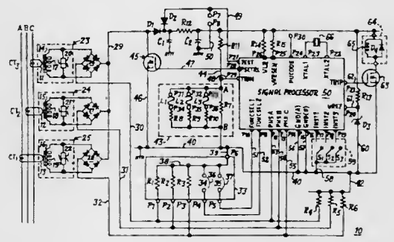
1. A method for calibrating a circuit breaker electronic trip unit comprising the steps of:

providing a circuit breaker electronic trip unit containing a resistance network arranged as a plurality of trimming resistors electrically in parallel with a base resistor through a corresponding plurality of fusible links;

applying a test input signal to said trip unit and reading a first pickup level output response;

comparing said first pickup level output response to a predetermined pickup level and determining a first difference value;

comparing said first difference value to predetermined binary weighted resistance values to provide a first calibration resistance value; and



adjusting said resistance network within said trip unit to provide said first calibration resistance value to said trip unit.

4,788,621

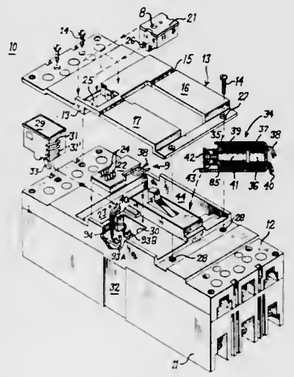
MOLDED CASE CIRCUIT BREAKER MULTIPLE ACCESSORY UNIT

Ronald R. Russell, Plainville; Robert A. Morris, Burlington; Gregory T. DiVincenzo, Plainville, and Graham A. Scott, Avon, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,869

Int. Cl.[4] H02B *1/08*

U.S. Cl. 361—115 **13 Claims**



1. Molded case circuit breaker having a combined trip actuator and accessory unit comprising:

a molded plastic circuit breaker cover and case, said cover defining an enclosure space;

a circuit breaker operating mechanism within said case and having means separating a pair of contacts to interrupt circuit current through said contacts;

a trip actuator-accessory unit within a first recess in said circuit breaker cover proximate said circuit breaker operating mechanism which interacts with said circuit breaker operating mechanism to separate said contacts automatically upon overcurrent conditions through said contacts and to interact with said operating mechanism upon receipt of a remote trip signal;

an electric switch-electronics unit within a second recess in said circuit breaker cover, an electric switch in said electric switch-electronics unit which interrupts said remote trip signal upon separation of said contacts and a printed circuit board in said electric switch-electronics unit providing operating power to said trip actuator-accessory unit;

wherein said trip actuator-accessory unit includes an undervoltage coil arranged for providing a magnetic holding force to hold a trip armature against the bias of a charged compression spring; and including a flux shift coil within said trip actuator-accessory unit for diverting said holding force away from said armature to allow said armature to interact with said circuit breaker operating mechanism upon occurrence of said overcurrent condition.

4,788,622

DEVICE FOR INDICATING THE SHORT-CIRCUITING OF A LIGHTNING ARRESTER

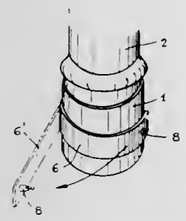
Jean-Pierre Cinquin, Sicclen St Julien, France, assignor to Ferraz, Lyon, France

Filed Jul. 28, 1987, Ser. No. 78,679

Claims priority, application France, Aug. 28, 1986, 86 12297

Int. Cl.[4] H02H *9/04*

U.S. Cl. 361—124 **7 Claims**



1. An indicator for marking the short-circuit condition of a lightning arrester wherein the lightning arrester includes an insulated element which normally separtes a first electrode from a second electrode but which allows the first and second electrodes to be electrically connected to dissipate high current voltage and thereafter be electrically insulated from one another and wherein the second electrode includes inner and outer surfaces, the indicator comprising an elastically yieldable strip means having first and second ends, means for securing said first end of said strip means to said outer surface of the second electrode, an opening through said second electrode, retaining pin means carried by said strip means adjacent said second end thereof, said retaining pin means normally extending through said opening so that said second end of said strip means is in engagement with the outer surface of the second electrode, retention means mounted within the second electrode, said retention means normally being in engagement with said retaining pin means, said retention means including means responsive to continuation current between said first electrode and said second electrode so as to disengage said retention means from said retaining pin means whereby said second end of said strip means moves outwardly away from said second electrode to thereby give a visual indication of a short-circuit condition.

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4,788,623

KEY OPERATED MECHANISM FOR PRODUCING CODED SIGNAL COMBINATIONS FOR SELECTING A FUNCTION OF A MULTIFUNCTIONAL DEVICE

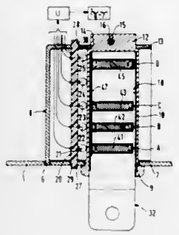
Werner Haug, Langnau, Switzerland, assignor to Frama AG, Lauperswil, Switzerland

Continuation of Ser. No. 903,768, Aug. 29, 1986, abandoned. This application Dec. 24, 1987, Ser. No. 135,277

Claims priority, application Switzerland, Sep. 12, 1985, 03941/85

Int. Cl.⁴ E05B *27/00;* **H01H** *47/00*

U.S. Cl. 361—171 **9 Claims**



1. A key operated mechanism for producing coded signal combinations for selecting a function of a multifunctional device, said mechanism comprising:

a keyguide having a rear abutment;

circuitry associated with said keyguide;

a signal processing unit associated with said circuitry for receiving signals from said circuitry;

a plurality of magnetically operable switches located generally in a row and associated with said keyguide, said switches being connected to said circuitry and operable to send said signals through said circuitry, at least one of said switches operable to power said signal processing unit and at least a second of said switches operable to block the operation of said signal processing unit;

a key receivable in said keyguide;

a first magnet located on said key, said key being capable of enabling said mechanism by closing said first switch when said key abuts said rear abutment and said first magnet being located generally between said first and said second switch and in operable proximity to said first switch.

4,788,624

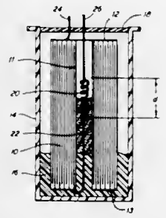
CAPACITOR HAVING CURRENT SURGE PROTECTION

Thomas F. Strange, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,875

Int. Cl.⁴ H01G *1/11*

U.S. Cl. 361—272 **10 Claims**



1. A surge-protected metallized dielectric capacitor assembly comprising:

a. a closed container;

b. a metallized dielectric capacitor enclosed in the container, said capacitor including first and second metallized insulative layers;

c. first externally-accessible connection means electrically connected to the first metallized layer;

d. a ferromagnetic core disposed in space in said container not occupied by the capacitor, said ferromagnetic core comprising a filler material containing ferromagnetic particles;

e. a conductive coil positioned in the assembly such that it is magnetically coupled to the ferromagnetic core to form an inductor, a first end of said coil being electrically connected to the second metallized layer; and

f. second externally-accessible connection means electrically connected to a second end of the coil.

4,788,625

METHOD OF PROVIDING A LEAD TO AN END OF A CAPACITOR AND A CAPACITOR MANUFACTURED ACCORDING TO THIS METHOD

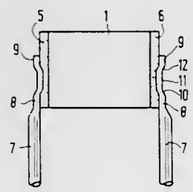
Andries C. Maijers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1987, Ser. No. 115,474

Claims priority, application Netherlands, Nov. 6, 1986, 8602804

Int. Cl.⁴ H01G *1/14, 7/00*

U.S. Cl. 361—306 **6 Claims**



6. A capacitor formed of two metal foils which are wound together and between which an insulating material is provided, in which at one end of the capacitor the edge of one foil projects from the edge of the other foil, and at the opposite end of the capacitor the edge of the latter foil projects from the edge of the former, viewed in a direction perpendicular to the longitudinal direction of the foils, whilst leads are secured to the capacitor at the opposed ends of the capacitor, characterized in that the projecting ends of the foils are coated with a metal layer to which the end of a lead is secured, this end having two substantially contiguous portions which lie against the outside of the metal layer, which portions are interconnected by a connecting portion which is pressed into the metal layer, which connecting portion is offset from the plane of symmetry and is symmetrical relative to a plane of symmetry which extends halfway between the facing ends of the contiguous portions and perpendicularly to the longitudinal axis thereof.

4,788,626

POWER SEMICONDUCTOR MODULE

Arno Neidig, Plankstadt; Reinhold Bayerer, Reichelsheim, and Bertold Hahn, Hofheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

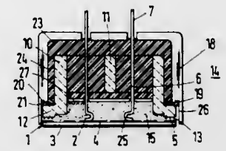
Filed Feb. 12, 1987, Ser. No. 14,272

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604882

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **10 Claims**

1. Power semiconductor module, comprising a plastic housing having an interior; a substrate in the form of a ceramic plate with upper and lower surfaces inserted in said housing as a housing bottom; metallizations disposed on said upper and lower surfaces of said ceramic plate, said metallization on said upper surface of said ceramic plate facing said interior of said housing and being structured to form conductor paths; power



semiconductor components, connecting elements and terminal elements for external terminals all being disposed on said upper surface of said ceramic plate; a frame connected to said substrate in said interior of said housing, said frame having inner and outer surfaces; and sealing compound surrounding said inner and outer surfaces of said frame and cooperating with said frame for sealing againt moisture.

4,788,627

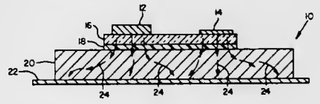
HEAT SINK DEVICE USING COMPOSITE METAL ALLOY

Michael R. Ehlert, Beaverton, and Earl R. Helderman, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jun. 6, 1986, Ser. No. 872,058

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **9 Claims**



1. A heat sink consisting essentially of about 75–95% by weight tungsten, about 3–23% by weight copper, and about 2% by weight nickel.

4,788,628

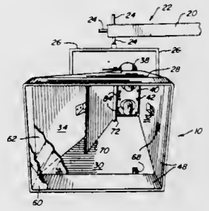
BANKLIGHT SYSTEM FOR PRODUCING VARIABLE GRADATION LIGHTING EFFECTS

Donald R. Farrall, Carrollton, Tex., assignor to Farrall Instruments, Inc., Grand Island, Nebr.

Filed Oct. 28, 1987, Ser. No. 114,297

Int. Cl.⁴ G03B *15/02*

U.S. Cl. 362—18 **28 Claims**



1. A banklight system for use in illuminating a subject to be photographed whereby the light image and light projection of a predetermined area exposed to the illumination can be varied, said system being adapted for use with an illuminating means that can be mounted thereto, comprising:

a housing having a rear wall, opposite side walls, opposite end walls, and a generally flat diffuser means located at the front portion of the housing, said housing having at least one aperture for receiving an illuminating means for illuminating the interior of said housing, said housing being adapted so that light emitted by said illuminating means is transmitted through said diffuser means;

a baffle means located within said housing between said diffuser means and said rear wall, said baffle means being adjustably positioned within said housing to define a first area of said diffuser means and a second area of said diffuser means to adjust the light image and light projection properties of the light emitted therethrough, the relative sizes of the first and second areas varying in response to adjustment of the position of said baffle means; and

means for adjusting the position of said baffle means.

4,788,629

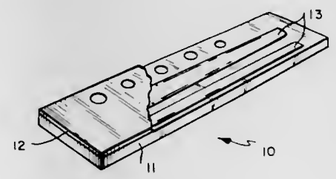
INSTRUMENT PANEL MEMBERS

Charles R. Handy, Wilder; Dwight H. Brattain, Quechee, both of Vt., and David L. Sousa, Enfield, N.H., assignors to Loctite Luminescent Systems, Inc., Lebanon, N.H.

Filed Oct. 29, 1986, Ser. No. 924,580

Int. Cl.⁴ F21V *9/16*

U.S. Cl. 362—23 **5 Claims**



1. An instrument panel member comprising

a first multiple-ply fiberglas reinforced plastic sheet pre-impregnated with a bonding resin and having a first selected thickness;

one or more electroluminescent lamp elements positioned in one or more recesses of said first sheet;

a second multiple-ply fiberglas reinforced plastic sheet pre-impregnated with a bonding resin and having a second thickness which is substantially less than that of said first selected thickness positioned in contact with said first fiberglas reinforced plastic sheet and the electroluminescent lamp elements positioned therein; and

said first sheet, said second sheet and said one or more electroluminescent lamp elements being bonded together by curing at a temperature selected within a range from about 210° F. to about 275° F. and a pressure selected within a range from about 50 p.s.i. to about 135 p.s.i. and by subsequent cooling thereof.

4,788,630

ILLUMINATION FOR VEHICLE ACCESSORIES

James A. Gavagan, Centerline, Mich., assignor to Irvin Industries, Inc., Rochester Hills, Mich.

Filed Jul. 10, 1987, Ser. No. 71,927

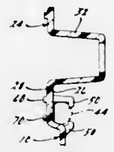
Int. Cl.⁴ B60Q *3/02*

U.S. Cl. 362—80 **22 Claims**

1. An illuminated vehicle interior accessory, comprising: a light-emitting light bar including an elongated rod member composed of a material that is at least semi-transparent an electrical light source operatively associated with said light bar; means for electrically connecting said electrical light

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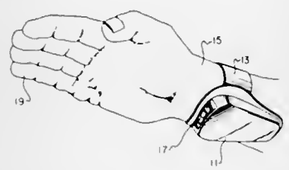
source with a source of electrical current on the vehicle; light bar connecting means for interconnecting said light bar with said vehicle interior accessory; and light-directing means for directing light emited from said light bar toward at least one predetermined portion of said vehicle interior in order to illuminate said predetermined portion of said vehicle interior, said elongated rod member being secured to an internal surface of said vehicle interior accessory, said vehicle interior acces-





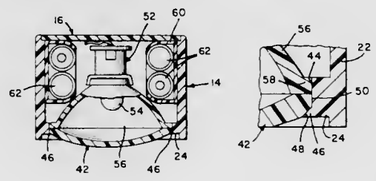
sory having at least one opening therethrough for allowing light emitted from said elongated rod member to pass through said opening, said opening being positioned generally adjacent said predetermined portion of said vehicle interior, said light bar connecting means including at least one generally hook-shaped connector member interconnected with said vehicle interior accessory, said hook-shaped connector member being adapted to engage said elongated rod member in a resilient snapped-on relationship therewith.

4,788,631
WRIST MOUNTED FLASHLIGHT
Raymond C. Fuller, 5700 W. 50th, Amarillo, Tex. 79109
Filed Jun. 1, 1987, Ser. No. 56,228
Int. Cl.[4] F21L *7/00, 15/08*
U.S. Cl. 362—103 **8 Claims**



1. A wrist mounted flashlight, comprising in combination:
a case, having a rearward end and a forward end, with an aperture located in the forward end;
means for strapping the case about the wrist of a user with the forward end facing toward the distal end of the user's hand;
retaining means inside the case for retaining a pair of batteries, and for retaining a bulb at the aperture;
electrical contact means in the case, movable between an engaged position electrically contacting the batteries with the bulb to energize the bulb, and a disengaged position electrically disengaging the batteries with the bulb;
a lens having a red light section and a white light section;
mounting means for mounting the lens to the forward end of the case for sliding movement between a red light position in which light from the bulb passes through the red light section and is blocked from the white light section, and a white light position in which light from the bulb passes through the white light section and is blocked from the red light section, and an off position in which the bulb is not illuminated; and
actuator means mounted to the lens for movement therewith, for moving the electrical contact means to the engaged position when the lens is in the red light position and also in the white light position, and for moving the electrical contact means to the disengaged position when the lens is in the off position.

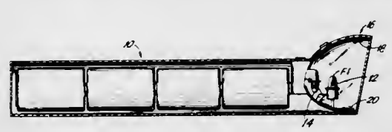
4,788,632
COMPACT FLASHLIGHT
Arthur S. Friedman, 2144 Seneca Dr. West, Merrick, N.Y. 11566
Filed Mar. 11, 1988, Ser. No. 166,990
Int. Cl.[4] F21L *7/00*
U.S. Cl. 362—200 **2 Claims**



1. A compact flashlight including a housing having a planar front wall with peripheral edges, peripheral walls affixed to said peripheral edges and extending rearward therefrom, a central opening defined through said front wall, an inwardly directed peripheral lip portion including a rearwardly directed beveled surface around said central opening, a lens spanning said opening, said lens having a peripheral edge complementing and frictionally engaging said front wall and said peripheral lip about said opening, a bulb mount with a forwardly direced bulb sprocket, said mount being rearward of said lens and centrally within said housing, a reflector having a leading peripheral edge coextensive with said lens edge and frictionally engaged and retained within said housing immediately behind said lens edge and wherein said front wall is of a thickness at least equal to the combined thickness of the peripheral edges of the lens and reflector, said reflector, peripherally thereabout, converging rearwardly from the leading edge and fixed to said bulb mount about said bulb socket, said reflector and bulb mount defining a pair of opposed battery chambers, one to each side thereof within said housing, battery means removably received in said battery chambers, and a rear wall removably engaged with said peripheral walls and closing said housing.

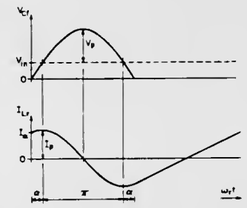
4,788,633
DEVICE WITH COMPOSITE REFLECTOR
Robert W. Zimermann, Sun Prairie, and David R. Schaller, Janesville, both of Wis., assignors to Rayovac Corporation, Madison, Wis.
Filed Aug. 24, 1987, Ser. No. 88,582
Int. Cl.[4] T21L *7/00*
U.S. Cl. 362—296 **6 Claims**

1. A device for generating a plurality of light beams comprising:
a plurality of light sources, each light source having a source optical axis; and
a common chamber for housing said light sources, said chamber being defined by a plurality of reflector surfaces joined to form a continuous composite reflector, each reflector surface having a reflector axis and a focal point



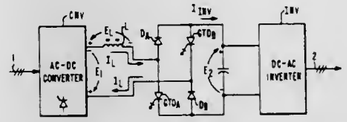
corresponding to one of said light sources, each source optical axis traversing a corresponding reflector optical axis.

4,788,634
RESONANT FORWARD CONVERTER
Martin F. Schlecht, Lexington, and Leo F. Casey, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Jun. 22, 1987, Ser. No. 65,016
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **63 Claims**



1. A resonant forward converter for converting voltage from an input dc voltage source to an output dc voltage for delivery to a load comprising:
a transformer having a primary and secondary winding wound about a common core element in which the polarities of the windings are matched, said transformer having a magnetizing inductor connected in parallel across one of said windings to provide a resonant ring independent of the load, the magnetizing inductor being naturally supplied by a magnetizing inductance of the transformer;
switching means connected in series with said primary winding and said input dc voltage source for alternately switching current on and off at a rapid rate through a first series circuit, said switching means causing, when it is turned off, a ring between the magnetizing inductopr and a first capacitor means coupled in parallel with the switching means; said first series circuit comprising the input dc voltage source, the primary winding of said transformer and the switching means in parallel with said first capacitor means; and
a second series circuit comprising said secondary winding of the transformer in series with a first unilateral conducting means, a parallel output capacitor and said load, said first unilateral conducting means having a second capacitor means coupled in parallel therewith, such that the first unilateral conducting means acts in unison with the switching means, both being turned on at about the same time and off at about the same time, the second capacitor means acting in parallel with the first capacitor means during the resonant ring.

4,788,635
CONVERTER SYSTEM COMBINING A TWO-QUADRANT VOLTAGE-SOURCE RECTIFIER AND A FOUR-QUADRANT VOLTAGE-SOURCE INVERTER, AND A MOTOR DRIVE EMBODYING THE SAME
Theodore M. Heinrich, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 10,879, Feb. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 807,568, Dec. 11, 1985, abandoned. This application Nov. 27, 1987, Ser. No. 126,056
Int. Cl.[4] H02P *3/20*
U.S. Cl. 363—35 **1 Claim**



1. In an AC motor drive system including:
an AC/DC converter having AC input lines, opposite poles and main thyristors forming a bridge across respective said AC input lines and across said poles; a constant voltage-source inverter having AC output lines and DC terminals; a DC-link capacitor across said inverter DC terminals; and an AC motor energized by said AC output lines;
the combination of:
first and second diode means operatively connected each between a corresponding pole of said thyristor bridge and an associated end of said DC-link capacitor for providing a current path between conducting main thyristor switches when the bridge is operating in the forward mode;
first and second GTO switches cross-coupled between a corresponding end of said DC-link capacitor and a corresponding pole of said thyristor bridge;
first means responsive to motor braking for initiating cyclical and alternate control of said first and second GTO switches and for providing a corresponding firing angle for said main thyristor bridge to provide a regenerative mode for bypassing said first and second diode means and for passing said current path through said DC-link capacitor in the opposite direction, thereby to allow energy feedback from said DC terminals through said converter onto said AC input lines; and
second means for inhibiting conduction of said first and second GTO switches during a time interval for each GTO switch so as to define a duty cycle in relation with an unbalance between the voltage input of said inverter and the voltage output of said AC/DC converter, thereby to match said inverter voltage input and said converter voltage output substantially.

4,788,636
INTERACTIVE DEVICE FOR ENTERING GRAPHIC DATA
Hidefumi Shiratori; Seishu Kawashima, and Hiromitsu Katoh, all of Abiko, Japan, assignors to Hitachi Seiki Co., Ltd., Tokyo, Japan
Filed May 6, 1986, Ser. No. 860,176
Claims priority, application Japan, May 7, 1985, 60-96232
Int. Cl.[4] G05F *15/46*
U.S. Cl. 364—191 **1 Claim**

1. A device for inputting data in list form representing the shape of a desired work comprising:
an operating unit having a display unit;
a display processing means for displying a graphic for selecting elements making up the shape of the work, and either

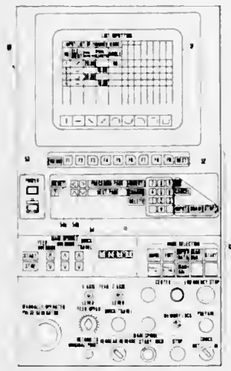
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a graphic of a blank list form or a graphic of the list form including input machining data on said display unit;

a graphic information processing means for converting numeric information into graphic information which is displayed on said display unit by said display processing means;

a memory for storing the pattern of the elements of the shape and the machining data of said graphic list;

a display memory for storing said graphic of said blank list form and said list form including input machining data,



said graphic of said blank list form and said list form including input machining data having been processed by said graphic information processing means in order to display said two lists on said display unit;

an arithmetic unit for converting the data within said display memory into data representing a coordinate position on the basis of an original machining point;

a work shape list memory for storing the result of the calculation in said arithmetic unit; and

a central processing unit which controls said memories and said processing means.

4,788,637

COMMUNICATION CONTROL APPARATUS

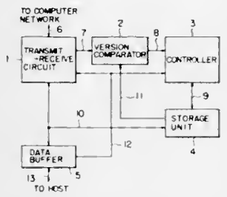
Kiichiro Tamaru, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1986, Ser. No. 912,516

Claims priority, application Japan, Sep. 30, 1985, 60-216840

Int. Cl.[4] G06F *13/00;* **H04J** *3/24*

U.S. Cl. 364—200 **8 Claims**



1. A communication control apparatus provided in each computer system for communication between computer systems linked by a computer network comprising:

a transmit-receive circuit connected to said computer network so as to communicate between a local station and other remote stations;

a reprogrammable storage unit in which a communication program is stored;

a comparison unit connected to said transmitreceive circuit for comparing a version number of a communication control program in a packet accepted by said transmit-receive circuit with that of the communication control program stored in said storage unit and outputting comparison results as to which program is of the latest version; and

a controller connected to said comparison unit, said transmit-receive circuit and said storage unit, for performing communication between said local station and a remote station using a communication control program of the latest version compatible therebetween on the basis of an output of said comparison unit.

4,788,638

DATA TRANSFER APPARATUS BETWEEN INPUT/OUTPUT DEVICES AND MAIN STORAGE WITH CHANNEL DEVICES BEING OF A CONCENTRATED TYPE AND STAND-ALONE TYPE

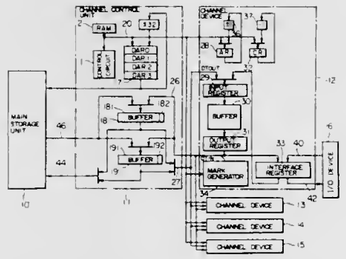
Tetsuji Ogawa; Tadashi Sato; Kazuhiko Ninomiya; Hideaki Shibata, and Ryo Yamagatu, all of Hadano, Japan, assignors to Hitachi, Limited, Tokyo, Japan

Filed Dec. 11, 1986, Ser. No. 940,621

Claims priority, application Japan, Dec. 13, 1985, 60-278904

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 **9 Claims**



1. A data transfer apparatus for transferring data between a main storage unit and a plurality of input/output devices, comprising:

a plurality of channel devices, each of said plurality of channel devices including:

a first data buffer for holding data to be transferred to and transferred from an input/output device, and

an address register for storing an address of said first data buffer;

a channel control unit, said channel control unit including:

a plurality of address holding means, each one connected to one of each said address register, one address holding means corresponding to each channel device, for holding an address of a main storage unit at which address data to be transferred to and transferred from the input-/output device is stored, wherein said address register holds a copy of lower bits of said address stored in said address holding means, and

a second data buffer said second data buffer holding the data to be transferred to and transferred from the input-/output device which data is accessed based on the address designated by said address holding means;

a first data bus for data transmission between said first data buffer and the plurality of input/output devices; and

a second data bus for data transmission between said first and said second data buffers, said second data bus having a larger transfer capacity than that of said first data bus.

4,788,639

FREQUENCY-CODED MULTI-LEVEL INTERRUPT CONTROL SYSTEM FOR A MULTIPROCESSOR SYSTEM

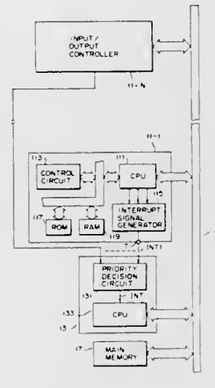
Kiichiro Tamaru, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 16, 1986, Ser. No. 863,948

Claims priority, application Japan, May 22, 1985, 60-109558

Int. Cl.[4] G06F *13/26*

U.S. Cl. 364—200 **6 Claims**



1. An information processing system having a plurality of controlled objects connected to a host system, said objects being operative to interrupt the host system upon the occurrence of predetermined events, said system comprising:

a plurality of subsystems, each operative to control a corresponding one of said plurality of controlled objects, each one of said subsystems upon the occurrence of a predetermined event being operative to output an interrupt signal having a selected frequency corresponding to one of a plurality of interrupt levels;

a plurality of interrupt lines;

a host system connected to each of said plurality of subsystems by a respective one of the plurality of interrupt lines for receiving from each of said subsystems an interrupt signal at any one of said plurality of interrupt levels, said host system being operative to determine a highest priority among the received interrupt signals including simultaneous interrupot signals in accordance with the frequencies of said interrupt signals and operative to process the determined highest priority interrupt signal; and

a data transmission system connected to said subsystems and said host system for transmitting data.

4,788,640

PRIORITY LOGIC SYSTEM

Richard B. Hansen, Aptos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 17, 1986, Ser. No. 819,726

Int. Cl.[4] G06F *3/14, 12/14, 13/00, 13/26*

U.S. Cl. 364—200 **21 Claims**

1. In a data processing system, a priority logic apparatus for determining a priority order of accessing a memory, comprising:

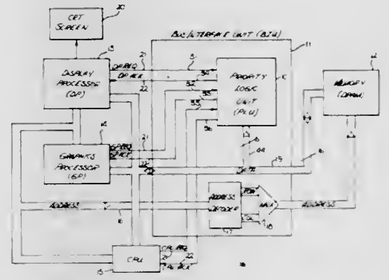
a plurality of memory request lines coupled to a plurality of memory accessing devices for receiving memory request signals from those said memory accessing devices which require access of said memory;

a plurality of request acknowledge lines coupled to said plurality of memory accessing devices for providing a request acknowledge signal to a corresponding memory accessing device selected;

a first set of registers for storing a first set of priority values which are selected for a single word transfer, each of said memory accessing devices having been assigned at least one of said first set of registers to store one of said first set of priority values corresponding to it;

a second set of registers for storing a second set of priority values which are selected for a multiple-word block segment transfer, each of said memory accessing devices capable of said multiple-word block segment transfer having been assigned at least one of said second set of registers to store one of said second set of priority values corresponding to it;

circuit means coupled to said memory request lines, said acknowledge lines, and said first and second set of registers for comparing priority values assigned to those said



memory accessing devices initiating said memory request signals, such that for each requesting memory accessing device a first priority value is selected if a request is for said single word transfer and a second priority value is selected if said request is for said multiple-word transfer;

said circuit means for selecting a highest priority value from comparison of said selected first and second priority values and generating a request acknowledge signal to a memory accessing device corresponding to said highest priority value selected, which request acknowledge signal controls access of memory by said selected memory accessing device;

wherein said single word transfer is achieved when said memory accessing device requesting said single word transfer achieves highest priority, and said multipleword block segment transfer is achieved as long as said memory accessing device requesting said multiple-word block segment transfer retains highest priority.

4,788,641

MAGNETIC TAPE PREFETCH CONTROL SYSTEM DYNAMICALLY VARYING THE SIZE OF THE PREFETCHED BLOCK

Masayuki Ishiguro, Kawasaki, and Noboru Ohwa, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 19, 1986, Ser. No. 897,918

Claims priority, application Japan, Aug. 20, 1985, 60-182820

Int. Cl.[4] G06F *13/10*

U.S. Cl. 364—200 **4 Claims**

1. A magnetic tape system comprising:

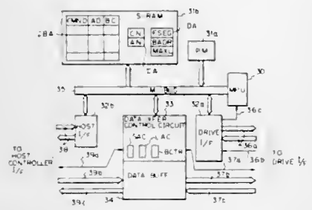
drive means including a magnetic head, reels for winding a magnetic tape, having an end portion, thereon, and a drive portion for driving said reels;

drive control means coupled to said drive means to control said drive means; and

prefetch control means, coupled to said drive control means and to a host controller, for prefetching access commands

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and for counting bytes of data and having first memory means for prefetching a plurality of commands from said host controller, second memory means, having a free area free of data, for temporarily storing write data commands, having a variable number of bytes, from said host controller or data read out from said magnetic tape, said drive means being operated through said drive control means according to commands stored in said first memory



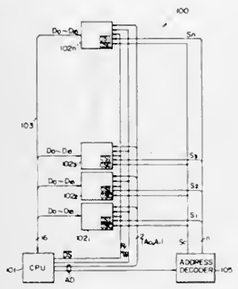
means, said prefetch control means counting the number of bytes of each write data command, and when the counted byte number is less than the number of bytes of the free area of the second memory means and is larger than a maximum block length (MALX) allowing prefetching in the second memory means, the counted byte number is set as a renewed maximum block length and prefetch control of the write data command is executed based on said renewed maximum block length.

4,788,642

DATA CONTROL SYSTEM ALLOWING SIMULTANEOUS COMMUNICATION BETWEEN A HOST AND A PLURALITY OF PERIPHERALS OVER PREDETERMINED BIT LINES

Satio Suzuki; Yasuhito Kawakita, and Koichi Kaneko, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 16, 1986, Ser. No. 886,527
Claims priority, application Japan, Jul. 19, 1985, 60-159981
Int. Cl.[4] G06F *13/40, 13/42*
U.S. Cl. 364—200 **6 Claims**



1. A bus control system for use in a data processing system including a central processing unit and a plurality of peripheral devices connected to the central processing unit through a common data bus having a plurality of bit-lines, the bus control system comprising:

address decoding means for decoding address data fed from the central processing unit to selectively output a common selecting signal for bringing all the devices into operative states or one of a plurality of individual selecting signals each for bringing a respective one of the plurality of devices into an operative state;

register means provided in each of the plurality of devices and responsive to a corresponding one of the plurality of individual selecting signals for storing data appearing on predetermined ones of the bit-lines of the common data bus thereinto; and

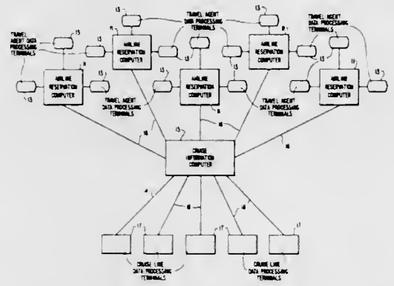
bit selection means provided in each of the plurality of devices and responsive to said common selecting signal for selecting at least one particular bit-line of the plurality of bit-lines of the common data bus as determined by the data stored in said register means of said each of the plurality of devices whereby said plurality of devices can communicate simultaneously with the central processing unit through differently selected at least one bit-lines of the common data bus.

4,788,643

CRUISE INFORMATION AND BOOKING DATA PROCESSING SYSTEM

Kenneth A. B. Trippe; Peter M. Edgar, both of P.O Box 5915, Ponce De Leon Blvd., Suite 16, Coral Gables, Fla. 33146, and David Vollrath, 3085 Aviation Ave., Miami, Fla. 33133

Continuation-in-part of Ser. No. 527,408, Aug. 29, 1983, abandoned. This application Aug. 27, 1985, Ser. No. 769,690
Int. Cl.[4] G06F *15/22*
U.S. Cl. 364—407 **7 Claims**



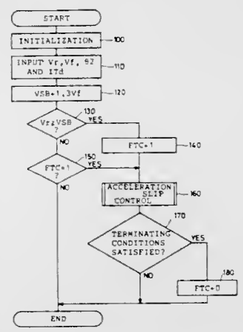
1. A passenger travel reservation and information system comprising an airline reservation computer having data storage means storing data on the availability of a passenger space on a plurality of airline flights, a plurality of terminals connected to said airline reservation computer, each of said terminals having means to enter flight reservation requests, and transmit each entered flight reservation request to said airline reservation computer, each flight reservation request specifying at least one of said flights, said airline reservation computer having means responsive to the receipt of a flight reservation request to book the reservation requested by the flight reservation request by reducing the indicated space available in the data storage means of said airline reservation computer on the flight specified in the flight reservation request, a cruise information computer connected to said airline reservation computer and having data storage means storing information on availability of passenger space on a plurality of cruises, each of said terminals having means to enter cruise information requests containing requests for information on available cruises and to transmit each entered cruise information request to said airline reservation computer, said cruise information requests containing a predetermined identifying data word, said airline reservation computer having means responsive to said predetermined identifying word in a received cruise information request from one of said terminals to transmit the cruise information request to said cruise information computer, said cruise information computer having means responsive to the receipt of a cruise information request from said airline reservation computer to locate information in the data storage means of said cruise information computer corresponding to the information requested in said cruise information request and to transmit the located cruise information to said airline reservation computer, said airline reservation computer having means responsive to the receipt of cruise information from said cruise information computer to transmit the received cruise information to the terminal which transmitted the cruise information request which resulted in the cruise information being transmitted to said airline reservation computer, each of said terminals having means to display cruise information transmitted thereto by said airline reservation computer.

4,788,644

METHOD FOR CONTROLLING AN ACCELERATION SLIP OF A VEHICLE

Takafumi Inagaki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 23, 1987, Ser. No. 41,541
Claims priority, application Japan, Apr. 23, 1986, 61-95458
Int. Cl.[4] B60T *8/00*
U.S. Cl. 364—426.03 **8 Claims**



1. A method for controlling a slip between a drive wheel of a vehicle and a road surface during acceleration, comprising the steps of:

detecting a slip rate of the drive wheel;

determining whether the detected slip rate is greater than a first preset value;

starting a slip control for reducing the slip rate when the detected slip rate is determined to be greater than the first preset value, the slip control including at least actuating a brake system of the drive wheel;

determining whether a brake force is less than a predetermined value;

determining whether the detected slip rate is less than a second preset value after said brake system is actuated, the second preset value being less than the first preset value; and

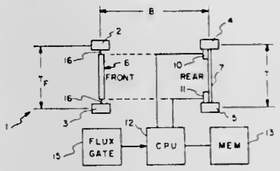
terminating the slip control after a preset time period during which the detected brake force is determined to be less than the predetermined value and the detected slip rate is determined to be less than the second preset value.

4,788,645

METHOD AND APPARATUS FOR MEASURING RELATIVE HEADING CHANGES IN A VEHICULAR ONBOARD NAVIGATION SYSTEM

Walter B. Zavoli, Palo Alto; Kenneth A. Milnes, Fremont, and Glenn R. Peterson, Los Gatos, all of Calif., assignors to Etak, Incorporated, Menlo Park, Calif.

Filed Mar. 21, 1986, Ser. No. 843,185
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—449 **42 Claims**



22. An apparatus for measuring a change in heading of a road vehicle during a turn, said vehicle having a pair of laterally spaced wheels which describe a track having a width comprising:

means for measuring the distance each one of said wheels is rotated during said turn;

means responsive to said distance measuring means for providing a signal ΔD having a magnitude corresponding to the difference in the measured distances, one of said wheels is rotated relative to the other during said turn;

means for measuring the velocity of said vehicle during said turn;

means responsive to said velocity measuring means for providing a signal V having a magnitude corresponding to said velocity;

means for providing a signal T having a magnitude corresponding to said track width; and

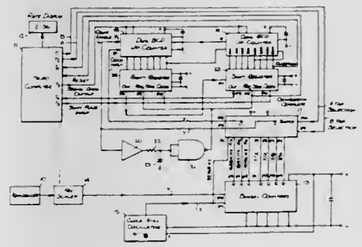
means for providing a signal $\Delta\theta_w$ in response to said signals ΔD, T, and V, wherein said signal $\Delta\theta_w$ corresponds to the change in heading of said vehicle during said turn.

4,788,646

FREQUENCY-TO-DIGITAL VALUE CONVERTER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Dec. 19, 1985, Ser. No. 810,760
Int. Cl.[4] G01R *23/02*
U.S. Cl. 364—484 **7 Claims**



1. A converter to convert an incoming variable data frequency which lies in a low frequency range whose upper limit is about 2,000 Hz to a corresponding digital value, the converter comprising:

(A) a digital computer;

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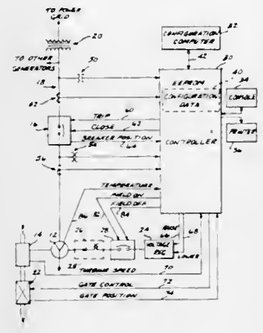
(B) an electronic UP counter having an enabling input and a count input;
(C) means controlled by the computer to derive from the incoming data frequency a data signal whose frequency is a selected sub-multiple of the data frequency;
(D) an electronic clock operating at a constant frequency which exceeds 10,000 Hz;
(E) means controlled by the computer to derive from the clock frequency a clock signal having periodic pulses whose repetition rate is a selected sub-multiple of the clock frequency;
(F) means to apply the data signal to the enabling input of the UP counter to enable the counter for an enabling period equal to a half cycle of the applied data signal;
(G) means to apply the clock signal to the count input of the UP counter whereby the count accumulated therein is determined by the number of pulses in the clock signal which appear during the enabling period; and
(H) means to enter the accumulated count in the computer which, on the basis of the data signal and the clock signal selected by the computer, then functions to calculate the time period (P) of the data frequency (F), from which it then calculates and provides a digital output corresponding to the incoming data frequency based on the equation $F=1/P$.

4,788,647

CONTROL SYSTEM FOR ELECTRIC POWER PLANT

Kirby L. McManus, Redmond, and Paul J. McManus, Seattle, both of Wash., assignors to Digitek, Inc., Kenmore, Wash.

Filed Sep. 24, 1986, Ser. No. 911,488
Int. Cl.[4] H02J *13/00*
U.S. Cl. 364—494 **2 Claims**



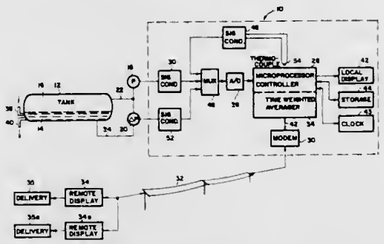
1. A control system for a power plant, the power plant comprising a generator including means for producing a generator field, a turbine for converting the flow of a fluid into mechanical power to drive the generator, a control means for regulating the flow of said fluid, a voltage regulator for controlling the generator field to thereby control the voltage produced by the generator, a bus, and a main circuit breaker for selectively connecting the generator to the bus, the control system comprising:
nonvolatile memory means for storing configuration data comprising a plurality of configuration parameters for the power plant;
input means for producing input data including data indicating a speed of the turbine, a position of the control means, a current and a voltage produced by the generator, a current and a voltage on the but, and a position of the main circuit breaker;
multitasking processing means for processing said input data in accordance with the configuration data, to thereby produce control signals including breaker signals for tripping and closing the main circuit breaker, voltage level signals for establishing a voltage setpoint for the voltage regulator, and a control signal for controlling the position of the control means; and,
edit means for enabling an operator to edit the configuration data, to thereby configure the control system for a particular power plant.

4,788,648

METHOD AND SYSTEM FOR MEASUREMENT OF A LIQUID LEVEL IN A TANK

Michael D. Ferretti, Nazareth; Brian L. Gabel, Northampton; James A. Horton, Bethlehem; Thomas S. Weiss, Sr., Emmaus, and Kevin K. Miller, Breinigsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 664,817, Oct. 25, 1984, Pat. No. 4,602,344. This application May 27, 1986, Ser. No. 867,853
Int. Cl.[4] G01F *23/00;* **F15B** *5/00;* **G06F** *15/24*
U.S. Cl. 364—509 **12 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 123 Pages)



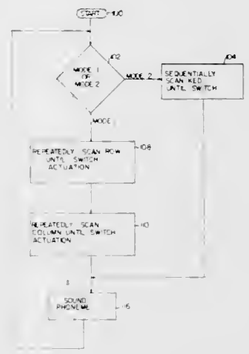
12. A method for measuring from a remote location the level of substance in a tank at a user location in which the level is subject to changes and updating a prior collected average level signal of the substance, comprising the steps of:
(a) continuously generating electrical signals representative of differential pressure within the tank and determining values of differential pressure form the generated differential pressure signals;
(b) generating a signal representative of the instantaneous level of substance within the tank in response to the determined values of differential pressure;
(c) generating a difference relationship signal between the prior collected average level signal and the instantaneous level signal;
(d) generating a relative weighting factor signal for the prior collected average level signal and the instantaneous level signal which weighting factor signal varies in accordance with the difference relationship signal;
(e) generating a new collected average level signal in response to the relative weighting factor signal;
(f) generaging signals representative of maximum and minimum levels within the tank and the time of occurrence of the maximum and minimum levels;
(g) receiving interrogation signals from the remote location and transmitting to the remote location the signals representative of the maximum and minimum levels and representative of the determined times in response to the interrogation; and,
(h) repeating steps (b) through (g) in which the new collected average signal becomes the prior collected average signal in step (c).

4,788,649

PORTABLE VOCALIZING DEVICE

F. William Shea, Bloomfield Hills; James P. Shea, Rochester Hills, and Patrick Lademan, Troy, all of Mich., assignors to Shea Products, Inc., Auburn Heights, Mich.

Filed Jan. 22, 1985, Ser. No. 693,117
Int. Cl.[4] G10L *5/00*
U.S. Cl. 364—513.5 **12 Claims**



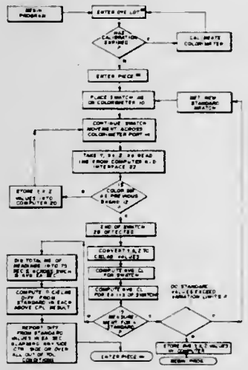
1. A portable vocalizing device comprising:
microprocessor means for storing and accessing data including programmed means for controlling said microprocessor,
input means for manually selecting said data,
synthesizer means for synthetically sounding the phonemes and phoneme combinations represented by said selected data,
display means for visibly indicating the alphabetic character of the phoneme and phoneme combinations represented by said selected data,
an electrical power supply circuit means for selectively connecting an electrical power source to said microprocessor means and said synthesizer means,
wherein said input means comprises a keyboard having a plurality of data identifiers and a switch means, each of said data identifiers having an illuminator,
means for selectively activating said illuminators in either of a first or a second mode,
wherein in said first mode said illuminators are repeatedly and sequentially illuminated in a predetermined row until a first activation of said switch means whereupon said illuminators are repeatedly and sequentially illuminated in a column selected upon said first activation, said repeated and sequential illumination in said column continuing until a second activation of said switch means whereupon the illuminated data identifier corresponds to the selected data, and
wherein in said second mode said illuminators are repeatedly and sequentially illuminated by row and column until activation of said switch means whereupon the illuminated data identifier corresponds to the selected data.

4,788,650

CONTINUOUS COLOR MEASUREMENT FOR SMALL FABRIC SAMPLES

Robert F. Willis; Robert H. Best, both of Greensboro; Vernon T. Daniel, Oak Ridge; Roland L. Connelly, and Ann Griesinger, both of Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sep. 19, 1986, Ser. No. 909,331
Int. Cl.[4] G01N *21/25*
U.S. Cl. 364—526 **20 Claims**



1. A method of determining the average color and/or excursions outside predetermined acceptable color limits of non-solid-shade fabrics, utilizing a colorimeter head, A/D converter, and computer means, comprising the steps of:
(a) continuously moving a swatch of non-solid-shade fabric with respect to the colorimeter head;
(b) continuously sampling the swatch with the colorimeter head, at a rate of at least about 100 readings/second, until the length of the entire swatch has been sampled and analog signals have been generated for all readings;
(c) continuously passing the analog signals from the colorimeter head directly to the A/D convertor;
(d) continuously converting the analog signals from the colorimeter head to digital signals utilizing the A/D convertor, and passing the digital signals to storage in the computer means; and
(e) after completion of step (b), analyzing the stored digital signals with the entire lenght of the computer means to determine average color and/or ecursions outside acceptable limits of color, for the non-solid-shade fabric swatch.

4,788,651

METHOD FOR IMPROVING TREAD NOISE BY RELATIVE ROTATION OF A RIB AND SIMULATING THE EFFECT THEREOF

David H. Parker, Brecksville; David G. Caruso, Cuyahoga Falls; Robert J. Blinn, North Canton, and Donald B. Thrasher, Brecksville, all of Ohio, assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio

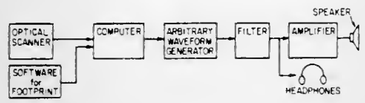
Continuation-in-part of Ser. No. 19,910, Feb. 27, 1987, Pat. No. 4,727,501. This application Feb. 22, 1988, Ser. No. 158,978
Int. Cl.[4] B60C *11/10*
U.S. Cl. 364—574 **5 Claims**

1. In a method for evaluating the level of objectionable noise associated with the operation of a tire by virtue of its tread contacting a road surface, comprising,
digitizing the tread design on a coordinate system so as to define load-supporting portions of the tread in contact with the pavement, and distinguish them in binary form from those portions of the tread which are not in contact, as multiple matrix elements;

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defining a generally arcuate profile of a leading or trailing edge of a footprint of the tread by fitting an equation to the edge;

sequentially performing a time ensemble summation, of the noise produced by each matrix element, over every matrix element on the entire circumferential surface;



converting the sequence of summation to a periodic analog signal;

converting the analog signal to a sound; and,

aurally evaluating the sound,

the improvement comprising,

rotating a predetermined rib over a preselected angular displacement relative to another rib.

4,788,652

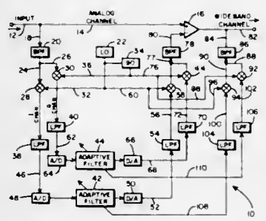
I-Q CHANNEL ADAPTIVE LINE ENHANCER

Scott R. Bullock, West Jordan; Patrick J. Smith, Salt Lake City, both of Utah, and Laurence D. Sawyer, Reading, Vt., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 26, 1987, Ser. No. 30,303

Int. Cl.[4] G06J *1/00;* **H04B** *3/14*

U.S. Cl. 364—602 **8 Claims**



1. An adaptive line enhancer comprising

input means for supplying an analog input sample signal,

oscillator signal means for supplying a local oscillator signal,

local oscillator delay means for providing a 90° delayed local oscillator signal,

I channel signal means comprising a first signal mixer means for mixing said analog input sample signal and said local oscillator signal and for supplying an I channel analog signal,

first analog-to-digital converter means coupled to receive said I channel analog signal and for providing a first digitized signal representative thereof,

first adaptive filter means coupled to receive said first digitized signal for providing a first adaptive filter output signal,

first digital-to-analog converter means coupled to receive said first adaptive filter output signal,

narrowband I channel means comprising second mixer means which receives said first adaptive filter output signal and said local oscillator signal for providing a first narrowband output signal,

Q channel signal means comprising third mixer means for mixing said analog input signal and said 90° delayed local oscillator signal and for supplying a Q channel analog signal,

second analog-to-digital converter means coupled to receive said Q channel analog signal and for providing a second digitized signal representative thereof,

second adaptive filter means coupled to receive said second digitized signal for providing a second adaptive filter output signal,

second digital-to-analog converter means coupled to receive said second adaptive filter output signal,

narrowband Q channel means comprising fourth mixer means which receives said second adaptive filter output signal and said 90° delayed local oscillator signal for providing a second narrowband output signal,

signal means coupled to receive said first and second narrowband output signals which is constructed to sum said first and second narrowband output signals, to provide a mixed narrowband output signal and to subtract said mixed narrowband output signal from said analog input sample signal in order to supply a wideband channel output signal, and

error means for sampling said wideband output signal to provide a wideband sample signal and for down converting said wideband sample signal to provide an adaptive control weight signal to both of said first and second adaptive filter means.

4,788,653

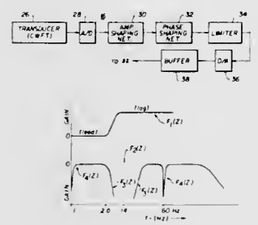
DIGITAL FILTER FOR POWER SYSTEM STABILIZER

Bruce C. Henderson, Troutville, and Rainer Hanisch, Roanoke, both of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 23, 1986, Ser. No. 945,741

Int. Cl.[4] G06F *15/31;* **H02K** *11/00*

U.S. Cl. 364—724.01 **16 Claims**



1. A method of digitally filtering signals in a power system stabilizer utilized in an electric power generation system exhibiting transitory electrical power oscillations and mechanical oscillations within a range of frequencies which is a function of said system, comprising the steps of:

(a) providing an analog signal proportional to changes in line frequency of the power generation system;

(b) converting said analog signal to a digital signal;

(c) providing a multi-stage digital filter having a phase lead characteristic relative to said power oscillations, a torsional reject characteristic relative to mechanical resonances of said system, a phase lag characteristic which enhances said torsional reject characteristic, a substantially zero DC gain characteristic, and a notch filter characteristic at said line frequency;

(d) feeding said digital signal through said digital filter;

(e) converting the filtered digital signal back to an analog signal; and

(f) coupling the filtered analog signal to circuit means controlling said power generation system.

4,788,654

DEVICE FOR REAL TIME PROCESSING OF DIGITAL SIGNALS BY CONVOLUTION

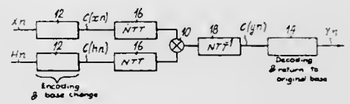
Pierre Duhamel, 97, avenue de Verdun 92130, and Hendrik Hollmann, 21, rue d'Estienne d'Orves 92130, both of Issy Les Moulineaux, France

Filed Sep. 23, 1985, Ser. No. 778,963

Claims priority, application France, Sep. 24, 1984, 84 14624

Int. Cl.[4] G06F *15/31, 15/332*

U.S. Cl. 364—728.01 **12 Claims**



1. A device for real time processing of digital signals by convolution, comprising:

(a) multiplier means having a plurality of inputs and an output;

(b) a plurality of circuits for performing a Numerical Theoretic Transform (NTT) with a modulus M of the form

$$2^p - 2^q + 1,$$

where "P" and "q" are integers, each of said NTT circuits being connected to one of said multiplier inputs for delivering said NTT to the associated one of said inputs;

(c) a reverse transformation circuit for performing an inverse Numerical Theoretic Transform (NTT^{-1}), said reverse transformation circuit connected to said output of said multiplier means for providing the NTT^{-1} transform of said output;

(d) a first unit consisting of (d1) means connected to each of said NTT circuits for performing an arithmetic base change and (d2) means for encoding, said first unit connected to receive an input digital signal and deliver an encoded signal to the respective one of said NTT circuit;

(e) a second unit consisting of (e1) means for decoding and (e2) means for return to the original arithmetic base of the output of said circuit for performing NTT^{-1}, said means being so arranged that to a number X modulo M representing one of said input signals in the original (powers of 2) base, there corresponds, in the new base, a number $x_{p-1} \ldots x_{p-2} \ldots x_1 x_0$ such that

$$X = \sum_{i=0}^{P-q-1} f_i x_i + \sum_{j=0}^{q-1} e_j \cdot x_{j-q+P} \text{ (modulo } M\text{)} \qquad (2)$$

where f_o is an integer of from 1 to N−1 and f_i and e_j are numbers that fulfill the following conditions:

$2f_{p-q-1} = e_o + f_o$ (mod M) and $2e_{q-1} = -f_o$ (mod M)

$2f_i = f_{i+1}$, $2e_i = e_{i+1}$ for the other values of index i

where "p", "q", and P are integers; and where "i" and "j" are integer indicies.

4,788,655

CONDITION CODE PRODUCING SYSTEM

Yozo Nakayama, Yokohama; Masahito Kubo, Sagamihara, and Yuuichi Yawata, Chigasaki, all of Japan, assignors to Panafacom Limited, Yamato, Japan

Filed Jun. 16, 1986, Ser. No. 874,700

Claims priority, application Japan, Jun. 17, 1985, 60-131051

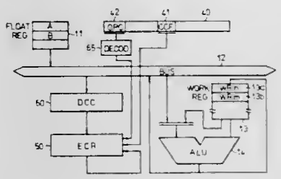
Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—748 **10 Claims**

1. A condition code producing system for an arithmetic unit having a bus, said arithmetic unit being controlled by a micro program of microinstructions and operating on precision and data portions of binary floating point data, said condition code producing system producing a condition code having a plurality of bits and describing an attribute of the binary floating point data, said condition code producing system comprising:

storing means for storing each bit of the condition code;

detection signal producing means for producing a plurality of detection signals from values of predetermined bits of the binary floating point data transferred to said bus within said airthmetic unit by an executing micro instruction performing data transfer, the executing micro instruction being one of the micro instructions constituting said



micro program, the executing micro instruction comprising a condition control field constituted by a plurality of bits having values depending on at least the precision and data portions of the binary floating point data being transferred; and

setting means for producing a new condition code from said plurality of detection signals and from the condition code already stored in said storing means depending on a value of said condition control field and for setting said new condition code in said storing means.

4,788,656

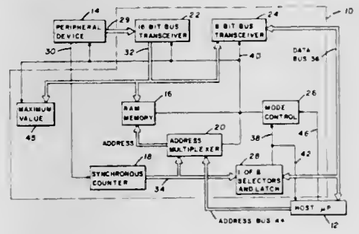
CACHE MEMORY AND PRE-PROCESSOR

Wayne I. Sternberger, Columbia, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed May 25, 1984, Ser. No. 614,226

Int. Cl.[4] G06F *7/00*

U.S. Cl. 364—900 **13 Claims**



1. An apparatus for interfacing between a peripheral device which outputs Q-bit data words and a host processor having an N bit data bus, wherein data are acquired from the peripheral device during an acquisition mode and retrieved from said interface apparatus during a retrieval mode, said apparatus comprising:

a plurality of single port memories, each memory having a M byte by N bit memory space;

a first bus transceiver means for connecting, during the acquisition mode, a different N bit portion of said Q bit data word to each of said plurality of memories;

a second bus transceiver means for directly connecting, during the retrieval mode, the data lines of each of said plurality of memories to the host processor N bit data bus;

a counter means for generating an incremental address each time the peripheral generates a new data word;

an address multiplexing means, for connecting the address lines of each of said plurality of single port memories to

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said counter means during the acquisition mode, and for directly connecting the address lines of each of said plurality of single port memories to certain most significant bits of he host processor address bus during the retrieval mode; and,

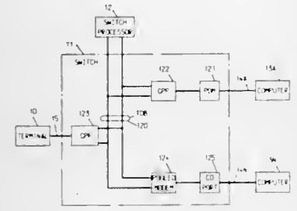
a selector means, operably connected to each of said plurality of single port memories, for alternatively enabling each of said plurality of single port memories in response to certain least significant bits of the host processors address bus during the retrieval mode.

4,788,657

COMMUNICATION SYSTEM HAVING RECONFIGURABLE DATA TERMINALS

Neal M. Douglas, Middletown; Kenneth M. Keverian, Westfield; Michael J. Miracle, Holmdel, and Gerald H. Smith, Freehold, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems, Inc., Morristown, N.J.

Continuation of Ser. No. 565,744, Dec. 27, 1983, abandoned.
This application Dec. 12, 1986, Ser. No. 941,568
Int. Cl.[4] G06F *13/14, 13/10, 9/06*
U.S. Cl. 364—900 **11 Claims**



1. A communication system comprising a terminal, a system controller, and a plurality of communication devices switchably connectable to said terminal, said terminal including

means for generating and transmitting one of a group of reconfiguration signals to said controller identifying one of said plurality of communication devices to which a connection is requested, and

means responsive to a predetermined terminal reconfiguration command received from said controller including parameter data for reconfiguring an operating parameter of said terminal in accordance with said reconfiguration command and

said controller including

means solely responsive to said one of a group of reconfiguration signals received from said terminal for selecting said parameter data and for transmitting it to said terminal in said predetermined reconfiguration command, said selecting and transmitting means operable prior to said controller establishing communication between said terminal and one of said plurality of communication devices specified in said one of a group of reconfiguration signals.

4,788,658

APPARATUS FOR CONNECTING COMPUTER COMPONENTS

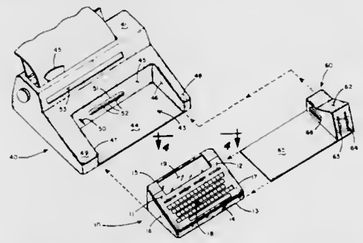
Charles E. Hanebuth, 11177 Vessey Ct., Bloomington, Minn. 55437-3141

Filed Jul. 3, 1986, Ser. No. 881,974
Int. Cl.[4] G06F *15/02, 15/16*
U.S. Cl. 364—900 **8 Claims**

1. Apparatus for temporarily mechanically containing and electrically connecting plural computer components together into a unitary assembly, comprising:

(a) a portable lap-top computer module, said computer module including a first housing having a top surface, a bottom surface, a front surface, opposite side surfaces and a back surface, one of said surfaces including a first electrical connector member;

(b) a first peripheral equipment assembly, said assembly including a second housing defining a U-shaped channel for receiving and containing said lap-top computer module within said U-shaped channel, and at least one peripheral component contained within said second housing and capable of being used in conjunction with said lap-top computer; and



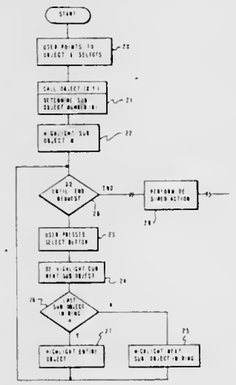
(c) said first peripheral equipment assembly including means receiving said first electrical connector for electrically coupling said lap-top computer with said peripheral equipment assembly for transmission of power and data representing signals between said lap-top computer and said peripheral equipment assembly when said lap-top computer is fitted into said U-shaped channel.

4,788,659

SCREEN BUILDING TO FACILITATE LATER SELECTION OF PORTIONS THEREOF

Richard E. Berry, Georgetown, and Thomas M. Ruiz, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1984, Ser. No. 666,846
Int. Cl.[4] G06F *15/62, 15/60, 3/037*
U.S. Cl. 364—900 **8 Claims**



5. In a device controlled display computer system including a device with a selection button, a method of generating a display screen having portions of an object displayed thereon such that a selective one of said portions may subsequently be selected and displayed in a prominent manner, said method comprises the steps of:

generating in a sequential order said portions which define said object;

storing said sequential order in which said portions are generated in said system;

positioning a selector coincident with a one of said plurality of portions of said object;

causing, upon a first activation of said selection button, said one of said plurality of portions to be displayed in a more prominent manner on said screen relative to the remaining portions of said object; and

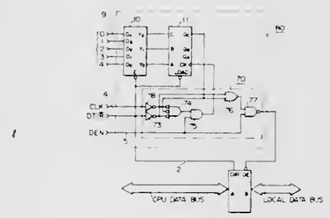
causing, upon a second activation of said selection button, an adjacent portion of said plurality of portions to be displayed on said screen in a more prominent manner relative to the remaining portions including said one of said portions based on said order between said portions without moving said selector.

4,788,660

DATA BUS BUFFER CONTROL CIRCUIT

Takeshi Arizono, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,182
Claims priority, application Japan, Sep. 18, 1985, 60-208019
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—900 **5 Claims**



1. A data bus buffer control circuit responsive to at least one control signal for controlling a data bus buffer connecting a CPU data bus to a local data bus to permit transfer of data through said data bus buffer from said local data bus to said CPU data bus during a read cycle and to permit transfer of data through said data bus buffer from said CPU data bus to said local data bus during a subsequent write cycle, said control circuit comprising:

delay selection means for selecting an amount of delay corresponding to a number of clock periods per read cycle, said delay selection means being capable of selecting a plurality of different amounts of delay;

a counter responsive to said delay selection means for counting through said number of clock periods from a commencement of a next subsequent write cycle and providing a write enable output after a delay period from the commencement of said next subsequent write cycle corresponding to said number of clock periods; and

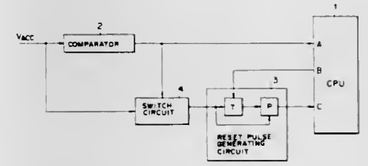
control logic means responsive to said write enable output of said counter and said at least one control signal for controlling said data bus buffer during a read cycle to permit data to pass through said data bus buffer from said local data bus to said CPU data bus and for controlling said data bus buffer to prevent data on said CPU data bus from passing through said data bus buffer during said delay period and, after said write enable output of said counter is provided, to allow data on said CPU data bus to pass through said data bus buffer to said local data bus.

4,788,661

MICROCOMPUTER RESET CIRCUIT

Tetsuya Morita, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1986, Ser. No. 923,381
Claims priority, application Japan, Nov. 1, 1985, 60-245358
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—900 **4 Claims**



1. A reset circuit for resetting the operation of a microcomputer operating according to a program stored therein comprising:

a reset pulse generator for outputting reset pulses to said microcomputer; and

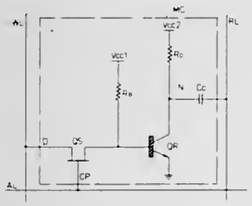
a timer for establishing a first time interval when said reset pulse is to be produced and acting on said reset pulse generator to produce said reset pulse at the end of said first time interval, said microcomputer including program-controlled means for periodically providing a reset inhibiting pulse within a second time interval shorter than said first time interval in normal execution of said program and outputting said reset inhibiting pulse to said timer to reset the operation thereof so that failure of said microcomputer to output a reset inhibiting pulse within said first time interval resets said microcomputer.

4,788,662

SEMICONDUCTOR MEMORY DEVICE USING RESONANT-TUNNELING HOT ELECTRON TRANSISTOR

Toshihiko Mori, Isehara, Japan, assignor to Director-General, Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 61,288
Claims priority, application Japan, Jun. 14, 1986, 61-138630
Int. Cl.[4] G11C *11/40, 13/00*
U.S. Cl. 365—159 **11 Claims**



1. A semiconductor memory device comprising:

an address line;

a write line;

a read line; and

a memory cell connected to said address line, said write line and said read line,

said memory cell comprising a memory active element, a power source coupled to a base of said memory active element through a first resistor, a switching element coupled between said write line and the base of said memory active element and controlled by a signal from said address line, and a data transfer element coupled between

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said read line and a collector of said memory active element, said collector being coupled to the power source through a second resistor,

said memory active element having a plurality of stable states and comprising an emitter potential barrier layer constituted by an emitter layer, a base layer and a superlattice layer formed between said emitter layer and said base layer, and a collector potential barrier layer formed between said base layer and a collector layer,

a base-emitter voltage versus current characteristic of said memory active element having at least one differential negative resistance region,

said data transfer element during a read operation of said semiconductor memory device transferring to said read line a signal corresponding to one of said plurality of stable states of said memory active element.

4,788,663

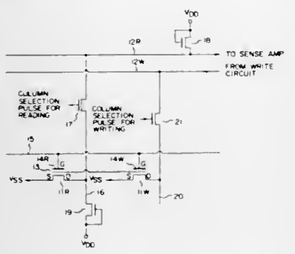
NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH A LIGHTLY-DOPED DRAIN STRUCTURE

Sumio Tanaka, Tokyo; Shinji Saito, Yokohama; Shigeru Atsumi, Tokyo, and Nobuaki Ohtsuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1987, Ser. No. 42,877

Int. Cl.⁴ G11C *11/34, 7/00;* H01L *29/78*

U.S. Cl. 365—185 **17 Claims**



1. A nonvolatile semiconductor memory device comprising memory cells, each including a read transistor and a write transistor which share a common floating gate and which have two separated drains, said read transistor being connected to a read bit line and said write transistor being connected to a write it line; and

voltage-biasing means connected to said read bit line for biasing the voltage of said read bit line;

wherein the hot electron injection rate in said read transistor is lower than that in said write transistor, and the impurity concentration of a drain diffusion layer of said read transistor is lower than that of said write transistor.

4,788,664

WORD LINE DRIVE CIRCUIT

Youichi Tobita, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1986, Ser. No. 909,938

Claims priority, application Japan, Dec. 10, 1985, 60-278655

Int. Cl.⁴ G11C *13/00*

U.S. Cl. 365—189 **11 Claims**

4. A word line drive circuit for a random access memory to provide a drive signal having a voltage greater than a voltage V supplied from an external power supply for said circuit, said circuit comprising

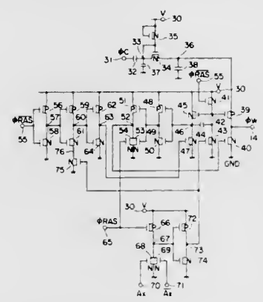
a first power supply terminal and a second power supply terminal,

means providing said first power supply terminal with a voltage greater than the voltage supplied from an external power supply,

a first FET and a second FET which are connected in series and between said first power supply terminal and said second power supply terminal,

a junction of said first FET and said second FET being connected to an output terminal at which said drive signal is produced and said first FET having an opposite conductivity to said second FET,

a boosting capacitor having a first electrode connected to a gate of said first FET and a second electrode connected to



a node to which a first control signal having a substantially inverse phase to that of said drive signal is supplied, and

drive means which supplies a second control signal to said gate of said first FET,

said second control signal having the same phase as that of said first control signal, and a voltage of said second control signal being increased by said boosting capacitor to a level sufficient to keep said first FET nonconductive.

4,788,665

SEMICONDUCTOR MEMORY

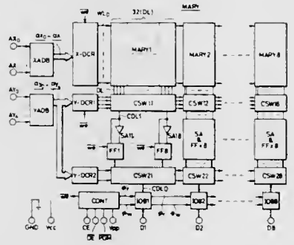
Minoru Fukuda, Tateno; Hideaki Takahashi, Koganei, both of Japan; June Sugiura, Troy, N.Y.; Fumio Tsuchiya, Kodaira, and Toshimasa Kihara, Tachikawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 770,576, Aug. 29, 1985, Pat. No. 4,691,298. This application Jul. 21, 1987, Ser. No. 75,986

Claims priority, application Japan, Sep. 26, 1984, 59-199576

Int. Cl.⁴ G11C *8/00*

U.S. Cl. 365—189 **22 Claims**



1. In a semiconductor memory, the improvement for writing information comprising:

a memory array, having plural data lines; including a plurality of semiconductor nonvolatile memory cells which can be erased and electrically written into;

external terminal means for receiving serially applied input signals to be written into the memory array;

first common data lines;

an external means for receiving a writing voltage;

a plurality of writing circuits, each having a terminal coupled to said external means and having an input and an output;

a first selector means and a second selector means; and

a plurality of storage circuit means, each having an input and an output, for temporarily storing respective input signals,

wherein said seocnd selector means seqeuntially feeds said input signals, via a plurality of signal paths, to the inputs of said plurality of storage circuit means,

wherein said plurality of writing circuits correspond in number to said first common data lines and its outputs are coupled to said first common data lines,

wherein said plurality of storage circuit means correspond in number to said writing circuits and its outputs are operatively connected to the inputs of said writing circuits for providing said temporarily stored signals to said writing circuits, and

wherein said first selector means, in response to address signals, operatively connects said first common data lines to said plural data lines for writing the stored data into the memory cells, wherein said plural data lines are greater in number than said first common data lines.

4,788,666

MEMORY UNITS WITH NORMAL AND BIT SELECT WRITE MODES

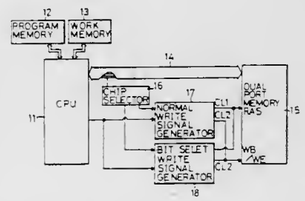
Tomoaki Hattori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 9, 1988, Ser. No. 165,926

Claims priority, application Japan, Mar. 13, 1987, 62-59797

Int. Cl.⁴ G11C *7/00, 8/00, 11/34*

U.S. Cl. 365—189 **3 Claims**



1. A memory unit comprising a memory element operated in response to a RAS clock signal and a bit select clock signal to selectively perform a normal write operation for storing data in a given storage area thereof or a bit select write operation for operating a data stored in a predetermined storage area thereof with respect to a newly supplied data to store the results in the same storage area where the data has been stored; a first timing signal generator for supplying to said memory element the RAS clock signal and the bit select clock signal at a first timing whereat said memory element performs the normal write operation; a second timing signal generator for supplying to said memory element the RAS clock signal and the bit select clock signal at a second timing whereat said memory element performs the bit select write operation; control means for generating said data and address data including at least one bit data assigned to specify either the normal write operation and the bit select write operation, and for transferring to said first and second timing signal generators respectively a first write command signal; and data select means operated in response to said at least one bit data to send a second write command signal to a selective one of said first and second timing signal generators, said selective one of said generators being operated in response to said first and second write command signals to drive for effecting a corresponding one of operational modes of said memory element.

4,788,667

SEMICONDUCTOR MEMORY DEVICE HAVING NIBBLE MODE FUNCTION

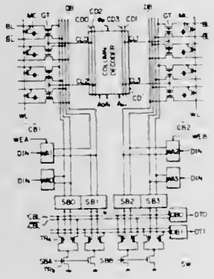
Masao Nakano, Kawasaki, and Yoshihiro Takemae, Tokyo, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 11, 1986, Ser. No. 895,113

Claims priority, application Japan, Aug. 16, 1985, 60-179445

Int. Cl.⁴ G11C *7/00*

U.S. Cl. 365—193 **3 Claims**



1. A semiconductor memory device having a nibble mode function comprising:

memory cell arrays divided into two groups of first and second cell blocks;

data bus lines provided separately to each of said first and second cell blocks;

sense amplifiers provided separately to each of said data bus lines;

a column decoder connecting between bit lines, provided in said memory cell array, and corresponding data bus lines based on address signals and gate signals in a selection state;

switching means for switching between sense amplifiers belonging to said first cell block and sense amplifiers belonging to said second cell block and for connecting these sense amplifiers to output buffers; and

a clock signal generating means for generating said gate signals, said gate signals being generated in such a way that each respective gate signal is raised in response to a corresponding leading edge of a column address strobe signal and is allowed to fall in response to a trailing edge of said column address strobe signal in said nibble mode.

4,788,668

DYNAMIC TYPE MEMORY DEVICE INCLUDING A REFERENCE POTENTIAL GENERATING CIRCUIT ARRANGEMENT

Yoshio Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 31, 1986, Ser. No. 824,647

Claims priority, application Japan, Feb. 1, 1985, 60-18123

Int. Cl.⁴ G11C *7/00, 11/24*

U.S. Cl. 365—202 **6 Claims**

1. A dynamic type memory device comprising:

a plurality of memory cells each having one transistor and one capacitor;

N first bit lines each of which is connected to the memory cells on the same column;

N second bit lines;

a plurality of word lines each of which is connected to the memory cells on the same row;

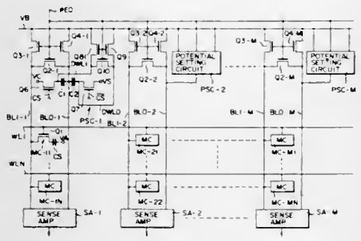
a power source terminal to which a power source voltage is applied and a reference potential terminal which is kept at a reference potential;

N first capacitors each having a first terminal directly con-

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nected to each of said second bit lines and a capacitance of ½ of each capacitor of said memory cells;

N second capacitors each having a first terminal directly connected to each of the second bit lines and a capacitance of ½ of each capacitor of said memory cells; and



potential setting means for connecting said power source terminal to said second bit lines through said first capacitors and also connecting said reference potential terminal to said second bit lines through said second capacitors to set the potentials of said second bit lines in a data readout mode.

4,788,669

ELECTRONIC TIMEPIECE

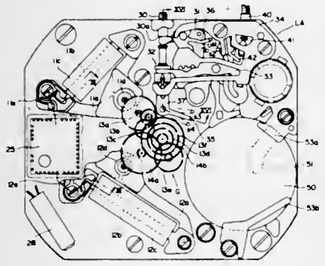
Yasuo Kamiyama, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 689,262, Jan. 2, 1985, abandoned. This application Jun. 22, 1987, Ser. No. 65,079

Claims priority, application Japan, Jan. 13, 1984, 59-4404

Int. Cl.[4] G04B *19/00;* **G04F** *5/00*

U.S. Cl. 368—80 **12 Claims**



1. An electronic timpiece having a mechanical analog time-display with hour, minute and second hands, said minute hand rotating about an axis, said electronic timepiece comprising:

a case;

a circuit chip disposed in said case at a peripheral portion thereof;

a crystal oscillator disposed at a peripheral portion of the case and adjacent said circuit chip;

first and second motors disposed in said case adjacent said circuit chip at opposite sides thereof;

a first gear train disposed between said first motor and said minute and hour hands for driving said minute and hour hands;

a second gear train disposed between said second motor and said second hand for driving said second hand;

supporting plates for supporting said first and second gear trains;

an indicator hand;

a third gear train for driving said indicator hand;

said second motor, circuit chip and first gear train being disposed to form a space therebetween to enable positioning of said third gear train therein to facilitate driving of said indicator;

a part of said supporting plates being extended into said space for supporting said indicator hand and third gear train;

stem axially shiftably provided in said case adjacent said gear trains;

a lever assembly disposed in said case adjacent the gear trains and operatively connected to the stem for changing the operational state of the timepiece; and

a battery disposed in said case between said lever assembly and one of said motors.

4,788,670

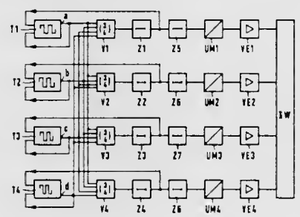
CLOCK VOLTAGE SUPPLY

Hermann Hofmann, Erlangen, Fed. Rep. of Germany; David Johnson, Portland, Oreg.; Werner Schirl, Nuremberg, and Hans-Peter Troendle, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,428

Int. Cl.[4] G04F *8/00;* **H03L** *7/00;* **H03K** *1/02*

U.S. Cl. 368—119 **5 Claims**



1. A clock voltage supply for generating multiple parallel clock signals at a predetermined reference frequency for an electronic control circuit having N phase-controllable clocks and N voters, each phase controllable clock having an output which is connected to one input of each of N voters, wherein N is an integer greater than one and the parallel clock signals are synchronous to each other in frequency and phase, comprising:

a concatenation of a plurality of logic circuits for combining input signals and output signals in each of the voters;

means for providing a delay time for the concatenation of a plurality of logic circuits, wherein the delay time corresponds to a predetermined reference value;

at least one delay element having a first delay time, the delay element being connected downstream of one of the voters, the voter having a predetermined delay time, the predetermined delay time being the sum of the first delay time and a corresponding voter delay time, the corresponding voter delay time being equal to an integer multiple of the period of a predetermined reference frequency; and

means for controlling the phase of the parallel clock signals utilizing a clock output signal and the output signal of the delay element associated therewith, the clock output signal being an actual phase input and the output signal being a reference phase value.

4,788,671

INFORMATION RECORDING AND REPRODUCING APPARATUS FOR EFFECTING SIMULTANEOUS RECORDING AND REPRODUCTION BUT AT DIFFERENT RATES

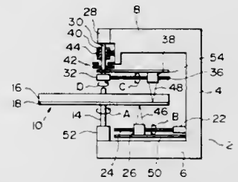
Shigeto Kanda, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1984, Ser. No. 686,152

Claims priority, application Japan, Jan. 9, 1984, 59-834

Int. Cl.[4] G11B *11/00*

U.S. Cl. 369—13 **4 Claims**



1. An information recording and reproducing apparatus comprising:

means for supporting a disk-shaped recording medium, said recording medium having opposing surfaces which allow information recording and reproduction from the opposing surfaces respectively, with respect to the same information;

a recording head positioned so as to be at one surface of said recording medium supported by said supporting means to record information on said recording medium;

a reproducing head positioned so as to be at the opposing surface of said recording medium supported by said supporting means to reproduce information recorded on said recording medium; and

rotary drive means for independently driving at least two of said supporting means, said recording head and said reproducing head about a geometrically common axis so that the relative speed in the circumferential direction of said recording medium between said recording medium and said recording head is different from that between said recording medium and said reproducing head.

4,788,672

METHOD AND APPARATUS FOR CONTROLLING RENEWAL OF DATA IN OPTICAL DISC MEMORY

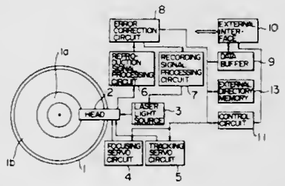
Takashi Toyooka; Norio Ohta, both of Sayama; Yutaka Sugita, Tokorozawa; Kazuo Shigematsu, Saitama, and Atsushi Saito, Ichikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,006

Claims priority, application Japan, Jul. 29, 1985, 60-165775

Int. Cl.[4] G11B *7/00*

U.S. Cl. 369—32 **23 Claims**



1. A method for controlling the reading and writing of data in an optical disc memory, such as an erasable optical disc memory, which stores data and directory data in respective regions, comprising the steps of transferring directory data written in said optical disc memory to an external directory memory, and controlling write-in and read-out of data to and from the optical disc memory by using the directory data stored in said external directory memory.

4,788,673

MULTI-DISK PLAYER SYSTEM

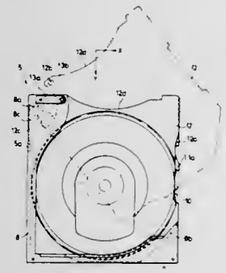
Yuji Ikedo; Takahiro Okajima; Masahiko Miyake, and Tsutomu Miyakawa, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 837,121, Mar. 7, 1986, Pat. No. 4,730,291. This application Jul. 31, 1987, Ser. No. 63,041

Claims priority, application Japan, Mar. 8, 1985, 60-46208; Mar. 8, 1985, 60-46209; Mar. 8, 1985, 60-46211; May 15, 1985, 60-104301

Int. Cl.[4] G11B *23/03*

U.S. Cl. 369—36 **6 Claims**



1. A disk container comprising a plurality of stacked trays on which disks are to be placed, and a magazine for accommodating said trays, at least one magazine element at a side of said magazine having partitions defined by spaced grooves sized to the thickness of said trays, and wherein said trays have peripheral portions fitted within said grooves with said tray peripheral portions overlapping the partitions with the trays fully positioned within the magazine, each tray having a manually accessible claw, and said claws being arranged in a forwardly and rearwardly offset alternate manner when received in said magazine, means for supporting said plurality of stacked trays for rotation about a common pivot axis parallel to the direction of stacking of said trays, and wherein said adjacent tray claws are at radially offset positions with respect to said common pivot axis to facilitate selective pivoting of a tray from a position internally of said disk container magazine for permitting placement of a disk on said selected tray or removal of said disk therefrom.

4,788,674

OPTICAL DISC RECORD REPRODUCING APPARATUS

Shigemi Maeda, Yamatokoriyama; Toshihisa Deguchi, Nara; Takeshi Yamaguchi, Tenri, and Shozou Kobayashi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1986, Ser. No. 902,593

Claims priority, application Japan, Sep. 2, 1985, 60-194120; Sep. 2, 1985, 60-194121; Nov. 25, 1985, 60-265574

Int. Cl.[4] G11B *7/00, 27/36*

U.S. Cl. 369—54 **8 Claims**

1. An optical disc recording and reproducing apparatus, comprising:

laser beam generating means for producing laser beams of variable power;

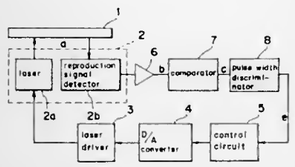
recording means for recording information bit signals in the form of bits on an optical disc using laser beams of sequentially varied power produced by said generating means over a plurality of predetermined time periods; and

power detecting means for detecting an optimal laser beam power, including

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means for producing information pulse signals corresponding to the bits recorded by said recording means over said plurality of time periods,

means for comparing pulse widths of said information pulse signals with a reference pulse width and producing an



output signal when said information pulse widths are at least equal to said reference pulse width, and

means responsive to the output signal from said comparing means for determining the optimal laser beam recording power.

4,788,675

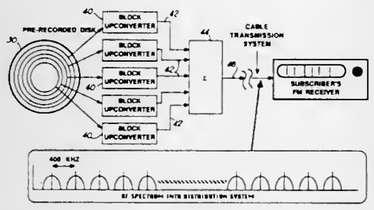
MUSIC DELIVERY SYSTEM

Markley L. Jones, 5143 Roswell Rd. #4, Atlanta, Ga. 30342; Lee Edwards, 2406 Woodward Way N.W., Atlanta, Ga. 30305, and John H. Bordelon, 1132 Research Dr., Marietta, Ga. 30066

Continuation-in-part of Ser. No. 538,573, Oct. 3, 1983, abandoned. This application Oct. 10, 1986, Ser. No. 917,526

Int. Cl.[4] H04J *1/08;* **G11B** *5/02*

U.S. Cl. 370—69.1 **16 Claims**



9. An arrangement for delivering audio information comprising:

means for generating electrical signals corresponding to a plurality of different pieces of audio information;

means for dividing the plurality of different pieces of audio information into several groups, and frequency multiplexing the signals within each group so that each group thus multiplexed forms a first composite signal;

means for recording these first composite signals onto separate tracks of a single wideband recording medium;

means for playing the recording medium to reproduce simultaneously the several first composite signals;

means for frequency "stacking" the several first composite signals to form a second composite signal having a bandwidth wider than that of said first composite signals, the second composite signal being a multiplexed signal composed of the several first composite signals each shifted in frequency appropriately for transmission through a transmission medium;

means for transmitting the second composite signal to a subscriber;

means for demultiplexing at the subscriber from the second composite signal a particular one of said plurality of pieces of audio information; and

means for transducing the demultiplexed signal into an audio signal.

4,788,676

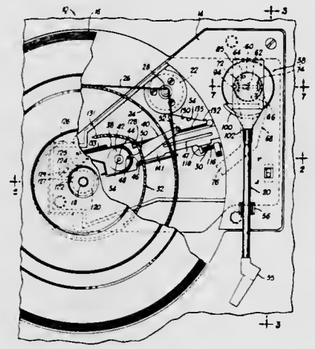
RECORD PLAYER

James T. Dennis, 2312 NW. 57th St., Oklahoma City, Okla. 73112

Filed Dec. 19, 1986, Ser. No. 944,462

Int. Cl.[4] G11B *17/08*

U.S. Cl. 369—176 **25 Claims**



1. A record player comprising:

a base;

a tone arm;

a tone arm supporting member on said base, said supporting member having an upwardly extending bearing member and at least one aperture defined therein adjacent said bearing member;

a tone arm shaft having at least one ear member extending axially from one end thereof, said tone arm shaft being concentrically disposed with respect to said supporting member with said ear member extending upwardly from beneath said base and through the aperture defined in said supporting member, said tone arm having an end that receives said ear member; and

means engaging said ear member and said the arm for supporting said tone arm and said tone arm shaft on said bearing member.

4,788,677

DISK SUPPORT MECHANISM IN A PLAYER

Yuji Ikedo, and Kenichi Takahashi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 5, 1987, Ser. No. 11,477

Claims priority, application Japan, Feb. 5, 1986, 61-24881; Feb. 5, 1986, 61-24884

Int. Cl.[4] G11B *3/10*

U.S. Cl. 369—223 **6 Claims**

1. A disk player comprising:

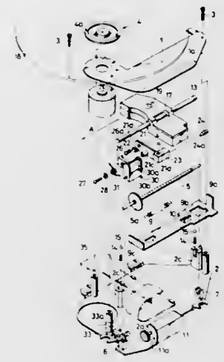
a support mechanism including a first plate-like support member with an opening in a main surface thereof;

a turntable mounted on said first support member for bearing and rotating a disk on a disk carrying surface adjacent said opening;

guiding means provided on said first support member and including a linear sliding member and holding means; and

a carriage which carries optical pickup means including an objective lens for causing a spotlight to impinge onto a recording surface of a disk and which slides on said sliding member and is guided by said guiding means in a moving direction substantially parallel to said disk carrying surface of said turntable, said carriage being held against said first support member by said holding means on a first side of said carriage with respect to said linear sliding member so as to be guided by said guiding means, said objective

lens being disposed on a second side of said carriage opposite said first side with respect to said linear sliding member and being disposed adjacent said opening of said first support member.



4,788,678

OPTICAL INFORMATION RECORDING MEDIA SUBSTRATE

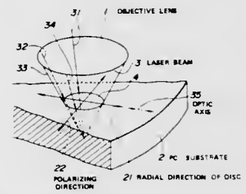
Akihiko Yoshizawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1986, Ser. No. 932,428

Claims priority, application Japan, Nov. 20, 1985, 60-260615

Int. Cl.[4] G11B *7/24, 5/84*

U.S. Cl. 369—284 **5 Claims**



1. An optical information recording media substrate comprising: a plane shaped article molded from a thermo-plastic resin having optical anisotropic properties, said article including a plane surface, an optical recording media and an optic axis set in a direction approximately parallel to said plane surface, whereby a light beam perpendicular to said plane surface is condensed and transmitted through said plane surface and led to a recording surface formed on said optical recording media.

4,788,679

PACKET SWITCH WITH VARIABLE DATA TRANSFER RATE LINKS

Hideki Kataoka, Tokorozawa; Tatsuro Takahashi, Tokyo; Shiro Kikuchi, Mitaka; Naoaki Yamanaka, Yokohama; Hajime Sakakibara, Musashino, and Miki Hirano, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 83,646

Claims priority, application Japan, Sep. 2, 1986, 61-206140; Sep. 3, 1986, 61-206966

Int. Cl.[4] H04J *3/26*

U.S. Cl. 370—60 **4 Claims**

1. A packet switch with variable data transfer rate links, which forms a packet switching network of a packet switching system, comprising:

a multi-stage structure including a plurality of unit packet switches, each of said unit packet switches including:

connections for a plurality of incoming trunks;

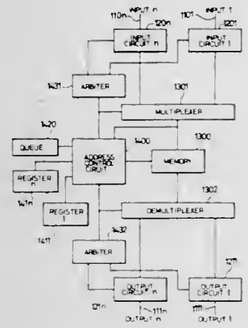
a plurality of input circuits connected to said connections for the plurality of incoming trunks, respectively, and each having a FIFO memory;

connections for a plurality of outgoing trunks;

a plurality of output circuits connected to said connections for the plurality of outgoing trunks, respectively, and each having a FIFO memory;

a buffer memory which is used in common for the incoming trunks and the outgoing trunks, by writing data received from the incoming trunks and reading it out for transfer to the outgoing trunks, the FIFO memory of each of the input circuits for temporarily storing the received data from the corresponding incoming trunk, the FIFO memory of each of the output circuits for temporarily storing the data to be sent to the corresponding outgoing trunk;

first signal lines, respectively connected to said input circuits, for providing information indicating the arrival of data at the corresponding input circuit from the incoming trunk connected thereto;



a first arbiter, connected to said first signal lines, for detecting data-process requests from said input circuits on the basis of the information provided on said first signal lines and for effecting priority control for servicing the requests;

second signal lines, respectively connected to said output circuits, for providing information indicating whether or not data transfer to the corresponding output circuit is possible; and

a second arbiter connected to said second signal lines, for detecting data-process requests from said output circuits on the basis of the information provided on said second signal lines and for effecting priority control for servicing the requests;

links interconnecting the respective stages of the unit packet switches, for performing asynchronous packet data transfer by handshaking; and

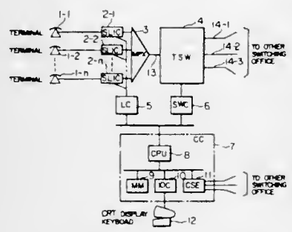
a control circuit for controlling the data transfer by handshaking while dynamically changing the capacity of each of said links within a range in which the sum of data transfer rates of said links accommodated in each unit packet switch is smaller than the operational speed of said buffer memory in said unit packet switch.

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4,788,680
METHOD OF SELECTING TIME SLOT IN TIME DIVISION SWITCHING NETWORK AND APPARATUS THEREFOR

Susumu Kikuchi; Katsumi Otani, both of Yokohama, and Takeaki Yamamoto, Iruma, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Corp., both of Tokyo, Japan

Filed Feb. 17, 1987, Ser. No. 15,626
Claims priority, application Japan, Feb. 28, 1986, 61-41816
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—68 **10 Claims**



5. A time slot selecting equipment for use by a first upstream switch in a time division switching network having time division switches connected in tandem and in multi-stage, comprising:

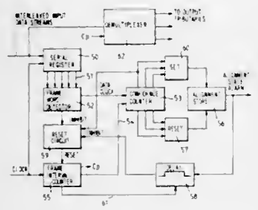
a controller responsive to a path connection request of multi-slot information by selecting idle time slots in accordance with a predetermined time slot selecting order such that the number of combination of time slots selectable by a second downstream switch, becomes large; and

a time division switch for connecting time slots of incoming and outgoing highways in accordance with information on the time slots selected by said controller.

4,788,681
DIGITAL TRANSMISSION SYSTEM

Anthony R. Thomas, Hinckley, and Stephen P. Ferguson, Earlsdon, both of England, assignors to The General Electric company, p.l.c., England

Filed Apr. 13, 1987, Ser. No. 37,929
Claims priority, application United Kingdom, Apr. 18, 1986, 8609499
Int. Cl.[4] H04J *3/06*
U.S. Cl. 370—100 **8 Claims**



1. A terminal for receiving digital data in the form of a time multiplexed (TDM) data stream incorporating frames appearing at a predetermined frame period and each frame incorporating a frame word, the terminal comprising:

(a) alignment detecting means including frame word detecting means for detecting the presence or absence of correctly aligned frame words and frame interval counter means for clocking said frame word detecting means once per frame;

(b) reset means for resetting said frame interval counter means;

(c) counting means operative for reaching a first predetermined state in response to said frame word detecting means indicating that a predetermined sequence of frame words has been correctly received;

(d) master alignment circuit means held in an inalignment state when said counting means is in said first predetermined state;

(e) means for setting said master alignment circuit means into an out-of-alignment state when said counting means changes to a second predetermined state in response to said frame word detecting means failing to detect a predetermined number of frame words in sequence;

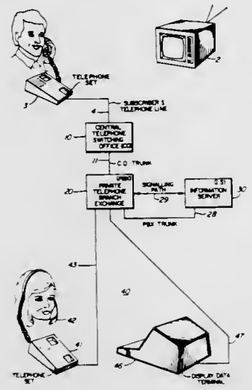
(f) search means for initiating a bit-by-bit search of the incoming data stream for the sequence of bits forming a frame word when an out-of-alignment condition has been detected and said master alignment circuit means is in said out-of-alignment state; and

(g) delay means for delaying the start of said bit-by-bit search after an out-of-alignment state has been detected, said delay means being connected to said reset means.

4,788,682
TELEPHONE SYSTEM ADAPTED TO TELEMARKETING

Jagdish C. Vij, Saratoga, and Herbert L. Steierman, Sunnyvale, both of Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 23, 1986, Ser. No. 910,642
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—110.1 **4 Claims**



1. A method for operating a telephone system in conjunction with an information server for providing a telemarketing function wherein displayable merchandising information is provided in association with a telephone terminal to which an incoming dialled telephone call is t be directed, the method including the steps of:

(a) in a call controller for directing operation of a switching network connected with said telephone terminal;

(i) recognizing a directory number indicated by the incoming dialled telephone call as being within a special number group;

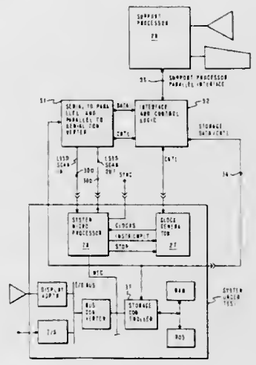
(ii) directing the incoming call to said telephone terminal; and

(iii) transmitting indication of a portion of the indicated directory number to an information server.

4,788,683
DATA PROCESSING SYSTEM EMULATION WITH MICROPROCESSOR IN PLACE

Phillip D. Hester, Austin, Tex., and William M. Johnson, San Jose, Calif., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 819,097, Jan. 14, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 143,308
Int. Cl.[4] G06F *11/30*
U.S. Cl. 371—20 **8 Claims**



1. Apparatus for testing a data processing system including a microprocessor, said testing occurring with said microprocessor in place in said system, said apparatus comprising:

a support microprocessor for controlling said testing;

a serial-to-parallel and parallel-to-serial converter connected between said support microprocessor and said system microprocessor;

means for supplying a series of parallel level sensitive scan design test signals from said support microprocessor through the parallel-to-serial portion of said converter to supply a series of serial test signals to said system microprocessor;

said system microprocessor having both low level and high level functions to be tested;

additional internal logic within said system microprocessor to support said low level testing functions of said system microprocessor in response to said level sensitive scan design test signals;

said support microprocessor providing signals for testing both said low level testing functions and said high level testing functions for testing said system microprocessor; and

means for returning the serial results of said low and said high level sensitive scan design test signals from said system microprocessor through the serial-to-parallel portion of said converter to supply a series of parallel test signal results to said support microprocessor.

4,788,684
MEMORY TEST APPARATUS

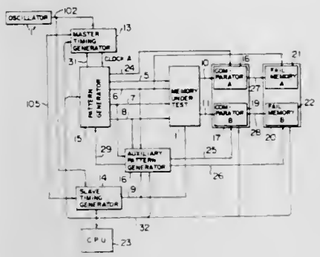
Ikuo Kawaguchi, and Yoshihiko Hayashi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 12, 1986, Ser. No. 895,846
Claims priority, application Japan, Sep. 9, 1985, 60-197839; Sep. 9, 1985, 60-197840
Int. Cl.[4] G06F *11/26*
U.S. Cl. 371—21 **15 Claims**

1. A memory test apparatus for testing a high performance memory of the type having first and second memory blocks, comprising:

means for generating an algorithmic pattern to be inputted to a first block of a memory under test;

auxiliary pattern generating means for storing an output from said algorithmic pattern generating means and for outputting an expected value for a second block of the memory under test at a preset timing based on the stored output;



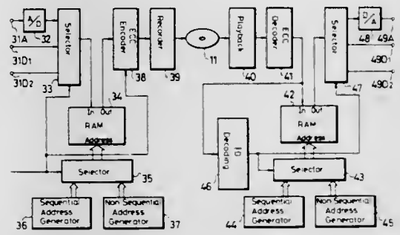
means for comparing outputs from said first and second blocks of the memory under test with expected values for said first and second blocks, respectively; and

memory means for storing an output from said comparing means.

4,788,685
APPARATUS FOR RECORDING AND REPRODUCING DATA

Yoichiro Sako, Tokyo; Tamotsu Yamagami, Kanagawa, and Shinichi Yamamura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,398
Claims priority, application Japan, Feb. 19, 1986, 61-34336
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **11 Claims**



1. Apparatus for recording input data on a recording medium, comprising:

a memory for storing input data to be recorded in units of a predetermined quantity;

a first address control means for determining an address of said memory;

a second address control means for determining an address of said memory; and

an encoding means for adding at least an error correcting code to each predetermined quantity unit of input data, and

wherein when the input data has no correlation with adjacent input data, the input data is sequentially written in said memory by said first address control means, read out therefrom, encoded by said encoding means, and recorded on the recording medium without changing the order of the input data, and when the input data has a correlation with adjacent input data, the input data is written in scrambled form in said memory by said second address

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control means, read out therefrom, as scrambled, and then the scrambled data is encoded by said encoding means and recorded on the recording medium.

4,788,686

GAS-LASER ARRANGEMENT

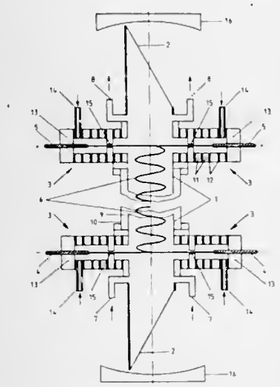
Jürgen Mentel, Universitätsstrasse 150, Gebäude IC-1, D-4630 Bochum 1, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 104,762

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611303

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—37 **11 Claims**



1. A gas-laser arrangement, with a gaseous medium being optically pumped, unimpeded by physical walls and using an arc or spark discharge, said arrangement comprising:

a pumplight source in the form of a helical arc or spark discharge, being produced by a magnetic field which exerts magnetic forces on a discharge current and radiation from said pumplight source pumping a gas volume surrounded by a discharge chamber along a helical axis parallel to said magnetic field corresponding to an axis of an optical resonator.

4,788,687

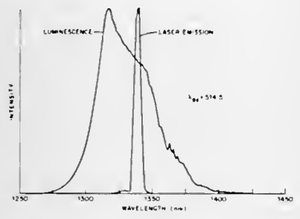
FLUOROZIRCONATE FIBER OPTIC LASER

William J. Miniscalco, Sudbury; Leonard J. Andrews, Wayland, and Barbara A. Thompsoo, Bedford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 16, 1987, Ser. No. 133,865

Int. Cl.⁴ H01S *3/17*

U.S. Cl. 372—40 **16 Claims**



1. A laser system having an active medium comprising a fluoride glass containing NdF_3, said laser system having a laser emission as a result of a transition from an electronic state $^4F_{3/2}$ of Nd^{3+} to an electronic state $^4I_{13/2}$ of Nd^{3+}.

4,788,688

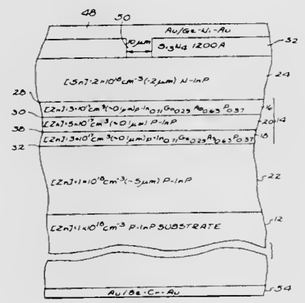
HETEROSTRUCTURE LASER

Thomas C. Hasenberg, Los Angeles, and Elsa M. Garmire, Manhattan Beach, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Jun. 20, 1986, Ser. No. 876,942

Int. Cl.⁴ H01S *3/19*; H01L *27/12*

U.S. Cl. 372—45 **15 Claims**



1. In a semiconductor laser of the heterostructure type, the improvement comprising:

a p-type substrate having lower electrode means for establishing electrical connection thereto;

a p-type lower confining layer overlying the substrate;

a composite active region formed on the lower confining layer,

the composite region having at least two p-type active layers separated by one or more p-type separation layers,

the active layers being of substantially identical composition, and

the active layers and the confining layers each being at least 300 angstroms thick;

an n-type upper confining layer formed on the composite active region to produce a p-n junction therewith;

upper electrode means for establishing electrical connection to the upper confining layer;

the active layers having band gaps smaller than the band gaps of the confining layers and the separation layers; and

means for applying an electrical potential between the upper electrode means and the lower electrode means to inject charge carriers into the active layers.

4,788,689

COMPOSITE RESONATOR-TYPE SEMICONDUCTOR LASER DEVICE

Yasunori Tokuda, and Kenzo Fujiwara, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 18, 1986, Ser. No. 829,969

Claims priority, application Japan, Feb. 26, 1985, 60-39591

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—45 **16 Claims**

1. A composite resonator-type semiconductor laser device comprising:

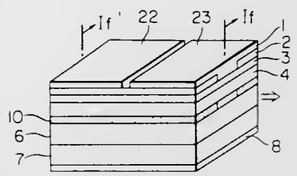
a semiconductor substrate of a first type of conductivity;

a second cladding layer which consists of a semiconductor layer of the first type of conductivity formed on said substrate;

an active layer of one of a quantum well structure and a superlattice structure formed on the upper surface of said second cladding layer;

a portion of damaged crystal which is formed in said active layer in a direction at least perpendicular to the direction of light propagation thereby to isolate the active layer;

a first cladding layer which consists of a semiconductor layer of a second type of conductivity formed on the upper surface of said active layer;



a cap layer which consists of a semiconductor layer of the second type of conductivity formed on said first cladding layer;

a first electrode connected to said cap layer; and

a second electrode connected to said semiconductor substrate.

4,788,690

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER WITH MONITOR

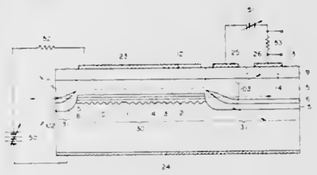
Shigeyuki Akiba, and Masashi Usami, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,451

Claims priority, application Japan, Dec. 25, 1985, 60-290846

Int. Cl.⁴ H01S *3/19, 3/08*; H01L *31/12*

U.S. Cl. 372—50 **3 Claims**



1. In a distributed feedback semiconductor laser with a monitor, having a substrate, a DFB region on the substrate comprising a light emitting layer, periodic corrugations extending in the direction of travel of light and a laser DFB region pn junction, the improvement comprising a window region provided on said substrate on at least one end of the light emitting layer with a semiconductor material having an energy gap greater than the energy gap of the light emitting layer, and a cap layer of first conductivity type provided on the DFB region and the window region having an energy gap smaller than the energy gap of the light emitting layer and a monitor pn junction electrically isolated from the DFB regoin pn junction so that a part of the light output emitted from the light emitting layer reaches the monitor pn junction by Fresnel diffraction of the light output in the window region and an electrical output for monitoring the light output is obtained through the monitor pn junction in the cap layer, the monitor pn junction being formed in the cap layer of first conductivity type by providing a second conductivity type region in the cap layer, and electrodes on the cap layer on the DFB region for effecting laser oscillation and others disposed for monitoring.

4,788,691

METHOD FOR THE OPERATION OF A GAS LASER AND A GAS LASER OPERATED IN ACCORD THEREWITH

Gerd Herziger, Fassanweg 2, D-6101 Rossdorf, and Helmut Schüilke, Max-Reger-Strasse 4, D-6110 Dieburg, both of Fed. Rep. of Germany

PCT No. PCT/DE85/00213, § 371 Date Feb. 13, 1986 § 102(e) Date Feb. 13, 1986

PCT Filed Jun. 25, 1985, Ser. No. 847,174

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423525

Int. Cl.⁴ H01S *3/097*

U.S. Cl. 372—84 **17 Claims**



1. A gas laser comprising:

first and second elongate layers of dielectric material extending parallel to one another and including a common section at a first end thereof, and respective second ends;

a dielectric plate mechanically coupled to and extending from said common section;

a chamber housing said dielectric plate and including a laser-active gas at a pressure above 100 mbar;

first, second and third electrodes, said first electrode carried on said first layer, said second electrode carried between said first and second layers and including an end defining a limiting end of said common section opposite said dielectric plate, and said third electrode carried on said second layer and forming a laminae structure;

said first electrode extending over a portion of said dielectric plate and said third electrode extending about the distal end of said dielectric plate and over to the plane of said first electrode to a point spaced from said first electrode to define a discharge gap therebetween; and

a high-voltage pulse generator electrically connected to said electrodes at the respective second ends of said dielectric layers and including first means connecting said first and third electrodes to a reference potential, second means connecting said second electrode to a high-voltage source, and switch means operable to connect and disconnect said first and second electrodes and generate voltage pulses of at least 8 kV therebetween with a rise greater than 1.5 kV per nanosecond.

4,788,692

ADAPTIVE DIFFERENTIAL PULSE CODE MODULATION SYSTEM

Tomoyoshi Takebayashi, Hiratsuka; Kaoru Yamamoto, Chofu; Tsuyoshi Miyazaki, Kawasaki; Kazuo Murano, Tokyo, and Hiromi Mori, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 20, 1986, Ser. No. 876,455

Claims priority, application Japan, Jun. 20, 1985, 60-134638; Aug. 1, 1985, 60-170488; Aug. 16, 1985, 60-180181

Int. Cl.⁴ H04B *14/06*

U.S. Cl. 375—27 **6 Claims**

1. An adaptive differential pulse code modulation system, comprising:

an adaptive quantizer and an adaptive predictor which have a coding characteristic optimized to a voice signal;

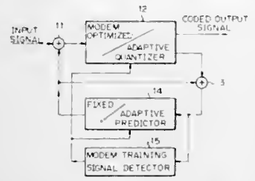
a quantizer and a predictor which have a coding characteristic optimized to a voice band modem signal; and

means, coupled to said adaptive quantizer, said adaptive predictor, said quantizer and said predictor, for detecting a modem training signal and comprising:

a phase synchronizing circuit which can detect a carrier frequency in a restricted region at a center of the carrier frequency; and

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means for detecting whether output power of the carrier frequency is larger than a predetermined threshold value, said modem training signal being detected, after detecting the carrier frequency by detecting that an output of said phase synchronizing circuit has not changed in polarity during a predetermined period, and



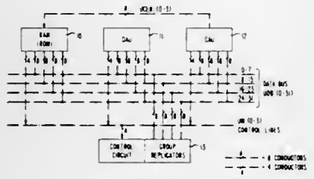
that the output power is larger than a predetermined threshold value during said predetermined period, said system normally being used as a coding system optimized to said voice signal, and when said system detects a modem training signal, said system becomes a coding system optimized to said modem signal.

4,788,693

DATA COMMUNICATION REPLICATOR

Laurence E. Bays, Whitehall, Pa., and Walter P. Hays, III, Rumson, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 30, 1985, Ser. No. 782,058
Int. Cl.[4] H04K *1/10*; H04L *27/28*
U.S. Cl. 375—38 **12 Claims**



1. A data system comprising:
a data bus adapted to transmit data words of differing sizes;
a data source adapted to transmitting in parallel the bits of a data word on a first group of conductors of said bus;
a destination adapted to receiving in parallel data bits from a second group of conductors of said bus;
a replicator for replicating the bits of said data word;
and control means adapted to receive from said data source the location of said first group of conductors on said bus, and to cause said replicator to replicate the bits of said data word onto said second group of conductors.

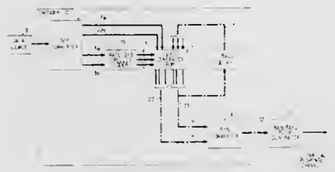
4,788,694

TRELLIS CODING WITH SUBSTRATES

Arthur R. Calderbank, Plainfield, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 20, 1987, Ser. No. 17,894
Int. Cl.[4] H04L *27/04*
U.S. Cl. 375—59 **14 Claims**

1. A data transmitter for generating and sequentially applying to a transmission channel during each of a succession of signalling intervals at least a pair of signal pulses representing a respective one of a succession of (k+n)-bit input words, said channel being such that at least one of the signal pulses applied thereto during each one of said signalling intervals is modified as a function of the value of at least one signal pulse applied to the channel in a prior signalling interval, said transmitter comprising,
means responsive to the values of n bits of said each input word and the value of at least one bit of a previous input word in said sequence for identifying one of 2^m predetermined cosets in a predetermined lattice, m being an integer greater than n,
means responsive to the value of said at least one previous signal pulse for identifying a predetermined alphabet of seed signal points, each of said seed signal points being such that, when it is transmitted through said channel in



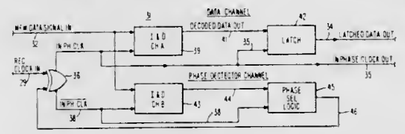
said one signalling interval, the resulting signal point at the output of said channel is a point in the identified one coset,
means for selecting an individual one of the seed signal points of the identified alphabet as a function of the values of the other k bits of said each input word, and
means for applying to said channel as said at least pair of said pulses a plurality of signal pulses representing said selected seed signal point.

4,788,695

SYSTEM FOR DECODING SELF-CLOCKING DATA SIGNALS

Myren L. Iverson, Layton, and Vaughn J. Jenkins, Bountiful, both of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 7, 1987, Ser. No. 105,380
Int. Cl.[4] H04L *27/14*
U.S. Cl. 375—80 **15 Claims**



1. A coherent detection and decoding system for decoding self-clocking data signals comprising,
a source of random self-clocking data signals,
a clock phase select switch for generating an inphase and a not inphase clock signal whose phase is unknown,
a data channel having first integrate and dump circuit means coupled to said inphase clock signal and said random self-clocking data signals for producing a decoded data output signal,
a phase select channel having second integrate and dump circuit means coupled to said not inphase clock signal and to said self-clocking data signals for producing a decoded data output signal when the data is inphase with the not inphase clock signal and is out of phase with the inphase clock signal, and
said data output signal from said second integrate and dump circuit means being coupled to a second input to said clock phase select switch for setting the correct inphase output and NOT inphase output from said clock phase select switch.

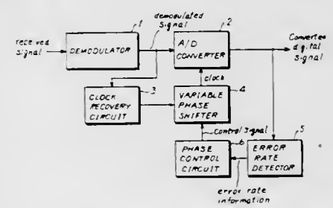
4,788,696

DECISION TIMING CONTROL CIRCUIT

Toshiaki Sakane, Nasu; Noboru Iizuka, Yokosuka, and Takanori Iwamatsu, Otawara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 18, 1987, Ser. No. 63,479
Claims priority, application Japan, Jun. 18, 1986, 61-141856
Int. Cl.[4] H04L *7/04*
U.S. Cl. 375—111 **6 Claims**

1. A decision timing control circuit having an actual and pseudo bit error rate, operatively connectable to receive a multi-level modulated signal having a clock signal with a phase, said decision timing control circuit comprising:
demodulation means for demodulating the multi-level modulated signal and for outputting a corresponding demodulated multi-level signal;
A/D conversion means, operatively connected to said demodulation means, for converting said demodulated multi-level signal into a corresponding digital output signal;
clock recovery means, operatively connected to said demodulation means, for recovering the clock signal from said demodulated multi-level signal and for providing a recovered clock signal output;
variable phase shifting means, operatively connected to said clock recovery means and said A/D conversion means, for phase shifting and providing said recovered clock signal to said A/D conversion means by phase shifting



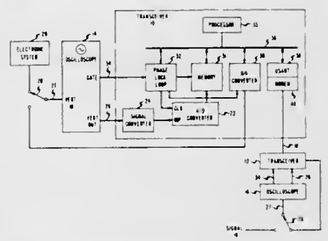
said recovered clock signal in accordance with a control signal;
error rate detection means, operatively connected to said A/D conversion means, for receiving said digital output signal and for generating an error rate information signal corresponding to the pseudo error rate of said digital output signal; and
phase control means, operatively connected to said error rate detection means and said variable phase shifting means, for generating and providing the control signal to said variable phase shifting means to vary an amount of phase shift of said variable phase shifting means, responsive to said error rate information signal so that the actual error rate becomes small on the basis of said error rate information signal.

4,788,697

METHOD AND APPARATUS FOR SYNCHRONIZING A SIGNAL TO A TIME BASE

Derwin H. Bell, Philadelphia, Pa.; Chauncey Herring, Jr., and Jose M. Miranda, both of Trenton, N.J., assignors to American Telephone & Telegraph Company, New York, N.Y.

Filed Jan. 2, 1987, Ser. No. 214
Int. Cl.[4] H04L *7/06*
U.S. Cl. 375—113 **10 Claims**



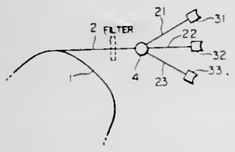
1. A method of communicating data across a communications channel comprising the steps of:
establishing a rate at which said data is to be sampled;
sampling said data at said established rate; and
transmitting the samples taken of said data across said communications channel, CHARACTERIZED IN THAT said establishing step comprises the step of:
choosing how many samples are to be taken of said data;
sampling said data at an arbitrary rate;
counting the number of samples obtained by sampling said data at the arbitrary rate;
comparing the counted number of samples to the chosen number of samples;
adjusting the arbitrary sampling rate when the counted number of samples differs from the chosen number of samples; and
repeating the sampling, counting, comparing and ajusting steps until the counted number of samples equals the chosen number of samples, whereupon said adjusted rate becomes the established sampling rate.

4,788,698

X-RAY EXPOSURE SYSTEM

Takeshi Kimura, Higashimurayama; Kozo Mochiji, Hachioji; Shojiro Asai, Kanagawa, all of Japan, and Hidehito Obayashi, Burlingame, Calif., assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 723,136, Apr. 15, 1984, abandoned.
This application Mar. 17, 1987, Ser. No. 28,024
Int. Cl.[4] G21K *5/00*
U.S. Cl. 378—34 **14 Claims**



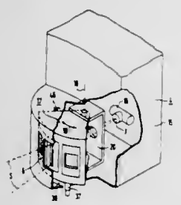
1. An X-ray exposure system for receiving a single beam of synchrotron radiation (SR) from an SR source comprising a plurality of X-ray exposure apparatuses each for duplicating a mask pattern on a radiation sensitive material disposed for receiving said single beam of SR from said SR source through an X-ray mask, and SR path changing means being disposed between the SR source and the X-ray exposure apparatuses for selectively changing the propagation direction of the single beam of SR emitted from said SR source for selectively introducing an entirety of said single beam of SR into a different one of said X-ray exposure apparatuses, respectively.

4,788,699

DENTAL X-RAY DIAGNOSTICS INSTALLATION FOR PRODUCING PANORAMA TOMOGRAMS OF THE JAW OF A PATIENT

Michael Dobert, Lorsch; Werner Gunther, and Erich Heubeck, both of Bensheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,544
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606654
Int. Cl.[4] G21K *1/04*
U.S. Cl. 378—38 **20 Claims**



1. In a dental X-ray diagnostics apparatus for producing panoramic tomograms of a jaw of a patient, said apparatus including a radiation source creating a beam of radiation directed in a beam path towards a film cassette, and a diaphragm being positioned in the beam path of the radiation beam for limiting the size of said beam the improvements comprising

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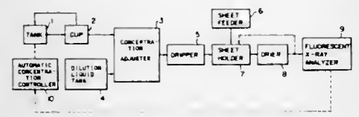
said diaphragm being a multiple diaphragm part having a plurality of diaphragm inserts with different diaphragm apertures, said part being mounted for rotation around an axis to position different diaphragm apertures in the beam path from the radiation source and means for adjustably mounting the inserts on the diaphragm part, said means for adjustably mounting including adjustment elements enabling selectively positioning each insert relative to the beam path when the insert is positioned in said beam path.

4,788,700

FLUORESCENT X-RAY ANALYZING METHOD OF SOLUTION SPECIMEN AND SPECIMEN SAMPLER USED FOR THE METHOD

Shigetoshi Kurozumi, Settsu; Tadahiro Abe, Chiba; Hideo Maruyama, Mukou, and Noriko Yasui, Yachiyo, all of Japan, assignors to Rigaku Industrial Corporation, Takatsuki and Kawasaki Steel Corporation, Kobe, both of, Japan

Continuation of Ser. No. 645,795, Aug. 30, 1984, abandoned.
This application Nov. 5, 1986, Ser. No. 928,657
Int. Cl.[4] G01N *23/223;* H05G *1/00*
U.S. Cl. 378—44 **19 Claims**



14. An automated, on-line, fluorescent X-ray analysis method, wherein the method is for on-line analysis and for automatic adjustment of on-line concentration of a specimen solution, which specimen solution is a manufacturing process fluid comprised of a solvent and a specimen solute to be analyzed dissolved in said solvent, the method comprising:

providing a storage tank for containing the specimen solution and filling the specimen solution into the storage tank;

supporting a porous sheet having a peripheral edge portion and a central portion on a sheet holder means so that only the peripheral edge portion of the porous sheet contacts the sheet holder means to provide a supported porous sheet;

removing a predetermined, constant amount of the specimen solution from the storage tank and impregnating the supported porous sheet by dripping onto the central portion thereof the specimen solution to provide an impregnated sheet;

drying the impregnated sheet to remove substantially all of the solvent therefrom and provide a dried sheet;

positioning the dried sheet in a chamber and surrounding same with a predetermined atmospheric environment to provide a positioned sheet;

irradiating the positioned sheet with primary X-rays to generate fluorescent X-rays from the specimen solute;

detecting one of wavelength and intensity of the fluorescent X-rays from the specimen solute as an output signal from a fluorescent X-ray analyzer;

ajdusting the concentration of the specimen solution remaining in the tank after the removal of the predetermined, constant amount of the specimen solution therefrom in response to the output signal from the fluorescent X-ray analyzer for the specimen solution by adding specimen solute to the specimen solution in the storage tank when the output signal is below a predetermined output signal, which predetermined output signal corresponds to a predetermined specimen solution concentration; and

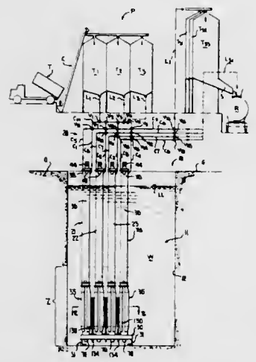
repeating the supporting, removing, impregnating, drying, positioning, irradiating, detecting, and adjusting steps, such that the on-line concentration of the specimen solution is automatically adjusted and maintained at a predetermined level to provide an adjusted specimen solution, and such that the adjusted specimen solution is supplied on-line to the manufacturing process which utilizes same.

4,788,701

IRRADIATORS FOR BULK, PALLETIZED AND/OR PACKAGED MATERIALS

Lawrence G. Barrett, 3223 Downing Dr., Lynchburg, Va. 24503

Filed Feb. 13, 1985, Ser. No. 701,310
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—69 **127 Claims**



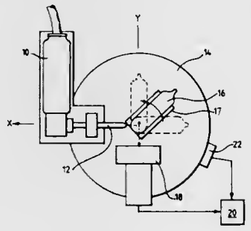
19. A modular irradiator comprising a plurality of individual substantially self-contained conveyor units, means for conveying material to be irradiated through each conveyor unit, a plurality of gamma ray source means spaced from each other for subjecting the conveyed material to gamma rays, a plurality of means for selectively locating said plurality of conveyor units in any one of a plurality of different spatial relationships relative to each other and to said plurality of gamma ray source means, and means for effecting eccentric repositioning of at least one of said conveyor units relative to base support means to vary its position relative to said gamma ray source means.

4,788,702

ORIENTATION OF CRYSTALS

Stephen Howe, 13D Venice Court, 41 Conduit Rd., Hong Kong, Hong Kong, and Donald Rogers, 11 Salvington Crescent, Bexhill on Sea, United Kingdom

Filed Aug. 8, 1986, Ser. No. 894,655
Claims priority, application United Kingdom, Mar. 26, 1986, 8607482
Int. Cl.[4] G01N *23/207*
U.S. Cl. 378—73 **4 Claims**



1. A method of determining orientation of a single crystal relative to a predetermined set of orthogonal axes, comprising the steps of:

directing an x-ray beam onto the crystal along one of said orthogonal axes, said x-ray beam including a peak of energy at a preselected wavelength;

rotating relatively the crystal and said x-ray beam from an initial position to an angular position about a single axis perpendicular to a plane containing said x-ray beam so as to generate Bragg x-ray reflections;

detecting said x-ray reflections by means of a two-dimensional position sensitive detector operable to generate coordinate data corresponding to said detected x-ray reflections that occur at said preselected wavelength and registering a first binary condition when said x-ray reflections at said preselected wavelength are below a predetermined intensity and a second binary condition when said x-ray reflections at said preselected wavelength are above said predetermined intensity;

generating data representing said angular position of the crystal relative to said initial position; and

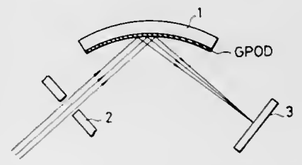
computing orientation data for the crystal responsive to said binary conditions from said coordinate data and from said angular position data.

4,788,703

RADIATION OPTICAL ELEMENT

Mutsuaki Murakami, Kawasaki, and Susumu Yoshimura, Yokohama, both of Japan, assignors to Research Development Corporation of Japan, Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 919,117
Claims priority, application Japan, Oct. 15, 1985, 60-227889
Int. Cl.[4] G21K *1/06*
U.S. Cl. 378—84 **6 Claims**



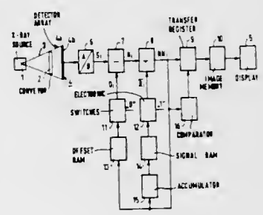
1. A diffraction element for penetrating radiation comprising a substrate having thereon a flexible graphite monocrystal formed by graphitizing a film of poly-(phenyleneoxadiazole).

4,788,704

X-RAY SCANNER & DETECTOR SIGNAL PROCESSING SYSTEM

Gerhard Donges, Heidenrod-Kemel, and Cornelius Koch, Wiesbaden, both of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 829,616, Feb. 14, 1986. This application Nov. 17, 1987, Ser. No. 121,862
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3507607
Int. Cl.[4] H05G *1/64;* G01N *23/04*
U.S. Cl. 378—99 **7 Claims**



7. An x-ray device for scanning objects moving on a conveyor path, processing signals acquired by said scanning, and displaying said signals on a display means, comprising:

means disposed on one side of said conveyor path for directing a fan-shaped x-ray beam at said objects perpendicular to the direction of conveyance of said objects;

an array of a plurality of x-ray detectors disposed on an opposite of said conveyor path for detecting radiation passing through said objects and for generating a signal corresponding to the detected radiation;

an image memory connected to a display, said image memory having a plurality of memory cells corresponding in number to said plurality of detectors for storing said signal from each detector therein;

means for controlling entry of signals from said detectors into said image memory;

divider means for forming a useful signal of reduced amplitude for each detector signal by dividing each detector signal by a reference signal for a radiation intensity of 100%;

means for generating said reference signal connected to said divider means;

means providing an input to said divider for measuring selected types of errors in said useful signal; and

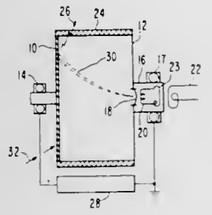
comparator means connected to the output of said divider, said comparator means being connected to said means for controlling entry of signals into said image memory for inhibiting transfer of a current signal upon the identification of an unacceptable error in the output from said divider and instead transferring the contents of a selected memory cell preceding the cell allocated for said current signal to said cell allocated for said current signal in place of said current signal.

4,788,705

HIGH-INTENSITY X-RAY SOURCE

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 683,988, Dec. 20, 1984, abandoned.
This application Jan. 21, 1987, Ser. No. 5,973
Int. Cl.[4] H01J *35/24*
U.S. Cl. 378—121 **24 Claims**



1. An X-ray source comprising:

a housing forming a vacuum chamber, the entirety of said housing being rotatable about an axis, a portion of said housing being an anode;

means for rotating said housing about said axis;

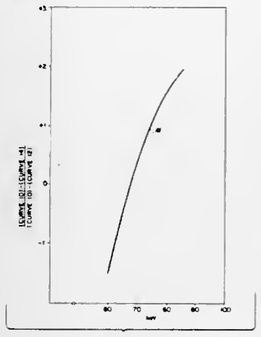
means, mounted within said chamber, for generating electrons and for focusing said electrons onto a region off said axis;

rf transformer means for inductively coupling rf energy from a source external to said vacuum chamber through a wall portion of said housing to said means for generating electrons, said transformer means comprising a primary coil mounted outside of said vacuum chamber and a secondary coil mounted within said vacuum chamber, said secondary coil having an air core; and

means for holding said means for generating and for focusing fixed when said housing is rotated about said axis so that said region remains fixed and said anode rotates through said region.

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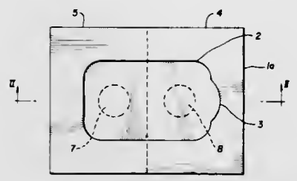
4,788,706
METHOD OF MEASUREMENT OF X-RAY ENERGY
Donald R. Jacobson, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.
Filed Dec. 17, 1987, Ser. No. 134,311
Int. Cl.[4] G01D *18/00*
U.S. Cl. 378—207 **6 Claims**



6. A method for measuring x-ray energy in a computed tomography (CT) system comprising the steps of:
providing a CT target using first, second, and third materials having predetermined x-ray attenuation coefficients, said first and second materials having similar attenuation variation as a function of x-ray energy over a predetermined range of energy, said third material having an attenuation characteristic which varies between that of said first and said second materials over the predetermined range;
computing ratios of attenuation differences from the difference in attenuation between said first and said second materials at a plurality of selected energies within the predetermined range of energy and the difference in attenuation between one of said first and said second materials and said third material at each of the selected energies;
exposing the target to x-rays in a CT machine and obtaining therefrom CT numbers for each of said first, second, and third materials;
calculating a ratio of the difference between the CT numbers for said first and said second of the materials and the difference between the CT numbers of one of said first and said second materials and the CT number of said third material;
identifying the ratio of the attenuation differences corresponding to the CT ratio; and
identifying a corresponding x-ray energy from the identified ratio.

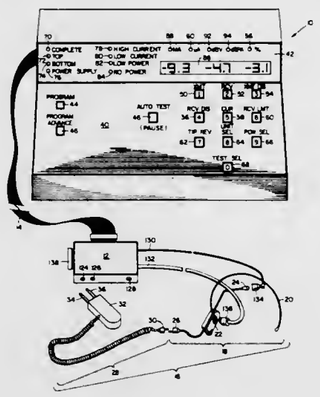
4,788,707
RADIATION EXPOSURE GAUGE
Herbert Malamud, 30 Wedgewood Dr., Westbury, N.Y. 11590, and Alex Chomenko, 3333 Henry Hudson Pkwy., Bronx, N.Y. 10463
Filed Dec. 2, 1986, Ser. No. 936,789
Int. Cl.[4] G01T *1/16;* **G01N** *23/02;* **H05G** *1/26*
U.S. Cl. 378—207 **16 Claims**

1. A gauge for use with x-ray machines to distinguish the following five x-ray film conditions, overexposure, upper limit of correct exposure, correct exposure, lower limit of correct exposure, and underexposure, by examining film densities at the upper and lower limits of the visible density range, consisting only of:
a. first means for achieving a film density at the low end of the visible density range in a first film region;
b. second means for achieving a film density at the high end of the visible density range in a second film region;
c. third means for achieving a film density, in a third film region, slightly higher than the low end of the visible density range, said third region being contiguous with the first film region;
d. fourth means for achieving a film density, in a fourth film region, slightly lower than the high end of the visible density range, said fourth region being contiguous with the second film region,



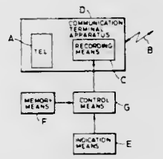
such that the degree of visibility of the difference between the film densities in said first and third regions and the degree of visibility of the difference between the film densities in said second and fourth regions indicates the correctness of the exposure of the x-ray film.

4,788,708
UNIVERSAL HEADSET TESTER
Gary Hendrix, San Antonio, Tex., assignor to Tele-Technix, Inc., San Antonio, Tex.
Filed Nov. 25, 1987, Ser. No. 125,569
Int. Cl.[4] H04R *29/00;* **H04M** *1/24*
U.S. Cl. 379—6 **38 Claims**



1. An apparatus for testing a telephone headset having a microphone and a speaker, comprising:
means for injecting a test signal into said headset, said injecting means providing a receive electric signal to said speaker and a transmit acoustic signal to said microphone;
means for receiving an output signal from said headset, said receiving means capturing a receive acoustic signal from said speaker, corresponding to said receive electric signal, and further capturing a transmit electric signal from said microphone, corresponding to said transmit acoustic signal; and
means for analyzing said output signal whereby various performance qualities of said headset may be ascertained, said analyzing means checking reception and transmission qualities of said headset by analyzing said receive acoustic signal and said transmit electric signal.

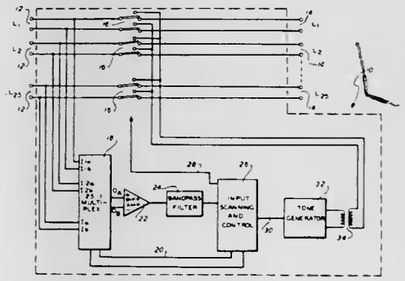
4,788,709
FACSIMILE COMMUNICATION TERMINAL WITH MEMO PATTERN MEMORY
Koichi Matsumoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 26, 1986, Ser. No. 901,058
Claims priority, application Japan, Sep. 3, 1985, 60-193125
Int. Cl.[4] H04M *11/00;* **H04N** *1/00*
U.S. Cl. 379—100 **8 Claims**



1. A communication terminal apparatus which is adapted to be used in combination with a telephone set; said terminal apparatus comprising:
recording means for recording information which is obtained through a line on a recording medium;
memory means for storing a predetermined pattern;
a manual switch for manually instructing that the recording medium used in said recording means is used for a memorandum and for manually instructing said terminal apparatus to cause said recording means to record on the recording medium said predetermined pattern stored in said memory means;
discharge means for discharging the recording medium, in response to instruction by said manual switch; and
control means for controlling such that the information obtained through the line is recorded on the recording medium by said recording means during a reception operation of said terminal apparatus, said predetermined pattern is read out from said memory means in a predetermined order in response to the instruction from said manual switch to be recorded on the recording medium by said recording means when an operation other than recording of information obtained through the line is being executed, and the recording medium on which said pattern is recorded is discharged by said discharge means.

4,788,710
TELEPHONE LINE SELECTION AND ISOLATION METHOD AND APPARATUS
Daniel Lynch, Jackson, N.J., assignor to Keptel, Inc., Tinton Falls, N.J.
Continuation-in-part of Ser. No. 828,205, Feb. 10, 1986, Pat. No. 4,682,347. This application Jun. 11, 1987, Ser. No. 61,500
Int. Cl.[4] H04M *1/24*
U.S. Cl. 379—29 **10 Claims**

6. Apparatus for indentifying and isolating a selected telephone line from among a plurality of telephone lines at a location remote from the central office, upon the application of a test signal to the selected line, comprising:
input/output means coupling each line of the plurality of lines to a respective subscriber line;
line selection means coupled to said input/output means, for selecting an evaluation line in a preselected sequence from among the plurality of lines in response to an input sequencing signal, and providing signals from said evaluation line as an evaluation output;
filter means coupled to said line selection means for filtering said evaluation output within a preselected wide frequency band and providing a filtered signal output;
control and detection means coupled to said filter means, operational in an initial detection mode for detecting the presence of an initial detection signal in an initial detection band within said wide frequency band during a first time interval and, upon detection of said initial detection signal, operational in a validation mode for detecting the presence of as validated test signal by detecting the presence of a validation signal lying in a validation band within said initial detection band during a second time interval, said second time interval being longer than said first time interval, for providing as an output a "commence test" signal upon detection of said validated test signal or a said input sequencing signal upon failure to detect a said initial detection signal during said initial detection mode or said



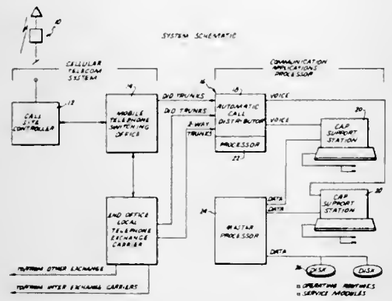
validation signal during said validataion mode, said control and detection means is operational in said initial detection mode to detect a leading edge of saisd initial detection signal, to activate a time base pulse generator upon detection of said leading edge, to deactivate said time base pulse generator upon a first preselected number of periods of the frequency of said initial detection signal, to accumulate the pulses generated by said time base pulse generator during said first preselected number of periods and to detect the presence of said initial detection signal within said intial detection band from the number of pulses accumulated during said first preselected number of periods of the frequency of said initial detection signal; and
isolation means coupled to said control and detection means and to said input/output means, for disconnecting said evaluation line from said respective subscriber line in response to said "commence test" signal.

4,788,711
APPARATUS AND METHOD FOR A CELLULAR FREEWAY EMERGENCY TELEPHONE SERVICE
Michael Nasco, Jr., Laguna Hills, Calif., assignor to Cellular Communications Corporation, Houston, Tex.
Filed Nov. 25, 1985, Ser. No. 801,410
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—59 **10 Claims**

1. A system for emergency call box service comprising:
a plurality of emergency call boxes, wherein each call box further comprises a controller, a cellular transceiver coupled to said controller, a battery coupled to said controller for providing power to said controller and transceiver, and means for generating power coupled to said controller for recharging said battery; and
a cellular telecommunications subsystem in radio-telecommunication with each of said plurality of emergency call boxes, said cellular transceiver being remotely progammable, said controller for programming operation of said cellular transceiver in response to information receivied from said cellular telecommunications subsystem wherein

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said controller further comprises means for receiving and processing information to initiate operations in said controller,



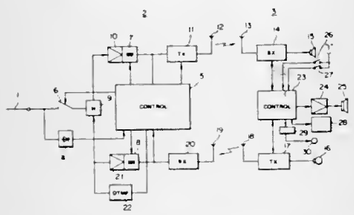
whereby said plurality of emergency call boxes can be installed which are capable of arbitrarily progammable interactive operations.

4,788,712

HOWLER INDICATOR IN CORDLESS TELEPHONE SYSTEM

Yuji Umemoto, and Akio Toki, both of Hino, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1987, Ser. No. 90,515
Claims priority, application Japan, Aug. 29, 1986, 61-201550
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 379—63 **9 Claims**



1. A howler indicator in a cordless telephone system comprising:

a master device connected to a subscriber's line;

a mobile device connected through a radio line to said master device;

means provided in the master device for detecting a howler signal applied thereto through said line;

means provided in said mobile device for informing an operator of on-hook prompting;

means for transmitting a predetermined command signal indication of presence of said howler signal detected by said howler signal detecting means from the master device through said radio line to the mobile device; and

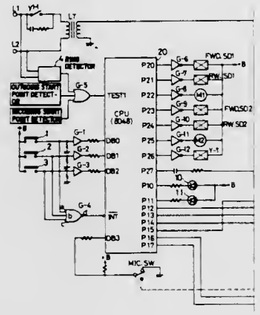
means for initiating said informing means in response to said command signal transmitted from the master device.

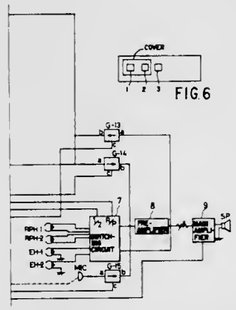
4,788,713

ONE BUTTON CONTROL SYSTEM FOR TELEPHONE ANSWERING DEVICE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Sep. 12, 1985, Ser. No. 775,301
Claims priority, application Japan, Sep. 13, 1984, 59-192343
Int. Cl.[4] G11B *15/10, 15/02*
U.S. Cl. 379—70 **7 Claims**





1. A recording/reproducing apparatus having a housing and at least one recording medium and operable in a plurality of modes, comprising:

operation selection means comprising a manual input means on the housing for selecting an operation mode of said recording/reproducing apparatus, said operation selection means being provided with recording medium drive control operating means for controlling selectively play and drive of the recording medium, and recording control operating means for controlling selectively recording and erasure of the recording medium;

means for establishing a predetermined period of time;

detecting means for detecting the number of successive operations of said manual input means occurring within the predetermined period of time; and

switching means for switching the operation mode in response to an output from said detecting means,

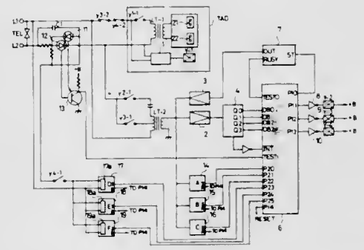
wherein said switching means selectively sets the recording medium in a play, rewind or fast forward mode in response to the number of successive operations of said manual input means detected by said detecting means within the predetermined period of time, and said switching means selectively sets the recording medium in a record mode, or at least one of either a rewind erasure mode or a fast-forward erasure in response to the operation of said recording control operating means and predetermined numbers of successive operations of said manual input means detected by said detecting means within the predetermined period of time, thereby selectively erasing contents of the recording medium at a speed higher than a recording or play speed.

4,788,714

REMOTE CONTROLLING TELEPHONE UNIT FOR SELECTIVELY ACTIVATING ONE OF A PLURALITY OF DEVICES

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 792,045, Oct. 28, 1985, abandoned. This application Aug. 6, 1987, Ser. No. 83,015
Claims priority, application Japan, Oct. 26, 1984, 59-225545
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—74 **4 Claims**



1. A remote controlling telephone unit incorporating a telephone answering means including a telephone and responsive to an incoming call on a telephone line for making a loop circuit, sending a prerecording outgoing message on the line and recording an incoming message, the unit comprising:

remote control means for controlling any one of a number of devices, such as a FAX, a TELEX and a person computer, etc., from a remote location over the telephone line, said remote control means including:

(a) first means responsive to incoming remote control signals received on the telephone line for placing all said devices into a standby condition;

(b) second means responsive to a predetermined remote control signal received on the telephone line for placing a corresponding predetermined one of said devices into an operating condition; and

(c) third means for resetting said predetermined one of said devices in the standby condition after operation thereof, ready for a next telephone call;

whereby a user who has, by mistake as a result of sending the wrong remote control signal, placed the wrong one of said devices into the operating condition, can, without hanging up the telephone, place the correct one of said devices into the operating condition by sending the correct remote control signal.

4,788,715

ANNOUNCING WAITING TIMES IN QUEUING SYSTEMS

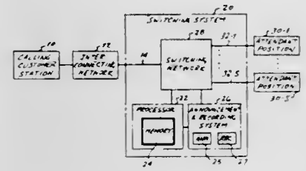
Dooyong Lee, Middletown, N.J., assignor to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 16, 1986, Ser. No. 920,260
Int. Cl.[4] H04M *1/64, 1/65*
U.S. Cl. 379—84 **13 Claims**

8. In a call processing system, means for determining the time delay in serving a received call; and

means responsive to a receipt of said received call for supplying said call with message signals for informing a caller of the length of the time delay determined by said determining means;

wherein said call processing system comprises an automatic call distributor system having a plurality of attendant positions and said determining means comprises means for ascertaining the average call holding time of said plurality of attendant positions and means for ascertaining the number of calls awaiting service by said plurality of attendants.

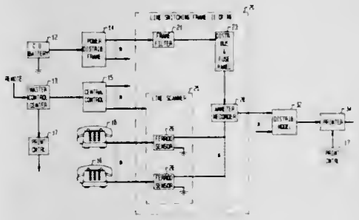


4,788,716

PUBLIC OPINION POLLING SYSTEM

Charles W. Zebe, Stuart, Fla., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 22, 1987, Ser. No. 136,697
Int. Cl.[4] H04M *11/00, 3/22*
U.S. Cl. 379—92 **7 Claims**



2. The method of conducting a poll which comprises:

(a) selecting a telephone loop network comprising a switching system normally capable of performing a call request initiation function in response to electrical current flow resulting from an off-hook condition in at least one of the telephone sets of said loop network;

(b) determining the statistical distribution of the electrical resistance of said network among the loops thereof;

(c) broadcasting a polling stimulus to customers served by said telephone loop network;

(d) eliciting from said customers a response to said polling stimulus during a specified polling period by causing an off-hook condition in their respective telephone sets;

(e) disabling said switching system call request initiation function capability during said polling period;

(f) determining the level of electrical current flow in said loop network during said polling period; and

(g) calculating from said polling period current flow level and said resistance distribution the number of telephone sets in said network that were in said off-hook condition during said polling period, thereby determining the number of said customers responding to said polling stimulus.

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4,788,717

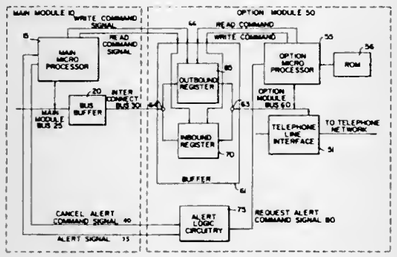
TELEPHONE LINE INTERFACE OPTION MODULE

Dennis R. Blanchard, Hampstead, N.H.; Edward A. Bruckert; David G. Conroy, both of Maynard, Mass.; Richard D. Ellison, Worcester, Mass., and Anthony J. Vitale, Northboro, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 808,787, Dec. 13, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 170,664

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—98 **4 Claims**



4. A method for coupling an electronic main module to a telephone line of a telephone network, comprising the following steps:

(a) storing a set of telephone interconnect regulations for controlling the flow of data onto said telephone line;

(b) storing inbound data received on said telephone line in a option module buffer arranged between said main module and said telephone line;

(c) outputting a status signal to said main module indicating that said inbound stored data is available for read-out for buffer by said main module;

(d) transmitting said inbound stored data from said buffer to said main module in response to a read command signal from said main module;

(e) storing outbound data received from said main module in said buffer;

(f) polling said buffer to detect the presence of outbound stored data; and

(g) transmitting said outbound stored data from said buffer to said telephone line under the control of an option module in accordance with said stored set of telephone interconnect regulations without modulation of the data being transmitted.

4,788,718

CALL DATA COLLECTION AND MODIFICATION OF RECEIVED CALL DISTRIBUTION

Sandra D. McNabb, Red Bank, and Richard S. Yien, Woodbridge, both of N.J., assignors to American Telephone and Telegraph Company, AT & T Laboratories, Murray Hill, N.J.

Filed Oct. 5, 1987, Ser. No. 104,724

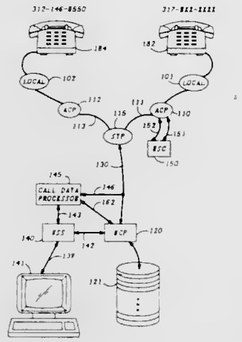
Int. Cl.[4] H04M *3/36*

U.S. Cl. 379—113 **9 Claims**

1. A telecommunication network arranged for a calling station to dial a customer's number to reach any one of a plurality of the customer's answering stations in the network, the network being arranged for communicating signaling messages through a common channel signaling circuit between the calling station and a network control point to set up a call from the calling station to one of the customer's answering stations selected by the customer call processing logic stored within the network, at least part of the customer's answering stations being arranged to distribute calls to a plurality of attendants, the network comprising

means for reading the signaling messages communicated through the common channel signaling circuit to collect the customer's call data from plural calls to the customer's number;

means interconnected with the reading means for storing the customer's call data from the plural calls to the customer's number; and



means interconnected with the storing means for processing the customer's call data collected from the plural calls to produce a traffic data summary for the plural calls to the customer's number.

4,788,719

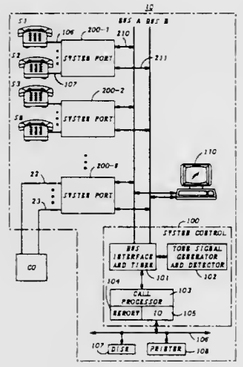
TELEPHONE CALL CHARGE ALLOCATION ARRANGEMENT

Shiv K. Gupta, Red Bank, N.J., assignor to American Telephone and Telegraph Company and AT & T Information Systems Inc., both of Murray Hill, N.J.

Filed Nov. 13, 1987, Ser. No. 119,881

Int. Cl.[4] H04M *15/16*

U.S. Cl. 379—114 **7 Claims**



1. A telephone call recording arrangement for use in a communication system having a plurality of telephone stations and outside telephone lines connected thereto, said communication system being operative for establishing a connection between one of said stations and one of said telephone lines, said arrangement comprising

memory means having a plurality of memory locations for the storage of telephone call records detailing respective connections between individual ones of said telephone stations and individual ones of said outside telephone lines,

means responsive to a request from said one station for transferring said connection from said one station to another one of said plurality of stations, and

means responsive to the transfer of said connection for establishing in said memory a call record for said other station, for entering in said other station call record call charges occurring subsequent to said transfer and for entering in a call record priorly established in said memory for said one station call charges occurring prior to said transfer.

4,788,720

PROGRAMMABLE SUBSCRIBER SET

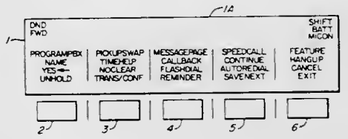
Robert P. Brennan, Pakenham; Joseph Camelon, Richmond; J. Bernard Trudel, Ottawa; Albert L. M. Hum, Nepean, and Donald G. McLeod, Kanata, all of Canada, assignors to Trillium Telephone Systems Inc., Ontario, Canada

Filed Sep. 3, 1986, Ser. No. 903,143

Claims priority, application Canada, May 12, 1986, 508859

Int. Cl.[4] H04M *3/42*

U.S. Cl. 379—201 **16 Claims**



1. A subscriber set for connection via tip and ring leads to a communication system for implementing a plurality of special features, comprised of:

(a) means for bidirectionally translating audio signals between the set and said communications system,

(b) a plurality of soft keys associated with predetermined ones of said special features, wherein said predetermined special features are independent of the number of said keys, each key being associated with different ones of said plurality of special features at different times during the course of a telephone call with said subscriber set,

(c) means for programming said set to generate and transmit to said communication system predetermined special feature access code signals in response to depression of a predetermined one or a sequence of said soft keys in order to implement said predetermined special features, and

(d) visual display means for generating prompt signals associated with said predetermined one or sequence of said soft keys for prompting the depression of said predetermined one or sequence of soft keys in order to generate said special feature access code signals.

4,788,721

ROUTING OF NETWORK TRAFFIC

Komandur R. Krishnan, Bridgewater Township, Somerset County, and Teunis J. Ott, Chester Township, Morris County, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 9, 1987, Ser. No. 130,423

Int. Cl.[4] H04M *3/36, 7/06*

U.S. Cl. 379—221 **8 Claims**



1. An improved method for routing offered traffic through a network comprising nodes wherein each node is adapted to communicate with each of the other nodes, said method including the steps of

generating a set of routes between a pre-selected node pair, and

controlling the selection of the traffic route between the pre-selected node pair from the set of routes by evaluating the routes in the set in response to current usage of the set and from future estimates of traffic blockings that take into consideration expected total traffic, including the offered traffic, and

wherein in the improved method the step of controlling by evaluating comprises the step of generating occupancy factors, each of said occupancy factors determined from both unassociated occupancy factors and from allocation factors, said unassociated factors being derived from a nominal routing scheme in which offered traffic blocked on a single route is treated as lost and said allocation factors being derived from a nominal routing scheme in which offered traffic is lost only when all routes are busy.

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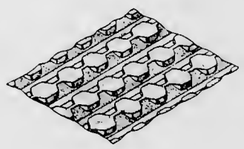
DESIGNS

NOVEMBER 29, 1988

298,680
LIFE JACKET
Hung-Chang Chou, No. 5, Shin Ho 2nd Road, Tainan, Taiwan
Filed Jun. 3, 1986, Ser. No. 870,134
Term of patent 14 years
U.S. Cl. D2—29



298,681
SHOE SOLE MATERIAL
Juan A. Diaz, Weymouth, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Jul. 16, 1987, Ser. No. 74,318
Term of patent 14 years
U.S. Cl. D2—314



298,682
SHOE SOLE MATERIAL
Juan A. Diaz, Weymouth, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Jul. 16, 1987, Ser. No. 74,469
Term of patent 14 years
U.S. Cl. D2—314



298,683
SHOE SOLE
Brenda Kelley, Beaverton, and Mona McCrea, Portland, both of Oreg., assignors to AVIA Group International, Inc., Portland, Oreg.
Filed Feb. 17, 1988, Ser. No. 156,641
Term of patent 14 years
U.S. Cl. D2—320



298,684
SHOE SOLE
Steven L. Pitchford, 1522 La Forest La., Concord, N.C. 28025
Filed Jun. 4, 1986, Ser. No. 871,602
Term of patent 14 years
U.S. Cl. D2—321



298,685
KARATE SHOE
L. Michael Dillard, 422 Hoffman Dr., Norman, Okla. 73071
Filed Feb. 14, 1986, Ser. No. 834,025
Term of patent 14 years
U.S. Cl. D2—271



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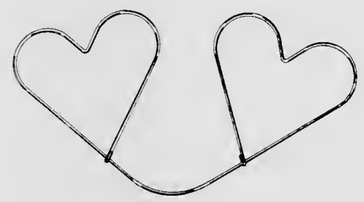
298,686
NOVELTY GLOVE
George M. Colclasure, Oklahoma City, Okla., assignor to Laid Back Enterprises, Inc., Oklahoma City, Okla.
Filed Apr. 7, 1986, Ser. No. 850,383
Term of patent 14 years
U.S. Cl. D2—617



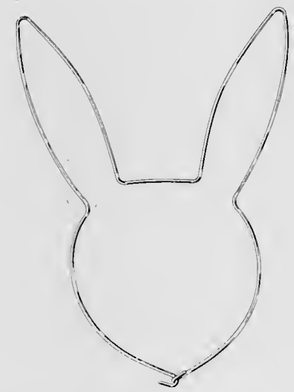
298,687
BASKET CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 139,870
Term of patent 14 years
U.S. Cl. D3—18



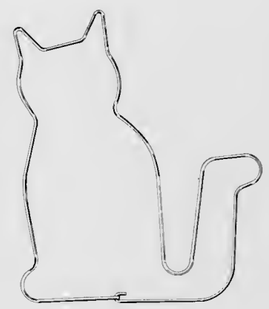
298,688
HEARTS CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 139,865
Term of patent 14 years
U.S. Cl. D3—18



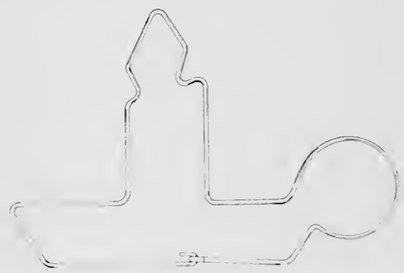
298,689
RABBIT CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 139,866
Term of patent 14 years
U.S. Cl. D3—18



298,690
CAT CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 139,869
Term of patent 14 years
U.S. Cl. D3—18



298,691
CANDLE AND CANDLESTICK CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Feb. 10, 1988, Ser. No. 154,609
Term of patent 14 years
U.S. Cl. D3—18



298,692
BEAR CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 140,258
Term of patent 14 years
U.S. Cl. D3—18

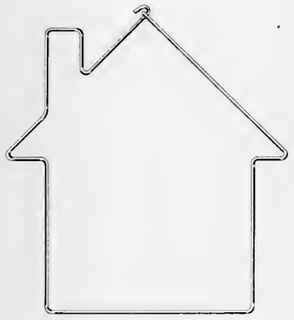


298,693
BELL CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Feb. 10, 1988, Ser. No. 154,611
Term of patent 14 years
U.S. Cl. D3—18

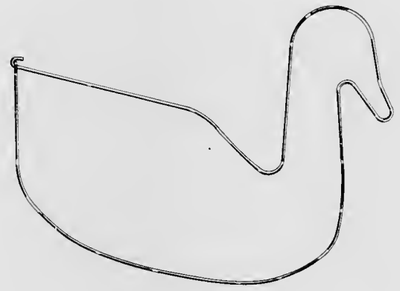


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298,694
HOUSE CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 139,868
Term of patent 14 years
U.S. Cl. D3—18

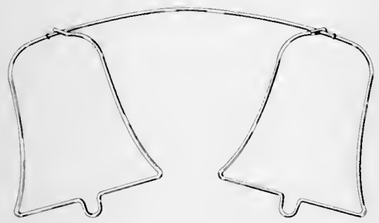


298,696
WATER FOWL CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Dec. 30, 1987, Ser. No. 139,867
Term of patent 14 years
U.S. Cl. D3—18





298,695
DOUBLE BELL CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Feb. 10, 1988, Ser. No. 154,608
Term of patent 14 years
U.S. Cl. D3—18



298,697
THREE-DIMENSIONAL HOOP CRAFT WIRE
Richard H. Sass, St. Louis, Mo., assignor to St. Louis Trimming, Inc., St. Louis, Mo.
Filed Feb. 10, 1988, Ser. No. 154,612
Term of patent 14 years
U.S. Cl. D3—18



298,698
KNITTING NEEDLE
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed May 4, 1982, Ser. No. 374,720
Term of patent 14 years
U.S. Cl. D3—28

298,700
POM POM LADDER
Miguel A. Caraballo, Vale, N.C., assignor to A to Z Cotton Trimmings Corporation, Hickory, N.C.
Filed Mar. 31, 1986, Ser. No. 847,554
Term of patent 14 years
U.S. Cl. D5—7



298,699
FISHING ROD HOLDER
Robert I. Glawe, 1714 W. 3rd, Waterloo, Iowa 50701
Filed Feb. 18, 1986, Ser. No. 833,754
Term of patent 14 years
U.S. Cl. D3—104



298,701
EMBOSSED TISSUE OR SIMILAR ARTICLE
Robert A. Drew, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 7, 1985, Ser. No. 803,998
Term of patent 14 years
U.S. Cl. D5—53

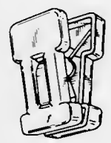


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298,702
EMBOSSED TISSUE OR SIMILAR ARTICLE
Robert A. Drew, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 7, 1985, Ser. No. 803,997
Term of patent 14 years
U.S. Cl. D5—53

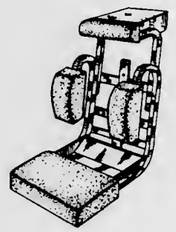


298,703
CLIP
William D. Arnold, St. Louis County, Mo., assignor to Lee-Rowan Company, St. Louis, Mo.
Filed May 22, 1986, Ser. No. 866,082
Term of patent 14 years
U.S. Cl. D6—328

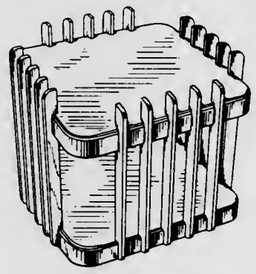




298,704
SEAT FOR USE PRIMARILY IN EMERGENCY VEHICLES
Theodore Ziaylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067
Filed Jan. 13, 1986, Ser. No. 818,520
Term of patent 14 years
U.S. Cl. D6—356



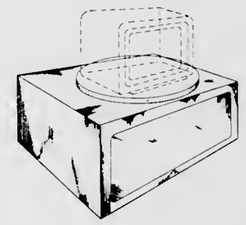
298,705
PLANT STAND
Stanley A. Johnson, Jr., 2575 Maple Hill Dr., Brookfield, Wis. 53005
Filed Apr. 25, 1986, Ser. No. 857,786
Term of patent 14 years
U.S. Cl. D6—405



298,706
TABLE
Roy N. Alchin, and Raymond J. Long, both of 95 Market Street, Smithfield, New South Wales 2164, Australia
Filed Jan. 21, 1986, Ser. No. 821,080
Term of patent 14 years
U.S. Cl. D6—451



298,707
STAND FOR VIDEO EQUIPMENT
Marianne D. Knight, 4 Sherwood Ct., Hillsborough, Calif. 94010
Filed Sep. 16, 1985, Ser. No. 776,206
Term of patent 14 years
U.S. Cl. D6—466

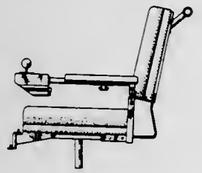




298,708
SIDE PANEL FOR A FURNITURE DRAWER
Ulf Nygren, Kalvlyckan 1, S-82 700 Ljusdal, Sweden
Filed Aug. 29, 1985, Ser. No. 770,574
Term of patent 14 years
U.S. Cl. D6—491

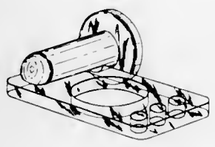


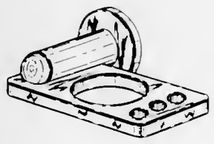
298,709
SEAT MODULE
Eric P. Rose, Canoga Park, and James J. Michel, Agoura, both of Calif., assignors to Everest & Jennings, Inc., Camarillo, Calif.
Filed Nov. 26, 1985, Ser. No. 805,299
Term of patent 14 years
U.S. Cl. D6—502



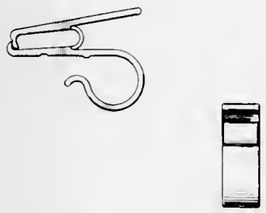
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298,710
COMBINED TOOTHBRUSH AND TUMBLER HOLDER
Peter S. Fayerman, Bryn Mawr, and Leslie A. Meck, Blandan, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Oct. 18, 1985, Ser. No. 789,173
Term of patent 14 years
U.S. Cl. D6—531





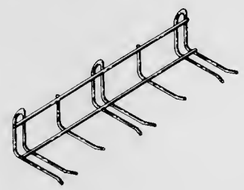
298,711
INTERFITTING TOWEL CLIP
Philip D. Lowance, 505 City Parkway W900, Orange, Calif. 92668
Filed Aug. 5, 1986, Ser. No. 893,331
Term of patent 14 years
U.S. Cl. D6—547



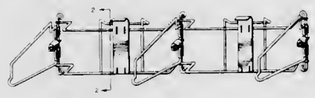
298,712
HOLDER FOR A TOILET BOWL BRUSH
Maurizio Mattei, Macerata, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Nov. 19, 1986, Ser. No. 932,901
Claims priority, application Italy, May 26, 1986, 21982/86[U]
Term of patent 14 years
U.S. Cl. D6—551



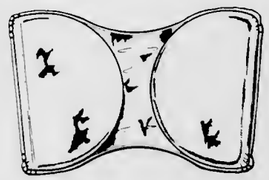
298,713
SKI STORAGE RACK
Daniel J. Hinderaker, and Philip D. Hinderaker, both of P.O. Box 33427, St. Paul, Minn. 55133-3427
Filed Sep. 24, 1986, Ser. No. 911,313
Term of patent 14 years
U.S. Cl. D6—552



298,714
BAG HOLDER OR THE LIKE
Randolph D. Prader, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Nov. 7, 1985, Ser. No. 803,996
The portion of the term of this patent subsequent to Mar. 18, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—566



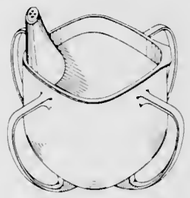
298,715
PILLOW
Laurie E. Swim, 48 Earl Street, Kingston, Ontario, Canada K7L 2G6
Filed May 22, 1986, Ser. No. 866,103
Claims priority, application Canada, Mar. 24, 1986, 24-03-86-2
Term of patent 14 years
U.S. Cl. D6—601



298,716
BATH PILLOW
Mark Kaplan, Newton, Mass., assignor to Laloren, Inc., Brockton, Mass.
Filed May 24, 1988, Ser. No. 197,897
Term of patent 14 years
U.S. Cl. D6—601



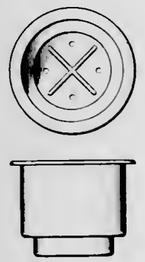
298,717
INFANT'S DRINKING CUP
Khipra Nichols, Providence; Fred D. Eddins, Mapleville, and David W. Crossley, Woonsocket, all of R.I., assignors to Playskool Baby, Inc., Northvale, N.J.
Filed Feb. 19, 1986, Ser. No. 834,432
Term of patent 14 years
U.S. Cl. D7—10



298,718
CHAMPAGNE FLUTE OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute 62510, Arques, France
Filed Jan. 24, 1986, Ser. No. 822,254
Term of patent 14 years
U.S. Cl. D7—13



298,719
HOLDER FOR BOTTLES, CONTAINERS OR THE LIKE
Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460
Filed Dec. 23, 1985, Ser. No. 812,454
Term of patent 14 years
U.S. Cl. D7—70

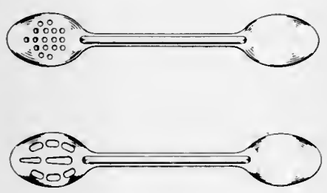


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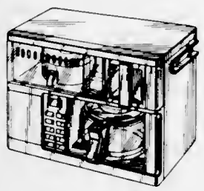
298,720
GARLIC CRUSHER
Robert Bolduc, 944, 44th Avenue, Lachine, Quebec, Canada, and Claude Bourbeau, 138 Paré , St-Jérôme, Quebec, Canada
Filed Nov. 22, 1985, Ser. No. 806,180
Claims priority, application Canada, Jun. 14, 1985, 14-06-85-5
Term of patent 14 years
U.S. Cl. D7—101



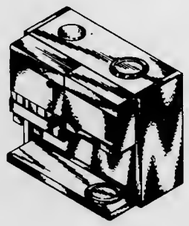
298,721
CULINARY COMBINATION SPOON
Mark A. Rea, Sr., 126 Academy Ave., Providence, R.I. 02908
Filed Mar. 5, 1986, Ser. No. 841,728
Term of patent 14 years
U.S. Cl. D7—140



298,722
MILL-EQUIPPED COFFEEMAKER
Koichi Nomura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 7, 1985, Ser. No. 763,228
Claims priority, application Japan, Feb. 22, 1985, 60-6320
Term of patent 14 years
U.S. Cl. D7—305

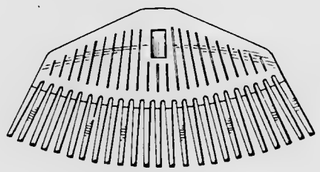


298,723
BEVERAGE DISPENSER
Pol F. Lambert, Milton Malsor, United Kingdom, assignor to Vortan International Holding N.V., Curaco, Netherlands
Filed Nov. 8, 1985, Ser. No. 803,988
Claims priority, application Switzerland, May 10, 1985, 005239
Term of patent 14 years
U.S. Cl. D7—309



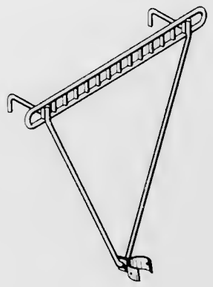
298,724
Patent Not Issued For This Number

298,725
RAKE HEAD
Timo Sunila, and Svante Rönnholm, both of Karjaa, Finland, assignors to Fiskars Oy Ab, Helsinki, Finland
Filed Mar. 25, 1986, Ser. No. 847,033
Claims priority, application Finland, Sep. 25, 1985, 714/85
Term of patent 14 years
U.S. Cl. D8—13

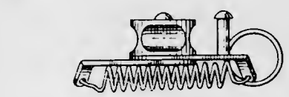


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298,726
RAKE CLEANER ATTACHMENT
John L. Carpenter, 700 Forni Rd., Placerville, Calif. 95667
Filed Apr. 28, 1986, Ser. No. 857,802
Term of patent 14 years
U.S. Cl. D8—13



298,727
CABLE TENSIOMETER
Lars H. Hansson, Fredstigen 7, Huddinge, Stockholm 14143, Sweden
Filed Oct. 28, 1985, Ser. No. 791,930
Term of patent 14 years
U.S. Cl. D8—44

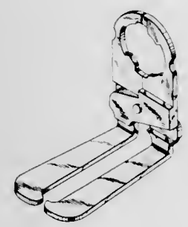




298,728
GRIPPING TONGS FOR HANDICAPPED PERSONS
Haken Bergkvist; Maria Benktzon, and Sven-Erik Juhlin, all of Box 14021, S-161 14 Bromma, Sweden
Filed Sep. 5, 1985, Ser. No. 772,856
Claims priority, application Sweden, Mar. 7, 1985, 85-0584
Term of patent 14 years
U.S. Cl. D8—51



298,729
TOOL FOR DISENGAGING PORTIONS OF A LAMP SOCKET
Charles Chase, East Meadow, and Robert Blaser, College Point, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Sep. 11, 1985, Ser. No. 774,102
Term of patent 14 years
U.S. Cl. D8—52



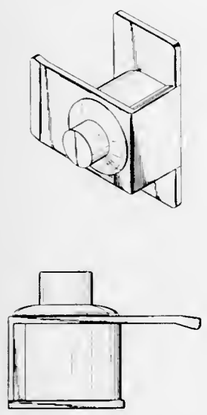
298,730
SCREW EYE DRIVING ATTACHMENT FOR AN ELECTRIC DRILL
John C. Zinn, 2302 E. Cameron Ave., West Covina, Calif. 91791
Filed Aug. 12, 1985, Ser. No. 764,540
Term of patent 14 years
U.S. Cl. D8—70



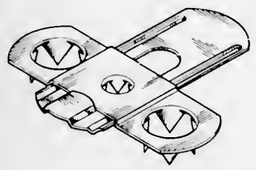
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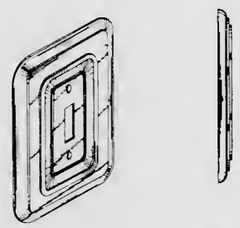
298,731
HANDLE FOR A DOOR, WINDOW OR THE LIKE
Peter Cook, Colchester, England, assignor to Titon Hardware Limited, Stanway, England
Filed Apr. 19, 1985, Ser. No. 725,276
Claims priority, application United Kingdom, Oct. 19, 1984, 1022775
The portion of the term of this patent subsequent to Nov. 8, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—300



298,732
LATCH
Jochum Pihl, Viksjöfors, Sweden, assignor to Nefab AB, Alfta, Sweden
Filed Apr. 2, 1986, Ser. No. 847,321
Claims priority, application Sweden, Oct. 4, 1985, 85-2389
Term of patent 14 years
U.S. Cl. D8—331



298,733
WALL PLATE
Daniel L. Pool, Paradise Valley, Ariz., assignor to Designer Bathware, Inc., Phoenix, Ariz.
Division of Ser. No. 63,631, Jun. 17, 1987, Pat. No. 294,907, which is a division of Ser. No. 845,772, Mar. 24, 1986, Pat. No. 291,753, which is a division of Ser. No. 514,002, Jul. 15, 1983, Pat. No. 283,188. This application Dec. 28, 1987, Ser. No. 139,033
Term of patent 14 years
U.S. Cl. D8—353

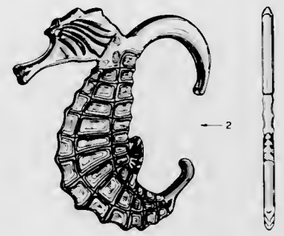


298,734
SUPPORT MEMBER FOR CABLE OR THE LIKE
Harvey M. Stern, 431 Haverford Rd., Wynnewood, Pa. 19096
Filed Nov. 15, 1985, Ser. No. 805,075
Term of patent 14 years
U.S. Cl. D8—356

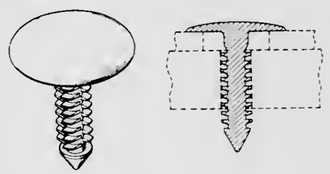


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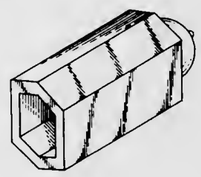
298,735
SHOWER CURTAIN RING
Steve Lakatos, Millbrook, Canada, assignor to Millbrook Mould Limited, Millbrook, Canada
Filed Dec. 24, 1985, Ser. No. 813,075
Term of patent 14 years
U.S. Cl. D8—367



298,736
PANEL FASTENER OR THE LIKE
Toshiyuki Shiraishi, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Mar. 20, 1986, Ser. No. 845,374
Claims priority, application Japan, Sep. 26, 1985, 60-40477
Term of patent 14 years
U.S. Cl. D8—388



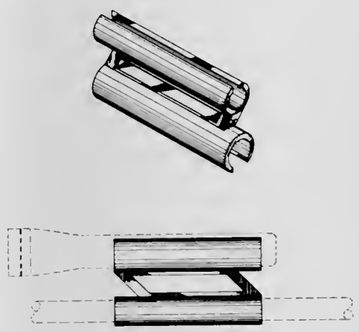
298,737
PROTECTIVE COVER FOR NUT OR BOLT HEADS
Wayne D. Wallace, 212 Mason Dr., Centerville, Ga. 31028
Filed Feb. 25, 1985, Ser. No. 705,378
Term of patent 14 years
U.S. Cl. D8—387



298,738
CLIP FOR CHRISTMAS LIGHTS
Donald D. Rumpel, Kellogg, Id., assignor to Kellogg Plastics, Ltd., Smelterville, Id.
Filed May 15, 1986, Ser. No. 863,476
Term of patent 14 years
U.S. Cl. D8—395



298,739
MOUNTING FOR ATTACHING A FLASHLIGHT TO A TUBULAR SUPPORT STRUCTURE SUCH AS A GUN BARREL
Henry W. Richards, Jr., P.O. Box 21, Meadow, Utah 84644
Filed May 23, 1986, Ser. No. 866,616
Term of patent 14 years
U.S. Cl. D8—395

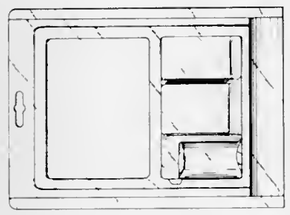


298,740
ROUND BOTTLE
Richard D. Warrell, Mystic, Conn., assignor to InnoPak Corporation, St. Louis, Mo.
Filed Oct. 17, 1985, Ser. No. 788,265
Term of patent 14 years
U.S. Cl. D9—349



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298,741
DISPLAY PACKAGE FOR A CAMERA
Norman Didia, Brooklyn, N.Y., assignor to Rokina Optical Co., Inc., Irvington, N.J.
Filed Dec. 10, 1985, Ser. No. 807,188
Term of patent 14 years
U.S. Cl. D9—415



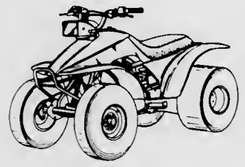
298,742
DISPLAY PACKAGE FOR AUXILIARY LENS
Norman Didia, Brooklyn, N.Y., assignor to Rokina Optical Co., Inc., Irvington, N.J.
Filed Dec. 10, 1985, Ser. No. 807,187
Term of patent 14 years
U.S. Cl. D9—415



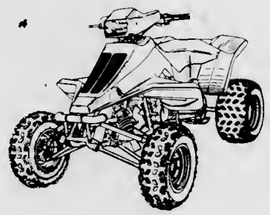
298,743
CONSTRUCTION LAYOUT TOOL
Steven A. Wiggins, 5742 Blue Jay Ct., Abilene, Tex. 79605
Filed Jan. 21, 1986, Ser. No. 820,065
Term of patent 14 years
U.S. Cl. D10—62



298,744
FOUR-WHEELED MOTORCYCLE
Kazuhiko Saito, Tokyo; Mitsuru Yamamoto; Tetsuya Nakazawa, both of Saitama; Shigeru Kuroda, Tokyo, and Yumio Shibata, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 11, 1986, Ser. No. 895,058
Claims priority, application Japan, Feb. 14, 1986, 61-4927
Term of patent 14 years
U.S. Cl. D12—107



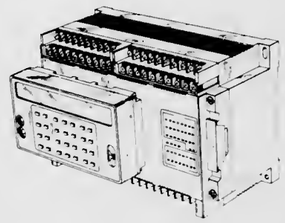
298,745
FOUR WHEELED MOTORCYCLE
Kazuyuki Takagaki, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed May 16, 1986, Ser. No. 864,119
Claims priority, application Japan, Jan. 21, 1986, 61-1783
Term of patent 14 years
U.S. Cl. D12—107



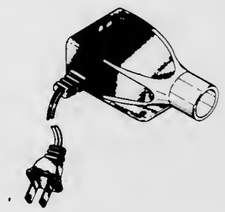
298,746
BICYCLE RACK
Cameron G. Whitworth, 58 Malvern Avenue; Harold Braul, 907 College, Apt. 6, and N. Charles Laviolette, 58 Malvern Avenue, all of Toronto, Ontario, Canada
Filed Oct. 31, 1986, Ser. No. 925,662
Term of patent 14 years
U.S. Cl. D12—115



298,747
PROGRAMMABLE CONTROLLER
Masato Shibayama, Sayama; Takeshi Abe, Tokyo; Nobuyuki Kojima, and Ryouichi Abe, both of Sibata, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 20, 1986, Ser. No. 834,455
Claims priority, application Japan, Dec. 18, 1985, 60-52392
Term of patent 14 years
U.S. Cl. D13—12



298,748
FLASHLIGHT BATTERY CHARGER
Raymond L. Sharrah, Collegeville, Pa., and Robert Bromley, Denver, Colo., assignors to Streamlight, Inc., Norristown, Pa.
Filed Aug. 29, 1986, Ser. No. 902,391
Term of patent 14 years
U.S. Cl. D13—6

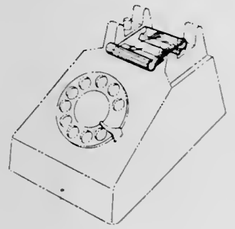




298,749
REMOTE CONTROL HANDLE FOR A PAVEMENT PATCHING VEHICLE OR THE LIKE
Robert M. Yant, P.O. Box 28434, Sacramento, Calif. 95828
Filed Nov. 21, 1985, Ser. No. 806,064
Term of patent 14 years
U.S. Cl. D13—32



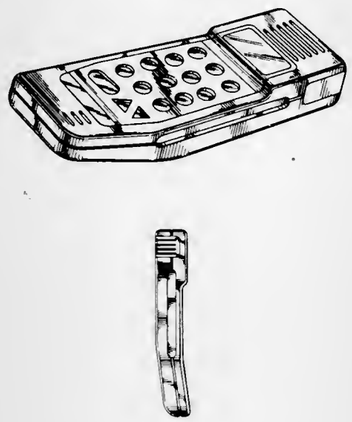
298,750
ATTACHMENT FOR TELEPHONE STAND
James S. Zaza, 78 Latimer Avenue, Toronto, Ontario, Canada M5N 2L8
Filed Nov. 4, 1986, Ser. No. 926,768
Claims priority, application Canada, May 14, 1986, 14-05-86-10
Term of patent 14 years
U.S. Cl. D14—59



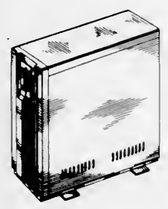


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298,751
HANDSET RADIO TELEPHONE
Dong-Yul Shin, Kacheon, Rep. of Korea, assignor to Samsung Semiconductor & Telecommunication Co., Ltd., Kyoungsang-buk-Do, Rep. of Korea
Filed Apr. 15, 1987, Ser. No. 38,589
Claims priority, application Rep. of Korea, Nov. 20, 1986, 1986/16342
Term of patent 14 years
U.S. Cl. D14—64



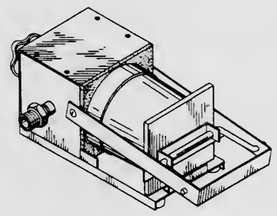
298,752
COMPUTER
Nobuhiko Hoshino, Ohra, Japan, assignor to Sanyo Electric Co., Ltd., Japan
Filed Dec. 12, 1985, Ser. No. 808,346
Claims priority, application Japan, Jul. 11, 1985, 60-29590
Term of patent 14 years
U.S. Cl. D14—100



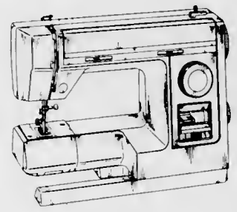
298,753
KEYBOARD REPLICA IMAGE FOR COMPUTER DISPLAY SCREEN
Ole Berg, Vedbaek, Denmark, assignor to Time/System International ApS, Denmark
Filed Dec. 3, 1985, Ser. No. 804,074
Claims priority, application Denmark, Sep. 9, 1985, 769/85
Term of patent 14 years
U.S. Cl. D14—115



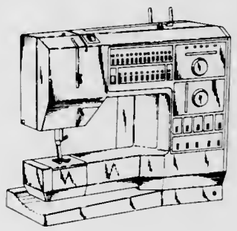
298,754
CARBON DIOXIDE COMPRESSING GENERATOR FOR DRY ICE MANUFACTURE
John Broeils, Wyckoff, N.J., assignor to Maddak, Inc., Pequannock, N.J.
Filed Sep. 2, 1986, Ser. No. 903,108
Term of patent 14 years
U.S. Cl. D15—9



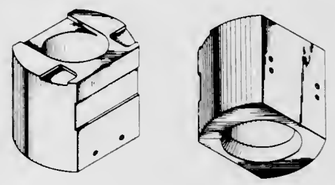
298,755
SEWING MACHINE
Ichirou Shibayama, Hyogo; Tetsuya Aono, and Mitsuru Oomura, both of Osaka, all of Japan, assignors to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Filed Jun. 3, 1986, Ser. No. 870,331
Claims priority, application Japan, Dec. 11, 1985, 60-51627
Term of patent 14 years
U.S. Cl. D15—69



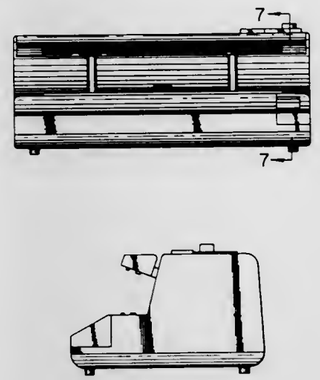
298,756
SEWING MACHINE
Roger H. Ramsey, Wadsworth, and Dale A. Panasewicz, Parma, both of Ohio, assignors to Fritz Gegauf Aktiengesellschaft, Steckborn, Switzerland
Filed Jan. 16, 1986, Ser. No. 819,292
Term of patent 14 years
U.S. Cl. D15—70



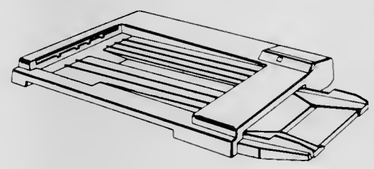
298,757
WRAPPING HEAD FOR ROUND ICE CREAM SANDWICH FORMING AND WRAPPING MACHINE
Charles L. Bergan, 8216 S. Oak Park Ave., Burbank, Ill. 60459
Filed Apr. 14, 1986, Ser. No. 852,106
Term of patent 14 years
U.S. Cl. D15—145



298,758
SEALER
Kendo Makihara, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 18, 1986, Ser. No. 944,594
Claims priority, application Japan, Jun. 18, 1986, 61-23712
Term of patent 14 years
U.S. Cl. D15—146

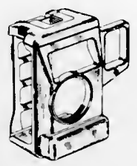


298,759
DOCUMENT FEEDER
Masanori Hashimoto, and Akira Imai, both of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Jan. 2, 1986, Ser. No. 815,565
Claims priority, application Japan, Jul. 2, 1985, 60-28285
Term of patent 14 years
U.S. Cl. D16—32

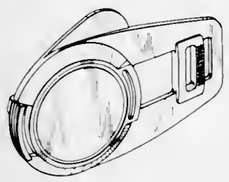


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298,760
ACCESSORY MOUNT FOR A CAMERA
Michio Yoshida, Tokyo, and Isao Nakazawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1985, Ser. No. 813,953
Claims priority, application Japan, Jul. 8, 1985, 60-29005
Term of patent 14 years
U.S. Cl. D16—44



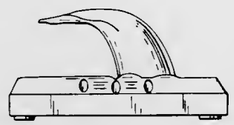
298,761
LENS CAP
Michio Yoshida, Tokyo, and Isao Nakazawa, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1985, Ser. No. 813,955
Claims priority, application Japan, Jul. 8, 1985, 60-29006
Term of patent 14 years
U.S. Cl. D16—136



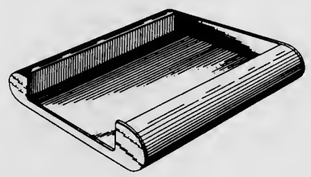
298,762
COMBINED HOLDER FOR A WRITING INSTRUMENT AND NOTE PAPER
Siegfried Hölterscheidt, Hückelhoven, Fed. Rep. of Germany, assignor to Walter Henkels GmbH, Ratheim, Fed. Rep. of Germany
Filed Apr. 10, 1986, Ser. No. 851,396
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1986, MR 167
Term of patent 14 years
U.S. Cl. D19—78



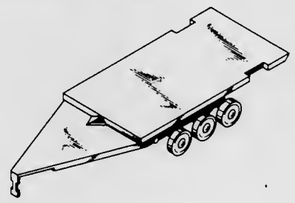
298,763
SIMULATIVE PEN HOLDER
James M. Fujiwara, 1955 A Aupuni St., Honolulu, Hi. 96817
Filed Feb. 5, 1986, Ser. No. 826,354
Term of patent 14 years
U.S. Cl. D19—82



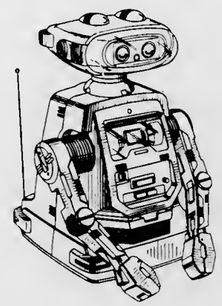
298,764
LETTER TRAY
Francis V. Herr, Kenmore, N.Y.; Robert A. O'Neil, West Chicago, and Leon C. Clouser, Lombard, both of Ill., assignors to Smith Metal Arts Co., Inc., Buffalo, N.Y.
Filed Oct. 22, 1984, Ser. No. 663,585
Term of patent 14 years
U.S. Cl. D19—92



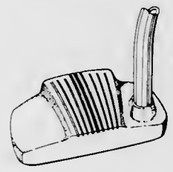
298,765
TOY TILT-BED TRAILER
Kenneth E. Pearson, 1326 Duck Rd., Grandview, Mo. 64030
Filed Aug. 30, 1985, Ser. No. 771,116
Term of patent 14 years
U.S. Cl. D21—141



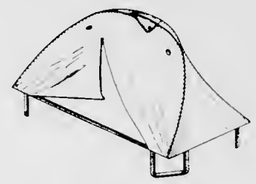
298,766
TOY ROBOT
Yuji Tanno, Tokyo, and Takeo Kimura, Kanagawa, both of Japan, assignors to Playtime Products, Inc., New York, N.Y.
Filed Apr. 11, 1986, Ser. No. 851,429
Term of patent 14 years
U.S. Cl. D21—150



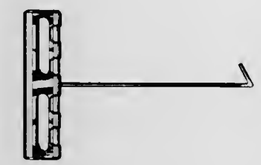
298,767
GOLF PUTTER
Harry Szczepanski, 755 Oakleigh, NW., Grand Rapids, Mich. 49504
Filed Jan. 6, 1986, Ser. No. 816,245
Term of patent 14 years
U.S. Cl. D21—219



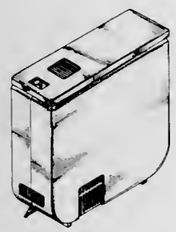
298,768
TENT FOR CHILD'S BED OR SIMILAR ARTICLE
Jack Dwosh, and Clive Edwards, both of Los Angeles, Calif., assignors to Pacific Products Ltd., Hong Kong, Hong Kong
Filed Jan. 6, 1986, Ser. No. 816,297
Term of patent 14 years
U.S. Cl. D21—253



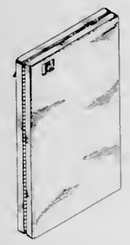
298,769
FISH HOOK REMOVER
Ralph G. Atkinson, Bensalem, Pa., assignor to Zober Industries, Inc., Croydon, Pa.
Filed Feb. 28, 1986, Ser. No. 838,013
Term of patent 14 years
U.S. Cl. D22—149



298,770
PORTABLE TOWEL HEATING DEVICE
Robert A. DeMars, 7932 Maestro, Canoga Park, Calif. 91304
Filed Oct. 28, 1985, Ser. No. 791,723
Term of patent 14 years
U.S. Cl. D23—314

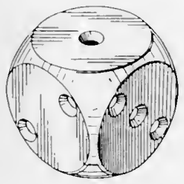


298,771
BRACKET MOUNTED TOWEL HEATING DEVICE
Robert A. DeMars, 7932 Maestro, Canoga Park, Calif. 91304
Filed Oct. 28, 1985, Ser. No. 791,728
Term of patent 14 years
U.S. Cl. D23—314

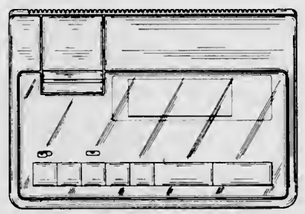


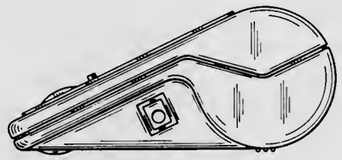
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298,772
AIR FRESHENER CASING
Giovanni F. Verri, Milan, Italy, assignor to S.I.P.A.L. Arexons S.p.A. Societa Italiana Prodotti Auto e Locomozione, Milan, Italy
Filed Feb. 6, 1986, Ser. No. 826,625
Term of patent 14 years
U.S. Cl. D23—367



298,774
ELECTRONIC SPHYGMOMANOMETER
Takahisa Yubisui; Hiroshi Sakaguchi, and Toshiya Takahashi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Nov. 21, 1986, Ser. No. 933,609
Claims priority, application Japan, May 23, 1986, 61-19742
Term of patent 14 years
U.S. Cl. D24—21





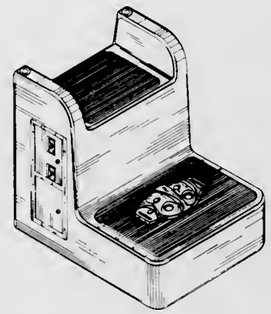
298,773
BABY HEARING TESTER
Leo H. Eckstein, 11350 Kingsland St., Los Angeles, Calif. 90066, and Joel Eckstein, 435 S. Curson Ave., Apartment 1A, Los Angeles, Calif. 90045
Filed Nov. 19, 1986, Ser. No. 932,380
Term of patent 14 years
U.S. Cl. D24—17



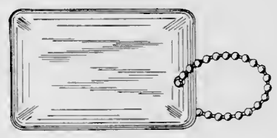
298,775
COMBINED HOT COMPRESS ACUPRESSOR AND MASSAGER
Sun S. Lee, 1st Fl., No. 28, Lane 360, Tun Hua S. Road, Taipei, Taiwan
Filed May 7, 1986, Ser. No. 860,494
Term of patent 14 years
U.S. Cl. D24—41



298,776
FOOT MASSAGER
Nancy C. Duncan, 1096 Farroll, Arroyo Grande, Calif. 93426, and Louis O. Schorsch, Grover City, Calif., assignors to Nancy C. Duncan, Arroyo Grande, Calif.
Continuation-in-part of Ser. No. 859,758, May 5, 1986. This application Aug. 19, 1986, Ser. No. 898,060
Term of patent 14 years
U.S. Cl. D24—42



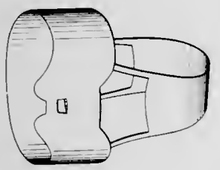
298,777
TEETHER
Jeffrey B. Gorman, Los Angeles, Calif., assignor to Epiphany, Inc., Los Angeles, Calif.
Filed Mar. 17, 1986, Ser. No. 845,035
Term of patent 14 years
U.S. Cl. D24—45



298,778
AUTOMOTIVE CIGAR LIGHTER
Kazumi Honjo, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan
Filed Jun. 26, 1985, Ser. No. 748,954
Claims priority, application Japan, Dec. 27, 1984, 59-54041
The portion of the term of this patent subsequent to Nov. 22, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D27—141



298,779
CHILD'S EXERCISE HARNESS
David Shepler, P.O. Box 302, East Randolph, Vt. 05041
Filed Sep. 16, 1986, Ser. No. 908,146
Term of patent 14 years
U.S. Cl. D29—11



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Ader, Gary B.: *See—*
Benit, Brad J.; and Ader, Gary B., 4,787,168, Cl. 43-25.200.

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Ahmed, Hassan J.; and Field, Michael J., to Westinghouse Electric Corp. Fuel assembly grid inspection apparatus. 4,787,715, Cl. 356-244.000.

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Ajiki, Yoshio; and Ishida, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating apparatus for an internal combustion engine. 4,787,346, Cl. 123-90.440.

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Yokokawa, Yoshio: *See—*
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Yokota, Takayoshi; Horiya, Shigekazu; and Tanaka, Kenjiroh, to Kabushiki Kaisha Kumagaigumi. Cloth faced form for forming concrete. 4,787,597, Cl. 249-113.000.

Yokote, Masatsugu; Ito, Hideo; Kawagoe, Kenzi; and Kawabata, Kazunobu, to Nissan Motor Company, Limited. Height control system for automotive vehicle with vehicular profile regulating feature. 4,787,644, Cl. 280-6.00R.

Yokoyama, Masato: *See—*
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Yoshida, Hiroshi; Kozuka, Hajime; and Murai, Masao, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Koyo Seiko Kabushiki Kaisha. Power steering system. 4,787,469, Cl. 180-142.000.

Yoshida, Hisayoshi: *See—*
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Young, Richard K., to Phillips Petroleum Company. Spiral flow in a shell and tube heat exchanger. 4,787,440, Cl. 165-1.000.

Younger, Ronald L.; and Coulter, John S., to J. M. Huber Corporation. Open mesh device for improved in-car slurrying. 4,787,782, Cl. 406-46.000.

Yu, Mason K., to General Motors Corporation. Flow path defining means and method of making. 4,787,421, Cl. 138-178.000.

Yuge, Akio; and Watanabe, Hiroshi, to Kabushiki Kaisha Toshiba. Paper sheet sorting apparatus. 4,787,518, Cl. 209-534.000.

Yuhshin Co., Ltd.: *See—*
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Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. Sweetening with L-aminodicarboxylic acid alkenes. 4,788,073, Cl. 426-548.000.

Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic acid esters. 4,788,332, Cl. 562-498.000.

Zavoli, Walter B.; Milnes, Kenneth A.; and Peterson, Glenn R., to Etak, Incorporated. Method and apparatus for measuring relative heading changes in a vehicular onboard navigation system. 4,788,645, Cl. 364-449.000.

Zebe, Charles W., to Bell Communications Research, Inc. Public opinion polling system. 4,788,716, Cl. 379-92.000.

Zeitlin, Alexander, to Press Technology Corporation. Flange connection with improved seal and bolt-nut design. 4,787,654, Cl. 285-101.000.

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Zenith Electronics Corporation: *See—*
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Zepeda, Ernesto F., to McNeil, Errol Rex. Frying oven. 4,787,364, Cl. 126-41.00R.

Zimermann, Robert W.; and Schaller, David R., to Rayovac Corporation. Device with composite reflector. 4,788,633, Cl. 362-296.000.

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Zoeller, Joseph R., to Eastman Kodak Company. Process for preparing 2-acetonaphthones. 4,788,341, Cl. 568-315.000.

Zrostlik, Francis L., to Iowa Mold Tooling Company, Incorporated. Hydraulic lift gate. 4,787,809, Cl. 414-557.000.

Zuber, Peter: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF NOVEMBER, 1988

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baker, Keith F.; Kowalski, Richard M.; and Mishler, Ralph E., to Synchro-Start Products, Inc. Latching solenoid mechanism. Re. 32,793, Cl. 335-170.000.

Igarashi, Seiko: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, Re. 32,792, Cl. 208-44.000.

Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing mesophase pitch. Re. 32,792, Cl. 208-44.000.

Keiper Recaro Incorporated: *See*—
Strowick, Willibald; and Werner, Paul, Re. 32,790, Cl. 297-367.000.

Kowalski, Richard M.: *See*—
Baker, Keith F.; Kowalski, Richard M.; and Mishler, Ralph E., Re. 32,793, Cl. 335-170.000.

Mishler, Ralph E.: *See*—
Baker, Keith F.; Kowalski, Richard M.; and Mishler, Ralph E., Re. 32,793, Cl. 335-170.000.

Naito, Tsutomu: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, Re. 32,792, Cl. 208-44.000.

Saunders, Harold D. Cervical traction device. Re. 32,791, Cl. 128-75.000.

Strowick, Willibald; and Werner, Paul, to Keiper Recaro Incorporated. Inertially locked hinge for motor vehicle seat. Re. 32,790, Cl. 297-367.000.

Synchro-Start Products, Inc.: *See*—
Baker, Keith F.; Kowalski, Richard M.; and Mishler, Ralph E., Re. 32,793, Cl. 335-170.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, Re. 32,792, Cl. 208-44.000.

Werner, Paul: *See*—
Strowick, Willibald; and Werner, Paul, Re. 32,790, Cl. 297-367.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bolt, Michael L.: *See*—
Irwin, Samuel N.; Lum, Francis; Bolt, Michael L.; Henke, Steven E.; Sokolik, Edmund L.; and Chambors, John M., B1 4,647,994, Cl. 360-85.000.

Chambors, John M.: *See*—
Irwin, Samuel N.; Lum, Francis; Bolt, Michael L.; Henke, Steven E.; Sokolik, Edmund L.; and Chambors, John M., B1 4,647,994, Cl. 360-85.000.

Henke, Steven E.: *See*—
Irwin, Samuel N.; Lum, Francis; Bolt, Michael L.; Henke, Steven E.; Sokolik, Edmund L.; and Chambors, John M., B1 4,647,994, Cl. 360-85.000.

Irwin Magnetic Systems, Inc.: *See*—
Irwin, Samuel N.; Lum, Francis; Bolt, Michael L.; Henke, Steven E.; Sokolik, Edmund L.; and Chambors, John M., B1 4,647,994, Cl. 360-85.000.

Irwin, Samuel N.; Lum, Francis; Bolt, Michael L.; Henke, Steven E.; Sokolik, Edmund L.; and Chambors, John M., to Irwin Magnetic Systems, Inc. Miniaturized cartridge-type tape drive for data processors. B1 4,647,994, 11-29-88, Cl. 360-85.000.

Lum, Francis: *See*—
Irwin, Samuel N.; Lum, Francis; Bolt, Michael L.; Henke, Steven E.; Sokolik, Edmund L.; and Chambors, John M., B1 4,647,994, Cl. 360-85.000.

McGinlay, James G.; and Urquhart, Roderick M., to Rodime plc. Micro hard-disk drive system. B1 4,568,988, 11-29-88, Cl. 360-77.000.

McGinlay, James G.; and Urguhart, Roderick M. Micro hard-disk drive system. B1 4,638,383, 11-29-88, Cl. 360-77.000.

Petersen, Walter J.: *See*—
Witt, Robert H.; and Petersen, Walter J., B1 4,325,211, Cl. 56-15.800.

Rodime plc: *See*—
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Sokolik, Edmund L.: *See*—
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Urguhart, Roderick M.: *See*—
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Urquhart, Roderick M.: *See*—
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Witt, Robert H.; and Petersen, Walter J., to Toro Company, The. Floating deck for rider mower. B1 4,325,211, 11-29-88, Cl. 56-15.800.

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Abe, Takeshi: *See*—
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Bergan, Charles L. Wrapping head for round ice cream sandwich forming and wrapping machine. 298,757, 11-29-88, Cl. D15-145.000.

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Carpenter, John L. Rake cleaner attachment. 298,726, 11-29-88, Cl. D8-13.000.

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Chou, Hung-Chang. Life jacket. 298,680, 11-29-88, Cl. D2-29.000.

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Diaz, Juan A., to Reebok International Ltd. Shoe sole material. 298,682, 11-29-88, Cl. D2-314.000.

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Didia, Norman, to Rokina Optical Co., Inc. Display package for auxiliary lens. 298,742, 11-29-88, Cl. D9-415.000.

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Drew, Robert A., to Kimberly-Clark Corporation. Embossed tissue or similar article. 298,702, 11-29-88, Cl. D5-53.000.

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521 4,787,365

CLASS 127

37 4,787,939
54 4,787,940

CLASS 128

4 4,787,369
6 4,787,370
24 A 4,787,371
24 R 4,787,372
24.1 4,787,373
65 4,787,374
70 4,787,375
75 Re.32,791
77 4,787,376
92 VD 4,787,377
92 YW 4,787,378
95.1 4,787,379
156 4,787,380
157 4,787,381
203.25 4,787,382
303 R 4,787,383
303.1 4,787,385
330 4,787,384
334 R 4,787,386
4,787,387
344 4,787,388
419 PG 4,787,389
641 4,787,390
654 4,787,391
660.03 4,787,394
660.04 4,787,393
661.01 4,787,392
661.09 4,787,395
667 4,787,396
742 4,787,397
770 4,787,398
772 4,787,399

CLASS 130

27 T 4,787,400

CLASS 131

360 4,787,401
370 4,787,402

CLASS 132

327 4,787,403

CLASS 134

1 4,787,941
198 4,787,404

CLASS 135

66 4,787,405

CLASS 137

1 4,787,406
2 4,787,407
14 4,787,408
67 4,787,409
78.4 4,787,410
244 4,787,411
454.2 4,787,412
494 4,787,413
595 4,787,414
596.15 4,787,415
624.12 4,787,416
624.13 4,787,417
625.48 4,787,418

CLASS 138

46 4,787,419
89 4,787,420
178 4,787,421

CLASS 139

435 4,787,422
4,787,423
441 4,787,424

CLASS 140

73 4,787,425
147 4,787,426

CLASS 141

39 4,787,427
4,787,428
383 4,787,429

CLASS 144

144 R 4,787,430
341 4,787,431
367 4,787,432

CLASS 148

6.15 4,787,942
152 4,787,944
428 4,787,945
437 4,787,943

CLASS 156

137 4,787,946
160 4,787,947
164 4,787,948
222 4,787,949
249 4,787,950
285 4,787,951
359 4,787,952
387 4,787,953
459 4,787,954
488 4,787,955
497 4,787,956
643 4,787,957
652 4,787,958

CLASS 157

1.17 4,787,433

CLASS 162

25 4,787,959
158 4,787,960

CLASS 164

34 4,787,434
228 4,787,435
305 4,787,436
453 4,787,437
4,787,438
518 4,787,439

CLASS 165

1 4,787,440
48.2 4,787,444
104.32 4,787,445
133 4,787,441
151 4,787,442
165 4,787,443

CLASS 166

66.4 4,787,446
169 4,787,447
176 4,787,448

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259 4,787,449
267 4,787,450
270 4,787,451
272 4,787,452
4,787,453
274 4,787,454
279 4,787,455
281 4,787,456
286 4,787,457
380 4,787,458

CLASS 169

42 4,787,459
51 4,787,460

CLASS 171

27 4,787,461

CLASS 172

730 4,787,462

CLASS 174

35 GC 4,788,381
52 FP 4,788,382
54 4,788,383

CLASS 175

45 4,787,463
57 4,787,464
67 4,787,465
329 4,787,466

CLASS 177

50 4,787,467

CLASS 178

18 4,788,384
19 4,788,385
4,788,386

CLASS 180

70.1 4,787,468
142 4,787,469
210 4,787,470
249 4,787,471

CLASS 181

145 4,787,472
224 4,787,473

CLASS 182

7 4,787,474
82 4,787,475
116 4,787,476
4,787,477
206 4,787,478

CLASS 184

7.2 4,787,479

CLASS 185

40 R 4,787,480

CLASS 187

110 4,787,481

CLASS 188

24.12 4,787,485
71.4 4,787,482
77 W 4,787,483
171 4,787,484
289 4,787,486
328 4,787,487

CLASS 190

104 4,787,488

CLASS 192

0.052 4,787,489
45 4,787,490
48.6 4,787,491
48.8 4,787,492
70.25 4,787,493
86 4,787,494

CLASS 194

209 4,787,495

CLASS 198

346.1 4,787,496
347 4,787,497
365 4,787,498
407 4,787,499
497 4,787,500
735 4,787,501
771 4,787,502
776 4,787,503
782 4,787,504
803.01 4,787,505

CLASS 200

47 4,788,387
77 4,788,388
81.9 M 4,788,389
144 AP 4,788,390
148 F 4,788,391
148 R 4,788,392
292 4,788,393

CLASS 204

9 4,787,961
32.1 4,787,962
180.1 4,787,963
282 4,787,964
290 R 4,787,965
406 4,787,966

CLASS 206

219 4,787,511
223 4,787,512
329 4,787,510
395 4,787,506
407 4,787,513
427 4,787,509
4,787,514
445 4,787,508
509 4,787,515
566 4,787,516
610 4,787,517
617 4,787,507

CLASS 208

44 Re.32,792
74 4,787,967
120 4,787,968
139 4,787,969

CLASS 209

534 4,787,518
674 4,787,519

CLASS 210

179 4,787,970
196 4,787,972
198.2 4,787,971
282 4,787,973
321.8 4,787,974
360.1 4,787,975
500.23 4,787,976
4,787,977
605 4,787,978
634 4,787,979
638 4,787,980
639 4,787,981
641 4,787,982
656 4,787,983
698 4,787,984
772 4,787,985
773 4,787,986
792 4,787,987
808 4,787,988

CLASS 211

13 4,787,520
51 4,787,521
71 4,787,522
74 4,787,523

CLASS 212

150 4,787,524

CLASS 215

201 4,787,525
216 4,787,526

CLASS 219

10.43 4,788,396
10.55 F 4,788,397
10.55 R 4,788,395
10.61 R 4,788,394
69 P 4,788,399
69 W 4,788,400
75 4,788,401
76.16 4,788,402
85 BA 4,788,403
85 R 4,788,404
109 4,788,405
113 4,788,406
120 4,788,407
121.46 4,788,409
121.49 4,788,408
124.34 4,788,410
127 4,788,411
137 PS 4,788,412
364 4,788,413
464 4,788,414
483 4,788,398
508 4,788,415
516 4,788,416
528 4,788,417

CLASS 220

74 4,787,527
86 R 4,787,528
203 4,787,529
266 4,787,530
324 4,787,531
410 4,787,532

CLASS 221

12 4,787,533

CLASS 222

130 4,787,534
148 4,787,535
212 4,787,536
334 4,787,537
511 4,787,538
639 4,787,539

CLASS 224

192 4,787,540
275 4,787,541

CLASS 225

1 4,787,542
19 4,787,543

CLASS 226

74 4,787,545
91 4,787,546
97 4,787,547
118 4,787,544

CLASS 228

6.2 4,787,548
8 4,787,549
47 4,787,550
179 4,787,551

CLASS 229

2.5 R 4,787,552
49 4,787,553

CLASS 235

379 4,788,418
381 4,788,419
483 4,788,420

CLASS 236

26 R 4,787,554
46 R 4,787,555

CLASS 238

14 4,787,556

CLASS 239

200 4,787,557
205 4,787,558
265.43 4,787,559
373 4,787,560

CLASS 241

30 4,787,561
117 4,787,562
208 4,787,563
275 4,787,564

CLASS 242

18 PW 4,787,565
35.6 R 4,787,566
55.2 4,787,567
56.9 4,787,568
107 4,787,569
195 4,787,570
4,787,571
201 4,787,572

CLASS 244

17.23 4,787,573
33 4,787,575
116 4,787,574
122 R 4,787,576
129.4 4,787,577
129.5 4,787,578
169 4,787,579
173 4,787,580

CLASS 246

247 4,787,581

CLASS 248

37.3 4,787,582
55 4,787,583
99 4,787,584
175 4,787,585
205.1 4,787,587
210 4,787,586
222.1 4,787,588
278 4,787,589
293 4,787,590
316.7 4,787,591
327 4,787,592
396 4,787,593
421 4,787,594
454 4,787,595

CLASS 249

59 4,787,596
113 4,787,597
162 4,787,598

CLASS 250

201 4,788,421
231 SE 4,788,422
235 4,788,423
270 4,788,424
311 4,788,425
327.2 4,788,426
330 4,788,427
332 4,788,428
363 S 4,788,429
376 4,788,430
397 4,788,431
472.1 4,788,432
474.1 4,788,433
484.1 4,788,434
4,788,435
485.1 4,788,436
486.1 4,788,437
506.1 4,788,438
561 4,788,439
4,788,440
572 4,788,442
574 4,788,443
577 4,788,444
578 4,788,445

CLASS 251

148 4,787,599
368 4,787,736

CLASS 252

8.511 4,787,990
8.6 4,787,989
12.4 4,787,991
18 4,787,992
4,787,993
32.5 4,787,994
49.5 4,787,995
51.5 R 4,787,996
79.4 4,787,997
174.11 4,787,998
174.17 4,787,999
299.61 4,788,000
312 4,788,001
364 4,788,002
373 4,788,003
4,788,004
539 4,788,005
550 4,788,006
589 4,788,007
609 4,788,008

CLASS 254

126 4,787,600

CLASS 256

19 4,787,601
23 4,787,602
25 4,787,603

CLASS 260

104 4,788,009
501.17 4,788,010
507 R 4,788,011
543 R 4,788,012

CLASS 261

24 4,788,013
39.2 4,788,014
153 4,788,020

CLASS 264

1.3 4,788,015
10 4,788,016
28 4,788,017
63 4,788,018
122 4,788,019
177.17 4,788,021
275 4,788,022
517 4,788,023

CLASS 266

44 4,787,604
194 4,787,605

CLASS 267

64.27 4,787,606
4,787,607
4,787,608
140 4,787,609
140.1 4,787,610
4,787,611
273 4,787,612

CLASS 269

75 4,787,613
303 4,787,614

CLASS 271

3 4,787,615
3.1 4,787,616
4,787,617
94 4,787,618
98 4,787,619
111 4,787,620
221 4,787,621
225 4,787,622

CLASS 272

74 4,787,623
75 4,787,624
76 4,787,625
93 4,787,626
99 4,787,627
118 4,787,628
123 4,787,629
146 4,787,630

CLASS 273

1 GF 4,787,631
32 B 4,787,632
37 4,787,633
4,787,634
109 4,787,635
167 R 4,787,636
212 4,787,637
232 4,787,638
249 4,787,639
357 4,787,640

CLASS 277

135 4,787,641
206 A 4,787,642

CLASS 280

5 A 4,787,643
6 R 4,787,644
91 4,787,645
95 R 4,787,646
240 4,787,647
275 4,787,648
561 4,788,441
707 4,787,649
4,787,650
803 4,787,651
824 4,787,652

CLASS 281

2 4,787,653

CLASS 285

101 4,787,654
151 4,787,655
177 4,787,656
323 4,787,657

CLASS 293

107 4,787,658

CLASS 294

1.1 4,787,659
4,787,660
58 4,787,661
64.1 4,787,662
99.2 4,787,663
103.2 4,787,664

CLASS 296

65.1 4,787,667
93 4,787,668
180.1 4,787,665
4,787,666
182 4,787,669
190 4,787,670

CLASS 297

35 4,787,671
296 4,787,672
301 4,787,673
317 4,787,674
335 4,787,675
353 4,787,676
367 Re.32,790
464 4,787,677

CLASS 299

39 4,787,678

CLASS 301

36 R 4,787,679
124 R 4,787,680
375 4,787,681

CLASS 303

109 4,787,682
110 4,787,683
111 4,787,684
114 4,787,685

CLASS 307

10 R 4,788,446
4,788,447
31 4,788,448
43 4,788,449
64 4,788,450
66 4,788,451
71 4,788,452
119 4,788,453
296 R 4,788,454
297 4,788,455
350 4,788,456
449 4,788,457
475 4,788,458
4,788,459
530 4,788,460
543 4,788,461
568 4,787,686
597 4,788,462

CLASS 310

4,788,463
268 4,788,464
269 4,788,465
316 4,788,466
323 4,788,467
4,788,468

CLASS 312

100 4,787,687

CLASS 313

113 4,788,469
440 4,788,470
477 R 4,788,471
496 4,788,472

CLASS 314

278 4,788,201

CLASS 315

39 4,788,473
119 4,788,474
183 4,788,475

CLASS 318

41 4,788,476
135 4,788,477
345 B 4,788,478
350 4,788,479
442 4,788,480
600 4,788,481
616 4,788,482
689 4,788,483
696 4,788,484
811 4,788,485

CLASS 320

17 4,788,486

CLASS 322

1 4,788,487

CLASS 324

61 P 4,788,489
61 R 4,788,488
62 4,788,490
71.1 4,788,491
73 R 4,788,492
140 R 4,788,493
142 4,788,494
158 F 4,788,496
158 R 4,788,495
177 4,788,497
207 4,788,498
238 4,788,499
309 4,788,500
314 4,788,501
318 4,788,502
322 4,788,503
377 4,788,504
379 4,788,505
446 4,788,506

CLASS 328

151 4,788,507

CLASS 330

51 4,788,508
54 4,788,509
253 4,788,510
277 4,788,511

CLASS 331

4 4,788,512

CLASS 332

7.51 4,788,514
16 R 4,788,513

CLASS 333

160 4,788,515

CLASS 335

84 4,788,516
170 Re.32,793
205 4,788,517

CLASS 337

49 4,788,518
280 4,788,519
301 4,788,520

CLASS 338

3 4,788,521
15 4,788,522
309 4,788,523
4,788,524

CLASS 340

58 4,788,525
71 4,788,526
310 A 4,788,527
521 4,788,529
527 4,788,530
574 4,788,532
575 4,788,533
601 4,788,534
703 4,788,535
4,788,536
710 4,788,537
747 4,788,538
753 4,788,539
789 4,788,540
825.00 4,788,541

825.31 4,788,542
825.44 4,788,543
853 4,788,544
856 4,788,545
870.37 4,788,546
945 4,788,531

CLASS 341

155 4,788,528

CLASS 342

100 4,788,547
458 4,788,548

CLASS 343

72 4,788,549
712 4,788,550
713 4,788,551
771 4,788,552
786 4,788,553
4,788,554
840 4,788,555

CLASS 346

1.1 4,788,556
4,788,557
76 PH 4,788,558
4,788,559
108 4,788,560
135.1 4,788,561
4,788,562
140 R 4,788,563
153.1 4,788,564

CLASS 350

3.71 4,787,688
96.12 4,787,689
4,787,690
96.14 4,787,691
96.16 4,787,692
4,787,693
96.19 4,787,694
96.20 4,787,695
4,787,696
4,787,697
4,787,698
4,787,706
96.21 4,787,699
4,787,700
4,787,701
4,787,704
96.23 4,787,702
4,787,703
4,787,705
4,787,707
96.28 4,787,708
96.34 4,787,709
173 4,787,710
174 4,787,711
333 4,787,712
342 4,787,713
354 4,787,714
357 4,787,716
4,787,717
427 4,787,718
4,787,719
429 4,787,720
432 4,787,721
452 4,787,722
475 4,787,723
4,787,724
539 4,787,725
637 4,787,726

CLASS 351

118 4,787,727
4,787,728
137 4,787,729
138 4,787,730
153 4,787,731
160 R 4,787,732
177 4,787,733
212 4,787,734
221 4,787,735

CLASS 353

57 4,787,737
120 4,787,738

CLASS 354

75 4,788,565
283 4,788,566
286 4,788,567
303 4,788,568
409 4,788,569

CLASS 355

3 CH 4,788,573
3 DD 4,788,570
3 SH 4,788,571
3 TR 4,788,572
4 4,788,574
14 SH 4,788,575
43 4,788,576
53 4,788,577

CLASS 356

4 4,787,739
31 4,787,740
35.5 4,787,741
71 4,787,742
124 4,787,743
244 4,787,715
246 4,787,744
346 4,787,745
349 4,787,747
361 4,787,746
376 4,787,748
381 4,787,749
437 4,787,750

CLASS 357

4 4,788,579
23.6 4,788,580
29 4,788,581
71 4,788,582
72 4,788,583
81 4,788,584

CLASS 358

10 4,788,585
28 4,788,586
75 4,788,587
93 4,788,588
133 4,788,589
143 4,788,590
190 4,788,591
213.13 4,788,593
4,788,594
213.29 4,788,592
213.31 4,788,595
222 4,788,596
253 4,788,597
256 4,788,578
260 4,788,598
296 4,788,599
335 4,788,600
336 4,788,601
337 4,788,602
342 4,788,603

CLASS 360

10.3 4,788,604
42 4,788,605
73 4,788,606
74.2 4,788,607
77 4,788,608
B1 4,568,988
B1 4,638,383
85 4,788,609
B1 4,647,994
96.3 4,788,610
96.5 4,788,616
120 4,788,611
4,788,612
123 4,788,613
132 4,788,614
135 4,788,615

CLASS 361

1 4,788,617
86 4,788,618
91 4,788,619
96 4,788,620
115 4,788,621
124 4,788,622
171 4,788,623
272 4,788,624
306 4,788,625
386 4,788,626
4,788,627

CLASS 362

18 4,788,628
23 4,788,629
80 4,788,630
103 4,788,631
200 4,788,632
296 4,788,633

CLASS 363

21 4,788,634
35 4,788,635

CLASS 364

191 4,788,636
200 4,788,637
4,788,638
4,788,639
4,788,640
4,788,641
4,788,642
407 4,788,643
426.03 4,788,644
449 4,788,645
484 4,788,646
494 4,788,647
509 4,788,648
513.5 4,788,649
526 4,788,650
574 4,788,651
602 4,788,652
724.01 4,788,653
728.01 4,788,654
748 4,788,655
900 4,788,656
4,788,657
4,788,658
4,788,659
4,788,660
4,788,661

CLASS 365

159 4,788,662
185 4,788,663
189 4,788,664
4,788,665
4,788,666
193 4,788,667
202 4,788,668

CLASS 366

110 4,787,751

CLASS 368

80 4,788,669
119 4,788,670

CLASS 369

13 4,788,671
32 4,788,672
36 4,788,673
54 4,788,674
176 4,788,676
223 4,788,677
284 4,788,678

CLASS 370

60 4,788,679
68 4,788,680
69.1 4,788,675
100 4,788,681
110.1 4,788,682

CLASS 371

20 4,788,683
21 4,788,684
38 4,788,685

CLASS 372

37 4,788,686
40 4,788,687
45 4,788,688
4,788,689
50 4,788,690
84 4,788,691

CLASS 374

45 4,787,752

CLASS 375

27 4,788,692
38 4,788,693
59 4,788,694
80 4,788,695
111 4,788,696
113 4,788,697

CLASS 376

107 4,788,024
143 4,788,025
245 4,788,026
260 4,788,027
264 4,788,028
272 4,788,029
4,788,030
296 4,788,031
352 4,788,032
353 4,788,033

CLASS 378

34 4,788,698
38 4,788,699
44 4,788,700
69 4,788,701
73 4,788,702
84 4,788,703
99 4,788,704
121 4,788,705
207 4,788,706
4,788,707

CLASS 379

6 4,788,708
29 4,788,710
59 4,788,711
63 4,788,712
70 4,788,713
74 4,788,714
84 4,788,715
92 4,788,716
98 4,788,717
100 4,788,709
113 4,788,718
114 4,788,719
201 4,788,720
221 4,788,721

CLASS 383

33 4,787,753
63 4,787,754
65 4,787,755

CLASS 384

47 4,787,756
470 4,787,757
559 4,787,758

CLASS 400

55 4,787,759
124 4,787,760
145.2 4,787,761
187 4,787,762
213 4,787,763
616.2 4,787,764

CLASS 401

191 4,787,765

CLASS 402

79 4,787,766

CLASS 403

187 4,787,767
235 4,787,768
252 4,787,769
317 4,787,770
370 4,787,771

CLASS 405

53 4,787,772
94 4,787,774
118 4,787,773
150 4,787,775
163 4,787,777
195 4,787,778
230 4,787,779
270 4,787,776
4,787,780
282 4,787,781

CLASS 406

46 4,787,782
106 4,787,783

CLASS 407

114 4,787,784

CLASS 409

136 4,787,785
180 4,787,786
219 4,787,787

CLASS 410

49 4,787,788
80 4,787,789

CLASS 411

109 4,787,790
124 4,787,791
339 4,787,793
387 4,787,792
433 4,787,794
510 4,787,795

CLASS 414

10 4,787,796
24.6 4,787,797
30 4,787,798
36 4,787,799
222 4,787,800
4,787,801
259 4,787,802
281 4,787,803
4,787,804
416 4,787,805
4,787,806
4,787,807
531 4,787,808
557 4,787,809
591 4,787,810
723 4,787,811
737 4,787,812
744.5 4,787,813
757 4,787,814

CLASS 415

164 4,787,815
168 4,787,816
174 4,787,817
219 C 4,787,818

CLASS 416

15 4,787,819
95 4,787,820
185 4,787,821

CLASS 417

2 4,787,822
45 4,787,823
54 4,787,824
63 4,787,825
203 4,787,826
234 4,787,827
271 4,787,828
353 4,787,829
462 4,787,830
500 4,787,832

CLASS 418

104 4,787,831

CLASS 420

075 4,788,034
420 4,788,035
448 4,788,036
534 4,788,037

CLASS 422

22 4,788,038
61 4,788,039
220 4,788,040
234 4,788,041
235 4,788,042
292 4,788,043

CLASS 423

62 4,788,044
85 4,788,045
122 4,788,046
244 4,788,047
261 4,788,048
344 4,788,049
447.2 4,788,050
579 4,788,051

CLASS 424

53 4,788,052
4,788,053
4,788,054
79 4,788,055
89 4,788,056
92 4,788,057
4,788,058
93 4,788,059
443 4,788,060
444 4,788,064
448 4,788,061
449 4,788,062
4,788,063

CLASS 425

126.1 4,787,833
145 4,787,834
150 4,787,835
190 4,787,836
385 4,787,837
393 4,787,838
406 4,787,839
549 4,787,840
556 4,787,841

CLASS 426

2 4,788,065
16 4,788,066
19 4,788,067
116 4,788,068
264 4,788,070
281 4,788,071
441 4,788,072
548 4,788,069
4,788,073
579 4,788,075

CLASS 427

27 4,788,076
34 4,788,077
38 4,788,078
166 4,788,079
204 4,788,080
212 4,788,081
248.1 4,788,082
340 4,788,083
343 4,788,084

CLASS 428

18 4,788,085
34.1 4,788,086
34.5 4,788,088
4,788,090
4,788,101
34.8 4,788,087
34.9 4,788,089
40 4,788,091
4,788,102
65 4,788,092
97 4,788,093
136 4,788,094
172 4,788,095
188 4,788,096
201 4,788,097
215 4,788,098
4,788,099
234 4,788,100
288 4,788,104
412 4,788,105
425.9 4,788,103
447 4,788,106
4,788,107
481 4,788,108
542.8 4,788,109

CLASS 429

19 4,788,110
27 4,788,111
54 4,788,112
139 4,788,113
217 4,788,114

CLASS 430

2 4,788,115
21 4,788,116
30 4,788,117
49 4,788,118
58 4,788,119
66 4,788,120
106 4,788,121
109 4,788,122
124 4,788,123
138 4,788,124
4,788,125
4,788,126
192 4,788,127
200 4,788,128
273 4,788,129
394 4,788,131
505 4,788,132
4,788,133
619 4,788,134

CLASS 432

72 4,787,842
91 4,787,843
242 4,787,844

CLASS 433

88 4,787,845
95 4,787,846
119 4,787,847
139 4,787,849
165 4,787,848
173 4,787,851
201.1 4,787,850

CLASS 434

328 4,787,852

CLASS 435

6 4,788,135
7 4,788,136
4,788,137
4,788,138
13 4,788,139
17 4,788,140
18 4,788,141
29 4,788,142
4,788,143
70 4,788,144
100 4,788,145
101 4,788,146
191 4,788,147
212 4,788,149
320 4,788,148

CLASS 436

2 4,788,151
45 4,788,150
69 4,788,152
97 4,788,153
180 4,788,154
501 4,788,155

CLASS 437

51 4,788,158
90 4,788,159
022 4,788,156
046 4,788,157
200 4,788,160
228 4,788,161

CLASS 439

55 4,787,853
67 4,787,854
92 4,787,855
152 4,787,856
189 4,787,857
268 4,787,866
350 4,787,858
352 4,787,859
358 4,787,860
482 4,787,861
502 4,787,862
557 4,787,863
595 4,787,864
614 4,787,865

CLASS 440

1 4,787,867
52 4,787,868
89 4,787,869
113 4,787,870

CLASS 441

61 4,787,871

CLASS 446

5 4,787,872
8 4,787,873
160 4,787,874
226 4,787,875
408 4,787,876

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	CLASS 449	242	4,788,194	130	4,788,238	113	4,788,281	115	4,788,322		4,788,365
1	4,787,108	252	4,788,195	271	4,788,239		**CLASS 540**	124	4,788,323	314	4,788,366
	CLASS 464		4,788,196	290	4,788,240	350	4,788,282	132	4,788,324	357	4,788,367
64	4,787,877	255	4,788,197	311	4,788,241		**CLASS 544**	174	4,788,325		4,788,368
83	4,787,878		4,788,198	459	4,788,242	82	4,788,283	205	4,788,326	408	4,788,369
	CLASS 474	259	4,788,199	469	4,788,244	139	4,788,284	220	4,788,327	415	4,788,370
49	4,787,879	267	4,788,200	503	4,788,243	144	4,788,285	222	4,788,328	443	4,788,371
	CLASS 493	285	4,788,202	518	4,788,245	191	4,788,286	330	4,788,329	500	4,788,372
213	4,787,880	291	4,788,203	547	4,788,247	196	4,788,287		**CLASS 562**	525	4,788,373
316	4,787,881	311	4,788,204	554	4,788,246	212	4,788,288	453	4,788,331	533	4,788,374
	CLASS 501	333	4,788,205		**CLASS 525**	336	4,788,289	465	4,788,360		4,788,375
5	4,788,162	346	4,788,206	66	4,788,248	357	4,788,290	493	4,788,330		4,788,376
17	4,788,163	365	4,788,207		4,788,249		**CLASS 548**	498	4,788,332	640	4,788,377
39	4,788,164		4,788,208	67	4,788,250	187	4,788,291	517	4,788,333	739	4,788,378
66	4,788,165	370	4,788,209		4,788,251	260	4,788,292	522	4,788,334	809	4,788,379
96	4,788,166	383	4,788,210		4,788,252	356	4,788,293		**CLASS 564**	820	4,788,380
98	4,788,167	392	4,788,211	83	4,788,253	544	4,788,294	279	4,788,335		**CLASS 600**
99	4,788,168	422	4,788,212	100	4,788,254	549	4,788,295	315	4,788,336	18	4,787,368
	CLASS 502	432	4,788,213	131	4,788,255		**CLASS 549**	457	4,788,339		**CLASS 604**
61	4,788,169	438	4,788,301	285	4,788,264	245	4,788,296		**CLASS 568**	4	4,787,882
152	4,788,170	456	4,788,214	326.8	4,788,256	285	4,788,297	1	4,788,340		4,787,883
155	4,788,171		4,788,215	403	4,788,257	289	4,788,298	315	4,788,341	8	4,787,884
167	4,788,172	468	4,788,216	414	4,788,258	300	4,788,299	350	4,788,342		4,787,885
204	4,788,173	469	4,788,217	420	4,788,259	419	4,788,300	355	4,788,343	9	4,787,886
324	4,788,174	510	4,788,218	423	4,788,260	458	4,788,302	376	4,788,337		4,787,887
342	4,788,175	523	4,788,219	452	4,788,261	466	4,788,305	387	4,788,338	20	4,787,888
401	4,788,176	557	4,788,220	457	4,788,262	525	4,788,303	487	4,788,347	22	4,787,889
	CLASS 512	661	4,788,130	463	4,788,263	549	4,788,304	614	4,788,344	128	4,787,890
20	4,788,177	808	4,788,221		**CLASS 526**		4,788,306	623	4,788,345	136	4,787,891
	CLASS 514		**CLASS 518**	64	4,788,265		**CLASS 556**	638	4,788,348	170	4,787,892
15	4,788,178	700	4,788,222	249	4,788,266	15	4,788,308	639	4,788,349	188	4,787,893
19	4,788,179		**CLASS 521**	287	4,788,267	412	4,788,309	677	4,788,350	319	4,787,894
26	4,788,180	32	4,788,223		**CLASS 528**	419	4,788,310	706	4,788,346	358	4,787,895
49	4,788,181	104	4,788,224	27	4,788,268	435	4,788,311	848	4,788,351	385.1	4,787,896
114	4,788,182	147	4,788,225	60	4,788,269		4,788,312		**CLASS 570**	389	4,787,897
166	4,788,183	184	4,788,226	77	4,788,270	442	4,788,313	153	4,788,352	411	4,787,898
183	4,788,184		**CLASS 523**	125	4,788,271		**CLASS 558**	203	4,788,353		**CLASS 623**
205	4,788,185	106	4,788,227	170	4,788,272				4,788,354	1	4,787,899
210	4,788,186	130	4,788,228	176	4,788,273	32	4,788,314		4,788,355		4,787,900
212	4,788,187	215	4,788,229		4,788,274	268	4,788,316		4,788,356	2	4,787,901
	4,788,188	219	4,788,230	179	4,788,275	319	4,788,317	226	4,788,357	6	4,787,902
221	4,788,189	334	4,788,231		4,788,276	335	4,788,318	241	4,788,358		4,787,903
227.8	4,788,190	351	4,788,232	215	4,788,277	430	4,788,315	243	4,788,359		4,787,904
230.8	4,788,191	400	4,788,233	370	4,788,278		**CLASS 560**		**CLASS 585**	7	4,787,905
233.5	4,788,192	402	4,788,234	392	4,788,279	54	4,788,320	10	4,788,361	16	4,787,906
237.8	4,788,193	451	4,788,235		**CLASS 536**	65	4,788,321	20	4,788,362	18	4,787,907
			CLASS 524	21	4,788,307	011	4,788,319	312	4,788,363	21	4,787,908
		55	4,788,236	104	4,788,280				4,788,364	23	4,787,909
			4,788,237								

CLASSIFICATION OF DESIGNS

D2—	29	298,680			298,697		566	298,714		331	298,732		12	298,747		92	298,764
	271	298,685		28	298,698		601	298,715		353	298,733		32	298,749	D21—	141	298,765
	314	298,681		104	298,699			298,716		356	298,734	D14—	59	298,750		150	298,766
		298,682	D5—	7	298,700	D7—	10	298,717		367	298,735		64	298,751		219	298,767
	320	298,683		53	298,701		13	298,718		387	298,737		100	298,752		253	298,768
	321	298,684			298,702		70	298,719		388	298,736		115	298,753	D22—	149	298,769
	617	298,686	D6—	328	298,703		101	298,720		395	298,738	D15—	9	298,754	D23—	314	298,770
D3—	18	298,687		356	298,704		140	298,721			298,739		69	298,755			298,771
		298,688		405	298,705		305	298,722	D9—	349	298,740		70	298,756		367	298,772
		298,689		451	298,706		309	298,723		415	298,741		145	298,757	D24—	17	298,773
		298,690		466	298,707	D8—	13	298,725			298,742		146	298,758		21	298,774
		298,691		491	298,708			298,726	D10—	62	298,743	D16—	32	298,759		41	298,775
		298,692		502	298,709		44	298,727	D12—	107	298,744		44	298,760		42	298,776
		298,693		531	298,710		51	298,728			298,745		136	298,761		45	298,777
		298,694		547	298,711		52	298,729		115	298,746	D19—	78	298,762	D27—	141	298,778
		298,695		551	298,712		70	298,730	D13—	6	298,748		82	298,763	D29—	11	298,779
		298,696		552	298,713		300	298,731									

CLASSIFICATION OF PLANTS

P.—	47	6,421		6,425		6,434		6,429			
	68	6,422		6,426		6,435		6,430		6,432	74 6,433
		6,424		6,427	69	6,428		6,431		6,436	86 6,423

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
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Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,787,203	4,787,637	4,788,515	12	4,787,146	4,787,703	4,787,193
	4,787,271	4,787,662	4,788,532		4,787,159	4,787,710	4,787,204
	4,787,555	4,787,663	4,788,538		4,787,205	4,787,759	4,787,487
04 :	4,787,495	4,787,678	4,788,548		4,787,212	4,787,767	4,787,809
	4,787,821	4,787,681	4,788,553		4,787,214	4,787,780	4,787,811
	4,787,873	4,787,699	4,788,554		4,787,334	4,787,793	4,787,845
	4,787,958	4,787,701	4,788,597		4,787,340	4,787,801	4,788,066
	4,788,053	4,787,713	4,788,640		4,787,362	4,787,837	4,788,550
	4,788,068	4,787,733	4,788,645		4,787,389	4,787,884	20	4,787,313
	4,788,416	4,787,739	4,788,682		4,787,408	4,787,892	4,787,526
	4,788,461	4,787,741	4,788,688		4,787,417	4,787,992	4,787,630
	4,788,527	4,787,747	4,788,705		4,787,439	4,787,999	4,787,731
	4,788,555	4,787,770	4,788,711		4,787,476	4,788,054	4,787,938
	4,788,605	4,787,813	08 :	4,787,273		4,787,520	4,788,060	4,788,013
05 :	4,787,109	4,787,830		4,787,361		4,787,538	4,788,075	4,788,059
	4,788,466	4,787,838		4,787,432		4,787,601	4,788,136	21	4,787,133
06 :	4,787,104	4,787,849		4,787,462		4,787,635	4,788,296	4,787,365
	4,787,118	4,787,859		4,787,772		4,787,677	4,788,371	4,787,792
	4,787,125	4,787,862		4,788,085		4,787,730	4,788,373	4,787,956
	4,787,138	4,787,876		4,788,465		4,787,751	4,788,407	4,788,398
	4,787,145	4,787,885	09	4,787,177		4,787,848	4,788,456	4,788,415
	4,787,148	4,787,889		4,787,192		4,787,857	4,788,471	22	4,787,102
	4,787,169	4,787,891		4,787,209		4,788,155	4,788,519	4,787,244
	4,787,239	4,787,904		4,787,211		4,788,230	4,788,524	4,787,315
	4,787,242	4,787,905		4,787,278		4,788,487	4,788,619	4,787,781
	4,787,274	4,787,907		4,787,311		4,788,716	4,787,968
	4,787,283	4,787,925		4,787,376	13 :	4,787,245	18	4,787,112	4,787,969
	4,787,291	4,787,942		4,787,387		4,787,325	4,787,173	23	4,787,236
	4,787,306	4,787,963		4,787,391		4,787,498	4,787,216	4,787,774
	4,787,348	4,787,971		4,787,510		4,787,706	4,787,267	24	4,787,128
	4,787,372	4,788,005		4,787,522		4,787,895	4,787,330	4,787,354
	4,787,373	4,788,020		4,787,757		4,787,989	4,787,528	4,787,460
	4,787,374	4,788,062		4,787,823		4,788,009	4,787,529	4,787,548
	4,787,404	4,788,109		4,787,888		4,788,069	4,787,606	4,787,822
	4,787,405	4,788,116		4,788,027		4,788,572	4,787,607	4,787,950
	4,787,406	4,788,129		4,788,067		4,788,675	4,787,608	4,787,952
	4,787,414	4,788,135		4,788,082	15 :	4,788,420	4,787,629	4,787,988
	4,787,445	4,788,138		4,788,110	17 :	Re.32,793	4,787,658	4,788,061
	4,787,450	4,788,156		4,788,198		4,787,101	4,787,670	4,788,181
	4,787,453	4,788,218		4,788,228		4,787,160	4,787,755	4,788,269
	4,787,457	4,788,268		4,788,241		4,787,174	4,787,818	4,788,656
	4,787,465	4,788,270		4,788,292		4,787,237	4,787,920	25	4,787,170
	4,787,470	4,788,309		4,788,303		4,787,316	4,788,077	4,787,252
	4,787,478	4,788,312		4,788,386		4,787,327	4,788,144	4,787,517
	4,787,500	4,788,404		4,788,462		4,787,352	4,788,263	4,787,546
	4,787,514	4,788,413		4,788,539		4,787,400	4,788,274	4,787,556
	4,787,551	4,788,419		4,788,557		4,787,425	4,788,275	4,787,560
	4,787,558	4,788,423		4,788,620		4,787,530	4,788,276	4,787,585
	4,787,584	4,788,428		4,788,621		4,787,640	4,788,301	4,787,591
	4,787,599	4,788,431	10	4,787,559		4,787,655	4,788,335	4,787,596
	4,787,613	4,788,439		4,788,333		4,787,661	4,788,452	4,787,686
	4,787,623	4,788,458		4,788,334		4,787,671	19	4,787,168	4,787,691
	4,787,626	4,788,467		4,788,427		4,787,692	4,787,178	4,787,696

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	4,787,729		4,325,211		4,788,370		4,787,402		4,787,505		4,787,524
	4,787,745	28	4,787,477		4,788,374		4,787,516		4,787,561		4,787,583
	4,787,843		4,787,544		4,788,375		4,787,586		4,787,587		4,787,642
	4,787,858		4,787,828		4,788,377		4,787,697		4,787,628		4,787,702
	4,787,879	29 :	4,787,132		4,788,378		4,787,704		4,787,656		4,787,722
	4,787,886		4,787,139		4,788,432		4,787,802		4,787,732		4,787,771
	4,787,900		4,787,301		4,788,450		4,787,949		4,787,831		4,787,778
	4,787,976		4,787,961		4,788,491		4,788,302		4,787,860		4,787,791
	4,788,046		4,787,980		4,788,516		4,788,383		4,787,864		4,787,810
	4,788,091		4,787,994		4,788,517		4,788,484		4,787,866		4,787,842
	4,788,137	30 :	4,787,472		4,788,657		4,788,650		4,787,898		4,787,855
	4,788,248	31 :	4,787,113		4,788,694	39 :	4,787,127		4,787,906		4,787,902
	4,788,249		4,787,878		4,788,710		4,787,130		4,787,934		4,787,983
	4,788,382		4,788,139		4,788,715		4,787,142		4,787,957		4,787,987
	4,788,388	32 :	4,787,519		4,788,718		4,787,150		4,788,021		4,788,158
	4,788,438	33 :	4,787,359		4,788,719		4,787,201		4,788,033		4,788,160
	4,788,449		4,787,625		4,788,721		4,787,253		4,788,049		4,788,289
	4,788,500		4,787,627	35 :	4,787,259		4,787,260		4,788,070		4,788,350
	4,788,511		4,787,941	36 :	4,787,100		4,787,270		4,788,107		4,788,352
	4,788,523		4,788,402		4,787,107		4,787,280		4,788,108		4,788,361
	4,788,634		4,788,426		4,787,126		4,787,289		4,788,117		4,788,367
	4,788,687		4,788,717		4,787,195		4,787,337		4,788,169		4,788,368
26 :	4,787,111	34 :	4,787,099		4,787,222		4,787,444		4,788,176		4,788,424
	4,787,151		4,787,110		4,787,247		4,787,486		4,788,187		4,788,433
	4,787,163		4,787,131		4,787,264		4,787,490		4,788,192		4,788,448
	4,787,185		4,787,167		4,787,307		4,787,531		4,788,193		4,788,512
	4,787,263		4,787,188		4,787,332		4,787,549		4,788,203		4,788,544
	4,787,275		4,787,298		4,787,369		4,787,659		4,788,223		4,788,628
	4,787,276		4,787,383		4,787,378		4,787,683		4,788,237		4,788,631
	4,787,288		4,787,384		4,787,442		4,787,750		4,788,255		4,788,659
	4,787,294		4,787,451		4,787,513		4,787,833		4,788,262		4,788,683
	4,787,302		4,787,525		4,787,542		4,787,844		4,788,288		4,788,708
	4,787,331		4,787,557		4,787,595		4,787,896		4,788,290	49 :	4,787,105
	4,787,343		4,787,580		4,787,639		4,787,918		4,788,304		4,787,380
	4,787,396		4,787,689		4,787,654		4,787,926		4,788,306		4,787,467
	4,787,403		4,787,693		4,787,687		4,787,935		4,788,372		4,787,899
	4,787,418		4,787,698		4,787,688		4,787,953		4,788,376		4,788,652
	4,787,421		4,787,714		4,787,727		4,787,964		4,788,488		4,788,695
	4,787,431		4,787,735		4,787,742		4,787,972		4,788,510	50 :	4,788,556
	4,787,483		4,787,738		4,787,752		4,787,984		4,788,635		4,788,629
	4,787,633		4,787,786		4,787,754		4,788,006		4,788,643	51 :	4,787,158
	4,787,634		4,787,825		4,787,765		4,788,008		4,788,646		4,787,339
	4,787,665		4,787,839		4,787,871		4,788,083		4,788,648		4,787,590
	4,787,666		4,787,852		4,787,875		4,788,111		4,788,693		4,787,631
	4,787,675		4,787,856		4,787,880		4,788,124		4,788,697		4,787,954
	4,787,679		4,787,865		4,787,919		4,788,125	44 :	4,787,523		4,788,271
	4,787,756		4,787,872		4,787,928		4,788,126		4,787,835		4,788,436
	4,787,776		4,787,916		4,787,946		4,788,173		4,788,172		4,788,509
	4,787,784		4,787,931		4,787,970		4,788,209	45 :	4,787,123		4,788,653
	4,787,799		4,787,937		4,787,974		4,788,229		4,787,624		4,788,701
	4,787,836		4,787,947		4,788,003		4,788,239		4,787,715	53 :	4,787,147
	4,787,932		4,787,967		4,788,024		4,788,245		4,787,827		4,787,165
	4,788,001		4,787,996		4,788,035		4,788,285		4,787,960		4,787,176
	4,788,313		4,788,007		4,788,051		4,788,317		4,788,026		4,787,322
	4,788,537		4,788,010		4,788,057		4,788,325		4,788,105		4,787,463
	4,788,593		4,788,040		4,788,073		4,788,328		4,788,493		4,787,540
	4,788,594		4,788,042		4,788,084		4,788,406		4,788,624		4,787,575
	4,788,630		4,788,052		4,788,123		4,788,441	47 :	4,787,464		4,787,576
	4,788,649		4,788,064		4,788,127		4,788,651		4,787,481		4,787,577
	4,647,994		4,788,075		4,788,131	40 :	4,787,180		4,787,653		4,787,589
27 :	Re.32,791		4,788,081		4,788,140		4,787,181		4,787,782		4,787,614
	4,787,117		4,788,096		4,788,153		4,787,335		4,787,914		4,787,779
	4,787,166		4,788,143		4,788,159		4,787,409		4,788,121		4,787,806
	4,787,197		4,788,146		4,788,162		4,787,433		4,788,298		4,787,847
	4,787,210		4,788,149		4,788,165		4,787,440		4,788,341		4,788,150
	4,787,215		4,788,151		4,788,170		4,787,447		4,788,355		4,788,401
	4,787,251		4,788,163		4,788,184		4,787,600		4,788,356		4,788,490
	4,787,398		4,788,164		4,788,189		4,787,726	48 :	4,787,129		4,788,505
	4,787,435		4,788,183		4,788,195		4,787,990		4,787,175		4,788,531
	4,787,461		4,788,190		4,788,251		4,788,019		4,787,194		4,788,558
	4,787,515		4,788,201		4,788,310		4,788,171		4,787,277		4,788,647
	4,787,768		4,788,206		4,788,329		4,788,232		4,787,297	54 :	4,787,945
	4,787,794		4,788,207		4,788,332		4,788,545		4,787,308		4,788,036
	4,787,894		4,788,211		4,788,336		4,788,676		4,787,321	55 :	4,787,121
	4,787,903		4,788,214		4,788,379	41 :	4,787,233		4,787,323		4,787,304
	4,787,923		4,788,220		4,788,380		4,787,564		4,787,338		4,787,397
	4,788,002		4,788,222		4,788,408		4,787,982		4,787,381		4,787,434
	4,788,088		4,788,236		4,788,475		4,788,390		4,787,419		4,787,547
	4,788,167		4,788,247		4,788,507		4,788,627		4,787,446		4,787,554
	4,788,235		4,788,258		4,788,543	42 :	4,787,196		4,787,448		4,787,632
	4,788,308		4,788,267		4,788,559		4,787,208		4,787,449		4,787,646
	4,788,339		4,788,280		4,788,586		4,787,240		4,787,452		4,787,753
	4,788,397		4,788,322		4,788,600		4,787,250		4,787,454		4,787,995
	4,788,411		4,788,337		4,788,632		4,787,420		4,787,455		4,788,243
	4,788,480		4,788,340		4,788,707		4,787,426		4,787,456		4,788,429
	4,788,520		4,788,364	37	4,787,179		4,787,459		4,787,458		4,788,633
	4,788,521		4,788,365		4,787,218		4,787,474		4,787,502		4,788,706
	4,788,612		4,788,366		4,787,336		4,787,504		4,787,512	56 :	4,787,915
	4,788,658		4,788,369		4,787,366						

04 :	298,733		298,776		298,716		298,695		298,764		298,748
06 :	298,707		298,777	26 :	298,767		298,696	37 :	298,684		298,769
	298,709	09 :	298,719	27 :	298,713		298,697		298,700	44 :	298,717
	298,711		298,740	29 :	298,687		298,703	39 :	298,756		298,721
	298,726	13 :	298,737		298,688		298,765	40 :	298,685	48 :	298,743
	298,730	15 :	298,763		298,689	34 :	298,754		298,686	49 :	298,739
	298,749	16 :	298,738		298,690	36 :	298,714	41 :	298,683	50 :	298,779
	298,768	17 :	298,757		298,691		298,729	42 :	298,704	55 :	298,701
	298,770	19 :	298,699		298,692		298,741		298,710		298,702
	298,771	25 :	298,681		298,693		298,742		298,734		298,705
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06 :	6,421		6,434								
39 :	6,427		6,435	41 :	6,422		6,424		6,425		6,426

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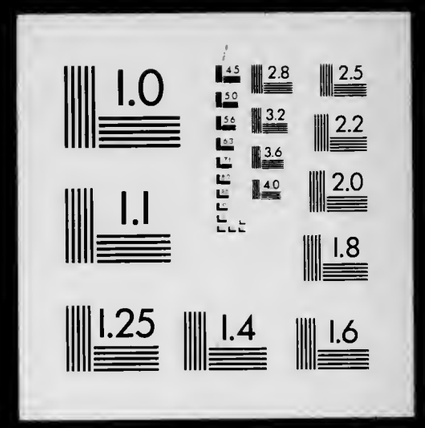
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